Nevada State Board of Equalization

Taxpayer Petition for DIRECT Appeal

If you have questions about this form or the appeal process, please call: (775) 684-2160.
Email completed form to: stateboard@tax.state.nv.us or Fax (775) 684-2020
Mail: State Board of Equalization, 3850 Arrowhead Dr., 2nd Floor, Carson City, NV, 89706

Please Print or Type:

Part A. PROPERTY OWNER AND PETITIONER INFORMATION

NAME OF PROPERTY OWNER AS IT APPEARS ON THE TAX ROLL:					
Eagle Shadow Mountain Solar, 325MK 8ME, LLC, C/O Arevon Energy					
NAME OF PETITIONER (IF DIFFERENT THAN PROPERTY OWNER)				TITLE	
Eric Huswick				Authorized Signatory	
MAILING ADDRESS OF PETITIONER (STREET ADDRESS OR P.O. BOX)				EMAIL ADDRESS:	
8800 Gainey Center Drive, Suite 100				ehuswick@arevonenergy.com	
CITY	STATE	ZIP CODE	DAYTIME PHONE	ALTERNATE PHONE	FAX NUMBER
Scottsdale	AZ	85258			

Part B. PROPERTY OWNER ENTITY DESCRIPTION

Check organization type which best describes the Property Owner if an entity and not a natural person. Natural persons may skip Part B.

☐ Sole Proprietorship ☐ Trust ☐ Corporation
■ Limited Liability Company (LLC) ☐ General or Limited Partnership ☐ Government or Governmental Agency
☐ Other, please describe: _____

The organization described above was formed under the laws of the State of Delaware.

The organization described above is a non-profit organization. ☐ Yes ■ No

Part C. RELATIONSHIP OF PETITIONER TO PROPERTY OWNER IN PART A

Check box which best describes the relationship of Petitioner to Property Owner: ☑ Additional information may be necessary.

☐ Self ☐ Trustee of Trust ■ Employee of Property Owner
☐ Co-owner, partner, managing member ☐ Officer of Company
☐ Employee or Officer of Management Company
☐ Employee, Officer, or Owner of Lessee of leasehold, possessory interest, or beneficial interest in real property
☐ Other, please describe: _____

Part D. PROPERTY IDENTIFICATION INFORMATION

1. Enter Physical Address of Property:

ADDRESS	STREET/ROAD	CITY (IF APPLICABLE)	COUNTY
			Clark

2. Enter Applicable APN or Account Number from assessment notice or tax bill:

ASSESSOR'S PARCEL NUMBER (APN)	ACCOUNT NUMBER	PROPERTY IDENTIFICATION NUMBER (PIN)-MINES
	229299	

3. Does this appeal involve multiple parcels? Yes ☐ No ■ *List multiple parcels on a separate, letter-sized sheet.*

If yes, enter number of parcels:		Multiple parcel list is attached. ☐

4. Check Property Type: ☑

☐ Vacant Land ☐ Mobile Home (Not on foundation) ☐ Mining Property
☐ Residential Property ■ Commercial Property ☐ Industrial Property
☐ Multi-Family Residential Property ☐ Agricultural Property ■ Personal Property
■ Possessory Interest in Real or Personal property

5. Check Year and Roll Type of Assessment being appealed: ☑

☐ 2024-2025 Secured Roll ☐ 2023-2024 Unsecured Roll ☐ 2023-2024 Supplemental Roll
☐ 2024-2025 Centrally-assessed Rol ☐ 2023-2024 Net Proceeds Roll

Other years being appealed: 2022/2023, 2023/2024, 2024/2025

Be prepared to cite the legal authority, if any, that permits the State Board to consider appeals of taxable value from prior years.

Part E. VALUE OF PROPERTY

	As established by County Assessor or Department of Taxation		Property Owner: *What is the value you seek? Write N/A on each line for values which are not being appealed.*	
Property Type	Taxable Value	Assessed Value	Taxable Value	Assessed value
Land				
Buildings				
Personal Property				
Possessory interest in real property				
Centrally-assessed properties				
Net Proceeds of Minerals				
Total	$321,558,863	$112,545,602	$0.00 (exempt)	

For Clerk Use Only:

Part F. TYPE OF APPEAL

Check box which best describes the authority of the State Board to take jurisdiction to hear the appeal.

- ☒ NRS 361.360(3): The value of real or personal property is being appealed, but the appeal could not be heard by a county board of equalization because the real or personal property was placed on the unsecured tax roll after December 15.
- ☐ NRS 361A.240(2)(b): The value of open-space property is being appealed, but the appeal could not be heard by a county board of equalization because the under-or-over valuation of open-space use assessment was placed on the unsecured tax roll after December 15.
- ☐ NRS 361A.273(2): This is an appeal of a determination that agricultural property has been converted to a higher use and for valuations for deferred tax years; the notice of conversion from the assessor was received after December 16 and before July 1.
- ☐ NRS 361.403: This is an appeal regarding the undervaluation, overvaluation or non-assessment of property by the Nevada Tax Commission (centrally-assessed utility, transportation or mine properties).
- ☐ NRS 362.135: This is an appeal of the certification of Net Proceeds of Minerals Tax by the Department of Taxation.
- ☐ This is an appeal of the denial of exemption of real or personal property by Department of Taxation
- ☐ Other reason, please describe. _____

Part G. ATTACH A STATEMENT DESCRIBING THE FACTS, REASONS AND STATUTORY BASIS RELIED UPON TO SUPPORT THE CLAIM, PURSUANT TO NAC 361.7012(6).

Part H. AUTHORIZATION OF AGENT

Complete this section only if an agent, including an attorney, has been appointed to represent the Property Owner/Petitioner in proceedings before the State Board.

I hereby authorize the agent whose name and contact information appears below to file a petition to the Nevada State Board of Equalization and to contest the value and/or exemption established for the properties named in Part D(2) of this Petition.

I further authorize the agent listed below to receive all notices and decision letters related thereto; and represent the Petitioner in all related hearings and matters including stipulations and withdrawals before the Nevada State Board of Equalization. This authorization is limited to the appeal of property valuation for the tax roll and fiscal year named in Part D(5) of this Petition.

List additional authorized agents on a separate sheet as needed, including printed name, contact information, signature, title and date.

Authorized Agent Contact Information:

NAME OF AUTHORIZED AGENT:			TITLE:		
Josh Hicks			Attorney - Partner		
AUTHORIZED AGENT COMPANY, IF APPLICABLE:			EMAIL ADDRESS:		
McDonald Carano			jhicks@mcdonaldcarano.com		
MAILING ADDRESS OF AUTHORIZED AGENT (STREET ADDRESS OR P.O. BOX)					
100 West Liberty Street, Tenth Floor					
CITY	STATE	ZIP CODE	DAYTIME PHONE	ALTERNATE PHONE	FAX NUMBER
Reno	NV	89501	775-788-2000		

I hereby accept appointment as the authorized agent of the Property Owner in proceedings before the State Board.

▶	Attorney - Partner	05/15/2025
Authorized Agent Signature	Title	Date

VERIFICATION

I verify (or declare) under penalty of perjury under the laws of the State of Nevada that the foregoing and all information hereon, including any accompanying statements or documents, is true, correct, and complete to the best of my knowledge and belief; and that I am either (1) the person who owns or controls taxable property, or possesses in its entirety taxable property, or the lessee or user of a leasehold interest, possessory interest, beneficial interest or beneficial use, pursuant to NRS 361.334; or (2) I am a person employed by the Property Owner or an affiliate of the Property Owner and I am acting within the scope of my employment. If Part H above is completed, I further certify I have authorized each agent named therein to represent the Property Owner as stated and I have the authority to appoint each agent named in Part H.

▶		
Petitioner Signature	Title	Date

Agent Signature required only if Petitioner did not sign certification and a separate Agent Authorization will be submitted.

I verify (or declare) under penalty of perjury under the laws of the State of Nevada that the foregoing and all information hereon, including any accompanying statements or documents, is true, correct, and complete to the best of my knowledge and belief; and I am the authorized agent with authority to petition the State Board subject to the requirements of NRS 361.362 and NAC 361.7018 and the limitations contained in the Agent Authorization Form 5105SBE to be separately submitted.

▶	Attorney - Partner	05/15/2025
Authorized Agent Signature	Title	Date

Form 5105SBE

Nevada State Board of Equalization

Agent Authorization Form

If you have questions about this form or the appeal process, please call: (775) 684-2160.
Email completed form to: stateboard@tax.state.nv.us or Fax (775) 684-2020
Mail: State Board of Equalization, 3850 Arrowhead Dr, Carson City, NV, 89706

Please Print or Type:

Part A. PROPERTY OWNER AND CONTACT INFORMATION OF PERSON GRANTING AUTHORITY TO AGENT

NAME OF PROPERTY OWNER AS IT APPEARS ON THE TAX ROLL:					
Eagle Shadow Mountain Solar, 325MK 8ME, LLC, C/O Arevon Energy					
NAME OF PERSON GRANTING AUTHORITY TO AGENT (IF DIFFERENT THAN PROPERTY OWNER LISTED IN PART A):				TITLE	
Eric Huswick				Authorized signatory	
MAILING ADDRESS OF PETITIONER (STREET ADDRESS OR P O BOX)				EMAIL ADDRESS:	
8800 Gainey Center Drive, Suite 100				ehuswick@arevonenergy.com	
CITY	STATE	ZIP CODE	DAYTIME PHONE	ALTERNATE PHONE	FAX NUMBER
Scottsdale	AZ	85258			

Part B. PROPERTY OWNER INFORMATION

Check organization type which best describes the Property Owner if not a natural person: ☑ ***Natural persons may skip Part B.***

☐ Sole Proprietorship ☐ Trust ☐ Corporation
■ Limited Liability Company (LLC) ☐ General or Limited Partnership ☐ Government or Governmental Agency
☐ Other, please describe: _____
The organization described above was formed under the laws of the State of Delaware.
The organization described above is a non-profit organization. ☐ Yes ■ No

Part C. RELATIONSHIP OF PERSON GRANTING AUTHORITY TO AGENT TO PROPERTY OWNER

Check box which best describes the relationship of Petitioner to Property Owner: ☑ ***Additional information may be necessary.***

☐ Self ☐ Trustee of Trust ☐ Employee of Property Owner
☐ Co-owner, partner, managing member ☐ Officer of Company
■ Employee or Officer of Management Company
☐ Employee, Officer, or Owner of Lessee of leasehold, possessory interest, or beneficial interest in real property
☐ Other, please describe: _____

Part D. PROPERTY SUBJECT TO THIS AGENT AUTHORIZATION:

Enter Applicable Number from assessment notice or tax bill:

ASSESSOR'S PARCEL NUMBER (APN)	ACCOUNT NUMBER	PROPERTY IDENTIFICATION NUMBER (PIN)-MINES
all property assessed to Eagle Shadow	including account #229299	

■ Multiple parcel list attached. (Use letter-size paper)

Part E. YEAR AND ROLL TYPE OF ASSESSMENT BEING APPEALED: ☑

☐ 2025-2026 Secured Roll ■ 2024-2025 Unsecured Roll ☐ 2024-2025 Supplemental Roll
☐ 2025-2026 Centrally-Assessed Roll ☐ 2024-2025 Net Proceeds Roll

Other years being appealed: 2022-23 and 2023-24
Be prepared to cite the legal authority, if any, that permits the State Board to consider appeals of taxable value from prior years.

For clerk use only

Attachment to Taxpayer Petition for Direct Appeal

Part G. Statement Describing The Facts and Reasons for Appeal

This is submitted in support of the appeal filed by Eagle Shadow Mountain Solar, 325MK 8ME, LLC, c/o Arevon Energy ("Arevon"), Account #229299.

This appeal covers tax years 2022/2023, 2023/2024, and 2024/2025, all of which were billed by Clark County on or about April 9, 2025.

Arevon's property consists of a renewable energy generation facility located on tribal land in Clark County Nevada. The Assessor's office issued an Unsecured Property Tax Bill for "Miscellaneous Personal Property" with an assessed valuation of $112,545,602.

This letter will be supplemented with additional information and evidence, but in sum, Arevon's position is as follows.

First, Arevon believes the property at issue should be classified as an improvement to real property, not as personal property. The determination of whether an item is personal property or is part of the real estate depends on the facts of the case. Arevon intends to present evidence demonstrating that the improvements are physically annexed, constructively annexed and intended to be improvements to real property. Importantly, Arevon remits a payment in lieu of tax (which functions similarly to a real property tax) to the Moapa Band of Paiutes. This demonstrates the intent of the parties to treat the property as an improvement to real property.

Second, uniformity and equality of assessments depend on proper classification. The Nevada Department of Taxation has a longstanding position that similar renewable energy projects should be classified as improvements to real property and other renewable energy projects throughout Nevada are, in fact, classified as improvements to real property. Assessors are required to assess similar projects in a uniform and equal manner. Here, the failure to do so is a violation of Arevon's right to uniform and equal treatment.

Third, if properties with identical use and a comparable location are not assessed in a similar manner, the State Board is authorized to equalize the assessments. Here, Arevon's project has been assessed while similar projects located on tribal land have not been assessed in the same manner.

Fourth, the taxable value assessed against Arevon exceeds the full cash value of the property. Taxable value set by the assessor was determined using a cost approach, without an adjustment for obsolescence. Here, the Investment Tax Credit can serve as a measure of obsolescence. In addition, Arevon will present evidence of the full cash value of the property using an income approach.

Finally, once Arevon's property is appropriately classified as an improvement to real property and its value lowered to its full cash value, the property should be considered exempt from Nevada property tax under both state and federal law.

As stated above, Arevon will submit additional information and evidence to support these positions.

UNSECURED PROPERTY TAX BILL - SPECIAL USE PROPERTY

Clark County

Briana Johnson, Clark County Assessor

500 S. Grand Central Pkwy., 2nd Floor, Las Vegas, NV 89155

www.ClarkCountyNV.gov/Assessor

togetherforbetter

Bill No.: 1540061
Date: 04/09/2025
Phone: (702) 455-3882

Fiscal Year	Account	Tax District	Tax Rate	Property Location and Description
2024/2025	229299	100	2.5017	MOAPA SOLAR RD MOAPA
Assessed Valuation				
Property Value			112,545,602	Miscellaneous Personal Property

Name	Exemption Values	
EAGLE SHADOW MOUNTAIN SOLAR 325MK 8ME, LLC C/O AREVON ENERGY 8800 GAINEY CENTER DR SUITE 100 SCOTTSDALE AZ 85258-2193	Renewable Energy 701A.360	61,900,081
	Total Exemption	61,900,081

Sale or disposal of this property after July 1, 2024 does not relieve the obligation to pay this tax.

Property Value Ad Valorem Tax	2,248,770.40
Abatement Amount	0.00
***Abatement Applied Limits Increase To 8.00%**	
Net Ad Valorem Tax	2,248,770.40
New Property Value Outside CAP	566,782.92
Adjusted Tax Amount	0.00
Exemption Amount	-1,548,554.34
Recapture Amount	0.00
Net Tax Amount	**1,266,998.98**
Penalties	**0.00**
Miscellaneous Fees	0.00
Veteran's Home Donation	0.00
Total Amount Billed	**1,266,998.98**
Less Payments Applied	**0.00**
Balance Remaining	**1,266,998.98**
Prior Year Delinquencies	**2,267,106.40**
Total Balance Owing	**$3,534,105.38**

Detail of Amount Due

Description	Total Due	Minimum Due
Tax Year 2024/2025	1,266,998.98	1,266,998.98
Tax Year 2023/2024	1,118,437.88	1,118,437.88
Tax Year 2022/2023	1,148,668.52	1,148,668.52
Total	3,534,105.38	3,534,105.38

Payments received will be applied to the oldest charge first.
To avoid penalties, payments must be postmarked by due date.
Penalties are 10% of the tax amount due.

All delinquent amounts are due immediately.

If property is protected by bankruptcy, this is for your information. Do not consider this an attempt to collect.

Current Year Tax Distribution

Agency	Rate	Amount
Clark County Capital	0.0500	25,322.77
Clark County Family Court	0.0192	9,723.93
Clark County General Operating	0.4599	232,918.75
County School Debt (Bonds)	0.5534	280,272.31
State Education	0.7500	379,841.41
Indigent Accident Fund	0.0150	7,596.83
LV/Clark County Library	0.0942	47,708.08
LVMPD Manpower Supplement County	0.2800	141,807.45
Medical Asst to Indigent Persons	0.1000	50,645.52
State Cooperative Extension	0.0100	5,064.55
State of Nevada	0.1700	86,097.38
Totals	2.5017	1,266,998.98

Payment Installment(s)

Description	Due Date	Amount Due
Installment 1	05/09/2025	1,266,998.98
Installment 2		0.00
Installment 3		0.00
Installment 4		0.00

Form 5105SBE

Part F. AUTHORIZATION OF AGENT

I hereby authorize the agent whose name and contact information appears below to file a petition to the Nevada State Board of Equalization and to contest the value and/or exemption established for the properties named in Part D of this Agent Authorization.

I further authorize the agent listed below to receive all notices and decision letters related thereto; and represent the Petitioner in all related hearings and matters including stipulations and withdrawals before the Nevada State Board of Equalization. This authorization is limited to the appeal of property valuation for the tax roll and fiscal year named in Part E of this document.

List additional authorized agents on a separate sheet as needed, including printed name, contact information, signature, title and date.

Authorized Agent Contact Information:

NAME OF AUTHORIZED AGENT:			TITLE:		
Josh Hicks			Attorney - Partner		
AUTHORIZED AGENT COMPANY, IF APPLICABLE:			EMAIL ADDRESS:		
McDonald Carano			jhicks@mcdonaldcarano.com		
MAILING ADDRESS OF AUTHORIZED AGENT (STREET ADDRESS OR P.O. BOX)					
100 West Liberty Street, Tenth Floor					
CITY	STATE	ZIP CODE	DAYTIME PHONE	ALTERNATE PHONE	FAX NUMBER
Reno	NV	89501	775-788-2000		

I hereby accept appointment as the authorized agent of the Property Owner in proceedings before the State Board.

▶ _____ Attorney- Partner 5/14/2025

Authorized Agent Signature | Title | Date

Authorized Agent Contact Information:

NAME OF AUTHORIZED AGENT:			TITLE:		
Zach Besso			Attorney - Associate		
AUTHORIZED AGENT COMPANY, IF APPLICABLE:			EMAIL ADDRESS:		
McDonald Carano			zbesso@mcdonaldcarano.com		
MAILING ADDRESS OF AUTHORIZED AGENT (STREET ADDRESS OR P.O BOX)					
100 West Liberty Street, 10th Floor					
CITY	STATE	ZIP CODE	DAYTIME PHONE	ALTERNATE PHONE	FAX NUMBER
Reno	NV	89501	775-326-4318		

I hereby accept appointment as the authorized agent of the Property Owner in proceedings before the State Board.

▶ _____ Attorney - Associate 5/14/2025

Authorized Agent Signature | Title | Date

VERIFICATION

I verify (or declare) under penalty of perjury under the laws of the State of Nevada that the foregoing and all information hereon, including any accompanying statements or documents, is true, correct, and complete to the best of my knowledge and belief; and that I am either (1) the person who owns or controls taxable property, or possesses in its entirety taxable property, or the lessee or user of a leasehold interest, possessory interest, beneficial interest or beneficial use, pursuant to NRS 361.334; or (2) I am a person employed by the Property Owner or an affiliate of the Property Owner and I am acting within the scope of my employment. I further certify I have authorized each agent named herein to represent the Property Owner as stated and I have the authority to appoint each agent named herein.

▶ _____ Authorized Signatory 5/14/2025

Property Owner / Petitioner Signature | Title | Date

PERSONAL PROPERTY BILLING INFORMATION

If you need an explanation of the method of appraisal of this property, please call (702) 455-3882. If you disagree with the value of this property, you have rights to an appeal pursuant to NRS 361.355(2) or NRS 361.360(3). Property placed on the unsecured roll assessed between May 1 and December 15 may be appealed on or before the following January 15 to the County Board of Equalization. If the property is assessed after December 15, but before or on the following April 30, an appeal may be filed on or before May 15 to the State Board of Equalization. Please contact our office to obtain information on how to file an appeal. To avoid penalties, this bill must be paid when due, even if an appeal is pending.

Payment Installments for a Manufactured Home

NRS 361.483 allows for taxes assessed upon a manufactured home to be paid in four installments if the taxes assessed exceed $100.00. If the taxes assessed are **$100.00 or less, taxes assessed must be paid in one installment.**

Change in Ownership of Manufactured Home

In order to change ownership on your manufactured home record, transfer documentation such as a title or a notarized bill of sale is required. A contract of sale or property deed is not acceptable.

Nevada Veteran, Disabled Veteran, Surviving Spouse & Blind Exemptions

If you have signed for your exemption with the Assessor's Office by June 15 of this year, your exemption has been deducted prior to the calculation of this tax bill.

If you have not renewed your exemption this year, you must do so before any deduction can be allowed.

Non-resident military personnel in active service need only to return their manufactured home bill with the SCR form from their commanding officer confirming home of record.

Payment by Credit Card, Debit Card or E-Check

For your convenience, property tax payments can be made online at www.ClarkCountyNV.gov/Assessor or by calling 1-833-230-2596. A convenience fee, charged by the processing company, will be assessed for these transactions.

Chali Spurlock

From: Zach D Besso <zbesso@mcdonaldcarano.com>
Sent: Thursday, May 15, 2025 4:54 PM
To: State Board Equalization
Cc: Joshua J. Hicks; Paul D. Bancroft
Subject: Eagle Shadow Mountain Solar - Appeal - Account #229299
Attachments: Eagle Shadow Mountain - LGS-F029-Taxpayer-Direct-Appeal - FINAL.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

WARNING - This email originated from outside the State of Nevada. Exercise caution when opening attachments or clicking links, especially from unknown senders.

Hello,

Please find the attached Appeal for Eagle Shadow Mountain Solar. This Appeal is for Account #229299. Please confirm receipt of this Appeal.

Thank you,
Zach Besso

Zach Besso | Attorney

100 West Liberty Street | Tenth Floor
Reno, NV 89501
P: 775.788.2000 | **D:** 775.326.4318
vCard

State Law Resources

PERSONAL AND CONFIDENTIAL: This message originates from the law firm of McDonald Carano LLP. This message and any file(s) or attachment(s) transmitted with it are confidential, intended only for the named recipient, and may contain information that is a trade secret, proprietary, protected by the attorney work product doctrine, subject to the attorney-client privilege, or is otherwise protected against unauthorized use or disclosure. This message and any file(s) or attachment(s) transmitted with it are transmitted based on a reasonable expectation of privacy consistent with ABA Formal Opinion No. 99-413. Any disclosure, distribution, copying, or use of this information by anyone other than the intended recipient, regardless of address or routing, is strictly prohibited. If you receive this message in error, please advise the sender by immediate reply and delete the original message. Personal messages express only the view of the sender and are not attributable to McDonald Carano LLP.

RECEIVED
May 15, 2025
STATE OF NEVADA
DEPARTMENT OF TAXATION

Form 5101SBE

Nevada State Board of Equalization
Taxpayer Petition for Appeal from the Decision of the County Board of Equalization

If you have questions about this form or the appeal process, please call: (775) 684-2160.
Email completed form to: stateboard@tax.state.nv.us or Fax (775) 684-2020 EMAIL or FAX by 5:00 p.m. March 10, 2025
Mail: State Board of Equalization, 3850 Arrowhead Dr, Carson City, NV, 89706 POSTMARK by 5:00 p.m. March 10, 2025

Please Print or Type:

Part A. PROPERTY OWNER AND PETITIONER INFORMATION

NAME OF PROPERTY OWNER AS IT APPEARS ON THE TAX ROLL					
EAGLE SHADOW MOUNTAIN SOLAR, 325MK 8ME, LLC C/O AREVON ENERGY					
NAME OF PETITIONER (IF DIFFERENT THAN PROPERTY OWNER LISTED IN PART A)				TITLE	
MAILING ADDRESS OF PETITIONER (STREET ADDRESS OR P.O. BOX)				EMAIL ADDRESS	
8800 N GAINEY CENTER DR., STE 100				Indirect-Tax@arevonenergy.com	
CITY	STATE	ZIP CODE	DAYTIME PHONE	ALTERNATE PHONE	FAX NUMBER
SCOTTSDALE	AZ	85258	480-789-3798		

Part B. PROPERTY OWNER ENTITY DESCRIPTION

Check organization type which best describes the Property Owner if an entity and not a natural person. Natural persons may skip Part B.

☐ Sole Proprietorship ☐ Trust ☐ Corporation
☒ Limited Liability Company (LLC) ☐ General or Limited Partnership ☐ Government or Governmental Agency
☐ Other, please describe: _____

The organization described above was formed under the laws of the State of _____.
The organization described above is a non-profit organization. ☐ Yes ☒ No

Part C. RELATIONSHIP OF PETITIONER TO PROPERTY OWNER IN PART A

Check box which best describes the relationship of Petitioner to Property Owner: ☑ Additional information may be necessary.

☐ Self ☐ Trustee of Trust ☐ Employee of Property Owner
☐ Co-owner, partner, managing member ☐ Officer of Company
☒ Employee or Officer of Management Company
☐ Employee, Officer, or Owner of Lessee of leasehold, possessory interest, or beneficial interest in real property
☐ Other, please describe: _____

Part D. PROPERTY IDENTIFICATION INFORMATION

1. Enter Physical Address of Property:

ADDRESS	STREET/ROAD	CITY (IF APPLICABLE)	COUNTY
	MOAPA SOLAR RD	MOAPA	CLARK

2. Enter Applicable APN or Account Number from assessment notice or taxbill:

ASSESSOR'S PARCEL NUMBER (APN)	ACCOUNT NUMBER
	229299

3. Does this appeal involve multiple parcels? Yes ☐ No ☒ *List multiple parcels on a separate, letter-sized sheet.*

If yes, enter number of parcels:		Multiple parcel list is attached. ☐

4. Check Property Use Type: ☑

☐ Vacant Land ☐ Mobile Home (Not on foundation) ☐ Mining Property
☐ Residential Property ☒ Commercial Property ☐ Industrial Property
☐ Multi-Family Residential Property ☐ Agricultural Property ☐ Personal Property
☐ Possessory Interest in Real or Personal property

5. Check Year and Roll Type of Assessment being appealed: ☑

☐ 2025-2026 Secured Roll ☒ 2024-2025 Unsecured Roll ☐ 2024-2025 Supplemental Roll
☐ 2025-2026 Centrally-assessed Roll ☐ 2024-2025 Net Proceeds Roll

Other years being appealed: 2022/2023, 2023/2024 Unsecured Roll
Be prepared to cite the legal authority, if any, that permits the State Board to consider appeals of taxable value from prior years.

Part E. VALUE OF PROPERTY

	As established by County Board of Equalization		Property Owner: *What is the value you seek? Write N/A on each line for values which are not being appealed.*	
Property Type	Taxable Value	Assessed Value	Taxable Value	Assessed value
Land			N/A	N/A
Buildings			311,995,347	109,198,371
Personal Property			242,378	84,832
Total			312,237,725	109,283,204

For Clerk Use Only
25-155

Form 5101SBE

Part F. TYPE OF APPEAL

Check box which best describes the authority of the State Board to take jurisdiction to hear the appeal.

☒ NRS 361.360(1); NRS 361.400(2): The value of real or personal property is being appealed; the Petitioner is aggrieved at the action of the County Board or the failure of the County Board to equalize resulting in overvaluation of property or undervaluation or non-assessment of other property.

☐ NRS 361A.240(2)(b): The under-or-over valuation of open-space use property is being appealed

☐ NRS 361A.273(1): This is an appeal of a determination that agricultural property has been converted to a higher use and for valuations for deferred tax years; the notice of conversion from the assessor was received after July 1 and before December 16 and the appeal was heard by the County Board.

☐ NRS 361.360(1); NAC 361.747(2)(c): The property was denied an exemption that is allowed by law. If so, describe the applicable exemption:

☒ Other reason, please describe. ASSESSED PROPERTY TYPE APPEAL (REAL V. PERSONAL)

Part G. ATTACH A BRIEF STATEMENT OR LETTER DESCRIBING THE ISSUES AND CONTENTIONS IN THIS APPEAL.

Part H. COUNTY APPEAL INFORMATION

County in which appeal was heard:	County Case Number:	Date Heard by County:

VERIFICATION

I verify (or declare) under penalty of perjury under the laws of the State of Nevada that the foregoing and all information hereon, including any accompanying statements or documents, is true, correct, and complete to the best of my knowledge and belief; and that I am either (1) the person who owns or controls taxable property, or possesses in its entirety taxable property, or the lessee or user of a leasehold interest, possessory interest, beneficial interest or beneficial use, pursuant to NRS 361.334; or (2) I am a person employed by the Property Owner or an affiliate of the Property Owner and I am acting within the scope of my employment. If Part I below is completed, I further certify I have authorized each agent named therein to represent the Property Owner as stated and I have the authority to appoint each agent named in Part I.

▶ Eric Huswick — AUTHORIZED SIGNATORY

Petitioner Signature — Title

ERIC HUSWICK — 5/15/2025

Print Name of Signatory — Date

Part I. AUTHORIZATION OF AGENT

Complete this section only if an agent, including an attorney, has been appointed to represent the Property Owner/Petitioner in proceedings before the State Board. List additional authorized agents on a separate sheet as needed, including printed name, contact information, signature, title and date.

I hereby authorize the agent whose name and contact information appears below to file a petition to the Nevada State Board of Equalization and to contest the value and/or exemption established for the properties named in Part D(2) of this Petition. I further authorize the agent listed below to receive all notices and decision letters related thereto; and represent the Petitioner in all related hearings and matters including stipulations and withdrawals before the Nevada State Board of Equalization. This authorization is limited to the appeal of property valuation for the tax roll and fiscal year named in Part D(5) of this Petition.

Authorized Agent Contact Information:

NAME OF AUTHORIZED AGENT:			TITLE:		
SEE ATTACHED AGENT AUTHORIZATION FORM					
AUTHORIZED AGENT COMPANY, IF APPLICABLE:			EMAIL ADDRESS:		
MAILING ADDRESS OF AUTHORIZED AGENT (STREET ADDRESS OR P O BOX)					
CITY	STATE	ZIP CODE	DAYTIME PHONE	ALTERNATE PHONE	FAX NUMBER

Authorized Agent must check each applicable statement and sign below.

☐ **I hereby accept appointment as the authorized agent of the Property Owner in proceedings before the County Board.**

☐ **I verify (or declare) under penalty of perjury under the laws of the State of Nevada that the foregoing and all information hereon, including any accompanying statements or documents, is true, correct, and complete to the best of my knowledge and belief; and I am the authorized agent with authority to petition the State Board subject to the requirements of NRS 361.362 and the limitations contained in the Agent Authorization Form to be separately submitted.**

▶ Authorized Agent Signature — Title

Print Name of Signatory — Date

Form 5105SBE

Nevada State Board of Equalization

Agent Authorization Form

If you have questions about this form or the appeal process, please call: (775) 684-2160.
Email completed form to: stateboard@tax.state.nv.us or Fax (775) 684-2020
Mail: State Board of Equalization, 3850 Arrowhead Dr, Carson City, NV, 89706

Please Print or Type:

Part A. PROPERTY OWNER AND CONTACT INFORMATION OF PERSON GRANTING AUTHORITY TO AGENT

NAME OF PROPERTY OWNER AS IT APPEARS ON THE TAX ROLL:					
Eagle Shadow Mountain Solar, 325MK 8ME, LLC, C/O Arevon Energy					
NAME OF PERSON GRANTING AUTHORITY TO AGENT (IF DIFFERENT THAN PROPERTY OWNER LISTED IN PART A):				TITLE	
Eric Huswick				Authorized signatory	
MAILING ADDRESS OF PETITIONER (STREET ADDRESS OR P.O. BOX)				EMAIL ADDRESS:	
8800 Gainey Center Drive, Suite 100				ehuswick@arevonenergy.com	
CITY	STATE	ZIP CODE	DAYTIME PHONE	ALTERNATE PHONE	FAX NUMBER
Scottsdale	AZ	85258			

Part B. PROPERTY OWNER INFORMATION

Check organization type which best describes the Property Owner if not a natural person: ☑ ***Natural persons may skip Part B.***

☐ Sole Proprietorship ☐ Trust ☐ Corporation
■ Limited Liability Company (LLC) ☐ General or Limited Partnership ☐ Government or Governmental Agency
☐ Other, please describe: _____

The organization described above was formed under the laws of the State of Delaware.
The organization described above is a non-profit organization. ☐ Yes ■ No

Part C. RELATIONSHIP OF PERSON GRANTING AUTHORITY TO AGENT TO PROPERTY OWNER

Check box which best describes the relationship of Petitioner to Property Owner: ☑ ***Additional information may be necessary.***

☐ Self ☐ Trustee of Trust ☐ Employee of Property Owner
☐ Co-owner, partner, managing member ☐ Officer of Company
■ Employee or Officer of Management Company
☐ Employee, Officer, or Owner of Lessee of leasehold, possessory interest, or beneficial interest in real property
☐ Other, please describe: _____

Part D. PROPERTY SUBJECT TO THIS AGENT AUTHORIZATION:

Enter Applicable Number from assessment notice or tax bill:

ASSESSOR'S PARCEL NUMBER (APN)	ACCOUNT NUMBER	PROPERTY IDENTIFICATION NUMBER (PIN)-MINES
all property assessed to Eagle Shadow	including account #229299	

■ Multiple parcel list attached. (Use letter-size paper)

Part E. YEAR AND ROLL TYPE OF ASSESSMENT BEING APPEALED: ☑

☐ 2025-2026 Secured Roll ■ 2024-2025 Unsecured Roll ☐ 2024-2025 Supplemental Roll
☐ 2025-2026 Centrally-Assessed Roll ☐ 2024-2025 Net Proceeds Roll

Other years being appealed: 2022-23 and 2023-24
Be prepared to cite the legal authority, if any, that permits the State Board to consider appeals of taxable value from prior years.

For clerk use only

Form 5105SBE

Part F. AUTHORIZATION OF AGENT

I hereby authorize the agent whose name and contact information appears below to file a petition to the Nevada State Board of Equalization and to contest the value and/or exemption established for the properties named in Part D of this Agent Authorization.

I further authorize the agent listed below to receive all notices and decision letters related thereto; and represent the Petitioner in all related hearings and matters including stipulations and withdrawals before the Nevada State Board of Equalization. This authorization is limited to the appeal of property valuation for the tax roll and fiscal year named in Part E of this document.

List additional authorized agents on a separate sheet as needed, including printed name, contact information, signature, title and date.

Authorized Agent Contact Information:

NAME OF AUTHORIZED AGENT:			TITLE:		
Josh Hicks			Attorney - Partner		
AUTHORIZED AGENT COMPANY, IF APPLICABLE:			EMAIL ADDRESS:		
McDonald Carano			jhicks@mcdonaldcarano.com		
MAILING ADDRESS OF AUTHORIZED AGENT (STREET ADDRESS OR P.O. BOX)					
100 West Liberty Street, Tenth Floor					
CITY	STATE	ZIP CODE	DAYTIME PHONE	ALTERNATE PHONE	FAX NUMBER
Reno	NV	89501	775-788-2000		

I hereby accept appointment as the authorized agent of the Property Owner in proceedings before the State Board.

▶ _____ Attorney- Partner 5/14/2025

Authorized Agent Signature | Title | Date

Authorized Agent Contact Information:

NAME OF AUTHORIZED AGENT:			TITLE:		
Zach Besso			Attorney - Associate		
AUTHORIZED AGENT COMPANY, IF APPLICABLE:			EMAIL ADDRESS:		
McDonald Carano			zbesso@mcdonaldcarano.com		
MAILING ADDRESS OF AUTHORIZED AGENT (STREET ADDRESS OR P.O BOX)					
100 West Liberty Street, 10th Floor					
CITY	STATE	ZIP CODE	DAYTIME PHONE	ALTERNATE PHONE	FAX NUMBER
Reno	NV	89501	775-326-4318		

I hereby accept appointment as the authorized agent of the Property Owner in proceedings before the State Board.

▶ _____ Attorney - Associate 5/14/2025

Authorized Agent Signature | Title | Date

VERIFICATION

I verify (or declare) under penalty of perjury under the laws of the State of Nevada that the foregoing and all information hereon, including any accompanying statements or documents, is true, correct, and complete to the best of my knowledge and belief; and that I am either (1) the person who owns or controls taxable property, or possesses in its entirety taxable property, or the lessee or user of a leasehold interest, possessory interest, beneficial interest or beneficial use, pursuant to NRS 361.334; or (2) I am a person employed by the Property Owner or an affiliate of the Property Owner and I am acting within the scope of my employment. I further certify I have authorized each agent named herein to represent the Property Owner as stated and I have the authority to appoint each agent namedherein.

▶ _____ Authorized Signatory 5/14/2025

Property Owner / Petitioner Signature | Title | Date

From:	Chris Clark
To:	State Board Equalization
Cc:	James Bergstrom
Subject:	Nevada BOE Appeal
Date:	Thursday, May 15, 2025 10:42:15 AM
Attachments:	image001.png ESM State Appeal Form - signed.pdf

WARNING - This email originated from outside the State of Nevada. Exercise caution when opening attachments or clicking links, especially from unknown senders.

Good Morning,

Please see the attached appeal application for your records.

Thank you,

CHRISTOPHER CLARK
Manager, State and Local Tax

office (480) 879-3798

AREVON.

Notice: This message and any attachments are intended exclusively for the individual or entity to which they are addressed. This communication may contain information that is proprietary, privileged or confidential or otherwise legally exempt from disclosure. If you are not the named addressee, you are not authorized to read, print, retain, copy or disseminate this message or any part of it. If you have received this message in error, please notify the sender immediately by e-mail and delete all copies of the message.

COUNTY RECORD

SBE NOTICE OF HEARING

JOE LOMBARDO
Governor

STATE OF NEVADA
STATE BOARD OF EQUALIZATION
3850 Arrowhead Drive, Second Floor
Carson City, Nevada 89706
Telephone (775) 684-2160
Fax (775) 684-2020

SHELLIE HUGHES
Secretary

September 3, 2025

NOTICE OF HEARING

PETITIONER:
EAGLE SHADOW MOUNTAIN SOLAR 325K MK 8 ME LLC
C/O AREVON ENERGY
ATTN: ERIC HUSWICK
8800 GAINEY CENTER DRIVE, SUITE 100
SCOTTSDALE, AZ 85258

CERTIFIED MAIL – 9489 0090 0027 6613 7915 84
RESPONDENT:
BRIANA JOHNSON
CLARK COUNTY ASSESSOR
500 S GRAND CENTRAL PARKWAY 2ND FLOOR
LAS VEGAS NV 89155-1401

DATE/ TIME: **September 29, 2025 at 9:30 AM**
September 30, 2025 at 9:00 AM
October 1, 2025 at 9:00 AM

PLACE: **Nevada Department of Taxation**
700 E Warm Springs Road, Room 150
Las Vegas, Nevada 89119

Nevada Department of Taxation
9850 Double R Blvd.
Reno, Nevada 89521

ZOOM OPTION:
https://us02web.zoom.us/j/82951348384
Or Telephone:
US:+1 669 900 9128 or +1 253 215 8782 or +1 346 248 7799 or +1 646 558 8656 or +1 301 715 8592 or +1 312 626 6799
Webinar ID: 829 5134 8384

Hearings begin on the first day. It is each taxpayer's or his representative's responsibility to be present when the case is called.

LEGAL AUTHORITY AND JURISDICTION OF THE STATE BOARD OF EQUALIZATION: NRS 361.360 (3)

BRIEF STATEMENT OF MATTER: Appeal from the action of the Clark County Assessor taken pursuant to NRS 361.260 – Unsecured Roll – Personal Property

Case No: **25-155** **Parcel No:** **Acct #229299**

The State Board of Equalization (State Board) will hear the Petitioner's appeal at the time and place stated above. Please be aware that the time is approximate and although you may be assured the appeal will not be heard prior to the stated time, be prepared for possible delays as several appeals are scheduled at the same time. If the taxpayer or his representative is not present when his hearing is called, the State Board will invoke the requirements of NRS 361.385 and NAC 361.708(4). The State Board may (a) proceed with the hearing; (b) dismiss the proceeding with or without prejudice; or (c) recess the hearing for a period to be set by the State Board to enable the party to attend.

Please be aware the State Board will limit its consideration to the issues and contentions set forth in the petition. Other issues may be heard if the requirements of NAC 361.745 are met.

Information regarding the rules of practice and procedure before the State Board are on the attached information sheet.

In compliance with the Americans with Disabilities Act, individuals needing special accommodations during this hearing should notify the Department at least 3 days before the hearing. In order to comply with the security procedures of the Department, you will be required to show identification and sign a visitor's log prior to entering the hearing room.

If you need an accommodation in order to communicate during the hearing, the Department will provide one at no cost to you. Arrangements for an interpreter should be made as soon as possible, but no later than 14 days before the scheduled meeting. Please contact Kari Skalsky at 775-684-2160 at least 14 days in advance to request an interpreter in your preferred language. You may also submit your request through stateboard@tax.state.nv.us.

Si necesita una ayuda para comunicarse durante la audiencia, el Departamento se lo proporcionará sin costo alguno. Los trámites para conseguir un intérprete deben hacerse lo antes posible, pero a más tardar 14 días antes de la cita programada. Por favor, póngase en contacto con Kari Skalsky al 775-684-2160 con al menos 14 días de anticipación para solicitar un intérprete en su idioma de preferencia. También puede solicitarlo a través de stateboard@tax.state.nv.us.

If you have any questions, please call (775) 684-2160.

Shellie Hughes
Secretary to the State Board of Equalization

By: K Skalsky
Kari Skalsky
Management Analyst III, Boards and Commissions
Department of Taxation

cc: **CERTIFIED MAIL** – 9489 0090 0027 6613 7919 73
MCDONALD CARANO
ATTN: JOSH HICKS/ZACH BESSO
100 W. LIBERTY STREET, TENTH FLOOR
RENO, NV 89501

McDONALD CARANO

Josh Hicks, Esq.
jhicks@mcdonaldcarano.com
Zach Besso, Esq.
zbesso@mcdonaldcarano.com

Reply to Reno

Via Email

September 9, 2025

Mr. Thomas Walusek, MAI
Senior Management Analyst,
Clark County Assessor's Office
500 S. Grand Central Pkwy, 2nd Floor
Las Vegas, NV 89155

Re: **State Board of Equalization Case No. 25-155; Appellant's Position on Appeal.**

Dear Mr. Walusek,

This memorandum is submitted in support of the direct appeal to the State Board of Equalization in Case No. 25-155 and provides a detailed explanation as to why 325MK 8ME, LLC ("Appellant")[1] considers its Eagle Shadow Mountain Solar Project (the "ESM Project"), a solar project located solely on Moapa Band of Paiute Tribe (the "Moapa Band") land and managed by Appellant, to be exempt from Nevada property tax. This memorandum may be supplemented with additional analysis, and we hope it will be helpful to your office particularly after the site tour that occurred August 25th, 2025.

I. EXECUTIVE SUMMARY

The ESM Project is located entirely on land held by the United States in trust for the federally-recognized Moapa Band. As such, the imposition of property tax by the State of Nevada and Clark County must comport with the United States Constitution, the Indian Reorganization Act of 1934, federal regulations, Ninth Circuit Court of Appeals precedent and Nevada law.[2]

[1] The name of the property owner as it appears on the tax roll is "Eagle Shadow Mountain Solar, 325MK 8ME, LLC, C/O Arevon Energy" and the Account Number as it appears on the tax roll is 229299. 325MK 8ME, LLC is owned by an affiliate of Arevon Energy, Inc.

[2] *See* United States Constitution Article 6(2); *see also* 25 U.S.C. § 5108 (providing that when the United States holds lands in trust for a tribe, "such lands or rights shall be exempt from State and local taxation"); *County of Yakima v. Confederated Tribes and Bands of the Yakima Indian Nation*, 502 U.S. 251, 269–70 (1992) (holding that tribal lands are not subject to state or local property tax assessments); NRS § 361.050 ("All lands and other property owned by the United States, not taxable because of the Constitution or laws of the United States, shall be exempt from taxation"); NRS § 361.157(2)(e) (providing that the taxability of a possessory interest in a for-profit enterprise on otherwise

Under the United States Constitution and federal statutes and regulations, land owned by the United States and held in trust for an Indian tribe is exempt from state and local taxation, including permanent improvements on that land.[3] Pursuant to Ninth Circuit precedent, "permanent improvements" upon tribal land are not subject to state or local taxation even when those permanent improvements are not owned by an Indian tribe.[4] As discussed in more detail below, the ESM Project is considered a "permanent improvement" under federal law. Therefore, controlling federal law prohibits the imposition of State and local property tax on the ESM Project, regardless of whether a non-tribal entity owns the permanent improvement. Consistent with controlling federal law, in 2020 the State of Nevada expressly informed Appellant that the ESM Project would be immune from property tax.

Although subordinate to federal law, Nevada law consistently supports the classification of the ESM project as real property. As discussed in more detail below, the Nevada Department of Taxation, which oversees and supervises all state and local taxation in Nevada, has consistently and publicly advised taxpayers that renewable energy projects, such as the ESM Project, should be classified as real property.

Alternatively, even if the ESM Project is not considered a "permanent improvement" under federal law, the imposition of Nevada's property tax on tribal land is only appropriate if the balance of interests weigh in favor of allowing the imposition of the property tax.[5] Here, the balance of interests weighs strongly against the imposition of the property tax, as the Moapa Band provides services to the ESM Project in part through property tax equivalent PILOT fees paid to the Moapa Band by the Appellant, and by the fact that Clark County provides no services on Moapa Band land. As such, the imposition of the property tax discriminates against and unreasonably burdens both the Appellant and the Moapa Band.

II. FACTUAL BACKGROUND

The ESM Project is a 300 MW-ac solar photovoltaic solar power generating facility wholly located on the Moapa Band's Reservation, land owned by the United States and held in trust for the Moapa Band. Appellant has contracted 100% of the ESM Project's output with Nevada Energy ("NV Energy") under a 25-year power purchase agreement awarded in 2018. The ESM Project is located approximately 30 miles northeast of Las Vegas, west of I-15 and east of U.S. Highway 93. It is located entirely on 2,300 leased acres of Moapa Band land pursuant to a 50-year land lease between Appellant and the Moapa Band. The project's approximately 12.5-mile gen-tie line crosses Bureau of Land Management ("BLM")-owned land, lands held in trust by the Bureau of Indian Affairs ("BIA") for the Moapa Band and administered by the BLM, and private lands owned by NV Energy.

Work on the ESM Project started in August 2020, with the bulk of significant grading and sitework completed by March 2021 to prepare the Moapa Band's land for fixtures. The solar array construction

exempt land does not apply to "Property of any Indian or of any Indian tribe, band or community which is held in trust by the United States or subject to a restriction against alienation by the United States").

[3] *See* United States Constitution Article 6(2); *see also* 25 U.S.C. § 5108; 25 C.F.R. § 162.017.

[4] *Confederated Tribes of Chehalis Reservation v. Thurston County Board of Equalization*, 724 F.3d 1153, 1157–158 (9th Cir. 2013).

[5] *White Mountain Apache Tribe v. Bracker*, 448 U.S. 136, 143–46 (1980).

commenced in December 2020 and concluded April 2023, while construction of the high voltage side of the project was completed in May 2021. The ESM Project became commercially operable in May 2023.

In the tax bill issued on April 9, 2025, the Clark County Assessor classified the ESM Project as taxable personal property for tax years 2022-23, 2023-24 and 2024-25, the classification of which resulted in a tax liability for Appellant in the amount of $3,534,105.38. The ESM Project had not previously received a tax bill.[6] On May 15, 2025, Appellant submitted to the Nevada State Board of Equalization its timely Petition for Direct Appeal of the Clark County Assessor's determinations ("Appeal"). Appellant received confirmation the Appeal was received by the State Board of Equalization and assigned Case No. 25-155.

During the pendency of its Appeal, Appellant learned that the Clark County Assessor has taken the position that all solar projects in Clark County should be classified as personal property for property tax purposes. The Clark County Assessor's position, at least with respect to projects located on tribal land, is contrary to federal law. With respect to state law, this "one size fits all" solar project classification in Clark County is contrary to caselaw, guidance from the Nevada Department of Taxation, and the position of other county assessors in the State. Ultimately, a determination of whether a solar project, or any item for that matter, is classified as taxable personal property or a non-taxable "fixture" of real property is dependent upon the unique facts of each case.

This memorandum explains why the ESM Project is considered a permanent improvement on Moapa Band land under federal law and, therefore, immune from the Clark County Assessor's recent assessment of property tax; how the Nevada Department of Taxation guidance provides that renewable energy projects are real property when the components of the project operate as a single unit; how, under state law and guidance, the ESM Project is a non-taxable fixture of real property; and how, even if considered personal property under federal law, the Clark County Assessor's recent assessment of property tax taxation is impermissible under federal law which requires balancing the interests of tribal sovereignty against a state's assertion of authority over the conduct of non-Indians engaging in business on Indian-land. By extension, this letter also demonstrates why the Clark County Assessor's blanket classification of all solar projects as taxable personal property is improper as contrary to federal and state law and established Nevada Department of Taxation valuation principles.

III. APPLICABLE LAW & DISCUSSION

A. Under Federal Law the ESM Project is a Permanent Improvement on United States Owned Land Held in Trust for the Moapa Band and is Therefore Immune to State and Local Taxation.

The Supremacy Clause of the United States Constitution generally prohibits state and local ad valorem taxes imposed on the value of lands owned by the United States.[7] By statute, the United States Secretary of the Interior is authorized to "acquire… any interest in lands… for the purpose of providing

[6] The reasons why the Clark County Assessor recently changed its position on the imposition of property tax on Moapa Band-based solar projects remains unclear.
[7] United States Constitution Article 6(2).

land for Indians[.]"[8] Moreover, "[t]itle to any lands or rights acquired pursuant to this Act… *shall be taken in the name of the United States in trust for the Indian tribe*… for which the land is acquired, *and such lands or rights shall be exempt from State and local taxation*."[9] In fact, the U.S. Supreme Court has held that all tribal lands, and any individual allotments held in trust by the Federal Government, are not subject to property tax assessments because federal law expressly prohibits state and local governments from taxing tribal lands.[10]

Whether the above federal statute expressly prohibits state and local taxation of buildings and structures owned by non-Indian entities located on land owned by the United States and held in trust for an Indian tribe was directly addressed by the Ninth Circuit in *Confederated Tribes of Chehalis Reservation v. Thurston County Board of Equalization* ("*Chehalis*"), 724 F.3d 1153 (9th Cir. 2013). In *Chehalis*, a non-Indian entity built and owned a hotel, waterpark and convention center (the "Lodge") on land it leased from the Confederated Tribes of the Chehalis which was owned by the United States and held in trust for the tribe.[11] Shortly after the Lodge opened, a Washington-county assessed property taxes, arguing the Lodge was not tax exempt because the terms of the lease between the parties granted ownership of the lodge to the non-Indian entity, not the tribe.[12]

The Ninth Circuit found that immunity from state and local taxation extends to a "permanent improvement" upon land owned by the United States held in trust for an Indian tribe even when the permanent improvement is not owned by an Indian tribe.[13] The Ninth Circuit reasoned that although the Lodge was owned by the non-Indian entity, the manner in which an Indian tribe chooses to conduct business (i.e., lease its land and grant ownership of erected structures), cannot be determinative of tax immunity.[14] The Ninth Circuit rejected the county's alternative argument that the Lodge was personal property subject to taxation under state law and, in doing so, reasoned state law was irrelevant to whether the Lodge was a permanent improvement on land owned by the United States and held in trust for the tribe (i.e., immune to state and local taxation under federal law).[15] The *Chehalis* case remains controlling precedent in the Ninth Circuit, which includes Nevada.

Under *Chehalis*, if the ESM Project is a "permanent improvement" on land owned by the United States and held in trust for the Moapa Band, it is exempt from state and local taxation regardless of ownership and State law. This exact sentiment is codified in federal regulation 25 C.F.R. § 162.017(a) under which "Subject only to applicable Federal law, permanent improvements on the leased land, without regard to ownership of those improvements, are not subject to any fee, tax, assessment, levy, or other charge

[8] 25 U.S.C. § 5108.
[9] 25 U.S.C. § 5108 (*emphasis* added).
[10] *See generally*, *County of Yakima v. Confederated Tribes and Bands of the Yakima Indian Nation*, 502 U.S. 251, (1992).
[11] *Confederated Tribes of Chehalis Reservation v. Thurston County Board of Equalization*, 724 F.3d 1153, 1154–155 (9th Cir. 2013).
[12] *Id*. at 1155.
[13] *Id*. at 1157–158.
[14] *Id*. at 1157.
[15] *Id*. at 1157–158.

imposed by any State or political subdivision of a State. Improvements may be subject to taxation by the Indian tribe with jurisdiction."

Therefore, according to *Chehalis* and 25 C.F.R. § 162.017(a), regardless of how the ESM Project is owned and whether the Clark County Assessor classifies the project as personal property under Nevada law, express preemption exists if the ESM Project is a "permanent improvement."[16]

i. The ESM Project is a permanent improvement under the U.S. Tax Court's six-factor Whiteco-test and, as such, is expressly preempted from State and local taxation.

Federal statutes pertaining to land owned by the United States and held in trust for an Indian tribe do not clearly define "permanent improvement." However, in *Whiteco Indus., Inc. v. Comm'r of Internal Revenue* ("*Whiteco*"), 65 T.C. 664 (1975), the U.S. Tax Court established a six-factor test to determine if assets—outdoor advertising signs in this case—were permanent improvements or personal property. The Ninth Circuit has employed the *Whiteco*-test when asked to determine whether something is permanent or temporary for purposes of taxation.[17]

Under *Whiteco*, the six factors are: (1) "Is the property capable of being moved, and has it in fact been moved?"; (2) "Is the property designed or constructed to remain permanently in place?"; (3) "Are there circumstances which tend to show the expected or intended length of affixation, i.e., are there circumstances which show that the property may or will have to be moved?"; (4) "How substantial a job is removal of the property and how time-consuming is it? Is it 'readily removable'?"; (5) "How much damage will the property sustain upon its removal?"; and (6) "What is the manner of affixation of the property to the land?"[18] The *Whiteco* Court's determination that the outdoor advertising signs "were not inherently permanent" was shaped by these factors.[19] The ESM Project is examined below according to the *Whiteco*-test to determine whether it is a permanent improvement under federal law. Note the six *Whiteco*-factors are examined out of numeric order as recited above for clarity and better understanding of the project.

a. <u>What is the manner of affixation of the property to the land</u>?

As to this factor, the *Whiteco* Court considered how the outdoor advertising signs were physically constructed and connected to land and how easily they could be removed.[20]

The ESM Project's Structural Design Plans detail how the project is physically connected to the land.[21] The ESM Project consists of two primary components that are connected to the real property: (1)

[16] Even if it was relevant to the federal express preemption analysis (it is not), the ESM Project is not "personal property" under Nevada law as explained in Sections B and C of this memorandum.
[17] *See Consol. Freightways, Inc. v. Comm'r*, 708 F.2d 1385, 1390 (9th Cir. 1983) (using *Whiteco*-factors to determine lighting fixtures and overhead doors were not temporary attachments of a loading dock but rather permanent structural components not eligible for an investment tax credit).
[18] *Whiteco Indus., Inc. v. Comm'r of Internal Revenue*, 65 T.C. 664, 672, 673 (1975).
[19] *Id*. at 673–74.
[20] *Id*. at 673 ("the poles on which the petitioner's signs are mounted are placed in the ground and surrounded by concrete; yet, such poles can easily be removed from the ground, and as a matter of practice, they are so removed").
[21] The Structural Design Plans are attached hereto as **Exhibit A**.

module-tracker structures, and (2) a substation. At a very high-level, a collection of 72-solar panels make up a "module"; a "module" is physically connected to a 200 foot long "tracker" which runs parallel to the ground and is permanently connected thereto via "earth trusses" or "driven piles"; through the solar panels, a module collects solar energy that is transmitted through a series of steps including an inverter to a "substation" permanently connected to the real property via robust cement foundations and steel framing; at the "substation", the solar energy is transmitted to a transformer for subsequent transmission. Each primary component is physically connected to the real property in a permanent fashion.

I. Module-Tracker Structures

Every module at the ESM Project is physically connected to a tracker. There are 10,618 tracker units at the ESM Project and each one is physically affixed to the ground by "earth trusses" or "driven piles."[22] 60% of the ESM Project module-tracker structures are permanently connected to the ground via earth trusses while 40% use driven pile connections.

Earth trusses are manufactured solar tracker foundations that include five parts and are assembled in an "A" frame configuration. These parts consist of two earth screws that anchor the truss into the ground. The earth screws have an outside diameter of approximately 3 inches (with an approximate wall thickness of 0.1 inches) and they measure between 5 and 7 feet long and weigh approximately 60 pounds each. The earth screws have continuous flights (or threads) and are hot dipped galvanized. The earth screws are installed into the ground using a proprietary installation rig that simultaneously drills a hole and advances the earth screws into the bedrock to the proper depth and angle. Two supporting pipe legs and an earth truss cap are then all permanently affixed to the earth screw in the field with a custom hydraulic crimper. The earth truss is firmly stabilized and immovable when the body of the earth screws are embedded nearly 4 feet deep into the bedrock. The tracker is then bolted to the completed A-Frame earth truss using industrial grade bolts. At the ESM Project, 83,304 earth trusses were used to permanently connect module-tracker structures to the ground.

Driven piles are between 8.5 feet and 15.5 feet long, the section of the pile (looking down from the top) is approximately 6 inches tall, and weigh between 60 and 186 pounds. As with earth trusses, to install driven piles a slightly undersized pilot hole is cut deep into the bedrock using a down-hole drill. After that, a mechanical pile driver is used to hammer the driven pile into the pilot hole until it reaches a stable layer of bedrock. This typically requires hammering the driven piles anywhere from 6 to 8 feet into the ground. At that point, the bedrock securely locks the driven pile into a vertically-fixed position, leaving about three to five feet of exposed driven pile above ground. The exposed portion of the driven pile is then bolted to the tracker using the same large-format bolts discussed above. At the ESM Project, 38,061 driven piles were used to permanently connect module-tracker structures to the ground.

The ESM Project's "Geotechnical Exploration Report" denotes the unique geological considerations of the Moapa Band's Reservation land which dictated the design and construction of the project.[23] Specifically, a combination of earth truss and driven pile connection methodologies were chosen

[22] Photos of the ESM Project, trackers, module-tracker structures, earth trusses and driven piles are attached hereto as **Exhibit B**.
[23] The Geotechnical Exploration Report, dated April 11, 2019, is attached hereto as **Exhibit C.**

to permanently connect the module-tracker structures to the ground on a location basis because of their respective effectiveness in addressing the "large volume changes in the subsurface" of the land.[24] For example, earth trusses were used to effectively address the "widespread occurrence of thick, resistant layers of cemented sand and gravel" on the Moapa Band's Reservation and "specialized excavation equipment" was required to excavate and prepare the "cemented soils" for module-tracker installation.[25]

The earth truss and driven pile technologies used to connect the module-tracker structures to the ground are critically important to consider because they demonstrate how the module-tracker structures are physically connected to the real property in a permanent manner. The screws and piles supporting the module-tracker structures are securely held in place only by the counter-force the ground exerts against the screws and piles which increases as they are twisted and hammered deeper into the earth. The amount of counter-force required to support the weight of the modules and trackers can only be achieved by pounding the screws and piles so deep into the bedrock that they become an extension of the ground itself.

Notably, the module-tracker structures—permanently connected to the ground through earth truss and driven pile technologies—took over 10 months to construct. This pro-longed construction timeline is attributable to the labor-intensive and difficult installation of earth truss and driven pile. Alone, the module-tracker structures cost nearly $139,610,823 to construct and install at the ESM Project, a cost which does not include $28,306,906 in grading and earth work, much of which was required to excavate and prepare the land for the module-tracker structures installation. The cost and time required to construct the module-tracker structures via earth truss and driven pile connections suggest the structures are affixed to the real property in a more permanent, less temporary manner.

Importantly, removal of the module-tracker structures as units is nearly impossible because of the earth truss and driven pile connection techniques. Once screws have been twisted that deep into the ground, it is impossible to "unscrew" or remove them without substantially damaging them as well as the structures attached. To remove screws, one must "cut them at grade" or physically sever them at ground level so the exposed, above-ground portion of the screw is removed and below-ground portion remains embedded in the bedrock. Driven piles are also "cut at grade." Removal by "cutting at grade" requires the use of a plasma torch. Similar to the removal of a building or a bridge, and as explained in a subsequent section of this letter, removal must be performed pursuant to permit-specific decommissioning specifications. Also explained in a later section, "cutting at grade" damages the screws and piles.

II. Substation

The second major component of the ESM Project, the substation, is also affixed to the real property through permanent means of connection.[26] On average, it takes 3 to 6 months to properly construct and install a solar project substation. The ESM Project's substation took nearly 6 months to construct and install. The ESM Project's substation cost $14,705,689 to construct and install. Again, this cost does not include

[24] *See* **Ex. C** at 20 (noting "large volume changes in the subsurface").
[25] *See* **Ex. C** at 20 (noting "widespread occurrence of thick, resistant layers of cemented sand and gravel").
[26] Photos of the ESM Project's substation are attached hereto as **Exhibit D**.

the substation's proportional share of the $28,306,906 grading and earth work costs. The substation's cost and construction timeframe suggest permanent affixation.

The ESM Project substation is connected to the real property through a variety of classic cement foundations. The first variant, a drilled caisson, encompasses drilling 82 concrete caisson foundations that range between 30 inches and 48 inches in diameter and between 8 and 13 feet deep directly into the bedrock. Reinforcing steel is placed and then the hole is filled with concrete. Additionally, there are seventeen concrete slab foundations to support the substation's additional equipment.

Of all the foundations at the ESM Project, the concrete foundations to which the substation equipment is affixed are the most robust. The substation equipment includes two main power transformers (each weighing in excess of 50,000 pounds); a control enclosure structure which houses all of the monitoring and controls devices; various high voltage and medium voltage breakers (among other electrical protection devices) and/or switching; a capacitor bank; a backup generator; and a series of steel structures which support the overhead medium and high voltage cables. All of these structures and equipment are affixed to individual foundations via anchor bolts which were either set into the concrete before it hardens or drilled and epoxied into already hardened concrete.

Removal of the substation is not easy. It would require substantial industrial grade-work and destroy the substation itself. Removal would involve a two-step process. First, the ancillary equipment connected to the cement foundations would need to be removed. Once removed, the steel structures bolted to cement foundations remain. There is no way to remove the cement foundations from the ground without a commercial excavation processes that substantially damages the cement foundations and real property. Thus, there is no real way to remove the substation without completely destroying it and substantially damaging the real property to which it is permanently attached.

The Board must consider the earth truss and driven pile connections used for the module-tracker structures and the concrete foundation-anchor nuts and bolts-steel framing connections used for the substation when analyzing how the ESM Project is physically affixed to the real property. It must also consider how difficult it would be to remove the two primary components of the ESM Project from the ground. The earth truss and driven pile connections render the module-tracker structures physically affixed to the real property by means of permanent installation as do the concrete foundation-anchor nuts and bolts-steel framing connections of the substation. Neither can be removed from the real property easily. Accordingly, this *Whiteco*-factor weighs in favor of the ESM Project being a permanent improvement.

b. Is the property designed or constructed to remain permanently in place?

In *Whiteco*, the U.S. Tax Court examined this factor by looking to the design and construction of the outdoor advertising signs as indicators of how long they were intended to last.[27]

[27] *Whiteco Indus., Inc. v. Comm'r of Internal Revenue*, 65 T.C. 664, 672 (1975) ("The evidence in this case indicates that the petitioner's signs are not designed or constructed to last permanently. They are designed or constructed to last for the term of a contract between the petitioner and one of its advertisers. On the average, the term of a contract will last only 5 years. At the end of such period, the sign structure requires substantial renovation. A new sign face must be attached, some stringers must be replaced, and poles are either replaced or straightened and recemented").

The design and construction-techniques used to affix the project's primary components—module-tracker structures and substation—to the ground are indicative of their intended permanent nature. The best representation of this is found in the intentional selection and design of the earth truss connection methodology. Earth trusses were specifically chosen to permanently connect a majority of the module-tracker structures to the ground because of their effectiveness in addressing the Moapa River Indian Reservation's "widespread occurrence of thick, resistant layers of cemented sand and gravel" which is more commonly known as caliche.[28]

Most commonly, caliche is a unique geological composition of soil in which calcium carbonate deposits are cemented together over time. This renders the soil more rock-hard and exponentially more difficult to cut through than most soil types. Because caliche makes-up the majority ground composition on the Moapa River Indian Reservation, earth trusses and screws were required to "break through" and "grip" the cement-like caliche in the manner required to support the weight of the module-tracker structures. Driven piles would not have sufficiently addressed the unique problems of the caliche-ground in a way that provides permanent affixation. The use of earth trusses is yet another indication that the ESM Project was custom-designed and constructed to remain permanently in place.

The majority of module-tracker structures at the ESM Project being connected through earth trusses is also unique. In fact, the ESM Project was one of the first solar projects in Nevada to utilize earth truss technology to permanently affix the module-tracker structures to the ground. As explained above, earth trusses were intentionally selected as part of the ESM Project's design to address the Moapa River Indian Reservation's unique caliche geological composition. While driven piles are the most common affixation technique used among solar projects both inside and outside Nevada, they would not have permanently connected all ESM Project module-tracker structures to the ground, particularly in areas where the ground is primarily caliche.

Additionally, the project was intentionally designed to include more solar panels than necessary so that, as individual panel power production slightly decreases over time, additional panels make-up for the production loss and the project continues to produce its intended generation outputs. The tracker, earth truss and driven pile components of the ESM Project are designed and constructed to last in perpetuity. The substation is designed and constructed to last in indefinitely while the transformer housed in the substation is expected to last anywhere from 35 to 50 years. Facts like these show that not only was the ESM Project designed and constructed to last permanently, but also it will produce solar energy, with only minor renovation or replacement, for the foreseeable future.

Intentional design and construction considerations employed to make the ESM Project a permanent improvement to the real property are reflected in the language of the ESM Project's written agreements such as the Solar Energy Ground Lease Agreement ("Lease") between the Moapa Band as "Landlord" and Appellant as "Tenant."[29] The "Term" of the Lease is 50 years.[30] However, Section 7.04(A) of the Lease

[28] *See* **Ex. C** at 20.
[29] The Solar Energy Ground Lease Agreement ("Lease") is attached hereto as **Exhibit E.**
[30] *See* **Ex. E** at 19.

states that the "Tenant Infrastructure Improvements," which expressly includes the Solar Power Facilities,[31] "shall be treated as permanent improvements."[32] Moreover, Section 12.01 of the Lease expressly grants an option to the Moapa Band to terminate the Lease and "not remove any of Tenant's Property including Tenant Infrastructure Improvements, from the Premises."[33]

Custom-design indicative of permanence is also observed in the Moapa Band's dedication of certain real property on the Moapa River Indian Reservation for a specific use and simultaneous limitation of Appellant's use of the real property. Section 3.01 of the Lease states:

> Solar Power Facilities. Tenant shall have the right to use the Premises for Tenant Operations, performance of the Tenant Work, and all ancillary and incidental activities related thereto or to the ownership or maintenance of the Solar Power Facilities. Tenant shall not use or authorize to be used the Premises, or any portion thereof, for any purpose beyond the use contemplated in this Lease and other agreements between the Parties whatsoever without Landlord's prior written approval, which approval may be withheld in Landlord's sole and absolute discretion.[34]

The Lease defines "Premises" as "that certain real property. . . located on a portion of the Reservation consisting of approximately two thousand three hundred (2,300) acres of vacant land located in Clark County, Nevada[.]"[35] The clear language of the Lease shows that the Moapa Band committed the real property upon which the ESM Project is located for "the ownership or maintenance of the Solar Power Facilities." The real property cannot be used for anything else under the express terms of the Lease.

Appellant constructed the ESM Project to realize the dedicated purpose of this particular segment of the Moapa River Indian Reservation for the foreseeable future. The ESM Project was specifically designed for the Moapa Band's real property and cost an estimated $460,300,001 dollars to construct. The ESM Project's Structural Design Plans took over 8 months to develop and were intentionally custom-designed to the address the real property's inimitable geographic characteristics. Construction of the project took 2.5 years (in part due to modules being detained by customs). Such written language of the Lease shows that the ESM Project was "custom-built" on the Moapa Band's land to fulfill the land's dedicated purpose.

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[31] *See* **Ex. E** at 12 (defining "Solar Power Facilities" as "any and all equipment, fixtures, and instruments used in the generation of solar-powered electrical energy and for the conversion of solar energy into electrical energy, together with the facilities necessary to collect, condition, store and transmit electrical energy generated on the Premises, including one or more solar gathering devices, solar panels, solar collectors, pyranometer measuring devices, inverters, structural support frames and mounting hardware, tracking systems, above-ground and/or underground electrical transmission and communication lines and related equipment, footings, towers, poles, crossarms, guy lines, anchors and wires, collection and transmission grids, power conditioning equipment, substations, interconnections and/or switching facilities and transformers, battery and/or other energy storage facilities, telecommunications equipment, laydown areas, radio relays, roads and gates, signs and fences, meteorological towers, control buildings, maintenance yards and other related facilities, machinery, equipment and improvements").
[32] *See* **Ex. E** at 26.
[33] *See* **Ex. E** at 41.
[34] *See* **Ex. E** at 17.
[35] *See* **Ex. E** at 7.

Second, the project's permanent design and construction is referenced in the ESM Project's "Conceptual Decommissioning Plan," submitted by the Moapa Band to the Environmental Protection Agency and BIA as part of the project's Environmental Impact Study.[36] The Conceptual Decommissioning Plan explains the project may be "used to generate solar energy even beyond the term of the initial lease and energy purchase agreements, remaining in solar energy production for the foreseeable future."[37]

The ESM Project's permanent design and construction are also referenced in the Long Term Renewable Power Purchase Agreement ("PPA") that Appellant entered into with NV Energy.[38] The PPA requires Appellant to provide all its solar generated power to NV Energy for a period of 25-years.[39] Under Section 6.3 of the PPA, NV Energy has the express option to purchase the ESM Project at the end of the 25-year term which indicates the ESM Project was intended to permanently exist on the real property and survive the term of the agreement.[40] The PPA is a clear indication that the ESM Project was designed to be in place for a significant period of time.

The ESM Project was specifically designed and constructed to last permanently on the Moapa Band's land and will continue to generate solar energy in perpetuity. The ESM Project was intentionally designed and constructed to remain with the land even after termination or expiration of the Lease. Accordingly, this *Whiteco*-factor weighs in favor of the ESM Project being a permanent improvement.

c. How substantial a job is removal of the property and how time-consuming is it? Is it 'readily removable'?

In *Whiteco*, the U.S. Tax Court examined this factor by considering what efforts removal of the outdoor advertising signs required and how long that process would take.[41]

The ESM Project is not "readily removable." The only way to "remove" the project is through decommissioning. Decommission of the ESM Project is a mammoth process as outlined in the project's Conceptual Decommissioning Plan which directly contemplates removal of the project, including its facilities, structures and electrical equipment.[42]

Removal is not a "relatively quick and easy process"; it would likely take a year or more to entirely remove the project from the Moapa Band's land.[43] As to cost, Appellant would be required to provide "performance and reclamation bonding in an amount sufficient to ensure the implementation of the approved Decommission Plan."[44] The bond amount required would be based on a decommissioning cost

[36] The Conceptual Decommissioning Plan is attached hereto as **Exhibit F**.
[37] *See* **Ex. F** at 1.
[38] The Long Term Renewable Power Purchase Agreement ("PPA") is attached hereto as **Exhibit G**.
[39] *See* **Ex. G** at 17.
[40] *See* **Ex. G** at 29.
[41] *Whiteco Indus. Inc. v. Comm'r of Internal Revenue*, 65 T.C. 664, 672 (1975) ("disassembly and removal of a sign is a relatively quick and easy process. Although specific figures were not supplied for the time necessary to remove the sign face and the stringers, it appears that the process may be accomplished quickly, using merely a hammer and a sledge hammer or an ax. Removal of the poles for a 40-foot sign takes only an hour or an hour and a half").
[42] *See generally*, **Ex. F**.
[43] *See* **Ex. F** at 5.
[44] *See* **Ex. F** at 8.

"estimate" provided by Appellant.[45] The cost of removing the ESM Project would be significant and cost millions of dollars.

Furthermore, removal is an incredibly complicated undertaking required to "be conducted in compliance with all applicable Federal and Tribal regulations in place at the time" and with constant "[c]onsultation with the [Moapa Band], BIA, BLM, and any other involved entities would be conducted to ensure that all Federal and Tribal requirements are addressed."[46] Appellant would be required to fund, develop and follow an Environmental Site Assessment, a Final Decommissioning Plan and a Restoration Plan to remove the project from the site.[47]

Removal would require all structures and facilities erected at the ESM Project to be dismantled through "approved methods" only.[48] This logically includes all above-ground structures like the 10,618 tracker structures and all below-ground structures such as the substation and its 82 drilled concrete caisson and 17 concrete slab foundations.[49] Access and on-site roads used at the ESM Project are also required to be removed. This process entails physical removal of any aggregate and/or other base material used to construct the roads, recycling or disposal of such material and restoration of the roads to approximate pre-project conditions.[50]

After all structures, facilities and roads are dismantled, removed and recycled or disposed of, the Conceptual Decommission Plan requires "Post-Demolition Site Stabilization" efforts which include the restoration of any "disturbed areas" to "promote pre-project drainage patterns, with the goal of reducing the potential for erosion."[51] Once the disturbed sites are stabilized, "restoration activities required to return the disturbed areas to a pre-construction function" are required in accordance with a Site Restoration Plan and Integrated Weed Management Plan.[52]

Moreover, as described in Section A(III)(i)(d) of this memorandum below, a unilateral decision to "remove" the project would require Appellant to breach many of its contractual obligations owed to NV Energy under the PPA.

Removal of the ESM Project is a substantial, complex, rigorous, laborious, time-consuming and expensive undertaking subject to intense regulatory scrutiny at every step. Clearly, the project is not "readily removable." Accordingly, this *Whiteco*-factor weighs in favor of the ESM Project being a permanent improvement.

d. Is the property capable of being moved, and has it in fact been moved?

[45] *See* **Ex. F** at 8.
[46] *See* **Ex. F** at 4.
[47] *See* **Ex. F** at 4, 5.
[48] *See* **Ex. F** at 5, 6.
[49] *See* **Ex. F** at 6.
[50] *See* **Ex. F** at 6.
[51] *See* **Ex. F** at 7.
[52] *See* **Ex. F** at 7.

This *Whiteco*-factor required the U.S. Tax Court to analyze whether the evidence demonstrated the outdoor advertising signs were capable of being moved or had actually been moved.[53]

Obviously, the ESM Project has never been moved. As explained in detail above, the evidence in this case shows the ESM Project is not capable of being removed, or moved for that matter, without incredible costs and sizable effort which is subject to strict regulatory oversight and requires Apellant's development of various additional plans such as the Conceptual Decommissioning Plan, Environmental Site Assessment, Final Decommissioning Plan, Site Restoration Plan and Integrated Weed Management Plan.

Notably, the ESM Project cannot be moved in a manner that renders the project operational. The module-tracker structures cannot be "picked-up" and moved because of the earth truss and driven pile ground-connections. To move these components, the connections would need to be "cut at grade" which completely severs the structures from the ground in a way that does not permit them to be reattached at another site or render them operable for that matter. Nor can the ESM Project's substation be moved because of its permanent concrete foundation-anchor nuts and bolts-steel framing affixation to the ground. To move the substation, one would have to destroy the substation rendering it unusable at another site.

The only parts of the ESM Project theoretically capable of being moved are smaller components that, in and of themselves and without connection to the ESM Project as a whole, are incapable of producing solar energy. Even then, there is no guarantee any such component could be used at another solar project as even the smaller components were specifically designed for use at the ESM Project. For example, the panels attached to the ESM Project's module-tracker structures were specially designed with certain voltage and wattage outputs. Even though panels are theoretically movable, the specific voltage and wattage specs of the ESM Project panels means they are potentially unusable at another solar project if that project does not share such voltage and wattage needs. This is all but confirmed by the ESM Project's Conceptual Decommissioning Plan which states that, after being dismantled, the project's parts are recycled or disposed of; there is no mention of moving or reusing any part of the ESM Project.[54]

Critical here, "moving" or "removing" the ESM Project would require Appellant to breach the PPA. Under the PPA, Appellant agreed to supply NV Energy with "all" renewable energy "Product" generated at the "Facility" for a period of 25 years.[55] That is, "[o]ne hundred percent (100%) of the Product from the Facility shall be dedicated exclusively to [NV Energy] for so long as [the PPA] is in force and effect" and Appellant "shall not: (a) sell, divert, grant, transfer or assign Product to any Person other than [NV Energy]; (b) provide [NV Energy] with any Product from any source other than the Facility; or (c) divert, redirect or make available the Facility or any resource therefrom to another generating facility or

[53] *Whiteco Indus. Inc. v. Comm'r of Internal Revenue*, 65 T.C. 664, 672 (1975) ("The evidence clearly shows that the petitioner's signs are capable of being moved and have in fact been moved").
[54] *See* **Ex. F** at 6.
[55] *See* **Ex. G** at 17.

any third party.[56] Importantly, the PPA defines "Facility" and "Generating Facility" to mean only the ESM Project located on the Moapa River Indian Reservation.[57]

The PPA makes clear that Appellant cannot "enter into a binding agreement to sell or transfer" the ESM Project and, if it does enter into such a "Restricted Transaction," it must notify NV Energy and NV Energy shall have a "Right of First Offer" to purchase the project or any "Offered Interest."[58] In fact, under the PPA, NV Energy has an express "Early Purchase Option" to purchase the ESM Project from Appellant "on a date chosen by [NV Energy] during the six (6) months after the Facility's 10th, 15th, and 20th anniversaries of the Commercial Operation Date[.]"[59]

Appellant is not "permitted to make any modification" to the ESM Project "that would increase the Expected Nameplate Capacity Rating, generating capability, or the rate of production and delivery of Net Energy… [w]ithout the prior written consent of" NV Energy.[60] Moreover, Appellant must notify NV Energy of "any temporary or permanent change to the performance, operating characteristics, or major generation components (such as turbines, generators, inverters, solar panels or similar equipment, as applicable)[.]"[61]

Apellant's contractual obligations under the PPA demonstrate that the ESM Project cannot just be "moved" or "removed" from the Moapa River Indian Reservation. Perhaps most important here, "moving" the ESM Project from the Moapa River Indian Reservation would cause Appellant to commit several "Events of Default" under the PPA because the PPA provisions pertain only to the "Facility" and "Generating Facility" on the Moapa River Indian Reservation. For example, if Appellant "moved" the ESM Project (notwithstanding the fact that it cannot be moved), Appellant would fail to comply with its material obligation of providing NV Energy with renewable energy "Product" *from the "Facility" on the Moapa River Indian Reservation* for 25-yeras[62]

The overwhelming evidence shows that ESM Project has not been moved and cannot be moved in a way that renders the project operational. Moreover, there is no evidence that indicates the ESM Project will be moved in the future. Even if Appellant wanted to move the project (it cannot be moved nor would Appellant ever attempt to move it), NV Energy has a "Right of First Offer" as well as various "Early Purchase Options" it could exercise to prevent the project from being moved. As noted, moving the ESM Project would also cause Appellant to default on the PPA. Accordingly, this *Whiteco*-factor weighs in favor of the ESM Project being a permanent improvement.

e. How much damage will the property sustain upon its removal?

[56] *See* **Ex. G** at 18.
[57] *See* **Ex. G** at 7 (defining "Facility" as "the Generating Facility"; defining "Generating Facility" as the "generating power plant as described in Exhibit 1, *located at the Project Site as identified in Exhibit 3A and 3B*") (*emphasis* added).
[58] *See* **Ex. G** at 28.
[59] *See* **Ex. G** at 29.
[60] *See* **Ex. G** at 39,40.
[61] *See* **Ex. G** at 45.
[62] *See* **Ex. G** at 61, 62.

In *Whiteco*, the U.S. Tax Court examined this factor by quantifying how much damage would result from removing the outdoor advertising signs.[63]

The ESM Project cannot be removed without substantial damage to the project and its components as well as the real property of the Moapa River Indian Reservation. As to the module-tracker structures permanently connected to the ground via earth trusses and driven piles, "cutting at grade" completely destroys each earth screw and pile and renders them unusable. "Cutting at grade" leaves a portion of each screw and pile embedded in the earth and a portion above the "cut" which remains attached to the module-tracker structure. The trusses and piles still connected to the module-tracker structures are no longer adequate length to re-install into the ground deep-enough to obtain the amount of ground-exerted counter-force required to support the weight of structures. Additionally, there is no way to remove the screws and piles still embedded in the ground without intensive excavation processes which disturb and damage the real property. Even if the screws and piles still embedded in the ground were removed, they would no longer be the correct length to permanently connect an above ground module-tracker structure to the ground.

Similarly, removal of the substation would essentially destroy the structure and damage the surrounding real property as explained in Section III(A)(i)(a)(II).

Damage to the ESM Project and the land of the Moapa River Indian Reservation upon removal of the project is not just theoretical, it was an actual consideration of the parties when they drafted the Lease. Appellant and the Moapa Band intentionally included Section 12.01 of the Lease which differentiates "Subject Property" as property "that is physically separable from the to-be-removed Tenant's Property *without material cost or damage*[.]"[64]

Removal of the ESM Project would result in irreversible and substantial damage to the project and its components. Removal would also disturb and damage the real property of the Moapa River Indian Reservation. Accordingly, this *Whiteco*-factor weighs in favor of the ESM Project being a permanent improvement.

f. Are there circumstances which tend to show the expected or intended length of affixation, i.e., are there circumstances which show that the property may or will have to be moved?

In *Whiteco*, the U.S. Tax Court examined this factor by exploring the parties' intent and expectations as indicative of potential permanence of the outdoor advertising signs and expected length of affixation.[65]

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[63] *Whiteco Indus. Inc. v. Comm'r of Internal Revenue*, 65 T.C. 664, 673 (1975) ("Much of the sign assembly is not damaged when it is moved. The only necessary wastage is that portion of the poles surrounded by concrete, but the remaining portions of the poles are used for other signs. If the sign is moved upon the expiration of a contract with an advertiser, the sign face is also replaced").

[64] *See* **Ex. E** at 41 (*emphasis* added).

[65] *Whiteco Indus. Inc. v. Comm'r of Internal Revenue*, 65 T.C. 664, 672, 673 (1975) ("petitioner does not intend, nor could it realistically expect, the signs to remain permanently in place. The petitioner realizes that in numerous situations it may have to move its signs at the expiration of a contract with an advertiser, or prior thereto. The signs may have to be moved because the owner of the leased land does not renew the lease or exercises his option to develop

Every circumstance here tends to show the ESM Project was expected and intended to be permanently affixed to the real property of the Moapa River Indian Reservation. The project's two primary components are affixed to the Moapa Band's land by permanent means; the module-tracker structures by earth truss and driven pile connections and the substation by concrete foundation-anchor nuts and bolts-steel framing connections. The ESM Project was intentionally designed using specific construction methods to address concerns unique to the Moapa Band's land (earth trusses to permanently connect the module-tracker structures to the caliche). Moreover, the language of the Lease, Conceptual Decommissioning Plan and PPA indicate the ESM Project is permanently affixed to the land and will remain there for the foreseeable future.

The ESM Project and its components cannot be removed unless through a year-or-longer decommissioning process which is robust, time-intensive, expensive and, at all times, subject to intense regulatory scrutiny. Similar to removal, moving the project will render the majority of its components destroyed and unusable while only a small fraction of components might be recycled. Because of this, the ESM Project has never been moved nor are there existing plans to move the project.

The ESM Project will be substantially and irreversible damaged if it is moved or removed. The Moapa Band's real property will also be substantially disturbed and damaged upon the project's removal or moving. Removing or moving the project will cause Appellant to breach the PPA in various ways and, even if the project could be removed or moved, NV Energy has the express right to purchase the project and block such removal or moving.

An additional circumstance that indicates intended permanence is the Tribal Agreement between Appellant and the Moapa Band ("Tribal Agreement").[66] The Tribal Agreement states that "[p]ursuant to federal and state law, no part of the Project will be subject to real estate taxation by either the State of Nevada or any local governmental authority, or division, department, agency, court, arbitrator, tribunal, commission, board, official, organization, body or other instrumentality thereof."[67] This language shows that the parties intended the ESM Project to be on the Moapa River Indian Reservation's land for the foreseeable future but never subject to real estate taxation by the State or Clark County.

Under the Tribal Agreement, Appellant and the Moapa Band agreed that Appellant would remit PILOT fees to the Moapa Band "in lieu of all taxes, tax levies or other tax assessments (other than sales and use tax as provided for in Section 3 above) that could be levied by the [Moapa Band] against [Appellant] or its contractors, against the Project, the Premises, the Improvements, the Infrastructure, the Rights of Way, the Solar Power Facilities, Tenant Improvements, Tenant Operations or any other property or activities of Project Company authorized under the Lease."[68]

The PILOT fees Appellant remits to the Moapa Band is in lieu of all taxes or other tax assessment (other than sales and use tax) that could be levied in the future. Such language unmistakably shows that the

his land, or because there is a change in the location of the road or the occurrence of some other condition which makes the position of the sign no longer desirable").

[66] The Tribal Agreement is attached hereto as **Exhibit H.**

[67] *See* **Ex. H** at 1.

[68] *See* **Ex. H** at 3.

parties intended all future potential taxes and tax liability for the ESM Project, apart from sales and use tax, to be incorporated in the PILOT fees remitted to the Moapa Band. The Clark County Assessor classifying the ESM Project as taxable personal property and levying such taxes against Appellant is at odds with the parties' mutual understanding of how the project would be taxed indefinitely under the Tribal Agreement.

The circumstances surrounding the ESM Project tend to show it was affixed for an extended and more permanent length of time and that, for the duration of that permanent affixation, the project would be treated uniquely for tax purposes. There are almost no circumstances showing the ESM Project may be removed or moved in the foreseeable future. Accordingly, this *Whiteco*-factor weighs in favor of the ESM Project being a permanent improvement.

Pursuant to analysis under the six *Whiteco*-factors, the ESM Project is a permanent improvement. Because the ESM Project is a permanent improvement on the Moapa Band's land—land owned by the United States and held in trust for the Moapa Band—it is expressly immune from state and local taxation, including the Clark County Assessor's recent property tax assessment. To conclude otherwise is contrary to the United States Constitution, the U.S. Supreme Court, the Ninth Circuit Court of Appeals in *Chehalis* and the U.S. Tax Court in *Whiteco*.

B. The ESM Project Should be Treated as Real Property Pursuant to Direct Guidance from the State of Nevada.

The State of Nevada has historically and unequivocally considered the ESM Project, and similarly situated renewable energy projects, to be real property. With respect to the ESM Project, the State has gone even further by expressly informing Appellant that it is immune from property tax.

i. Direct Guidance to Appellant.

With respect to the ESM Project, Appellant applied to the State of Nevada in 2020 for renewable energy tax incentives offered under NRS Chapter 701A ("RETA").[69] At the inception of the RETA application process, Appellant was informed by the State of Nevada that the project "would only be granted a sales and use tax partial abatement since the property taxes would be paid to the tribe and not the state. Our office/the state do not have jurisdiction over the property taxes paid on trial [sic] land."[70]

When Appellant submitted its RETA application, it checked the boxes indicating it was applying for both a sales/use tax and a property tax abatement.[71] In issuing its Order approving the RETA application, the State expressly noted that the amount of property tax that would be due was **zero**.[72] This is entirely consistent with the position articulated by the State at the outset that no property taxes would be due for a solar project located on tribal land.

[69] The RETA program abates sales/use taxes by imposing a reduced rate of 2.6% for three years and abates property taxes by 55% for 20 years. *See* NRS § 701A.370.
[70] The email from Laura Wickham to Joshua Hicks, dated October 22, 2019, is attached hereto as **Exhibit I**.
[71] The ESM Project's RETA Application is attached hereto as **Exhibit J**.
[72] The Order on ESM Project's RETA Application is attached hereto as **Exhibit K**.

The State's position was correct and entirely consistent with federal law, as discussed above. Moreover, Appellant relied on the State's position in constructing, financing and operating the ESM Project, understanding that it would not owe Nevada property tax but would instead be subject to the Moapa Band's property tax equivalent PILOT assessment.[73]

ii. State Treatment of Comparable Solar Projects.

Aside from the direct guidance provided to Appellant on the ESM Project, the State of Nevada has consistently treated comparable solar projects as real property.

As discussed, the ESM Project is located on land leased from the Moapa Band but held in trust by the United States for the Moapa Band. Battle Mountain Solar ("BMS") is a comparable photovoltaic generation facility located in Humboldt County, Nevada, and leased from a private landowner.[74] In 2022, BMS appealed the Humboldt County Assessor's property tax valuation to the County Board of Equalization. One of the issues in the case was whether the BMS project should be classified as real or personal property. The County Board of Equalization rejected BMS's argument that the project should be treated as personal property and agreed with the Humboldt County Assessor's position that it should be classified as real property.

However, the County Board of Equalization found for BMS on a non-related issue and the Humboldt County Assessor appealed that issue to the State Board of Equalization. In August of 2022, the State Board of Equalization issued an Order in which it acknowledged the County Board of Equalization's previous determination that the BMS project was properly classified as real property was correct even though the real property-personal property issue was not before the State Board of Equalization.[75]

Importantly, the Humboldt County Assessor's position on the BMS project is in alignment with the State of Nevada. When BMS applied for RETA in 2019, its application classified the project as personal property.[76] The State of Nevada issued a fiscal impact statement on that application classifying the BSM project as real property.[77] Explaining its position, the Nevada Department of Taxation stated as follows:

> The Department's understanding is that the solar field consists of components either attached to the land and foundations, or "so essential to the land or improvement that the land or improvement cannot perform its desired function without the nonattached item," for example, the solar array foundations, underground cabling, substations and transmission lines. At the time this fiscal note was produced, the Taxpayer had not submitted any information regarding the exception to the fixture test in NAC 361.1127 and NAC 361.11745 with regard to whether solar modules and other components are installed

[73] *See DriveTime Car Sales, Inc. v. Nevada Dep't of Tax'n*, 127 Nev. 1131, 2011 WL 683778, *5 (2011) ("NRS 360.294(1)(a) grants a waiver of 'any tax, penalty and interest owed' as a result of detrimental reliance on written advice from" the Nevada Department of Taxation) (unpublished).
[74] The BMS RETA Application is attached hereto as **Exhibit L**.
[75] The BMS-Humboldt County Petition for Judicial Review and attached Nevada State Board of Equalization Order are attached hereto as **Exhibit N**; *see* **Ex. N** at 8.
[76] *See* **Ex. L** at 1**.**
[77] The BMS RETA Fiscal Note is attached hereto as **Exhibit O**

> non-permanently and not for the enhancement of the real property to which it is attached; and had not shown whether the property has a unique identity and function distinct from the real property to which it is attached. The list of construction permits obtained by Battle Mountain Solar, LLC from Humboldt County and listed in the application are also an objective indication of the permanent nature of the facility.[78]

The Department accordingly "determined that all components were real property when operated as a unit."[79]

The position articulated by the Nevada Department of Taxation in the BMS RETA Fiscal Note is not unique. In fact, the **Department has restated the exact same position, 43 times in 43 different RETA applications over the last 14-years**, **and as recently as April of 2025** on the application submitted by Dry Lake East Energy Center LLC.[80] The position of the State of Nevada, through the Nevada Department of Taxation, is unequivocal and consistent—renewable energy projects are classified as real property and not as personal property.

With respect to the ESM Project, the Nevada Department of Taxation did not provide a property tax fiscal impact statement because, as noted above, the State of Nevada took the position that no property tax would be due because the ESM Project was located on tribal land. The State of Nevada determined that zero dollars in property tax would be paid by the ESM Project.[81] There is no reason to believe that the Nevada Department of Taxation would veer from the position it took on nearly every other renewable energy abatement application. Regardless, the Nevada Department of Taxation has taken the consistent position that renewable energy projects are real property, particularly when the components of the project operate as a single unit, as does the ESM Project.[82]

The Department is charged with the "general supervision and control over the entire revenue system of the State[.]"[83] County assessors, the counties and state boards of equalization are obligated to follow guidance issued by the Department. Further, all taxpayers must be treated with "courtesy, fairness, uniformity, **consistency** and common sense." (emphasis added).[84] Here, in order to satisfy the legal requirements of equalization and consistency, and in deference to guidance from the State of Nevada and the Department, the ESM Project should be treated as a fixture affixed to real property and, therefore, non-taxable real property.

C. Under Nevada Law, the ESM Project is a Permanent "Fixture" of Real Property, Not Personal Property.

Although federal law is determinative on this Appeal, it is important to note that Nevada law, beyond the direct guidance issued by the Nevada Department of Taxation, similarly requires the ESM Project to be considered a permanent improvement. Under Nevada Revised Statute ("NRS") §

[78] *See* **Ex. O** at 2.
[79] *See* **Ex. O** at 2.
[80] The RETA Fiscal Notes for these 42 renewable energy projects are attached hereto as **Exhibit P**.
[81] *See* **Exhibit K** at 3, 4.
[82] *See generally*, **Ex. P**.
[83] NRS § 360.200.
[84] NRS § 360.291(1)(a).

361.035(1)(a), "houses, buildings, fences, ditches, structures, erections, railroads, toll roads and bridges, or other improvements built or erected upon any land" are considered "real property." If something is not a "structure," it must be shown to be a "fixture" to be considered real property.[85] Under Nevada Administrative Code ("NAC") § 361.1127, a "fixture" is "an item, other than a trade fixture, that was originally personal property which has been installed or attached to land or an improvement in a permanent manner."

In Nevada, the analysis to determine whether something is a "fixture" of real property or personal property is set forth in Appendix E ("Appendix E") of the 2025–2026 Nevada Department of Taxation, ("Department") Division of Excise and Local Government Services' Personal Property Manual: Valuation Guidelines ("Department's Personal Property Manual").[86] According to Appendix E:

> NRS 361.333 requires that each major class of property be examined to determine whether there is equality of assessment. One of the principal classes of property is personal property, pursuant to NRS 361.227(4). Uniformity and equality of assessment thus depend on proper classification. Although NRS 361.035 defines real estate and NRS 361.030 defines personal property, in practice it is sometimes difficult to tell whether an item is personal property or a fixture that is part of the real estate. As the Attorney General stated in Opinion #41 (1963), 'the classification depends on the facts of each particular case.' The assessor is encouraged to consult the Division of Local Government Services and/or the District Attorney in difficult cases . . . A fixture may be defined as an item that was originally personal property which has been installed or attached to land or an improvement in a permanent manner. There is an abundant amount of case law which discusses three tests often used in deciding whether an item is a fixture.[87]

This same principle is published by the Nevada Department of Taxation in Nevada Property Tax: Elements and Application:

> An item of property not physically annexed to real property is constructively annexed to real property if the nonattached item is:
>
> 1. A necessary, integral or working part of the real property; and
> 2. Designed or committed for use with real property; and
> 3. So essential to the real property that the real property cannot perform its desired function without the nonattached item.[88]

[85] *See* Nevada Attorney General Opinion 2012-10 (10-31-2012).
[86] The 2025–2026 Nevada Department of Taxation, Division of Excise and Local Government Services' Personal Property Manual: Valuation Guidelines are attached hereto as **Exhibit Q**.
[87] *See* **Ex. Q** at 72. This same language was published in the Personal Property Tax Manual for FY 2020-2021, when the ESM Project commenced.
[88] Nevada Property Tax: Elements and Application, 28 (March, 2025), included as **Exhibit R** (further stating that "[a] more complete discussion on the treatment of fixtures may also be found in The Personal Property Manual Appendix published by the Department and approved by the Commission annually").

Per the Department's guidance then, the Clark County Assessor's determination of whether the ESM Project is classified as personal property and or a "fixture" of real property under Nevada law depends on the facts and circumstances of the ESM Project.[89]

There is more evidence in the Department's Personal Property Manual suggesting that the ESM project, like other renewable energy generation projects, is not always personal property and that such classification of renewable energy projects in general is facts and circumstances dependent. Under the Department's Personal Property Manual, "utilities" are described as, among other things, "electric power generation, transmission and distribution" and the personal property of a utility is further defined as "[p]ersonal property used in generating, transmitting, and/or distributing electric power. A typical example of personal property in this category would include inventory and spare parts."[90] Here, the County's determination that the entire ESM Project is personal property clearly goes well beyond "inventory and spare parts."

The Department's Personal Property Manual also includes an important disclaimer stating "[f]or the purposes of this manual, the following descriptions *apply only to those items which can be classified as Personal Property*. *The designated life does not apply to Real Property or fixtures which have been converted to Real Property*."[91] This is further proof that the Department recognizes there is no such thing as a "one size fits all" approach to the classification of renewable energy projects and that such classification turns on the facts and circumstances of each project.

The Department's Personal Property Tax Manual is based on Nevada caselaw, under which the facts and circumstances of a particular case are examined through the lens of three inquiries: annexation, adaptation, and intent.[92] Broadly, "where it can be demonstrated that a reasonable person would consider the property to be physically annexed to the land, adapted to a use specific to the real property, or intended to be permanently affixed to the real property, such item will be considered a fixture."[93] More specifically, "[t]he annexation test is met where the chattel is actually or constructively joined to the real property. . . The adaptation test is met when the object in question is adapted to the use to which the real property is devoted. . . the most important factor in making the determination of whether an item is a fixture … is the intention of the parties at the time the items were installed."[94, 95]

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[89] *See* Nevada Attorney General Opinion 2012-10 (10-31-2012) ("the test in Nevada to determine whether property is a fixture is a facts and circumstances test").
[90] *See* **Ex. Q** at 23.
[91] *See* **Ex. Q** at 23 (*emphasis* added).
[92] *See Fondren, et al, v. K/L Complex Ltd., et al.*, 800 P.2d 719, 722 (1990) (explaining annexation, adaptation and intent are the "three factors used in making the determination of whether an item is a 'fixture'"); *see also* **Ex. Q** at 72.
[93] Nevada Attorney General Opinion 2012-10 (10-31-2012).
[94] *Fondren, et al, v. K/L Complex Ltd., et al*., 800 P.2d 719, 722 (1990).
[95] The three inquiries are detailed thoroughly in NAC § 361.1127 under which a "fixture" must be "installed or attached to land or an improvement in a permanent manner" which expressly means that (1) the "item is attached to, imbedded in or permanently resting upon land or an improvement, or is attached by other means that are normally used for permanent installation, and cannot be removed without substantially damaging the item or the land or improvement with which it is being used;" (2) "The use or purpose of an item that is not otherwise physically annexed to land or an improvement is so adapted that it is: [ ] A necessary, integral or working part of the land or improvement; [ ] Designed or committed for use with the land or improvement; or [ ] So essential to the land or improvement that

The ESM Project satisfies all three inquiries here just as it does as a "permanent improvement" under federal law: it is physically and constructively joined to the real property using permanent connections; it is adapted to the Moapa Band's dedicated use of the real property to generate solar-powered electrical energy; and the land lease between Appellant and the Moapa Band shows the parties intended the project to be a permanent fixture of the real property.

i. Annexation: the ESM Project is permanently connected to the real property.

The *annexation* inquiry asks whether the item is "attached to, imbedded in or permanently resting upon land or an improvement, or is attached by other means that are normally used for permanent installation, and cannot be removed without substantially damaging the item or the land or improvement with which it is being used[.]"[96] Annexation deals with the manner in which the item is physically connected to the real property and inquires as to whether the item is "annexed to the property" in such a way that it is "physically attached" to the real property to the point it has "become a part thereof."[97]

This inquiry is functionally the same as *Whiteco* factors 1 and 4-6. The module-tracker systems and substation are physically connected to the land. For the same reasons the *Whiteco* factors are met, as discussed above in Sections III(A)(i)(a), III(A)(i)(c), III(A)(i)(d) and III(A)(i)(e), the ESM Project is considered annexed to the underlying land.

ii. The ESM Project is adapted to the dedicated use of real property.

The *adaptation* inquiry asks whether the use or purpose of an item is so adapted to the land that it is a "necessary, integral or working part of the land or improvement"; "[d]esigned or committed for use with the land or improvement"; or "[s]o essential to the land or improvement that the land or improvement cannot perform its desired function without the nonattached item."[98] Generally, adaptation reveals whether the item is "specifically designed" for and "exclusively used" in a way that augments the devoted purpose of the real property.[99]

As detailed in Section III(A)(i)(b), the ESM Project is a necessary, integral or working part of the land and so essential to the land or improvement that the land or improvement cannot perform its desired function without the nonattached item. The ESM Project is the exact type of "Solar Power Facility" to which the Moapa Band dedicated the land to be used. The ESM Project fulfills and augments the land's devoted purpose. Without the project, the land would be dedicated to generation of solar-powered electrical energy but unable to generate solar-powered electrical energy.

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the land or improvement cannot perform its desired function without the nonattached item;" and (3) "A reasonable person would consider the item to be a permanent part of the land or improvement, taking into account annexation, adaptation and other objective manifestations of permanence[.]"

[96] See **Ex. Q** at 72.

[97] *Fondren, et al, v. K/L Complex Ltd., et al.*, 800 P.2d 719, 722 (1990).

[98] *See* **Ex. Q** at 72.

[99] *Fondren, et al, v. K/L Complex Ltd., et al.*, 800 P.2d 719, 722 (1990).

The project has been generating solar-powered electrical energy for over 4 years.[100] Thus, the ESM Project is "exclusively used" to augment the devoted purpose of the Moapa Band's real property, the foundational consideration of adaptation.[101] Because the ESM Project augments the dedicated use of the Moapa Band's land, it must be considered a "fixture" adapted to the land.[102]

As explained in Section III(A)(i)(b) of this memorandum, specific construction techniques like earth trusses for example were intentionally chosen to address engineering and geological concerns around the caliche soil at the location. Construction of the project took 2.5 years due to modules being detained by customs. As explained in Section III(A)(i)(e), smaller components of the ESM Project could theoretically be recycled for use at another solar project but there is no guarantee any ESM Project component would fit or be of use to another solar project. Such considerations show that the ESM Project was "'custom-built' to match the design and optimize the layout" of the Moapa Band's real property, rendering the project "truly unique," and "not readily usable anywhere else."[103]

This inquiry is functionally the same as *Whiteco* factor 2. It is clear that the Moapa Band devoted the real property for use in the generation of solar-powered electrical energy and that the ESM Project is a necessary, integral or working part of the land, custom built and designed or committed for use with the land, and so essential to the land that the land cannot perform its desired function without it. For the same reasons the *Whiteco* factor is met, as discussed above in Section III(A)(i)(b), the ESM Project is considered adapted to the dedicated use of the underlying land.

iii. Appellant and the Moapa Band intended the ESM Project to be permanent.

Under the *intent* inquiry, the "assessor must consider whether the item is intended to be a permanent part of the land or improvement, taking into account physical or constructive annexation, and other objective manifestations of permanence."[104] "Objective manifestations of permanence," as defined in NAC § 361.1127(2), include a consideration of whether removal of the item "would destroy the item or cause significant damage to the real property to which it is installed or attached." NAC § 361.1127(2) also notes that the "terms of a written agreement between parties indicates the intention" of the parties particularly as to removal of or transferred ownership of the item.

This inquiry is functionally the same as *Whiteco* factor 3. The expected life-span of the project, the PPA, the project's inability to be removed without substantial damage to the project and real property, as well as the Lease between the Appellant and the Moapa Band showing the parties intended Appellant to pay PILOT assessments and not property taxes, all unmistakably demonstrate that the ESM Project was

[100] The ESM Project first produced energy in October 2021. By the end of 2021, approximately 70% of the project was operational and producing energy. However, full operation of the ESM Project was not realized until May 2023. In other words, the ESM Project has been operational and producing energy since October 2021 but the project has operated and produced energy at its full intended capacity only since May 2023.
[101] *See Fondren, et al, v. K/L Complex Ltd., et al.*, 800 P.2d 719, 722 (1990) (reasoning the adaptation test was met where a contractor installed fixtures that were "specifically designed" for a restaurant "used almost exclusively as such").
[102] *See* **Ex. Q** at 72 (where "the purpose of the item is to augment the use of the improvement no matter how it is attached . . . the item must be considered a fixture").
[103] *See Fondren, et al, v. K/L Complex Ltd., et al.*, 800 P.2d 719, 722 (1990).
[104] *See* **Ex. Q** at 72, 73.

intended to be permanent. For the same reasons the *Whiteco* factor is met, as discussed above in Section III(A)(i)(f), the ESM Project is intended to be permanent.

D. Alternatively, federal law and the U.S. Supreme Court's *Bracker*-test impliedly preempt State and local taxation of the ESM Project.

If the ESM Project is not determined to be a permanent improvement under federal or state law, the Clark County Assessor's property tax assessment is still preempted and immune from property tax under federal law and the interest-balancing test adopted by the U.S. Supreme Court in *White Mountain Apache Tribe v. Bracker* ("*Bracker*"), 448 U.S. 136 (1980).

i. Under a Bracker-analysis, the county-imposed property tax is impermissible as impliedly preempted by federal law because Clark County's interests do not outweigh the Federal Government and Moapa Band's interests.

The *Bracker*-test applies when "a State asserts authority over the conduct of non-Indians engaging in activity on the reservation."[105] Under the *Bracker*-test, a court makes a "particularized inquiry into the nature of the state, federal, and tribal interests at stake" which is "designed to determine whether, in the specific context, the exercise of state authority would violate federal law."[106] *White Mountain Apache Tribe v. Bracker*, 448 U.S. 136, 145 (1980). Where the state authority "interferes or is incompatible with" federal and tribal interests, the state authority will be preempted "unless the State interests at stake are sufficient to justify the assertion of State authority."[107]

Notions of "Indian sovereignty" provide "a crucial 'backdrop'" for the *Bracker*-test "against which any assertion of State authority must be assessed" as does the long-held principle that tribes and the Federal Government "are firmly committed to the goal of promoting tribal self-government[.]"[108] There "is a significant geographical component to tribal sovereignty, a component which remains highly relevant to the pre-emption inquiry" and specifically "remains an important factor to weigh in determining whether state authority has exceeded the permissible limits."[109]

a. Federal Government and Tribal interests are strong.

In the context of a *Bracker*-analysis, federal interests "are greatest when the government's regulation of a given sphere is 'comprehensive and pervasive.'"[110] As established in Section III(A)(ii)(a)'s analysis of 25 C.F.R. § 162.017 and its preamble, the Federal Government's regulation of leases on tribal land is comprehensive and, therefore, the interests are "greatest" in the instant case.

Again, under the regulations preamble, the purpose of leasing Indian land is "to allow Indian landowners to use their land profitably for economic development, ultimately contributing to tribal well-

[105] *White Mountain Apache Tribe v. Bracker*, 448 U.S. 136, 144 (1980).
[106] *Id*. at 145.
[107] *New Mexico v. Mescalero Apache Tribe*, 462 U.S. 324, 334 (1983).
[108] *Id*. at 334–35.
[109] *White Mountain Apache Tribe v. Bracker*, 448 U.S. 136, 151 (1980).
[110] *Barona Band of Mission Indians v. Yee*, 528 F.3d 1184, 1192 (9th Cir. 2008).

being and self-government[.]"[111] Importantly, the preamble states that "[a]ssessment of State and local taxes would obstruct Federal policies supporting tribal economic development, self-determination, and strong tribal governments."[112] Where an agency has established that imposition of State taxes frustrates the promotion of economic development, tribal well-being and tribal self-determination, such factors "may be weighed… by a court applying the *Bracker* test[.]"[113] The Federal Government also "has an additional interest in achieving uniformity in the regulation and taxation of tribal leasing."[114]

Here, the Federal Government's comprehensive regulation of leases on tribal land weighs in favor of a strong federal interest. The clearly defined purposes of regulations such as 25 C.F.R. § 162.017—promoting traditional notions of Indian sovereignty, economic development, tribal well-being and uniformity in the governance of leasing Indian-land—also weigh in favor of a strong federal interest. Finally, the Federal Government also has a strong interest in uniform regulation and taxation of tribal leases. Collectively then, the federal interest at stake in this case is strong, comprehensive and pervasive.

The Moapa Band's interests largely parallel the Federal Government's interests. Specifically implicated here by Clark County's property tax assessment are the Moapa Band's interests of self-determination and economic development, two touchstones of Congress' "overriding goal" of "tribal self-government."[115] Intertwined with that overriding goal are the well-settled principles that "tribes have the power to manage the use of [their] territory and resources by both members and nonmembers…to undertake and regulate economic activity within the reservation…and to defray the cost of governmental services by levying taxes."[116] Therefore, "when a tribe undertakes an enterprise under the authority of federal law, an assertion of State authority must be viewed against any interference with the successful accomplishment of the federal purpose."[117]

The Moapa River Indian Reservation—which is held in trust by the United States for the benefit of the Moapa Band—is over 79,000 acres, most of which is vacant land in the dry and arid Nevada high desert. While the Moapa Band has almost complete control to decide how it uses its trust land, options for economic development are limited as the land contains few natural resources that could be utilized for the Moapa Band's gain. Moreover, the trust land is not easily developable due to its geography and lack of critical infrastructure.

However, due to its location and access to transmission infrastructure on and near the Moapa River Indian Reservation, the Moapa Band has found great success in leasing its trust lands (with the support and approval of the Federal Government) to companies for the development and construction of solar energy projects. Pursuant to federal and tribal law, the Moapa Band is currently a party to three (3) leases by which the Moapa Band leases over 7,000 acres of its trust land for solar projects. These leases bring in significant

[111] 77 Fed. Reg. 72440-01 (Dec. 5, 20120), 2012 WL 6019492.
[112] *Id*.
[113] *Cnty. of Yakima v. Confederated Tribes & Bands of Yakima Indian Nation*, 502 U.S. 251, 275, (1992).
[114] *Agua Caliente Band of Cahuilla Indians v. Riverside Cnty.*, 181 F. Supp. 3d 725, 742 (C.D. Cal. 2016).
[115] *New Mexico v. Mescalero Apache Tribe*, 462 U.S. 324, 334–34 (1983).
[116] *Id*. at 335–36.
[117] *Id*. at 336.

government revenue to the Moapa Band through land rental payments, sales and use taxes, PILOT taxes and other tribal government fees.

Here, Clark County's assessed property tax threatens the Moapa Band's interests in self-determination and economic development because it encroaches upon the Moapa Band's authority to govern its affairs, conduct its business and collect income to provide services to its Members on the Moapa River Indian Reservation. Clark County's imposition of a multi-million dollar property tax on Appellant will ultimately discourage and dissuade Appellant from continuing to do business with the Moapa Band and lease land on the Moapa River Indian Reservation.

Clark County's plan to assess property taxes on all solar projects located in Clark County, including those located on the Moapa River Indian Reservation, would likely cause all existing Moapa Band solar project lessees, as well as future solar project land lessees, to not do business with the Moapa Band. This irrefutably stifles the Moapa Band's ability to develop economically as the Moapa Band would be forced to figure out another way to use its dry, arid and natural resource-lacking trust land for income.

Many federal courts have recognized that "the imposition of a possessory interest tax on non-Indian lessees has an 'adverse economic effect' upon the Indian lessors."[118] This is no exception; Clark County's property tax assessment on the ESM Project would directly inhibit the Moapa Band's realization of self-determination and economic development, two historically important tribal interests.[119]

b. Clark County's interest is not strong.

Clark County's interest in assessing property tax on the ESM Project must be weighed against the Federal Government and Moapa Band's strong interests. Importantly, under a *Bracker*-analysis, a county's tax "must be 'narrowly tailored' to funding the services it provides to the Tribe and the activity being taxed" for the county's interest in the tax "to outweigh strong tribal and federal interests."[120] In fact, the Ninth Circuit has stated "[t]o be valid, the [State] tax must bear some relationship to the activity being taxed."[121]

Here, we are unaware of any legitimate interest of Clark County justifying the imposition of property taxes on the ESM Project. Of critical importance is that Clark County is not assessing property tax in exchange for the provision of local government services to the Moapa Band or ESM Project. In fact, the county *does not* furnish local government services relative to any property on the Moapa River Indian Reservation including the ESM Project. For example, Clark County stops maintaining the roads and highways once they cross onto the Moapa River Indian Reservation. As observed on the site tour, after a person enters the Moapa River Indian Reservation to access the ESM Project, the roads are maintained by

[118] *Agua Caliente Band of Cahuilla Indians v. Riverside Cnty*., 181 F. Supp. 3d 725, 744 (C.D. Cal. 2016).
[119] Appellant recognizes that the "reduction of tribal revenues is not, on its own, sufficient to invalidate a state tax[,]" but it is "one factor [ ] among others to be considered in the *Bracker* balancing test." *Agua Caliente Band of Cahuilla Indians v. Riverside Cnty*., 181 F. Supp. 3d 725, 744 (C.D. Cal. 2016) (citations and quotations omitted).
[120] *Agua Caliente Band of Cahuilla Indians v. Riverside Cnty.*, 181 F. Supp. 3d 725, 744–45 (C.D. Cal. 2016).
[121] *Hoopa Valley Tribe v. Nevins*, 881 F.2d 657, 661 (9th Cir. 1989).

the Moapa Band, not Clark County, and there is a stark difference between the well-paved county roads and the dirt, potholed and wash boarded tribal-roads.[122]

Further, when the ESM Project was built, Clark County building permits were largely not required nor issued. The only County permits issued in conjunction with the ESM Project's construction were a special use permit related to the portion of the gen-tie line on BLM and NV Energy property and a dust control permit, both of which pertained to work done on non-tribal land.[123]

During this Appeal, Appellant has attempted to discern Clark County's justifications for and interests in classifying the ESM Project as taxable personal property notwithstanding the State's previous assertions that "property taxes would be paid to the tribe and not the state" because the State does "not have jurisdiction over the property taxes paid on trial [sic] land."[124]

The only justification for or interest in classifying the ESM Project as taxable personal property and imposing property taxes provided by Clark County thus far is that the county is seeking to raise revenue. Clark County has offered no other interest in assessing the property tax, let alone a legitimate interest in doing so. Without more, Clark County's justification has the look and feel of "raising revenue" for the sake of growing Clark County's budget. "Raising revenue" alone is not justification for imposing a local tax under *Bracker*.[125]

The Clark County Assessor's recent assessment of property tax on the ESM Project has no apparent connection or relation to any governmental or regulatory service provided to the Moapa Band by Clark County. Quite simply, Clark County's general and singular interest in revenue collection is insufficient to outweigh the strong federal and tribal interests at stake here. Accordingly, the Clark County Assessor's assessment of personal property tax on the ESM Project—a project constructed on tribal land—is impliedly preempted under *Bracker*.[126]

IV. CONCLUSION

Appellant was directly informed by the State of Nevada that property taxes would not apply to the ESM Project. The State's basis for its position is legally correct. Federal law treats the ESM Project as a State and local tax-immune permanent improvement. State law and guidance similarly treats the ESM

[122] Photos of Clark County maintained roads leading to the Moapa River Indian Reservation and Moapa Band maintained roads once they cross onto the Moapa River Indian Reservation are attached hereto as **Exhibit S**.
[123] The Special Use Permit and Dust Control Operating Permit For Construction Activities, the only two permits issued by Clark County relative to the ESM Project, are attached hereto as **Exhibit T**.
[124] *See* **Ex. I**.
[125] *White Mountain Apache Tribe v. Bracker*, 448 U.S. 136, 151 (1980) ("where respondents are unable to justify the taxes except in terms of a generalized interest in raising revenue, we believe that the proposed exercise of state authority is impermissible").
[126] Clark County seeks to impose personal property tax on the ESM Project directly, rather than asserting that Appellant has a possessory interest in tribal property. However, even if Clark County pivoted to a tax based on a possessory interest in personal property, the same *Bracker* analysis would be required. See 25 C.F.R. § 162.017(b)-(c); 77 Fed.Reg. 72440-01 (Dec. 5, 2012), 2012 WL 6019492 (explaining that 25 C.F.R. § 162.017 "addresses not only taxation of improvements on leased Indian land, but also taxation of the leasehold or possessory interest, and taxation of activities (e.g., excise or severance taxes) occurring or services performed on leased Indian land.").

Project as a fixture to real property. Even if the ESM Project were considered personal property, it would remain immune from State and local taxation under federal law because the balance of interests weigh strongly against taxation.[127, 128]

For all of these reasons, Appellant respectfully requests the State Board of Equalization to grant its Appeal and determine that no property tax is due to Clark County or the State of Nevada with respect to the ESM Project

Sincerely,



_____

Josh Hicks, Esq.
McDonald Carano LLP

[127] The Affidavit of Justin Johnson, Executive Vice President and Chief Operating Officer of Arevon Energy, Inc., is attached hereto as **Exhibit M**.

[128] All exhibits were electronically shared with Mr. Walusek via email on September 9, 2025, through OneDrive. Certain exhibits attached to this memorandum are confidential and not subject to public disclosure pursuant to Nevada law. These exhibits have been marked as such.

MOAPA BAND OF PAIUTES

MOAPA RIVER INDIAN RESERVATION
BOX 340
MOAPA, NEVADA 89025
TELEPHONE (702) 865-2787
FAX (702) 865-2875

September 8th, 2025

State of Nevada Board of Equalization
3850 Arrowhead Dr., 2nd Floor
Carson City, NV 89706

RE: Comment in Support of Arevon Energy, Inc. in State Board of Equalization Case No. 25-155

Dear Board Members:

The Moapa Band of Paiutes (the "Tribe") offers the following comments in support of Arevon Energy, Inc. ("Arevon") in Case No. 25-155 before the Nevada State Board of Equalization (the "Board"). Like Arevon, the Tribe opposes the Clark County Assessor's Office's ("CCAO") attempt to impose a Nevada personal property tax on Arevon's solar project, Eagle Shadow Mountain Solar Farm ("ESM"), which is located wholly on the Moapa River Indian Reservation (the "Reservation"). The Tribe respectfully requests the Board follow well-established legal precedent to find that the Nevada property tax in question, and the CCAO's attempts to apply it to the Reservation and ESM, is preempted by federal law and barred by the Tribe's sovereign authority over the Reservation, as acknowledged by tribal, federal and state law.

I. Introduction

a. The Tribe is a Sovereign Nation

The Moapa Band of Paiutes is a federally recognized Indian Tribe organized pursuant to the Indian Reorganization Act of 1934. The Southern Paiute people who comprise the Tribe's population have occupied the Reservation and vast areas of the surrounding region since time immemorial. We have been sustained by and acted as stewards of this land, since long before the establishment of the United States and the State of Nevada. Today, we inhabit and govern a small fraction of our ancestral homelands. We do so with care and foresight, and with the intent of protecting and enhancing the lives and well-being of our future generations.

b. The Tribe's Business Council Governs the Reservation

The Reservation is comprised of approximately 79,000 acres of land held in trust for the benefit of the Tribe by the United States. The Tribe adopted the Constitution and By-Laws of the Moapa Band of Paiutes in 1942, which established a governing body known as the Business Council vested with the authority to manage all economic affairs and enterprises on the Reservation, and to lease and encumber Reservation lands. *Moapa Const. Art. V, Sec. 1(c), (e)*. The Tribe's ability to lease or encumber its land is also governed by federal law, pursuant to the Indian Long-Term Leasing Act, 26 U.S.C. § 415(a), and the corresponding Department of Interior leasing regulations

at 25 CFR Part 162. The Tribe is also governed by the Moapa Law & Order Code and various Ordinances promulgated by the Business Council to promote the general welfare of the Tribe and to codify the inherent sovereign authority of the Tribe over its territory and the activities that occur within the Reservation.

c. The Project is Regulated by the Tribe and Applicable Federal Law

Arevon operates Eagle Shadow Mountain Solar Farm ("ESM") on 2,300 acres of land wholly within the Reservation pursuant to a long-term land lease with the Tribe (the "Lease"). ESM is a 300 MW solar photovoltaic power generating facility, which will operate for at least the next 25 years under a power purchase agreement with Nevada Energy. The ESM interconnects to Nevada Energy through a substation also wholly located on the Reservation. ESM uses water and sand and gravel from the Reservation for construction, operations and maintenance requirements. Access to ESM is over Reservation roads, which are maintained by Arevon.

The Lease and other associated agreements were approved by the Tribe through its Business Council, in accordance with the laws of the Tribe. The Lease was also approved on behalf of the United States by the Bureau of Indian Affairs pursuant to federal law, 25 U.S.C. §415 and regulations, 25 CFR Part 162. Various laws and ordinances of the Tribe apply to the Lease including those that address employment of Tribal members, desert tortoise management and conservation, tribal sales and use taxes, project financing, and related commercial transactions. Furthermore, the Tribe entered the Lease Agreement underlying ESM with the understanding that "no part of the Project will be subject to real estate taxation by either the State of Nevada or any local governmental authority." *Tribal Agreement Between Arevon and the Moapa Tribe*, at Recital D. To address taxation, Arevon and the Tribe agreed Arevon would make payment in lieu of taxes ("PILOT") payments to the Tribe for taxes that could be levied by the Tribe against the project, its contractors, the lease premises, the improvements, solar power facilities, etc. *Id.* at Section 4.

Given the scale and scope of ESM, the Tribe permitted the project on the Reservation to facilitate economic development, create jobs and employment opportunities for Tribal members, to promote sustainable renewable resources, and to serve as an example of tribal energy self-sufficiency and sustainability in the region and nationally. The Tribe's objectives are also key federal objectives and are supported by numerous federal laws and policies. The Tribe supports Arevon's position that ESM is a fixture of real property within the Reservation and that the Nevada personal property tax at issue cannot be applied to the Reservation or ESM. As Arevon has argued, ESM is physically and constructively joined to the Reservation using permanent connections. Second, it is adapted to the Tribe's dedicated use of the Reservation to generate solar-powered electrical energy. Most importantly, Arevon and the Tribe intended the project to be a permanent fixture of the Reservation as evidenced by the language of the parties' land lease agreement, which has a term of up to fifty years, and establishes that the project facilities "shall be treated as permanent improvements." *Solar Energy Ground Lease Agreement*, Section 7.04(A). This language is consistent with federal regulations, which treat improvements to be constructed on leased lands as permanent improvements. See 25 C.F.R. §§ 162.003, 162.543(a). Relevant to all three inquiries, the ESM Project cannot be removed without substantial damage to both the project and the Reservation. Therefore, ESM should be considered a non-taxable "fixture" of real property notwithstanding the Clark County Assessor's current assessment that the project is taxable personal property.

II. The Tribe's Legal Position

a. Nevada Law Does Not Apply on the Reservation.

The Tribe possesses inherent plenary and exclusive power over the Reservation and its citizens, subject only to limitations imposed by federal law. *Worcester v. Georgia*, 31 U.S. 515, 555 (1832). Subject to such limitations, the Tribe also maintains authority over the activities of non-Indians within the Reservation, including the power to exclude non-members from the Reservation. *Iowa Mutual Ins. Co. v. LaPlante*, 480 U.S. 9, 18 (1987); *Water Wheel Camp Recreation Area v. Larance*, 642 F.3d 802, 808 (9th Cir. 2013). Furthermore, federal courts and federal policy have long recognized and affirmed a tribe's right to "make their own laws and be ruled by them" as a key barrier to the exercise of state power within the territory of a tribe. *Williams v. Lee*, 358 U.S. 217, 220 (1959); *Fisher v. Dist. Ct.*, 424 U.S. 382, 386 (1976).

The Tribe's sovereignty and jurisdictional authority over the Reservation and the activities that occur thereon, is dependent on, and subordinate to only the federal government, not the state. *California v. Cabazon Band of Mission Indians*, 480 U.S. 202, 207 (1987). It is from these well-established precedents and presumption that the Tribe governs the Reservation, enters agreements to allow businesses onto the Reservation, and regulates conduct on the Reservation. It is from this foundation that the Tribe maintains its position that the Nevada personal property tax in question cannot be applied on the Reservation and to ESM. In other words, and to be clear, the application of the Nevada tax to the Reservation is preempted by federal law and would infringe on the Tribe's sovereign rights.

Furthermore, federal leasing regulations that control the terms and conditions of the ESM Lease state that: "permanent improvements on the leased land, without regard to ownership of those improvements, are not subject to any fee, tax, assessment, levy, or other charge imposed by any State or political subdivision of a State." 25 C.F.R. 162.017(a). See also, *Seminole Tribe of Florida v. Stranburg*, 799 F.3d 1324 (11th Cir. 2015) (citing to federal regulations and holding that Florida's Rental Tax on non-Indian lessees of tribal lands was a prohibited tax on a privilege of property ownership)

The Public Utilities Commission of Nevada (the "Commission") previously considered the application of Nevada environmental laws (the Utility Environmental Protection Act) to ESM and the Reservation. In the Tribe's favor, the Commission concluded the project was not subject to the Nevada law because: it was preempted by federal law and policy; it would infringe on tribal jurisdiction over the Reservation and the project; and, because there was no compelling state interest justifying its application to the ESM and the Reservation. *Petition of Moapa Solar, LLC for a Declaratory Order that the Moapa Solar Energy Center on Tribal Land is not subject to the Utility Environmental Protection Act, Docket No. 14-07035, Order, Sept. 19, 2014.* The Board should follow the Commission's course.

b. The Nevada Tax and the CCAO's Actions are Preempted by Federal Law and Infringe on Tribal Sovereignty

The Tribe acknowledges that certain limited exceptions exist, under federal law, allowing the application of state law to non-Indian activities on reservation lands. Further, the Tribe anticipates

the State or CCAO may argue the tax at issue should apply to ESM because it is a non-Indian entity and or because it applies to non-Indian property. The Tribe believes those arguments must fail because the issue of state jurisdiction over non-Indians within Indian lands must be analyzed from the presumptions against such authority as set forth above and against the backdrop of tribal sovereignty. *McClanahan v. Ariz. State Tax Comm'n*, 411 U.S. 164, 172 (1973); *see Okla. Tax Comm'n v. Sac & Fox Nation*, 508 U.S. 114 (1993).

Federal courts have identified two key legal barriers against the assertion of state regulatory authority over tribal reservations and on-reservation activities: (1) preemption by federal law, and (2) the federal objectives of promoting tribal self-government free from unlawful infringement by the states upon the right of tribes to make their own laws and be ruled by them. *New Mexico v. Mescalero Apache Tribe*, 462 U.S. 324 (1983); *White Mountain Apache Tribe v. Bracker*, 448 U.S. 136 (1980). As discussed below, it is the Tribe's position that the CCAO's attempted application of the subject tax cannot overcome these barriers.

i. The Subject Tax and CCAO's Authority Are Preempted by Federal Law

In *Bracker*, the Supreme Court considered the application of a state tax to a non-Indian trucking company operating solely on the White Mountain Apache Reservation under a contract with a tribal business. In its analysis of whether the state tax was preempted by federal law, the Court did not require an express federal law preempting the Arizona tax but instead considered the tribal, federal, and state interests broadly to determine whether the tax would violate federal law. *Bracker*, at 145. Ultimately, the Court determined application of the Arizona tax would violate federal law and policies, implemented to promote tribal economic development and natural resource management, including applicable comprehensive federal statutes and detailed federal regulations. *Bracker*, at 148-149. The Court noted the importance of tribal revenues from the tribal venture to fund tribal governmental programs and the economic burden the tax could have on those revenues. *Bracker*, at 145-151.

The Supreme Court has also held that no actual interference with federal law needs to be demonstrated, rather potential impact to the overriding federal policy or action could be sufficient to block state authority. *Ramah Navajo School Board, Inc. v. Bureau of Revenue*, 458 U.S. 832 (1982) (barring a state tax on a non-Indian contractor building a school for Indian students it believed had the potential to interfere with federal Indian education goals by increasing the costs of constructing the school).

In the current matter, involving ESM and the Tribe, the Tribe acted to put a lease in place for the project in accordance with tribal and federal law, including the federal leasing statute, 26 U.S.C. § 415(a), and the corresponding Department of Interior Leasing Regulations at 25 CFR Part 162. Upon Tribal approval, the long-term lease was carefully considered and approved by the Bureau of Indian Affairs. Further, the Tribe acted in accordance with federal policy of promoting tribal economic development by seeking to derive revenues from its land base which the United States holds in trust for the benefit of the Tribe. The Tribe also acted in accordance with broad federal laws policies, and tribal-specific policies to utilize renewable and environmentally sound energy resources such as solar. Through the project and lease, the Tribe sought to utilize its natural resources for the direct benefit of its citizens. Accordingly, like the other tribal activities and ventures considered by the Supreme Court, the Nevada tax would be preempted by federal law.

ii. The Subject Tax and CCAO's Authority Would Infringe on the Tribe's Sovereign Rights to Make its Own Laws and Be Ruled by Them

Allowing the application of the County tax to the Reservation and ESM would violate and interfere with the federal economic development and resource development policies discussed above. Furthermore, application of the Nevada tax to the Reservation, the Tribe's sole land base, would infringe on the Tribe's rights to govern its own territory and to legislate on behalf of its citizens. The County's tax could place a financial burden on ESM and the Tribe, which would negatively impact Tribal revenues and governmental services, such as infrastructure, housing, law enforcement, health care, childcare, elder care, or education. The County's tax could deter further development of the Tribe's land base for similar long-term lucrative projects. Additionally, the County's tax could prevent the Tribe from being able to tax the project or similar new projects in the future. Finally, the County's tax runs counter to the state's tax policy of tax comity with Indian tribes. See, e.g. N.R.S. 372.800 – 801.

In its relationship with ESM and Arevon, the Tribe is seeking to become a leader amongst other tribal governments in renewable energy development. In the future, the Tribe may own these types of projects themselves or form lucrative partnerships to own and develop similar projects on the Reservation. The purpose for those objectives is to promote the well-being of the Tribe's citizens, to create jobs, and to provide the services necessary for the stability of the Tribe. The County tax has the clear potential to unravel and deter those positive intentions and unduly infringe upon the Tribe's sovereign authority, which is well founded in tribal and federal law.

The County tax would supplant tribal tax laws and further dictate the terms on which non-members would be permitted to utilize the Reservation's resources. This cannot be allowed. *See New Mexico v. Mescalero Apache Tribe*, 462 U.S. 324 (1983) (barring application of New Mexico hunting and fishing laws to non-Indian on-reservation activities).

III. Conclusion

Thank you for accepting this comment in support of Arevon's appeal in this matter. Thank you for carefully considering the Tribe's position on this critical issue, which has the potential to have a significant impact on the Tribe and its future business partners. We believe it is evident the County tax should not be applied to the Reservation and ESM, and that an effort to do so would be barred by well-established federal law and policy. The Tribe looks forward to working with the State on issues such as this and in order to continue our role in the careful development of our region's resources.

Very Sincerely,



Ivan Reel, Chairman

ASSESSOR’s INFORMATION

STATE

BOARD OF EQUALIZATION

Case #25-155

Assessor Information

Clark County Assessor Case Summary
Unsecured Roll - Personal Property
Direct Appeal to State

Case #: 25-155 **Appraiser:** Jason Priebe
Year Subject To Appeal: Various **Appeal Issue:** Valuation
Assessor Account: 229299
Business / Owner Name: EAGLE SHADOW MOUNTAIN SOLAR
Location Address: MOAPA SOLAR RD, MOAPA
Property Type: Solar Electric Power Generation

Date of Valuation: 7/1/2024
Declaration received: 10/2/2024 **Declaration meets requirements of NRS 361.265**

Fiscal Year	Recommended Taxable Value
2024/2025	321,558,863
2023/2024	283,854,690
2022/2023	291,527,100

Notes

This is a multi-year appeal (FY's 22/23, 23/24, and 24/25) of Eagle Shadow Mountain, a utility grade photovoltaic solar power generating facility located on tribal land (Moapa Band of Paiute Indians). Only the personal property owned by Eagle Shadow Mountain (a non-tribal entity) is being assessed and the subject of this appeal. Fiscal years 2022/2023 and 2023/2024 were billed on March 25, 2025 and fiscal year 2024/2025 was billed on April 9, 2025. This makes all years eligible to be appealed directly to the State Board of Equalization since they were billed after December 15, 2024.

CLARK COUNTY
OFFICE OF THE DISTRICT ATTORNEY
Civil Division

STEVEN B. WOLFSON
District Attorney

500 S. Grand Central Pkwy, Suite 5075 • Las Vegas, NV 89155 • 702-455-4761 • Fax: 702-382-5178 • TTY and/or other relay services: 711

ALEXANDER CHEN *Assistant District Attorney*
ROBERT DASKAS *Assistant District Attorney*
BRIGID J. DUFFY *Assistant District Attorney*
KAREN S. CLIFFE *Assistant District Attorney*
LISA LOGSDON *County Counsel*

September 8, 2025
Via Email Only

David Denman, Manager
jde@ClarkCountyNV.gov

Re: Eagle Shadow Mountain Solar, 325MK, 8ME, LLC c/o Arevon Energy
SBOE Direct Appeal

Dear Mr. Denman:

Question and Brief Answer

(1) What constitutes personal property under Nevada law for taxation purposes rather than an improvement to real property?

Under Nevada law all property of every kind and nature shall be subject to taxation. NRS 361.045. In addition to the definition of personal and real property in NRS 361.030 and NRS 361.035, Appendix E of the Nevada Department of Taxation personal property manual also provides guidance on determining whether property is real or personal. The assessor must consider whether an item is intended to be a permanent part of the land or improvement, taking into account physical or constructive annexation and other objective manifestations of permanence. In general, property that does not meet the criteria of real property is personal property.

(2) Can property (interest in real property or personal property) be taxed if the property is located on tribal land, but owned by a non-tribal entity?

It depends. The general rule is that tribal land/property is not taxable, but if improvements are made on tribal lands and owned by a non-tribal entity then the improvements that the tribe has no ownership interest in can be taxable.

(3) Are the Tenant Improvements as defined in the lease between the Moapa Band of Paiute Indians ("Tribe") and 325Mk 8 ME LLC ("Eagle Shadow") taxable?

Yes. Pursuant to Section 7.04(B) of the lease the Tenant Improvements are owned

and controlled by the Eagle Shadow. In this case, the Tribe does not have any ownership interest in the Tenant Improvements. Furthermore, the lease provides that upon the termination of the lease the Tenant Improvements must be removed by Eagle Shadow, and the property must be restored to substantially the same condition as the beginning of the lease unless the Tribe elects to purchase the Tenant Improvements. Since the Tribe does not currently have any ownership interest in the Tenant Improvements, the Tenant Improvements are taxable under state and federal law.

Opinion

Determining Real Property vs. Personal Property

NRS 361.035 defines real property as all houses, buildings, fences, ditches, structures, erections, railroads, toll roads and bridges, or other improvements built or erected upon any land. But subsection 3 of NRS 361.035 provides an exception to the general rule of real property. If there is an agreement entered into for the dismantling, moving or carrying away or wrecking of the property described as real property in subsection 1 of NRS 361.035, then property **must** be classified as personal property. Emphasis added. Here, the parties entered a lease, which requires the decommissioning of the Tenant Improvements, if the Tribe does not elect to purchase the Tenant Improvements. Upon termination of the lease Section 12 of the lease requires, at the Tribe's election, that Eagle Shadow remove all of Tenant's Property, including Tenant Infrastructure Improvements. Section 12 also requires a decommissioning plan which will restore the property to substantially the same condition as the beginning of the lease. *See* definition of "decommissioning" in Section 12.02 of the lease. Since the lease has a requirement to remove the Tenant Improvements under Nevada law the Tenant Improvements are personal property in accordance with NRS 361.035(3).

In addition to the statutory definition of real property, Appendix E of the Department of Taxation's Personal Property Manual provides guidance on determining whether fixtures are real or personal property. Appendix E provides three tests: (1) physical annexation; (2) constructive annexation; and (3) intent. Under the first test if the property can be removed without substantially damaging the item or the land then it's mostly like personal property. Under the second test, if the purpose of the item is to augment the use of the improvement no matter how it is attached, such as an elevator, the item would be real property. Under the third test, the assessor can consider the intention of the owner, such as written agreements between the real property owner and the owner of the property being taxed.

Lastly, similar to the guidance in Appendix E, the United State Tax Court, in *Whiteco Industries v. Commission on Internal Revenue*, 65 T.C. 664 (1975) established

six criteria for distinguishing personal property from permanent structures for tax purposes. The six criteria to consider are: (1) capability and history of being moved; (2) whether the property was designed or constructed to remain permanently in place; (3) circumstances indicating the expected or intended duration of affixation; (4) substantiality and time required for removal; (5) damage sustained upon removal; and (6) manner of affixation to the land. The Assessor analyzed each criteria under the Whiteco case and found that the Tenant Improvements are personal property. *See*, Exhibit A, Assessor's analysis using the test in Appendix E and the criteria established in the *Whiteco* case.

The Assessor's office has correctly assessed the Tenant Improvements owned by Eagle Shadow as personal property based on Nevada law, Appendix E of the Department of Taxation's Personal Property Manual and the criteria established in *Whiteco* case.

Taxation of a Non-Tribal Entity on Tribal Land

The taxation of property located on tribal land is complex, flexible and sensitive to the particular facts and legislation involved and requires a particularized examination of the relevant state, federal and tribal interests, including tribal sovereignty and independence. *Cotton Petroleum Corporation v New Mexico*, 430 US 163 (1989).

In 2013, the United States Court of Appeals, Ninth Circuit in *Confederated Tribes of Chehalis Reservation v Thurston County Board of Equalization,* 724 F.3d 1153 (2013) held that improvements owned by an LLC, which the tribe was the majority owner (51%) were not taxable because of the tribal ownership in the LLC and at the end of the lease the improvements reverted to the tribe. In *Chehalis,* the Ninth Circuit held that the particular form in which the tribe chose to conduct its business was irrelevant as long as the tribe had an ownership interest in the improvements. Based on this federal court decision, on September 17, 2014, the Nevada Department of Taxation issued Guidance Letter 14-001 regarding the taxability of permanent improvements owned by any person or company that were located on tribal trust land. The Department of Taxation opined that real property such as buildings and improvements located on lands held in trust by the United States Government for an Indian Tribe are not taxable property, even when owned by a person or entity other than the tribe. This guidance also states that personal property owned by unrelated third parties and located on trust lands may continue to be considered taxable property by the State and its subdivisions. While the Department's guidance is helpful it cannot be read to create a bright-line rule that any buildings or improvements located on tribal land are exempt from taxation.

In this case, the Assessor taxed the Tenant Improvements as personal property, therefore under the Department's guidance the Tenant Improvements are taxable, but even if the Assessor had determined that the Tenant Improvements were improvements to

real property and not personal property the Tenant Improvements made by Eagle Shadow would still be taxable as the facts in this case are different from *Chehalis*. The *Chehalis* decision turned on very specific facts regarding the tribe's ownership interest in the improvements, which are absent from this case.

The Tenant Improvements owned by Eagle Shadow are similar to a recent Arizona Supreme Court decision that found that the Section 5 of the Indian Reorganization Act does not expressly exempt state and local taxes imposed on permanent improvements affixed by non-Indian lessees to land owned by the federal government in trust for Indians when the parties agrees that the lessee owns those improvements. *See South Point Energy Center, LLC v. Arizona Department of Revenue*, 508 P.3d 246 (2022). In *South Point Energy,* the Arizona Supreme Court ruled that a power plant owned and operated by South Point Energy was not exempt from taxation solely because the plant was located on tribal land. The power plant owned by South Point Energy had similar characteristics to the facts in this case. The lease agreement between the Fort Mohave Indian Tribe and South Point Energy was clear that South Point Energy owned and controlled all the improvements and at the end of the lease South Point Energy had the obligation to remove all above-ground real property improvements.[1]

The facts of this case are more akin to the property in the *South Point Energy* case than *Chehalis*. Unlike *Chehalis* where the tribe owned 51% of the LLC operating the property and the ownership of the improvements reverted to the tribe at the end of the lease, here the lease is clear that Eagle Shadow as the tenant is the owner of the Tenant Improvements. *See* Section 7.04 of lease. The lease provides the Tribe with the option of requiring Eagle Shadow to remove the Tenant Improvement or the Tribe can purchase the Tenant Improvements. *See* Section 12 of lease. Under the lease the Tribe has no ownership interest in the Tenant Improvements unlike the tribe in *Chehalis*. The relationship between the Tribe and Eagle Shadow is like the relationship between the tribe and South Point Energy as the parties have agreed that Eagle Shadow owns the improvements not the Tribe and therefore the property should be taxed and is not exempt or preempted under state or federal law.

Upon finding that federal law did not preempt the Arizona Department of Revenue from imposing property taxes upon South Point Energy, the Arizona Supreme Court

[1] It is important to note that on June 30, 2025, the United States Supreme Court denied South Point Energy's request for the high court to review the federal preemption issue regarding the State's ability to tax permanent improvement owned by nontribal entities but situated on tribal lands.

remanded the case to the Arizona Court of Appeals to determine whether the State of Arizona was preempted under the *Bracker* interest-balancing test. *White Mountain Apache Tribe v. Bracker,* 448 U.S. 136 (1980). Under the *Bracker* interest-balancing test the court must consider: (1) the extent of the federal and tribal regulations governing the taxes activity; (2) whether the economic burden of the tax falls on the tribe or the non-Indian entity; and (3) the extent of the state interest in justifying the imposition of the taxes.

There have been several cases that have reviewed the imposition of state or local taxes on non-Indians, but the most recent cases involving the imposition of ad valorem property taxes are the *South Point Energy* case and a case in South Dakota (*Pickerel Lake Outlet Association v. Day County*, 953 N.W.2d 82 (2020)). Both courts found that the state was not preempted from imposing property taxes on a non-Indian entity under *Bracker* test. In both *South Point Energy* and *Pickerel Lake* the courts found that Congress had not authorized the Bureau of Indian Affairs to preempt the State's authority to tax structures owned by non-Indians. While the federal government retains exclusive power to regulate Indian affairs, it has asserted little to no regulatory power in the area of state-imposed ad valorem taxes on structures owned by non-Indians and it is generally within the province of the State to assess property taxes. *South Point Energy Center, LLC v. Arizona Department of Revenue,* 257 Ariz. 216 (2024) citing *Pickerel Lake*, 953 N.W.2d at 94. The second part of the *Bracker* test evaluates who is responsible for the property taxes. Here, Eagle Shadow is responsible for the property taxes on the Tenant Improvements not the Tribe. Furthermore, the tribal land is not being taxed, therefore, Eagle Shadow would fail the second part of the *Bracker* test. The third part of the *Bracker* test requires the court to consider the state's interest in justifying the imposition of the tax. In the same way that the court in *South Point Energy* found a substantial government interest in the imposition of taxes, here the tax revenue supports local services that help Eagle Shadow, its employees and the Tribe. Clark County has a substantial interest as the property tax helps Clark County maintain roads and supports numerous other County services which aid the Tribe.

Just like the governmental entities in *South Point Energy* and *Pickerel Lake*, Clark County is not preempted under the *Bracker* test from taxing the Tenant Improvements owned by Eagle Shadow on tribal land as there are no federal regulations preempting state ad valorem taxes, the economic burden falls on the non-Indian entity and Clark County has a substantial interest in imposing property taxes.

Conclusion

The Assessor's decision to categorize the Tenant Improvements as personal property and not real property is supported by Nevada law, but regardless of whether the

Tenant Improvements are assessed as personal or real property, the Assessor's office has lawfully assessed the Tenant Improvements owned by Eagle Shadow as the Tenant Improvements are not preempted or exempt under state or federal law.

Sincerely,

STEVEN B. WOLFSON
DISTRICT ATTORNEY

BY: /s/ *Lisa V. Logsdon*
LISA V. LOGSDON
County Counsel
Lisa.Logsdon@ClarkCountyDA.com

cc: Briana Johnson, County Assessor

EXHIBIT A

EXHIBIT A

Personal Property -vs- Real Property Analysis (Whiteco, Inc -vs- Commissioner & Appendix E of Personal Property Manual)			
Whiteco Test	**Result**	**Analysis**	**Appendix E Test**
1. Is it capable of being moved?	YES	Solar panels are disconnected from wires & supports. Ojjo Truss Foundation system is screwed into the ground & can be unscrewed for removal. Inverters & housings can be lifted & removed as a unit. Everything that is in the ground other than the Ojjo Truss Foundation system is direct imbedded not cemented in.	Physical Annexation Constructive Annexation Intent
2. Is it designed or constructed to remain permanently in place?	NO	Design is of a non-permanent nature. Ojjo Truss Foundation system is screwed into ground and can be unscrewed for-removal. Fence posts are direct imbedded not cemented in for removal. Invertors & housings are a prefabbed unit that can be lifted and removed or put into place.	Physical Annexation Constructive Annexation Intent
3. Are there circumstances that show the intended length of fixation? Circumstances which show the property may or will have to be moved/removed?	YES	Panels are warrantied for 20 years. Lease has an expiration. Lease has a requirement for potential removal at end of lease. Security bond or cash payment put down as part of lease for returning land to original state.	Intent

4. Is the property/equipment readily removable and how much effort is involved?	YES	Inverters are sitting on gravel bed & are complete housed units that can be removed readily. Property in the ground such as fence posts are direct imbedded and removable without damage. Solar panels and electrical wiring can be removed readily without damage. A-frames screwed in ground per manufacturer/installer can ~~easily~~ be removed without damage by unscrewing the screws holding them in.	Physical Annexation Constructive Annexation Intent
5. How much damage will the property/equipment sustain during removal?	Minimal to none	Information from Nexttracker concerning the Ojjo Earth Truss Foundation (A-frames supporting panels) states removal by unscrewing screws no damage should occur.	Physical Annexation Constructive Annexation Intent
6. How is the property/equipment affixed to the land?	In a non-permanent manner	Property such as fences are direct imbedded not cemented in. The Ojjo Earth Truss Foundation is screwed into the ground & can be removed by unscrewing the screws holding it to the ground. Invertors & housing units can easily be lifted from the ground with no damage and easily loaded on trucks to be removed.	Physical Annexation Constructive Annexation

KeyCite Yellow Flag
Distinguished by Parnell v. Western Sky Financial, LLC, N.D.Ga., April 28, 2014

724 F.3d 1153
United States Court of Appeals, Ninth Circuit.

CONFEDERATED TRIBES OF the CHEHALIS RESERVATION, a federally recognized Indian tribe on its own behalf and as parens patriae for its members; CTGW, LLC, a limited liability company organized under Delaware law, Plaintiffs–Appellants,
v.
THURSTON COUNTY BOARD OF EQUALIZATION, a political subdivision of the State of Washington; John Morrison, Thurston County Board of Equalization member, in his official capacity; Bruce Reeves, Thurston County Board of Equalization member, in his official capacity; Thurston County, a political subdivision of the State of Washington; Steven Drew, Thurston County Assessor, in his official capacity; Shawn Myers, Thurston County Treasurer; Elizabeth Lyman, Thurston County Board of Equalization member, Defendants–Appellees.

No. 10–35642
|
Argued and Submitted June 5, 2013.
|
Filed July 30, 2013.

Synopsis
Background: Tribe and lessee brought action against county, challenging assessment of property taxes on leased property. Cross-motions for summary judgment were filed. The United States District Court for the Western District of Washington, Benjamin H. Settle, J., 2010 WL 1406524, awarded summary judgment to county, finding that state and local governments were not prohibited from taxing permanent improvements, like resort on leased property, that were owned by non-Indians, and 2010 WL 2595232, denied in part tribe's motion to amend. Tribe and lessee appealed.

[Holding:] The Court of Appeals, Ikuta, Circuit Judge, held that land and permanent improvements on land were exempt from state and local taxation.

Reversed.

Procedural Posture(s): On Appeal; Motion for Summary Judgment.

West Headnotes (1)

[1] **Taxation** Indian lands and other property
Land where lessee operated resort was held in trust for use of tribe, and thus land and permanent improvements on land were exempt from state and local taxation. Indian Reorganization Act, § 5, 25 U.S.C.A. § 465.

10 Cases that cite this headnote
More cases on this issue

Attorneys and Law Firms

***1153** Gabriel S. Galanda and Anthony S. Broadman, Galanda Broadman, PLLC, Seattle, WA; Kevin M. Fong (argued) and Blaine I. Green, Pillsbury Winthrop Shaw Pittman, LLP, San Francisco, CA, for Plaintiffs–Appellants.

Jon Tunheim, Prosecuting Attorney, Jane Futterman and Scott C. Cushing (argued), Deputy Prosecuting Attorneys, Olympia WA, for Defendants–Appellees.

Rob Roy Smith, Ater Wynne LLP, Seattle, WA, for Amicus Curiae Marine View Ventures, Inc., Island Enterprises, Inc., and Port Madison Enterprises.

Appeal from the United States District Court for the Western District of Washington, Benjamin H. Settle, District Judge, Presiding. D.C. No. 3:08–cv–05562–BHS.

***1154** Before: ARTHUR L. ALARCÓN, M. MARGARET McKEOWN, and SANDRA S. IKUTA, Circuit Judges.

OPINION

IKUTA, Circuit Judge:

At issue in this case is whether state and local governments have the power to tax permanent improvements built on non-

reservation land owned by the United States and held in trust for an Indian tribe. Pursuant to 25 U.S.C. § 465, and *Mescalero Apache Tribe v. Jones,* 411 U.S. 145, 93 S.Ct. 1267, 36 L.Ed.2d 114 (1973), we hold that they do not.

I

The Confederated Tribes of the Chehalis Reservation is a federally recognized Indian tribe in Southwest Washington. [1] In 2002, the Tribe purchased approximately forty-three acres of land known as the "Grand Mound Property," which was located off the Tribe's reservation in Thurston County, Washington. Two years later, the Tribe asked the Department of the Interior to buy the Grand Mound Property and hold it in trust for the use and benefit of the Tribe pursuant to the Department's authority under 25 U.S.C. § 465. [2] Section 465 authorizes the Secretary of the Interior to acquire "any interest in lands, water rights, or surface rights to lands, within or without existing reservations," and to hold title to such lands and rights "in the name of the United States in trust for the Indian tribe or individual Indian for which the land is acquired." The statute also provides that "such lands or rights shall be exempt from State and local taxation." *Id.* [3]

In 2005, while the Tribe's request was still pending before the Department, the Tribe and Great Wolf Resorts, Inc. entered into an agreement to form CTGW, LLC, a Delaware limited liability company, for the purpose of building a resort, conference center, and water park (collectively, the Great Wolf Lodge) on the Grand Mound Property. Under the agreement, the Tribe owned an undivided 51 percent interest in CTGW. In 2006, the Department agreed to purchase the Grand Mound Property pursuant to § 465 and to hold the land in trust for the Tribe.

The Tribe and CTGW subsequently entered into a lease agreement that gave CTGW the right to use the Grand Mound Property "for a hotel, indoor water park and convention center and related economic development or for any other lawful purpose" for twenty-five years. Article 11 of that lease provides:

> ***1155** All buildings and improvements on the Premises shall be owned in fee by [CTGW] during the term of this Lease provided that such buildings and improvements (excluding removable personal property and trade fixtures) shall remain on the Premises after the termination of this Lease and shall thereupon become the property of the [Tribe].

In short, under Article 11, CTGW would own the Great Wolf Lodge's physical structures for twenty-five years, at which time the Tribe would become the owner. The Bureau of Indian Affairs approved the lease on July 9, 2007, and it remained in effect at all times relevant to this suit. The Lodge opened the following year.

In 2007, Thurston County began assessing property taxes on the Great Wolf Lodge. The County recognized that § 465 exempted the Grand Mound Property from state and local taxation. It concluded, however, that the structures on the land were not tax exempt, because under the terms of the lease they were owned by CTGW and not the Tribe.

The Tribe and CTGW believed that federal law barred the County from imposing these property taxes, and brought suit against the County and related defendants on September 18, 2008, seeking declaratory and injunctive relief. [4] The district court awarded summary judgment to the County, holding that state and local governments are not necessarily prohibited from taxing permanent improvements, like the Great Wolf Lodge, that are owned by non-Indians. The Tribe and CTGW timely appealed, [5] and we have jurisdiction pursuant to 28 U.S.C. § 1291.

II

On appeal, we review the summary judgment order de novo, asking "whether, viewing the evidence in the light most favorable to" the Tribe and CTGW, "there are any genuine issues of material fact and whether the district court correctly applied the relevant substantive law." *Ellins v. City of Sierra Madre,* 710 F.3d 1049, 1056 (9th Cir.2013) (quoting *Delia v. City of Rialto,* 621 F.3d 1069, 1074 (9th Cir.2010)). "[S]ummary judgment is appropriate where there 'is no genuine issue as to any material fact' and the moving party is 'entitled to a judgment as a matter of law.' " *Alabama v. North*

Carolina, 560 U.S. 330, 130 S.Ct. 2295, 2308, 176 L.Ed.2d 1070 (2010) (quoting Fed.R.Civ.P. 56(c)).

A

This appeal raises the purely legal question whether the exemption of trust lands from state and local taxation under § 465 extends to permanent improvements on such lands.

The law relevant to this appeal traces back to *United States v. Rickert,* 188 U.S. 432, 23 S.Ct. 478, 47 L.Ed. 532 (1903), a case that precedes the enactment of § 465 by over thirty years. In *Rickert,* the federal government challenged the taxes imposed by Roberts County, South Dakota on "certain permanent improvements" on lands within the former Sisseton Indian Reservation. *Id.* at 432–33, 23 S.Ct. 478. The United States had allotted the lands to individual members of the Sisseton band of Sioux Indians, but held the lands in trust for a period of twenty-five years or longer. *Id.* at 435–36, 23 S.Ct. 478 (discussing Act of Feb. 8, 1887, ch. 119, § 5, 24 ***1156** Stat. 388, 389 (1887) (codified as amended at 25 U.S.C. § 348 (2006))). *Rickert* first held that state and local governments had no power to tax the land itself because it was owned by the federal government. *Id.* at 437–39, 23 S.Ct. 478 ("If, as is undoubtedly the case, these lands were held by the United States ... it would follow that there was no power in the state of South Dakota, for state or municipal purposes, to assess and tax the lands in question until at least the fee was conveyed to the Indians."). In reaching this conclusion, the Court relied on the proposition that "property of the United States was exempt by the Constitution of the United States from taxation under the authority of any state." *Id.* at 438, 23 S.Ct. 478 (citing *Van Brocklin v. Tennessee,* 117 U.S. 151, 155, 6 S.Ct. 670, 29 L.Ed. 845 (1886)). The Court then turned to the related question whether "the permanent improvements, such as houses and other structures upon the lands held by allotment," were subject to state and local taxes as personal property. *Id.* at 441–42, 23 S.Ct. 478. The Court held that the state and local governments had no power to tax these improvements, concluding that "[e]very reason that can be urged to show that the land was not subject to local taxation applies to the assessment and taxation of the permanent improvements." *Id.* at 442, 23 S.Ct. 478.

Decades after *Rickert,* the Court again addressed the question whether state and local governments had the power to tax permanent improvements on non-reservation land owned by the United States and held in trust for Indians. *See Mescalero Apache Tribe v. Jones,* 411 U.S. 145, 93 S.Ct. 1267, 36 L.Ed.2d 114 (1973). In that case, the Mescalero Apache Tribe operated a ski resort on land located adjacent to reservation lands, but outside "the existing boundaries of the reservation." *Id.* at 146, 93 S.Ct. 1267. Although the record did not establish the precise form of the business entity that was operating the ski resort, the Court quickly dispensed with this issue, reasoning that "the question of tax immunity cannot be made to turn on the particular form in which the Tribe chooses to conduct its business" *Id.* at 157 n. 13, 93 S.Ct. 1267. The Mescalero Apache Tribe challenged two taxes imposed on the ski resort by New Mexico: a tax on the ski resort's gross receipts, and a use tax "based on the purchase price of materials used to construct two ski lifts at the resort." *Id.* at 147, 93 S.Ct. 1267. The Tribe argued that federal law barred the state from assessing either tax, because the Tribe's interest in the lands was "within the immunity afforded by § 465." *Id.* at 155 n. 11, 93 S.Ct. 1267; *see also id.* at 146, 93 S.Ct. 1267.

The Court rejected the Tribe's argument with respect to the gross receipts tax, holding that § 465 exempted "lands and rights in land" from taxation, and "not income derived from [the land's] use." *Id.* at 155, 93 S.Ct. 1267. But the Court struck down the use tax, reasoning that this form of tax was equivalent to a tax on land, and therefore barred by § 465. In reaching this conclusion, the Court first noted that the construction material at issue had already been "installed in the construction of the ski lifts," and was therefore "permanently attached to the realty." *Id.* at 158, 93 S.Ct. 1267. Relying on *Rickert* and § 465, the Court reasoned that "these permanent improvements on the Tribe's tax-exempt land would certainly be immune from the State's ad valorem property tax." *Id.* The Court then held that the tax exemption in § 465 barred the tax New Mexico characterized as a "use tax." As the Court explained, " 'use' is among the 'bundle of privileges that make up property or ownership' of property," and therefore "a tax upon 'use' is a tax upon the property itself." *Id.* at 158, 93 S.Ct. 1267 (quoting ***1157** *Henneford v. Silas Mason Co.,* 300 U.S. 577, 582, 57 S.Ct. 524, 81 L.Ed. 814 (1937)). It followed that the "use of permanent improvements upon land is so intimately connected with use of the land itself that an explicit provision relieving the latter of state tax burdens must be construed to encompass an exemption for the former." *Id.* at 158, 93 S.Ct. 1267 (citing *Rickert,* 188 U.S. at 441–43, 23 S.Ct. 478). On this basis, the Court struck down the tax.

Accordingly, *Mescalero* makes it clear that where the United States owns land covered by § 465, and holds it in trust for

the use of a tribe (regardless of "the particular form in which the [t]ribe chooses to conduct its business"), § 465 exempts permanent improvements on that land from state and local taxation. [6]

B

Mescalero 's ruling is dispositive in this case. The Grand Mound Property at issue here is owned by the United States and held in trust pursuant to § 465. Under *Mescalero*, § 465's exemption from state and local taxation applies to the permanent improvements on that land. Thus, neither Thurston County nor any other state or local entity can tax the Great Wolf Lodge or other permanent improvements on that land. Thurston County's property taxes on the Grand Mound Property are therefore invalid under § 465 and *Mescalero.*

The County raises several arguments to counter this conclusion. First, the County attempts to distinguish *Mescalero* on the ground that the improvements at issue in this case are owned by CTGW, not the Tribe itself. *Mescalero* instructs us, however, that this distinction is irrelevant. In that case, as noted above, the form of the business through which the Mescalero Apache Tribe owned and operated the ski resort was unclear. *Mescalero* acknowledged this, but concluded it was unimportant because "the question of tax immunity cannot be made to turn on the particular form in which the Tribe chooses to conduct its business." *Mescalero,* 411 U.S. at 157 n. 13, 93 S.Ct. 1267. In light of this ruling, the question of immunity from the County's property tax assessments on the Great Wolf Lodge "cannot be made to turn on" the Tribe's decision to give ownership of the Lodge to its limited liability company for the duration of the lease. *See id.*

Second, the County argues that because the Great Wolf Lodge constitutes "personal property" under Washington law, it cannot constitute "lands or rights" as that phrase is used in § 465. *See* R.C.W. 84.04.080 (defining "personal property" to include "all improvements upon lands the fee of which is still vested in the United States"). This argument also fails. *Mescalero* interpreted the scope of § 465 without reference to state law. As such, it ruled that permanent improvements on land owned by the United States and held in trust for Indians may not be taxed as a matter of federal law. *See Mescalero,* 411 U.S. at 155, 158, 93 S.Ct. 1267 (holding, without consideration of New Mexico state law, that permanent improvements are ***1158** within "the scope of the immunity specifically afforded by" § 465). Therefore, it is irrelevant whether permanent improvements constitute personal property under Washington law. *See* U.S. Const., art. VI, cl. 2; *cf. Drye v. United States,* 528 U.S. 49, 52–53, 120 S.Ct. 474, 145 L.Ed.2d 466 (1999) (holding that federal law defines "property and rights to property" for purposes of a federal tax statute, irrespective of whether the right is defined as a "property" right under state law).

Accordingly, we are bound by *Mescalero* 's interpretation of § 465 to conclude that Thurston County was barred from taxing the Great Wolf Lodge during the time in which the Grand Mound Property was owned by the United States and held in trust pursuant to § 465. The district court therefore erred in granting summary judgment for the County.

C

The Tribe and CTGW argue in the alternative that the tax here at issue is preempted under *White Mountain Apache Tribe v. Bracker,* 448 U.S. 136, 100 S.Ct. 2578, 65 L.Ed.2d 665 (1980). In *Bracker,* relying on Congress's broad authority to regulate Indians and the "semi-independent position of Indian tribes," *id.* at 142 (internal quotation marks omitted), the Court held that the validity of state laws taxing transactions between Indians and non-Indians, on reservation land, is to be assessed based on "a particularized inquiry into the nature of the state, federal, and tribal interests at stake." *Id.* at 145, 100 S.Ct. 2578; *see also Wagnon v. Prairie Band of Potawatomi Nation,* 546 U.S. 95, 110–11, 126 S.Ct. 676, 163 L.Ed.2d 429 (2005) (specifying that *Bracker* applies "only where the legal incidence of the tax [falls] on a nontribal entity engaged in a transaction with tribes or tribal members ... on the reservation." (internal quotation marks omitted)). *Bracker* thus creates a balancing test, *Wagnon,* 546 U.S. at 110, 126 S.Ct. 676, "designed to determine whether, in the specific context, the exercise of state authority would violate federal law," *Bracker,* 448 U.S. at 145, 100 S.Ct. 2578.

We have applied the *Bracker* balancing test in a variety of circumstances involving the imposition of state or local taxes on non-Indians. *See, e.g., Yavapai–Prescott Indian Tribe v. Scott,* 117 F.3d 1107, 1112 (9th Cir.1997) (balancing state, federal, and tribal interests, and ruling against preemption of state taxes on food and room sales); *Salt River Pima–Maricopa Indian Cmty. v. Arizona,* 50 F.3d 734, 738 (9th Cir.1995) (under a *Bracker* analysis, taxes on sales to non-Indians on Indian land were not preempted). Even prior to *Bracker,* we applied a similar mode of analysis in holding that

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possessory interest taxes on "non-Indian lessees of property held in trust by the United States Government for reservation Indians" are not per se preempted. *See Fort Mojave Tribe v. Cnty. of San Bernardino,* 543 F.2d 1253, 1255 (9th Cir.1976); *see also Agua Caliente Band of Mission Indians v. Cnty. of Riverside,* 442 F.2d 1184, 1186–87 (9th Cir.1971). None of these cases involved property taxes, however, so they do not implicate § 465. [7]

***1159** Unlike the cases requiring us to undertake a *Bracker* analysis, the case before us involves only property taxes on permanent improvements on non-reservation land owned by the United States and held in trust for Indians. [8] In this context, we are bound by *Mescalero* 's holding that such taxes are preempted under § 465, and need not consider *Bracker* or any other theory of preemption.

III

Mescalero sets forth the simple rule that § 465 preempts state and local taxes on permanent improvements built on non-reservation land owned by the United States and held in trust for an Indian tribe. This is true without regard to the ownership of the improvements. Because the Supreme Court has not revisited this holding, we are required to apply it. We therefore reverse the district court's summary judgment order and remand for proceedings consistent with this opinion.

REVERSED AND REMANDED.

All Citations

724 F.3d 1153, 13 Cal. Daily Op. Serv. 8085, 2013 Daily Journal D.A.R. 9964

Footnotes

1 The documents filed with this court inconsistently refer to the Confederated Tribes of the Chehalis Reservation as both the "Tribe" and the "Tribes." We will use the singular form, as does the Tribe in its brief.

2 The parties indicated in passing that the Grand Mound Property was converted to reservation land at some time after the facts at issue in this appeal. Because the parties did not address the effect of this change, we do not reach it here.

3 25 U.S.C. § 465 states, in pertinent part:

> The Secretary of the Interior is authorized, in his discretion, to acquire, through purchase, relinquishment, gift, exchange, or assignment, any interest in lands, water rights, or surface rights to lands, within or without existing reservations, including trust or otherwise restricted allotments, whether the allottee be living or deceased, for the purpose of providing land for Indians.
>
> ....
>
> Title to any lands or rights acquired pursuant to this Act or the Act of July 28, 1955 (69 Stat. 392), as amended (25 U.S.C. 608 et seq.) shall be taken in the name of the United States in trust for the Indian tribe or individual Indian for which the land is acquired, and such lands or rights shall be exempt from State and local taxation.

4 For convenience, we refer to the defendants collectively as "the County."

5 The County's argument that the appeal was not timely is meritless. The final judgment in this case issued on April 2, 2010. The Tribe and CTGW filed a Rule 59(e) motion seeking reconsideration, which was denied

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June 23, 2010. They appealed within thirty days of that denial, making the appeal timely under Federal Rule of Appellate Procedure 4(a)(4)(A)(iv).

6 In connection with our analysis of *Mescalero,* the Tribe asks us to consider the following regulation recently promulgated by the Bureau of Indian Affairs to further interpret § 465:

> Subject only to applicable Federal law, permanent improvements on the leased land, without regard to ownership of those improvements, are not subject to any fee, tax, assessment, levy, or other charge imposed by any State or political subdivision of a State. Improvements may be subject to taxation by the Indian tribe with jurisdiction.

25 C.F.R. § 162.017(a). Because this regulation "merely clarifies and confirms" what § 465 "already conveys," we need not reach the applicability of this regulation or the level of deference owed to the Bureau of Indian Affairs in this context. *See Watters v. Wachovia Bank, N.A.,* 550 U.S. 1, 20–21, 127 S.Ct. 1559, 167 L.Ed.2d 389 (2007).

7 While the distinction between taxes imposed on non-Indian lessees' rights of possession (as in *Agua Caliente* and *Fort Mojave*) and property taxes imposed on improvements owned by non-Indians (as in *Mescalero*) may appear formalistic, it is critical here. Where a state or local government assesses a tax on land or improvements covered by § 465, we are bound by § 465 and *Mescalero* to invalidate such taxes. *Cf. Rodriguez de Quijas v. Shearson/American Exp., Inc.,* 490 U.S. 477, 484, 109 S.Ct. 1917, 104 L.Ed.2d 526 (1989) ("If a precedent of [the Supreme] Court has direct application in a case, yet appears to rest on reasons rejected in some other line of decisions, the Court of Appeals should follow the case which directly controls."). This is not so, however, when state or local governments impose taxes on interests other than the "lands or rights" covered by § 465. In *Agua Caliente,* for example, we stressed that "[t]he California tax on possessory interests does not purport to tax the land as such," which would be barred by § 465, "but rather taxes the 'full cash value' of the lessee's interest in it," which is not covered by § 465. 442 F.2d at 1186.

8 Although neither the record nor the parties' briefs reference the tax statute or ordinance under which the County levied its taxes, the parties agree that the tax at issue in this case is a property tax on the Great Wolf Lodge, and not a possessory interest or other type of tax. The tax bills and other evidence in the record support this conclusion.

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257 Ariz. 216
Court of Appeals of Arizona, Division 1.

SOUTH POINT ENERGY
CENTER LLC, Plaintiff/Appellant,
v.
ARIZONA DEPARTMENT OF
REVENUE, et al., Defendants/Appellees.

No. 1 CA-TX 20-0004
|
Filed March 19, 2024
|
Review Denied December 3, 2024

Synopsis

Background: Non-Indian lessee of land on Indian reservation initiated lawsuits seeking refund of payments for county and state property taxes imposed on power plant that it operated on the land. The Arizona Tax Court, Nos. TX2013-000522, TX2014-000451, TX2015-000850, TX2016-001228, TX2017-001744, TX2018-000019, and TX2019-000086, Christopher T. Whitten, J., consolidated lawsuits and granted summary judgment for the Arizona Department of Revenue (ADOR) and county. Lessee appealed. The Court of Appeals, 251 Ariz. 263, 490 P.3d 372, reversed and remanded. ADOR and county filed petition for review, which was granted. The Supreme Court, 253 Ariz. 30, 508 P.3d 246, vacated in part and remanded.

Holdings: On remand, the Court of Appeals, Bailey, J., held that:

[1] extent of federal and tribal regulations governing the taxed activity did not weigh in favor of implied federal preemption;

[2] economic burden of state's and county's property tax fell on lessee rather than the tribe, which weighed against implied federal preemption; and

[3] substantial state interest existed justifying imposition of state's and county's taxation of plant, and thus taxation was not impliedly preempted by federal law.

Affirmed.

Procedural Posture(s): On Appeal; Motion for Summary Judgment.

West Headnotes (21)

[1] **Appeal and Error** 🔑 De novo review
Appeal and Error 🔑 Summary Judgment
The Court of Appeals reviews the entry of summary judgment de novo, viewing the facts in the light most favorable to the nonmoving party.

[2] **Appeal and Error** 🔑 Summary Judgment
The Court of Appeals will affirm the entry of summary judgment if there is no genuine issue of material fact and the moving party is entitled to judgment as a matter of law. Ariz. R. Civ. P. 56(a).

[3] **Federal Preemption** 🔑 Indians
Taxation 🔑 Indian lands and other property
Non-Indian lessee of land on Indian reservation had burden to prove implied federal preemption of state tax law in lessee's action seeking refund of payments for county and state property taxes imposed on power plant that it operated on the land. 25 U.S.C.A. § 5108.

[4] **Indians** 🔑 Appeal or other review
Federal preemption regarding state or local taxes imposed on non-Indians doing business on a reservation is a question of law, and the Court of Appeals can decide the issue based on a de novo analysis of the record before it. 25 U.S.C.A. § 5108.

[5] **Statutes** 🔑 Intent
The primary goal of the Court of Appeals in interpreting federal statutes is to determine and give effect to Congress's intent.

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[6] **Statutes** Plain Language; Plain, Ordinary, or Common Meaning

Statutes Context

Statutes Relation to plain, literal, or clear meaning; ambiguity

When interpreting a federal statute, the Court of Appeals reads words within the statutory context and aims to bring about the plain, logical meaning of a statute unless doing so would bring about an absurd result.

[7] **Statutes** In general; factors considered

Statutes Relation to plain, literal, or clear meaning; ambiguity

When interpreting ambiguous language in a federal statute, the Court of Appeals considers secondary interpretive principles, such as an act's subject matter, history, and purpose, and the consequences of differing interpretations.

[8] **Federal Preemption** Grounds for preemption in general

Express statutory authorization is not necessarily required for federal preemption of state law to apply.

[9] **Federal Preemption** Occupation of field; field preemption

In the absence of express preemptive language, Congress' intent to preempt all state law in a particular area may be inferred where the scheme of federal regulation is sufficiently comprehensive to make reasonable the inference that Congress left no room for supplementary state regulation.

[10] **Federal Preemption** Presumptions and burden of proof

The Court of Appeals will not lightly presume that federal preemption exists.

[11] **Federal Preemption** Indians

Municipal, County, and Local Government Particular Cases and Contexts

Taxation Indian lands and other property

In determining whether a state or local tax on non-Indians doing business on an Indian reservation is preempted, a court undertakes a particularized inquiry into the nature of the state, federal, and tribal interests at stake, an inquiry designed to determine whether, in the specific context, the exercise of state authority would violate federal law.

[12] **Federal Preemption** Indians

Municipal, County, and Local Government Particular Cases and Contexts

Taxation Indian lands and other property

For a court balancing the state, federal, and tribal interests at stake while determining whether a state or local tax on non-Indians doing business on the reservation is preempted, traditional notions of Indian sovereignty provide a crucial backdrop against which any assertion of state authority must be assessed, as does the fact that both the tribes and the federal government are firmly committed to the goal of promoting tribal self-government, a goal embodied in numerous federal statutes.

[13] **Taxation** Indian lands and other property

If the state authority to impose a tax on non-Indians doing business on an Indian reservation interferes or is incompatible with federal and tribal interests, the state authority will be preempted, unless the state interests at stake are sufficient to justify the assertion of state authority.

[14] **Federal Preemption** Indians

Taxation Indian lands and other property

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In determining whether a state or local tax on non-Indians doing business on the reservation is preempted, courts must consider (1) the extent of the federal and tribal regulations governing the taxed activity; (2) whether the economic burden of the tax falls on the tribe or the non-Indian individual or entity; and (3) the extent of the state interest in justifying the imposition of the taxes.

[15] **Taxation** Indian lands and other property

A federal statutory scheme, agency regulations, and day-to-day agency supervision can inform the federal and tribal interests and signal a federal regulatory scheme that is so pervasive that it preempts the state tax on non-Indians doing business on the reservation.

[16] **Taxation** Indian lands and other property

A state tax on non-Indians doing business on a reservation may be impermissible on federal-preemption grounds when a number of the policies underlying the federal regulatory scheme are threatened by application of the tax, and the taxing authority is unable to justify the taxes except in terms of a generalized interest in raising revenue.

[17] **Municipal, County, and Local Government** Particular Cases and Contexts

Taxation Indian lands and other property

Extent of federal and tribal regulations governing the taxed activity did not weigh in favor of implied federal preemption of state's and county's taxation of electric power generating plant that non-Indian lessee operated on Indian reservation; pervasiveness of federal regulation of tribal lease was immaterial because no aspect of the lease was subject to tax, and federal regulation of power plants applied to all power plants regardless of their location. 25 C.F.R. § 162.017(a).

[18] **Municipal, County, and Local Government** Particular Cases and Contexts

Taxation Indian lands and other property

Economic burden of state's and county's property tax fell on non-Indian lessee of land on Indian reservation, rather than the tribe, which weighed against implied federal preemption of state's and county's taxation of lessee's electric power generating plant; tax was being levied on plant and related improvements, all of which were wholly and separately owned by lessee, and not on the land, which the tribe owned, no partnership existed between lessee and tribe, and tribe's land was not part of assessed property since lessee's property never became part of land.

[19] **Taxation** Indian lands and other property

Principles of federal Indian law, whether stated in terms of pre-emption, tribal self-government, or otherwise, do not authorize Indian tribes to market an exemption from state taxation to persons who would normally do their business elsewhere.

[20] **Municipal, County, and Local Government** Particular Cases and Contexts

Taxation Indian lands and other property

As to the extent of the state interest in justifying the imposition of taxes on non-Indians doing business on an Indian reservation, there is no proportionality requirement imposed on the taxing authority, and preemption should occur only when there has been a complete abdication or noninvolvement by the state or county.

[21] **Municipal, County, and Local Government** Regulation of Private Conduct; Police Power

Taxation Indian lands and other property

Substantial state interest existed justifying imposition of state's and county's taxation

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of electric power generating plant that non-Indian lessee operated on Indian reservation, and thus taxation was not impliedly preempted by federal law; tax revenue supported local services that helped lessee, its employees, and Indian tribe, tax helped county maintain roads that provided important and commonly used access to plant, and tax supported numerous other state and county services, some of which aided reservation, including flood control, law enforcement, emergency planning, local fire districts, libraries, and oversight of pipelines used to fuel plant.

****1132** Appeal from the Arizona Tax Court, No. TX2013-000522, TX2014-000451, TX2015-000850, TX2016-001228, TX2017-001744, TX2018-000019, TX2019-000086 (Consolidated), The Honorable Christopher T. Whitten, Judge. **AFFIRMED**

Attorneys and Law Firms

Lewis Roca Rothgerber Christie LLP, Phoenix, By Patrick Derdenger, Karen M. Jurichko Lowell, Co-Counsel for Plaintiff/Appellant

Dickinson Wright PLLC, Phoenix, By Bennett Evan Cooper, Vail C. Cloar, Co-Counsel for Plaintiff/Appellant

Gammage & Burnham, P.L.C., Phoenix, By Cameron C. Artigue, Christopher L. Hering, Counsel for Defendants/Appellees Arizona Department of Revenue and Mohave County

Arizona Attorney General's Office, Phoenix, By Kimberly J. Cygan, Counsel for Defendant/Appellee Arizona Department of Revenue

Arizona Attorney General's Office, Phoenix, By Jerry A. Fries, Counsel for Defendant/Appellee Mohave County

Kewenvoyouma Law, PLLC, Tempe, By Verrin T. Kewenvoyouma, Christopher Love, Co-Counsel for Amici Curiae Fort Mojave Indian Tribe, et al.

Jenner and Block, LLP, Washington, D.C., By Charles W. Galbraith, Pro Hac Vice, Co-Counsel for Amici Curiae Fort Mojave Indian Tribe, et al.

Judge Cynthia J. Bailey delivered the opinion of the Court, in which Presiding Judge Paul J. McMurdie and Judge D. Steven Williams joined.

OPINION

BAILEY, Judge:

***218** ¶1 Plaintiff South Point Energy Center, LLC ("South Point") appeals the tax court's summary judgment for the Arizona Department of Revenue ("ADOR") and Mohave County (collectively, "the County"). South Point argues that the tax court erred in concluding that the County's valuation and taxation of South Point's electric power generating plant ("the Plant") is not preempted under *White Mountain Apache Tribe v. Bracker*, 448 U.S. 136, 100 S.Ct. 2578, 65 L.Ed.2d 665 (1980). The issue comes to us on remand from the Arizona Supreme Court, which directed us to consider whether applying the *Bracker* interest-balancing test evidences ****1133** ***219** Congress's implicit intent to preempt taxing the Plant—a question previously raised by South Point on appeal but not decided by this court. *See S. Point Energy Ctr. LLC v. Ariz. Dep't of Revenue* (*South Point I*), 251 Ariz. 263, 268, ¶ 24, 490 P.3d 372, 377 (App. 2021), *vacated in part and remanded by S. Point Energy Ctr. LLC v. Ariz. Dep't of Revenue* (*South Point II*), 253 Ariz. 30, 39, ¶¶ 37–38, 508 P.3d 246, 255 (2022). For the following reasons, we affirm the tax court, which correctly ruled that the Plant is not exempt from the County's tax under *Bracker*.

FACTS AND PROCEDURAL HISTORY [1]

¶2 In 1999, Calpine Construction Finance Co. ("Calpine"), a non-Indian-owned entity, leased 320 acres of undeveloped land on a long-term basis from the Fort Mojave Indian Tribe ("the Tribe") to build and operate the Plant on reservation land. Beginning operations in 2001, the Plant is a "merchant plant" that sells electrical energy to public and private utility companies for resale to end-users. It does not supply electrical power to the Tribe or any person or entity on the reservation. The Tribe did not finance the Plant and does not contribute any operating funds.

¶3 Mohave County then assessed ad valorem property taxes against the Plant based on valuations determined by ADOR. *See* former Ariz. Const. art. 9, § 2(13) ("All property in the

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state not exempt under the laws of the United States or under this constitution or exempt by law under the provisions of this section shall be subject to taxation to be ascertained as provided by law.")[2]; *accord* Ariz. Rev. Stat. ("A.R.S.") § 42-11002. ADOR assessed the value of the Plant itself and the personal property used to operate the Plant; ADOR did not assess the value of the underlying land.

¶4 Calpine paid the taxes and unsuccessfully sued for a refund, arguing the Tribe, as lessor, owned all improvements to the leased property, thereby exempting the Plant from state taxation according to federal law. *See Calpine Constr. Fin. Co. v. Ariz. Dep't of Revenue*, 221 Ariz. 244, 249, ¶ 22, 211 P.3d 1228, 1233 (App. 2009); *see also Cass Cnty. v. Leech Lake Band of Chippewa Indians*, 524 U.S. 103, 110, 118 S.Ct. 1904, 141 L.Ed.2d 90 (1998) ("State and local governments may not tax Indian reservation land 'absent cession of jurisdiction or other federal statutes permitting it.' " (quoting *Cnty. of Yakima v. Confederated Tribes & Bands of Yakima Nation*, 502 U.S. 251, 258, 112 S.Ct. 683, 116 L.Ed.2d 687 (1992))). On appeal, this court acknowledged the general rule that a lessor owns all real property improvements made by a lessee, but concluded the parties' lease varied that rule by providing that Calpine owned all improvements. *Calpine Constr.*, 221 Ariz. at 248, ¶¶ 16–17, 211 P.3d at 1232. Consequently, this court affirmed the tax court's judgment that Calpine was liable for property taxes based on the value of the Plant and related personal property. *See id.* at 246, ¶ 1, 211 P.3d at 1230.

¶5 After a series of transactions involving Calpine and several of its related entities, the Tribe's land and the Plant were sublet to South Point, another Calpine-related entity, with the Tribe's consent and approval by the United States Bureau of Indian Affairs ("the BIA"). In 2012, the Tribe and Calpine's successor-lessees, which are included in references to "South Point," executed an amended lease that remained in place during this lawsuit. The amended lease provides that no partnership exists between the Tribe and South Point. The amended lease also reaffirms that the Plant and "all [i]mprovements and associated materials, supplies, and equipment" are "owned and controlled" by South Point, and that at the expiration of the lease, South Point must remove all above-ground ****1134 *220** real property improvements and personal property, excepting roads and foundations.

¶6 The amended lease contemplates that ad valorem property taxes may be assessed on the Plant. In addition, the amended lease requires South Point to timely pay all taxes levied by any governmental entity to prevent the imposition of any liens and to hold the Tribe harmless against any imposed liens. The BIA approved the amended lease.

¶7 South Point initiated these consolidated lawsuits seeking a refund of payments for property taxes imposed from 2010 to 2018, to the extent they were based on valuations of the Plant. *See* A.R.S. § 42-11005 (authorizing a lawsuit to recover illegally levied, assessed, or collected taxes). South Point did not challenge the tax assessments based on ownership of the Plant, as Calpine did in its earlier lawsuit. Instead, South Point argued that § 5 of the Indian Reorganization Act of 1934 ("the Act"), *see* 25 U.S.C. § 5108 (former 25 U.S.C. § 465), expressly preempts states from imposing property taxes on any real property improvements, regardless of ownership, located on land held in trust by the federal government to benefit Indian tribes or individual Indians. Alternatively, South Point argued that applying the balancing test announced in *Bracker* demonstrates Congress's implicit intent to preempt taxing the Plant.

¶8 The tax court rejected both of South Point's arguments and granted summary judgment for the County. We reversed, concluding § 5 of the Act expressly and categorically exempted permanent improvements on the Tribe's land from state taxation regardless of ownership. *See South Point I*, 251 Ariz. at 269, ¶ 30, 490 P.3d at 378. We remanded for the tax court to conduct an analysis under *Whiteco Industries, Inc. v. Commissioner*, 65 T.C. 664 (1975),[3] to determine which, if any, of the assets making up the Plant constituted permanent tax-exempt improvements. *South Point I*, 251 Ariz. at 269, ¶ 30, 490 P.3d at 378. We did not apply the *Bracker* balancing test but directed the tax court to do so in considering whether property taxes on the Plant's impermanent assets were preempted. *Id.*

¶9 The Arizona Supreme Court granted the County's petition for review to decide whether the Act's § 5 "expressly preempts taxing permanent improvements constructed on tribal lands acquired under that section when those improvements are owned by non-Indians." *South Point II*, 253 Ariz. at 33, ¶ 9, 508 P.3d at 249. The supreme court then vacated a portion of our opinion, holding that the Act does not expressly preempt Mohave County's ad valorem property tax on the Plant. *Id.* at 31, 39, ¶¶ 1, 37–38, 508 P.3d at 247, 255. The court remanded the case to this court, *see* ARCAP 23(m)(2), to decide the remaining issue we had not addressed: "whether the tax court correctly ruled that the Plant is also not impliedly exempt

from the County's tax under *Bracker*," *South Point II*, 253 Ariz. at 39, ¶ 37, 508 P.3d at 255.

¶10 On remand, we ordered additional briefing by the parties and invited other interested parties to file amicus briefs, setting forth their respective positions on the issue. [4] We now address the question presented to us on remand, and after consideration of *Bracker* and its progeny, we affirm the tax court.

DISCUSSION

[1] **[2]** ¶11 "We review the tax court's entry of summary judgment de novo, viewing the facts in the light most favorable to South Point as the nonmoving party." *South Point II*, 253 Ariz. at 33, ¶ 10, 508 P.3d at 249 (citing *Dinsmoor v. City of Phoenix*, 251 Ariz. 370, 373, ¶ 13, 492 P.3d 313, 316 (2021)). We will affirm if there is no genuine issue of material fact and the moving party is entitled to judgment as a matter of law. *Id.* (citing ****1135** ***221** *Dinsmoor*, 251 Ariz. at 373, ¶ 13, 492 P.3d at 316; Ariz. R. Civ. P. 56(a)).

[3] **[4]** ¶12 Preemption is a question of law, and we can decide the issue "based on a *de novo Bracker* analysis of the record before us." *Seminole Tribe of Fla. v. Stranburg*, 799 F.3d 1324, 1329 (11th Cir. 2015). The burden rests on South Point, as plaintiff, to prove implied federal preemption of state law. *See Pickerel Lake Outlet Ass'n v. Day Cnty.*, 953 N.W.2d 82, 92, ¶ 23 (S.D. 2020).

[5] **[6]** **[7]** ¶13 Our primary goal in interpreting federal statutes is to determine and give effect to Congress's intent. *See Steven H. v. Ariz. Dep't of Econ. Sec.*, 218 Ariz. 566, 570, ¶ 14, 190 P.3d 180, 184 (2008) (citing federal cases). We read words within the statutory context and aim to bring about the plain, logical meaning of a statute unless doing so would bring about an absurd result. *See Conroy v. Aniskoff*, 507 U.S. 511, 515–16, 113 S.Ct. 1562, 123 L.Ed.2d 229 (1993); *Armstrong Paint & Varnish Works v. Nu-Enamel Corp.*, 305 U.S. 315, 332–33, 59 S.Ct. 191, 83 L.Ed. 195 (1938); *Welch v. Cochise Cnty. Bd. of Supervisors*, 251 Ariz. 519, 523, ¶ 11, 494 P.3d 580, 584 (2021). If the language is ambiguous, we consider secondary interpretive principles, such as an act's subject matter, history, and purpose, and the consequences of differing interpretations. *See Conroy*, 507 U.S. at 516–18, 113 S.Ct. 1562; *United States v. Am. Trucking Ass'ns*, 310 U.S. 534, 543–44, 60 S.Ct. 1059, 84 L.Ed. 1345 (1940); *Welch*, 251 Ariz. at 523, ¶ 11, 494 P.3d at 584.

¶14 By statute, the United States Secretary of the Interior can acquire "any interest in lands, water rights, or surface rights to lands, within or without existing reservations ... for the purpose of providing land for Indians." 25 U.S.C. § 5108. This statute further provides that "[t]itle to any lands or rights acquired ... shall be taken in the name of the United States in trust for the Indian tribe or individual Indian for which the land is acquired, and such lands or rights shall be exempt from State and local taxation." 25 U.S.C. § 5108.

[8] **[9]** **[10]** ¶15 In *South Point II*, our supreme court determined that although § 5 of the Act "preempts state and local taxes imposed on land and rights acquired by the Secretary of the Interior and titled in the name of the United States in trust for Indian tribes or individual Indians," "[w]hen that lessee is a non-Indian, § 5 does not preempt a state or locality from taxing the improvements." 253 Ariz. at 39, ¶ 36, 508 P.3d at 255. Thus, under the facts present here, no express authorization for preemption exists under § 5 of the Act. But express authorization is not necessarily required for preemption to apply. *See Bracker*, 448 U.S. at 144, 100 S.Ct. 2578. "In the absence of express pre-emptive language, Congress' intent to pre-empt all state law in a particular area may be inferred where the scheme of federal regulation is sufficiently comprehensive to make reasonable the inference that Congress 'left no room' for supplementary state regulation." *Hillsborough Cnty. v. Automated Med. Laboratories, Inc.*, 471 U.S. 707, 713, 105 S.Ct. 2371, 85 L.Ed.2d 714 (1985) (quoting *Rice v. Santa Fe Elevator Corp.*, 331 U.S. 218, 230, 67 S.Ct. 1146, 91 L.Ed. 1447 (1947)). We will not, however, lightly presume that preemption exists. *See Washington v. Confederated Tribes of Colville Indian Rsrv.*, 447 U.S. 134, 155–56, 100 S.Ct. 2069, 65 L.Ed.2d 10 (1980).

[11] **[12]** **[13]** ¶16 *Bracker* imposes a balancing test that applies when "a State asserts authority over the conduct of non-Indians engaging in activity on the reservation." 448 U.S. at 144, 100 S.Ct. 2578. To determine whether a state or local tax on non-Indians doing business on the reservation is preempted, a court undertakes a "particularized inquiry into the nature of the state, federal, and tribal interests at stake, an inquiry designed to determine whether, in the specific context, the exercise of state authority would violate federal law." *Id.* at 145, 100 S.Ct. 2578; *accord Dep't of Tax'n & Fin. of N.Y. v. Milhelm Attea & Bros., Inc.*, 512 U.S. 61, 73, 114 S.Ct. 2028, 129 L.Ed.2d 52 (1994) ("Resolution of conflicts of this kind does not depend on 'rigid rules' or on 'mechanical or absolute conceptions of state or tribal sovereignty,' but

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instead on 'a particularized inquiry ....' " (quoting *Bracker*, 448 U.S. at 142, 145, 100 S.Ct. 2578)). In balancing these interests, "[t]he traditional notions of Indian ****1136 *222** sovereignty provide a crucial 'backdrop' against which any assertion of State authority must be assessed," as does the fact that "both the tribes and the Federal Government are firmly committed to the goal of promoting tribal self-government, a goal embodied in numerous federal statutes." *New Mexico v. Mescalero Apache Tribe*, 462 U.S. 324, 334–35, 103 S.Ct. 2378, 76 L.Ed.2d 611 (1983) (internal citations omitted). If the state authority "interferes or is incompatible with" federal and tribal interests, the state authority will be preempted, "unless the State interests at stake are sufficient to justify the assertion of State authority." *Id.* at 334, 103 S.Ct. 2378 (citations omitted).

[14] [15] [16] ¶17 In applying *Bracker*, courts must consider "(1) the extent of the federal and tribal regulations governing the taxed activity; (2) whether the 'economic burden' of the tax falls on the tribe or the non-Indian individual or entity; and (3) the extent of the state interest in justifying the imposition of the taxes." *Ute Mountain Ute Tribe v. Rodriguez*, 660 F.3d 1177, 1187 (10th Cir. 2011). A federal statutory scheme, agency regulations, and day-to-day agency supervision can "inform the federal and tribal interests" and "signal a federal regulatory scheme that is so pervasive that it preempts the state tax." *Seminole Tribe*, 799 F.3d at 1337 (citing *Bracker*, 448 U.S. at 145–48, 100 S.Ct. 2578). Further, a tax may be impermissible when "a number of the policies underlying the federal regulatory scheme are threatened" by its application, and the taxing authority is "unable to justify the taxes except in terms of a generalized interest in raising revenue." *Bracker*, 448 U.S. at 151, 100 S.Ct. 2578.

¶18 Courts have applied the *Bracker* interest-balancing test in several circumstances involving the imposition of state or local taxes on non-Indians. *See, e.g., Yavapai–Prescott Indian Tribe v. Scott*, 117 F.3d 1107, 1111–12 (9th Cir. 1997) (ruling against preemption of state transaction privilege taxes on lodging, food, and beverage sales on tribal land); *Gila River Indian Cmty. v. Waddell*, 91 F.3d 1232, 1236, 1239 (9th Cir. 1996) (allowing transaction privilege taxes on tickets and concessionary items at a raceway and concert center on tribal land); *Salt River Pima–Maricopa Indian Cmty. v. Arizona*, 50 F.3d 734, 736, 738 (9th Cir. 1995) (holding that taxes on sales to non-Indians by a non-Indian business on Indian land were not preempted). *But see Ramah Navajo Sch. Bd., Inc. v. Bureau of Revenue of N.M.*, 458 U.S. 832, 841–43, 102 S.Ct. 3394, 73 L.Ed.2d 1174 (1982) (holding that a tax imposed on the gross receipts that a non-Indian construction company received from a tribal school board for the construction of a school for Indian children on the reservation was preempted because the Interior Department had a detailed regulatory plan for Indian schooling and the State of New Mexico had declined to take any responsibility for the education of the Indian children).

¶19 None of the aforementioned cases dealt with a property tax like the one at issue, however. In *Seminole Tribe*, an Indian tribe sued the Florida Department of Revenue executive director, challenging the imposition of a rental tax on rent paid to the tribe by non-Indian lessees for the use of commercial space at the tribe's casinos. 799 F.3d at 1326–27. The 11th Circuit Court of Appeals held that the tax was preempted, partly because it was a tax on "*a right in land*" rather than a tax on economic activity or tangible property removed from the land. *Id.* at 1331–32. In effect, *Seminole Tribe* held that the leases were so connected to the land that their taxation amounted to taxation of the land itself. *Id.* at 1329, 1331. Similarly, in *Confederated Tribes of Chehalis Reservation v. Thurston County Board of Equalization*, the Ninth Circuit Court of Appeals barred property taxes on permanent improvements on non-reservation Indian trust lands. 724 F.3d 1153, 1159 (9th Cir. 2013).

¶20 This case is distinguishable from *Seminole Tribe* and *Chehalis*. Here, the amended lease provides that the Plant and related operating equipment are owned and controlled by South Point, which must remove all above-ground real property improvements and personal property, except roads and foundations, at the expiration of the lease. And neither the land itself nor South Point's leasehold interest in the land is a factor in the tax because (1) in determining the tax, ADOR assessed only the value of the Plant ****1137 *223** itself and the personal property used to operate it and did not assess the value of the underlying land, and (2) the amended lease provides that no partnership exists between the Tribe and South Point. Since land owned by the Tribe is exempt from state property taxes, no portion of the fee interest, including South Point's leasehold interest, is taxed.

[17] ¶21 South Point relies on United States Department of the Interior/BIA regulations—and specifically 25 C.F.R. § 162.017(a)—as support for its preemption argument. Recently, the South Dakota Supreme Court upheld an ad valorem property tax assessed by a local taxing authority on non-Indian owners of structures and permanent

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improvements located on Indian trust land. *See Pickerel Lake*, 953 N.W.2d at 85, ¶ 1.[5] In considering the extent of the regulations governing the taxed activity, the court rejected reliance on 25 C.F.R. § 162.017(a) as authority for implied preemption, concluding that "Congress has not authorized the BIA to preempt the State's authority to tax structures owned by non-Indians." *Pickerel Lake*, 953 N.W.2d at 92–93, ¶¶ 25–29; *see also South Point II*, 253 Ariz. at 39, ¶ 35, 508 P.3d at 255 (holding that "the regulation itself [25 C.F.R. § 162.017(a)] cannot preempt the County's tax" and "we have no need to defer to the Department of Interior's interpretation" (citations omitted)). The *Pickerel Lake* court further concluded that any preemptive language in the federal regulations should have no impact on its analysis and found "little evidence of congressional intent to supersede the State's authority." 953 N.W.2d at 93, ¶ 30 (citing *Wyeth v. Levine*, 555 U.S. 555, 576, 129 S.Ct. 1187, 173 L.Ed.2d 51 (2009)); *see also South Point II*, 253 Ariz. at 39, ¶ 35, 508 P.3d at 255 ("The Department of Interior has taken the position in other cases that '§ 162.017 has no legal effect at all,' and ... is 'agnostic' on whether any specific state tax is preempted." (citing *Desert Water Agency v. U.S. Dep't of the Interior*, 849 F.3d 1250, 1254–55 (9th Cir. 2017) (adopting the view that the phrase "[s]ubject only to applicable Federal law" in the regulation means subject to a *Bracker* analysis))).

¶22 The court also reasoned that although the federal government retains exclusive power to regulate Indian affairs, it "has asserted little to no regulatory power in the area of state-imposed ad valorem taxes on structures owned by non-Indians," and "[i]t is generally within the province of the State to assess property taxes." *Pickerel Lake*, 953 N.W.2d at 94, ¶ 31 (citations omitted). The court noted that courts "presume that 'Congress does not intend to pre-empt areas of traditional state regulation,' " and "assume the State retains its historic power to regulate by imposing state and local taxes." *Id.* (citations omitted). Finally, in concluding that implied preemption did not apply, the *Pickerel Lake* court held: "Because there is little or no federal regulatory scheme in place with respect to property taxes, and because the State's taxation does not implicate Indians or their tribes, thereby implicating federal law, the State's assessment of nondiscriminatory ad valorem property taxes against structures owned exclusively by non-Indians [on Indian trust land] is not [impliedly] preempted by federal law." *Id.* at ¶ 32. *See also N. Border Pipeline Co. v. State*, 237 Mont. 117, 772 P.2d 829, 835 (1989) (upholding a state property tax on a pipeline crossing tribal land); *Thomas v. Gay*, 169 U.S. 264, 273–74, 18 S.Ct. 340, 42 L.Ed. 740 (1898) (holding that Oklahoma could tax cattle owned by non-Indian lessees of Indian land and rejecting the suggestion that the tax constituted a tax on the land); *Utah & N. Ry. Co. v. Fisher*, 116 U.S. 28, 29–30, 33, 6 S.Ct. 246, 29 L.Ed. 542 (1885) (upholding a territorial tax of a section of a non-Indian's railroad that crossed onto reservation land, reasoning that the tax did not interfere with tribal sovereignty).[6]

****1138** ***224** ¶23 The truisms relied on by the *Pickerel Lake* court apply here as well, and South Point points to nothing about the federal regulation of power plants that is more extensive or intensive when a plant is on tribal land or how a particularized inquiry into the nature of the federal, tribal, and state interests at stake leads to the conclusion that the tax is preempted. *See generally Ute Mountain Ute Tribe*, 660 F.3d at 1187. As the tax court noted, the pervasiveness of federal regulation of tribal leases is immaterial because no aspect of the lease is subject to tax, and federal regulation of power plants applies to all power plants regardless of their location; thus, if state or local taxation of power plants on reservations is preempted, state taxation on every other power plant would also be preempted.

[18] **[19]** ¶24 As for whether the economic burden of the County's property tax falls on the non-Indian entity (South Point) or the Tribe, *see id.*, it is clear the tax is being levied on the Plant and related improvements, all of which are wholly and separately owned by South Point, and not on the land, which the Tribe owns, and that no partnership exists between South Point and the Tribe. Thus, South Point is the actual taxpayer and bears the tax's legal incidence. *See Circle K Stores, Inc. v. Apache Cnty.*, 199 Ariz. 402, 407, ¶ 13, 18 P.3d 713, 718 (App. 2001). Moreover, the United States Supreme Court has rejected the argument that when the federal government's or a tribe's interest in economic development on reservations—and the associated profitability that comes with that interest—might be indirectly affected, that indirect burden supports granting non-Indian contractors immunity from state or local taxation:

> It is, of course, reasonable to infer that the existence of the state tax imposes some limit on the profitability of Indian oil and gas leases—just as it no doubt imposes a limit on the profitability of off-reservation leasing arrangements—but that is precisely the same indirect burden that we

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> rejected as a basis for granting non-Indian contractors an immunity from state taxation in *Helvering v. Mountain Producers Corp.*, 303 U.S. 376 [58 S.Ct. 623, 82 L.Ed. 907] (1938); *Oklahoma Tax Comm'n v. United States*, 319 U.S. 598 [63 S.Ct. 1284, 87 L.Ed. 1612] (1943); *Oklahoma Tax Comm'n v. Texas Co.*, 336 U.S. 342 [69 S.Ct. 561, 93 L.Ed. 721] (1949); *Moe v. Confederated Salish and Kootenai Tribes of Flathead Reservation*, 425 U.S. 463 [96 S.Ct. 1634, 48 L.Ed.2d 96] (1976); and *Colville*, 447 U.S. at 134 [100 S.Ct. 2069].

Cotton Petroleum Corp. v. New Mexico, 490 U.S. 163, 191, 109 S.Ct. 1698, 104 L.Ed.2d 209 (1989) (citations cleaned up); *accord Waddell*, 91 F.3d at 1239 (concluding that indirect economic effects, including those flowing from double taxation, were insufficient grounds to preempt a state tax). As the Supreme Court previously stated in *Colville*, "We do not believe that principles of federal Indian law, whether stated in terms of pre-emption, tribal self-government, or otherwise, authorize Indian tribes thus to market an exemption from state taxation to persons who would normally do their business elsewhere." 447 U.S. at 155, 100 S.Ct. 2069.

¶25 Moreover, no salient argument exists that should the property tax not be paid, the State could impose a tax lien on the underlying real property, thereby damaging the Tribe. We cannot see how a tax lien could be imposed on land exempt from taxation, and A.R.S. § 42-17153 provides that "a tax that is levied on real or personal property is *a lien on the assessed property*." (Emphasis added.) Under the amended lease, South Point's property never becomes part of the land, so the Tribe's land is not part of the assessed property.

[20] ¶26 Finally, as to the extent of the state interest in justifying the imposition of the taxes, *see Ute Mountain Ute Tribe*, 660 F.3d at 1187, we conclude that although South Point demands few direct services from the state or Mohave County, there has also been no complete declination of responsibility for services as found to exist in *Ramah Navajo School Board*, *see* 458 U.S. at 843–45, 102 S.Ct. 3394, *cited in Cotton Petroleum*, 490 U.S. at 184–87, 109 S.Ct. 1698. As the *Cotton Petroleum* court recognized, there ****1139 *225** is no "proportionality requirement" imposed on the taxing authority, and preemption should occur only when there has been a "complete abdication or noninvolvement" by the state or County. 490 U.S. at 185, 109 S.Ct. 1698.

[21] ¶27 Here, the tax revenue supports local services that help South Point, its employees, and the Tribe, including "services on the reservation" and "services off the reservation that benefit the reservation and members of the Tribe." *See id.* at 171 n.7, 185, 109 S.Ct. 1698 (relying on the trial court's factual findings to distinguish the case from *Bracker* and *Ramah Navajo School Board*). For example, the tax revenue supports the local school districts, and both tribal-member children and children of South Point non-Indian employees attend schools in these districts. *See N. Border Pipeline*, 772 P.2d at 835 (finding no preemption because "the State's interest in funding the school districts involved here and providing local services outweighs the federal/tribal interests asserted"). Additionally, the tax helps Mohave County maintain roads that provide important and commonly used access to the Plant. Revenue from the tax also supports numerous other state and County services—some of which aid the reservation—including flood control, law enforcement and emergency planning, local fire districts, libraries, the County Recorder, and the Arizona Corporation Commission's oversight and inspection of the pipelines used to fuel the Plant. A substantial state interest exists justifying the imposition of the taxes, and the funding of these numerous services militates against finding an implied preemption of the County's tax. Accordingly, application of the interest-balancing test announced in *Bracker* does not establish Congress's implicit intent to preempt taxing the Plant.

CONCLUSION

¶28 We affirm the tax court, which correctly ruled that the Plant is not impliedly exempt from the County's tax under *Bracker*.

All Citations

257 Ariz. 216, 118 Arizona Cases Digest 18, 546 P.3d 1130

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Footnotes

1 The facts set out in this section are largely taken from our supreme court's opinion in *South Point II*. *See* 253 Ariz. at 31–33, ¶¶ 2–8, 508 P.3d at 247–49.

2 In the November 8, 2022 general election, voters approved Proposition 130 to amend the Arizona Constitution with regard to property tax exemption provisions. Article 9, Section 2, of the Arizona Constitution was amended effective December 5, 2022, to reflect the results of the election, and Section 2(A) now provides: "All property in this state that is not exempt under the laws of the United States or under this section is subject to taxation as provided by law."

3 Whether an asset is a permanent improvement or personal property turns on the guidelines set out in *Whiteco*. *See* 65 T.C. at 672–73. *See also PPL Corp. v. Comm'r*, 135 T.C. 176, 193–97 (2010); *Trentadue v. Comm'r*, 128 T.C. 91, 99–108 (2007).

4 At oral argument on remand, the parties agreed that we need not remand for a *Whiteco* analysis.

5 The court applied what it deemed a "standard preemption analysis" rather than a *Bracker* analysis after noting (1) the parties agreed *Bracker* did not apply, (2) the Tribe had not intervened, and (3) the record contained no evidence that (a) tribal interests weighed against the county's taxation authority with respect to non-Indian lessees, (b) the county's separate ad valorem tax affected the Tribe's ability to lease the land, or (c) the taxes had otherwise impacted tribal interests. *Pickerel Lake*, 953 N.W.2d at 88, ¶ 12.

6 *Bracker* cited both *Thomas* and *Fisher* but did not overrule either case. *See* 448 U.S. at 142, 145, 100 S.Ct. 2578; *see also Mashantucket Pequot Tribe v. Town of Ledyard*, 722 F.3d 457, 472 (2d Cir. 2013) (concluding that "*Thomas* [and other pre-*Bracker* non-Indian lessee cases] inform[ ]" but do not forgo a *Bracker* analysis).

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253 Ariz. 30
Supreme Court of Arizona.

SOUTH POINT ENERGY CENTER LLC, Plaintiff/Appellant,
v.
ARIZONA DEPARTMENT OF REVENUE, et al., Defendants/Appellees.

No. CV-21-0130-PR
|
Filed April 26, 2022

Synopsis

Background: Non-Indian lessee of land owned by the federal government in trust for Indians initiated lawsuits seeking refund of payments for county property taxes imposed on power plant it operated on the land. The Arizona Tax Court, Nos. TX2013-000522, TX2014-000451, TX2015-000850, TX2016-001228, TX2017-001744, TX2018-000019, TX2019-000086, Christopher T. Whitten, J., consolidated the lawsuits and granted summary judgment for the county. Lessee appealed. The Court of Appeals, Division One, Cynthia Bailey, J., 251 Ariz. 263, 490 P.3d 372, reversed and remanded. County's petition for review was granted.

Holdings: The Supreme Court, Timmer, J., held that:

[1] as a matter of first impression, the Indian Reorganization Act does not expressly exempt state and local taxes imposed on permanent improvements affixed by non-Indian lessees to land owned by the federal government in trust for Indians when the parties agree that the lessee owns those improvements, and

[2] ad valorem tax imposed on power plant was not preempted by the Act.

Court of Appeals' opinion vacated in part and remanded.

Procedural Posture(s): On Appeal; Petition for Discretionary Review; Motion for Summary Judgment; Review of Administrative Decision.

West Headnotes (12)

[1] **Appeal and Error** De novo review
Appeal and Error Summary Judgment
Supreme Court reviews the entry of summary judgment de novo, viewing the facts in the light most favorable to the nonmoving party.
3 Cases that cite this headnote

[2] **Appeal and Error** Summary Judgment
Supreme Court will affirm summary judgment on appeal if there is no genuine dispute of material fact and the moving party is entitled to judgment as a matter of law. Ariz. R. Civ. P. 56(a).
1 Case that cites this headnote

[3] **Appeal and Error** Choice of Law
Prior court's preemption decisions are issues of law that are reviewed de novo by the Supreme Court.

[4] **Appeal and Error** Statutory or legislative law
Supreme Court reviews statutory interpretations de novo as an issue of law.
1 Case that cites this headnote

[5] **Federal Preemption** Congressional Intent or Purpose
Within constitutional limits, Congress may generally preempt application of state law in a few ways, including by so stating in express terms, which is known as “express preemption.” U.S. Const. art. 6, cl. 2.

[6] **Indians** Preemption
Court faced with a preemption challenge to state law applied to non-Indian activities conducted on an Indian reservation, absent express

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preemption, should make a particularized inquiry into the nature of the state, federal, and tribal interests at stake to determine whether, in the specific context, the exercise of state authority would violate federal law; if so, the state law is impliedly preempted.

[7] **Statutes** Intent

Primary goal in interpreting a statute is to determine and give effect to Congress's intent.

[8] **Statutes** Plain Language; Plain, Ordinary, or Common Meaning

Statutes Context

Statutes Relation to plain, literal, or clear meaning; ambiguity

When interpreting a statute, the court reads words in context and effectuates the plain meaning of the statute unless doing so would be absurd.

1 Case that cites this headnote

[9] **Statutes** In general; factors considered

If the language of a statute is ambiguous, the court considers secondary interpretive principles, such as the statute's subject matter, history, and purpose, and the consequences of differing interpretations.

1 Case that cites this headnote

[10] **Landlord and Tenant** Ownership of improvements in general

General rule that a permanent structure placed upon and attached to realty by a tenant is real property belonging to the lessor does not apply when the lease provides that the tenant owns the permanent improvements.

[11] **Federal Preemption** Indians

Indians Preemption

Taxation Indian lands and other property

The Indian Reorganization Act does not expressly exempt state and local taxes imposed on permanent improvements affixed by non-Indian lessees to land owned by the federal government in trust for Indians when the parties agree that the lessee owns those improvements. 25 U.S.C.A. § 5108.

[12] **Indians** Land held in trust in general

Indians Preemption

Non-Indian lessee owned power plant on land purportedly acquired by the federal government under the Indian Reorganization Act and held in trust for the benefit of the tribe, and thus, the Act did not expressly preempt county's ad valorem property tax on the plant, since the lease provided that lessee owned the permanent improvements. 25 U.S.C.A. § 5108.

More cases on this issue

****247** Appeal from the Arizona Tax Court, The Honorable Christopher T. Whitten, Judge, Nos. TX2013-000522, TX2014-000451, TX2015-000850, TX2016-001228, TX2017-001744, TX2018-000019, TX2019-000086 (Consolidated)

Opinion of the Court of Appeals, Division One, 251 Ariz. 263, 490 P.3d 372 (App. 2021), **VACATED IN PART AND REMANDED**

Attorneys and Law Firms

Bennett Evan Cooper (argued), Vail C. Cloar, Dickinson Wright PLLC, Phoenix; Pat Derdenger, Karen Lowell, Lewis Roca Rothgerber Christie LLP, Phoenix, Attorneys for South Point Energy Center LLC

Cameron C. Artigue (argued), Camila Alarcon, Christopher L. Hering, Gammage & Burnham, P.L.C., Phoenix, Attorneys for Arizona Department of Revenue, et al.

Charles W. Galbraith, Jenner and Block LLP, Washington, D.C.; Verrin T. Kewenvoyouma, Christopher Love, Kewenvoyouma Law, PLLC, Tempe, Attorneys for Amici Curiae Fort Mojave Indian Tribe, the Navajo Nation, the Gila River Indian Community, Gila River Indian Community

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Utility Authority, the Inter-Tribal Association of Arizona, and the National Congress of American Indians

James M. Susa, DeConcini McDonald Yetwin & Lacy, P.C., Tucson, Attorneys for Amicus Curiae County Supervisors Association of Arizona and the Arizona Association of Counties

VICE CHIEF JUSTICE TIMMER authored the opinion of the Court, in which CHIEF JUSTICE BRUTINEL and JUSTICES BOLICK, LOPEZ, BEENE, MONTGOMERY, and KING joined.

Opinion

VICE CHIEF JUSTICE TIMMER, opinion of the Court:

***31** ¶1 The issue here is whether the Indian Reorganization Act of 1934 (the "Act") expressly preempts Mohave County's ad valorem property tax on a power plant owned by non-Indian lessees of land purportedly acquired by the federal government under the Act and held in trust for the benefit of an Indian tribe. We hold the Act does not expressly preempt this tax.

BACKGROUND

¶2 In 1999, Calpine Construction Finance Co. ("Calpine"), a non-Indian-owned entity, leased 320 acres of undeveloped land on a long-term basis from the Fort Mojave Indian Tribe (the "Tribe") to construct and operate an electric power generating plant (the "Plant") on reservation lands. The Plant, which began operating in 2001, is a "merchant plant" that sells electrical energy to public and private utility companies for resale and redistribution to end-users. It does not supply electrical energy to the Tribe or to any person or entity located on the reservation. The Tribe did not finance the Plant's construction and does not contribute any operating funds.

***32** ****248** ¶3 After the Plant was built, Mohave County assessed ad valorem property taxes against the Plant based on valuations determined by the Arizona Department of Revenue ("ADOR"). *See* Ariz. Const. art. 9, § 2(13) ("All property in the state not exempt under the laws of the United States or under this constitution or exempt by law under the provisions of this section shall be subject to taxation to be ascertained as provided by law."); A.R.S. § 42-11002 (to same effect). ADOR assessed only the value of the Plant itself and the personal property used to operate it; ADOR did not assess the value of the underlying land.

¶4 Calpine paid the taxes and unsuccessfully sued for a refund, arguing the Tribe, as lessor, owned all improvements to the leased property, thereby exempting the Plant from state taxation pursuant to federal law. *See Calpine Constr. Fin. Co. v. Ariz. Dep't of Revenue*, 221 Ariz. 244, 249 ¶ 22, 211 P.3d 1228, 1233 (App. 2009); *see also Cass County v. Leech Lake Band of Chippewa Indians*, 524 U.S. 103, 110, 118 S.Ct. 1904, 141 L.Ed.2d 90 (1998) ("State and local governments may not tax Indian reservation land 'absent cession of jurisdiction or other federal statutes permitting it.' " (quoting *County of Yakima v. Confederated Tribes & Bands of Yakima Nation*, 502 U.S. 251, 258, 112 S.Ct. 683, 116 L.Ed.2d 687 (1992))). In the ensuing appeal, the court of appeals acknowledged the general rule that a lessor owns all real property improvements made by a lessee but concluded the parties' lease varied that rule by providing that Calpine owns all improvements. *Calpine Constr.*, 221 Ariz. at 248 ¶¶ 16–17, 211 P.3d at 1232. Consequently, the court affirmed the tax court's judgment that Calpine was liable for property taxes based on the value of the Plant and related personal property. *See id.* at 246 ¶1, 211 P.3d at 1230.

¶5 After a series of transactions involving Calpine and several of its related entities, the Tribe's land and the Plant were sublet to South Point Energy Center LLC ("South Point"), another Calpine-related entity, with the Tribe's consent and approval by the Bureau of Indian Affairs (the "BIA"). In 2012, the Tribe and Calpine's successor-lessees, which we include in our references to "South Point" for convenience, executed an amended lease, which remained in place during this lawsuit. Among other things, the amended lease provides that no partnership exists between the Tribe and South Point. It further reaffirms that the Plant and "all [i]mprovements and associated materials, supplies, and equipment" are "owned and controlled" by South Point, and that at the expiration of the lease, South Point must remove all above-ground real property improvements and personal property, excepting roads and foundations.

¶6 The amended lease contemplates that ad valorem property taxes may be assessed on the Plant. The lease requires South Point to timely pay all taxes levied by any governmental entity to prevent imposition of any liens and to hold the Tribe harmless against any liens that are imposed. The BIA approved the amended lease.

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¶7 South Point initiated these consolidated lawsuits seeking a refund of payments for property taxes imposed from 2010 to 2018, to the extent they were based on valuations of the Plant. *See* A.R.S. § 42-11005 (authorizing suit to recover illegally levied, assessed, or collected taxes). South Point does not challenge the tax assessments based on ownership of the Plant, as Calpine did in its earlier lawsuit. Instead, South Point argues that § 5 of the Act, 25 U.S.C. § 5108, expressly preempts states from imposing property taxes on any real property improvements, regardless of ownership, located on land held in trust by the federal government for the benefit of Indian tribes or individual Indians. Alternatively, South Point argues that application of a balancing test announced in *White Mountain Apache Tribe v. Bracker*, 448 U.S. 136, 100 S.Ct. 2578, 65 L.Ed.2d 665 (1980), evidences Congress's implicit intent to preempt taxing the Plant.

¶8 The tax court rejected both of South Point's arguments and granted summary judgment for Mohave County and ADOR (collectively, the "County"). The court of appeals reversed, reasoning that § 5 of the Act expressly and categorically exempts permanent improvements on the Tribe's land from state taxation regardless of ownership. ***33 **249** *S. Point Energy Ctr. LLC v. Ariz. Dep't of Revenue*, 251 Ariz. 263, 269 ¶ 30, 490 P.3d 372, 378 (App. 2021). It remanded for the tax court to determine which, if any, of the assets making up the Plant constitute the tax-exempt permanent improvements. *Id.* The court did not itself apply the balancing test under *Bracker* but instead instructed the tax court to do so in considering whether property taxes on the Plant's impermanent assets were taxable. *Id.*

¶9 We granted review to decide whether § 5 of the Act expressly preempts taxing permanent improvements constructed on tribal lands acquired under that section when those improvements are owned by non-Indians, an issue of statewide importance.

DISCUSSION

I.

[1] [2] [3] [4] ¶10 We review the tax court's entry of summary judgment de novo, viewing the facts in the light most favorable to South Point as the nonmoving party. *Dinsmoor v. City of Phoenix*, 251 Ariz. 370, 373 ¶ 13, 492 P.3d 313, 316 (2021). We will affirm if there is no genuine dispute of material fact and the State is entitled to judgment as a matter of law. *Id.*; Ariz. R. Civ. P. 56(a). We review the prior courts' preemption decisions and their interpretation of § 5 of the Act de novo as issues of law. *See Conklin v. Medtronic, Inc.*, 245 Ariz. 501, 504 ¶ 7, 431 P.3d 571, 574 (2018) (preemption); *Brenda D. v. Dep't of Child Safety*, 243 Ariz. 437, 442 ¶ 15, 410 P.3d 419, 424 (2018) (statutory interpretation).

II.

A.

[5] [6] ¶11 The Supremacy Clause of the United States Constitution makes valid federal laws predominate over conflicting state laws. *See* U.S. Const. art. 6, cl. 2. Within constitutional limits, Congress may generally preempt application of state law in a few ways, including "by so stating in express terms," which is known as "express preemption." *See Pac. Gas & Elec. Co. v. State Energy Res. Conservation & Dev. Comm'n*, 461 U.S. 190, 203–04, 103 S.Ct. 1713, 75 L.Ed.2d 752 (1983) (describing different types of preemption). In deciding whether state laws apply to non-Indian activities conducted on an Indian reservation, the Court in *Bracker* provided an additional pathway for finding federal preemption. 448 U.S. at 144–45, 100 S.Ct. 2578. A court faced with a preemption challenge in that circumstance, absent express preemption, should make "a particularized inquiry into the nature of the state, federal, and tribal interests at stake ... to determine whether, in the specific context, the exercise of state authority would violate federal law." *Id.* If so, the state law is impliedly preempted. *See id.*; *see also Cotton Petroleum Corp. v. New Mexico*, 490 U.S. 163, 176–77, 109 S.Ct. 1698, 104 L.Ed.2d 209 (1989) ("It bears emphasis that although congressional silence no longer entails a broad-based immunity from taxation for private parties doing business with Indian tribes, federal preemption is not limited to cases in which Congress has expressly—as compared to impliedly—preempted the state activity.").

¶12 The only issue before us is whether § 5 of the Act expressly preempts application of Arizona's ad valorem tax laws against the Plant. *See Confederated Tribes of Chehalis Rsrv. v. Thurston Cnty. Bd. of Equalization*, 724 F.3d 1153, 1159 (9th Cir. 2013) (stating that when § 5 of the Act applies to preempt taxation, there is no need to consider implied preemption under *Bracker*).

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B.

¶13 Section 5 of the Act provides in relevant part:

> The Secretary of the Interior is authorized, in his discretion, to acquire, through purchase, relinquishment, gift, exchange, or assignment, any interest in lands, water rights, or surface rights to lands, within or without existing reservations, including trust or otherwise restricted allotments, whether the allottee be living or deceased, for the purpose of providing land for Indians.
>
> ....
>
> Title to any lands or rights acquired pursuant to this Act or the Act of July 28, 1955 ***34** ****250** (69 Stat. 392), as amended (25 U.S.C. 608 et seq.) shall be taken in the name of the United States in trust for the Indian tribe or individual Indian for which the land is acquired, **and such lands or rights shall be exempt from State and local taxation**.

25 U.S.C. § 5108 (emphasis added). South Point argues that the above-emphasized language categorically exempts the Plant from the County's property tax regardless of ownership. The County asserts that because the Plant is not owned by the United States in trust for the Tribe or for individual Indians, the Plant is not included in "such lands or rights" exempt from tax under § 5.

[7] **[8]** **[9]** ¶14 Our primary goal in interpreting § 5 is to determine and give effect to Congress's intent. *See Steven H. v. Ariz. Dep't of Econ. Sec.*, 218 Ariz. 566, 570 ¶ 14, 190 P.3d 180, 184 (2008). We read words in context and effectuate the plain meaning of § 5 unless doing so would be absurd. *See Welch v. Cochise Cnty. Bd. of Supervisors*, 251 Ariz. 519, 523 ¶ 11, 494 P.3d 580, 584 (2021). If the language is ambiguous, we consider secondary interpretive principles, such as the Act's subject matter, history, and purpose, and the consequences of differing interpretations. *Id.*

¶15 We start with § 5's plain language. The provision exempts "such lands or rights" from state and local taxation. § 5108. "Such lands or rights" are identified as "any interest in lands, water rights, or surface rights to lands" acquired by the Secretary of the Interior "for the purpose of providing land for Indians" and titled "in the name of the United States in trust for [an] Indian tribe or [an] individual Indian." *Id.* These "lands or rights" can be located "within or without existing reservations." *Id.* Thus, to fall under § 5's tax exemption, the Plant must be (1) an "interest in lands, water rights, or surface rights to lands," (2) acquired by the Secretary of the Interior pursuant to § 5, and (3) titled "in the name of the United States in trust for the Indian tribe or [an] individual Indian." *See id.* The primary issue here is whether the Plant is included within the federal government's ownership rights, and thus the Tribe's beneficial rights, in the land underlying the Plant. If it is, and § 5's additional requirements are satisfied, the Plant is tax exempt.

[10] ¶16 The Act itself does not delineate the rights included in the federal government's ownership of land under § 5. According to the BIA, those rights include "any interests, benefits, and rights inherent in the ownership of the real property." 25 C.F.R. § 150.2. As acknowledged in *Calpine Construction*, such rights generally include ownership of permanent improvements constructed by a tenant on leased property. 221 Ariz. at 248 ¶ 16, 211 P.3d at 1232; *see also Cutter Aviation, Inc. v. Ariz. Dep't of Revenue*, 191 Ariz. 485, 492, 958 P.2d 1, 8 (App. 1997) (recognizing that generally "a permanent structure placed upon and attached to the realty by a tenant is real property belonging to the lessor"). This general rule does not apply when, as here, the lease provides that the tenant owns the permanent improvements. *See Calpine Constr.*, 221 Ariz. at 248 ¶¶ 16–17, 211 P.3d at 1232; *Cutter Aviation*, 191 Ariz. at 492, 958 P.2d at 8. The BIA recognizes this exception as applying to leases of land owned by the federal government pursuant to § 5. 25 C.F.R. § 162.415(a) ("A business lease must specify who will own any permanent improvements the lessee constructs during the lease term and may specify under what conditions, if any, permanent improvements the lessee constructs may be conveyed to the Indian landowners during the lease term.").

¶17 It is settled that South Point, not the federal government, owns the Plant. *Calpine Constr.*, 221 Ariz. at 248 ¶ 17, 211 P.3d at 1232. Based on this fact alone, § 5 seemingly does not exempt the Plant from the County's property taxes because the land owned by the United States in trust for the Tribe does not include the Plant. *See* § 5108. As South Point notes, however, the Supreme Court expansively applied § 5 in *Mescalero Apache Tribe v. Jones*, 411 U.S. 145, 93 S.Ct. 1267, 36 L.Ed.2d 114 (1973), to exempt a state tax imposed on a tribal entity for using permanent improvements it constructed and owned on land leased from the federal government. In doing so, the Court relied on *United States v. Rickert*, 188 U.S. 432, 441–43, 23 S.Ct. 478, 47 L.Ed. 532 (1903), a pre-Act ***35** ****251** case, which disallowed a state property tax on permanent improvements constructed by Indians on land held

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in trust for them by the federal government. We therefore consider these cases in determining whether § 5 broadly applies to categorically exempt all permanent improvements affixed to land owned by the federal government in trust for Indians. *See James v. City of Boise*, 577 U.S. 306, 307, 136 S.Ct. 685, 193 L.Ed.2d 694 (2016) (concluding that state and federal courts are bound by the Supreme Court's interpretation of federal law); *Weatherford ex rel. Michael L. v. State*, 206 Ariz. 529, 532 ¶ 8, 81 P.3d 320, 323 (2003) (acknowledging that a Supreme Court decision on a substantive federal issue binds the state courts on that issue).

¶18 The Court in *Rickert* addressed whether a South Dakota county could assess and impose property taxes on permanent improvements and personal property owned by Indians and used in cultivating lands allotted them under the now-defunct General Allotment (Dawes) Act of 1887, ch. 119, 24 Stat. 388 (codified as amended in scattered sections of 25 U.S.C.). 188 U.S. at 432–33, 23 S.Ct. 478. That act authorized the federal government to allot agricultural and grazing lands on Indian reservations to individual Indians. General Allotment Act, § 1. Upon allotment, the land was owned by the government in trust for the sole use and benefit of allottee Indians for twenty-five years, at which time the government would convey fee simple title to them and discharge the trust. *Id.* § 5. After all Indians were allotted reservation lands, any remaining lands could be sold to the United States, which could then open them to non-Indians for homesteading. *Id.* "[T]he allotment process was designed to assimilate Indians into the larger society," the theory being that by the time they took fee title to the lands, the Indians would have adapted to the mainstream western agricultural economy. Philip P. Frickey, *A Common Law for Our Age of Colonialism: The Judicial Divestiture of Indian Tribal Authority over Nonmembers*, 109 Yale L.J. 1, 14–15 (1999).

¶19 The *Rickert* Court first concluded that the South Dakota county lacked authority "to assess and tax the lands in question until at least the fee was conveyed to the Indians." 188 U.S. at 437, 23 S.Ct. 478. It characterized the allotted trust lands as "an instrumentality employed by the United States" to benefit Indians and reasoned that permitting taxation would defeat the government's statutory obligation to convey the land in fee to allottees free of any encumbrances, including tax liens. *Id.* at 437–38, 23 S.Ct. 478.

¶20 The Court applied similar reasoning in holding the county could not assess and tax the Indians' permanent improvements or personal property (cattle, horses, and the like), the latter having been purchased with federal funds to fulfill the government's goal of aiding the Indians in successfully cultivating the allotted lands. *See id.* at 441–45, 23 S.Ct. 478. The Court stated that allotting lands to individual Indians evidenced Congress's expectation that those lands "would be improved and cultivated by the allottee," and concluded "that object would be defeated if the improvements [and personal property] could be assessed and sold for taxes." *Id.* at 442, 23 S.Ct. 478. Responding to the county's suggestion that the government's only interest was conveying the allotted land free from encumbrance after twenty-five years and not the improvements or personalty, the Court explained that the government owed a duty of "care and protection" to the Indians that transcended its contractual obligation. *Id.* at 442–43, 23 S.Ct. 478. "The government would not adequately discharge its duty to these people if it placed its engagements with them upon the basis merely of contract, and failed to exercise any power it possessed to protect them in the possession of such improvements and personal property as were necessary to the enjoyment of the land held in trust for them." *Id.* at 443, 23 S.Ct. 478.

¶21 After *Rickert*, and by the 1920s, allotment proved disastrous for Indian tribes and individual Indians. *See* Frickey, *supra*, at 15 (describing the loss of "huge amounts of Indian land ... through sales and tax foreclosures" after the Indians became fee owners of the allotted lands); L. Scott Gould, *The Consent Paradigm: Tribal Sovereignty at the Millennium*, 96 Colum. L. Rev. 809, 829 (1996) ("Although the [General Allotment ***36** ****252** Act] was ostensibly intended to reduce poverty among Indians, it had the opposite effect."). Confronting this failure, Congress passed the Act in 1934 "to rehabilitate the Indian's economic life and to give him a chance to develop the initiative destroyed by a century of oppression and paternalism" by giving Indian tribes and Indians control of their own property and affairs. *See Mescalero*, 411 U.S. at 152, 93 S.Ct. 1267 (quoting H.R. Rep. No. 73-1804, at 6 (1934)). In addition to authorizing the Secretary of the Interior to acquire lands, water rights, or surface rights in trust for Indians, the Act discontinued the allotment program and strengthened means for Indian tribes and Indians to self-govern and perpetuate their cultures. *See* Indian Reorganization (Wheeler-Howard) Act, Pub. L. No. 73-383, 48 Stat. 984 (1934) (codified as amended at 25 U.S.C. §§ 461–479) (describing the Act as one "[t]o conserve and develop Indian lands and resources; to extend to Indians the right to form business and other organizations; to establish a credit system for Indians; to grant certain rights of home rule

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to Indians; to provide for vocational education for Indians; and for other purposes").

¶22 This brings us to *Mescalero*. The Mescalero Apache Tribe owned and operated an off-reservation ski resort in New Mexico, which the tribe developed under the Act. *Mescalero*, 411 U.S. at 146, 93 S.Ct. 1267. Specifically, the United States Forest Service leased land to the tribe, and the federal government loaned the tribe money to build and equip the resort. [1] *See id.* New Mexico imposed both a sales tax on the resort's gross receipts and a use tax for the tribe's use of two ski lifts operating at the resort. *See id.* at 146–47, 93 S.Ct. 1267. In the tribe's subsequent challenge under § 5 of the Act, then codified at 25 U.S.C. § 465, the Court upheld the sales tax, reasoning that "[o]n its face, the statute exempts land and rights in land, not income derived from its use." *Id.* at 155, 93 S.Ct. 1267. The Court acknowledged that an exemption for sales tax is arguably supported by the context and purposes of § 5 but concluded that "absent clear statutory guidance, courts ordinarily will not imply tax exemptions." *Id.* at 155–56, 93 S.Ct. 1267; *see also id.* at 156, 93 S.Ct. 1267 (stating that a tax exemption affecting Indians "can not [sic] rest on dubious inferences" but must be expressed by Congress "in plain words" (quoting *Okla. Tax Comm'n v. United States*, 319 U.S. 598, 607, 63 S.Ct. 1284, 87 L.Ed. 1612 (1943))).

¶23 The Court reached a contrary conclusion regarding the use tax, which taxed the tribe's use of the ski lifts and was assessed based on the out-of-state purchase price for the materials used to construct the lifts. *See id.* at 147, 158, 93 S.Ct. 1267. The Court initially noted the ski lifts had been permanently attached to the land and, citing *Rickert*, concluded they "would certainly be immune from the State's ad valorem property tax." *Id.* at 158, 93 S.Ct. 1267. It found that the same immunity extended to the use tax, reasoning that use of land "is among the 'bundle of privileges that make up property or ownership' of property and, in this sense, at least, a tax upon 'use' is a tax upon the property itself." *Id.* (quoting *Henneford v. Silas Mason Co.*, 300 U.S. 577, 582, 57 S.Ct. 524, 81 L.Ed. 814 (1937)). And because "use of permanent improvements upon land is so intimately connected with use of the land itself," the Court concluded that § 5's exemption applied to the use tax. *Id.*

¶24 South Point argues *Mescalero* categorically bars the County's assessment of property taxes on the Plant under § 5 regardless of South Point's ownership of the facility. It asserts that, as with use of the ski lifts in *Mescalero*, the Plant is included within the "bundle of privileges" comprising the Tribe's beneficial ownership of the land underlying the Plant, and taxing the Plant necessarily, and impermissibly, taxes that "bundle." The County counters *Mescalero* had "nothing to do with the taxation of non-Indian property," and we should therefore apply the plain language of § 5 to find it does not exempt the Plant from the County's tax.

***37 **253** ¶25 We do not read *Mescalero* as applying § 5 to exempt taxation of non-Indian-owned permanent improvements. First, the Court's analysis solely concerned tribal property and tribal activities. A tribal-owned entity owned and used the ski lifts, and New Mexico assessed the use taxes "against the [Mescalero Apache] Tribe." *Id.* at 147, 93 S.Ct. 1267. The Court did not address whether New Mexico could impose a use tax on non-Indians using property at the ski resort or whether it could assess a property tax on non-Indian-owned property affixed to the resort land.

¶26 Second, *Rickert*, which the *Mescalero* Court relied on for its use-tax analysis, turned on the property owners' status as Indians. Specifically, *Rickert* prohibited imposition of property taxes on Indian-owned permanent improvements and personal property on allotted lands to avoid taxing "an instrumentality" employed by the federal government to benefit and protect allottee Indians in improving and cultivating trust lands. 188 U.S. at 437, 442–44, 23 S.Ct. 478; *cf. M'Culloch v. Maryland*, 17 U.S. (4 Wheat.) 316, 436–37, 4 L.Ed. 579 (1819) (disallowing a state-levied tax on the operations of a national bank that, in violation of the Supremacy Clause, interfered with the federal government's execution of powers). Taxing permanent improvements owned by non-Indians would not affect those objectives. Thus, it does not necessarily follow that *Rickert*, as applied in *Mescalero* to interpret § 5, exempts non-Indian-owned property from state taxation.

¶27 Third, before *Mescalero*, the Court had refused to extend *Rickert*'s "federal instrumentality" analysis to exempt state property taxes and state excise taxes for non-Indian lessees of Indian lands if those taxes were imposed on similarly situated persons. *See Okla. Tax Comm'n v. Tex. Co.*, 336 U.S. 342, 343, 366–67, 69 S.Ct. 561, 93 L.Ed. 721 (1949) (holding that a non-Indian lessee of mineral rights on lands allotted under the General Allotment Act was not immunized by the Supremacy Clause from state taxes levied against both the lessee's property used in producing petroleum and on the oil and gas produced in the tax year); *Taber v. Indian Territory Illuminating Oil Co.*, 300 U.S. 1, 3–5, 57 S.Ct. 334, 81 L.Ed. 463 (1937) (upholding a state's non-

discriminatory ad valorem property taxes on dwelling, tool house, garage, and equipment used by non-Indian lessee of restricted Indian lands to produce oil and gas). The Court in *Oklahoma Tax Commission v. Texas Co.* concluded that "whether immunity shall be extended in situations like these is essentially legislative in character," and because Congress had not created such immunity by affirmative action, the taxes there were validly levied. 336 U.S. at 365–66, 69 S.Ct. 561.

¶28 The *Mescalero* Court recognized that *Oklahoma Tax Commission v. Texas Co.* and other cases had "cut to the bone the proposition that restricted Indian lands and the proceeds from them were—as a matter of constitutional law—automatically exempt from state taxation." 411 U.S. at 150, 93 S.Ct. 1267. In determining § 5's applicability, the Court also relied on *Oklahoma Tax Commission v. Texas Co.* in stating that "[l]essees of otherwise exempt Indian lands are also subject to state taxation." *Id.* at 157, 93 S.Ct. 1267. In light of this pronouncement, if the Court had interpreted § 5 as also exempting permanent improvements owned by non-Indian lessees from state and local taxation, we would expect the Court to have said so rather than leaving confusion in its wake. It did not.

¶29 Fourth, applying *Mescalero*'s holding outside the context of Indian-owned property would ignore § 5's requirement that the federal government own the "lands or rights" in trust for an Indian tribe or for individual Indians. *See* § 5108. *Mescalero* included permanent improvements and their use as among the "bundle of privileges" making up property or property ownership because such improvements are "intimately connected with use of the land itself." 411 U.S. at 158, 93 S.Ct. 1267. But when ownership of permanent improvements is purposefully plucked from that bundle, as occurred here, it loses that intimate connection. In that circumstance, the Indian beneficiary has no possessory or use interest in the permanent improvements, and the federal government's "lands or rights" do not include those improvements.

***38 **254** ¶30 *Chehalis* does not persuade us that *Mescalero* interpreted § 5 as imposing the categorical bar urged by South Point. There, the Ninth Circuit considered whether § 5 preempted a county tax on a resort, conference center, and water park owned by a limited liability company and built on land held in trust by the United States for the Confederated Tribes of Chehalis Reservation. 724 F.3d at 1154–55. The tribe, which formed the company and owned an undivided 51% interest in it, leased the land to the company for twenty-five years. *Id.* at 1154. Per the lease, the tribe would take ownership of all buildings and other improvements at the end of the leasehold term. *Id.* at 1154–55.

¶31 The Ninth Circuit found *Mescalero* dispositive and held the county was barred from taxing the company's permanent improvements. *See id.* at 1157–58. In its concluding paragraph, the court stated, "*Mescalero* sets forth the simple rule that [§ 5] preempts state and local taxes on permanent improvements built on non-reservation land owned by the United States and held in trust of an Indian tribe. *This is true without regard to the ownership of the improvements*." *Id.* at 1159 (emphasis added). In isolation, this statement supports South Point's view of *Mescalero*. But the body of the opinion clarifies that § 5 preemption applies to permanent improvements regardless of the ownership vehicle a *tribe* uses to own the improvements. Specifically, the court rejected the county's argument that *Mescalero* was distinguishable because a private company rather than the Confederated Tribes of Chehalis Reservation itself owned the permanent improvements. *See id.* at 1157. The court characterized *Mescalero* as instructing that "the question of tax immunity cannot be made to turn on the particular form in which the [t]ribe chooses to conduct its business." *Id.* at 1156 (quoting *Mescalero*, 411 U.S. at 157 n.13, 93 S.Ct. 1267). The court then concluded that "the [t]ribe's decision to give ownership of the [permanent improvements] to its limited liability company for the duration of the lease" was irrelevant. *Id.* at 1157. *Chehalis*, therefore, does not support applying *Mescalero* to exempt the tax against the Plant. Alternately, if the Ninth Circuit indeed intended the broader reading of *Mescalero* urged by South Point, we reject that reading for the reasons previously explained. *See supra* ¶¶ 25–29.

¶32 We are also unpersuaded that other federal authorities cited by South Point establish that § 5 preempts the County's tax on the Plant. In *Seminole Tribe of Florida v. Stranburg*, 799 F.3d 1324, 1326 (11th Cir. 2015), one issue was whether § 5 exempted a state tax on rents paid by a non-Indian lessee of food-court operations inside two Indian-owned casinos. Under Florida law, the tax was imposed for the "privilege [of engaging] in the business of renting, leasing, letting, or granting a license for the use of any real property," assessed against the lessee and collected by the landlord, which remitted the tax to the state. *Id.* (alteration in original) (quoting Fla. Stat. § 212.031(1)(a)). Relying heavily on *Mescalero*, the Eleventh Circuit concluded that § 5 preempted the rental tax. *Id.* at 1328–32. The court described *Mescalero* as "stand[ing] for the proposition that [§ 5] precludes state taxation of that

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'bundle of privileges that make up property or ownership of property.' " *Id.* at 1330 (quoting *Mescalero*, 411 U.S. at 158, 93 S.Ct. 1267). After concluding that leasing property "is a fundamental privilege of property ownership," the court found that Florida's tax on that privilege was tantamount to the use tax at issue in *Mescalero* and similarly preempted. *Id.*

¶33 *Stranburg* did not apply *Mescalero*'s holding to taxing non-Indian-owned permanent improvements because the case did not involve taxing such improvements. Nevertheless, South Point seizes on *Stranburg*'s description of *Mescalero* as meaning § 5 preempts state and local taxes on privileges attending Indians' beneficial ownership of property, asserts the Tribe's ownership privileges include benefitting from South Point's "use of the land and any permanent improvements," and argues the tax here infringes those privileges and are therefore preempted under § 5. This is a leap too far. The County's property tax is not imposed on South Point's rental payments, so the tax does not burden the Tribe's use of its land as was the case in *Stranburg*. And as previously explained, the Tribe has no ownership interest ***39 **255** in the Plant, so the tax could not infringe on it. *Cf. Okla. Tax Comm'n*, 336 U.S. at 353, 69 S.Ct. 561 (stating that the taxes there raised no issues regarding the immunity of Indian lands because "[t]here is no possibility that ultimate liability for the taxes may fall upon the owner of the land"). Thus, because the Tribe derives no benefit from the Plant, the tax cannot infringe on it.

¶34 South Point also asks us to give weight to a Department of Interior regulation concerning Indian land leases. *See Wade v. Ariz. State Ret. Sys.*, 241 Ariz. 559, 563, 390 P.3d 799, 803 (2017) (acknowledging that absent legislative direction, the court will give weight to an agency's construction of the system it administers). Title 25, § 162.017(a) of the Code of Federal Regulations states that "[s]ubject only to applicable Federal law, permanent improvements on the leased land, without regard to ownership of those improvements, are not subject to any fee, tax, assessment, levy, or other charge imposed by any State or political subdivision of a State."

¶35 The regulation does not persuade us to interpret § 5 differently. First, the regulation itself cannot preempt the County's tax. *See Kansas v. Garcia*, —— U.S. ——, 140 S. Ct. 791, 801, 206 L.Ed.2d 146 (2020) (stating preemption can arise only from "the Constitution itself or a valid statute enacted by Congress"). Second, Congress has provided direction on the exemption at issue by enacting § 5. We can ascertain that provision's meaning by applying interpretive principles, and we have no need to defer to the Department of Interior's interpretation. *See Wade*, 241 Ariz. at 563, 390 P.3d at 803 (recognizing the judiciary has final authority in interpreting statutes). Third, the regulation is "[s]ubject ... to applicable Federal law," which includes § 5, the cases interpreting it, and *Bracker*. § 162.017(a). The Department of Interior has taken the position in other cases that "§ 162.017 has no legal effect at all," and the department is "agnostic" on whether any specific state tax is preempted. *Desert Water Agency v. U.S. Dep't of the Interior*, 849 F.3d 1250, 1254 (9th Cir. 2017). Instead, the regulation merely reflects the agency's view that when a *Bracker* analysis is conducted, "the federal and tribal interests at stake are strong enough to have a preemptive effect in the generality of cases." *See id.*; *see also Stranburg*, 799 F.3d at 1337–38 (declining to defer to § 162.017 and describing the preamble to the regulations as "outlin[ing] the *Bracker* balancing test and then appl[ying] it generally").

[11] ¶36 In sum, § 5 preempts state and local taxes imposed on land and rights acquired by the Secretary of the Interior and titled in the name of the United States in trust for Indian tribes or individual Indians. Ownership rights in land generally include permanent improvements affixed to that land by a lessee but not if the parties agree that the lessee owns those improvements. When that lessee is a non-Indian, § 5 does not preempt a state or locality from taxing the improvements. Neither *Mescalero* nor other federal authorities provides otherwise.

[12] ¶37 Here, South Point indisputably owns the Plant, and the property taxes fall solely on it and not the Tribe's land. Consequently, § 5 does not exempt the Plant from taxation, and the court of appeals erred by holding otherwise. Considering our decision, we need not address the County's additional argument that exemption does not apply because the Secretary of the Interior did not acquire the land underlying the Plant pursuant to § 5. Because the court of appeals did not address whether the tax court correctly ruled that the Plant is also not impliedly exempt from the County's tax under *Bracker*, we remand to the court of appeals to decide that issue. *See S. Point Energy Ctr.*, 251 Ariz. at 268 ¶ 24, 490 P.3d at 377.

CONCLUSION

¶38 For the foregoing reasons, we vacate the court of appeals' opinion ¶¶ 9–24 and the first sentence in ¶ 30. We remand

to the court of appeals to decide the remaining issue left undecided by that court.

All Citations

253 Ariz. 30, 69 Arizona Cases Digest 4, 508 P.3d 246

Footnotes

1 The Court acknowledged that "[t]he ski resort land was not technically 'acquired' 'in trust for the Indian tribe.' " *Mescalero*, 411 U.S. at 155 n.11, 93 S.Ct. 1267. It nevertheless concluded that § 5 applied to the tribe's interest in the land as "it would have been meaningless for the United States, which already had title to the forest, to convey title to itself for the use of the Tribe." *Id.*

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Whiteco Industries, Inc. v. Commissioner, 65 T.C. 664 (1975)

Dec. 31, 1975 · United States Tax Court · Docket Nos. 3918-73, 3919-73, 7188-74

65 T.C. 664

Whiteco Industries, Inc., et al., 1 Petitionersv.Commissioner of Internal Revenue, Respondent

John S. Pennell, Don S. Harnack, and *George W. Benson,* for the petitioners.
Harmon B. Dow, for the respondent.

1

Cases of the following petitioners are consolidated herewith: Whiteco Industries, Inc., and Subsidiaries, docket Nos. 3919-73 and 7188-74.

*670OPINION

We must decide whether the petitioner's outdoor advertising signs may qualify for the investment credit of section 38.

Property can qualify for the investment credit only if it constitutes "section 38 property." Such term is defined in section 48(a)(l), which provides in relevant part:

(a) Section 38 Property.—

(1) In GENERAL. — * * * the term "section 38 property" means—

(A) tangible personal property, or

(B) other tangible property (not including a building and its structural components) but only if such property—

(i) is used as an integral part of manufacturing, production, or extraction or of furnishing transportation, communications, electrical energy, gas, water, or sewage disposal services, * * *

The petitioner argues that the outdoor advertising signs qualify for the investment credit either as "tangible personal property" within the meaning of section 48(a)(1)(A) or as "other tangible property" within the meaning of section 48(a)(1)(B). We hold that the signs constitute "tangible personal property." In light of our holding, we do not address the petitioner's alternative contention.

Although this Court has not ruled on the type of property in issue herein, the Court of Claims recently held, in two companion cases, *Alabama Displays, Inc. v. United States,* 507 F. 2d 844 (1974), and *National Advertising Co. v. United States,* 507 F. 2d 850 (1974), that outdoor advertising signs, indistinguishable from the ones before us, constitute tangible personal property. We believe the result reached by the Court of Claims is sound, and for the reasons set forth hereinafter, we reach the same result.

The statute contains no definition of the term "tangible personal property," but committee reports relating to the enactment of the investment credit do contain many

statements which are helpful in understanding the types of property intended to be included within the term. The Income Tax Regulations also contain many relevant guidelines. The technical explanations at *671tached to the House and Senate committee reports provide that the term "tangible personal property" for purposes of section 48:

> includes any tangible property except land, and improvements thereto, such as buildings or other inherently permanent structures thereon (including items which are structural componente of such buildings or structures). * * * [H. Rept. No. 1447, 87th Cong., 2d Sess. (1962), 1962-3 C.B. 405, 515-516; S. Rept. No. 1881, 87th Cong., 2d Sess. (1962), 1962-3 C.B. 707,858.]

Thus, all tangible property constitutes tangible personal property unless it is excluded because it is land or an improvement thereto. A building is given as an example of an improvement, but the common characteristic which is attributed to improvements is that they are "inherently permanent structures." Section 1.48-1(c), Income Tax Regs., adopts the same definition of tangible personal property as that given in the technical explanations to the committee reports, and the regulations characterize improvements as "inherently permanent structures."[3] Accordingly, as both parties recognize, resolution of the issue before us turns on whether the petitioner's outdoor advertising signs are "inherently permanent structures."

The term "inherently permanent structure" does not describe a clearly recognizable or defined class of property. The committee report also states: "Tangible personal property is not intended to be defined narrowly here, nor to necessarily follow the rules of State law." H. Rept. No. 1447, *supra,* 1962-3 C.B. at 415. Thus, although under State law, fixation to the land is a basis for distinguishing personal property from other property, such basis is not to be relied upon for purposes of deciding what property may qualify for the investment credit. Such a rule is illustrated by the following statement in the committee report:

> Assets accessory to the operation of a business, such as machinery, printing presses, transportation or office equipment, refrigerators, individual air-conditioning unite, grocery counters, testing equipment, display racks and shelves, etc., generally constitute tangible personal property for purposes of section 48, *even though such assets may be termed fixtures under local law.**** [S. Rept. No. 1881, *supra,* 1962-3 C.B. at 858; emphasis supplied.]

See also H. Rept. No. 1447, *supra,* 1962-3 C.B. at 516.

*672In line with such legislative history and regulations, the decided cases have held that affixation to land does not per se exclude the property from the category of tangible personal property. See *Kenneth D. LaCroix,* 61 T.C. 471, 488 (1974); *Estate of Shirley Morgan,* 52 T.C. 478, 483 (1969), affd. per curiam 448 F. 2d 1397 (9th Cir. 1971). In deciding whether property is to be classified as tangible personal property for purposes of the investment credit, the courts have developed several questions to be considered:

(1) Is the property capable of being moved, and has it in fact been moved? *Alabama Displays, Inc. v. United States,* 507 F. 2d. at 849; *Joseph Henry Moore,* 58 T.C. 1045, 1052 (1972), affd. per curiam 489 F. 2d 285 (5th Cir. 1973). The evidence clearly shows that the petitioner's signs are capable of being moved and have in fact been moved.

(2) Is the property designed or constructed to remain permanently in place? *Joseph B. Weirick,* 62 T.C. 446, 451 (1974); *C. C. Everhart,* 61 T.C. 328, 330 (1973); *Beverly R. Roberts,* 60 T.C. 861, 866 (1973). The evidence in this case indicates that the petitioner's signs are not designed or constructed to last permanently. They are designed or constructed to' last for the term of a contract between the petitioner and one of its advertisers. On the average, the term of a contract will last only 5 years. At the end of such period, the sign structure requires substantial renovation. A new sign face must be attached, some stringers must be replaced, and poles are either replaced or straightened and recemented.

(3) Are there circumstances which tend to show the expected or intended length of affixation, i.e., are there circumstances which show that the property may or will have to be moved? *Alabama Displays, Inc. v. United States, supra; Kenneth D. LaCroix,* 61 T.C. at 487. The petitioner does not intend, nor could it realistically expect, the signs to remain permanently in place. The petitioner realizes that in numerous situations it may have to move its signs at the expiration of a contract with an advertiser, or prior thereto. The signs may have to be moved because the owner of the leased land does not renew the lease or exercises his option to develop his land, or because there is a change in the location of the road or the occurrence of some other condition which makes the position of the sign no longer desirable. The Court of Claims placed great emphasis upon such *673facts to demonstrate the inherently temporary nature of the affixation of the signs therein. *Alabama Displays, Inc. v. United States,* 507 F. 2d at 845; *National Advertising Co. v. United States,* 507 F. 2d at 851-852. Such court also used such facts to distinguish the signs therein from the pilings which were used to secure a floating dock and which we found were not tangible personal property. *Estate of Shirley Morgan, supra.*

(4) How substantial a job is removal of the property and how time-consuming is it? Is it "readily removable"? *Estate of Shirley Morgan,* 52 T.C. at 483. The disassembly and removal of a sign is a' relatively quick and easy process. Although specific figures were not supplied for the time necessary to remove the sign face and the stringers, it appears that the process may be accomplished quickly, using merely a hammer and a sledge hammer or an ax. Removal of the poles for a 40-foot sign takes only an hour or an hour and a half.

(5) How much damage will the property sustain upon its removal? *King Radio Corp. v. United States,* 486 F. 2d 1091, 1096 (10th Cir. 1973). Much of the sign assembly is not damaged when it is moved. The only necessary wastage is that portion of the poles surrounded by concrete, but the remaining portions of the poles are used for other signs. If the sign is moved upon the expiration of a contract with an advertiser, the sign face is also replaced.

(6) What is the manner of affixation of the property to the land? *Joseph B. Weirick, supra; C. C. Everhart, supra; Beverly R. Roberts, supra.* The poles on which the petitioner's signs are mounted are placed in the ground and surrounded by concrete; yet, such poles can easily be removed from the ground, and as a matter of practice, they are so removed.

In our judgment, the application of these criteria to the facts of this case leads to the conclusion that the outdoor advertising signs of the petitioner were not inherently permanent. They were not'expected to last indefinitely; inevitably, they would have to be moved in a relatively short time; and they could be removed easily. Such signs are manifestly less permanent in nature than other properties which the courts have found to be tangible personal property for purposes of the investment credit: *King Radio Corp. v. United States, supra; Minot Federal Savings & Loan Assn. v. United States,* 435 F. 2d 1368 (8th Cir. 1970) (movable partition system fastened to the floor and ceiling by *674screws or masonry nails); *Marineland of the Pacific, Inc.,* T.C. Memo. 1975-288 (338-foot sky tower); *Joseph B. Weirick,* 62 T.C. 446 (1974) (holddown towers for a ski lift and its cable support as well as wooden passenger ramps); *Joseph Henry Moore,* 58 T.C. 1045 (1972) (mobile homes placed on concrete blocks); *Estate of Shirley Morgan,* 52 T.C. 478(1969)(a floating dock held down by pilings). Moreover, the Income Tax Regulations specifically provide that "neon and other signs, which * * * [are] contained in or attached to a building" are tangible personal property for purposes of the credit allowed by section 38. Sec. 1.48-l(c), Income Tax Regs. Certainly, such signs may be constructed, designed, and affixed in a much more permanent fashion than the signs of the petitioner.

In deciding what property qualifies for the investment credit as tangible personal property, some very subtle distinctions have been suggested. It is difficult to reconcile the position maintained by the Commissioner in this case with his own rulings. He has allowed property, far more inherently permanent than the petitioner's signs, to qualify: Rev. Rul. 74-602, 1974-2 C.B. 12 (gasoline storage tanks of approximately 8,000-gallon capacity (located usually below ground but some above ground and not generally moved during useful life) and associated piping in a retail gasoline station); Rev. Rul. 71-104,1971-1 C.B. 5 (burner and 14-story preheater structure for cement kiln facility); Rev. Rul. 70-236,1970-1 C.B. 8 (liquified petroleum gas equipment); Rev. Rul. 70-160,1970-1 C.B. 7 (boiler facility to produce steam used in the manufacture of furniture); Rev. Rul. 70-103,1970-1 C.B. 6 (a diesel generator, fuel tanks, exhaust equipment, a chlorinator, vault doors with combination locks, dehumidifiers, pumps, space heaters, safety doors, and louvers); Rev. Rul. 69-602, 1969-2 C.B. 6 (propane gas storage tanks and water heaters installed on customers' premises); Rev: Rul. 69-557,1969-2 C.B. 3 (dry kiln structures to remove moisture from wood); Rev. Rul. 67-349, 1967-2 C.B. 48 (wall-to-wall carpeting installed in guest rooms, office space, bar areas, and dining rooms of a motel); and Rev. Rul. 65-79, 1965-1 C.B. 26 (bank vault doors, night depository facilities, walk-up and drive-up teller's windows). As a court, we must be guided by rational principles in making our decisions, and if those items of property are to be treated as tangible personal property, we see no rational basis for disqualifying the petitioner's outdoor advertising signs.

*675The Commissioner argues that the petitioner's signs cannot qualify as tangible personal property, in any event, because the House committee report specifically excludes such outdoor advertising signs. The passage on which he relies is:

In order to qualify for the credit, property (other than tangible personal property and research or storage facilities used in the specified activities) must be used as an integral part of one or more of the specified activities. Thus, for example, section 38 property would ordinarily not include such assets as pavements, parking areas, *advertising displays,* outdoor lighting facilities, or swimming pools which, although used as a part of the overall business operation, are not used directly in the specified activities. * * * [H. Rept. No. 1447, supra, 1962-3 C.B. at 517; emphasis supplied.]

This same argument was rejected by the Court of Claims in *Alabama Displays, Inc. v. United States,* 507 F. 2d 844 (1974). We also believe the argument is misplaced and therefore reject it.

There- are a number of reasons for rejecting the Commissioner's argument. In the first place, it is not clear as to what is meant by the term "advertising displays." There is some indication that the term may have been used to refer to show windows. A spokesman for the American Retail Federation appeared before the Senate Finance Committee and urged the committee to allow the investment credit with respect to a retailer's show windows, and it may have been those show windows to which the committee meant to refer. Hearings Before the Senate Committee on Finance on H.R. 10650, 87th Cong., 2d Sess., part 3, 1019 (1962). In. addition, it is not clear that the committee had .in mind such property as the petitioner's signs. The committee may have intended to indicate merely that the advertising displays of a person engaged in manufacturing or production were not an integral part of his business, and the committee may not have intended to make any reference to a person who was in the advertising business. The Court of Claims adopted this view of the language in the legislative history. *Alabama Displays, Inc. v. United States, supra.* Moreover, the committee merely indicated that advertising displays are not ordinarily to qualify for the investment credit, but the committee may have had in mind advertising displays that were much more substantial and more permanent than the petitioner's signs..For these reasons, we are not persuaded that the committee intended to indicate that outdoor advertising signs of the type *676erected by the petitioner could not qualify for the investment credit.

Decisions will be entered under Rule 155.

3
Sec. 1.48-l(c), Income Tax Regs., in relevant part, provides:

(c) *Definition of tangible personal property.* * * * For purposes of this section, the term "tangible personal property" means any tangible property except land and improvements thereto, such as buildings or *other inherently permanent structures* (including items which are structural components of such buildings or structures). * * * [Emphasis supplied.]

APPENDIX E

2025-26 PERSONAL PROPERTY MANUAL: VALUATION GUIDELINES

Determining Whether Fixtures are Real or Personal Property

NRS 361.333 requires that each major class of property be examined to determine whether there is equality of assessment. One of the principal classes of property is personal property, pursuant to NRS 361.227(4). Uniformity and equality of assessment thus depend on proper classification. Although NRS 361.035 defines real estate and NRS 361.030 defines personal property, in practice it is sometimes difficult to tell whether an item is personal property or a fixture that is part of the real estate. As the Attorney General stated in Opinion #41 (1963), "the classification depends on the facts of each particular case." The assessor is encouraged to consult the Division of Local Government Services and/or the District Attorney in difficult cases.

A fixture may be defined as an item that was originally personal property which has been installed or attached to land or an improvement in a permanent manner. There is an abundant amount of case law which discusses three tests often used in deciding whether an item is a fixture. The tests are:

1. Physical Annexation;
2. Constructive Annexation, also called Adaptation; and
3. Intent

Under the first test, annexation, an item is a fixture if it is attached to, imbedded in or permanently resting upon land or an improvement, or is attached by other means that are normally used for permanent installation, and cannot be removed without substantially damaging the item or the land or improvement with which it is being used. For example, an item which is attached to real property for stability and has quick disconnect attachments such as simple wiring and conduit connections may not meet the test for a permanent fixture.

Under the second test, constructive annexation, an item is a fixture if the use or purpose of an item that is not otherwise physically annexed to land or an improvement is so adapted that it is:

A. A necessary, integral or working part of the land or improvement;
B. Designed or committed for use with the land or improvement; or
C. So essential to the land or improvement that the land or improvement cannot perform its desired function without the nonattached item.

Using the constructive annexation test, if the purpose of the item is to augment the use of the improvement no matter how it is attached, such as an elevator, the item must be considered a fixture. Another example would be heating, ventilation, and air conditioning equipment (HVAC). Equipment used to heat, ventilate, or cool a structure is considered to be real property.

Permanently attached personal property may be temporarily removed for repair or renovation onsite and still be considered permanently attached. Permanently attached fixtures do not include movable tangible personal property that is attached for convenience, stability, or an obviously temporary purpose.

Underlying both the physical or constructive annexation tests is a determination of intent. An assessor must consider whether the item is intended to be a permanent part of the land or improvement, taking into account

physical or constructive annexation, and other objective manifestations of permanence. NAC 361.1127 provides examples of objective manifestations of permanence.

A trade fixture may be distinguished from a fixture. It is an item of personal property that is non-permanently attached to real property for the purpose of conducting a business or trade; and has a unique identity and function separate from the real property to which it is attached. NAC 361.11745 provides a definition of trade fixture.

Pursuant to NRS 361.244, a mobile or manufactured home becomes real property when the Assessor has listed it on the tax roll as real property. The classification of mobile and manufactured homes as real property may be made when the requirements enumerated in NRS 361.244(1) and (2) are met. This includes the issuance of a Real Property Notice by the Manufactured Housing Division of the Department of Business and Industry. Factory-built housing becomes real property once it is permanently affixed to the land. These housing units conform to the Uniform Building Code and are not titled. As such they are not personal property nor are they considered "conversions". These "UBC" homes do not exhibit the HUD placards found on manufactured housing. Instead, they may have a placard referencing NRS 461.080 and their serial numbers may begin with the characters "UBC".

In general, personal property is defined by exception pursuant to NRS 361.030. Property that does not meet the criteria of real property is personal property. To assist in making the determination on real and personal property, which occurs on a case-by-case basis, the six-factor Whiteco test, in which the following questions were developed in helping determine if property was/is considered tangible personal property or real property. The six questions are:

1. Is the property capable of being moved, and has it in fact been moved?
2. Is the property designed or constructed to remain permanently in place?
3. Are there circumstances which tend to show the expected or intended length of affixation — that is, are there circumstances which show that the property may or will have to be moved?
4. How substantial a job is removal of the property and how time consuming is it? Is it "readily removable"?
5. How much damage will the property sustain upon its removal?
6. What is the manner of affixation of the property to the land? Can it be removed without causing damage?

The Assessor should recognize that certain fixtures such as bars, stages, walk-in coolers, or bank drive-ups, may already be included in the real property component of the Assessor's Taxable Value. The Assessor should review the differing building occupancies of the Marshall-Swift cost manuals to ensure that a component of real or personal property is not double-assessed. The improper classification of any component of taxable property as real or personal does not render the valuation void or invalid.

For further research and explanation, please consult:

Attorney General Opinion 2012-10 (10-31-2012) (as it applies to fixtures, not to trade fixtures)
Attorney General Opinion #41 (1963)
Attorney General Opinion No. 2000-04
Marvin Arnold, Respondent, v. Goldfield Third Chance Mining Co, 32 Nev. 447; 109 P. 718 (1910)
National Advertising Co. v. State Department of Transportation, 116 Nev. Adv. Op. No. 10, (Feb. 2, 2000)

Fondren, et al, v. K/L Complex Ltd., et al., 106 Nev. 705; 800 P.2d 719; (1990)
Morse Signal Devices of California v. County of Los Angeles, 161 Cal. App. 3d 570; 207 Cal Rptr. 742 (1984)
Crocker National Bank v. City and County of San Francisco, 782 P.2d 278 (1989)
State v. Pioneer Citizens Bank of Nevada, 85 Nev. 395 (1969)
Kaiser Co. v. *Reid* (1947) 30 Cal.2d 610
Whiteco Industries, Inc. v. Commissioner, 65 T.C. 664 (1975)

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STATE OF NEVADA
DEPARTMENT OF TAXATION
Web Site: http://tax.state.nv.us
1550 College Parkway, Suite 115
Carson City, Nevada 89706-7937
Phone: (775) 684-2000 Fax: (775) 684-2020

RENO OFFICE
4600 Kietzke Lane
Building L, Suite 235
Reno, Nevada 89502
Phone: (775) 687-9999
Fax: (775) 688-1303

BRIAN SANDOVAL
Governor
ROBERT R. BARENGO
Chair, Nevada Tax Commission
CHRISTOPHER G. NIELSEN
Executive Director

LAS VEGAS OFFICE
Grant Sawyer Office Building, Suite1300
555 E. Washington Avenue
Las Vegas, Nevada 89101
Phone: (702) 486-2300 Fax: (702) 486-2373

HENDERSON OFFICE
2550 Paseo Verde Parkway, Suite 180
Henderson, Nevada 89074
Phone: (702) 486-2300
Fax: (702) 486-3377

Guidance Letter 14-001

Date: September 17, 2014

To: Centrally-assessed Section, Division of Assessment Standards; County Assessors

From: Terry E. Rubald, Deputy Executive Director, Department of Taxation

CC: Christopher G. Nielsen, Executive Director, Department of Taxation

Subject: Taxability of real property located on tribal lands held in trust by the U.S. Government

SUMMARY:

This Guidance Letter is intended to clarify that real property located on lands held in trust by the U.S. Government on behalf of Indian tribes, is not taxable for purposes of property tax. This includes property owned by third parties unrelated to an Indian tribe. In the past, real and personal property owned by third parties, but located on trust lands, had been considered subject to property taxation in Nevada pursuant to NRS 361.045. Due to recent decisions by Federal courts, however, any permanent improvements owned by any person or company and located on trust lands, are not taxable property by the State of Nevada and its subdivisions. Personal property owned by unrelated third parties and located on trust lands, however, may continue to be considered taxable property by the State and its subdivisions. Possessory interests in property of any Indian tribe, band or community held in trust by the United States, continue to be exempt pursuant to NRS 361.157(2)(e).

AUTHORITY:

NRS 360.215(6): The Department shall continually supervise assessment procedures which are carried on in the several counties of the State and advise county assessors in the application of such procedures.

NRS 360.215(7) The Department shall carry on a continuing program to maintain and study the assessment of public utilities and all other property assessed by the Department to the end that the assessment is equalized with the property assessable by county assessors.

DISCUSSION:

NRS 361.045 provides that, except as otherwise provided by law, all property of every kind and nature whatever within this state shall be subject to taxation. Recently however, the 9th Circuit, U.S. Court of Appeals, ruled in *Confederated Tribes of the Chehalis Reservation v. Thurston County Board of Equalization et al (July 30, 2013)* that state and local governments lack the power to tax permanent improvements built on non-reservation land owned by the United States and held in trust for an Indian

tribe pursuant to 25 U.S.C. §465.[1] 25 U.S.C. §465 authorizes the Secretary of the Interior to acquire "any interest in lands, water rights, or surface rights to lands, within or without existing reservations," and to hold title to such lands and rights "in the name of the United States in trust for the Indian tribe or individual Indian for which the land is acquired." The statute also provides that "such lands or rights shall be exempt from State and local taxation." The Court held that the exemption of trust lands from state and local taxation under §465 extends to permanent improvements on such lands. The Court concluded that the fact that the improvements were owned by a limited liability company, rather than by the tribe itself, was irrelevant.

The Bureau of Indian Affairs has also adopted 25 C.F.R. §162.017(a) which clarifies and confirms 25 U.S.C. §465:

> Subject only to applicable Federal law, permanent improvements on the leased land, *without regard to ownership of those improvements*, are not subject to any fee, tax, assessment, levy, or other charge imposed by any State or political subdivision of a State. Improvements may be subject to taxation by the Indian tribe with jurisdiction.

Based on the rulings of the Federal courts and Federal regulation, real property such as buildings and improvements located on lands held in trust by the United States Government for an Indian tribe is not taxable property, even when owned by a person or entity other than the tribe. Such property owned by third parties is not exempt per se, because exemption implies that a property is subject to tax which later qualifies for exemption. It is simply not subject to taxation. However, calling such property "non-taxable" as opposed to "exempt" may be a distinction without much of a difference.

There is not a specific exemption in state law for property owned by third parties but located on trust lands. For example, NRS 361.050 specifically exempts all lands and other property *owned by the United States* "not taxable because of the Constitution or laws of the United States." NRS 361.157(2)(e) exempts otherwise taxable possessory interests in the property of any Indian or of any Indian tribe, band or community which is held in trust by the United States or subject to a restriction against alienation by the United States. Neither of these exemptions cover the property at issue.

APPLICATION:

1.) In order for the Department or assessors to determine whether the real property is non-taxable, it must be established that the property is located on lands owned by the United States held in trust for an Indian tribe. Title records must be checked to confirm said ownership of the land. In addition, the Taxpayer must provide a copy of the lease showing that the subject property is on property owned by the United States and held in trust for the Indian tribe.

2.) For centrally-assessed properties which use unitary valuation methods, the Taxpayer must provide sufficient information for the Department to determine what portion of the unitary assessment represents non-taxable property. The information must include a metes and bounds description of the location of the non-taxable property and a map in sufficient detail to show location in each section, township and range in which the property is located. The information must also include a list of the real property improvements located on trust lands, the date the improvement or structure was built or placed on tribal trust lands, and the portion of original book cost and current book cost less depreciation which represents non-taxable property located on trust lands.

3.) For centrally-assessed properties, the wire-miles or pipeline miles associated with non-taxable property must be separately indicated on wire-mile reports.

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[1] *See also United States v. Rickert,* 188 U.S. 432 (1903); and *Mescalero Apache Tribe v. Jones*, 411 U.S. 145 (1973).

4.) For purposes of tracking property for various reports, including the Statistical Analysis of the Roll and the AB 466 Tax Expenditure Report, assessors and the Department should categorize non-taxable property owned by third parties and located on Indian trust lands as "non-taxable" property. If the software used by the assessor is not currently capable of identifying property as "non-taxable," classification as "exempt" will be acceptable. For purposes of AB 466, the legal reference to use for classifying the property will be 25 CFR §162.017(a).

If you have any questions about this guidance letter, please call the Local Government Finance Section of the Division of Local Government Services, Department of Taxation at (775) 684-2100.

WEBSITE LOCATIONS:

Nevada Revised Statutes (NRS): http://www.leg.state.nv.us/NRS/
Nevada Administrative Code: http://www.leg.state.nv.us/NAC/CHAPTERS.html

Department of Taxation Guidance letters: http://www.tax.state.nv.us; then select "Publications;" then select Assessment Standards Publications and "Guidance letters."

2022/2023

Description	Year Acq	Acquisition Cost	Cost Index per pp Manual	RCN	% Good per PP Manual	Taxable	Obs Adj	Adj Taxable
Solar System Blocks 1	2021	348,300,000	1.01	351,783,000	93	327,158,190	0.89108911	291,527,100
2022/2023		348,300,000		351,783,000		327,158,190		291,527,100

2023/2024

Description	Year Acq	Acquisition Cost	Cost Index per pp Manual	RCN	% Good per PP Manual	Taxable	Obs Adj	Adj Taxable
Solar System Blocks 1	2021	348,300,000	1.15	400,545,000	87	348,474,150	0.72173913	251,507,430
Solar System Block 12	2022	37,400,000	1.12	41,888,000	93	38,955,840	0.83035714	32,347,260
2023/2024		385,700,000		442,433,000		387,429,990		283,854,690

2024/2025

Description	Year Acq	Acquisition Cost	Cost Index per pp Manual	RCN	% Good per PP Manual	Taxable	Obs Adj	Adj Taxable
Solar System Blocks 1	2021	348,300,000	1.16	404,028,000	81	327,262,680	0.69827586	228,519,629
Solar System Block 12	2022	37,400,000	1.06	39,644,000	87	34,490,280	0.82075472	28,308,060
Inventory	2023	242,379	1.03	249,650	93	232,175	0.90291262	209,634
Solar System Blocks 1	2023	74,600,001	1.03	76,838,001	93	71,459,341	0.90291262	64,521,541
2024/2025		460,542,380		520,759,651		433,444,476		321,558,864

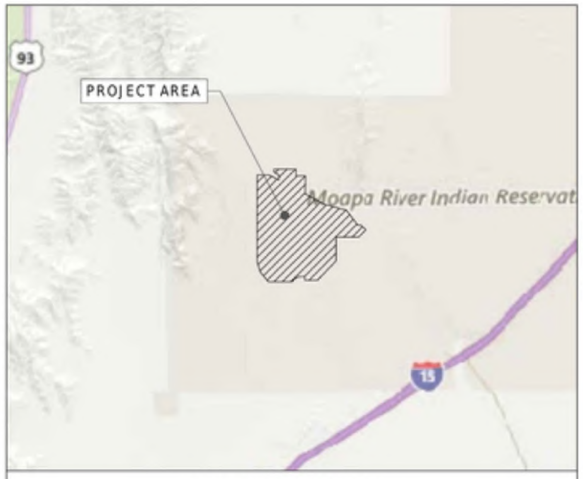
NRS 361.035 "Real estate" and "real property" defined.

1. "Real estate" or "real property" means:
   (a) All houses, buildings, fences, ditches, structures, erections, railroads, toll roads and bridges, or other improvements built or erected upon any land, whether such land is private property or property of this state or of the United States, or of any municipal or other corporation, or of any county, city or town in this state.
   (b) Any mobile home, factory-built housing or manufactured home which meets the requirements of NRS 361.244.
   (c) The ownership of, or claim to, or possession of, or right of possession to any lands within this state.
   (d) The claim by or the possession of any person, firm, corporation, association or company to any land.
2. The property described in subsection 1 must be listed under the head of "real estate."
3. Except as otherwise provided in NRS 361.2445, when an agreement has been entered into, whether in writing or not, or when there is sufficient reason to believe that an agreement has been entered into, for the dismantling, moving or carrying away or wrecking of the property described in subsection 1, the property must be classified as personal property, and not real estate.
4. For the purposes of this chapter, "real estate" or "real property" does not include leasehold or other possessory interests in land owned by the Federal Government on which land the Federal Government is paying taxes to the State of Nevada or is, pursuant to contractual obligation, paying any sum in lieu of taxes to the State of Nevada.

[Part 3:344:1953]—(NRS A 1957, 358; 1975, 1655; 1979, 824; 1993, 1183; 1999, 3465)

NAC 361.344 "Obsolescence" defined. (NRS 360.090, 361.320) "Obsolescence" means the lessening of value due to causes other than physical causes and may be functional where circumstances internal to the property item render it less desirable or economic where circumstances external to the item and beyond the control of the owner render the property item less desirable.

STRUCTURAL DESIGN PLANS
FOR
EAGLE SHADOW MOUNTAIN SOLAR
IN CLARK COUNTY, NEVADA
SITE ENTRANCE COORDINATES: 36.542521, -114.800796



VICINITY MAP
NTS



LOCATION MAP
NTS

CLARK COUNTY, NEVADA

DRAWING INDEX			
SHEET NUMBER	SHEET TITLE	REV	REV DATE
S-000	TITLE SHEET	1	6/14/2023
S-001	CS BLOCK 203 & TRINA GENERAL NOTES	1	6/14/2023
S-002	TRINA WIDE FLANGE TRACKER AND LOAD BREAK DISCONNECT FOUNDATION	1	6/14/2023
S-003	TRINA CAB DETAILS AND FOUNDATIONS	1	6/14/2023
S-004	PCS AND PILE CAP CONNECTION	1	6/14/2023
S-005	PCS, MET, AUXILIARY RACK FOUNDATION	1	6/14/2023
S-006	CS AND JINKO TRACKER GENERAL NOTES AND FOUNDATION	1	6/14/2023
S-007	CS & JINKO CAB DETAILS AND FOUNDATIONS	1	6/14/2023

PREPARED BY:
KLEINFELDER
Bright People. Right Solutions.
707 17TH STREET, SUITE 3000
DENVER, CO 80202
O: 303.237.6601
www.kleinfelder.com

KLEINFELDER
Bright People. Right Solutions.
707 17th Street, Suite 3000
Denver, CO 80202
Phone: 303-237-6601
www.kleinfelder.com

REVISIONS

REV	DESCRIPTION	DSN / DWN	CHK / APP	DATE
0	CONSTRUCTION PLANS	JAC / AD	ADT / ADT	10/16/2020
1	RECORD DRAWINGS	/	/ ADT	6/14/2023

ORIGINAL DRAWING SIZE IS 24 x 36

EAGLE SHADOW MOUNTAIN SOLAR

MOAPA RIVER INDIAN RESERVATION
CLARK COUNTY, NEVADA

PRIMORIS RENEWABLE ENERGY
4880 HAVANA STREET, SUITE 500
DENVER, COLORADO 80239

TITLE SHEET

PROJECT NO.	20203753.003A
ISSUE DATE	6/14/2023
CURRENT REVISION	1
DESIGNED BY	AD/JAC
DRAWN BY	AD/JAC
CHECKED BY	ADT
APPROVED BY	ADT

S-000

SHEET 1 of 8

CAD FILE: \\denver.kleinfelder.com\DENVER-DATAWORKING\20203753.002 - Eagle Shadow Mountain Design\2.0 Technical Information\2.8 Technical And CADD Figures\20203753 Eagle Shadow Mountain_20201016.dwg LAYOUT: TITLE SHEET PLOTTED: 10/16/2020 5:40 PM BY: adam.tuchida

GENERAL STRUCTURAL NOTES

1. THE NOTES ON THIS SHEET ARE GENERAL AND APPLY TO THE CANADIAN SOLAR BLOCK 203 AND TRINA ARRAY FOUNDATION, MESSENGER WIRE (CAB) SYSTEM, LOAD DISCONNECT, AUXILIARY RACK, POWER CONVERSION STATION AND METEOROLOGICAL STATION. IF THERE ARE QUESTIONS, THEY SHALL BE SUBMITTED TO THE OWNER'S REPRESENTATIVE AND ANSWERED IN WRITING PRIOR TO CONSTRUCTION.

2. ALL WORK ASSOCIATED WITH THE CONSTRUCTION OF THIS PROJECT SHALL COMPLY WITH THE 2018 IBC, ASCE 7-16, SOUTHERN NEVADA AMENDMENTS TO THE 2018 IBC, AND AS ADOPTED AND AMENDED BY THE LOCAL AUTHORITY HAVING JURISDICTION; AND ALL OTHER APPLICABLE CODES, ORDINANCES AND LAWS.

3. DESIGN CRITERIA: RISK CATEGORY I
   a. ROOF / PANEL LOADS:
      0 PSF (GROUND SNOW LOAD)
      0 PSF (FLAT ROOF SNOW LOAD)
      IMPORTANCE FACTOR SNOW = 0.8
   b. WIND LOAD:
      93 MPH (3 SECOND GUST)
      WIND EXPOSURE CATEGORY = C
   c. SEISMIC LOAD:
      IMPORTANCE FACTOR SEISMIC (IE): 1.0
      MAPPED SPECTRAL RESPONSE ACCELERATIONS:
      Ss = 0.624g, S1 = 0.203g
      SITE CLASS: C
      SPECTRAL RESPONSE COEFFICIENT: SDs = 0.520g, SD1 = 0.203g
      SEISMIC DESIGN CATEGORY: D
      BASIC SEISMIC FORCE RESISTING SYSTEM: NON-BUILDING STRUCTURE
      RESPONSE MODIFICATION FACTOR R = 2.0

4. THE CONTRACTOR SHALL VERIFY THE ASSUMED CONDITIONS AS DESCRIBED HEREIN BY ACTUAL FIELD MEASUREMENTS AND INSPECTIONS PRIOR TO FABRICATION OF ANY MATERIALS AND START OF CONSTRUCTION WORK. ANY DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER FOR CORRECTIVE MEASURES.

5. SECTIONS AND DETAILS SHOWN ARE INTENDED TO ESTABLISH THE GENERAL TYPES OF DETAILS TO BE USED THROUGHOUT. IF THE CONTRACTOR WISHES TO USE DETAILS OTHER THAN THOSE SHOWN ON THE DRAWINGS, SUCH DETAILS SHALL BE APPROVED BY ENGINEER OF RECORD, BEFORE ANY WORKS AND SHOP DRAWINGS ARE COMMENCED.

6. ENGINEER IS NOT RESPONSIBLE FOR WORK THAT ENGINEER DOES NOT REVIEW AND/OR WORK NOT COMPLETED IN ACCORDANCE WITH ENGINEER'S PLANS AND/OR INSTRUCTIONS.

COORDINATION

1. THESE PLANS SHALL BE VERIFIED WITH ELECTRICAL AND CIVIL PLANS PRIOR TO CONSTRUCTION.

2. IT IS SOLELY THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE ERECTION PROCEDURE AND THEIR COMPONENT PARTS DURING ERECTION.

3. IF CONSTRUCTION IS NOT IN PROGRESS OR COMPLETED WITHIN TWO YEARS FROM ORIGINAL DATE OF ISSUE, THE DESIGN IS VOID, UNLESS UPDATED TO ACCEPTABLE CODES AND PRACTICES AT THAT TIME.

FOUNDATIONS & EARTHWORK

1. THE FOLLOWING GEOTECHNICAL INFORMATION WAS UTILIZED TO GENERATE THE BELOW RECOMMENDATIONS FOR THE FOUNDATION DESIGN.

   a. "GEOTECHNICAL EXPLORATION REPORT, EAGLE SHADOW MOUNTAIN SOLAR PROJECT, MOAPA RIVER INDIAN RESERVATION, CLARK COUNTY, NEVADA", BY KLEINFELDER, DATED JUNE 3, 2020, PROJECT NO. 20203753.001A.

   b. "PILE LOAD TESTING REPORT, EAGLE SHADOW MOUNTAIN SOLAR PROJECT, MOAPA RIVER INDIAN RESERVATION, USA" BY KLEINFELDER, DATED AUGUST 21, 2020 PROJECT NO. 20203753.001A.

DESIGN AND MODEL:

   a. LAYER 1: 0-1 FT
      a.1. ELASTIC SUBGRADE
      a.2. EFFECTIVE UNIT WEIGHT: 110 PCF
      a.3. ELASTIC SUBGRADE REACTION 400 PCI
      a.4. ULTIMATE SKIN FRICTION: 0 PSF
      a.5. ULTIMATE END BEARING: 0 PSF
   b. LAYER 2: 1-15 FT
      b.1. ELASTIC SUBGRADE
      b.2. EFFECTIVE UNIT WEIGHT: 110 PCF
      b.3. COHESION: ELASTIC SUBGRADE REACTION 400 PCI
      b.4. ULTIMATE SKIN FRICTION: 600 PSF
      b.5. ULTIMATE END BEARING: 10,000 PSF

PILE FOUNDATIONS

1. ACCURATELY LOCATE AND INSTALL PILES/SUPPORTS. WIDE FLANGE PILES SHALL BE INSTALLED AS ONE (1) CONTINUOUS MEMBER WITHOUT SPLICE.
2. DO NOT BEGIN PILE INSTALLATION UNTIL THE EARTHWORK IN THE AREA WHERE PILES ARE TO BE INSTALLED HAS BEEN COMPLETED.
3. MATERIALS
   a. SIZE AS STATED IN DRAWINGS
   b. ASTM A992 50 ksi YIELD (WIDE FLANGE PILES)
   c. GALVANIZE PER ASTM A123, MINIMUM 3 MIL GALVANIZATION THICKNESS
4. ENDS OF PILES TO BE MACHINE CUT AND SQUARE MAKING AN ANGLE OF 90 DEGREES WITH THE LONGITUDINAL AXIS OF THE PILE. CUTS SHALL BE DEBURRED TO REMOVE SHARP EDGES.
5. TOLERANCES:
   a. PILE FABRICATION TOLERANCES: CONFORM TO REQUIREMENTS OF A6 AND ASTM A992.
   b. PLACEMENT TOLERANCES PER TRACKER MANUFACTURERS REQUIREMENTS.
6. EACH PILE TO BE FREE FROM DEFECTS AND DAMAGE DUE TO CONSTRUCTION, FABRICATION, DELIVERY, INSTALLATION OR OTHER CAUSES.
   a. REPLACE DAMAGED PILES. DAMAGE INCLUDES BUT NOT NECESSARILY LIMITED TO PILES BENT, BUCKLED, CRACKED, WITH FABRICATION TOLERANCES BEYOND THOSE INDICATED ABOVE, IMPERFECTION OR DAMAGE TO CORROSION PROTECTIVE COATING, OR WITH ANY OTHER DEFECT AS DETERMINED BY ENGINEER.
   b. CORRECT ANY FOUNDATION OR OTHER CONSTRUCTION THAT HAS BEEN DAMAGED BY FOUNDATION INSTALLATION.
7. FOUNDATION INSTALLATION LOGS SHALL BE MAINTAINED DAILY BY THE INSTALLATION CONTRACTOR THAT DETAIL POST LOCATION, INSTALLATION DATE, INSTALLATION DEPTH, UNUSUAL DRIVING TIME OR ANY INSTALLATION ABNORMALITIES.
8. DRIVEN PILES SHALL BE INSTALLED USING IMPACT OR VIBRATORY EQUIPMENT. DUE TO SHALLOW BEDROCK AND CEMENTED SOIL. PREDRILLING WILL BE REQUIRED TO INSTALL PILES. PREDRILLING FOR PILES SHOULD BE PERFORMED AS INDICATED BELOW:
   a. PREDRILL THE HOLE TO DEPTH USING A 7" OR 8" DIAMETER AUGER FOR W6X7, W6X8.5, W6X9, AND W6X12 SHAPES, AND A 9" OR 10" DIAMETER AUGER FOR W6X15 OR W6X20 SHAPES NO DEEPER THAN THE REQUIRED EMBEDMENT DEPTH.
   b. BACKFILL THE EXCAVATED HOLE TO GRADE SURFACE WITH THE EXCAVATED MATERIALS, TAMPED IN THREE TO FIVE LIFTS.

CONCRETE

1. ALL CONCRETE WORK SHALL BE IN CONFORMANCE WITH THE LATEST EDITION OF THE FOLLOWING PUBLICATIONS:
   a. ACI 318 "BUILDING CODE REQUIREMENTS FOR STRUCTURA CONCRETE"
   b. ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE"
   c. ACI 302.1R "GUIDE FOR CONCRETE FLOOR AND SLAB CONSTRUCTION"
   d. ACI 305R "HOT WEATHER CONCRETING"
   e. ACI 306R "COLD WEATHER CONCRETING"
   f. ACI 315 "DETAILS AND DETAILING OF CONCRETE REINFORCEMENT"
2. A CONCRETE MIX DESIGN AND WITH POSSIBLE ADMIXTURES SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
   a. CEMENT SHALL BE ASTM TYPE I/II
   b. MAXIMUM WATER CEMENT RATIO OF 0.48
   c. MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS
   d. SLUMP SHALL BE 5" - 8"
   e. FINE AGGREGATE SHALL NOT BE MORE THAN 50% OF THE AGGREGATE. COURSE AGGREGATE SHALL NOT BE LARGER THAN $\frac{3}{4}$"
   f. ADMIXTURES ARE TO BE APPROVED BY OWNER'S RETAINED ENGINEER. ADMIXTURES SHALL BE CHLORIDE FREE. DO NOT USE CALCIUM CHLORIDE
3. SEE CONCRETE TESTING NOTE BELOW

STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL WORK SHALL BE IN CONFORMANCE WITH "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS", AISC.
2. ALL STRUCTURAL MATERIALS SPECIFIED IN THIS DOCUMENT SHALL HAVE ADEQUATE CORROSION PROTECTION FOR THE ENVIRONMENT. STRUCTURAL STEEL SHALL BE HOT DIPPED GALVANIZED OR AN APPROVED EQUIVALENT SHALL BE EVALUATED BY THE ENGINEER. GALVANIZATION IN CONFORMANCE WITH ASTM A123, MINIMUM 3 MIL GALVANIZATION THICKNESS.

   a. □ EAGLE SHADOW MOUNTAIN SOLAR PROJECT□ CORROSION EVALUATION REPORT□ BY INTEGRITY SOLUTIONS FIELD SERVICES, INC. DATED 4/30/2020

3. MATERIAL STANDARDS: (UNLESS NOTED OTHERWISE)
   a. WIDE FLANGE PILES: ASTM A992
   b. PLATES AND ANGLES: ASTM A36
4. TOUCH-UP PAINT: ZINC RICH, CONTAINING A MINIMUM 93% METALLIC ZINC CONTENT.
5. ALL WELDS AND OTHER AREAS WHERE GALVANIZATION IS REMOVED FOR CONSTRUCTION SHALL BE COATED WITH 2 COATS OF ZINC RICH TOUCH UP PAINT.

REQUIRED INSPECTION AND TESTING

1. THE FOLLOWING INSPECTIONS AND TESTS SHALL BE COMPLETED. REPORTS BY THE INSPECTOR SHALL BE PROVIDED TO THE OWNER AND ENGINEER.
   a. DRIVEN STEEL WIDE FLANGE PILES
      a.1. DRIVEN STEEL PILE INSTALLATION TO BE DOCUMENTED ON INSTALLATION LOG AS DETAILED UNDER **PILE FOUNDATIONS** SECTION, ITEM 7.
      a.2. FIFTEEN RANDOMLY SELECTED POSTS THAT DON'T REQUIRE REMEDIAL ACTION WILL BE LOAD TESTED A MINIMUM OF THREE DAYS AFTER INSTALLATION. PROOF LOAD TESTS WILL BE PROVIDED TO THE ENGINEER FOR REVIEW. LOAD TESTING WILL CONSIST OF TENSION AND LATERAL TESTS ON EACH OF THE FIFTEEN PILES TO LOADS PROVIDED BELOW. TESTING SHALL BE COMPLETED:
         a.2.1. WITHIN THE FIRST TWO WEEKS OF INSTALLATION.
         a.2.2. WHEN INSTALLATION IS APPROXIMATELY 25% COMPLETE.
         a.2.3. WHEN INSTALLATION IS APPROXIMATELY 50% COMPLETE.
         a.2.4. WHEN INSTALLATION IS APPROXIMATELY 75% COMPLETE.
         a.2.5. AT END OF INSTALLATION.
      a.3. THE FREQUENCY OF TESTING FOR PILES THAT REQUIRE REMEDIAL ACTION IS PROVIDED IN THE REMEDIAL ACTION SECTION OF THIS DOCUMENT. PROOF LOAD TESTS WILL BE PROVIDED TO THE ENGINEER FOR REVIEW AND COMMENT TO DETERMINE IF ANY ACTION IS REQUIRED. LOAD TESTING WILL CONSIST OF TENSION AND LATERAL TESTS ON EACH OF THE REQUIRED PILES TO LOADS PROVIDED BELOW.
2. PROOF LOAD TESTING
   a. PROOF LOAD TESTING SHALL BE CONDUCTED IN CONFORMANCE WITH ASTM D3966 AND ASTM D3689, MODIFIED AS BE APPROPRIATE FOR PV, CAB, AND PCU PILES.
   b. PROOF LOAD TESTING SHALL BE PERFORMED AS REQUIRED IN THIS SECTION AND THE REMEDIAL ACTIONS SECTION. PROOF LOAD TESTS WILL BE PROVIDED TO ENGINEER OF RECORD FOR REVIEW.
   c. PROOF LOAD TESTING SHALL INCLUDE RECORDING DEFLECTIONS FOR LATERAL LOADS AND VERTICAL MOVEMENT FOR VERTICAL LOADS AT 25%, 50%, 75%, 100% AND 125% OF THE LOADS PROVIDED BELOW FOR EACH OF THE PILE TYPES. LATERAL DEFLECTIONS SHALL BE RECORDED 4 INCHES ABOVE THE BOTTOM OF THE PILE AND AT THE LOAD APPLICATION POINT.
   d. EQUIPMENT: LOAD CELL (DYNAMOMETER) RATED FOR A MINIMUM RANGE OF 5,000 LBS. CALIBRATION CERTIFICATE WITHIN 1 YEAR. MOVEMENTS IN A DIRECTION COLLINEAR TO THE LINE OF LOADING SHALL BE RECORDED BY DIAL GAUGES WITH A MINIMUM RESOLUTION OF 0.01 INCHES.
   e. PROCEDURE: PERFORMANCE TESTING SHALL BE CONDUCTED BY LOADING THE PILE FIRST LATERALLY AND THEN IN VERTICAL TENSION AS INDICATED BELOW. ONCE A LOAD INCREMENT HAS BEEN OBTAINED, THE LOAD SHALL BE HELD FOR THE MINIMUM OF ONE MINUTE OR LONG ENOUGH TO GET A STABLE READING, WHICHEVER IS LONGER.

   LATERAL LOAD TEST:
   a. APPLY HORIZONTAL LOAD AND RECORD DEFLECTION AT 4 INCHES BELOW TOP OF PILE.
   b. LOAD TO BE 1,300 LBS FOR EXTERIOR ARRAY PV PILES
   c. LOAD TO BE 1,000 LBS FOR INTERIOR ARRAY PV PILES
   d. LOAD TO BE 1,200 LBS FOR PCS PILES
   e. LOAD TO BE 1,800 LBS FOR CAB PILES
   f. ACCEPTANCE: MAX. DEFLECTION UNDER LOAD = 3.5 INCHES AT TOP OF PILE. MAX DEFLECTION AFTER UNLOADING 0.25 INCHES AT BOTTOM OF PILE.

   MAX 1" DEFLECTON AT 4" ABOVE GRADE

   PULLOUT (TENSION) LOAD TEST:
   a. APPLY VERTICAL PULLOUT LOAD AT TOP OF PILE AND RECORD ANY DISPLACEMENTS.
   b. LOAD TO BE 600 LBS FOR EXTERIOR ARRAY PV PILES
   c. LOAD TO BE 400 LBS FOR INTERIOR ARRAY PV PILES
   d. LOAD TO BE 0 LBS FOR PCS PILES
   e. LOAD TO BE 0 LBS FOR CAB PILES
   f. ACCEPTANCE: MAX. VERTICAL MOVEMENT UNDER LOAD = 1.0 INCHES.
3. CONCRETE TESTING (AUXILLARY RACK 4/S-5 AND FENCE)
   THE CONTRACTOR SHALL CONTACT THE ENGINEER'S REPRESENTATIVE FOR TESTING AT LEAST 48 HOURS BEFORE CONCRETE PLACEMENT. THE FOLLOWING TESTING SHALL BE PERFORMED:
   a. AIR ENTRAINMENT: FIRST TRUCK EACH DAY AND EVERY 50 CUBIC YARDS THEREAFTER.
   b. CONCRETE TEMPERATURE: FIRST TRUCK EACH DAY AND EVERY 50 CUBIC YARDS THEREAFTER.
   c. CONCRETE SLUMP: FIRST TRUCK EACH DAY AND EVERY 50 CUBIC YARDS THEREAFTER.
   d. COMPRESSIVE STRENGTH:
      1. ONE (1) SET OF FOUR (4) CONCRETE TEST CYLINDERS (4 OR 6 INCH DIAMETER) FOR EACH DAY OF CONCRETE PLACEMENT AND EVERY 50 CUBIC YARDS THEREAFTER.
      2. INDICATE CONCRETE PLACEMENT LOCATIONS THAT THE TEST CYLINDERS REPRESENT.
      3. TEST TWO CYLINDERS AT 7 DAYS AND TWO AT 28 DAYS FOR COMPRESSIVE STRENGTH PER ASTM C39.

REQUIRED REPORTS:

1. THE INSPECTOR SHALL FURNISH INSPECTION REPORTS TO THE ENGINEER.
2. DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR AND ENGINEER FOR CORRECTION.
3. A FINAL REPORT DOCUMENTING THE REQUIRED INSPECTIONS AND CORRECTION OF ANY DISCREPANCIES NOTED IN THE INSPECTIONS SHALL BE SUBMITTED AT A POINT IN TIME AGREED UPON BY THE PERMIT APPLICANT AND THE BUILDING OFFICIAL PRIOR TO THE START OF WORK.

REMEDIAL ACTIONS

1. PILES DRIVEN OUTSIDE OF LOCATION, TWIST OR PLUMBNESS TOLERANCE:
   a. WITHDRAW PILE AND REPLACE WITHIN TOLERANCE AS NOTED IN THE GENERAL NOTES "**PILE FOUNDATIONS**" SECTION 8.
   b. CONSULT ENGINEER, AS REQUIRED.

2. Over drilled piles that compacts the soil as hammering commences shall be tested in compression and tension for structural soundness according to 2c above. LATERAL DEFLECTIONS SHALL BE RECORDED 4" ABOVE THE BOTTOM OF THE PILE AND AT THE LOAD APPLICATION POINT. LATERAL LOAD TEST:. APPLY HORIZONTAL LOAD AND RECORD DEFLECTION AT 4INCHES BELOW TOP OF PILE.

3. Wide flange bearing piles may be replaced with an Ojjo Earth truss, up to one per tracker wing. No motor pile wide flange beams may be replaced with Ojjo Earth trusses.

4. All piles should attempt to achieve the design embedment. If there are occasional piles that achieve refusal with less embedment, the following criteria can be used to evaluate piles.

   Refusal is defined as no pile advancement with the pile driver operating at full power for at least 30 seconds.

   Bearing piles achieving refusal within 12 inches (1.0 feet) of design depth can be cut off up without additional testing. Bearing piles achieving refusal between 12 inches and 18 inches (1.5 feet) short of design depth can remain if the pile demonstrates acceptable performance with lateral testing. Testing shall be completed to 150% of the test load and with the procedure under "LATERAL LOAD TEST", under PROOF LOAD TESTING on Design Sheet S-001. No more than two bearing piles per tracker wing can be short of design depth and be cut off.

   Motor piles achieving refusal can have embedment shortened up to a maximum of 9 inches (0.75 feet).

   Piles cut off shall have all exposed surfaces coated with two coats of cold galvanization.

5. PILES MAY BE SPLICED WITH A FULL PENETRATION JOINT PROVIDED NOR MORE THAN 1 SPLICE PER PILE, A MINIMUM OF 2 FEET ABOVE GRADE

TABLE 1705.6 (IBC 2018)
REQUIRED VERIFICATION AND INSPECTION OF SOILS

VERIFICATION AND INSPECTION TASK	CONTINUOUSLY DURING TASK LISTED	PERIODICALLY DURING TASK LISTED
1. Verify excavations are extended to proper depth and have reached proper material.	---	X

TABLE 1705.7 (IBC 2018)
REQUIRED VERIFICATION AND INSPECTION OF DRIVEN DEEP FOUNDATION ELEMENTS

VERIFICATION AND INSPECTION TASK	CONTINUOUSLY DURING TASK LISTED	PERIODICALLY DURING TASK LISTED
1. Verify element materials, galvanization, sizes and lengths comply with the requirements.	---	X
2. Observe driving operations and maintain complete and accurate records for each element.	---	X
3. Verify placement locations and plumbness, and document any damage to foundation element.	---	X
4. For steel elements, perform additional inspections in accordance with Section 1705.2.	---	---
5. Preinstallation verification of DTI's and skid pile caps per notes on Dwg. S-0004.	X	---
6. Fit up prior to pretension of skid pile caps per note 8 on Dwg. S-0004.	---	X

(1) PILE INSTALLATION CONTRACTOR TO MAINTAIN LOG IN CONFORMANCE WITH PILE FOUNDATIONS SECTION, ITEM 7.

ABBREVIATIONS

&	AND
@	AT
℄	CENTER LINE
ℙ	PLATE, PROPERTY LINE
APPROX	APPROXIMATE
CLR	CLEAR
DIA	DIAMETER
DIM	DIMENSION
DL	DEAD LOAD
ENGINEER	ENGINEER OF RECORD
EOR	ENGINEER OF RECORD
EQUIP	EQUIPMENT
EXT	EXTERIOR
FDN	FOUNDATION
FIN	FINISH
FT	FEET / FOOT
FTG	FOOTING
GA	GAUGE
GALV	GALVANIZED
GRD	GRADE
HDG	HOT DIPPED GALVANIZED
HORIZ	HORIZONTAL
HT	HEIGHT
IN	INCH
INT	INTERIOR
KIPS	KILOPOUNDS (1,000 POUNDS)
LB	POUND
LL	LIVE LOAD
MAT	MATERIAL
MAX	MAXIMUM
MIN	MINIMUM
MANUF	MANUFACTURER
NOM	NOMINAL
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
PL OR (ℙ)	PLATE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCHES
RAD	RADIUS
REQD	REQUIRED
REV	REVISION
SCHED	SCHEDULE
SECT	SECTION
SF	SQUARE FOOT
SPEC	SPECIFICATION
SQ	SQUARE
SS	SHEET STEEL
STL	STEEL
STRUCT	STRUCTURAL
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
VERT OR (V)	VERTICAL
V.I.F	VERIFY IN FIELD
W/	WITH
W/O	WITHOUT
WT	WEIGHT

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REVISIONS

REV	DESCRIPTION	DSN / DWN	CHK / APP	DATE
0	CONSTRUCTION PLANS	JAC / AD	ADT / ADT	10/16/2020
1	RECORD DRAWINGS		ADT	6/14/2023

8minute SOLAR ENERGY

ORIGINAL DRAWING SIZE IS 24 x 36

EAGLE SHADOW MOUNTAIN SOLAR

MOAPA RIVER INDIAN RESERVATION
CLARK COUNTY, NEVADA

PSC Primoris

PRIMORIS RENEWABLE ENERGY
4880 HAVANA STREET, SUITE 500
DENVER, COLORADO 80239

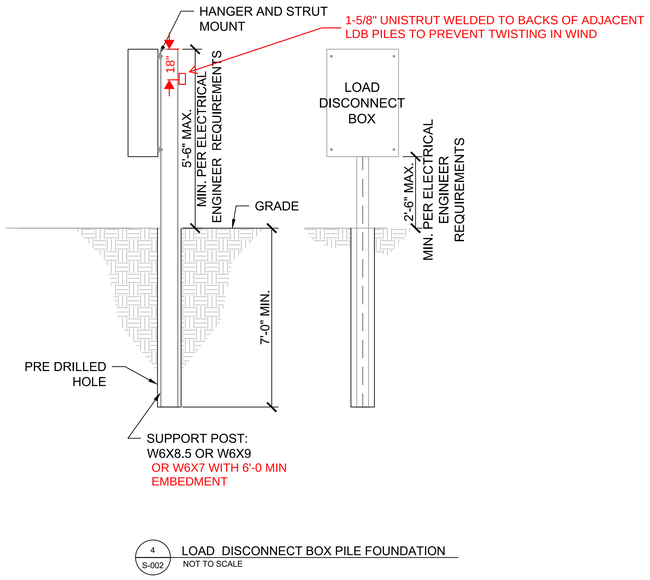
CS BLOCK 203 & TRINA
GENERAL NOTES

PROJECT NO.	20203753.003A
ISSUE DATE	6/14/2023
CURRENT REVISION	1
DESIGNED BY	AD/JAC
DRAWN BY	AD/JAC
CHECKED BY	ADT
APPROVED BY	ADT

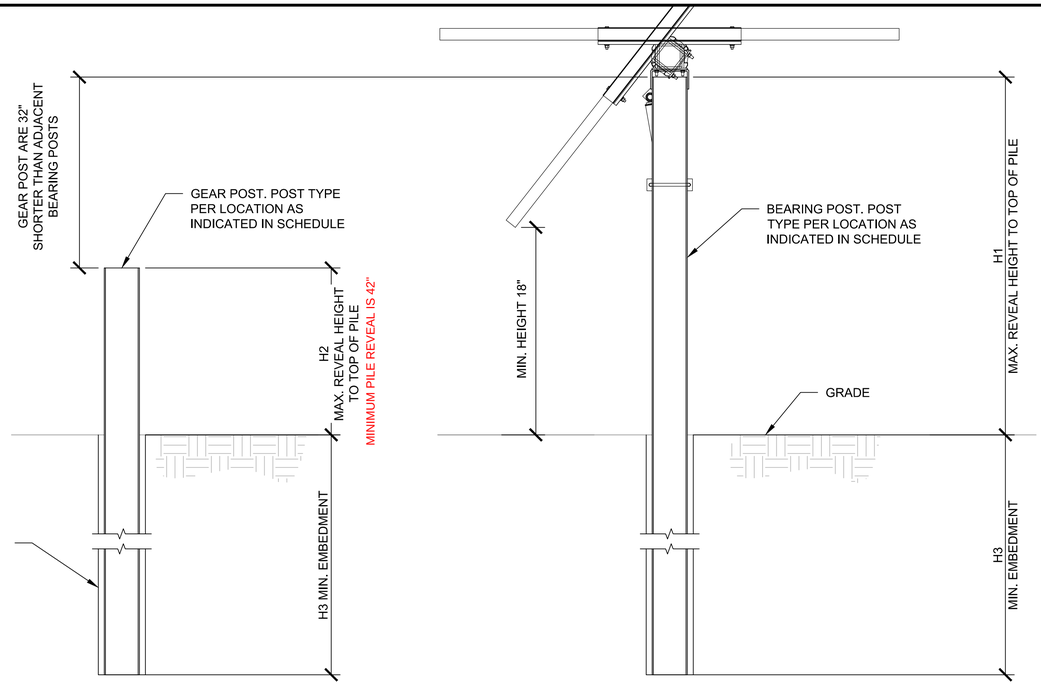
S-001

SHEET 2 of 8

CAD FILE: \\denver.kleinfelder.com\DENVER-DATA\WORKING\20203753.002 - Eagle Shadow Mountain Design\2.0 Technical Information\2.8 Technical And CADD Figures\20203753 Eagle Shadow Mountain_20201016.dwg LAYOUT: GEN NOTES CS_FND PLOTTED: 10/16/2020 5:41 PM BY: adam.tschida



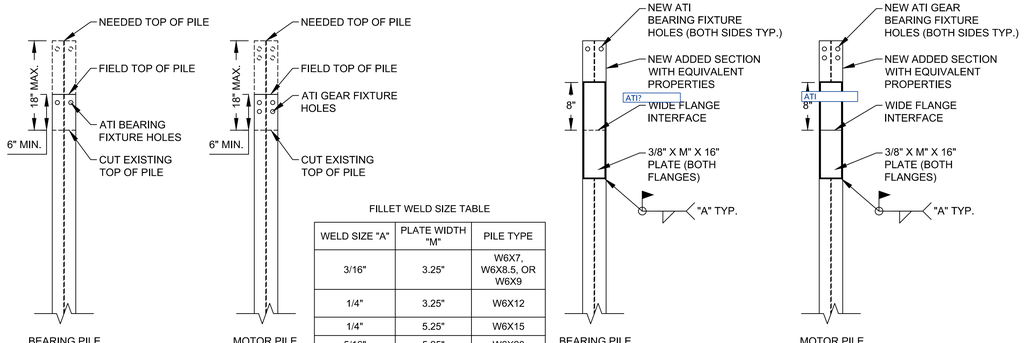
4 S-002 LOAD DISCONNECT BOX PILE FOUNDATION
NOT TO SCALE



2 S-002 GEAR PILE
NOT TO SCALE

1 S-002 BEARING PILE
NOT TO SCALE

There should be no structural conflicts with using Ojjo Earth trusses to selectively replace piles in tracker rows. At this time we only suggest replacement of bearing piles, we do not recommend using an Ojjo truss to replace the motor pile. Additionally, we do not recommend replacement of more than 1 pile per wing of tracker. Adam D. Tschida, P.E.*



FILLET WELD SIZE TABLE

WELD SIZE "A"	PLATE WIDTH "M"	PILE TYPE
3/16"	3.25"	W6X7, W6X8.5, OR W6X9
1/4"	3.25"	W6X12
1/4"	5.25"	W6X15
5/16"	5.25"	W6X20

PILES MAY BE SPLICED WITH A FULL PENETRATION JOINT PROVIDED NOT MORE THAN 1 SPLICE PER PILE, A MINIMUM OF 2 FEET ABOVE GRADE

3 S-002 MITIGATION FOR OVERDRIVEN TO SHORT OR DAMAGED PILE
NOT TO SCALE

TRINA MODULE AND CANADIAN SOLAR MODULE FOR BLOCK 203 ONLY - ATI DURATRACK HZ WITH WIDE FLANGE FOUNDATIONS

FOUNDATION LOCATION	PILE TYPE	BEARING PILE MAX. ABOVE GRADE, INSTALLED PILE REVEAL (H1)	MOTOR PILE MAX. ABOVE GRADE, INSTALLED PILE REVEAL (H2)	MAX. CONSIDERED SCOUR DEPTH	MIN. INSTALLED EMBEDMENT (H3)	PREDRILL DEPTH
EXTERIOR	W6X7	5'-3"	2'-7"	0'-6"	6'-0"	6'-0"
		4'-9"	2'-1"	1'-0"	6'-6"	6'-6"
		4'-3"	1'-7"	1'-6"	7'-0"	7'-0"
	W6X8.5	6'-0"	3'-4"	0'-6"	6'-3"	6'-3"
		5'-6"	2'-10"	1'-0"	6'-9"	6'-9"
		5'-0"	2'-4"	1'-6"	7'-6"	7'-6"
	W6X9	6'-6"	3'-10"	0'-6"	6'-6"	6'-6"
		6'-0"	3'-4"	1'-0"	7'-0"	7'-0"
		5'-6"	2'-10"	1'-6"	7'-6"	7'-6"
	W6X12	8'-0"	5'-4"	0'-6"	6'-9"	6'-9"
		7'-5"	4'-9"	1'-0"	7'-6"	7'-6"
		7'-0"	4'-4"	1'-6"	8'-0"	8'-0"
INTERIOR	W6X7	6'-0"	3'-4"	0'-6"	6'-0"	6'-0"
		5'-6"	2'-10"	1'-0"	6'-6"	6'-6"
		5'-0"	2'-4"	1'-6"	7'-0"	7'-0"
	W6X8.5	7'-0"	4'-4"	0'-6"	6'-0"	6'-0"
		6'-6"	3'-10"	1'-0"	6'-9"	6'-9"
		6'-0"	3'-4"	1'-6"	7'-3"	7'-3"
	W6X9	7'-6"	4'-10"	0'-6"	6'-3"	6'-3"
		7'-0"	4'-4"	1'-0"	6'-9"	6'-9"
		6'-6"	3'-10"	1'-6"	7'-3"	7'-3"

NOTE: CONFIRM WITH CURRENT ATI REQUIREMENTS. SET SCREWS REQUIRED TO TRANSFER WEAK AXIS LOAD ON ALL BEARING COLUMNS.

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0	CONSTRUCTION PLANS	JAC	ADT	10/16/2020
		AD	ADT	
1	RECORD DRAWINGS			6/14/2023
			ADT	

MINUTE SOLAR ENERGY

ORIGINAL DRAWING SIZE IS 24 x 36

EAGLE SHADOW MOUNTAIN SOLAR

MOAPA RIVER INDIAN RESERVATION
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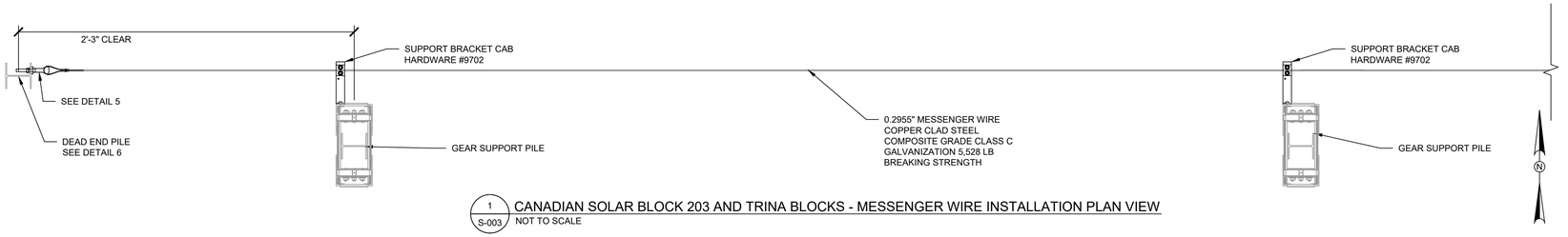
WIDE FLANGE TRACKER AND LOAD DISCONNECT FOUNDATION

PROJECT NO.	20203753.003A
ISSUE DATE	6/14/2023
CURRENT REVISION	1
DESIGNED BY	AD/JAC
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CHECKED BY	ADT
APPROVED BY	ADT

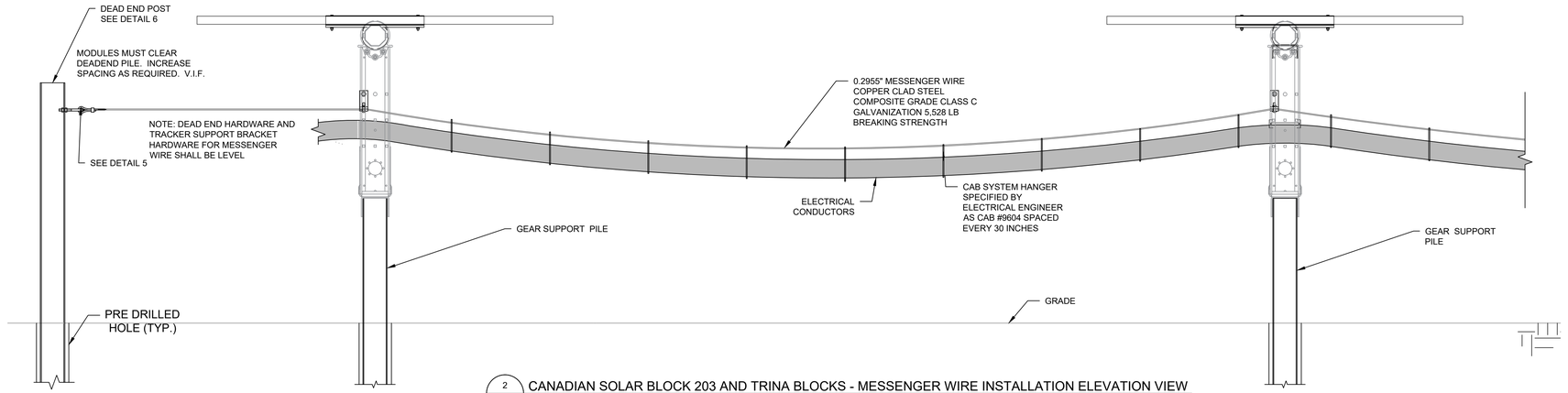
S-002

SHEET 3 of 8

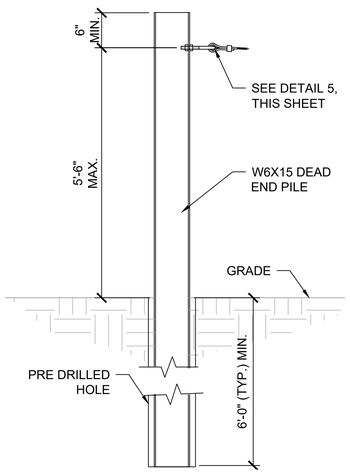
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1 S-003 CANADIAN SOLAR BLOCK 203 AND TRINA BLOCKS - MESSENGER WIRE INSTALLATION PLAN VIEW
NOT TO SCALE



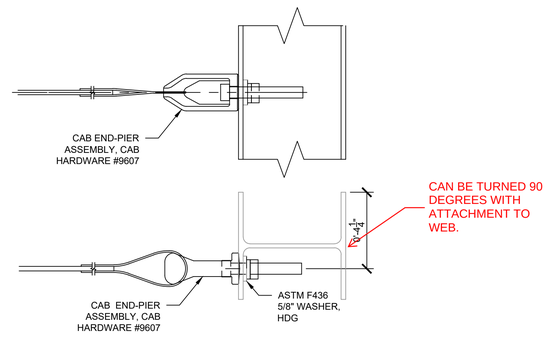
2 S-003 CANADIAN SOLAR BLOCK 203 AND TRINA BLOCKS - MESSENGER WIRE INSTALLATION ELEVATION VIEW
NOT TO SCALE



6 S-003 CAB DEAD END PILE DETAIL
NOT TO SCALE

LBDS INTERFERRING WITH CAB MAY HAVE HANGER ADDED TO THEM TO RUN CAB AROUND

DEAD ENDS MAY BE AT ENDS OF BLOCK, SHORTENING MESSENGER WIRE SPAN.



5 S-003 DEAD END PILE CONNECTION DETAIL
NOT TO SCALE

MESSENGER CABLE INSTALLATION SEQUENCE:

1. SECURE MESSENGER WIRE TO ONE DEAD END FOUNDATION (DETAIL 5).
2. LAY MESSENGER WIRE THROUGH ALL MID-SPAN BRACKETS. DO **NOT** SECURE. TENSION THE MESSENGER WIRE AND ATTACH TO SECOND DEAD END PER THE INSTALLATION SAG IN TABLE 1 AT MIDSPAN BETWEEN L-BRACKETS.
3. TIGHTEN THE RETAINER PLATES OF THE MID-SPAN BRACKETS.
4. STRING ON THE CAB HANGERS ALONG ALL SPANS. STRING ALL CONDUCTORS THROUGH THE CAB HANGERS AND RECHECK THE SAG AT ALL MIDSPANS. FINAL SAG SHOULD BE ESTIMATED PER TABLE 2.
5. DEAD LOAD SPECIFIED BY ELECTRICAL ENGINEER AS 4.7 PLF.

TABLE 1: MESSENGER WIRE STRINGING SAG CHART

		TEMPERATURE (°F)											
SAG (INCHES)	ROW-TO-ROW SPAN	10	20	30	40	50	60	70	80	90	100	110	120
	20'-0" TO 25'-0" (CCS)	1.68	2.16	2.64	3.00	3.36	3.72	4.08	4.32	4.68	4.92	5.16	5.40
	20'-0" TO 25'-0" (EHS)	2.16	2.52	2.88	3.24	3.48	3.72	4.08	4.32	4.56	4.80	5.04	5.16

NOTE: MID-SPAN SAG OF THE MESSENGER WIRE LISTED ABOVE OCCURS BEFORE ANY ELECTRICAL CABLES OR SUPPORTS ARE HUNG FROM THE MESSENGER CABLE (I.E. ONLY THE BARE EHS MESSENGER WIRE).

TABLE 2: MESSENGER WIRE MAXIMUM FINAL SAG CHART

		TEMPERATURE (°F)				
SAG (INCHES)	ROW-TO-ROW SPAN	0	30	60	90	120
	20'-0" TO 25'-0" (CCS)	7.30	7.70	8.00	8.40	8.80
	20'-0" TO 25'-0" (EHS)	7.40	7.70	8.00	8.30	8.60

NOTE: MAXIMUM SAG VALUES SHOWN ABOVE INCLUDE THE INITIAL SAG PLUS THE SAG DUE TO MAXIMUM VERTICAL FACTORED LOAD CONDITION OF 4.7 LB/FT FOR MESSENGER WIRE.

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8minute SOLAR ENERGY

ORIGINAL DRAWING SIZE IS 24 x 36

EAGLE SHADOW MOUNTAIN SOLAR

MOAPA RIVER INDIAN RESERVATION
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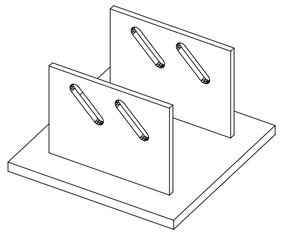
CAB DETAILS & FOUNDATION

PROJECT NO.	20203753.003A
ISSUE DATE	6/14/2023
CURRENT REVISION	1
DESIGNED BY	AD/JAC
DRAWN BY	AD/JAC
CHECKED BY	ADT
APPROVED BY	ADT

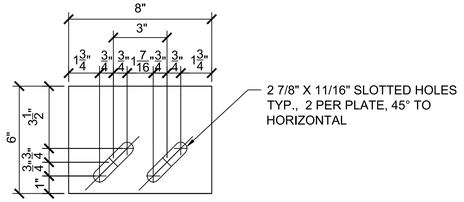
S-003

SHEET 4 of 8

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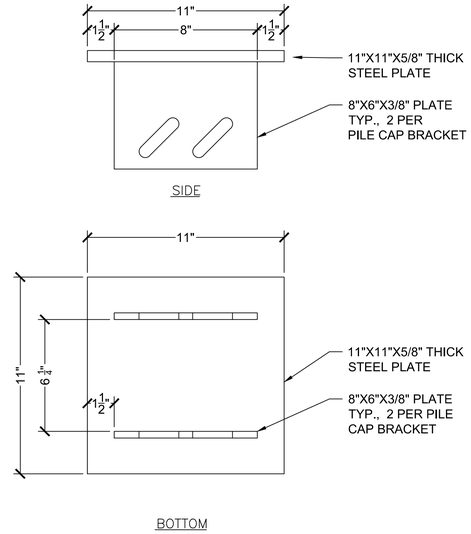


ORTHOGRAPHIC PILE CAP BRACKET



SIDE

4 S-004 PILE CAP CONNECTION PLATE
NOT TO SCALE

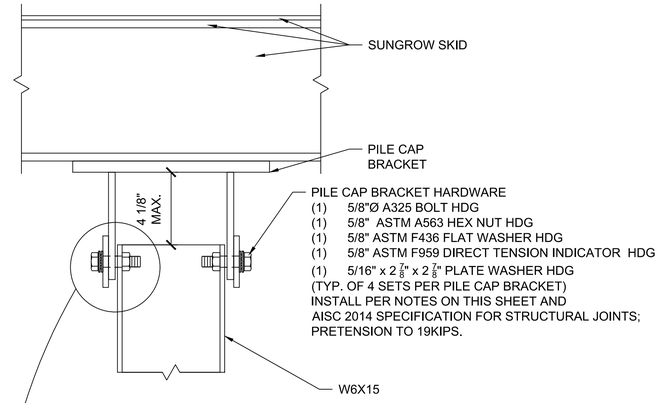


SIDE

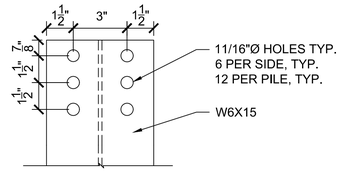
BOTTOM

CROSS-SECTION

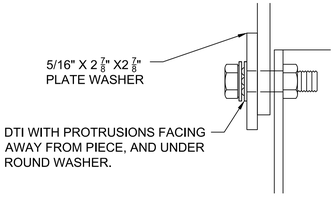
3 S-004 PILE CAP PLATE ASSEMBLY
NOT TO SCALE



1 S-004 PILE CAP BRACKET ASSEMBLY SIDE VIEW
NOT TO SCALE



2 S-004 TOP OF PILE HOLE PATTERN
NOT TO SCALE



SLIP CRITICAL CONNECTION CLASS A

PILE CAP BRACKET AND FOUNDATION NOTES:

1. BOLTS TO MEET ASTM F3125, GRADE A325, WITH MATCHING NUT.
2. ALL HARDWARE TO BE HOT DIP GALVANIZED.
3. STEEL PLATES TO BE HOT DIP GALVANIZED PER ASTM A123.
4. PILES TO BE COATED PER GENERAL NOTE: FOUNDATION, ITEM 3d.
5. BOLTS TO BE INSTALLED PER SPECIAL INSPECTION TABLE, DWG. S-001.

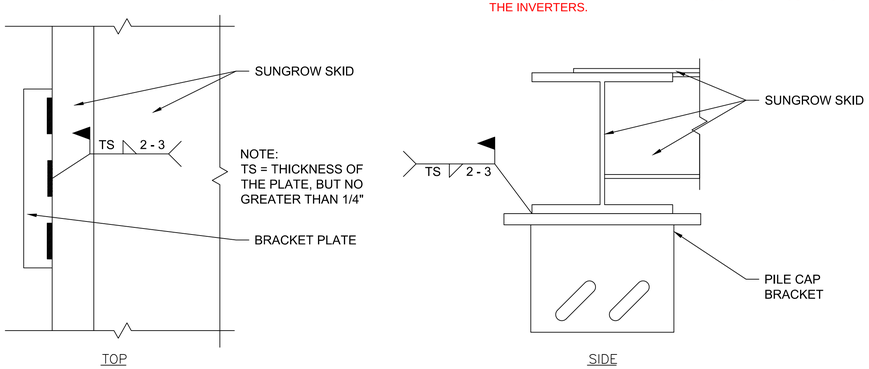
INSTALLATION OF PILE CAP:

1. DETAILED INSTALLATION INSTRUCTIONS SHALL BE PREPARED BY THE DIRECT TENSION INDICATOR (DTI) MANUFACTURER AND SUBMITTED TO THE ENGINEER OF RECORD WHICH SHALL PROVIDE FOR:
   A) THE REQUIRED CHARACTER AND FREQUENCY OF PREINSTALLATION VERIFICATION;
   B) THE ALIGNMENT OF BOLT HOLES TO PERMIT INSERTION OF THE BOLT WITHOUT UNDUE DAMAGE TO THE THREADS;
   C) THE PLACEMENT OF FASTENER ASSEMBLIES IN ALL TYPES AND SIZES OF HOLES, INCLUDING PLACEMENT AND ORIENTATION OF THE WASHERS;
   D) THE SYSTEMATIC ASSEMBLY OF THE JOINT, PROGRESSING FROM THE MOST RIGID PART OF THE JOINT UNTIL THE CONNECTED PLIES ARE IN FIRM CONTACT;
   E) THE SUBSEQUENT SYSTEMATIC PRETENSIONING OF ALL BOLTS IN THE JOINT PROGRESSING FROM THE MOST RIGID PART OF THE JOINT IN A MANNER THAT WILL MINIMIZE RELAXATION OF PREVIOUSLY PRETENSIONED BOLTS;
   F) OBSERVATION OF THE REQUIRED PRE-INSTALLATION VERIFICATION TESTING;
   G) SUBSEQUENT ROUTINE OBSERVATION TO ENSURE THE PROPER USE OF THE DTI.

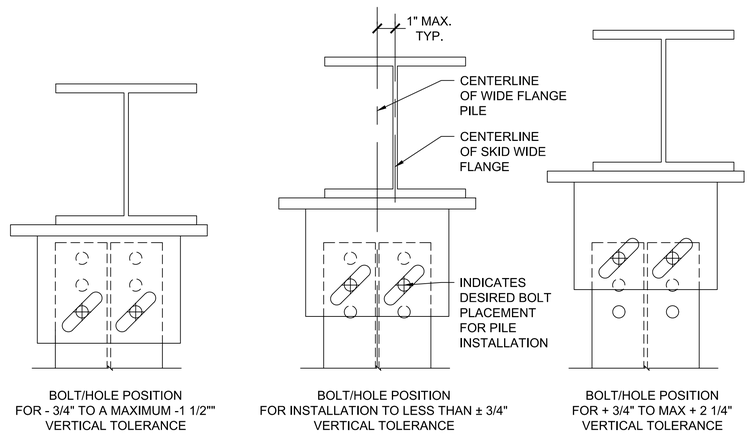
INSTALLATION OF PILE CAP (CONT.):

2. PRE-INSTALLATION VERIFICATION SHALL BE PERFORMED WITH INSPECTOR PRESENT ON NOT FEWER THAN THREE COMPLETE FASTENER ASSEMBLIES OF EACH COMBINATION OF DIAMETER, LENGTH, GRADE AND **LOT** TO BE USED IN THE WORK TO VERIFY THAT THE MINIMUM PRETENSION OF 20K (FOR 5/8" BOLTS) CAN BE DEVELOPED.
3. UPON SATISFACTORY PREINSTALLATION TESTING, PRODUCTION PILES OF THE SAME LOT MAY BE INSTALLED WITH A PRETENSION OF 19K. THIS IS TO BE PERFORMED BY HOLDING THE NUT STEADY AND TIGHTENING THE BOLT.
4. ALL FAYING SURFACES MUST BE PREPARED BY BRUSHING WITH A WIRE BRUSH OR BY GRIT BLASTING.
5. ALL 4 BOLTS MUST BE INSTALLED WITH WASHERS & DTI'S AS SHOWN.
6. *COMPACT* THE JOINT BY STARTING WITH THE STIFFEST BOLT SET, TIGHTEN UNTIL ALL PLIES ARE IN FIRM CONTACT, AND THEN PROCEEDING TO THE NEXT STIFFEST BOLT SET, UNTIL ALL ARE IN FIRM CONTACT. THIS IS TO BE PERFORMED BY HOLDING THE NUT STEADY AND TIGHTENING THE BOLT.
7. COMMENCE PRETENSIONING TO 19K. THE GAP SHALL NOT BE LESS THAN THE JOB INSPECTION GAP IN ACCORDANCE WITH ASTM F959 AND THE MANUFACTURER INSTRUCTIONS, OR THE DTI SHALL BE REMOVED AND REPLACED.
8. THE INSPECTOR SHALL OBSERVE THE PREINSTALLATION VERIFICATION TESTING REQUIRED. SUBSEQUENTLY, BUT PRIOR TO PRETENSIONING, IT SHALL BE ENSURED BY ROUTINE OBSERVATION THAT THE APPROPRIATE FEELER GAGE IS ACCEPTED IN AT LEAST HALF OF THE SPACES BETWEEN THE PROTRUSIONS OF THE DTI AND THAT THE PROTRUSIONS ARE PROPERLY ORIENTED AWAY FROM THE WORK. IF THE APPROPRIATE FEELER GAGE IS ACCEPTED IN FEWER THAN HALF THE SPACES, THE DTI SHALL BE REMOVED AND REPLACED. AFTER PRETENSIONING, IT SHALL BE ENSURED BY ROUTINE OBSERVATION THAT THE APPROPRIATE FEELER GAGE IS REFUSED ENTRY INTO AT LEAST HALF OF THE SPACES BETWEEN PROTRUSIONS. NO FURTHER EVIDENCE OF CONFORMITY IS REQUIRED.

9. 1/16X5.5X5.5 GALVANIZED FLAT STOCK MAY BE USED TO LEVEL THE INVERTERS.



5 S-004 SKID WELD TO BRACKET DETAIL
NOT TO SCALE



BOLT/HOLE POSITION FOR - 3/4" TO A MAXIMUM -1 1/2"" VERTICAL TOLERANCE

BOLT/HOLE POSITION FOR INSTALLATION TO LESS THAN ± 3/4" VERTICAL TOLERANCE

BOLT/HOLE POSITION FOR + 3/4" TO MAX + 2 1/4" VERTICAL TOLERANCE

7 S-004 BOLT/HOLE POSITION FOR INSTALLED PILE TOLERANCE
NOT TO SCALE

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REVISIONS

REV	DESCRIPTION	DSN / DWN	CHK / APP	DATE
0	CONSTRUCTION PLANS	JAC / AD	ADT / ADT	10/16/2020
1	RECORD DRAWINGS	/	/ ADT	6/14/2023

ORIGINAL DRAWING SIZE IS 24 x 36

EAGLE SHADOW MOUNTAIN SOLAR

MOAPA RIVER INDIAN RESERVATION
CLARK COUNTY, NEVADA

PRIMORIS RENEWABLE ENERGY
4880 HAVANA STREET, SUITE 500
DENVER, COLORADO 80239

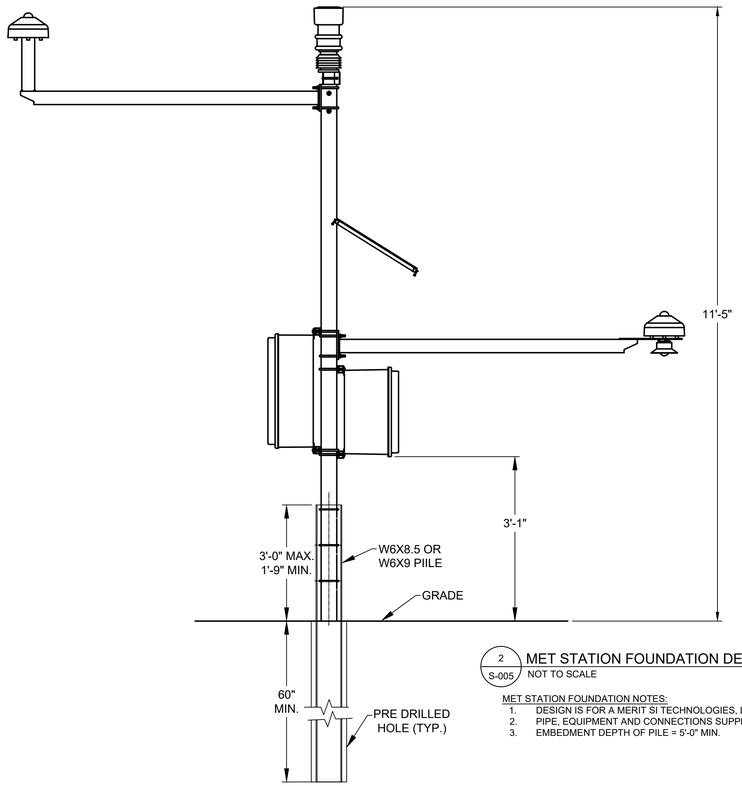
PCS & PILE CAP CONNECTION

PROJECT NO.	20203753.003A
ISSUE DATE	6/14/2023
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DESIGNED BY	AD/JAC
DRAWN BY	AD/JAC
CHECKED BY	ADT
APPROVED BY	ADT

S-004

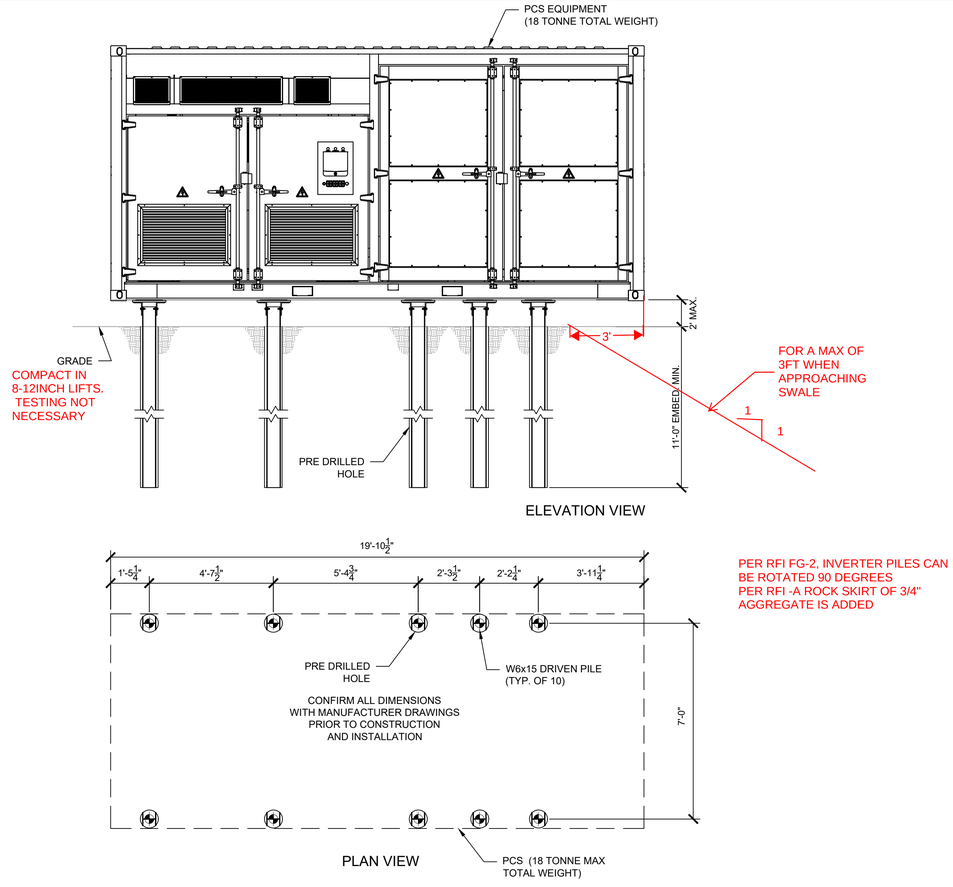
SHEET 5 of 8

CAD FILE: \\denver.kleinfelder.com\DENVER-DATA\WORKING\20203753.002 - Eagle Shadow Mountain Design\2.0 Technical Information\2.8 Technical And CADD Figures\20203753 Eagle Shadow Mountain_ 20201016.dwg LAYOUT: SKID CONN PLOTTED: 10/16/2020 5:43 PM BY: adam.tschida



2 S-005 MET STATION FOUNDATION DETAIL - WEST ELEVATION VIEW
NOT TO SCALE

MET STATION FOUNDATION NOTES:
1. DESIGN IS FOR A MERIT SI TECHNOLOGIES, LLC, METEOROLOGICAL STATION ASSEMBLY.
2. PIPE, EQUIPMENT AND CONNECTIONS SUPPLIED BY MANUFACTURER
3. EMBEDMENT DEPTH OF PILE = 5'-0" MIN.

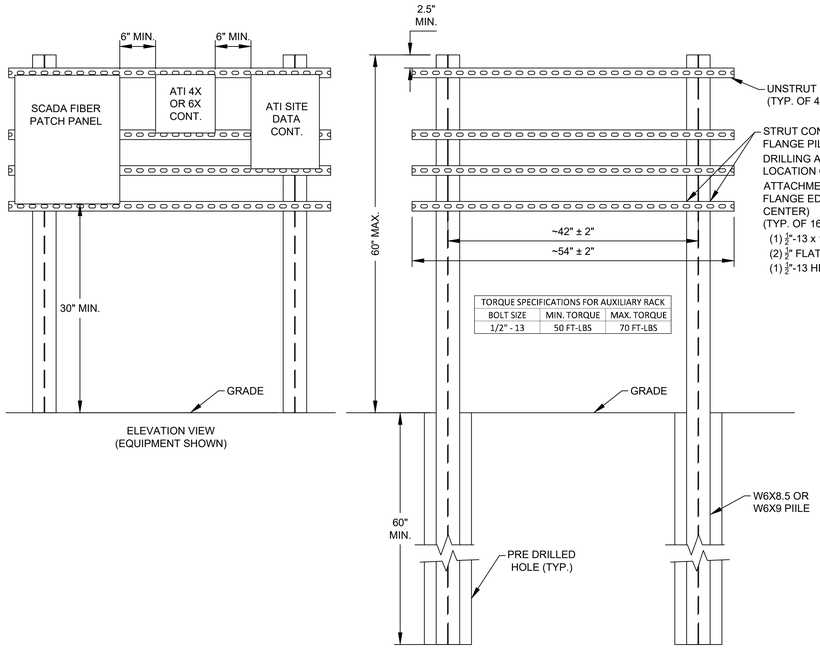


ELEVATION VIEW

PLAN VIEW

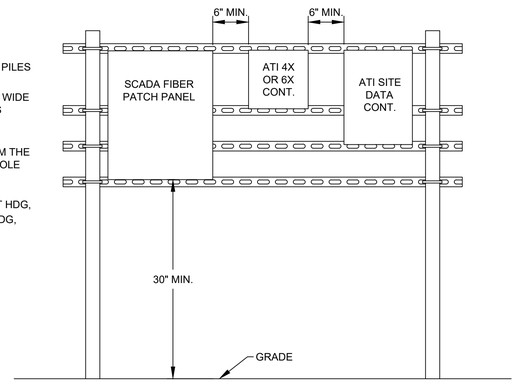
PER RFI FG-2, INVERTER PILES CAN BE ROTATED 90 DEGREES
PER RFI -A ROCK SKIRT OF 3/4" AGGREGATE IS ADDED

1 S-005 SUNGROW SG3150V-MV PCS FOUNDATION
NOT TO SCALE

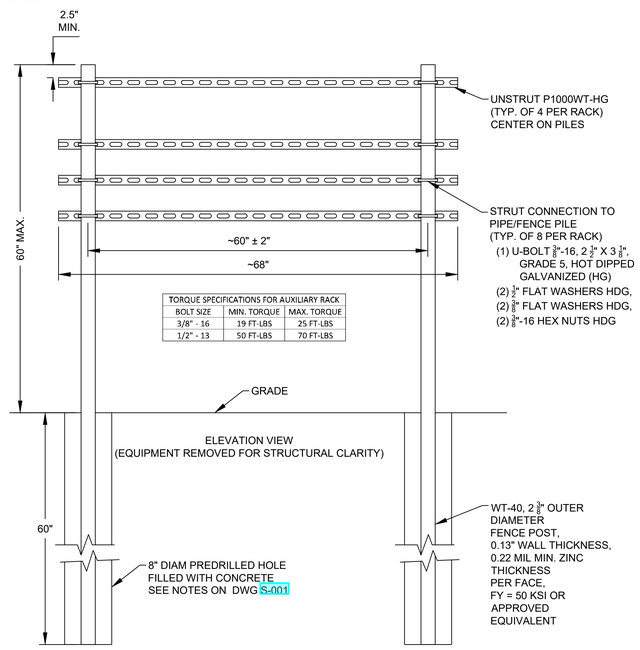


ELEVATION VIEW
(EQUIPMENT SHOWN)

3 S-005 AUXILIARY RACK - WIDE FLANGE PILE OPTION
NOT TO SCALE



NOTE: REFER TO EQUIPMENT SPECIFICATION AND INSTALLATION GUIDES FOR ADDITIONAL MOUNTING EQUIPMENT NOT SHOWN.



ELEVATION VIEW
(EQUIPMENT REMOVED FOR STRUCTURAL CLARITY)

4 S-005 AUXILIARY RACK - PIPE COLUMN OPTION
NOT TO SCALE

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8MINUTE SOLAR ENERGY

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EAGLE SHADOW MOUNTAIN SOLAR

MOAPA RIVER INDIAN RESERVATION
CLARK COUNTY, NEVADA

PSC Primoris

PRIMORIS RENEWABLE ENERGY
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DENVER, COLORADO 80239

PCS AND MET FOUNDATION, & AUXILIARY RACK

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APPROVED BY	ADT

S-005

SHEET 6 of 8

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ADDITIONAL GENERAL STRUCTURAL NOTES FOR OJJO FOUNDATIONS

1. THE NOTES ON THIS SHEET APPLY TO THE CANADIAN SOLAR (LESS BLOCK 203) AND JINKO ARRAY OJJO EARTH TRUSS FOUNDATIONS AND THE OJJO DEADEND FOR THE MESSENGER WIRE (CAB) SYSTEM. IF THERE ARE QUESTIONS, THEY SHALL BE SUBMITTED TO THE OWNER'S REPRESENTATIVE AND ANSWERED IN WRITING PRIOR TO CONSTRUCTION.

OJJO EARTH TRUSS FOUNDATIONS

1. ACCURATELY LOCATE AND INSTALL EARTH TRUSS SUPPORTS. EARTH TRUSS FOUNDATIONS SHALL BE INSTALLED PER THE "OJJO EARTH TRUSS FOUNDATION SYSTEM WITH ATI DURATRACK HZ V3, INSTALLATION MANUAL, V 2020.2, SEPTEMBER 2020.
2. DO NOT BEGIN EARTH TRUSS INSTALLATION UNTIL THE EARTHWORK IN THE AREA WHERE EARTH TRUSSES ARE TO BE INSTALLED HAS BEEN COMPLETED.
3. MATERIALS
   a. SIZE PER OJJO SPECIFICATIONS
   b. MINIMUM YIELD STRENGTH OF 50 ksi, MINIMUM ULTIMATE STRENGTH OF 62 ksi (OJJO EARTH TRUSS)
   c. GALVANIZE PER ASTM A123, MINIMUM 2.5 MIL GALVANIZATION THICKNESS
4. TOLERANCES:
   a. TOP OF TRUSS CAP E-W POSITION: ± 1/2"
   b. TOP OF TRUSS CAP N-S POSITION: ± 3/8"
   b. TRUSS CAP VERTICAL: ± 1/2"
   c. TRUSS CAP TWIST: ± 3.0°
   d. TRUSS CAP PLUMB E-W: ± 3.0°
   e. TRUSS CAP PERPENDICULAR TO TORQUE TUBE N-S: ± 3.0°
5. EACH PART OF THE EARTH TRUSS TO BE FREE FROM DEFECTS AND DAMAGE DUE TO CONSTRUCTION, FABRICATION, DELIVERY, INSTALLATION OR OTHER CAUSES.
   a. REPLACE DAMAGED EARTH TRUSS. DAMAGE INCLUDES BUT NOT NECESSARILY LIMITED TO BENT, BUCKLED, AND CRACKED PARTS. IMPERFECTION OR DAMAGE TO CORROSION PROTECTIVE COATING, OR WITH ANY OTHER DEFECT AS DETERMINED BY ENGINEER. REPAIRS TO BE COMPLETED PER THE "OJJO EARTH TRUSS CORRECTION MATRIX" AND "OJJO TESTING AND INSPECTION PROCEDURES, QA-2020".
   b. CORRECT ANY FOUNDATION OR OTHER CONSTRUCTION THAT HAS BEEN DAMAGED BY FOUNDATION INSTALLATION.
6. FOUNDATION INSTALLATION LOGS SHALL BE MAINTAINED CONSTANTLY DURING INSTALLATION. THAT INCLUDES INSTALLATION DATE, ANCHOR, INSTALLATION TIMES, TRUSS CAP HEIGHT, HYDRAULIC PRESSURE, ETC.

STRUCTURAL STEEL

1. MATERIAL STANDARDS: (UNLESS NOTED OTHERWISE)
   a. SIZE PER OJJO SPECIFICATIONS
   b. MINIMUM YIELD STRENGTH OF 50 KSI, MINIMUM ULTIMATE STRENGTH OF 62 KSI (OJJO EARTH TRUSS)
   c. GALVANIZE, MINIMUM 2.5 MIL GALVANIZATION THICKNESS
2. TOUCH-UP PAINT: ZINC RICH, CONTAINING A MINIMUM 93% METALLIC ZINC CONTENT.

REQUIRED INSPECTION AND TESTING

1. THE FOLLOWING INSPECTIONS AND TESTS SHALL BE COMPLETED. REPORTS BY THE INSPECTOR SHALL BE PROVIDED TO THE OWNER AND ENGINEER.
   a. OJJO EARTH TRUSS FOUNDATION
      a.1. OJJO EARTH TRUSS FOUNDATION INSTALLATION TO BE DOCUMENTED ON INSTALLATION LOG AS DETAILED UNDER **OJJO EARTH TRUSS FOUNDATIONS** SECTION, ITEM 6 AND "OJJO TESTING AND INSPECTION PROCEDURES, QA-2020".
2. PROOF LOAD TESTING
   a. PROOF LOAD TESTING SHALL BE CONDUCTED IN CONFORMANCE WITH ASTM D3966 AND ASTM D3689, MODIFIED AS BE APPROPRIATE FOR OJJO EARTH TRUSS FOUNDATIONS.
   b. PROOF LOAD TESTING SHALL BE PERFORMED AS REQUIRED IN THIS SECTION AND THE REMEDIAL ACTIONS SECTION. PROOF LOAD TESTS WILL BE PROVIDED TO ENGINEER OF RECORD FOR REVIEW.
   c. PROOF LOAD TESTING SHALL INCLUDE RECORDING DEFLECTIONS FOR LATERAL LOADS AND VERTICAL MOVEMENT FOR VERTICAL LOADS AT 25%, 50%, 75%, 100% AND 125% OF THE LOADS PROVIDED BELOW FOR EACH OF THE FOUNDATION TYPES. LATERAL DEFLECTIONS SHALL BE RECORDED PER "OJJO TESTING AND INSPECTION PROCEDURES, QA-2020".
   d. EQUIPMENT: LOAD CELL (DYNAMOMETER) RATED FOR A MINIMUM RANGE OF 5,000 LBS. CALIBRATION CERTIFICATE WITHIN 1 YEAR. MOVEMENTS IN A DIRECTION COLLINEAR TO THE LINE OF LOADING SHALL BE RECORDED BY DIAL GAUGES WITH A MINIMUM RESOLUTION OF 0.01 INCHES.
   e. PROCEDURE: PERFORMANCE TESTING SHALL BE CONDUCTED BY LOADING THE EARTH TRUSS FIRST LATERALLY AND THEN IN VERTICAL TENSION AS INDICATED BELOW AND PER THE "OJJO TESTING AND INSPECTION PROCEDURES, QA-2020". ONCE A LOAD INCREMENT HAS BEEN OBTAINED, THE LOAD SHALL BE HELD FOR THE MINIMUM OF ONE MINUTE OR LONG ENOUGH TO GET A STABLE READING, WHICHEVER IS LONGER.
3. LATERAL LOAD TEST
   a. PRODUCTION PIERS SHALL BE RANDOMLY SELECTED AND TESTED FOR LATERAL CAPACITY TESTING UNDER DIRECTION OF RESPONSIBLE ENGINEER. APPLICATION OF LOAD AND RECORDED READINGS SHALL BE PER "OJJO TESTING AND INSPECTION PROCEDURES, QA-2020".
   b. LATERAL TESTS SHALL BE PERFORMED IN ACCORDANCE WITH ASTM D3966, AS MODIFIED HERE:
      b.1. TEST PIERS SHALL BE LOADED TO 100% OF THE DESIGN LOAD AND UNLOADED AT 0%, IN 25% INCREMENTS. LOAD INCREMENTS SHALL BE AS FOLLOWS:
         b.1.1. LOAD TO BE 1,400 LBS FOR EXTERIOR ARRAY PV EARTH TRUSS
         b.1.2. LOAD TO BE 1,200 LBS FOR INTERIOR ARRAY PV EARTH TRUSS
      b.2. EACH LOAD INCREMENT SHALL BE HELD FOR 1 MINUTE OR UNTIL MOVEMENT STABILIZES, WHICH IS LONGER.
   c. LOAD SHALL BE APPLIED USING CUSTOM PULL FIXTURE FROM OJJO, WHICH PROVIDES A PULL POINT EQUIVALENT TO THE CENTER OF ROTATION OF ARRAY TECHNOLOGIES TORQUE TUBE.
   d. ACCEPTANCE CRITERIA SHALL BE AT THE DETERMINATION OF THE RESPONSIBLE ENGINEER. DEFLECTION UNDER LOAD = 3.5 INCHES AT TOP OF FOUNDATION. MAX DEFLECTION AFTER UNLOADING 0.25 INCHES AT BOTTOM OF FOUNDATION.
   e. A PIER LOAD TEST REPORT SHALL BE PRODUCED WITH PIER ID, PIER CHARACTERISTICS, MECHANICAL PERFORMANCE DATA, AND A MAP OF PIER TEST LOCATIONS.
4. PULLOUT (TENSION) LOAD TEST:
   a. PRODUCTION PIERS SHALL BE RANDOMLY SELECTED AND TESTED FOR AXIAL CAPACITY TESTING UNDER DIRECTION OF RESPONSIBLE ENGINEER. APPLICATION OF LOAD AND RECORDED READINGS SHALL BE PER "OJJO TESTING AND INSPECTION PROCEDURES, QA-2020"
   b. AXIAL TESTS SHALL BE PERFORMED IN ACCORDANCE WITH ASTM D3689, AS MODIFIED HERE.
      b.1. TEST PIERS SHALL BE LOADED TO 125% OF THE DESIGN LOAD AND UNLOADED TO 0%. LOAD INCREMENTS SHALL BE AS FOLLOWS:
         b.1.1. LOAD TO BE 700 LBS FOR EXTERIOR ARRAY PV EARTH TRUSS
         b.1.2. LOAD TO BE 600 LBS FOR INTERIOR ARRAY PV EARTH TRUSS
      b.2. EACH LOAD INCREMENT SHALL BE HELD FOR 1 MINUTE OR UNTIL MOVEMENT STABILIZES, WHICH IS LONGER.
   c. LOAD SHALL BE APPLIED USING CUSTOM PULL FIXTURE FROM OJJO, WHICH PROVIDES A PULL POINT EQUIVALENT TO THE CETNER OF ROTATION OF ARRAY TECHNOLOGIES TORQUE TUBE.
   d. ACCEPTANCE CRITERIA SHALL BE AT THE DETERMINATION OF THE RESPONSIBLE ENGINEER. ACCEPTANCE: MAX. VERTICAL MOVEMENT UNDER LOAD SHALL BE LESS THAN = 1.0 INCHES.
   e. A PIER LOAD TEST REPORT SHALL BE PRODUCED WITH PIER ID, PIER CHARACTERISTICS, MECHANICAL PERFORMANCE DATA, AND A MAP OF PIER TEST LOCATIONS.

REQUIRED REPORTS:

1. THE INSPECTOR SHALL FURNISH INSPECTION REPORTS TO THE ENGINEER.
2. DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR AND ENGINEER FOR CORRECTION.
3. A FINAL REPORT DOCUMENTING THE REQUIRED INSPECTIONS AND CORRECTION OF ANY DISCREPANCIES NOTED IN THE INSPECTIONS SHALL BE SUBMITTED AT A POINT IN TIME AGREED UPON BY THE PERMIT APPLICANT AND THE BUILDING OFFICIAL PRIOR TO THE START OF WORK.

REMEDIAL ACTIONS

1. FOUNDATIONS DRIVEN OUTSIDE OF LOCATION, TWIST OR PLUMBNESS TOLERANCE:
   a. REFER TO THE "OJJO TESTING AND INSPECTION PROCEDURES, QA-2020" AND "OJJO EARTH TRUSS CORRECTION MATRIX" FOR MITIGATION.
   b. CONSULT ENGINEER, AS REQUIRED.

IN CEMENTED MATERIALS, A MINIMUM EMBEDMENT 24" MAY BE USED WITH A MINIMUM OF 20' INTO CEMENTED MATERIAL, PROVIDED LOAD TESTING PROVES STRUCTURAL VIABILITY.

ADDITIONAL HOLES MAY BE PUNCHED IN THE TRUSS CAP TO ACCOMMODATETHE OUT OF TOLERANCE TRUSS AND ALLOW FOR PROPER TORQUE TUBE ALIGNMENT

THE FOLLOWING PROCEDURE IS ALLOWED:

Reviewing the Screw Anchor embedment data collected by Ojjo and Primoris at the Eagle Shadow Mountain jobsite, there is a correlation between Screw Anchor Capacity and Truss Driver Machine hammering length (as seen in Figure 1 below).

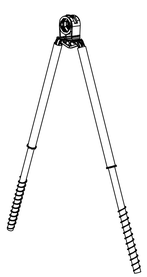
Ojjo's solution to this is the following: The controls will accumulate the total distance during screw drive for which the hammer is running. In the case where the hammer turns on, then off, then on again, if the "hammer off distance" is less than 1", it will be *included* in the total hammering distance. If this "hammer off distance" is greater than 1", it will be excluded. The screw will be driven until either the total hammering distance is 18", or the total embedment is 42", whichever comes first – then will continue to drive the screw past those values in order that a pre-cut leg can be used in the truss.

Ojjo

Ojjo Earth Truss Correction Matrix

	Correction Procedure	Description	When to Employ Corrective Procedure
1	Remove and redrive Earth Screw	Earth Screw is unscrewed from the ground and redriven	1. Screw did not initially achieve minimum embedment. 2. Screw has a deficiency which requires replacement.
2	Realign Earth Screw	Earth Screw is gently repositioned in the soil with skidsteer or similar equipment	1. Screw is out of intended NS or EW position 2" or less.
3	Install longer Earth Screw	An Earth Screw is replaced with a longer Earth Screw	1. Screw did not have adequate capacity during initial installation. 2. Soil was disturbed and no longer has adequate capacity.
4	Install new Crimp Collar	Crimp Collar of a screw is replaced with a replacement Crimp Collar	1. Top of Earth Screw has been damaged, but threaded Anchor maintains sufficient capacity.
5	Install new Truss Cap	Truss cap is replaced with a replacmnt Truss Cap	1. Truss cap has been damaged. 2. Truss cap is substantially misaligned and requires repositioning.
6	Install new Leg	Leg(s) are replaced with replacement Leg	1. Leg has been damaged. 2. Truss cap is substantially misaligned and requires repositioning (includes Earth Truss being too short or too tall).
7	Bump Truss	Truss is gently pushed at grade, below the Crimps, in the NS direction with skidsteer or similar equipment	1. Top of Truss is misaligned in NS direction.
8	Slurry plug	Anchor location is predrilled with 3.5" hole or larger, filled with 500psi slurry, and Screw Anchor is redriven or placed in the slurry	1. Screw has been damaged. 2. Screw does not have adequate capacity. 3. Soil has been disturbed.
9	Pour in place	Dig pit around Earth Screw or in appropriate location for Earth Screw (dimensions to be communicated by EOR), fill with 500psi slurry, secure Earth Truss in place during slurry curing period.	1. Earth Screw does not have adequate capacity, but Earth Truss is in adequate condition.
10	Replace Earth Truss (above ground components only)	Earth Screws remain in place. Cut and remove Legs and Truss Cap. Position Truss Driver. Recrimp Legs and Truss Cap into final position.	1. Any above ground components of Earth Truss are damaged. 2. Positioning is misaligned in EW direction or NS direction.
11	Replace Earth Truss (above and below ground components)	Position Truss Driver. Select appropriate Earth Screw and/or prepare soil substrate per Engineer. Drive Earth Screw(s). Crimp Legs and Truss Cap into final position.	1. Soil has been disturbed. 2. Earth Truss has been damaged. 3. Earth Truss does not have adequate capacity.
12	Cut legs	Cut leg tube with circular or portable band saw, spray with cold galvinizaion spray	1. Screw not driven to match leg legnth bin. 2. Ideal leg length not available.
13	Recrimp	Leg tube is recrimped around Screw Collar or Truss Cap Collar	1. Intial crimp is found to to lack adequate capacity. 2. Crimp QC Gage cannot fit onto a crimped Leg. 3. Crimp is loose. 4. Crimp is found to have damage.
14	Contact Ojjo and EOR	Obtain written guidance from EOR and Ojjo.	1. Any condition not covered in the Truss Correction Matrix.

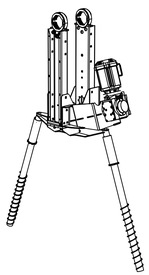
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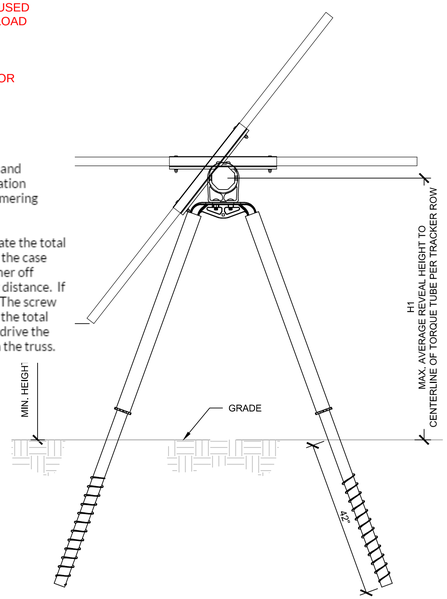
1 S-006 BEARING EARTH TRUSS - OBLIQUE VIEW
NOT TO SCALE



2 S-006 BEARING EARTH TRUSS W/DAMPER - OBLIQUE VIEW
NOT TO SCALE



3 S-006 GEAR EARTH TRUSS - OBLIQUE VIEW
NOT TO SCALE



4 S-006 BEARING OJJO EARTH TRUSS FOUNDATION ELEVATION VIEW
NOT TO SCALE

TRACKER ROW CONDITION WITH 3 INCHES OR LESS OF MAXIMUM SCOUR PER FOUNDATION
CANADIAN SOLAR MODULE (LESS BLOCK 203) AND JINKO MODULE - ATI DURATRACK HZ WITH OJJO EARTH TRUSS FOUNDATIONS

TRACKER ROW CONDITION	PILE TYPE	FOUNDATION AVERAGE REVEAL HEIGHT TO CENTER OF TORQUE TUBE (H1)*	MAXIMUM FOUNDATION NORTH-SOUTH TILT (DEGREES)
EXTERIOR	JINKO	6'-0"	9
		7'-0"	9
		8'-0"	6
	CANADIAN SOLAR	6'-0"	9
		7'-0"	9
		8'-0"	6
INTERIOR	JINKO	6'-0"	9
		7'-0"	9
		8'-0"	6
	CANADIAN SOLAR	6'-0"	9
		7'-0"	9
		8'-0"	6

NOTE: CONFIRM WITH CURRENT ATI REQUIREMENTS. SET SCREWS REQUIRED TO TRANSFER WEAK AXIS LOAD ON ALL BEARING COLUMNS.

TRACKER ROW CONDITION WITH 18 INCHES OR LESS OF MAXIMUM SCOUR PER FOUNDATION
CANADIAN SOLAR MODULE (LESS BLOCK 203) AND JINKO MODULE - ATI DURATRACK HZ WITH OJJO EARTH TRUSS FOUNDATIONS

TRACKER ROW CONDITION	PILE TYPE	FOUNDATION AVERAGE REVEAL HEIGHT TO CENTER OF TORQUE TUBE (H1)*	MAXIMUM FOUNDATION NORTH-SOUTH TILT (DEGREES)
EXTERIOR	JINKO	6'-0"	9
		7'-0"	4
		8'-0"	2
	CANADIAN SOLAR	5'-0"	9
		6'-0"	4
		7'-0"	2
		8'-0"	1
INTERIOR	JINKO	6'-0"	9
		7'-0"	4
		8'-0"	2
	CANADIAN SOLAR	5'-0"	9
		6'-0"	7
		7'-0"	4
		8'-0"	2

NOTE: CONFIRM WITH CURRENT ATI REQUIREMENTS. SET SCREWS REQUIRED TO TRANSFER WEAK AXIS LOAD ON ALL BEARING COLUMNS.

*"AVERAGE REVEAL HEIGHT" IS THE ARITHMETIC AVERAGE OF THE DESIGN HEIGHTS ABOVE GRADE FOR ALL PILES SUPPORTING AN INDIVIDUAL TRACKER.

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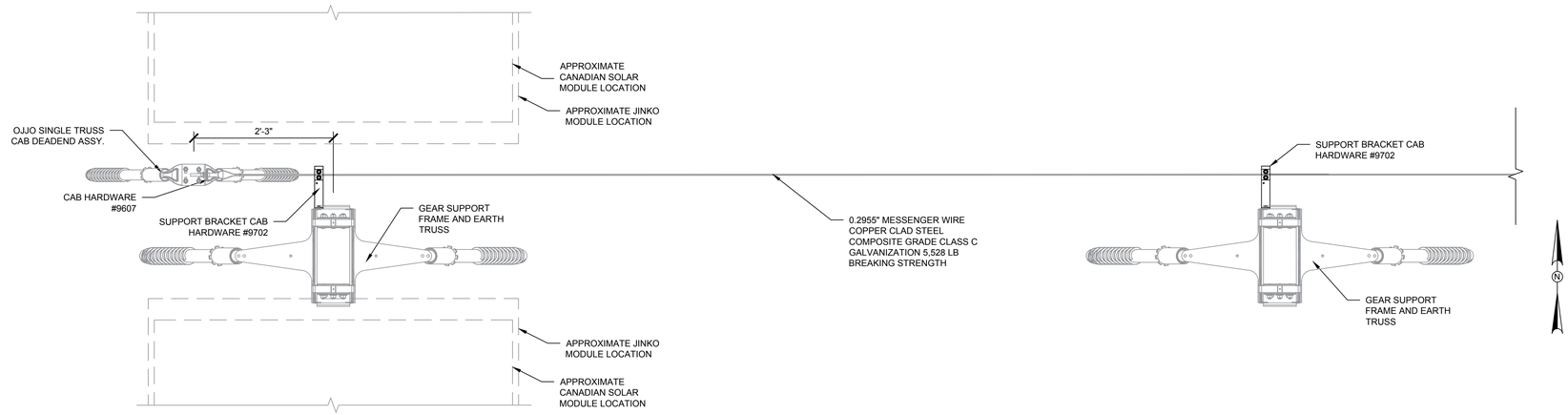
CANADIAN SOLAR AND JINKO
GENERAL NOTES AND OJJO FOUNDATION

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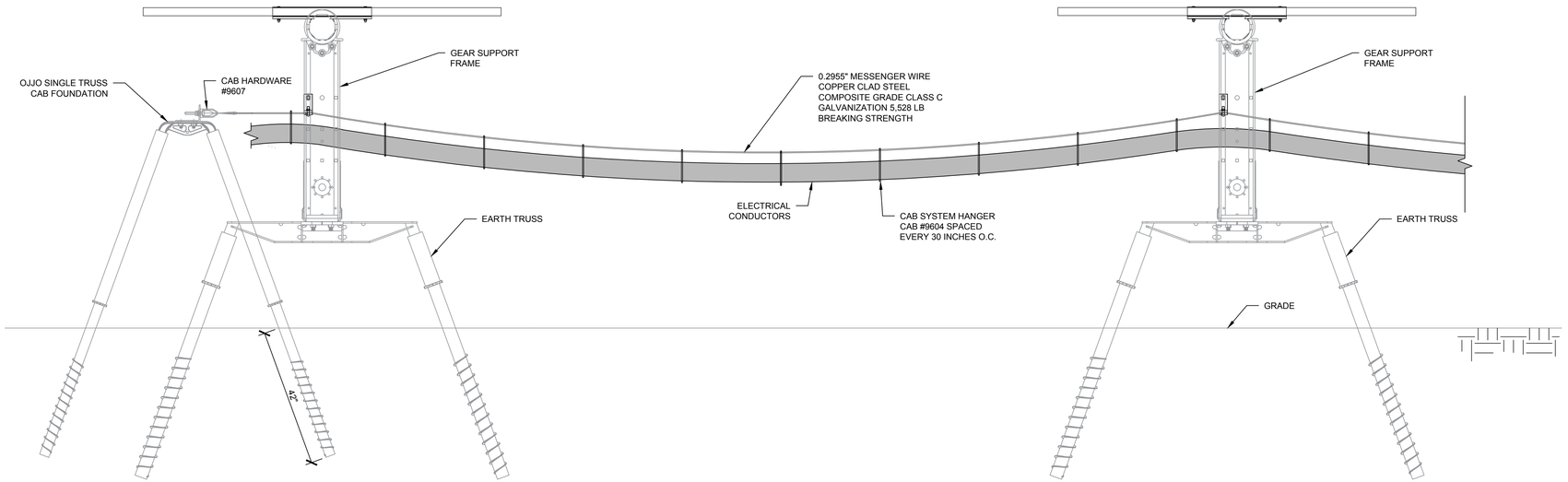
SHEET 7 of 8

CAD FILE: \\denver.kleinfelder.com\DENVER-DATA\WORKING\20\20203753.002 - Eagle Shadow Mountain Design\2.0 Technical Information\2.8 Technical And CADD Figures\20203753 Eagle Shadow Mountain_20201020.dwg LAYOUT: CS AND JINKO FND PLOTTED: 10/20/2020 6:02 PM BY: adam.tschida



2 S-007 CANADIAN SOLAR (LESS BLOCK 203) AND JINKO MODULES - MESSENGER WIRE INSTALLATION PLAN VIEW
NOT TO SCALE

NOTE: CAB MAY RUN ACROSS ONE BLOCK OR MANY BLOCKS



1 S-007 CANADIAN SOLAR (LESS BLOCK 203) AND JINKO MODULES - MESSENGER WIRE INSTALLATION ELEVATION VIEW
NOT TO SCALE

MESSENGER CABLE INSTALLATION SEQUENCE:

1. SECURE MESSENGER WIRE TO ONE DEAD END FOUNDATION.
2. LAY MESSENGER WIRE THROUGH ALL MID-SPAN BRACKETS. DO NOT SECURE. TENSION THE MESSENGER WIRE AND ATTACH TO SECOND DEAD END PER THE INSTALLATION SAG IN TABLE 1 AT MIDSPAN BETWEEN L-BRACKETS.
3. TIGHTEN THE RETAINER PLATES OF THE MID-SPAN BRACKETS.
4. STRING ON THE CAB HANGERS ALONG ALL SPANS. STRING ALL CONDUCTORS THROUGH THE CAB HANGERS AND RECHECK THE SAG AT ALL MIDSPANS. FINAL SAG SHOULD BE ESTIMATED PER TABLE 2.
5. DEAD LOAD SPECIFIED BY ELECTRICAL ENGINEER AS 4.7 PLF.

TABLE 1: MESSENGER WIRE STRINGING SAG CHART

		TEMPERATURE (°F)										
SAG (INCHES)	ROW-TO-ROW SPAN	10	20	30	40	50	60	70	80	90	100	110	120
	20'-0" TO 25'-0" (CCS)	1.68	2.16	2.64	3.00	3.36	3.72	4.08	4.32	4.68	4.92	5.16	5.40

NOTE: MID-SPAN SAG OF THE MESSENGER WIRE LISTED ABOVE OCCURS BEFORE ANY ELECTRICAL CABLES OR SUPPORTS ARE HUNG FROM THE MESSENGER CABLE.

TABLE 2: MESSENGER WIRE MAXIMUM FINAL SAG CHART

		TEMPERATURE (°F)				
SAG (INCHES)	ROW-TO-ROW SPAN	0	30	60	90	120
	20'-0" TO 25'-0" (CCS)	7.30	7.70	8.00	8.40	8.80

NOTE: MAXIMUM SAG VALUES SHOWN ABOVE INCLUDE THE INITIAL SAG PLUS THE SAG DUE TO MAXIMUM VERTICAL FACTORED LOAD CONDITION.

KLEINFELDER
Bright People. Right Solutions.
707 17th Street, Suite 3000
Denver, CO 80202
Phone: 303-237-6601
www.kleinfelder.com

REVISIONS

REV	DESCRIPTION	DSN	CHK	DATE
		DWN	APP	
0	CONSTRUCTION PLANS	JAC	ADT	10/20/2020
		JAC	ADT	
1	RECORD DRAWINGS			6/14/2023
			ADT	

8MINUTE SOLAR ENERGY

ORIGINAL DRAWING SIZE IS 24 x 36

EAGLE SHADOW MOUNTAIN SOLAR

MOAPA RIVER INDIAN RESERVATION
CLARK COUNTY, NEVADA

PSC Primoris

PRIMORIS RENEWABLE ENERGY
4880 HAVANA STREET, SUITE 500
DENVER, COLORADO 80239

CANADIAN SOLAR AND JINKO OJJO CAB DETAILS & FOUNDATION

PROJECT NO.	20203753.003A
ISSUE DATE	6/14/2023
CURRENT REVISION	1
DESIGNED BY	JAC
DRAWN BY	JAC
CHECKED BY	ADT
APPROVED BY	ADT

S-007

SHEET 8 of 8

CAD FILE: \\denver.kleinfelder.com\DENVER-DATA\WORKING\20203753.002 - Eagle Shadow Mountain Design\2.0 Technical Information\2.8 Technical And CADD Figures\20203753 Eagle Shadow Mountain_20201020.dwg LAYOUT: OJJO CAB FND
PLOTTED: 10/20/2020 6:03 PM BY: adam.tschida

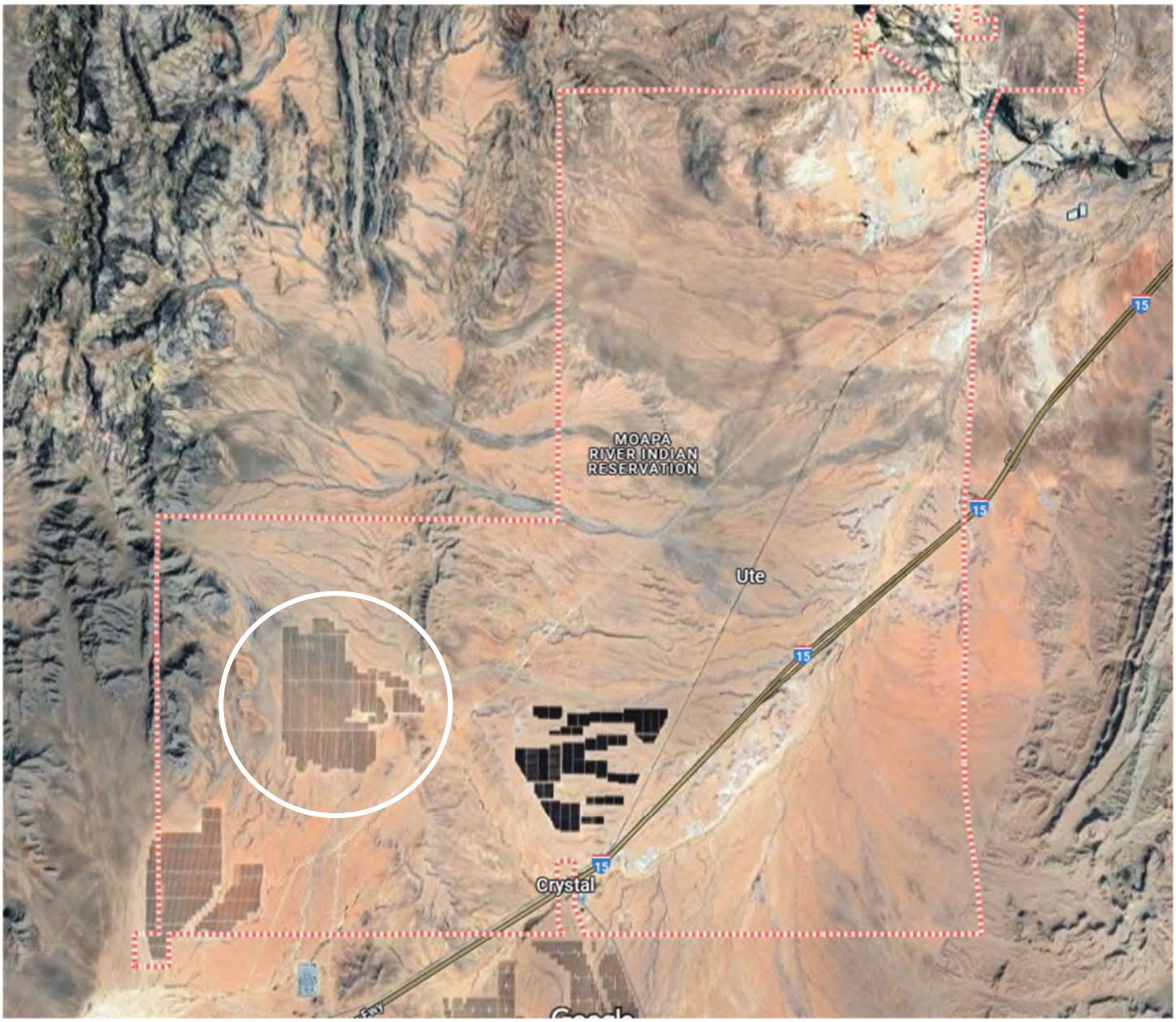

MOAPA
RIVER INDIAN
RESERVATION
Ute
Crystal
15
15
15
15

Exhibit 1 Summary of Definitions of Value

Source	Value Definition
Federal Mortgage Lending (Comptroller of the Currency) 12 C.F.R. § 34.42(g) Same definition for FDIC, NCUA, FNMA Selling Guide	*Market value* means the most probable price which a property should bring in a competitive and open market under all conditions requisite to a fair sale, the buyer and seller each acting prudently and knowledgeably, and assuming the price is not affected by undue stimulus. Implicit in this definition is the consummation of a sale as of a specified date and the passing of title from seller to buyer under conditions whereby: (1) buyer and seller are typically motivated; (2) both parties are well informed or well advised, and acting in what they consider their own best interests; (3) a reasonable time is allowed for exposure in the open market; (4) payment is made in terms of cash in U.S. dollars or in terms of financial arrangements comparable thereto; and (5) the price represents the normal consideration for the property sold unaffected by special or creative financing or sales concessions granted by anyone associated with the sale.
California Code of Civil Procedure, Eminent Domain C.C.P. § 1263.320(a)	The fair market value of the property taken is the highest price on the date of valuation that would be agreed to by a seller, being willing to sell but under no particular or urgent necessity for so doing, not obliged to sell, and a buyer, being ready, willing, and able to buy but under no particular necessity for so doing, each dealing with the other with full knowledge of all the uses and purposes for which the property is reasonably adaptable and available.
California Real Property Damage Civil Jury Instructions § 3903F	"Fair market value" is the highest price for the property that a willing buyer would have paid to a willing seller, assuming: (1) that there is no pressure on either one to buy or sell; and (2) that the buyer and seller know all the uses and purposes which the property is reasonably capable of being used.
California Marital Dissolution *In re Marriage of Cream* 13 Cal.App.4th 81 (1993)	The fair market value of a marketable asset in marital dissolution cases is the highest price on the date of valuation that would be agreed to by a seller, being willing to sell but under no obligation or urgent necessity to do so, and a buyer, being ready, willing and able to buy but under no particular necessity for so doing.
IAAO Glossary for Property Appraisal and Assessment, 2nd ed. (2013)	Market value is the major focus of most real property appraisal assignments. Both economic and legal definitions of market value have been developed and refined. A current economic definition agreed upon by agencies that regulate federal financial institutions in the United States is: [see above]
California Property Taxation R.T.C. § 110(a)	"Full cash value" or "fair market value" means the amount of cash or its equivalent that property would bring if exposed for sale in the open market under conditions in which neither buyer nor seller could take advantage of the exigencies of the other, and both the buyer and the seller have knowledge of all of the uses and purposes to which the property is adapted and for which it is capable of being used, and of the enforceable restrictions upon those uses and purposes.
Federal Estate Tax 26 C.F.R. § 20.2031-1(b)	The fair market value is the price at which the property would change hands between a willing buyer and a willing seller, neither being under any compulsion to buy or to sell and both having reasonable knowledge of relevant facts.

CONTINUED >

Exhibit 1 Summary of Definitions of Value *(continued)*

Source	Value Definition
Federal Casualty Loss 26 C.F.R. § 1.165-7 Instructions for Form 4684	Fair market value (FMV) is the price at which the property would be sold between a willing buyer and willing seller, each having knowledge of the relevant facts. The difference between the FMV immediately before the casualty or theft and the FMV immediately after represents the decrease in FMV because of the casualty or theft.
Uniform Appraisal Standards for Federal Land Acquisitions (2016) § 1.2.4	Market value is the amount in cash, or on terms reasonably equivalent to cash, for which in all probability the property would have sold on the effective date of value, after a reasonable exposure time on the open competitive market, from a willing and reasonably knowledgeable seller to a willing and reasonably knowledgeable buyer, with neither acting under any compulsion to buy or sell, giving due consideration to all available economic uses of the property.
Legal (general) *Black's Law Dictionary* 2nd pocket edition (2016)	The price that a seller is willing to accept and a buyer is willing to pay on the open market and in an arm's length transaction; the point at which supply and demand intersect. (fair market value)
Financial Reporting FASB 157 ¶ 5-14 [excerpts]	Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. The measurement should consider attributes specific to the asset or liability. A fair value measurement assumes that the asset or liability is exchanged in an orderly transaction between market participants to sell the asset or transfer the liability at the measurement date. A fair value measurement assumes that the transaction to sell the asset or transfer the liability occurs in the principal market for the asset or liability or, in the absence of a principal market, the most advantageous market for the asset or liability. Market participants are buyers and sellers in the principal (or most advantageous) market for the asset or liability that are: (a) Independent of the reporting entity; that is, they are not related parties (b) Knowledgeable, having a reasonable understanding about the asset or liability and the transaction based on all available information (c) Able to transact for the asset or liability (d) Willing to transact for the asset or liability; that is, they are motivated but not forced or otherwise compelled to do so. A fair value measurement assumes the highest and best use of the asset by market participants.
Global Valuation International Valuation Standards (2017) ¶ 30.1	Market Value is the estimated amount for which an asset or liability *should* exchange on the valuation date between a willing buyer and a willing seller in an arm's length transaction, after proper marketing and where the parties had each acted knowledgeably, prudently and without compulsion.



Ojjo Earth Truss Foundation System

Engineered for Rocky, Hard Rock, and Mixed Soil Types

As the solar industry accelerates and project complexity increases, the need for innovative solutions to address diverse soil conditions has become more important. Nextracker's patented Ojjo Earth Truss® foundation system, part of Nextracker's comprehensive suite of NX Foundation Solutions, excels in rocky, hard rock, and mixed soils offering an efficient, light on land, and cost-effective alternative to traditional foundations. Coupling a resilient truss structure with semi-automated installation equipment, Ojjo Earth Truss integrates seamlessly with NX Horizon™ solar tracker systems to streamline engineering and procurement while overcoming the most difficult ground conditions.

Innovative Technology

The Ojjo Earth Truss foundation system utilizes the semi-automated Truss Driver™, a hollow ground-screw, a drill shaft and drill bit to simultaneously drill and drive. This innovative design accelerates installation, reduces costs, and simplifies logistics, eliminating the need for pre-drilling. With a generous five-foot reveal window, the system can also accommodate uneven terrain with zero or minimal site grading. This technology ensures precise, consistent installation while mitigating subsurface risks and preventing disruptions or cost overruns.

Key Benefits

EFFICIENT INSTALLATION
Avoid pre-drilling, delays and cost overruns

PRECISE ALIGNMENT
Prevent rework with GPS and real-time QC

IMPROVED SAFETY
Reduce hazards and crew fatigue

LIGHT-ON-LAND
Minimize noise and land disturbance

Build on hard and rocky soils without pre-drilling

The Ojjo Earth Truss® foundation system works in synergy with the Truss Driver™ installation machine to perform rapid, accurate, semi-automated installation. Together, the Earth Truss and Truss Driver eliminate the need for pre-drilling and can dramatically reduce or eliminate grading, resulting in significant time and cost savings with reduced environmental impact, versus traditional piles.





Ojjo Earth Truss

- The hollow screw design allows for direct drilling and driving in place, efficiently installing foundations in hard soils.
- Specifically designed to mount NX Horizon, the screws, legs and truss caps are crimped together by the Truss Driver for a secure, lifetime connection.
- A range of leg lengths enables up to a 5-foot reveal window

Earth Truss Driver

- With GPS based positioning, intelligent closed-loop control and a simple operator interface, the Truss Driver installs the Earth Truss system with precision and speed.
- The automated drill and drive operation ensures consistent, repeatable screw installation across varied and changing soil conditions. The machine adjusts embedment depth and supports setting of final alignment via high-power crimp tools and built-in quality control checks.

GENERAL	
Applicable Tracking System	NX Horizon, NX Horizon-XTR
Targeted Soil Conditions	Rocky, hard rock, mixed
N-S Slope	Up to 15%
E-W Slope	Up to 15%
Tracker Elevation Range	1.0 to 3.0 meters

COMPONENTS	
Screw	Threads eliminate reliance on skin friction. Driven at an angle, loaded in tension. Designed for shallow embedment depth.
Leg	Legs form efficient truss structure once connected from Screws to Truss Caps.
Truss Cap	Connects a pair of legs to NX Horizon BHA.
Connections	Fast-connect crimp and engineered fasteners.
Materials	Galvanized steel. Range of costing thicknesses available.

INSTALLATION	
Machine Type	Ojjo Truss Driver
Pile Placement	GPS based
Screw Driving	Patented, simultaneous “drill and drive” technology for hard, rocky soils.
Leg Assembly	Crimped to each pair of screws and truss cap; height adjustable.
Tracker Assembly	No additional alignment or fastening steps required.

SERVICES	
Geotech Analysis	NX supported
Foundation Engineering Package	NX supported
Pull-Out Testing	NX supported
Training	NX supported

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6200 Paseo Padre Parkway | Fremont, CA 94555 | USA | +1 510 270 2500 | nextracker.com

Jeff Bonesteel

Documented Call on August 28th.

On August 28th, Jeff Bonesteel from the Clark County Assessor's Office had a phone conversation with Sol Hutson from Nextracker regarding the Ojjo Earth Truss foundation system currently in use at the Eagle Shadow Mountain Solar facility.

Sol provided clarity on the installation process of the Ojjo Earth Truss system. According to the conversation, no predrilling is required for their product. The Earth Truss Driver installation machine is semi-automated, GPS-enabled, and utilizes a hollow screw design for shallow embedment. This allows for direct drilling and installation of ground screws, onto which the poles and truss caps are crimped to form a single truss.

This automated drill-and-drive process ensures consistent and repeatable screw installation across varied and changing soil conditions. The Earth Truss Driver adjusts embedment depth and supports final alignment using high-power crimp tools and built-in quality control checks. Because the truss placement and installation are GPS-enabled, no additional alignment is necessary for installing tracker systems and solar panels.

Nextracker emphasizes that their foundation systems are "Light-On-Land," requiring minimal land disturbance. When asked about removal of this particular truss foundation system, Mr. Hutson explained that applying sufficient torque to the screws allows them to be easily extracted.





STATE

BOARD OF EQUALIZATION

Case #25-155

Fiscal Year 2024/2025

Declaration Assets Filed Online
Account ID# 229299

Account Name / DBA:	EAGLE SHADOW MOUNTAIN SOLAR
Corporate Name:	AREVON ENERGY
Location Address	0 MOAPA SOLAR RD
Location City	MOAPA
Location Zip	89025
Mailing To	325MK 8ME, LLC C/O AREVON ENERGY
Mailing Address 1	8800 GAINEY CENTER DR SUITE 100
Mailing Address 2	
Mailing City	SCOTTSDALE
Mailing State	AZ
Mailing Zip	85258
Business Phone	(480) 653-8450
NAICS Code	221114
Contact Name	James Bergstrom
Contact Title	Senior Tax Manager
Contact Phone	(480) 681-4031
Contact Email	jbergstrom@arevonenergy.com
Status	no_status_change
Status Date	
Status Notes	
Submission Date	10/2/2024 10:41:19 AM

Add Or Delete	Asset ID # or Serial # (optional)	Description	Year Acquired	Acquisition Cost	Department Code
ADD		Inventory	2023	242,379.00	TFX
ADD		Solar System Blocks 1-10 & 13	2021	348,300,000.00	RP
ADD		Solar system blocks 11 & 14	2023	74,600,001.00	RP
ADD		Solar system block 12	2022	37,400,000.00	RP

Fiscal Year 2024 - 2025

BUSINESS PERSONAL PROPERTY DECLARATION & ASSET LISTING

Assessor ID# **229299** **Group:**
Business Name **EAGLE SHADOW MOUNTAIN SOLAR**

Mailing Address **8800 GAINEY CENTER DR SUITE 100**
SCOTTSDALE AZ 85258-2193

Location Address **MOAPA SOLAR RD**
MOAPA 89025-

Phone Number

Prior Assessor ID#
Legal/Corporation Name **AREVON ENERGY**
Contact Name
Contact Phone
Email Address
NAICS **221114**
Solar Electric Power Generation

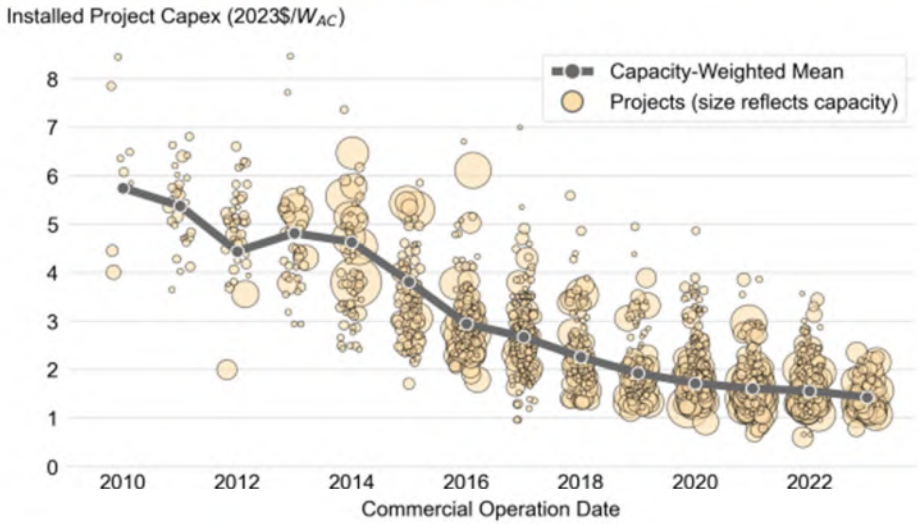
Totals	460,542,380	321,558,863	321,558,863	112,545,602

Add or Delete	Asset ID # or Serial # (optional)	Description	Year Acquired	Acquisition Cost	Taxable	Override Value	Assessed	Dept Code
		INVENTORY	2023	242,379	209,634	209,634	73,372	30RA
		SOLAR SYSTEM BLOCKS 1	2021	348,300,000	228,519,629	228,519,629	79,981,870	30RA
		SOLAR SYSTEM BLOCKS 1	2023	74,600,001	64,521,540	64,521,540	22,582,539	30RA
		SOLAR SYSTEM BLOCK 12	2022	37,400,000	28,308,060	28,308,060	9,907,821	30RA
				460,542,380	321,558,863	321,558,863	112,545,602	

Obsolescence – Utility Scale Solar 2024-2025

Installed costs of PV have fallen by 8% since 2022, to $1.43/$W_{AC}$ ($1.08/$W_{DC}$) in 2023

Sample: 1,279 projects totaling 66.5 GW_{AC}



Note: The 2023 sample does not yet include data contributions from EIA 860, cost findings may thus be revised as higher quality data will become available.

Since 2010, costs for installed utility-scale PV have fallen by 75% (or 10% annually):

- **Capacity-weighted means** (reflecting the average costs of solar capacity) decreased in real terms from $1.56/$W_{AC}$ in 2022 to $1.43/$W_{AC}$ in 2023.
- **Medians** (reflecting typical project costs) decreased from $1.61/$W_{AC}$ in 2022 to $1.33/$W_{AC}$ in 2023.

Despite strong inflationary pressures, we have not observed cost increases in real dollar terms in recent years, unlike some other industry observers.

The lowest 20th percentile of project costs fell in real terms from $1.3/$W_{AC}$ ($1.0/$W_{DC}$) in 2022 to $1.2/$W_{AC}$ ($0.9/$W_{DC}$) in 2023.

Historical sample is robust (covering 96% of installed capacity through 2022). 2023 data covers 34% of new projects (75) or 37% of new capacity (6.9 GW_{AC}).

Detailed statistics in $/$W_{DC}$ are shown in the accompanying data workbook.

Utility-Scale Solar, 2024 Edition
http://utilityscalesolar.lbl.gov

22

Installed Costs 2023 $/W$_{AC}$ from Berkeley Labs

Year	Median Installed Costs $/W$_{AC}$	Cost Decline (%)	Market Based Installed Cost (% Good)
2026			
2025			
2024	$1.38	0.00	1.00
2023	$1.33	-0.04	1.04
2022	$1.61	0.14	0.86
2021	$1.58	0.13	0.87
2020	$1.86	0.26	0.74
2019	$1.85	0.25	0.75
2018	$2.13	0.35	0.65
2017	$2.63	0.48	0.52
2016	$2.84	0.51	0.49
2015	$3.43	0.60	0.40
2014	$3.87	0.64	0.36
2013	$4.49	0.69	0.31
2012	$5.04	0.73	0.27
2011	$5.40	0.74	0.26
2010	$6.21	0.78	0.22
2009	$5.99	0.77	0.23
2008	$5.56	0.75	0.25
2007	$12.06	0.89	0.11
2006			
2005			

Red = Estimated

30-Year Life Table based % Good vs Market Based Installed Cost | Predictive Analys

	Chart 1		Chart 2	
Year Built	Statutory 24-25 Personal Property Manual 30-Year Life Table Percent Good	Market Based Installed Cost (% Good)	Statutory 24-25 Personal Property Manual 30-Year Life Table Percent Good	Trend Line Predicted Market Based Installed Cost (% Good)
2026				
2025				
2024	1.00	1.00	1.00	1.11
2023	0.93	1.04	0.93	1.02
2022	0.87	0.86	0.87	0.93
2021	0.81	0.87	0.81	0.84
2020	0.76	0.74	0.76	0.76
2019	0.71	0.75	0.71	0.68
2018	0.66	0.65	0.66	0.61
2017	0.62	0.52	0.62	0.55
2016	0.58	0.49	0.58	0.48
2015	0.54	0.40	0.54	0.43
2014	0.50	0.36	0.50	0.37
2013	0.47	0.31	0.47	0.32
2012	0.44	0.27	0.44	0.28
2011	0.41	0.26	0.41	0.24
2010	0.38	0.22	0.38	0.21
2009	0.36	0.23	0.36	0.18
2008	0.33	0.25	0.33	0.15
2007	0.31	0.11	0.31	0.13
2006				
2005				

Chart 1

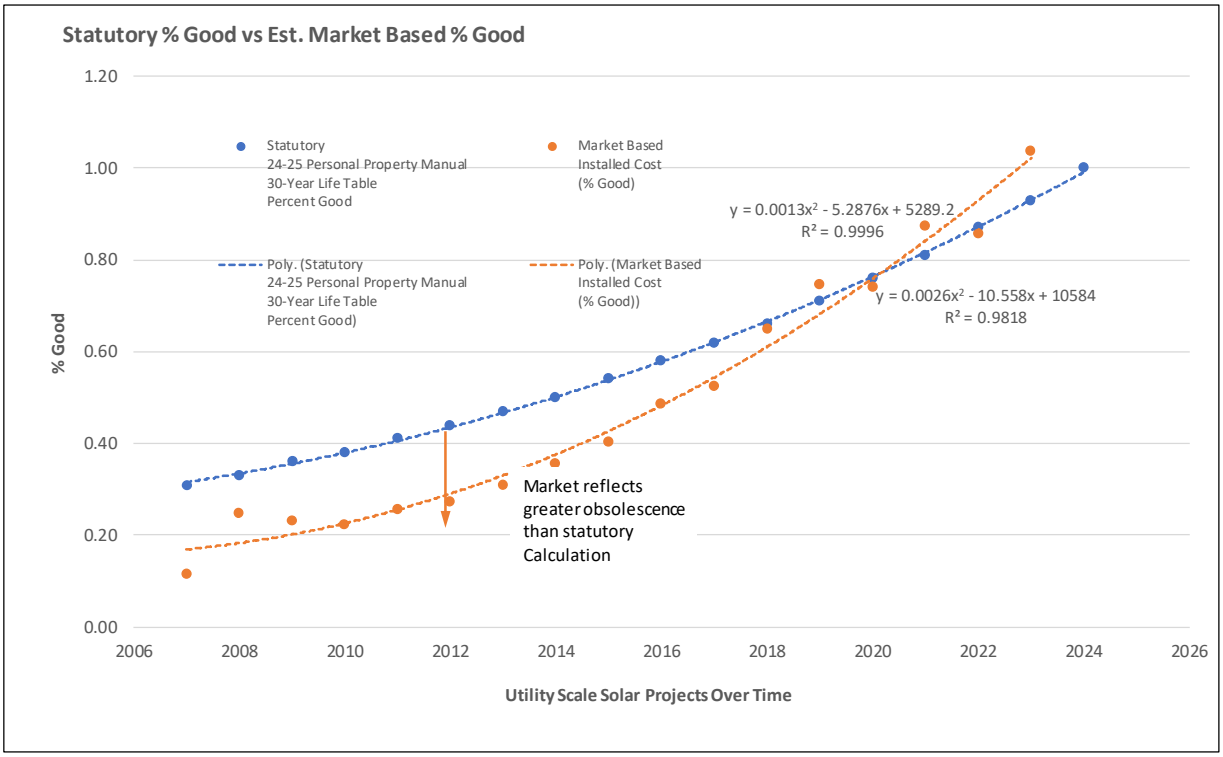
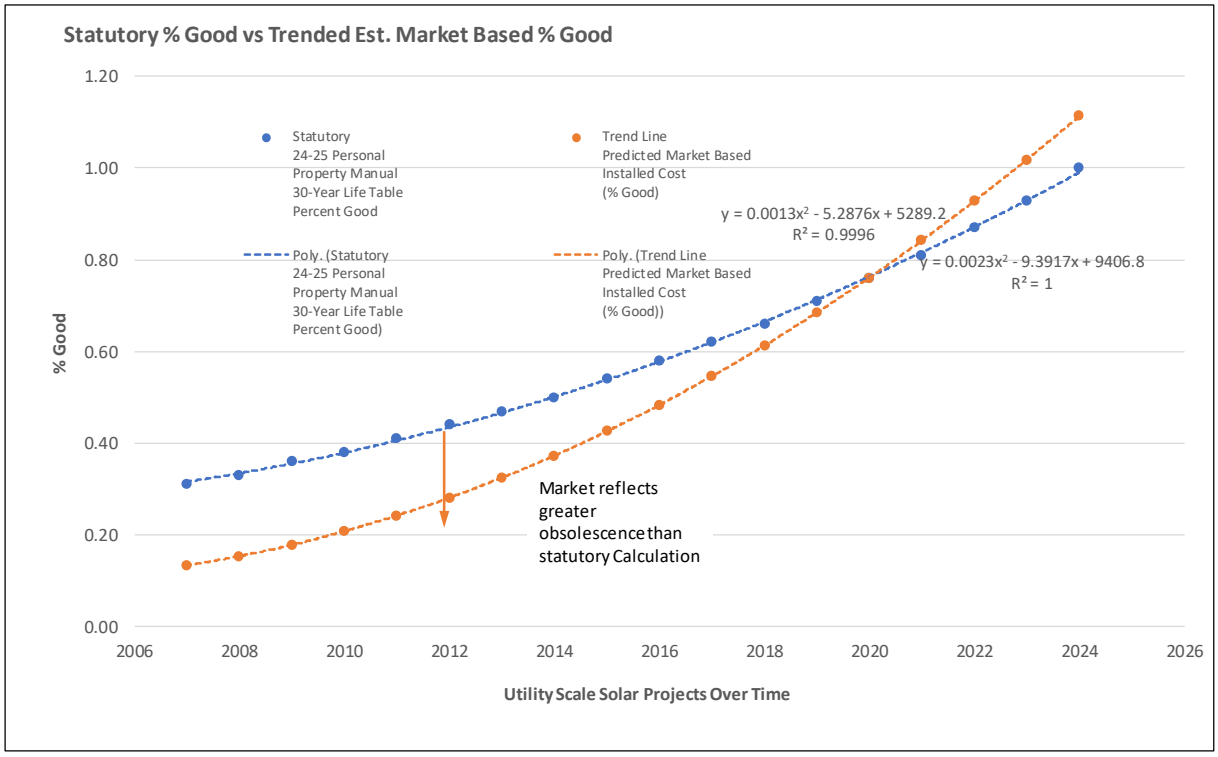


Chart 2



Final Recommendation for an Obsolescence Adjustment (With Example for $1,000 in Historical Cost)

Year Built	Historical or Declared Cost	Statutory 24-25 Personal Property Manual 30-Year Life Table Cost Index	RCN	Statutory 24-25 Personal Property Manual 30-Year Life Table Percent Good	Statutory Taxable Value
2026					
2025					
2024		1.00		100.00	
2023		1.03		93.00	
2022		1.06		87.00	
2021	$1,000.00	1.16	$1,160.00	81.00	$939.60
2020		1.21		76.00	
2019		1.23		71.00	
2018		1.26		66.00	
2017		1.29		62.00	
2016		1.32		58.00	
2015		1.33		54.00	
2014		1.34		50.00	
2013		1.36		47.00	
2012		1.38		44.00	
2011		1.41		41.00	
2010		1.44		38.00	
2009		1.45		36.00	
2008		1.47		33.00	
2007		1.52		31.00	
2006					
2005					

Year Built	Historical or Declared Cost	Market Based Installed Cost Multiplier (% Good)	Adjusted Current Cost	Statutory 24-25 Personal Property Manual 30-Year Life Table Percent Good	Market Taxable Value
2026					
2025					
2024		1.00		100.00	
2023		0.93		93.00	
2022		0.87		87.00	
2021	$1,000.00	0.81	$810.00	81.00	$656.10
2020		0.76		76.00	
2019		0.68		71.00	
2018		0.61		66.00	
2017		0.55		62.00	
2016		0.48		58.00	
2015		0.43		54.00	
2014		0.37		50.00	
2013		0.32		47.00	
2012		0.28		44.00	
2011		0.24		41.00	
2010		0.21		38.00	
2009		0.18		36.00	
2008		0.15		33.00	
2007		0.13		31.00	
2006					
2005					

Market Taxable Value	$656.10
Minus: Statutory Taxable Value	$939.60
Recommended Obsolescence	-$283.50
as a Percentage Deduction	**0.30172414**
or as a Factor	**0.69827586**

Utility-Scale Solar, 2024 Edition

Empirical Trends in Deployment, Technology, Cost, Performance, PPA Pricing, and Value in the United States

Joachim Seel[1], Julie Mulvaney Kemp[1]
Anna Cheyette, Dev Millstein, Will Gorman, Seongeun Jeong,
Dana Robson, Rachman Setiawan, and Mark Bolinger (consultant)

Lawrence Berkeley National Laboratory
Energy Markets and Policy Department

[1] Corresponding authors

October 2024


Photo credit: Intersect Power

This material is based upon work supported by the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy (EERE) under Solar Energy Technologies Office (SETO) Agreement Number 38444 and Contract No. DE-AC02-05CH11231.

Utility-Scale Solar, 2024 Edition

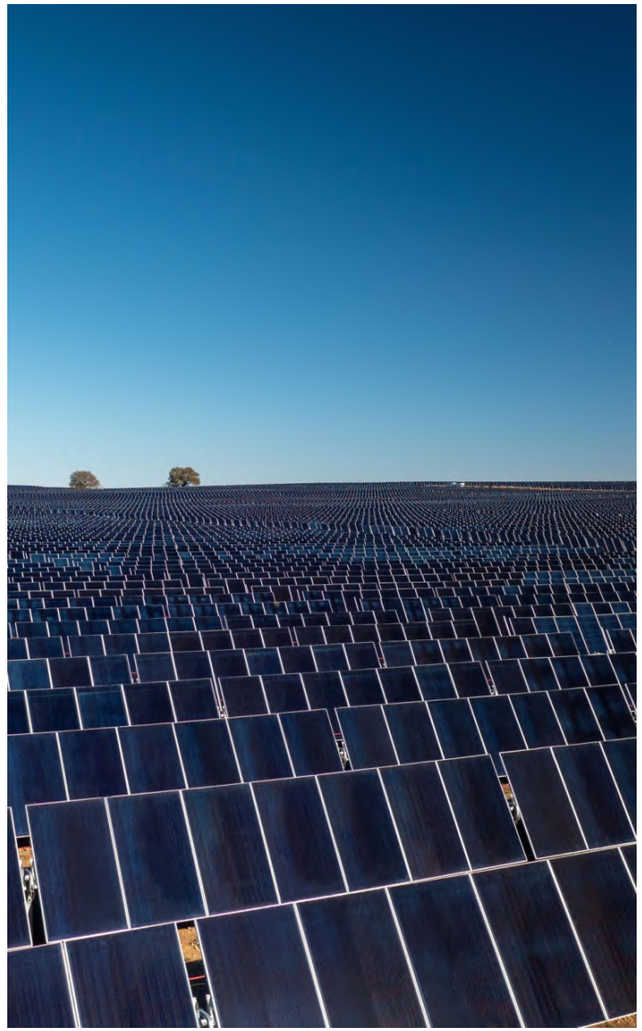


Photo credit:
Intersect Power's 415 MW_{DC}/320 MW_{AC} Radian solar facility, completed in 2023.

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Acknowledgements

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Utility-Scale Solar, 2024 Edition

Purpose and Scope:

- Summarize public and private data on key trends in U.S. utility-scale solar sector
- Focus on ground-mounted projects >5 MW_{AC}
  - There are separate DOE-funded data collection efforts on distributed PV (e.g., trackingthesun.lbl.gov)
- Focus on historical data, emphasizing the most-recent full calendar year

Data and Methods:

- See summaries at the beginning of each section

Funding:

- U.S. Department of Energy's Solar Energy Technologies Office

Products in addition to this slide deck:

- This report deck is complemented by an Excel data file that lists all data behind each graph (and more), a written executive summary, and interactive visualizations. All products are available at: utilityscalesolar.lbl.gov

New in this year's edition:

- Analyses of PV projects in newly designated Energy Communities
- Discussion of PV performance degradation rates
- Comparison of Berkeley Lab's PPA data with data from LevelTen[1] and Trio[2]
- Comparison of PV market value with generation costs and climate + health benefits
- Discussion of solar withdrawal rates and study status in interconnection queues

These two companies operate renewable energy marketplaces and publish PPA pricing trends:
[1] https://www.leveltenenergy.com/ppa
[2] https://www.trioadvisory.com/publications

Other recent publications from our team related to utility-scale solar

Annual Reports

[Queued Up: 2024 Edition]

Berkeley Lab's annual report documents the growing backlog of new power generation, particularly solar, wind, and storage, seeking transmission connections.

[Hybrid Power Plants: 2024 Edition]

This annual briefing tracks existing hybrid plants in the U.S. while also synthesizing data from PPAs and interconnection queues to shed light on future growth.

[U.S. State Renewables Portfolio & Clean Electricity Standards: 2024 Status Update]

This report provides a status update on state renewable portfolio and clean electricity standards.

[U.S. Large-Scale Solar Photovoltaic Database]

In collaboration with the USGS, the USPVDB creates an accurate, comprehensive, and publicly accessible national large-scale PV database of large-scale PV facilities.

Siting and Community Engagement

[Developer Practices and Perspectives on Community Engagement for Utility-Scale Renewable Energy in the United States]

A survey of professionals shows that renewable developers use community engagement strategies but favor limited public input, falling short of full citizen empowerment.

[Laws in Order: An Inventory of State Renewable Energy Siting Policies]

This report outlines state and territorial authorities responsible for siting and permitting large-scale wind and solar projects, alongside an interactive map for exploring state-specific information.

[Perceptions of Large-Scale Solar Project Neighbors]

A survey of residents living near large-scale solar projects provides insights into local perceptions that can inform future large-scale solar deployment.

Value of Renewable Energy

[The Renewables and Wholesale Electricity Prices (ReWEP) Tool]

The ReWEP tool allows users to explore trends in nodal wholesale energy pricing and their relationship to renewable generation.

[Grid Value and Cost of Utility-Scale Wind and Solar: Potential Implications for Consumer Electricity Bills]

This research quantifies the market value of wind and solar over time, exploring how contractual and market structures influence consumers' ability to benefit from cost savings.

[Renewable-Battery Hybrid Power Plants in Congested Electricity Markets]

Berkeley Lab's analysis of hybrid renewable-battery plants in congested U.S. regions reveals optimal energy and capacity value for solar and wind hybrid projects.

[Solar and Storage Integration in the Southeastern U.S.]

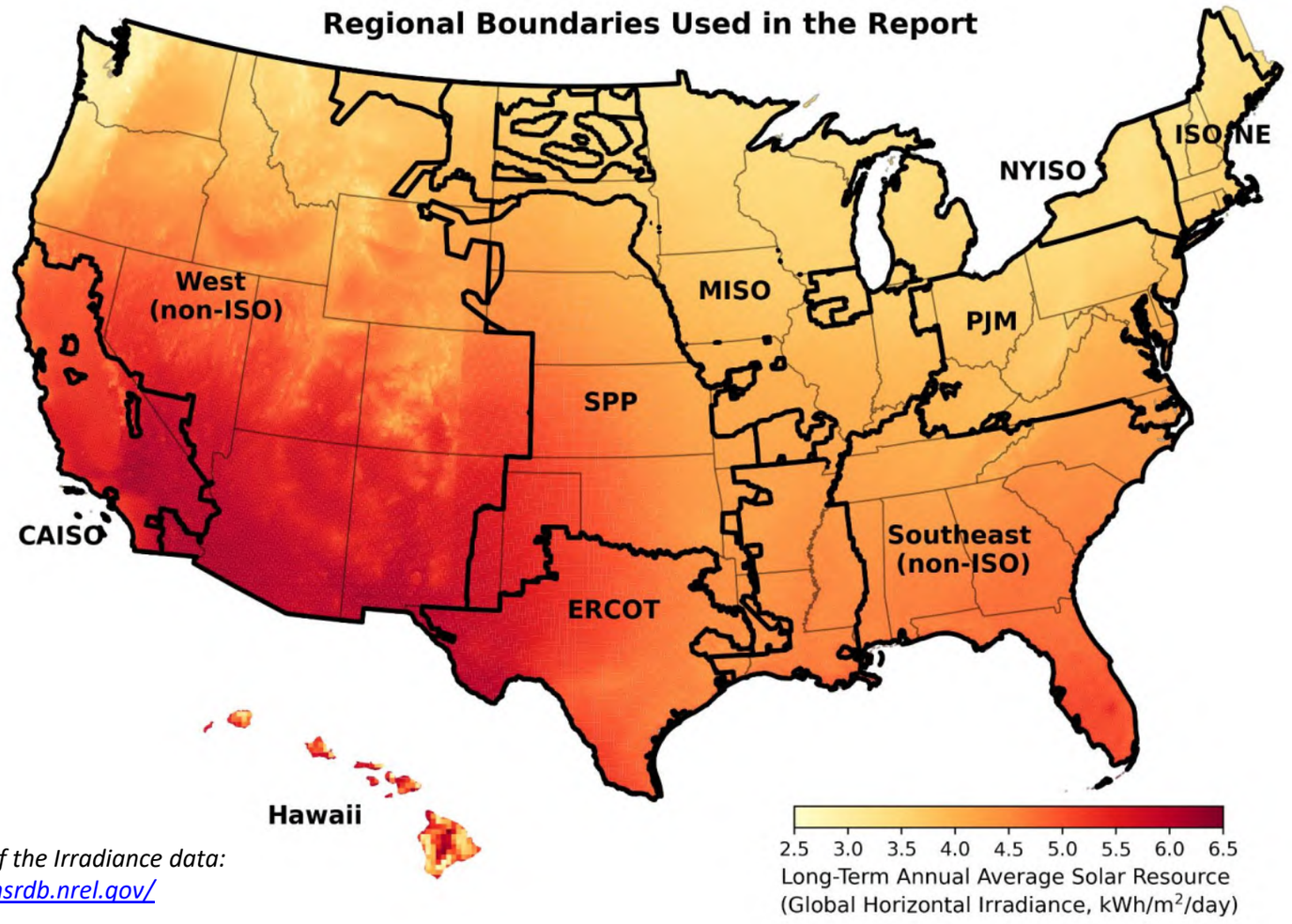
This study evaluates how varying levels of solar and storage would affect electricity system costs, reliability, and operations in the Southeast U.S. by 2035.

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Report Contents

- Deployment and Technology Trends
- Capital Costs (CapEx) and Operation & Maintenance (O&M) Costs
- Performance (Capacity Factors)
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- Wholesale Market Value, Air and Climate Benefits, and Net Value
- PV+Battery Hybrid Plants
- Concentrating Solar Thermal Power (CSP) Plants
- Capacity in Interconnection Queues
- Summary

Regional boundaries applied in this analysis include the seven independent system operators (ISO) and two non-ISO regions



Source of the Irradiance data:
https://nsrdb.nrel.gov/

Deployment and Technology Trends

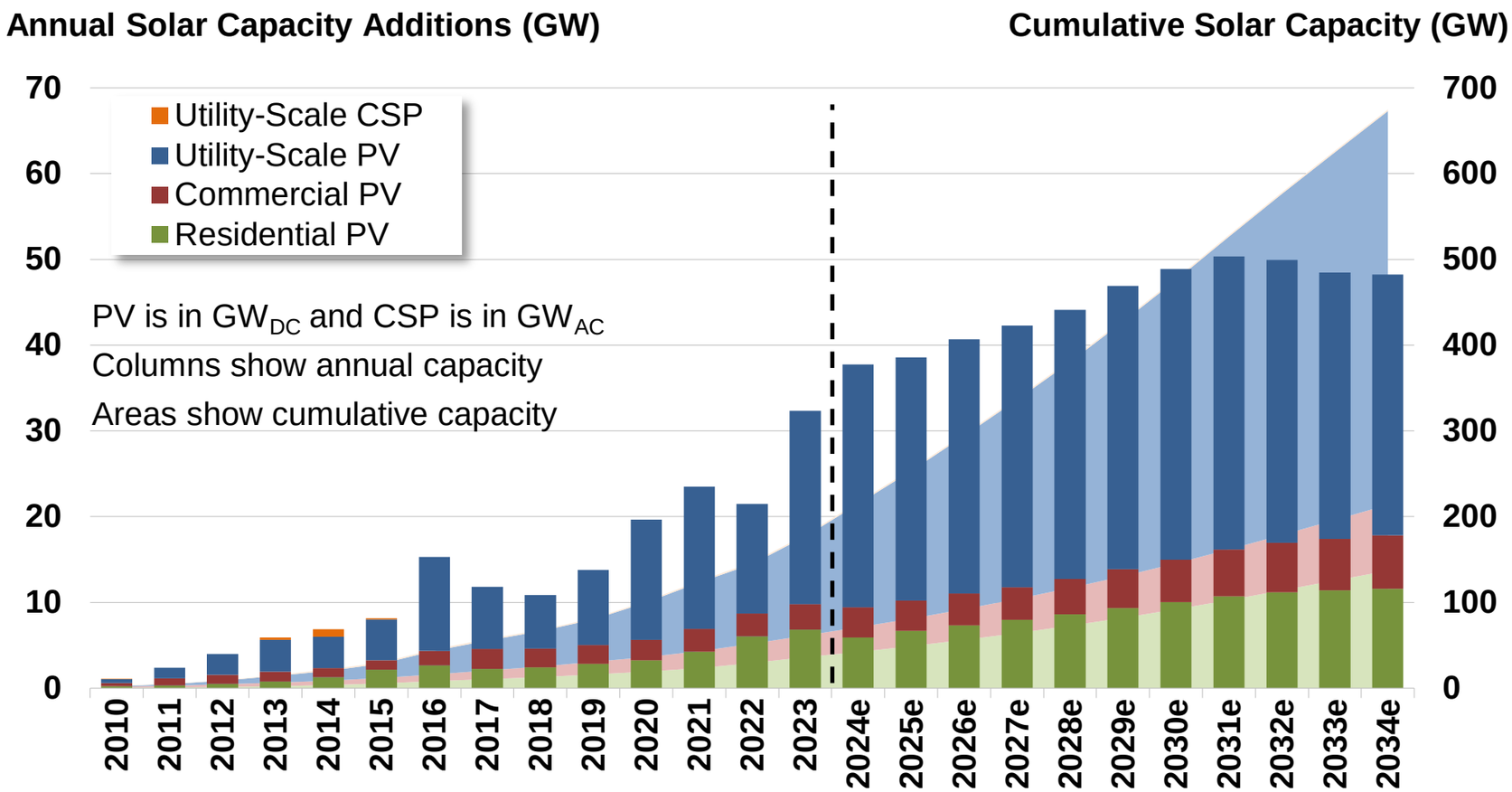
Deployment and Technology Trends: data and methodology

Deployment Trends Data: National and state-level deployment data are sourced from the Energy Information Administration (EIA), the American Clean Power Association (ACP), Wood Mackenzie/SEIA Solar Market Insight Reports, and Berkeley Lab datasets.

Technology Trends Data: Project-level metadata are sourced from a combination of Form EIA-860, FERC Form 556, state regulatory filings, interviews and websites of project developers and owners, and news and trade press articles. We independently verify much of the metadata—such as project location, fixed-tilt vs. tracking, azimuth—via satellite imagery.

Methods: Because we collect data from a variety of unaffiliated and incongruous sources, the data must be synthesized and cleaned in multiple steps before becoming useful for analytic purposes. In some cases, we essentially create new data by piecing together various snippets of information that are of less consequence on their own.

The utility-scale sector has the greatest share of the U.S. solar market



Sources: *Wood Mackenzie/SEIA Solar Market Insight Reports, Berkeley Lab*

Wood Mackenzie and SEIA report that the utility-scale sector added 22.5 GW_{DC} of new solar capacity in 2023, accounting for **70% of all new solar** capacity. Annual growth rose by 77% compared to 2022 and set a new record.

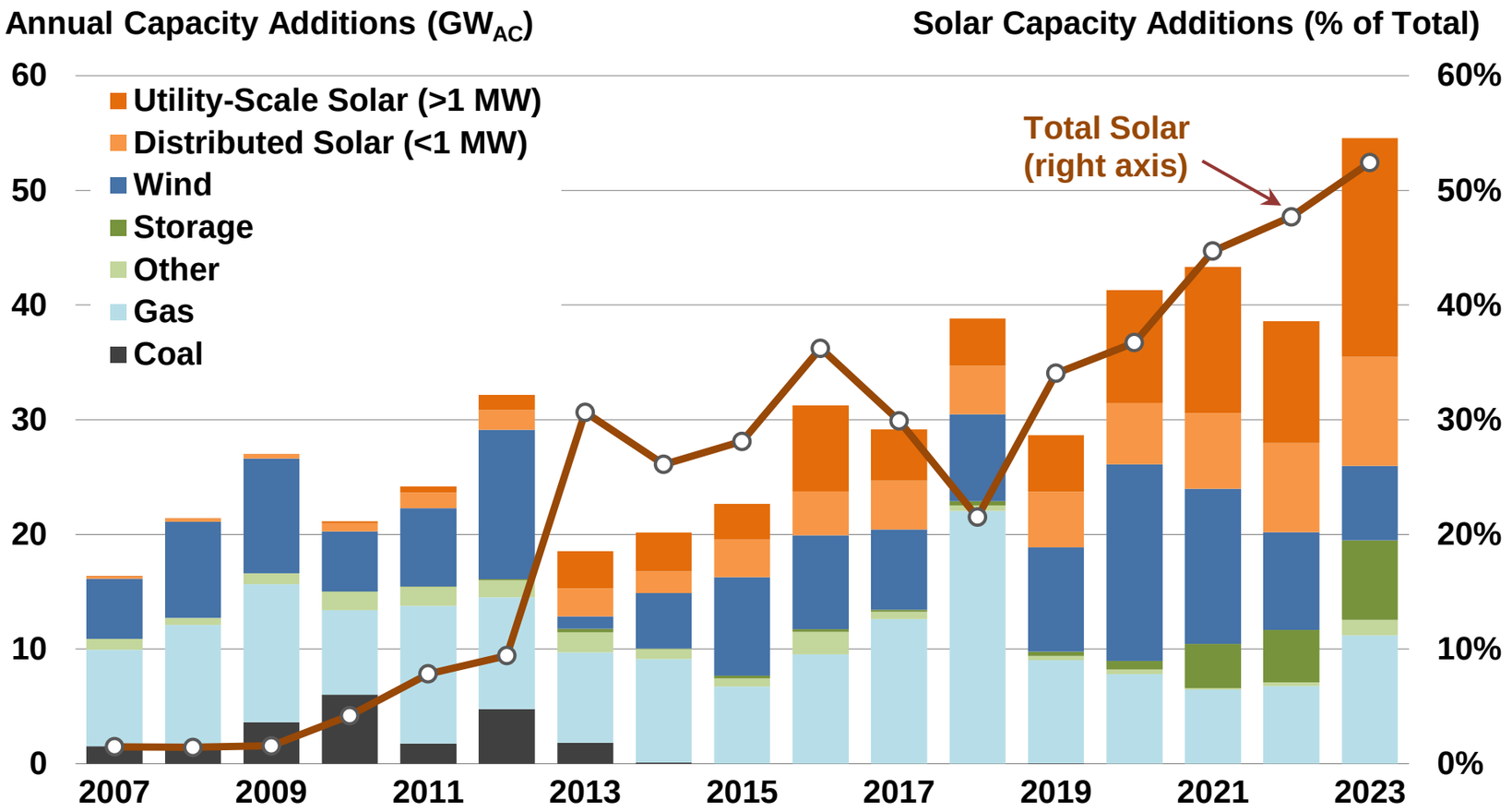
Utility-scale solar contributed **65% of cumulative solar** capacity (and 69% of solar generation) in 2023; this share is projected to rise to nearly 70% by 2027.

Our data analysis focuses on a subset of this sample—all projects larger than 5 MW_{AC}—based on their completion date:

- **2022**: 153 new projects totaling 10.4 GW_{AC} or 13.4 GW_{DC}
- **2023**: 221 new projects totaling 18.5 GW_{AC}. The subset of 217 projects with known DC capacity total 23.9 GW_{DC}.

Note: Graph above shows utility-scale solar as >1 MW_{DC} while most of this report uses >5 MW_{AC}.

More than 50% of new U.S. grid capacity came from solar in 2023



Bars represent annual capacity additions in GW_{AC} (left axis),
Line represents solar's capacity share of annual additions (right axis)

Utility-scale (35%) and distributed (17%) solar accounted for a combined 52% of all capacity added to U.S. grids in 2023.

It is the first year that solar made up more than half of new US grid capacity.

Solar has added more capacity than any other fuel since 2021, contributing >40% of capacity additions each year, >30% in 7 of the last 8 years, and >20% in each of the last 11 years.

Storage continues to expand as well: 6.9 GW of storage were added to U.S. grids in 2023, up from 4.6 GW in 2022 and 3.9GW in 2021.

Note: Graph above shows utility-scale solar as >1 MW_{AC} while most of this report uses >5 MW_{AC}.

Solar generation's market share was 5.6% across the U.S. in 2023, but reached >25% in California and Nevada

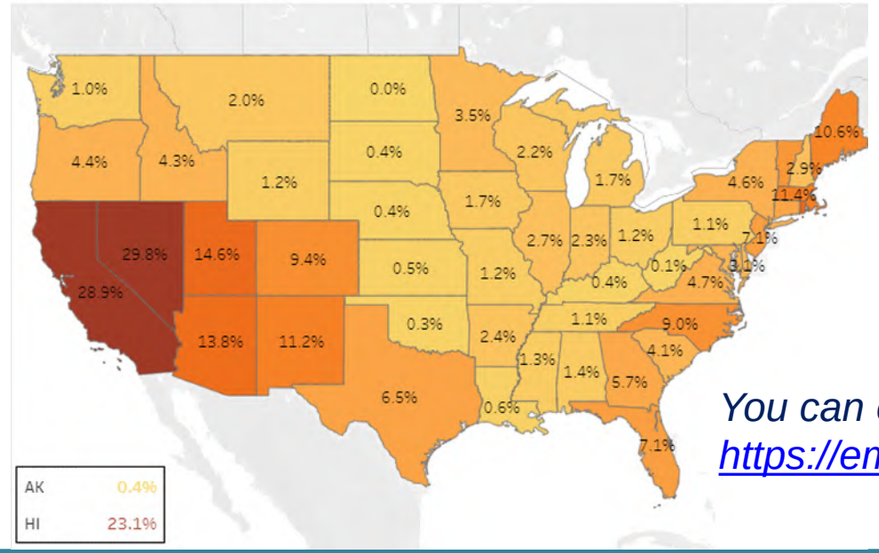
Top 20 States	Preliminary 2023			
	Solar generation as a % of in-state generation		Solar generation as a % of in-state load	
	All Solar	Utility-Scale Solar Only	All Solar	Utility-Scale Solar Only
California	28.2%	16.7%	28.9%	17.1%
Nevada	25.9%	22.1%	29.8%	25.4%
Massachusetts	24.4%	8.6%	11.4%	4.0%
Vermont	18.9%	8.6%	8.2%	3.7%
Hawaii	18.9%	5.9%	23.1%	7.2%
Utah	13.9%	11.3%	14.6%	11.9%
Rhode Island	11.8%	5.1%	14.7%	6.4%
Arizona	10.2%	6.3%	13.8%	8.6%
Maine	9.9%	4.9%	10.6%	5.2%
North Carolina	9.3%	8.8%	9.0%	8.4%
Colorado	9.0%	6.1%	9.4%	6.4%
New Mexico	8.2%	6.4%	11.2%	8.8%
New Jersey	7.4%	2.4%	7.1%	2.3%
Delaware	7.0%	3.1%	3.1%	1.4%
Idaho	6.9%	5.4%	4.3%	3.3%
Florida	6.7%	5.3%	7.1%	5.6%
Virginia	6.6%	5.8%	4.7%	4.2%
Maryland	6.3%	2.6%	4.2%	1.7%
Georgia	6.1%	5.7%	5.7%	5.4%
Texas	5.8%	5.0%	6.5%	5.6%
TOTAL U.S.	**5.6%**	**3.9%**	**6.2%**	**4.3%**

Solar market share can vary considerably depending on whether it is calculated as a percentage of total generation or load (e.g., Vermont).

As a percentage of in-state generation, California's solar market share reached 28% in 2023, while Nevada, Massachusetts, Vermont, and Hawaii all surpassed 15%.

The utility-scale sector's contribution varies by state: a minority in the Northeast and Hawaii, a majority in Southwest states and the overall U.S.

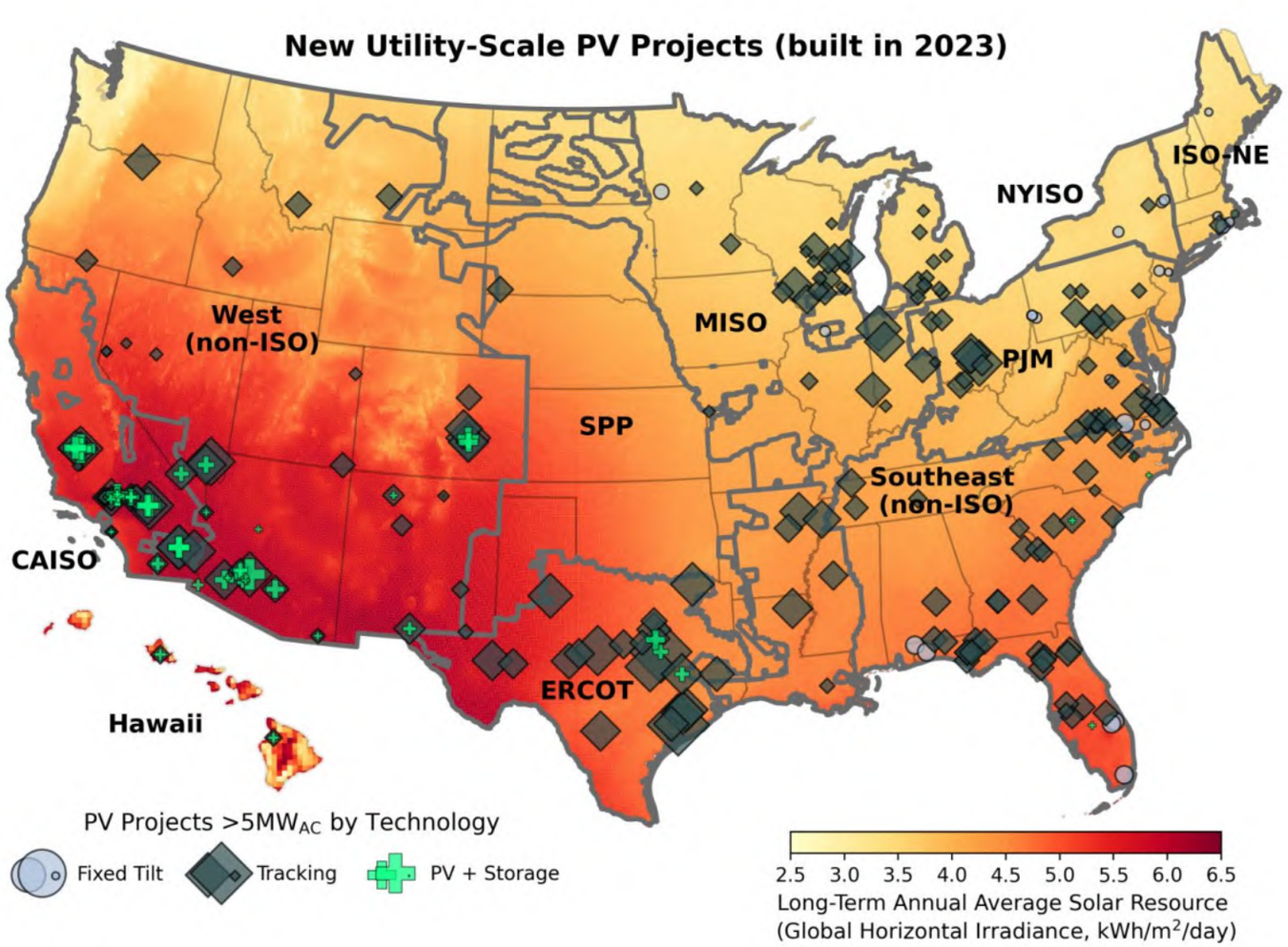
Percentage of In-State Electricity Sales and Generation from Solar PV, as of 2023



You can explore this data over time at https://emp.lbl.gov/capacity-and-generation-state

Note: Table above shows utility-scale solar as >1 MW_{AC} (most of this report uses >5 MW_{AC}). Percentages represent annual averages. Data is based on an early EIA data for 2023, findings may be revised with final data.

New utility-scale solar projects were built in the eastern Midwest, the mid-Atlantic, and southern United States in 2023



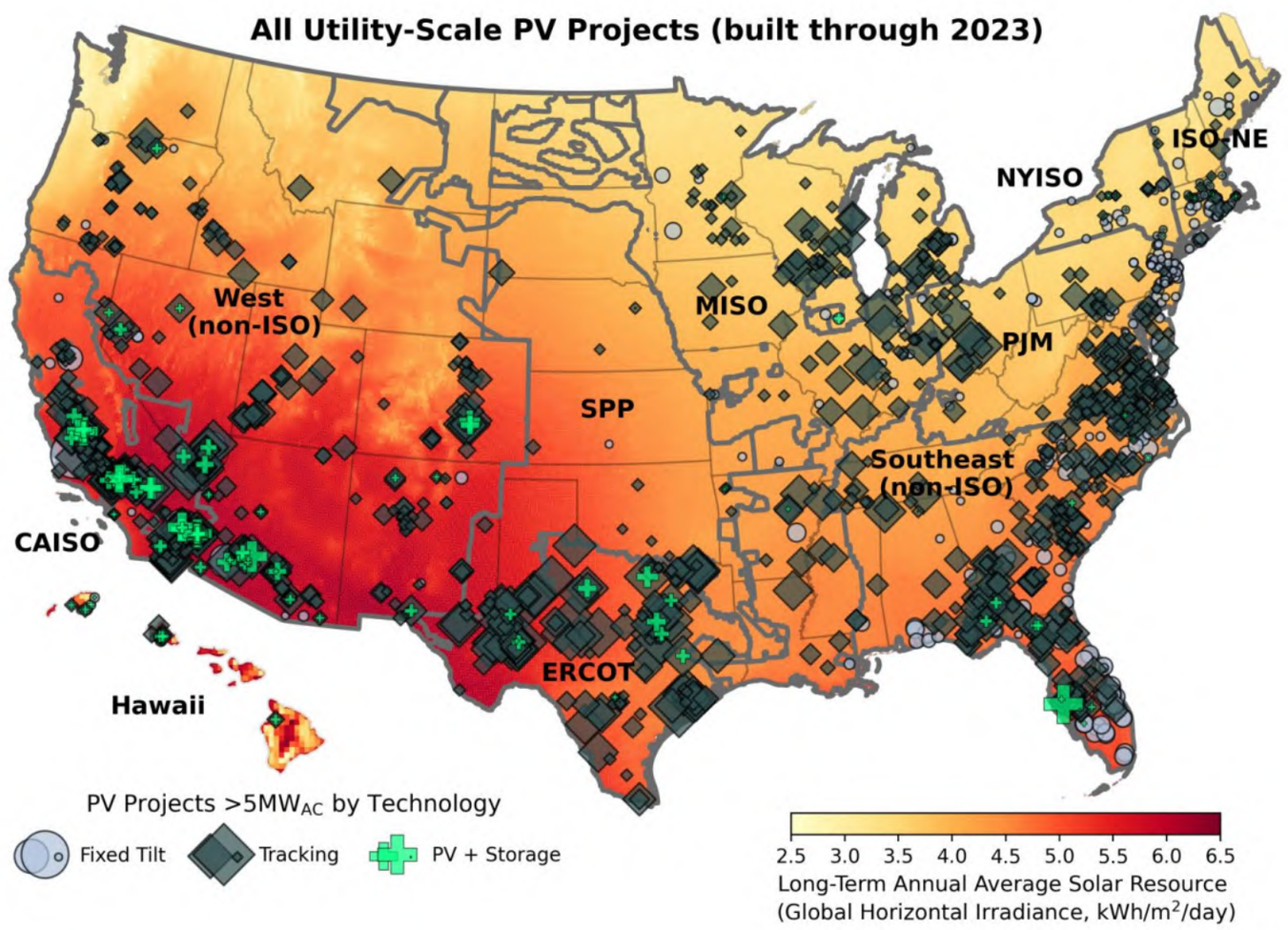
Fixed-tilt ( ) projects are increasingly only being built on particularly challenging sites (e.g., due to terrain or wind loading) or in the least-sunny regions in the northeast.

Other high-latitude states such as Oregon, Minnesota, Wisconsin, and Michigan, added predominantly **tracking** projects in 2023 ( ).

In 2023, storage ( ) hybrid projects hit the ground in record numbers. Batteries were added to already existing (15) and new (37) PV projects. Solar-rich CA added the most storage capacity (1657 MW), followed by the non-ISO West (1046 MW).

Note: A 6MW$_{AC}$ project in Alaska is not shown in the map above. Larger icons represent greater capacity.
You can explore this data interactively at https://emp.lbl.gov/technology-trends

Utility-scale solar has been built throughout the United States



Utility-scale PV is well-represented throughout the nation, with the exception of the central “wind belt” states in SPP, Montana, and Wyoming.

Projects larger than 100 MW were built in 2023 in northern MISO, with solar growth in PJM occurring in Virginia, Ohio, and Pennsylvania, and solar expansion in Texas extending beyond the panhandle.

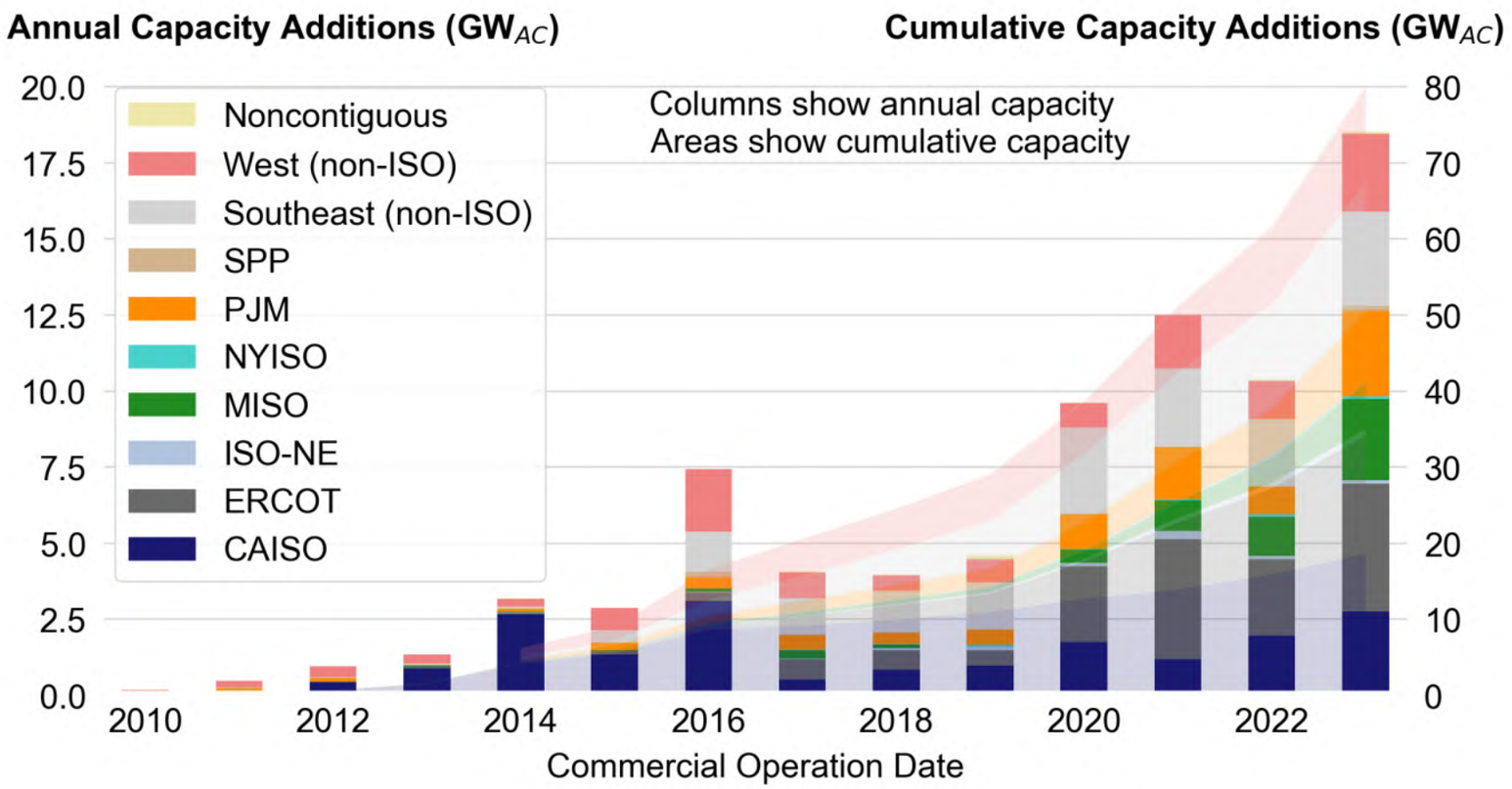
Montana and South Dakota had their first large solar projects (3x80 MW) in 2023, as did Alaska (6 MW). West Virginia’s first project was completed in 2024 (80 MW).

Only North Dakota and New Hampshire still await their first utility-scale solar projects in our sample.

You can explore this data interactively at https://emp.lbl.gov/technology-trends

Texas and the non-ISO Southwest added the most utility-scale solar capacity in 2023

PV project population: 1,506 projects totaling 80.2 GW_{AC}

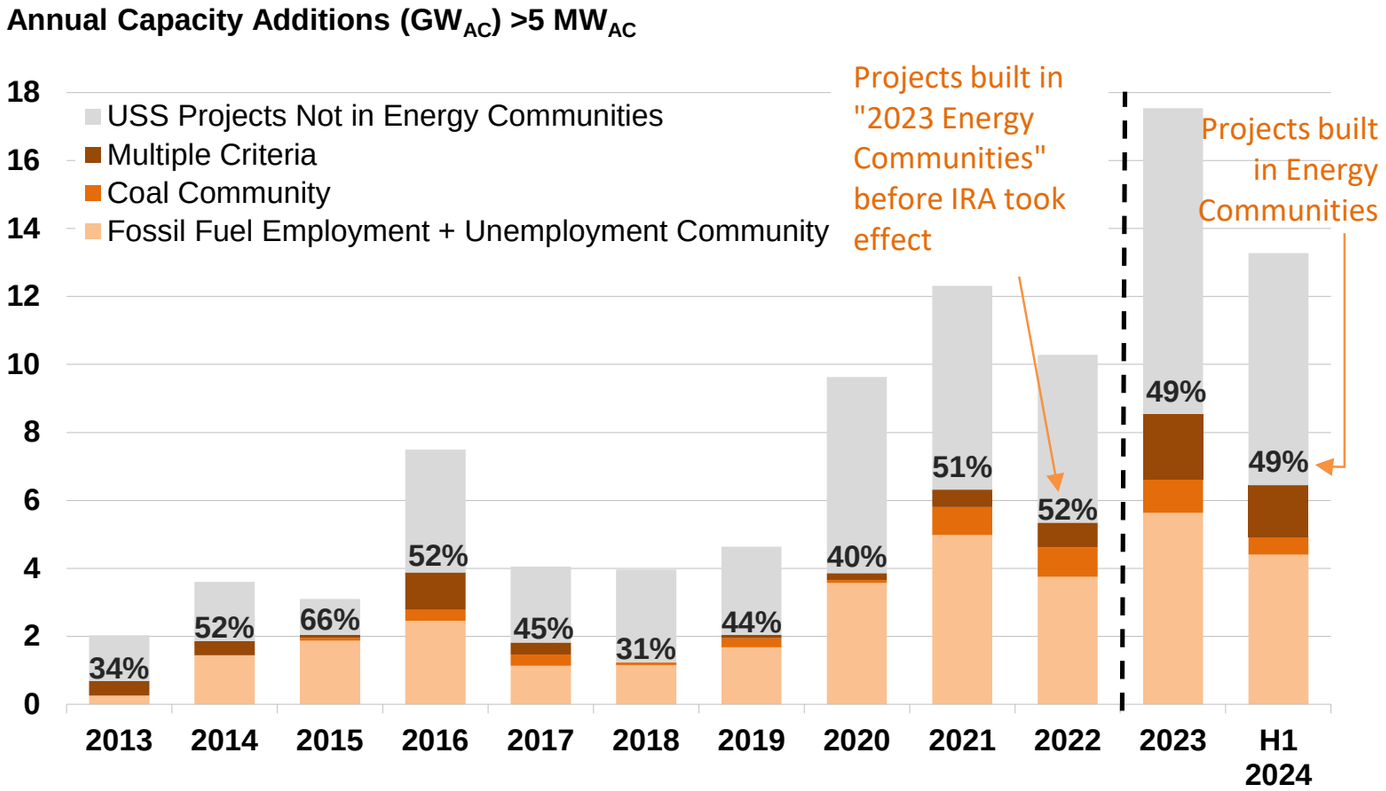


After a temporary decline in 2022, utility-scale solar deployment set again new records in 2023, with multiple GW of additions in ERCOT (4.2 GW_{AC}), the non-ISO Southeast (3.1 GW_{AC}), PJM (2.8 GW_{AC}), CAISO (2.7 GW_{AC}), MISO (2.7 GW_{AC}) and the non-ISO West (2.5 GW_{AC}) regions.

Taking a state perspective, **Texas** led the nation with 4.3 GW_{AC}. **California's** USS growth accelerated in 2023 to 2.6 GW_{AC}—its greatest deployment since 2016. **Florida** (1.8 GW_{AC}), **Ohio** (0.9 GW_{AC}), and **Wisconsin** (0.8 GW_{AC}) scored 3rd to 5th place.

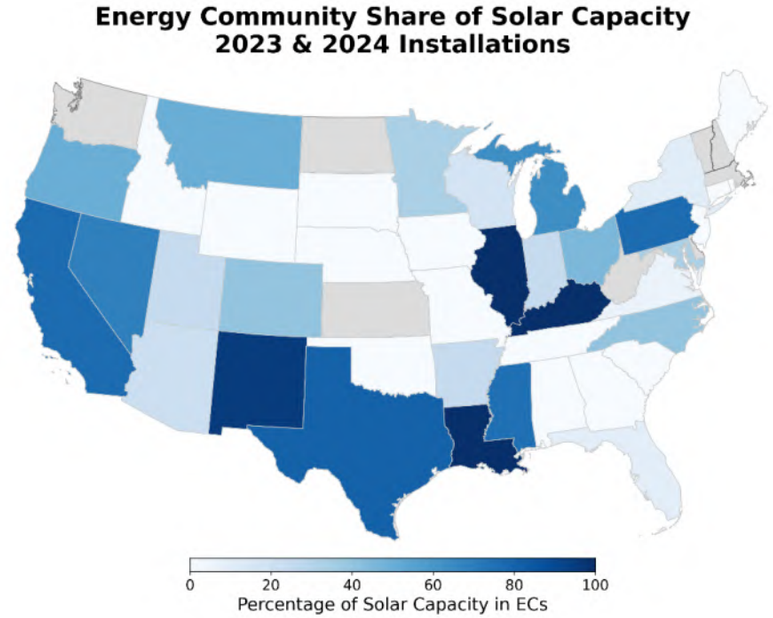
In cumulative deployment, ERCOT (15 GW_{AC}) is still lagging CAISO (19 GW_{AC}), and the non-ISO Southeast (17 GW_{AC}) although the gap is narrowing.

Half of new solar capacity is built in Energy Communities



The Inflation Reduction Act offers a tax credit adder for new solar projects located in "**Energy Communities**", which are areas with:

- Employment or tax revenue from coal, oil, natural gas and greater unemployment than national mean
- A closed coal mine or coal power plant
- Contaminated properties (brownfields)

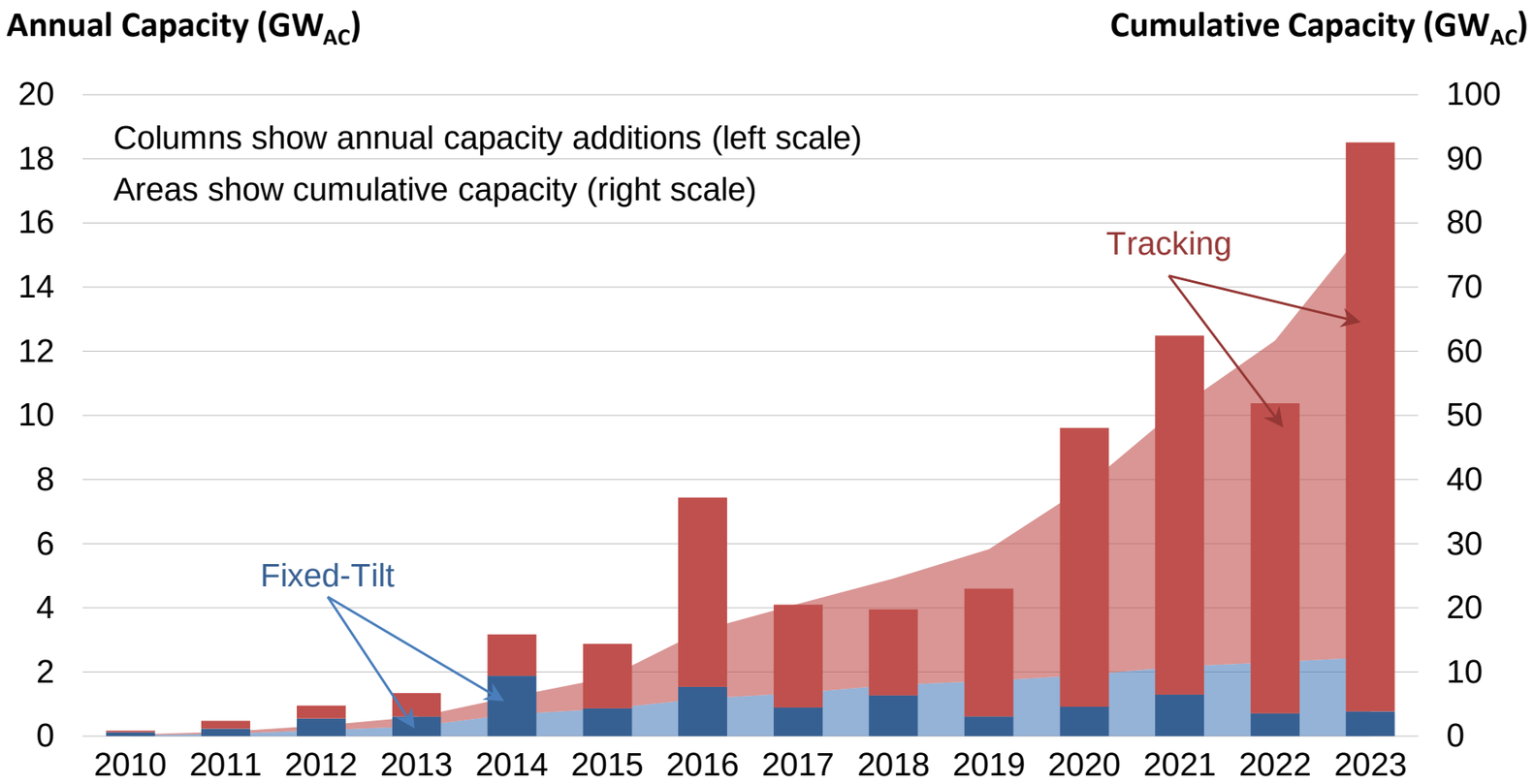


New projects built since the passing of the IRA may not yet have been intentionally sited to capture the bonus (interconnection processes take several years). Nearly half of the new solar capacity built since 2022 is located in areas qualifying as Energy Communities.

Note: Some solar projects developed on brownfield sites may not be accurately classified as part of an Energy Community due to data availability issues. *H1 2024 data is preliminary from EIA 860M.

Projects with tracking technology dominated 2023 additions

PV project population: 1,504 projects totaling 80.2 GW_{AC}



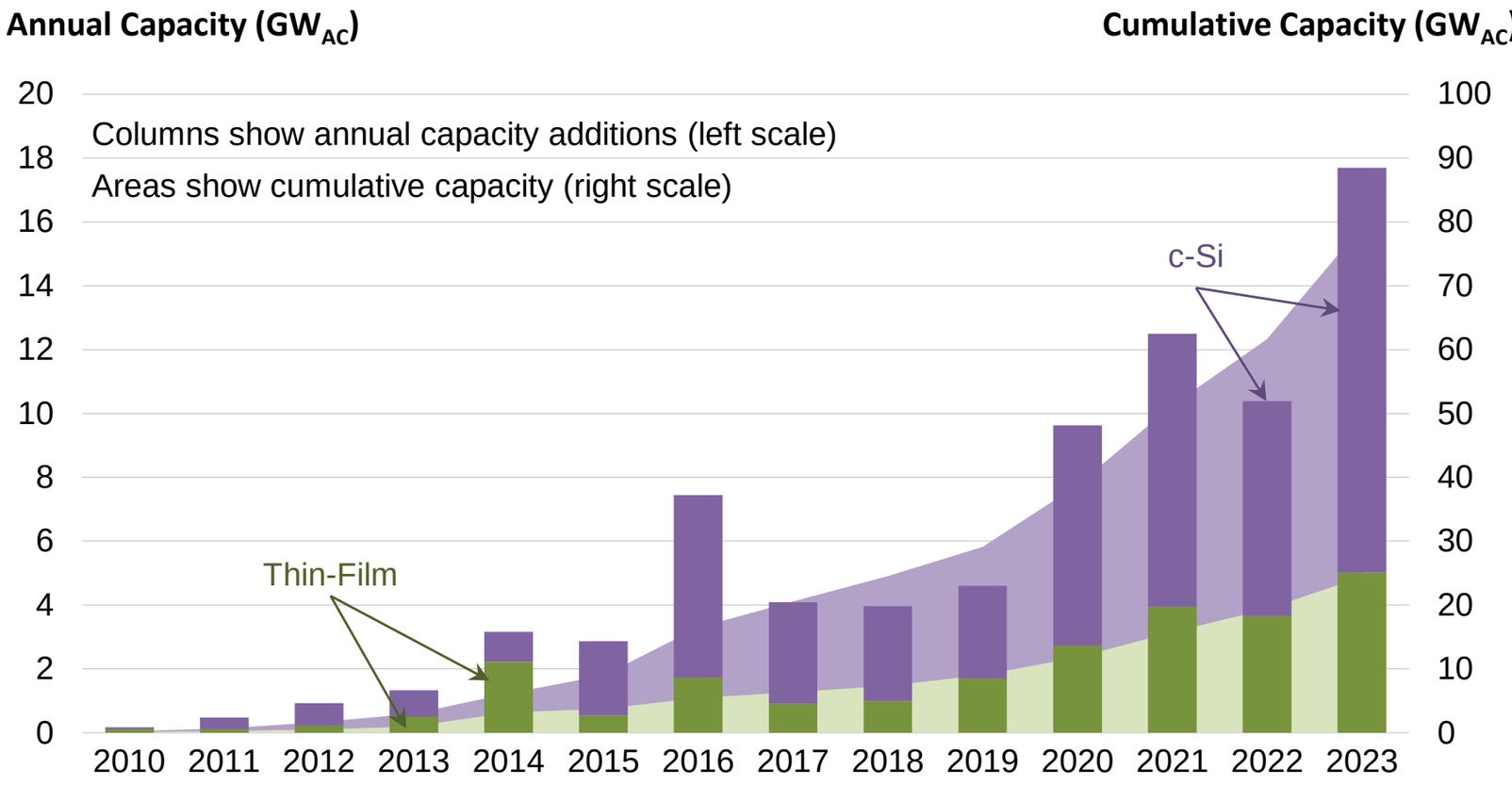
Projects using single-axis **tracking** have consistently exceeded **fixed-tilt** installations since 2015, and dominated again in 2023, with 96% of all new capacity using tracking—the greatest ever.

Upfront cost premiums for trackers have generally fallen over the years, resulting in favorable economics in most of the United States thanks to increased generation (though 2023 saw again an uptick in cost premiums—discussed later).

You can explore this data interactively at https://emp.lbl.gov/technology-trends

Use of c-Si modules grew again in 2023

PV project population: 1,494 projects totaling 79.3 GW_{AC}



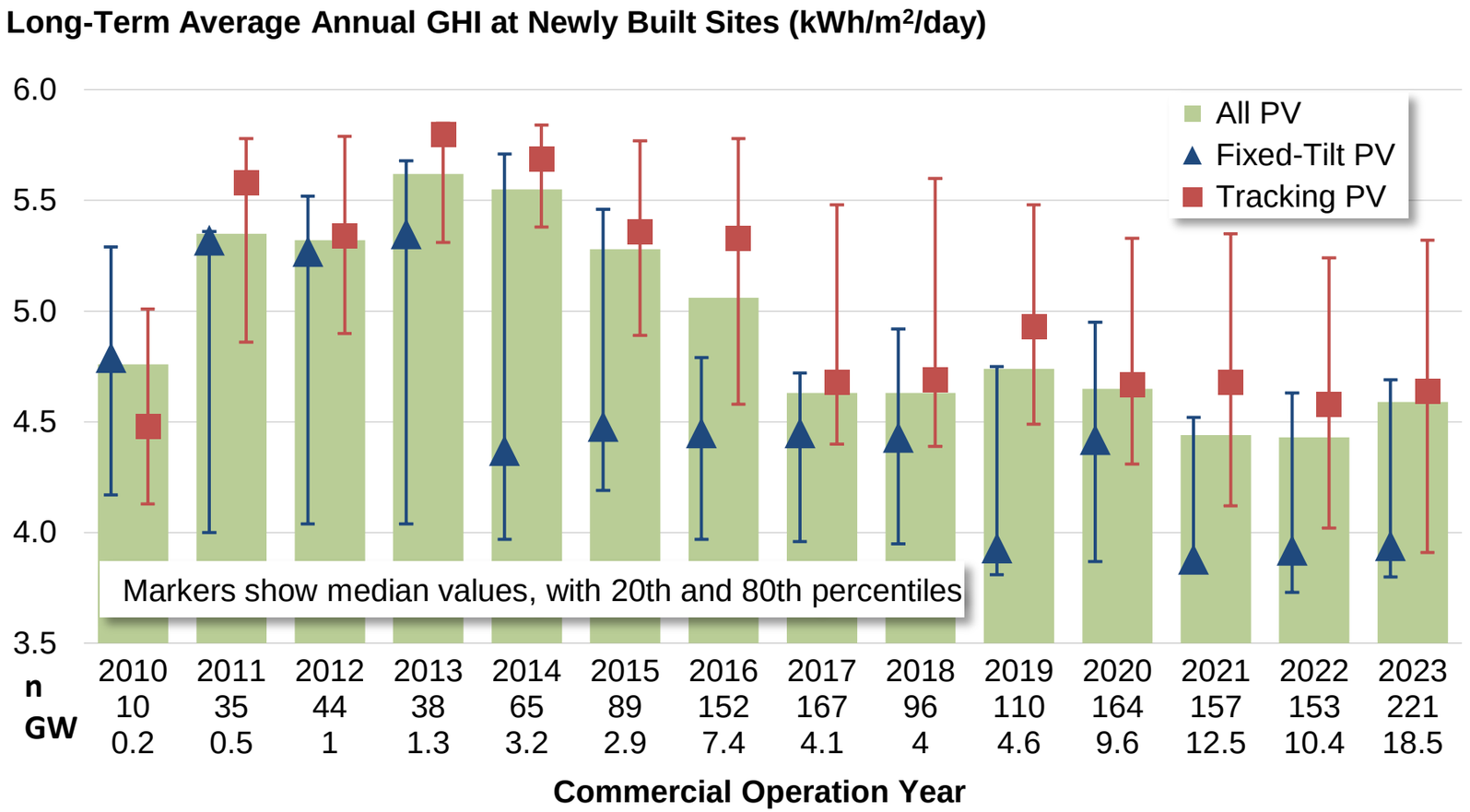
Note: The 2023 sample includes 6 projects (0.8GW_{AC}) without conclusive module type data which are excluded from the graph above

c-Si modules have been the dominant module technology at large-scale solar projects in the US since 2015. After a temporary decline in relative growth in 2022, c-Si modules expanded their market share again in 2023 to 72% of newly installed capacity.

Thin-film modules grew in popularity between 2018 and 2021 as they were not subject to Section 201 import tariffs. In 2023 they reached a new record annual deployment of 5 GW_{AC}.

Solar projects built were built in very solar rich areas in the early 2010s. Project locations and associated resource quality have become much more diverse since then.

PV project population: 1,506 projects totaling 80.2 GW_{AC}



The average long-term global horizontal irradiance (**GHI**) at newly built sites declined from 2013 through 2017 as the market expanded to less-sunny states. This metric rebounded slightly in 2023 to 4.59 kWh/m²/day.

Fixed-tilt PV is increasingly relegated to lower-insolation sites, while **tracking** PV is increasingly pushing into those same areas (note the decline in its 20th percentile).

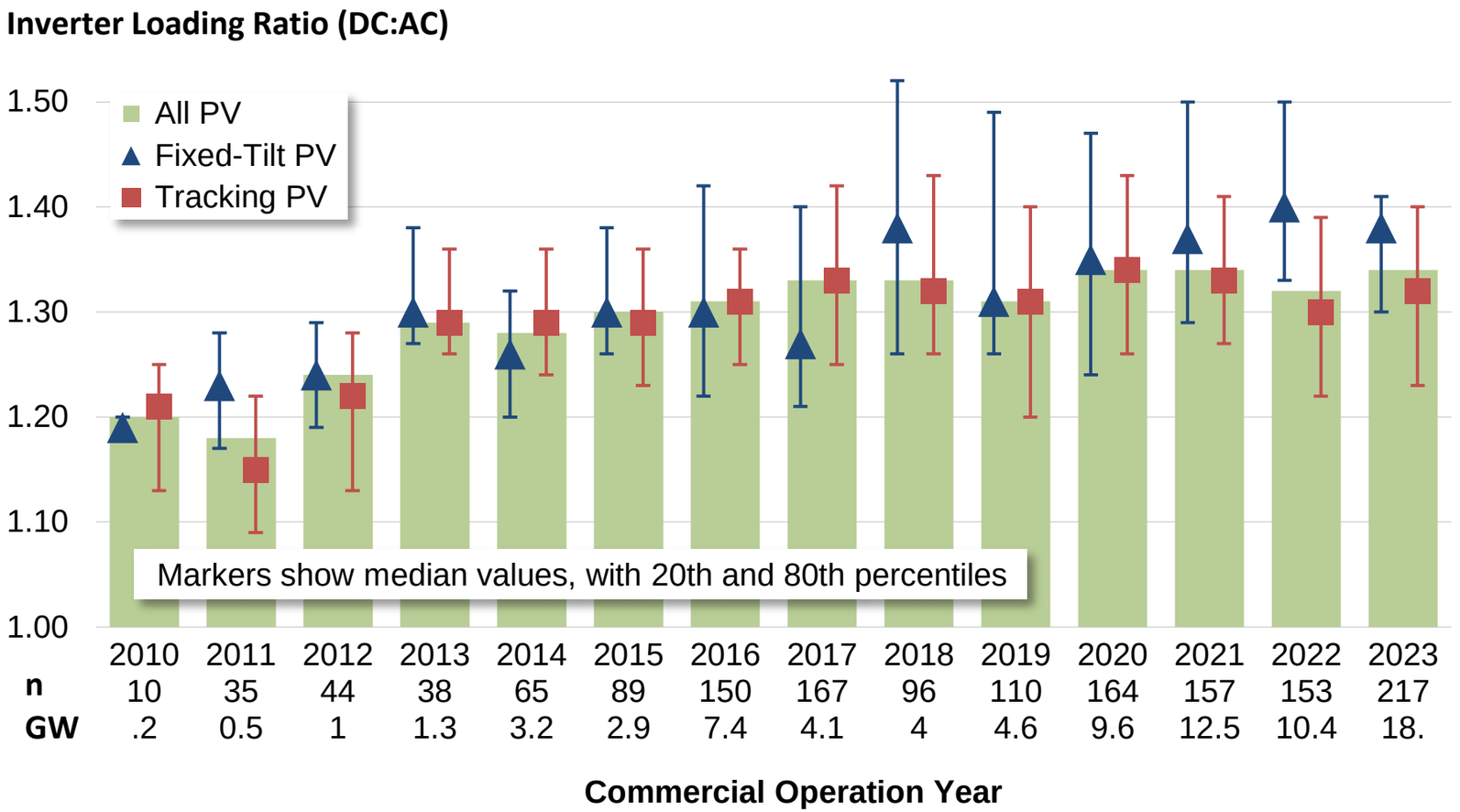
Exceptions are fixed-tilt installations in windy regions (Florida), on brownfields and landfill sites, and on particularly challenging terrain. About 25% of these projects now have a south-western orientation to maximize evening production.

All else equal, the buildout of lower-GHI sites dampens sample-wide capacity factors (reported later).

Note: We use NREL's NSRDB to estimate long-term solar resource quality for each new USS project. Bars are sample-wide medians, markers show distribution for fixed-tilt and tracking projects.

The median inverter loading ratio (ILR) is higher for fixed-tilt projects than tracking projects

PV project population: 1,500 projects totaling 79.6 GW_{AC}



As module prices have fallen (faster than inverter prices), developers have oversized the DC array capacity relative to the AC inverter capacity to enhance revenue and reduce output variability.

In 2023, the median inverter loading ratio (**ILR:** MW_{DC} to MW_{AC} ratio) was 1.34, and was higher for fixed-tilt installations (1.38) than for tracking projects (1.32).

All else equal, a higher ILR should boost capacity factors (denominated in AC terms and discussed later in the report).

Capital Costs (CapEx) and Operation & Maintenance (O&M) Costs

Capital and Operation & Maintenance Costs: data and methodology

CapEx Data:

- Project-level capital expenditure (CapEx) estimates are sourced from a combination of Form EIA-860, Section 1603 grant data from the U.S. Treasury, FERC Form 1, data from applicable state rebate and incentive programs, state regulatory filings, company financial filings, interviews with developers and owners, trade press articles, and data previously gathered by NREL.
- CapEx estimates for projects built from 2013-2022 have been cross-checked against confidential EIA-860 data obtained under a non-disclosure agreement. The close agreement between the confidential EIA data and our other sources in most cases provides comfort that our data collection process yield reputable CapEx estimates.

CapEx Methods:

- We present data in $/$W_{AC}$ terms to facilitate cost comparison between generators of multiple fuel types. The accompanying data file on our project website also provides detailed data in $/$W_{DC}$ terms.
- We define cost scope in close alignment with EIA's 860 Schedule 5B (p29) to include:
  - construction costs (civil and structural costs, equipment and installation, electrical and instrumentation, indirect costs (incl. overhead and profits) and owner costs (incl. tie-in and potential transmission network upgrades)). For a detailed analysis of interconnection costs of utility-scale solar see https://emp.lbl.gov/interconnection_costs.
  - construction finance costs.

O&M Data:

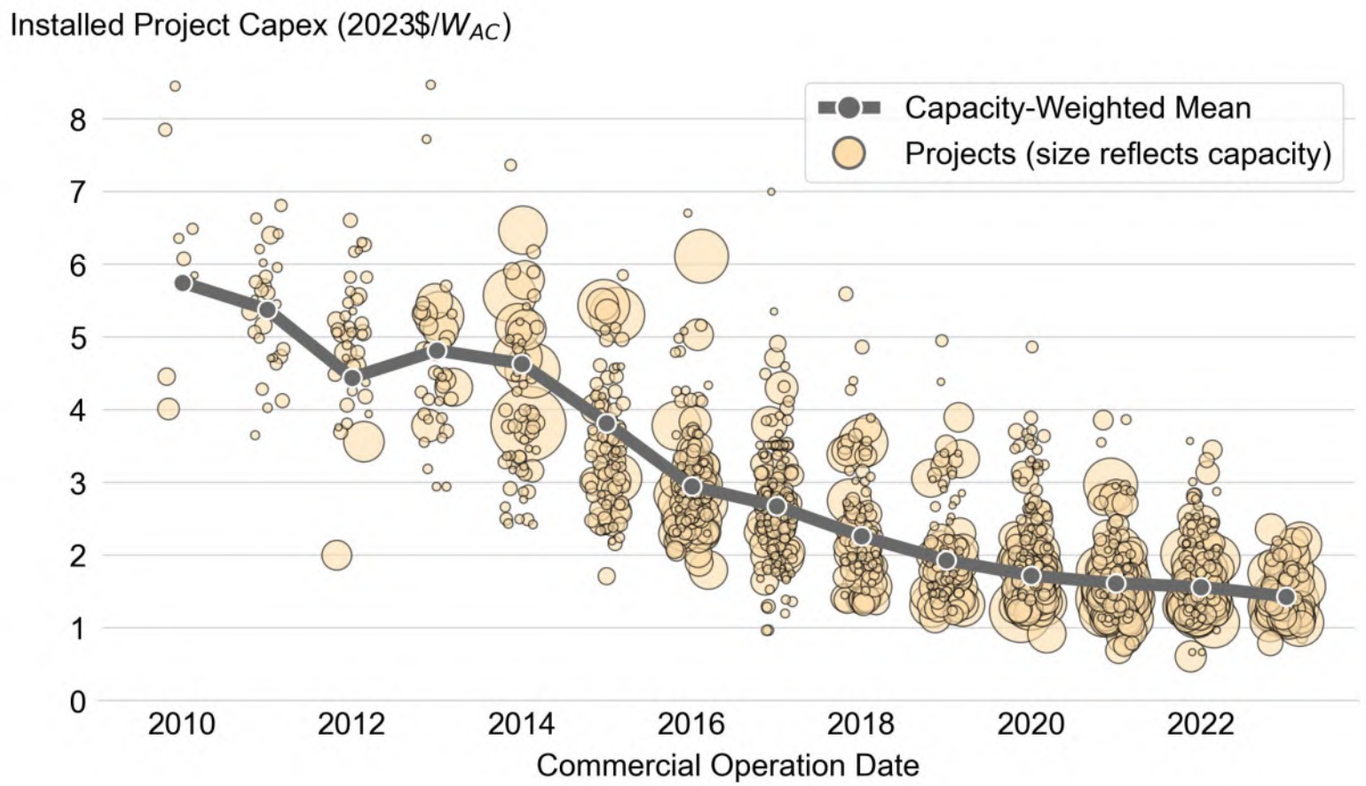
- Plant-level operation and maintenance costs, capacity, net generation, and construction year are sourced from FERC Form 1 Annual Reports, which are filed by major electric utilities.

O&M Methods:

- We exclude O&M cost observations from the year a plant was constructed to avoid data based on a partial year of operations.
- We also exclude projects ≤5 MW in size, consistent with our definition of utility-scale.
- We present data for combined operations and maintenance costs in $/kW$_{AC}$ (capacity denomination) and $/MWh (generation denomination) terms.

Installed costs of PV have fallen by 8% since 2022, to $1.43/$W_{AC}$ ($1.08/$W_{DC}$) in 2023

Sample: 1,279 projects totaling 66.5 GW_{AC}



Note: The 2023 sample does not yet include data contributions from EIA 860, cost findings may thus be revised as higher quality data will become available.

Since 2010, costs for installed utility-scale PV have fallen by 75% (or 10% annually):

- **Capacity-weighted means** (reflecting the average costs of solar capacity) decreased in real terms from $1.56/$W_{AC}$ in 2022 to $1.43/$W_{AC}$ in 2023.
- **Medians** (reflecting typical project costs) decreased from $1.61/$W_{AC}$ in 2022 to $1.33/$W_{AC}$ in 2023.

Despite strong inflationary pressures, we have not observed cost increases in real dollar terms in recent years, unlike some other industry observers.

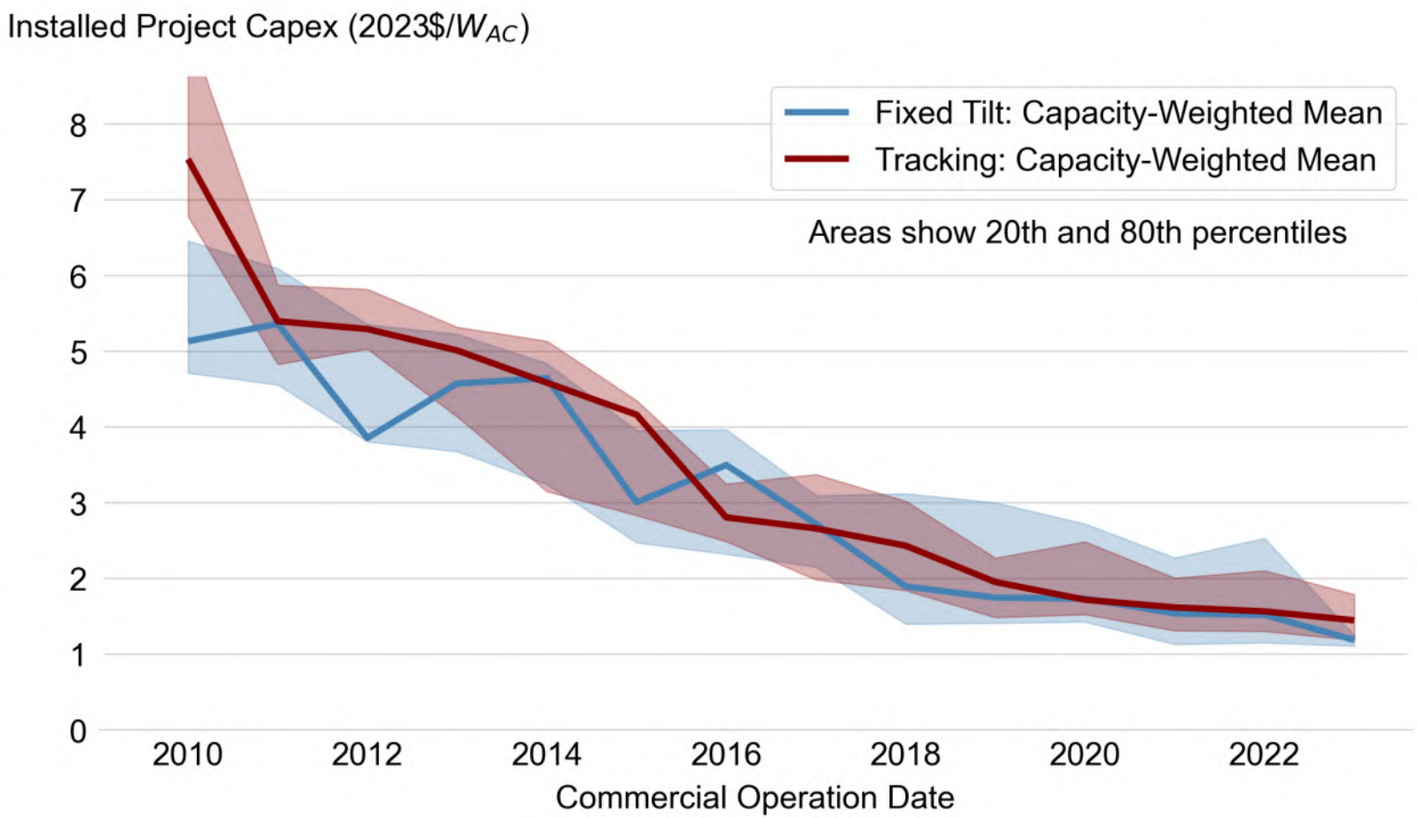
The lowest 20th percentile of project costs fell in real terms from $1.3/$W_{AC}$ ($1.0/$W_{DC}$) in 2022 to $1.2/$W_{AC}$ ($0.9/$W_{DC}$) in 2023.

Historical sample is robust (covering 96% of installed capacity through 2022). 2023 data covers 34% of new projects (75) or 37% of new capacity (6.9 GW_{AC}).

Detailed statistics in $/$W_{DC}$ are shown in the accompanying data workbook.

Tracking projects cost $0.2/W more than fixed-tilt projects on average

Sample: 1,279 projects totaling 66.5 GW_{AC}



We focus here on cost differences between projects using tracking and fixed-tilt mounting. The graph shows capacity-weigthed average costs by mounting type across our sample but does not control for other factors that influence total project costs (equipment, labor, land, grid interconnection, project size…).

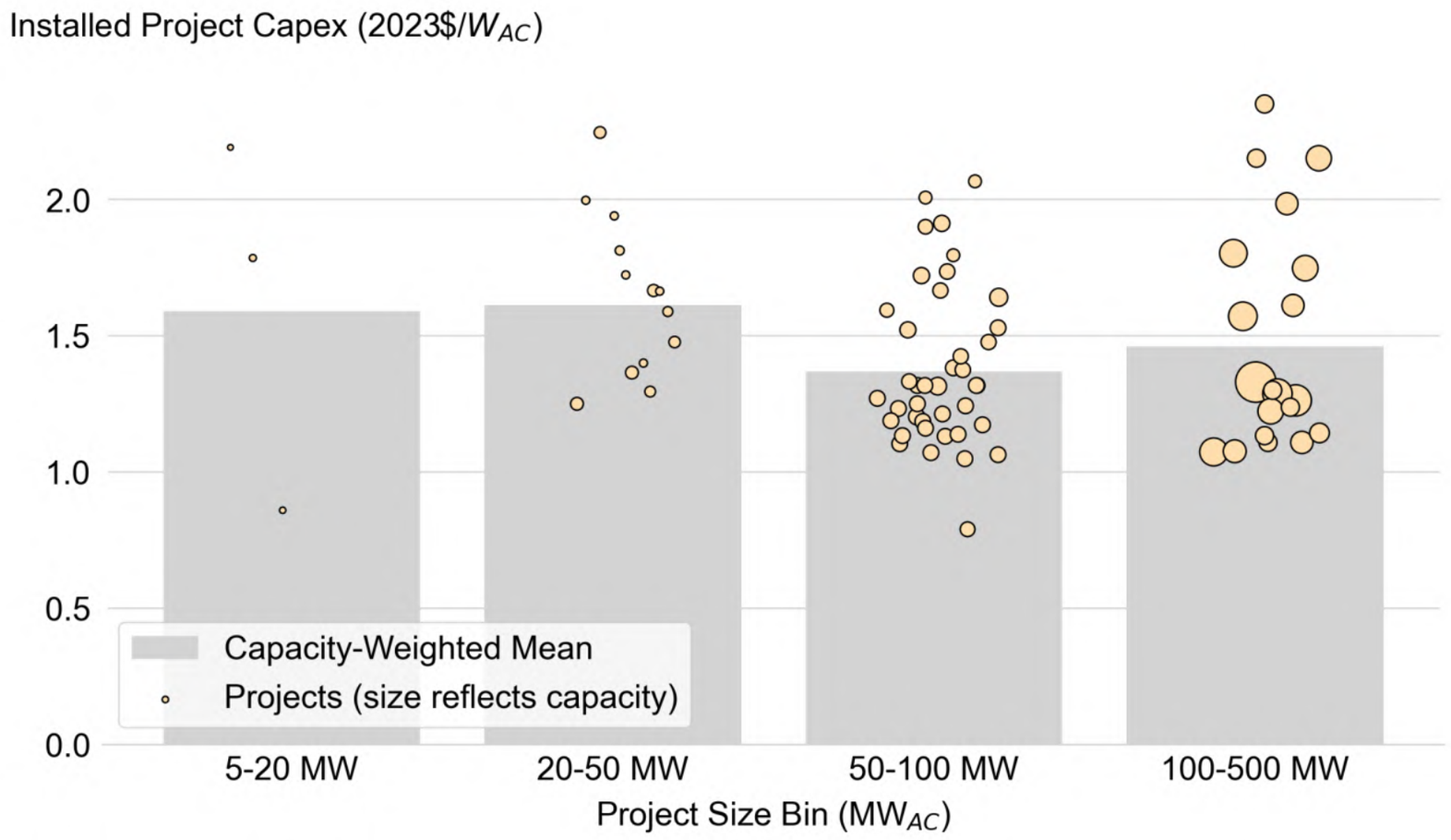
Trackers can sustain some higher upfront costs because they deliver more energy per installed capacity.

Over time tracking projects have often been more expensive, at least on average across our sample, but the cost premium has fluctuated and at times even reversed (like in 2016).

Beginning in 2020, tracker installations boomed. By 2023, 96% of all new capacity used trackers, and tracking projects ($1.4/$W_{AC}$ or $1.1/$W_{DC}$) were slightly more expensive than fixed-tilt projects ($1.2/$W_{AC}$ or $0.9/$W_{DC}$).

Larger solar projects (>50 MW) cost 13% less than smaller (5-50 MW) per MW of installed capacity in 2023

Sample in 2023: 76 projects totaling 7.1 GW_{AC}



Differences in project size could potentially explain cost variation—we focus only on 2023 for this slide.

Cost savings seem to occur especially in projects larger than 50 MW_{AC} at ~\$1.4/W_{AC} vs. \$1.6/W_{AC} for smaller projects.

In \$/W_{DC} terms, prices seem to decline especially among the largest projects:

- \$1.28/W_{DC} for 5-20 MW
- \$1.23/W_{DC} for 20-50 MW
- \$1.18/W_{DC} for 50-100 MW
- \$1.05/W_{DC} for 100-700 MW

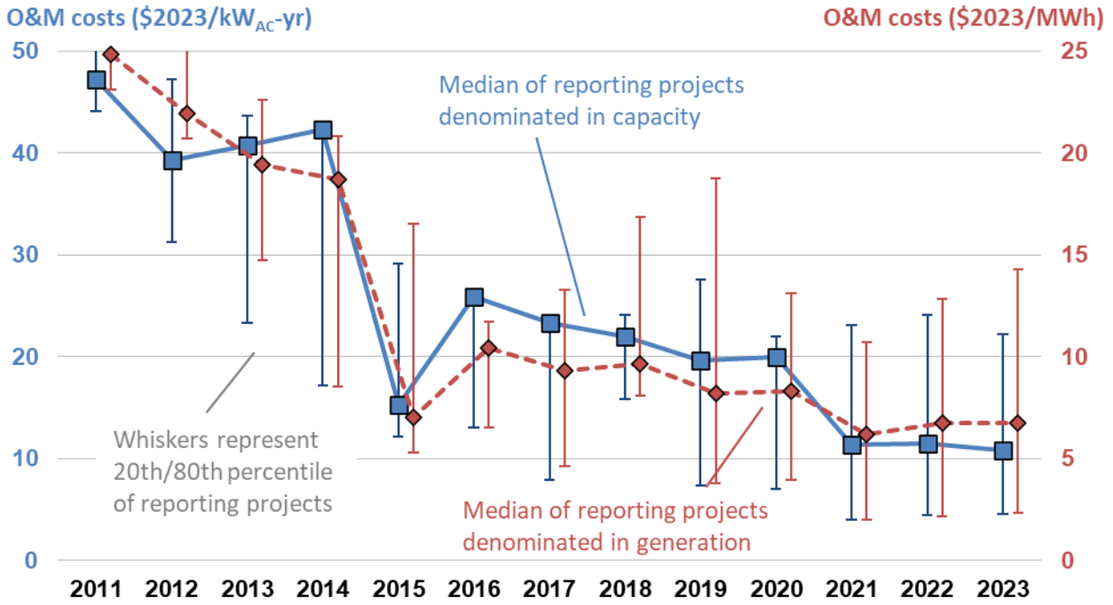
Operation and maintenance (O&M) costs have decreased by 73% since 2012, but remained flat the past 3 years

PV project population in 2023: 145 projects totaling 7.4 GW_{AC}

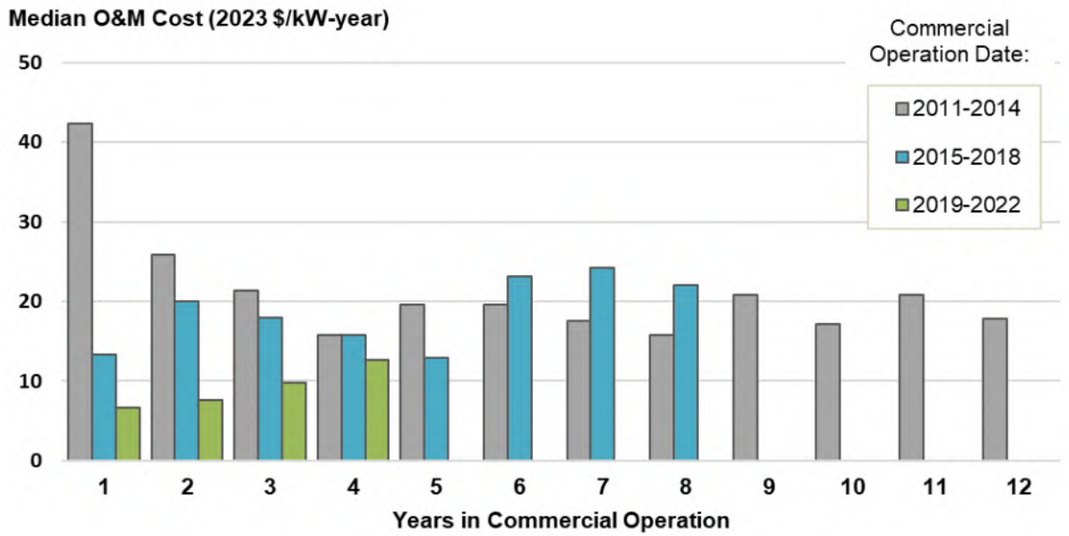
Regulated utilities report solar O&M costs for plants that they own, representing a mix of technologies and at least one full operational year.

These O&M costs are only one part of total operating expenses.

Cost Scope (per guidelines for FERC Form 1):
- **Includes** supervision and engineering, maintenance, rents, and training
- **Excludes** payments for property taxes, insurance, land royalties, performance bonds, various administrative and other fees, and overhead



Median O&M costs for the cumulative sample have declined from about \$39/kW_{AC}-year or \$22/MWh in 2012 to about **\$11/kW_{AC}-year or \$7/MWh in 2023**.



Projects built since 2019 report much lower O&M costs in their first three years of operation compared to older ones, potentially due to a narrower scope of service agreements. Starting in year 6 of a project's life there does not appear to be a sustained upward or downward trend in O&M costs.

Note: Detailed project-level data are shown in the accompanying data workbook.

Performance (Capacity Factors)

PV performance analysis: data and methodology

Net generation data are sourced largely from EIA Form 923. These data reflect net generation and thus exclude energy used by the plant itself. They also exclude energy that was curtailed (for economic or system stability reasons). Outliers and low-quality data are dropped from the analysis. We exclude observations from the first calendar year of the plant's operation.

Net Capacity Factors (AC) measure a plant's performance, representing the ratio of its actual annual generation delivered to the grid to the maximum possible annual output if it operated continuously every hour of the year.

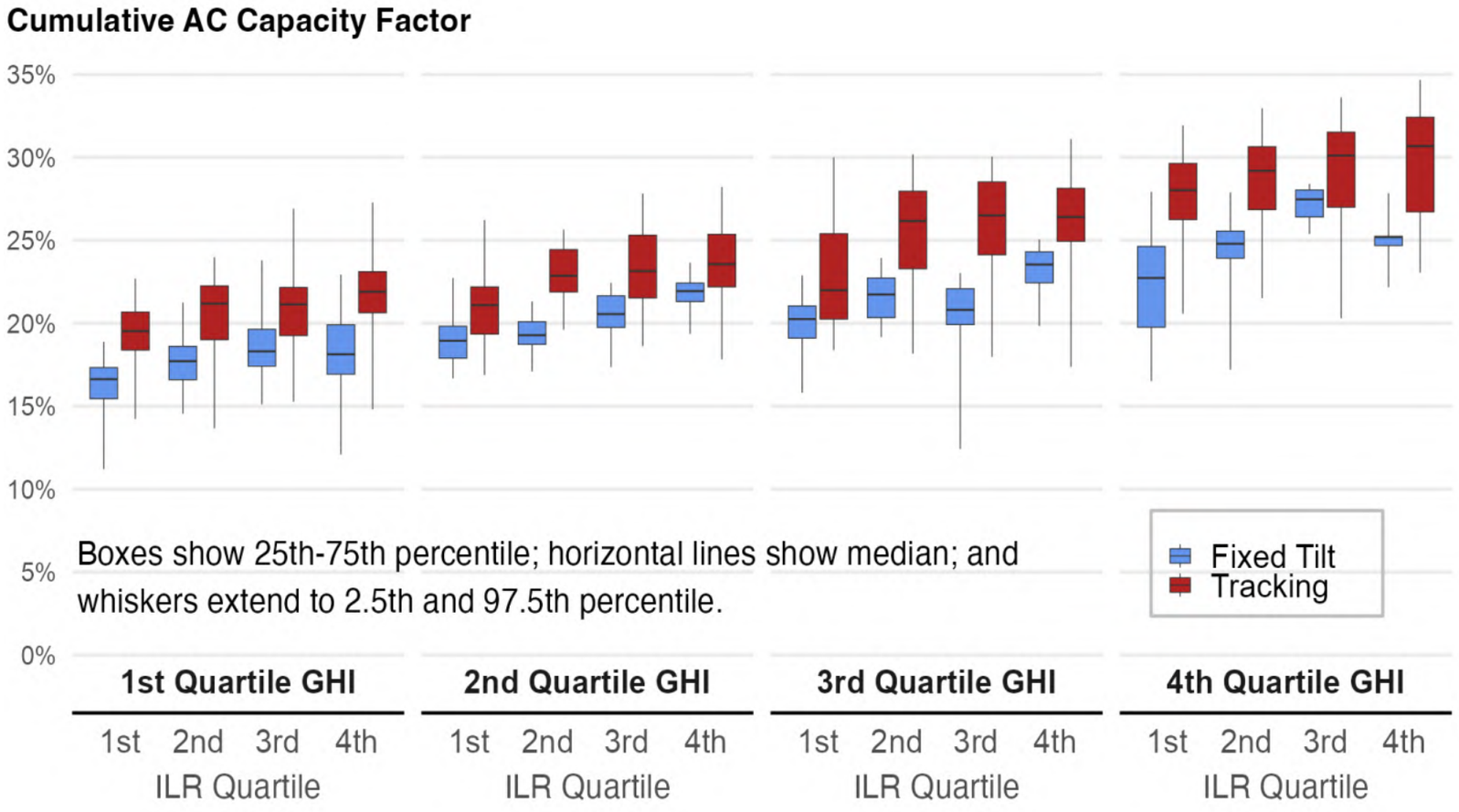
$$Annual\ Net\ Capacity\ Factor = \frac{Annual\ Net\ Generation\ (MWh)}{Capacity\ (MW_{AC}) * number\ of\ hours\ in\ year}$$

We use MW_{AC} capacity terms in our capacity factor calculations to facilitate comparisons with other bulk system generator types.

Annual generation can vary based on weather and climate variability, system degradation, system uptime, or curtailment. We thus present primarily **cumulative net capacity factors**, which represent the average capacity factor over the lifetime of a project up until the most recent reported period (i.e., no future modeled generation data).

PV performance varies widely among projects, driven by resource availability and project design choices

Sample: 1,253 plants totaling 61.4 GW_{AC}



The cumulative net capacity factor is typically around 24% but ranges from 7% to 35% among all projects in our sample.

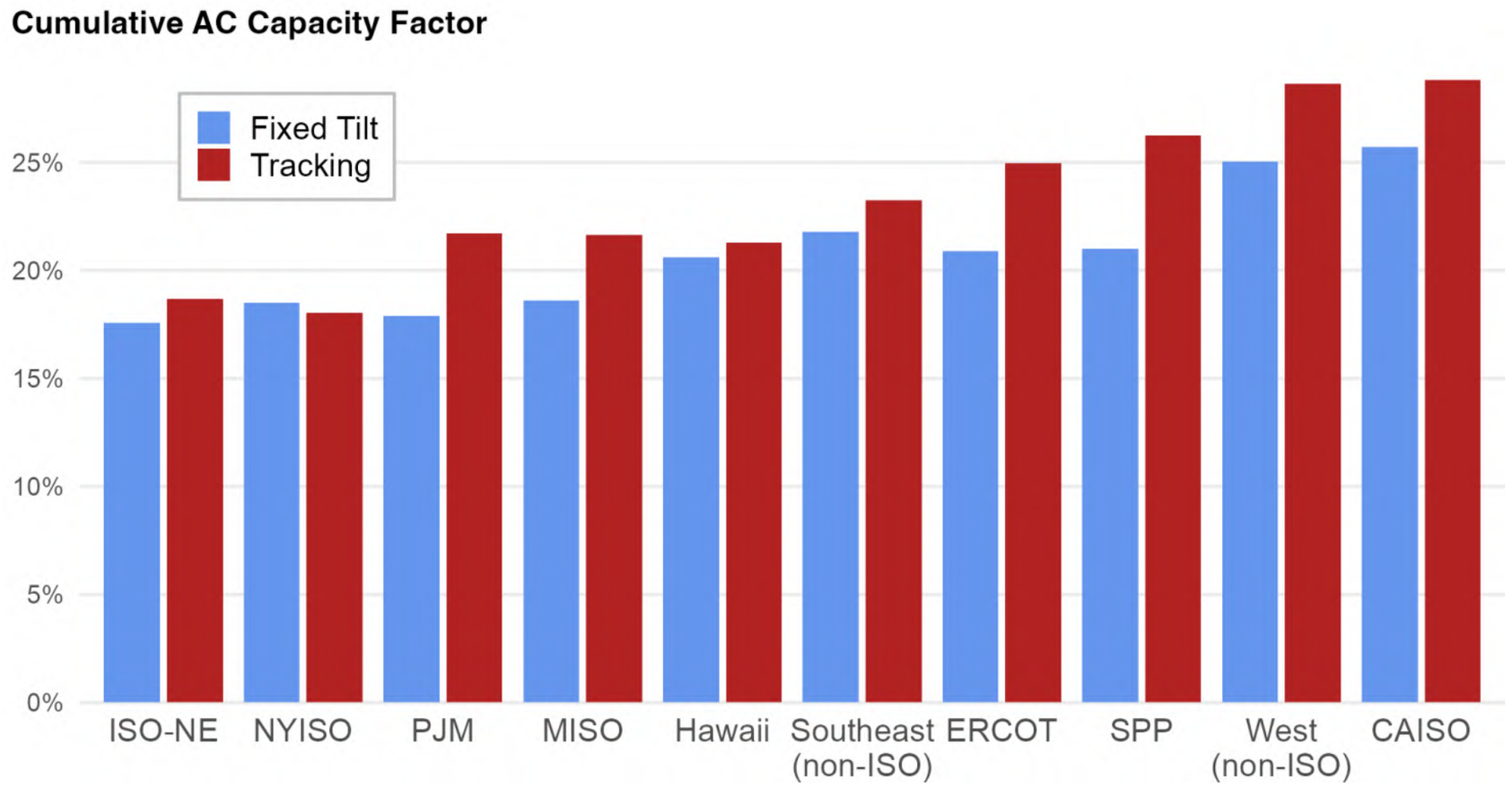
Project-level variation in PV capacity factor is driven by:

- **Solar Resource (GHI)**: Strongest solar resource quartile has ~9 percentage point higher capacity factor than lowest resource quartile
- **Tracking**: Adds ~4 percentage points to capacity factor on average, with improvement from tracking more pronounced in higher solar resource areas
- **Inverter Loading Ratio (ILR)**: Highest ILR quartiles have on average ~2 percentage point higher capacity factors than lowest ILR quartiles

You can explore this data interactively at https://emp.lbl.gov/pv-capacity-factors

Tracking boosts capacity factors by roughly 5 percentage points in high-insolation regions

Sample: 1,253 plants totaling 61.4 GW_{AC}



Notes: The NYISO tracking sample comprises just projects, possibly driving unexpected results.
Capacity factors represent weighted means by capacity (MW_{AC}).

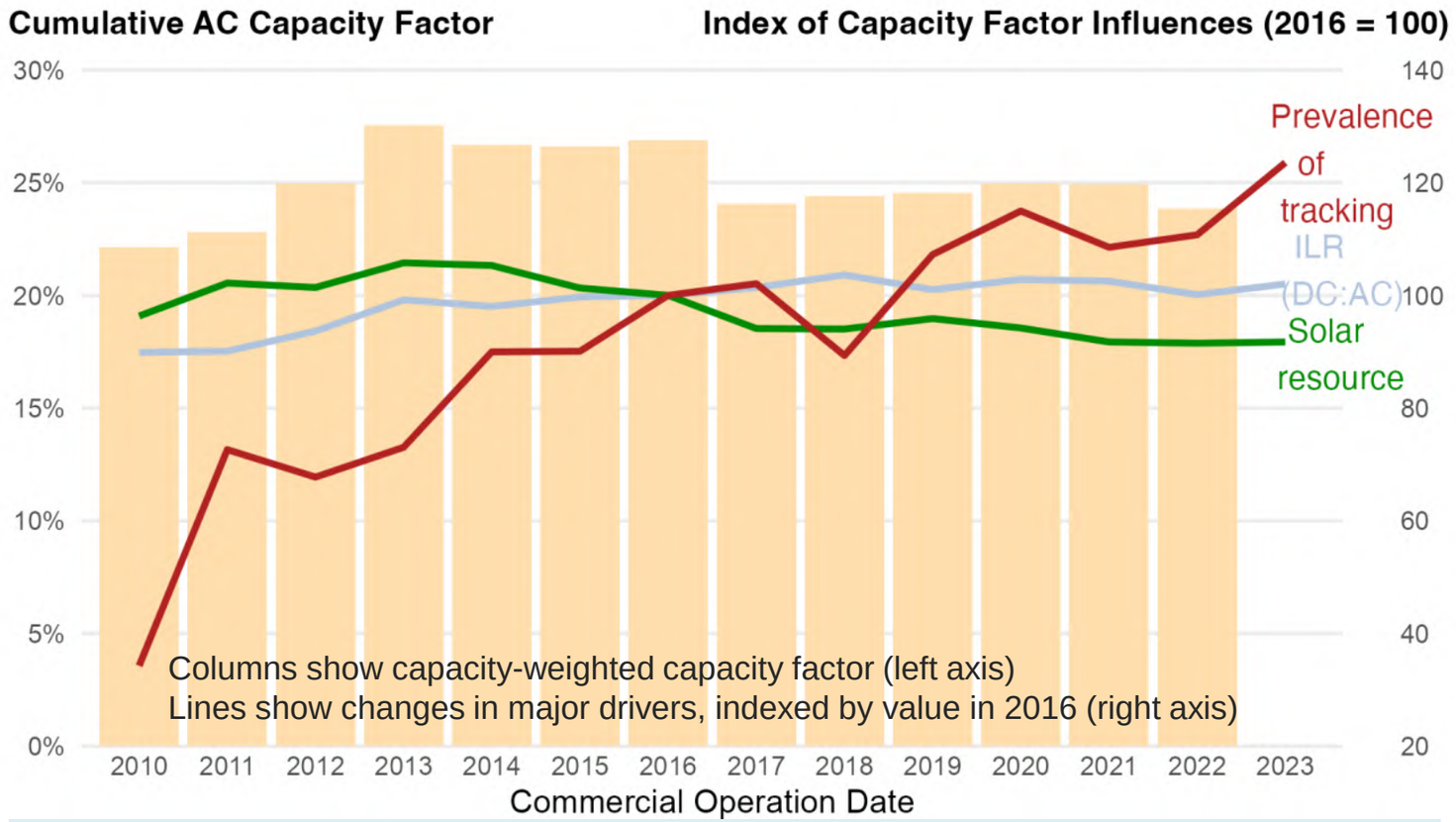
Not surprisingly, capacity factors are highest in California and the non-ISO West, and lowest in the Northeast (ISO-NE and NYISO).

Tracking yields more benefits compared with fixed-tilt installations in regions with strong solar resources, leading to a greater proportion of tracking projects in those regions.

You can explore this data interactively at https://emp.lbl.gov/pv-capacity-factors

Since 2013, competing drivers have caused average capacity factors by plant vintage to stabilize

Sample: 1,253 plants totaling 61.4 GW_{AC}



Flat trend since 2014 is not necessarily negative, but rather a sign of a market that is expanding geographically into less-sunny regions

Cumulative capacity-weighted capacity factors improved for projects from 2010 to 2013 due to increased DC-oversizing, adoption of single-axis tracking, and better solar resources.

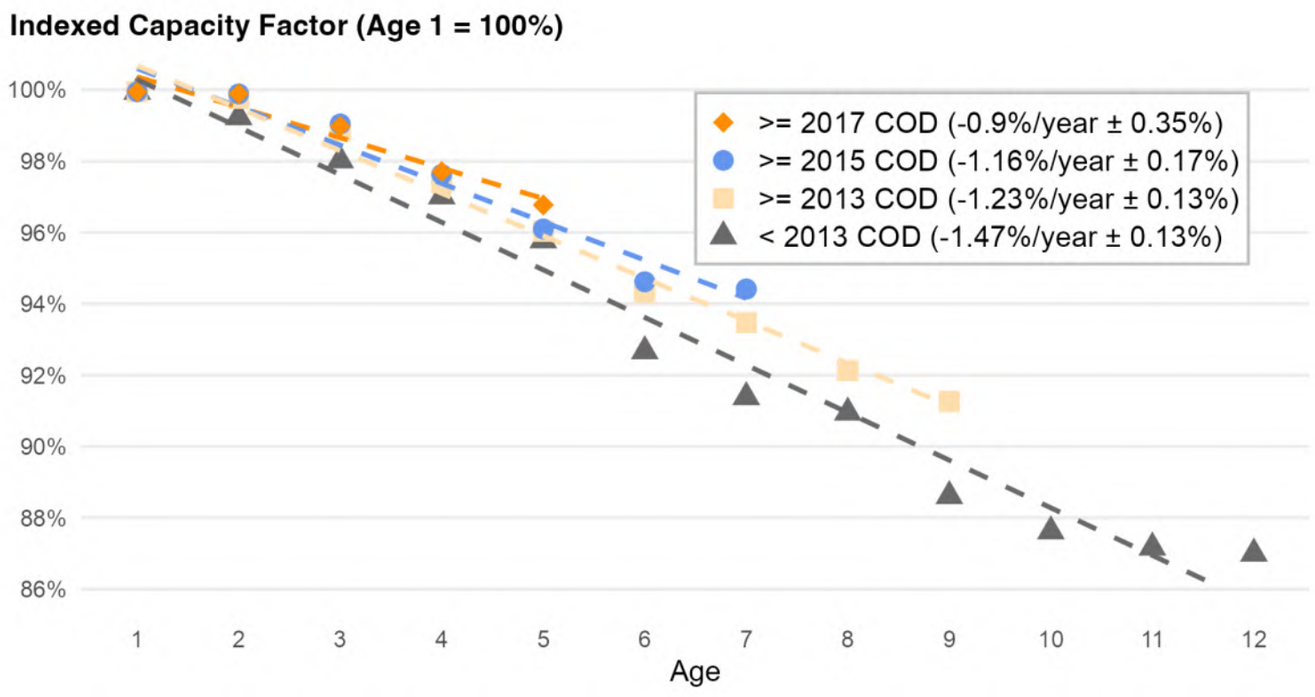
Since 2013, capacity factors have stagnated due to mixed factors: while tracking has become widespread (50% to 90%) and ILR has seen minor growth, new projects have expanded into less sunny regions (average GHI decreased from 5.30 to 4.32 kWh/m²/day).

In our latest cohort (145 projects, 2022 vintage), annual output declined by 1% (absolute) or 4% (relative) compared to 2021 projects. Key drivers remained stable, and irradiance-based modeling even suggested a slight performance increase. We will continue monitoring potential performance issues as more data emerges.

You can explore this data interactively at https://emp.lbl.gov/pv-capacity-factors

Plant output declines with age, but the performance of newer projects has fallen at a slower rate compared to older projects

Sample: 905 plants totaling 37.4 GW_{AC}



Note: Sample includes plants built through 2020 (model requires two years of performance with weather data available through 2022). All four slopes are statistically significant, but commercial operation date (COD) ≥ 2015 is not statistically different from COD ≥ 2013 or ≥ 2017.

Annual system-level performance degradation varies by cohort, with newer plants degrading 0.9% per year compared to 1.47% for older plants.

Fixed effects regression model defined by:

$$CF_{f,t}^{\ actual} = CF_{f,t}^{\ ideal} + S_f + A_T + \epsilon_{f,t}$$

where:

$CF_{f,t}^{\ actual}$ = Actual capacity factor of plant f at time t (raw empirical data, but grossed up for curtailment in CAISO and ERCOT)

$CF_{f,t}^{\ ideal}$ = "Ideal" capacity factor of plant f at time t, estimated based on physical plant characteristics and solar resource at the site

S_f = Site-level fixed effects of plant f to control for differences in capacity factor across plants

A_T = Age fixed effects at time t to control for differences in capacity factor within plants

$\epsilon_{f,t}$ = Residual of plant f at time t

Note: For greater detail on methods, see Bolinger et al. (2020) System-level Performance and Degradation of 21 GW_{DC} of Utility-Scale PV Plants in the United States.

Levelized Cost of Energy (LCOE) and Power Purchase Agreement (PPA) Prices

LCOE analysis: data sets and methodology

Methods:

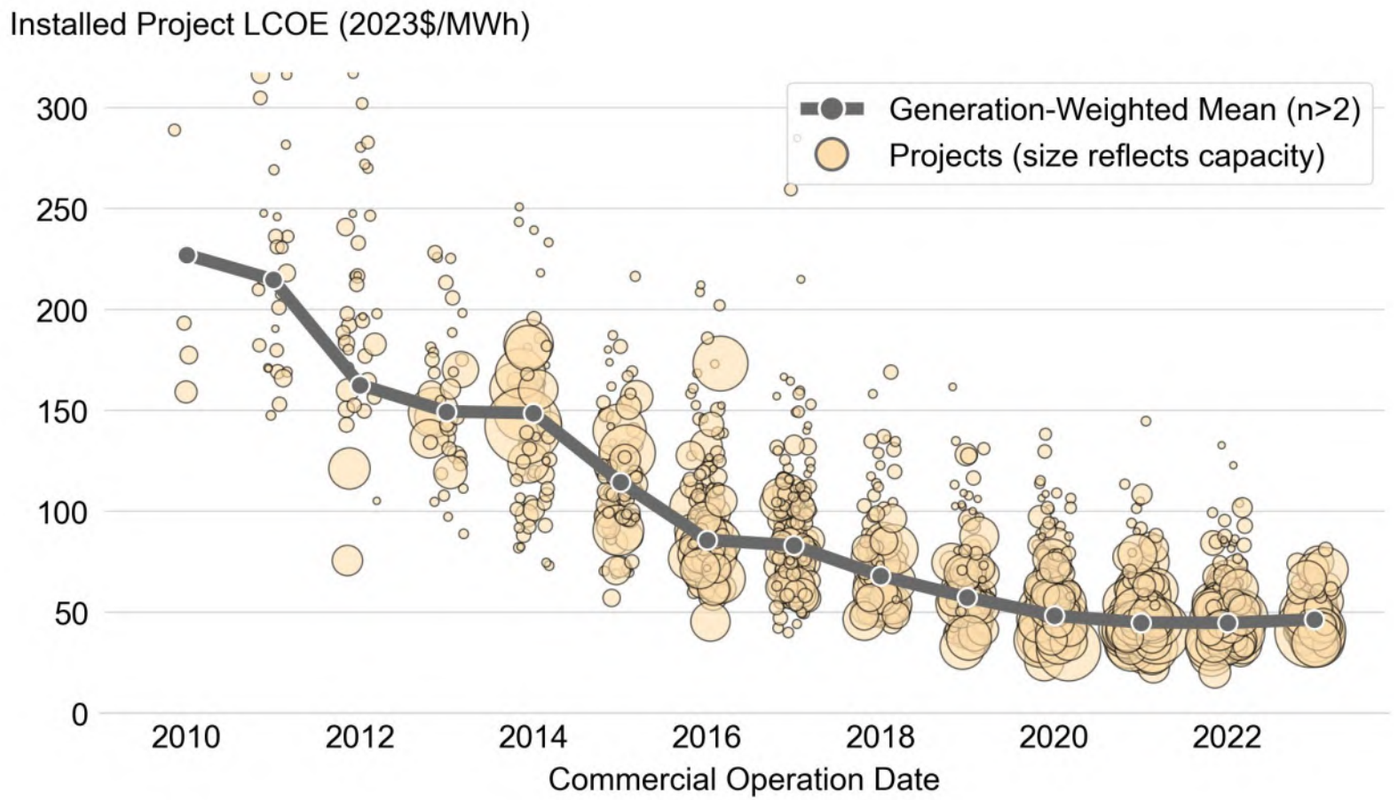
- For our project-level LCOE estimates of solar projects we follow the formula published in NREL's Annual Technology Baseline.
- We use LCOE as proxy for generation costs in later parts of this presentation. It is important to note that additional integration costs (transmission needs beyond what is captured via interconnection costs and LMP congestion components or ancillary service costs) are not fully accounted for here.

Data and Assumptions:

- LCOE will be presented first without and then later with inclusion of federal tax credits (assuming labor requirements for ITC and PTC are met, including Energy Community adders where applicable, but assuming no Domestic Content adders).
- Project-level variation:
  - **Capex:** LCOE is only calculated for projects with empirical cost estimates, only costs of solar components are used for PV-battery projects.
  - **Net Capacity Factor:** We use empirical annual NCF estimates based on EIA 923 data when available. For missing and future years we assume annual degradation rates ranging between 1.47% (pre-2013) and 0.9% (post-2016). For projects without any reported generation (e.g., most recent COD cohort) we use the regional average NCF of recent projects. NCF is levelized over the project design life.
- Cohort-level variation:
  - **OpEx** is levelized and declines from \$41/kW_{DC}-yr in 2007 to \$16/kW_{DC}-yr in 2023 (in 2023\$, based on prior LBNL and NREL Benchmarks)
  - **Project design life** increases from 21.5 years in 2007 to 35 years in 2021 and thereafter (prior LBNL research).
  - **Weighted average cost of capital (WACC):**
    - based on a constant 70%/30% debt/equity ratio and time-varying market rates.
    - Combined income tax rate of 38.25% pre-2018 and 24.95% post-2017.
    - 5-yr MACRS; forward-looking inflation expectations range from -0.2% (early Covid pandemic) to 4.2%.
    - Real WACC for 2023 COD projects is 2.58%.

Average LCOE (without the ITC/PTC) has been largely stable since 2021

Sample: 1,261 projects totaling 66.3 GW_{AC}



Note: LCOE estimates depicted here do not include tax credit benefits.
Only preliminary data is available for new solar projects coming online in 2023.
Findings may shift as more Capex and project-specific performance data become available.

Utility-scale PV's average LCOE has fallen by 80% since 2010, driven by lower capital costs and operating expenses, as well as increased project design life.

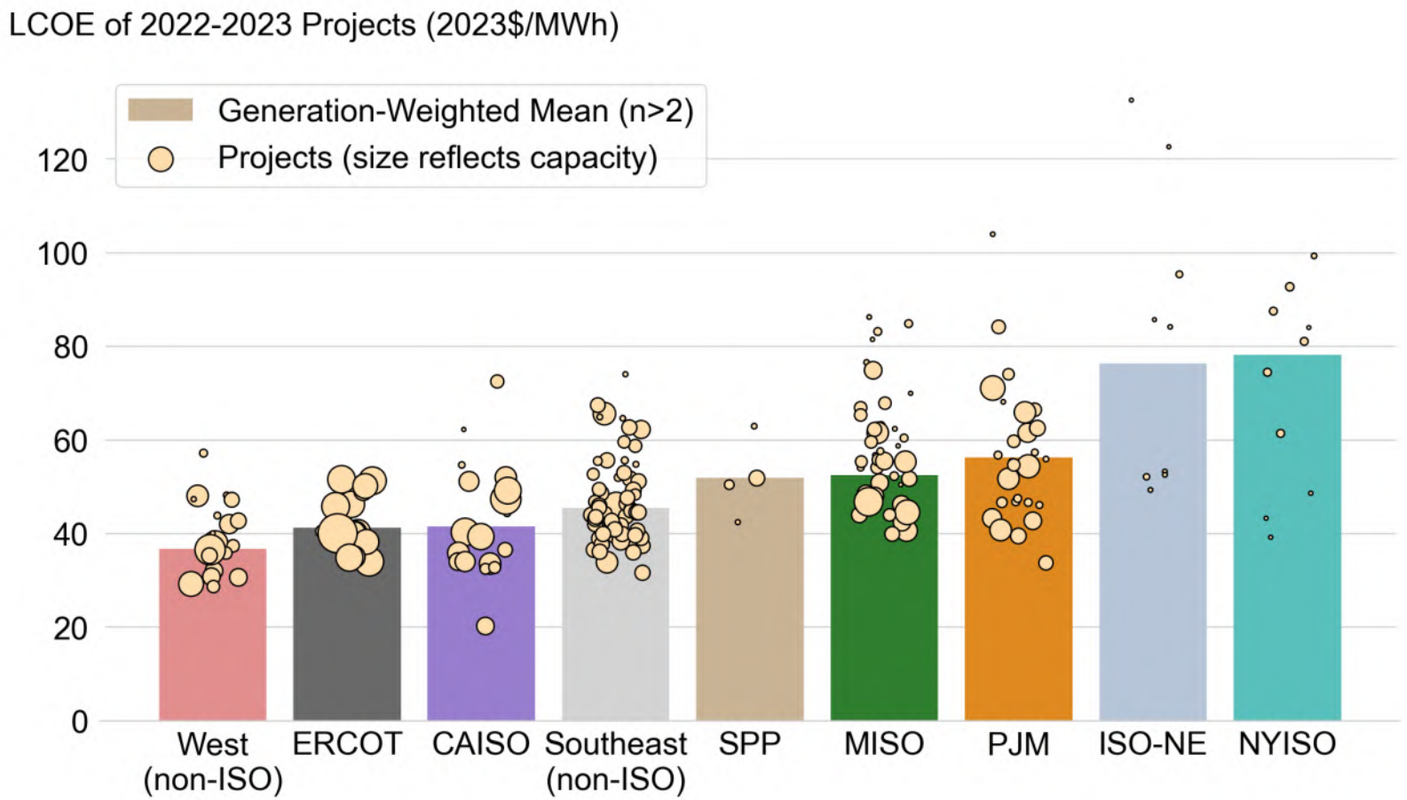
Counteracting these beneficial longer-term trends are falling national average capacity factors since 2016 and less favorable financing terms since 2020.

Average LCOE (not including any tax credits) increased slightly among projects coming online recently, from $45/MWh in 2022 to $46/MWh in 2023.

See interactive visualization at https://emp.lbl.gov/capex-lcoe-and-ppa-prices-region

LCOE varies between regions due to differences in solar resource quality, project costs, and system size

Sample: 214 projects totaling 16.9 GW_{AC}



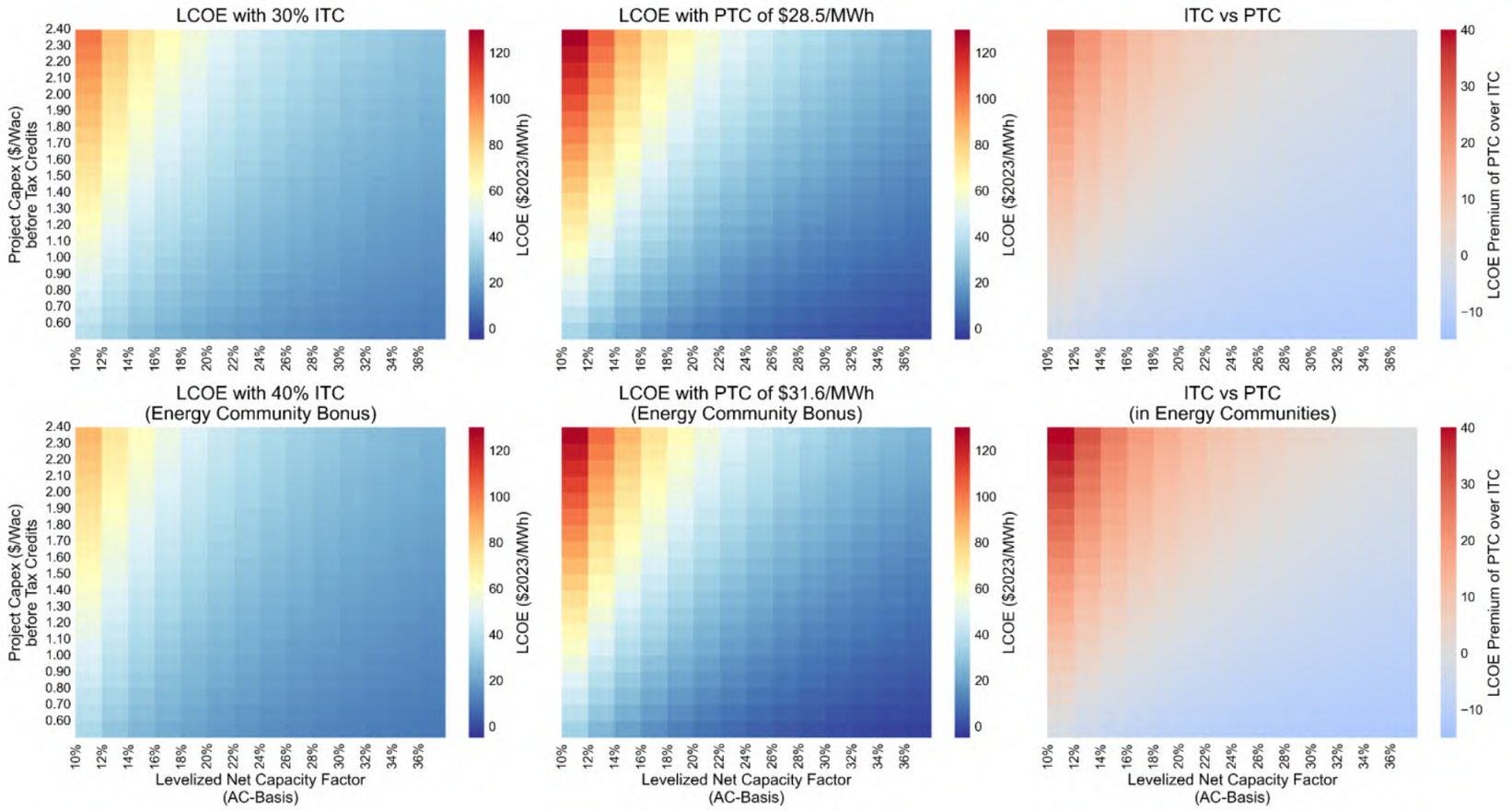
Note: LCOE estimates depicted here do not include tax credit benefits.
Only preliminary data is available for new solar projects coming online in 2023.
Findings may shift as more Capex and project-specific performance data become available.

Lower-insolation regions (ISO-NE, NYISO, PJM, MISO) will always have higher LCOEs than higher-insolation regions (ERCOT, CAISO, the non-ISO West and Southeast), but the difference has narrowed over time.

Among projects coming online in 2022 and 2023, large projects in the non-ISO West, ERCOT, and CAISO had the lowest cost ($37, 41 and $42/MWh), while smaller projects in ISO-NE and NYISO had the highest cost in our sample ($76 and $78/MWh).

See interactive visualization at https://emp.lbl.gov/capex-lcoe-and-ppa-prices-region

Most projects installed in 2023 seem to benefit more from the Production Tax Credit than the Investment Tax Credit



Available federal tax credits lower the effective LCOE shown on the previous slides. The graphs show post-incentive LCOE variation by project capex and performance, both for the Investment Tax Credit (ITC, left) and the new Production Tax Credit (PTC, center). Introduced by the Inflation Reduction Act, the PTC is paid for the first 10 years ($28.5/MWh and rising with inflation) – levelized over a 35-year project lifetime it reduces LCOE by ~$14.5/MWh.

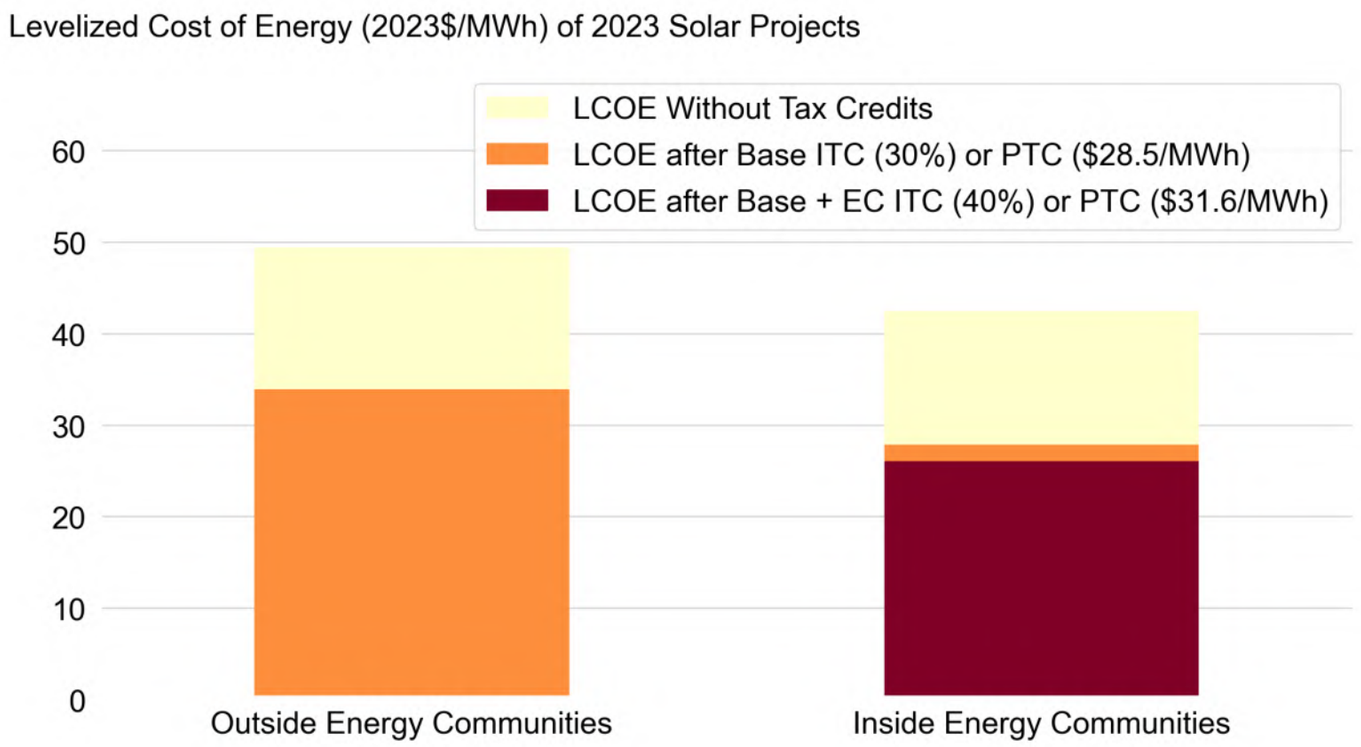
The right column compares the benefit of each tax credit, with red squares showing where the ITC results in a lower LCOE (higher-cost, lower-performing projects) and the blue squares showing where the PTC is preferable (lower-cost, higher-performing projects).

For the 2023 COD cohort, preliminary data indicates that most projects (54 out of 74) would benefit more from the Base PTC than the ITC (although the PTC comes with some challenges such as greater performance risk that we do not account for in this comparison).

The lower column repeats the analyses but includes the bonus adder available for projects sited in Energy Communities (more details on the next slide).

2023 solar projects in Energy Communities have an average after-tax credit LCOE of $26/MWh, compared to $34/MWh in the rest of the country

Sample: 75 projects totaling 7.1 GW_{AC} (23 EC projects, 3.1 GW_{AC})



Note: Only preliminary data is available for new solar projects coming online in 2023. Findings may shift as more Capex and project-specific performance data become available.

About half of all new utility-scale solar capacity in 2023 qualifies for the Energy Community Tax Credit Adder. Not considering potential Domestic Content adders, these project are eligible for a 40% ITC or a $31.6/MWh PTC over the first 10-years ($2023) – equivalent to $16.1/MWh levelized over a project's lifetime.

Using a simple multivariate regression model, solar projects in Energy Communities in our sample are on average $0.22/$W_{AC}$ cheaper than similarly designed projects outside of Energy Communities, contributing to a lower LCOE before any tax credits are applied.

The ITC benefit over the PTC increases if additional adders (like Energy Community or Domestic Content) are available for a project, but even among our 23 projects in Energy Communities, 16 have a lower LCOE with the PTC than the ITC.

Power Purchase Agreement (PPA) price analysis: data sets and methodology

PPA prices are from utility-scale solar plants built since 2007 or planned for future installation, and include:

- 472 PV-only contracts totaling 36.8 GW_{AC}
- 104 PV+battery contracts totaling 13.0 GW_{AC} of PV capacity and 7.8 GW_{AC} / 30.9 GWh of battery capacity (presented in a later section)
- 5 concentrating solar thermal power (CSP) contracts totaling 1.2 GW_{AC} (presented in a later section)

PPA prices reflect the bundled price of electricity and RECs as sold by the project owner under the PPA

- Dataset excludes merchant plants, projects that sell renewable energy certificates (RECs) separately, and most direct retail sales
- PPAs are priced to recover both capital and other ongoing operational costs while accounting for the receipt of state and federal incentives (e.g., the ITC) and, as a result, do not simply reflect solar generation *costs.* Ultimately PPA prices reflect marketplace conditions, including the supply of ready-to-build plants, cost of capital, and demand for energy, capacity, and RECs.

Data collection

- We gather PPA price data from a combination of FERC Electric Quarterly Reports, FERC Form 1, Form EIA-923, state regulatory filings, company financial filings, and trade press articles. We prioritize data quality over quantity in this process. That is, we only include a PPA within our sample if we have high confidence in all of the key variables such as execution date, starting date, starting price, escalation rate (if any), time-of-day factor (if any), and term.
- To augment our PPA price sample, and to gain visibility into corporate PPA pricing (which is not well-represented within our sample), we also compile LevelTen Energy[1] and Trio[2] data on PPA offers (25th percentile). These often reflect shorter contract durations and target voluntary and corporate offtakers, though fewer contract specifics are known relative to the PPA data we collect directly.

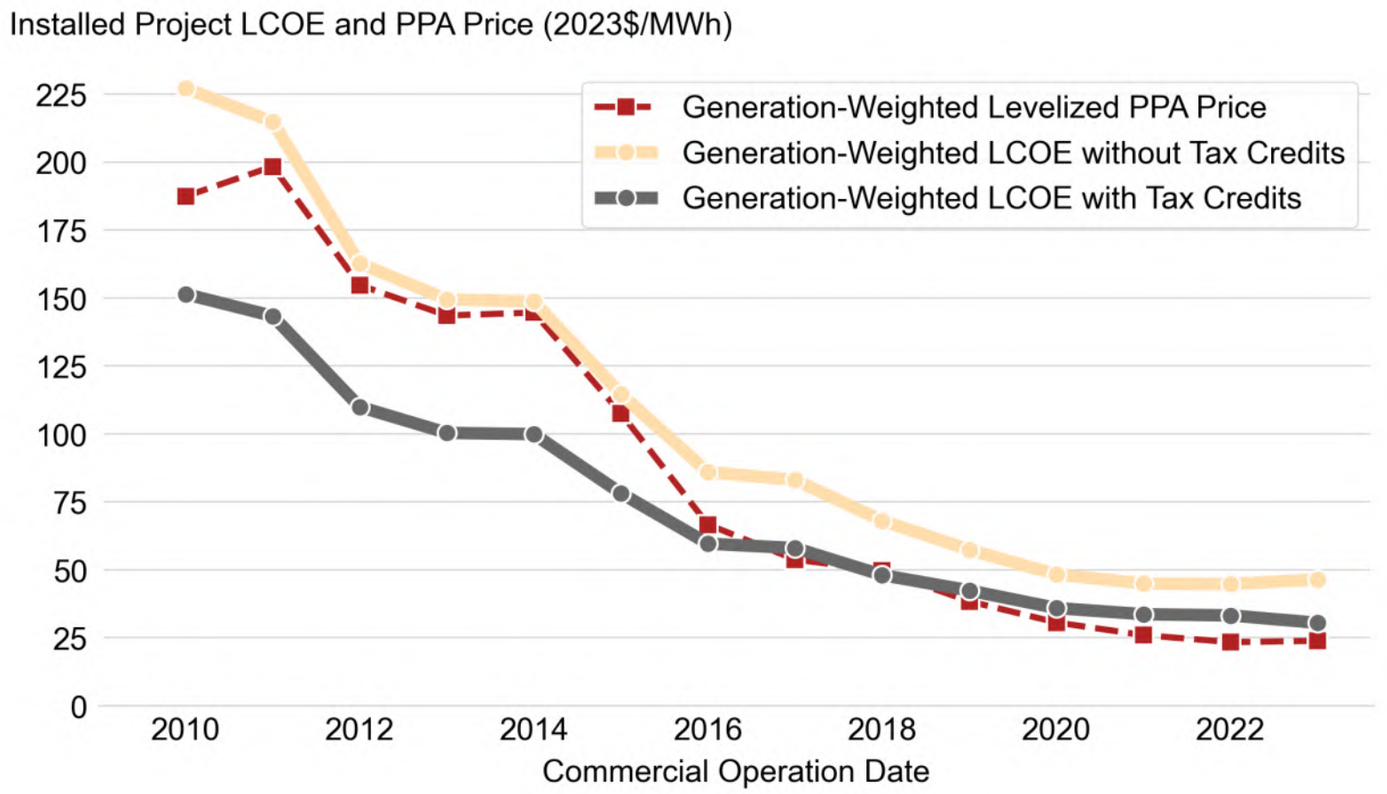
Levelization methodology

- We deflate the nominal dollar price series to 2023 dollars using a GDP deflator (actual deflators historically, along with projected future deflators), and then levelize the resulting price series using a 4% real discount rate.
  - For PPA prices we collect, prices are levelized over the full term of each contract, after accounting for any escalation rates and/or time-of-delivery factors.
  - For LevelTen Energy and Trio, we assume the reported prices are for 12-year, flat-priced (in nominal dollars) PPAs that commence in the following calendar year.

[1] https://www.leveltenenergy.com/ppa
[2] https://www.trioadvisory.com/publications

Since 2016, levelized PPA prices have tracked the LCOE accounting for tax credits of utility-scale PV

Sample: 1,266 projects totaling 66.3 GW_{AC}



Note: Only preliminary data is available for new solar projects coming online in 2023. Findings may shift as more Capex and project-specific performance data become available.

This graph contrasts solar LCOE with and without tax credits - choosing either PTC or ITC for each project that results in lowest cost (not including Domestic Content adder).

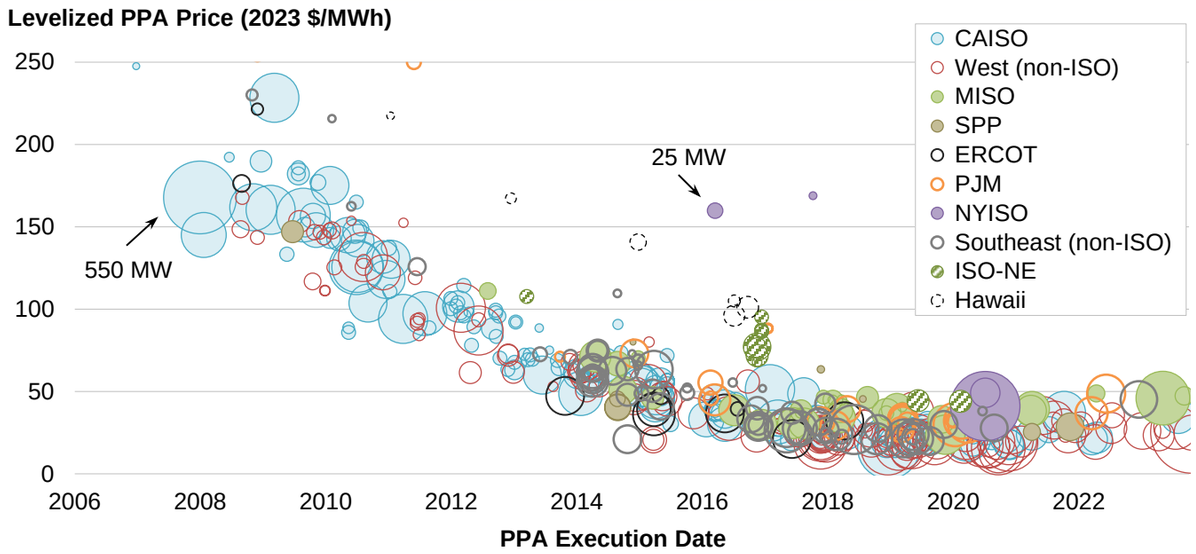
With new tax credits becoming available in 2023 we see for the first time since 2010 a widening gap between pre- and post-incentive LCOE.

While generation-weighted average LCOE increased slightly in 2023 before the application of tax credits ($46.5/MWh vs. $44.8 in 2022), post-credit LCOE continued to fall ($30.5/MWh vs. $33.3/MWh).

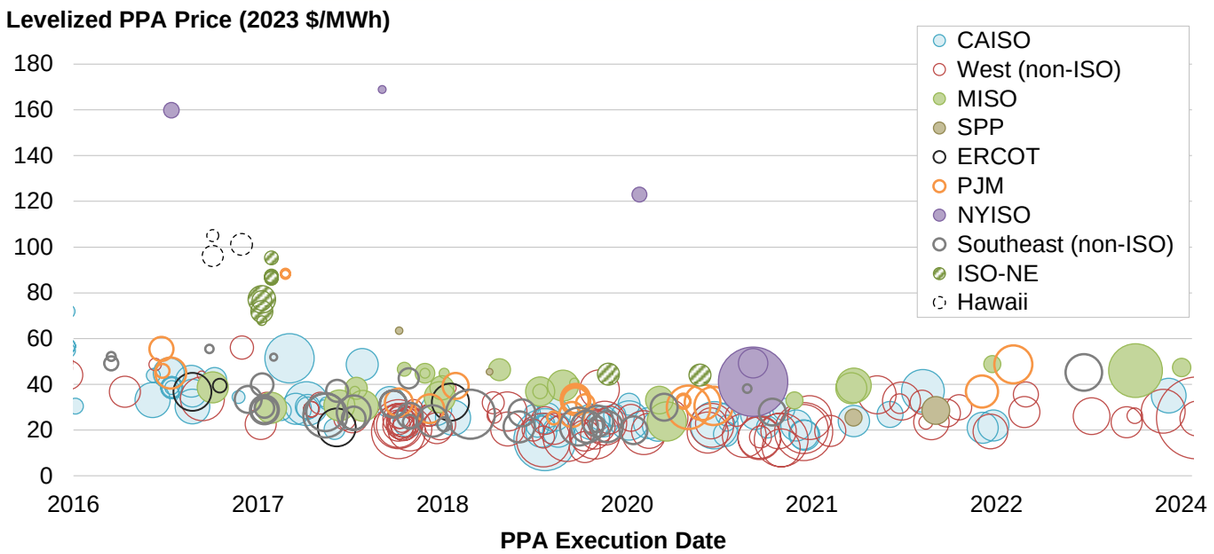
Since 2016, levelized PPA prices charted by plant COD have closely tracked or hovered slightly below the LCOE with tax credits. This suggests a pass-through of these tax credits and a competitive PPA market.

Individual PPAs typically follow the national price trend, though there are high-price outliers for projects in NY, HI, and New England

Full sample: 472 PPAs, 36.8 GW_{AC}

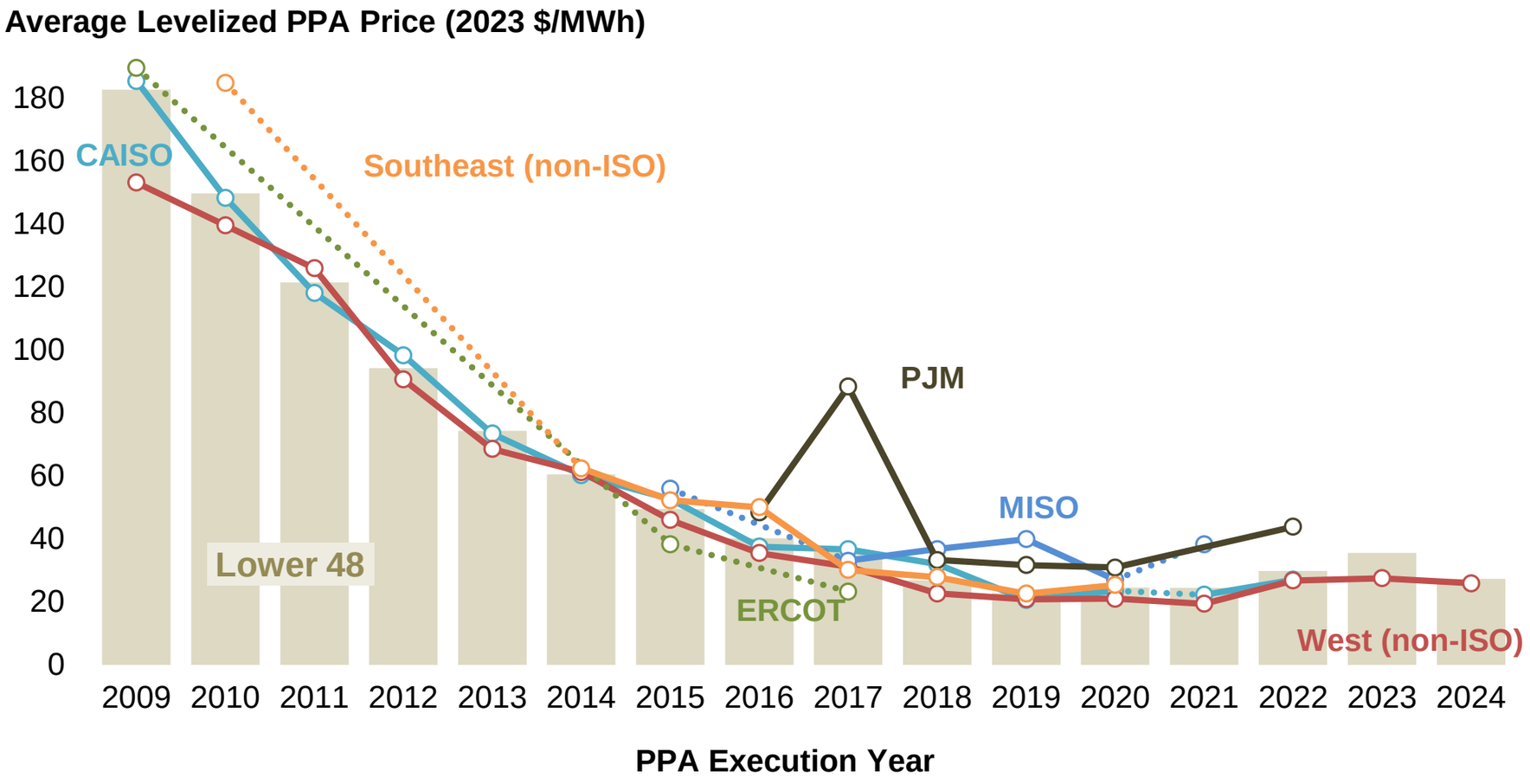


Post-2015 sample: 263 PPAs, 21.1 GW_{AC}



- Power Purchase Agreement (PPA) prices are levelized over the full term of each contract, after accounting for any escalation rates and/or time-of-delivery factors, and are shown in real 2023 dollars
  - Contract term is between 20 and 25 years (inclusive) for 76% of projects in the full sample
- >95% of the sample is currently operational
- Aided by the 30% ITC, PPAs in our sample executed in 2021 or later are usually priced around $20-$30/MWh for projects in CAISO and the non-ISO West, and $35-$47/MWh for projects elsewhere in the continental United States

Average PPA prices in the Lower 48 fell by ~88% (or ~19%/year) from 2009-2019, but have been stagnant or rising ever since



This graph focuses on national and regional average PPA prices, rather than project-level (as in the prior slide).

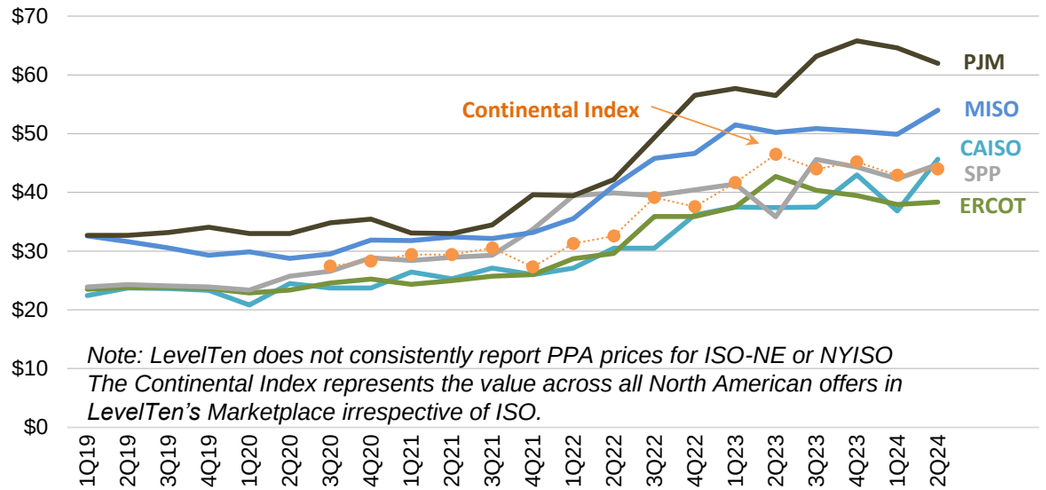
The generation-weighted national average was $35/MWh in 2023 (based on a small sample of 7 PPAs), up considerably from 2019's low of $23/MWh.

Year-Region combinations with fewer than 2 PPAs are excluded from the graph (dashed line segments indicate that the line is skipping over such years).

The graph reflects PV-only pricing, not PV+battery (PV+battery PPA prices are presented separately, in a later section).

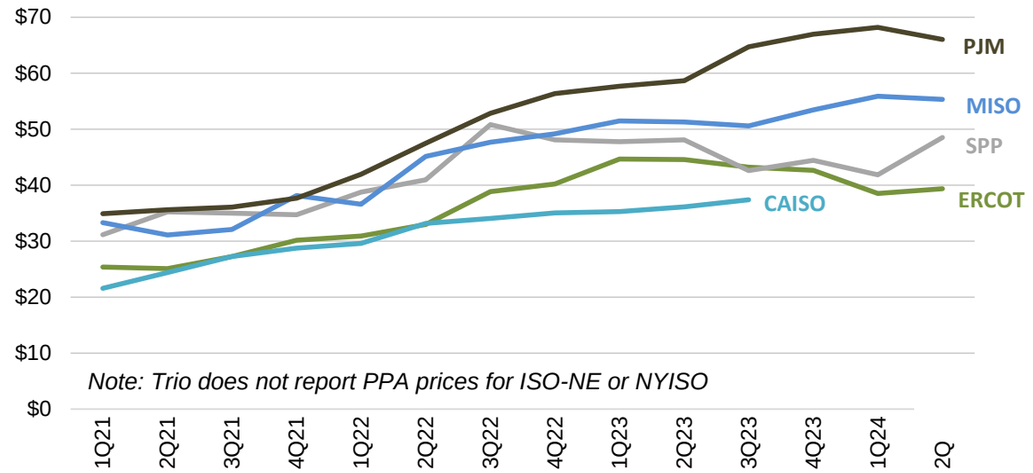
LevelTen Energy and Trio's utility-scale PV PPA price indices match the increasing trend seen in the LBNL sample since 2021

LevelTen PPA Price Index (Levelized 2023 $/MWh, 25th percentile of first-year offer)



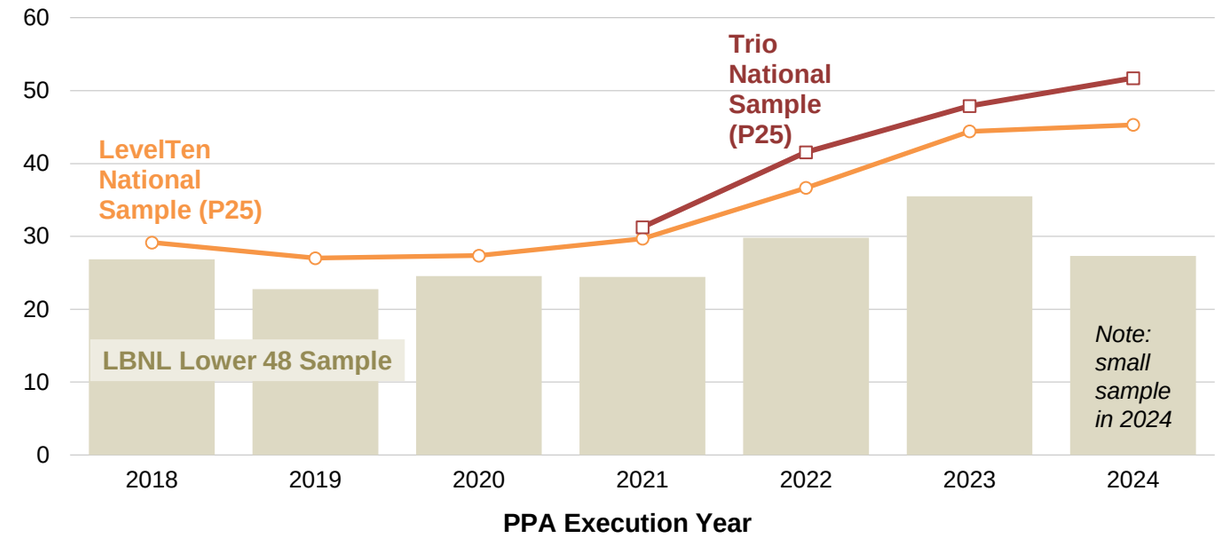
Note: LevelTen does not consistently report PPA prices for ISO-NE or NYISO
The Continental Index represents the value across all North American offers in LevelTen's Marketplace irrespective of ISO.

Trio PPA Price Index (Levelized 2023 $/MWh, 25th percentile of first-year offer)



Note: Trio does not report PPA prices for ISO-NE or NYISO

Average Levelized PPA Price (2023 $/MWh)

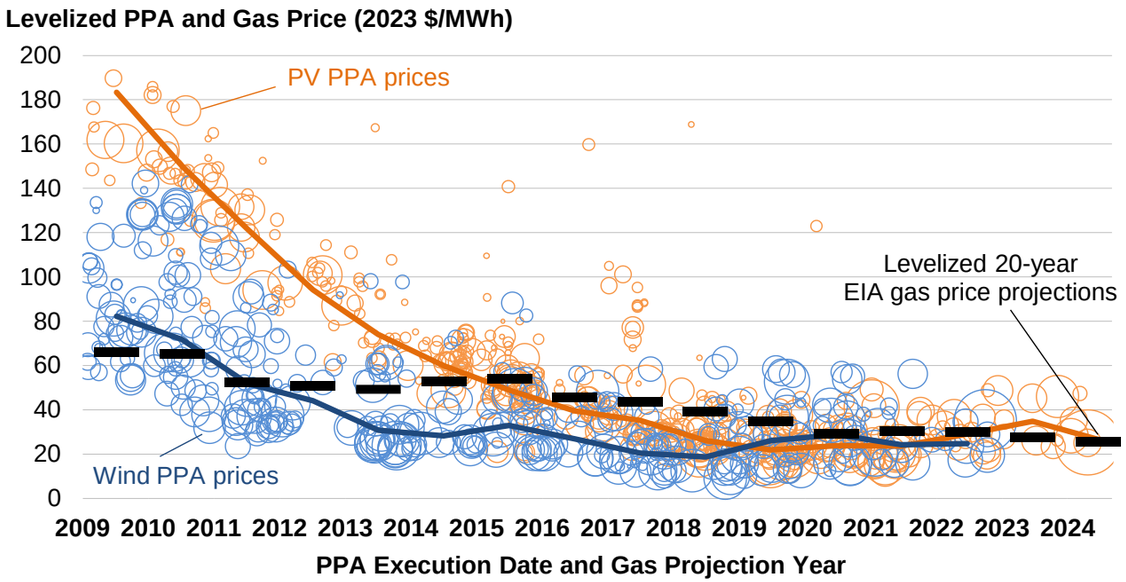


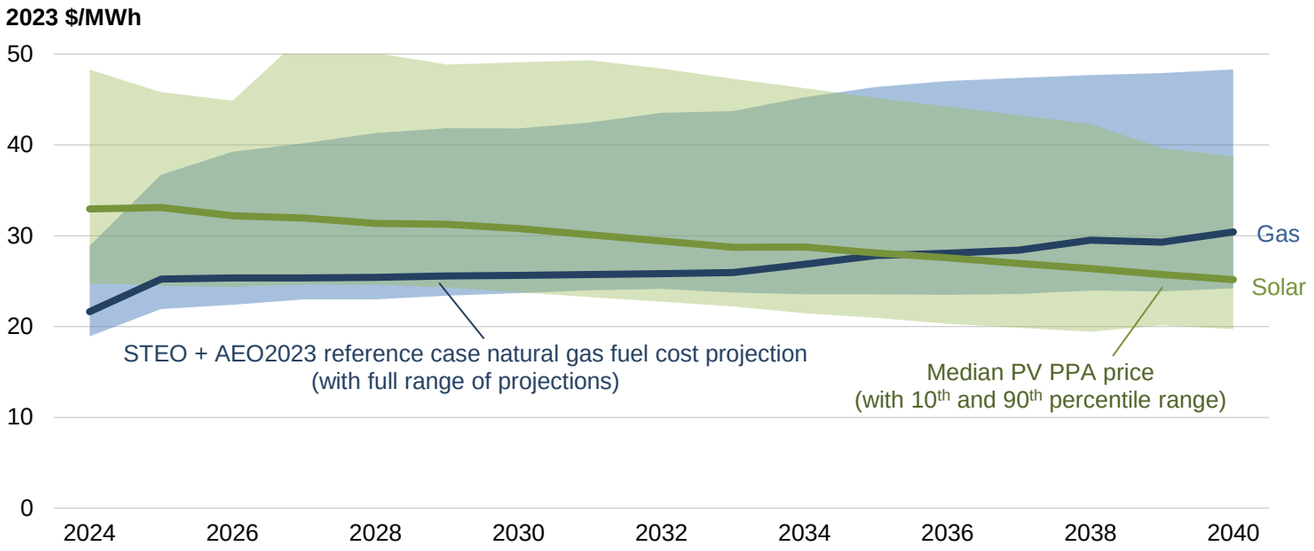
To augment our PPA price sample, and to gain visibility into corporate PPA pricing (which is not well-represented within our sample), we present LevelTen Energy and Trio's PPA price indices.

Drivers of PPA price increases in recent years include:

- High interest rates leading to higher financing costs
- Long lead times for high- and medium-voltage equipment
- Supply constraints by these equipment lead times and long interconnection and permitting timelines
- High demand from corporations and utilities in advance of 2025 and 2030 emissions targets

Solar PPA prices are competitive with wind. Recent declines in natural gas prices give *existing* gas-fired generators a near-term cost advantage.





The left graph shows that solar PPA prices have largely closed the gap with wind, and some contracts are competitive with levelized gas price projections.

The right graph compares recent (2022-24 execution date) solar PPA prices (extending over their contract terms through 2040) to the range of gas price projections from the EIA's Annual Energy Outlook 2023 (AEO 2023) and Short-Term Energy Outlook (STEO). Gas price projections through 2025 have dropped considerably compared to expectations one year ago. PV can help hedge against fuel price risk in the short to medium-term, and by the mid-2030s most PV is projected to be competitive with the cost of burning fuel in an ***existing*** combined-cycle natural gas unit (NGCC).

Note that PV PPAs are priced to recover both *capital* and other *ongoing operational costs*—for a new NGCC, this would add another ~$20-$80/MWh (per *Lazard* data) to the projected fuel costs shown in the graphs.

Wholesale Market Value, Air and Climate Benefits, and Net Value

Wholesale market value analysis: data sets and methodology

We estimate the wholesale market value for each utility-scale PV project larger than 1 MW (as reported on Form EIA-860). Each project-level estimate may be prone to some biases - greater emphasis should thus be placed on the aggregate generation-weighted averages which we calculate for all seven ISOs and ten additional balancing authorities.

We draw from project-level modeled hourly solar generation (using NREL's System Advisor Model and site- and year-specific insolation data from NREL's National Solar Radiation Database and NOAA's High Resolution Rapid Refresh Model) and de-bias the generation by leveraging ISO-reported aggregate solar generation and plant-level reported generation by Form EIA-923. Hourly curtailment data is either derived from plant-level reports (ERCOT: HSL minus MW) or allocated from ISO-level reports (CAISO).

Energy value is the product of hourly solar generation by plant or county and concurrent wholesale energy prices

- Plant-level debiased hourly solar generation
- Real-time energy price from
  - nearest LMP node (ISOs, CAISO's + SPP's EIM BAs)
  - gateway node from nearby ISO / FERC Lambda for some BAs

$$Energy\ Value = \frac{\sum Postcurtailment\ Generation_h * Wholesale\ RT\ Energy\ Price_h}{\sum Precurtailment\ Generation_h}$$

Capacity value is the product of a plant's or county's capacity credit and capacity prices

- Capacity credit based on plant-level profile; varies by month, season, or year
- Capacity prices from respective ISO region; prices vary by month, season, or year
- Estimate bilateral capacity prices for regions without organized capacity markets
- Focus on annual value of solar for projects with a full calendar year of operation
- Calculate capacity value for all solar, even if some solar does not participate in capacity markets

$$Capacity\ Value = \frac{\sum Capacity\ Credit_T * Nameplate * Capacity\ Price_T}{\sum Precurtailment\ Generation_T}$$

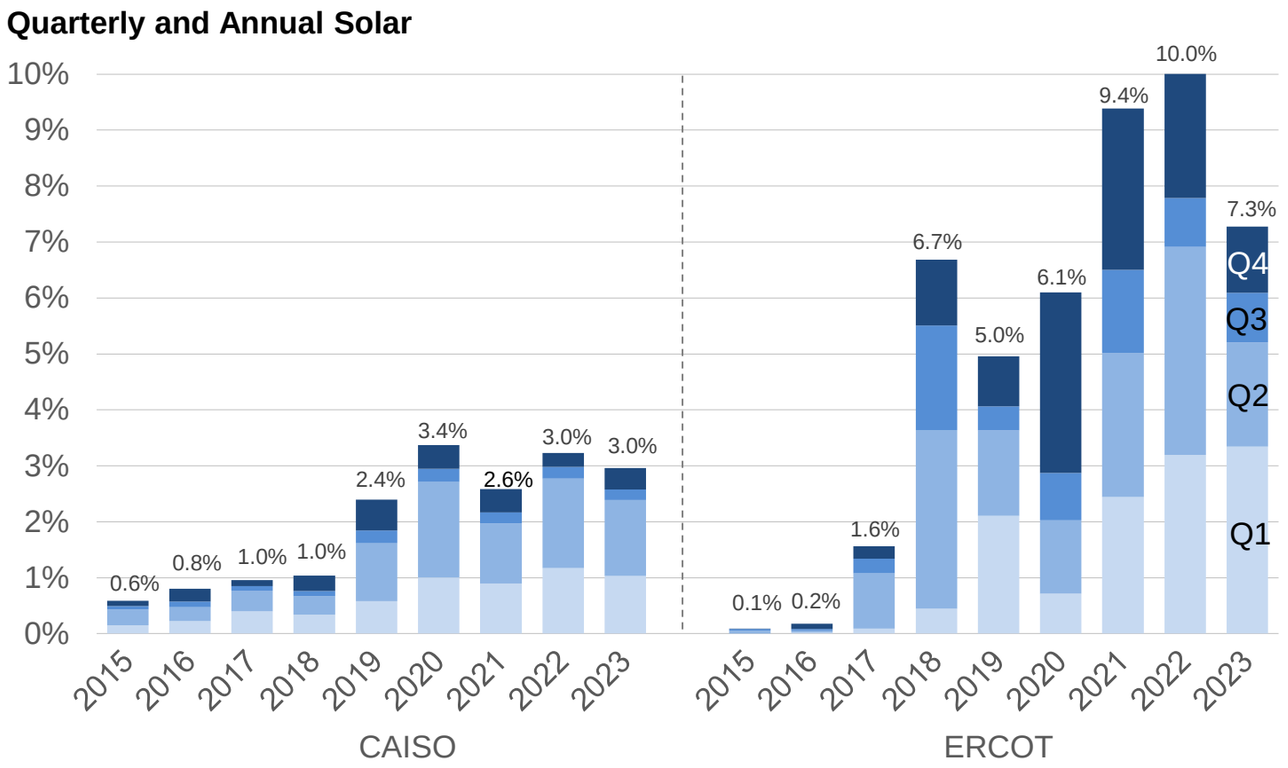
Market value vs. Generation costs and Environmental benefits: Scope of value comparisons and methods

- **Total wholesale market value** is simply the sum of solar's energy and capacity value
  - It represents the "replacement costs" of what an offtaker would have to pay in the wholesale market had they not procured solar generation. Revenues for a solar project owner are set by their PPA terms and may differ from our estimate. However, in a market with little friction, we expect long-term convergence.
  - It does not include any potential additional revenue streams (ancillary service (AS) revenues, renewable energy credits, infrastructure deferral, or resilience that are not already internalized in wholesale energy and capacity markets).
  - It is based on the real-time LMP market and thus reflects the marginal solar value. It does not fully consider sub-hourly variability and forecast errors.
  - It excludes broader sectoral impacts such as merit-order effect on power prices or reduced natural gas demand and associated price declines.

- **Generation costs** are approximated by LCOE (with and without tax credits), but do not include:
  - Full integration costs (AS) or transmission needs (beyond LMP congestion components and interconnection network upgrade costs).
  - The full cost to the Treasury of federal investment and production tax credits.
  - Other costs and benefits to local communities and ecosystems.
  - LCOE sample is matched to market value sample on slide 53, but only reflects a subset of solar projects that contribute to the environmental benefits on slide 54 (LCOE projects are greater than $5MW_{AC}$ with some 2022 COD projects missing).

- **Health and climate benefits** are approximated by the marginal avoided emission rate * damage per ton of pollutant emitted
  - Avoided emissions rates are regression results leveraging hourly generation data by source type, accounting for imports and exports between regions, and time shifting of impacts through redispatch of hydropower. Coal and gas emissions data are used to determine the emissions avoided from solar in each region.
  - Health benefits are a function of the total mass of pollutants avoided and where those reductions occur based on a suite of reduced-complexity air quality health impact models.
  - Climate benefits are calculated as a function of the social cost of carbon, as described in EPA's Report on Social Cost of Greenhouse Gases (2023).
  - We represent central estimates ($125/MWh) from range of plausible values (5%: $38/MWh , 95%: $303/MWh)

Solar curtailment was 3.0% in CAISO and 7.3% in ERCOT in 2023. Other ISOs and regions do not yet report curtailment.



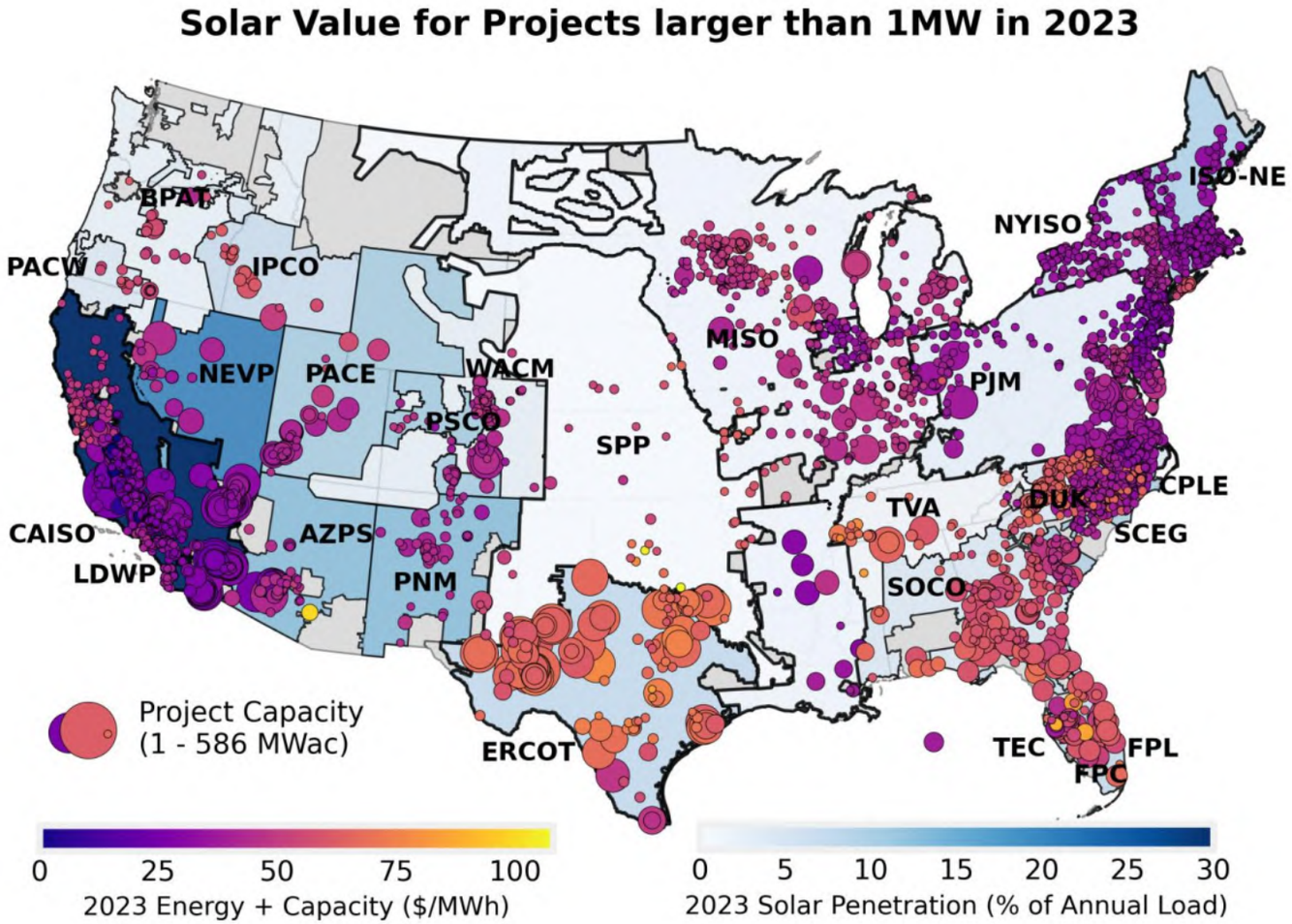
The *rate of curtailment* was much higher in ERCOT (7.3%) than in CAISO (3.0%) in 2023, even though solar's penetration rate is far lower in ERCOT (7%) than CAISO (27%). Most of ERCOT's curtailment occurs in the western part of Texas, driven by transmission/pipeline congestion and excess local electricity production (prices for natural gas, a byproduct of oil production, were at times negative in 2023 in the Permian Basin).

CAISO had 2,051 GWh of solar curtailed in 2023, equivalent to the annual output of a hypothetical 816 MW_{AC} tracking PV project operating at an average CA capacity factor of 28.7% (which would have been 29.6% if not for curtailment).

ERCOT had 2,500 GWh of solar curtailed in 2023, equivalent to the annual output of a hypothetical 1142 MW_{AC} tracking PV project operating at an average TX capacity factor of 25.0% (which would have been 27.0% if not for curtailment).

Note: The data shows ISO-wide solar curtailment relative to total solar production (sum of utility-scale and distributed solar)

Solar's energy and capacity value varied by location



Note: Marker size shows project capacity while marker color shows market value.

Solar's average energy and capacity value in 2023 varies from one region to another: It was lower in CAISO at $27/MWh, but high in many southeastern balancing authorities ($48-65/MWh), ERCOT ($67/MWh), SPP ($58/MWh), and the Pacific Northwest ($48-58/MWh).

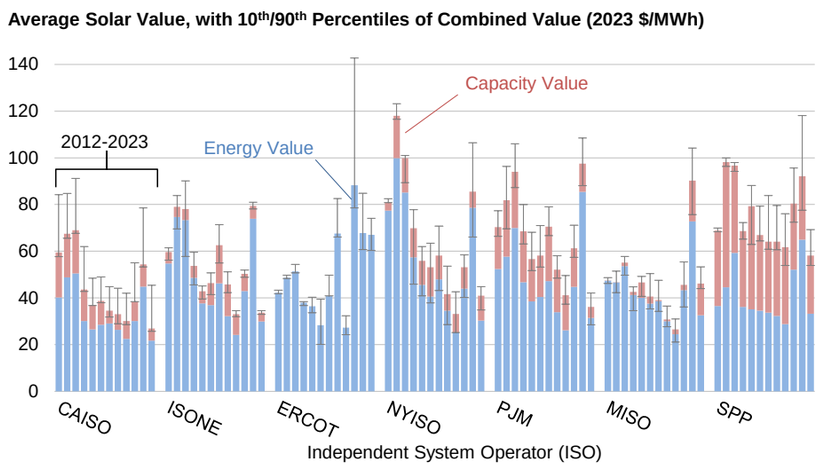
But value also varies within regions, driven by transmission congestion, solar resource quality or differing use of technology like trackers.

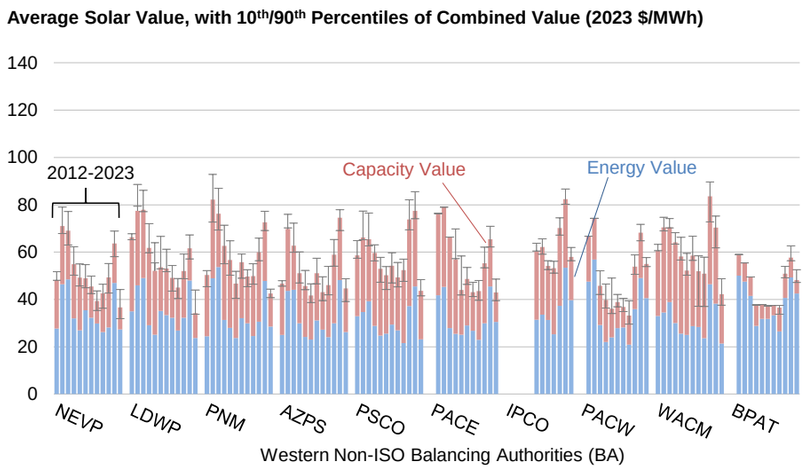
For example, in CAISO the northern zone has typically higher average values than the southern zone. Solar in southern SPP and NYISO was nearly $20/MWh more valuable than solar in the north of the ISOs.

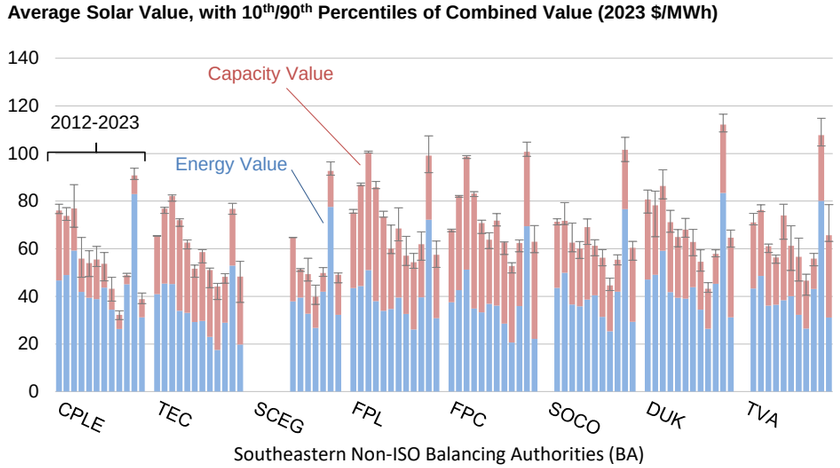
Other markets like ISO-NE show very little variation in annual average value between projects (10th vs. 90th percentile had a difference of less than $2/MWh).

You can explore this data interactively at https://emp.lbl.gov/utility-scale-solar-value

Solar's average energy and capacity value across the U.S. was $45/MWh in 2023, similar to pre-pandemic levels







Energy value typically makes up the bulk of total market value. After high natural gas prices in 2022, solar's average energy value across the US returned to more normal levels in 2023 of $34/MWh.

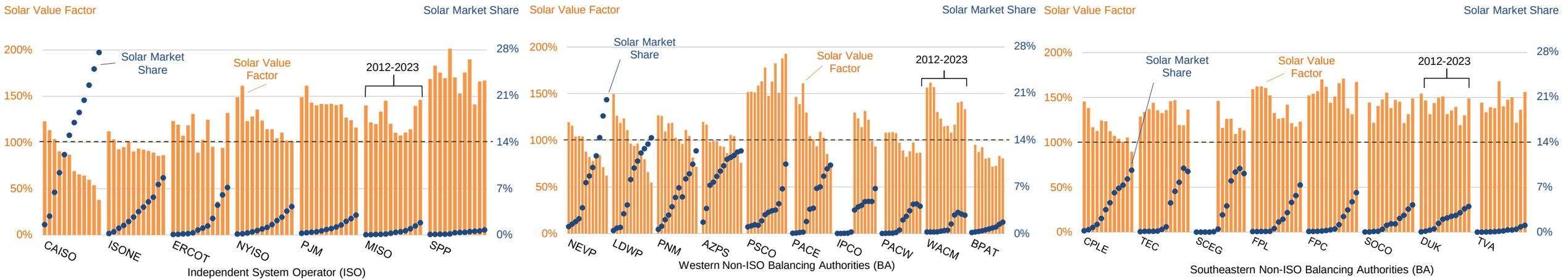
Capacity value is more significant in the non-ISO regions and can add $30-40/MWh in some BAs, where capacity prices are high (e.g., SERC region) and where the solar profile is still well aligned with peak netload hours.

Variation across years mostly reflects fluctuations in wholesale power prices, but also shows how increasing solar penetration can dampen solar's value (e.g., CAISO).

In 2023, combined energy and capacity value was lowest in CAISO ($27/MWh) and highest in ERCOT ($67/MWh). Even though ERCOT reduced its price cap from $9000/MWh to $5000/MWh in 2023, summer heat waves and associated record demand levels contributed to high prices that allowed solar to capture value at 2022 levels.

Note: The data shows generation-weighted average annual market value of all large-scale (1 MW+) solar projects in select Balancing Authorities.

Solar's value factor tends to decline as solar serves a higher share of a region's load



The columns represent the solar value factor (left axis), the dots show growth in solar market share (right axis)

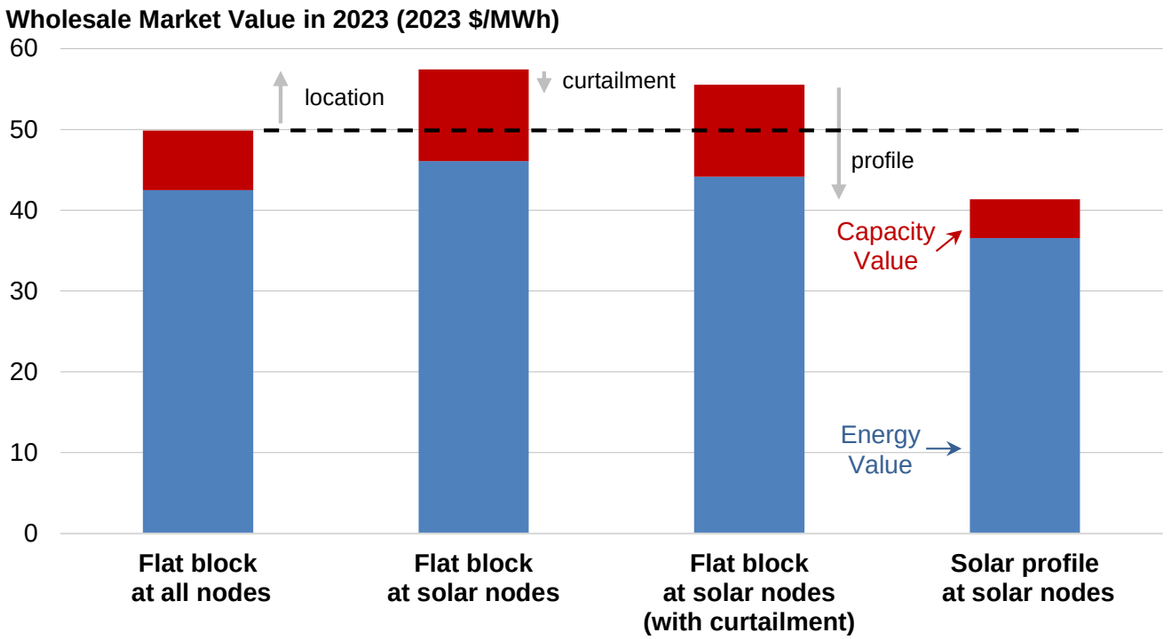
The 'Value Factor' is defined as the ratio of solar's total market value (including both energy and capacity) to the market value of a 'flat block' of power (i.e., a 24x7 block). It indicates whether solar's total revenue is above or below the average wholesale revenue, with generators delivering electricity during high-value hours achieving a value factor above 100%."

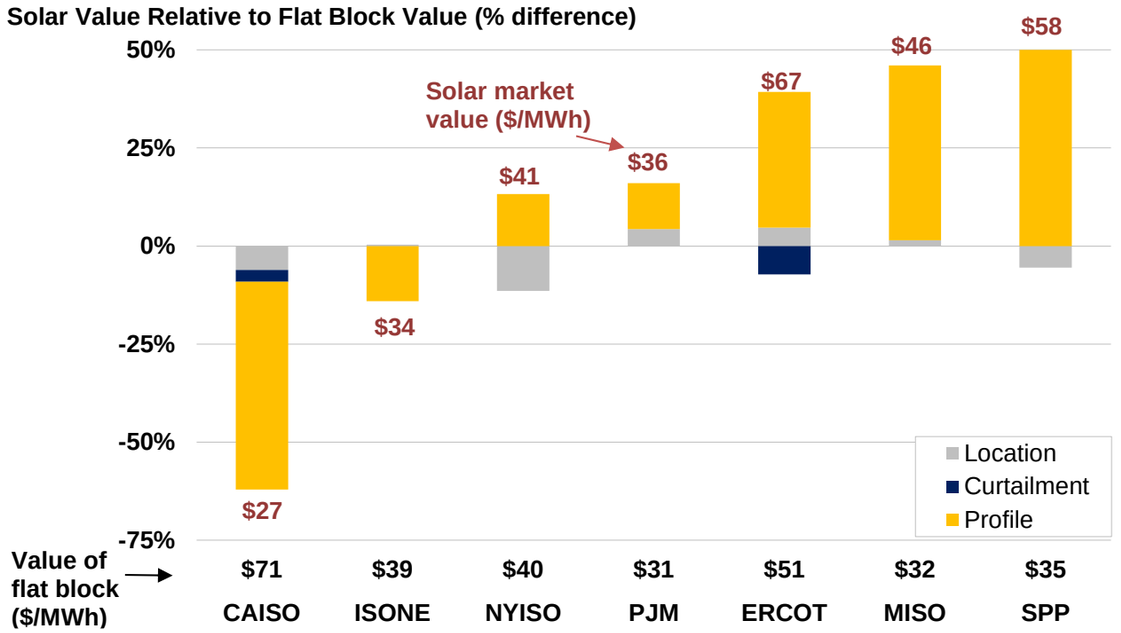
It controls for fluctuations in energy and capacity prices across years (and across ISOs) and focuses instead on the impact of solar's generation profile (and penetration) on value.

Most regions with the highest solar market shares show Value Factors less than 100%, even just 38% in CAISO. However, in many southeastern BAs solar still provides above-average value despite approaching 10% penetration.

Note: IPCO and SCEG did not have solar projects larger than 1 MW_{AC} operating in the early years. Solar market share in those years only reflects contribution of distributed PV.

Solar's generation profile was the largest source of value differences between solar and a flat block in 2023





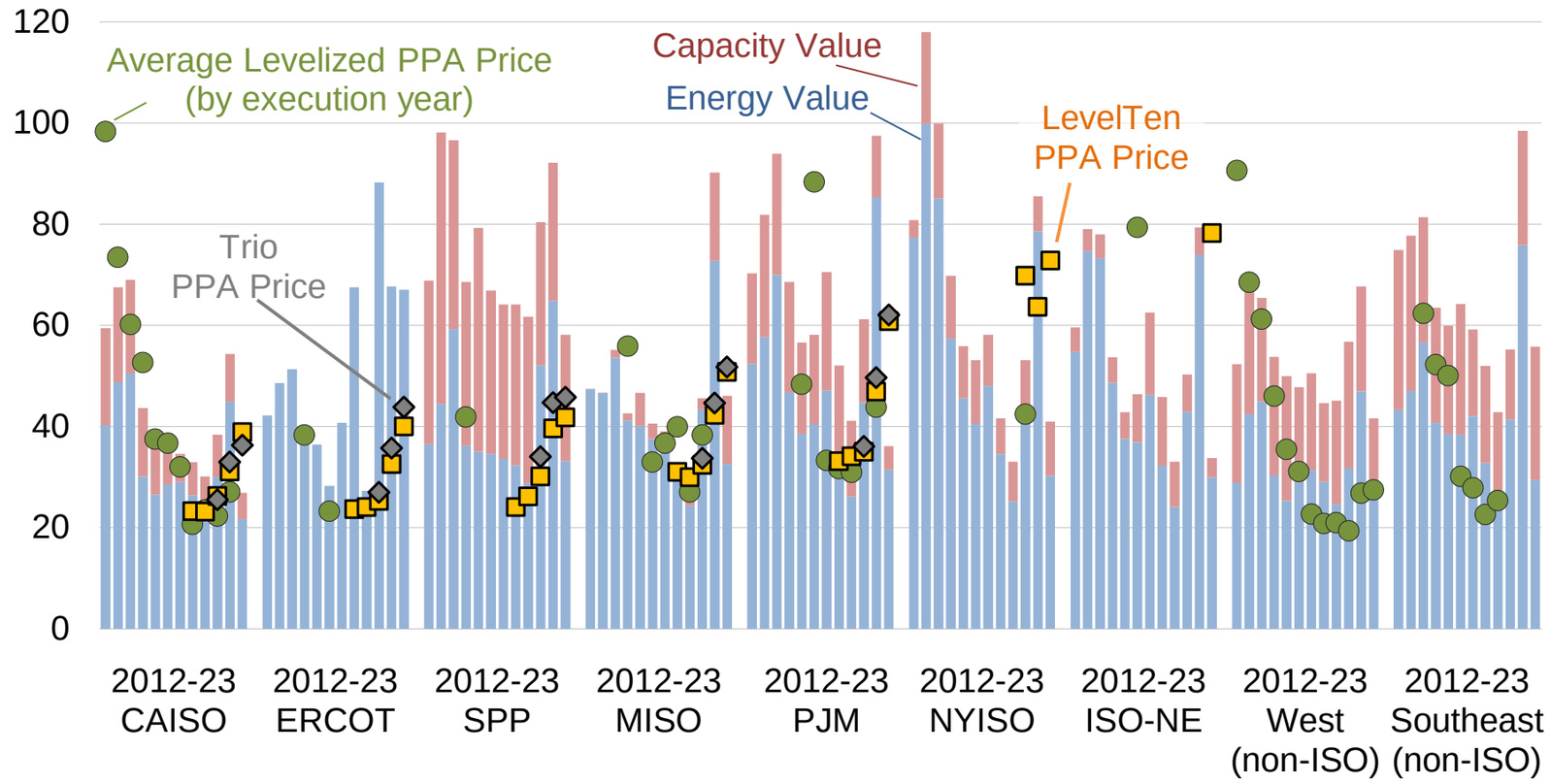
Across the seven ISOs, solar projects were usually sited at locations with above average energy values. The large amount of solar deployed in areas with lower relative value (particularly CAISO) yields a value factor of 82% across all solar projects in the ISOs.

Solar's generation profile has the largest impact and either hurts (in CAISO, ISO-NE) or helps (in SPP, MISO, ERCOT, PJM, NYISO) solar's value relative to a flat block. Curtailment is becoming a growing issue for solar in ERCOT.

Note: Numbers and figures shown here only reflect market value in the year 2023 in the seven ISOs and do not include data from other years or non-ISO regions.

Market Value vs. PPAs: Rising prices for new PPAs started to exceed solar's wholesale market value in some regions in 2023

Solar Value and PPA Price (2023 $/MWh)



PPAs provide the power purchaser a hedge value for price fluctuations over 10 to 20 years. While we show price trends by individual years, a true benefit accounting should span the length of the PPA contract. PPA prices are influenced by solar's generation costs, solar's wholesale market "replacement costs", and broader supply and demand dynamics.

Solar's market value has declined over time within several regions. Falling PPA prices had largely kept pace until PPAs started rising in 2021.

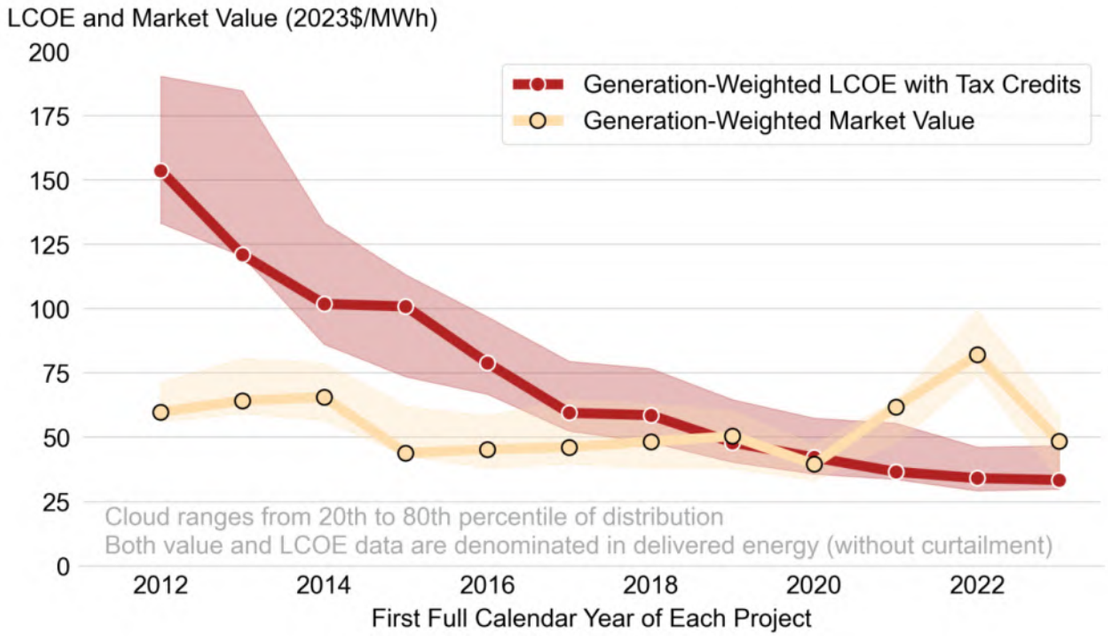
Temporarily high energy prices in 2022 more than compensated for emerging PPA price increases, but PPAs have begun to exceed wholesale market value in 2023 in CAISO, MISO, PJM, and NYISO, indicating potential future economic challenges based on solar's wholesale market value in these regions.

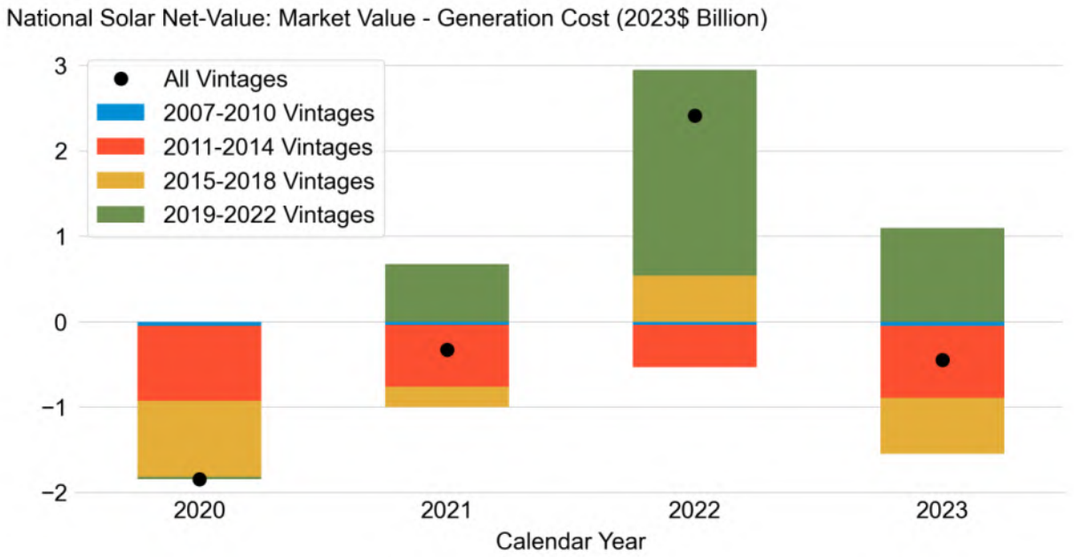
In contrast, solar offered greater value than what it is paid for in PPAs in ERCOT and SPP in 2023.

Note: We do not have sufficient PPA data to present robust trends for every balancing authority. PPAs are indexed here by execution date and span a longer time than the annual wholesale market value estimates.

Market Value vs. LCOE (with tax credits): Newer solar projects had greater value than their generation costs in 2023, yielding over $1BN in benefits

Sample: Only includes >5 MW_{AC} projects with LCOE and wholesale market value data: 1,079 projects totaling 55.9 GW_{AC}



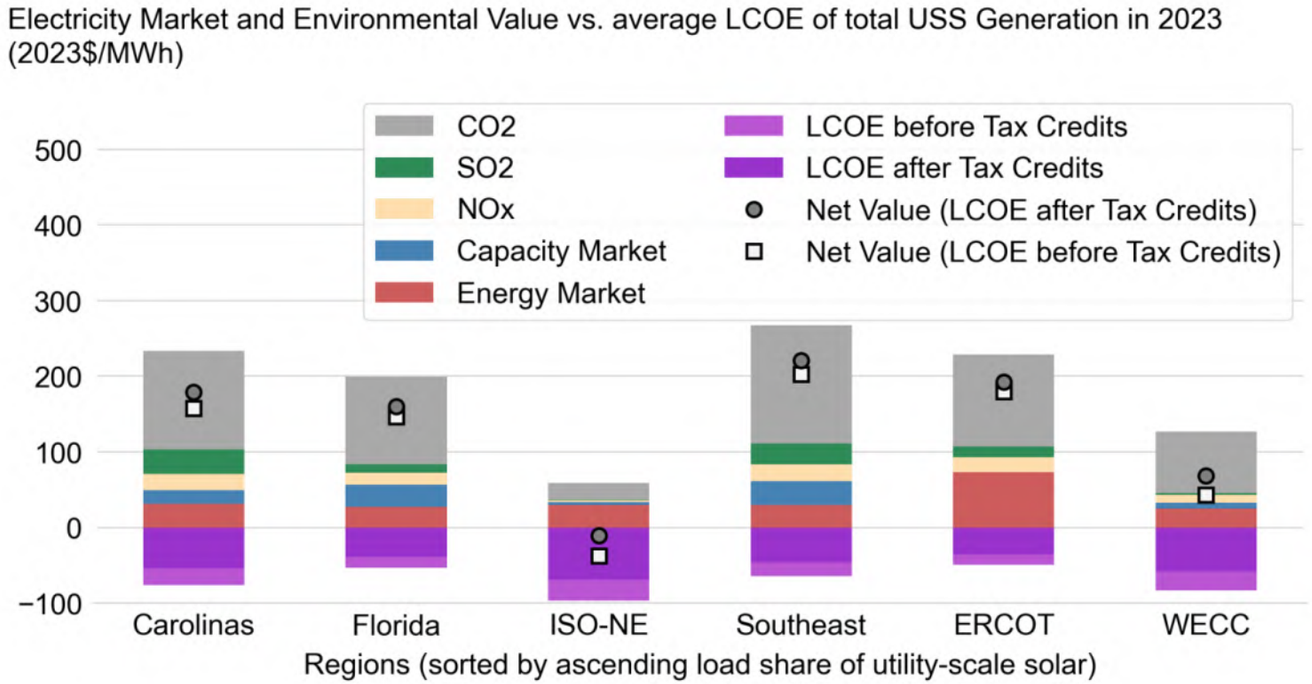


National average energy and capacity market value has been greater than levelized generation costs (after tax credits) for new utility-scale solar projects since 2020. Plants built in 2022 delivered on average $15/MWh more wholesale market value in 2023 than their LCOE.

In 2023, recent projects in our sample offer, in aggregate, a net market value of about $1.1 billion that could be passed on to end-use customers. Older projects had generation costs that were higher than their wholesale market revenues alone in 2023.

Note: For greater detail on methods and impacts, see Wiser et al (2024) Grid Value and Cost of Utility-Scale Wind and Solar: Potential Implications for Consumer Electricity Bills.

Combined climate, air quality, and market values of historical solar fleet are greater than generation costs and incentives in most regions in 2023



The estimated aggregate net value of utility-scale solar generation across the examined regions was $13.7 BN in 2023 (or $16.5 BN when using after tax credit LCOE).

Solar is offsetting electricity generation by coal and natural gas plants, thereby reducing emission-associated health and climate damages.

Employing statistical analyses of empirical generation and emission records, we can infer impacts for regions with greater solar generation share (shown in graph).

Using avoided emission values from the scientific literature and air quality models, we estimate the U.S. health benefits from solar generation in 2023 equaled $24/MWh, based on reductions to SO2 and NOx emissions. Solar also reduced global damages caused by climate change at $101/MWh, based on reductions of CO2 emissions and standard estimates of the Social Cost of Carbon.

We can subsequently compare market and environmental value with the weighted generation costs of the solar projects that contribute to these benefits (COD 2007-2022). The net value is positive in all regions except ISO-NE (which has both higher solar costs and a relatively clean grid in 2023).

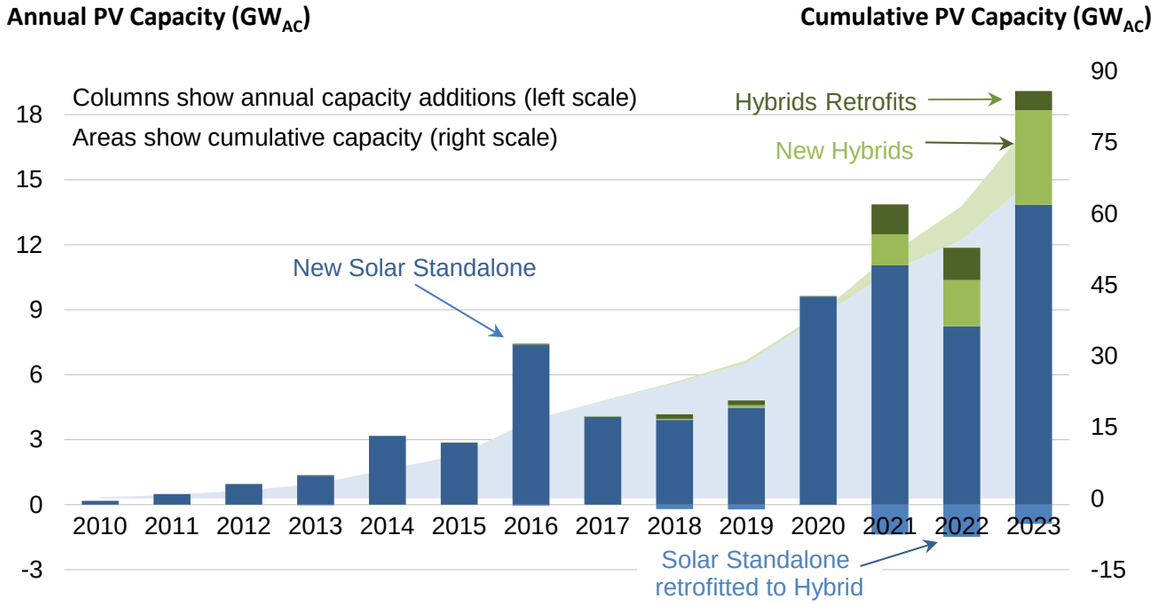
Note: For more detail on methods and discussion of caveats, see Millstein et al (2024) Climate and air quality benefits of wind and solar generation in the United States from 2019 to 2022.

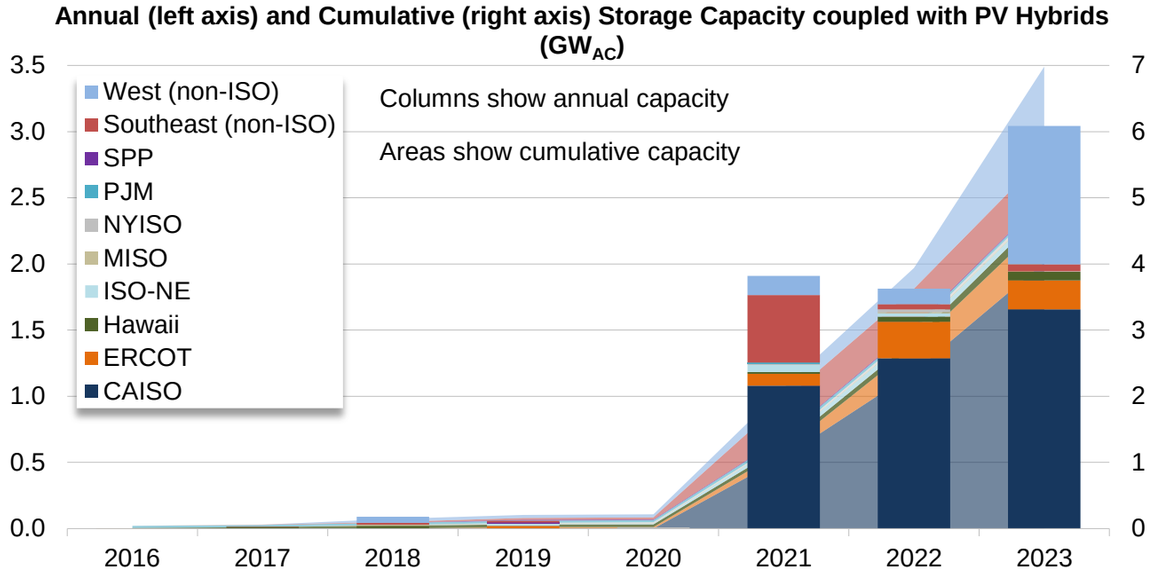
PV+Battery Hybrid Plants

(for more of Berkeley Lab's analysis of hybrid power plants, see https://emp.lbl.gov/hybrid)

Deployment of PV-battery hybrid plants set a record with 5.3GW greenfield and retrofit capacity in 2023

Sample: 155 projects totaling 12.4 GW_{AC} of PV, 7.0 GW_{AC} of battery capacity, and 22.7 GWh of battery energy



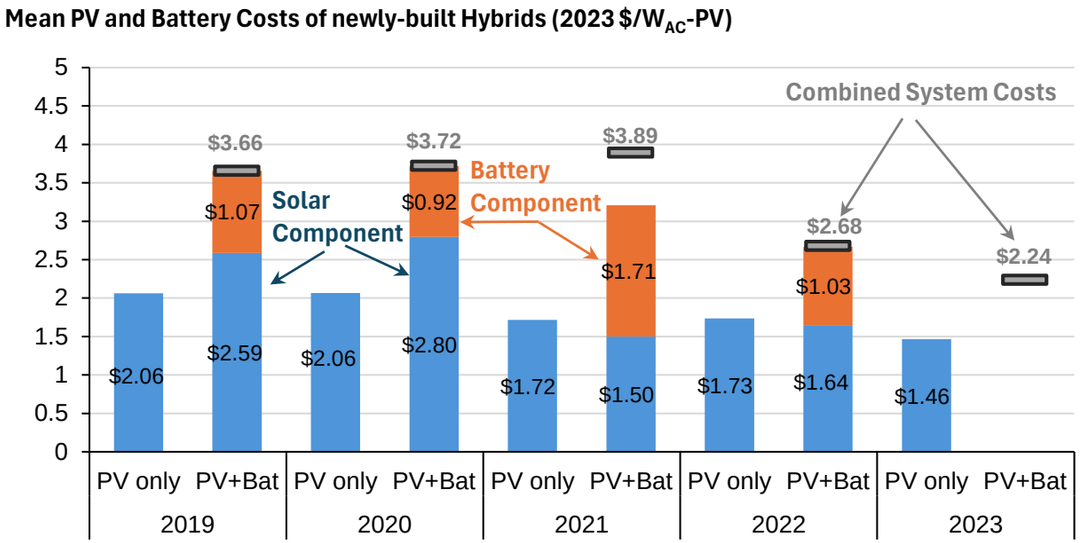


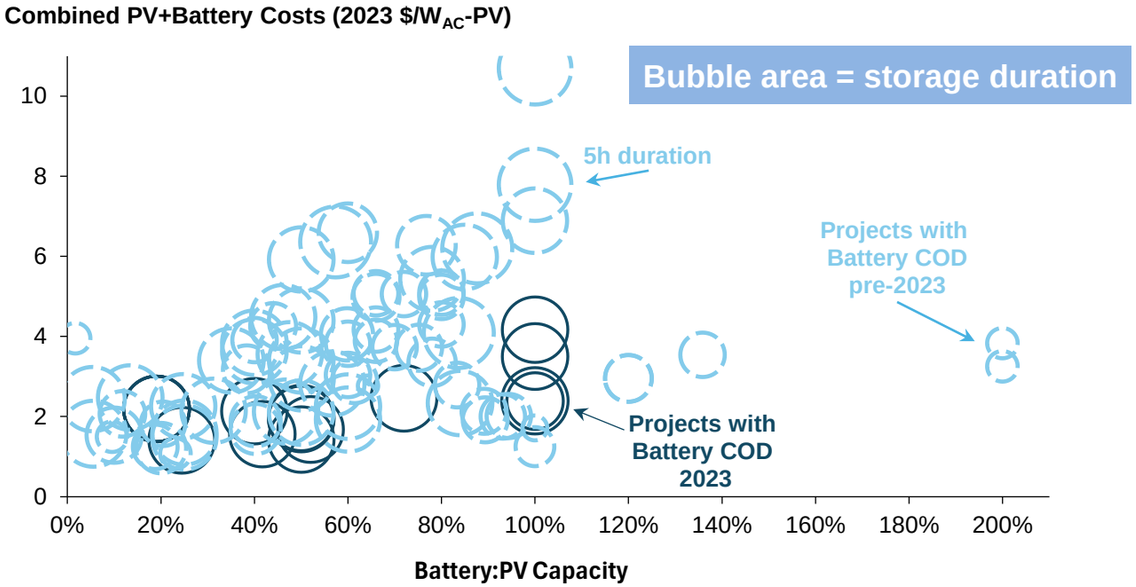
The large-scale PV+battery hybrid build-out started slowly in 2016, with just 1-12 plants/year built through 2020. The market started in earnest in 2021 with 39 hybrid installations. Following steady growth in 2022, 2023 was another record year for newly built hybrids (37 plants, 4.4 GW_{AC}-PV) while storage retrofits to existing stand-alone solar projects declined a bit (15 plants, 0.9 GW_{AC}-PV).

Most of the new hybrid storage was built in CAISO (22 plants, 1.7 GW storage capacity with ~3.5h storage energy). Hybrids had their first big year in the solar rich non-ISO West (20 plants, 4.0 GW capacity with ~3.8h energy). Hybrid additions declined slightly in ERCOT (3 plants, 0.2 GW storage capacity with ~1.3h energy) and ISO-NE (only 1 project in the MA Smart program).

Greenfield PV+battery project costs fell 15% in 2023 relative to 2022

Sample: 91 plants totaling 9,605 MW_{AC} of PV and 5,360 MW / 16,854 MWh of batteries with CODs from 2018-2023





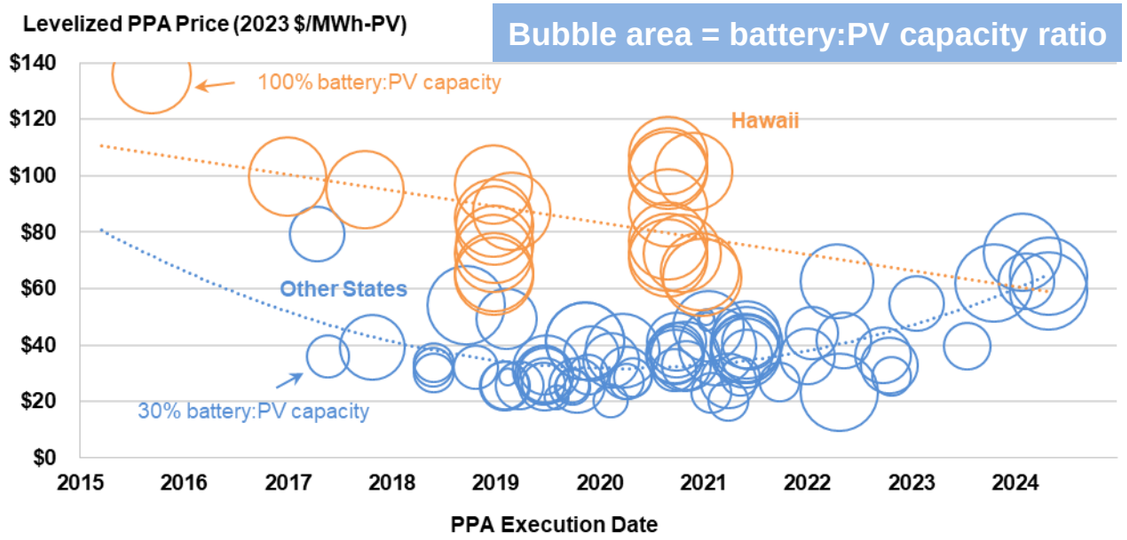
In our newly-built hybrid sample, average combined costs have fallen 11% from \$2.68/W_{AC}-PV in 2022 (n=22) to \$2.24/W_{AC}-PV in 2023 (n=16).

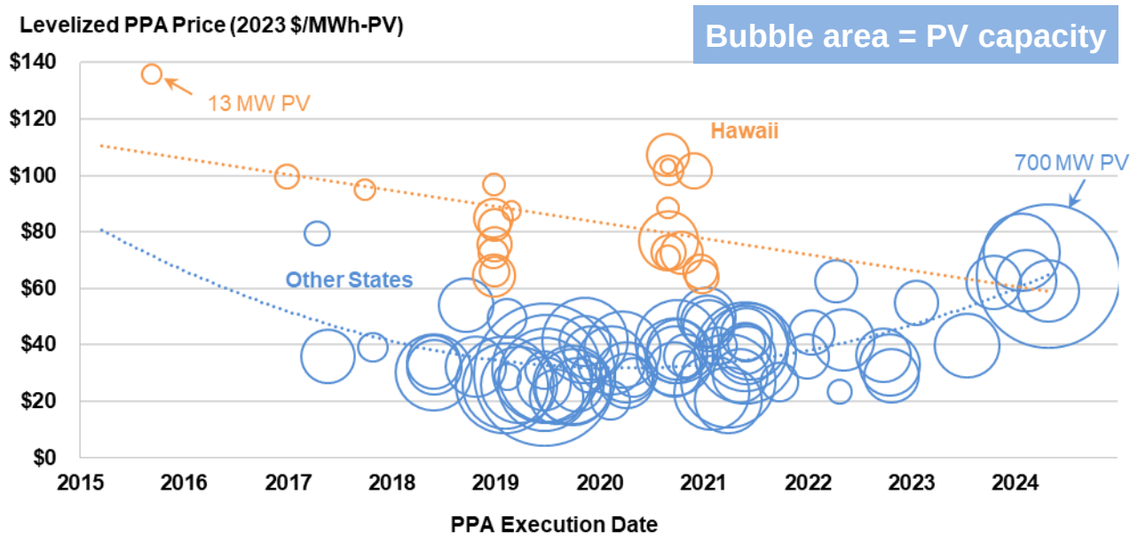
Associated average storage duration in our cost sample increased from 2.9h in 2022 to 3.2h in 2023, and the battery:PV capacity ratio increased from 0.6 in 2022 to 0.7 in 2023.

Unfortunately, we do not have a robust sample of separate battery and PV costs among recent newly-built projects (2023) as recent EIA 860 capex data is not yet available. In 2022, median storage costs were \$500/kWh. As shown above, combined PV+battery costs generally scale with increased battery capacity (relative to the PV capacity) and storage duration.

Note: "Combined System Costs" and "Component System Costs" in left graph may deviate due to different sample sizes contributing to each cost estimate.

PPA prices for PV+battery have approximately doubled since 2019/20 lows; Hawaii historically at a premium

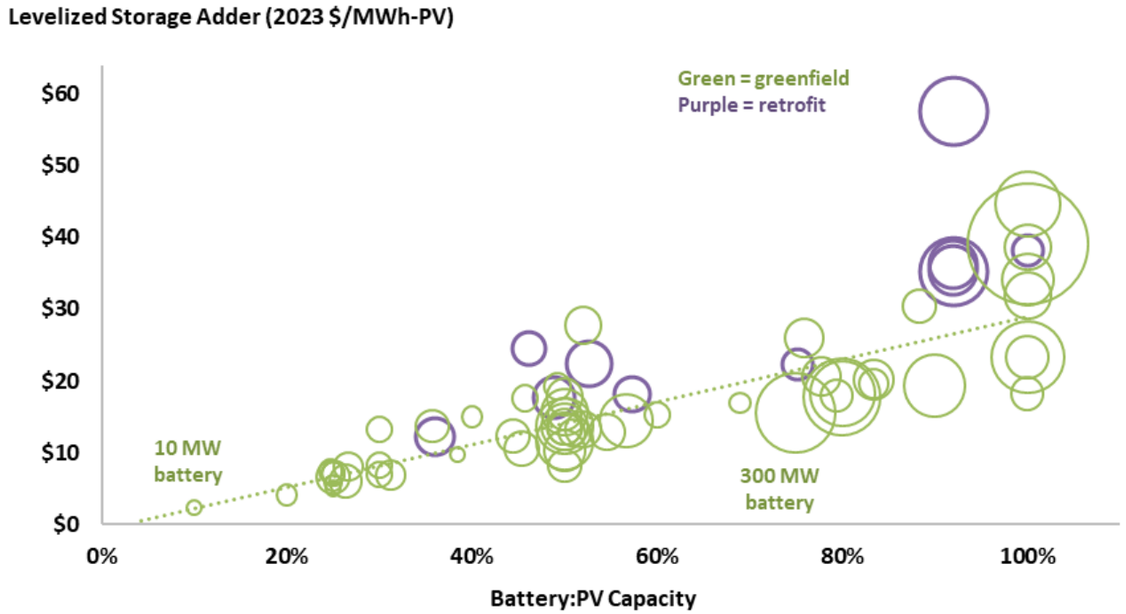


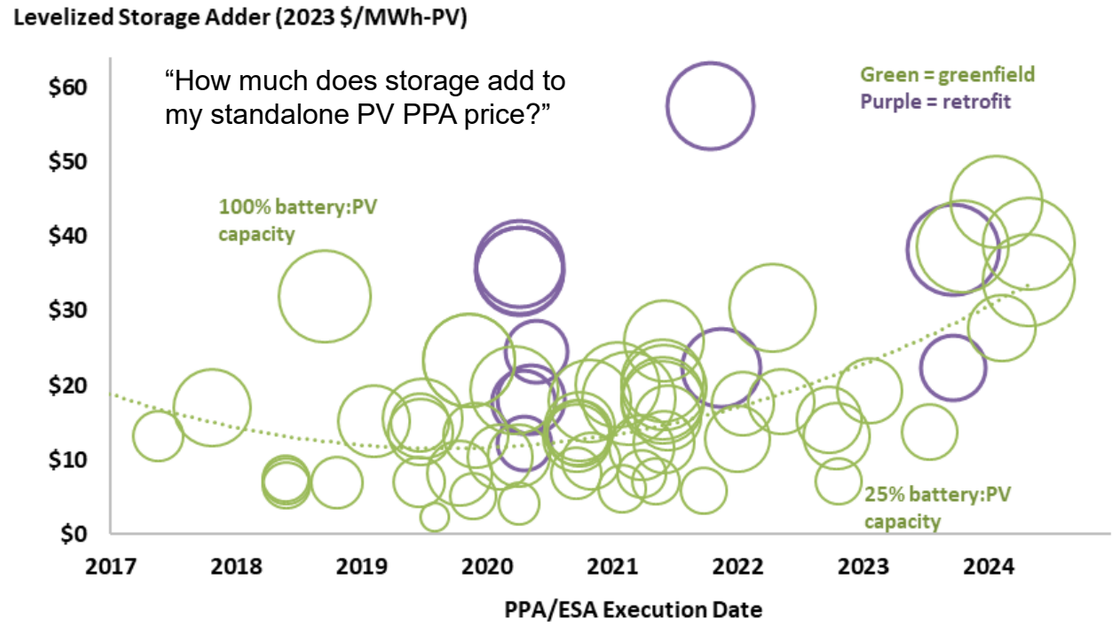


- Both graphs show same data from sub-sample of 93 plants (retrofits not included); the only difference is what the bubble size represents
  - Hawaii (orange): 22 plants, 0.8 GW_{AC} PV, 0.8 GW_{AC} battery (third round of Hawaii PPAs expected soon)
  - Other States (blue): 71 plants, 10.5 GW_{AC} PV, 5.8 GW_{AC} battery
  - Storage duration ranges from 2-8 hours; 80 plants have 4-hr duration (the other 13 are 5x2 hr, 1x2.5, 1x3, 1x3.7, 4x5, and 1x8 hr)
- Upward price trend among PPAs on the mainland, with prices in 2024 approximately twice typical prices in 2020
  - Rate of hybrid PPA price growth exceeds that of stand-alone solar, which saw increases of ~50-65% since 2020/2021 (see previous "LCOE & PPA Prices" section)

PPAs that price the PV and storage separately enable us to calculate a "levelized storage adder," which has increased in recent years

Graph Sample: 66 PV hybrid projects with 5.9 GW_{AC} of batteries (all 4h duration) in CA (35), NV (16), NM (11), AZ (3) and OR (1)





A larger capacity battery adds more to a PPA price than a smaller battery, when normalized for the PV plant size. This relationship between "levelized storage adders" and Battery-to-PV capacity ratios is roughly linear.

Retrofits tend to have higher "levelized storage adders" than greenfield projects.

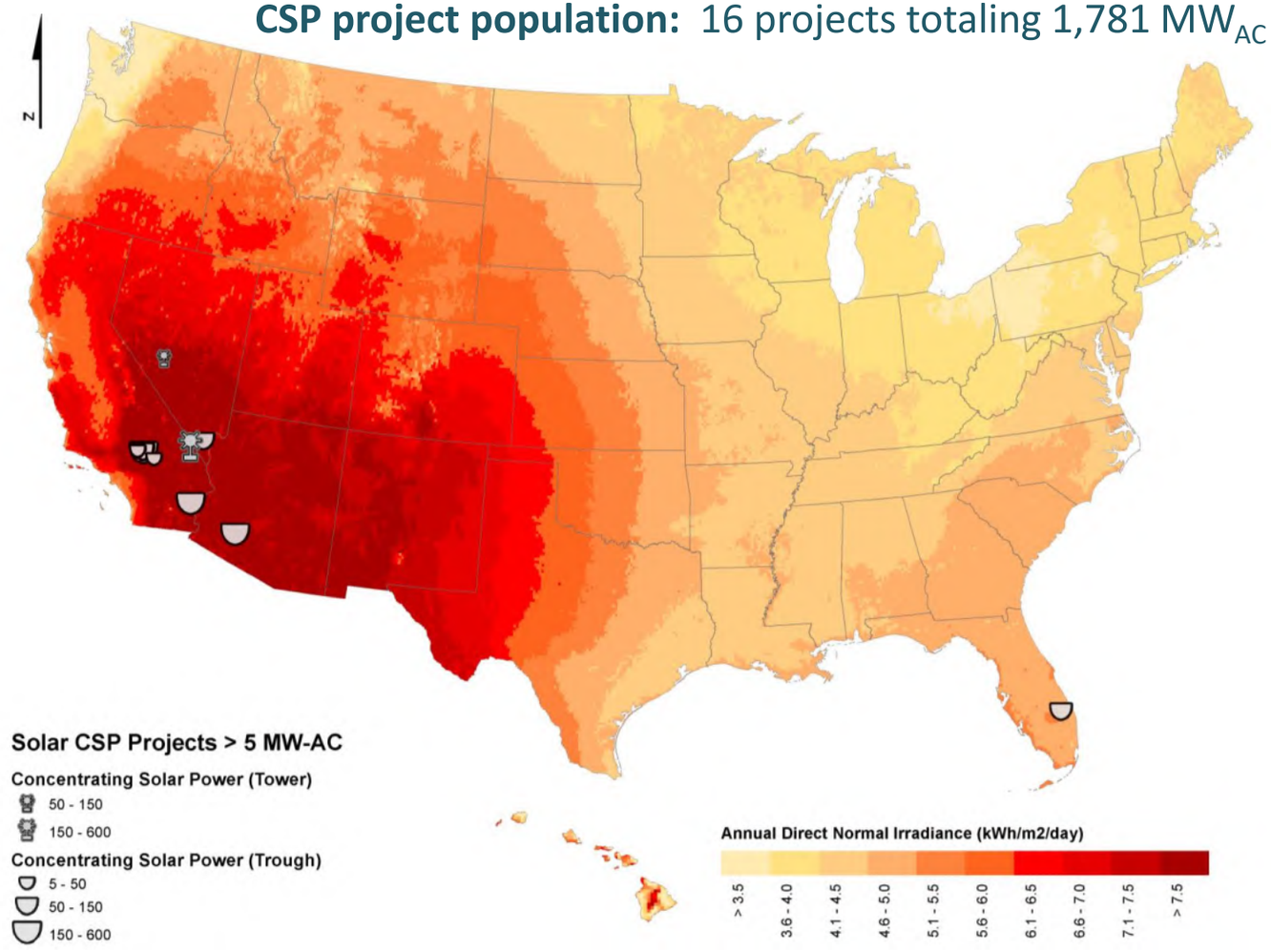
Increased PPA prices for the battery component explain some, but not all, of the recent increase in hybrid PPA prices. Levelized price increase since 2020 ($2023):

- Hybrid PPAs: ~$30/MWh-PV (see prior slide)
- Storage Adder: ~$23/MWh-PV
- All PV PPAs (not just hybrid): ~$10/MWh-PV

Concentrating Solar Thermal Power (CSP) Plants

Sample description of CSP projects

CSP project population: 16 projects totaling 1,781 MW_{AC}



After nearly 400 MW_{AC} built in the late-1980s and early-1990s, no new CSP was built in the U.S. until 2007 (68 MW_{AC}), 2010 (75 MW_{AC}), and 2013-2015 (1,237 MW_{AC}).

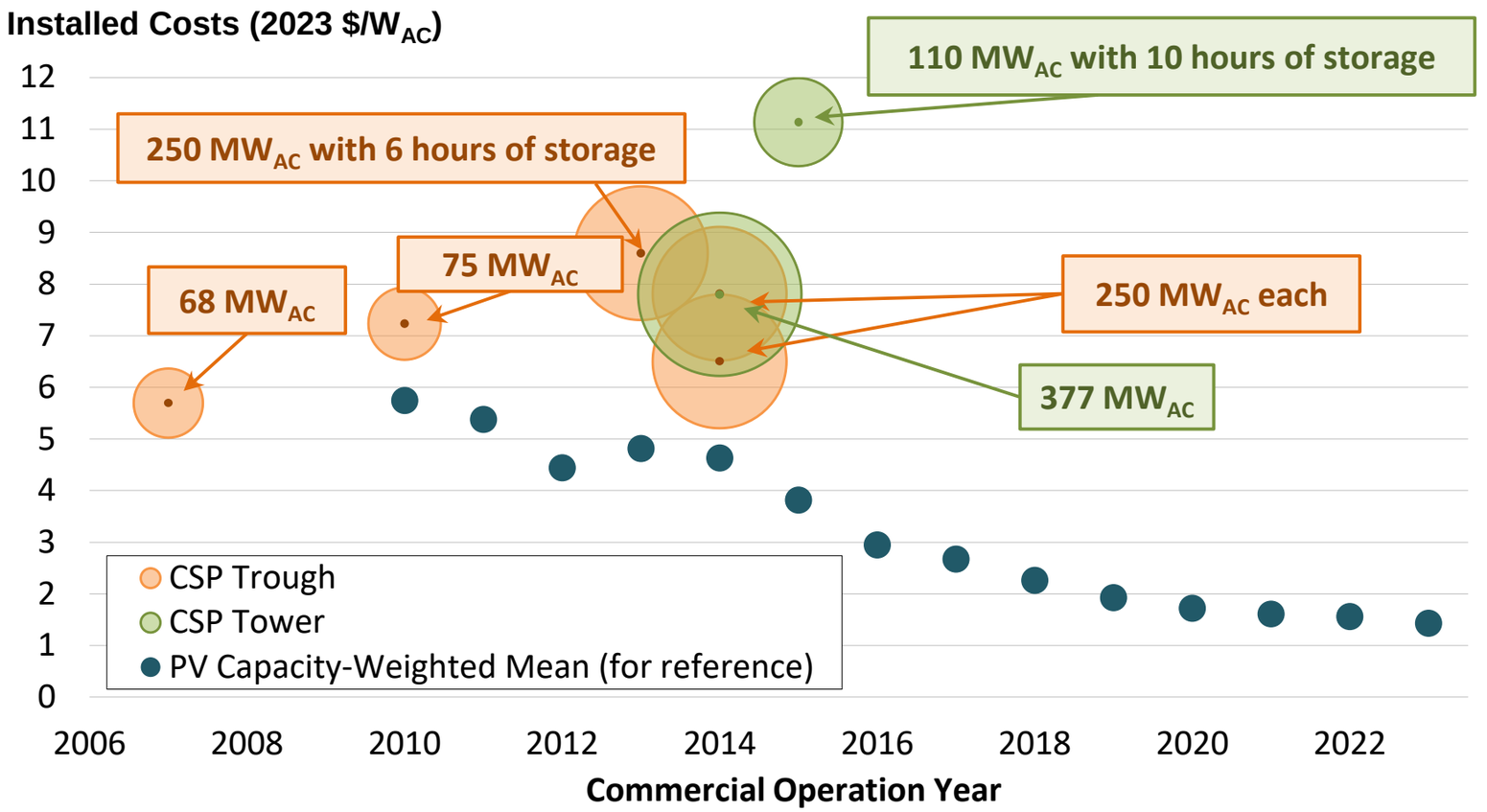
Prior to the large 2013-15 build-out, all utility-scale CSP projects in the U.S. used parabolic trough collectors.

The five 2013-2015 projects include:

- 3 parabolic troughs (one with 6 hours of storage) totaling 750 MW_{AC} (net) and
- 2 “power tower” projects (one with 10 hours of storage) totaling 487 MW_{AC} (net).

With no recent CSP installations in the U.S., empirical installed cost data are dated

CSP cost sample: 7 projects totaling 1,381 MW_{AC}

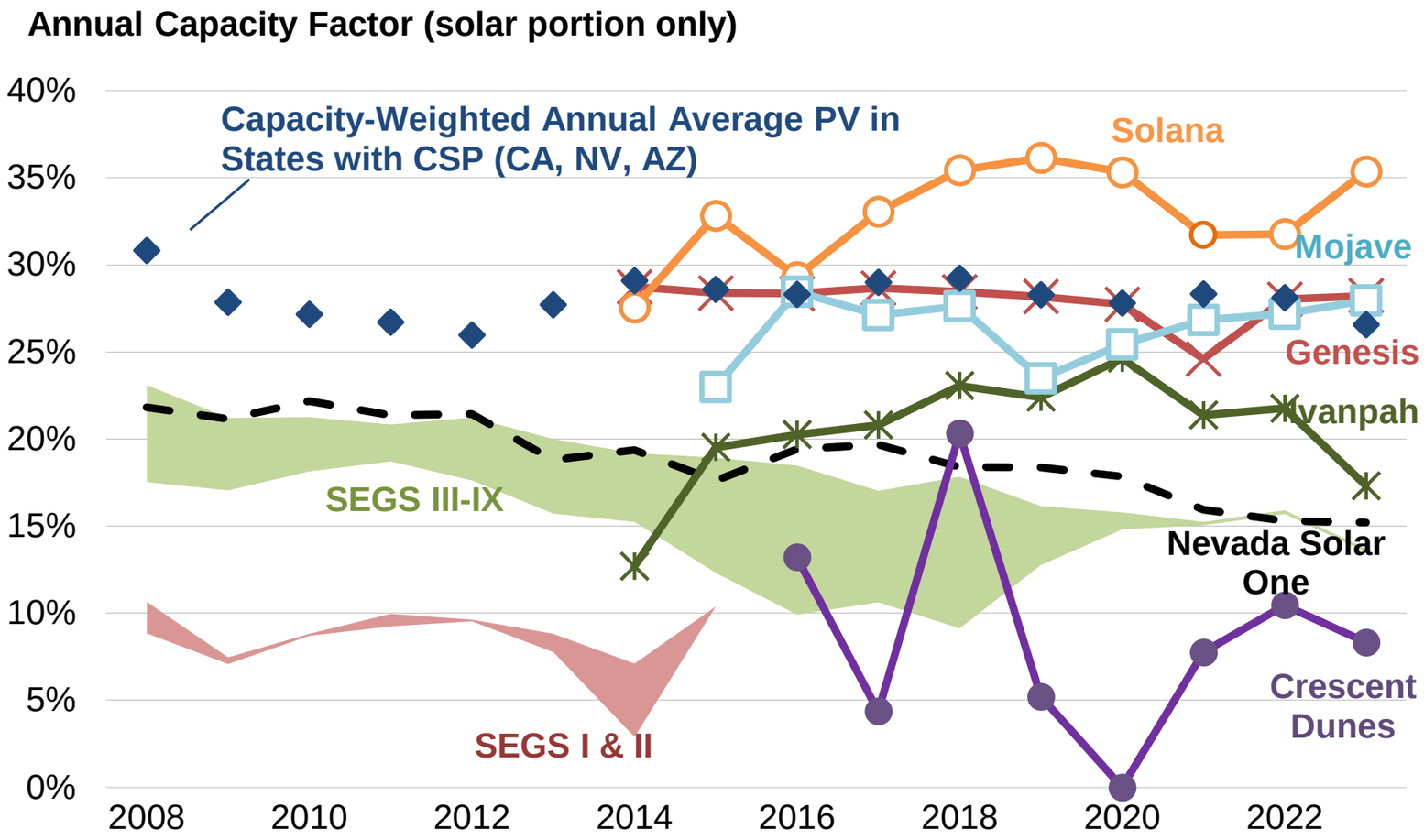


Small sample of 7 projects using different technologies makes it hard to identify trends. Newer projects (5 built in 2013-15) did not show cost declines, though some included storage or used new technology (power tower).

PV costs have continuously declined and are now far below the historical CSP costs. While international CSP projects seem to be more competitive with PV, no new CSP projects are currently under active development in the U.S.

Most newer CSP projects continue to underperform relative to long-term expectations

CSP capacity factor sample: 7 projects totaling 1,394 MW_{AC}



Power Towers: Ivanpah's (377 MW) capacity factor fell in 2023 to just 17.3%, well below long term expectations of 27%. Two of Ivanpah's generators reported no power generation over a combined three-month period in 2023. Crescent Dunes (110 MW with 10 hours of storage) performed at just 8.3% capacity factor in 2023.

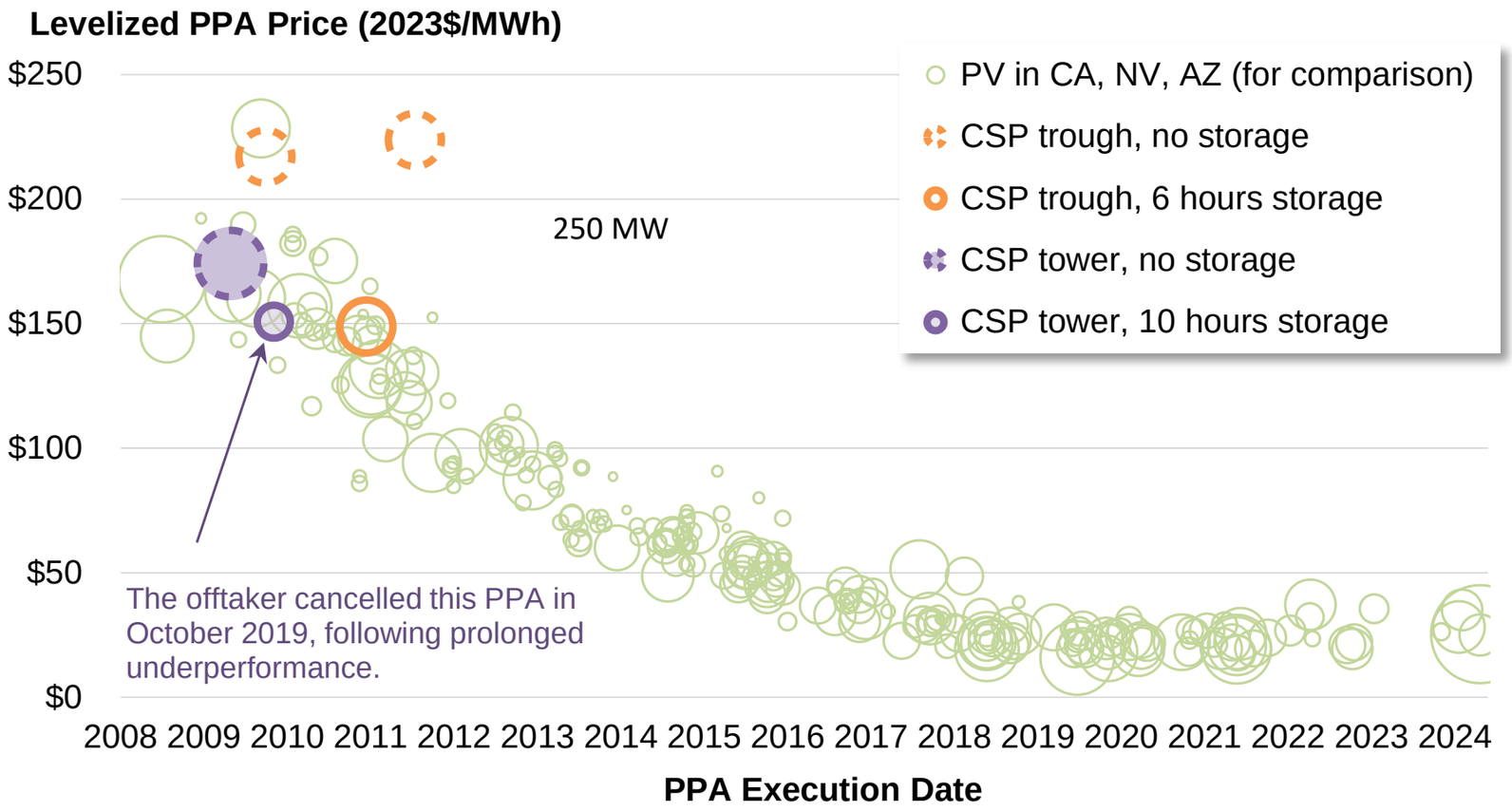
Trough with storage: Solana (250 MW trough project with 6 hours of storage) performed at 35.4% capacity factor in 2023, an increase from the previous two years but below long-term expectations of >40%.

Troughs without storage: Mojave and Genesis (both 250 MW net) were at 27-28% capacity factor in 2023. Both have performed better than the old SEGS projects (now decommissioned and repowered with PV) and the 2007 Nevada Solar One project.

Only Solana, Genesis, and Mojave have matched or exceeded the average capacity factor among utility-scale PV projects across CA, NV, and AZ.

Though CSP was once competitive, PV PPA prices have declined dramatically. Without new CSP PPA data, current comparisons are difficult

CSP PPA price sample: 5 projects totaling 1,237 MW_{AC}



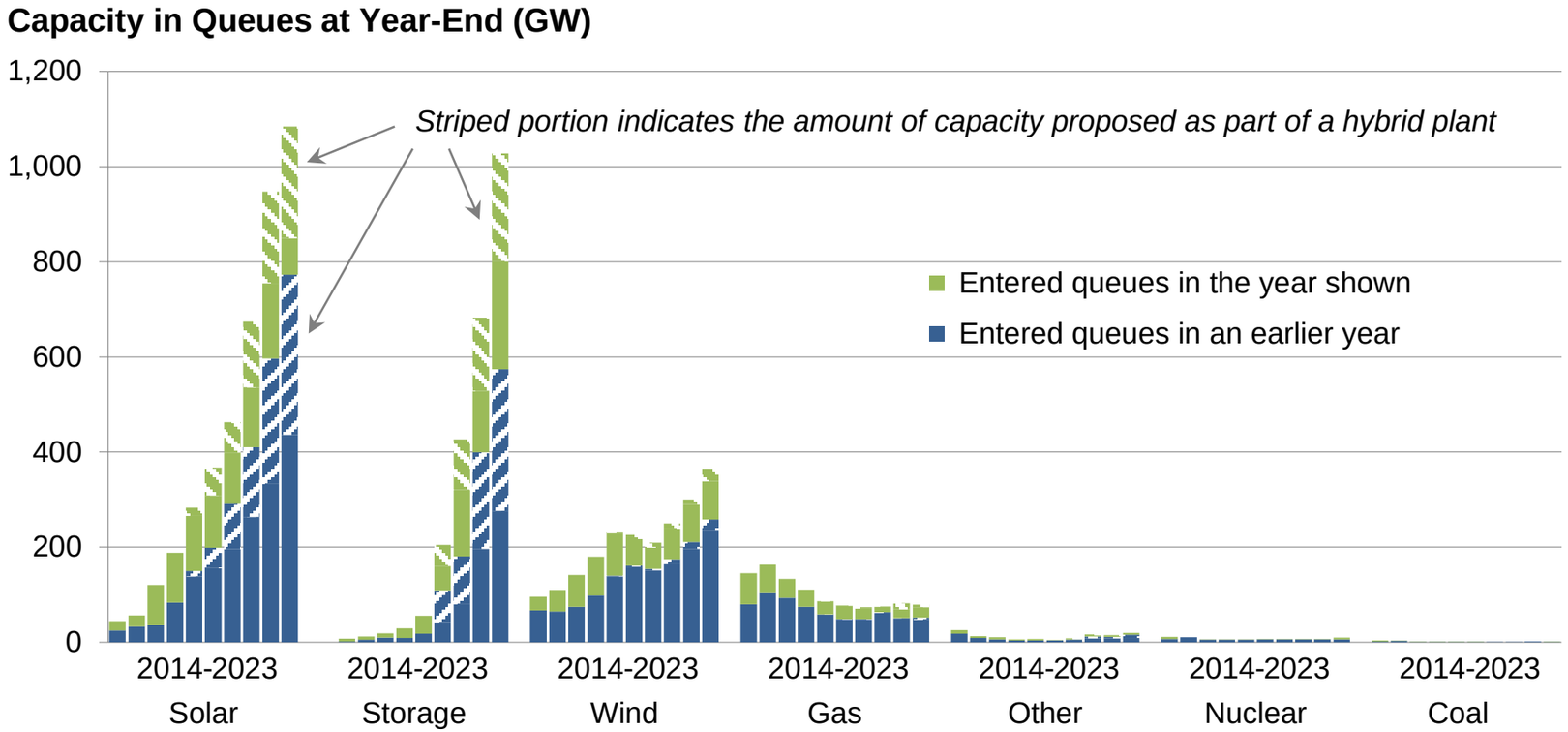
When PPAs for the most recent batch of CSP projects (with CODs of 2013-15) were signed back in 2009-2011, they were still mostly competitive with PV.

But CSP has not been able to keep pace with PV's price decline. Partly as a result, no new PPAs for CSP projects have been signed in the U.S. since 2011 – though the technology continues to advance overseas.

Capacity in Interconnection Queues

Looking ahead: Strong growth in the utility-scale solar pipeline

Sample: Active bulk-power interconnection requests from 51 interconnection queues.



1085 GW of solar was in the queues at the end of 2023—312 GW of this total entered the queues in 2023 (the remainder entered in earlier years and remain active).

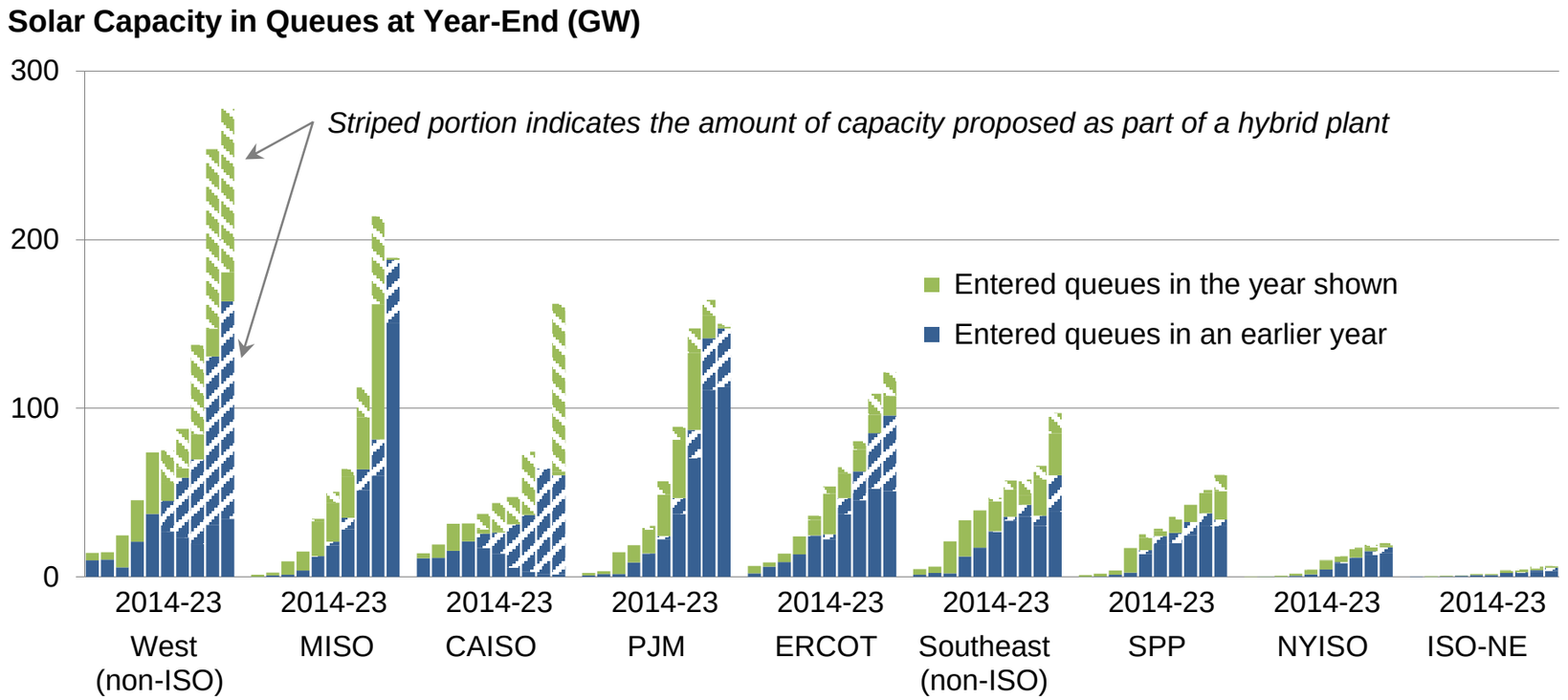
571 GW of the 1085 GW of solar in the queues (i.e., 53%) includes a battery in a PV hybrid configuration.

Solar (both in standalone and hybrid form) is the largest resource within these queues, followed closely by storage, with wind and gas a distant 3rd and 4th. (All other resources are negligible in comparison.)

Note: Not all projects will ultimately be built as many withdraw during the interconnection process. For more details on methods see Berkeley Lab's Annual Queued Up Report.

Looking ahead: Continued broadening of the market

Sample: Data from 51 interconnection queues across the U.S.



Most regions of the country saw growth in the amount of queued solar, with CAISO, the non-ISO West and Southeast leading the way in 2023

- MISO and PJM did not accept new interconnection requests in 2023, so all solar in those queues entered in an earlier year

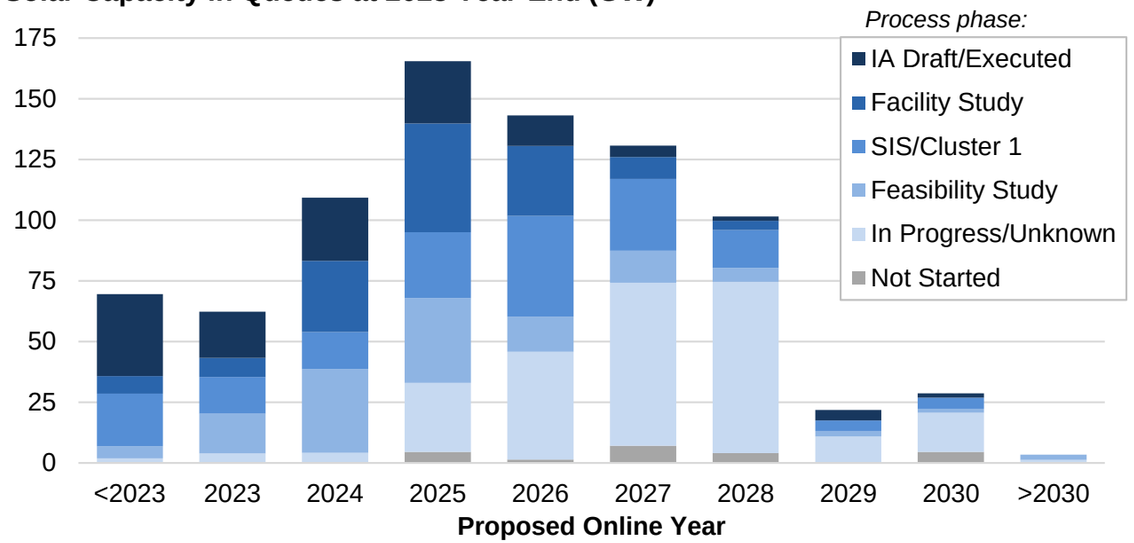
98% of the solar capacity in CAISO's queue at the end of 2023 was paired with a battery; in the non-ISO West, that number was also high, at 81%

- Both regions are grappling with "duck curve" issues due to solar's relatively high market share

Note: Not all projects will ultimately be built as many withdraw during the interconnection process. For more details on methods see Berkeley Lab's Annual Queued Up Report.

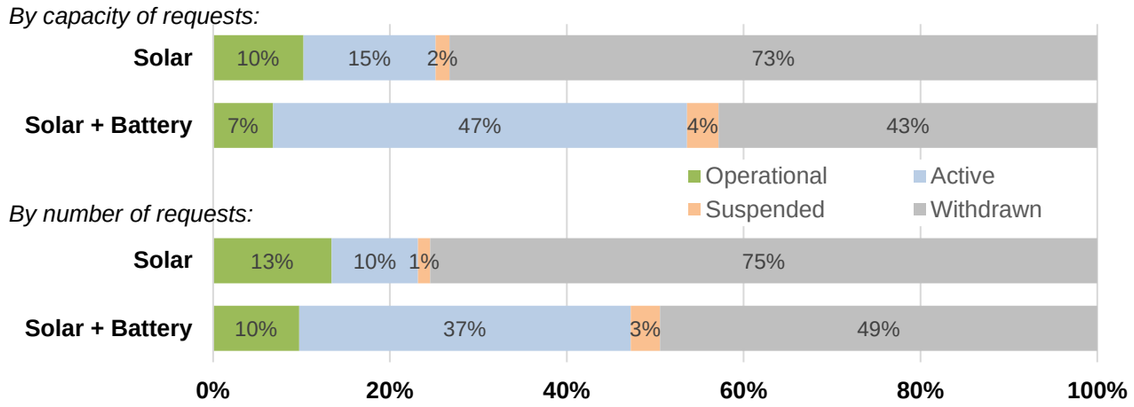
Most active solar proposes to be online by 2028, but the historical completion rate for solar projects requesting interconnection is low

Solar Capacity in Queues at 2023 Year-End (GW)



- Few solar projects have requested interconnection with a proposed online date of 2029 or later
- Proposed online dates are included in the developer's original interconnection request and may differ from actual online date
  - ❑ 132 GW of active solar requests were already past their proposed online date at the end of 2023
- 130 GW of solar capacity have an interconnection agreement (either draft or executed) – these projects are the most likely to be completed

Current Status for Requests Submitted 2000-2018



- If historical patterns persist, only ~10% of solar capacity requesting interconnection will ultimately get built and become operational
- Developers withdraw interconnection requests for myriad reasons:
  - ❑ Some reasons are based in the interconnection process, such as high cost to interconnect and study delays
  - ❑ Some reasons arise outside of the interconnection process, such as failure to secure financing or an offtaker, permitting issues, or insufficient resources to complete all proposed projects

Note: Not all projects will ultimately be built as many withdraw during the interconnection process. For more details on methods see Berkeley Lab's Annual Queued Up Report.

Summary

- Utility-scale PV continued to lead solar deployment in 2023, with Texas adding the most new capacity. 89% of new projects and 96% of new capacity feature single-axis tracking.
- The capacity-weighted installed cost of solar projects that came online in 2023 fell to \$1.43/W_{AC} (\$1.08/W_{DC}), down 8% from 2022 and 75% from 2010. Median prices (perhaps better reflecting typical project costs) fell from \$1.61/W_{AC} to 1.33/W_{AC} .
- Average capacity factors range from 17% in the least-sunny regions to 31% in the sunniest. Single-axis tracking adds more than five percentage points to capacity factors in the regions with the strongest solar resource.
- The generation-weighted LCOE from utility-scale PV has declined by 80% since 2010 to \$46/MWh (without tax credits) or \$31/MWh (with tax credits) in 2023. Levelized PPA prices have kept pace, but prices on newly executed agreements have trended upward the last few years. Since 2021 prices have typically ranged from \$20-45/MWh in CAISO and the non-ISO West to \$35-\$85/MWh elsewhere, with the highest prices in PJM and MISO.
- The market value of solar fell in 2023 to \$44/MWh on average, as energy prices returned to more normal levels. The generation costs of newer projects is less than their wholesale market replacement costs. Rising prices for new PPAs are now higher in some regions than solar's energy and capacity market value in 2023. When accounting for climate and health benefits, solar generation delivered nearly \$14 billion net-value in 2023.
- Interest in hybridization (pairing PV with batteries) continued to set new records in 2023 (37 new greenfield plants, 4.4 GW_{AC}-PV and 15 project retrofits, 0.9 GW_{AC}-PV). Recent (2022-2024) PV+battery hybrid PPAs in the continental US had a capacity-weighted average of \$55/MWh-PV.
- Across all 7 ISOs and 44 additional utilities, there were 1085 GW of solar in interconnection queues at the end of 2023. More than half of this proposed solar capacity is paired with battery storage, with the highest concentration of these PV+battery hybrid plants in CAISO (98%) and the non-ISO West (81%).

BERKELEY LAB

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For more information

Explore this report deck, a written technical brief, an extensive workbook with all underlying data, and interactive visualizations: http://utilityscalesolar.lbl.gov

For questions or technical assistance requests, contact:
Joachim Seel (JSeel@lbl.gov)
Julie Mulvaney Kemp (JMulvaneykemp@lbl.gov)

Read our other solar and wind work at: https://emp.lbl.gov/utility-scale-renewable-energy-storage

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NEVADA DEPARTMENT OF TAXATION
Division of Local Government Services

PERSONAL PROPERTY MANUAL:

VALUATION GUIDELINES

2024-2025

Personal Property Manual: Valuation Guidelines 2024-2025

Department of Taxation
Division of Local Government Services
1550 College Parkway, Suite 144
Carson City, NV 89706
Phone 775.684.2100 ● Fax 775.684.2020

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INTRODUCTION

2024-25 PERSONAL PROPERTY MANUAL – VALUATION GUIDELINES

The schedules presented herein are interpretive guidelines for use by county assessors to establish taxable value, pursuant to the requirements of NRS 361.227(4) and NAC 361.1365 and 361.1375.

CLASSIFICATION OF PROPERTY

Personal property is defined in NRS 361.030 and includes (j) "all property of whatever kind or nature, except vehicles as defined in NRS 371.020, not included in the term "real estate." Real estate is defined in NRS 361.035, and includes land, houses, buildings, fences, ditches, structures,[1] erections, railroads, other improvements, and property rights. Real property is further defined in NAC 361.11715 as land, fixtures, improvements; on-site enhancements; and any rights, interests, benefits and privileges belonging or attached to the land.

NRS 361.333 requires that each major class of property be examined to determine whether there is equality of assessment. Uniformity and equality of assessment thus depend on proper classification. Although NRS 361.035 defines real estate and NRS 361.030 defines personal property, in practice it is sometimes difficult to tell whether an item is personal or real property. As the Attorney General stated in Opinion #41 (1963), "the classification depends on the facts of each particular case." The assessor is encouraged to consult the Division of Local Government Services and/or the District Attorney in difficult cases.

All references to statutes and regulations may be found in Appendix A of this Manual.

EXEMPT PROPERTY

NRS 361.050 through NRS 361.187 provide exemptions for assorted types of eligible property, including household goods; business inventories; property in transit; property owned by government entities, charitable organizations or veterans; and fine art for display.

Additionally, NRS 361.228(1) provides that

All intangible personal property is exempt from taxation, including, without limitation:

(a) Shares of stock, bonds, mortgages, notes, bank deposits, book accounts such as an acquisition adjustment and credits, and securities and chooses in action of like character; and

(b) Goodwill, customer lists, contracts and contract rights, patents, trademarks, trade names, custom computer programs, copyrights, trade secrets, franchises and licenses.

A complete discussion of exemptions and a cross-reference table is included in Appendix D of this manual.

[1] Structures include self-supporting structures other than buildings which carry gravity loads and resist the effects of earthquakes. They are generally not designed for continuous human occupancy and may be open to the environment, part of landscape design elements, or part of infrastructure systems (transport, water, energy). Examples of non-building structures include silos, chimneys, stacks, cooling towers, bins and hoppers, amusement structures, and monuments. *See American Society of Civil Engineers, "Minimum Design Loads for Buildings and Other Structures;" Revision of ASCE Standard 7-98, SEI/ASCE 7-02, 2nd Edition, Section 9.14, Nonbuilding Structures, p. 186. See also Bachman, Robert and Susan Dowty, "Nonstructural Component or Nonbuilding Structure," originally published in Building Safety Journal (April-May, 2008).*

PROCEDURES FOR DETERMINING TAXABLE VALUE

To calculate the taxable value of personal property, NAC 361.1371 and NAC 361.1375 require the assessor to determine four input values:

- Acquisition cost
- Acquisition year
- Expected life, and
- Cost conversion factor

The personal property declaration submitted by the taxpayer pursuant to NRS 361.265 should list the acquisition cost for each item and the year acquired. The declaration should also contain sufficient information to identify each item's industry classification (NAICS code), property type, and corresponding expected life.

Acquisition Cost

For personal property mobile or manufactured homes, acquisition cost means replacement cost when new, which equals the retail selling price to the original owner. For other types of personal property including billboards, acquisition cost means the actual cost of property to its present owner. For all personal property, acquisition cost includes any expense required to place the asset into service except sales tax--including all charges for transportation, installation, accessories, and profit and overhead, as well as additions to or renovations of the property other than routine maintenance or repairs. Observe, however, that the cost of manufactured homes does not include appurtenant improvements like outbuildings, decks, or paving. The assessor should value these separately as real property and depreciate as appropriate.

Should a taxpayer fail to file a valid personal property declaration or sufficient data is not otherwise available for the assessor to establish acquisition cost, NRS 361.265 authorizes the assessor to make an estimate of the value of the property. NAC 361.139 further requires the assessor to estimate its acquisition cost using any nationally recognized valuation technique. Because NRS 361.265(5) defines failure to file a declaration as a misdemeanor, assessors should advise taxpayers to file complete, accurate, and timely personal property declarations. In addition, if the reported acquisition cost appears inconsistent with market data, the assessor may request documentation for the cost reported and may pursue penalties for perjury if necessary.

Acquisition Year

For mobile and manufactured homes, the acquisition year equals the year of the sale to the original owner, which often corresponds to the manufacturer's model year. For all other personal property, the acquisition year equals the year the current owner purchased or leased the property. Observe that the acquisition year remains constant at the year first sold for manufactured homes but resets to the year acquired each time billboards or equipment change owners.

Expected life

The Life Expectancy Guidelines section assigns typical asset lives to each major industrial classification grouped by NAICS code. For example, all industries classified as *Agriculture and Forestry (NAICS .11)* have 15 year lives, while *Mining (NAICS .21)* assigns a 20 year life to *Oil and Gas Exploration (NAICS .2111)* and a 15 year life to *Mining (NAICS .2121 & .2122)*.

Certain items within industries appear separately as Itemized Equipment with specific lives that may differ from the industry norm. For example, *Agriculture and Forestry* industries with a typical 15-year life expectancy also use specialized equipment whose asset lives equal 7, 10 or 20 years. To improve accuracy, assessors should employ the itemized equipment lives whenever they can assign a specific life expectancy to a particular item.

Having identified the industry classification for the subject account the assessor then assigns its appropriate NAICS code and corresponding expected lives to its assets. *See discussion on NAICS below for current requirements.*

Readers may also use the alphabetical listing of personal property by general type found in the Index of this Manual to locate the appropriate expected life for individual items. Because some industries use similar types of business equipment, like desks or computers, readers should select the NAICS classification that best describes the subject account.

Besides these NAICS Life Expectancy Guidelines, the Personal Property Manual also contains a Special Properties section with descriptions and asset life tables for:

- Short-life property subject to rapid obsolescence;
- Items similar to real property classified as personal, like mobile and manufactured homes or billboards;
- Generic business equipment found across many industries, like furniture and trade fixtures or computers; and
- Specialized assets like high-tech medical diagnostic equipment whose economic lives differ substantially from industry norms.

Cost Conversion Factors

Based on the acquisition cost, acquisition year and expected life for an item, the assessor should select the appropriate Cost Conversion Factor from the tables published in the Personal Property Manual.

Cost Conversion Factors contain three components: Cost Index, Age and Percent Good. To satisfy the requirement of NAC 361.1375(2) the department develops Paasche indexes for manufactured homes, billboards, and business equipment derived from pertinent Marshall Swift comparative cost multiplier tables, the West Urban, All Items CPI index, and the PPI Index for Capital Equipment, Stage of Processing. These indexes inflate replacement cost new expressed in acquisition year nominal dollars into replacement cost new expressed in current year nominal dollars.

Cost indexes do not apply to mobile and manufactured homes first sold prior to July 1, 1982, whose taxable value always equals 20% of their original selling price. Cost indexes for equipment and billboards do not accrue beyond their expected lives; such items have a constant residual cost conversion factor equal to their residual percent good multiplied by the residual year cost index.

To comply with NAC 361.130(2)(b), however, cost indexes do apply to mobile and manufactured homes first sold on or after July 1, 1982. Even though mobile homes fully depreciate after sixteen years, applying the cost index to the years between the current year minus 16 and 1982 may actually produce a temporary increase in taxable value.

NAC 361.1375(4)&(5) specify declining balance depreciation with a 5% residual (salvage value) for all property types except manufactured homes and billboards, which use straight line depreciation. Unless the Department has conducted a market study or has otherwise obtained information which indicates a different residual amount, the Department currently relies on a double declining balance method for all equipment and a 5% residual; 5% per year depreciation with a 20% residual for mobile homes (16 year life), and 1.5% per year depreciation with a 25% residual for billboards (50 year life).

Percent good equals (1 - accrued depreciation) for the given asset age, where age equals the current year (first year of the biennium) minus the acquisition year. For example, for the 2024-25 fiscal year, an asset acquired in 2017 has an age of seven years, a manufactured home first sold in 1992 has an age of thirty-two years. Although one could calculate depreciation directly, the tables reduce this process to a simple lookup.

To calculate taxable value using the Personal Property Manual, the assessor completes three steps:

- Select the appropriate expected life table,
- Look up the cost conversion factor for the given acquisition year and,
- Multiply the acquisition cost by the indicated cost conversion factor.

As usual, assessed value equals 35% of taxable value.

A NOTE ON NAICS

The North American Industry Classification System (*NAICS)* replaced the Standard Industrial Classification (SIC) in 1997. NAICS is based on a production-oriented concept, meaning that it groups establishments into industries according to similarity in the processes used to produce goods or services.

NAICS in the United States was designed for statistical purposes. However, NAICS is frequently used for various administrative, regulatory, contracting, taxation, and other non-statistical purposes.

For additional information and complete tables, readers may consult the US Census Bureau website http://www.census.gov/eos/www/naics/

The Department highly recommends assessors use the NAICS code on each personal property account. Use of the NAICS code will assist in the proper valuation of property pursuant to this Personal Property Manual because the NAICS code identifies the type of industry engaged in by the taxpayer.

In addition, the NAICS code is now a required component on the Statistical Analysis of the Roll Reports required by the Department in NRS 361.390 (3) in order to keep track of tax expenditures per NRS 360.137. For those concerned about the availability of the NAICS code to business taxpayers, use of the NAICS code will be widespread because taxpayers subject to the new Commerce Tax are required to provide the NAICS code. In addition, the NAICS code is required on applications for abatement to the Governor's Office on Economic Development and the Governor's Office on Renewable Energy. **The Department recommends assessors collect the NAICS code on Personal Property Declarations used by business taxpayers.**

2024-25 COST CONVERSION FACTORS

THREE (3) YEAR LIFE

NEVADA DEPARTMENT OF TAXATION

THREE (3) YEAR LIFE

200% DECLINING BALANCE

YEAR ACQUIRED	AGE	COST INDEX	PERCENT DEPRECIATION	PERCENT GOOD	CONVERSION FACTOR
2024	0	1.00	0.0	100.0	1.0000
2023	1	1.03	67.0	33.0	0.3399
2022	2	1.06	89.0	11.0	0.1166
2021	3	1.16	95.0	5.0	0.0580
Residual		1.16	95.0	5.0	0.0580

NEVADA DEPARTMENT OF TAXATION

FIVE (5) YEAR LIFE

200% DECLINING BALANCE

YEAR ACQUIRED	AGE	COST INDEX	PERCENT DEPRECIATION	PERCENT GOOD	CONVERSION FACTOR
2024	0	1.00	0.0	100.0	1.0000
2023	1	1.03	40.0	60.0	0.6180
2022	2	1.06	64.0	36.0	0.3816
2021	3	1.16	78.0	22.0	0.2552
2020	4	1.21	87.0	13.0	0.1573
2019	5	1.23	95.0	5.0	0.0615
Residual		1.23	95.0	5.0	0.0615

NEVADA DEPARTMENT OF TAXATION

SEVEN (7) YEAR LIFE

200% DECLINING BALANCE

YEAR ACQUIRED	AGE	COST INDEX	PERCENT DEPRECIATION	PERCENT GOOD	CONVERSION FACTOR
2024	0	1.00	0.0	100.0	1.0000
2023	1	1.03	29.0	71.0	0.7313
2022	2	1.06	49.0	51.0	0.5406
2021	3	1.16	64.0	36.0	0.4176
2020	4	1.21	74.0	26.0	0.3146
2019	5	1.23	81.0	19.0	0.2337
2018	6	1.26	88.0	12.0	0.1512
2017	7	1.29	95.0	5.0	0.0645
Residual		1.29	95.0	5.0	0.0645

NEVADA DEPARTMENT OF TAXATION

TEN YEAR LIFE

200% DECLINING BALANCE

YEAR ACQUIRED	AGE	COST INDEX	PERCENT DEPRECIATION	PERCENT GOOD	CONVERSION FACTOR
2024	0	1.00	0.0	100.0	1.0000
2023	1	1.03	20.0	80.0	0.8240
2022	2	1.06	36.0	64.0	0.6784
2021	3	1.16	49.0	51.0	0.5916
2020	4	1.21	59.0	41.0	0.4961
2019	5	1.23	67.0	33.0	0.4059
2018	6	1.26	74.0	26.0	0.3276
2017	7	1.29	79.0	21.0	0.2709
2016	8	1.32	84.0	16.0	0.2112
2015	9	1.33	90.0	10.0	0.1330
2014	10	1.34	95.0	5.0	0.0670
Residual		1.34	95.0	5.0	0.0670

NEVADA DEPARTMENT OF TAXATION

15 YEAR LIFE

200% DECLINING BALANCE

YEAR ACQUIRED	AGE	COST INDEX	PERCENT DEPRECIATION	PERCENT GOOD	CONVERSION FACTOR
2024	0	1.00	0.0	100.0	1.0000
2023	1	1.03	13.0	87.0	0.8961
2022	2	1.06	25.0	75.0	0.7950
2021	3	1.16	35.0	65.0	0.7540
2020	4	1.21	44.0	56.0	0.6776
2019	5	1.23	51.0	49.0	0.6027
2018	6	1.26	58.0	42.0	0.5292
2017	7	1.29	63.0	37.0	0.4773
2016	8	1.32	68.0	32.0	0.4224
2015	9	1.33	72.0	28.0	0.3724
2014	10	1.34	76.0	24.0	0.3216
2013	11	1.36	80.0	20.0	0.2720
2012	12	1.38	84.0	16.0	0.2208
2011	13	1.41	87.0	13.0	0.1833
2010	14	1.44	91.0	9.0	0.1296
2009	15	1.45	95.0	5.0	0.0725
Residual		1.45	95.0	5.0	0.0725

NEVADA DEPARTMENT OF TAXATION

20 YEAR LIFE

200% DECLINING BALANCE

YEAR ACQUIRED	AGE	COST INDEX	PERCENT DEPRECIATION	PERCENT GOOD	CONVERSION FACTOR
2024	0	1.00	0.0	100.0	1.0000
2023	1	1.03	10.0	90.0	0.9270
2022	2	1.06	19.0	81.0	0.8586
2021	3	1.16	27.0	73.0	0.8468
2020	4	1.21	34.0	66.0	0.7986
2019	5	1.23	41.0	59.0	0.7257
2018	6	1.26	47.0	53.0	0.6678
2017	7	1.29	52.0	48.0	0.6192
2016	8	1.32	57.0	43.0	0.5676
2015	9	1.33	61.0	39.0	0.5187
2014	10	1.34	65.0	35.0	0.4690
2013	11	1.36	69.0	31.0	0.4216
2012	12	1.38	72.0	28.0	0.3864
2011	13	1.41	75.0	25.0	0.3525
2010	14	1.44	78.0	22.0	0.3168
2009	15	1.45	80.0	20.0	0.2900
2008	16	1.47	83.0	17.0	0.2499
2007	17	1.52	86.0	14.0	0.2128
2006	18	1.59	89.0	11.0	0.1749
2005	19	1.64	92.0	8.0	0.1312
2004	20	1.70	95.0	5.0	0.0850
Residual		1.70	95.0	5.0	0.0850

NEVADA DEPARTMENT OF TAXATION

30 YEAR LIFE
200% DECLINING BALANCE

YEAR ACQUIRED	AGE	COST INDEX	PERCENT DEPRECIATION	PERCENT GOOD	CONVERSION FACTOR
2024	0	1.00	0.0	100.0	1.0000
2023	1	1.03	7.0	93.0	0.9579
2022	2	1.06	13.0	87.0	0.9222
2021	3	1.16	19.0	81.0	0.9396
2020	4	1.21	24.0	76.0	0.9196
2019	5	1.23	29.0	71.0	0.8733
2018	6	1.26	34.0	66.0	0.8316
2017	7	1.29	38.0	62.0	0.7998
2016	8	1.32	42.0	58.0	0.7656
2015	9	1.33	46.0	54.0	0.7182
2014	10	1.34	50.0	50.0	0.6700
2013	11	1.36	53.0	47.0	0.6392
2012	12	1.38	56.0	44.0	0.6072
2011	13	1.41	59.0	41.0	0.5781
2010	14	1.44	62.0	38.0	0.5472
2009	15	1.45	64.0	36.0	0.5220
2008	16	1.47	67.0	33.0	0.4851
2007	17	1.52	69.0	31.0	0.4712
2006	18	1.59	71.0	29.0	0.4611
2005	19	1.64	73.0	27.0	0.4428
2004	20	1.70	75.0	25.0	0.4250
2003	21	1.74	77.0	23.0	0.4002
2002	22	1.77	79.0	21.0	0.3717
2001	23	1.78	81.0	19.0	0.3382
2000	24	1.81	83.0	17.0	0.3077
1999	25	1.85	85.0	15.0	0.2775
1998	26	1.87	87.0	13.0	0.2431
1997	27	1.89	89.0	11.0	0.2079
1996	28	1.92	91.0	9.0	0.1728
1995	29	1.96	93.0	7.0	0.1372
1994	30	2.04	95.0	5.0	0.1020
Residual		2.04	95.0	5.0	0.1020

NEVADA DEPARTMENT OF TAXATION

MOBILE HOMES SOLD ON OR AFTER JULY 1, 1982

16 YEAR STRAIGHT LINE

YEAR FIRST SOLD	AGE	COST INDEX	PERCENT DEPRECIATION	PERCENT GOOD	CONVERSION FACTOR
2024	0	1.00	0.0	100.0	1.0000
2023	1	1.06	5.0	95.0	1.0070
2022	2	1.16	10.0	90.0	1.0440
2021	3	1.26	15.0	85.0	1.0710
2020	4	1.31	20.0	80.0	1.0480
2019	5	1.35	25.0	75.0	1.0125
2018	6	1.36	30.0	70.0	0.9520
2017	7	1.43	35.0	65.0	0.9295
2016	8	1.44	40.0	60.0	0.8640
2015	9	1.46	45.0	55.0	0.8030
2014	10	1.46	50.0	50.0	0.7300
2013	11	1.49	55.0	45.0	0.6705
2012	12	1.55	60.0	40.0	0.6200
2011	13	1.60	65.0	35.0	0.5600
2010	14	1.60	70.0	30.0	0.4800
2009	15	1.62	75.0	25.0	0.4050
2008	16	1.66	80.0	20.0	0.3320
2007	17	1.74	80.0	20.0	0.3480
2006	18	1.84	80.0	20.0	0.3680
2005	19	1.95	80.0	20.0	0.3900
2004	20	2.04	80.0	20.0	0.4080
2003	21	2.11	80.0	20.0	0.4220
2002	22	2.16	80.0	20.0	0.4320
2001	23	2.17	80.0	20.0	0.4340
2000	24	2.20	80.0	20.0	0.4400
1999	25	2.24	80.0	20.0	0.4480
1998	26	2.27	80.0	20.0	0.4540
1997	27	2.28	80.0	20.0	0.4560
1996	28	2.32	80.0	20.0	0.4640
1995	29	2.34	80.0	20.0	0.4680
1994	30	2.37	80.0	20.0	0.4740
1993	31	2.42	80.0	20.0	0.4840

Continued on next page …

NEVADA DEPARTMENT OF TAXATION

MOBILE HOMES SOLD ON OR AFTER JULY 1, 1982

16 YEAR STRAIGHT LINE (Continued)

YEAR FIRST SOLD	AGE	COST INDEX	PERCENT DEPRECIATION	PERCENT GOOD	CONVERSION FACTOR
1992	32	2.51	80.0	20.0	0.5020
1991	33	2.58	80.0	20.0	0.5160
1990	34	2.62	80.0	20.0	0.5240
1989	35	2.67	80.0	20.0	0.5340
1988	36	2.79	80.0	20.0	0.5580
1987	37	2.86	80.0	20.0	0.5720
1986	38	2.88	80.0	20.0	0.5760
1985	39	2.95	80.0	20.0	0.5900
1984	40	3.01	80.0	20.0	0.6020
1983	41	3.14	80.0	20.0	0.6280
1982	42	3.28	80.0	20.0	0.6560
Residual		1.00	80.0	20.0	0.2000[2]

[2] For Mobile Homes Sold On or Before July 1, 1982.

NEVADA DEPARTMENT OF TAXATION

BILLBOARDS

50 YEAR STRAIGHT LINE

YEAR ACQUIRED	AGE	COST INDEX	PERCENT DEPRECIATION	PERCENT GOOD	CONVERSION FACTOR
2024	0	1.00	0.0	100.0	1.0000
2023	1	1.04	1.5	98.5	1.0244
2022	2	1.04	3.0	97.0	1.0088
2021	3	1.18	4.5	95.5	1.1269
2020	4	1.27	6.0	94.0	1.1938
2019	5	1.29	7.5	92.5	1.1933
2018	6	1.32	9.0	91.0	1.2012
2017	7	1.37	10.5	89.5	1.2262
2016	8	1.40	12.0	88.0	1.2320
2015	9	1.40	13.5	86.5	1.2110
2014	10	1.42	15.0	85.0	1.2070
2013	11	1.44	16.5	83.5	1.2024
2012	12	1.47	18.0	82.0	1.2054
2011	13	1.51	19.5	80.5	1.2156
2010	14	1.55	21.0	79.0	1.2245
2009	15	1.54	22.5	77.5	1.1935
2008	16	1.57	24.0	76.0	1.1932
2007	17	1.62	25.5	74.5	1.2069
2006	18	1.69	27.0	73.0	1.2337
2005	19	1.77	28.5	71.5	1.2656
2004	20	1.87	30.0	70.0	1.3090
2003	21	1.96	31.5	68.5	1.3426
2002	22	1.99	33.0	67.0	1.3333
2001	23	2.02	34.5	65.5	1.3231
2000	24	2.05	36.0	64.0	1.3120
1999	25	2.12	37.5	62.5	1.3250
1998	26	2.15	39.0	61.0	1.3115
1997	27	2.18	40.5	59.5	1.2971
1996	28	2.22	42.0	58.0	1.2876

Continued on next page …

NEVADA DEPARTMENT OF TAXATION

BILLBOARDS

50 YEAR STRAIGHT LINE

YEAR ACQUIRED	AGE	COST INDEX	PERCENT DEPRECIATION	PERCENT GOOD	CONVERSION FACTOR
1995	29	2.26	43.5	56.5	1.2769
1994	30	2.32	45.0	55.0	1.2760
1993	31	2.40	46.5	53.5	1.2840
1992	32	2.47	48.0	52.0	1.2844
1991	33	2.52	49.5	50.5	1.2726
1990	34	2.58	51.0	49.0	1.2642
1989	35	2.66	52.5	47.5	1.2635
1988	36	2.75	54.0	46.0	1.2650
1987	37	2.84	55.5	44.5	1.2638
1986	38	2.88	57.0	43.0	1.2384
1985	39	2.93	58.5	41.5	1.2160
1984	40	3.00	60.0	40.0	1.2000
1983	41	3.10	61.5	38.5	1.1935
1982	42	3.20	63.0	37.0	1.1840
1981	43	3.37	64.5	35.5	1.1964
1980	44	3.67	66.0	34.0	1.2478
1979	45	4.05	67.5	32.5	1.3163
1978	46	4.46	69.0	31.0	1.3826
1977	47	4.86	70.5	29.5	1.4337
1976	48	5.18	72.0	28.0	1.4504
1975	49	5.51	73.5	26.5	1.4602
1974	50	6.17	75.0	25.0	1.5425
Residual		6.17	75.0	25.0	1.5425

SHORT-LIFE PROPERTY

Expected Life .....Three (3) years

Short-Life Property consists of items prone to rapid obsolescence or susceptible to breakage, loss or abnormal wear and tear.

Examples include:

Linens	Uniforms
Glassware	Pots, Pans, Utensils
Barware	Motion Picture Prints
Silverware	Rental Video Tapes, DVDs, CDs

Jigs, Dies, and Molds

Patterns, jigs, dies and molds fall into this category when the type of product manufactured, industry class, use of caustic chemicals, or physical deterioration associated with production volume act to shorten their useful lives and thus require their frequent replacement. Examples include injection molds for plastic parts of high-tech devices or dies used in heavy equipment production.

Ideally, assessors should identify the industrial application and determine the actual service lives of equipment used in current production from owner declarations or surveys of average lives from individual manufacturers before classifying such property as Short-life.

Digital Cameras

Digital cameras fall into two basic categories: professional and snapshot. In recent years, consumer-grade, digital snapshot and video cameras have become a generic commodity. They offer small, flimsy LCD monitors, low image resolution, and lack advanced features like interchangeable lenses. Only snapshot cameras qualify as Short-life property.

INFORMATION SYSTEMS

Life expectancies for computers and peripherals fall into four broad categories:

PCs, Tablets, and associated peripherals .....Three (3) years
Mini-computers (AS 400, VAX) .....Three (3) years
Servers ..... Five (5) years
Mainframe Computers (IBM 360).....Seven (7) years

An information system consists of computers and peripheral equipment used for processing normal business transactions and the maintenance, retrieval, and analysis of business records.

A computer functions as a programmable, electronically-activated device capable of accepting information, applying prescribed processes to the information, and supplying the results of these processes with or without human intervention. It usually contains a central processing unit that provides storage, logic, arithmetic, and control capabilities. Observe that adding machines and electronic calculators do not fall into this category.

To assign appropriate expected lives to computing equipment, assessors need to recognize the differences among mainframes, servers, client computers and personal computers.

Recent advances in computing technology make differentiating mainframes, minicomputers and servers difficult, especially for laymen. When in doubt, consult manufacturer marketing divisions, service literature, or websites to determine how they classify their various product lines.

A mainframe serves as a high-performance computer used for large-scale computing environments that demand greater availability and security than smaller-scale machines can offer. Banks, government agencies, insurance companies, credit card companies, and other organizations that perform massive transaction processing typically use mainframe systems. It is also possible to obtain a server which contains many "blades," each of which is used for a single application.[2] Currently, there are blade servers that have as many as 160 blades.

Mainframes should not be confused with servers, or with a server that uses software to spin off many virtual servers, each with its own computer operating system. Servers usually cost considerably more than personal computers, have more processing power and substantial amounts of computer memory. They are therefore significantly more expensive than most personal computers and they are often kept in service longer than personal computers. Servers are often dedicated to specific tasks like

- Transaction processing (On Line Transaction or OLT servers)
- print queuing and printing (print server)
- running mission critical software, clustering, fail-over and load-balancing (application server)
- audio and video transmission (audio video server)
- exchanging short bursts of written information and opinions in an environment that offers real-time discussions (chat servers)
- sending and receiving faxes without using fax machines (fax server)
- File Transfer Protocol – moving files between computers while providing security and, organization, and transfer control (FTP server)

Historically, mainframes have been associated with centralized rather than distributed computing, although that distinction has blurred as smaller computers become more powerful and mainframes become more multi-purpose. Today, mainframes can serve both distributed users and smaller servers in computing networks. Interestingly, a mainframe actually resides within a server box.

[2] A major advantage of a blade server is that it dramatically reduces cabling requirements.

A key distinguishing feature of a mainframe is that it takes computing power away from end users and puts it in a central location. Another way to visualize a mainframe is to think of the computer as a super server, with multiple operating systems.

Here is a link to the Family Tree And Chronology of some of the older IBM Mainframes. This link will take you to the IBM page for System Z Mainframes.

By comparison, minicomputers are stand-alone computers (computer systems with attached terminals and other devices) sold to small and mid-size businesses for general business applications and to large enterprises for department-level operations. In recent years, the minicomputer has evolved into the "mid-range server" and is part of a network. IBM's AS/400e is a good example.

Peripheral equipment consists of the auxiliary machines which are designed to be placed under the control of a central processing unit. Peripheral equipment may include card readers, card punches, mass storage units, paper tape equipment, keypunches, data-entry devices, teleprinters, terminals, tape drives, disc drives, disc files, disc packs, visual image projector tubes, card sorters, plotters, collators, small inkjet printers, small laser printers, and small desktop all-in-one devices (e.g. printer/fax/scanner combination) that are sold as commodities in retail outlets and which are rapidly replaced as faster machines with new features are added.

Although one could classify computers by processor architecture, number of users supported, total system throughput, etc, ultimately the classification boils down to total system cost and the total time required to amortize the assets. Again, taxpayer records that reveal the actual service lives and disposition values of their own data processing equipment provide the best source of verifiable market data.

TAXABLE SOFTWARE (NOT ASSOCIATED WITH COMPUTER-INTEGRATED MACHINERY)

Expected Life ..... Three (3) years

Nevada law treats standard, prewritten software programs as tangible personal property.[3] A standard prewritten program, often called canned or off-the-shelf software, means a generic application not originally developed and produced for a specific user. This includes any programs, procedures, rules, and associated documentation pertaining to the operation of a computer system. Custom software programs consist of original, one-of-a-kind computer applications developed under contract exclusively for the particular requirements of a specific user. Custom computer programs qualify as exempt intangible personal property pursuant to NRS 361.228.

[3] **According to the IRS, "**Computer software is not a section 197 intangible even if acquired in connection with the acquisition of a business, if it meets all of the following tests.

- It is readily available for purchase by the general public.
- It is subject to a nonexclusive license.
- It has not been substantially modified.

If the software meets the tests above, it can be depreciated and may qualify for the section 179 expense deduction and the special depreciation allowance (if applicable)." http://www.irs.gov/publications/p225/ch07.html

COMPUTER-INTEGRATED MACHINERY

Expected Life ..... Seven (7) years

Computer integrated machinery, including its integrated programming or software, exhibits the following characteristics:

- The machinery and computer sell as a single unit
- The machinery cannot operate without the computer and the computer cannot perform functions outside the machinery.
- The components of the computer form an integral, structural part of the equipment itself; it is not economically or functionally feasible to replace the computer without replacing the entire machine.
- For income tax purposes, depreciation accrues to the total cost of the machine and computer as a unit.
- The capabilities of the machine cannot be expanded by substituting a more complex computer for the original.
- Embedded programming or pre-loaded software designed primarily for the function of the machine into which it is integrated runs the computer.

Examples of computer-integrated machinery include computer driven mills; computer integrated manufacturing machinery; computer integrated fabrication machinery; computerized machine lathes; and computerized assembly machinery.

ROBOTS AND ROBOTIC DEVICES

Expected Life:

Industrial and Service Robots .....Ten (10) years
Medical Robots .....Seven (7) years
Robotic Devices..... Five (5) years

This category includes robots and robotic devices operating in both industrial and non-industrial environments. The assessor should assign expected lives to the robots and robotic devices separately. Any robotic machines or devices that do not meet the characteristics of a robot as set forth by the International Organization for Standardization (ISO) are not considered robot for personal property assessment purposes.

Robots and robotics are usually used interchangeably but robotics has a broader meaning than the term robots. The ISO created a differentiation between robotic devices and robots. **Robotic Devices** are "mechanisms developed with robotic technology but not fulfilling all characteristics of a robot." For example, *teleoperated remote manipulator, **haptic device**, end-effector, unpowered exoskeleton, two-axis industrial manipulator*. **Robots** are "programmed actuated mechanism with a degree of autonomy to perform locomotion, manipulation, or positioning."

Robots are mainly mechanical or hardware but also contain some level of programming (software component). The hardware or physical component includes the body/frame, central processing unit (CPU) or control system for processing and executing instructions, sensors for collecting data from the environment, actuators (motors) for physical movement, end effectors for completion of tasks, and power supply for providing energy to the robot. The software (program) is an integral part for robots to operate for its intended use. The combination of

programming software and control system provides the robot the capability to perform and complete its tasks. The software can be upgraded or modified depending on the business needs.

In general, robots are categorized by their primary use or intended application. Nowadays, the most common robot types include industrial robots used for manufacturing (e.g., automotive, aerospace, electronics, consumer goods, etc) and service robots used for retail and hospitality, healthcare, and logistic businesses. The following provides the definition and distinction between the industrial robot and the service robot in accordance with the ISO standards.

Industrial Robot

An industrial robot is "a multifunctional, reprogrammable, automatically controlled manipulator, programmable in three or more axes that can be fixed in one area or mobile for use in industrial automation applications" (ISO 8373:2012). Thus, industrial robots are fully autonomous machines that do not require human intervention and can be re-programmed to perform several functions such as welding, painting, assembly/disassembly, pick and place for printed circuit boards, packaging and labeling, palletizing, product inspection, material handling, cutting, or grinding, testing, etc. Single-purpose automated machines that cannot be re-programmed to perform other tasks or need a human operator are not considered industrial robot. Autonomous Mobile Robots (AMR) used in industrial environments that have less than three axes (movement) and lack of manipulation capabilities are not considered industrial robots. Robots not intended for industrial applications are also not considered industrial robot.

Six Major Types of Industrial Robots Based on Mechanical Structure:

1. Articulated Robots – most common industrial robot; emulate human arm (have three to six rotary joints) that allows a wide range of movement; capable of lifting heavy objects
2. Cartesian Robots – have three prismatic joints for the movement of the tool and three rotary joints for its orientation in space (can only move linearly in three directions – forward and backward, up and down, and side to side); rigid in all three axes which makes them accurate
3. Cylindrical Robots – characterized by rotary joint at the base and at least one prismatic joint connecting its links (can move vertically and horizontally); commonly used in small spaces and ideal for objects that require circular symmetry (e.g., wires, pipes)
4. Spherical (Polar) Robots – an older technology; a combination of two rotational joints and one linear joint creating a spherical-shaped working space; commonly used for painting and welding
5. SCARA (Selective Compliance Assembly Robot Arm) Robots – characterized by two parallel joints which provide movement in X-Y plane; rotating shafts are positioned vertically at the effector; ideal for assembly application and palletization
6. Delta Robots – consist of parallel links connected to a common base (spider-like arm); useful for direct control tasks and high maneuvering operations (pick-and-place).

Service Robot

A service robot is a robot "that performs useful tasks for humans or equipment excluding industrial automation applications." A degree of autonomy (full or partial) is required for service robots. Thus, service robots are either fully autonomous or operated by a built-in control system, with manual override options, and assist people by performing repetitive, dull, dirty, or dangerous tasks. Service robots are for professional use. Examples include logistics and delivery robots, social robots, restaurant/waiter robots, cleaning robots, disinfection robots, kitchen/chef robots, agricultural robots, aerial robots (drones), underwater robots, etc.

Medical Robot

The "new" ISO robotics vocabulary standard ISO 8373:2021 defines medical robots as a third category next to industrial and service robots. A medical robot is a robot intended to be used as medical electrical equipment or medical electrical systems. It is controlled by a surgeon (not autonomous). An example of medical robot is the Da Vinci Surgical System. Currently, it is the only surgical robot approved by the Food and Drug Administration (FDA) to perform surgical procedures. Da Vinci assists surgeons in performing gynecological surgeries, urological, head and neck, thoracic, colorectal, cardiac and general surgeries. This robot machine consists of three parts: the control center (which carry the surgeon's seat allowing a 3D-magnified, high-definition view and use of hand and foot controls); the patient cart (which holds the surgical instruments and the camera); and the vision cart (which contains a video screen). In line with high-tech electronic medical equipment, the medical robot is assigned a seven-year life.

COMPUTERIZED EQUIPMENT

Expected Life:

Free-standing computer system ..... Seven (7) years or
Generic personal computer .....Three (3) years
Equipment component.....NAICS industry class life

This category includes machines controlled by computers that sell as a separate unit from the machine and can perform additional functions outside the machine. The assessor should assign expected lives to the two components separately; the computer equipment has the same expected life as similar computer equipment; the machinery has the expected life assigned to its specific industry.

Examples include:

Computerized Machine Lathes,
Computerized Assembly Machinery,
Cash Management Systems,
3-D Printers.

HIGH-TECH MEDICAL DIAGNOSTIC EQUIPMENT

Expected Life ..... Five (5) years

High-tech medical diagnostic equipment exhibits these characteristics:

- Used in medical or dental facilities;
- Subject to accelerated functional and economic obsolescence caused by rapid technological development.

Examples include:

Cardiac Ultrasonic Scanners
CAT (Comp Tomography) Scanners
Diagnostic Ultrasounds

General Ultrasonic Scanners
MRI (Magnetic) Scanners
Nuclear Medicine Cameras
OB/GYN Ultrasonic Scanners
PET Scanners (Positron Emission)
All Portable Units of Same
Endoscopy Equipment (amnioscopes, angioscopes, arthroscopes, bronchoscopes, colonoscopes, cystoscopes, encephaloscopes, esophagoscopes, gastroscopes, hysteroscopes, laparoscopes, laryngoscopes, mediastinoscopes, nephroscopes, proctoscopes, rhinoscopes, thoracoscopes, endoscopy tower, endoscopy camera, endoscopy light sources, endoscopy video processors, insufflators, and electrosurgical units)

HIGH-TECH ELECTRONIC MEDICAL EQUIPMENT

Expected Life:

Cardiac laser units .....Three (3) years
Other items .....Seven (7) years

High-tech electronic medical equipment exhibits these characteristics:

- Used in medical or dental facilities;
- Subject to accelerated functional and economic obsolescence caused by rapid technological development.

Examples include patient monitors of all kinds:

Anesthesia Monitors, Machines and Devices
Apnea Monitors
Blood Pressure Monitors
Chart Recorders
Defibs
Dopplers
EEG Machines
EKG Machines
External Pace Makers
Heart Rate Devices
Medical Laser Units
Neurological Monitors
Oximeters
Oxygen Analyzers
Spirometers
Systolic Monitors
Temperature Monitors

OFFICE FURNITURE, RETAIL SALES EQUIPMENT, OTHER

This category includes furniture and equipment that can be found across industries.

Description	Life in Years
Air Conditioners	**15**
Air Conditioners, Window	**7**
Cash Registers (electronic)	**7**

Coin-wrap Equipment 15
Copy and Duplicating Machines 5
Cabinets and Shelving 15
Check-out Counters 15
Data Processing Equipment (See Also Information Systems) 7
Décor 15
Displays, Cases, and Racks 15
Mailing Machines 7
Office Furniture (Desks, Chairs, Filing Cabinets) 15
Office Kitchen Appliances (Microwave Ovens, Refrigerators) 15
POS – Point-of-Sale Computer Systems[4] 7
Signs[5] (Other than Billboards and electronic) 15
Signs, Electronic 7
Sound Systems (background and public address) 7

MOBILE OR MANUFACTURED HOMES

This section applies only to mobile or manufactured homes classified as personal property. Pursuant to NRS 361.561, those units identified as a "travel trailer," "utility trailer" and "van conversion," in chapter 482 of NRS and any other vehicle required to be registered with the department of motor vehicles and public safety are subject to property tax unless registered and taxed pursuant to Chapter 371 of NRS. Such unregistered units and vehicles must be taxed in the manner provided in NRS 361.562 to 361.5644, inclusive.

The sticker issued pursuant to NRS 361.5643 must be affixed to a mobile or manufactured home in such a way that the sticker is clearly visible from the street. The window decal is not required for licensed mobile units or on units considered real property and may be issued at the option of the county assessor.

NRS 361.325(3) segregates mobile homes into two different categories for assessment purposes based on age. Mobile homes sold on or after July 1, 1982 shall be classified according to those factors which most closely determine their useful lives. In establishing the value of other mobile homes, the commission shall begin with the retail selling price and depreciate it by 5 percent per year, but not below 20 percent of its original amount. The assessment ratio in all cases is 35 percent of the computed taxable values. See NAC 361.130 for additional information on the calculation of value for mobile homes.

Depreciation schedules and cost conversion factors apply to the 2024-25 Secured and Unsecured Tax Rolls. The 2024-25 Cost Conversion Index for Mobile or Manufactured Homes appears on page 8 of this manual.

[4] Point-of-Sale systems include all peripherals and handheld devices used to take electronic payments or to collect related data with the exception of smartphones, tablets and POS tablets. Smartphones, tablets and POS tablets should be given a three-year life.

[5] See Appendix F to determine whether signs are real or personal property. Personal property signs include vinyl and fabric banners and sign-waving mannequins.

BILLBOARDS

NRS 361.013 defines a billboard as ". . . a sign that directs attention to a business, commodity, service, entertainment or attraction that is sold, offered or exists at a location other than the premises on which the sign is located."

NRS 361.227 requires that depreciation of a billboard must be calculated at 1.5 percent of the cost of replacement for each year after the year of acquisition of the billboard, up to a maximum of 50 years. Additional information on the calculation of billboards may be found in NAC 361.1305.

Depreciation schedules and cost conversion factors apply to the 2024-25 Secured and Unsecured Tax Rolls. The 2024-25 Cost Conversion Index for Billboards may be found on page 10 of this manual.

LIFE EXPECTANCY GUIDELINES

2024-25 PERSONAL PROPERTY MANUAL

NAICS Industry Code.....Description.....Life in Years

11 AGRICULTURE AND FORESTRY

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

111 Crop Production 15

Personal property includes machinery and equipment such as tractors, combines, hay balers, forage harvesters, unlicensed farm vehicles including utility trailers, wagons and utensils used to grow crops mainly for food and fiber. The subsection comprises establishments, such as farms, orchards, groves, greenhouses, and nurseries, primarily engaged in growing crops, plants, vines, or trees (including Christmas trees) and their seeds.

Itemized Equipment

Fertilizer Distribution 10
Laser sending and receiving equipment 10
Seed cleaning machinery and equipment 20
Seed cleaning equipment – portable 10

112 Animal Production 15

Personal property includes machinery and equipment used to raise or fatten animals for the sale of animals or animal products. The subsection comprises establishments, such as ranches, farms, and feedlots primarily engaged in keeping, grazing, breeding, or feeding animals. These animals are kept for the products they produce or for eventual sale.

Itemized Equipment

1125 Animal Aquaculture, including nets and pens 7
11212 Dairy Production 15
1123 Egg Packing Equipment 20

113 Forestry and Logging 15

Personal property includes machinery and equipment used to: (1) cut timber; (2) cut and transport timber; and (3) produce wood chips in the field, including stationary saw mills, skidders, and log loaders.

Itemized Equipment

Chain saws 7
Portable saw mill 7

21 MINING

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

2111 Oil and Gas Extraction 20

Personal property used in oil and gas extraction are used to explore for crude petroleum and natural gas. A typical example of personal property in this category would include inventory and spare parts.

Itemized Equipment

Bolted and fiberglass tanks 15
Drilling rigs 15
Heaters, treaters, knockout dryer, separators, conditioning equipment 15
LACT units, metering devices, manifolds 15
Motors, engines, drive units 10
Secondary recovery (injection pumps, re-pressure equipment) 15
Transformers 30

2122 Metal Ore Mining 15

Personal property used in developing the mine site, mining or quarrying dimension stone. A typical example of personal property in this category would include inventory and spare parts.

Itemized Equipment

Oxygen generation 20
Mobile equipment, heavy use* 7

2123 Nonmetallic Mineral Mining and Quarrying 15

Personal property used in developing the mine site, mining or quarrying dimension stone. A typical example of personal property in this category would include inventory and spare parts.

* Heavy use is defined as in operation for more than one shift per day, seven days a week. Mining mobile equipment eligible for this category includes haul packs, loaders, shovels, dozers, graders, backhoes, drilling trucks, and excavators.

22 UTILITIES

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

2211 Electric Power Generation, Transmission, and Distribution 30

Personal property used in generating, transmitting, and/or distributing electric power. A typical example of personal property in this category would include inventory and spare parts.

2212 Natural Gas Distribution 30

Personal property used in (1) operating gas distribution systems (e.g., mains, meters); (2) establishments known as gas marketers that buy gas from the well and sell it to a distribution system; (3) establishments known as gas brokers or agents that arrange the sale of gas over gas distribution systems operated by others; and (4) establishments primarily engaged in transmitting and distributing gas to final consumers. A typical example of personal property in this category would include inventory and spare parts.

2213 Water, Sewage, and Other Systems 30

Personal property used in establishments primarily engaged in operating water treatment plants and/or operating water supply systems. A typical example of personal property in this category would include inventory and spare parts.

221330 Steam and Air-Conditioning Supply 30

Personal property used in providing steam, heated air, or cooled air. A typical example of personal property in this category would include inventory and spare parts.

23 CONSTRUCTION

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

236 Construction of Buildings 15

237 Heavy and Civil Engineering Construction 15

238 Specialty Trade Construction 15

Personal property used primarily in the construction of buildings, major engineering projects such as highways and dams, and specialty trades such as pouring concrete, site preparation, plumbing, painting, and electrical work. Includes fixed load and mobile equipment such as:

Air compressors

Motor graders/leveling graders

238 Specialty Trade Construction *continuation…*

Air drills
Asphalt plants
Asphalt spreaders
Backhoe/loaders
Carryalls
Cement mixers/spreaders
Crusher/crushing plant
Roadrollers/sheepsfoot rollers
Crawler cranes/ tractors
Ditchers/diggers
Earthmoving scrapers
Excavators
Fork lifts
Front end loaders / bucket loaders
Mixmobiles
Paving equipment
Portable shop
Portable storage bins
Portable storage tanks
Power hoists
Power shovels
Sand classifiers and drags
Scarifiers and rollers
Scrap metal balers
Scrubber screens and plant feeders
Welder
Wiring Equipment

Itemized Equipment

Cranes

Bridge	20
Jib	20
Mobile Telescopic	10
Electric generating equipment	20
Electronic controlled infrared/laser instruments	10
Power tools (saws, drills, etc.)	7
Hand tools	7
Mobile equipment, heavy use[6]	7

[6] Heavy use is defined as in operation for more than one shift per day, seven days a week

31 MANUFACTURING

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

311 Food 15

Personal property used in this industry transform livestock and agricultural products into products for intermediate or final consumption. The food products manufactured in these establishments are typically sold to wholesalers or retailers for distribution to consumers, but establishments primarily engaged in retailing bakery and candy products made on the premises not for immediate consumption are included. Includes equipment such as walk-in coolers, freezers and other refrigeration, grain tanks, bottling and canning equipment in the following industries:

3111	Animal food manufacturing
3112	Grain and oil seed milling
3113	Sugar and confectionery product manufacturing
3114	Fruit and vegetable preserving and specialty food manufacturing
31141	Frozen food manufacturing
31142	Fruit and vegetable canning
3115	Dairy product manufacturing
3116	Animal slaughtering and processing
3117	Seafood product preparation and packaging
3118	Bakeries and tortilla manufacturing
311811	Retail bakeries
311812	Commercial bakeries
3119	Other food manufacturing, such as honey processing

Itemized Equipment

Cereal manufacturing 20

Grain elevators, non-farm 20

Mechanical portion of packing and sorting line equipment 2nd view 30

Electronic portion of line equipment[7] 10

312 Beverage and Tobacco Product Manufacturing 15

Personal property used to manufacture beverages and tobacco products. Please note that ice manufacturing, while not a beverage, is included with nonalcoholic beverage manufacturing because it uses the same production process as water purification.

[7] If electronic component's original cost cannot be separated from other line assets, use 20 years.

312 **Beverage and Tobacco Product Manufacturing** *continuation…*

Manufacturing processes include:

31211 Soft drink manufacturing

31212 Breweries

31213 Wineries

31214 Distilleries

Itemized Equipment

Cold Storage and Ice-making equipment 20

313 **Textile Mills** **15**

Personal property used in the main processes in this industry which include preparation and spinning of fiber, knitting or weaving of fabric, and the finishing of the textile.

314 **Textile Product** **15**

Personal property used in creation of textile products. With a few exceptions, processes used in this industry are generally cut and sew (i.e., purchasing fabric and cutting and sewing to make non-apparel textile products, such as sheets and towels).

315 **Apparel Manufacturing** **15**

Personal property used in the Apparel Manufacturing industry. This industry includes a diverse range of establishments manufacturing full lines of ready-to-wear apparel and custom apparel: apparel contractors, performing cutting or sewing operations on materials owned by others; jobbers performing entrepreneurial functions involved in apparel manufacture; and tailors, manufacturing custom garments for individual clients.

316 **Leather and Allied Product Manufacturing** **15**

Personal property used to transform hides into leather by tanning or curing and fabricating the leather into products for final consumption. It also includes the manufacture of similar products from other materials, including products (except apparel) made from "leather substitutes," such as rubber, plastics, or textiles It includes dyeing or dressing furs.

321 **Wood Product Manufacturing** **15**

The production processes of the Wood Product Manufacturing sub sector include sawing, planing, shaping, laminating, and assembling of wood products starting from logs that are cut into bolts, or lumber that then may be further cut, or shaped by lathes or other shaping tools. The lumber or other transformed wood shapes may also be subsequently planed or smoothed, and assembled into finished products, such as wood containers.

322 **Paper Manufacturing** 15

3221 **Pulp, paper and paperboards mills** 15

Personal property used in the manufacturing of pulp and involves separating the cellulose fibers from other impurities in wood or used paper. The manufacturing of paper involves matting these fibers into a sheet.

3222 **Converted Paper Product Manufacturing** 15

Personal property used in the manufacture of paperboard containers including corrugating, cutting, and shaping machinery to form paperboard into containers. Paper bag and coated and treated paper manufacturing establishments cut and coat paper and foil. Stationery product manufacturing establishments make a variety of paper products used for writing, filing, and similar applications. Other converted paper product manufacturing includes, in particular, the conversion of sanitary paper stock into such things as tissue paper and disposable diapers.

323 **Printing and related support activities** 15

Personal property including presses, used to transfer an image from a plate, screen, film, or computer file to some medium, such as paper, plastics, metal, textile articles, or wood. The most prominent of these methods is to transfer the image from a plate or screen to the medium (lithographic, gravure, screen, and flexographic printing). When publishing and printing are done in the same establishment, the establishment is classified under Industry Code 51, Information.

Itemized Equipment

Digital or *non-impact printing equipment* 5

(Uses a computer file to directly "drive" the printing mechanism to create the image)

Blue Print Machines 15

Blue Print Machines – small table model 7

3-D Printers 7

324 **Petroleum and Coal Products Manufacturing** 20

Personal property used to transform crude petroleum and coal into usable products. The dominant process is petroleum refining that involves the separation of crude petroleum into component products through such techniques as cracking and distillation. Products such as asphalt coatings and petroleum lubricating oils are made.

325 **Chemical Manufacturing** 15

3251 **Basic Chemical Manufacturing** 15

Personal property used in both basic chemical processes, such as thermal cracking and distillation, and in petrochemical processes, such as (1) manufacturing acyclic (i.e., aliphatic) hydrocarbons such as ethylene, propylene, and butylenes made from refined petroleum or liquid hydrocarbon and/or (2) manufacturing cyclic aromatic hydrocarbons such as benzene, toluene, styrene, xylene, ethyl benzene, and cumene made from refined petroleum or liquid hydrocarbons.

3254 **Pharmaceutical and Medicine Manufacturing** 15

Personal property used in one or more of the following: (1) manufacturing biological and medicinal products; (2) processing (i.e., grading, grinding, and milling) botanical drugs and herbs; (3) isolating active medicinal principals from botanical drugs and herbs; and (4) manufacturing pharmaceutical products intended for internal and external consumption in such forms as ampoules, tablets, capsules, vials, ointments, powders, solutions, and suspensions.

3255 **Paint, Coating, and Adhesive Manufacturing** 15

Personal property used to (1) mix pigments, solvents, and binders into paints and other coatings, such as stains, varnishes, lacquers, enamels, shellacs, and water repellant coatings for concrete and masonry, and/or (2) manufacture allied paint products, such as putties, paint and varnish removers, paint brush cleaners, and frit.

326 **Plastics and Rubber Products** 15

3261 **Plastics Product Manufacturing** 15

Personal property used in processing new or spent (i.e., recycled) plastics resins into intermediate or final products, using such processes as compression molding; extrusion molding; injection molding; blow molding; and casting.

Itemized Equipment

Special tools 7

3262 **Rubber Product Manufacturing** 15

Personal property used in the industry group comprised of establishments primarily engaged in processing natural, and synthetic or reclaimed rubber materials into intermediate or final products using processes such as vulcanizing, cementing, molding, extruding, and lathe-cutting.

Itemized Equipment

Special tools 7

327 Nonmetallic Mineral Product 20

Personal property used to transform mined or quarried nonmetallic minerals, such as sand, gravel, stone, clay, and refractory materials, into products for intermediate or final consumption. Processes used include grinding, mixing, cutting, shaping, and honing.

3271 Clay Product and Refractory Manufacturing 15

Personal property used in shaping, molding, glazing, and firing pottery, ceramics, and plumbing fixtures made entirely or partly of clay or other ceramic materials.

3272 Glass and Glass Product Manufacturing 15

Personal property used in manufacturing glass and/or glass products. Establishments in this industry may manufacture glass and/or glass products by melting silica sand or cullet or purchasing glass.

Itemized Equipment

Special tools 5

3273 Cement and Concrete Product Manufacturing 20

Personal property used in manufacturing Portland, natural, masonry, pozzalanic, and other hydraulic cements

Itemized Equipment

Quarry equipment{XE "quarry equipment} (Yahoo search)..... 15

Portable ready-mix plants 15

3274 Lime and Gypsum Product Manufacturing 20

Personal property used in manufacturing lime from calcitic limestone, dolomitic limestone, or other calcareous materials, such as coral, chalk, and shells. Lime manufacturing establishments may mine, quarry, collect, or purchase the sources of calcium carbonate.

3279 Abrasive Product Manufacturing 20

Personal property used in manufacturing abrasive grinding wheels of natural or synthetic materials, abrasive-coated products, and other abrasive products.

327991 Cut Stone and Stone Product Manufacturing 15

Personal property used in cutting, shaping, and finishing granite, marble, limestone, slate, and other stone for building and miscellaneous uses. Stone product manufacturing establishments may mine, quarry, or purchase stone.

331 Primary Metal Manufacturing 20

Personal property used to smelt and/or refine ferrous and nonferrous metals from ore, pig or scrap, using electrometallurgical and other process metallurgical techniques. Metal alloys and super alloys are also manufactured by introducing other chemical elements to pure metals. The output of smelting and refining, usually in ingot form, is used in rolling, drawing, and extruding operations to make sheet, strip, bar, rod, or wire, and in molten form to make castings and other basic metal products.

Includes:

3311 Iron and Steel Mills and Ferroalloy Manufacturing

Itemized Equipment

Special Tools 7

332 Fabricated Metal Product Manufacturing 15

Personal property is used to transform metal into intermediate or end products, other than machinery, computers and electronics, and metal furniture or treating metals and metal formed products fabricated elsewhere. Important fabricated metal processes are forging, stamping, bending, forming, and machining, used to shape individual pieces of metal; and other processes, such as welding and assembling, used to join separate parts together.

Itemized Equipment

Special Tools 5

333 Machinery Manufacturing 15

Personal property used to create end products that apply mechanical force, for example, the application of gears and levers, to perform work. Some important processes for the manufacture of machinery are forging, stamping, bending, forming, and machining that are used to shape individual pieces of metal. Processes, such as welding and assembling are used to join separate parts together. Although these processes are similar to those used in metal fabricating establishments, machinery manufacturing is different because it typically employs multiple metal forming processes in manufacturing the various parts of the machine.

333314 Optical Instrument and Lens Manufacturing 15

Personal property used in: (1) manufacturing optical instruments and lens, such as binoculars, microscopes (except electron, proton), telescopes, prisms, and lenses (except ophthalmic); (2) coating or polishing lenses (except ophthalmic); and (3) mounting lenses (except ophthalmic).

334 Computer and Electronic Product Manufacturing 7

Personal property used in the manufacture of computers, computer peripherals, communications equipment, and similar electronic products and components. The design and use of integrated circuits and the application of highly specialized miniaturization

technologies are common elements in the production technologies of the computer and electronic industry.

3341 Computer and Peripheral Equipment Manufacturing 7

Personal property used in manufacturing and/or assembling electronic computers, such as mainframes, personal computers, workstations, laptops, and computer servers; and computer peripheral equipment, such as storage devices, printers, monitors, input/output devices and terminals.

Personal property used in manufacturing wire telephone and data communications equipment. These products may be standalone or board-level components of a larger system. Examples of products made by these establishments are central office switching equipment, cordless telephones (except cellular), PBX equipment, telephones, telephone answering machines, LAN modems, multi-user modems, and other data communications equipment, such as bridges, hubs, routers, and gateways.

3343 Audio and Video Equipment Manufacturing 10

Personal property used in manufacturing electronic audio and video equipment for home entertainment, motor vehicle, public address and musical instrument amplifications. Examples of products made include video cassette recorders, televisions, stereo equipment, speaker systems, household-type video cameras, jukeboxes, and amplifiers for musical instruments and public address systems.

3344 Semiconductor and Other Electronic Components 5

Personal property used in manufacturing semiconductors and other components for electronic applications. Examples of products made by these establishments are capacitors, resistors, microprocessors, bare and loaded printed circuit boards, electron tubes, electronic connectors, and computer modems.

Includes:

clean room equipment, crystal growing equipment, deionized water systems, encapsulation equipment, photo mask and wafer manufacturing equipment, semiconductor chemical and gas systems, semiconductor electrical systems, and semiconductor test equipment.

3345 Navigation, Measuring, Medical, Control Instrument Manufacturing 7

Personal property used in manufacturing navigational, measuring, electro medical, and control instruments. Examples of products made by these establishments are aeronautical instruments, appliance regulators and controls (except switches), laboratory analytical instruments, navigation and guidance systems, and physical properties testing equipment.

335 Electrical Equipment, Appliance, and Component Manufacturing 15

Personal property used to manufacture products that generate, distribute and use electrical power, such as electric lamp bulbs, lighting fixtures, small and major electrical appliances, electric motors, generators, transformers, switchgear apparatus, devices for storing electrical power (e.g., batteries), for transmitting electricity (e.g., insulated wire), and wiring devices (e.g., electrical outlets, fuse boxes, and light switches).

336 Transportation Equipment Manufacturing 15

Personal property used in production processes similar to those of other machinery manufacturing establishments - bending, forming, welding, machining, and assembling metal or plastic parts into components and finished products.

The section includes:

3361 Motor Vehicle Manufacturing

3362 Motor Vehicle Body & Trailer Manufacturing

3363 Motor Vehicle Parts Manufacturing

3365 Railroad Rolling Stock Manufacturing

3364 Aerospace Product and Parts Manufacturing..... 15

Personal property used in one or more of the following: (1) manufacturing complete aircraft, missiles, or space vehicles; (2) manufacturing aerospace engines, propulsion units, auxiliary equipment or parts; (3) developing and making prototypes of aerospace products; (4) aircraft conversion (i.e., major modifications to systems); and (5) complete aircraft or propulsion systems overhaul and rebuilding (i.e., periodic restoration of aircraft to original design specifications).

This section includes:

336412 Aircraft Engine and Engine Parts Manufacturing

337 Furniture and Related Product Manufacturing 10

Personal property used to make furniture and related articles, such as mattresses, window blinds, cabinets, and fixtures. The processes used in the manufacture of furniture include the cutting, bending, molding, laminating, and assembly of such materials as wood, metal, glass, plastics, and rattan.

339 Miscellaneous Manufacturing 15

Personal property used in the manufacture of products as diverse as medical equipment and supplies, jewelry, sporting goods, toys, and office supplies.

33991 Jewelry and Silverware Manufacturing 15

Personal property used in: (1) manufacturing, engraving, chasing, or etching jewelry; (2) manufacturing metal personal goods (i.e., small articles carried on or about the person, such as compacts or cigarette cases); (3) manufacturing, engraving, chasing, or etching precious metal solid, precious metal clad, or pewter cutlery and flatware; (4) manufacturing, engraving, chasing, or etching personal metal goods (i.e., small articles carried on or about the person, such as compacts or cigarette cases); (5) stamping coins; (6) manufacturing unassembled jewelry parts and stock shop products, such as sheet, wire, and tubing; (7) cutting, slabbing, tumbling, carving, engraving, polishing, or faceting precious or semiprecious stones and gems; (8) re-cutting, re-polishing, and setting gem stones; and (9) drilling, sawing, and peeling cultured and costume pearls.

42 WHOLESALE TRADE

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

423 Wholesale Trade Fixtures and Equipment 15

Trade fixtures (as opposed to fixtures) and equipment are used in establishments engaged in wholesaling merchandise, generally without transformation, and rendering services incidental to the sale of merchandise. Wholesalers sell merchandise to other businesses and normally operate from a warehouse or office. See also separate listings for specific types of equipment.

423440 Other Commercial Equipment Merchant Wholesalers (lockers (except refrigerated) merchant wholesalers) Example: Product Delivery Lockers retail and e-commerce

423740, Refrigeration Equipment and Supplies Merchant Wholesalers (lockers, refrigerated, merchant wholesalers) Example: Product Delivery Lockers retail and e-commerce

44 RETAIL TRADE

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

Includes the personal property for the following:

441 **Motor Vehicle and Parts Dealers** 15

442 **Furniture and Home Furnishing Stores** 15

443 **Electronics and Appliance Stores** 15

444 **Building Material and Garden Equipment and Supply Stores** 15

445 **Food and Beverage Stores (including Convenience Stores)** 15

446 **Health and Personal Care Stores** 15

447 **Gasoline Stations** 15

448 **Clothing and Clothing Accessories Stores** 15

451 **Sporting Goods, Hobby, Book, and Music Stores** 15

452 **General Merchandise Stores** 15

453 **Miscellaneous Store Retailers, including** 15

4531 Florists 15

454 **Non-store Retailers** 15

See also separate listings for specific types of equipment.

48 TRANSPORTATION AND WAREHOUSING

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

481 **Air Transportation** 20

Personal property includes most airplanes; helicopters (rotorcraft); drones weighing over 50 pounds; and aircraft, all of which have a life of 20 years. There are some exceptions, which are itemized below.

Itemized Equipment

Kit built Aircraft 15

Gliders 15

Hot Air Balloons 15

Experimental Aircraft 15

Drones weighing 50 pounds or less 10

482 Rail Transportation..... 20

482112 Short Line Railroads

Itemized Equipment

Railroad Rolling Stock 20

483 Water Transportation 20

Personal property used in providing inland water transportation of passengers and/or cargo on lakes, rivers, or intracoastal waterways.

484 Truck Transportation 10

Itemized Equipment

Light Trucks 7

General freight Trucks 10

Tractor-trailers 10

485 Transit and Ground Passenger Transportation 10

Personal property includes equipment used in Transit and Ground Passenger Transportation. This industry includes a variety of passenger transportation activities, such as urban transit systems; chartered bus, school bus, and interurban bus transportation and taxis.

Itemized Equipment

Buses..... 15

Automobiles, unlicensed..... 7

492 Couriers and Messengers 15

Personal property used in the provision of intercity and/or local delivery of parcels. These articles can be described as those that may be handled by one person without using special equipment. Messengers, which usually deliver within a metropolitan or single urban area, may use bicycle, foot, small truck, or van.

493 Warehousing and Storage..... 15

Personal property used in operating warehousing and storage{XE “storage:} facilities for general merchandise, refrigerated goods, and other warehouse products. These establishments provide facilities to store goods. They do not sell the goods they handle.

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

511 Publishing Industries 15

Personal property used in the publishing of newspapers, magazines, other periodicals, and books, as well as directory and mailing list and software publishing.

512 Motion Picture Production and Sound Recording 7

Personal property used in the production and/or distribution of motion pictures, videos, television programs, or commercials; in the exhibition of motion pictures; or in the provision of postproduction and related services. Sound recording machinery and equipment is used in producing and distributing musical recordings, in publishing music, or in providing sound recording and related services.

512131 Motion Picture Theaters 15

Includes projection equipment, furniture and trade fixtures.

515 Broadcasting and Telecommunications ..... *See Categories*

51511 Radio Broadcasting..... 10

Personal property used in broadcasting audio signals. These establishments operate radio broadcasting studios and facilities for the transmission of aural programming by radio to the public, to affiliates, or to subscribers. In recognition of the FCC change from analog to digital broadcasting equipment in radio, television, and cable industries, all analog equipment MAY be valued using a seven-year life. All other equipment will remain at the life indicated. The assessor will still be responsible for measuring obsolescence if any.

Itemized Equipment

Radio Production Equipment 7

Service and Repair Equipment 10

51512 Television Broadcasting 10

Personal property used in broadcasting images together with sound. These establishments operate television broadcasting studios and facilities for the programming and transmission of programs to the public. In recognition of the FCC mandated change from analog to digital broadcasting equipment in radio, television, and cable industries, all analog equipment MAY be valued using a three-year life. All other equipment will remain at the life indicated. The assessor will still be responsible for measuring obsolescence if any.

Itemized Equipment

Television Production Equipment 7

Service and Repair Equipment 10

517 Telecommunications ..... *See Itemized Equipment*

Wired telecommunications personal property used in (1) operating and maintaining switching and transmission facilities to provide point-to-point communications via landlines, microwave, or a combination of landlines and satellite linkups or (2) furnishing telegraph and other non-vocal communications using their own facilities. Wireless telecommunications assets are used in operating and maintaining switching and transmission facilities that provide omni-directional communications via airwaves, such as cellular telephone or paging services. For handheld devices used to take electronic payments, see Point-of-Sale descriptions.

Itemized Equipment

Central Office Equipment, except computer-based switching equipment 15

Computer-based switching equipment 5

Distribution Plant (if personal property) 30

Fiber optic cable 15

Paging Systems 5

Microwave Systems, except towers 10

Station Equipment 10

Telephone equipment, including, telex, facsimile and Two-Way Radio 5

Cellular Telephones, Smartphones, Hand-helds, Tablets and POS Tablets, and PDAs..... 3

517110 Cable and Other Program Distribution .... *See Itemized Equipment*

Personal property used in distribution systems for broadcast programming. Head end assets are defined as the electronic control center -- generally located at the antenna site of a CATV system -- usually including antennas, preamplifiers, frequency converters, demodulators, modulators and other related equipment which amplify, filter and convert incoming broadcast TV signals to cable system channels. Microwave systems include assets such as antennas, transmitting and receiving equipment, and broad band microwave assets. Program origination equipment includes assets such as cameras, film chains, video tape recorders, lighting, and remote location equipment excluding vehicles. Service and test assets include oscilloscopes, field strength meters, spectrum analyzers, and cable testing equipment. Subscriber connection and distribution systems include assets such as trunk and feeder cable, connecting hardware, amplifiers, power equipment, passive devices, directional taps, pedestals, pressure taps, drop cables, matching transformers, multiple set connector equipment, and converters. In recognition of the FCC mandated change from analog to digital broadcasting equipment in radio, television, and cable industries all analog equipment MAY be valued using a seven-year life. All other equipment will remain at the life indicated. The assessor will still be responsible for measuring obsolescence if any.

Itemized Equipment

Coaxial Cable, installed inside buildings 15
Fiber Optic Cable 15
Head end Equipment, except towers 10
Microwave Systems, except towers 10
Program Origination Equipment 10
Satellite Dish Relay; Earth station equipment 10
Box converters having specialized computer components 3
Service and Test Equipment 10
Subscriber Connection and Distribution Systems 10

518 Internet Service Providers, Web Search Portals, and Data Processing Services

For life expectancy, please see Special Properties

Personal property assets used by Internet Service Providers, Web Search Portals, and Data Processing Services to provide: (1) access to the Internet; (2) search facilities for the Internet; and (3) data processing, hosting, and related services.

519 Other Information Services 15

Personal property assets used in supplying information, storing information, providing access to information, and searching and retrieving information. The main components of this group are news syndicates, libraries, and archives. It includes law and medical libraries.

53 REAL ESTATE, RENTAL, AND LEASING

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

532 Rental and Leasing Services 15

Personal property includes a wide array of tangible goods, such as automobiles, computers, consumer goods, and industrial machinery and equipment, to customers in return for a periodic rental or lease payment.

Itemized Equipment

Formal wear and costume rental 3
Bottled water Dispensers & Equipment 7
Furniture Rental & Leasing 7
Heavy equipment ..... *See Construction (Code 23)*
Lawn and Garden equipment 7

Linens and Uniforms 3
Musical Instrument rentals 7
Rent-to-Own Merchandise 7
Ski Equipment Rentals 7
Video Tapes ..... *See Special Properties*
See also separate listings for specific types of equipment.

54 PROFESSIONAL, SCIENTIFIC, & TECHNICAL SERVICES

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

- See Itemized Equipment

Itemized Equipment

Laboratory equipment , except electronic and computerized 15
Laboratory equipment, electronic and computerized 7
Medical and law libraries (*See also other information services*)..... 15
Photography 15
Professional and scientific equipment (*See also NAICS Code 3345*) 7
Professional libraries..... 15

Surveying Equipment

GPS 7
Non-GPS 15

56 WASTE MANAGEMENT AND REMEDIATION SERVICES

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

5616 Investigation and Security Services 15

Personal property includes burglar and fire alarms and locking devices, along with equipment necessary for installation, repair, or monitoring services or (2) remote monitoring of electronic security alarm systems.

Itemized Equipment

Closed Circuit TV – Camera System 7
Firearms 20

Locksmith Equipment, including:

Mechanical and electronic locking devices 20

Safes and security vaults 20

5617 Services to Buildings and Dwellings 15

Includes the fixtures and equipment for the following:

56171 Exterminating and Pest Control Services
56172 Janitorial Services
56173 Landscaping Services
56174 Carpet and Upholstery Cleaning Services

Itemized Equipment

Carpet Cleaning 15

Lawn mowing Equipment 7

562 Waste Management and Remediation Services 10

Personal property used in the collection, treatment, and disposal of waste materials. This includes establishments engaged in local hauling of waste materials; operating materials recovery facilities (i.e., those that sort recyclable materials from the trash stream); providing remediation services (i.e., those that provide for the cleanup of contaminated buildings, mine sites, soil, or ground water); and providing septic pumping and other miscellaneous waste management services.

Itemized Equipment

Garbage Dumpsters..... 10

Portable toilets 10

62 HEALTH CARE AND SOCIAL ASSISTANCE

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

621 Ambulatory Health Care Services 15

Personal property used by health practitioners in the provision of outpatient services, with the facilities and equipment not usually being the most significant part of the production process. Includes the fixtures and equipment for the following:

6211 Offices of Physicians

6212 Offices of Dentists

6213 Offices of Other Health Practitioners, including Chiropractors, Optometrists, Mental Health Practitioners, and Physical, Occupational, and Speech Therapists

Medical and Dental Instruments Not Otherwise Noted in Special Properties, include:

All Portable Units of Same

Angiographic X-ray units
Chest X-ray Units
Dental X-ray Units
Exam tables and chairs
Fluorographic X-ray Units
Lensometer
Mammographic X-ray Units
Mesoptometers
Microscopes
Portable X-ray Units
Radiographic X-ray Units
Special Procedure X-ray Units
Sterilizers

622 Hospitals 15

Personal property used to provide inpatient health services, particularly specialized facilities and equipment that form a significant and integral part of the production process. *See list above for examples of equipment.*

See also Special Properties for Medical Diagnostic and Medical Lab.

6244 Child Day Care Facilities 10

Personal property used in providing day care of infants or children.

71 ARTS, ENTERTAINMENT, AND RECREATION

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

711 Performing Arts, Spectator Sports, and Related 10

Includes projection equipment, furniture and trade fixtures such as movable set props, aerial and acrobatic equipment, rigging, costumes, production lighting, and special effects equipment.

Itemized Equipment

Electronic Equipment including Sound Systems 7
Seating, stages including fixed set designs, hydraulics, fountains 15
Support operations, including equipment and furniture for dressing rooms, ticket booths, snack bars, offices ..... 15[8]
Water tanks..... 20[9]

[8] May be considered to be real property fixtures. The cost may be established from Marshall & Swift.

711212 Car racing – race cars 3

713 Amusement, Gambling and Recreation Industries 15

Personal property used to (1) operate facilities where patrons can primarily engage in sports, recreation, amusement, or gambling activities and/or (2) provide other amusement and recreation services, such as supplying and servicing amusement devices in places of business operated by others; operating sports teams, clubs, or leagues engaged in playing games for recreational purposes; and guiding tours without using transportation equipment.

Itemized Equipment

Amusement Park (does not include structures) 15
Bowling Alley Pinsetters and Other Equipment 15
Bowling Electronic Scoring Machines 7

Gaming Equipment:
Electronic Slots, or Computers 7
Player Tracking Systems 7
Mechanical Slots 15
Other 15
Golf Carts, Electric 7
Golf Course Machinery and Equipment, except Lawn Mowing Equipment 15
Golf Course Lawn Mowing Equipment 7
Juke Box 15
Ski Area Equipment: Snow Cats and Packers 7
Ski Rentals 7
Video and Flipper Games 7

72 ACCOMMODATION AND FOOD SERVICES

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

721 Accommodation 15

Personal property used in: (1) traveler accommodation, (2) recreational accommodation, and (3) rooming and boarding houses.

Itemized Equipment

Apartment Furnishings 15
Hotel Furnishings 10

[9] May be considered to be real property fixtures. The cost may be established from Marshall & Swift.

Outdoor Patio Furnishings 7
Fire and Security Equipment 15
Health Spa Equipment: Manual 15
Health Spa Equipment: Electronic 7
Heavy Use Washers 7
Linens, Glassware, Silverware, and Uniforms (not rented) 3
Televisions 5
Telephone Systems (*See also NAICS Code 517*) 5

722 Food Services and Drinking Places 15

The industry groups are full-service restaurants; limited-service eating places; special food services, such as food service contractors, caterers, and mobile food services; and drinking places.

Itemized Equipment

Bar 15
Coffee Brewing Equipment 15
Walk-in Coolers (*See Also NAICS 311*) 15
Linens, Glassware, Silverware, and Uniforms (not rented) 3
Televisions, Digital 5
Televisions, Analog 5
Vending Machines 15

81 OTHER SERVICES

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

Establishments in this sector are primarily engaged in activities, such as equipment and machinery repairing, promoting or administering religious activities, grant making, advocacy, and providing dry cleaning and laundry services, personal care services, death care services, pet care services, photofinishing services, temporary parking services, and dating services.

811 Repair and Maintenance 15

Personal property used to restore machinery, equipment, and other products to working order. These establishments also typically provide general or routine maintenance (i.e., servicing) on such products to ensure they work efficiently and to prevent breakdown and unnecessary repairs.

Includes the fixtures and equipment for the following:

8111 Automobile Repair and Maintenance

811192 Car Washes

8112 Electronic & Precision Equipment

8113 Commercial Equipment Repair and Maintenance

8114 Personal and Household Goods Repair and Maintenance

81143 Footwear and Leather Goods Repair

Itemized Equipment

Auto Repair Diagnostic Equipment (Electronic) 7
Small Tools (See Hand Tools, NAICS 423120) 7
Welding Equipment..... 15
EV Charging Stations..... 15

812 Personal and Laundry Services..... 15

Includes the equipment and some trade fixtures for the following (*See Appendix D for determination of real or personal property*):

8121 Personal Care Services

81211 Hair, Nail and Skin Care Services

81219 Other, including Diet and Weight Reducing – Fitness

8122 Death Care Services

81221 Funeral Homes

81222 Cemeteries and Crematories

8123 Dry Cleaning and Laundry Services

81231 Coin-operated Laundries and Dry Cleaners

81232 Dry Cleaning and Laundry, except Coin-operated

8129 Other Personal Services

81291 Pet Care (except Veterinary)

81292 Photo-finishing

Itemized Equipment

Coin Laundries..... 15
Heavy Use Washers 7
Commercial Dry Cleaning Equipment..... 15

APPENDIX A

2024-25 PERSONAL PROPERTY MANUAL

NEVADA REVISED STATUTES AND NEVADA ADMINISTRATIVE CODE RELATED TO PERSONAL PROPERTY

(This listing may not be comprehensive. Please consult the statutes and regulations. You may find the statutes and regulations on the internet at http://leg.state.nv.us/law1.cfm).

Nevada Revised Statutes

NRS 361.013 "Billboard" defined. "Billboard" means a sign that directs attention to a business, commodity, service, entertainment or attraction that is sold, offered or exists at a location other than the premises on which the sign is located.

(Added to NRS by 1989, 1817)

NRS 361.028 "Manufactured home" defined. "Manufactured home" has the meaning ascribed to it in NRS 489.113.

(Added to NRS by 2001, 1540)

NRS 361.029 "Mobile home" defined. "Mobile home" means a vehicular structure, built on a chassis or frame, which is designed to be used with or without a permanent foundation and is capable of being drawn by a motor vehicle. It may be used as a dwelling when connected to utilities or may be used permanently or temporarily for the advertising, sales, display or promotion of merchandise or services. The term does not include a recreational park trailer as defined in NRS 482.1005.

(Added to NRS by 1989, 169; A 2001, 1727

NRS 361.030 "Personal property" defined.

1. "Personal property" means:

(a) All household and kitchen furniture.

(b) All law, medical and miscellaneous libraries.

(c) All goods, wares and merchandise.

(d) All chattels of every kind and description, except vehicles as defined in NRS 371.020.

(e) Stocks of goods on hand.

(f) Any vehicle not included in the definition of vehicle in NRS 371.020.

(g) All locomotives, cars, rolling stock and other personal property used in operating any railroad within the State.

(h) All machines and machinery, all works and improvements, all steamers, vessels and watercraft of every kind and name navigating or used upon the waters of any river or lake within this State or having a general depot or terminus within this State.

(i) The money, property and effects of every kind, except real estate, of all banks, banking institutions or firms, bankers, moneylenders and brokers.

(j) All property of whatever kind or nature, except vehicles as defined in NRS 371.020, not included in the term "real estate" as that term is defined in NRS 361.035.

2. Gold-bearing and silver-bearing ores, quartz or minerals from which gold or silver is extracted, when in the hands of the producers thereof, shall not mean, not be taken to mean, nor be listed and assessed under the term "personal property" as used in this section, but are specially excepted therefrom, and shall be listed, assessed and taxed as provided by law. [Part 3:344:1953]—(NRS A 1963, 305, 1121; 1983, 1191; 2013, 3115)

NRS 361.035 "Real estate" and "real property" defined.

1. "Real estate" or "real property" means:

(a) All houses, buildings, fences, ditches, structures, erections, railroads, toll roads and bridges, or other improvements built or erected upon any land, whether such land is private property or property of this state or of the United States, or of any municipal or other corporation, or of any county, city or town in this state.

(b) Any mobile home, factory-built housing or manufactured home which meets the requirements of NRS 361.244.

(c) The ownership of, or claim to, or possession of, or right of possession to any lands within this state.

(d) The claim by or the possession of any person, firm, corporation, association or company to any land.

2. The property described in subsection 1 must be listed under the head of "real estate."

3. Except as otherwise provided in NRS 361.2445, when an agreement has been entered into, whether in writing or not, or when there is sufficient reason to believe that an agreement has been entered into, for the dismantling, moving or carrying away or wrecking of the property described in subsection 1, the property must be classified as personal property, and not real estate.

4. For the purposes of this chapter, "real estate" or "real property" does not include leasehold or other possessory interests in land owned by the Federal Government on which land the Federal Government is paying taxes to the State of Nevada or is, pursuant to contractual obligation, paying any sum in lieu of taxes to the State of Nevada.

[Part 3:344:1953]—(NRS A 1957, 358; 1975, 1655; 1979, 824; 1993, 1183; 1999, 3465)

NRS 361.045 Taxable property. Except as otherwise provided by law, all property of every kind and nature whatever within this state shall be subject to taxation.

[Part 1:344:1953; A 1954, 29; 1955, 340]

NRS 361.227 Determination of taxable value.

1. Any person determining the taxable value of real property shall appraise:

(a) The full cash value of:

(1) Vacant land by considering the uses to which it may lawfully be put, any legal or physical restrictions upon those uses, the character of the terrain, and the uses of other land in the vicinity.

(2) Improved land consistently with the use to which the improvements are being put.

(b) Any improvements made on the land by subtracting from the cost of replacement of the improvements all applicable depreciation and obsolescence. Depreciation of an improvement made on real property must be calculated at 1.5 percent of the cost of replacement for each year of adjusted actual age of the improvement, up to a maximum of 50 years.

2. The unit of appraisal must be a single parcel unless:

(a) The location of the improvements causes two or more parcels to function as a single parcel;

(b) The parcel is one of a group of contiguous parcels which qualifies for valuation as a subdivision pursuant to the regulations of the Nevada Tax Commission; or

(c) In the professional judgment of the person determining the taxable value, the parcel is one of a group of parcels which should be valued as a collective unit.

3. The taxable value of a leasehold interest, possessory interest, beneficial interest or beneficial use for the purpose of NRS 361.157 or 361.159 must be determined in the same manner as the taxable value of the property would otherwise be determined if the lessee or user of the property was the owner of the property and it was not exempt from taxation, except that the taxable value so determined must be reduced by a percentage of the taxable value that is equal to the:

(a) Percentage of the property that is not actually leased by the lessee or used by the user during the fiscal year; and

(b) Percentage of time that the property is not actually leased by the lessee or used by the user during the fiscal year, which must be determined in accordance with NRS 361.2275.

4. The taxable value of other taxable personal property, except a mobile or manufactured home, must be determined by subtracting from the cost of replacement of the property all applicable depreciation and obsolescence. Depreciation of a billboard must be calculated at 1.5 percent of the cost of replacement for each year after the year of acquisition of the billboard, up to a maximum of 50 years.

5. The computed taxable value of any property must not exceed its full cash value. Each person determining the taxable value of property shall reduce it if necessary to comply with this requirement. A person determining whether taxable value exceeds that full cash value or whether obsolescence is a factor in valuation may consider:

(a) Comparative sales, based on prices actually paid in market transactions.

(b) A summation of the estimated full cash value of the land and contributory value of the improvements.

(c) Capitalization of the fair economic income expectancy or fair economic rent, or an analysis of the discounted cash flow.

➥ A county assessor is required to make the reduction prescribed in this subsection if the owner calls to his or her attention the facts warranting it, if the county assessor discovers those facts during physical reappraisal of the property or if the county assessor is otherwise aware of those facts.

6. The Nevada Tax Commission shall, by regulation, establish:

(a) Standards for determining the cost of replacement of improvements of various kinds.

(b) Standards for determining the cost of replacement of personal property of various kinds. The standards must include a separate index of factors for application to the acquisition cost of a billboard to determine its replacement cost.

(c) Schedules of depreciation for personal property based on its estimated life.

(d) Criteria for the valuation of two or more parcels as a subdivision.

7. In determining, for the purpose of computing taxable value, the cost of replacement of:

(a) Any personal property, the cost of all improvements of the personal property, including any additions to or renovations of the personal property, but excluding routine maintenance and repairs, must be added to the cost of acquisition of the personal property.

(b) An improvement made on land, a county assessor may use any final representations of the improvement prepared by the architect or builder of the improvement, including, without limitation, any final building plans, drawings, sketches and surveys, and any specifications included in such representations, as a basis for establishing any relevant measurements of size or quantity.

8. The county assessor shall, upon the request of the owner, furnish within 15 days to the owner a copy of the most recent appraisal of the property, including, without limitation, copies of any sales data, materials presented on appeal to the county board of equalization or State Board of Equalization and other materials used to determine or defend the taxable value of the property.

9. The provisions of this section do not apply to property which is assessed pursuant to NRS 361.320.

(Added to NRS by 1965, 1445; A 1969, 1451; 1975, 65, 1656; 1977, 1318; 1979, 79; 1981, 788, 789; 1983, 1047, 1884, 1885; 1987, 2075; 1989, 668, 1818; 1993, 2312; 1997, 1111; 1999, 1029; 2001, 842; 2003, 2758; 2009, 1216; 2013, 3116)

NRS 361.265 Written statement concerning personal property: Demand; contents; return of statement; valuation of unlisted property claimed by absent or unknown person; penalties.

1. To enable the county assessor to make assessments, he or she shall demand from each natural person or firm, and from the president, cashier, treasurer or managing agent of each corporation, association or company, including all banking institutions, associations or firms within the county, a written statement, signed under penalty of perjury, on forms and in the format prescribed by the county assessor of all the personal property within the county, owned, claimed, possessed, controlled or managed by those persons, firms, corporations, associations or companies. The signature required by this subsection may include an electronic signature as defined in NRS 719.100.

2. The statement must include:

(a) A description of the location of any taxable personal property that is owned, claimed, possessed, controlled or managed by the natural person, firm, corporation, association or company, but stored, maintained or otherwise placed at a location other than the principal residence of the natural person or principal place of business of the firm, corporation, association or company;

(b) The cost of acquisition of each item of taxable personal property including the cost of any improvements of the personal property, such as additions to or renovations of the property other than routine maintenance or repairs, and the year in which each item of taxable personal property was acquired; and

(c) If the natural person, firm, corporation, association or company owns at least 25 mobile or manufactured homes that are being leased within the county for commercial purposes, and those homes have not been converted to real property pursuant to NRS 361.244, the year, make or model, size, serial number and location of each such mobile or manufactured home.

3. The statement must be returned not later than July 31, except for a statement mailed to the taxpayer after July 15, in which case it must be returned within 15 days after demand for its return is made. Upon petition of the property owner showing good cause, the county assessor may grant one or more 30-day extensions.

4. If the owners of any taxable property not listed by another person are absent or unknown, or fail to provide the written statement as described in subsection 1, the county assessor shall make an estimate of the value of the property and assess it accordingly. If the name of the absent owner is known to the county assessor, the property must be assessed in that name. If the name of the owner is unknown to the county assessor, the property must be assessed to “unknown

owner," but no mistake made in the name of the owner or the supposed owner of personal property renders the assessment or any sale of the property for taxes invalid.

5. If any person, officer or agent neglects or refuses on demand of the county assessor or his or her deputy to give the statement required by this section, or gives a false name, or refuses to give his or her name or sign the statement, the person, officer or agent is guilty of a misdemeanor.

[Part 5:344:1953]—(NRS A 1967, 558; 1969, 1452; 1981, 327; 1983, 519, 1193; 1985, 748; 1987, 531; 1989, 1820; 2003, 2761; 2005, 2656)

NRS 361.325 Nevada Tax Commission to establish valuations of mobile homes and land; property escaping taxation to be placed on assessment roll.

1. On or before the first Monday in June of each year, the Nevada Tax Commission shall:

(a) Fix and establish the valuation for assessment purposes of all mobile homes in the State.

(b) Classify land and fix and establish the valuation thereof for assessment purposes. The classification of agricultural land must be made on the basis of crop, timber or forage production, either in tons of crops per acre, board feet or other unit, or animal unit months of forage. An animal unit month is the amount of forage which is necessary for the complete sustenance of one animal unit for 1 month. One animal unit is defined as one cow and calf, or its equivalent, and the amount of forage necessary to sustain one animal unit for 1 month is defined as 900 pounds of dry weight forage.

2. The valuation of mobile homes and land so fixed and established is for the next succeeding year and is subject to equalization by the State Board of Equalization.

3. In establishing the value of new mobile homes sold on or after July 1, 1982, the Nevada Tax Commission shall classify them according to those factors which most closely determine their useful lives. In establishing the value of other mobile homes, the Commission shall begin with the retail selling price and depreciate it by 5 percent per year, but not below 20 percent of its original amount.

4. The Nevada Tax Commission shall cause to be placed on the assessment roll of any county property found to be escaping taxation coming to its knowledge after the adjournment of the State Board of Equalization. This property must be placed upon the assessment roll prior to the delivery thereof to the ex officio tax receiver. If such property cannot be placed upon the assessment roll of the proper county within the proper time, it must be placed upon the tax roll for the next ensuing year, in addition to the assessment for the current year, if any, and taxes thereon must be collected for the prior year in the same amount as though collected upon the prior year's assessment roll.

5. The Nevada Tax Commission shall not raise or lower any valuations established by the State Board of Equalization unless, by the addition to any assessment roll of property found to be escaping taxation, it is necessary to do so.

6. Nothing in this section provides an appeal from the acts of the State Board of Equalization to the Nevada Tax Commission.

[7:177:1917; A 1929, 299; 1939, 279; 1945, 78; 1953, 576]—(NRS A 1957, 314; 1963, 1123; 1967, 825; 1975, 1105, 1660, 1762; 1981, 859; 1983, 1195)

Nevada Administrative Code

NAC 361.1127 "Fixture" defined. (NRS 360.090, 360.250) "Fixture" means an item, other than a trade fixture, that was originally personal property which has been installed or attached to land or an improvement in a permanent manner. As used in this section, "installed or attached to land or an improvement in a permanent manner" means that:

1. Either:

(a) An item is attached to, imbedded in or permanently resting upon land or an improvement, or is attached by other means that are normally used for permanent installation, and cannot be removed without substantially damaging the item or the land or improvement with which it is being used; or

(b) The use or purpose of an item that is not otherwise physically annexed to land or an improvement is so adapted that it is:

(1) A necessary, integral or working part of the land or improvement;

(2) Designed or committed for use with the land or improvement; or

(3) So essential to the land or improvement that the land or improvement cannot perform its desired function without the nonattached item; and

2. A reasonable person would consider the item to be a permanent part of the land or improvement, taking into account annexation, adaptation and other objective manifestations of permanence, including, without limitation, whether:

(a) Removal of the item would destroy the item or cause significant damage to the real property to which it is installed or attached;

(b) The historic use of the item indicates an intention to leave the item in place;

(c) The terms of a written agreement between parties indicates the intention of a tenant or lessee to remove or transfer ownership of the item; or

(d) Ownership of the item would be conveyed with a transfer of the real property to which it is installed or attached.

(Added to NAC by Tax Comm'n by R039-10, 8-13-2010, eff. 7-1-2012; A by R068-12, 9-14-2012)

NAC 361.11715 "Real property" defined. (NRS 360.090, 360.250)

1. "Real property" has the meaning ascribed to it in NRS 361.035 and includes:

(a) Land;

(b) Fixtures;

(c) Improvements;

(d) On-site enhancements; and

(e) Any rights, interests, benefits and privileges belonging or attached to the land.

2. The term does not include a trade fixture.

(Added to NAC by Tax Comm'n by R039-10, 8-13-2010, eff. 7-1-2012; A by R068-12, 9-14-2012)

NAC 361.130 Mobile or manufactured home. (NRS 360.090, 360.250, 361.227, 361.2445, 361.325)

1. The taxable value of a mobile home or manufactured home which constitutes real property is the cost of replacement of the mobile home or manufactured home less depreciation and obsolescence.

2. In determining the taxable value of a mobile home or manufactured home which constitutes personal property, each county assessor shall, if the mobile home or manufactured home was sold as new:

(a) Before July 1, 1982, value it at its retail selling price when sold to the original owner less depreciation at 5 percent per year, to a maximum depreciated value of 20 percent of its original retail selling price.

(b) On or after July 1, 1982, value it at replacement cost, when new, less depreciation. Replacement cost when new is the retail selling price to the original owner adjusted by factors reflected in the annual *Personal Property Manual*.

➥ Depreciation must be calculated pursuant to the schedule located in the annual *Personal Property Manual*. Additional depreciation and obsolescence may be calculated separately.

3. The retail selling price of a mobile home or manufactured home includes all charges for transportation, installation, accessories, profit and overhead.

4. If the owner of a mobile home or manufactured home which has been converted to real property wishes to convert the mobile home or manufactured home back to personal property, the county assessor shall provide the owner with a form for an affidavit of conversion which has been approved by the Commission and which must be recorded in the county recorder's office pursuant to NRS 361.2445 before the mobile home or manufactured home may be removed from the tax rolls. The affidavit of conversion may include information concerning the cost of acquisition of the mobile home or manufactured home. All signatures required pursuant to NRS 361.2445 to effectuate the conversion must be notarized.

5. The county assessor shall value the mobile home or manufactured home as personal property upon satisfaction of all the requirements set forth in NRS 361.2445 if the mobile home or manufactured home remains within the jurisdiction of the county assessor.

6. If a mobile home or manufactured home which has been converted to real property is completely destroyed and removed from real property, the county assessor shall remove the mobile home or manufactured home from the tax roll.

[Tax Comm'n, Property Tax Reg. part No. 2, eff. 1-14-82]— (NAC A 10-10-83; 6-29-84; 5-16-86; R031-03, 8-4-2004; R166-07, 6-17-2008)

NAC 361.1305 Billboards. (NRS 360.090, 360.250, 361.227)

1. The taxable value of a billboard is the cost of replacement of the billboard less depreciation and obsolescence.

2. The cost of replacement of a billboard must be computed by multiplying the cost of acquisition to the current owner by the appropriate factor located in the annual *Personal Property Manual*. The factor that corresponds to the year the billboard was acquired must be used. Additional depreciation and obsolescence may be calculated separately.

(Added to NAC by Tax Comm'n, eff. 8-2-90; A by R031-03, 8-4-2004)

Determination of Taxable Value of Personal Property

NAC 361.1345 Definitions. (NRS 360.090, 360.250, 361.227) As used in NAC 361.1345 to 361.139, inclusive, unless the context otherwise requires, the words and terms defined in NAC 361.1351, 361.1355 and 361.1361 have the meanings ascribed to them in those sections.
(Added to NAC by Tax Comm'n by R034-03, eff. 12-4-2003)

NAC 361.1351 "Acquisition cost" and "original cost" defined. (NRS 360.090, 360.250, 361.227) "Acquisition cost" or "original cost" means the actual cost of property to its present owner, including, without limitation, the costs of transportation and the costs of installation.
(Added to NAC by Tax Comm'n by R034-03, eff. 12-4-2003)

NAC 361.1355 "Costs of installation" defined. (NRS 360.090, 360.250, 361.227) "Costs of installation" means the costs of direct labor, direct overhead and the capitalized expense of interest or imputed charges for interest which are necessary to make the property operational.
(Added to NAC by Tax Comm'n by R034-03, eff. 12-4-2003)

NAC 361.1361 *"Personal Property Manual"* defined. (NRS 360.090, 360.250, 361.227) *"Personal Property Manual"* means a manual for the valuation of personal property that is published by the Department annually pursuant to NAC 361.1365.
(Added to NAC by Tax Comm'n by R034-03, eff. 12-4-2003)

NAC 361.1365 *Personal Property Manual*: Publication; contents; approval; use. (NRS 360.090, 360.250, 361.227)
1. The Department will annually publish a *Personal Property Manual* which describes the methods and standards that must be used for the valuation of personal property. The manual must include, without limitation, annually updated:
(a) Cost-index factors that must be used in the conversion of acquisition cost into an estimate of replacement cost new;
(b) Expected-life schedules that indicate the category of expected life for each type of property or type of industry in which the property is used; and
(c) Percent-good tables which indicate the rate of depreciation that must be applied.
2. The *Personal Property Manual* must be approved by the Commission before publication. The Department, at least 1 month before presenting the manual to the Commission for approval, must disclose all proposed modifications to the manual and hold a public workshop on the modifications.
3. Each county assessor shall use the *Personal Property Manual* in determining the taxable value of personal property.
(Added to NAC by Tax Comm'n by R034-03, eff. 12-4-2003)

NAC 361.1371 Procedure for determination of taxable value. (NRS 360.090, 360.250, 361.227)
1. The taxable value of personal property must be determined by adjusting the acquisition cost of the property by a cost-index factor and reducing the adjusted acquisition cost by an estimate of applicable depreciation. The taxable value so determined shall be deemed to be the indicator of value of replacement cost new less depreciation.
2. In determining taxable value, a county assessor shall use the schedules in the *Personal Property Manual* that show the cost-index factors, the rates of depreciation and the percent good by year. The assessor shall use the schedules by:
(a) Selecting the appropriate expected useful life of the personal property; and
(b) Selecting the appropriate cost-index factor, based on the year of acquisition of the property, and applying it to the acquisition cost of the property.
➥ The result shall be deemed to be the replacement cost new of the property.
3. The assessor shall select the method of applying depreciation to the personal property by either:

(a) Multiplying the adjusted acquisition cost of the property by the rate of depreciation and subtracting the result from the adjusted acquisition cost; or

(b) Multiplying the adjusted acquisition cost of the property by the percent-good factor.

➥ The result from either approach shall be deemed to be the taxable value of the property.

(Added to NAC by Tax Comm'n by R034-03, eff. 12-4-2003)

NAC 361.1375 Determination of expected life, cost-index factors and depreciation. (NRS 360.090, 360.250, 361.227)

1. Personal property must be categorized by the specific type of property that it is or by the type of industry in which it is used. Each category must be assigned to a schedule of expected life which is based on commonly available sources of information, including, without limitation, the life expectancy guidelines published by the Marshall and Swift Valuation Service and any other sources published in the *Personal Property Manual*.

2. The cost-index factors published in the *Personal Property Manual* must be determined by calculating the average change in costs over time. The Department shall identify the sources used to calculate the average change.

3. For purposes of calculating the amount of applicable depreciation, personal property must be assigned to one of the following expected lives:

(a) Three-year life;

(b) Five-year life;

(c) Seven-year life;

(d) Ten-year life;

(e) Fifteen-year life;

(f) Twenty-year life; or

(g) Thirty-year life.

4. Depreciation must be calculated over the expected life of the personal property by using the declining balance method, except that tables which provide a method other than the declining balance method for calculating depreciation may be used if the tables have been approved by the Commission and included in the *Personal Property Manual*.

5. For purposes of calculating the rate of depreciation, a residual amount of 5 percent must be used. Percent-good tables using a residual amount other than 5 percent may be adopted by the Commission if the Department has conducted a market study or has otherwise obtained information which indicates that a different residual amount is appropriate for the category in which the personal property is placed pursuant to subsection 1.

(Added to NAC by Tax Comm'n by R034-03, eff. 12-4-2003)

NAC 361.138 Reported acquisition cost for leased equipment. (NRS 360.090, 360.250, 361.227) For leased equipment, the reported acquisition cost is the cost which the user of the property would incur if the equipment were purchased, less any discount customarily allowed by a seller.

(Added to NAC by Tax Comm'n, eff. 10-10-83; A by R034-03, 12-4-2003)

NAC 361.139 Personal property acquired with real property for lump sum; use of other valuation techniques. (NRS 360.090, 360.250, 361.227)

1. In determining the taxable value of personal property which was acquired with real property for a lump sum, the assessor may refer to appropriate guides which list the cost of equipment to determine the value of the personal property in relation to the value of the real property. In addition, the assessor may estimate the age of the equipment by inspecting it or discussing the approximate value of the equipment with manufacturers, dealers or other persons in the business who have knowledge of the value of the equipment. The serial number, if it exists, may enable a manufacturer to determine the date of manufacture and the original cost.

2. If sufficient data is not otherwise available to establish acquisition cost, or if the assessor determines that a reported acquisition cost is not equal to the fair market value of the property at the time of acquisition plus any costs of transportation and costs of installation, the assessor may use any nationally recognized valuation technique to determine the acquisition cost, including, without limitation:

(a) Establishing the current cost of replacement of the property with new property by reference to current manufacturing costs. If the current cost of replacement is known, the assessor shall apply depreciation to that cost to determine the taxable value.

(b) Using a guide which lists the cost or a procedure recognized by businesses which use such equipment to determine the taxable value. Before such a guide or procedure may be used, an assessor must receive approval from the Executive Director.

(c) Using information based on current market data.

3. Upon request, the Division of Local Government Services of the Department will provide information on various guides which may be used to determine original cost.

(Added to NAC by Tax Comm'n, eff. 10-10-83; A 6-29-84; R034-03, 12-4-2003; R068-12, 9-14-2012)

NAC 361.11745 "Trade fixture" defined. (NRS 360.090, 360.250) "Trade fixture" means an item of personal property that:

1. Is installed or attached nonpermanently to real property by an owner or tenant for the purpose of conducting a business or trade and not for the enhancement of the real property to which it is installed or attached; and

2. Has a unique identity and function which is related to the business or trade for which it is installed or attached, and which is distinct from the real property to which it is installed or attached.

(Added to NAC by Tax Comm'n by R068-12, eff. 9-14-2012)

Excerpts from Department of Taxation Letter of Guidance

Letter dated December 2, 2004, responding to County Assessors' Question:

"In determining the proper amount of depreciation to be applied to personal property using the Department's Personal Property Manual, does the year of acquisition refer to a calendar year or a fiscal year?"

Short Answer:

The use of the year of acquisition is dependent on the fiscal year only with regard to the correct selection of the Personal Property Manual to be used. The year of acquisition is otherwise an actual date during a calendar year that indicates the age of the property to be used in the expected life tables.

(Please ask the department for a copy of the letter if you wish to read the entire discussion.)

APPENDIX B

Methodology Used to Estimate Cost Indexes

The percent change in each index is measured between the current year and the prior year. The mean of the sum of the changes for each year of the expected life table is calculated and becomes the basis for the cost index to trend acquisition cost to a current replacement cost.

Sources Used to Estimate Cost Indexes

Producer Price Index (PPI)

The Producer Price Index (PPI) is a family of indexes that measures the average change over time in selling prices received by domestic producers of goods and services. PPIs measure price change from the perspective of the seller. This contrasts with other measures, such as the Consumer Price Index (CPI), that measure price change from the purchaser's perspective. Sellers' and purchasers' prices may differ due to government subsidies, sales and excise taxes, and distribution costs.

Data Source

- The PPI sample includes over 16,000 establishments providing approximately 64,000 price quotations per month supplemented with data from other sources for some areas.
- Establishments are selected for the PPI survey via systematic sampling of a list of all firms in the industry.
- Participation by firms is completely voluntary.
- Participating establishments report price data online through a secure website.
- Good and services included in the PPI are weighted by value-of-shipments data contained in the 2017 economic censuses.
- Industries and products undergo systematic resampling as needed, to account for changing market conditions.

The Producer Price Index series reference has been updated from a Stage of Processing ID code to a Final Demand-Intermediate Demand Goods Index. The conversion may be found in an Index Concordance Table located at http://www.bls.gov/ppi/fdidconcordance.htm, which converts SOP3200, Capital equipment, to FD41312, Private capital equipment. The PPI Index using FD41312 may be found at http://www.bls.gov/ppi/fdidsf16.htm.

Consumer Price Indexes (CPI)

The consumer price index (CPI) is a measure of the average change over time in the prices paid by urban consumers or households for a market basket of consumer goods and services. The Bureau of Labor Statistics publishes CPIs for two population groups: (1) the CPI for Urban Wage Earners and Clerical Workers (CPI-W), which covers households of wage earners and clerical workers that comprise approximately 29 percent of the total population and (2) the CPI for All Urban Consumers (CPI-U) and the

Chained CPI for All Urban Consumers (C-CPI-U), which cover approximately 93 percent of the total population and include in addition to wage earners and clerical worker households, groups such as professional, managerial, and technical workers, the self-employed, short-term workers, the unemployed, and retirees and others not in the labor force.

The CPI represents all goods and services purchased for consumption by the reference population (CPI-U or CPI-W). BLS has classified all expenditure items into more than 200 categories, arranged into eight major groups. Major groups and examples of categories in each are as follows:

- FOOD and BEVERAGES (breakfast cereal, milk, coffee, chicken, wine, full-service meals and snacks)
- HOUSING (rent of primary residence, owners' equivalent rent, fuel oil, bedroom furniture)
- APPAREL (men's shirts and sweaters, women's dresses, jewelry)
- TRANSPORTATION (new vehicles, airlines fares, gasoline, motor vehicle insurance)
- MEDICAL CARE (prescription drugs and medical supplies, physicians' services, eyeglasses and eye care, hospital services)
- RECREATION (televisions, cable television, pets and pet products, sports equipment, admissions)
- EDUCATION AND COMMUNICATIONS (college tuition, postage, telephone services, computer software and accessories)
- OTHER GOODS AND SERVICES (tobacco and smoking products, haircuts and other personal services, funeral expenses)

Also included within these major groups are various government-charged user fees, such as water and sewerage charges, auto registration fees, and vehicle tolls. The CPI also includes taxes (such as sales and excise taxes) that are directly associated with the prices of specific goods and services. However, the CPI excludes taxes (such as income and Social Security taxes) not directly associated with the purchase of consumer goods and services.

The CPI does not include investment items, such as stocks, bonds, and life insurance. (These items relate to savings and not to day-to-day consumption expenses.)

The Consumer Price Index series ID reference is CUUR0400SA0, CUUS0400SA0 for area West Urban, All Items. The base period is 1982-84 = 100. The data may be found at http://data.bls.gov/pdq/SurveyOutputServlet?data_tool=dropmap&series_id=CUUR0400SA0,CUUS0400SA0.

Marshall Valuation Service

Marshall Valuation Service publishes a national average equipment cost index based on industry type. The Department measures the change in the index for each category of industry from the prior year.

Market Tests

In addition to the sources already cited, the Department conducts market tests to validate the results of applying the cost indices to particular items of personal property. The original cost of a selected sample of personal property items is trended using the proposed cost index conversion factor. The result of this calculation is compared to the actual average resale of the item obtained from various market research sources. The purpose of the market test is to ensure the proposed cost indices do not result in a value which exceeds full cash value. The market tests are also used to establish hypothetical market-based depreciation schedules. The sources of information for the market comparisons include the following:

- **N.A.D.A., The Manufactured Housing Cost Guide,** (Online Version) (J.D. Power) The Guide provides the average retail book value by manufacturer, model, and region of mobile home, with tables for options. Values are provided for homes one to fourteen years of age, and conversion tables for homes older than 14 years.
- **Aircraft Bluebook Price Digest Online**, (Online Version) (Price Digests, Informa Business Media, Inc., Overland Park, KS). The Bluebook provides representative average retail prices of fixed wing aircraft and helicopters.
- **Grounds Maintenance Equipment Blue Book Online**, (Online Version) (Price Digests, Informa Media, Overland Park, KS). The Blue Book provides the estimated average resale or retail price, excluding options of power equipment.
- **Powersport Vehicle Blue Book**, (Online Version) (Price Digests, Informa Business Media, Inc., Overland Park, KS). The Blue Book provides pricing in the powersports industry, including snowmobiles, personal watercraft, trailers, and motorcycles.
- **The Official Tractor Blue Book Online**, (Online Version) (Price Digests, Informa Business Media, Inc., Overland Park, KS). The Blue Book provides the estimated average resale or retail price, excluding options of power equipment.
- **Green Guide for Construction Equipment**, (Online Version) (Equipment Watch, 6151 Powers Ferry Road, Suite 200, Atlanta, GA 30339) The values in this guide are derived from a reporting system of equipment dealers, distributors, manufacturers, auctioneers and contractors. It is based on both surveys and averaging of actual sales. These volumes include Volume 1: Earthmoving Equipment, Volume 2: Lifting Equipment and Volume 3: Other Equipment (Compaction, Concrete and Crushers).
- **Orion Research Corporation**, (Roger Rohrs Publisher) (http://www.usedprice.com) The website is the electronic successor to the Orion Blue Book. It determines the used prices of computers and peripherals based on dealer surveys gathered nationwide. Dealers are asked to provide the "asking price," "Selling price," and "days to sell." The used price is then calculated based on what an average store could sell the product for in 30 days or less. Orion Research states that this data is updated on an ongoing basis.

APPENDIX C

Methodology Used to Estimate Expected Useful Life

The Department estimates the expected useful life of different types of personal property by surveying a variety of sources. Expected useful life is defined as the amount of time an item of personal property can be expected to last before it wears out, decays, gets used up, becomes obsolete, or loses its value from natural causes. The life is measured from the time the property is first put into service until it is retired from service or permanently withdrawn from use in a trade or business, or when the production of income ceases because the property has been sold, exchanged, converted to personal use, abandoned, or otherwise destroyed.

The Department does not have the resources available to perform its own mortality or actuarial studies. However, there are other sources that do perform this service. The sources itemized below include actuarial studies of the Internal Revenue Service, Marshall and Swift Costing Service, and the California State Board of Equalization. Also included are the surveys of several western states and certain industries.

Sources Used to Estimate Expected Useful Life

Marshall Swift Valuation Service, "Residential Cost Handbook", (Marshall & Swift, L.P., December 2022) Costs ranges are based on averages created for the US and Canada, and other items listed are based on what is readily available today.

Marshall Swift Valuation Service, "Life Expectancy Guidelines," (Marshall & Swift, L.P., January 2023)

Depreciable assets are listed by industry group and are extracted from U.S. Treasury Department Internal Revenue Service Publication 534 titled "Depreciation." The Guidelines list ranges of life. In certain cases, the IRS was not the primary source. In those cases, the range of life is based on a composite of studies of equipment, bookkeeping practices and appraisers' opinions as compiled from a consensus of recognized trade groups, suppliers and other interested parties. Computers and terminals are one example of an independent study conducted by Marshall & Swift.

Department of the Treasury, Internal Revenue Service, Publication 946, "How to Depreciate Property," and Publication 534, "Depreciating Property Placed in Service Before 1987."

These two publications specifically identify types of property and the expected useful life. For instance, an example of five-year property is computers and peripheral equipment.

Arizona:

Arizona Department of Revenue Personal Property Manual

California:

California Assessors' Handbook Section 581, January

California Assessors' Association Economic Life and Minimum Percent Good Table (Section IV)

California Assessors' Association Business Assessment Factors, January

Colorado:

Colorado Department of Local Affairs Personal Property Manual,

Montana:

Montana Department of Revenue Personal Property Depreciation Schedules and Trend Tables

New Mexico:

New Mexico Taxation and Revenue Department Business Personal Property Valuation Guidelines

Oregon:

Oregon Department of Revenue Personal Property Valuation Guidelines

Utah:

Utah State Tax Commission Recommended Personal Property Valuation Schedules and Registered Vehicle Uniform Fees

Washington:

Washington State Department of Revenue Personal Property Manual,

Personal and Industrial Property Valuation Guidelines,

Combined Trended Investment Tables for Personal and Industrial Property (Percent Good Indicators)

Wyoming:

Wyoming Department of Revenue Personal Property Valuation Manual,

Life, Trending, and Depreciation Tables

APPENDIX D

2024-25 PERSONAL PROPERTY MANUAL: VALUATION GUIDELINES

Exemptions from Property Taxes

Article 10, Section 1 of the Nevada Constitution requires the "valuation for taxation of **all** property, real, personal and possessory...." NRS 361.045 also provides that, except as otherwise provided by law, all property of every kind and nature whatever within this state shall be subject to taxation. Other statutes, however, grant exemptions to particular types of property. Some are granted exemption at face-value, and other types of property must qualify according to specific criteria in order to receive the exemption.

The types of exemptions range from partial exemptions granted to veterans, disabled veterans, surviving spouses and blind persons to exemptions from taxation for all real and personal property granted to governmental entities, religious, charitable and non-profit organizations, and individual organizations which are specifically cited. In many cases, the statutes specifically recite that the property must be used to carry out the legitimate function of the organization, and if not, the property becomes taxable.

For the types of exemptions which must go through a qualification process, the county assessors must collect, evaluate and process the various claims for property tax exemptions. Application forms which have been approved by the Nevada Tax Commission should be made available. Each form should request information regarding taxpayer contact information, the type of exemption being claimed, the property which the exemption, if granted, would affect, a statement or statements why the property qualifies for the exemption, and supporting documentation if necessary. The purpose of any form is to provide sufficient information to help assessors make a reasoned determination to approve or deny applications.

In the event a claim for exemption is ambiguous or open to interpretation, how the property is used may indicate whether or not an exemption applies. The general rule espoused by the courts is that strict construction of exemption statutes applies to exemptions for property held in private ownership but not to exemptions for public property where exemption is the rule and taxation the exception. 2 Thomas M. Cooley, *The Law of Taxation*, § 673 at 1414-15 (4th ed. 1924). Said another way, property held in private ownership must strictly comply with all the criteria established for the exemption because “taxation is the rule and exemption the exception.” On the other hand, for property held by a public entity, the rule is reversed to say “exemption is the rule and taxation the exception.”

The purpose in establishing a broad construction of exemption for public entities is to prevent an escalating spiral of unnecessary taxation and administrative costs with no benefit to the public. 16 Eugene McQuillin, *The Law of Municipal Corporations*, § 44.57 at 206 (3rd ed. 1994). If one governmental entity chooses to tax the property of another governmental entity, the governmental entity forced to pay taxes may have to levy and collect new taxes to meet the demands of the tax. 2 Cooley, *supra*, § 621 at 1313. The effect of such a tax spiral is that the public would be taxing itself to raise money to pay itself.

In cases where it is not clear whether an exemption should be granted, assessors should solicit legal advice from the county district attorney's (D.A.) office.

The attached chart lists the current status of specific exemptions available in the statutes, in alphabetical order.

Legend:
Due Date for Application:
(1) No application required
(2) One time only until status changes. The claim must be made by June 15th. *See NRS 361.155 (1) and (3)*
(3) Annually, by June 15th. *See NRS 361.155 (1)*
(4) Annually, by July 1st. *See NAC 361.062*
(5) Annually, by December 30th. *See NRS 362.050*

Exemption Type	NRS Reference	NAC Reference	Property Type	Due Date for Application See Legend	Explanation
Airport	361.061(1)		Real	(2)	Improvement of land by the public as an airport is a municipal purpose, whether or not the airport is owned or operated by a local government.
American Land Conservancy	361.111		Real	(2)	Real property including improvements is exempt if: the property is held for acquisition by a Federal, state or local government and the said government has agreed in writing to consider acquiring said real property; or if the property will be held indefinitely and vested in the listed conservancy organization. If the property is held for purposes of conservation for any entity other than the State or local government, the land must be assessed as first-class pasture. If the property is transferred for purposes other than conservation, taxes must be collected for each year it was exempt.

Exemption Type	NRS Reference	NAC Reference	Property Type	Due Date for Application See Legend	Explanation
American National Red Cross and Nevada Chapters	361.110		Both	(2)	All real and personal property is exempt, unless it is used for a purpose other than the legitimate functions of the organization. *See also YMCA, YWCA, American National Red Cross, Salvation Army Corp, GSA, Camp Fire Girls, BSA, Sierra Arts Foundation, Nevada Museum of Art, Inc.*
Apprenticeship Programs	361.106		Both	(2)	Real and personal property of an apprenticeship program is exempt if (1) the property is held in a trust created by 29 U.S.C. § 186 or (2) is owned by a local or state apprenticeship committee and the program is operated by a qualifying organization and registered and approved by the state apprenticeship council.
Archaeological Conservancy	361.111, AB 209 (2007)		Real	(2)	See explanation under American Land Conservancy.
Architectural Barrier Removal for Disabled Persons	361.087		Real	(2)	Improvements to a residence occupied by a person with a disability are exempt. The person must claim the benefit by filing an affidavit setting forth the nature of the improvement and the date of making the improvement. See statute for examples.
Bank Deposits	Article 10		Personal	(1)	Articles of personal property deemed to represent an interest in real or personal property already assessed and taxed is exempt.
Bee Colonies	361.068		Personal	(1)	Bee colonies are exempt personal property.

Blind Persons	361.085		Both	(3)	Property of blind persons up to an assessed value of $3,000, as modified by CPI, is exempt. The original affidavit of claim must be accompanied by a certificate from a physician certifying the person is blind. Renewal affidavits must be completed each year.
Boats	361.068		Personal	(1)	All boats are exempt.
Bonds	Article 10		Personal	(1)	Articles of personal property deemed to represent an interest in real or personal property already assessed and taxed is exempt.
Book Accounts	Article 10		Personal	(1)	Articles of personal property deemed to represent an interest in real or personal property already assessed and taxed is exempt.
Boulder City Museum and Historical Association	361.110		Both	(2)	All real and personal property is exempt, unless it is used for a purpose other than the legitimate functions of the organization. *See also YMCA, YWCA, American National Red Cross, Salvation Army Corp, GSA, Camp Fire Girls, BSA, Sierra Arts Foundation.*
Boy Scouts of America	361.11		Both	(2)	All real and personal property is exempt, unless it is used for a purpose other than the legitimate functions of the organization. *See also Nevada Museum of Art.*
Business Inventories & Consumables	361.068	361.065	Personal	(1)	Property consumed during the operation of the business, as differentiated from a component part of a manufactured item, is exempt. The property must meet the criteria listed in NAC 361.065.
Camp Fire Girls Inc.	361.11		Both	(2)	All real and personal property is exempt, unless it is used for a purpose other than the legitimate functions of the organization. *See also Nevada Museum of Art.*
Campers, Slide-in & Shells	361.068		Personal	(1)	All slide-in campers and camper shells are exempt.

Carnival, Circus, Convention, Display, Exhibition, Fair	361.068		Personal	(1)	Personal property, transient in nature, owned by a non-resident and located in this state for use by or in a carnival, circus, convention, display, exhibition or fair is exempt. *See also transient personal property.*
Cost of collection	361.068		Personal	(1)	Personal property for which the annual taxes would be less than the cost of collecting those taxes is exempt. NTC determines level of cost.
Cemeteries and Graveyards - Public	361.130		Real	(1)	Exempt cemeteries and graveyards must be open to the public and no charge is made for burial.
Cemeteries and Graveyards – Private	361.132		Real	(2)	Real property of a nonprofit corporation governed by the provisions of NRS Chapter 82 formed for the purposes of procuring and holding lands to be used exclusively for a cemetery are exempt, so long as the lots or plats remain dedicated to the purpose of a cemetery.
Charitable Foundation: *See University*	361.098		Both	(2)	All property owned by the charitable foundation established by the Board of Regents of University of Nevada is exempt unless it is used for a purpose other than carrying out the legitimate functions of the foundation.
Charitable Organizations	361.135		Both	(2)	See Lodges
Charitable Corporations	361.140		Both	(2)	Property actually occupied and used by corporation meeting certain qualifying criteria is exempt.
Charter School Leased Property	361.096		Both	(2)	All property leased or rented to a charter school is deemed to be used for an educational purpose and is exempt. Only the portion of the property that is used for the lease or rental to a charter school is exempt.

Churches & Chapels	361.125		Both	(2)	Buildings and personal property used for religious worship other than marriage chapels, is exempt. The property must be owned by a recognized religious society or corporation. If the property is used for other than church purposes and a rent is received, the property is not exempt.
Church Land, see *also "Land Used for Worship"*	361.125		Real	(2)	Parcels of land used exclusively for worship, including without limitation, both developed and undeveloped portions of a parcel.
Counties, Town, Municipal Corp	361.060		Both	(1)	Property of counties, domestic municipal corporations, irrigation drainage, reclamation district, or town, except for certain community pastures, is exempt. *See also Nevada Rural Housing Authority, Irrigation Districts*
Conservation District	361.060		Real	(1)	Real property acquired on or after 7-1-2003 by a conservation district is exempt.
Defenders of Wildlife	361.135		Both	(2)	*See Lodges for explanation.*
Disabled Veterans	361.091		Both	(3)	Up to $20,000 assessed value of property, adjusted by CPI, may be exempt, based on a sliding scale of disability of the veteran-owner. Only the property of residents or their surviving spouses meeting certain qualifying criteria is eligible for exemption.
Drainage Ditches, Canals & Irrigation Systems	361.070		Real	(1)	Drainage ditches and canals along with the lands included in the right-of-way of the ditch or canal are exempt. Each part of a permanently installed irrigation system, including pipes, concrete linings of ditches and headgates, are exempt.
Elderly & Handicapped Housing	361.086		Real and personal used for housing	(2)	All real property and mobile or modular housing and related facilities for elderly or handicapped persons are exempt if certain qualifying criteria are met.
Eagles Club	361.135		Both	(2)	*See Lodges for explanation*
Elks Club	361.135		Both	(2)	See Lodges for explanation.

Energy Systems (fka Heating & Cooling Systems)	701A.200 (fka 361.079)	361.052-361.058	Both	(1)	The value of a qualified system is not included in the assessed value of the building of which it is a part. Qualified systems in commercial or industrial buildings receiving certain other abatements or exemptions are ineligible for this exemption. System must conform to standards established by the Department.
Fine Art for Public Display	361.068; 361.186	361.030 – 361.044	Personal	(3)	The exemption is limited to certain kinds of works of art purchased for $25,000 or more and meets certain public display requirements. When a taxpayer collects an admission fee, the amount of exemption is reduced by the net revenue received by taxpayer. *See NRS and NAC requirements.*
Girl Scouts of America	361.11		Both	(2)	All real and personal property is exempt, unless it is used for a purpose other than the legitimate functions of the organization. *See also Nevada Museum of Art.*
Habitat for Humanity	361.115		Both	(2)	All property is exempt unless it is used for a purpose other than carrying out the legitimate functions of the organization. *See also Nevada Children's Foundation, Nevada Heritage Association.*
Hospital	361.083		Real	(2)	Property on which stands a hospital or other charitable asylum for the care or relief of orphans or sick, infirm or indigent persons owned by a qualifying non-profit corporation, is exempt. If the property is used for a different purpose, the property is taxable. *See also orphan children.*
Household Goods and Furniture	361.069	361.085	Personal	(1)	Household goods, furniture except certain appliances and furniture of time-share projects, are exempt. Examples are in both statute and regulation.
Irrigation, Drainage, Reclamation District	361.060		Both	(1)	See Counties, Towns for explanation.
Knights of Pythias	361.135		Both	(2)	*See Lodges for explanation.*
Knights of Columbus	361.135		Both	(2)	*See Lodges for explanation.*

Lahontan Audubon Society	361.135		Both	(2)	*See Lodges for explanation.*
Land Used for Worship	361.125		Real	(2)	*See Church Land for explanation.*
Livestock	361.068		Personal	(1)	Livestock is exempt. Livestock is defined at NAC 361A.055. See also Article 10 (6).
Lodges & Other Charitable Organizations	361.135		Both	(2)	Funds, furniture, paraphernalia and regalia owned by certain charitable organizations as well as real estate and fixtures are exempt. If the real estate is leased, the exemption does not apply to the portion so leased or rented.
Low Income Housing Projects	361.082	361.089	Both	(3)	That portion of real property and tangible personal property used for housing and related facilities for persons with low incomes is exempt if the property meets certain criteria.
Masons	361.135		Both	(2)	*See Lodges for explanation.*
Mortgages	Article 10		Personal	(1)	Articles of personal property deemed to represent an interest in real or personal property already assessed and taxed is exempt.
Motor Vehicles	361.067		Personal	(1)	Vehicles defined in NRS 371.020 are exempt, except mobile homes. NRS 371.020 refers to NRS 482 and 706. Under NRS 482.210, special mobile equipment is not licensed and is therefore taxable for property tax.
Nathan Adelson Hospice	361.088		Both	(2)	All property is exempt, unless it is used for any purpose other than carrying out the legitimate functions of hospice care.
National Audubon Society	361.135		Both	(2)	*See Lodges for explanation.*
Nature Conservancy	361.111		Real	(2)	*See explanation under American Land Conservancy.*
Nevada Children's Foundation	361.115		Both	(2)	*See Habitat for Humanity for explanation.*
Nevada Heritage Association	361.115		Both	(2)	*See Habitat for Humanity for explanation.*
Nevada Land Conservancy	361.111		Real	(2)	*See explanation under American Land Conservancy.*

Nevada Museum of Art	361.11		Both	(2)	All real and personal property is exempt, unless it is used for a purpose other than the legitimate functions of the organization. *See also YMCA, YWCA, American National Red Cross, Salvation Army Corp, GSA, Camp Fire Girls, BSA, Sierra Arts Foundation.*
Nevada Rural Housing Authority	361.060		Real	(1)	*See explanation under Counties, Cities*
Noncommercial Theaters	361.145		Both	(2)	Buildings, furniture & equipment of noncommercial theaters owned and operated by nonprofit educational corporations organized for the exclusive purpose of conducting theater practice classes and the production of plays on a nonprofessional basis are exempt.
Nonprofit Private Schools	361.105		Both	(2)	All property is exempt from taxation.
Odd Fellows	361.135		Both	(2)	*See Lodges for explanation.*
Orphan Children or Sick, Infirm or Indigent Persons	361.083		Real	(2)	Land and buildings use for the care or relief of orphans or of sick, infirm or indigent persons owned by a nonprofit corporation organized or existing pursuant to NRS 82, is exempt. *See also Hospitals.*
Patented Mining Claims	362.010-362.095		Real	(5)	Upon receipt of an affidavit from the county recorder pursuant to NRS 362.050, the assessor shall exclude from the roll the assessment against the patented mine or mining claim named in the affidavit.
Pershing County Kids, Horses, Rodeo Inc.	361.107		Both	(2)	All real and personal property is exempt, unless it is used for a purpose other than the legitimate functions of the organization.
Personal Property Held for Sale by Merchant	361.068		Personal	(1)	Personal property held for sale by a merchant is exempt.
Personal Property Held for Sale by Manufacturer	361.068		Personal	(1)	Personal property held for sale by a manufacturer is exempt.

Personal Property in Transit	361.160-361.185	361.062	Personal	(4)	Claims must be submitted to county assessor in which the warehouse is located and a certification from the warehouse as to the status of the property must be attached.
Pipe & Irrigation Equipment	361.068		Personal	(1)	Pipe and other agricultural equipment used to convey water for the irrigation of legal crops is exempt.
Pollution Control Devices	361.077	361.046-361.050	Both	(3)	Property used as a facility, device, or method for the control of air or water pollution is exempt. Taxpayer must supply an annual affidavit to assessor on a form approved by Department. Certain property is not exempt per NAC 361.046.
Possessory Interest – Vending Stands	361.159		Personal	(3)	The possessory interest in otherwise exempt property is taxable, except for vending stands operated by blind persons under the auspices of the Bureau of Services to the Blind – DETR.
Possessory Interest – Public Airport	361.159		Personal	(2)	The possessory interest in otherwise exempt property is taxable, except for personal property owned and used in a public airport.
Possessory Interest – Public Airport, Park, Market, Fairground	361.157(2)(a)		Real	(2)	The possessory interest in otherwise exempt property is taxable, except for real property located upon a public airport, park, market, or fairground. Certain leased property on a public airport made available for purposes other than the purposes of a public airport is taxable.
Possessory Interest – Federal Property	361.157(2)(b)		Real	(1)	A possessory interest in federal property for which PILT payments are made is exempt.
Possessory Interest – State-supported Educational Institution	361.157(2)c		Real	(1)	A possessory interest in the property of any state-supported educational institution is exempt, except any part located within a TIA created pursuant to NRS 278C.155.

Possessory Interest – Taylor Grazing Act, USFS, BuRec	361.157(2)(d)		Real	(1)	A possessory interest in property used by persons, associations or corporations according to the Taylor Grazing Act, United States Forest Service or the Bureau of Reclamation is exempt.
Possessory Interest – Indian Tribe	361.157(2)(e)		Real	(1)	A possessory interest in property of any Indian held in trust by the U.S. is exempt.
Possessory Interest – Vending Stands of the Blind	361.157(2)(f)		Real	(1)	A possessory interest in vending stand locations operated by blind persons under the auspices of the Bureau of Services to the Blind and Visually Impaired – DETR, is exempt.
Possessory Interest – Geothermal Leases	361.157(2)(g)		Real	(1)	A possessory interest in geothermal leases for resources which have not been put into commercial production, is exempt.
Possessory Interest – Public Officer or Employee	361.157(2)(h)		Real	(1)	A possessory interest in property that is leased, loaned or made available to a public officer or employee in the course of public employment, is exempt.
Possessory Interest – Parsonage	361.157(2)(i)		Real	(1)	A possessory interest in a parsonage owned by a recognized religious society or corporation when used exclusively as a parsonage, is exempt.
Possessory Interest – Charitable or Religious Residence	361.157(2)(j)		Real	(1)	A possessory interest in a residence used by a person carrying out the activities of a charitable or religious organization is exempt
Possessory Interest – Shelter for Elderly or Indigent	361.157(2)(k)		Real	(1)	A possessory interest in property which is used to provide shelter at a reduced rate to the elderly or indigent is exempt.
Possessory Interest – Rental of Meeting Rooms	361.157(2)(l)		Real	(1)	A possessory interest in property used as meeting rooms or similar facilities for periods of less than 30 consecutive days is exempt.
Possessory Interest – Daycare	361.157(2)(m)		Real	(1)	A possessory interest in property used as a daycare by a nonprofit organization is exempt.

Promissory Notes	Article 10		Personal	(1)	Articles of personal property deemed to represent an interest in real or personal property already assessed and taxed is exempt.
Privately Owned Airports Used by Public	361.061(2)		Real	(2)	Privately owned airport property used for a public purpose, except areas from which income is derived, is exempt.
Privately Owned Parks Used by Public	361.0605	361.080	Real	(2)	The initial claim for exemption must be accompanied by a copy of the agreement with a local government that the property may be used by the public without charge. A sign must also be posted at each entrance to park. The exemption does not include areas from which income is derived.
Public Function Trusts	361.062		Both	(2)	Property of a trust created for the benefit of any public function pursuant to law is exempt, however, PILT monies may be paid to the beneficiary if so, provided in any agreement contained in creating the trust.
Radioactive Fallout Shelters	361.078		Real	(3)	Residential property is exempt up to $1,000 in assessed value if it meets certain qualifying conditions.
Raw Materials & Components Consumed in the Process of Manufacture	361.068		Personal	(1)	Raw materials are exempt when they are held by a manufacturer for manufacture into products. Supplies consumed in the process of manufacture are also exempt.
Salvation Army Corps	361.11		Both	(2)	All real and personal property is exempt, unless it is used for a purpose other than the legitimate functions of the organization. *See also Nevada Museum of Art.*
School Districts	361.065		Both	(1) school dist	All property owned by any legally created school district or charter school and devoted to public school purposes is exempt.
				(2) charter school	

Sierra Arts Foundation	361.11		Both	(2)	All real and personal property is exempt, unless it is used for a purpose other than the legitimate functions of the organization. *See also Nevada Museum of Art.*
State Lands	361.055		Both	(1)	All property owned by the state, except land assigned to the Department of Wildlife, is exempt. PILT payments are made by the Department of Wildlife.
Stocks	Article 10		Personal	(1)	Articles of personal property deemed to represent an interest in real or personal property already assessed and taxed is exempt.
Surviving Spouse	361.080		Both	(3)	Property of surviving spouses up to an assessed value of $1,000, as modified by CPI, is exempt. The original affidavit of claim must be accompanied by a death certificate showing the claimant was married to the deceased at the time of their death. Renewal affidavits must be completed each year.
Surviving Spouses of Disabled Veterans	361.091		Both	(3)	See Disabled Veterans.
Transient Personal Property	361.068		Personal	(1)	Personal property owned by a non-resident and located in Nevada for purposes of a display, exhibition, convention, carnival, fair or circus is exempt. *See also Carnival, fair circus.*
United States	361.050		Both	(1)	All property owned by the United States is exempt.
University Fraternities & Sororities	361.100		Real	(2)	Real property owned by fraternities and sororities whose members are students at UNR or UNLV and use the property as their home, is exempt.
University System: Charitable Foundation	361.098		Both	(2)	All property owned by a charitable foundation established by the Board of Regents of the University of Nevada is exempt, unless it is used for a purpose other than the legitimate functions of the foundation.

University System Leased Property	361.099	361.070	Both	(2)	Property leased to the Nevada System of Higher Education is exempt if the total consideration from the lease is less than 10 percent of the fair market value of the property. Certain documentation must be provided. *See NAC 361.070.*
Unpatented Mines & mining Claims	361.075		Real	(1)	Unpatented mines and mining claims are exempt, except for possessory interests in lands held by U.S. or state of Nevada.
Vehicles	361.067		Personal	(1)	*See Motor Vehicles*
Veterans	361.09		Both	(3)	Up to $2,000 assessed value, adjusted by CPI, of property may be exempt. Only the property of residents meeting certain qualifying criteria is eligible for exemption.
Veteran Organizations	361.095		Both	(2)	Up to $10,000 assessed value, adjusted by CPI, of Funds, furniture, paraphernalia and regalia owned by certain charitable organizations as well as real estate and fixtures, is exempt. If the real estate is leased, the exemption does not apply to the portion so leased or rented.
Volunteer Fire Departments	361.150		Both	(2)	All property is exempt, unless it is used for any purpose other than carrying out the legitimate functions of a volunteer fire department.
Water Users' Nonprofit Associations	361.073		Both	(2)	All property is exempt, unless it is used for any purpose other than carrying out the legitimate functions of a water users' nonprofit cooperative corporation.
Young Men's Christian Association	361.110		Both	(2)	All real and personal property is exempt, unless it is used for a purpose other than the legitimate functions of the organization. *See also Nevada Museum of Art.*
Young Women's Christian Association	361.110		Both	(2)	All real and personal property is exempt, unless it is used for a purpose other than the legitimate functions of the organization. *See also Nevada Museum of Art.*

APPENDIX E

2024-25 PERSONAL PROPERTY MANUAL: VALUATION GUIDELINES

Determining Whether Fixtures are Real or Personal Property

NRS 361.333 requires that each major class of property be examined to determine whether there is equality of assessment. One of the principal classes of property is personal property, pursuant to NRS 361.227(4). Uniformity and equality of assessment thus depend on proper classification. Although NRS 361.035 defines real estate and NRS 361.030 defines personal property, in practice it is sometimes difficult to tell whether an item is personal property or a fixture that is part of the real estate. As the Attorney General stated in Opinion #41 (1963), "the classification depends on the facts of each particular case." The assessor is encouraged to consult the Division of Local Government Services and/or the District Attorney in difficult cases.

A fixture may be defined as an item that was originally personal property which has been installed or attached to land or an improvement in a permanent manner. There is an abundant amount of case law which discusses three tests often used in deciding whether an item is a fixture. The tests are:

1. Physical Annexation;
2. Constructive Annexation, also called Adaptation; and
3. Intent

Under the first test, annexation, an item is a fixture if it is attached to, imbedded in or permanently resting upon land or an improvement, or is attached by other means that are normally used for permanent installation, and cannot be removed without substantially damaging the item or the land or improvement with which it is being used. For example, an item which is attached to real property for stability and has quick disconnect attachments such as simple wiring and conduit connections may not meet the test for a permanent fixture.

Under the second test, constructive annexation, an item is a fixture if the use or purpose of an item that is not otherwise physically annexed to land or an improvement is so adapted that it is:

A. A necessary, integral or working part of the land or improvement;
B. Designed or committed for use with the land or improvement; or
C. So essential to the land or improvement that the land or improvement cannot perform its desired function without the nonattached item.

Using the constructive annexation test, if the purpose of the item is to augment the use of the improvement no matter how it is attached, such as an elevator, the item must be considered a fixture. Another example would be heating, ventilation, and air conditioning equipment (HVAC). Equipment used to heat, ventilate, or cool a structure is considered to be real property.

Permanently attached personal property may be temporarily removed for repair or renovation onsite and still be considered permanently attached. Permanently attached fixtures do not include movable tangible personal property that is attached for convenience, stability or an obviously temporary purpose.

Underlying both the physical or constructive annexation tests is a determination of intent. An assessor must consider whether the item is intended to be a permanent part of the land or improvement, taking into account physical or constructive annexation, and other objective manifestations of permanence. NAC 361.1127 provides examples of objective manifestations of permanence.

A trade fixture may be distinguished from a fixture. It is an item of personal property that is non-permanently attached to real property for the purpose of conducting a business or trade; and has a unique identity and function separate from the real property to which it is attached. NAC 361.11745 provides a definition of trade fixture.

Pursuant to NRS 361.244, a mobile or manufactured home becomes real property when the Assessor has listed it on the tax roll as real property. The classification of mobile and manufactured homes as real property may be made when the requirements enumerated in NRS 361.244(1) and (2) are met. This includes the issuance of a Real Property Notice by the Manufactured Housing Division of the Department of Business and Industry. Factory-built housing becomes real property once it is permanently affixed to the land. These housing units conform to the Uniform Building Code and are not titled. As such they are not personal property nor are they considered "conversions". These "UBC" homes do not exhibit the HUD placards found on manufactured housing. Instead they may have a placard referencing NRS 461.080 and their serial numbers may begin with the characters "UBC".

In general, personal property is defined by exception pursuant to NRS 361.030. Property that does not meet the criteria of real property is personal property. The Assessor should recognize that certain fixtures such as bars, stages, walk-in coolers, or bank drive-ups, may already be included in the real property component of the Assessor's Taxable Value. The Assessor should review the differing building occupancies of the Marshall-Swift cost manuals to ensure that a component of real or personal property is not double-assessed. The improper classification of any component of taxable property as real or personal does not render the valuation void or invalid.

For further research and explanation, please consult:

Attorney General Opinion 2012-10 (10-31-2012) (as it applies to fixtures, not to trade fixtures)
Attorney General Opinion #41 (1963)
Attorney General Opinion No. 2000-04
Marvin Arnold, Respondent, v. Goldfield Third Chance Mining Co, 32 Nev. 447; 109 P. 718 (1910)
National Advertising Co. v. State Department of Transportation, 116 Nev. Adv. Op. No. 10, (Feb. 2, 2000)
Fondren, et al, v. K/L Complex Ltd., et al., 106 Nev. 705; 800 P.2d 719; (1990)
Morse Signal Devices of California v. County of Los Angeles, 161 Cal. App. 3d 570; 207 Cal Rptr. 742 (1984)
Crocker National Bank v. City and County of San Francisco, 782 P.2d 278 (1989)
State v. Pioneer Citizens Bank of Nevada, 85 Nev. 395 (1969)
Kaiser Co. v. *Reid* (1947) 30 Cal.2d 610

References:

International Association of Assessing Officers, Standard on the Valuation of Personal Property, December 2005. This publication may be obtained free of charge from the IAAO website at http://docs.iaao.org/media/standards/StandardValuationPersonalProperty.pdf

The Appraisal Institute: The Appraisal of Real Estate, 14th Edition, Chicago: 2013

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STATE OF NEVADA
DEPARTMENT OF TAXATION
Web Site: https://tax.nv.gov
Call Center: (866) 962-3707

LAS VEGAS OFFICE
700 E. Warm Springs Rd, Suite 200
Las Vegas, Nevada 89119
Phone (702) 486-2300
Fax (702) 486-2373

JOE LOMBARDO
Governor
TONY WREN
Chair, Nevada Tax Commission
SHELLIE HUGHES
Executive Director

CARSON CITY OFFICE
1550 College Parkway, Suite 115
Carson City, Nevada 89706-7937
Phone: (775) 684-2000
Fax: (775) 684-2020

RENO OFFICE
4600 Kietzke Lane, Suite L235
Reno, NV 89502
Phone: (775) 687-9999
Fax: (775) 688-1303

May 15, 2023

In the Matter of:)
Approval of the 2024-2025)
Personal Property Manual)

Re: Nevada Tax Commission

AMENDED NOTICE OF DECISION

Jeffrey Mitchell, Deputy Director, Excise & Local Government Services Division, appeared on behalf of the Department of Taxation (the "Department").

Summary:

The matter of the approval of the 2024-2025 Personal Property Manual required to be published by the Department pursuant to NAC 361.1365(2) came before the Nevada Tax Commission (the "Commission") for hearing on May 1, 2023, after due notice to each Assessor and to the public. Pursuant to NAC 361.1365(2), the Department previously held a public workshop on April 17, 2023, to disclose all proposed modifications to the manual and to receive information from the public. The Commission reviewed the Personal Property Manual and the report of the Department.

DECISION

The Commission, having considered all evidence and testimony pertaining to the matter, hereby approves the 2024-2025 Personal Property Manual as reported by the Department for use by county Assessors pursuant to NAC 361.1365(2). With updates including robots and robotic devices on page 15 and the adjustment of hotel furnishings from a 15 year life to a 10 year life on page 42.

BY THE NEVADA TAX COMMISSION THIS 1st DAY OF MAY 2023.

SHELLIE HUGHES
Executive Director
Nevada Department of Taxation

cc: County Assessors

Arevon Energy, Inc.

Arevon Energy, Inc. : Arevon Energy JV V, LLC (AE V Master) : Arevon Energy JV V, LLC : Arevon Energy JV HoldCo V, LLC : 8point3 Solar CEI, LLC : CD Clean Energy and Infrastructure (Joint Holdings), LLC : ESM Solar CEI, LLC : ESM Solar InvestCo, LLC : ESM Solar HoldCo, LLC : 325MK 8ME, LLC

Balance Sheet

As of December 31, 2024

Financial Row	Amount
ASSETS	
Current Assets	
Bank	
10000 - Cash and cash equivalents_Non-Restricted	
10500 - CEI VII	
10849 - CEIVII_325MK8ME_Const Comp_BofA_8734	$1,536,321.74
11847 - CEIVII_325MK8MEProject_BofA_9968	$532,679.55
Total - 10500 - CEI VII	$2,069,001.29
Total - 10000 - Cash and cash equivalents_Non-Restricted	$2,069,001.29
Total Bank	$2,069,001.29
Accounts Receivable	
12000 - Accounts Receivable	
12005 - PPA Receivables	$1,091,483.91
Total - 12000 - Accounts Receivable	$1,091,483.91
Total Accounts Receivable	$1,091,483.91
Other Current Asset	
13000 - Other Current Assets	
13300 - Prepaid Expenses	
13305 - Prepaid Expenses - General	$98,528.82
13310 - Prepaid Insurance	$88,446.44
13315 - Prepaid Taxes	$98,400.86
Total - 13300 - Prepaid Expenses	$285,376.12
Total - 13000 - Other Current Assets	$285,376.12
Total Other Current Asset	$285,376.12
Total Current Assets	$3,445,861.32
Fixed Assets	
15000 - Fixed Assets	
15200 - Solar Energy Systems	
15205 - Solar Energy Systems - General	$390,858,870.11
Total - 15200 - Solar Energy Systems	$390,858,870.11
17060 - Fixed Assets - Accumulated Depreciation	($31,477,944.09)
Total - 15000 - Fixed Assets	$359,380,926.02
16000 - Inventory	
16004 - Other	$130,680.00
Total - 16000 - Inventory	$130,680.00
Total Fixed Assets	$359,511,606.02
Other Assets	
17100 - Asset Retirement Obligation Asset	
17105 - Asset Retirement Obligation Asset - General	$5,647,401.97
17110 - Asset Retirement Obligation Asset - Accumulated Amortization	($418,307.52)
Total - 17100 - Asset Retirement Obligation Asset	$5,229,094.45
17900 - Deposits	
17905 - Refundable Deposits	$100,000.00
Total - 17900 - Deposits	$100,000.00
18300 - Other Non-Current Assets	
18316 - Operating Lease ROU Asset	$51,642,262.83
Total - 18300 - Other Non-Current Assets	$51,642,262.83
Total Other Assets	$56,971,357.28
Total ASSETS	$419,928,824.62
Liabilities & Equity	
Current Liabilities	
Accounts Payable	

Financial Row	Amount
20000 - Accounts Payable	$321,193.08
Total Accounts Payable	$321,193.08
Other Current Liability	
20100 - Accrued Expense	$1,443,591.17
21000 - Other Current Liabilities	
21305 - Operating Lease Liability - Current	$135,298.88
21500 - Intercompany Payable	
21569 - Moapa Southern Paiute Solar, LLC	$8,500.00
21720 - Ark I CEI HoldCo, LLC	($110,018.66)
Total - 21500 - Intercompany Payable	($101,518.66)
Total - 21000 - Other Current Liabilities	$33,780.22
Total Other Current Liability	$1,477,371.39
Total Current Liabilities	$1,798,564.47
Long Term Liabilities	
28000 - Other Long Term Liabilities	
28010 - Asset Retirement Obligation Liability	$7,238,481.22
28016 - Operating Lease Liability - Non-Current	$55,947,652.98
Total - 28000 - Other Long Term Liabilities	$63,186,134.20
Total Long Term Liabilities	$63,186,134.20
Equity	
32000 - Member's Equity	
32005 - Member's Contributions	$434,810,858.50
32010 - Member's Return of Capital	($36,582,247.71)
32015 - Member's Distributions	($28,091,234.59)
32020 - Income (Loss) Allocation	($15,193,250.25)
Total - 32000 - Member's Equity	$354,944,125.95
Retained Earnings	($4,832,389.67)
Net Income	$4,832,389.67
Total Equity	$354,944,125.95
Total Liabilities & Equity	$419,928,824.62

Arevon Energy, Inc.

Arevon Energy, Inc. : Arevon Energy JV V, LLC (AE V Master) : Arevon Energy JV V, LLC : Arevon Energy JV HoldCo V, LLC : 8point3 Solar CEI, LLC : CD Clean Energy and Infrastructure (Joint Holdings), LLC : ESM Solar CEI, LLC : ESM Solar InvestCo, LLC : ESM Solar HoldCo, LLC : 325MK 8ME, LLC

Income Statement

January 1, 2024 - December 31, 2024

Financial Row	Amount
Ordinary Income/Expense	
Income	
40000 - Revenue	
40005 - PPA Revenue	$21,729,169.40
40167 - Insurance Proceeds Operations	$1,100,000.00
Total - 40000 - Revenue	$22,829,169.40
Total - Income	$22,829,169.40
Cost Of Sales	
50000 - Cost Of Operations	
50005 - Maintenance Agreement - Operations & Maintenance	$1,211,713.87
50010 - Maintenance Agreement - Additional O&M	$143,883.11
50016 - Interconnection & Transmission	$17,000.00
50020 - Utilities	$249,242.06
50022 - Regulatory Compliance	$99,588.25
50023 - Utilities - Telecommunications	$103,464.93
50025 - Environmental	$15,470.00
50030 - Taxes	$233,296.09
50035 - Insurance	$598,666.51
50045 - Asset Management Fee	$243,186.23
50050 - Spare Parts	$6,027.12
50055 - Vegetation Management	$186,500.00
50065 - Power Factors	$92,645.04
50070 - REC Fees	$10,213.54
50075 - Operational Costs - Other	$49,001.73
50200 - Ground Lease	
50201 - Lease Expense - General	$2,219,321.51
Total - 50200 - Ground Lease	$2,219,321.51
Total - 50000 - Cost Of Operations	$5,479,219.99
Total - Cost Of Sales	$5,479,219.99
Gross Profit	$17,349,949.41
Expense	
60000 - General And Administrative Expenses	
60005 - General And Administrative - General	$6,103.63
60010 - Audit	$40,640.00
60020 - Legal	$120,704.02
60050 - Business License And Permits	$3,555.50
60055 - Letter of Credit Fees	$420,292.76
Total - 60000 - General And Administrative Expenses	$591,295.91
70000 - Depreciation, Amortization And Accretion Expense	
70005 - Depreciation Expense	$11,387,190.27
70015 - Accretion Expense	$528,417.48
Total - 70000 - Depreciation, Amortization And Accretion Expense	$11,915,607.75
Total - Expense	$12,506,903.66
Net Ordinary Income	$4,843,045.75
Other Income and Expenses	
Other Expense	
90000 - Other Expense	
90050 - Other Expense - General	($0.02)
92000 - Income Tax Expense (Benefit)	
92010 - Income Tax Expense - State	$10,656.10
Total - 92000 - Income Tax Expense (Benefit)	$10,656.10
Total - 90000 - Other Expense	$10,656.08

Financial Row	Amount
Total - Other Expense	$10,656.08
Net Other Income	($10,656.08)
Net Income	$4,832,389.67



STATE
BOARD OF EQUALIZATION

Case #25-155

Fiscal Year 2023/2024

Declaration Assets Filed Online
Account ID# 229299

Account Name / DBA:	EAGLE SHADOW MOUNTAIN SOLAR
Corporate Name:	AREVON ENERGY
Location Address	0 MOAPA SOLAR RD
Location City	MOAPA
Location Zip	89025
Mailing To	325MK 8ME, LLC C/O AREVON ENERGY
Mailing Address 1	8800 GAINEY CENTER DR SUITE 100
Mailing Address 2	
Mailing City	SCOTTSDALE
Mailing State	AZ
Mailing Zip	85258
Business Phone	(480) 653-8450
NAICS Code	221114
Contact Name	James Bergstrom
Contact Title	Senior Tax Manager
Contact Phone	(480) 681-4031
Contact Email	jbergstrom@arevonenergy.com
Status	no_status_change
Status Date	
Status Notes	
Submission Date	10/2/2024 10:41:19 AM

Add Or Delete	Asset ID # or Serial # (optional)	Description	Year Acquired	Acquisition Cost	Department Code
ADD		Inventory	2023	242,379.00	TFX
ADD		Solar System Blocks 1-10 & 13	2021	348,300,000.00	RP
ADD		Solar system blocks 11 & 14	2023	74,600,001.00	RP
ADD		Solar system block 12	2022	37,400,000.00	RP

Fiscal Year 2023 - 2024

BUSINESS PERSONAL PROPERTY DECLARATION & ASSET LISTING

Assessor ID# **229299** **Group:**
Business Name **EAGLE SHADOW MOUNTAIN SOLAR**

Mailing Address **8800 GAINEY CENTER DR SUITE 100**
SCOTTSDALE AZ 85258-2193

Location Address **MOAPA SOLAR RD**
MOAPA 89025-

Phone Number

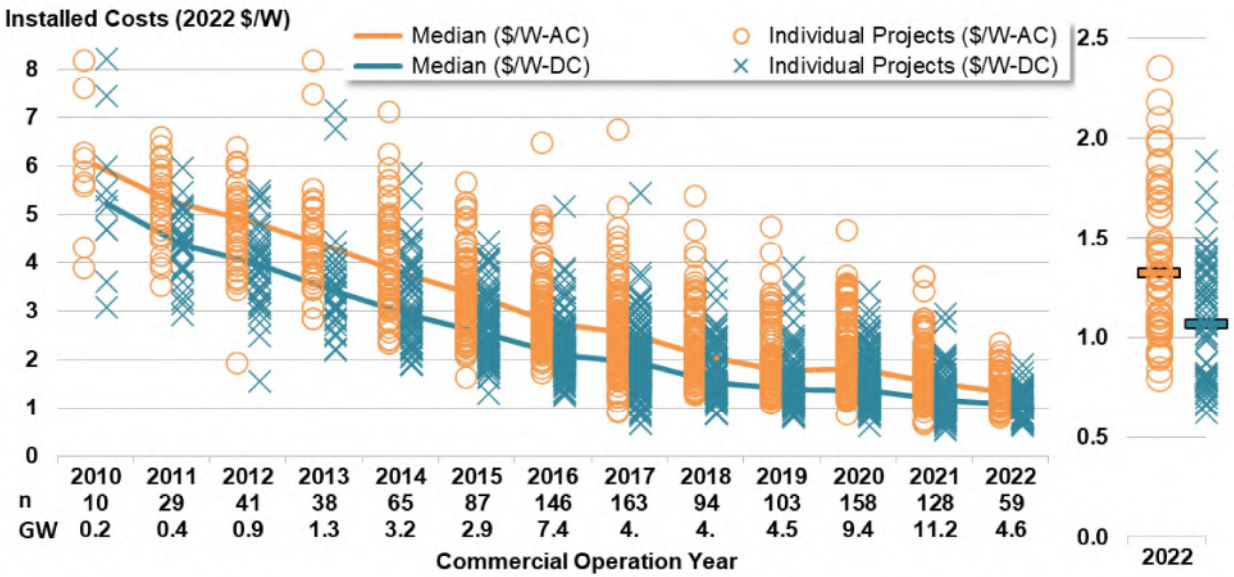
Prior Assessor ID#
Legal/Corporation Name **AREVON ENERGY**
Contact Name
Contact Phone
Email Address
NAICS **221114**
Solar Electric Power Generation

Totals	385,700,000	283,854,690	283,854,690	99,349,141

Add or Delete	Asset ID # or Serial # (optional)	Description	Year Acquired	Acquisition Cost	Taxable	Override Value	Assessed	Dept Code
		SOLAR SYSTEM BLOCKS 1	2021	348,300,000	251,507,430	251,507,430	88,027,600	30RA
		SOLAR SYSTEM BLOCK 12	2022	37,400,000	32,347,260	32,347,260	11,321,541	30RA
				385,700,000	283,854,690	283,854,690	99,349,141	

Median installed costs of PV have fallen by 78% (or 10% annually) since 2010, to $1.32/$W_{AC}$ ($1.07/$W_{DC}$) in 2022

Sample: 1,126 projects totaling 54.2 GW_{AC}



Note on solar costs and inflation: We adjust costs to account for general inflation using BEA's implicit price deflators. As a result, costs for past years are 7% higher when expressed in $2022 compared to last year's report. Conversely, decreasing solar costs in real terms indicate that solar projects find at least some savings relative to the wider economy, even if prices may rise in nominal terms. Compared to the previous year, $/$W_{AC}$ costs fell both in real (-13%) and nominal (-8%) terms in 2022 in our sample. $/$W_{DC}$ costs decreased by 8% in real and 6% in nominal terms.

Despite inflationary pressures, utility-scale solar costs continued to decrease from $1.5/$W_{AC}$ in 2021 to $1.3/$W_{AC}$ in 2022.

The lowest 20th percentile of project costs fell in real terms from $1.2/$W_{AC}$ ($0.9/$W_{DC}$) in 2021 to $1.1/$W_{AC}$ ($0.8/$W_{DC}$) in 2022.

The lowest-cost projects among the 59 data points in 2022 are now around $0.9/$W_{AC}$.

Historical sample is robust (covering 97% of installed capacity through 2021). 2022 data covers 40% of new projects or 44% of new capacity.

This sample is backward-looking and does not reflect the costs of projects built in 2023/2024.

Obsolescence – Utility Scale Solar 2024-07-01

Installed Costs 2022 $/W$_{AC}$ from Berkley Labs

Year	Median Installed Costs $/W$_{AC}$	Cost Decline (%)	Market Based Installed Cost (% Good)
2023	$1.20	0.00	1.00
2022	$1.32	0.09	0.91
2021	$1.52	0.21	0.79
2020	$1.81	0.34	0.66
2019	$1.77	0.32	0.68
2018	$2.06	0.42	0.58
2017	$2.54	0.53	0.47
2016	$2.74	0.56	0.44
2015	$3.31	0.64	0.36
2014	$3.79	0.68	0.32
2013	$4.35	0.72	0.28
2012	$4.89	0.75	0.25
2011	$5.28	0.77	0.23
2010	$6.03	0.80	0.20
2009	$5.81	0.79	0.21
2008	$5.40	0.78	0.22
2007	$11.71	0.90	0.10
2006			
2005			

Red = Estimated

30-Year Life Table based % Good vs Market Based Installed Cost | Predictive Analyses

	Chart 1		Chart 2	
Year Built	Statutory 23-24 Personal Property Manual 30-Year Life Table Percent Good	Market Based Installed Cost (% Good)	Statutory 23-24 Personal Property Manual 30-Year Life Table Percent Good	Trend Line Predicted Market Based Installed Cost (% Good)
2023	1.00	1.00	1.00	1.00
2022	0.93	0.91	0.93	0.90
2021	0.87	0.79	0.87	0.80
2020	0.81	0.66	0.81	0.71
2019	0.76	0.68	0.76	0.63
2018	0.71	0.58	0.71	0.56
2017	0.66	0.47	0.66	0.49
2016	0.62	0.44	0.62	0.43
2015	0.58	0.36	0.58	0.37
2014	0.54	0.32	0.54	0.32
2013	0.50	0.28	0.50	0.28
2012	0.47	0.25	0.47	0.25
2011	0.44	0.23	0.44	0.22
2010	0.41	0.20	0.41	0.20
2009	0.38	0.21	0.38	0.18
2008	0.36	0.22	0.36	0.17
2007	0.33	0.10	0.33	0.17
2005				
2006				

Chart 1

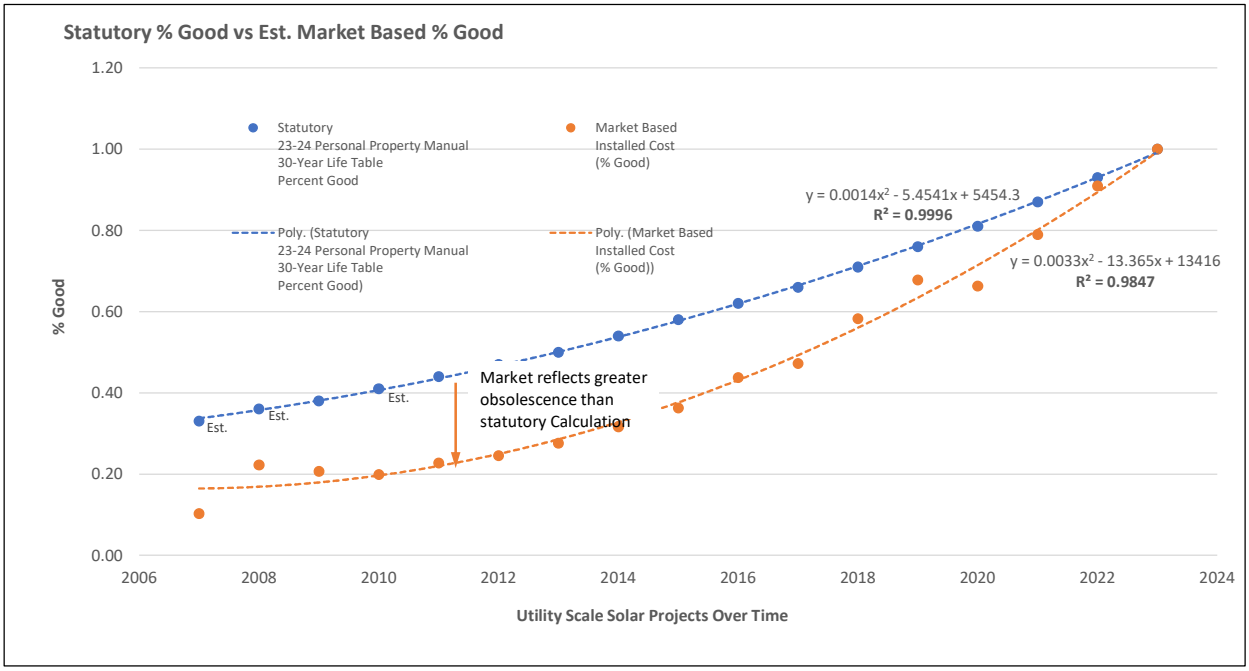
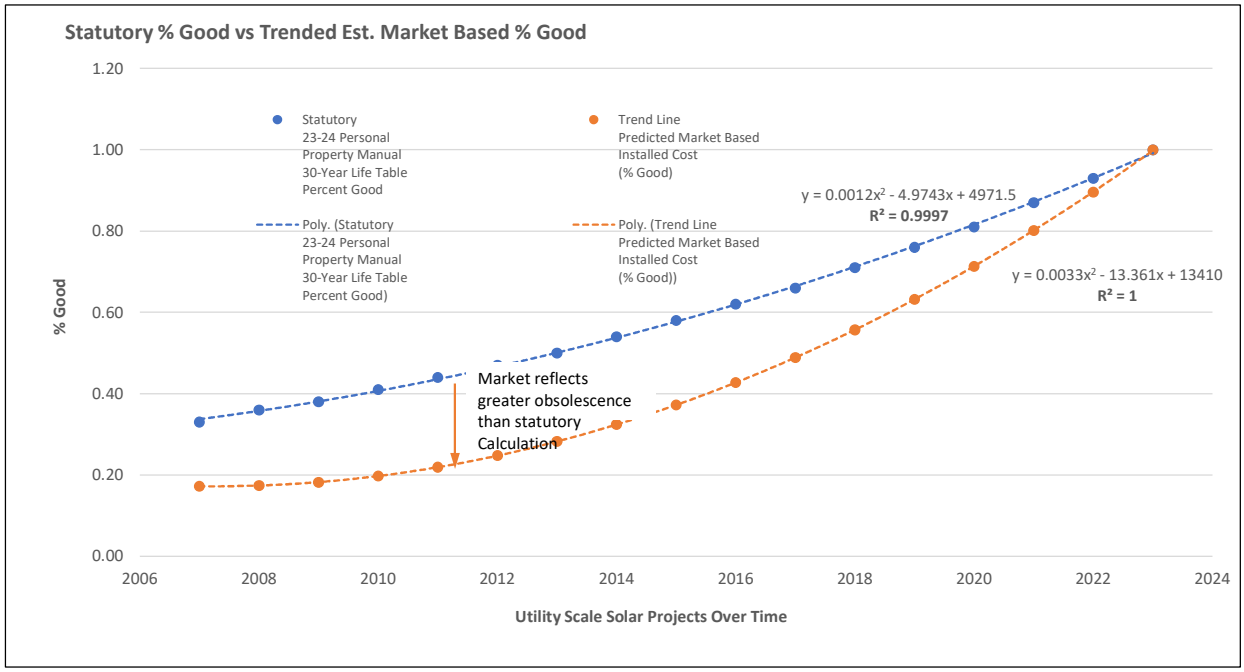


Chart 2



Final Recommendation for an Obsolescence Adjustment (With Example for $1,000 in Historical Cost)

Year Built	Historical or Declared Cost	Statutory 23-24 Personal Property Manual 30-Year Life Table Cost Index	RCN	Statutory 23-24 Personal Property Manual 30-Year Life Table Percent Good	Statutory Taxable Value
2023		1.00		100.0	
2022		1.12		93.0	
2021	$1,000.00	1.15	$1,150.00	87.0	$1,000.50
2020		1.16		81.0	
2019		1.18		76.0	
2018		1.22		71.0	
2017		1.24		66.0	
2016		1.26		62.0	
2015		1.27		58.0	
2014		1.28		54.0	
2013		1.30		50.0	
2012		1.32		47.0	
2011		1.35		44.0	
2010		1.38		41.0	
2009		1.39		38.0	
2008		1.42		36.0	
2007		1.47		33.0	
2006					
2005					

Year Built	Historical or Declared Cost	Market Based Installed Cost Multiplier (% Good)	Adjusted Current Cost	Statutory 23-24 Personal Property Manual 30-Year Life Table Percent Good	Market Taxable Value
2023		1.00		100.0	
2022		0.90		93.0	
2021	$1,000.00	0.80	$800.00	87.0	$696.00
2020		0.71		81.0	
2019		0.63		76.0	
2018		0.56		71.0	
2017		0.49		66.0	
2016		0.43		62.0	
2015		0.37		58.0	
2014		0.32		54.0	
2013		0.28		50.0	
2012		0.25		47.0	
2011		0.22		44.0	
2010		0.20		41.0	
2009		0.18		38.0	
2008		0.17		36.0	
2007		0.17		33.0	
2006					
2005					

Market Taxable Value	$696.00
Minus: Statutory Taxable Value	$1,000.50
Recommended Obsolescence	**-$304.50**
or as a Factor	**0.695652174**

Utility-Scale Solar, 2023 Edition

Empirical Trends in Deployment, Technology, Cost, Performance, PPA Pricing, and Value in the United States

Mark Bolinger[1], Joachim Seel[1],
Julie Mulvaney Kemp, Cody Warner, Anjali Katta, and Dana Robson

Lawrence Berkeley National Laboratory
[1]Corresponding authors

October 2023



Photo credit: Terra-Gen

This material is based upon work supported by the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy (EERE) under Solar Energy Technologies Office (SETO) Agreement Number 38444 and Contract No. DE-AC02-05CH11231.

Utility-Scale Solar, 2023 Edition



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Acknowledgements

The authors thank Ammar Qusaibaty, Juan Botero, Michele Boyd, and Becca Jones-Albertus of the U.S. Department of Energy Solar Energy Technologies Office for supporting this work. The authors also thank the many individuals from utilities, the solar industry, state agencies, and other organizations who contributed data to this report and/or who responded to numerous inquiries and requests. Without the contributions of these individuals and organizations, this report would not be possible.

Photo credit:
Terra Gen's Edward's Sanborn Solar and Energy Storage Project
with 718MWdc solar and 424MW/1057MWh storage as of the end of 2022

Utility-Scale Solar, 2023 Edition

Purpose and Scope:

- Summarize publicly available data on key trends in U.S. utility-scale solar sector
- Focus on ground-mounted projects >5 MW_{AC}
  - There are separate DOE-funded data collection efforts on distributed PV (e.g., trackingthesun.lbl.gov)
- Focus on historical data, emphasizing the most-recent full calendar year

Data and Methods:

- See summary at end of PowerPoint deck

Funding:

- U.S. Department of Energy's Solar Energy Technologies Office

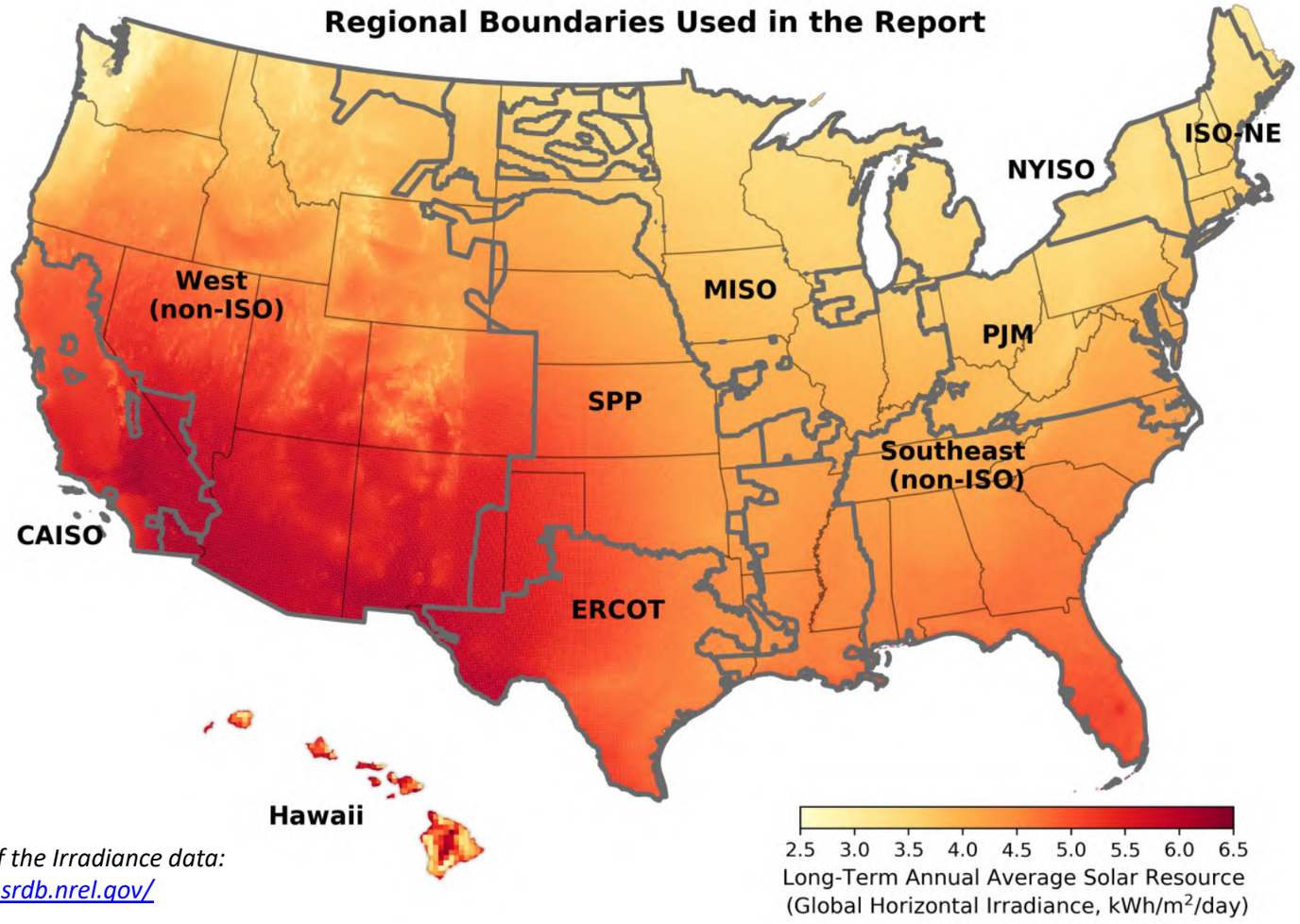
Products and Availability:

- This report deck is complemented by an Excel data file, a written executive summary, and interactive visualizations
- All products are available at: utilityscalesolar.lbl.gov

Report Contents

- Deployment and Technology Trends
- Capital Costs (CapEx) and O&M Costs
- Performance (Capacity Factors)
- Levelized Cost of Energy (LCOE) and Power Purchase Agreement (PPA) Prices
- Wholesale Market Value
- PV+Battery Hybrid Plants
- Concentrating Solar Thermal Power (CSP) Plants
- Capacity in Interconnection Queues
- Summary
- Data and Methods

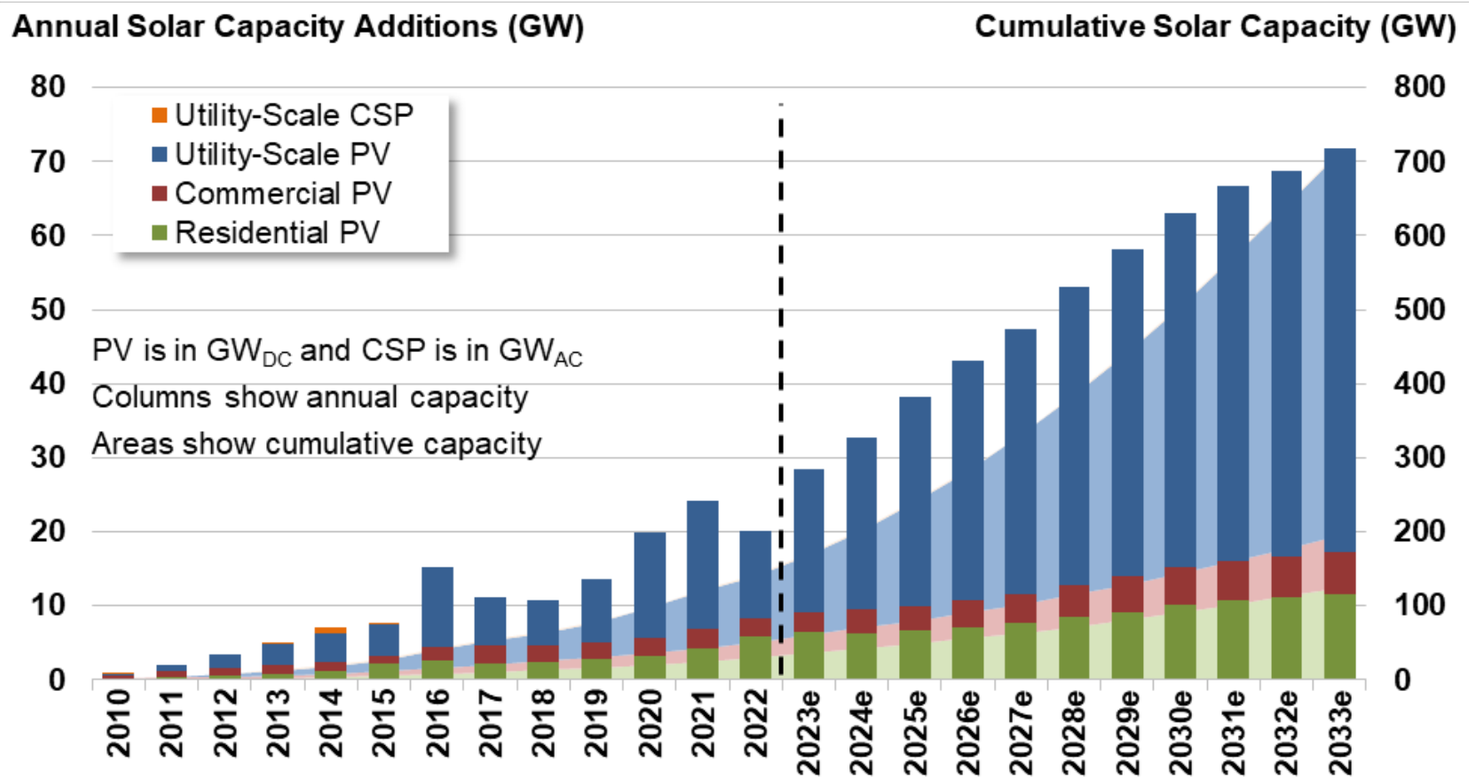
Regional boundaries applied in this analysis include the seven independent system operators (ISO) and two non-ISO regions



Source of the Irradiance data:
https://nsrdb.nrel.gov/

Deployment and Technology Trends

The utility-scale sector has the greatest share of the U.S. solar market



Sources: *Wood Mackenzie/SEIA Solar Market Insight Reports, Berkeley Lab*

We define "utility-scale" as any ground-mounted project that is larger than 5 MW_{AC}

Smaller systems are analyzed in LBNL's *"Tracking the Sun"* series (trackingthesun.lbl.gov)

Wood Mackenzie and SEIA report that the utility-scale sector added 12 GW_{DC} of new solar capacity in 2022, accounting for **59% of all new solar** capacity. Annual growth declined by 32% compared to the record year 2021.

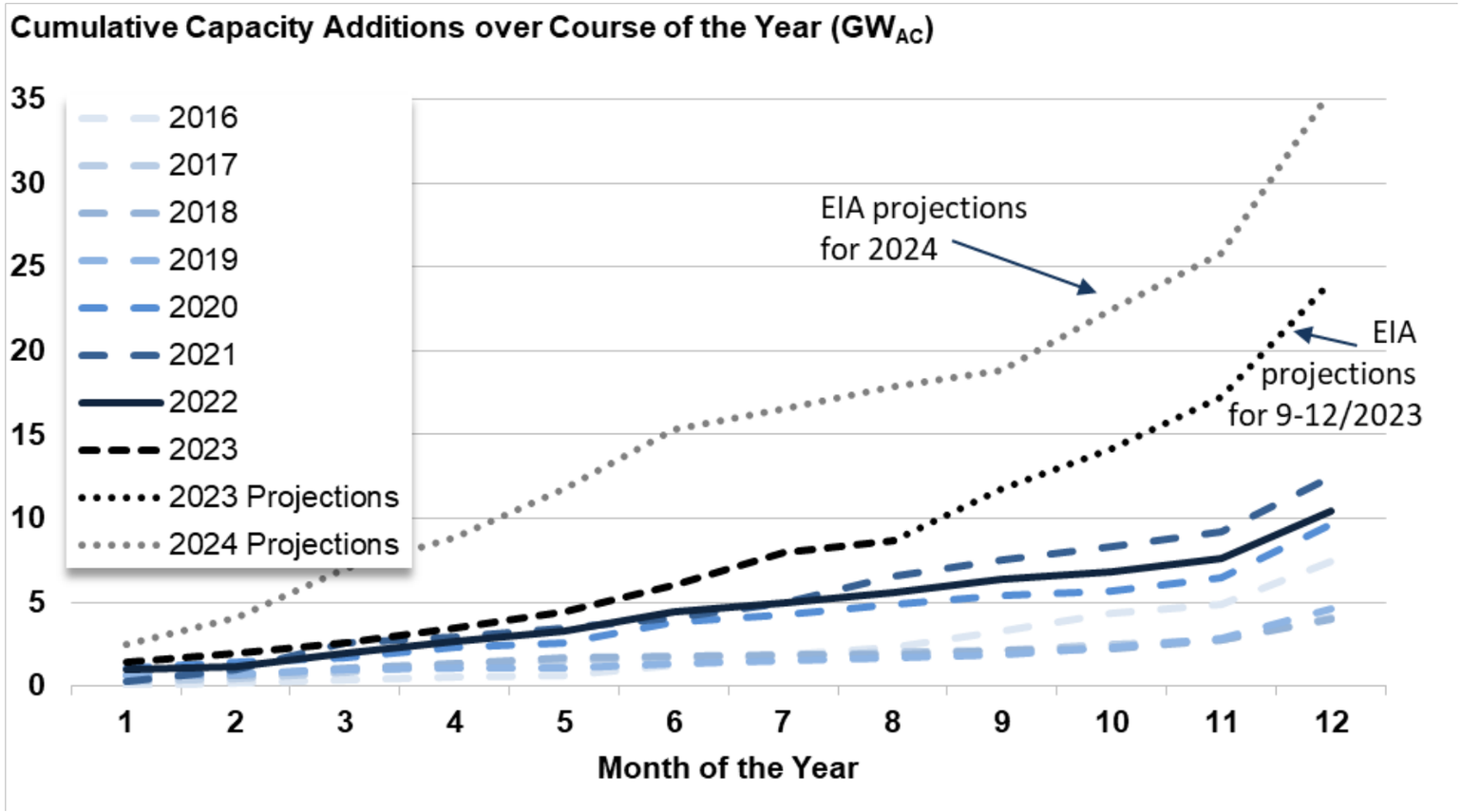
Utility-scale solar contributed **63% of cumulative solar** capacity (and 72% of solar generation) in 2022; this share is projected to rise above 67% by 2025 and 73% by 2033.

Our data analysis focuses on a subset of this sample—all projects larger than 5 MW_{AC} that were completed by the end of 2022:

- **2021**: 155 new projects totaling 16.6 GW_{DC} or 12.5 GW_{AC}
- **2022**: 147 new projects totaling 13.2 GW_{DC} or 10.4 GW_{AC}

Note: Wood Mackenzie/SEIA's graph above defines utility-scale solar as >1 MW_{DC} while this report uses a definition of >5 MW_{AC}.

Utility-scale solar capacity additions on track for record year in 2023



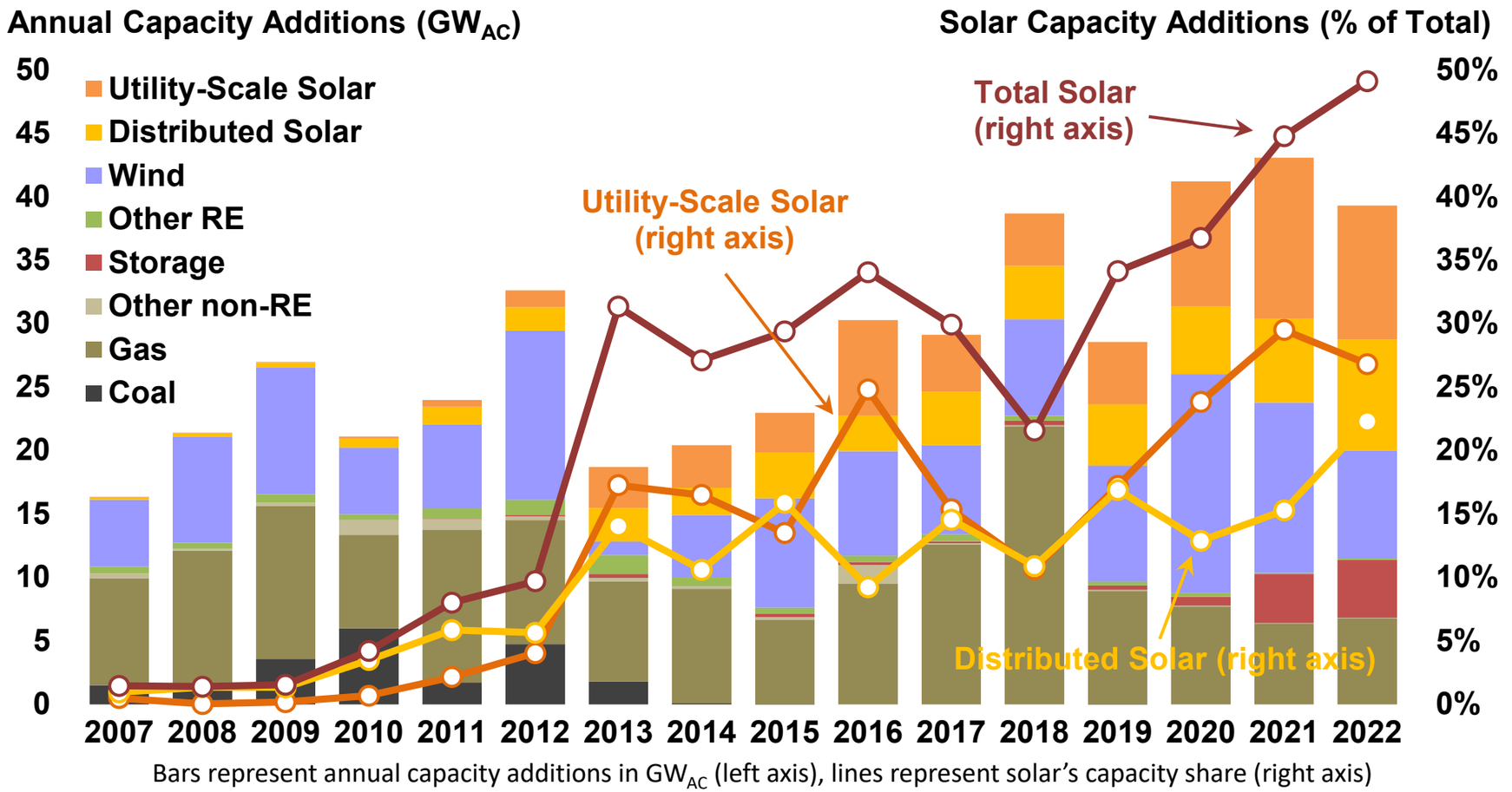
Utility-scale additions in 2022 did not reach 2021 levels as less capacity came online over the summer, in part due to temporary anti-dumping/circumvention tariffs and supply chain inspections related to Uyghur Forced Labor Prevention Act.

December had the most capacity growth in 2022, like past years. This does *not* point to a strategic withholding of capacity to benefit from more lucrative ITC/PTC benefits that took effect in January 2023.

2023 shapes up to be a record year, with 50% more capacity installed so far compared to the same month in 2022. Based on EIA estimated "Planned Capacity" more than 24GW_{AC} may get installed in 2023.

Note: This graph defines utility-scale solar as larger than 5 MW_{AC}.

Solar was the largest source of capacity added to U.S. grids in 2022



Bars represent annual capacity additions in GW_{AC} (left axis), lines represent solar's capacity share (right axis)

Utility-scale (27%) and distributed (22%) solar accounted for a combined 49% of all capacity added to U.S. grids in 2022 (ahead of wind's 22%).

Solar has contributed >40% of all new capacity for the past 2 years, >30% in 6 of the last 7 years, and >20% in each of the last 10 years.

Storage continues to expand: 4.5 GW of storage were added to U.S. grids in 2022, up from 3.9 GW in 2021 and 0.7 GW in 2020.

Sources: *EIA, Berkeley Lab*

Note: This graph follows the EIA's split between distributed (<1 MW_{AC}) and utility-scale (≥1 MW_{AC}) solar, rather than our 5 MW_{AC} threshold.

Solar generation's market share was 4.7% across the U.S. in 2022, but reached 27% in California and exceeded 15% in four other states

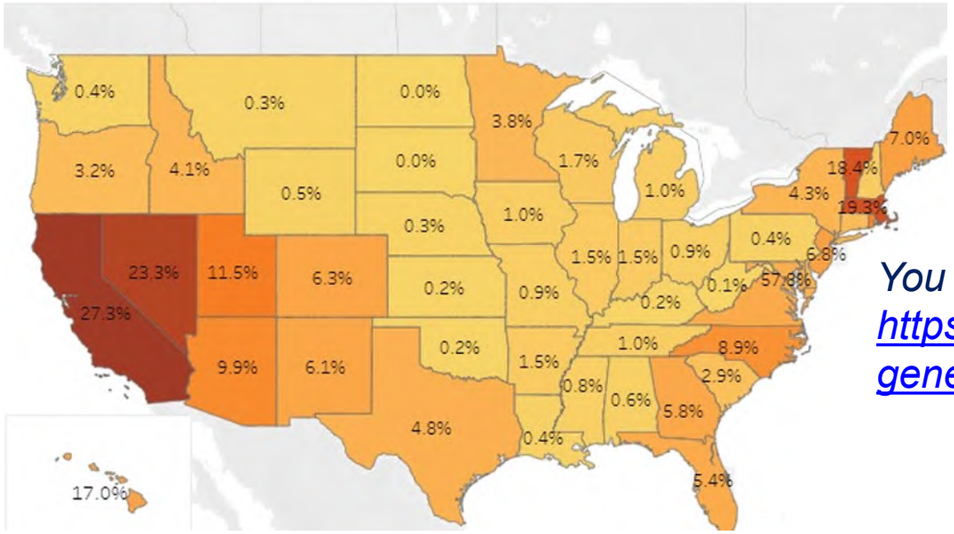
State	Solar generation as a % of in-state generation		Solar generation as a % of in-state load	
	All Solar	Utility-Scale Solar Only	All Solar	Utility-Scale Solar Only
California	27.3%	17.2%	24.8%	15.6%
Nevada	23.3%	20.4%	25.7%	22.4%
Massachusetts	19.3%	8.5%	9.2%	4.0%
Vermont	18.4%	9.4%	7.6%	3.9%
Hawaii	17.0%	5.3%	20.4%	6.3%
Utah	11.5%	9.6%	14.0%	11.6%
Rhode Island	11.0%	4.9%	12.5%	5.7%
Arizona	9.9%	6.5%	12.8%	8.5%
North Carolina	8.9%	8.5%	8.6%	8.2%
Maine	7.0%	4.2%	7.2%	4.3%
New Jersey	6.8%	2.4%	6.3%	2.2%
Colorado	6.3%	4.1%	6.6%	4.3%
New Mexico	6.1%	4.8%	9.2%	7.2%
Georgia	5.8%	5.4%	5.1%	4.8%
Virginia	5.6%	5.1%	3.9%	3.6%
Florida	5.4%	4.3%	5.4%	4.4%
Maryland	4.9%	2.0%	3.1%	1.3%
Texas	4.8%	4.2%	5.6%	4.9%
New York	4.3%	1.6%	3.8%	1.5%
Idaho	4.1%	3.1%	2.7%	2.1%
Rest of U.S.	*1.0%*	*0.7%*	*1.3%*	*0.9%*
TOTAL U.S.	**4.7%**	**3.4%**	**5.2%**	**3.7%**

Solar market share can vary considerably depending on whether it is calculated as a percentage of total generation or load (e.g., see Vermont)

As a percentage of in-state generation, California's solar market share reached 27% in 2022, while Nevada, Massachusetts, Vermont, and Hawaii all surpassed 15%

The utility-scale sector's contribution varies by state: a minority in the Northeast and Hawaii, a majority in Southwest states and the overall U.S.

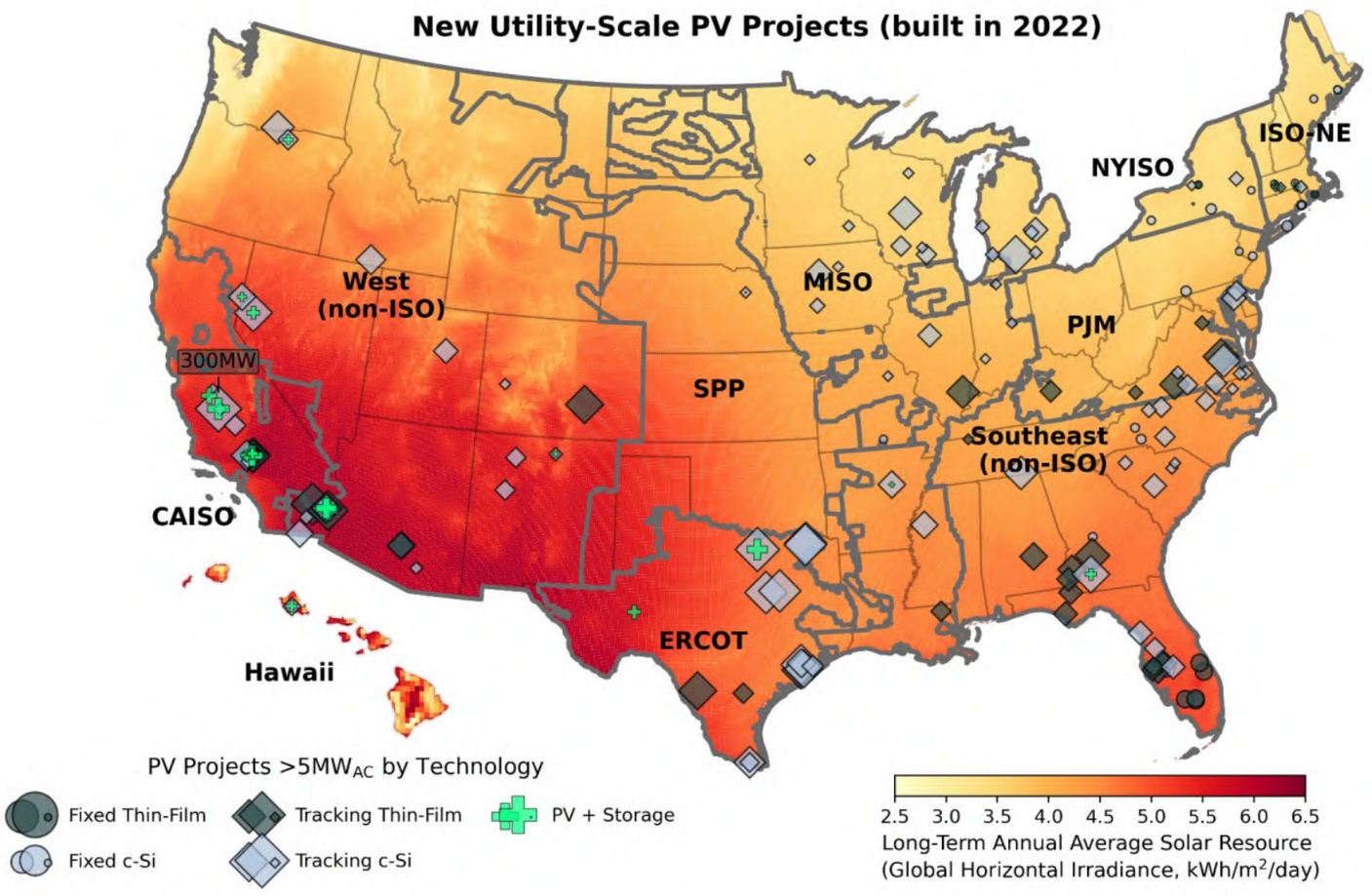
Percentage of In-State Electricity Sales and Generation from Solar PV, as of 2022



You can explore this data interactively at https://emp.lbl.gov/capacity-and-generation-state

Note: In this table, "utility-scale" refers to projects ≥ 1 MW_{AC}, rather than our typical 5 MW_{AC} threshold.

Texas continued to lead in new utility-scale solar deployment



Texas continues to add the most capacity in the nation, although less than in 2021. New projects shifted away from the northwest and closer to load centers.

Fixed-tilt ( ) projects are increasingly only being built on particularly challenging sites (e.g., due to terrain or wind loading) or in the least-sunny regions in the northeast.

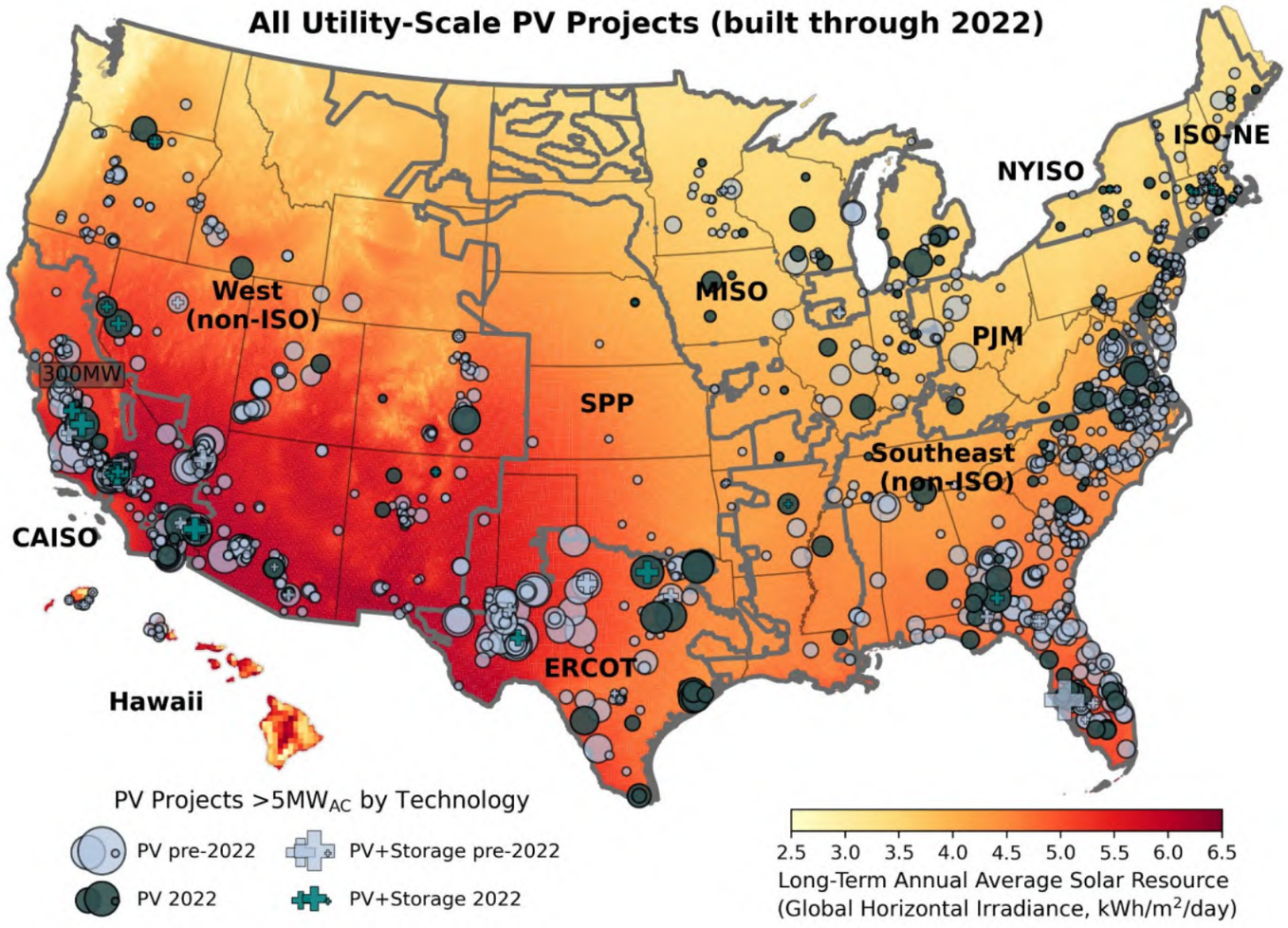
Other high-latitude states such as Oregon, Minnesota, Wisconsin, and Michigan, added predominantly **tracking** projects in 2022 ( ).

In 2022, storage ( ) hybrid projects hit the ground in record numbers. Batteries were added to already existing (4) and new (26) PV projects. Solar-rich CA added the most storage capacity (960 MW), while MA deployed several (6) small-sized battery projects.

2022 was the first time in 15 years that no new state joined the utility-scale solar market.

You can explore this data interactively at https://emp.lbl.gov/technology-trends

Utility-scale solar has become a growing source of electricity in all regions of the United States



Utility-scale PV is well-represented throughout the nation, with the exception of upper-Midwestern states in the “wind belt”.

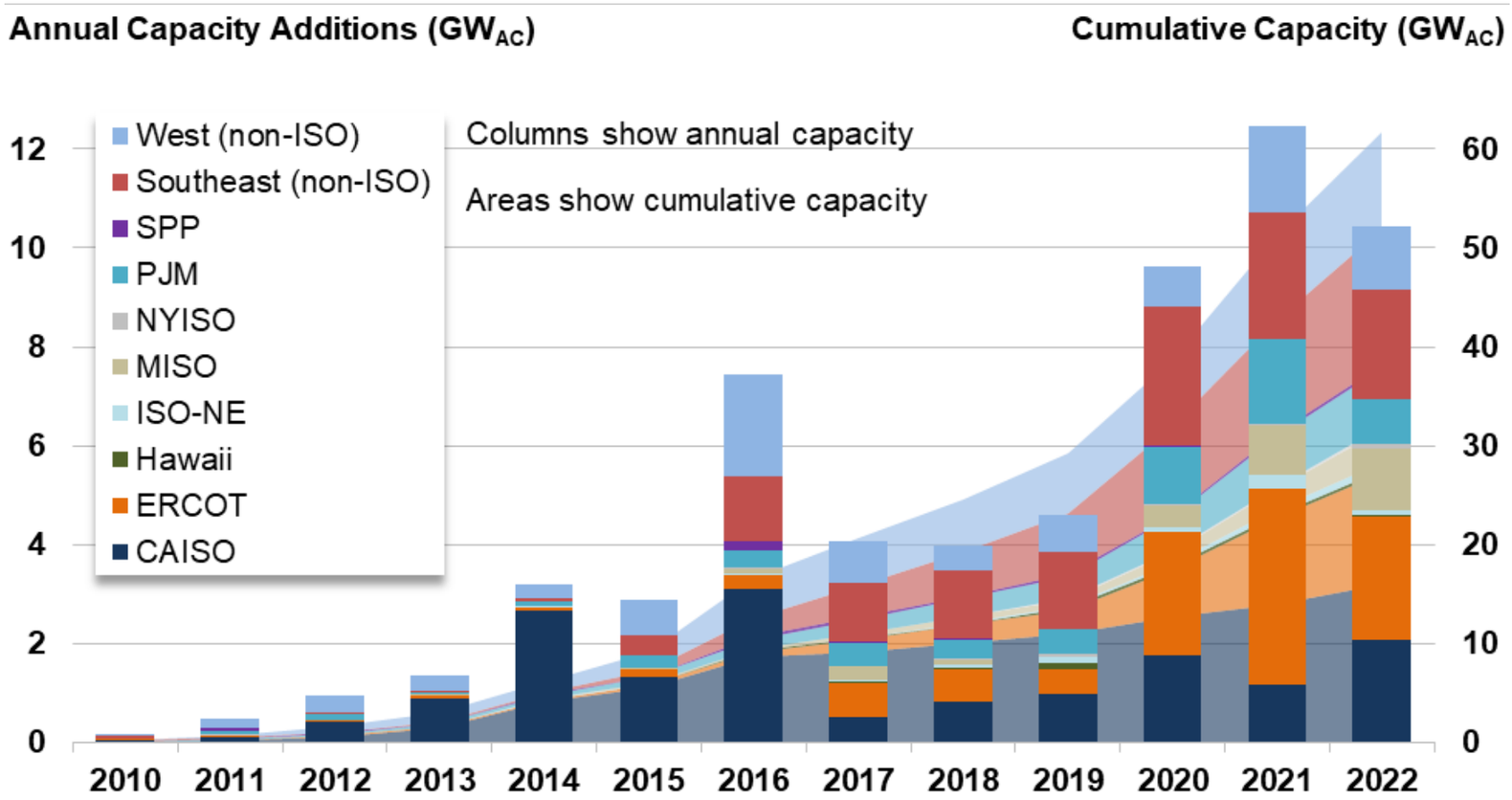
Large solar projects (>100 MW) are now being built in northern MISO, while Texas solar increasingly expands beyond the panhandle.

Montana, the Dakotas, New Hampshire, and West Virginia still await their first utility-scale solar projects in our sample.

You can explore this data interactively at https://emp.lbl.gov/technology-trends

Texas and California added the most utility-scale solar capacity in 2022

PV project population: 1,277 projects totaling 61.7 GW_{AC}



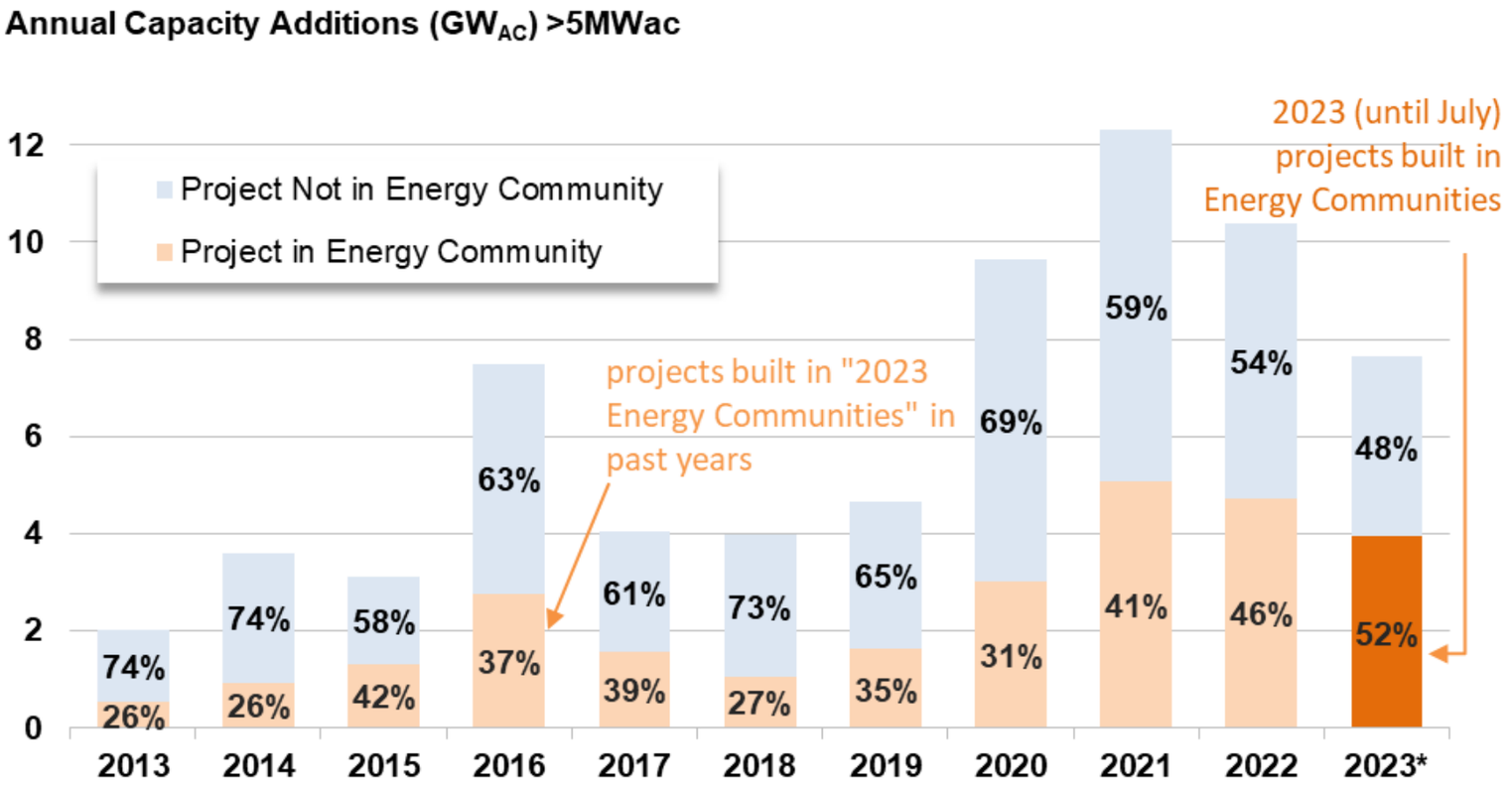
2022 utility-scale solar additions decreased compared to 2021 both across the nation and in many regions.

Texas (ERCOT) remains the strongest market, having added 2.5 GW_{AC} or 24% of all utility-scale solar capacity in 2022. In cumulative deployment, Texas is still lagging California (CAISO) with 11 GW_{AC} vs. 16 GW_{AC}, although the gap is narrowing.

California's USS growth accelerated in 2022 to 2.1 GW_{AC}—its greatest deployment since 2016. **Florida** (1.1 GW_{AC}), **Virginia** (0.6 GW_{AC}), and **Georgia** (0.5 GW_{AC}) continued to lead solar growth in the Southeast in 2022.

You can explore this data interactively at https://emp.lbl.gov/capacity-and-generation-state

Half of 2023-to-date solar capacity is in Energy Communities



The Inflation Reduction Act offers a tax credit adder (10% for PTC and 10 percentage points for ITC) for solar projects located in "Energy Communities," starting in 2023.

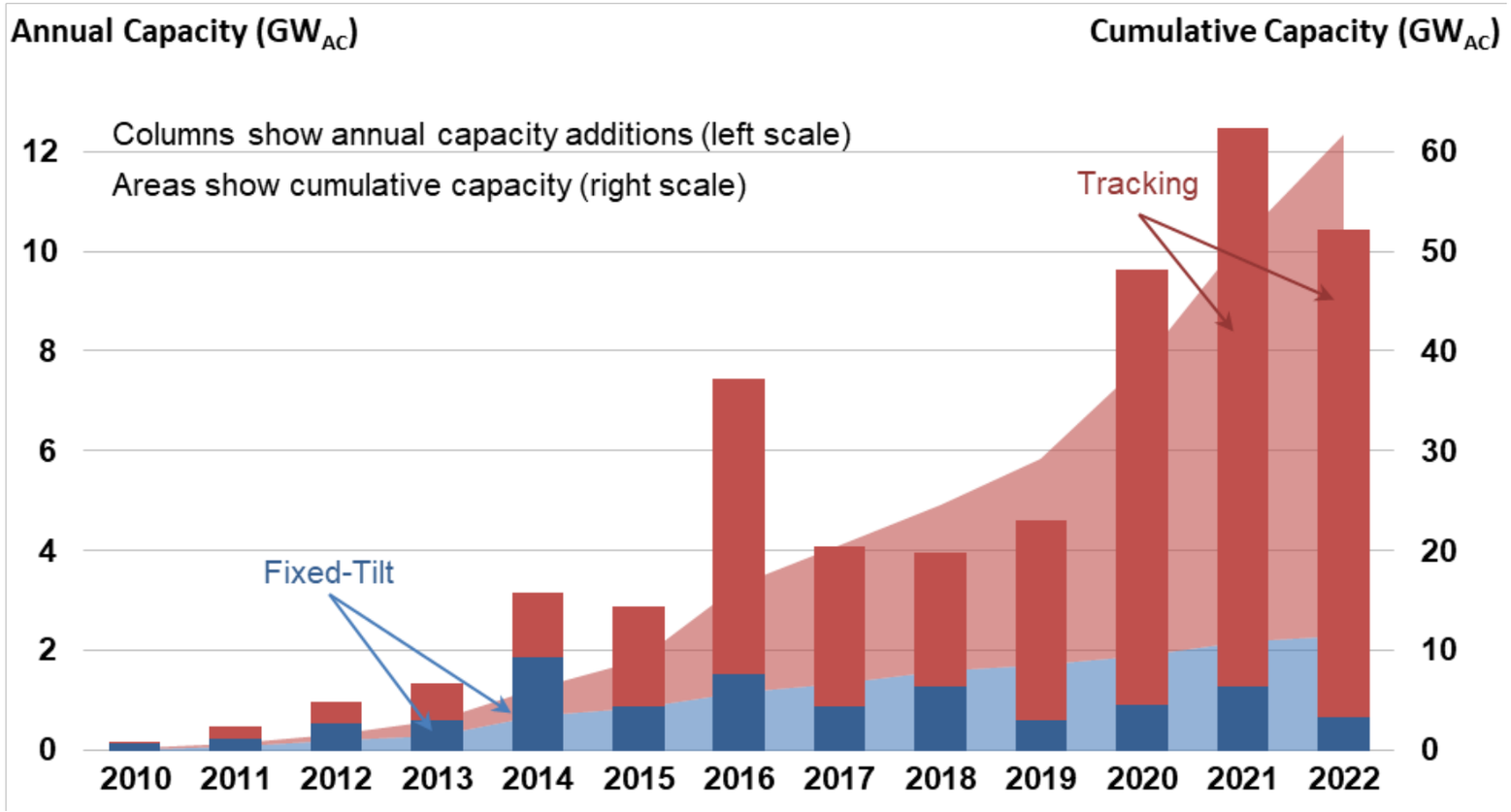
While relatively few projects were built in such communities a decade ago (e.g., 26% of capacity in 2013 and 2014), the share has trended upwards over the past five years.

Even though 2023 projects are unlikely to have been intentionally sited in such communities in order to capture the bonus credit (given that the interconnection process takes several years), more than half of the solar capacity built through July 2023 should qualify for the Energy Community tax credit adder.

Note: These data do not yet include solar projects built at brownfield sites as being part of an Energy Community and thus eligible for the added incentives.

Projects with tracking technology dominated 2021 additions

PV project population: 1,275 projects totaling 61.7 GW_{AC}

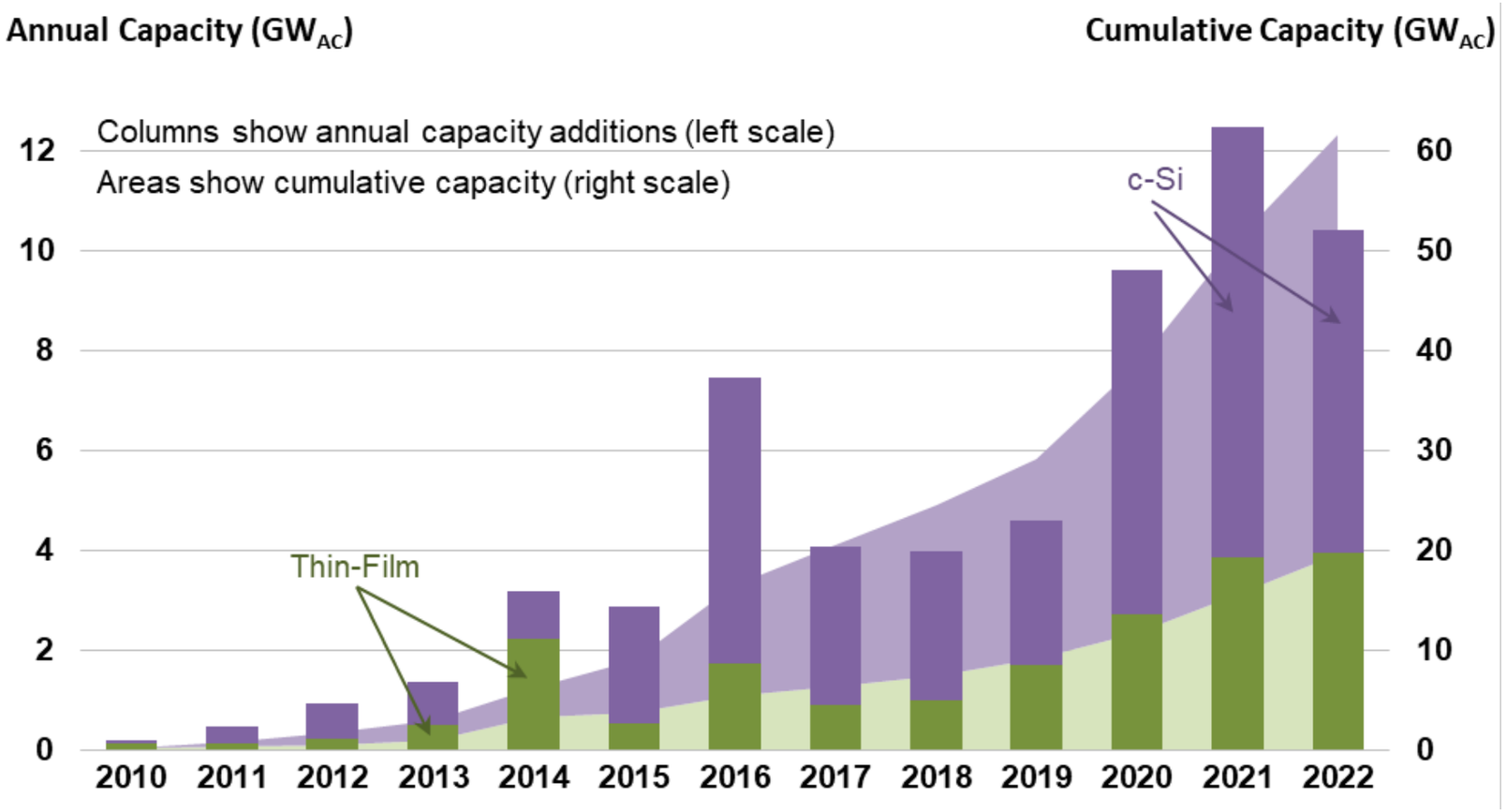


Projects using single-axis **tracking** have consistently exceeded **fixed-tilt** installations since 2015, and dominated again in 2022, with 94% of all new capacity using tracking- the greatest ever.

Upfront cost premiums for trackers have generally fallen over the years, resulting in favorable economics in most of the United States thanks to increased generation (though 2022 saw again an uptick in cost premiums—discussed later).

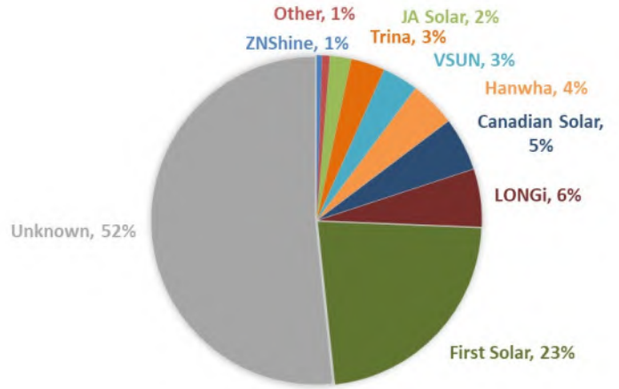
Thin-film modules became more popular in 2022, but c-Si modules still dominate

PV project population: 1,271 projects totaling 61.7 GW_{AC}



c-Si modules continued their clear lead (62% of newly installed capacity) relative to **thin-film** modules, though the latter have steadily become more popular since 2018 as they were not subject to Section 201 import tariffs.

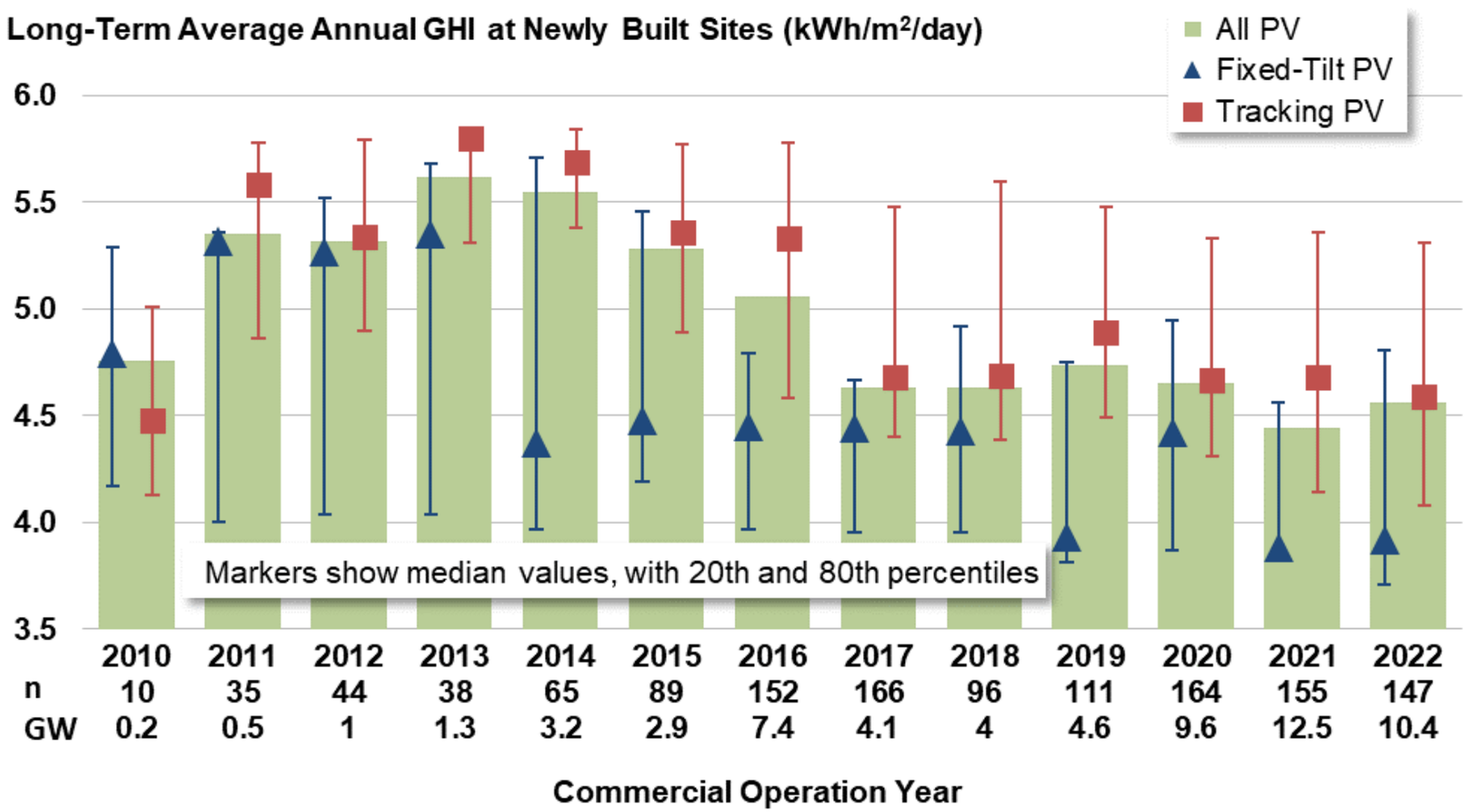
LONGi had the highest market share among known c-Si modules in our sample, followed by Canadian Solar and Hanwha. All thin-film modules in our 2022 sample were made by First Solar.



You can explore this data interactively at https://emp.lbl.gov/technology-trends

The median global horizontal irradiance (GHI) at utility-scale solar sites has trended sideways since 2017, after falling from 2013's peak

PV project population: 1,277 projects totaling 61.7 GW_{AC}



The decline in the average long-term global horizontal irradiance (**GHI**) at newly built sites from 2013 through 2017 represents the market expanding to less-sunny states. This metric rebounded slightly to 4.56 $kWh/m^2/day$ in 2022.

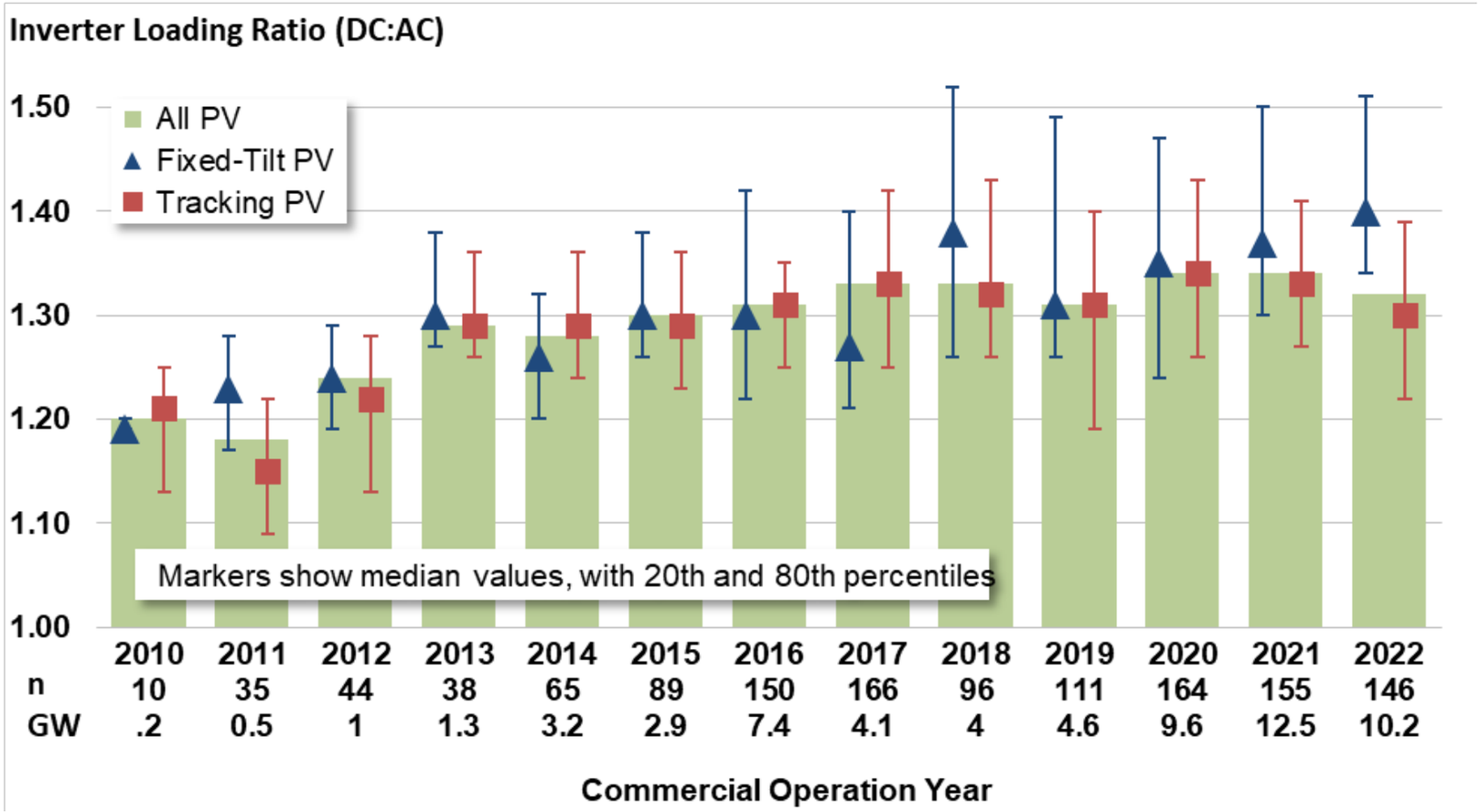
Fixed-tilt PV is increasingly relegated to lower-insolation sites, while tracking PV is increasingly pushing into those same areas (note the decline in its **20th percentile**).

Exceptions are fixed-tilt installations in windy regions (Florida), on brownfields and landfill sites, and on particularly challenging terrain. About 25% of these projects now choose a south-western orientation to maximize evening production.

All else equal, the buildout of lower-GHI sites dampens sample-wide capacity factors (reported later).

The median inverter loading ratio (ILR) has decreased recently for tracking projects but continues to grow for fixed-tilt projects

PV project population: 1,274 projects totaling 61.5 GW_{AC}



As module prices have fallen (faster than inverter prices), developers have oversized the DC array capacity relative to the AC inverter capacity to enhance revenue and reduce output variability.

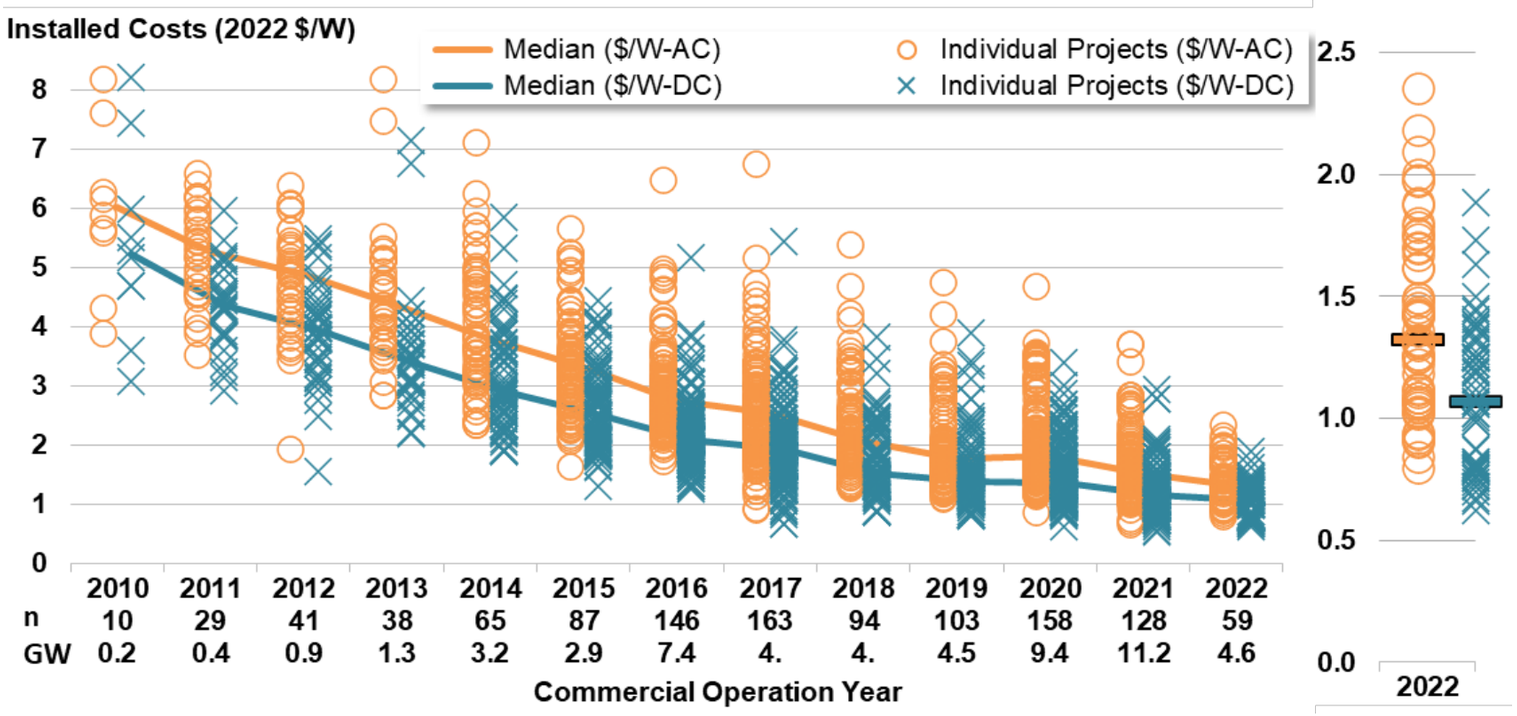
In 2022, the median inverter loading ratio (**ILR** or DC:AC ratio) was 1.32, and was higher for fixed-tilt installations (1.40) than for tracking projects (1.30).

All else equal, a higher ILR should boost capacity factors (reported later).

Capital Costs (CapEx) and O&M Costs

Median installed costs of PV have fallen by 78% (or 10% annually) since 2010, to $1.32/$W_{AC}$ ($1.07/$W_{DC}$) in 2022

Sample: 1,126 projects totaling 54.2 GW_{AC}



Despite inflationary pressures, utility-scale solar costs continued to decrease from $1.5/$W_{AC}$ in 2021 to $1.3/$W_{AC}$ in 2022.

The lowest 20th percentile of project costs fell in real terms from $1.2/$W_{AC}$ ($0.9/$W_{DC}$) in 2021 to $1.1/$W_{AC}$ ($0.8/$W_{DC}$) in 2022.

The lowest-cost projects among the 59 data points in 2022 are now around $0.9/$W_{AC}$.

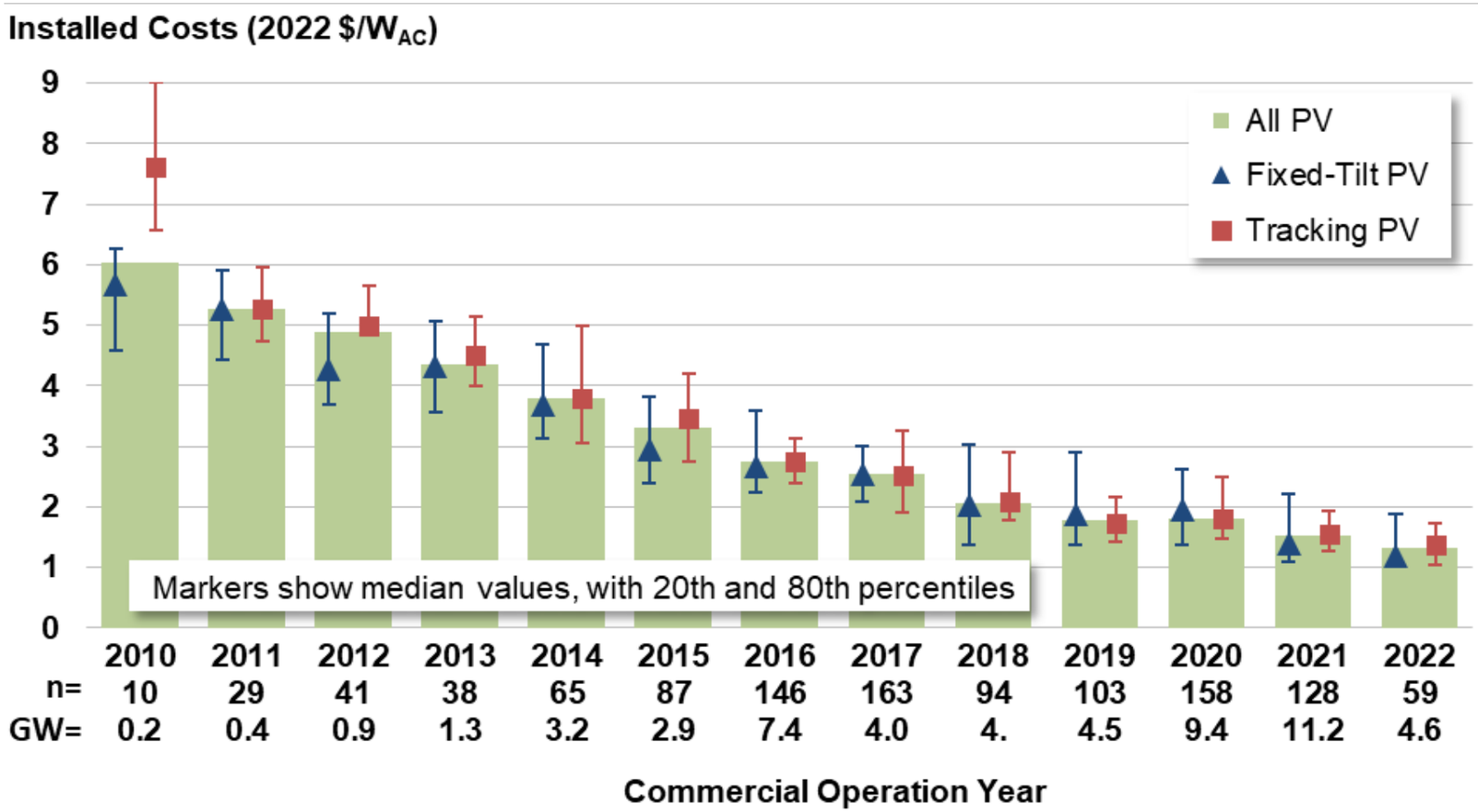
Historical sample is robust (covering 97% of installed capacity through 2021). 2022 data covers 40% of new projects or 44% of new capacity.

This sample is backward-looking and does not reflect the costs of projects built in 2023/2024.

Note on solar costs and inflation: We adjust costs to account for general inflation using BEA's implicit price deflators. As a result, costs for past years are 7% higher when expressed in $2022 compared to last year's report. Conversely, decreasing solar costs in real terms indicate that solar projects find at least some savings relative to the wider economy, even if prices may rise in nominal terms. Compared to the previous year, $/$W_{AC}$ costs fell both in real (-13%) and nominal (-8%) terms in 2022 in our sample. $/$W_{DC}$ costs decreased by 8% in real and 6% in nominal terms.

The cost premium for tracking projects relative to fixed-tilt has diminished over time

Sample: 1,126 projects totaling 54.2 GW_{AC}



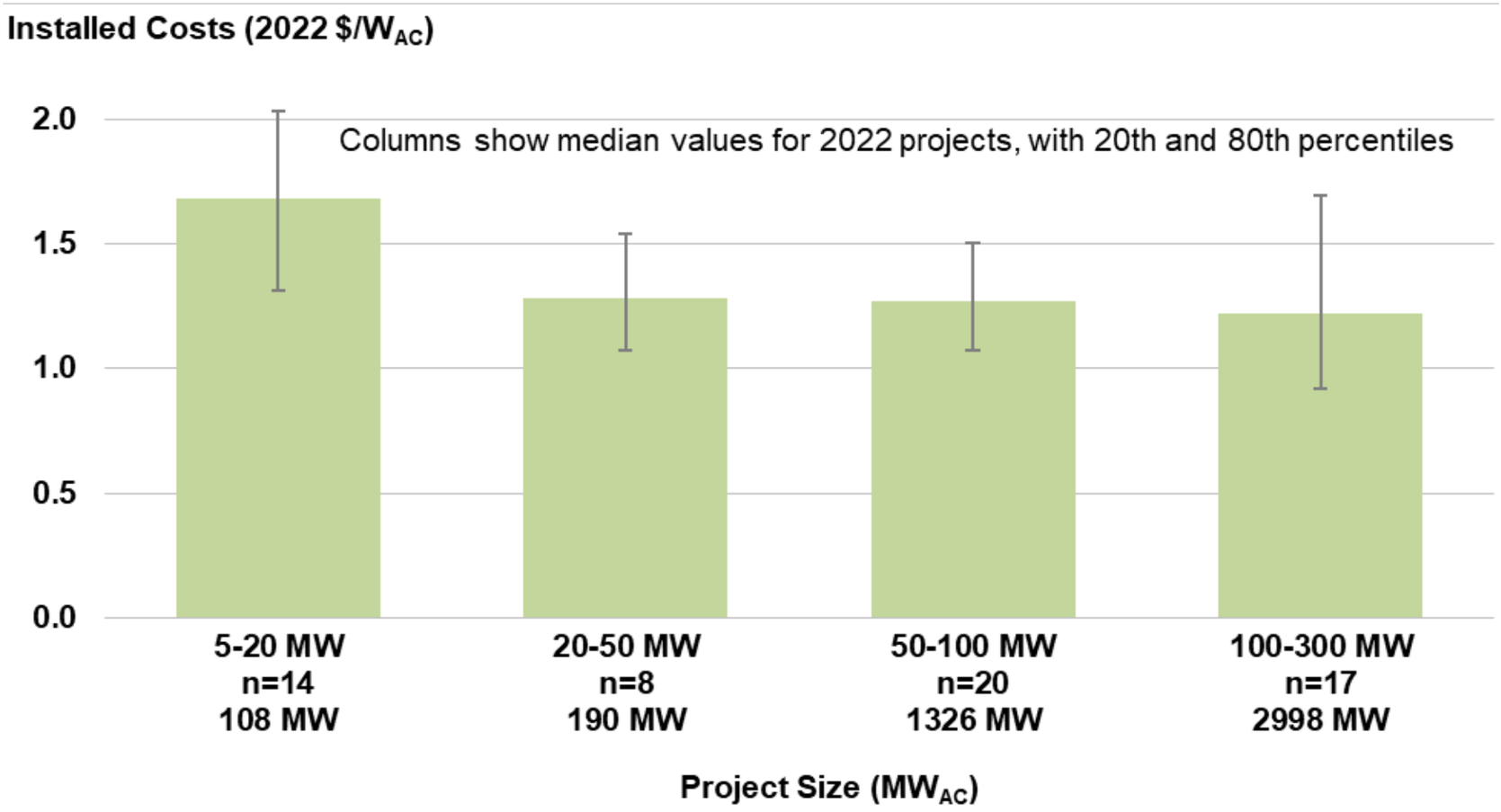
Through 2018, tracking projects in our sample were, on average, regularly more expensive (though by varying amounts) than fixed-tilt projects. In 2020, tracking projects ($1.8/$W_{AC}$ or $1.4/$W_{DC}$) appeared to be cheaper than fixed-tilt projects ($2.0/$W_{AC}$ or $1.5/$W_{DC}$).

This apparent reversal may be driven by challenging construction environments for fixed-tilt projects (e.g., high wind loads, sensitive brown-field sites) as well as sampling issues. However, for any ***individual*** project, using trackers presumably has a higher CapEx than mounting at a fixed-tilt.

In our 2022 sample, trackers ($1.4/$W_{AC}$ or $1.1/$W_{DC}$) once again exhibit a premium over fixed-tilt plants ($1.2/$W_{AC}$ or $0.9/$W_{DC}$). Trackers can sustain some amount of higher upfront costs because they deliver more kWh per kW.

Larger utility-scale solar projects cost 26% less than smaller projects (5-20 MW) per MW of installed capacity in 2022

Sample in 2022: 59 projects totaling 4.6 GW_{AC}



Differences in project size could potentially explain cost variation—we focus only on 2022 for this slide.

Cost savings seem to occur especially in projects larger than 20 MW_{AC} at ~$1.25/$W_{AC}$ vs. $1.68/$W_{AC}$ for smaller projects.

In $/$W_{DC}$ terms, prices seem to decline especially among the largest projects:

- $1.26/$W_{DC}$ for 5-20MW
- $1.02/$W_{DC}$ for 20-50MW
- $1.20/$W_{DC}$ for 50-100MW
- $0.82/$W_{DC}$ for 100-400MW

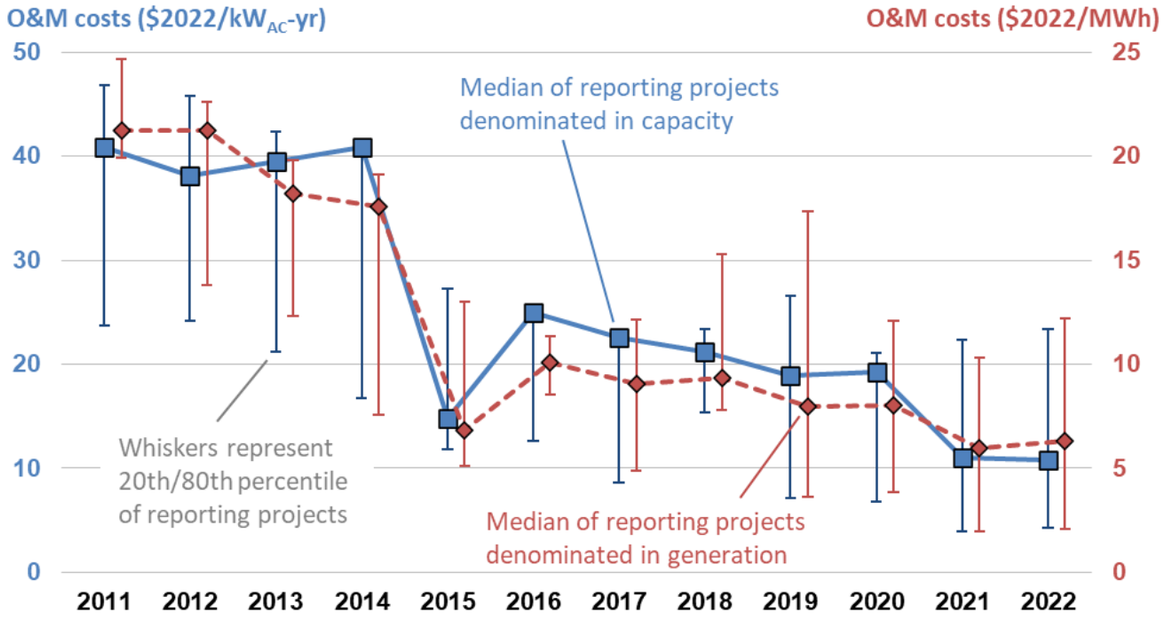
Operation and maintenance (O&M) costs decreased by 74% since 2011 as project portfolios grow and projects become established

PV project population: 122 projects totaling 6.4 GW_{AC}

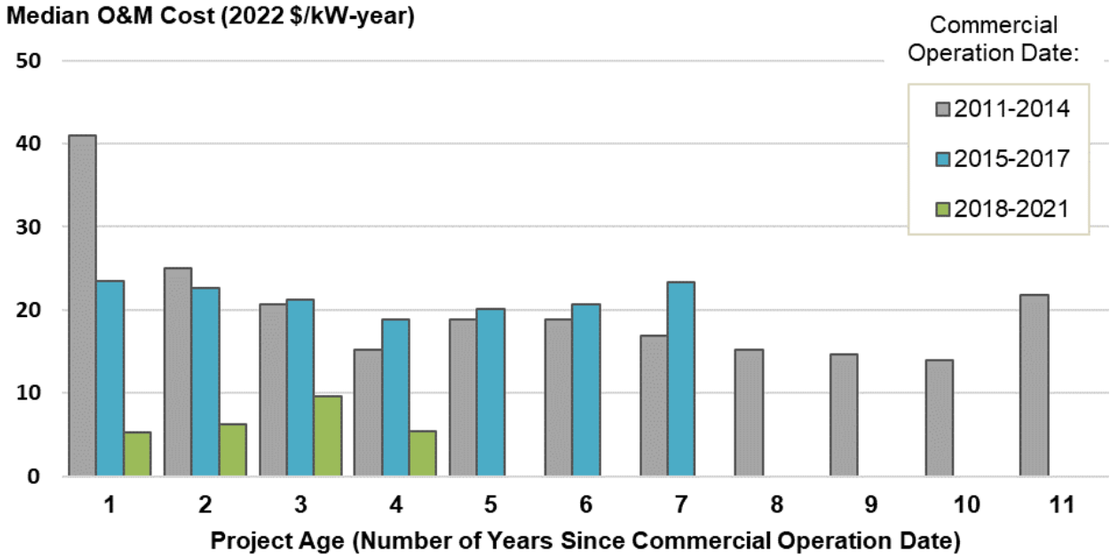
Regulated utilities report solar O&M costs for plants that they own, representing a mix of technologies and at least one full operational year.

These O&M costs are only one part of total operating expenses:

Cost Scope (per guidelines for FERC Form 1):
- **Includes** supervision and engineering, maintenance, rents, and training
- **Excludes** payments for property taxes, insurance, land royalties, performance bonds, various administrative and other fees, and overhead



Median O&M costs for the cumulative sample have declined from about \$41/kW_{AC}-year or \$21/MWh in 2011 to about **\$11/kW_{AC}-year or \$6/MWh in 2022**.

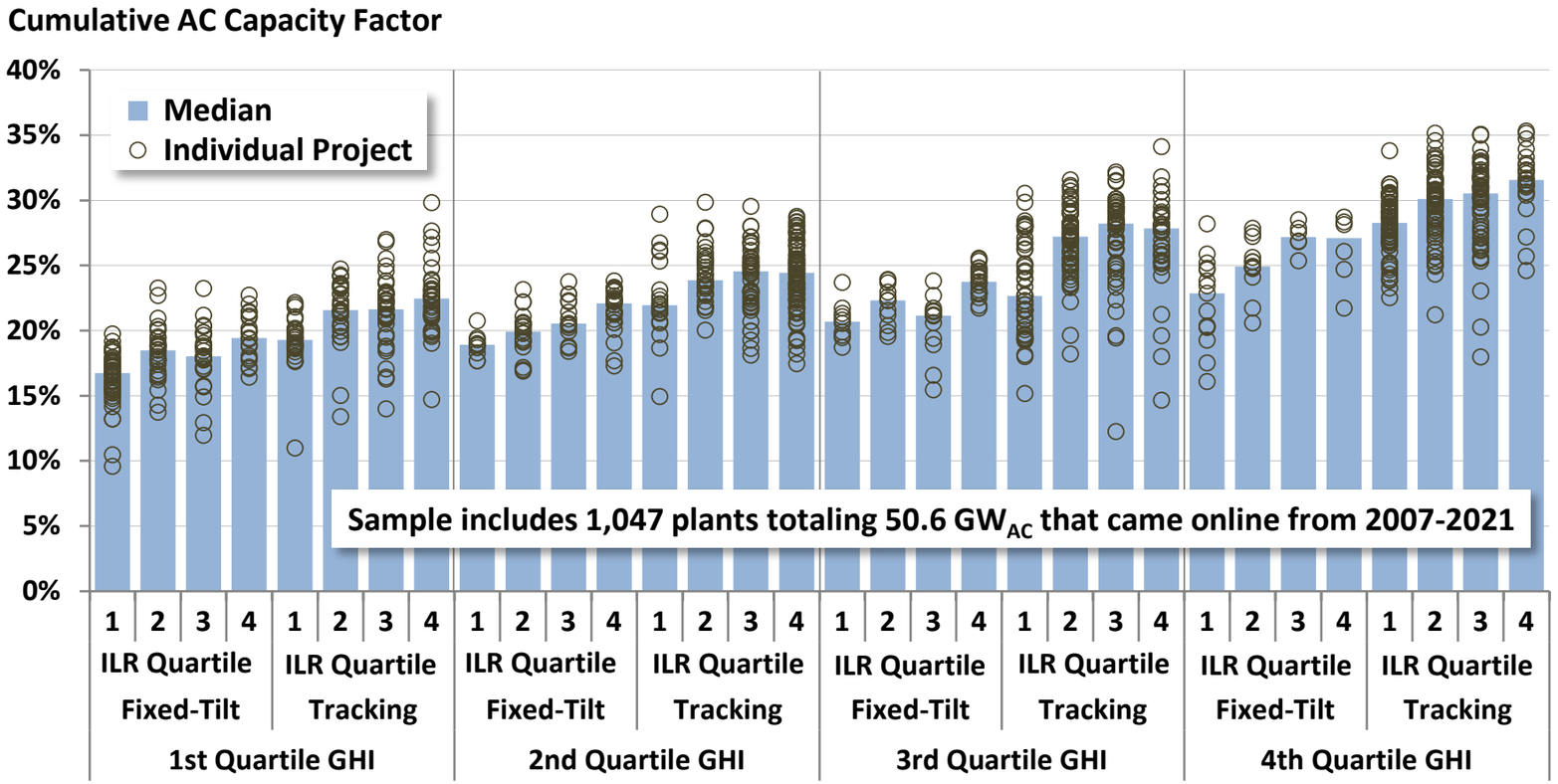


Projects built since 2018 report much lower O&M costs compared to older ones, potentially due to a narrower service scope of agreements. Costs seem to decline over the first 4 years across project vintages as projects become established. Among a very small sample of projects costs increase after 10 years.

Performance (Capacity Factors)

24% median PV net capacity factor (cumulative, sample-wide), but with large plant-level range from 9%-35%

PV performance sample: 1,047 plants totaling 50.6 GW_{AC}

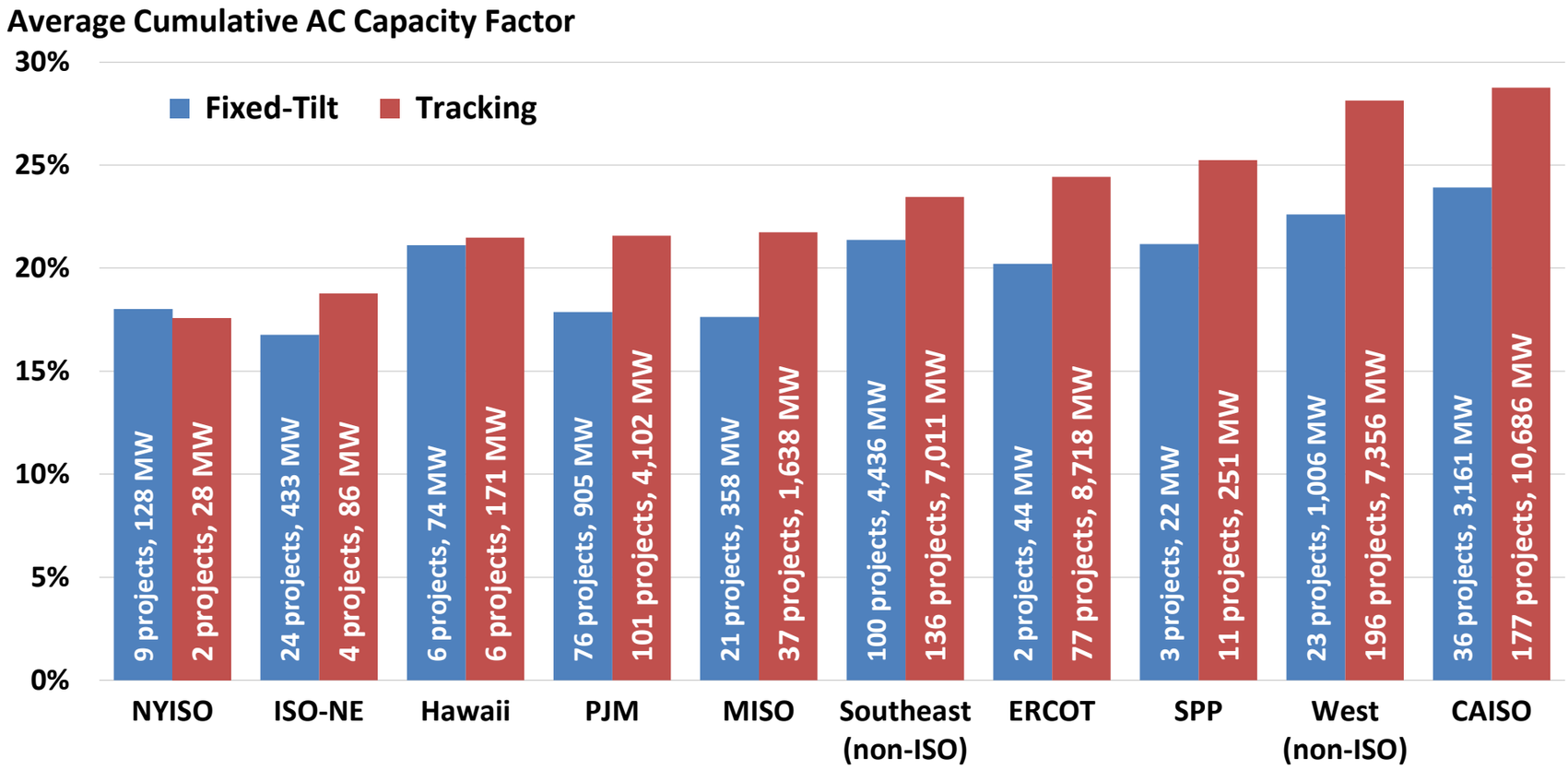


Project-level variation in PV capacity factor driven by:

- **Solar Resource (GHI)**: Strongest solar resource quartile has a ~8 percentage point higher capacity factor than lowest resource quartile
- **Tracking**: Adds ~4 percentage points to capacity factor on average, depending on solar resource quartile
- **Inverter Loading Ratio (ILR)**: Highest ILR quartiles have on average ~3 percentage point higher capacity factors than lowest ILR quartiles

Tracking boosts capacity factors by nearly 5 percentage points in high-insolation regions

Sample: 1,047 plants totaling 50.6 GW_{AC}



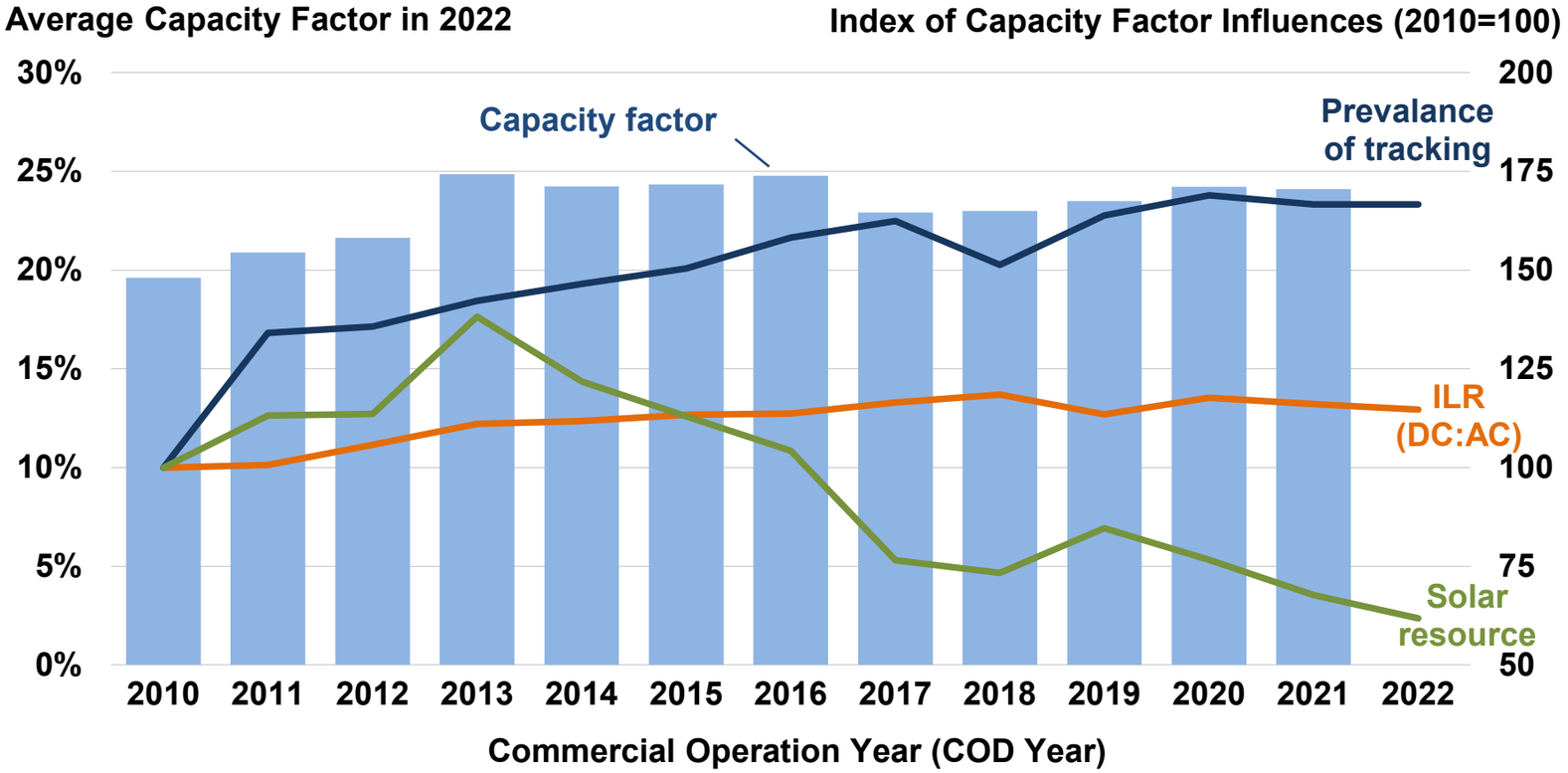
Not surprisingly, capacity factors are highest in California and the non-ISO West, and lowest in the Northeast (ISO-NE and NYISO).

Tracking provides more benefit in high-insolation regions, leading to a greater proportion of tracking projects in those regions.

Note: The regions are defined in the earlier slides with a map of the United States

You can explore this data interactively at https://emp.lbl.gov/pv-capacity-factors

Since 2013, competing drivers have caused average capacity factors by plant vintage to stagnate



The columns represent the capacity factor (left axis), the lines show changes in major drivers (right axis)

Recent flat trend is not necessarily negative, but rather a sign of a market that is expanding geographically into less-sunny regions

Average capacity factors increased from 2010- to 2013-vintage projects, due to a sample-wide increase in:

- ILR (from 1.17 to 1.28)
- tracking (from 14% to 57% of projects)
- average site-level GHI (from 4.97 to 5.35 kWh/m^2/day)

Since 2013, however, opposing forces have resulted in capacity factor stagnation (on average):

- ILR has increased (from 1.28 to 1.35)
- tracking has increased (from 57% to >80% of plants)
- average site-level GHI has declined (from 5.35 to 4.65 kWh/m^2/day) as the market has expanded to less-sunny parts of the country

You can explore this data interactively at https://emp.lbl.gov/pv-capacity-factors

Levelized Cost of Energy (LCOE) and Power Purchase Agreement (PPA) Prices

LCOE and PPA price analysis: data sets and methodology

Project-level LCOE is based on empirical CapEx and capacity factor data presented earlier, as well as:

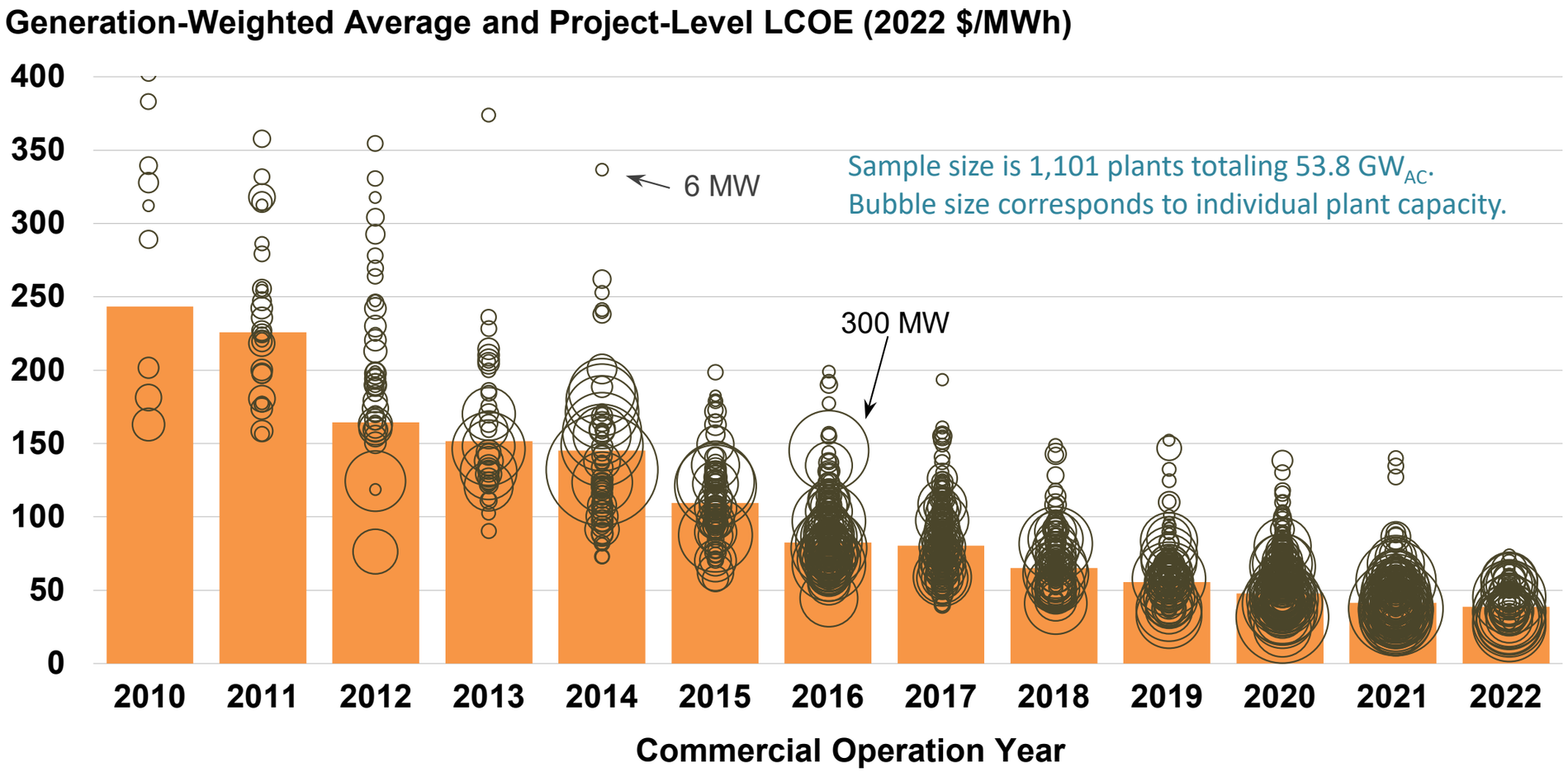
- OpEx and project life that change with vintage: OpEx declines from \$40/kW$_{DC}$-yr in 2007 to \$14/kW$_{DC}$-yr in 2022 (levelized, in 2022\$); project life increases from 21.5 years in 2007 to 35 years in 2021 and thereafter (both based on prior LBNL research)
- Weighted average cost of capital (WACC) based on a constant 70%/30% debt/equity ratio and time-varying market rates
- Combined income tax rate of 38% pre-2018 and 25% post-2017; 5-yr MACRS; inflation expectations ranging from 1.9%-2.6%

PPA prices are from utility-scale solar plants built since 2007 or planned for future installation, and include:

- 422 PV-only contracts totaling 30.6 GW$_{AC}$
- 81 PV+battery contracts totaling 9.9 GW$_{AC}$ of PV capacity and 5.5 GW$_{AC}$ / 21.8 GWh of battery capacity (presented in a later section)
- 5 concentrating solar thermal power (CSP) contracts totaling 1.2 GW$_{AC}$ (presented in a later section)

- PPA prices reflect the bundled price of electricity and RECs as sold by the project owner under the PPA
  - Dataset excludes merchant plants, projects that sell renewable energy certificates (RECs) separately, and most direct retail sales
  - Prices reflect receipt of state and federal incentives (e.g., the ITC), and as a result do not reflect solar generation *costs*
- We also present LevelTen Energy data on PPA offers; these are often for shorter contract durations and targeted at corporate offtakers

LCOE has fallen by 84% (or 14% annually) since 2010, to $39/MWh (without the ITC)

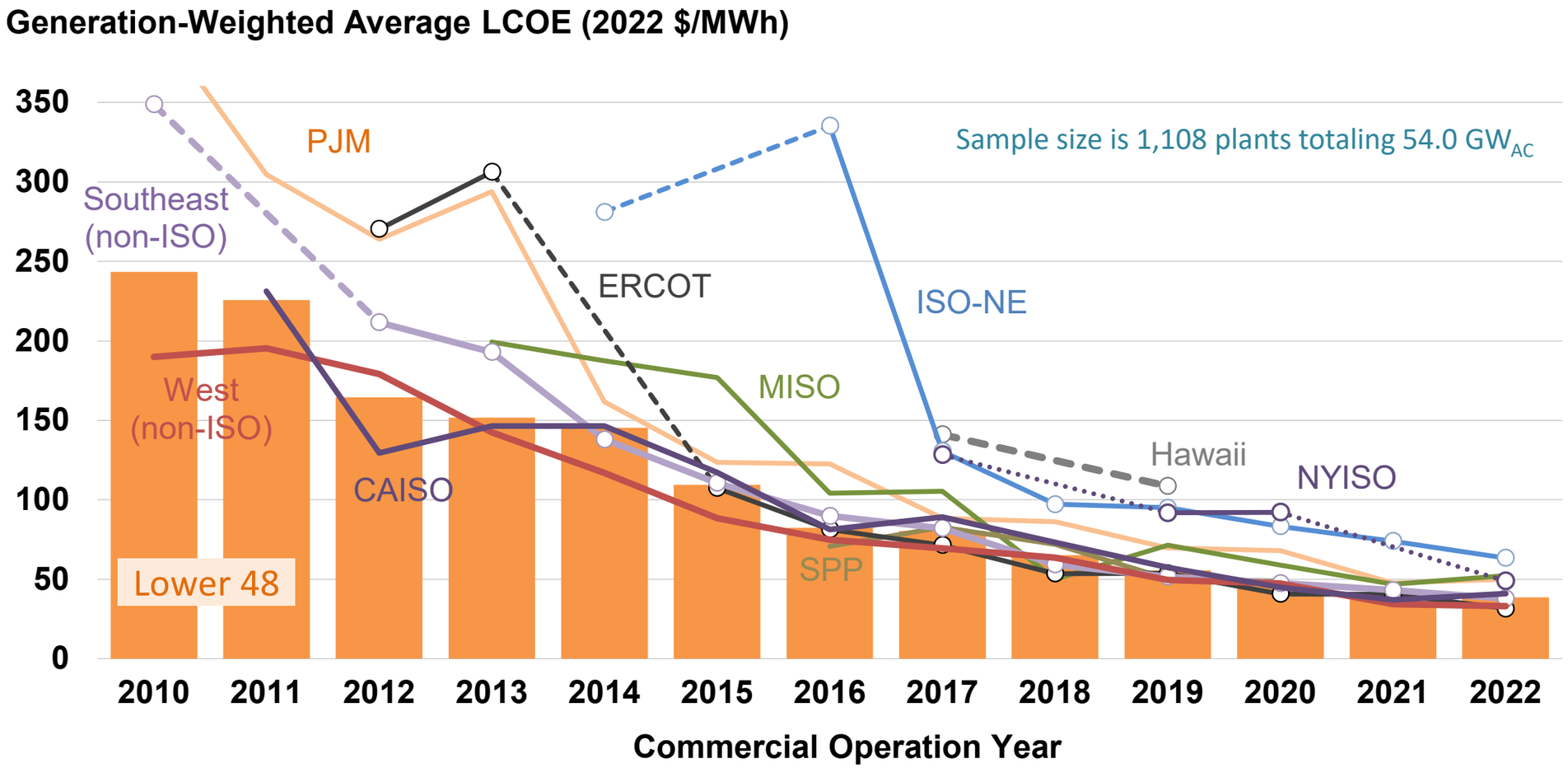


Driven by lower capital costs costs and, at least through 2013, higher capacity factors (as well as lower operating expenses, longer design life, and improved financing terms), utility-scale PV's average LCOE has fallen by about 84% since 2010, to $39/MWh in 2022 (not including the ITC)—down slightly from $41/MWh in 2021.

The standard deviation of project-level LCOEs has declined sharply among recent vintages (though the coefficient of variation has been more stable).

See interactive visualization at https://emp.lbl.gov/capex-lcoe-and-ppa-prices-region

Utility-Scale PV's LCOE has been slowly converging across regions



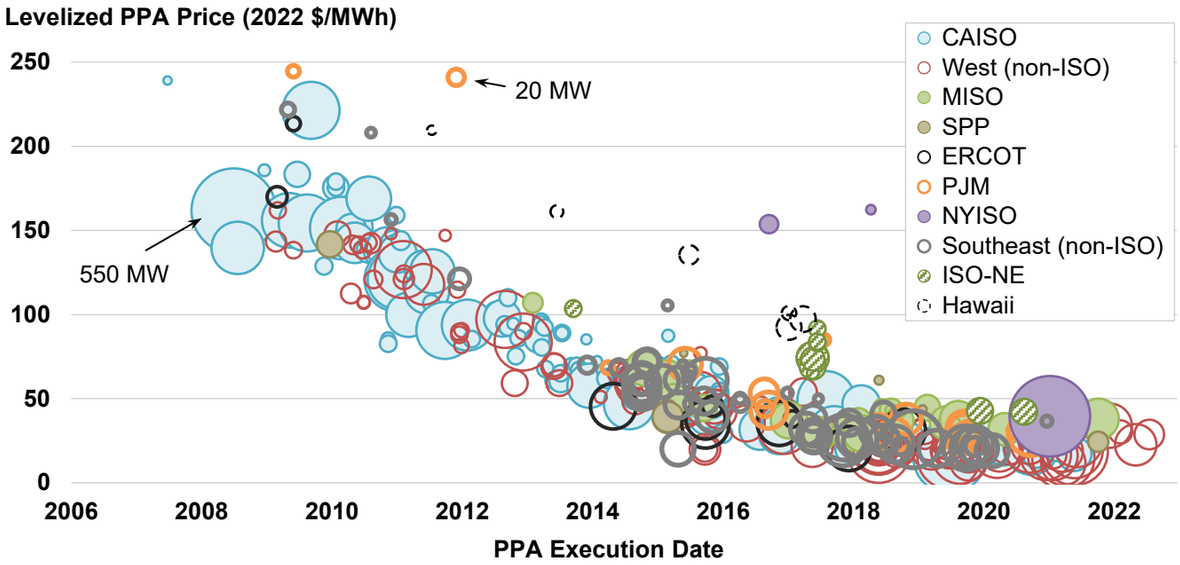
Lower-insolation regions (ISO-NE, NYISO, PJM, MISO) will always have higher LCOEs than higher-insolation regions (ERCOT, CAISO, the non-ISO West and Southeast), but the difference has narrowed over time.

Dashed segments of lines indicate no data (i.e., <2 projects) for that particular region-year combination.

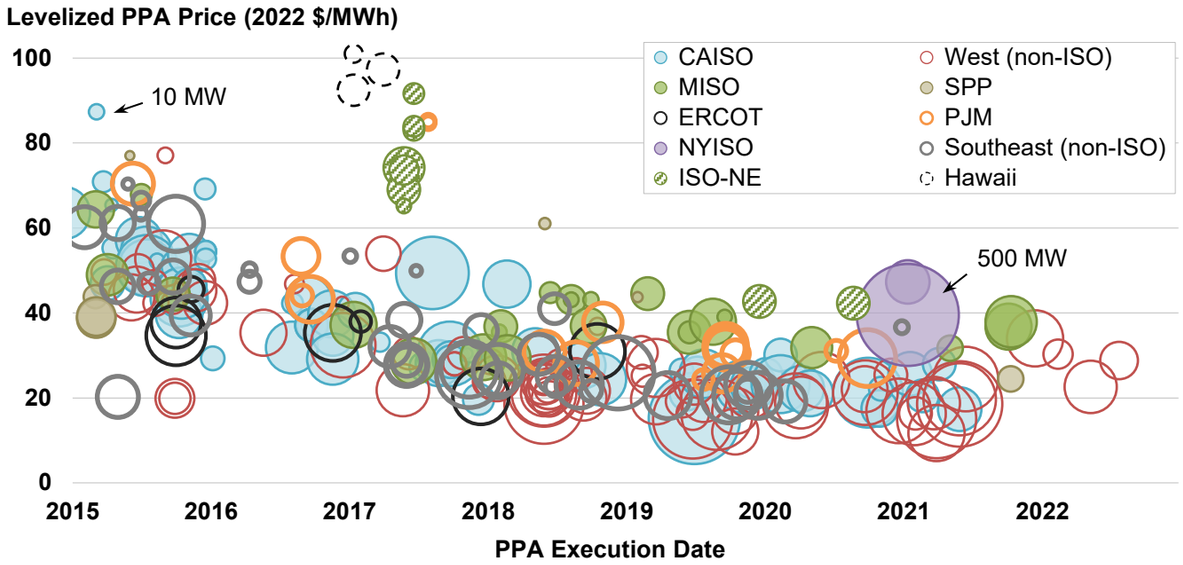
See interactive visualization at https://emp.lbl.gov/capex-lcoe-and-ppa-prices-region

Levelized PPA prices have followed LCOE lower in all regions, but have stagnated since 2019

Full sample: 422 PPAs, 30.6 GW_{AC}

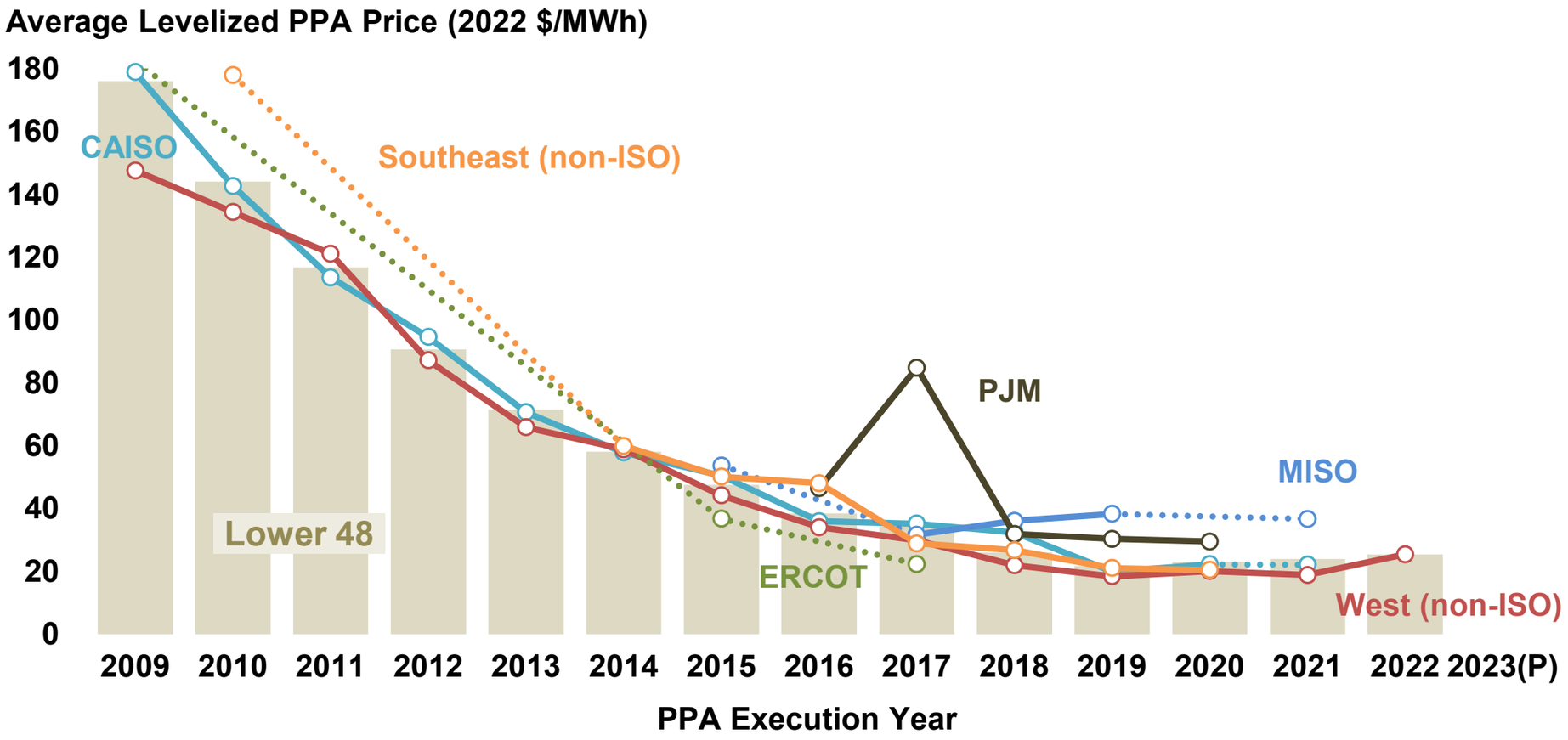


Post-2014 sample: 263 PPAs, 21.1 GW_{AC}



- Power Purchase Agreement (PPA) prices are levelized over the full term of each contract, after accounting for any escalation rates and/or time-of-delivery factors, and are shown in real 2022 dollars
- Aided by the 30% ITC, most recent PPAs in our sample are priced around $20-$30/MWh for projects in CAISO and the non-ISO West, and $30-$40/MWh for projects elsewhere in the continental United States
- Hawaiian PPAs are often higher-priced (and most include battery storage, and so are not shown here—see later section)
- >95% of the sample is currently operational

Average PPA prices in the Lower 48 fell by ~88% (or ~19%/year) from 2009-2019, but have been stagnant (or slightly higher) ever since



This graph focuses on national and regional average PPA prices, rather than project-level (as in the prior slide).

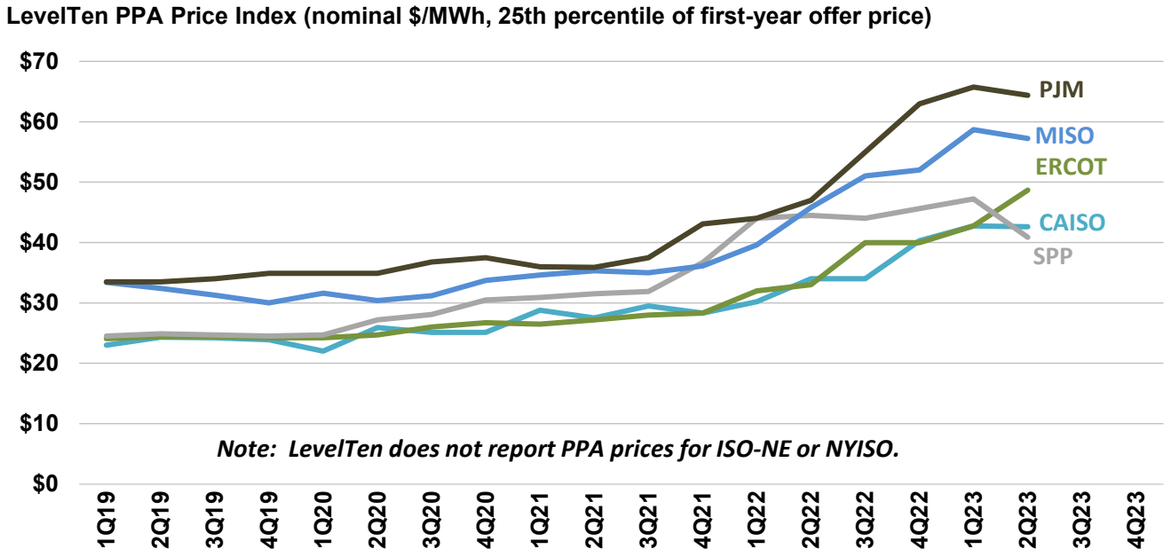
The national average was $25/MWh in 2022 (based on a small sample), up slightly from 2019's low of $22/MWh.

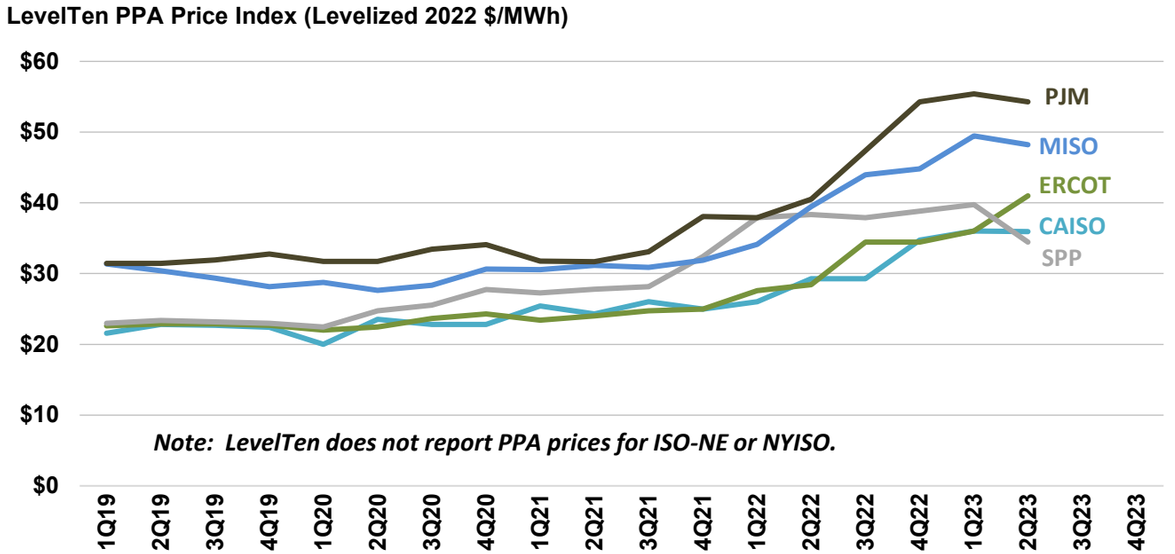
Year-Region combinations with fewer than 2 PPAs are excluded from the graph (dashed line segments indicate that the line is skipping over such years).

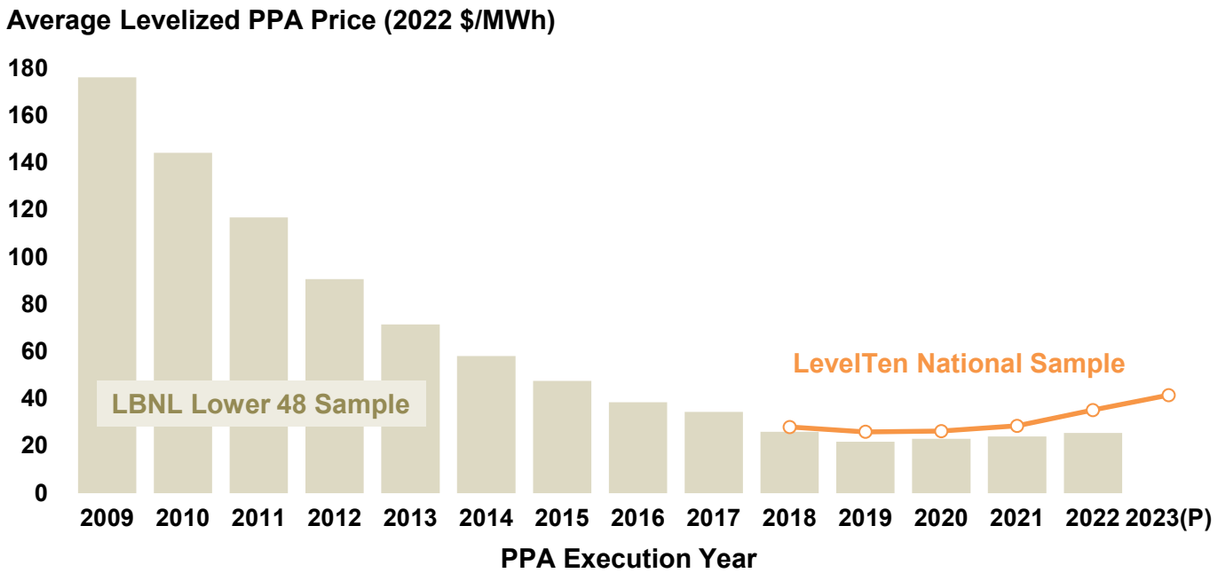
The graph reflects PV-only pricing, not PV+battery (PV+battery PPA prices are presented separately, in a later section).

You can explore this data interactively at https://emp.lbl.gov/pv-ppa-prices

Converted to real dollar terms, LevelTen Energy's utility-scale PV PPA price indices match trends seen in the LBNL sample





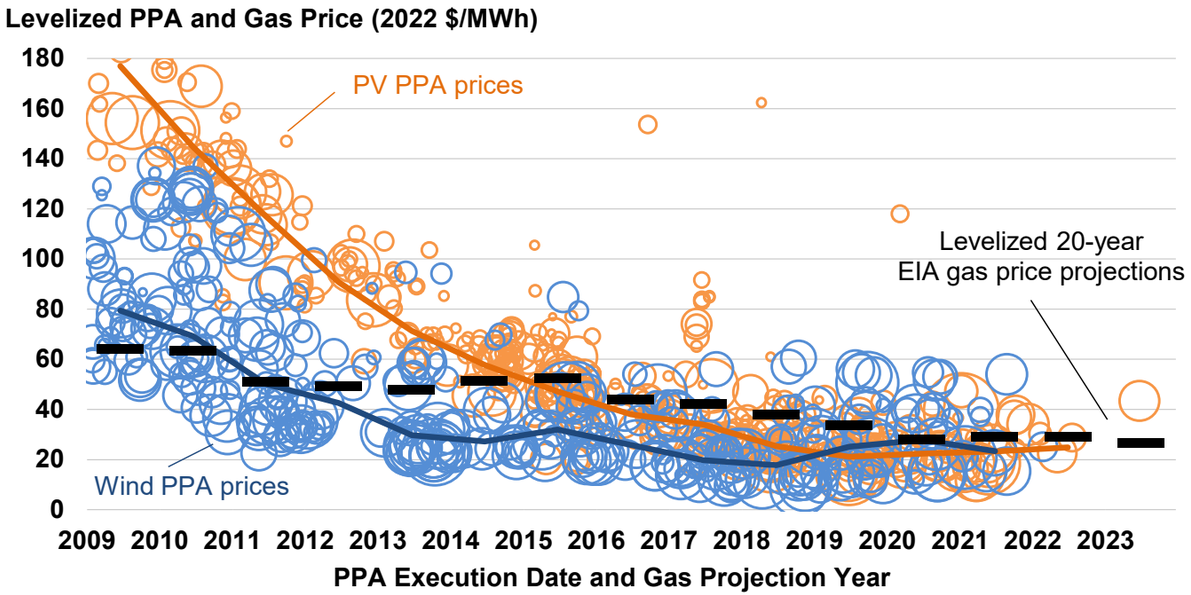


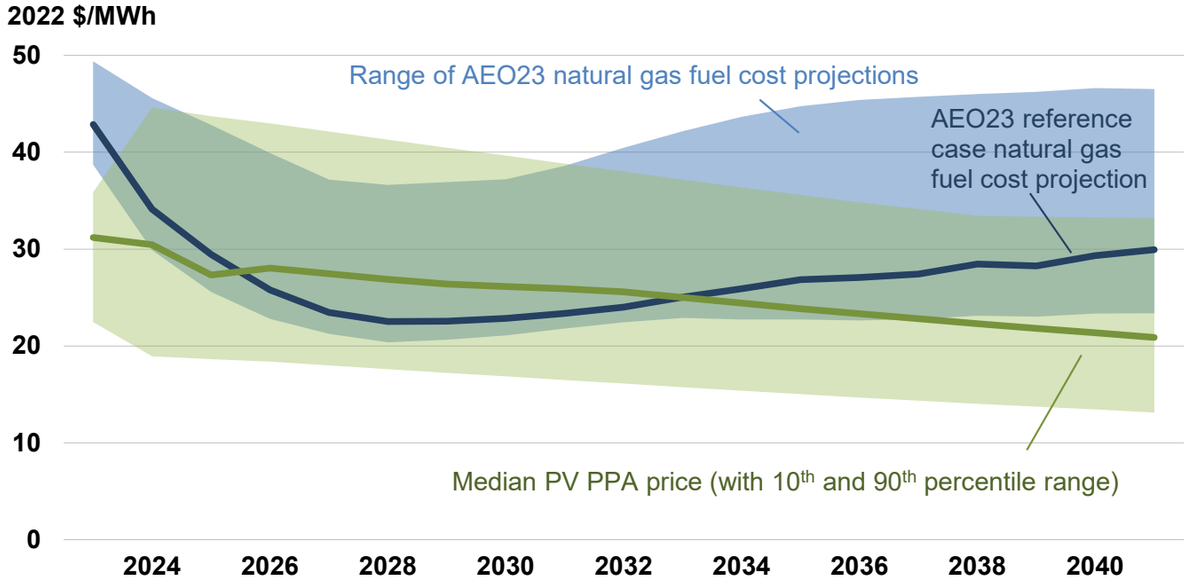
To augment our PPA price sample, and to gain visibility into corporate PPA pricing (which is not well-represented within our sample), we present LevelTen Energy's PPA Price Index.

LevelTen reports the 25th percentile of first-year offer prices in nominal dollar terms (upper left graph); in the upper right graph, we have converted the data to levelized real dollar terms (see the data workbook for notes on conversion methodology).

The bottom left graph shows consistency in national time trends between the two data sets, with the LevelTen data foreshadowing continued price increases in 2023.

Solar PPA prices are now often competitive with wind PPA prices, as well as the cost of burning fuel in *existing* gas-fired generators

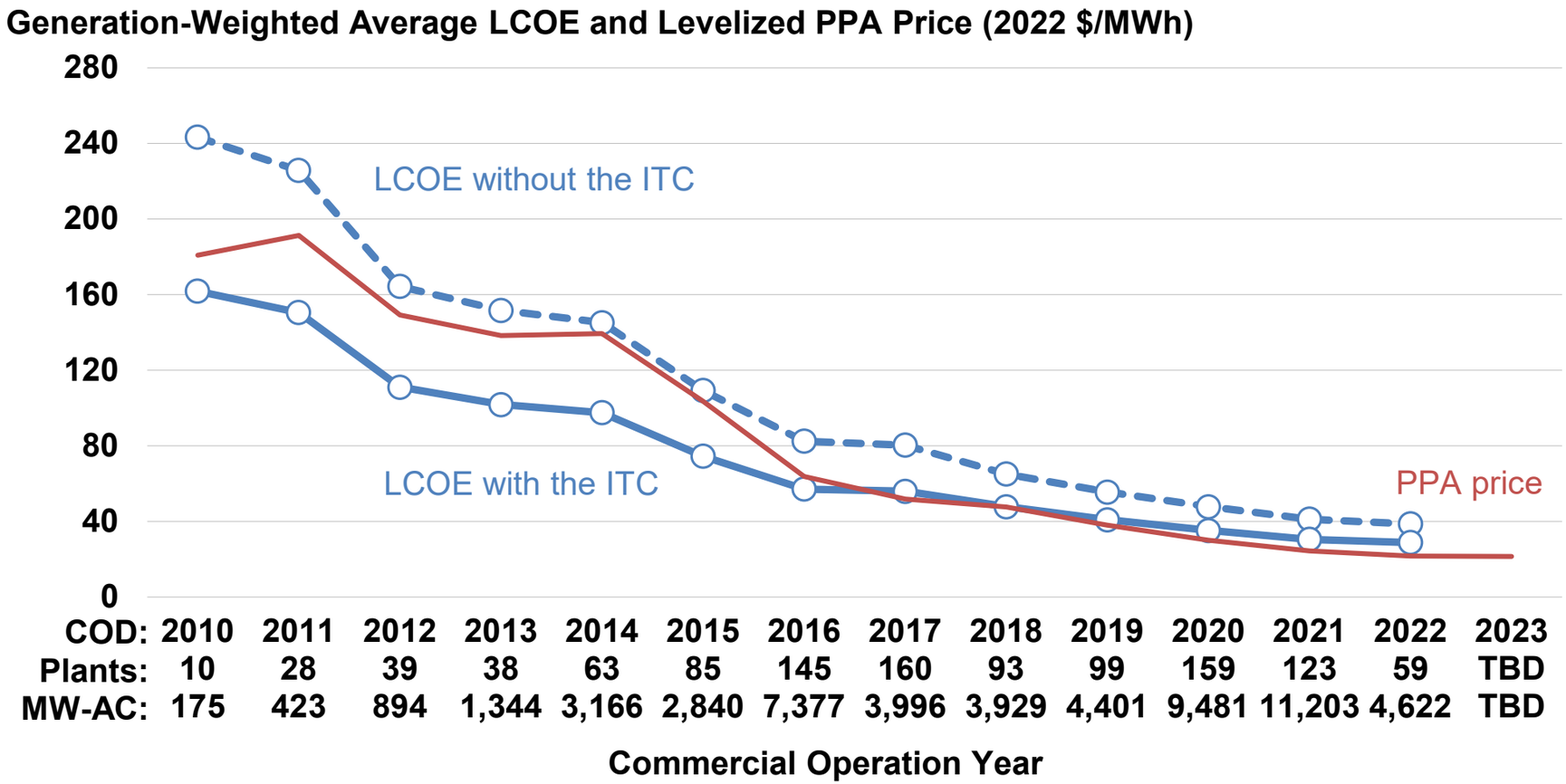




- The left graph shows that solar PPA prices have largely closed the gap with wind, and both are competitive with levelized gas price projections.
- The right graph compares recent solar PPA prices (extending out over their contract terms through 2040) to the range of gas price projections from the EIA's Annual Energy Outlook 2023 (AEO 2023). The median price from solar PPAs signed post-2020 is competitive with the projected AEO 2023 reference case cost of burning fuel in an ***existing*** combined-cycle natural gas unit (NGCC). The widening gap over the longer term suggests how PV can help protect against fuel price risk.
- Note that PV PPAs are priced to recover *both* capital *and* other ongoing operational costs—for an NGCC, this would add another ~$18-$77/MWh (per *Lazard* data) to the projected fuel costs shown in the graphs.

Levelized PPA prices track the LCOE of utility-scale PV

LCOE Sample: 1,101 plants totaling 53.8 GW_{AC}

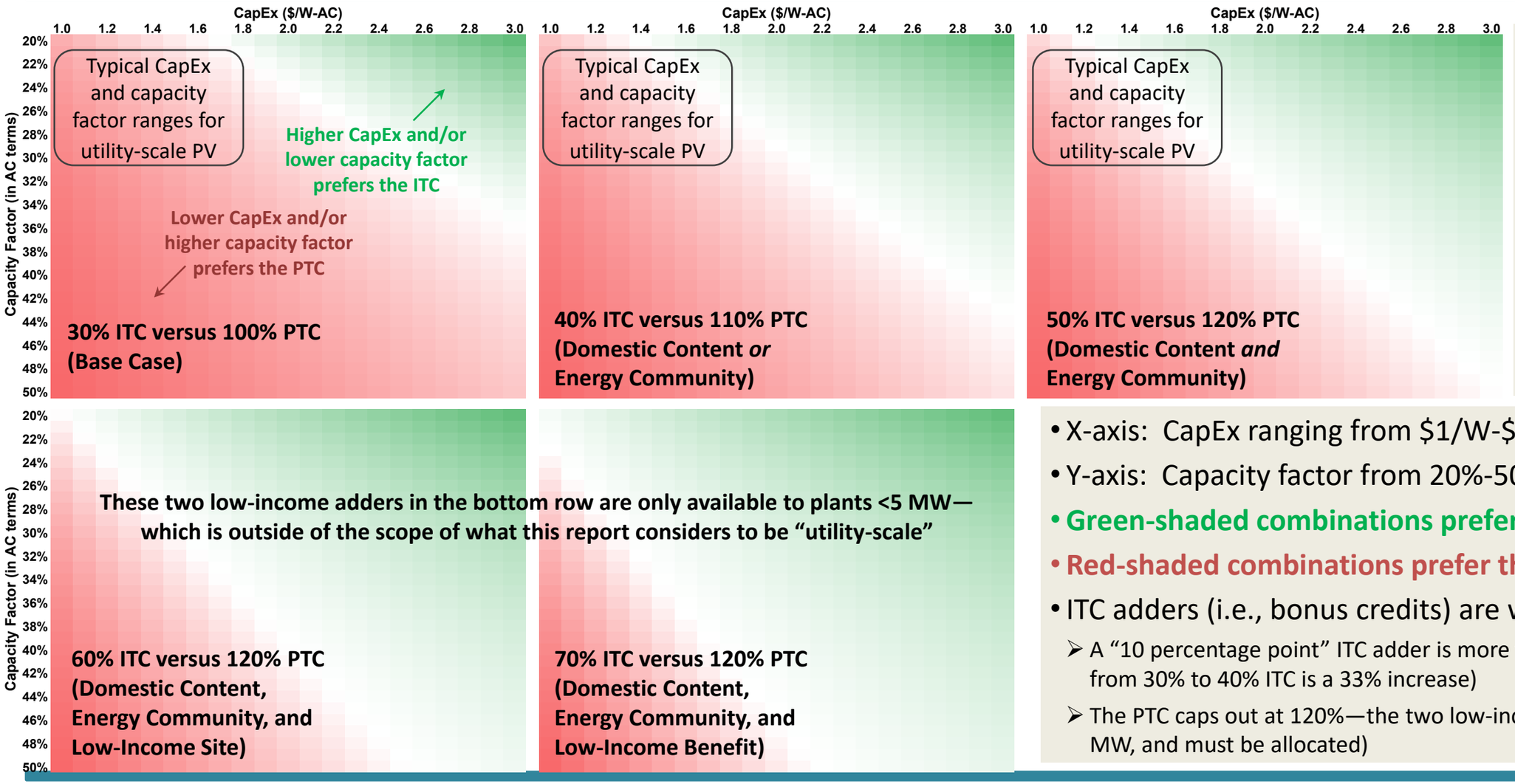


Prior LCOE graphs exclude the ITC, but here we graph LCOE both with and without the ITC, plotted against PPA prices by COD year (rather than by PPA execution date).

Levelized PPA prices fall within the range of the two LCOE curves over time, and since 2016 have closely tracked LCOE with the ITC, suggesting full pass-through of the credit and a competitive PPA market.

Also notable is the declining value of the ITC in $/MWh terms: while the credit has remained constant over time in percentage terms (at 30%), it has shrunk in $/MWh terms along with the CapEx to which it is applied.

Starting in 2023, PPA prices could benefit from solar now having access to the PTC under the Inflation Reducation Act (IRA)



All else equal, many utility-scale PV plants will find the **production tax credit (PTC)** to be more valuable than the **investment tax credit (ITC)**…but the PTC's advantage fades somewhat with the addition of bonus credits.

- X-axis: CapEx ranging from \$1/W-\$3/W_{AC}
- Y-axis: Capacity factor from 20%-50% (in AC terms)
- **Green-shaded combinations prefer the ITC**
- **Red-shaded combinations prefer the PTC**
- ITC adders (i.e., bonus credits) are worth more than PTC adders
  - A "10 percentage point" ITC adder is more than a "10%" PTC adder (moving from 30% to 40% ITC is a 33% increase)
  - The PTC caps out at 120%—the two low-income adders are ITC-only (and <5 MW, and must be allocated)

Wholesale Market Value

Wholesale market value analysis: data sets and methodology

We estimate the wholesale market value for each utility-scale PV project larger than 1 MW (as reported on Form EIA-860). We then aggregate the project-level data as generation-weighted averages for all seven ISOs and ten additional balancing authorities.

We draw from project-level modeled hourly solar generation (using NREL's System Advisor Model and site- and year-specific insolation data from NREL's National Solar Radiation Database and NOAA's High Resolution Rapid Refresh Model) and de-bias the generation by leveraging ISO-reported aggregate solar generation and plant-level reported generation by Form EIA-923.

Energy value is the product of hourly solar generation by plant or county and concurrent wholesale energy prices

- Plant-level debiased hourly solar generation
- Real-time energy price from nearest pricing node
- Focus on annual value of solar from all sectors

$$Energy\ Value = \frac{\sum Postcurtailment\ Generation_h * Wholesale\ RT\ Energy\ Price_h}{\sum Precurtailment\ Generation_h}$$

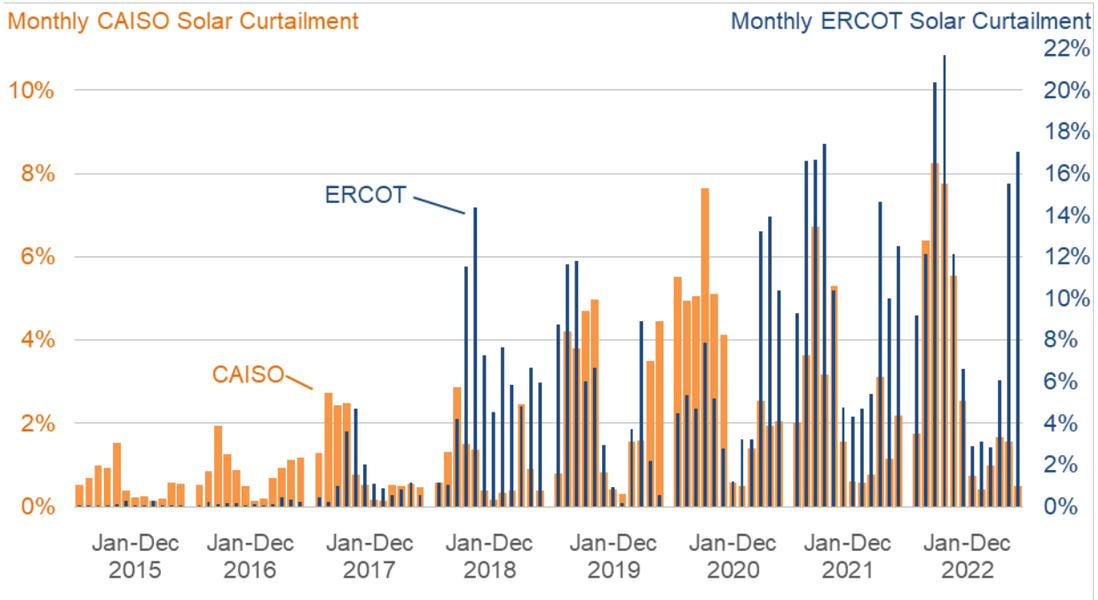
Capacity value is the product of a plant's or county's capacity credit and capacity prices

- Capacity credit based on plant-level profile; varies by month, season, or year
- Capacity prices from respective ISO region; prices vary by month, season, or year
- Estimate bilateral capacity prices for regions without organized capacity markets
- Focus on annual value of solar for projects with a full calendar year of operation
- Calculate capacity value for all solar, even if some solar does not participate in capacity markets

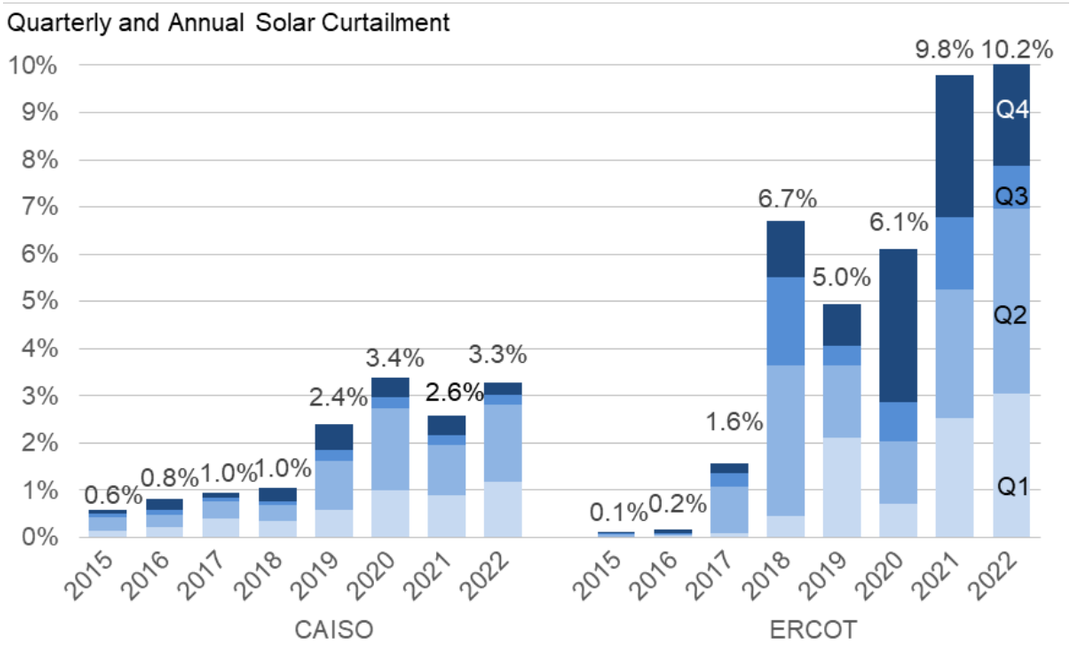
$$Capacity\ Value = \frac{\sum Capacity\ Credit_T * Nameplate * Capacity\ Price_T}{\sum Precurtailment\ Generation_T}$$

Total market value is simply the sum of energy and capacity value and does not include any potential additional revenue streams (ancillary service revenues, renewable energy credits, infrastructure deferral, resilience, energy security, or any other environmental or social values that are not already internalized in wholesale energy and capacity markets).

Only two of the seven ISOs currently report solar curtailment: CAISO and ERCOT



The orange columns represent curtailment in CAISO (left axis), the blue ones in ERCOT (right axis)

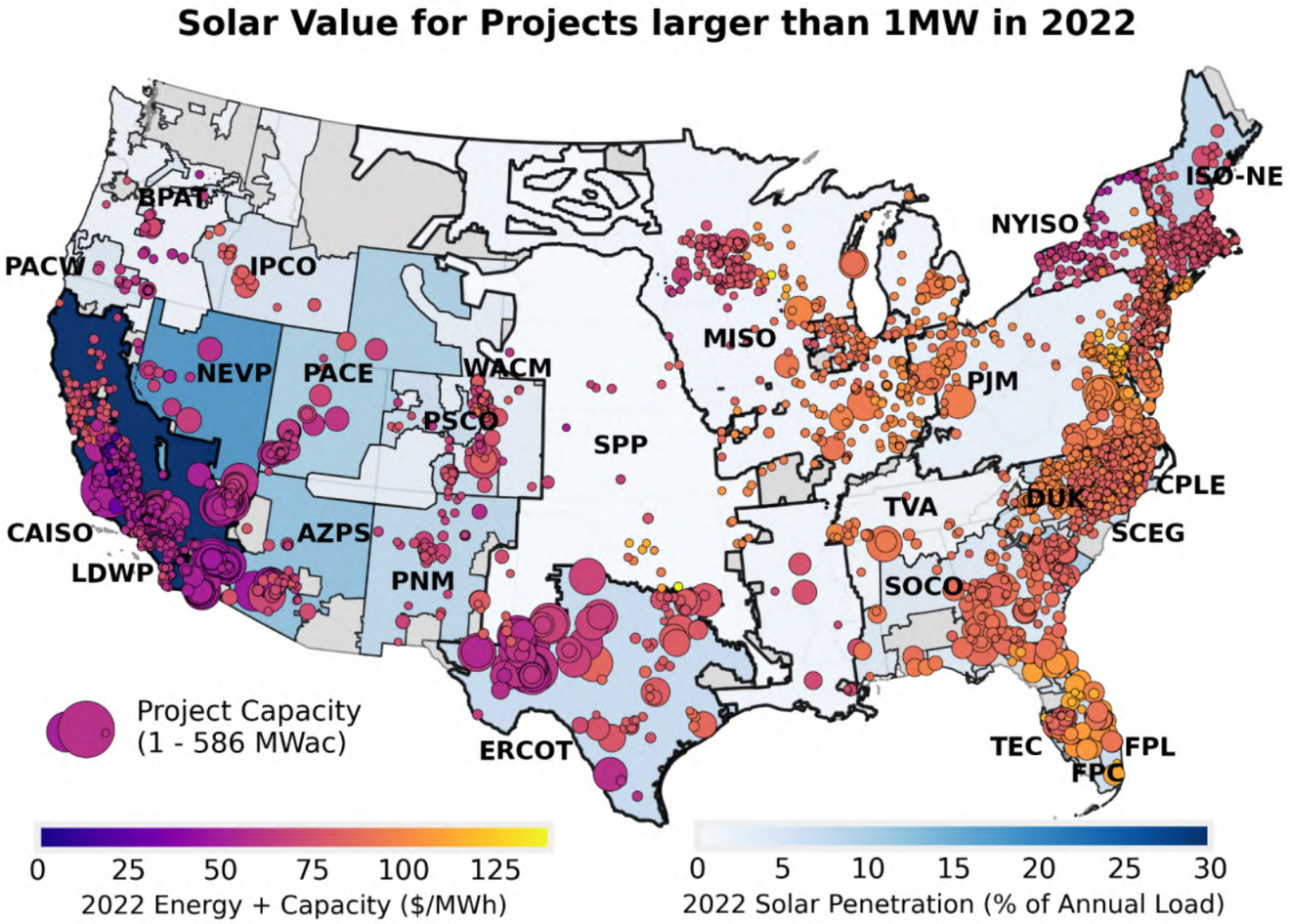


CAISO: 2,057 GWh of solar curtailed in 2022, equivalent to the annual output of a hypothetical 815 MW_{AC} tracking PV project operating at an average CA capacity factor of 28.8% (which would have been 29.8% if not for curtailment).

ERCOT: 2,797 GWh of solar curtailed in 2022, equivalent to the annual output of a hypothetical 1309 MW_{AC} tracking PV project operating at an average TX capacity factor of 24.4% (which would have been 27.2% if not for curtailment).

Much higher *rate of curtailment* in ERCOT (10.2%) than in CAISO (3.3%) in 2022, even though solar's penetration rate is far lower in ERCOT (6.5%) than CAISO (26%). While CAISO's curtailment is usually focused in the spring time, curtailment in ERCOT also occurs in the winter.

Solar's energy and capacity value varied by location



Solar's energy and capacity value varies from one wholesale market to another: It is lower in CAISO at $51/MWh, but high in many southeastern regions ($84-108/MWh), PJM ($85/MWh), Indiana ($81/MWh), or ISO-NE ($77/MWh.

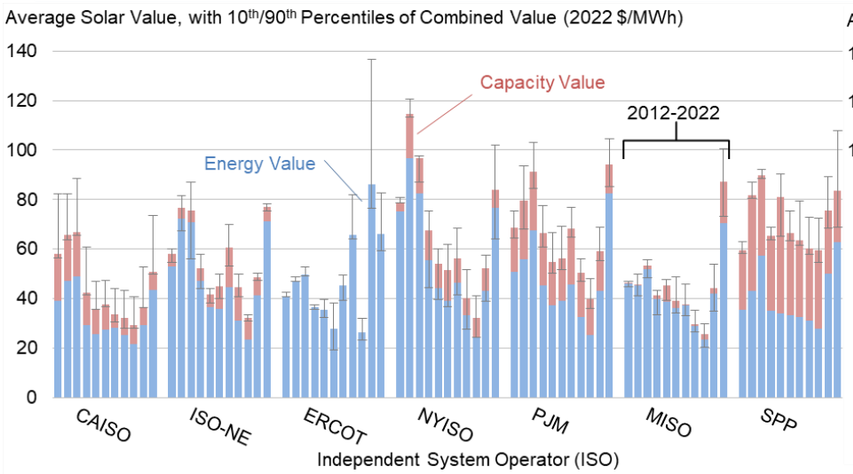
But value also varies within regions, driven by transmission congestion, solar resource quality or differing use of technology like trackers.

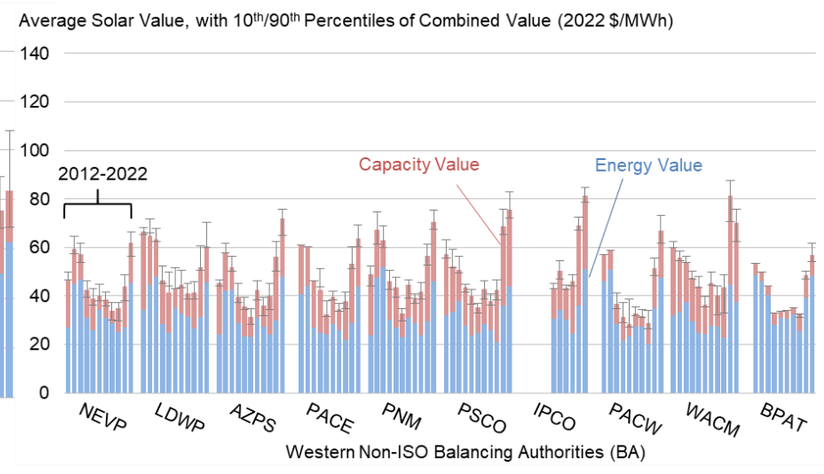
For example, in ERCOT, the western zone typically has lower solar values than the eastern zone. Solar in southern SPP and NYISO was nearly $40/MWh more valuable than solar in the north of the ISOs.

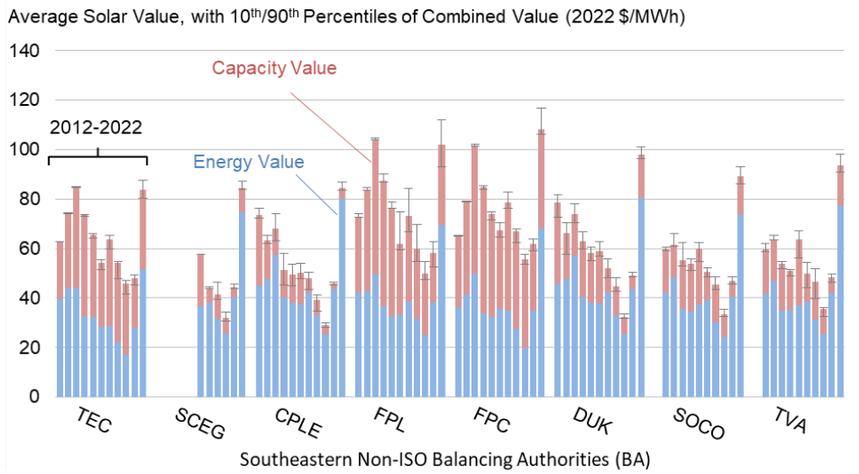
Other markets like PACE or BPAT show value variation of under $10/MWh.

You can explore this data interactively at https://emp.lbl.gov/utility-scale-solar-value

Very high electricity prices lifted solar's energy value in 2022, bringing total energy and capacity value to record $71/MWh (40% above 2021 levels)







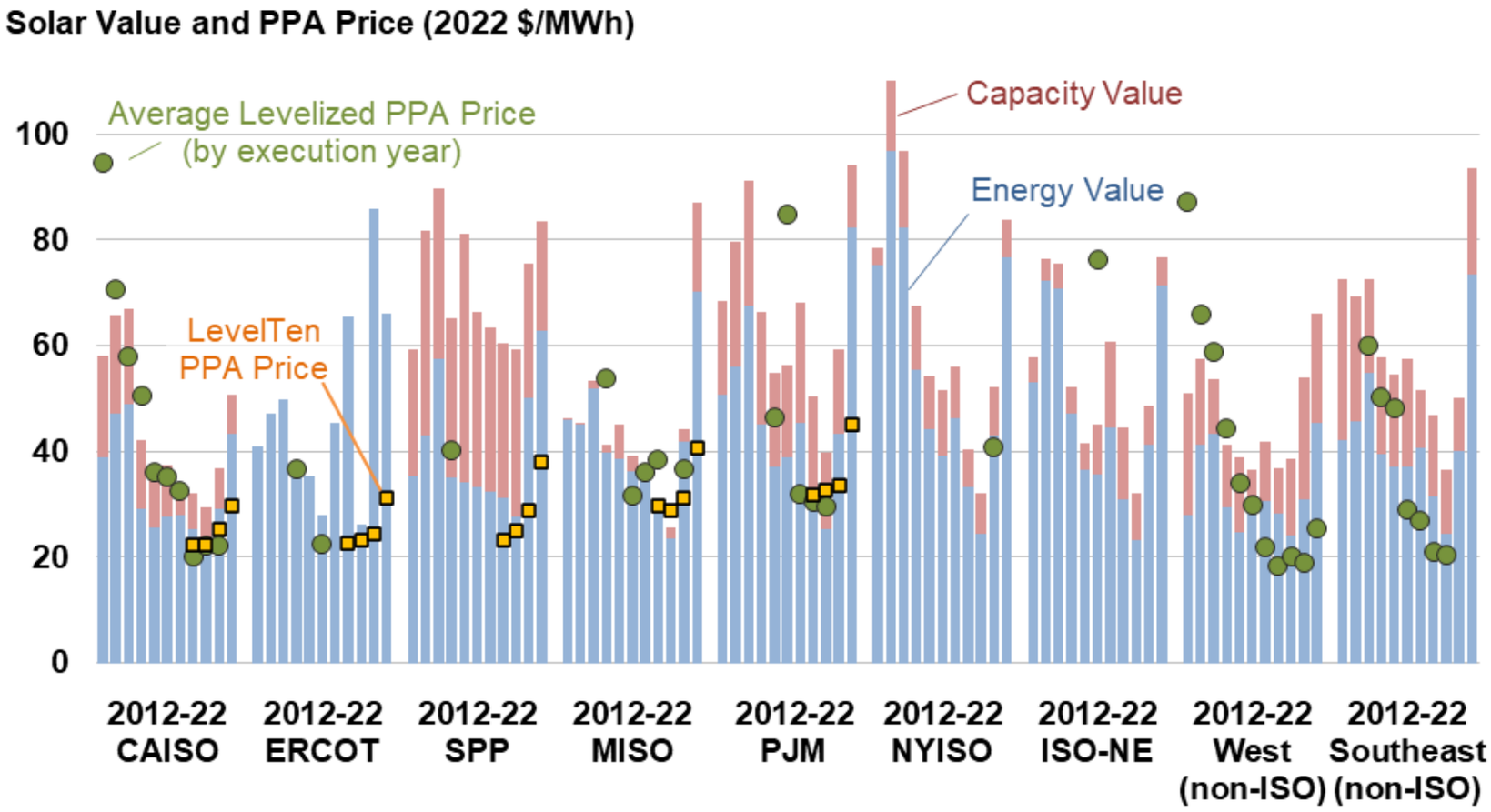
The regional solar value is the generation-weighted average value of all large-scale (1 MW+) solar generation in a given balancing authority.

The energy value typically makes up the bulk of total market value. High natural gas prices in 2022 lifted solar's average energy value to $60/MWh – 250% of what it was in 2020. Capacity value is more significant in the non-ISO regions and can add $30-40/MWh in some BAs.

Variation across years mostly reflect fluctuations in wholesale power prices, but also reflects increasing solar penetration that dampens solar's value (CAISO).

In 2022, market value was lowest in CAISO ($51/MWh) and highest in Duke Energy Florida (FPC - $108/MWh).

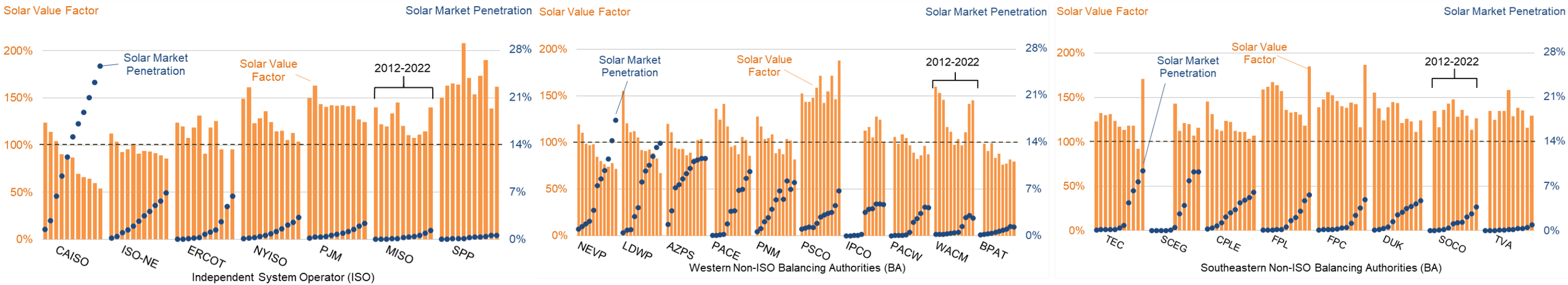
Solar's wholesale market value has been greater than PPA costs in recent years, despite rising PPA levels



The green dots show the average levelized solar PPA price within each region among new contracts signed in each year as reported by Berkeley Lab, the yellow squares represent PPA price estimates by LevelTen. We do not have sufficient PPA data to present robust trends for each balancing authority.

While solar's market value within several of these regions has declined over time, falling PPA prices have largely kept pace. Since 2020, rising wholesale energy prices more than compensated for moderate PPA price increases, making solar more competitive than it has ever been across the nation.

Solar provides below-average value in some regions with high solar penetration rates



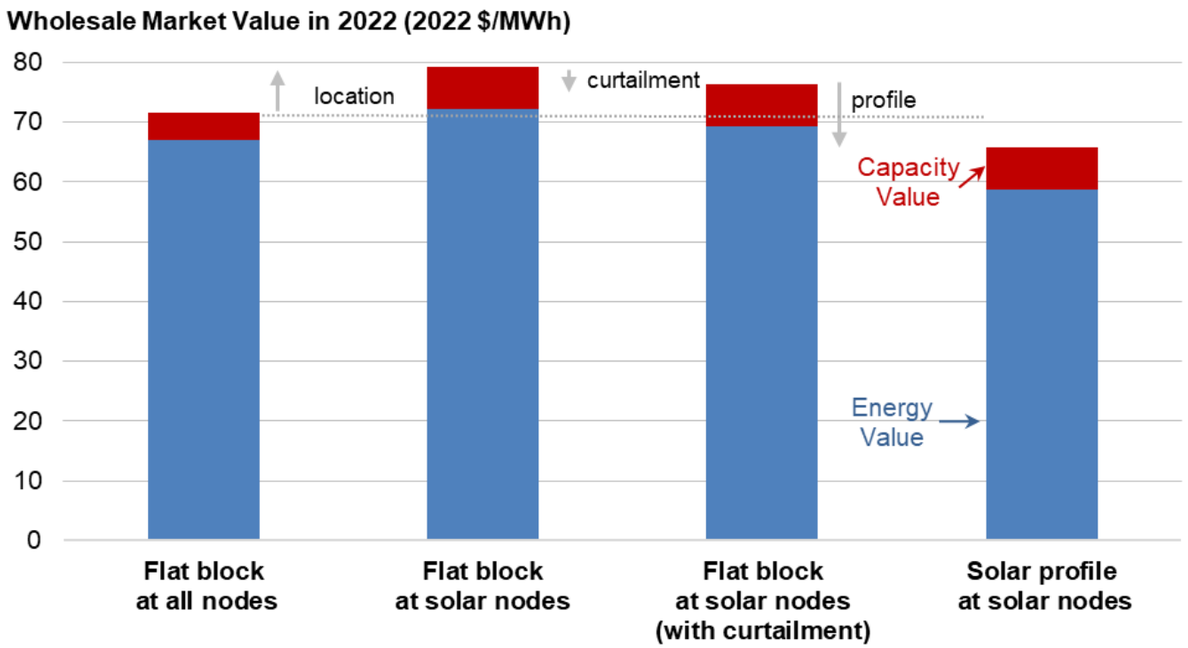
The columns represent the solar value factor (left axis), the dots show growth in solar market penetration (right axis)

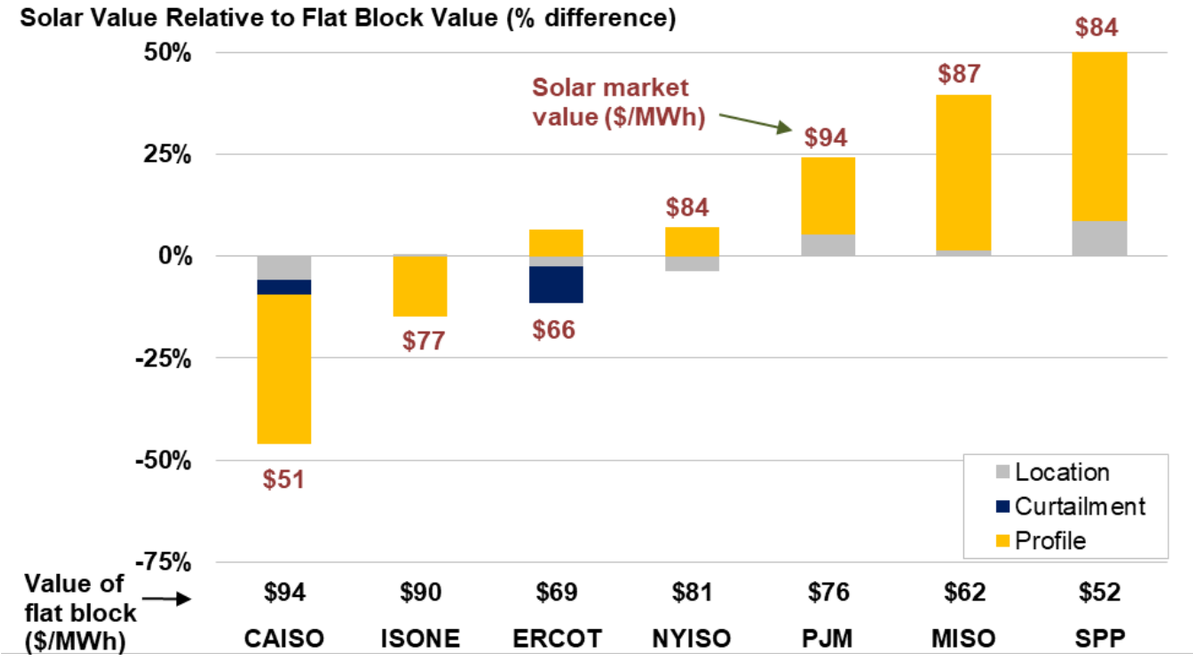
The “Value Factor” is defined as the ratio of solar’s total market value (both energy and capacity) to the market value of a “flat block” (i.e., a 24x7 block) of power. It indicates whether the total revenue captured by solar is higher (>100%) or lower (<100%) than the average wholesale price across all hours.

It controls for fluctuations in energy and capacity prices across years (and across ISOs), and focuses instead on the impact of solar’s generation profile (and penetration) on value.

Most regions with the highest solar penetration rates show Value Factors less than 100%, even just 54% in CAISO. However, in many southeastern BAs solar still provides above-average value despite approaching 10% penetration.

Solar's generation profile was the largest source of value differences between solar and a flat block in 2022





Across the seven ISOs, solar projects are usually sited at locations with above average energy values. The large amount of solar deployed in areas with lower relative value (CAISO, ERCOT, ISONE) yields a value factor of 92% across all solar projects in the ISOs.

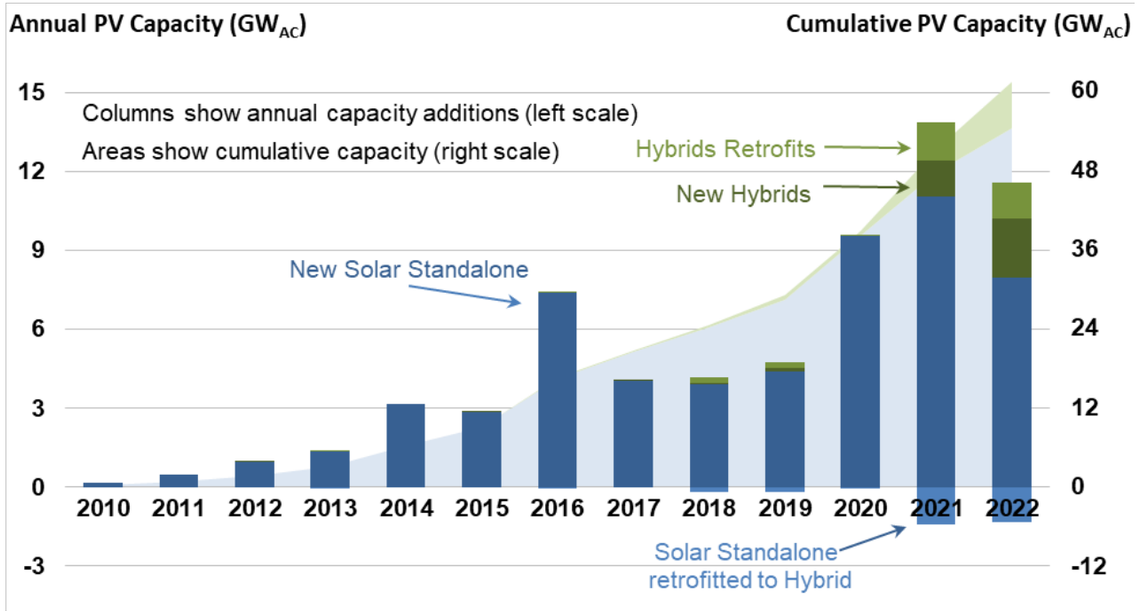
Solar's generation profile has the largest impact and either hurts (in CAISO and ISO-NE) or helps (in ERCOT, NYISO, MISO, PJM, and SPP) solar's value relative to a flat block. Curtailment is becoming a growing issue for solar in ERCOT.

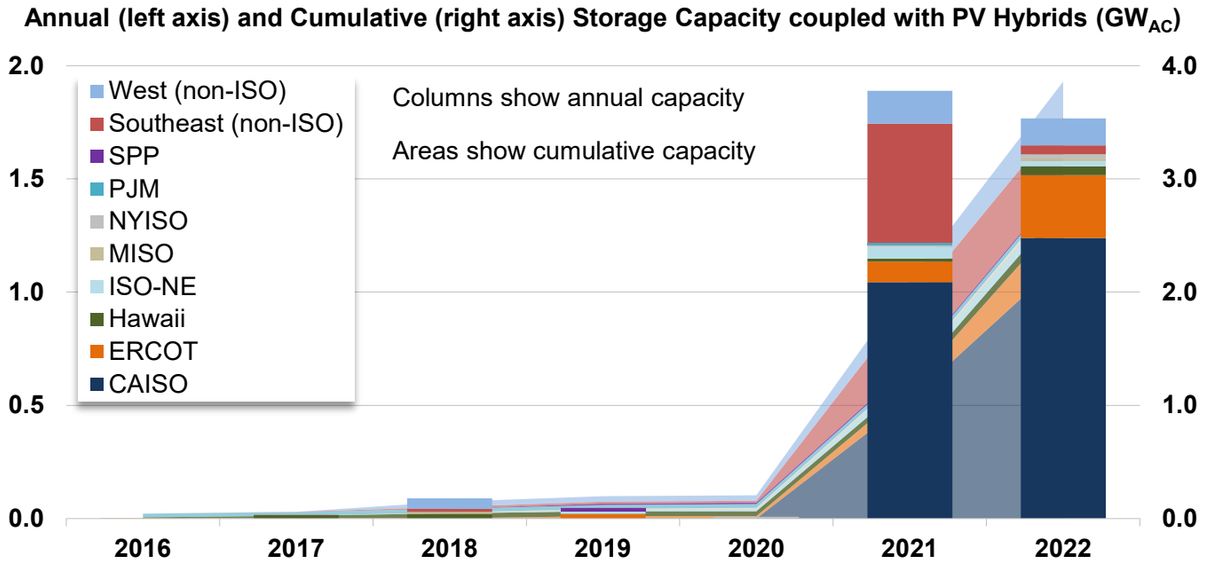
PV+Battery Hybrid Plants

(for more of Berkeley Lab's analysis of hybrid power plants, see https://emp.lbl.gov/hybrid)

Deployment of PV-battery hybrid plants was largely stable in 2022 after a surge in 2021

Sample: 100 projects totaling 7.1 GW_{AC} of PV, 3.9 GW_{AC} of battery capacity, and 12.1 GWh of battery energy



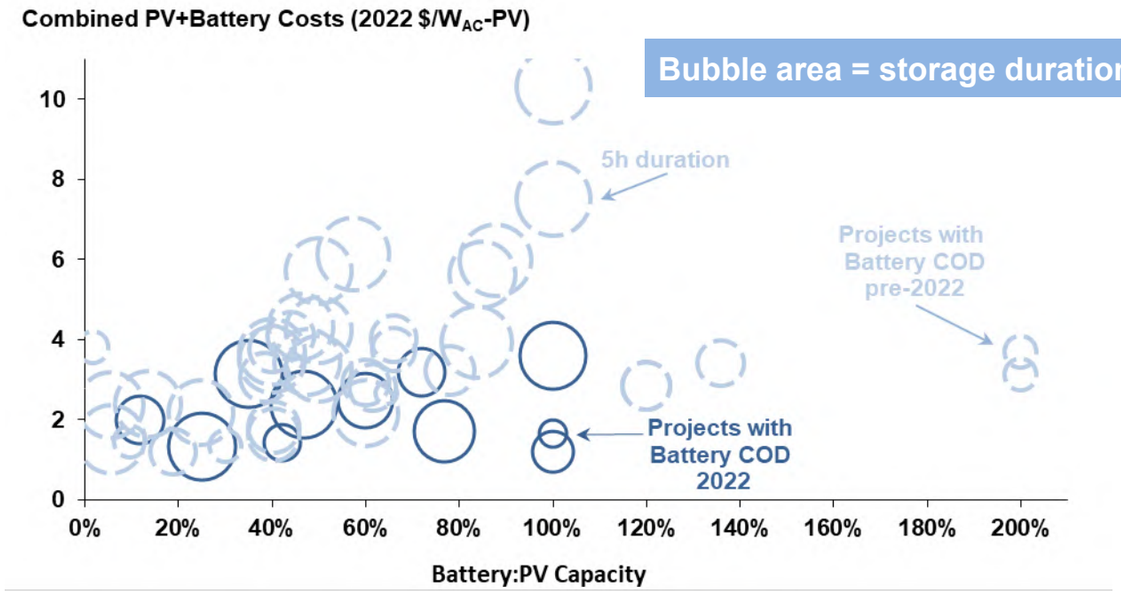


The large-scale PV+battery hybrid build-out started slowly in 2016, with just 1-11 plants/year built through 2020. The market started in earnest in 2021 with 39 hybrid installations. While growth slowed a bit in 2022 among retrofits to existing PV plants (9 plants, 1.4 GW_{AC}-PV), new greenfield hybrids installed record capacity (26 plants, 2.2 GW_{AC}-PV).

Most of the new hybrid storage was built in CAISO (13 plants, 1.2 GW storage capacity with ~3.5h storage energy), and ERCOT (3 plants, 0.3 GW storage capacity with ~1h energy). Massachusetts built smaller plants via the MA Smart program (6 plants, 24 MW capacity with ~2h energy)

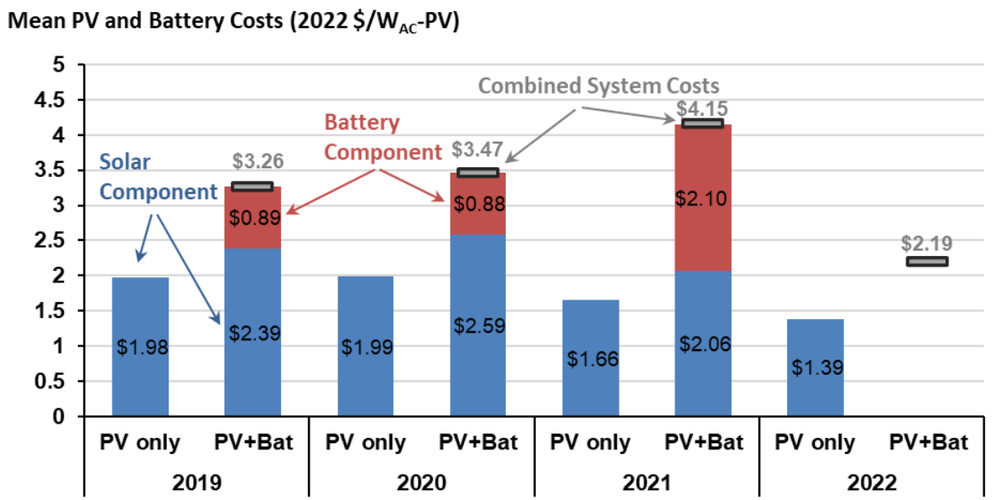
For PV+battery hybrid plants, the battery cost adder scales with increased storage capacity and duration

Sample: 63 plants totaling 5,317 MW_{AC} of PV and 3,029 MW/ 9,979 MWh of batteries with CODs from 2018-2022



Combined PV+battery costs generally scale with increased battery capacity (relative to the PV capacity) and storage duration.

In our hybrid cost sample, average combined costs decreased from \$4.15/W_{AC}-PV in 2021 (n=21) to \$2.19/W_{AC}-PV in 2022 (n=11). In 2021, half of the hybrids were retrofits to older PV projects, whereas our 2022 cost sample contains primarily new builds. Average storage duration in our cost sample decreased from 3.2h in 2021 to 2.7h in 2022



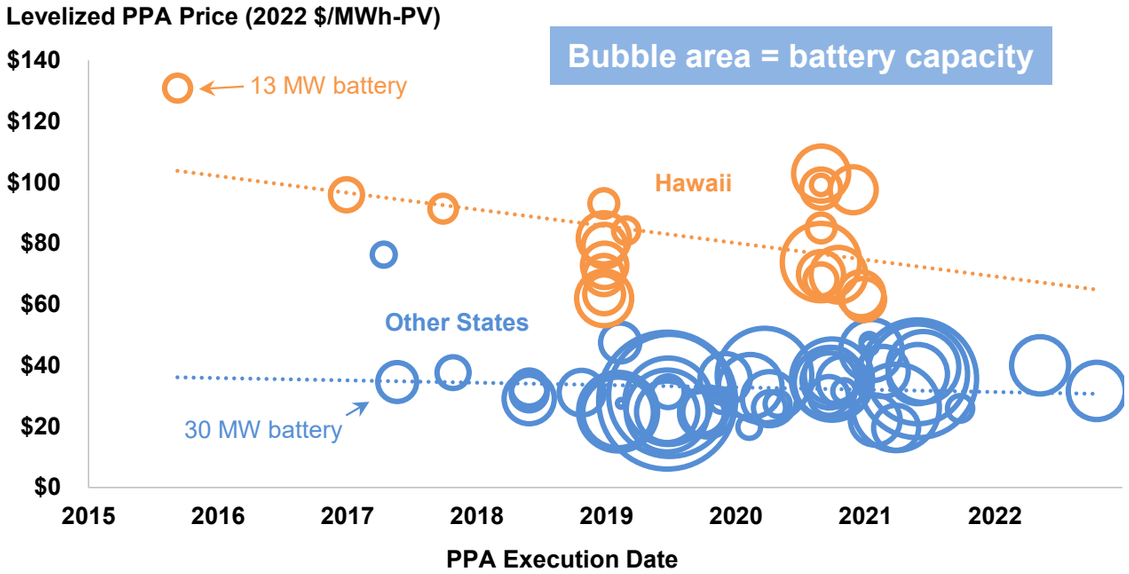
Not enough projects reported component costs in 2022 for a credible analysis, but we now have a robust cost sample for the year 2021. Back then, batteries cost \$709/kWh, representing a cost adder of \$2.1/W_{AC}-PV, or 51% of overall hybrid plant installed costs.

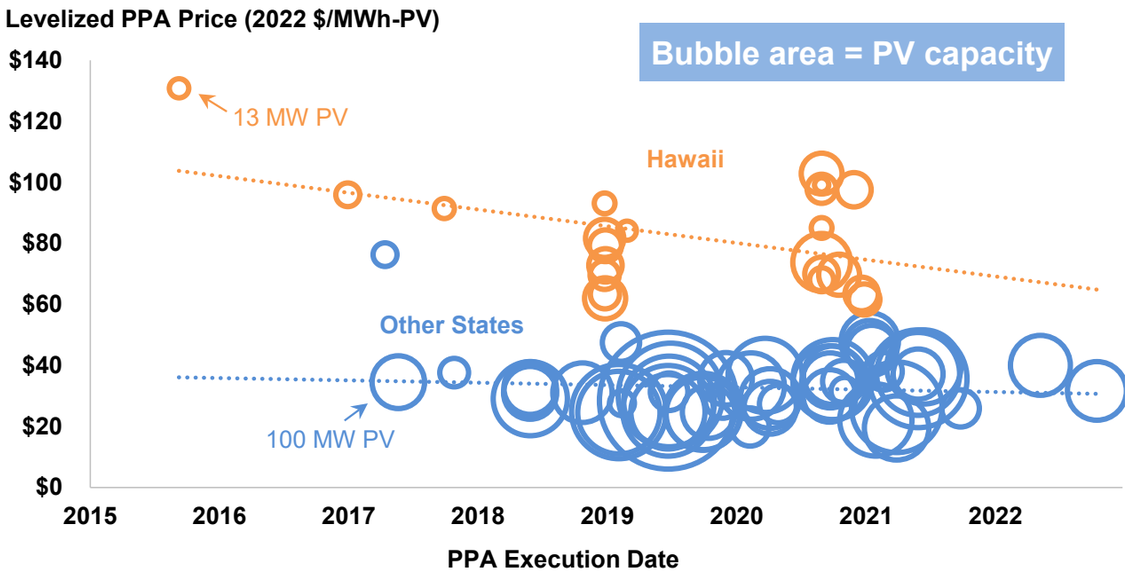
Solar components of hybrids may be more costly than standalone PV due to:

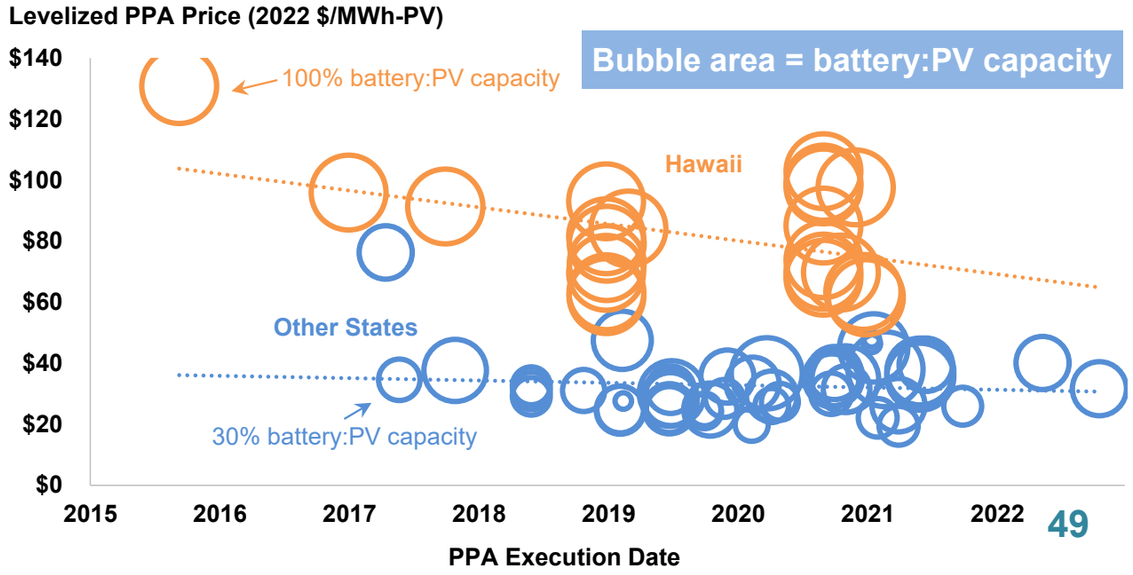
- a greater inverter loading ratio (overbuilt module arrays),
- retrofits to older PV projects when solar was more expensive,
- an uneven accounting of costs between the PV and battery components.

Note: We use means for the component cost analysis as medians (that we use for PV standalone cost analysis) do not sum neatly.

PPA prices for PV+battery hybrids have declined over time; Hawaii priced at a premium





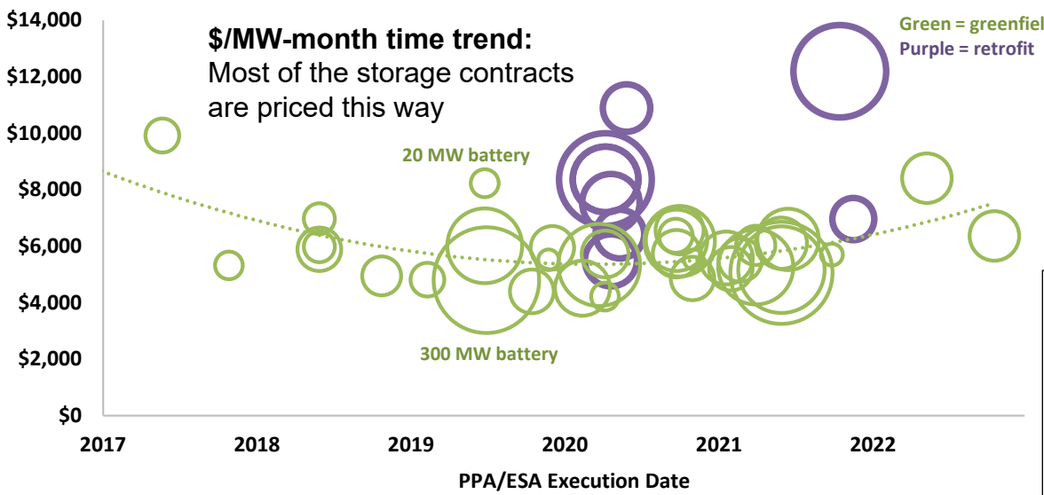


- All 3 graphs show same data from sub-sample of 71 plants (retrofits not included); the only difference is what the bubble size represents
  - Hawaii (orange): 22 plants, 0.8 GW_{AC} PV, 0.8 GW_{AC} battery
  - Other States (blue): 49 plants, 7.6 GW_{AC} PV, 3.7 GW_{AC} battery
- Downward trend over time, particularly in HI, but refinement is complicated by multi-dimensionality of these plants; other states are more heterogenous than HI in terms of solar resource
- Battery:PV capacity ratio always at 100% in HI; lower on the mainland (but increasing over time—see bottom right graph)
- Storage duration ranges from 2-8 hours; 59 of the 71 plants have 4-hour duration (other 12 are 5x2 hour, 1x2.5 hr, 1x3.7 hr, 4x5 hr, and 1x8 hr)

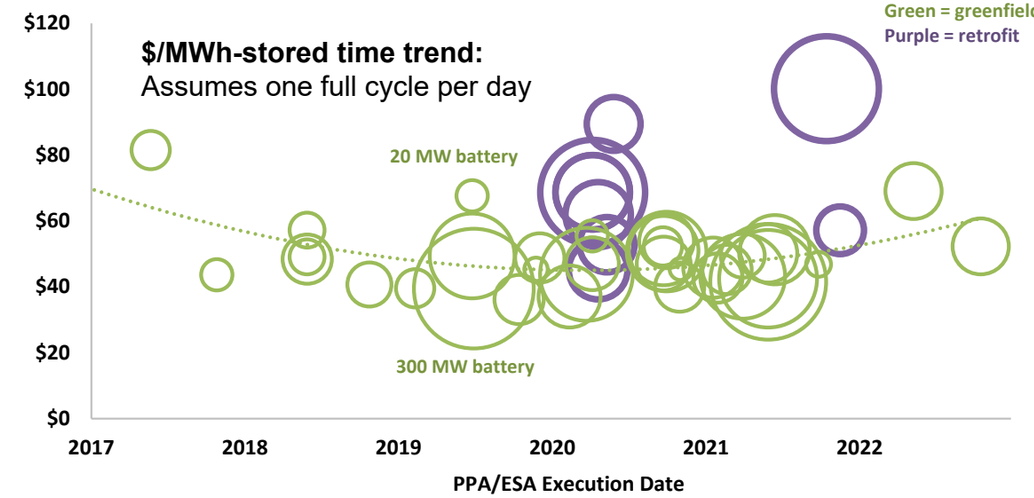
PPAs that price the PV and storage separately enable us to calculate a "levelized storage adder," shown here 4 different ways

Graphs show adders from 44 PV hybrids in CA (25), NM (9), NV (6), AZ (3) and OR (1) totaling >3.7 GW_{AC} of batteries, all with 4-hour duration

Levelized Storage Adder (2022 $/MW-month)



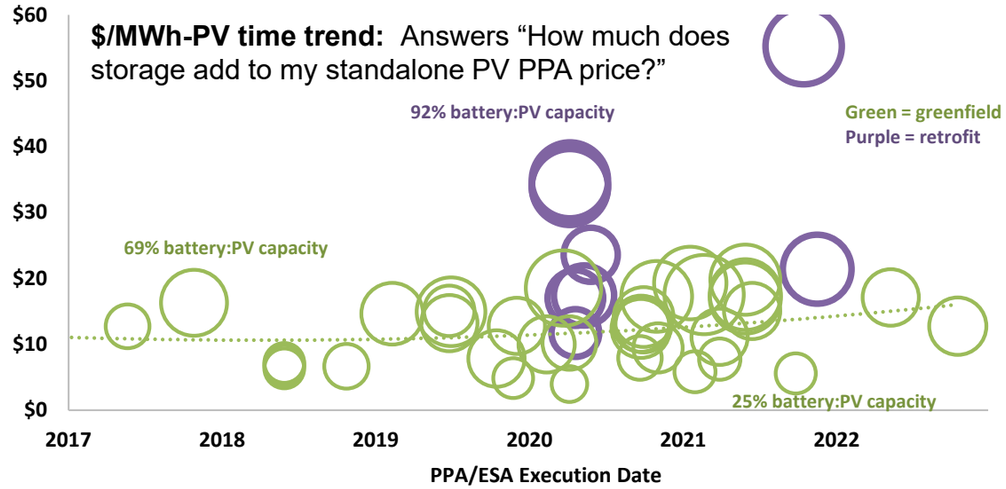
Levelized Storage Adder (2022 $/MWh-stored)



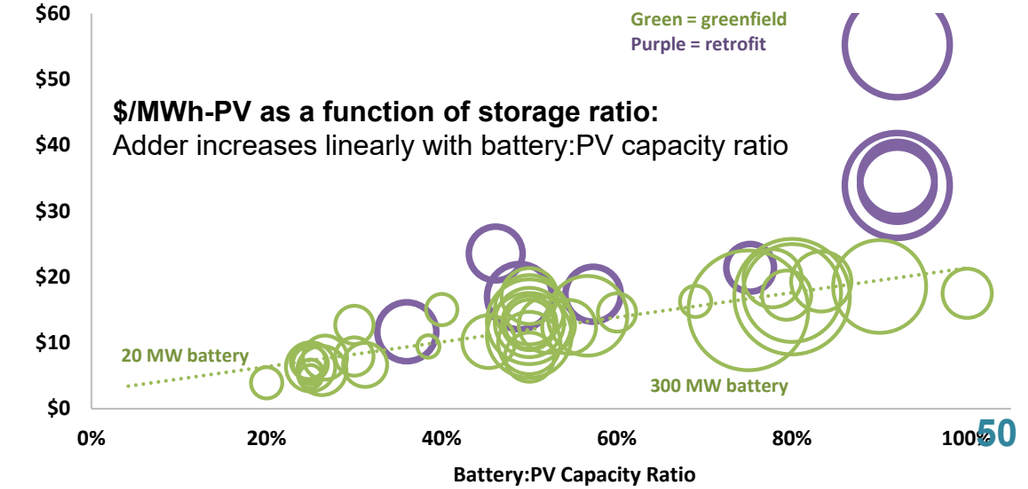
Green = greenfield
Purple = battery retrofit

Trend lines represent greenfield plants only. Bubble size corresponds to battery capacity except in bottom-left graph, where it corresponds to battery:PV capacity.

Levelized Storage Adder (2022 $/MWh-PV)



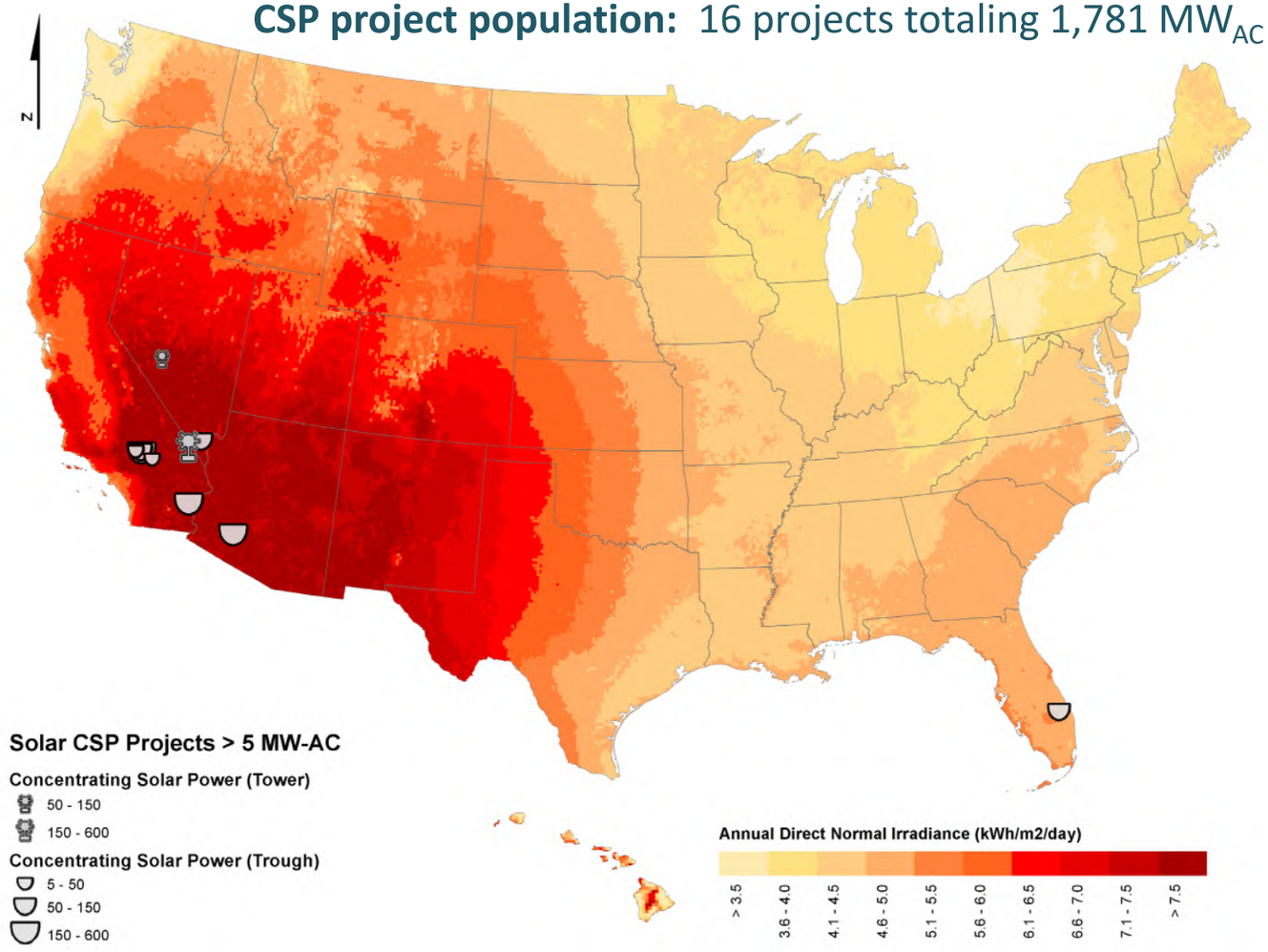
Levelized Storage Adder (2022 $/MWh-PV)



Concentrating Solar Thermal Power (CSP) Plants

Sample description of CSP projects

CSP project population: 16 projects totaling 1,781 MW_{AC}



After nearly 400 MW_{AC} built in the late-1980s (and early-1990s), no new CSP was built in the U.S. until 2007 (68 MW_{AC}), 2010 (75 MW_{AC}), and 2013-2015 (1,237 MW_{AC}).

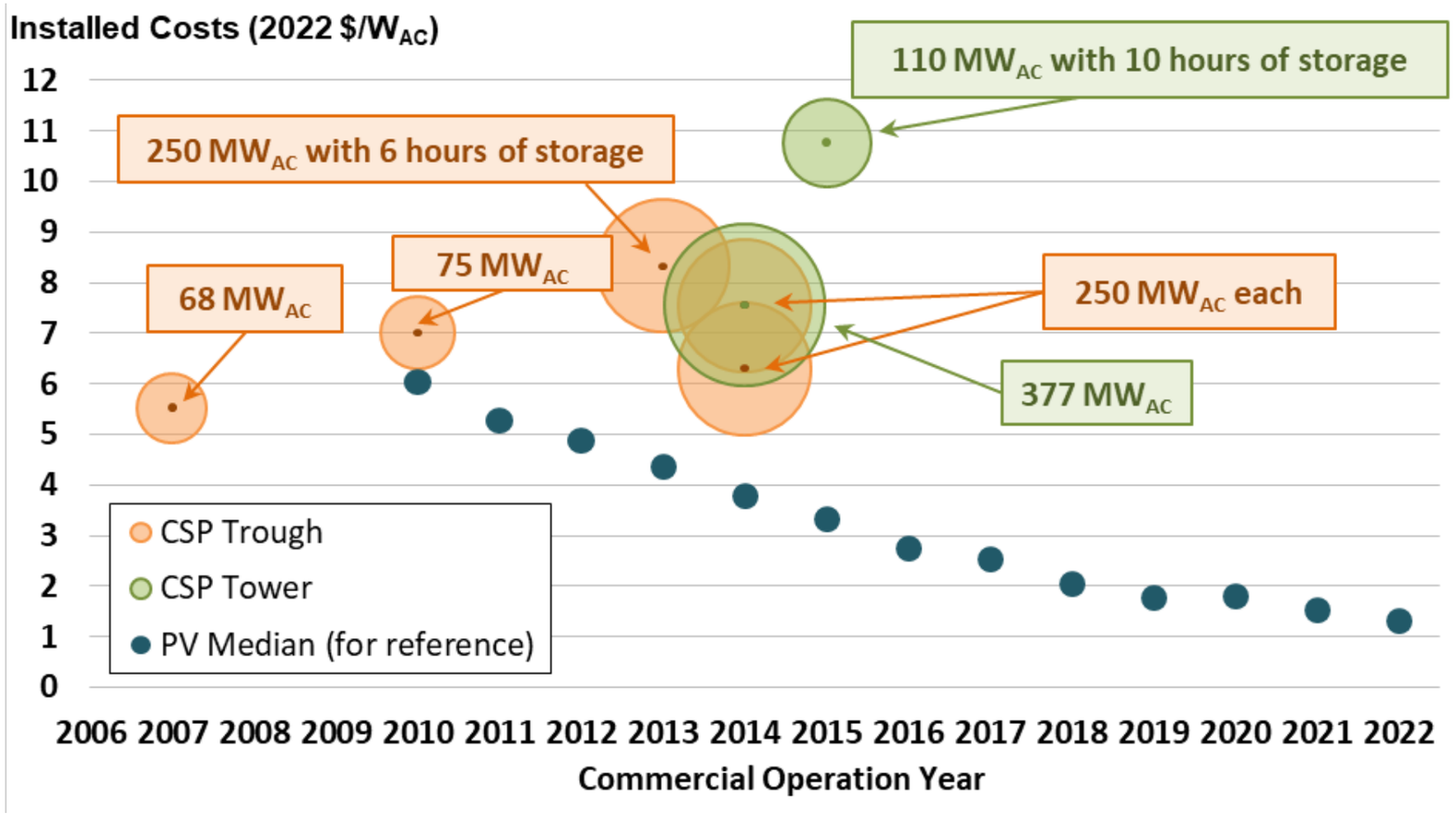
Prior to the large 2013-15 build-out, all utility-scale CSP projects in the U.S. used parabolic trough collectors.

The five 2013-2015 projects include:

- 3 parabolic troughs (one with 6 hours of storage) totaling 750 MW_{AC} (net) and
- 2 “power tower” projects (one with 10 hours of storage) totaling 487 MW_{AC} (net).

Not much movement in the installed costs of CSP

CSP cost sample: 7 projects totaling 1,381 MW_{AC}

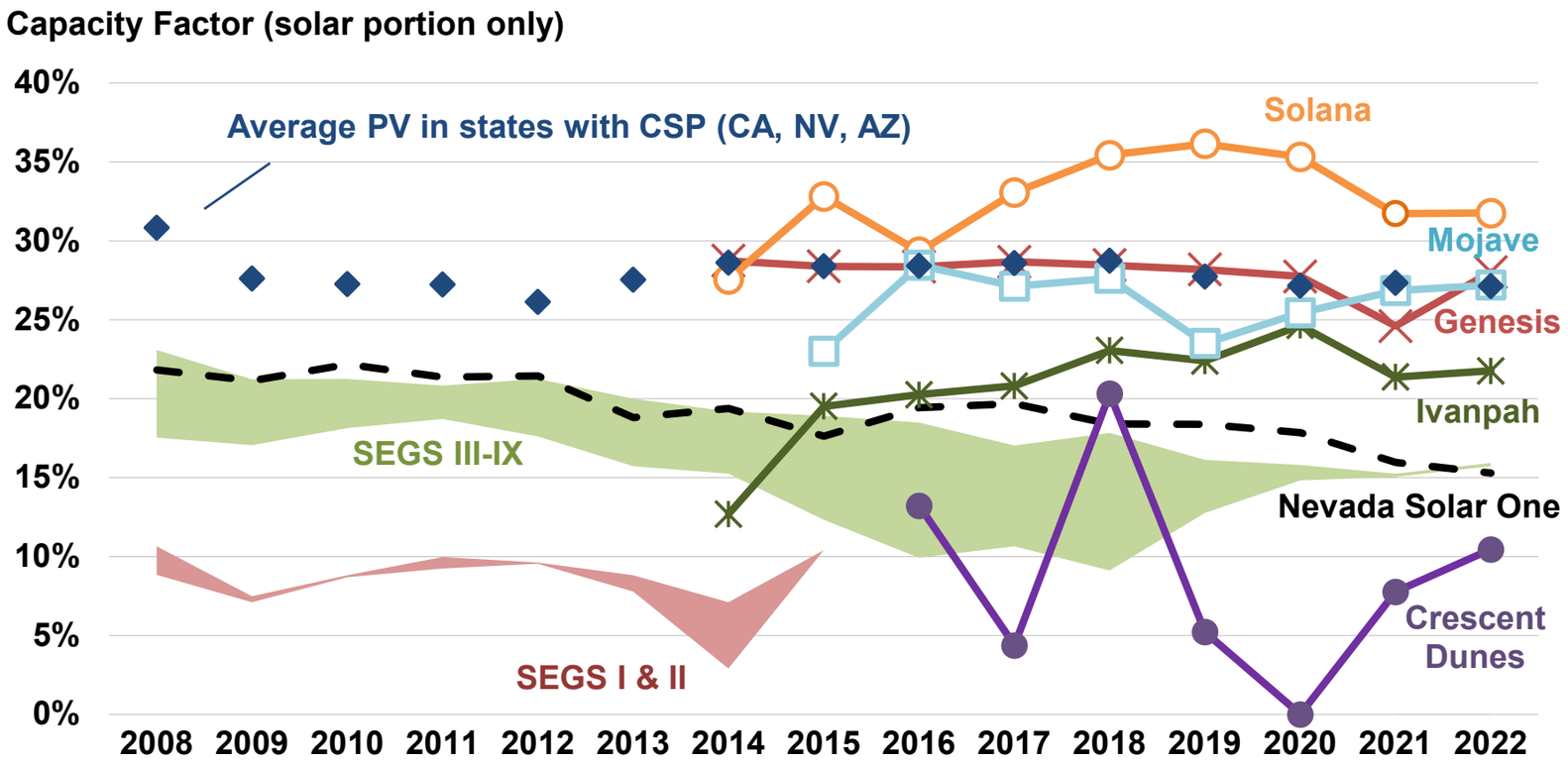


Small sample of 7 projects using different technologies makes it hard to identify trends. Newer projects (5 built in 2013-15) did not show cost declines, though some included storage or used new technology (power tower).

PV costs have continuously declined and are now far below the historical CSP costs. While international CSP projects seem to be more competitive with PV, no new CSP projects are currently under active development in the U.S.

Most newer CSP projects continue to underperform relative to long-term expectations

CSP capacity factor sample: 7 projects totaling 1,394 MW_{AC}



Power Towers: Ivanpah's (377 MW) capacity factor held steady in 2022, but is still below long-term expectations of ~27%, while Crescent Dunes (110 MW with 10 hours of storage) returned to service in the second half of 2021 after not operating for >2 years, but only managed 10% in 2022.

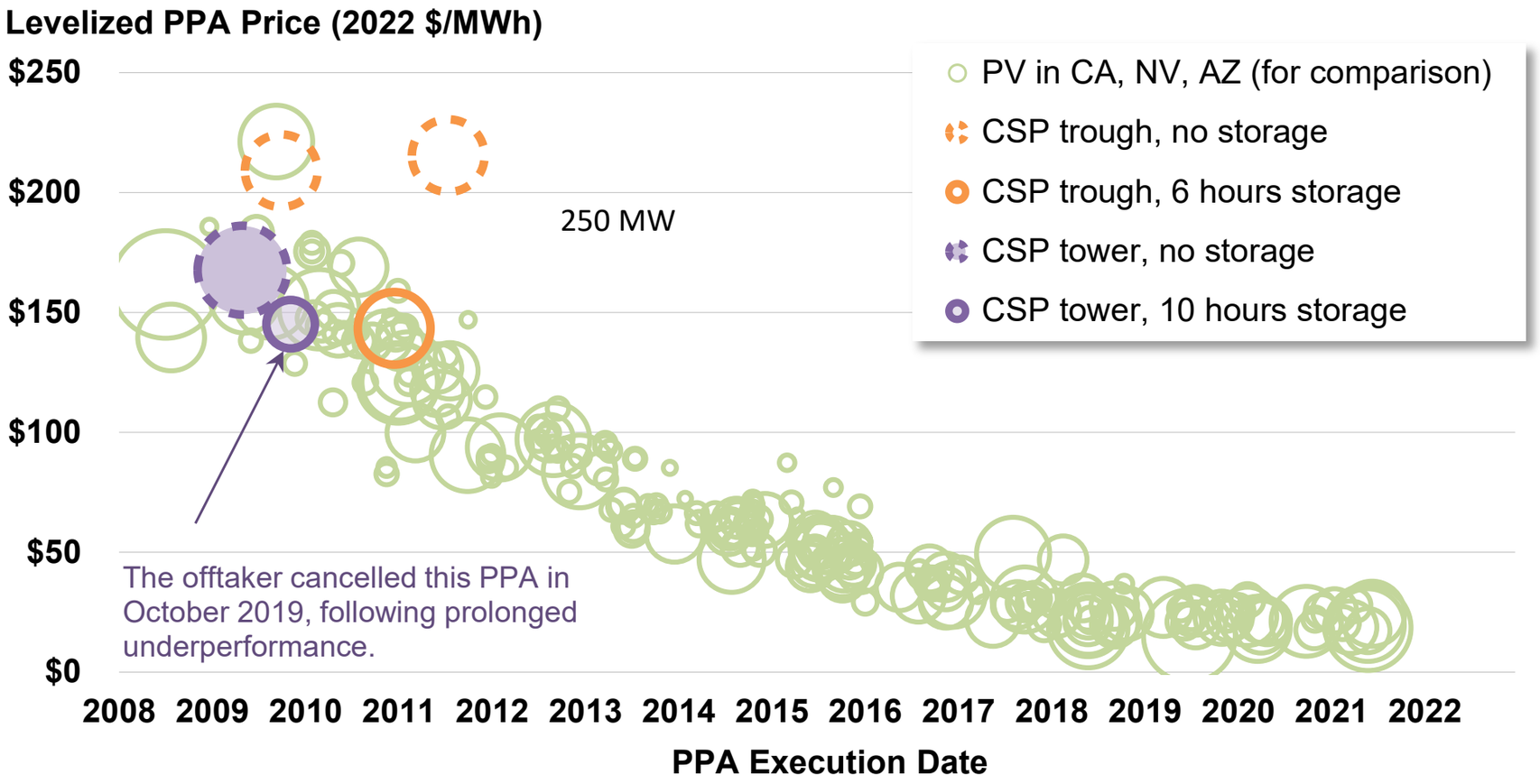
Trough with storage: Solana's (250 MW trough project with 6 hours of storage) capacity factor held steady at 32% in 2022, below long-term expectations of >40%.

Troughs without storage: Mojave and Genesis (both 250 MW net) were at 27-28% in 2022. Both have performed better than the old SEGS projects (now mostly decommissioned and being repowered with PV) and the 2007 Nevada Solar One project.

Only Solana, Genesis, and Mojave have matched or exceeded the average capacity factor among utility-scale PV projects across CA, NV, and AZ.

Though once competitive, CSP PPA prices have failed to keep pace with PV's PPA price decline

CSP PPA price sample: 5 projects totaling 1,237 MW_{AC}



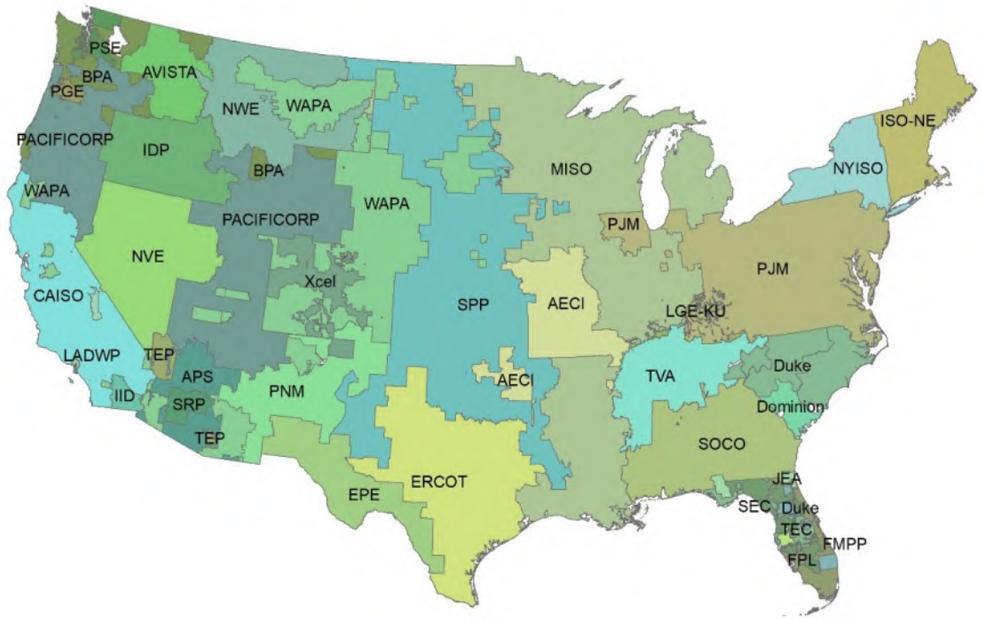
When PPAs for the most recent batch of CSP projects (with CODs of 2013-15) were signed back in 2009-2011, they were still mostly competitive with PV.

But CSP has not been able to keep pace with PV's price decline. Partly as a result, no new PPAs for CSP projects have been signed in the U.S. since 2011 – though the technology continues to advance overseas.

Capacity in Interconnection Queues

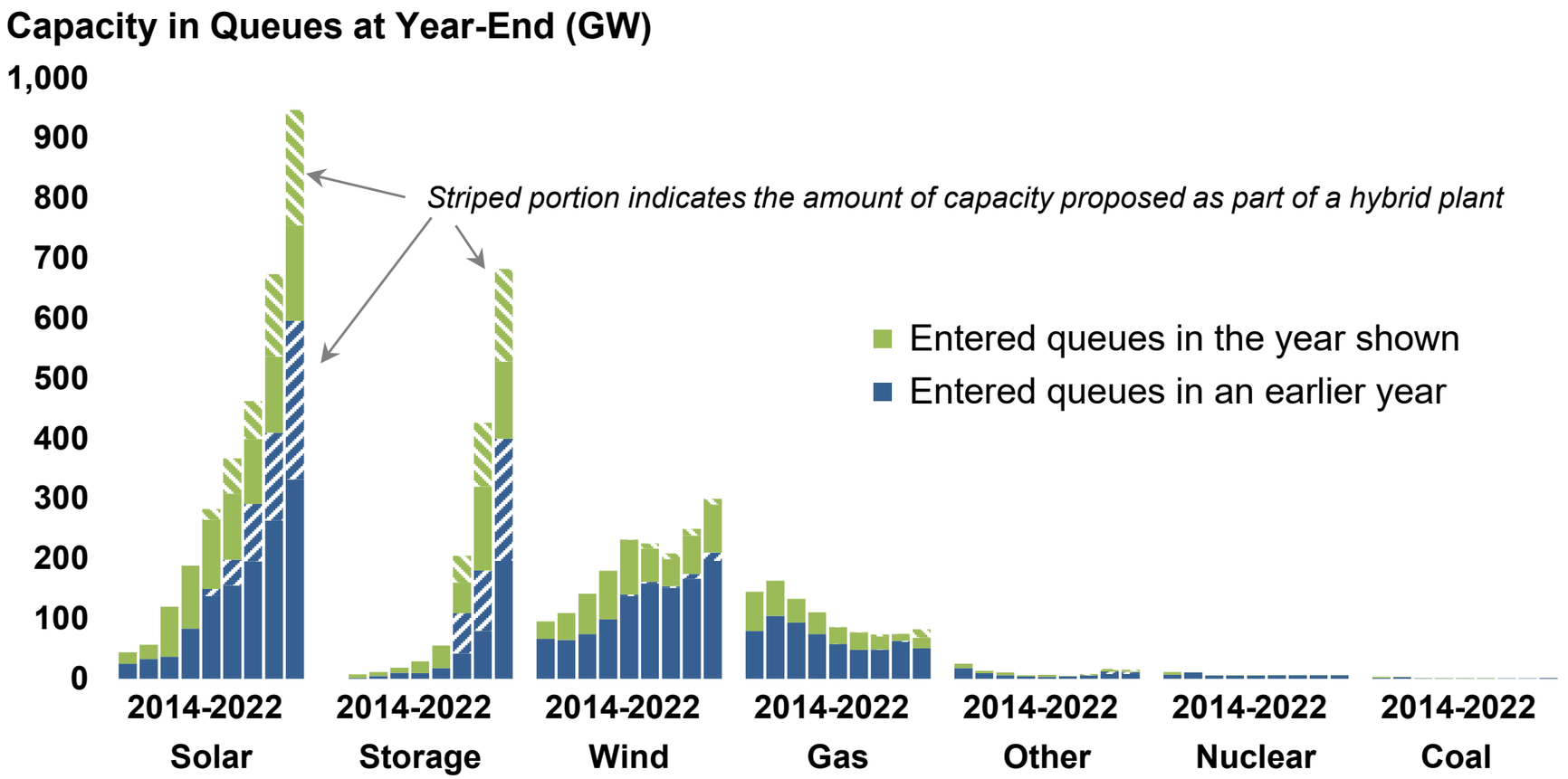
Scope of generator interconnection queue data

- Data compiled from **interconnection queues** for 7 ISOs and 35 utilities, representing ~85% of all U.S. electricity load
  - Projects that connect to the bulk power system: not behind-the-meter
  - Includes all projects in queues through the end of 2022
  - Filtered to include only "active" projects: removed those listed as "online," "withdrawn," or "suspended"
- Hybrid / co-located projects were identified and categorized
  - Storage capacity for hybrids (i.e., broken out from generator capacity) was not available in all queues
- Note that being in an interconnection queue does not guarantee ultimate construction: majority of plants are not subsequently built
- More queue data and analysis are available at: *https://emp.lbl.gov/queues*



Coverage area of entities for which data was collected
Data source: Homeland Infrastructure Foundation-Level Data (HIFLD)

Looking ahead: Strong growth in the utility-scale solar pipeline



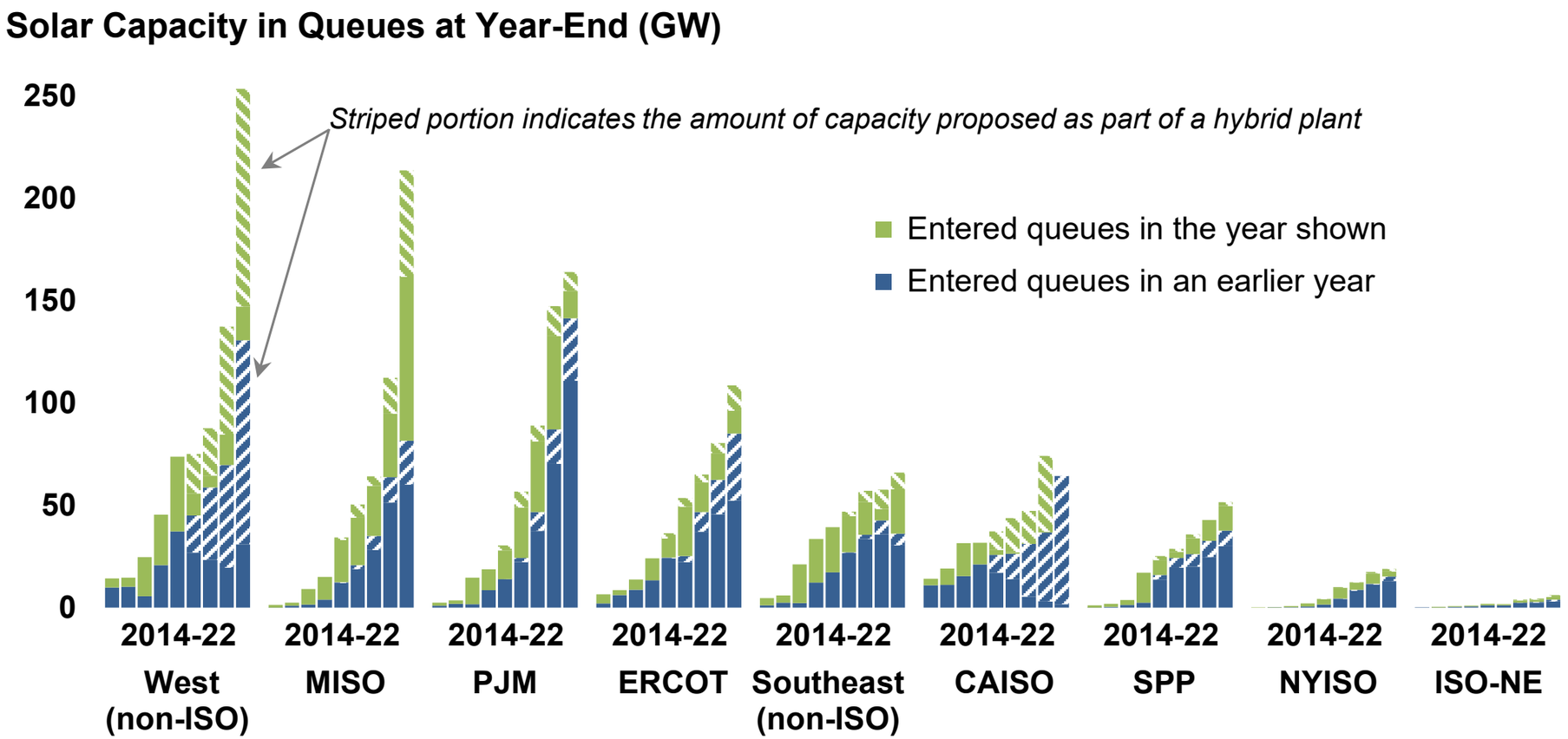
947 GW of solar was in the queues at the end of 2022—351 GW of this total entered the queues in 2022 (the remainder entered in earlier years, and remain active)

457 GW of the 947 GW of solar in the queues (i.e., 48%) includes a battery in a PV hybrid configuration

Solar (both standalone and in hybrid form) is by far the largest resource within these queues, followed by storage, wind, and natural gas (all other resources are negligible in comparison)

Graph shows solar and other capacity in 42 interconnection queues across the US:
Not all of these projects will ultimately be built!

Looking ahead: Continued broadening of the market



The growth of solar within these queues is widely distributed across most regions of the country, with the non-ISO West, MISO, and PJM leading the way

97% of the solar capacity in CAISO's queue at the end of 2022 was paired with a battery; in the non-ISO West, that number was also high, at 81%

- Both regions are grappling with "duck curve" issues due to solar's relatively high market share

Graph shows solar capacity in 42 interconnection queues across the US:
Not all of these projects will ultimately be built!

Summary

Data Summary

- Utility-scale PV continued to lead solar deployment in 2022, with Texas adding the most new capacity. 81% of new projects and 94% of new capacity feature single-axis tracking.
- The median installed cost of projects that came online in 2022 fell to \$1.3/W_{AC} (\$1.1 /W_{DC}), down 13% from 2021 and 78% from 2010.
- Average capacity factors range from 17% in the least-sunny regions to 32% where it is sunniest. Single-axis tracking adds nearly five percentage points to capacity factor in the regions with the strongest solar resource.
- Not including the ITC, the median LCOE from utility-scale PV has declined by 84% since 2010, to \$39/MWh in 2022. Levelized PPA prices have kept pace, and—with the benefit of the ITC—currently range from \$20-30/MWh in CAISO and the non-ISO West to \$30-\$40/MWh elsewhere.
- The market value of solar has increased with rising energy prices in 2022 to \$71/MWh on average, more than compensating for modest PPA increases and making solar more competitive than it has ever been across the nation.
- Interest in hybridization (pairing PV with batteries) continued to surge in 2022. Some of these PV+battery hybrid plants have inked PPAs in the mid-\$30/MWh-PV range. It remains to be seen if this trend towards hybridization will continue in the wake of the IRA's new standalone storage ITC.
- Across all 7 ISOs and 35 additional utilities, there were 947 GW of solar in interconnection queues at the end of 2022. Nearly half of this proposed solar capacity is paired with battery storage, with the highest concentration of these PV+battery hybrid plants in CAISO (97%) and the non-ISO West (81%).

Data and Methods

Summary of Data and Methods (1)

Much of the analysis in this report is based on primary data, the sources of which are listed below (along with some general secondary sources) by data set. We collect data from a variety of unaffiliated and incongruous sources, often resulting in data of varying quality that must be synthesized and cleaned in multiple steps before becoming useful for analytic purposes. In some cases, we essentially create new and useful data by piecing together various snippets of information that are of less consequence on their own.

Technology Trends: Project-level metadata are sourced from a combination of Form EIA-860, FERC Form 556, state regulatory filings, interviews with project developers and owners, and trade press articles. We independently verify much of the metadata—such as project location, fixed-tilt vs. tracking, azimuth, module type—via satellite imagery. Other metadata are indirectly confirmed (or flagged, as the case may be) by examining project performance—e.g., if a project's capacity factor appears to be an outlier given what we think we know about its characteristics, then we dig deeper to revisit the veracity of the metadata.

Installed Costs: Project-level CapEx estimates are sourced from a combination of Form EIA-860, Section 1603 grant data from the U.S. Treasury, FERC Form 1, data from applicable state rebate and incentive programs, state regulatory filings, company financial filings, interviews with developers and owners, trade press articles, and data previously gathered by NREL. CapEx estimates for projects built from 2013-2021 have been cross-checked against confidential EIA-860 data obtained under a non-disclosure agreement (and we expect to receive similar data for 2022 projects and successive years going forward). The close agreement between the confidential EIA data and our other sources in most cases provides comfort that our normal data collection process (i.e., the process that we go through prior to receiving the confidential EIA data with a one-year lag) does, in fact, yield reputable CapEx estimates. That said, we do caution readers to focus more on the overall trends rather than on individual project-level data points.

Capacity Factors: We calculate project-level capacity factors using net generation data sourced from a combination of FERC Electric Quarterly Reports, FERC Form 1, Form EIA-923, and state regulatory filings. Because many projects file data with several of these sources, we are often able to cross-reference (and correct, if needed) odd-looking data across several sources, thereby providing higher confidence in the veracity of the data.

Summary of Data and Methods (2)

PPA Prices: We gather PPA price data from a combination of FERC Electric Quarterly Reports, FERC Form 1, Form EIA-923, state regulatory filings, company financial filings, and trade press articles. We only include a PPA within our sample if we have high confidence in all of the key variables such as execution date, starting date, starting price, escalation rate (if any), time-of-day factor (if any), and term. By this process of exclusion, there is very little chance for erroneous PPA price data to enter our sample. Instead, this winnowing process results in our PPA price sample being somewhat smaller than it might otherwise be—though we are typically able to add back in any "incomplete" PPAs in subsequent years, once more data have become available with the passage of time.

LCOE: Our project-level LCOE calculations draw upon the empirical project-level data presented throughout this report, including CapEx and capacity factors, and are supplemented with assumptions about financing and other items, as described in more detail in earlier slides.

Market Value: We draw from project-level modeled hourly solar generation (using NREL's *System Advisor Model* and site- and year-specific insolation data from NREL's *National Solar Radiation Database and NOAA's High Resolution Rapid Refresh Model)* and de-bias the generation leveraging ISO-reported aggregate solar generation and plant-level reported generation by EIA 923.

Energy value is the product of hourly solar generation by plant (utility-scale) and the wholesale hourly real-time energy prices of the nearest node (for ISOs and most BAs) or the system-wide energy price (a few BAs that can only be approximated with gateway LMP nodes or FERC system lambdas).

Capacity value relies on the same reported and constructed generation profiles as does energy value to assess the "capacity credit" of solar according to each ISO's rules in place at the time (for BAs we examine the historical plant-level performance over the top 100 load hours over the past 3 years). We then multiply the resulting capacity credit by historical zonal capacity prices to arrive at capacity value.

For more information, see Berkeley Lab's publication: "Solar-to-Grid: Trends in System Impacts, Reliability, and Market Value in the United States with Data Through 2020." *https://emp.lbl.gov/renewable-grid-insights*

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For more information

Explore this report deck, a written technical brief, an extensive workbook with all underlying data, and interactive visualizations: http://utilityscalesolar.lbl.gov

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Contact the corresponding authors:

Mark Bolinger (MABolinger@lbl.gov)

Joachim Seel (JSeel@lbl.gov)

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NEVADA DEPARTMENT OF TAXATION
Division of Local Government Services

PERSONAL PROPERTY MANUAL:

VALUATION GUIDELINES

2023-2024

Personal Property Manual: Valuation Guidelines 2023-2024

Department of Taxation
Division of Local Government Services
1550 College Parkway, Suite 144
Carson City, NV 89706
Phone 775.684.2100 ● Fax 775.684.2020

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INTRODUCTION

2023-24 PERSONAL PROPERTY MANUAL – VALUATION GUIDELINES

The schedules presented herein are interpretive guidelines for use by county assessors to establish taxable value, pursuant to the requirements of NRS 361.227(4) and NAC 361.1365 and 361.1375.

CLASSIFICATION OF PROPERTY

Personal property is defined in NRS 361.030 and includes (j) "all property of whatever kind or nature, except vehicles as defined in NRS 371.020, not included in the term "real estate." Real estate is defined in NRS 361.035, and includes land, houses, buildings, fences, ditches, structures,[1] erections, railroads, other improvements, and property rights. Real property is further defined in NAC 361.11715 as land, fixtures, improvements; on-site enhancements; and any rights, interests, benefits and privileges belonging or attached to the land.

NRS 361.333 requires that each major class of property be examined to determine whether there is equality of assessment. Uniformity and equality of assessment thus depend on proper classification. Although NRS 361.035 defines real estate and NRS 361.030 defines personal property, in practice it is sometimes difficult to tell whether an item is personal or real property. As the Attorney General stated in Opinion #41 (1963), "the classification depends on the facts of each particular case." The assessor is encouraged to consult the Division of Local Government Services and/or the District Attorney in difficult cases.

All references to statutes and regulations may be found in Appendix A of this Manual.

EXEMPT PROPERTY

NRS 361.050 through NRS 361.187 provide exemptions for assorted types of eligible property, including household goods; business inventories; property in transit; property owned by government entities, charitable organizations or veterans; and fine art for display.

Additionally, NRS 361.228(1) provides that

All intangible personal property is exempt from taxation, including, without limitation:

(a) Shares of stock, bonds, mortgages, notes, bank deposits, book accounts such as an acquisition adjustment and credits, and securities and chooses in action of like character; and

(b) Goodwill, customer lists, contracts and contract rights, patents, trademarks, trade names, custom computer programs, copyrights, trade secrets, franchises and licenses.

A complete discussion of exemptions and a cross-reference table is included in Appendix D of this manual.

[1] Structures include self-supporting structures other than buildings which carry gravity loads and resist the effects of earthquakes. They are generally not designed for continuous human occupancy and may be open to the environment, part of landscape design elements, or part of infrastructure systems (transport, water, energy). Examples of non-building structures include silos, chimneys, stacks, cooling towers, bins and hoppers, amusement structures, and monuments. *See American Society of Civil Engineers, "Minimum Design Loads for Buildings and Other Structures;" Revision of ASCE Standard 7-98, SEI/ASCE 7-02, 2nd Edition, Section 9.14, Nonbuilding Structures, p. 186. See also Bachman, Robert and Susan Dowty, "Nonstructural Component or Nonbuilding Structure," originally published in Building Safety Journal (April-May, 2008).*

PROCEDURES FOR DETERMINING TAXABLE VALUE

To calculate the taxable value of personal property, NAC 361.1371 and NAC 361.1375 require the assessor to determine four input values:

- Acquisition cost
- Acquisition year
- Expected life, and
- Cost conversion factor

The personal property declaration submitted by the taxpayer pursuant to NRS 361.265 should list the acquisition cost for each item and the year acquired. The declaration should also contain sufficient information to identify each item's industry classification (NAICS code), property type, and corresponding expected life.

Acquisition Cost

For personal property mobile or manufactured homes, acquisition cost means replacement cost when new, which equals the retail selling price to the original owner. For other types of personal property including billboards, acquisition cost means the actual cost of property to its present owner. For all personal property, acquisition cost includes any expense required to place the asset into service except sales tax--including all charges for transportation, installation, accessories, and profit and overhead, as well as additions to or renovations of the property other than routine maintenance or repairs. Observe, however, that the cost of manufactured homes does not include appurtenant improvements like outbuildings, decks, or paving. The assessor should value these separately as real property and depreciate as appropriate.

Should a taxpayer fail to file a valid personal property declaration or sufficient data is not otherwise available for the assessor to establish acquisition cost, NRS 361.265 authorizes the assessor to make an estimate of the value of the property. NAC 361.139 further requires the assessor to estimate its acquisition cost using any nationally recognized valuation technique. Because NRS 361.265(5) defines failure to file a declaration as a misdemeanor, assessors should advise taxpayers to file complete, accurate, and timely personal property declarations. In addition, if the reported acquisition cost appears inconsistent with market data, the assessor may request documentation for the cost reported and may pursue penalties for perjury if necessary.

Acquisition Year

For mobile and manufactured homes, the acquisition year equals the year of the sale to the original owner, which often corresponds to the manufacturer's model year. For all other personal property, the acquisition year equals the year the current owner purchased or leased the property. Observe that the acquisition year remains constant at the year first sold for manufactured homes but resets to the year acquired each time billboards or equipment change owners.

Expected life

The Life Expectancy Guidelines section assigns typical asset lives to each major industrial classification grouped by NAICS code. For example, all industries classified as *Agriculture and Forestry (NAICS .11)* have 15 year lives, while *Mining (NAICS .21)* assigns a 20 year life to *Oil and Gas Exploration (NAICS .2111)* and a 15 year life to *Mining (NAICS .2121 & .2122)*.

Certain items within industries appear separately as Itemized Equipment with specific lives that may differ from the industry norm. For example, *Agriculture and Forestry* industries with a typical 15-year life expectancy also use specialized equipment whose asset lives equal 7, 10 or 20 years. To improve accuracy, assessors should employ the itemized equipment lives whenever they can assign a specific life expectancy to a particular item.

Having identified the industry classification for the subject account the assessor then assigns its appropriate NAICS code and corresponding expected lives to its assets. *See discussion on NAICS below for current requirements.*

Readers may also use the alphabetical listing of personal property by general type found in the Index of this Manual to locate the appropriate expected life for individual items. Because some industries use similar types of business equipment, like desks or computers, readers should select the NAICS classification that best describes the subject account.

Besides these NAICS Life Expectancy Guidelines, the Personal Property Manual also contains a Special Properties section with descriptions and asset life tables for:

- Short-life property subject to rapid obsolescence;
- Items similar to real property classified as personal, like mobile and manufactured homes or billboards;
- Generic business equipment found across many industries, like furniture and trade fixtures or computers; and
- Specialized assets like high-tech medical diagnostic equipment whose economic lives differ substantially from industry norms.

Cost Conversion Factors

Based on the acquisition cost, acquisition year and expected life for an item, the assessor should select the appropriate Cost Conversion Factor from the tables published in the Personal Property Manual.

Cost Conversion Factors contain three components: Cost Index, Age and Percent Good. To satisfy the requirement of NAC 361.1375(2) the department develops Paasche indexes for manufactured homes, billboards, and business equipment derived from pertinent Marshall Swift comparative cost multiplier tables, the West Urban, All Items CPI index, and the PPI Index for Capital Equipment, Stage of Processing. These indexes inflate replacement cost new expressed in acquisition year nominal dollars into replacement cost new expressed in current year nominal dollars.

Cost indexes do not apply to mobile and manufactured homes first sold prior to July 1, 1982, whose taxable value always equals 20% of their original selling price. Cost indexes for equipment and billboards do not accrue beyond their expected lives; such items have a constant residual cost conversion factor equal to their residual percent good multiplied by the residual year cost index.

To comply with NAC 361.130(2)(b), however, cost indexes do apply to mobile and manufactured homes first sold on or after July 1, 1982. Even though mobile homes fully depreciate after sixteen years, applying the cost index to the years between the current year minus 16 and 1982 may actually produce a temporary increase in taxable value.

NAC 361.1375(4)&(5) specify declining balance depreciation with a 5% residual (salvage value) for all property types except manufactured homes and billboards, which use straight line depreciation. Unless the Department has conducted a market study or has otherwise obtained information which indicates a different residual amount, the Department currently relies on a double declining balance method for all equipment and a 5% residual; 5% per year depreciation with a 20% residual for mobile homes (16 year life), and 1.5% per year depreciation with a 25% residual for billboards (50 year life).

Percent good equals (1 - accrued depreciation) for the given asset age, where age equals the current year (first year of the biennium) minus the acquisition year. For example, for the 2012-13 fiscal year, an asset acquired in 2005 has an age of seven years, a manufactured home first sold in 1992 has an age of twenty years. Although one could calculate depreciation directly, the tables reduce this process to a simple lookup.

To calculate taxable value using the Personal Property Manual, the assessor completes three steps:

- Select the appropriate expected life table,
- Look up the cost conversion factor for the given acquisition year and,
- Multiply the acquisition cost by the indicated cost conversion factor.

As usual, assessed value equals 35% of taxable value.

A NOTE ON NAICS

The North American Industry Classification System (*NAICS)* replaced the Standard Industrial Classification (SIC) in 1997. NAICS is based on a production-oriented concept, meaning that it groups establishments into industries according to similarity in the processes used to produce goods or services.

NAICS in the United States was designed for statistical purposes. However, NAICS is frequently used for various administrative, regulatory, contracting, taxation, and other non-statistical purposes.

For additional information and complete tables, readers may consult the US Census Bureau website http://www.census.gov/eos/www/naics/

The Department highly recommends assessors use the NAICS code on each personal property account. Use of the NAICS code will assist in the proper valuation of property pursuant to this Personal Property Manual because the NAICS code identifies the type of industry engaged in by the taxpayer.

In addition, the NAICS code is now a required component on the Statistical Analysis of the Roll Reports required by the Department in NRS 361.390 (3) in order to keep track of tax expenditures per NRS 360.137. For those concerned about the availability of the NAICS code to business taxpayers, use of the NAICS code will be widespread because taxpayers subject to the new Commerce Tax are required to provide the NAICS code. In addition, the NAICS code is required on applications for abatement to the Governor's Office on Economic Development and the Governor's Office on Renewable Energy. **The Department recommends assessors collect the NAICS code on Personal Property Declarations used by business taxpayers.**

2023-24 COST CONVERSION FACTORS

THREE (3) YEAR LIFE

NEVADA DEPARTMENT OF TAXATION

THREE (3) YEAR LIFE

200% DECLINING BALANCE

YEAR ACQUIRED	AGE	COST INDEX	PERCENT DEPRECIATION	PERCENT GOOD	CONVERSION FACTOR
2023	0	1.00	0.0	100.0	1.0000
2022	1	1.12	67.0	33.0	0.3696
2021	2	1.15	89.0	11.0	0.1265
2020	3	1.16	95.0	5.0	0.0580
Residual		1.16	95.0	5.0	0.0580

NEVADA DEPARTMENT OF TAXATION

FIVE (5) YEAR LIFE

200% DECLINING BALANCE

YEAR ACQUIRED	AGE	COST INDEX	PERCENT DEPRECIATION	PERCENT GOOD	CONVERSION FACTOR
2023	0	1.00	0.0	100.0	1.0000
2022	1	1.12	40.0	60.0	0.6720
2021	2	1.15	64.0	36.0	0.4140
2020	3	1.16	78.0	22.0	0.2552
2019	4	1.18	87.0	13.0	0.1534
2018	5	1.22	95.0	5.0	0.0610
Residual		1.22	95.0	5.0	0.0610

NEVADA DEPARTMENT OF TAXATION

SEVEN (7) YEAR LIFE

200% DECLINING BALANCE

YEAR ACQUIRED	AGE	COST INDEX	PERCENT DEPRECIATION	PERCENT GOOD	CONVERSION FACTOR
2023	0	1.00	0.0	100.0	1.0000
2022	1	1.12	29.0	71.0	0.7952
2021	2	1.15	49.0	51.0	0.5865
2020	3	1.16	64.0	36.0	0.4176
2019	4	1.18	74.0	26.0	0.3068
2018	5	1.22	81.0	19.0	0.2318
2017	6	1.24	88.0	12.0	0.1488
2016	7	1.26	95.0	5.0	0.0630
Residual		1.26	95.0	5.0	0.0630

NEVADA DEPARTMENT OF TAXATION

TEN YEAR LIFE

200% DECLINING BALANCE

YEAR ACQUIRED	AGE	COST INDEX	PERCENT DEPRECIATION	PERCENT GOOD	CONVERSION FACTOR
2023	0	1.00	0.0	100.0	1.0000
2022	1	1.12	20.0	80.0	0.8960
2021	2	1.15	36.0	64.0	0.7360
2020	3	1.16	49.0	51.0	0.5916
2019	4	1.18	59.0	41.0	0.4838
2018	5	1.22	67.0	33.0	0.4026
2017	6	1.24	74.0	26.0	0.3224
2016	7	1.26	79.0	21.0	0.2646
2015	8	1.27	84.0	16.0	0.2032
2014	9	1.28	90.0	10.0	0.1280
2013	10	1.30	95.0	5.0	0.0650
Residual		1.30	95.0	5.0	0.0650

NEVADA DEPARTMENT OF TAXATION

15 YEAR LIFE

200% DECLINING BALANCE

YEAR ACQUIRED	AGE	COST INDEX	PERCENT DEPRECIATION	PERCENT GOOD	CONVERSION FACTOR
2023	0	1.00	0.0	100.0	1.0000
2022	1	1.12	13.0	87.0	0.9744
2021	2	1.15	25.0	75.0	0.8625
2020	3	1.16	35.0	65.0	0.7540
2019	4	1.18	44.0	56.0	0.6608
2018	5	1.22	51.0	49.0	0.5978
2017	6	1.24	58.0	42.0	0.5208
2016	7	1.26	63.0	37.0	0.4662
2015	8	1.27	68.0	32.0	0.4064
2014	9	1.28	72.0	28.0	0.3584
2013	10	1.30	76.0	24.0	0.3120
2012	11	1.32	80.0	20.0	0.2640
2011	12	1.35	84.0	16.0	0.2160
2010	13	1.38	87.0	13.0	0.1794
2009	14	1.39	91.0	9.0	0.1251
2008	15	1.42	95.0	5.0	0.0710
Residual		1.42	95.0	5.0	0.0710

NEVADA DEPARTMENT OF TAXATION

20 YEAR LIFE

200% DECLINING BALANCE

YEAR ACQUIRED	AGE	COST INDEX	PERCENT DEPRECIATION	PERCENT GOOD	CONVERSION FACTOR
2023	0	1.00	0.0	100.0	1.0000
2022	1	1.12	10.0	90.0	1.0080
2021	2	1.15	19.0	81.0	0.9315
2020	3	1.16	27.0	73.0	0.8468
2019	4	1.18	34.0	66.0	0.7788
2018	5	1.22	41.0	59.0	0.7198
2017	6	1.24	47.0	53.0	0.6572
2016	7	1.26	52.0	48.0	0.6048
2015	8	1.27	57.0	43.0	0.5461
2014	9	1.28	61.0	39.0	0.4992
2013	10	1.30	65.0	35.0	0.4550
2012	11	1.32	69.0	31.0	0.4092
2011	12	1.35	72.0	28.0	0.3780
2010	13	1.38	75.0	25.0	0.3450
2009	14	1.39	78.0	22.0	0.3058
2008	15	1.42	80.0	20.0	0.2840
2007	16	1.47	83.0	17.0	0.2499
2006	17	1.57	86.0	14.0	0.2198
2005	18	1.62	89.0	11.0	0.1782
2004	19	1.65	92.0	8.0	0.1320
2003	20	1.68	95.0	5.0	0.0840
Residual		1.68	95.0	5.0	0.0840

NEVADA DEPARTMENT OF TAXATION

30 YEAR LIFE

200% DECLINING BALANCE

YEAR ACQUIRED	AGE	COST INDEX	PERCENT DEPRECIATION	PERCENT GOOD	CONVERSION FACTOR
2023	0	1.00	0.0	100.0	1.0000
2022	1	1.12	7.0	93.0	1.0416
2021	2	1.15	13.0	87.0	1.0005
2020	3	1.16	19.0	81.0	0.9396
2019	4	1.18	24.0	76.0	0.8968
2018	5	1.22	29.0	71.0	0.8662
2017	6	1.24	34.0	66.0	0.8184
2016	7	1.26	38.0	62.0	0.7812
2015	8	1.27	42.0	58.0	0.7366
2014	9	1.28	46.0	54.0	0.6912
2013	10	1.30	50.0	50.0	0.6500
2012	11	1.32	53.0	47.0	0.6204
2011	12	1.35	56.0	44.0	0.5940
2010	13	1.38	59.0	41.0	0.5658
2009	14	1.39	62.0	38.0	0.5282
2008	15	1.42	64.0	36.0	0.5112
2007	16	1.47	67.0	33.0	0.4851
2006	17	1.57	69.0	31.0	0.4867
2005	18	1.62	71.0	29.0	0.4698
2004	19	1.65	73.0	27.0	0.4455
2003	20	1.68	75.0	25.0	0.4200
2002	21	1.70	77.0	23.0	0.3910
2001	22	1.71	79.0	21.0	0.3591
2000	23	1.74	81.0	19.0	0.3306
1999	24	1.78	83.0	17.0	0.3026
1998	25	1.81	85.0	15.0	0.2715
1997	26	1.84	87.0	13.0	0.2392
1996	27	1.87	89.0	11.0	0.2057
1995	28	1.91	91.0	9.0	0.1719
1994	29	1.95	93.0	7.0	0.1365
1993	30	2.04	95.0	5.0	0.1020
Residual		2.04	95.0	5.0	0.1020

NEVADA DEPARTMENT OF TAXATION

MOBILE HOMES SOLD ON OR AFTER JULY 1, 1982

16 YEAR STRAIGHT LINE

YEAR FIRST SOLD	AGE	COST INDEX	PERCENT DEPRECIATION	PERCENT GOOD	CONVERSION FACTOR
2023	0	1.00	0.0	100.0	1.0000
2022	1	1.13	5.0	95.0	1.0735
2021	2	1.18	10.0	90.0	1.0620
2020	3	1.20	15.0	85.0	1.0200
2019	4	1.26	20.0	80.0	1.0080
2018	5	1.29	25.0	75.0	0.9675
2017	6	1.30	30.0	70.0	0.9100
2016	7	1.30	35.0	65.0	0.8450
2015	8	1.30	40.0	60.0	0.7800
2014	9	1.34	45.0	55.0	0.7370
2013	10	1.37	50.0	50.0	0.6850
2012	11	1.43	55.0	45.0	0.6435
2011	12	1.47	60.0	40.0	0.5880
2010	13	1.53	65.0	35.0	0.5355
2009	14	1.59	70.0	30.0	0.4770
2008	15	1.53	75.0	25.0	0.3825
2007	16	1.55	80.0	20.0	0.3100
2006	17	1.57	80.0	20.0	0.3140
2005	18	1.66	80.0	20.0	0.3320
2004	19	1.79	80.0	20.0	0.3580
2003	20	1.83	80.0	20.0	0.3660
2002	21	1.90	80.0	20.0	0.3800
2001	22	1.91	80.0	20.0	0.3820
2000	23	1.93	80.0	20.0	0.3860
1999	24	1.93	80.0	20.0	0.3860
1998	25	1.95	80.0	20.0	0.3900
1997	26	1.96	80.0	20.0	0.3920
1996	27	1.97	80.0	20.0	0.3940
1995	28	2.08	80.0	20.0	0.4160
1994	29	2.20	80.0	20.0	0.4400
1993	30	2.22	80.0	20.0	0.4440
1992	31	2.23	80.0	20.0	0.4460
1991	32	2.29	80.0	20.0	0.4580

Continued on next page …

NEVADA DEPARTMENT OF TAXATION

MOBILE HOMES SOLD ON OR AFTER JULY 1, 1982

16 YEAR STRAIGHT LINE (Continued)

YEAR FIRST SOLD	AGE	COST INDEX	PERCENT DEPRECIATION	PERCENT GOOD	CONVERSION FACTOR
1990	33	2.44	80.0	20.0	0.4880
1989	34	2.45	80.0	20.0	0.4900
1988	35	2.51	80.0	20.0	0.5020
1987	36	2.59	80.0	20.0	0.5180
1986	37	2.67	80.0	20.0	0.5340
1985	38	2.77	80.0	20.0	0.5540
1984	39	2.70	80.0	20.0	0.5400
1983	40	2.70	80.0	20.0	0.5400
Residual		1.00	80.0	20.0	0.2000[2]

[2] For Mobile Homes Sold On or Before July 1, 1982.

NEVADA DEPARTMENT OF TAXATION
BILLBOARDS
50 YEAR STRAIGHT LINE

YEAR ACQUIRED	AGE	COST INDEX	PERCENT DEPRECIATION	PERCENT GOOD	CONVERSION FACTOR
2023	0	1.01	0.0	100.0	1.0100
2022	1	1.02	1.5	98.5	1.0047
2021	2	1.12	3.0	97.0	1.0864
2020	3	1.18	4.5	95.5	1.1269
2019	4	1.19	6.0	94.0	1.1186
2018	5	1.22	7.5	92.5	1.1285
2017	6	1.26	9.0	91.0	1.1466
2016	7	1.29	10.5	89.5	1.1546
2015	8	1.29	12.0	88.0	1.1352
2014	9	1.31	13.5	86.5	1.1332
2013	10	1.33	15.0	85.0	1.1305
2012	11	1.36	16.5	83.5	1.1356
2011	12	1.40	18.0	82.0	1.1480
2010	13	1.43	19.5	80.5	1.1512
2009	14	1.42	21.0	79.0	1.1218
2008	15	1.45	22.5	77.5	1.1238
2007	16	1.50	24.0	76.0	1.1400
2006	17	1.56	25.5	74.5	1.1622
2005	18	1.63	27.0	73.0	1.1899
2004	19	1.73	28.5	71.5	1.2370
2003	20	1.80	30.0	70.0	1.2600
2002	21	1.83	31.5	68.5	1.2536
2001	22	1.86	33.0	67.0	1.2462
2000	23	1.89	34.5	65.5	1.2380
1999	24	1.96	36.0	64.0	1.2544
1998	25	1.98	37.5	62.5	1.2375
1997	26	2.02	39.0	61.0	1.2322
1996	27	2.05	40.5	59.5	1.2198
1995	28	2.08	42.0	58.0	1.2064

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NEVADA DEPARTMENT OF TAXATION

BILLBOARDS

50 YEAR STRAIGHT LINE (Continued)

YEAR ACQUIRED	AGE	COST INDEX	PERCENT DEPRECIATION	PERCENT GOOD	CONVERSION FACTOR
1994	29	2.14	43.5	56.5	1.2091
1993	30	2.25	45.0	55.0	1.2375
1992	31	2.31	46.5	53.5	1.2359
1991	32	2.37	48.0	52.0	1.2324
1990	33	2.45	49.5	50.5	1.2373
1989	34	2.52	51.0	49.0	1.2348
1988	35	2.59	52.5	47.5	1.2303
1987	36	2.64	54.0	46.0	1.2144
1986	37	2.70	55.5	44.5	1.2015
1985	38	2.77	57.0	43.0	1.1911
1984	39	2.87	58.5	41.5	1.1911
1983	40	2.98	60.0	40.0	1.1920
1982	41	3.15	61.5	38.5	1.2128
1981	42	3.43	63.0	37.0	1.2691
1980	43	3.76	64.5	35.5	1.3348
1979	44	4.12	66.0	34.0	1.4008
1978	45	4.43	67.5	32.5	1.4398
1977	46	4.85	69.0	31.0	1.5035
1976	47	5.26	70.5	29.5	1.5517
1975	48	5.69	72.0	28.0	1.5932
1974	49	6.33	73.5	26.5	1.6775
1973	50	6.88	75.0	25.0	1.7200
Residual		6.88	75.0	25.0	1.7200

SHORT-LIFE PROPERTY

Expected Life .....Three (3) years

Short-Life Property consists of items prone to rapid obsolescence or susceptible to breakage, loss or abnormal wear and tear. Examples include:

Linens	Uniforms
Glassware	Pots, Pans, Utensils
Barware	Motion Picture Prints
Silverware	Rental Video Tapes, DVDs, CDs

Jigs, Dies, and Molds

Patterns, jigs, dies and molds fall into this category when the type of product manufactured, industry class, use of caustic chemicals, or physical deterioration associated with production volume act to shorten their useful lives and thus require their frequent replacement. Examples include injection molds for plastic parts of high-tech devices or dies used in heavy equipment production.

Ideally, assessors should identify the industrial application and determine the actual service lives of equipment used in current production from owner declarations or surveys of average lives from individual manufacturers before classifying such property as Short-life.

Digital Cameras

Digital cameras fall into two basic categories: professional and snapshot. In recent years, consumer-grade, digital snapshot and video cameras have become a generic commodity. They offer small, flimsy LCD monitors, low image resolution, and lack advanced features like interchangeable lenses. Only snapshot cameras qualify as Short-life property.

INFORMATION SYSTEMS

Life expectancies for computers and peripherals fall into four broad categories:

PCs , tablets, and associated peripherals .....Three (3) years
Mini-computers (AS 400, VAX) .....Three (3) years
Servers ..... Five (5) years
Mainframe computers (IBM 360).....Seven (7) years

An information system consists of computers and peripheral equipment used for processing normal business transactions and the maintenance, retrieval, and analysis of business records.

A computer functions as a programmable, electronically-activated device capable of accepting information, applying prescribed processes to the information, and supplying the results of these processes with or without human intervention. It usually contains a central processing unit that provides storage, logic, arithmetic, and control capabilities. Observe that adding machines and electronic calculators do not fall into this category.

To assign appropriate expected lives to computing equipment, assessors need to recognize the differences among mainframes, servers, client computers and personal computers.

Recent advances in computing technology make differentiating mainframes, minicomputers and servers difficult, especially for laymen. When in doubt, consult manufacturer marketing divisions, service literature, or websites to determine how they classify their various product lines.

A mainframe serves as a high-performance computer used for large-scale computing environments that demand greater availability and security than smaller-scale machines can offer. Banks, government agencies, insurance companies, credit card companies, and other organizations that perform massive transaction processing typically use mainframe systems. It is also possible to obtain a server which contains many "blades," each of which is used for a single application.[2] Currently, there are blade servers that have as many as 160 blades.

Mainframes should not be confused with servers, or with a server that uses software to spin off many virtual servers, each with its own computer operating system. Servers usually cost considerably more than personal computers, have more processing power and substantial amounts of computer memory. They are therefore significantly more expensive than most personal computers and they are often kept in service longer than personal computers. Servers are often dedicated to specific tasks like

- Transaction processing (On Line Transaction or OLT servers)
- print queuing and printing (print server)
- running mission critical software, clustering, fail-over and load-balancing (application server)
- audio and video transmission (audio video server)
- exchanging short bursts of written information and opinions in an environment that offers real-time discussions (chat servers)
- sending and receiving faxes without using fax machines (fax server)
- File Transfer Protocol – moving files between computers while providing security and, organization, and transfer control (FTP server)

Historically, mainframes have been associated with centralized rather than distributed computing, although that distinction has blurred as smaller computers become more powerful and mainframes become more multi-purpose. Today, mainframes can serve both distributed users and smaller servers in computing networks. Interestingly, a mainframe actually resides within a server box.

[2] A major advantage of a blade server is that it dramatically reduces cabling requirements.

A key distinguishing feature of a mainframe is that it takes computing power away from end users and puts it in a central location. Another way to visualize a mainframe is to think of the computer as a super server, with multiple operating systems.

Here is a link to the Family Tree And Chronology of some of the older IBM Mainframes. This link will take you to the IBM page for System Z Mainframes.

By comparison, minicomputers are stand-alone computers (computer systems with attached terminals and other devices) sold to small and mid-size businesses for general business applications and to large enterprises for department-level operations. In recent years, the minicomputer has evolved into the "mid-range server" and is part of a network. IBM's AS/400e is a good example.

Peripheral equipment consists of the auxiliary machines which are designed to be placed under the control of a central processing unit. Peripheral equipment may include card readers, card punches, mass storage units, paper tape equipment, keypunches, data-entry devices, teleprinters, terminals, tape drives, disc drives, disc files, disc packs, visual image projector tubes, card sorters, plotters, collators, small inkjet printers, small laser printers, and small desktop all-in-one devices (e.g. printer/fax/scanner combination) that are sold as commodities in retail outlets and which are rapidly replaced as faster machines with new features are added.

Although one could classify computers by processor architecture, number of users supported, total system throughput, etc, ultimately the classification boils down to total system cost and the total time required to amortize the assets. Again, taxpayer records that reveal the actual service lives and disposition values of their own data processing equipment provide the best source of verifiable market data.

TAXABLE SOFTWARE (NOT ASSOCIATED WITH COMPUTER-INTEGRATED MACHINERY)

Taxable Software not associated with computer-integrated machinery..... Three (3) year life
Nevada law treats standard, prewritten software programs as tangible personal property.[3] A standard prewritten program, often called canned or off-the-shelf software, means a generic application not originally developed and produced for a specific user. This includes any programs, procedures, rules, and associated documentation pertaining to the operation of a computer system. Custom software programs consist of original, one-of-a-kind computer applications developed under contract exclusively for the particular requirements of a specific user. Custom computer programs qualify as exempt intangible personal property pursuant to NRS 361.228.

[3] **According to the IRS, "**Computer software is not a section 197 intangible even if acquired in connection with the acquisition of a business, if it meets all of the following tests.

- It is readily available for purchase by the general public.
- It is subject to a nonexclusive license.
- It has not been substantially modified.

If the software meets the tests above, it can be depreciated and may qualify for the section 179 expense deduction and the special depreciation allowance (if applicable)." http://www.irs.gov/publications/p225/ch07.html

COMPUTER-INTEGRATED MACHINERY

Expected Life: .....Seven (7) years

Computer integrated machinery, including its integrated programming or software, exhibits the following characteristics:

- The machinery and computer sell as a single unit
- The machinery cannot operate without the computer and the computer cannot perform functions outside the machinery.
- The components of the computer form an integral, structural part of the equipment itself; it is not economically or functionally feasible to replace the computer without replacing the entire machine.
- For income tax purposes, depreciation accrues to the total cost of the machine and computer as a unit.
- The capabilities of the machine cannot be expanded by substituting a more complex computer for the original.
- Embedded programming or pre-loaded software designed primarily for the function of the machine into which it is integrated runs the computer.

Examples of computer-integrated machinery include computer driven mills; computer integrated manufacturing machinery; computer integrated fabrication machinery; computerized machine lathes; and computerized assembly machinery.

COMPUTERIZED EQUIPMENT

Expected Life:

Free-standing computer system ..... Seven (7) years or
Generic personal computer .....Three (3) years
Equipment component.....NAICS industry class life

This category includes machines controlled by computers that sell as a separate unit from the machine and can perform additional functions outside the machine. The assessor should assign expected lives to the two components separately; the computer equipment has the same expected life as similar computer equipment; the machinery has the expected life assigned to its specific industry.

Examples Include:

Computerized Machine Lathes,
Computerized Assembly Machinery,
Cash Management Systems,
3-D Printers.

HIGH-TECH MEDICAL DIAGNOSTIC EQUIPMENT

Expected Life: ..... Five (5) years

High-tech medical diagnostic equipment exhibits these characteristics:

- Used in medical or dental facilities;
- Subject to accelerated functional and economic obsolescence caused by rapid technological development.

Examples include:

Cardiac Ultrasonic Scanners
CAT (Comp Tomography) Scanners
Diagnostic Ultrasounds
General Ultrasonic Scanners
MRI (Magnetic) Scanners
Nuclear Medicine Cameras
OB/GYN Ultrasonic Scanners
PET Scanners (Positron Emission)
All Portable Units of Same

HIGH-TECH ELECTRONIC MEDICAL EQUIPMENT

Expected Life:

Cardiac laser units .....Three (3) years
Other items .....Seven (7) years

High-tech electronic medical equipment exhibits these characteristics:

- Used in medical or dental facilities;
- Subject to accelerated functional and economic obsolescence caused by rapid technological development.

Examples include patient monitors of all kinds:

Anesthesia Monitors, Machines and Devices
Apnea Monitors
Blood Pressure Monitors
Chart Recorders
Defibs
Dopplers
EEG Machines
EKG Machines
External Pace Makers
Heart Rate Devices
Medical Laser Units
Neurological Monitors
Oximeters
Oxygen Analyzers
Spirometers
Systolic Monitors
Temperature Monitors

OFFICE FURNITURE, RETAIL SALES EQUIPMENT, OTHER

This category includes furniture and equipment that can be found across industries.

Description	Life in Years
Air Conditioners	15
Air Conditioners, Window	7
Cash Registers (electronic)	7
Coin-wrap Equipment	15
Copy and Duplicating Machines	5
Cabinets and Shelving	15
Check-out Counters	15
Data Processing Equipment (See Also Information Systems)	7
Décor	15
Displays, Cases, and Racks	15
Mailing Machines	7
Office Furniture (Desks, Chairs, Filing Cabinets)	15
Office Kitchen Appliances (Microwave ovens, refrigerators)	15
POS – Point-of-Sale Computer Systems[4]	7
Signs[5] (Other than billboards and electronic)	15
Signs, Electronic	7
Sound Systems (background and public address)	7

MOBILE OR MANUFACTURED HOMES

This section applies only to mobile or manufactured homes classified as personal property. Pursuant to NRS 361.561, those units identified as a "travel trailer," "utility trailer" and "van conversion," in chapter 482 of NRS and any other vehicle required to be registered with the department of motor vehicles and public safety are subject to property tax unless registered and taxed pursuant to Chapter 371 of NRS. Such unregistered units and vehicles must be taxed in the manner provided in NRS 361.562 to 361.5644, inclusive.

The sticker issued pursuant to NRS 361.5643 must be affixed to a mobile or manufactured home in such a way that the sticker is clearly visible from the street. The window decal is not required for licensed mobile units or on units considered real property and may be issued at the option of the county assessor.

[4] Point-of-Sale systems include all peripherals and handheld devices used to take electronic payments or to collect related data with the exception of smartphones, tablets and POS tablets. Smartphones, tablets and POS tablets should be given a three-year life.

[5] See Appendix F to determine whether signs are real or personal property. Personal property signs include vinyl and fabric banners and sign-waving mannequins.

NRS 361.325(3) segregates mobile homes into two different categories for assessment purposes based on age. Mobile homes sold on or after July 1, 1982 shall be classified according to those factors which most closely determine their useful lives. In establishing the value of other mobile homes, the commission shall begin with the retail selling price and depreciate it by 5 percent per year, but not below 20 percent of its original amount. The assessment ratio in all cases is 35 percent of the computed taxable values. See NAC 361.130 for additional information on the calculation of value for mobile homes.

Depreciation schedules and cost conversion factors apply to the 2022-23 secured and unsecured tax rolls. The 2022-23 Cost Conversion Index for Mobile or Manufactured Homes appears on page 8 of this Manual.

BILLBOARDS

NRS 361.013 defines a billboard as ". . . a sign that directs attention to a business, commodity, service, entertainment or attraction that is sold, offered or exists at a location other than the premises on which the sign is located."

NRS 361.227 requires that depreciation of a billboard must be calculated at 1.5 percent of the cost of replacement for each year after the year of acquisition of the billboard, up to a maximum of 50 years. Additional information on the calculation of billboards may be found in NAC 361.1305.

Depreciation schedules and cost conversion factors apply to the 2022-2023 secured and unsecured tax rolls. The 2022-23 Cost Conversion Index for Billboards may be found on page 9 of this manual.

LIFE EXPECTANCY GUIDELINES

NAICS Industry Code	Description	Life in Years

11 AGRICULTURE AND FORESTRY

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

111 Crop Production 15

Personal property includes machinery and equipment such as tractors, combines, hay balers, forage harvesters, unlicensed farm vehicles including utility trailers, wagons and utensils used to grow crops mainly for food and fiber. The subsection comprises establishments, such as farms, orchards, groves, greenhouses, and nurseries, primarily engaged in growing crops, plants, vines, or trees (including Christmas trees) and their seeds.

Itemized Equipment

Fertilizer Distribution 10

Laser sending and receiving equipment 10

Seed cleaning machinery and equipment 20

Seed cleaning equipment – portable 10

112 Animal Production 15

Personal property includes machinery and equipment used to raise or fatten animals for the sale of animals or animal products. The subsection comprises establishments, such as ranches, farms, and feedlots primarily engaged in keeping, grazing, breeding, or feeding animals. These animals are kept for the products they produce or for eventual sale.

Itemized Equipment

1125 Animal Aquaculture, including nets and pens 7

11212 Dairy Production 15

1123 Egg Packing Equipment 20

113 Forestry and Logging 15

Personal property includes machinery and equipment used to: (1) cut timber; (2) cut and transport timber; and (3) produce wood chips in the field, including stationary saw mills, skidders, and log loaders.

Itemized Equipment

Chain saws 7

Portable saw mill 7

21 MINING

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

2111 Oil and Gas Extraction 20

Personal property used in oil and gas extraction are used to explore for crude petroleum and natural gas. A typical example of personal property in this category would include inventory and spare parts.

Itemized Equipment

Bolted and fiberglass tanks 15
Drilling rigs 15
Heaters, treaters, knockout dryer, separators, conditioning equipment 15
LACT units, metering devices, manifolds 15
Motors, engines, drive units 10
Secondary recovery (injection pumps, re-pressure equipment) 15
Transformers 30

2122 Metal Ore Mining 15

Personal property used in developing the mine site, mining or quarrying dimension stone. A typical example of personal property in this category would include inventory and spare parts.

Itemized Equipment

Oxygen generation 20
Mobile equipment, heavy use* 7

2123 Nonmetallic mineral mining and quarrying 15

Personal property used in developing the mine site, mining or quarrying dimension stone. A typical example of personal property in this category would include inventory and spare parts.

* Heavy use is defined as in operation for more than one shift per day, seven days a week. Mining mobile equipment eligible for this category includes haul packs, loaders, shovels, dozers, graders, backhoes, drilling trucks, and excavators.

22 UTILITIES

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

2211 Electric Power Generation, Transmission, and Distribution 30

Personal property used in generating, transmitting, and/or distributing electric power. A typical example of personal property in this category would include inventory and spare parts.

2212 Natural Gas Distribution 30

Personal property used in (1) operating gas distribution systems (e.g., mains, meters); (2) establishments known as gas marketers that buy gas from the well and sell it to a distribution system; (3) establishments known as gas brokers or agents that arrange the sale of gas over gas distribution systems operated by others; and (4) establishments primarily engaged in transmitting and distributing gas to final consumers. A typical example of personal property in this category would include inventory and spare parts.

2213 Water, Sewage, and Other Systems 30

Personal property used in establishments primarily engaged in operating water treatment plants and/or operating water supply systems. A typical example of personal property in this category would include inventory and spare parts.

221330 Steam and Air-Conditioning Supply 30

Personal property used in providing steam, heated air, or cooled air. A typical example of personal property in this category would include inventory and spare parts.

23 CONSTRUCTION

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

236 Construction of Buildings 15

237 Heavy and civil engineering construction 15

238 Specialty Trade construction 15

Personal property used primarily in the construction of buildings, major engineering projects such as highways and dams, and specialty trades such as pouring concrete, site preparation, plumbing, painting, and electrical work. Includes fixed load and mobile equipment such as:

Air compressors

Motor graders/leveling graders

238 **Specialty Trade construction Cont.**

Air drills
Asphalt plants
Asphalt spreaders
Backhoe/loaders
Carryalls
Cement mixers/spreaders
Crusher/crushing plant
Roadrollers/sheepsfoot rollers
Crawler cranes/ tractors
Ditchers/diggers
Earthmoving scrapers
Excavators
Fork lifts
Front end loaders / bucket loaders
Mixmobiles
Paving equipment
Portable shop
Portable storage bins
Portable storage tanks
Power hoists
Power shovels
Sand classifiers and drags
Scarifiers and rollers
Scrap metal balers
Scrubber screens and plant feeders
Welder
Wiring Equipment

Other Itemized Equipment

Cranes

Bridge 20
Jib 20
Mobile Telescopic 10
Electric generating equipment 20
Electronic controlled infrared/laser instruments 10
Power tools (saws, drills, etc.) 7
Hand tools 7
Mobile equipment, heavy use[6] 7

[6] Heavy use is defined as in operation for more than one shift per day, seven days a week

31 MANUFACTURING

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

311 Food 15

Personal property used in this industry transform livestock and agricultural products into products for intermediate or final consumption. The food products manufactured in these establishments are typically sold to wholesalers or retailers for distribution to consumers, but establishments primarily engaged in retailing bakery and candy products made on the premises not for immediate consumption are included. Includes equipment such as walk-in coolers, freezers and other refrigeration, grain tanks, bottling and canning equipment in the following industries:

3111	Animal food manufacturing
3112	Grain and oil seed milling
3113	Sugar and confectionery product manufacturing
3114	Fruit and vegetable preserving and specialty food manufacturing
31141	Frozen food manufacturing
31142	Fruit and vegetable canning
3115	Dairy product manufacturing
3116	Animal slaughtering and processing
3117	Seafood product preparation and packaging
3118	Bakeries and tortilla manufacturing
311811	Retail bakeries
311812	Commercial bakeries
3119	Other food manufacturing, such as honey processing

Itemized Equipment

Cereal manufacturing 20

Grain elevators, non-farm 20

Mechanical portion of packing and sorting line equipment 2nd view 30

Electronic portion of line equipment[7] 10

312 Beverage and Tobacco Product Manufacturing 15

Personal property used to manufacture beverages and tobacco products. Please note that ice manufacturing, while not a beverage, is included with nonalcoholic beverage manufacturing because it uses the same production process as water purification.

[7] If electronic component's original cost cannot be separated from other line assets, use 20 years.

312 **Beverage and Tobacco Product Manufacturing Cont.**

Manufacturing processes include:

31211 Soft drink manufacturing

31212 Breweries

31213 Wineries

31214 Distilleries

Itemized Equipment

Cold Storage and Ice-making equipment 20

313 **Textile Mills** 15

Personal property used in the main processes in this industry which include preparation and spinning of fiber, knitting or weaving of fabric, and the finishing of the textile.

314 **Textile Product** 15

Personal property used in creation of textile products. With a few exceptions, processes used in this industry are generally cut and sew (i.e., purchasing fabric and cutting and sewing to make non-apparel textile products, such as sheets and towels).

315 **Apparel Manufacturing** 15

Personal property used in the Apparel Manufacturing industry. This industry includes a diverse range of establishments manufacturing full lines of ready-to-wear apparel and custom apparel: apparel contractors, performing cutting or sewing operations on materials owned by others; jobbers performing entrepreneurial functions involved in apparel manufacture; and tailors, manufacturing custom garments for individual clients.

316 **Leather and Allied Product Manufacturing** 15

Personal property used to transform hides into leather by tanning or curing and fabricating the leather into products for final consumption. It also includes the manufacture of similar products from other materials, including products (except apparel) made from "leather substitutes," such as rubber, plastics, or textiles It includes dyeing or dressing furs.

321 **Wood Product Manufacturing** 15

The production processes of the Wood Product Manufacturing sub sector include sawing, planing, shaping, laminating, and assembling of wood products starting from logs that are cut into bolts, or lumber that then may be further cut, or shaped by lathes or other shaping tools. The lumber or other transformed wood shapes may also be subsequently planed or smoothed, and assembled into finished products, such as wood containers.

322 Paper Manufacturing 15

3221 Pulp, paper and paperboards mills 15

Personal property used in the manufacturing of pulp and involves separating the cellulose fibers from other impurities in wood or used paper. The manufacturing of paper involves matting these fibers into a sheet.

3222 Converted Paper Product Manufacturing 15

Personal property used in the manufacture of paperboard containers including corrugating, cutting, and shaping machinery to form paperboard into containers. Paper bag and coated and treated paper manufacturing establishments cut and coat paper and foil. Stationery product manufacturing establishments make a variety of paper products used for writing, filing, and similar applications. Other converted paper product manufacturing includes, in particular, the conversion of sanitary paper stock into such things as tissue paper and disposable diapers.

323 Printing and related support activities 15

Personal property including presses, used to transfer an image from a plate, screen, film, or computer file to some medium, such as paper, plastics, metal, textile articles, or wood. The most prominent of these methods is to transfer the image from a plate or screen to the medium (lithographic, gravure, screen, and flexographic printing). When publishing and printing are done in the same establishment, the establishment is classified under Industry Code 51, Information.

Itemized Equipment

Digital or *non-impact printing equipment* 5

(Uses a computer file to directly "drive" the printing mechanism to create the image)

Blue Print Machines 15

Blue Print Machines – small table model 7

3-D Printers 7

324 Petroleum and Coal Products Manufacturing 20

Personal property used to transform crude petroleum and coal into usable products. The dominant process is petroleum refining that involves the separation of crude petroleum into component products through such techniques as cracking and distillation. Products such as asphalt coatings and petroleum lubricating oils are made.

325 Chemical Manufacturing 15

3251 Basic Chemical Manufacturing 15

Personal property used in both basic chemical processes, such as thermal cracking and distillation, and in petrochemical processes, such as (1) manufacturing acyclic (i.e., aliphatic) hydrocarbons such as ethylene, propylene, and butylenes made from refined petroleum or liquid hydrocarbon and/or (2) manufacturing cyclic aromatic hydrocarbons such as benzene, toluene, styrene, xylene, ethyl benzene, and cumene made from refined petroleum or liquid hydrocarbons.

3254 Pharmaceutical and Medicine Manufacturing 15

Personal property used in one or more of the following: (1) manufacturing biological and medicinal products; (2) processing (i.e., grading, grinding, and milling) botanical drugs and herbs; (3) isolating active medicinal principals from botanical drugs and herbs; and (4) manufacturing pharmaceutical products intended for internal and external consumption in such forms as ampoules, tablets, capsules, vials, ointments, powders, solutions, and suspensions.

3255 Paint, Coating, and Adhesive Manufacturing 15

Personal property used to (1) mix pigments, solvents, and binders into paints and other coatings, such as stains, varnishes, lacquers, enamels, shellacs, and water repellant coatings for concrete and masonry, and/or (2) manufacture allied paint products, such as putties, paint and varnish removers, paint brush cleaners, and frit.

326 Plastics and Rubber Products 15

3261 Plastics Product Manufacturing 15

Personal property used in processing new or spent (i.e., recycled) plastics resins into intermediate or final products, using such processes as compression molding; extrusion molding; injection molding; blow molding; and casting.

Itemized Equipment

Special tools 7

3262 Rubber Product Manufacturing 15

Personal property used in the industry group comprised of establishments primarily engaged in processing natural, and synthetic or reclaimed rubber materials into intermediate or final products using processes such as vulcanizing, cementing, molding, extruding, and lathe-cutting.

Itemized Equipment

Special tools 7

327 Nonmetallic Mineral Product..... 20

Personal property used to transform mined or quarried nonmetallic minerals, such as sand, gravel, stone, clay, and refractory materials, into products for intermediate or final consumption. Processes used include grinding, mixing, cutting, shaping, and honing.

3271 Clay Product and Refractory Manufacturing 15

Personal property used in shaping, molding, glazing, and firing pottery, ceramics, and plumbing fixtures made entirely or partly of clay or other ceramic materials.

3272 Glass and Glass Product Manufacturing..... 15

Personal property used in manufacturing glass and/or glass products. Establishments in this industry may manufacture glass and/or glass products by melting silica sand or cullet or purchasing glass.

Itemized Equipment

Special tools 5

3273 Cement and Concrete Product Manufacturing 20

Personal property used in manufacturing Portland, natural, masonry, pozzalanic, and other hydraulic cements

Itemized Equipment

Quarry equipment{XE "quarry equipment} (Yahoo search)..... 15

Portable ready-mix plants 15

3274 Lime & Gypsum Product Manufacturing 20

Personal property used in manufacturing lime from calcitic limestone, dolomitic limestone, or other calcareous materials, such as coral, chalk, and shells. Lime manufacturing establishments may mine, quarry, collect, or purchase the sources of calcium carbonate.

3279 Abrasive Product Manufacturing..... 20

Personal property used in manufacturing abrasive grinding wheels of natural or synthetic materials, abrasive-coated products, and other abrasive products.

327991 Cut Stone and Stone Product Manufacturing..... 15

Personal property used in cutting, shaping, and finishing granite, marble, limestone, slate, and other stone for building and miscellaneous uses. Stone product manufacturing establishments may mine, quarry, or purchase stone.

331 Primary Metal Manufacturing..... 20

Personal property used to smelt and/or refine ferrous and nonferrous metals from ore, pig or scrap, using electrometallurgical and other process metallurgical techniques. Metal alloys and super alloys are also manufactured by introducing other chemical elements to pure metals. The output of smelting and refining, usually in ingot form, is used in rolling,

drawing, and extruding operations to make sheet, strip, bar, rod, or wire, and in molten form to make castings and other basic metal products.

Includes:

3311 Iron and Steel Mills and Ferroalloy Manufacturing

Itemized Equipment

Special Tools 7

332 Fabricated Metal Product Manufacturing 15

Personal property is used to transform metal into intermediate or end products, other than machinery, computers and electronics, and metal furniture or treating metals and metal formed products fabricated elsewhere. Important fabricated metal processes are forging, stamping, bending, forming, and machining, used to shape individual pieces of metal; and other processes, such as welding and assembling, used to join separate parts together.

Itemized Equipment

Special Tools 5

333 Machinery Manufacturing 15

Personal property used to create end products that apply mechanical force, for example, the application of gears and levers, to perform work. Some important processes for the manufacture of machinery are forging, stamping, bending, forming, and machining that are used to shape individual pieces of metal. Processes, such as welding and assembling are used to join separate parts together. Although these processes are similar to those used in metal fabricating establishments, machinery manufacturing is different because it typically employs multiple metal forming processes in manufacturing the various parts of the machine.

333314 Optical Instrument and Lens Manufacturing 15

Personal property used in: (1) manufacturing optical instruments and lens, such as binoculars, microscopes (except electron, proton), telescopes, prisms, and lenses (except ophthalmic); (2) coating or polishing lenses (except ophthalmic); and (3) mounting lenses (except ophthalmic).

334 Computer and Electronic Product Manufacturing 7

Personal property used in the manufacture of computers, computer peripherals, communications equipment, and similar electronic products and components. The design and use of integrated circuits and the application of highly specialized miniaturization technologies are common elements in the production technologies of the computer and electronic industry.

3341 Computer and Peripheral Equipment Manufacturing 7

Personal property used in manufacturing and/or assembling electronic computers, such as mainframes, personal computers, workstations, laptops, and computer servers; and computer peripheral equipment, such as storage devices, printers, monitors, input/output devices and terminals.

Personal property used in manufacturing wire telephone and data communications equipment. These products may be standalone or board-level components of a larger system. Examples of products made by these establishments are central office switching equipment, cordless telephones (except cellular), PBX equipment, telephones, telephone answering machines, LAN modems, multi-user modems, and other data communications equipment, such as bridges, hubs, routers, and gateways.

3343 Audio and Video Equipment Manufacturing 10

Personal property used in manufacturing electronic audio and video equipment for home entertainment, motor vehicle, public address and musical instrument amplifications. Examples of products made include video cassette recorders, televisions, stereo equipment, speaker systems, household-type video cameras, jukeboxes, and amplifiers for musical instruments and public address systems.

3344 Semiconductor and Other Electronic Components 5

Personal property used in manufacturing semiconductors and other components for electronic applications. Examples of products made by these establishments are capacitors, resistors, microprocessors, bare and loaded printed circuit boards, electron tubes, electronic connectors, and computer modems.

Includes:

clean room equipment, crystal growing equipment, deionized water systems, encapsulation equipment, photo mask and wafer manufacturing equipment, semiconductor chemical and gas systems, semiconductor electrical systems, and semiconductor test equipment.

3345 Navigation, Measuring, Medical, Control Instrument Manufacturing 7

Personal property used in manufacturing navigational, measuring, electro medical, and control instruments. Examples of products made by these establishments are aeronautical instruments, appliance regulators and controls (except switches), laboratory analytical instruments, navigation and guidance systems, and physical properties testing equipment.

335 Electrical Equipment, Appliance, and Component Manufacturing 15

Personal property used to manufacture products that generate, distribute and use electrical power, such as electric lamp bulbs, lighting fixtures, small and major electrical appliances,

electric motors, generators, transformers, switchgear apparatus, devices for storing electrical power (e.g., batteries), for transmitting electricity (e.g., insulated wire), and wiring devices (e.g., electrical outlets, fuse boxes, and light switches).

336 Transportation Equipment Manufacturing 15

Personal property used in production processes similar to those of other machinery manufacturing establishments - bending, forming, welding, machining, and assembling metal or plastic parts into components and finished products.

The section includes:

3361 Motor Vehicle Manufacturing

3362 Motor Vehicle Body & Trailer Manufacturing

3363 Motor Vehicle Parts Manufacturing

3365 Railroad Rolling Stock Manufacturing

3364 Aerospace Product and Parts Manufacturing..... 15

Personal property used in one or more of the following: (1) manufacturing complete aircraft, missiles, or space vehicles; (2) manufacturing aerospace engines, propulsion units, auxiliary equipment or parts; (3) developing and making prototypes of aerospace products; (4) aircraft conversion (i.e., major modifications to systems); and (5) complete aircraft or propulsion systems overhaul and rebuilding (i.e., periodic restoration of aircraft to original design specifications).

This section includes:

336412 Aircraft Engine and Engine Parts Manufacturing

337 Furniture and Related Product Manufacturing 10

Personal property used to make furniture and related articles, such as mattresses, window blinds, cabinets, and fixtures. The processes used in the manufacture of furniture include the cutting, bending, molding, laminating, and assembly of such materials as wood, metal, glass, plastics, and rattan.

339 Miscellaneous Manufacturing..... 15

Personal property used in the manufacture of products as diverse as medical equipment and supplies, jewelry, sporting goods, toys, and office supplies.

33991 Jewelry and Silverware Manufacturing 15

Personal property used in: (1) manufacturing, engraving, chasing, or etching jewelry; (2) manufacturing metal personal goods (i.e., small articles carried on or about the person, such as compacts or cigarette cases); (3) manufacturing, engraving, chasing, or etching precious metal solid, precious metal clad, or pewter cutlery and flatware; (4) manufacturing, engraving, chasing, or etching personal metal goods (i.e., small articles carried on or about the person, such

as compacts or cigarette cases); (5) stamping coins; (6) manufacturing unassembled jewelry parts and stock shop products, such as sheet, wire, and tubing; (7) cutting, slabbing, tumbling, carving, engraving, polishing, or faceting precious or semiprecious stones and gems; (8) re-cutting, re-polishing, and setting gem stones; and (9) drilling, sawing, and peeling cultured and costume pearls.

42 WHOLESALE TRADE

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

423 Wholesale Trade Fixtures and Equipment 15

Trade fixtures (as opposed to fixtures) and equipment are used in establishments engaged in wholesaling merchandise, generally without transformation, and rendering services incidental to the sale of merchandise. Wholesalers sell merchandise to other businesses and normally operate from a warehouse or office. See also separate listings for specific types of equipment.

423440 Other Commercial Equipment Merchant Wholesalers (lockers (except refrigerated) merchant wholesalers) Example: Product Delivery Lockers retail and e-commerce

423740, Refrigeration Equipment and Supplies Merchant Wholesalers (lockers, refrigerated, merchant wholesalers) Example: Product Delivery Lockers retail and e-commerce

44 RETAIL TRADE

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

Includes the personal property for the following:

441 Motor Vehicle and Parts Dealers 15
442 Furniture and Home Furnishing Stores 15
443 Electronics and Appliance Stores 15
444 Building Material and Garden Equipment and Supply Stores 15
445 Food and Beverage Stores (including Convenience Stores) 15
446 Health and Personal Care Stores 15
447 Gasoline Stations 15
448 Clothing and Clothing Accessories Stores 15

451 **Sporting Goods, Hobby, Book, and Music Stores 15**
452 **General Merchandise Stores 15**
453 **Miscellaneous Store Retailers, including 15**
4531 Florists 15
454 **Non-store Retailers 15**
See also separate listings for specific types of equipment.

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

481 Air Transportation 20

Personal property includes most airplanes; helicopters (rotorcraft); drones weighing over 50 pounds; and aircraft, all of which have a life of 20 years. There are some exceptions, which are itemized below.

Itemized Equipment

Kit built Aircraft 15
Gliders 15
Hot Air Balloons 15
Experimental Aircraft..... 15
Drones weighing 50 pounds or less..... 10

482 Rail Transportation..... 20

482112 Short Line Railroads

Itemized Equipment

Railroad Rolling Stock 20

483 Water Transportation 20

Personal property used in providing inland water transportation of passengers and/or cargo on lakes, rivers, or intracoastal waterways.

484 Truck Transportation 10

Itemized Equipment

Light Trucks 7
General freight Trucks 10
Tractor-trailers 10

485 Transit and Ground Passenger Transportation 10

Personal property includes equipment used in Transit and Ground Passenger Transportation. This industry includes a variety of passenger transportation activities, such as urban transit systems; chartered bus, school bus, and interurban bus transportation and taxis.

Itemized Equipment

Buses..... 15

Automobiles, unlicensed..... 7

492 Couriers and Messengers 15

Personal property used in the provision of intercity and/or local delivery of parcels. These articles can be described as those that may be handled by one person without using special equipment. Messengers, which usually deliver within a metropolitan or single urban area, may use bicycle, foot, small truck, or van.

493 Warehousing and Storage..... 15

Personal property used in operating warehousing and storage{XE "storage:} facilities for general merchandise, refrigerated goods, and other warehouse products. These establishments provide facilities to store goods. They do not sell the goods they handle.

51 INFORMATION

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

511 Publishing Industries 15

Personal property used in the publishing of newspapers, magazines, other periodicals, and books, as well as directory and mailing list and software publishing.

512 Motion Picture Production & Sound Recording 7

Personal property used in the production and/or distribution of motion pictures, videos, television programs, or commercials; in the exhibition of motion pictures; or in the provision of postproduction and related services. Sound recording machinery and equipment is used in producing and distributing musical recordings, in publishing music, or in providing sound recording and related services.

512131 Motion Picture Theaters 15

Includes projection equipment, furniture and trade fixtures.

515 Broadcasting and Telecommunications ..... See Categories

51511 Radio Broadcasting..... 10

Personal property used in broadcasting audio signals. These establishments operate radio broadcasting studios and facilities for the transmission of aural programming by radio to the public, to affiliates, or to subscribers. In recognition of the FCC change from analog to

digital broadcasting equipment in radio, television, and cable industries, all analog equipment MAY be valued using a seven-year life. All other equipment will remain at the life indicated. The assessor will still be responsible for measuring obsolescence if any.

51511 Radio Broadcasting Cont.

Itemized Equipment

Radio Production Equipment 7

Service and Repair Equipment 10

51512 Television Broadcasting 10

Personal property used in broadcasting images together with sound. These establishments operate television broadcasting studios and facilities for the programming and transmission of programs to the public. In recognition of the FCC mandated change from analog to digital broadcasting equipment in radio, television, and cable industries, all analog equipment MAY be valued using a three-year life. All other equipment will remain at the life indicated. The assessor will still be responsible for measuring obsolescence if any.

Itemized Equipment

Television Production Equipment 7

Service and Repair Equipment 10

517 Telecommunications ..... See itemized equipment

Wired telecommunications personal property used in (1) operating and maintaining switching and transmission facilities to provide point-to-point communications via landlines, microwave, or a combination of landlines and satellite linkups or (2) furnishing telegraph and other non-vocal communications using their own facilities. Wireless telecommunications assets are used in operating and maintaining switching and transmission facilities that provide omni-directional communications via airwaves, such as cellular telephone or paging services. For handheld devices used to take electronic payments, see Point-of-Sale descriptions.

Itemized Equipment

Central Office Equipment, except computer-based switching equipment 15

Computer-based switching equipment 5

Distribution Plant (if personal property) 30

Fiber optic cable 15

Paging Systems 5

Microwave Systems, except towers 10

Station Equipment 10

Telephone equipment, including, telex, facsimile and Two-Way Radio 5
Cellular Telephones, Smartphones, Hand-helds, Tablets and POS Tablets, and PDAs..... 3

517110 Cable and Other Program Distribution..... See itemized equipment

Personal property used in distribution systems for broadcast programming. Head end assets are defined as the electronic control center -- generally located at the antenna site of a CATV system -- usually including antennas, preamplifiers, frequency converters, demodulators, modulators and other related equipment which amplify, filter and convert incoming broadcast TV signals to cable system channels. Microwave systems include assets such as antennas, transmitting and receiving equipment, and broad band microwave assets. Program origination equipment includes assets such as cameras, film chains, video tape recorders, lighting, and remote location equipment excluding vehicles. Service and test assets include oscilloscopes, field strength meters, spectrum analyzers, and cable testing equipment. Subscriber connection and distribution systems include assets such as trunk and feeder cable, connecting hardware, amplifiers, power equipment, passive devices, directional taps, pedestals, pressure taps, drop cables, matching transformers, multiple set connector equipment, and converters. In recognition of the FCC mandated change from analog to digital broadcasting equipment in radio, television, and cable industries all analog equipment MAY be valued using a seven-year life. All other equipment will remain at the life indicated. The assessor will still be responsible for measuring obsolescence if any.

Itemized Equipment

Coaxial Cable, installed inside buildings..... 15
Fiber Optic Cable..... 15
Head end Equipment, except towers..... 10
Microwave Systems, except towers..... 10
Program Origination Equipment..... 10
Satellite Dish Relay; Earth station equipment..... 10
Box converters having specialized computer components 3
Service and Test Equipment..... 10
Subscriber Connection and Distribution Systems..... 10

518 **Internet Service Providers, Web Search Portals, and Data Processing Services**

For life expectancy, please see Special Properties

Personal property assets used by Internet Service Providers, Web Search Portals, and Data Processing Services to provide: (1) access to the Internet; (2) search facilities for the Internet; and (3) data processing, hosting, and related services.

519 **Other Information Services 15**

Personal property assets used in supplying information, storing information, providing access to information, and searching and retrieving information. The main components of this group are news syndicates, libraries, and archives. It includes law and medical libraries.

53 REAL ESTATE, RENTAL, AND LEASING

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

532 **Rental and Leasing Services 15**

Personal property includes a wide array of tangible goods, such as automobiles, computers, consumer goods, and industrial machinery and equipment, to customers in return for a periodic rental or lease payment.

Itemized Equipment

Formal wear and costume rental 3
Bottled water Dispensers & Equipment 7
Furniture Rental & Leasing 7
Heavy equipment ..... See Construction (Code 23)
Lawn and Garden equipment 7
Linens and Uniforms 3
Musical Instrument rentals 7
Rent-to-Own Merchandise 7
Ski Equipment Rentals 7
Video Tapes ..... See Special Properties

See also separate listings for specific types of equipment.

54 PROFESSIONAL, SCIENTIFIC, AND TECHNICAL SERVICES

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

- See itemized equipment

Itemized Equipment

Laboratory equipment , except electronic & computerized 15
Laboratory equipment, electronic and computerized 7
Medical and law libraries (See also other information services)..... 15
Photography 15

54 PROFESSIONAL, SCIENTIFIC, AND TECHNICAL SERVICES CONT

Professional and scientific equipment (See also NAICS Code 3345) 7
Professional libraries..... 15

Surveying equipment

GPS 7
Non-GPS 15

56 WASTE MANAGEMENT AND REMEDIATION SERVICES

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

5616 Investigation and Security Services 15

Personal property includes burglar and fire alarms and locking devices, along with equipment necessary for installation, repair, or monitoring services or (2) remote monitoring of electronic security alarm systems.

Itemized Equipment

Closed Circuit TV – Camera System 7
Firearms 20

Locksmith equipment, including:

Mechanical and electronic locking devices 20
Safes and security vaults 20

5617 Services to Buildings and Dwellings 15

Includes the fixtures and equipment for the following:

56171 Exterminating and Pest Control Services
56172 Janitorial Services
56173 Landscaping Services
56174 Carpet and Upholstery Cleaning Services

Itemized Equipment

Carpet Cleaning 15

Lawn mowing Equipment 7

562 Waste Management and Remediation Services 10

Personal property used in the collection, treatment, and disposal of waste materials. This includes establishments engaged in local hauling of waste materials; operating materials recovery facilities (i.e., those that sort recyclable materials from the trash stream); providing remediation services (i.e., those that provide for the cleanup of contaminated buildings, mine sites, soil, or ground water); and providing septic pumping and other miscellaneous waste management services.

Itemized Equipment

Garbage Dumpsters..... 10

Portable toilets 10

62 HEALTH CARE AND SOCIAL ASSISTANCE

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

621 Ambulatory Health Care Services 15

Personal property used by health practitioners in the provision of outpatient services, with the facilities and equipment not usually being the most significant part of the production process. Includes the fixtures and equipment for the following:

6211 Offices of Physicians

6212 Offices of Dentists

6213 Offices of Other Health Practitioners, including Chiropractors, Optometrists, Mental Health Practitioners, and Physical, Occupational, and Speech Therapists

Medical and dental instruments not otherwise noted in Special Properties, include:

All Portable Units of Same

Angiographic X-ray units

Chest X-ray Units

Dental X-ray Units
Exam tables and chairs
Fluorographic X-ray Units
Lensometer
Mammographic X-ray Units
Mesoptometers
Microscopes
Portable X-ray Units
Radiographic X-ray Units
Special Procedure X-ray Units
Sterilizers

622 Hospitals 15

Personal property used to provide inpatient health services, particularly specialized facilities and equipment that form a significant and integral part of the production process. See list above for examples of equipment.

See also Special Properties for Medical Diagnostic and Medical Lab.

6244 Child Day Care Facilities 10

Personal property used in providing day care of infants or children.

71 ARTS, ENTERTAINMENT, AND RECREATION

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

711 Performing Arts, Spectator Sports, and Related 10

Includes projection equipment, furniture and trade fixtures such as movable set props, aerial and acrobatic equipment, rigging, costumes, production lighting, and special effects equipment.

Itemized Equipment

Electronic Equipment including Sound Systems 7
Seating, stages including fixed set designs, hydraulics, fountains 15
Support operations, including equipment and furniture for dressing rooms, ticket booths, snack bars, offices ..... 15[8]
Water tanks..... 20[9]

711212 Car racing – race cars 3

[8] May be considered to be real property fixtures. The cost may be established from Marshall/Swift.
[9] May be considered to be real property fixtures. The cost may be established from Marshall/Swift.

713 Amusement, Gambling and Recreation Industries 15

Personal property used to (1) operate facilities where patrons can primarily engage in sports, recreation, amusement, or gambling activities and/or (2) provide other amusement and recreation services, such as supplying and servicing amusement devices in places of business operated by others; operating sports teams, clubs, or leagues engaged in playing games for recreational purposes; and guiding tours without using transportation equipment.

Itemized Equipment

Amusement Park (does not include structures) 15
Bowling Alley Pinsetters and Other Equipment 15
Bowling Electronic Scoring Machines 7
Gaming Equipment:
Electronic, slots, or computers 7
Gaming Equipment Cont.:
Player tracking systems 7
Mechanical slots 15
Other 15
Golf Carts, electric 7
Golf Course Machinery & Equipment, except lawn mowing equipment 15
Golf Course: Lawn Mowing Equipment 7
Juke Box 15
Ski Area Equipment: Snow Cats and Packers 7
Ski Rentals 7
Video and Flipper Games 7

72 ACCOMMODATION AND FOOD SERVICES

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

721 Accommodation 15

Personal property used in: (1) traveler accommodation, (2) recreational accommodation, and (3) rooming and boarding houses.

Itemized Equipment

Apartment Furnishings 15
Hotel Furnishings 15
Outdoor Patio Furnishings 7
Fire and Security Equipment 15

Health Spa Equipment: Manual 15
Health Spa Equipment: Electronic 7
Heavy use Washers 7
Linens, glassware, silverware, and uniforms (not rented) 3
Televisions 5
Telephone Systems (See also NAICS Code 517) 5

722 Food Services and Drinking Places 15

The industry groups are full-service restaurants; limited-service eating places; special food services, such as food service contractors, caterers, and mobile food services; and drinking places.

722 Food Services and Drinking Places Cont.

Itemized Equipment

Bar 15
Coffee Brewing Equipment 15
Walk-in coolers (See Also NAICS 311) 15
Linens, glassware, silverware, and uniforms (not rented) 3
Televisions, Digital 5
Televisions, Analog 5
Vending Machines 15

81 OTHER SERVICES 15

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

Establishments in this sector are primarily engaged in activities, such as equipment and machinery repairing, promoting or administering religious activities, grant making, advocacy, and providing dry cleaning and laundry services, personal care services, death care services, pet care services, photofinishing services, temporary parking services, and dating services.

811 Repair and Maintenance 15

Personal property used to restore machinery, equipment, and other products to working order. These establishments also typically provide general or routine maintenance (i.e., servicing) on such products to ensure they work efficiently and to prevent breakdown and unnecessary repairs.

Includes the fixtures and equipment for the following:

8111 Automobile Repair and Maintenance

811192 Car Washes

8112 Electronic & Precision Equipment

8113 Commercial Equipment Repair and Maintenance

8114 Personal and Household Goods Repair and Maintenance

81143 Footwear and Leather Goods Repair

Itemized Equipment

Auto Repair Diagnostic Equipment (Electronic) 7
Small Tools (See Hand Tools, NAICS 423120) 7
Welding Equipment 15
EV Charging Stations 15

812 Personal and Laundry Services 15

Includes the equipment and some trade fixtures for the following (See Appendix D for determination of real or personal property):

8121 Personal Care Services

81211 Hair, nail and skin care services

81219 Other, including Diet and weight reducing – fitness

8122 Death Care Services

81221 Funeral Homes

81222 Cemeteries and Crematories

8123 Dry cleaning and Laundry Services

81231 Coin-operated Laundries and Drycleaners

81232 Dry cleaning and Laundry, except coin-operated

8129 Other Personal Services

81291 Pet Care (except Veterinary)

81292 Photo-finishing

Itemized Equipment

Coin Laundries 15
Heavy Use Washers 7
Commercial Dry Cleaning Equipment 15

APPENDIX A

2023-24 PERSONAL PROPERTY MANUAL

NEVADA REVISED STATUTES AND NEVADA ADMINISTRATIVE CODE RELATED TO PERSONAL PROPERTY

(This listing may not be comprehensive. Please consult the statutes and regulations. You may find the statutes and regulations on the internet at http://leg.state.nv.us/law1.cfm).

Nevada Revised Statutes

NRS 361.013 "Billboard" defined. "Billboard" means a sign that directs attention to a business, commodity, service, entertainment or attraction that is sold, offered or exists at a location other than the premises on which the sign is located.

(Added to NRS by 1989, 1817)

NRS 361.028 "Manufactured home" defined. "Manufactured home" has the meaning ascribed to it in NRS 489.113.

(Added to NRS by 2001, 1540)

NRS 361.029 "Mobile home" defined. "Mobile home" means a vehicular structure, built on a chassis or frame, which is designed to be used with or without a permanent foundation and is capable of being drawn by a motor vehicle. It may be used as a dwelling when connected to utilities or may be used permanently or temporarily for the advertising, sales, display or promotion of merchandise or services. The term does not include a recreational park trailer as defined in NRS 482.1005.

(Added to NRS by 1989, 169; A 2001, 1727

NRS 361.030 "Personal property" defined.

1. "Personal property" means:

(a) All household and kitchen furniture.

(b) All law, medical and miscellaneous libraries.

(c) All goods, wares and merchandise.

(d) All chattels of every kind and description, except vehicles as defined in NRS 371.020.

(e) Stocks of goods on hand.

(f) Any vehicle not included in the definition of vehicle in NRS 371.020.

(g) All locomotives, cars, rolling stock and other personal property used in operating any railroad within the State.

(h) All machines and machinery, all works and improvements, all steamers, vessels and watercraft of every kind and name navigating or used upon the waters of any river or lake within this State or having a general depot or terminus within this State.

(i) The money, property and effects of every kind, except real estate, of all banks, banking institutions or firms, bankers, moneylenders and brokers.

(j) All property of whatever kind or nature, except vehicles as defined in NRS 371.020, not included in the term "real estate" as that term is defined in NRS 361.035.

2. Gold-bearing and silver-bearing ores, quartz or minerals from which gold or silver is extracted, when in the hands of the producers thereof, shall not mean, not be taken to mean, nor be listed and assessed under the term "personal property" as used in this section, but are specially excepted therefrom, and shall be listed, assessed and taxed as provided by law. [Part 3:344:1953]—(NRS A 1963, 305, 1121; 1983, 1191; 2013, 3115)

NRS 361.035 "Real estate" and "real property" defined.

1. "Real estate" or "real property" means:

(a) All houses, buildings, fences, ditches, structures, erections, railroads, toll roads and bridges, or other improvements built or erected upon any land, whether such land is private property or property of this state or of the United States, or of any municipal or other corporation, or of any county, city or town in this state.

(b) Any mobile home, factory-built housing or manufactured home which meets the requirements of NRS 361.244.

(c) The ownership of, or claim to, or possession of, or right of possession to any lands within this state.

(d) The claim by or the possession of any person, firm, corporation, association or company to any land.

2. The property described in subsection 1 must be listed under the head of "real estate."

3. Except as otherwise provided in NRS 361.2445, when an agreement has been entered into, whether in writing or not, or when there is sufficient reason to believe that an agreement has been entered into, for the dismantling, moving or carrying away or wrecking of the property described in subsection 1, the property must be classified as personal property, and not real estate.

4. For the purposes of this chapter, "real estate" or "real property" does not include leasehold or other possessory interests in land owned by the Federal Government on which land the Federal Government is paying taxes to the State of Nevada or is, pursuant to contractual obligation, paying any sum in lieu of taxes to the State of Nevada.

[Part 3:344:1953]—(NRS A 1957, 358; 1975, 1655; 1979, 824; 1993, 1183; 1999, 3465)

NRS 361.045 Taxable property. Except as otherwise provided by law, all property of every kind and nature whatever within this state shall be subject to taxation.

[Part 1:344:1953; A 1954, 29; 1955, 340]

NRS 361.227 Determination of taxable value.

1. Any person determining the taxable value of real property shall appraise:

(a) The full cash value of:

(1) Vacant land by considering the uses to which it may lawfully be put, any legal or physical restrictions upon those uses, the character of the terrain, and the uses of other land in the vicinity.

(2) Improved land consistently with the use to which the improvements are being put.

(b) Any improvements made on the land by subtracting from the cost of replacement of the improvements all applicable depreciation and obsolescence. Depreciation of an improvement made on real property must be calculated at 1.5 percent of the cost of replacement for each year of adjusted actual age of the improvement, up to a maximum of 50 years.

2. The unit of appraisal must be a single parcel unless:

(a) The location of the improvements causes two or more parcels to function as a single parcel;

(b) The parcel is one of a group of contiguous parcels which qualifies for valuation as a subdivision pursuant to the regulations of the Nevada Tax Commission; or

(c) In the professional judgment of the person determining the taxable value, the parcel is one of a group of parcels which should be valued as a collective unit.

3. The taxable value of a leasehold interest, possessory interest, beneficial interest or beneficial use for the purpose of NRS 361.157 or 361.159 must be determined in the same manner as the taxable value of the property would otherwise be determined if the lessee or user of the property was the owner of the property and it was not exempt from taxation, except that the taxable value so determined must be reduced by a percentage of the taxable value that is equal to the:

(a) Percentage of the property that is not actually leased by the lessee or used by the user during the fiscal year; and

(b) Percentage of time that the property is not actually leased by the lessee or used by the user during the fiscal year, which must be determined in accordance with NRS 361.2275.

4. The taxable value of other taxable personal property, except a mobile or manufactured home, must be determined by subtracting from the cost of replacement of the property all applicable depreciation and obsolescence. Depreciation of a billboard must be calculated at 1.5 percent of the cost of replacement for each year after the year of acquisition of the billboard, up to a maximum of 50 years.

5. The computed taxable value of any property must not exceed its full cash value. Each person determining the taxable value of property shall reduce it if necessary to comply with this requirement. A person determining whether taxable value exceeds that full cash value or whether obsolescence is a factor in valuation may consider:

(a) Comparative sales, based on prices actually paid in market transactions.

(b) A summation of the estimated full cash value of the land and contributory value of the improvements.

(c) Capitalization of the fair economic income expectancy or fair economic rent, or an analysis of the discounted cash flow.

➥ A county assessor is required to make the reduction prescribed in this subsection if the owner calls to his or her attention the facts warranting it, if the county assessor discovers those facts during physical reappraisal of the property or if the county assessor is otherwise aware of those facts.

6. The Nevada Tax Commission shall, by regulation, establish:

(a) Standards for determining the cost of replacement of improvements of various kinds.

(b) Standards for determining the cost of replacement of personal property of various kinds. The standards must include a separate index of factors for application to the acquisition cost of a billboard to determine its replacement cost.

(c) Schedules of depreciation for personal property based on its estimated life.

(d) Criteria for the valuation of two or more parcels as a subdivision.

7. In determining, for the purpose of computing taxable value, the cost of replacement of:

(a) Any personal property, the cost of all improvements of the personal property, including any additions to or renovations of the personal property, but excluding routine maintenance and repairs, must be added to the cost of acquisition of the personal property.

(b) An improvement made on land, a county assessor may use any final representations of the improvement prepared by the architect or builder of the improvement, including, without limitation, any final building plans, drawings, sketches and surveys, and any specifications included in such representations, as a basis for establishing any relevant measurements of size or quantity.

8. The county assessor shall, upon the request of the owner, furnish within 15 days to the owner a copy of the most recent appraisal of the property, including, without limitation, copies of any sales data, materials presented on appeal to the county board of equalization or State Board of Equalization and other materials used to determine or defend the taxable value of the property.

9. The provisions of this section do not apply to property which is assessed pursuant to NRS 361.320.

(Added to NRS by 1965, 1445; A 1969, 1451; 1975, 65, 1656; 1977, 1318; 1979, 79; 1981, 788, 789; 1983, 1047, 1884, 1885; 1987, 2075; 1989, 668, 1818; 1993, 2312; 1997, 1111; 1999, 1029; 2001, 842; 2003, 2758; 2009, 1216; 2013, 3116)

NRS 361.265 Written statement concerning personal property: Demand; contents; return of statement; valuation of unlisted property claimed by absent or unknown person; penalties.

1. To enable the county assessor to make assessments, he or she shall demand from each natural person or firm, and from the president, cashier, treasurer or managing agent of each corporation, association or company, including all banking institutions, associations or firms within the county, a written statement, signed under penalty of perjury, on forms and in the format prescribed by the county assessor of all the personal property within the county, owned, claimed, possessed, controlled or managed by those persons, firms, corporations, associations or companies. The signature required by this subsection may include an electronic signature as defined in NRS 719.100.

2. The statement must include:

(a) A description of the location of any taxable personal property that is owned, claimed, possessed, controlled or managed by the natural person, firm, corporation, association or company, but stored, maintained or otherwise placed at a location other than the principal residence of the natural person or principal place of business of the firm, corporation, association or company;

(b) The cost of acquisition of each item of taxable personal property including the cost of any improvements of the personal property, such as additions to or renovations of the property other than routine maintenance or repairs, and the year in which each item of taxable personal property was acquired; and

(c) If the natural person, firm, corporation, association or company owns at least 25 mobile or manufactured homes that are being leased within the county for commercial purposes, and those homes have not been converted to real property pursuant to NRS 361.244, the year, make or model, size, serial number and location of each such mobile or manufactured home.

3. The statement must be returned not later than July 31, except for a statement mailed to the taxpayer after July 15, in which case it must be returned within 15 days after demand for its return is made. Upon petition of the property owner showing good cause, the county assessor may grant one or more 30-day extensions.

4. If the owners of any taxable property not listed by another person are absent or unknown, or fail to provide the written statement as described in subsection 1, the county assessor shall make an estimate of the value of the property and assess it accordingly. If the name of the absent owner is known to the county assessor, the property must be assessed in that name. If the name of the owner is unknown to the county assessor, the property must be assessed to “unknown

owner," but no mistake made in the name of the owner or the supposed owner of personal property renders the assessment or any sale of the property for taxes invalid.

5. If any person, officer or agent neglects or refuses on demand of the county assessor or his or her deputy to give the statement required by this section, or gives a false name, or refuses to give his or her name or sign the statement, the person, officer or agent is guilty of a misdemeanor.

[Part 5:344:1953]—(NRS A 1967, 558; 1969, 1452; 1981, 327; 1983, 519, 1193; 1985, 748; 1987, 531; 1989, 1820; 2003, 2761; 2005, 2656)

NRS 361.325 Nevada Tax Commission to establish valuations of mobile homes and land; property escaping taxation to be placed on assessment roll.

1. On or before the first Monday in June of each year, the Nevada Tax Commission shall:

(a) Fix and establish the valuation for assessment purposes of all mobile homes in the State.

(b) Classify land and fix and establish the valuation thereof for assessment purposes. The classification of agricultural land must be made on the basis of crop, timber or forage production, either in tons of crops per acre, board feet or other unit, or animal unit months of forage. An animal unit month is the amount of forage which is necessary for the complete sustenance of one animal unit for 1 month. One animal unit is defined as one cow and calf, or its equivalent, and the amount of forage necessary to sustain one animal unit for 1 month is defined as 900 pounds of dry weight forage.

2. The valuation of mobile homes and land so fixed and established is for the next succeeding year and is subject to equalization by the State Board of Equalization.

3. In establishing the value of new mobile homes sold on or after July 1, 1982, the Nevada Tax Commission shall classify them according to those factors which most closely determine their useful lives. In establishing the value of other mobile homes, the Commission shall begin with the retail selling price and depreciate it by 5 percent per year, but not below 20 percent of its original amount.

4. The Nevada Tax Commission shall cause to be placed on the assessment roll of any county property found to be escaping taxation coming to its knowledge after the adjournment of the State Board of Equalization. This property must be placed upon the assessment roll prior to the delivery thereof to the ex officio tax receiver. If such property cannot be placed upon the assessment roll of the proper county within the proper time, it must be placed upon the tax roll for the next ensuing year, in addition to the assessment for the current year, if any, and taxes thereon must be collected for the prior year in the same amount as though collected upon the prior year's assessment roll.

5. The Nevada Tax Commission shall not raise or lower any valuations established by the State Board of Equalization unless, by the addition to any assessment roll of property found to be escaping taxation, it is necessary to do so.

6. Nothing in this section provides an appeal from the acts of the State Board of Equalization to the Nevada Tax Commission.

[7:177:1917; A 1929, 299; 1939, 279; 1945, 78; 1953, 576]—(NRS A 1957, 314; 1963, 1123; 1967, 825; 1975, 1105, 1660, 1762; 1981, 859; 1983, 1195)

Nevada Administrative Code

NAC 361.1127 "Fixture" defined. (NRS 360.090, 360.250) "Fixture" means an item, other than a trade fixture, that was originally personal property which has been installed or attached to land or an improvement in a permanent manner. As used in this section, "installed or attached to land or an improvement in a permanent manner" means that:

1. Either:

(a) An item is attached to, imbedded in or permanently resting upon land or an improvement, or is attached by other means that are normally used for permanent installation, and cannot be removed without substantially damaging the item or the land or improvement with which it is being used; or

(b) The use or purpose of an item that is not otherwise physically annexed to land or an improvement is so adapted that it is:

(1) A necessary, integral or working part of the land or improvement;

(2) Designed or committed for use with the land or improvement; or

(3) So essential to the land or improvement that the land or improvement cannot perform its desired function without the nonattached item; and

2. A reasonable person would consider the item to be a permanent part of the land or improvement, taking into account annexation, adaptation and other objective manifestations of permanence, including, without limitation, whether:

(a) Removal of the item would destroy the item or cause significant damage to the real property to which it is installed or attached;

(b) The historic use of the item indicates an intention to leave the item in place;

(c) The terms of a written agreement between parties indicates the intention of a tenant or lessee to remove or transfer ownership of the item; or

(d) Ownership of the item would be conveyed with a transfer of the real property to which it is installed or attached.

(Added to NAC by Tax Comm'n by R039-10, 8-13-2010, eff. 7-1-2012; A by R068-12, 9-14-2012)

NAC 361.11715 "Real property" defined. (NRS 360.090, 360.250)

1. "Real property" has the meaning ascribed to it in NRS 361.035 and includes:

(a) Land;

(b) Fixtures;

(c) Improvements;

(d) On-site enhancements; and

(e) Any rights, interests, benefits and privileges belonging or attached to the land.

2. The term does not include a trade fixture.

(Added to NAC by Tax Comm'n by R039-10, 8-13-2010, eff. 7-1-2012; A by R068-12, 9-14-2012)

NAC 361.130 Mobile or manufactured home. (NRS 360.090, 360.250, 361.227, 361.2445, 361.325)

1. The taxable value of a mobile home or manufactured home which constitutes real property is the cost of replacement of the mobile home or manufactured home less depreciation and obsolescence.

2. In determining the taxable value of a mobile home or manufactured home which constitutes personal property, each county assessor shall, if the mobile home or manufactured home was sold as new:

(a) Before July 1, 1982, value it at its retail selling price when sold to the original owner less depreciation at 5 percent per year, to a maximum depreciated value of 20 percent of its original retail selling price.

(b) On or after July 1, 1982, value it at replacement cost, when new, less depreciation. Replacement cost when new is the retail selling price to the original owner adjusted by factors reflected in the annual *Personal Property Manual*.

➥ Depreciation must be calculated pursuant to the schedule located in the annual *Personal Property Manual*. Additional depreciation and obsolescence may be calculated separately.

3. The retail selling price of a mobile home or manufactured home includes all charges for transportation, installation, accessories, profit and overhead.

4. If the owner of a mobile home or manufactured home which has been converted to real property wishes to convert the mobile home or manufactured home back to personal property, the county assessor shall provide the owner with a form for an affidavit of conversion which has been approved by the Commission and which must be recorded in the county recorder's office pursuant to NRS 361.2445 before the mobile home or manufactured home may be removed from the tax rolls. The affidavit of conversion may include information concerning the cost of acquisition of the mobile home or manufactured home. All signatures required pursuant to NRS 361.2445 to effectuate the conversion must be notarized.

5. The county assessor shall value the mobile home or manufactured home as personal property upon satisfaction of all the requirements set forth in NRS 361.2445 if the mobile home or manufactured home remains within the jurisdiction of the county assessor.

6. If a mobile home or manufactured home which has been converted to real property is completely destroyed and removed from real property, the county assessor shall remove the mobile home or manufactured home from the tax roll.

[Tax Comm'n, Property Tax Reg. part No. 2, eff. 1-14-82]— (NAC A 10-10-83; 6-29-84; 5-16-86; R031-03, 8-4-2004; R166-07, 6-17-2008)

NAC 361.1305 Billboards. (NRS 360.090, 360.250, 361.227)

1. The taxable value of a billboard is the cost of replacement of the billboard less depreciation and obsolescence.

2. The cost of replacement of a billboard must be computed by multiplying the cost of acquisition to the current owner by the appropriate factor located in the annual *Personal Property Manual*. The factor that corresponds to the year the billboard was acquired must be used. Additional depreciation and obsolescence may be calculated separately.

(Added to NAC by Tax Comm'n, eff. 8-2-90; A by R031-03, 8-4-2004)

Determination of Taxable Value of Personal Property

NAC 361.1345 Definitions. (NRS 360.090, 360.250, 361.227) As used in NAC 361.1345 to 361.139, inclusive, unless the context otherwise requires, the words and terms defined in NAC 361.1351, 361.1355 and 361.1361 have the meanings ascribed to them in those sections.

(Added to NAC by Tax Comm'n by R034-03, eff. 12-4-2003)

NAC 361.1351 "Acquisition cost" and "original cost" defined. (NRS 360.090, 360.250, 361.227) "Acquisition cost" or "original cost" means the actual cost of property to its present owner, including, without limitation, the costs of transportation and the costs of installation.

(Added to NAC by Tax Comm'n by R034-03, eff. 12-4-2003)

NAC 361.1355 "Costs of installation" defined. (NRS 360.090, 360.250, 361.227) "Costs of installation" means the costs of direct labor, direct overhead and the capitalized expense of interest or imputed charges for interest which are necessary to make the property operational.

(Added to NAC by Tax Comm'n by R034-03, eff. 12-4-2003)

NAC 361.1361 *"Personal Property Manual"* defined. (NRS 360.090, 360.250, 361.227) *"Personal Property Manual"* means a manual for the valuation of personal property that is published by the Department annually pursuant to NAC 361.1365.

(Added to NAC by Tax Comm'n by R034-03, eff. 12-4-2003)

NAC 361.1365 *Personal Property Manual*: Publication; contents; approval; use. (NRS 360.090, 360.250, 361.227)

1. The Department will annually publish a *Personal Property Manual* which describes the methods and standards that must be used for the valuation of personal property. The manual must include, without limitation, annually updated:

(a) Cost-index factors that must be used in the conversion of acquisition cost into an estimate of replacement cost new;

(b) Expected-life schedules that indicate the category of expected life for each type of property or type of industry in which the property is used; and

(c) Percent-good tables which indicate the rate of depreciation that must be applied.

2. The *Personal Property Manual* must be approved by the Commission before publication. The Department, at least 1 month before presenting the manual to the Commission for approval, must disclose all proposed modifications to the manual and hold a public workshop on the modifications.

3. Each county assessor shall use the *Personal Property Manual* in determining the taxable value of personal property.

(Added to NAC by Tax Comm'n by R034-03, eff. 12-4-2003)

NAC 361.1371 Procedure for determination of taxable value. (NRS 360.090, 360.250, 361.227)

1. The taxable value of personal property must be determined by adjusting the acquisition cost of the property by a cost-index factor and reducing the adjusted acquisition cost by an estimate of applicable depreciation. The taxable value so determined shall be deemed to be the indicator of value of replacement cost new less depreciation.

2. In determining taxable value, a county assessor shall use the schedules in the *Personal Property Manual* that show the cost-index factors, the rates of depreciation and the percent good by year. The assessor shall use the schedules by:

(a) Selecting the appropriate expected useful life of the personal property; and

(b) Selecting the appropriate cost-index factor, based on the year of acquisition of the property, and applying it to the acquisition cost of the property.

➥ The result shall be deemed to be the replacement cost new of the property.

3. The assessor shall select the method of applying depreciation to the personal property by either:

(a) Multiplying the adjusted acquisition cost of the property by the rate of depreciation and subtracting the result from the adjusted acquisition cost; or

(b) Multiplying the adjusted acquisition cost of the property by the percent-good factor.

➥ The result from either approach shall be deemed to be the taxable value of the property.

(Added to NAC by Tax Comm'n by R034-03, eff. 12-4-2003)

NAC 361.1375 Determination of expected life, cost-index factors and depreciation. (NRS 360.090, 360.250, 361.227)

1. Personal property must be categorized by the specific type of property that it is or by the type of industry in which it is used. Each category must be assigned to a schedule of expected life which is based on commonly available sources of information, including, without limitation, the life expectancy guidelines published by the Marshall and Swift Valuation Service and any other sources published in the *Personal Property Manual*.

2. The cost-index factors published in the *Personal Property Manual* must be determined by calculating the average change in costs over time. The Department shall identify the sources used to calculate the average change.

3. For purposes of calculating the amount of applicable depreciation, personal property must be assigned to one of the following expected lives:

(a) Three-year life;

(b) Five-year life;

(c) Seven-year life;

(d) Ten-year life;

(e) Fifteen-year life;

(f) Twenty-year life; or

(g) Thirty-year life.

4. Depreciation must be calculated over the expected life of the personal property by using the declining balance method, except that tables which provide a method other than the declining balance method for calculating depreciation may be used if the tables have been approved by the Commission and included in the *Personal Property Manual*.

5. For purposes of calculating the rate of depreciation, a residual amount of 5 percent must be used. Percent-good tables using a residual amount other than 5 percent may be adopted by the Commission if the Department has conducted a market study or has otherwise obtained information which indicates that a different residual amount is appropriate for the category in which the personal property is placed pursuant to subsection 1.

(Added to NAC by Tax Comm'n by R034-03, eff. 12-4-2003)

NAC 361.138 Reported acquisition cost for leased equipment. (NRS 360.090, 360.250, 361.227) For leased equipment, the reported acquisition cost is the cost which the user of the property would incur if the equipment were purchased, less any discount customarily allowed by a seller.

(Added to NAC by Tax Comm'n, eff. 10-10-83; A by R034-03, 12-4-2003)

NAC 361.139 Personal property acquired with real property for lump sum; use of other valuation techniques. (NRS 360.090, 360.250, 361.227)

1. In determining the taxable value of personal property which was acquired with real property for a lump sum, the assessor may refer to appropriate guides which list the cost of equipment to determine the value of the personal property in relation to the value of the real property. In addition, the assessor may estimate the age of the equipment by inspecting it or discussing the approximate value of the equipment with manufacturers, dealers or other persons in the business who have knowledge of the value of the equipment. The serial number, if it exists, may enable a manufacturer to determine the date of manufacture and the original cost.

2. If sufficient data is not otherwise available to establish acquisition cost, or if the assessor determines that a reported acquisition cost is not equal to the fair market value of the property at the time of acquisition plus any costs of transportation and costs of installation, the assessor may use any nationally recognized valuation technique to determine the acquisition cost, including, without limitation:

(a) Establishing the current cost of replacement of the property with new property by reference to current manufacturing costs. If the current cost of replacement is known, the assessor shall apply depreciation to that cost to determine the taxable value.

(b) Using a guide which lists the cost or a procedure recognized by businesses which use such equipment to determine the taxable value. Before such a guide or procedure may be used, an assessor must receive approval from the Executive Director.

(c) Using information based on current market data.

3. Upon request, the Division of Local Government Services of the Department will provide information on various guides which may be used to determine original cost.

(Added to NAC by Tax Comm'n, eff. 10-10-83; A 6-29-84; R034-03, 12-4-2003; R068-12, 9-14-2012)

NAC 361.11745 "Trade fixture" defined. (NRS 360.090, 360.250) "Trade fixture" means an item of personal property that:

1. Is installed or attached nonpermanently to real property by an owner or tenant for the purpose of conducting a business or trade and not for the enhancement of the real property to which it is installed or attached; and

2. Has a unique identity and function which is related to the business or trade for which it is installed or attached, and which is distinct from the real property to which it is installed or attached.

(Added to NAC by Tax Comm'n by R068-12, eff. 9-14-2012)

Excerpts from Department of Taxation Letter of Guidance

Letter dated December 02, 2004, responding to county assessors' question:

"In determining the proper amount of depreciation to be applied to personal property using the Department's Personal Property Manual, does the year of acquisition refer to a calendar year or a fiscal year?"

Short Answer

The use of the year of acquisition is dependent on the fiscal year only with regard to the correct selection of the Personal Property Manual to be used. The year of acquisition is otherwise an actual date during a calendar year that indicates the age of the property to be used in the expected life tables.

(Please ask the department for a copy of the letter if you wish to read the entire discussion.)

APPENDIX B

Methodology Used to Estimate Cost Indexes

The percent change in each index is measured between the current year and the prior year. The mean of the sum of the changes for each year of the expected life table is calculated and becomes the basis for the cost index to trend acquisition cost to a current replacement cost.

Sources Used to Estimate Cost Indexes

Producer Price Index (PPI)

The Producer Price Index (PPI) is a family of indexes that measures the average change over time in selling prices received by domestic producers of goods and services. PPIs measure price change from the perspective of the seller. This contrasts with other measures, such as the Consumer Price Index (CPI), that measure price change from the purchaser's perspective. Sellers' and purchasers' prices may differ due to government subsidies, sales and excise taxes, and distribution costs.

Data Source

- The PPI sample includes approximately 25,000 establishments providing close to 100,000 price quotations per month.
- Participating establishments report price data primarily through the mail.
- Good and services included in the PPI are weighted by value-of-shipments data contained in the 1992 economic census.
- Industries and products are systematically resampled as needed.

The producer price index series reference has been updated from a Stage of Processing ID code to a Final Demand-Intermediate Demand Goods Index. The conversion may be found in an Index Concordance Table located at http://www.bls.gov/ppi/fdidconcordance.htm, which converts SOP3200, Capital equipment, to FD41312, Private capital equipment. The PPI Index using FD41312 may be found at http://www.bls.gov/ppi/fdidsf16.htm.

Consumer Price Indexes (CPI)

The consumer price index (CPI) is a measure of the average change in prices over time of goods and services purchased by households. The Bureau of Labor Statistics publishes CPIs for two population groups: (1) the CPI for Urban Wage Earners and Clerical Workers (CPI-W), which covers households of wage earners and clerical workers that comprise approximately 32 percent of the total population and (2) the CPI for All Urban Consumers (CPI-U) and the Chained CPI for All Urban Consumers (C-CPI-U), which cover approximately 87 percent of the total population and include in addition to wage earners and clerical worker households, groups such as professional, managerial, and technical

workers, the self-employed, short-term workers, the unemployed, and retirees and others not in the labor force.

The CPI represents all goods and services purchased for consumption by the reference population (CPI-U or CPI-W). BLS has classified all expenditure items into more than 200 categories, arranged into eight major groups. Major groups and examples of categories in each are as follows:

- FOOD and BEVERAGES (breakfast cereal, milk, coffee, chicken, wine, full-service meals and snacks)
- HOUSING (rent of primary residence, owners' equivalent rent, fuel oil, bedroom furniture)
- APPAREL (men's shirts and sweaters, women's dresses, jewelry)
- TRANSPORTATION (new vehicles, airlines fares, gasoline, motor vehicle insurance)
- MEDICAL CARE (prescription drugs and medical supplies, physicians' services, eyeglasses and eye care, hospital services)
- RECREATION (televisions, cable television, pets and pet products, sports equipment, admissions)
- EDUCATION AND COMMUNICATION (college tuition, postage, telephone services, computer software and accessories)
- OTHER GOODS AND SERVICES (tobacco and smoking products, haircuts and other personal services, funeral expenses)

Also included within these major groups are various government-charged user fees, such as water and sewerage charges, auto registration fees, and vehicle tolls. The CPI also includes taxes (such as sales and excise taxes) that are directly associated with the prices of specific goods and services. However, the CPI excludes taxes (such as income and Social Security taxes) not directly associated with the purchase of consumer goods and services.

The CPI does not include investment items, such as stocks, bonds, real estate, and life insurance. (These items relate to savings and not to day-to-day consumption expenses.)

The Consumer Price Index series ID reference is CUUR0400SA0, CUUS0400SA0 for area West Urban, All Items. The base period is 1982-84 = 100. The data may be found at http://data.bls.gov/pdq/SurveyOutputServlet?data_tool=dropmap&series_id=CUUR0400SA0,CUUS0400SA0.

Marshall Valuation Service

Marshall Valuation Service publishes a national average equipment cost index based on industry type. The Department measures the change in the index for each category of industry from the prior year.

Market Tests

In addition to the sources already cited, the Department conducts market tests to validate the results of applying the cost indices to particular items of personal property. The original cost of a selected sample of personal property items is trended using the proposed cost index conversion factor. The result of this calculation is compared to the actual average resale of the item obtained from various market research sources. The purpose of the market test is to ensure the proposed cost indices do not result in a value which exceeds full cash value. The market tests are also used to establish hypothetical market-based depreciation schedules. The sources of information for the market comparisons include the following:

- **N.A.D.A., The Manufactured Housing Guide Cost Online** (Online Version) The Guide provides the average retail book value by manufacturer, model, and region of mobile home, with tables for options. Values are provided for homes one to fourteen years of age, and conversion tables for homes older than 14 years.
- **Aircraft Bluebook Price Digest Online**, (Online Version) (Price Digests, Informa Business Media, Inc., Overland Park, KS). The Bluebook provides representative average retail prices of fixed wing aircraft and helicopters.
- **Grounds Maintenance Equipment Blue Book Online**, (Online Version) (Price Digests, Informa Media, Overland Park, KS). The Blue Book provides the estimated average resale or retail price, excluding options of power equipment.
- **Powersport Vehicle Blue Book**, (Online Version) (Price Digests, Informa Business Media, Inc., Overland Park, KS). The Blue Book provides pricing in the powersports industry, including snowmobiles, personal watercraft, trailers, and motorcycles.
- **The Official Tractor Blue Book Online**,(Online Version) (Price Digests, Informa Business Media, Inc., Overland Park, KS). The Blue Book provides the estimated average resale or retail price, excluding options of power equipment.
- **Green Guide for Construction Equipment**, (Online version) (Equipment Watch, 6151 Powers Ferry Road, Suite 200, Atlanta, GA 30339) The values in this guide are derived from a reporting system of equipment dealers, distributors, manufacturers, auctioneers and contractors. It is based on both surveys and averaging of actual sales. These volumes include Volume 1: Earthmoving Equipment, Volume 2: Lifting Equipment and Volume 3: Other Equipment (Compaction, Concrete and Crushers).
- **Orion Research Corporation**, (Roger Rohrs Publisher) http://www.usedprice.com. The web site /is the electronic successor to the Orion Blue Book. It determines the used prices of computers and peripherals based on dealer surveys gathered nationwide. Dealers are asked to provide the “asking price,” “Selling price,” and “days to sell.” The used price is then calculated based on what an average store could sell the product for in 30 days or less. Orion Research states that this data is updated on an ongoing basis.
- **Estimated Useful Lives of Depreciable Hospital Assets**, (Revised 2013, 2018 Edition AHA Chicago Press, Health Forum, Inc. 155 North Wacker Drive, Suite 400, Chicago IL 60606)

APPENDIX C

Methodology Used to Estimate Expected Useful Life

The Department estimates the expected useful life of different types of personal property by surveying a variety of sources. Expected useful life is defined as the amount of time an item of personal property can be expected to last before it wears out, decays, gets used up, becomes obsolete, or loses its value from natural causes. The life is measured from the time the property is first put into service until it is retired from service or permanently withdrawn from use in a trade or business, or when the production of income ceases because the property has been sold, exchanged, converted to personal use, abandoned, or otherwise destroyed.

The Department does not have the resources available to perform its own mortality or actuarial studies. However, there are other sources that do perform this service. The sources itemized below include actuarial studies of the Internal Revenue Service, Marshall and Swift Costing Service, and the California State Board of Equalization. Also included are the surveys of several western states and certain industries.

Sources Used to Estimate Expected Useful Life

Marshall Swift Valuation Service, "Residential Cost Handbook", (Marshall & Swift, L.P., December 2021) Costs ranges are based on averages created for the US and Canada, and other items listed are based on what is readily available today.

Marshall Swift Valuation Service, "Life Expectancy Guidelines," (Marshall & Swift, L.P., January 2021)

Depreciable assets are listed by industry group and are extracted from U.S. Treasury Department Internal Revenue Service Publication 534 titled "Depreciation." The Guidelines list ranges of life. In certain cases, the IRS was not the primary source. In those cases, the range of life is based on a composite of studies of equipment, bookkeeping practices and appraisers' opinions as compiled from a consensus of recognized trade groups, suppliers and other interested parties. Computers and terminals are one example of an independent study conducted by Marshall & Swift.

Department of the Treasury, Internal Revenue Service, Publication 946, "How to Depreciate Property," and Publication 534, "Depreciating Property Placed in Service Before 1987."

These two publications specifically identify types of property and the expected useful life. For instance, an example of five-year property is computers and peripheral equipment.

California:

California Assessors Equipment Index and Percent Good Factors January

California Assessors Handbook Table of Contents

Arizona:

Arizona Department of Revenue Personal Property Manual

Montana:

State of Montana Personal Property and Livestock Reporting for Tax Year

Oregon:

Oregon Department of Revenue, Personal Property Valuation Guidelines

Utah:

Utah State Tax Commission Recommended Personal Property Valuation Schedules and Registered Vehicle Uniform Fees

Wyoming:

Wyoming Department of Revenue Life Expectancies for Personal Property

APPENDIX D

2023-24 PERSONAL PROPERTY MANUAL: VALUATION GUIDELINES

Exemptions from Property Taxes

Article 10, Section 1 of the Nevada Constitution requires the "valuation for taxation of **all** property, real, personal and possessory...." NRS 361.045 also provides that, except as otherwise provided by law, all property of every kind and nature whatever within this state shall be subject to taxation. Other statutes, however, grant exemptions to particular types of property. Some are granted exemption at face-value, and other types of property must qualify according to specific criteria in order to receive the exemption.

The types of exemptions range from partial exemptions granted to veterans, disabled veterans, surviving spouses and blind persons to exemptions from taxation for all real and personal property granted to governmental entities, religious, charitable and non-profit organizations, and individual organizations which are specifically cited. In many cases, the statutes specifically recite that the property must be used to carry out the legitimate function of the organization, and if not, the property becomes taxable.

For the types of exemptions which must go through a qualification process, the county assessors must collect, evaluate and process the various claims for property tax exemptions. Application forms which have been approved by the Nevada Tax Commission should be made available. Each form should request information regarding taxpayer contact information, the type of exemption being claimed, the property which the exemption, if granted, would affect, a statement or statements why the property qualifies for the exemption, and supporting documentation if necessary. The purpose of any form is to provide sufficient information to help assessors make a reasoned determination to approve or deny applications.

In the event a claim for exemption is ambiguous or open to interpretation, how the property is used may indicate whether or not an exemption applies. The general rule espoused by the courts is that strict construction of exemption statutes applies to exemptions for property held in private ownership but not to exemptions for public property where exemption is the rule and taxation the exception. 2 Thomas M. Cooley, *The Law of Taxation*, § 673 at 1414-15 (4th ed. 1924). Said another way, property held in private ownership must strictly comply with all the criteria established for the exemption because “taxation is the rule and exemption the exception.” On the other hand, for property held by a public entity, the rule is reversed to say “exemption is the rule and taxation the exception.”

The purpose in establishing a broad construction of exemption for public entities is to prevent an escalating spiral of unnecessary taxation and administrative costs with no benefit to the public. 16 Eugene McQuillin, *The Law of Municipal Corporations*, § 44.57 at 206 (3rd ed. 1994). If one governmental entity chooses to tax the property of another governmental entity, the governmental entity forced to pay taxes may have to levy and collect new taxes to meet the demands of the tax. 2 Cooley, *supra*, § 621 at 1313. The effect of such a tax spiral is that the public would be taxing itself to raise money to pay itself.

In cases where it is not clear whether an exemption should be granted, assessors should solicit legal advice from the county district attorney's (D.A.) office.

The attached chart lists the current status of specific exemptions available in the statutes, in alphabetical order.

Legend:
Due Date for Application:
(1) No application required
(2) One time only until status changes. The claim must be made by June 15th. *See NRS 361.155 (1) and (3)*
(3) Annually, by June 15th. *See NRS 361.155 (1)*
(4) Annually, by July 1st. *See NAC 361.062*
(5) Annually, by December 30th. *See NRS 362.050*

Exemption Type	NRS Reference	NAC Reference	Property Type	Due Date for Application See Legend	Explanation
Airport	361.061(1)		Real	(2)	Improvement of land by the public as an airport is a municipal purpose, whether or not the airport is owned or operated by a local government.
American Land Conservancy	361.111		Real	(2)	Real property including improvements is exempt if: the property is held for acquisition by a Federal, state or local government and the said government has agreed in writing to consider acquiring said real property; or if the property will be held indefinitely and vested in the listed conservancy organization. If the property is held for purposes of conservation for any entity other than the State or local government, the land must be assessed as first-class pasture. If the property is transferred for purposes other than conservation, taxes must be collected for each year it was exempt.

Exemption Type	NRS Reference	NAC Reference	Property Type	Due Date for Application See Legend	Explanation
American National Red Cross and Nevada Chapters	361.110		Both	(2)	All real and personal property is exempt, unless it is used for a purpose other than the legitimate functions of the organization. *See also YMCA, YWCA, American National Red Cross, Salvation Army Corp, GSA, Camp Fire Girls, BSA, Sierra Arts Foundation, Nevada Museum of Art, Inc.*
Apprenticeship Programs	361.106		Both	(2)	Real and personal property of an apprenticeship program is exempt if (1) the property is held in a trust created by 29 U.S.C. § 186 or (2) is owned by a local or state apprenticeship committee and the program is operated by a qualifying organization and registered and approved by the state apprenticeship council.
Archaeological Conservancy	361.111, AB 209 (2007)		Real	(2)	See explanation under American Land Conservancy.
Architectural barrier Removal for Disabled Persons	361.087		Real	(2)	Improvements to a residence occupied by a person with a disability are exempt. The person must claim the benefit by filing an affidavit setting forth the nature of the improvement and the date of making the improvement. See statute for examples.
Bank Deposits	Article 10		Personal	(1)	Articles of personal property deemed to represent an interest in real or personal property already assessed and taxed is exempt.
Bee colonies	361.068		Personal	(1)	Bee colonies are exempt personal property.

Blind Persons	361.085		Both	(3)	Property of blind persons up to an assessed value of $3,000, as modified by CPI, is exempt. The original affidavit of claim must be accompanied by a certificate from a physician certifying the person is blind. Renewal affidavits must be completed each year.
Boats	361.068		Personal	(1)	All boats are exempt.
Bonds	Article 10		Personal	(1)	Articles of personal property deemed to represent an interest in real or personal property already assessed and taxed is exempt.
Book Accounts	Article 10		Personal	(1)	Articles of personal property deemed to represent an interest in real or personal property already assessed and taxed is exempt.
Boulder City Museum and Historical Association	361.110		Both	(2)	All real and personal property is exempt, unless it is used for a purpose other than the legitimate functions of the organization. *See also YMCA, YWCA, American National Red Cross, Salvation Army Corp, GSA, Camp Fire Girls, BSA, Sierra Arts Foundation.*
Boy Scouts of America	361.11		Both	(2)	All real and personal property is exempt, unless it is used for a purpose other than the legitimate functions of the organization. *See also Nevada Museum of Art.*
Business Inventories & Consumables	361.068	361.065	Personal	(1)	Property consumed during the operation of the business, as differentiated from a component part of a manufactured item, is exempt. The property must meet the criteria listed in NAC 361.065.
Camp Fire Girls Inc.	361.11		Both	(2)	All real and personal property is exempt, unless it is used for a purpose other than the legitimate functions of the organization. *See also Nevada Museum of Art.*
Campers, slide-in & shells	361.068		Personal	(1)	All slide-in campers and camper shells are exempt.

Carnival, circus, convention, display, exhibition, fair	361.068		Personal	(1)	Personal property, transient in nature, owned by a non-resident and located in this state for use by or in a carnival, circus, convention, display, exhibition or fair is exempt. *See also transient personal property.*
Cost of collection	361.068		Personal	(1)	Personal property for which the annual taxes would be less than the cost of collecting those taxes is exempt. NTC determines level of cost.
Cemeteries and Graveyards - Public	361.130		Real	(1)	Exempt cemeteries and graveyards must be open to the public and no charge is made for burial.
Cemeteries and Graveyards – Private	361.132		Real	(2)	Real property of a nonprofit corporation governed by the provisions of NRS Chapter 82 formed for the purposes of procuring and holding lands to be used exclusively for a cemetery are exempt, so long as the lots or plats remain dedicated to the purpose of a cemetery.
Charitable Foundation: *See University*	361.098		Both	(2)	All property owned by the charitable foundation established by the Board of Regents of University of Nevada is exempt unless it is used for a purpose other than carrying out the legitimate functions of the foundation.
Charitable Organizations	361.135		Both	(2)	See Lodges
Charitable Corporations	361.140		Both	(2)	Property actually occupied and used by corporation meeting certain qualifying criteria is exempt.
Charter School Leased Property	361.096		Both	(2)	All property leased or rented to a charter school is deemed to be used for an educational purpose and is exempt. Only the portion of the property that is used for the lease or rental to a charter school is exempt.

Churches & Chapels	361.125		Both	(2)	Buildings and personal property used for religious worship other than marriage chapels, is exempt. The property must be owned by a recognized religious society or corporation. If the property is used for other than church purposes and a rent is received, the property is not exempt.
Church Land, see *also "Land Used for Worship"*	361.125		Real	(2)	Parcels of land used exclusively for worship, including without limitation, both developed and undeveloped portions of a parcel.
Counties, Town, Municipal Corp	361.060		Both	(1)	Property of counties, domestic municipal corporations, irrigation drainage, reclamation district, or town, except for certain community pastures, is exempt. *See also Nevada Rural Housing Authority, Irrigation Districts*
Conservation District	361.060		Real	(1)	Real property acquired on or after 7-1-2003 by a conservation district is exempt.
Defenders of Wildlife	361.135		Both	(2)	*See Lodges for explanation.*
Disabled Veterans	361.091		Both	(3)	Up to $20,000 assessed value of property, adjusted by CPI, may be exempt, based on a sliding scale of disability of the veteran-owner. Only the property of residents or their surviving spouses meeting certain qualifying criteria is eligible for exemption.
Drainage Ditches, Canals & Irrigation Systems	361.070		Real	(1)	Drainage ditches and canals along with the lands included in the right-of-way of the ditch or canal are exempt. Each part of a permanently installed irrigation system, including pipes, concrete linings of ditches and headgates, are exempt.
Elderly & Handicapped Housing	361.086		Real and personal used for housing	(2)	All real property and mobile or modular housing and related facilities for elderly or handicapped persons are exempt if certain qualifying criteria are met.
Eagles Club	361.135		Both	(2)	*See Lodges for explanation*
Elks Club	361.135		Both	(2)	See Lodges for explanation.

Energy Systems (fka Heating & Cooling Systems)	701A.200 (fka 361.079)	361.052-361.058	Both	(1)	The value of a qualified system is not included in the assessed value of the building of which it is a part. Qualified systems in commercial or industrial buildings receiving certain other abatements or exemptions are ineligible for this exemption. System must conform to standards established by the Department.
Fine Art for public display	361.068; 361.186	361.030 – 361.044	Personal	(3)	The exemption is limited to certain kinds of works of art purchased for $25,000 or more and meets certain public display requirements. When a taxpayer collects an admission fee, the amount of exemption is reduced by the net revenue received by taxpayer. *See NRS and NAC requirements.*
Girl Scouts of America	361.11		Both	(2)	All real and personal property is exempt, unless it is used for a purpose other than the legitimate functions of the organization. *See also Nevada Museum of Art.*
Habitat for Humanity	361.115		Both	(2)	All property is exempt unless it is used for a purpose other than carrying out the legitimate functions of the organization. *See also Nevada Children's Foundation, Nevada Heritage Association.*
Hospital	361.083		Real	(2)	Property on which stands a hospital or other charitable asylum for the care or relief of orphans or sick, infirm or indigent persons owned by a qualifying non-profit corporation, is exempt. If the property is used for a different purpose, the property is taxable. *See also orphan children.*
Household goods and furniture	361.069	361.085	Personal	(1)	Household goods, furniture except certain appliances and furniture of time-share projects, are exempt. Examples are in both statute and regulation.
Irrigation, Drainage, Reclamation District	361.060		Both	(1)	See Counties, Towns for explanation.
Knights of Pythias	361.135		Both	(2)	*See Lodges for explanation.*

Knights of Columbus	361.135		Both	(2)	*See Lodges for explanation.*
Lahontan Audubon Society	361.135		Both	(2)	*See Lodges for explanation.*
Land used for Worship	361.125		Real	(2)	*See Church Land for explanation.*
Livestock	361.068		Personal	(1)	Livestock is exempt. Livestock is defined at NAC 361A.055. See also Article 10 (6).
Lodges & other charitable organizations	361.135		Both	(2)	Funds, furniture, paraphernalia and regalia owned by certain charitable organizations as well as real estate and fixtures are exempt. If the real estate is leased, the exemption does not apply to the portion so leased or rented.
Low income housing projects	361.082	361.089	Both	(3)	That portion of real property and tangible personal property used for housing and related facilities for persons with low incomes is exempt if the property meets certain criteria.
Masons	361.135		Both	(2)	*See Lodges for explanation.*
Mortgages	Article 10		Personal	(1)	Articles of personal property deemed to represent an interest in real or personal property already assessed and taxed is exempt.
Motor Vehicles	361.067		Personal	(1)	Vehicles defined in NRS 371.020 are exempt, except mobile homes. NRS 371.020 refers to NRS 482 and 706. Under NRS 482.210, special mobile equipment is not licensed and is therefore taxable for property tax.
Nathan Adelson Hospice	361.088		Both	(2)	All property is exempt, unless it is used for any purpose other than carrying out the legitimate functions of hospice care.
National Audubon Society	361.135		Both	(2)	*See Lodges for explanation.*
Nature Conservancy	361.111		Real	(2)	*See explanation under American Land Conservancy.*
Nevada Children's Foundation	361.115		Both	(2)	*See Habitat for Humanity for explanation.*
Nevada Heritage Association	361.115		Both	(2)	*See Habitat for Humanity for explanation.*
Nevada Land Conservancy	361.111		Real	(2)	*See explanation under American Land Conservancy.*

Nevada Museum of Art	361.11		Both	(2)	All real and personal property is exempt, unless it is used for a purpose other than the legitimate functions of the organization. *See also YMCA, YWCA, American National Red Cross, Salvation Army Corp, GSA, Camp Fire Girls, BSA, Sierra Arts Foundation.*
Nevada Rural Housing Authority	361.060		Real	(1)	*See explanation under Counties, Cities*
Noncommercial theaters	361.145		Both	(2)	Buildings, furniture & equipment of noncommercial theaters owned and operated by nonprofit educational corporations organized for the exclusive purpose of conducting theater practice classes and the production of plays on a nonprofessional basis are exempt.
Nonprofit private schools	361.105		Both	(2)	All property is exempt from taxation.
Odd Fellows	361.135		Both	(2)	*See Lodges for explanation.*
Orphan children or sick, infirm or indigent persons	361.083		Real	(2)	Land and buildings use for the care or relief of orphans or of sick, infirm or indigent persons owned by a nonprofit corporation organized or existing pursuant to NRS 82, is exempt. *See also Hospitals.*
Patented Mining Claims	362.010-362.095		Real	(5)	Upon receipt of an affidavit from the county recorder pursuant to NRS 362.050, the assessor shall exclude from the roll the assessment against the patented mine or mining claim named in the affidavit.
Pershing County Kids, Horses, Rodeo Inc.	361.107		Both	(2)	All real and personal property is exempt, unless it is used for a purpose other than the legitimate functions of the organization.
Personal Property held for sale by merchant	361.068		Personal	(1)	Personal property held for sale by a merchant is exempt.
Personal Property held for sale by manufacturer	361.068		Personal	(1)	Personal property held for sale by a manufacturer is exempt.

Personal property in transit	361.160-361.185	361.062	Personal	(4)	Claims must be submitted to county assessor in which the warehouse is located and a certification from the warehouse as to the status of the property must be attached.
Pipe & Irrigation Equipment	361.068		Personal	(1)	Pipe and other agricultural equipment used to convey water for the irrigation of legal crops is exempt.
Pollution control devices	361.077	361.046-361.050	Both	(3)	Property used as a facility, device, or method for the control of air or water pollution is exempt. Taxpayer must supply an annual affidavit to assessor on a form approved by Department. Certain property is not exempt per NAC 361.046.
Possessory Interest –Vending stands	361.159		Personal	(3)	The possessory interest in otherwise exempt property is taxable, except for vending stands operated by blind persons under the auspices of the Bureau of Services to the Blind – DETR.
Possessory Interest – Public Airport	361.159		Personal	(2)	The possessory interest in otherwise exempt property is taxable, except for personal property owned and used in a public airport.
Possessory Interest – Public airport, park, market, fairground	361.157(2)(a)		Real	(2)	The possessory interest in otherwise exempt property is taxable, except for real property located upon a public airport, park, market, or fairground. Certain leased property on a pubic airport made available for purposes other than the purposes of a public airport is taxable.
Possessory Interest – Federal Property	361.157(2)(b)		Real	(1)	A possessory interest in federal property for which PILT payments are made is exempt.
Possessory interest – state-supported educational institution	361.157(2)c		Real	(1)	A possessory interest in the property of any state-supported educational institution is exempt, except any part located within a TIA created pursuant to NRS 278C.155.

Possessory interest – Taylor Grazing Act, USFS, BuRec	361.157(2)(d)		Real	(1)	A possessory interest in property used by persons, associations or corporations according to the Taylor Grazing Act, United States Forest Service or the Bureau of Reclamation is exempt.
Possessory interest – Indian tribe	361.157(2)(e)		Real	(1)	A possessory interest in property of any Indian held in trust by the U.S. is exempt.
Possessory interest – Vending stands of the blind	361.157(2)(f)		Real	(1)	A possessory interest in vending stand locations operated by blind persons under the auspices of the Bureau of Services to the Blind and Visually Impaired – DETR, is exempt.
Possessory interest – geothermal leases	361.157(2)(g)		Real	(1)	A possessory interest in geothermal leases for resources which have not been put into commercial production, is exempt.
Possessory interest – public officer or employee	361.157(2)(h)		Real	(1)	A possessory interest in property that is leased, loaned or made available to a public officer or employee in the course of public employment, is exempt.
Possessory interest – parsonage	361.157(2)(i)		Real	(1)	A possessory interest in a parsonage owned by a recognized religious society or corporation when used exclusively as a parsonage, is exempt.
Possessory interest – Charitable or religious residence	361.157(2)(j)		Real	(1)	A possessory interest in a residence used by a person carrying out the activities of a charitable or religious organization is exempt
Possessory interest – shelter for elderly or indigent	361.157(2)(k)		Real	(1)	A possessory interest in property which is used to provide shelter at a reduced rate to the elderly or indigent is exempt.
Possessory interest – rental of meeting rooms	361.157(2)(l)		Real	(1)	A possessory interest in property used as meeting rooms or similar facilities for periods of less than 30 consecutive days is exempt.
Possessory interest – daycare	361.157(2)(m)		Real	(1)	A possessory interest in property used as a daycare by a nonprofit organization is exempt.

Promissory Notes	Article 10		Personal	(1)	Articles of personal property deemed to represent an interest in real or personal property already assessed and taxed is exempt.
Privately owned airports used by public	361.061(2)		Real	(2)	Privately owned airport property used for a public purpose, except areas from which income is derived, is exempt.
Privately owned parks used by public	361.0605	361.080	Real	(2)	The initial claim for exemption must be accompanied by a copy of the agreement with a local government that the property may be used by the public without charge. A sign must also be posted at each entrance to park. The exemption does not include areas from which income is derived.
Public Function Trusts	361.062		Both	(2)	Property of a trust created for the benefit of any public function pursuant to law is exempt, however, PILT monies may be paid to the beneficiary if so, provided in any agreement contained in creating the trust.
Radioactive fallout shelters	361.078		Real	(3)	Residential property is exempt up to $1,000 in assessed value if it meets certain qualifying conditions.
Raw materials & components consumed in the process of manufacture	361.068		Personal	(1)	Raw materials are exempt when they are held by a manufacturer for manufacture into products. Supplies consumed in the process of manufacture are also exempt.
Salvation Army Corps	361.11		Both	(2)	All real and personal property is exempt, unless it is used for a purpose other than the legitimate functions of the organization. *See also Nevada Museum of Art.*
School districts	361.065		Both	(1) school dist	All property owned by any legally created school district or charter school and devoted to public school purposes is exempt.
				(2) charter school	

Sierra Arts Foundation	361.11		Both	(2)	All real and personal property is exempt, unless it is used for a purpose other than the legitimate functions of the organization. *See also Nevada Museum of Art.*
State lands	361.055		Both	(1)	All property owned by the state, except land assigned to the Department of Wildlife, is exempt. PILT payments are made by the Department of Wildlife.
Stocks	Article 10		Personal	(1)	Articles of personal property deemed to represent an interest in real or personal property already assessed and taxed is exempt.
Surviving Spouse	361.080		Both	(3)	Property of surviving spouses up to an assessed value of $1,000, as modified by CPI, is exempt. The original affidavit of claim must be accompanied by a death certificate showing the claimant was married to the deceased at the time of their death. Renewal affidavits must be completed each year.
Surviving Spouses of Disabled Veterans	361.091		Both	(3)	See Disabled Veterans.
Transient Personal Property	361.068		Personal	(1)	Personal property owned by a non-resident and located in Nevada for purposes of a display, exhibition, convention, carnival, fair or circus is exempt. *See also Carnival, fair circus.*
United States	361.050		Both	(1)	All property owned by the United States is exempt.
University Fraternities & Sororities	361.100		Real	(2)	Real property owned by fraternities and sororities whose members are students at UNR or UNLV and use the property as their home, is exempt.
University System: Charitable Foundation	361.098		Both	(2)	All property owned by a charitable foundation established by the Board of Regents of the University of Nevada is exempt, unless it is used for a purpose other than the legitimate functions of the foundation.

University System Leased Property	361.099	361.070	Both	(2)	Property leased to the Nevada System of Higher Education is exempt if the total consideration from the lease is less than 10 percent of the fair market value of the property. Certain documentation must be provided. *See NAC 361.070.*
Unpatented Mines & mining Claims	361.075		Real	(1)	Unpatented mines and mining claims are exempt, except for possessory interests in lands held by U.S. or state of Nevada.
Vehicles	361.067		Personal	(1)	*See Motor Vehicles*
Veterans	361.09		Both	(3)	Up to $2,000 assessed value, adjusted by CPI, of property may be exempt. Only the property of residents meeting certain qualifying criteria is eligible for exemption.
Veteran Organizations	361.095		Both	(2)	Up to $10,000 assessed value, adjusted by CPI, of Funds, furniture, paraphernalia and regalia owned by certain charitable organizations as well as real estate and fixtures, is exempt. If the real estate is leased, the exemption does not apply to the portion so leased or rented.
Volunteer Fire Departments	361.150		Both	(2)	All property is exempt, unless it is used for any purpose other than carrying out the legitimate functions of a volunteer fire department.
Water Users' Nonprofit Associations	361.073		Both	(2)	All property is exempt, unless it is used for any purpose other than carrying out the legitimate functions of a water users' nonprofit cooperative corporation.
Young Men's Christian Association	361.110		Both	(2)	All real and personal property is exempt, unless it is used for a purpose other than the legitimate functions of the organization. *See also Nevada Museum of Art.*
Young Women's Christian Association	361.110		Both	(2)	All real and personal property is exempt, unless it is used for a purpose other than the legitimate functions of the organization. *See also Nevada Museum of Art.*

APPENDIX E

2023-24 PERSONAL PROPERTY MANUAL: VALUATION GUIDELINES

Determining Whether Fixtures are Real or Personal Property

NRS 361.333 requires that each major class of property be examined to determine whether there is equality of assessment. One of the principal classes of property is personal property, pursuant to NRS 361.227(4). Uniformity and equality of assessment thus depend on proper classification. Although NRS 361.035 defines real estate and NRS 361.030 defines personal property, in practice it is sometimes difficult to tell whether an item is personal property or a fixture that is part of the real estate. As the Attorney General stated in Opinion #41 (1963), "the classification depends on the facts of each particular case." The assessor is encouraged to consult the Division of Local Government Services and/or the District Attorney in difficult cases.

A fixture may be defined as an item that was originally personal property which has been installed or attached to land or an improvement in a permanent manner. There is an abundant amount of case law which discusses three tests often used in deciding whether an item is a fixture. The tests are:

1. Physical Annexation;
2. Constructive Annexation, also called Adaptation; and
3. Intent

Under the first test, annexation, an item is a fixture if it is attached to, imbedded in or permanently resting upon land or an improvement, or is attached by other means that are normally used for permanent installation, and cannot be removed without substantially damaging the item or the land or improvement with which it is being used. For example, an item which is attached to real property for stability and has quick disconnect attachments such as simple wiring and conduit connections may not meet the test for a permanent fixture.

Under the second test, constructive annexation, an item is a fixture if the use or purpose of an item that is not otherwise physically annexed to land or an improvement is so adapted that it is:

A. A necessary, integral or working part of the land or improvement;
B. Designed or committed for use with the land or improvement; or
C. So essential to the land or improvement that the land or improvement cannot perform its desired function without the nonattached item.

Using the constructive annexation test, if the purpose of the item is to augment the use of the improvement no matter how it is attached, such as an elevator, the item must be considered a fixture. Another example would be heating, ventilation, and air conditioning equipment (HVAC). Equipment used to heat, ventilate, or cool a structure is considered to be real property.

Permanently attached personal property may be temporarily removed for repair or renovation onsite and still be considered permanently attached. Permanently attached fixtures do not include movable tangible personal property that is attached for convenience, stability or an obviously temporary purpose.

Underlying both the physical or constructive annexation tests is a determination of intent. An assessor must consider whether the item is intended to be a permanent part of the land or improvement, taking into account physical or constructive annexation, and other objective manifestations of permanence. NAC 361.1127 provides examples of objective manifestations of permanence.

A trade fixture may be distinguished from a fixture. It is an item of personal property that is non-permanently attached to real property for the purpose of conducting a business or trade; and has a unique identity and function separate from the real property to which it is attached. NAC 361.11745 provides a definition of trade fixture.

Pursuant to NRS 361.244, a mobile or manufactured home becomes real property when the Assessor has listed it on the tax roll as real property. The classification of mobile and manufactured homes as real property may be made when the requirements enumerated in NRS 361.244(1) and (2) are met. This includes the issuance of a Real Property Notice by the Manufactured Housing Division of the Department of Business and Industry. Factory-built housing becomes real property once it is permanently affixed to the land. These housing units conform to the Uniform Building Code and are not titled. As such they are not personal property nor are they considered "conversions". These "UBC" homes do not exhibit the HUD placards found on manufactured housing. Instead they may have a placard referencing NRS 461.080 and their serial numbers may begin with the characters "UBC".

In general, personal property is defined by exception pursuant to NRS 361.030. Property that does not meet the criteria of real property is personal property. The Assessor should recognize that certain fixtures such as bars, stages, walk-in coolers, or bank drive-ups, may already be included in the real property component of the Assessor's Taxable Value. The Assessor should review the differing building occupancies of the Marshall-Swift cost manuals to ensure that a component of real or personal property is not double-assessed. The improper classification of any component of taxable property as real or personal does not render the valuation void or invalid.

For further research and explanation, please consult:

Attorney General Opinion 2012-10 (10-31-2012) (as it applies to fixtures, not to trade fixtures)
Attorney General Opinion #41 (1963)
Attorney General Opinion No. 2000-04
Marvin Arnold, Respondent, v. Goldfield Third Chance Mining Co, 32 Nev. 447; 109 P. 718 (1910)
National Advertising Co. v. State Department of Transportation, 116 Nev. Adv. Op. No. 10, (Feb. 2, 2000)
Fondren, et al, v. K/L Complex Ltd., et al., 106 Nev. 705; 800 P.2d 719; (1990)
Morse Signal Devices of California v. County of Los Angeles, 161 Cal. App. 3d 570; 207 Cal Rptr. 742 (1984)
Crocker National Bank v. City and County of San Francisco, 782 P.2d 278 (1989)
State v. Pioneer Citizens Bank of Nevada, 85 Nev. 395 (1969)
Kaiser Co. v. *Reid* (1947) 30 Cal.2d 610

References:

International Association of Assessing Officers, Standard on the Valuation of Personal Property, December 2005. This publication may be obtained free of charge from the IAAO website at http://docs.iaao.org/media/standards/StandardValuationPersonalProperty.pdf

The Appraisal Institute: The Appraisal of Real Estate, 14th Edition, Chicago: 2013

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STATE
BOARD OF EQUALIZATION

Case #25-155

Fiscal Year 2022/2023

Declaration Assets Filed Online
Account ID# 229299

Account Name / DBA:	EAGLE SHADOW MOUNTAIN SOLAR
Corporate Name:	AREVON ENERGY
Location Address	0 MOAPA SOLAR RD
Location City	MOAPA
Location Zip	89025
Mailing To	325MK 8ME, LLC C/O AREVON ENERGY
Mailing Address 1	8800 GAINEY CENTER DR SUITE 100
Mailing Address 2	
Mailing City	SCOTTSDALE
Mailing State	AZ
Mailing Zip	85258
Business Phone	(480) 653-8450
NAICS Code	221114
Contact Name	James Bergstrom
Contact Title	Senior Tax Manager
Contact Phone	(480) 681-4031
Contact Email	jbergstrom@arevonenergy.com
Status	no_status_change
Status Date	
Status Notes	
Submission Date	10/2/2024 10:41:19 AM

Add Or Delete	Asset ID # or Serial # (optional)	Description	Year Acquired	Acquisition Cost	Department Code
ADD		Inventory	2023	242,379.00	TFX
ADD		Solar System Blocks 1-10 & 13	2021	348,300,000.00	RP
ADD		Solar system blocks 11 & 14	2023	74,600,001.00	RP
ADD		Solar system block 12	2022	37,400,000.00	RP

Fiscal Year 2022 - 2023

BUSINESS PERSONAL PROPERTY DECLARATION & ASSET LISTING

Assessor ID# **229299** **Group:**
Business Name **EAGLE SHADOW MOUNTAIN SOLAR**

Mailing Address **8800 GAINEY CENTER DR SUITE 100**
SCOTTSDALE AZ 85258-2193

Location Address **MOAPA SOLAR RD**
MOAPA 89025-

Phone Number

Prior Assessor ID#
Legal/Corporation Name **AREVON ENERGY**
Contact Name
Contact Phone
Email Address
NAICS **221114**
Solar Electric Power Generation

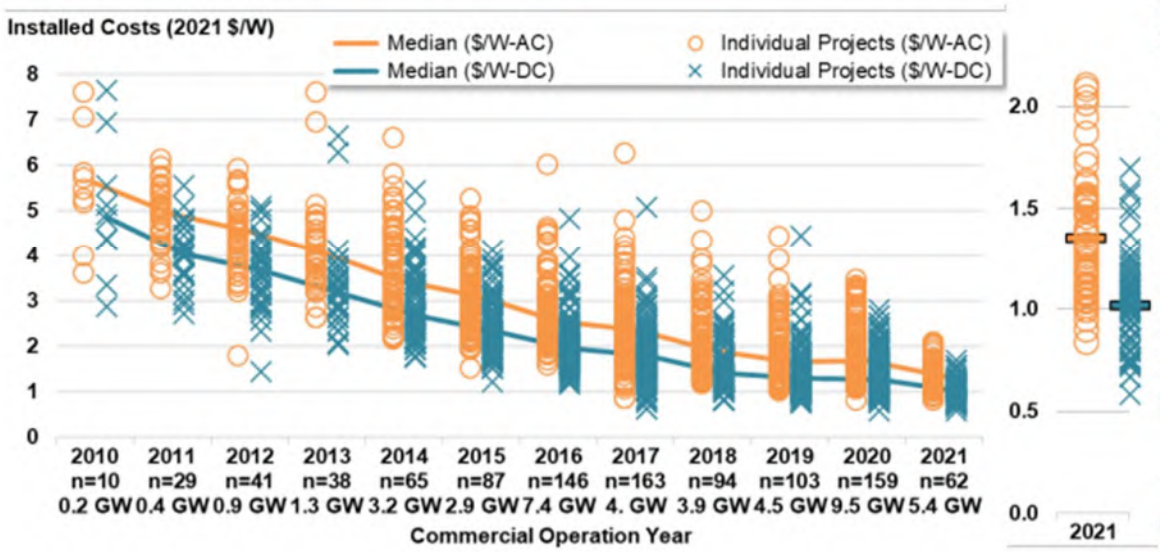
Totals	348,300,000	291,527,100	291,527,100	102,034,485

Add or Delete	Asset ID # or Serial # (optional)	Description	Year Acquired	Acquisition Cost	Taxable	Override Value	Assessed	Dept Code
		SOLAR SYSTEM BLOCKS 1	2021	348,300,000	291,527,100	291,527,100	102,034,485	30RA
				348,300,000	291,527,100	291,527,100	102,034,485	

Obsolescence – Utility Scale Solar 2022-2023

Median installed costs of PV have fallen by 76% (or 10% annually) since 2010, to $1.35/$W_{AC}$ ($1.02/$W_{DC}$) in 2021

Sample: 1,002 projects totaling 43,800 MW_{AC}



The lowest 20th percentile of project costs fell from $1.4/$W_{AC}$ ($1.0/$W_{DC}$) in 2020 to $1.1/$W_{AC}$ ($0.8/$W_{DC}$) in 2021.

The lowest-cost projects among the 62 data points in 2021 are now below $1.0/$W_{AC}$.

Historical sample is robust (covering 99% of installed capacity through 2020). 2021 data covers 40% of new projects or 43% of new capacity.

This sample is backward-looking and does not reflect the costs of projects built in 2022/2023.

BERKELEY LAB

Utility-Scale Solar, 2022 Edition
http://utilityscalesolar.lbl.gov

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Installed Costs 2021 $/W$_{AC}$ from Berkeley Labs

Year	Median Installed Costs $/W$_{AC}$	Cost Decline (%)	Market Based Installed Cost (% Good)
2026			
2025			
2024			
2023			
2022	$1.24	0.00	1.00
2021	$1.35	0.08	0.92
2020	$1.68	0.26	0.74
2019	$1.65	0.25	0.75
2018	$1.91	0.35	0.65
2017	$2.36	0.47	0.53
2016	$2.55	0.51	0.49
2015	$3.08	0.60	0.40
2014	$3.44	0.64	0.36
2013	$4.05	0.69	0.31
2012	$4.55	0.73	0.27
2011	$4.92	0.75	0.25
2010	$5.61	0.78	0.22
2009	$5.41	0.77	0.23
2008	$5.02	0.75	0.25
2007	$10.90	0.89	0.11
2006			
2005			

Red = Estimated

30-Year Life Table based % Good vs Market Based Installed Cost | Predictive Analys

	Chart 1		Chart 2	
Year Built	Statutory 22-23 Personal Property Manual 30-Year Life Table Percent Good	Market Based Installed Cost (% Good)	Statutory 22-23 Personal Property Manual 30-Year Life Table Percent Good	Trend Line Predicted Market Based Installed Cost (% Good)
2026				
2025				
2024				
2023				
2022	1.00	1.00	1.00	1.01
2021	0.93	0.92	0.93	0.90
2020	0.87	0.74	0.87	0.80
2019	0.81	0.75	0.81	0.71
2018	0.76	0.65	0.76	0.62
2017	0.71	0.53	0.71	0.55
2016	0.66	0.49	0.66	0.48
2015	0.62	0.40	0.62	0.41
2014	0.58	0.36	0.58	0.36
2013	0.54	0.31	0.54	0.31
2012	0.50	0.27	0.50	0.28
2011	0.47	0.25	0.47	0.24
2010	0.44	0.22	0.44	0.22
2009	0.41	0.23	0.41	0.20
2008	0.38	0.25	0.38	0.20
2007	0.36	0.11	0.36	0.20
2006				
2005				

Chart 1

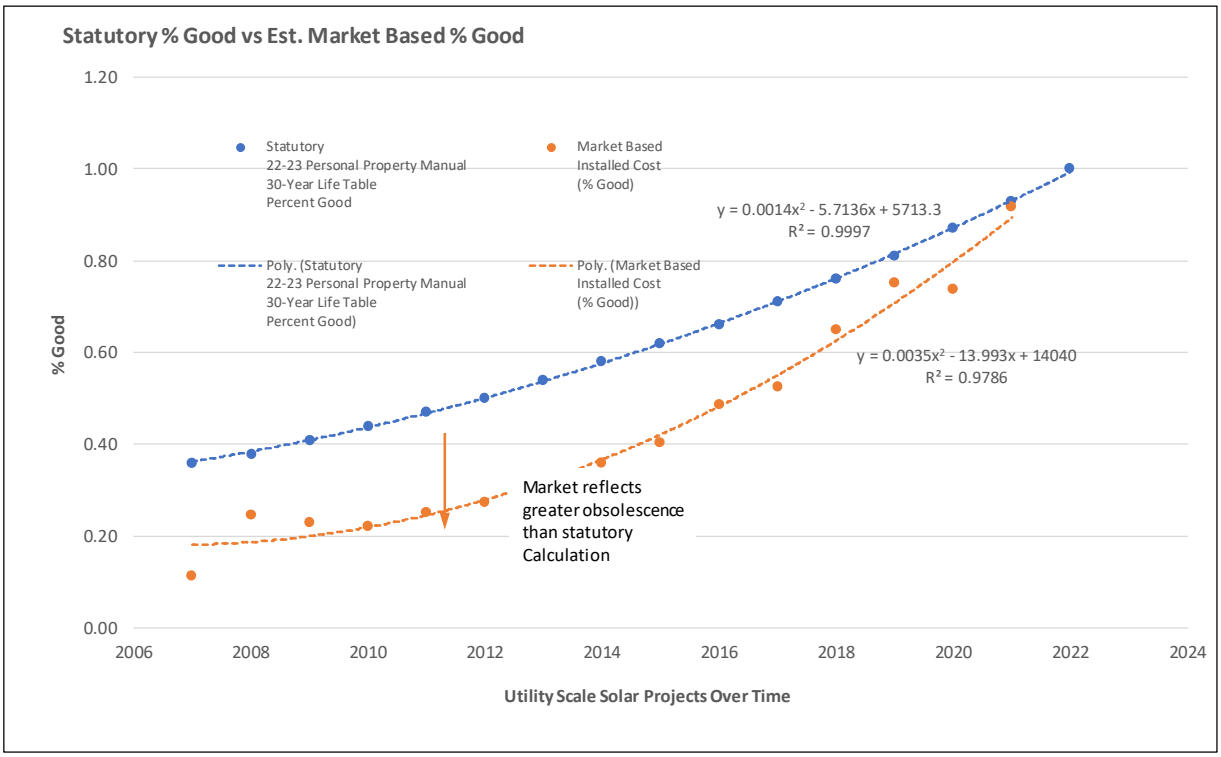
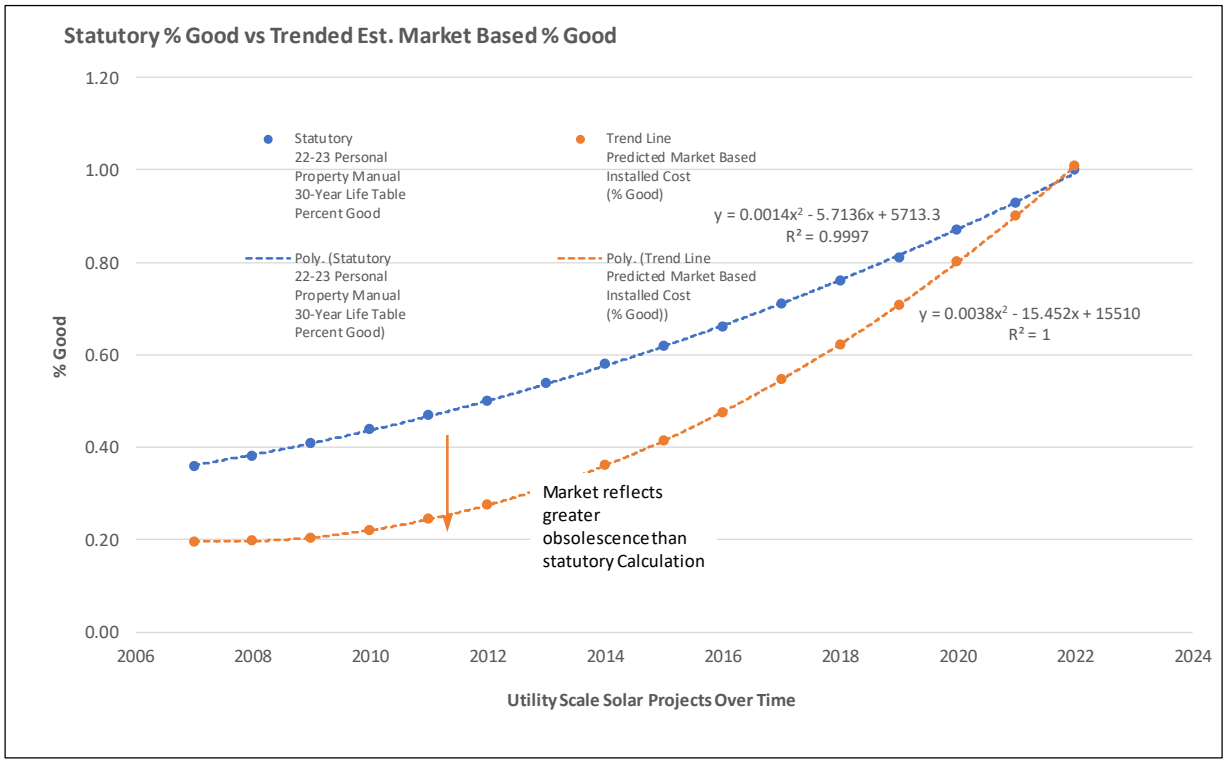


Chart 2



Final Recommendation for an Obsolescence Adjustment (With Example for $1,000 in Historical Cost)

Year Built	Historical or Declared Cost	Statutory 22-23 Personal Property Manual 30-Year Life Table Cost Index	RCN	Statutory 22-23 Personal Property Manual 30-Year Life Table Percent Good	Statutory Taxable Value
2026					
2025					
2024					
2023					
2022		1.00		100.00	
2021	$1,000.00	1.01	$1,010.00	93.00	$939.30
2020		1.03		87.00	
2019		1.05		81.00	
2018		1.08		76.00	
2017		1.10		71.00	
2016		1.13		66.00	
2015		1.13		62.00	
2014		1.14		58.00	
2013		1.16		54.00	
2012		1.17		50.00	
2011		1.20		47.00	
2010		1.23		44.00	
2009		1.24		41.00	
2008		1.26		38.00	
2007		1.30		36.00	
2006					
2005					

Year Built	Historical or Declared Cost	Market Based Installed Cost Multiplier (% Good)	Adjusted Current Cost	Statutory 22-23 Personal Property Manual 30-Year Life Table Percent Good	Market Taxable Value
2026					
2025					
2024					
2023					
2022		1.00		100.00	
2021	$1,000.00	0.90	$900.00	93.00	$837.00
2020		0.80		87.00	
2019		0.71		81.00	
2018		0.62		76.00	
2017		0.55		71.00	
2016		0.48		66.00	
2015		0.41		62.00	
2014		0.36		58.00	
2013		0.31		54.00	
2012		0.28		50.00	
2011		0.24		47.00	
2010		0.22		44.00	
2009		0.20		41.00	
2008		0.20		38.00	
2007		0.20		36.00	
2006					
2005					

Market Taxable Value	$837.00
Minus: Statutory Taxable Value	$939.30
Recommended Obsolescence	-$102.30
as a Percentage Deduction	**0.10891089**
or as a Factor	**0.89108911**

Utility-Scale Solar, 2022 Edition

Empirical Trends in Deployment, Technology, Cost, Performance, PPA Pricing, and Value in the United States

Mark Bolinger[1], Joachim Seel[1],
Cody Warner, and Dana Robson

Lawrence Berkeley National Laboratory
[1]Corresponding authors

September 2022


Photo: *Enel Green Power*

This material is based upon work supported by the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy (EERE) under Solar Energy Technologies Office (SETO) Agreement Number 38444 and Contract No. DE-AC02-05CH11231.

Utility-Scale Solar, 2022 Edition



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Photo credit:
Enel's 497 MW_{DC} Roadrunner Solar Project with bifacial modules

Utility-Scale Solar, 2022 Edition

Purpose and Scope:

- Summarize publicly available data on key trends in U.S. utility-scale solar sector
- Focus on ground-mounted projects >5 MW_{AC}
  - There are separate DOE-funded data collection efforts on distributed PV
- Focus on historical data, emphasizing the most-recent full calendar year

Data and Methods:

- See summary at end of PowerPoint deck

Funding:

- U.S. Department of Energy's Solar Energy Technologies Office

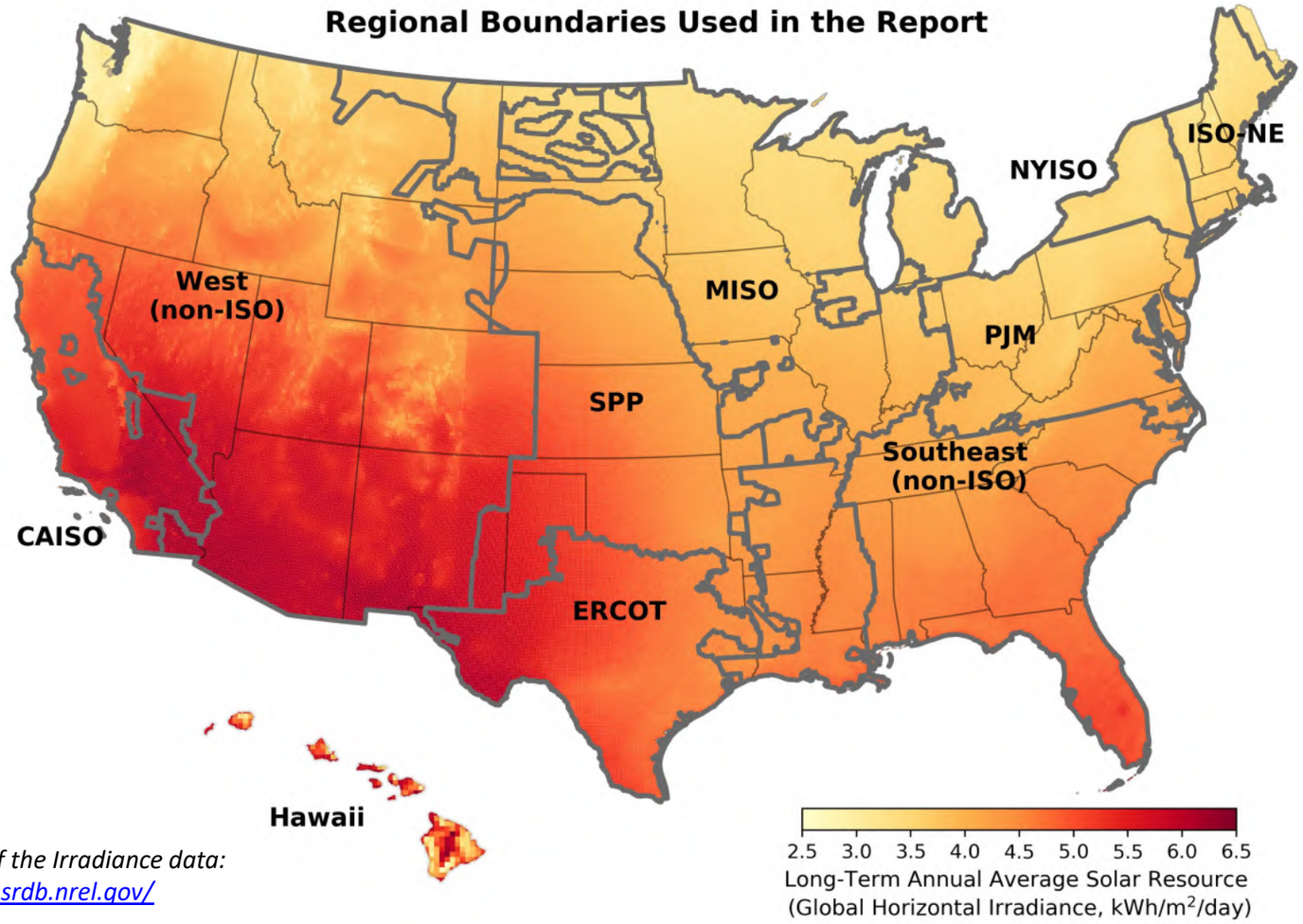
Products and Availability:

- This report deck is complemented by an Excel data file, a written technical brief, and interactive visualizations
- All products are available at: utilityscalesolar.lbl.gov

Report Contents

- Deployment and Technology Trends
- Capital Costs (CapEx) and O&M Costs
- Performance (Capacity Factors)
- Levelized Cost of Energy (LCOE) and Power Purchase Agreement (PPA) Prices
- Wholesale Market Value
- PV+Battery Hybrid Plants
- Concentrating Solar Thermal Power (CSP) Plants
- Capacity in Interconnection Queues
- Summary
- Data and Methods

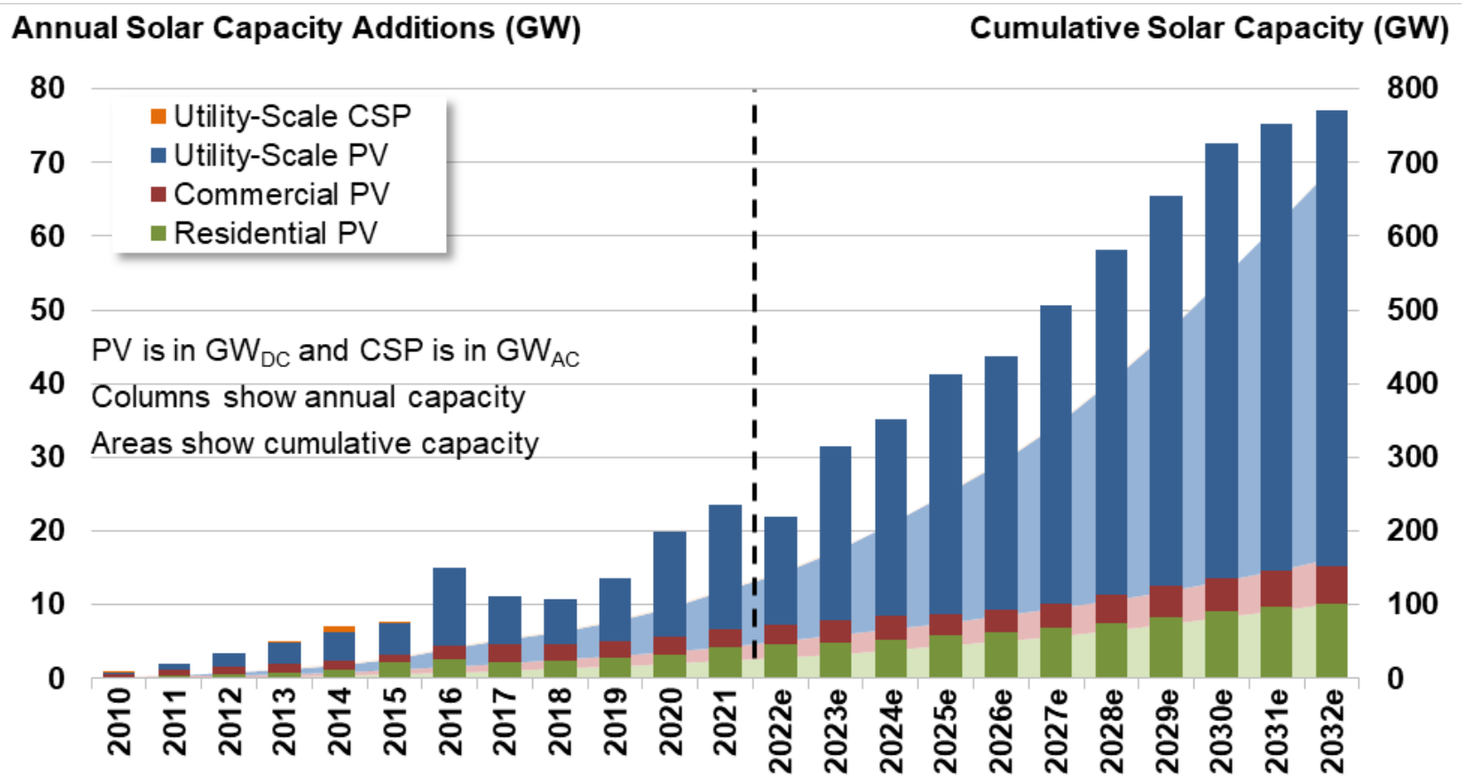
Regional boundaries applied in this analysis include the seven independent system operators (ISO) and two non-ISO regions



Source of the Irradiance data:
https://nsrdb.nrel.gov/

Deployment and Technology Trends

The utility-scale sector has the greatest share of the U.S. solar market



Sources: *Wood Mackenzie/SEIA Solar Market Insight Reports, Berkeley Lab*

We define "utility-scale" as any ground-mounted project that is larger than 5 MW_{AC}

Smaller systems are analyzed in LBNL's *"Tracking the Sun"* series (trackingthesun.lbl.gov)

Wood Mackenzie and SEIA report that the utility-scale sector added a record 17 GW_{DC} of new solar capacity in 2021, accounting for **72% of all new solar** capacity and representing a year-over-year growth rate of 19%.

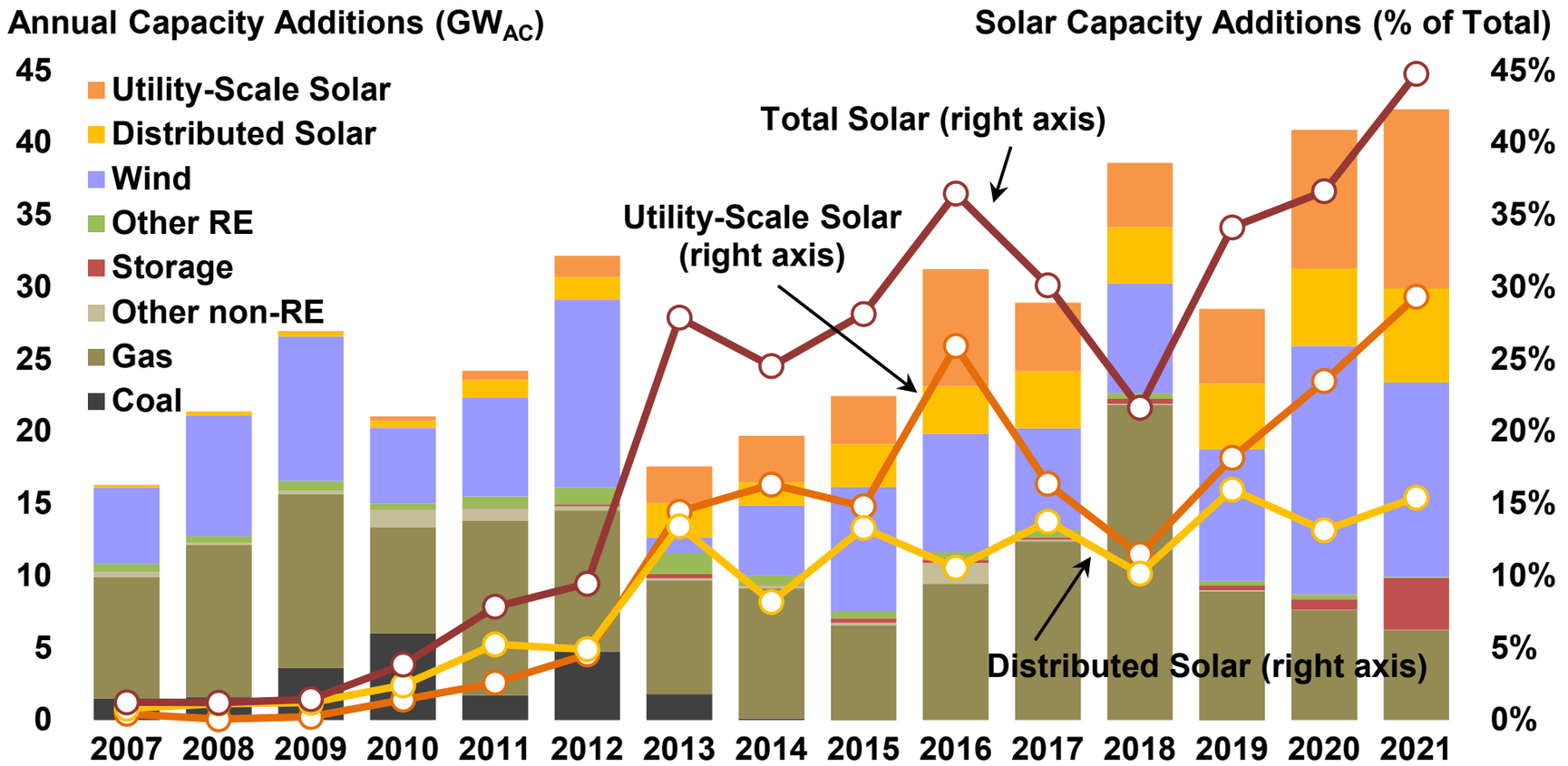
Utility-scale solar contributed **65% of cumulative solar** capacity (and 70% of solar generation) in 2021; this share is projected to rise above 70% by 2025 and 75% by 2030.

Our data analysis focuses on a subset of this sample—all projects larger than 5 MW_{AC} that were completed by the end of 2021:

- **2020**: 164 new projects totaling 12.8 GW_{DC} or 9.6 GW_{AC}
- **2021**: 156 new projects totaling 16.7 GW_{DC} or 12.5 GW_{AC}

Note: Wood Mackenzie/SEIA's graph above defines utility-scale solar as >1 MW_{DC} while this report uses a definition of >5 MW_{AC}.

Solar was the largest source of capacity added to U.S. grids in 2021



Bars represent annual capacity additions in GW_{AC} (left axis), lines represent solar's capacity share (right axis)

Sources: *ABB, ACP/AWEA, Wood Mackenzie/SEIA Solar Market Insight Reports, Berkeley Lab*

Utility-scale (29%) and distributed (15%) solar accounted for a combined 45% of all capacity added to U.S. grids in 2021 (ahead of wind's 32%).

Solar has contributed >30% of all new capacity in 5 of the last 6 years, and >20% in each of the last 9 years.

We have included storage in the graph this year: 3.6 GW of storage were added to U.S. grids in 2021, up from 0.7 GW in 2020.

Note: This graph follows Wood Mackenzie/SEIA split between distributed and utility-scale solar, rather than our 5 MW_{AC} threshold.

Solar generation's market share was 3.9% across the U.S. in 2021, but reached 25% in California and exceeded 15% in four other states

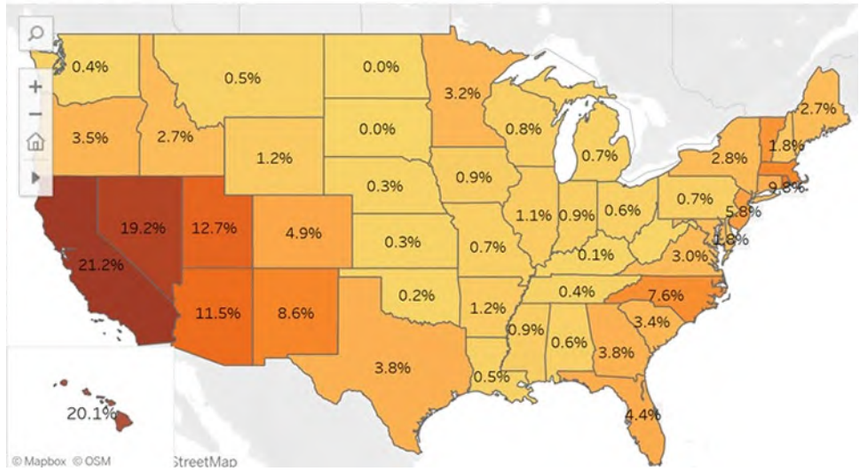
State	Solar generation as a % of in-state generation		Solar generation as a % of in-state load	
	All Solar	Utility-Scale Solar Only	All Solar	Utility-Scale Solar Only
California	25.0%	15.8%	22.0%	13.9%
Massachusetts	19.7%	8.1%	8.5%	3.5%
Nevada	18.0%	15.5%	19.7%	16.9%
Hawaii	17.1%	5.0%	20.1%	5.8%
Vermont	16.1%	8.1%	6.9%	3.5%
Utah	9.5%	8.0%	12.7%	10.7%
Arizona	9.0%	6.0%	12.4%	8.2%
Rhode Island	8.6%	4.0%	9.8%	4.6%
North Carolina	7.9%	7.5%	7.6%	7.3%
New Jersey	6.6%	2.4%	5.8%	2.1%
New Mexico	6.2%	4.9%	8.6%	6.8%
Delaware	4.8%	1.5%	1.8%	0.5%
Colorado	4.8%	3.0%	4.9%	3.1%
Florida	4.4%	3.7%	4.4%	3.8%
Maryland	4.2%	1.6%	2.9%	1.1%
Georgia	4.1%	3.8%	3.8%	3.5%
Idaho	4.0%	3.3%	2.7%	2.2%
Virginia	3.9%	3.6%	3.0%	2.7%
Minnesota	3.5%	3.2%	3.2%	2.9%
Texas	3.4%	2.9%	3.8%	3.3%
Rest of U.S.	*0.9%*	*0.5%*	*1.0%*	*0.6%*
TOTAL U.S.	**3.9%**	**2.8%**	**4.3%**	**3.0%**

Solar market share can vary considerably depending on whether it is calculated as a percentage of total generation or load (e.g., see Vermont)

As a percentage of in-state generation, California's solar market share reached 25% in 2021, while Massachusetts, Nevada, Hawaii, and Vermont all surpassed 15%

The utility-scale sector's contribution varies by state: a minority in the Northeast and Hawaii, a majority in Southwest states and the overall U.S.

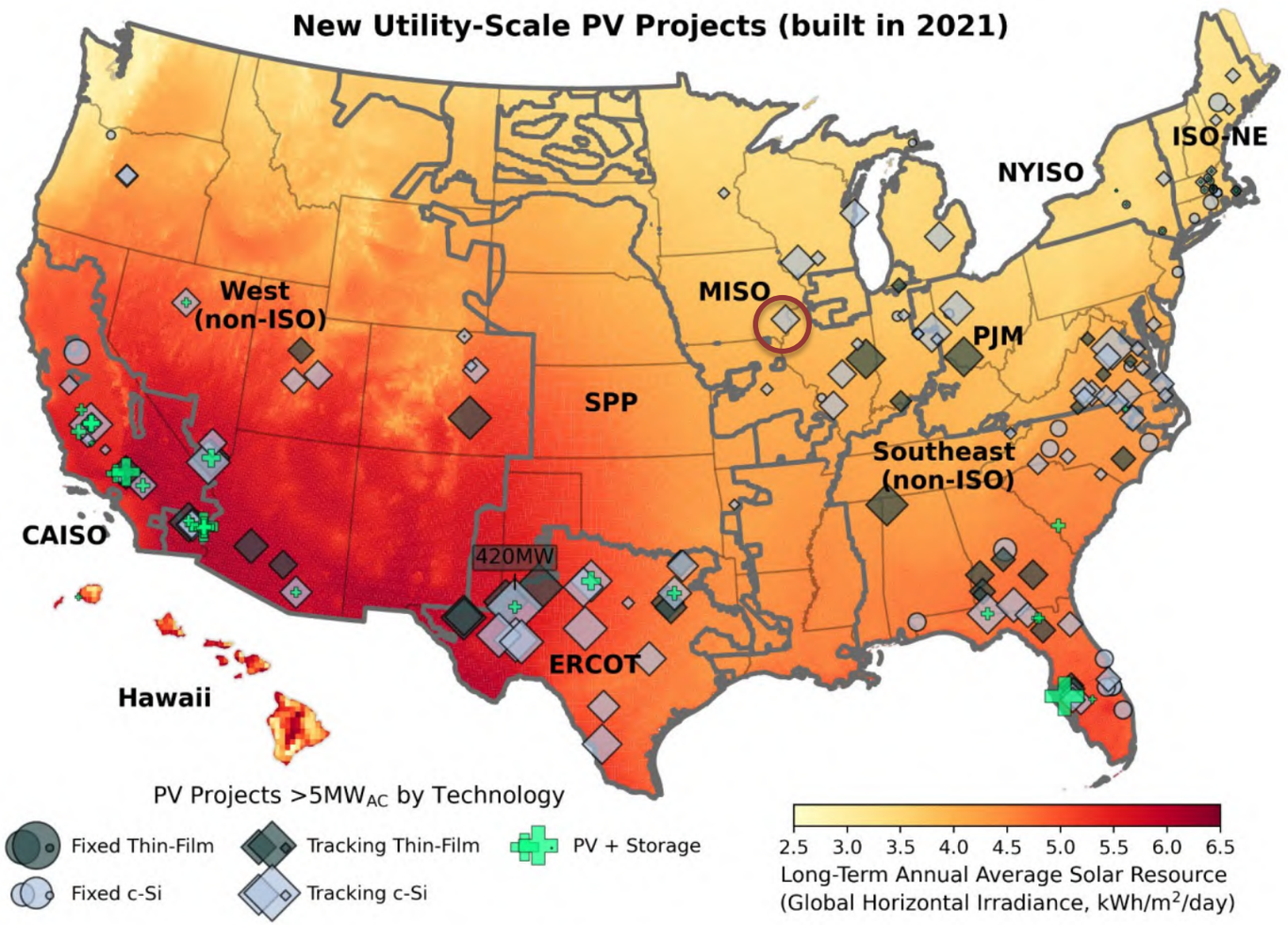
Percentage of In-State Electricity Sales and Generation from Solar PV, as of **2021**



You can explore this data interactively at https://emp.lbl.gov/capacity-and-generation-state

Note: In this table, "utility-scale" refers to projects ≥ 1 MW_{AC}, rather than our typical 5 MW_{AC} threshold.

Texas continued to lead in new utility-scale solar deployment



Texas completed some of the largest projects we have seen in the US (up to 420 MW_{AC}).

Fixed-tilt ( ) projects are increasingly only being built on particularly challenging sites (e.g., due to terrain or wind loading) or in the least-sunny regions in the northeast.

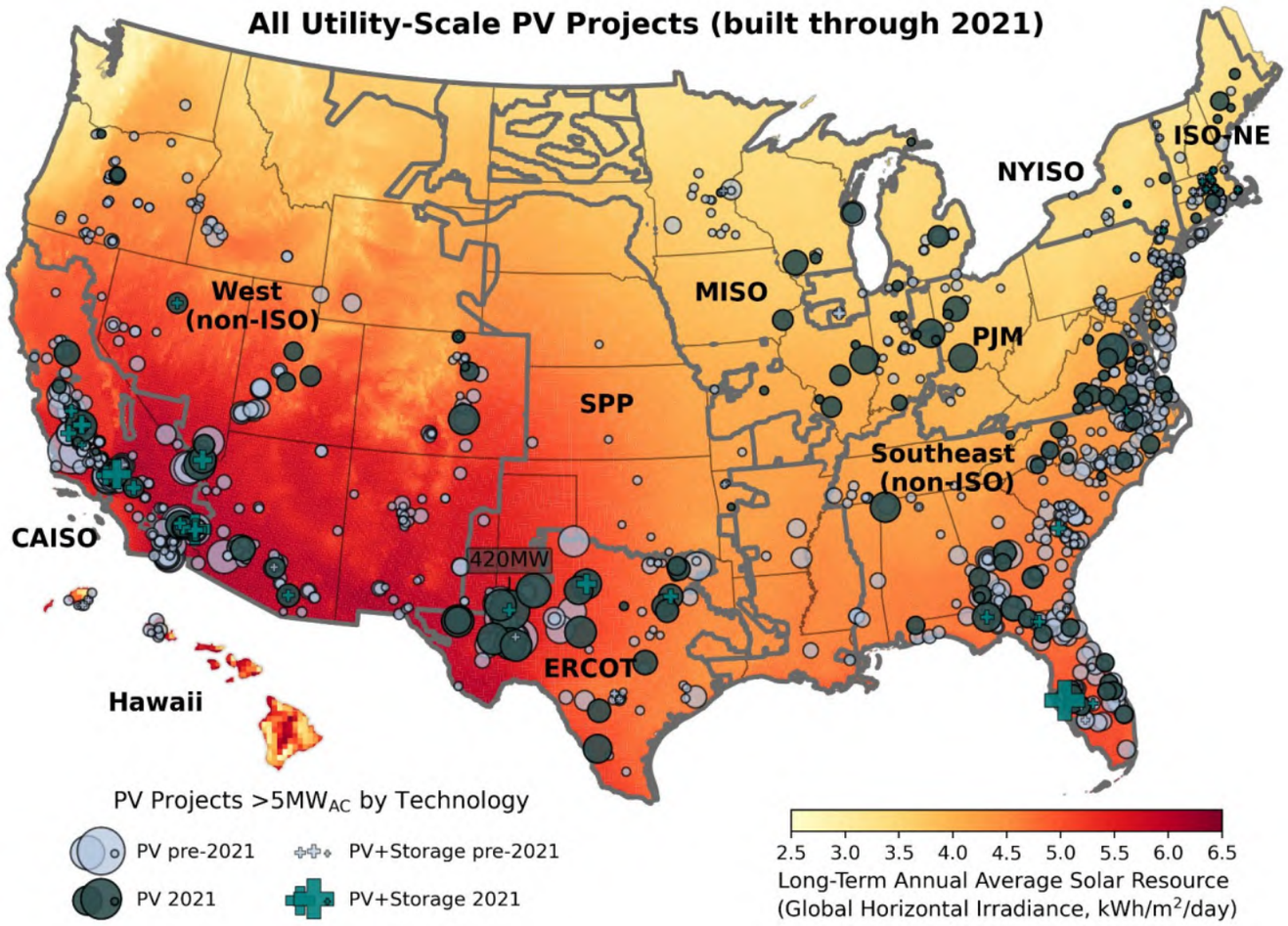
Other high-latitude states such as Oregon, Minnesota, Wisconsin, Michigan, and Maine added predominantly **tracking** projects in 2021 ( ).

In 2021, storage ( ) hybrid projects hit the ground in record numbers. Batteries were added to already existing (18) and new (29) PV projects. Solar-rich CA added the most storage capacity (1.2 GW), while MA deployed many (14) small-sized battery projects.

Iowa added its first utility-scale PV project: (100 MW_{AC} Wapello Solar)

You can explore this data interactively at https://emp.lbl.gov/technology-trends

Utility-scale solar has become a growing source of electricity in all regions of the United States



Utility-scale PV is well-represented throughout the nation, with the exception of upper-Midwestern states in the “wind belt”.

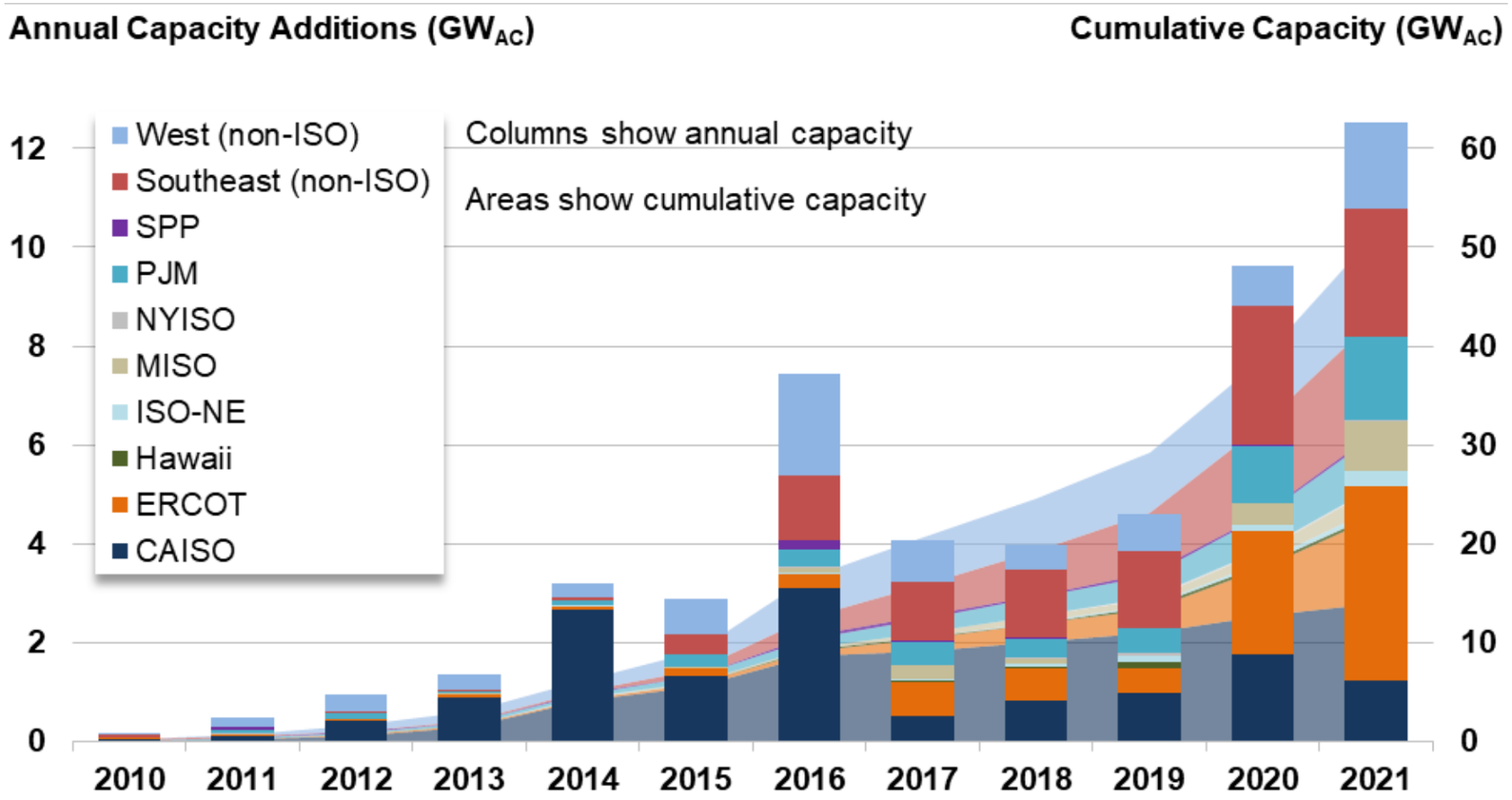
Large solar projects (>100 MW) are now being built in western PJM and eastern MISO, while Texas solar increasingly expands beyond the panhandle.

Montana, the Dakotas, New Hampshire, and West Virginia still await their first utility-scale solar projects in our sample.

You can explore this data interactively at https://emp.lbl.gov/technology-trends

Texas and the Southeast added the most utility-scale solar capacity in 2021

PV project population: 1,131 projects totaling 51,343 MW_{AC}



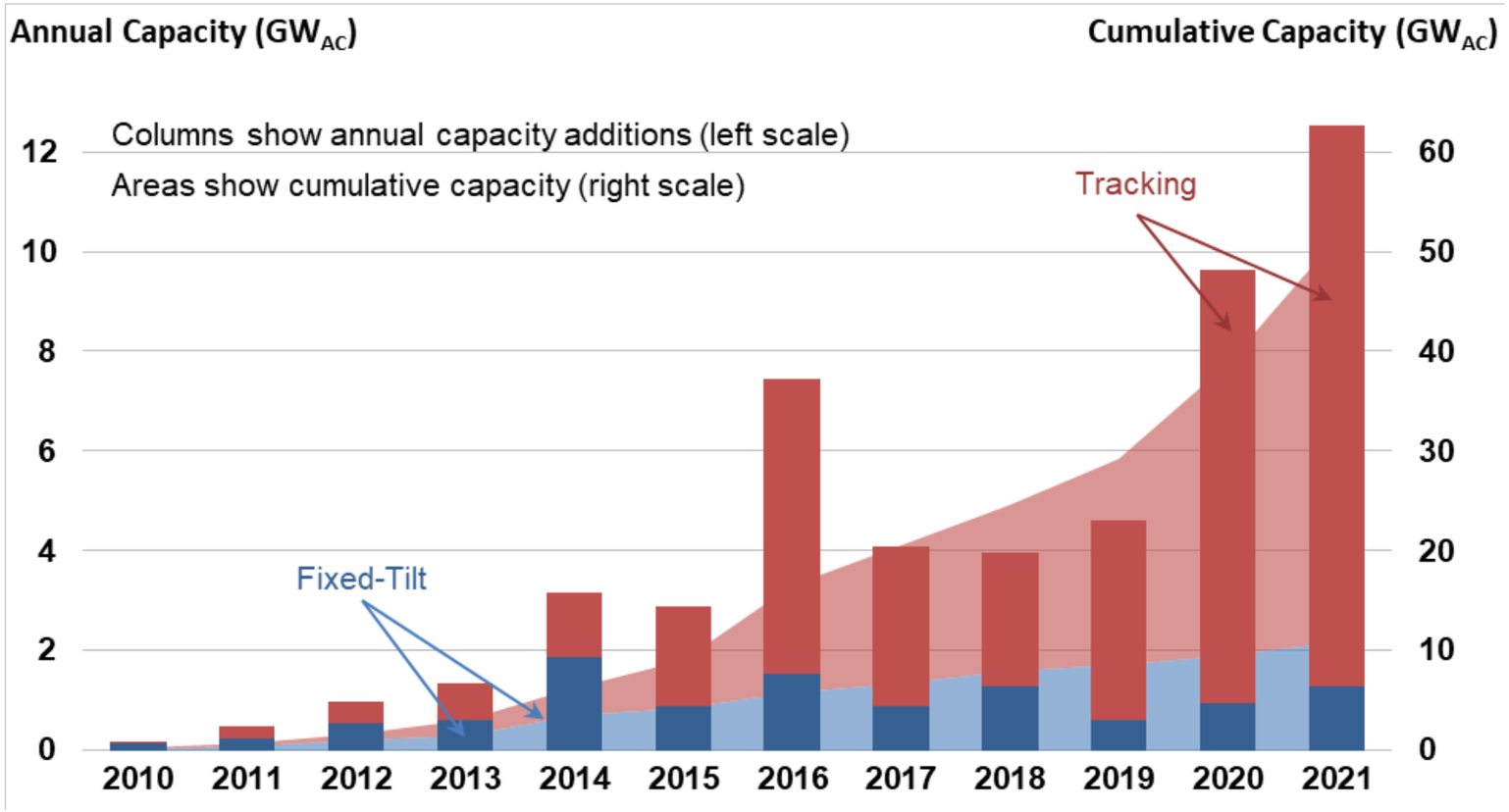
Texas (ERCOT) has established itself as a solar hotbed, having added 3.9 GW_{AC} or 32% of all utility-scale solar capacity in 2021. This was more than 3x the new capacity added in California last year, potentially putting Texas on a path to soon lead the U.S. in terms of cumulative utility-scale solar capacity.

Florida (1.1 GW_{AC}), **Georgia**, and **Virginia** (both 0.9 GW_{AC}) continued to lead solar growth in the Southeast in 2021. **California's** USS growth slowed with "only" 1.2 GW_{AC} in 2021, but it still accounts for the most installed capacity on a cumulative basis (26% of the U.S. total).

You can explore this data interactively at https://emp.lbl.gov/capacity-and-generation-state

Projects with tracking technology dominated 2021 additions

PV project population: 1,129 projects totaling 51,330 MW_{AC}

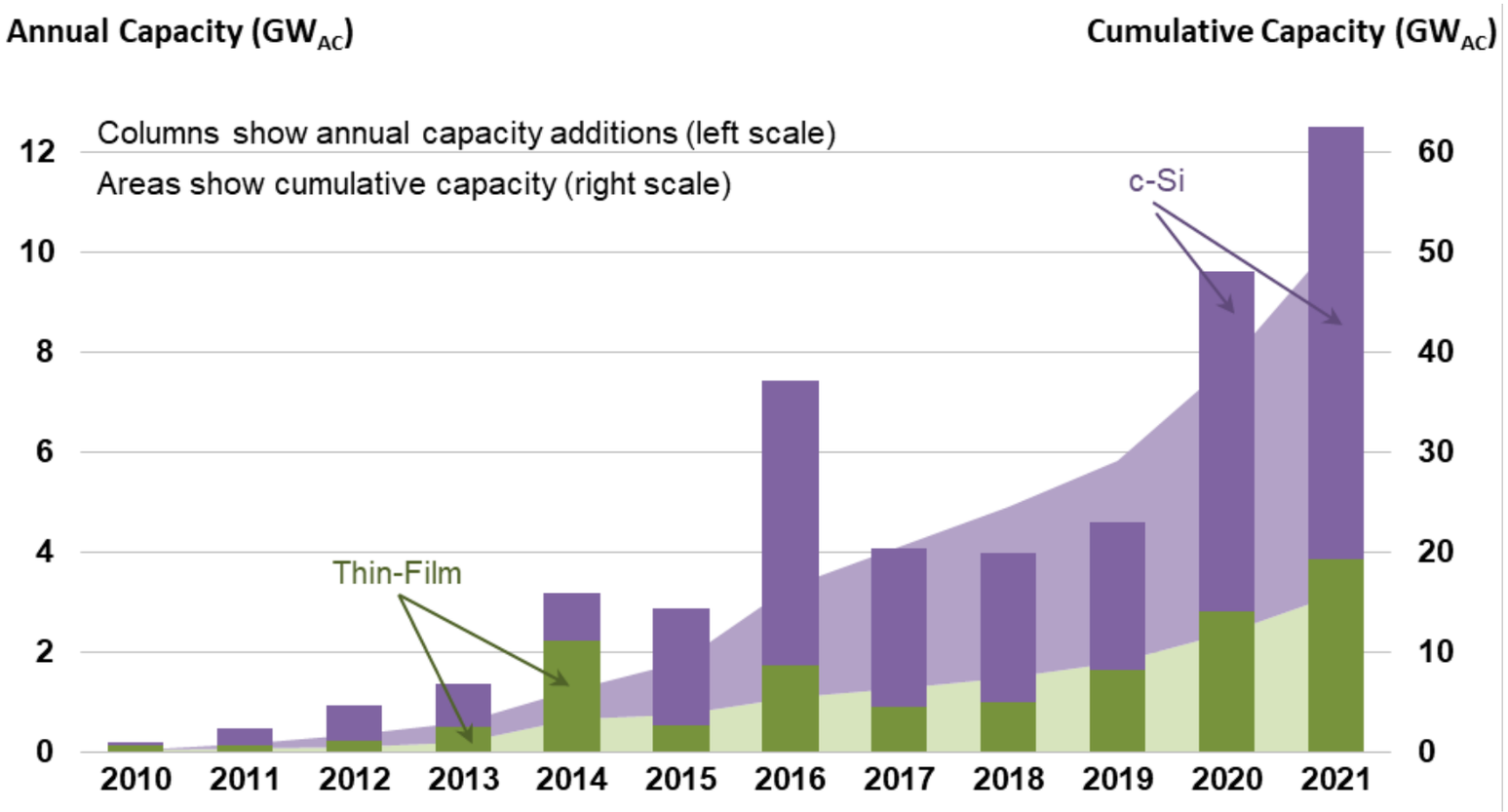


Projects using single-axis **tracking** have consistently exceeded **fixed-tilt** installations since 2015, and dominated again in 2021, with 90% of all new capacity using tracking.

Upfront cost premiums for trackers have generally fallen over the years, resulting in favorable economics in most of the United States thanks to increased generation (though 2021 saw a slight uptick in cost premiums—discussed later).

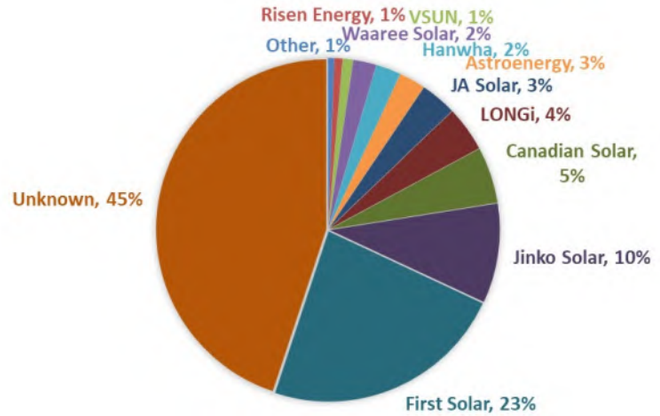
Projects using c-Si modules led thin-film additions in 2021

PV project population: 1,125 projects totaling 51,260 MW_{AC}



c-Si modules continued their clear lead (69% of newly installed capacity) relative to **thin-film** modules, though the latter have become more popular since 2018 as they were not subject to Section 201 import tariffs.

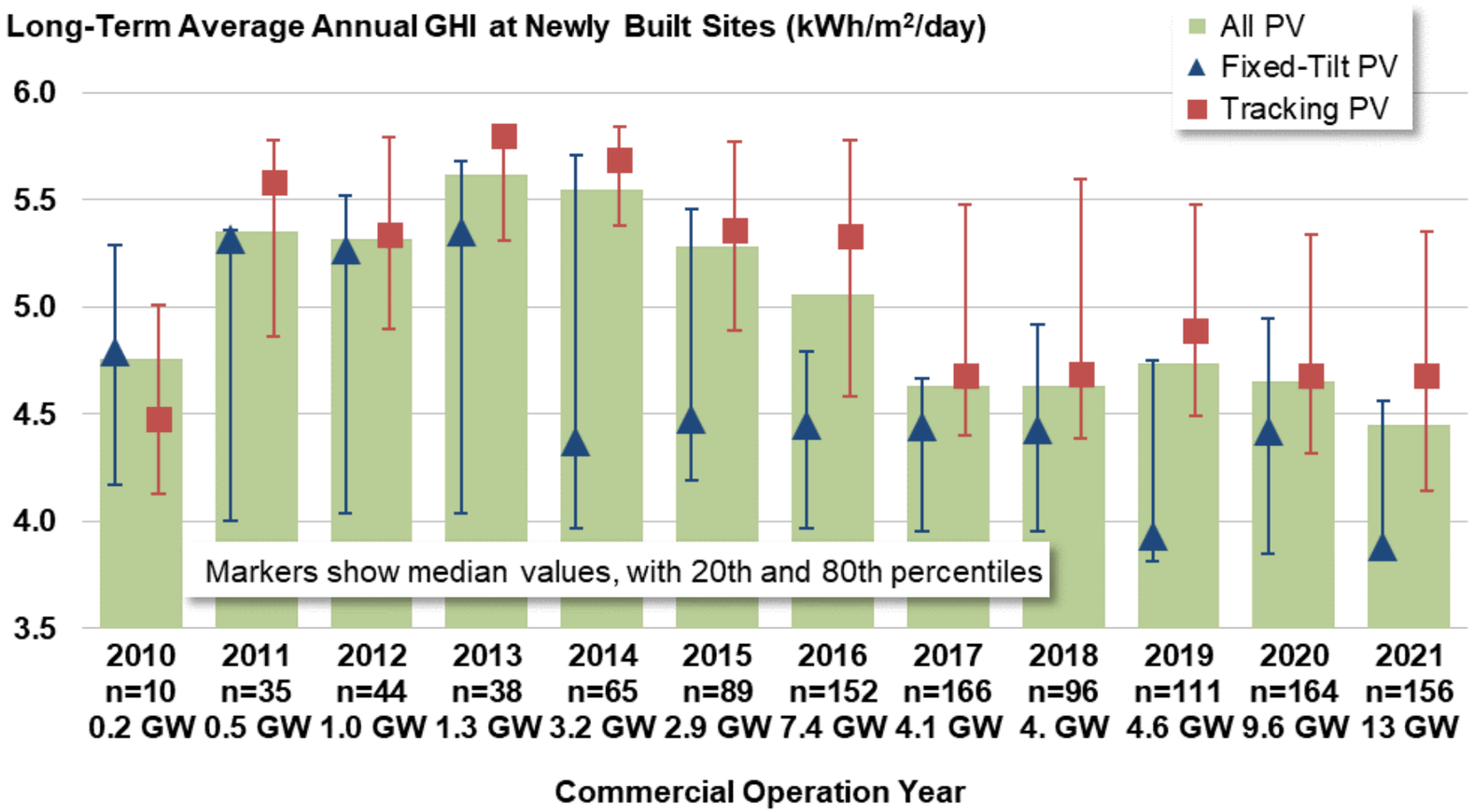
Jinko had the highest market share among known c-Si modules in our sample, followed by Canadian Solar and LONGi. All thin-film modules in our 2021 sample were made by First Solar.



You can explore this data interactively at https://emp.lbl.gov/technology-trends

The median global horizontal irradiance (GHI) at utility-scale solar project sites has declined since 2013

PV project population: 1,131 projects totaling 51,343 MW_{AC}



The median solar resource (measured in long-term global horizontal irradiance—**GHI**) at new project sites has declined since development began expanding to less-sunny states post-2013, and reached a new record low of just 4.45 kWh/m²/day in 2021.

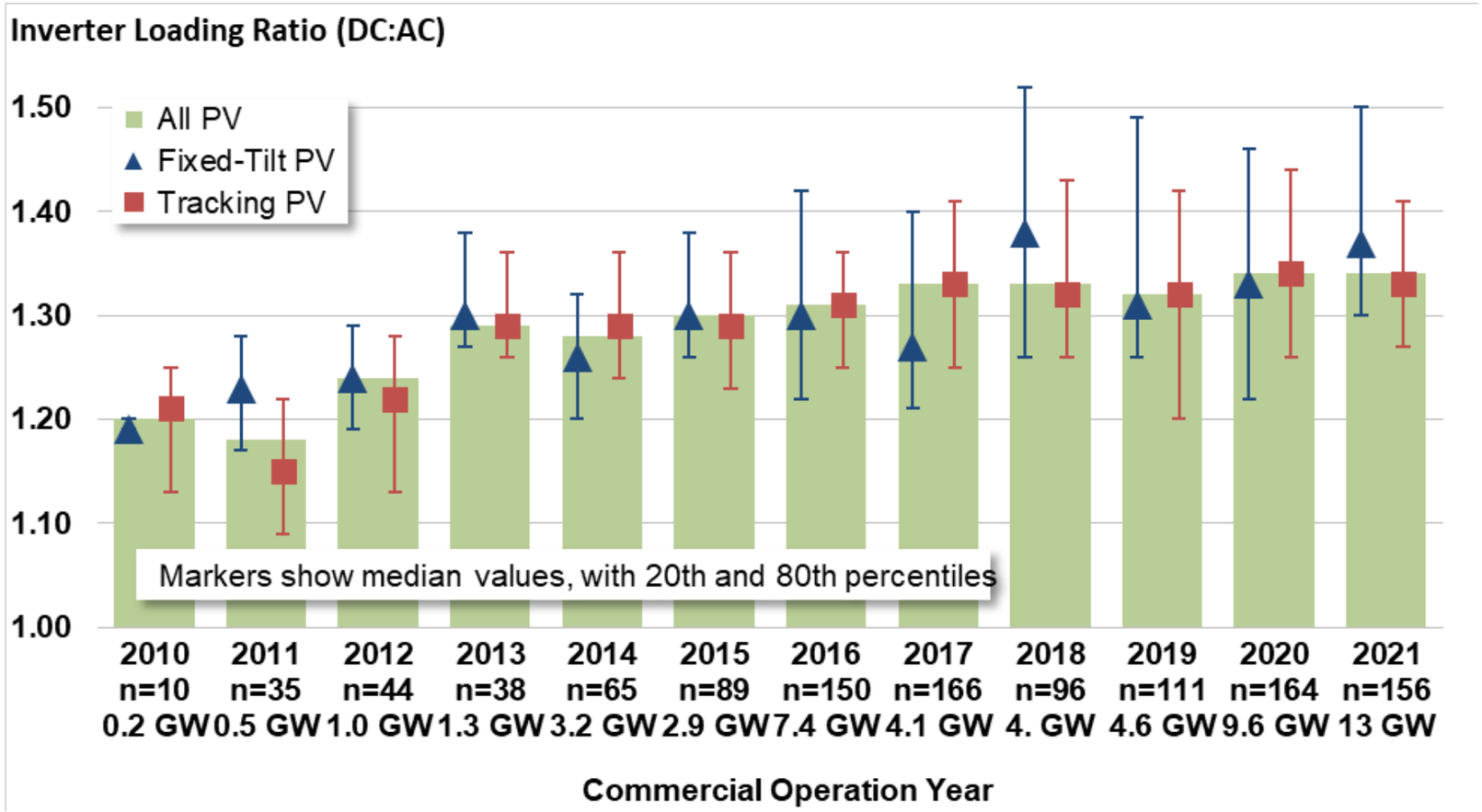
Fixed-tilt PV is increasingly relegated to lower-insolation sites, while tracking PV is pushing into those same areas (note the decline in its **20th percentile**).

Exceptions are fixed-tilt installations in windy regions (Florida), on brownfields and landfill sites, and on particularly challenging terrain.

All else equal, the buildout of lower-GHI sites dampens sample-wide capacity factors (reported later).

The median inverter loading ratio (ILR) continues to gradually climb

PV project population: 1,129 projects totaling 51,283 MW_{AC}



As module prices have fallen (faster than inverter prices), developers have oversized the DC array capacity relative to the AC inverter capacity to enhance revenue and reduce output variability.

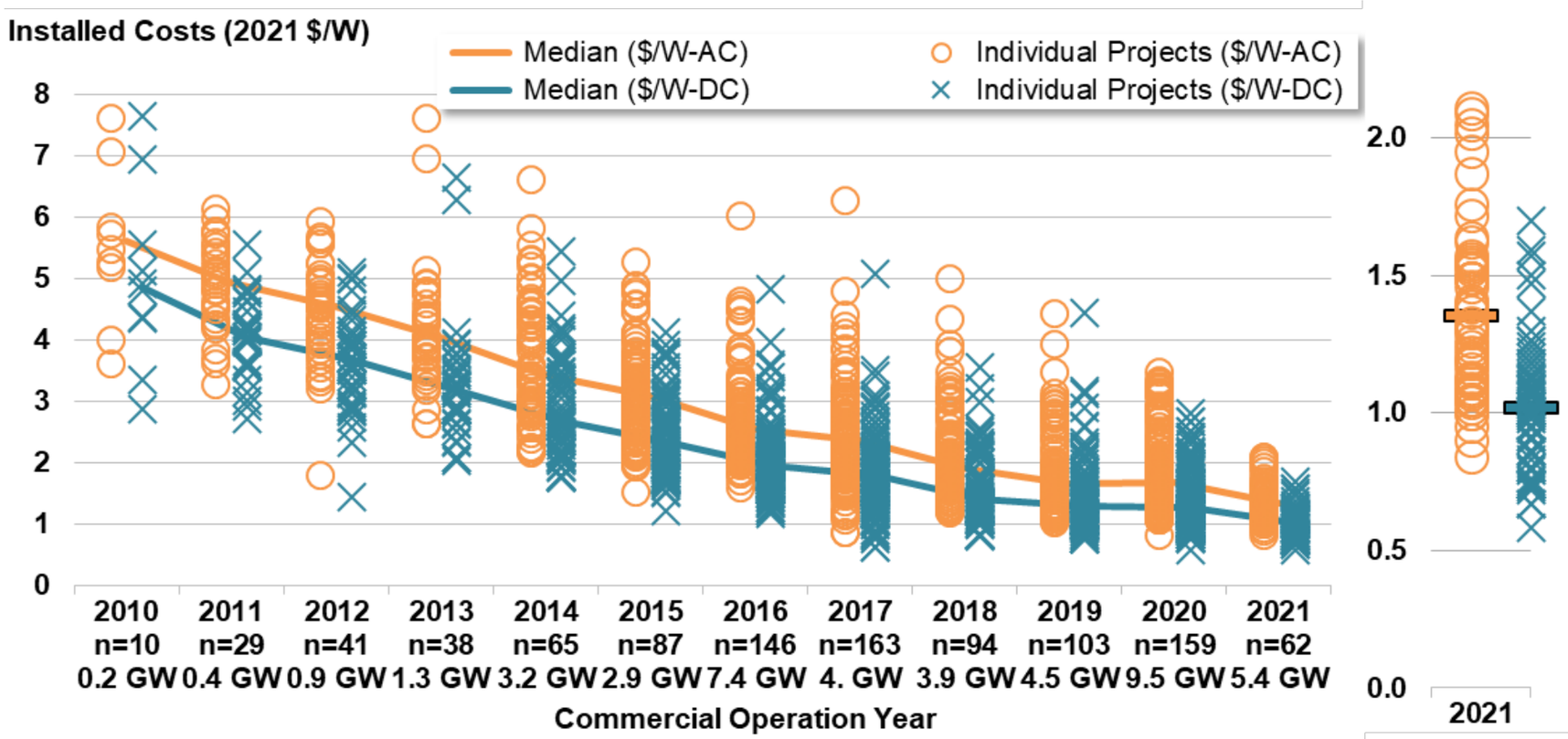
In 2021, the median inverter loading ratio (**ILR** or DC:AC ratio) was 1.34, and was slightly higher for fixed-tilt installations (1.37) than for tracking projects (1.33).

All else equal, a higher ILR should boost capacity factors (reported later).

Capital Costs (CapEx) and O&M Costs

Median installed costs of PV have fallen by 76% (or 10% annually) since 2010, to $1.35/W$_{AC}$ ($1.02/W$_{DC}$) in 2021

Sample: 1,002 projects totaling 43,800 MW$_{AC}$



The lowest 20th percentile of project costs fell from $1.4/W$_{AC}$ ($1.0/W$_{DC}$) in 2020 to $1.1/W$_{AC}$ ($0.8/W$_{DC}$) in 2021.

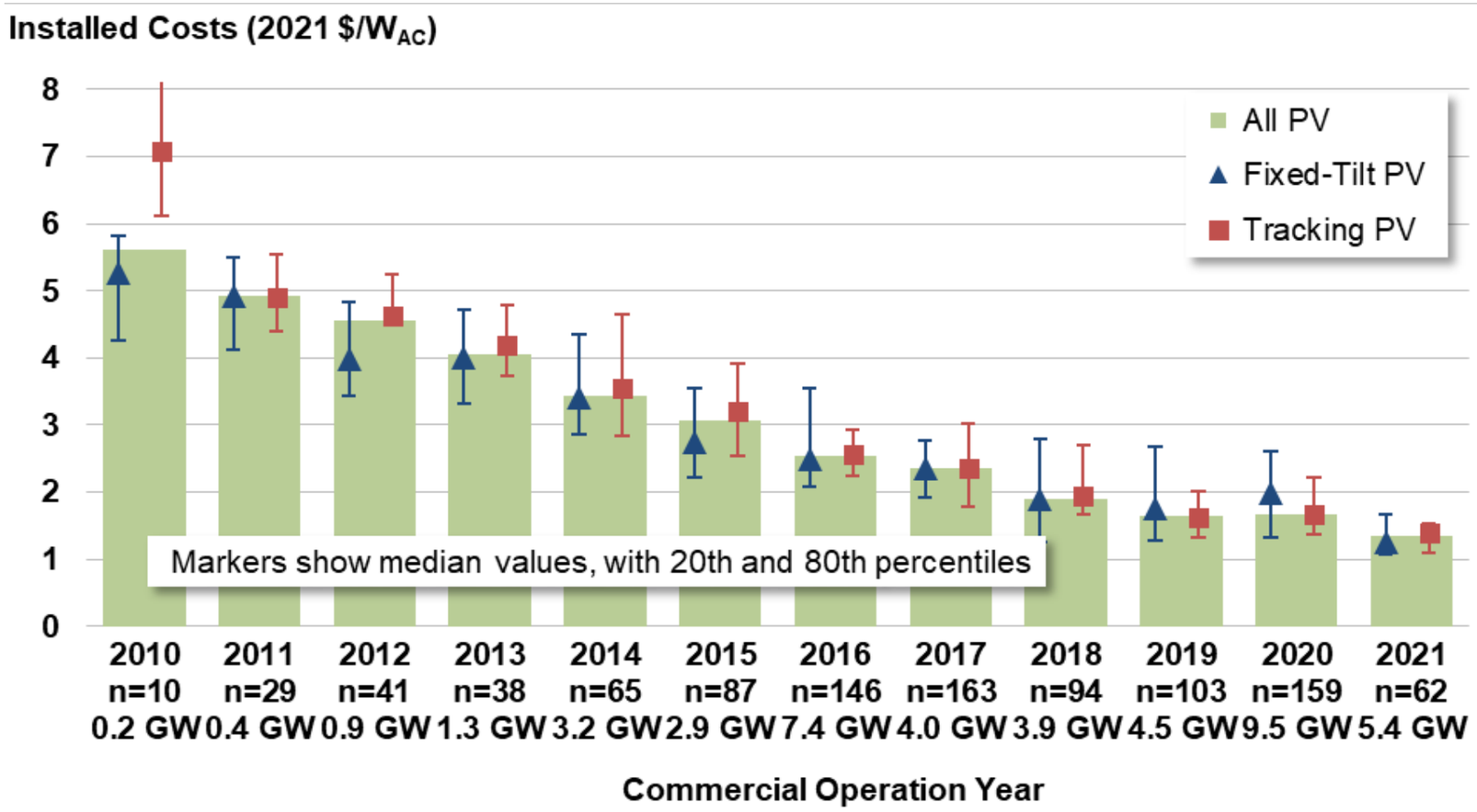
The lowest-cost projects among the 62 data points in 2021 are now below $1.0/W$_{AC}$.

Historical sample is robust (covering 99% of installed capacity through 2020). 2021 data covers 40% of new projects or 43% of new capacity.

This sample is backward-looking and does not reflect the costs of projects built in 2022/2023.

The cost premium for tracking projects relative to fixed-tilt has diminished over time

Sample: 1,002 projects totaling 43,800 MW_{AC}



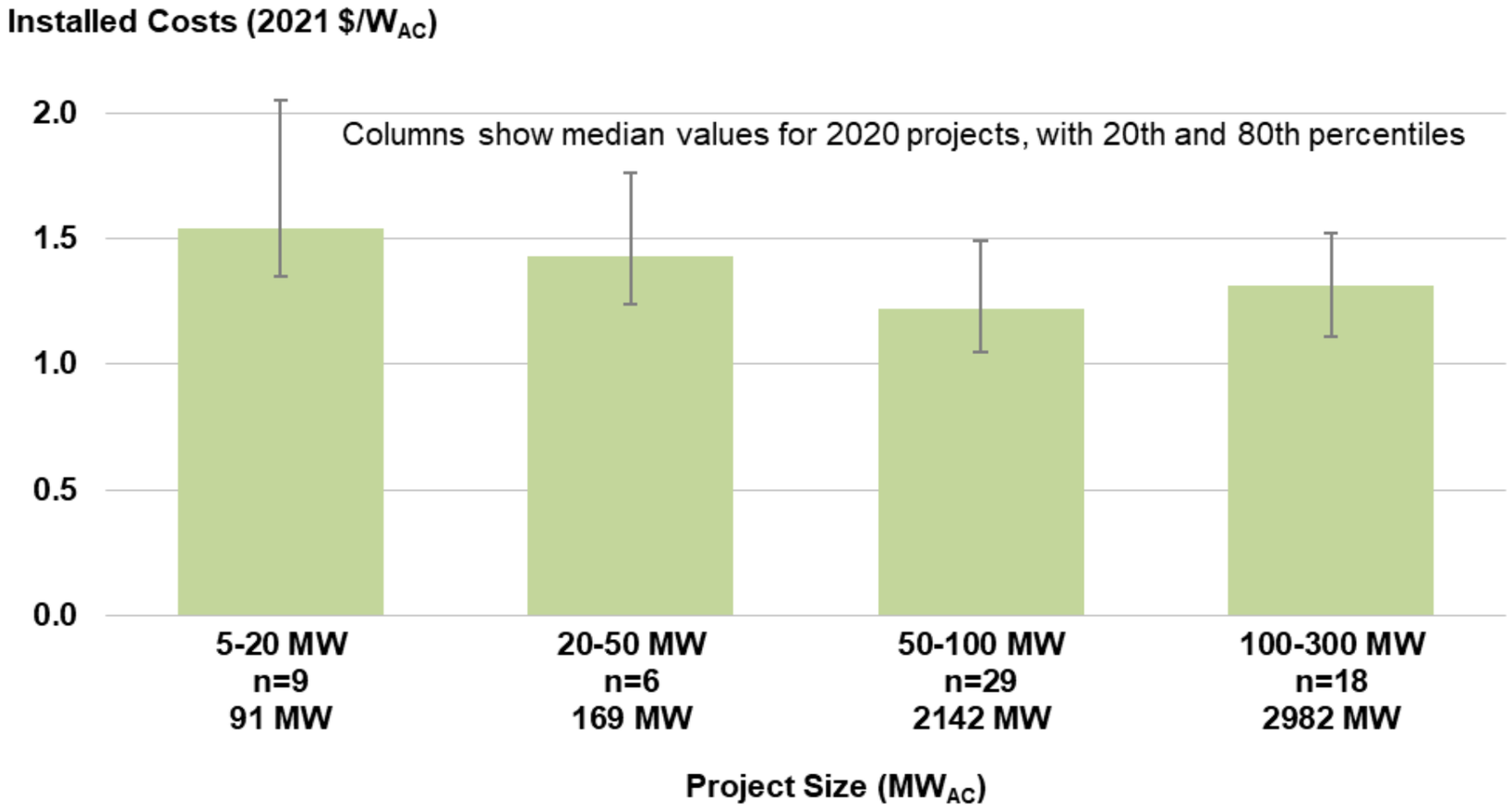
Through 2018, tracking projects in our sample were, on average, regularly more expensive (though by varying amounts) than fixed-tilt projects. This relationship became more nuanced in 2019, and in 2020, tracking projects ($1.7/$W_{AC}$ or $1.3/$W_{DC}$) appeared to be cheaper than fixed-tilt projects ($2.0/$W_{AC}$ or $1.5/$W_{DC}$).

This apparent reversal may be driven by challenging construction environments for fixed-tilt projects (e.g., high wind loads, sensitive brown-field sites) as well as sampling issues. However, for any ***individual*** project, using trackers presumably has a higher CapEx than mounting at a fixed-tilt.

In our 2021 sample, trackers ($1.4/$W_{AC}$ or $1.0/$W_{DC}$) once again exhibit a premium over fixed-tilt plants ($1.3/$W_{AC}$ or $0.9/$W_{DC}$). Trackers can sustain some amount of higher upfront costs because they deliver more kWh per kW.

Larger utility-scale solar projects (50-100 MW) cost 21% less than smaller projects (5-20 MW) per MW of installed capacity in 2021

Sample in 2021: 62 projects totaling 5,383 MW_{AC}



Differences in project size could potentially explain cost variation—we focus only on 2021 for this slide.

Cost savings seem to occur especially in the third size bin (50-100 MW_{AC}) at \$1.22/W_{AC} vs. \$1.54/W_{AC}.

In \$/W_{DC} terms, prices seem to decline less with scale:

- \$1.14/W_{DC} for 5-20MW
- \$0.95/W_{DC} for 20-50MW
- \$1.06/W_{DC} for 50-100MW
- \$1.00/W_{DC} for 100-300MW

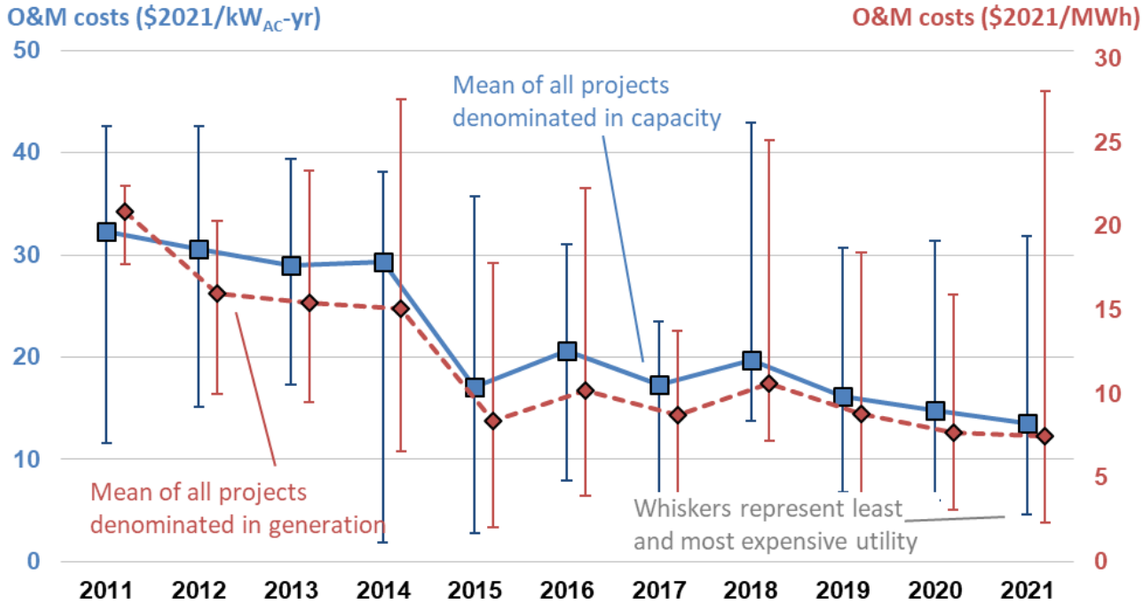
Operation and maintenance (O&M) costs decreased by 58% since 2011 as project portfolios grow and projects become established

PV project population: 90 projects totaling 3,964 MW_{AC}

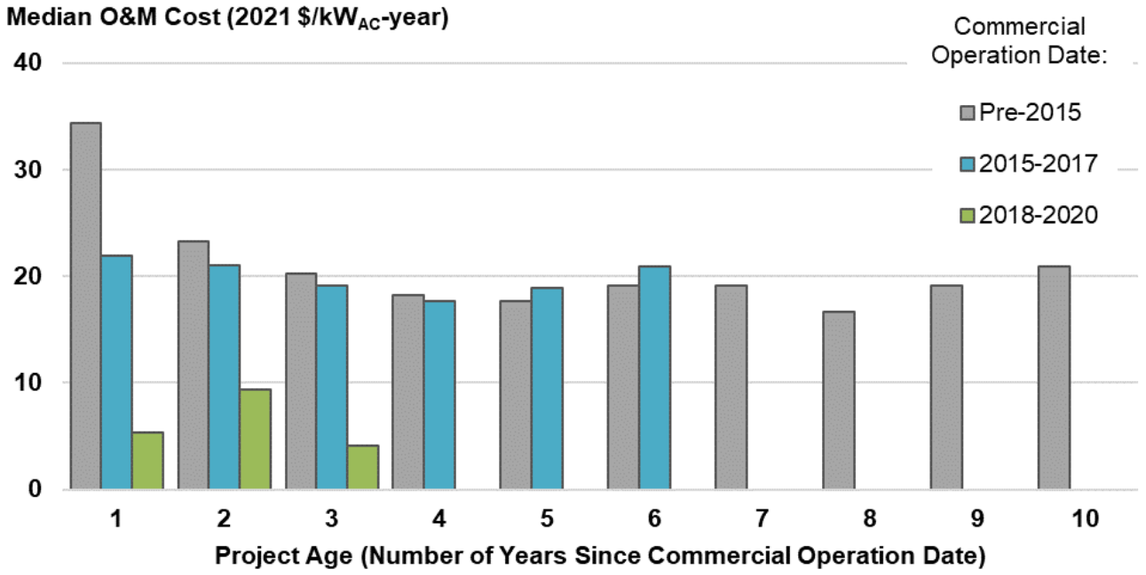
Regulated utilities report solar O&M costs for plants that they own, representing a mix of technologies and at least one full operational year.

These O&M costs are only one part of total operating expenses:

Cost Scope (per guidelines for FERC Form 1):
- **Includes** supervision and engineering, maintenance, rents, and training
- **Excludes** payments for property taxes, insurance, land royalties, performance bonds, various administrative and other fees, and overhead



Average O&M costs for the cumulative sample have declined from about \$32/kW_{AC}-year or \$21/MWh in 2011 to about \$13/kW_{AC}-year or \$7/MWh in 2021.

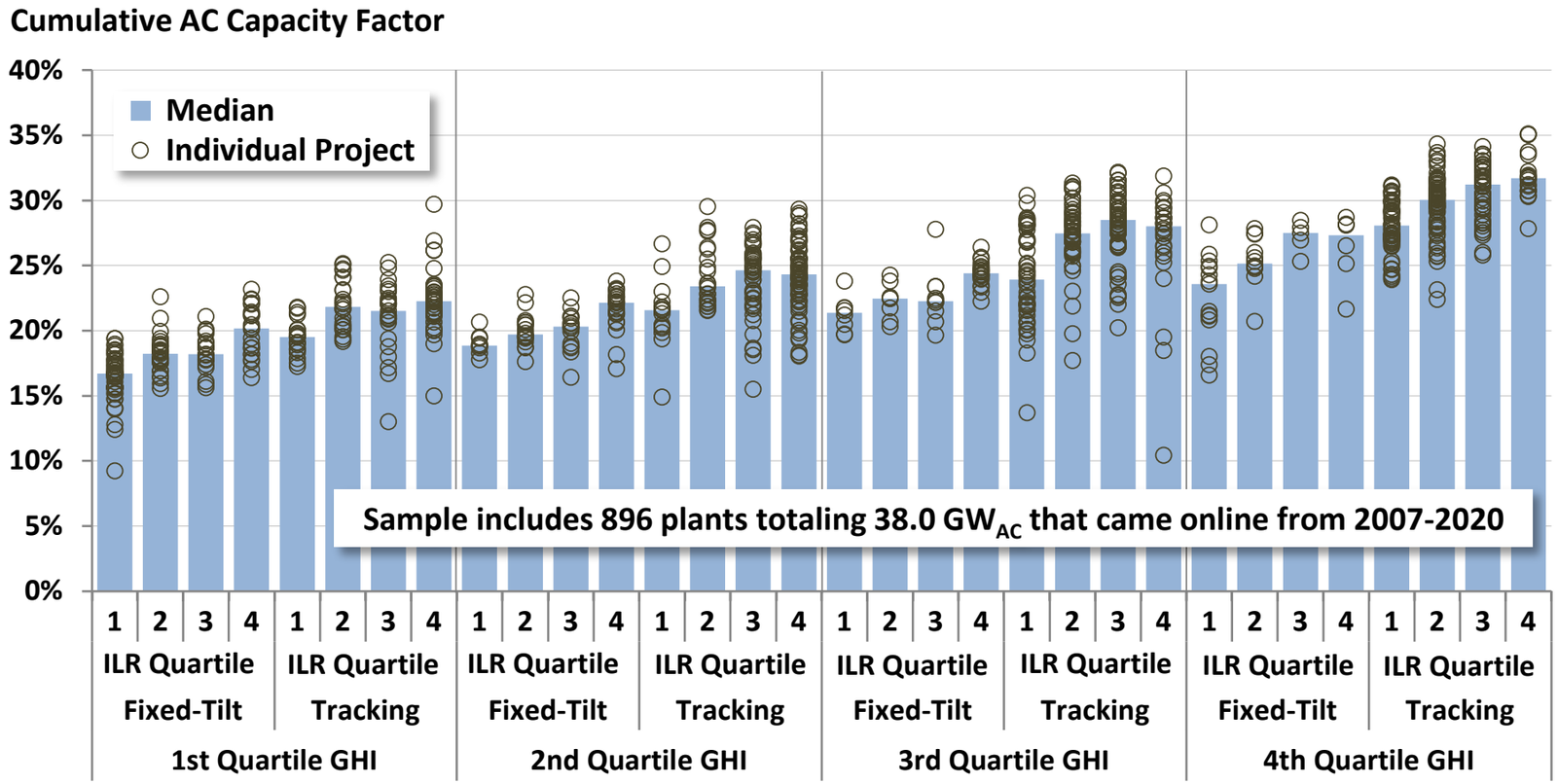


Projects built since 2018 report much lower O&M costs compared to older ones, potentially due to a narrower service scope of agreements. Costs seem to decline over the first 5 years across project vintages as projects become established.

Performance (Capacity Factors)

24% median PV net capacity factor (cumulative, sample-wide), but with large plant-level range from 9%-35%

PV performance sample: 896 projects totaling 38,034 MW_{AC}



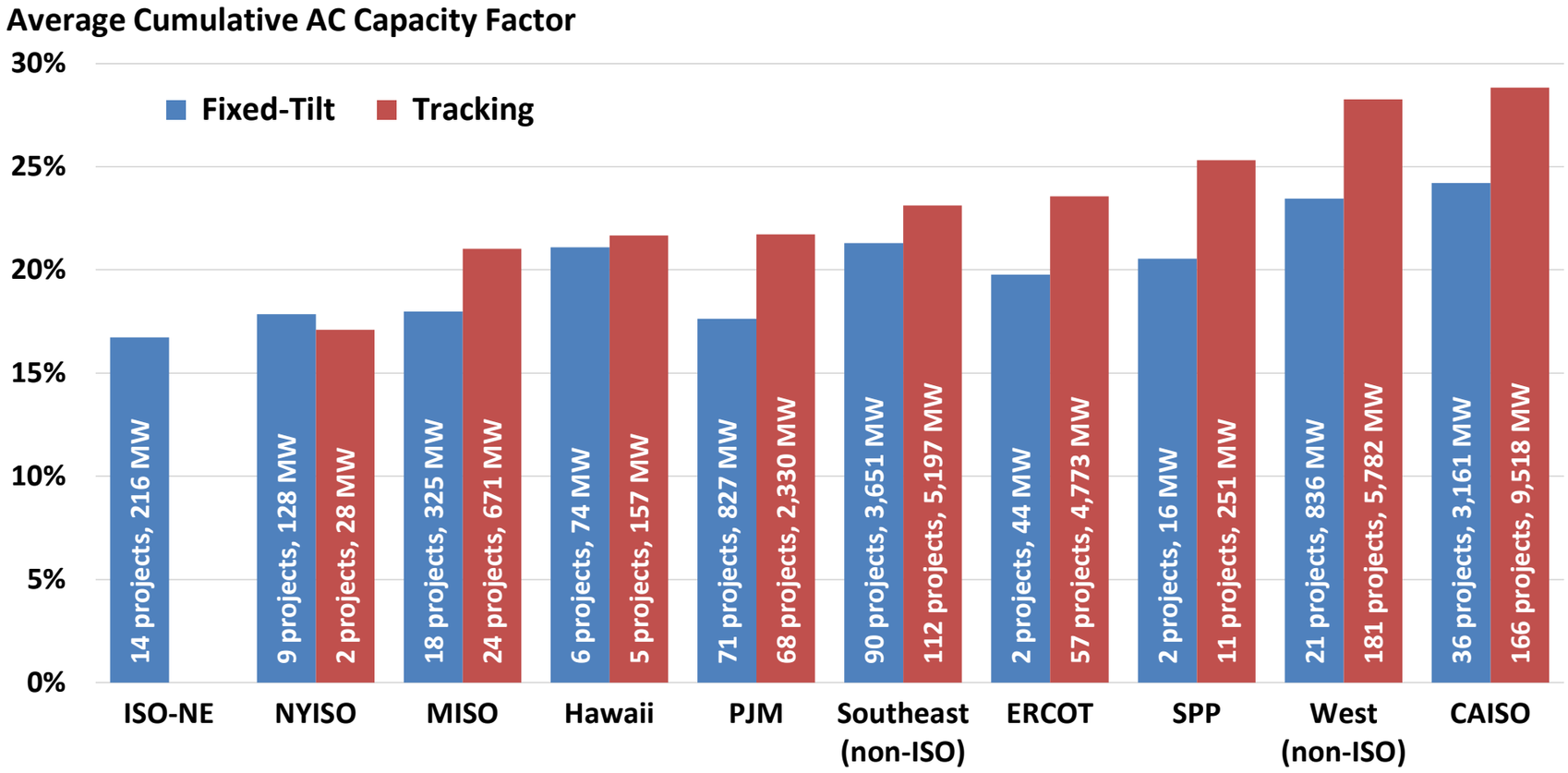
Project-level variation in PV capacity factor driven by:

- **Solar Resource (GHI)**: Strongest solar resource quartile has a ~8 percentage point higher capacity factor than lowest resource quartile
- **Tracking**: Adds ~4 percentage points to capacity factor on average, depending on solar resource quartile
- **Inverter Loading Ratio (ILR)**: Highest ILR quartiles have on average ~3 percentage point higher capacity factors than lowest ILR quartiles

You can explore this data interactively at https://emp.lbl.gov/pv-capacity-factors

Tracking boosts capacity factors by nearly 5 percentage points in high-insolation regions

Sample: 895 projects totaling 37,984 MW_{AC}

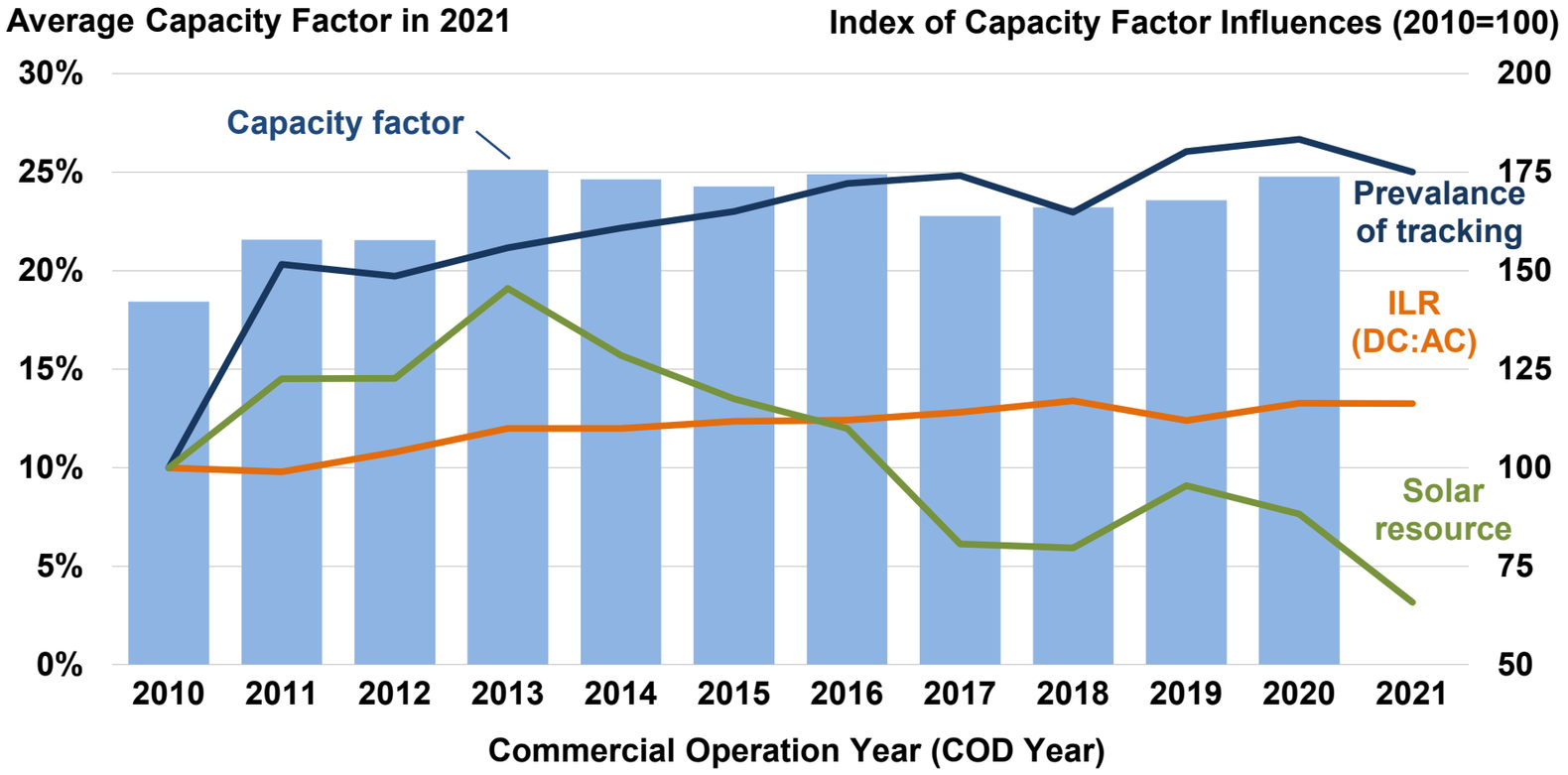


Not surprisingly, capacity factors are highest in California and the non-ISO West, and lowest in the Northeast (ISO-NE and NYISO).

Tracking provides more benefit in high-insolation regions, leading to a greater proportion of tracking projects in those regions.

Note: The regions are defined in the earlier slides with a map of the United States

Since 2013, competing drivers have caused average capacity factors by project vintage to stagnate



The columns represent the capacity factor (left axis), the lines show changes in major drivers (right axis)

Recent flat trend is not necessarily negative, but rather a sign of a market that is expanding geographically into less-sunny regions

Average capacity factors increased from 2010- to 2013-vintage projects, due to a sample-wide increase in:

- ILR (from 1.19 to 1.29)
- tracking (from 0% to 56% of projects)
- average site-level GHI (from 4.90 to 5.36 kWh/m^2/day)

Since 2013, however, opposing forces have resulted in capacity factor stagnation (on average):

- ILR has increased (from 1.29 to 1.35)
- tracking has increased (from 56% to 83% of projects)
- average site-level GHI has declined (from 5.36 to 4.78 kWh/m^2/day) as the market has expanded to less-sunny parts of the country

You can explore this data interactively at https://emp.lbl.gov/pv-capacity-factors

Levelized Cost of Energy (LCOE) and Power Purchase Agreement (PPA) Prices

LCOE and PPA price analysis: data sets and methodology

Project-level LCOE is based on empirical CapEx and capacity factor data presented earlier, as well as:

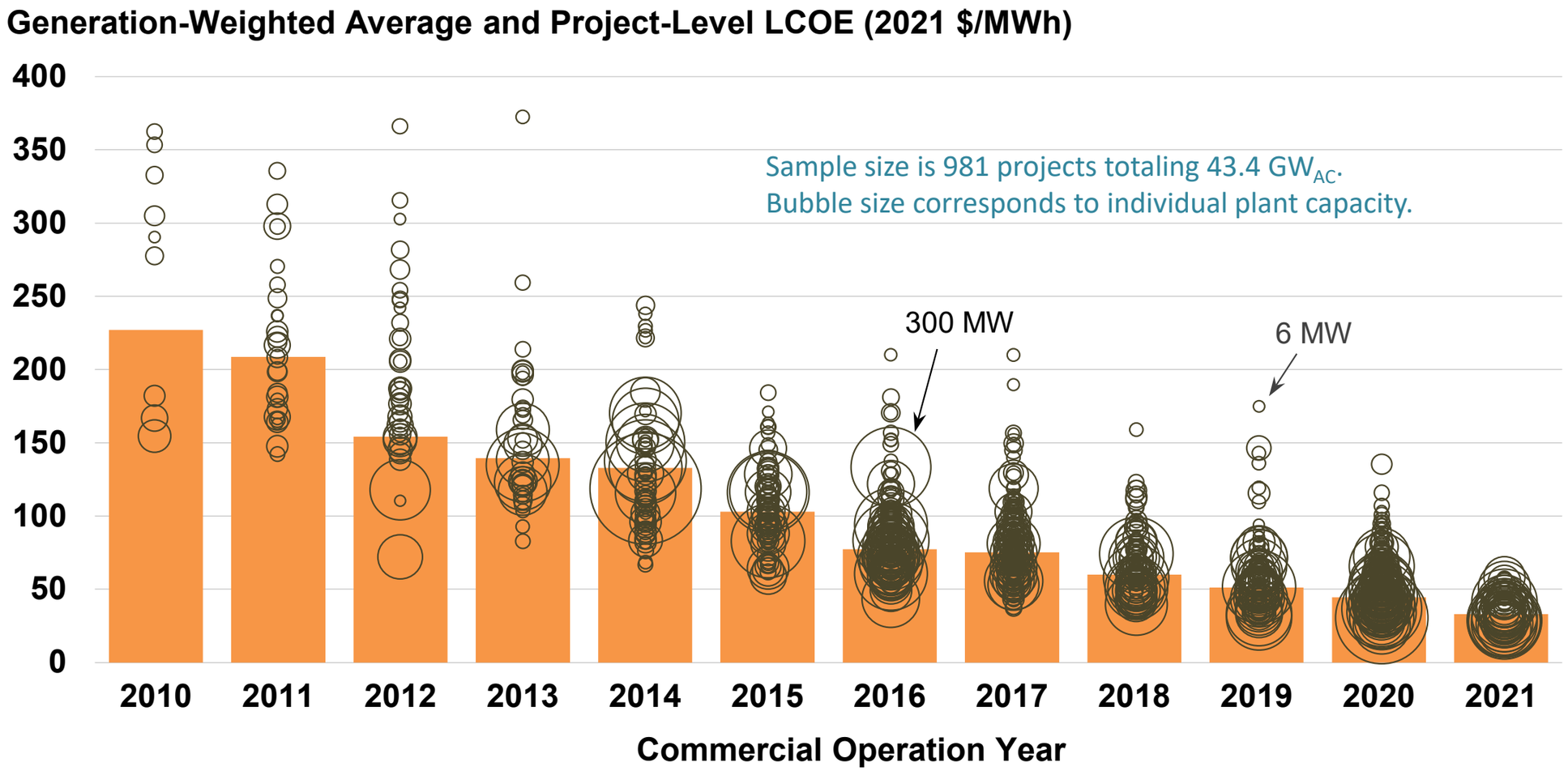
- OpEx and project life that change with vintage: OpEx declines from \$37/kW$_{DC}$-yr in 2007 to \$14/kW$_{DC}$-yr in 2021 (levelized, in 2021\$); project life increases from 21.5 years in 2007 to 35 years in 2021 (both based on prior LBNL research)
- Weighted average cost of capital (WACC) based on a constant 70%/30% debt/equity ratio and time-varying market rates
- Combined income tax rate of 38% pre-2018 and 25% post-2017; 5-yr MACRS; inflation expectations ranging from 1.9%-2.6%

PPA prices are from utility-scale solar plants built since 2007 or planned for future installation, and include:

- 372 PV-only contracts totaling 26.85 GW$_{AC}$
- 67 PV+battery contracts totaling 8.0 GW$_{AC}$ of PV capacity and 4.5 GW$_{AC}$ / 18.0 GWh of battery capacity (presented in a later section)
- 5 concentrating solar thermal power (CSP) contracts totaling 1.2 GW$_{AC}$ (presented in a later section)

- PPA prices reflect the bundled price of electricity and RECs as sold by the project owner under the PPA
  - Dataset excludes merchant plants, projects that sell renewable energy certificates (RECs) separately, and most direct retail sales
  - Prices reflect receipt of state and federal incentives (e.g., the ITC), and as a result do not reflect solar generation *costs*
- We also present LevelTen Energy data on PPA offers; these are often for shorter contract durations and targeted at corporate offtakers

LCOE has fallen by 85% (or 16% annually) since 2010, to $33/MWh (without the ITC)

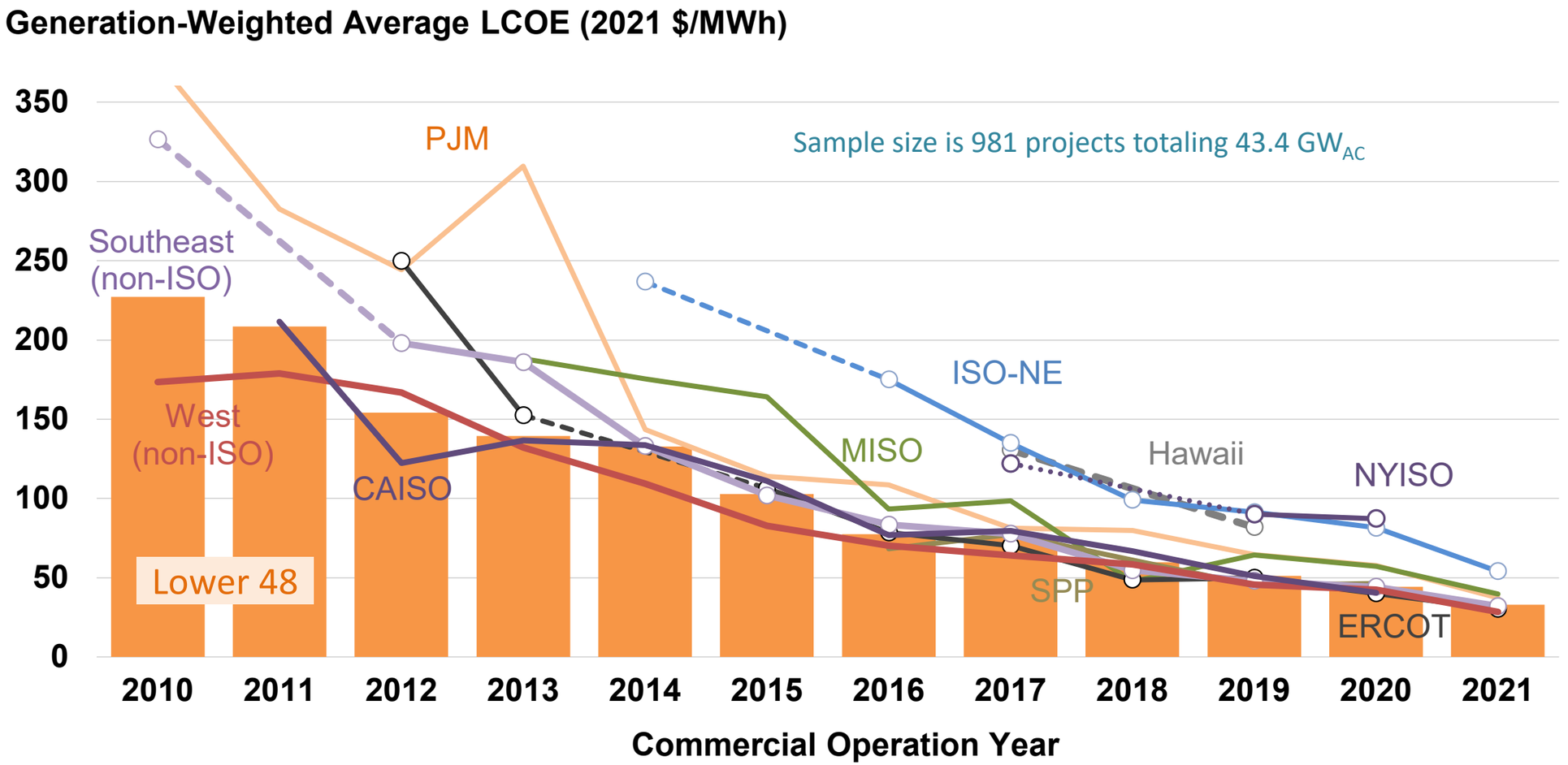


Driven by lower capital costs costs and, at least through 2013, higher capacity factors (as well as lower operating expenses, longer design life, and improved financing terms), utility-scale PV's average LCOE has fallen by about 85% since 2010, to $33/MWh in 2021 (not including the ITC).

The standard deviation of project-level LCOEs has declined sharply among recent vintages (though the coefficient of variation has been more stable).

See interactive visualization at https://emp.lbl.gov/capex-lcoe-and-ppa-prices-region

Utility-Scale PV's LCOE has been slowly converging across regions



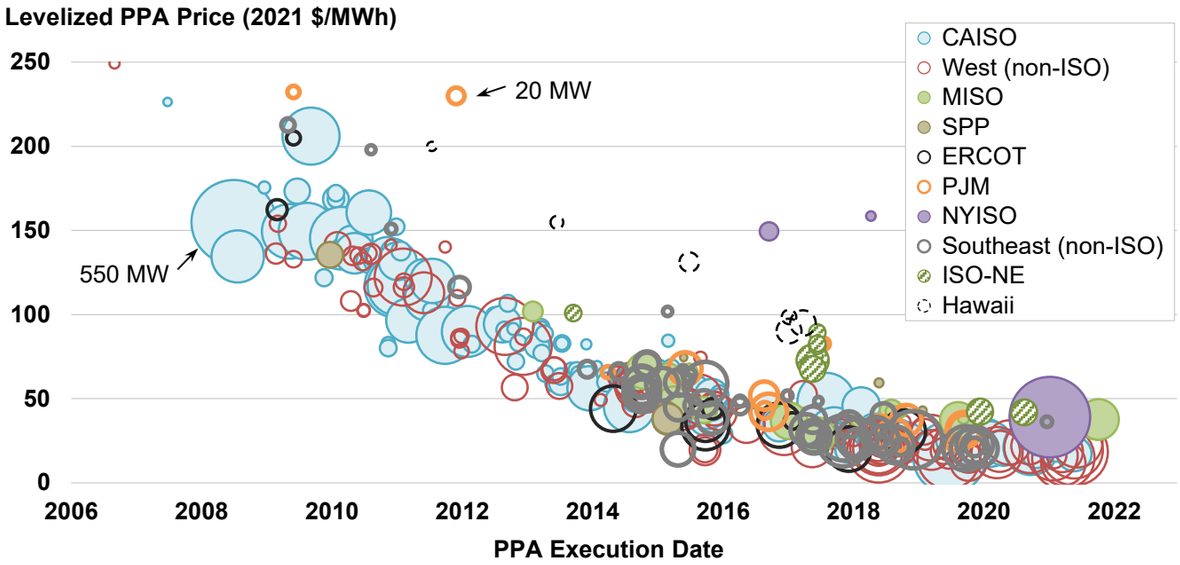
Lower-insolation regions (ISO-NE, NYISO, PJM, MISO) will always have higher LCOEs than higher-insolation regions (ERCOT, CAISO, the non-ISO West and Southeast), but the difference has narrowed over time.

Dashed segments of lines indicate no data (i.e., <2 projects) for that particular region-year combination.

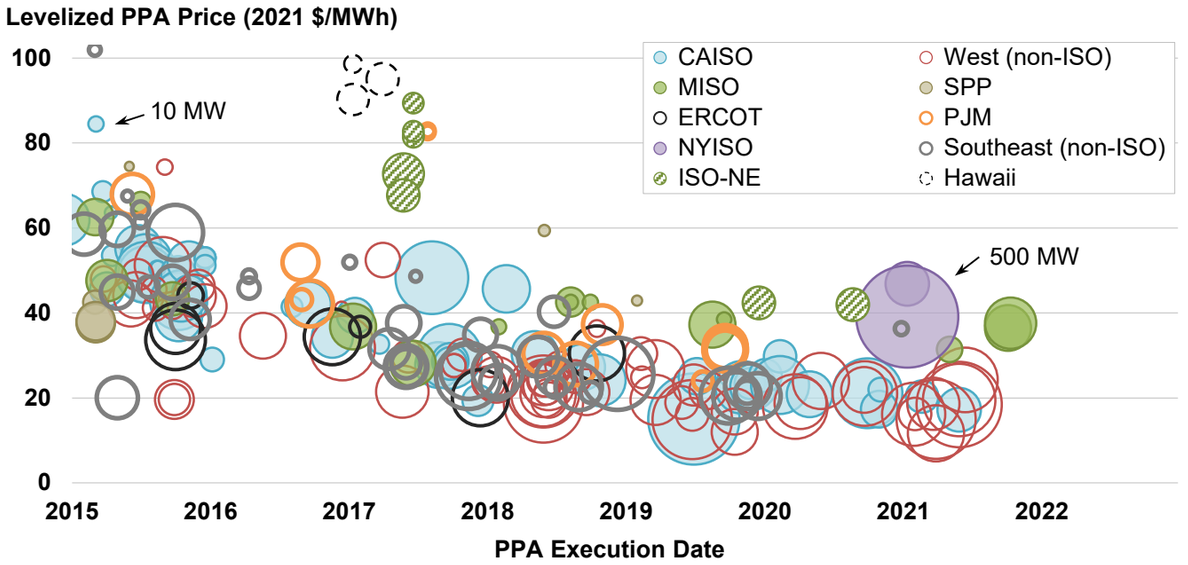
See interactive visualization at https://emp.lbl.gov/capex-lcoe-and-ppa-prices-region

Levelized PPA prices have followed LCOE lower in all regions, but have stagnated since 2019

Full sample: 372 PPAs, 26.85 GW_{AC}

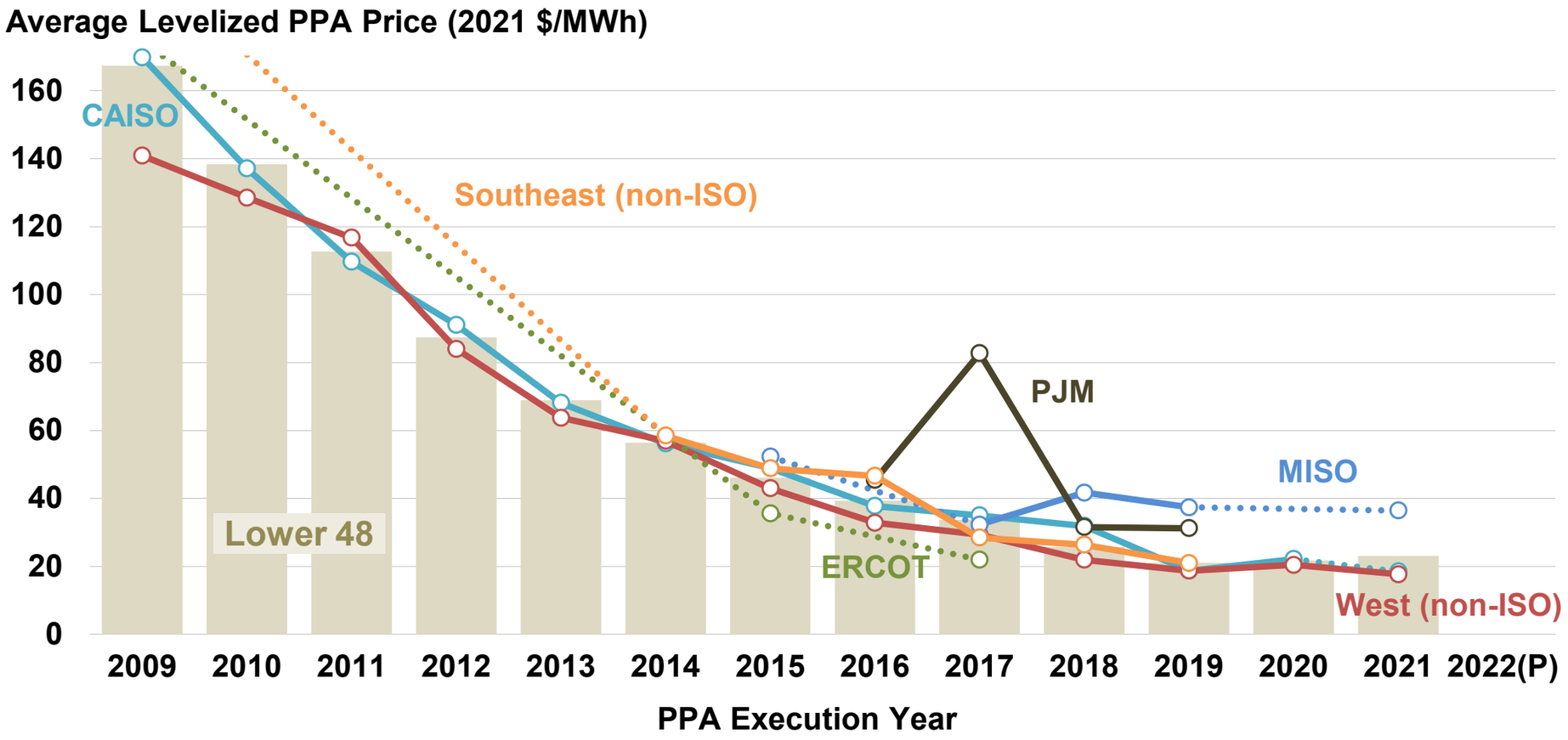


Post-2014 sample: 213 PPAs, 17.4 GW_{AC}



- Power Purchase Agreement (PPA) prices are levelized over the full term of each contract, after accounting for any escalation rates and/or time-of-delivery factors, and are shown in real 2021 dollars
- Aided by the 30% ITC, most recent PPAs in our sample are priced around $20/MWh for projects in CAISO and the non-ISO West, and $30-$40/MWh for projects elsewhere in the continental United States
- Hawaiian PPAs are often higher-priced (and most include battery storage, and so are not shown here—see later section)
- >95% of the sample is currently operational

Average PPA prices in the Lower 48 fell by ~87% (or ~19%/year) from 2009-2019, but have been stagnant (or slightly higher) ever since



This graph focuses on national and regional average PPA prices, rather than project-level (as in the prior slide).

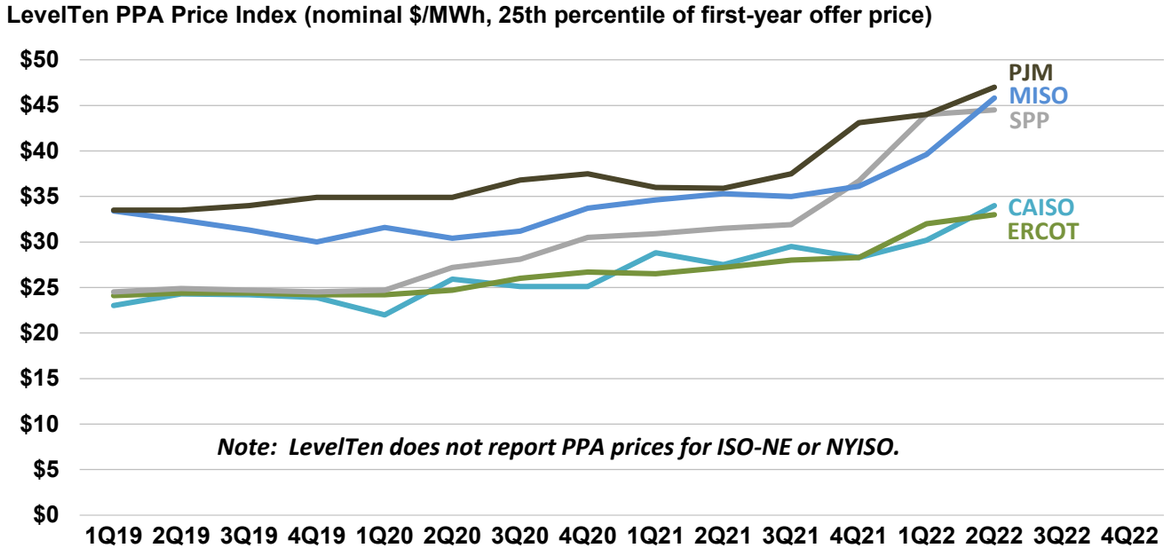
Note a slight uptick in the national average since 2019.

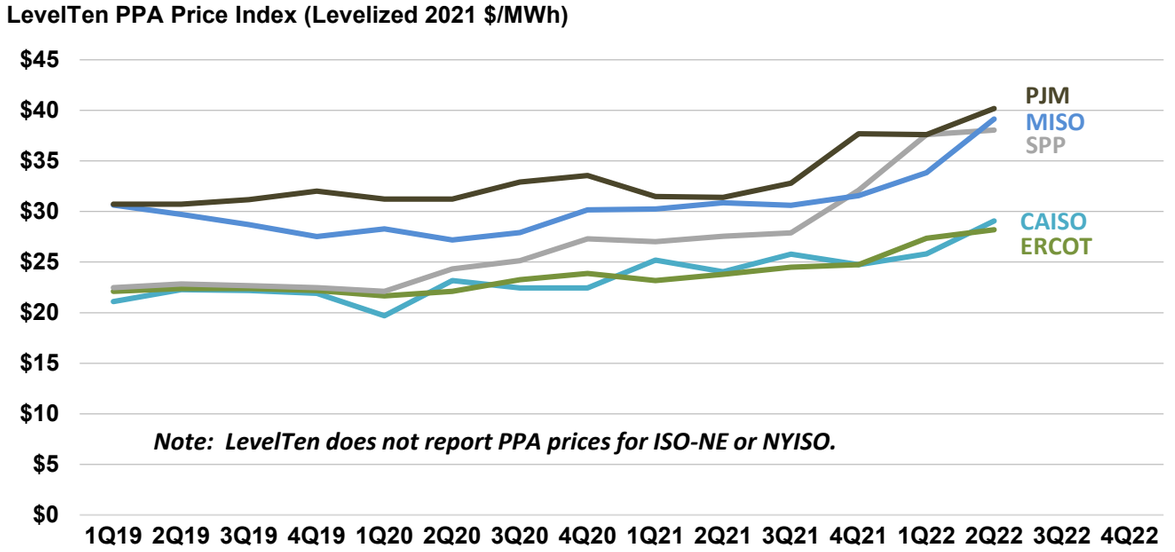
Year-Region combinations with fewer than 2 PPAs are excluded from the graph (dashed line segments indicate that the line is skipping over such years).

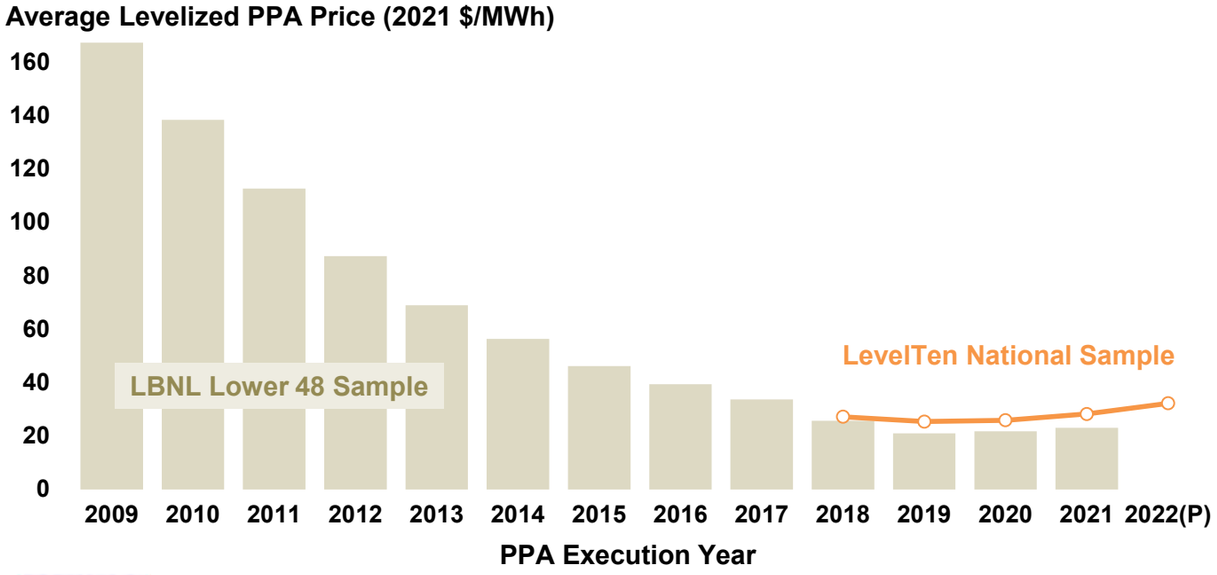
The graph reflects PV-only pricing, not PV+battery (PV+battery PPA prices are presented separately, in a later section).

You can explore this data interactively at https://emp.lbl.gov/pv-ppa-prices

Converted to real dollar terms, LevelTen Energy's utility-scale PV PPA price indices match trends seen in the LBNL sample





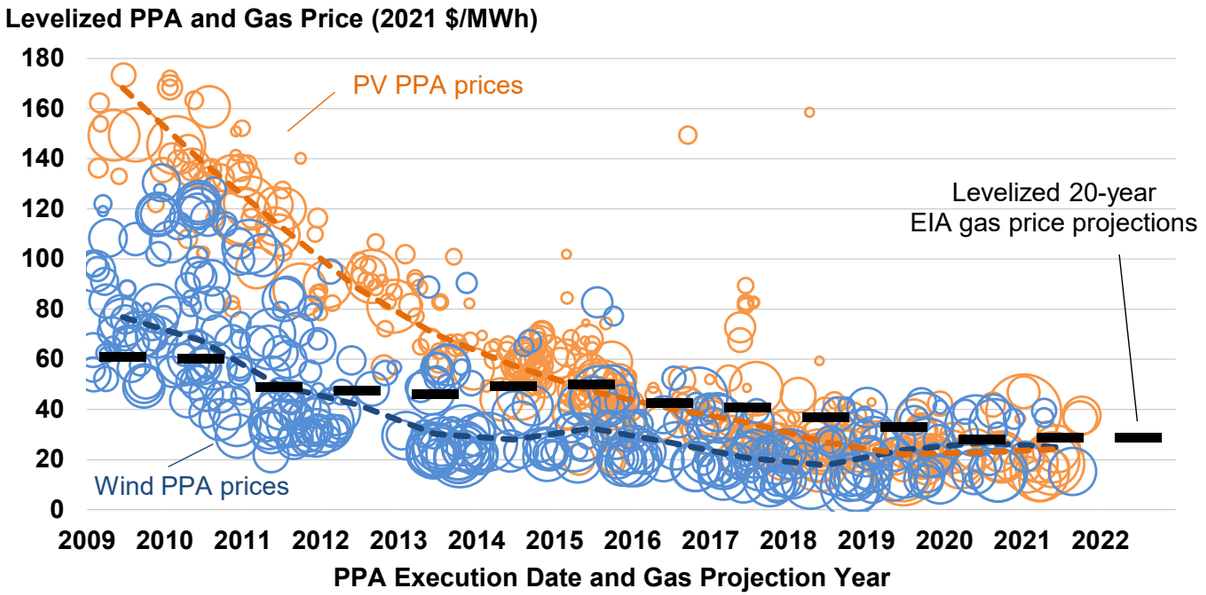


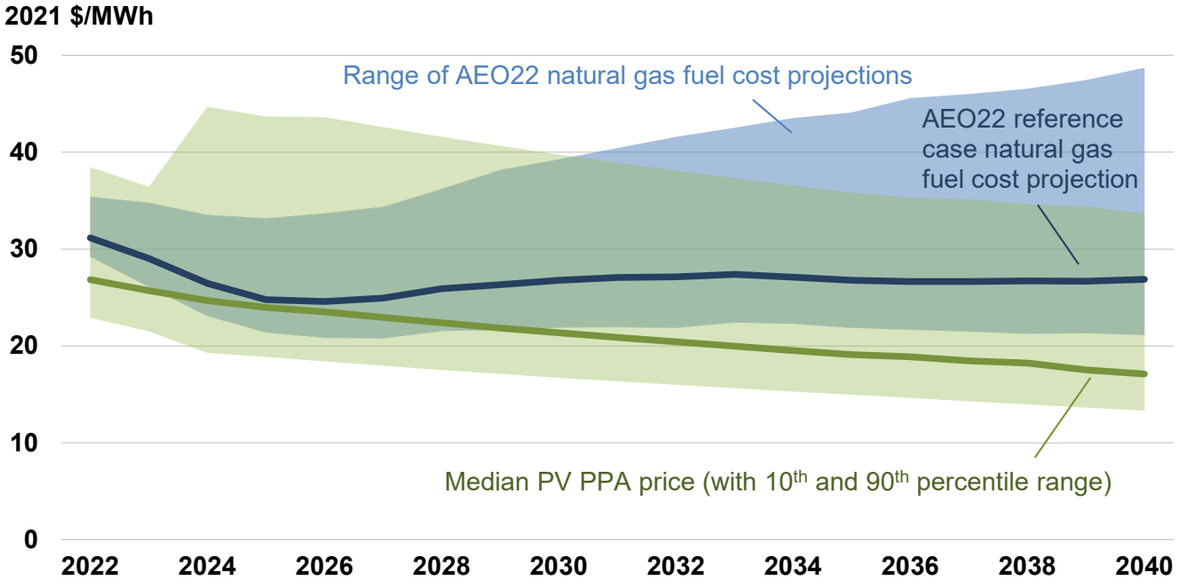
To augment our PPA price sample, and to gain visibility into corporate PPA pricing (which is not well-represented within our sample), we present LevelTen Energy's PPA Price Index.

LevelTen reports the 25th percentile of first-year offer prices in nominal dollar terms (upper left graph); in the upper right graph, we have converted the data to levelized real dollar terms (see the data workbook for notes on conversion methodology).

The bottom left graph shows consistency in national time trends between the two data sets, with the LevelTen data foreshadowing continued price increases in 2022.

Solar PPA prices are now often competitive with wind PPA prices, as well as the cost of burning fuel in *existing* gas-fired generators

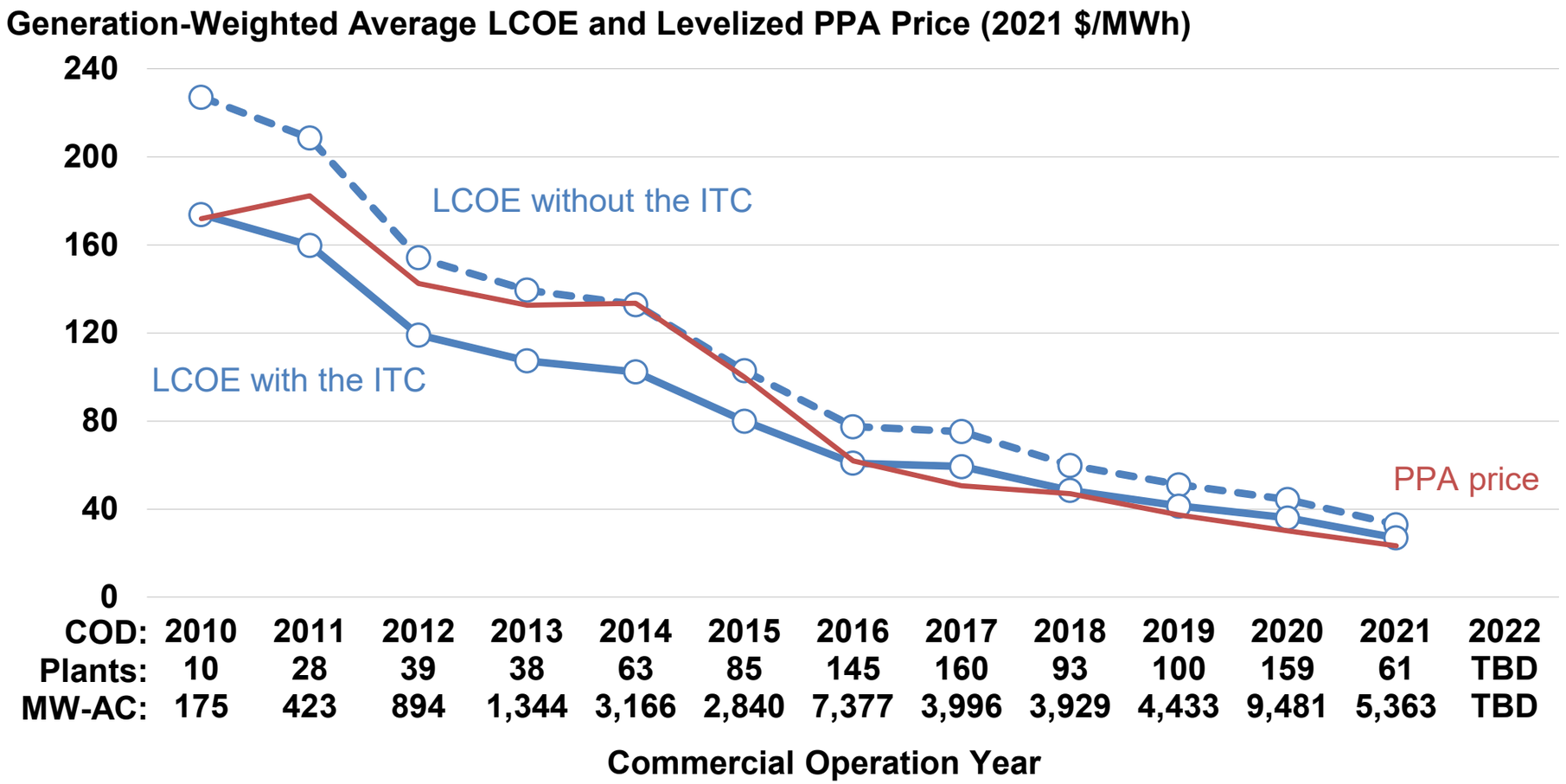




- The left graph shows that solar PPA prices have largely closed the gap with wind, and both are competitive with levelized gas price projections.
- The right graph compares recent solar PPA prices (extending out over their contract terms through 2040) to the range of gas price projections from AEO 2022. The median price from solar PPAs signed post-2019 is consistently below the projected AEO 2022 reference case cost of burning fuel in an ***existing*** combined-cycle natural gas unit (NGCC). The widening gap over longer terms suggests how PV can help protect against fuel price risk.
- Note that PV PPAs are priced to recover *both* capital *and* other ongoing operational costs—for an NGCC, this would add another ~$23-$51/MWh to the projected fuel costs shown in the graphs.

Levelized PPA prices track the LCOE of utility-scale PV

LCOE Sample: 981 projects totaling 43,421 MW_{AC}



Prior LCOE graphs exclude the ITC, but here we graph LCOE both with and without the ITC, plotted against PPA prices by COD year (rather than by PPA execution date).

Levelized PPA prices fall within the range of the two LCOE curves over time, and since 2016 have closely tracked LCOE with the ITC, suggesting full pass-through of the credit and a competitive PPA market.

Also notable is the declining value of the ITC in $/MWh terms: while the credit has remained constant over time in percentage terms (at 30%), it has shrunk in $/MWh terms along with the CapEx to which it is applied.

Wholesale Market Value

Wholesale market value analysis: data sets and methodology

We estimate the wholesale market value for each utility-scale PV project larger than 1 MW (as reported on Form EIA-860). We then aggregate the project-level data as generation-weighted averages for all seven ISOs and ten additional balancing authorities.

We draw from project-level modeled hourly solar generation (using NREL's System Advisor Model and site- and year-specific insolation data from NREL's National Solar Radiation Database and NOAA's High Resolution Rapid Refresh Model) and de-bias the generation by leveraging ISO-reported aggregate solar generation and plant-level reported generation by Form EIA-923.

Energy value is the product of hourly solar generation by plant or county and concurrent wholesale energy prices

- Plant-level debiased hourly solar generation
- Real-time energy price from nearest pricing node
- Focus on annual value of solar from all sectors

$$Energy\ Value = \frac{\sum Postcurtailment\ Generation_h * Wholesale\ RT\ Energy\ Price_h}{\sum Precurtailment\ Generation_h}$$

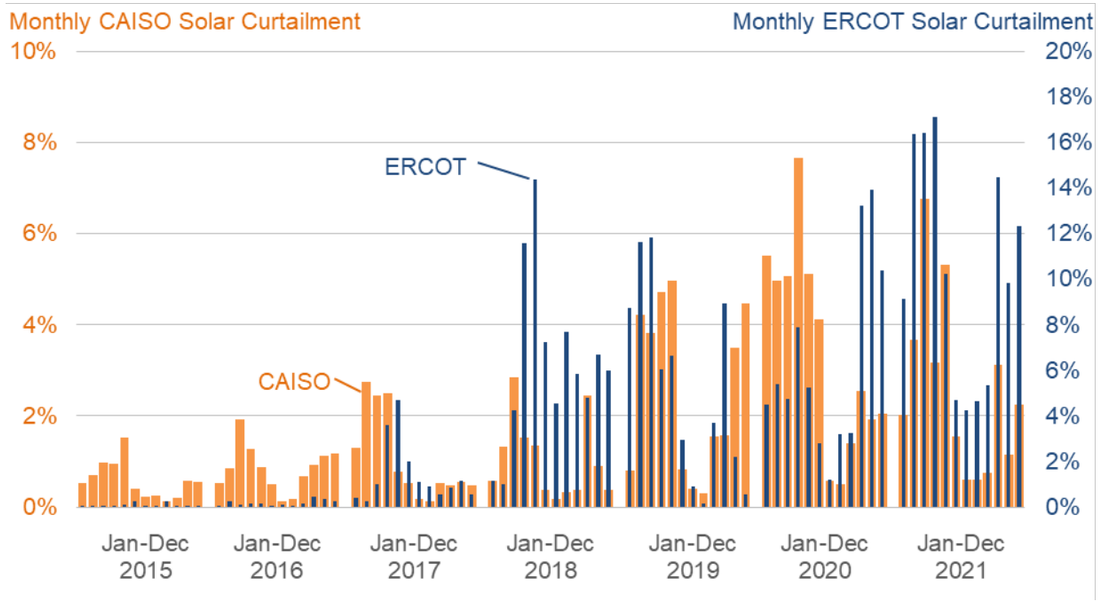
Capacity value is the product of a plant's or county's capacity credit and capacity prices

- Capacity credit based on plant-level profile; varies by month, season, or year
- Capacity prices from respective ISO region; prices vary by month, season, or year
- Estimate bilateral capacity prices for regions without organized capacity markets
- Focus on annual value of solar for projects with a full calendar year of operation
- Calculate capacity value for all solar, even if some solar does not participate in capacity markets

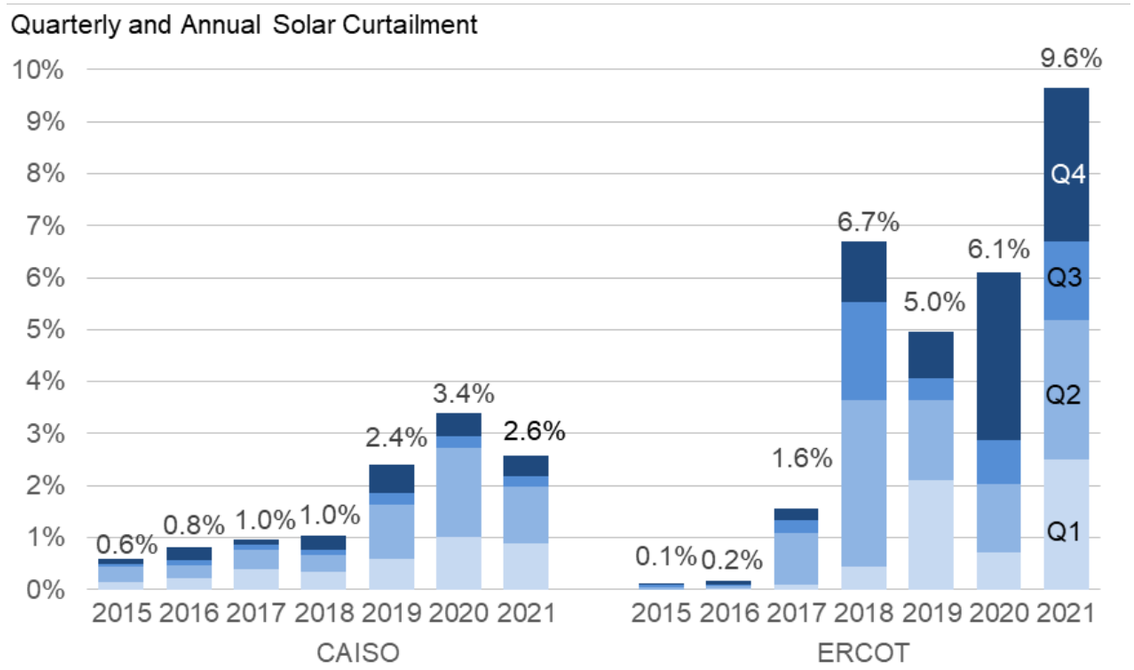
$$Capacity\ Value = \frac{\sum Capacity\ Credit_T * Nameplate * Capacity\ Price_T}{\sum Precurtailment\ Generation_T}$$

Total market value is simply the sum of energy and capacity value and does not include any potential additional revenue streams (ancillary service revenues, renewable energy credits, infrastructure deferral, resilience, energy security, or any other environmental or social values that are not already internalized in wholesale energy and capacity markets).

Only two of the seven ISOs currently report solar curtailment: CAISO and ERCOT



The orange columns represent curtailment in CAISO (left axis), the blue ones in ERCOT (right axis)

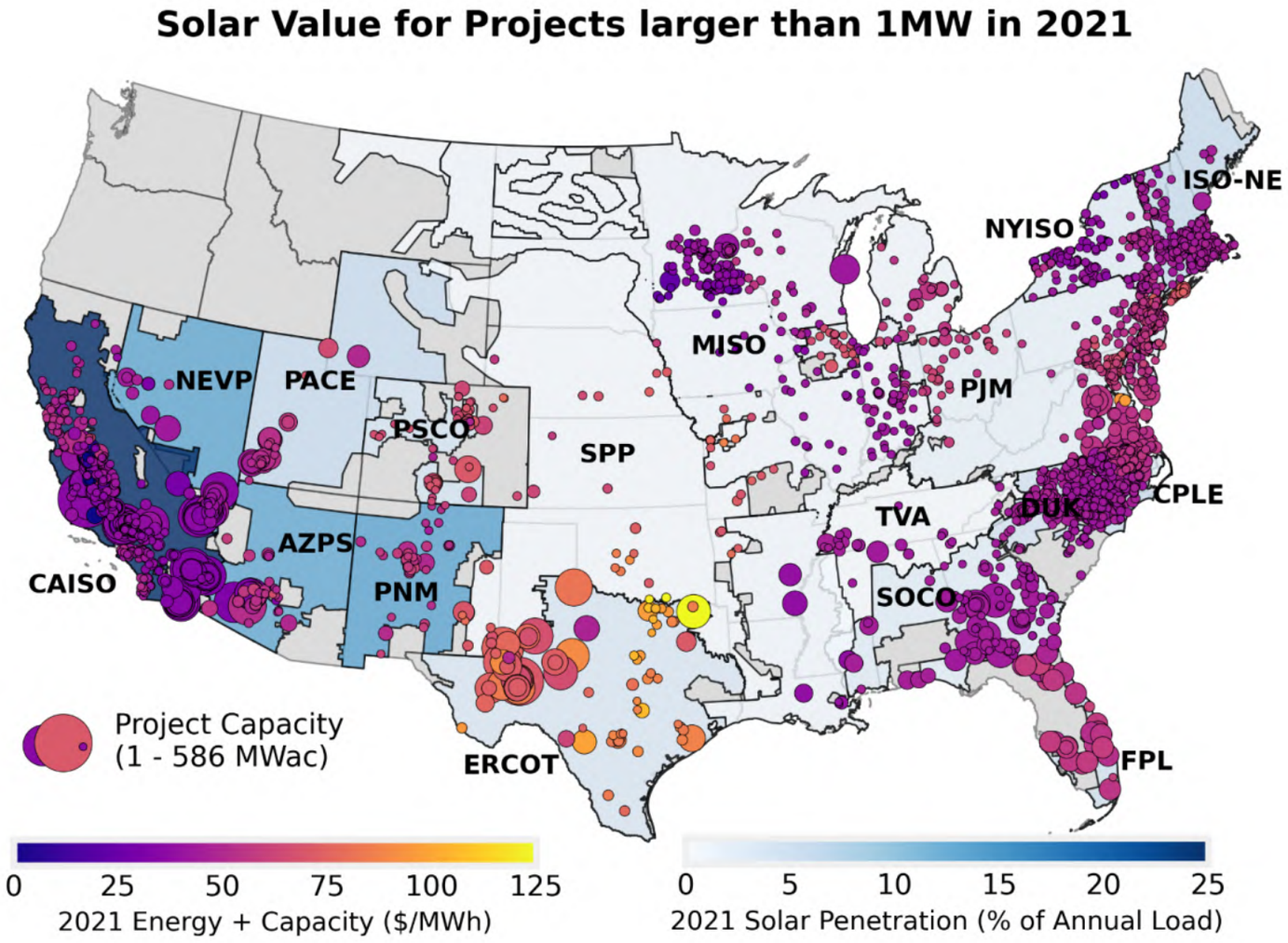


CAISO: 1,426 GWh of solar curtailed in 2021, equivalent to the annual output of a hypothetical 604 MW_{AC} PV project operating at an average CA capacity factor of 27.0% (which would have been 28.1% if not for curtailment).

ERCOT: 1,876 GWh of solar curtailed in 2021, equivalent to the annual output of a hypothetical 952 MW_{AC} PV project operating at an average TX capacity factor of 22.5% (which would have been 26.6% if not for curtailment).

Much higher *rate of curtailment* in ERCOT (9.6%) than in CAISO (2.6%) in 2021, even though solar's penetration rate is far lower in ERCOT (3.5%) than CAISO (~23%). While CAISO's curtailment is usually focused in the spring time, curtailment in ERCOT occurs in spring, fall, and winter.

Solar's energy and capacity value varied by location



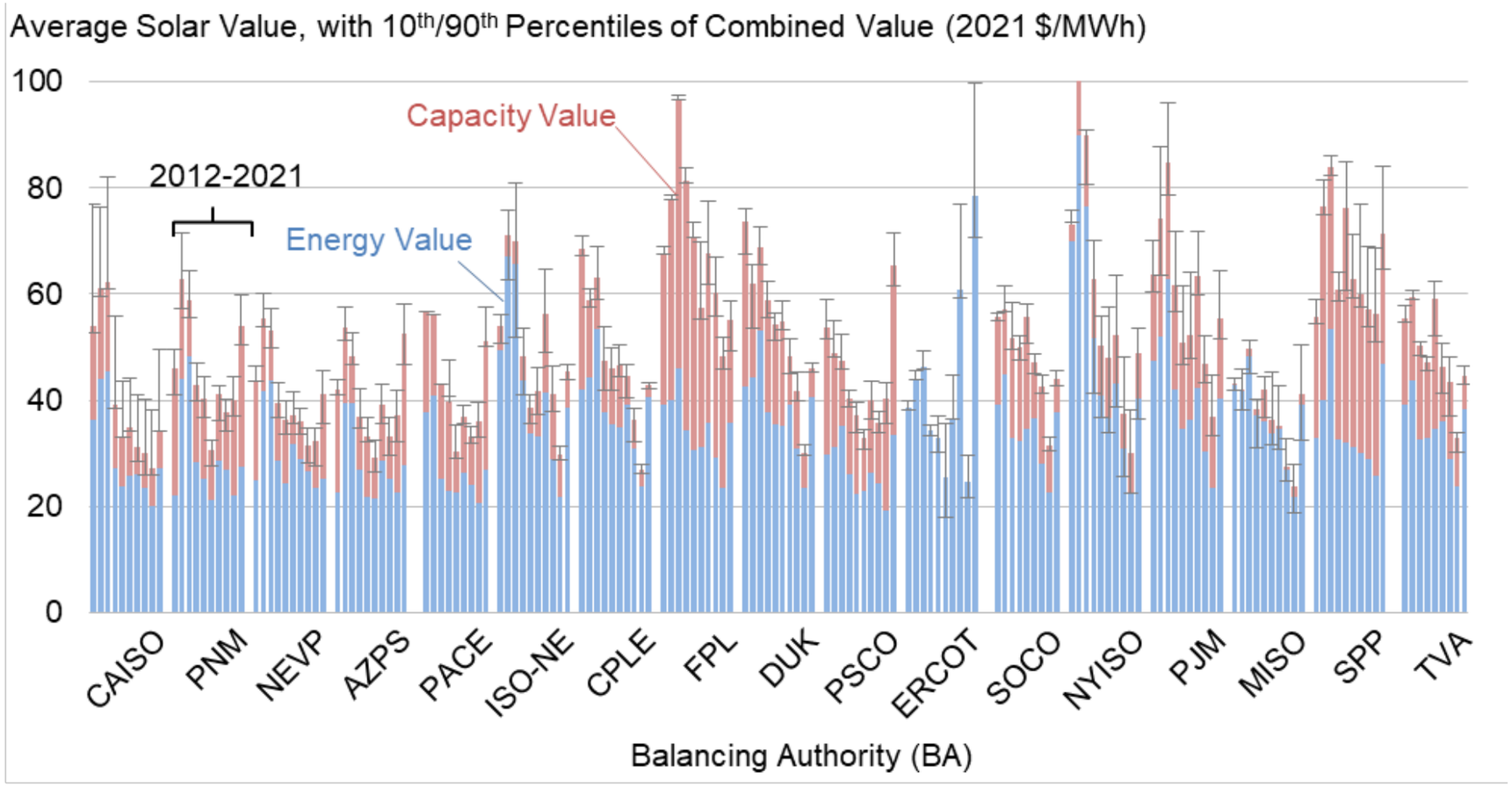
Solar's energy and capacity value varies from one wholesale market to another: It is low in CAISO at $34/MWh, but high in ERCOT ($78/MWh), SPP ($71/MWh) and PSCO ($66/MWh).

But value also varies within regions, driven by transmission congestion, solar resource quality or differing use of technology like trackers.

For example, in ERCOT, the western zone typically has lower solar values than the eastern zone, and the 10th-90th percentile value range across all of ERCOT in 2021 was $71-$100/MWh. Other markets show very little value variation (ISO-NE's range is only $44-47/MWh). CAISO and MISO have the largest relative value spread of 45% (~$33-$50/MWh).

You can explore this data interactively at https://emp.lbl.gov/utility-scale-solar-value

Rising electricity prices lifted solar's energy value in 2021, bringing total energy and capacity value to $47/MWh (50% above 2020 levels)



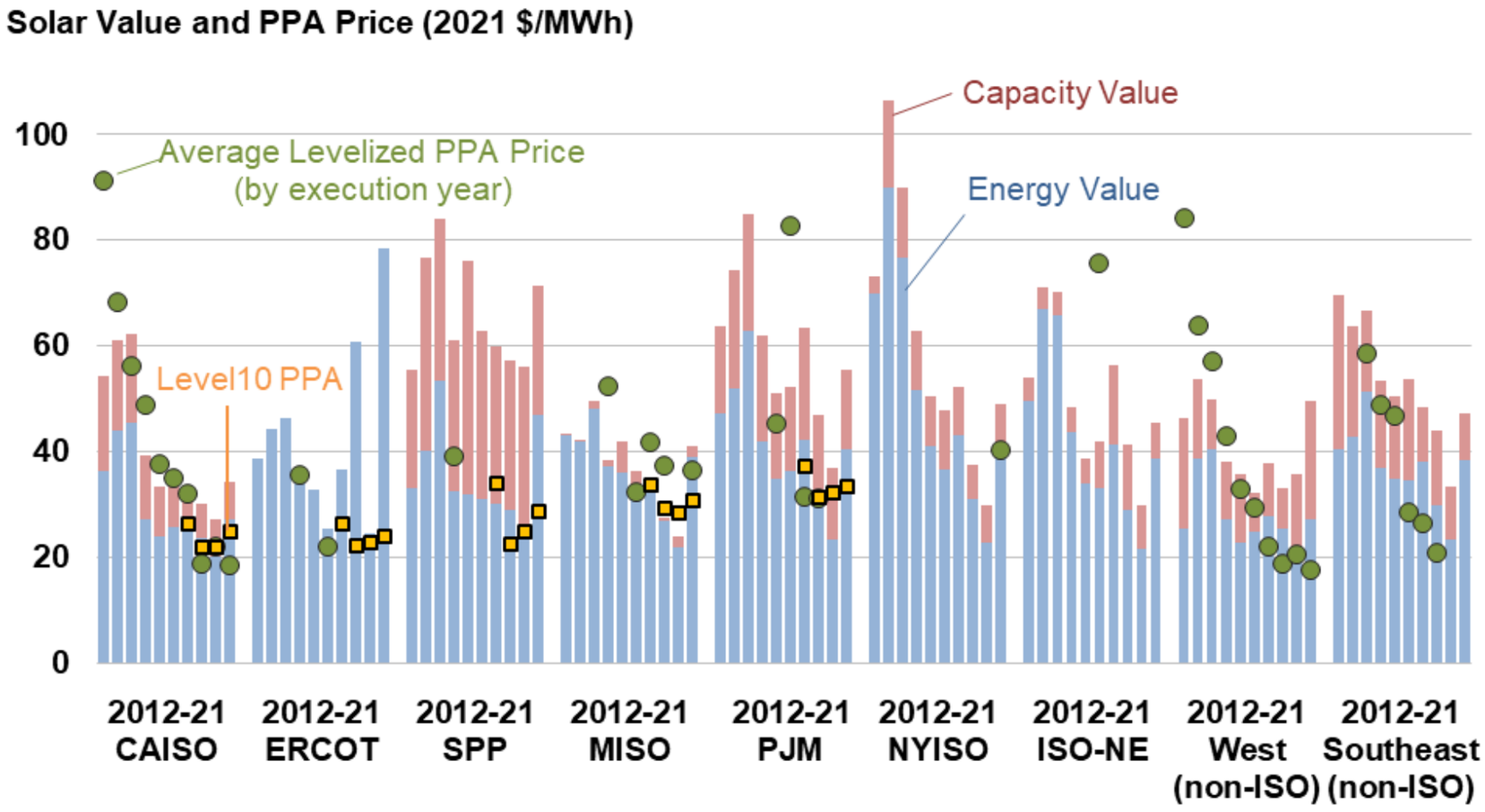
In 2021, market value was lowest in CAISO ($34/MWh) and highest in ERCOT ($78/MWh).

The regional solar value is the generation-weighted average value of all large-scale (1 MW+) solar generation in a given balancing authority.

The energy value typically makes up the bulk of total market value (80% in 2021), but capacity value is significant in eastern markets in particular.

Variation across years mostly reflect fluctuations in wholesale power prices, but in CAISO, the visible decline in value over time also reflects increasing solar penetration.

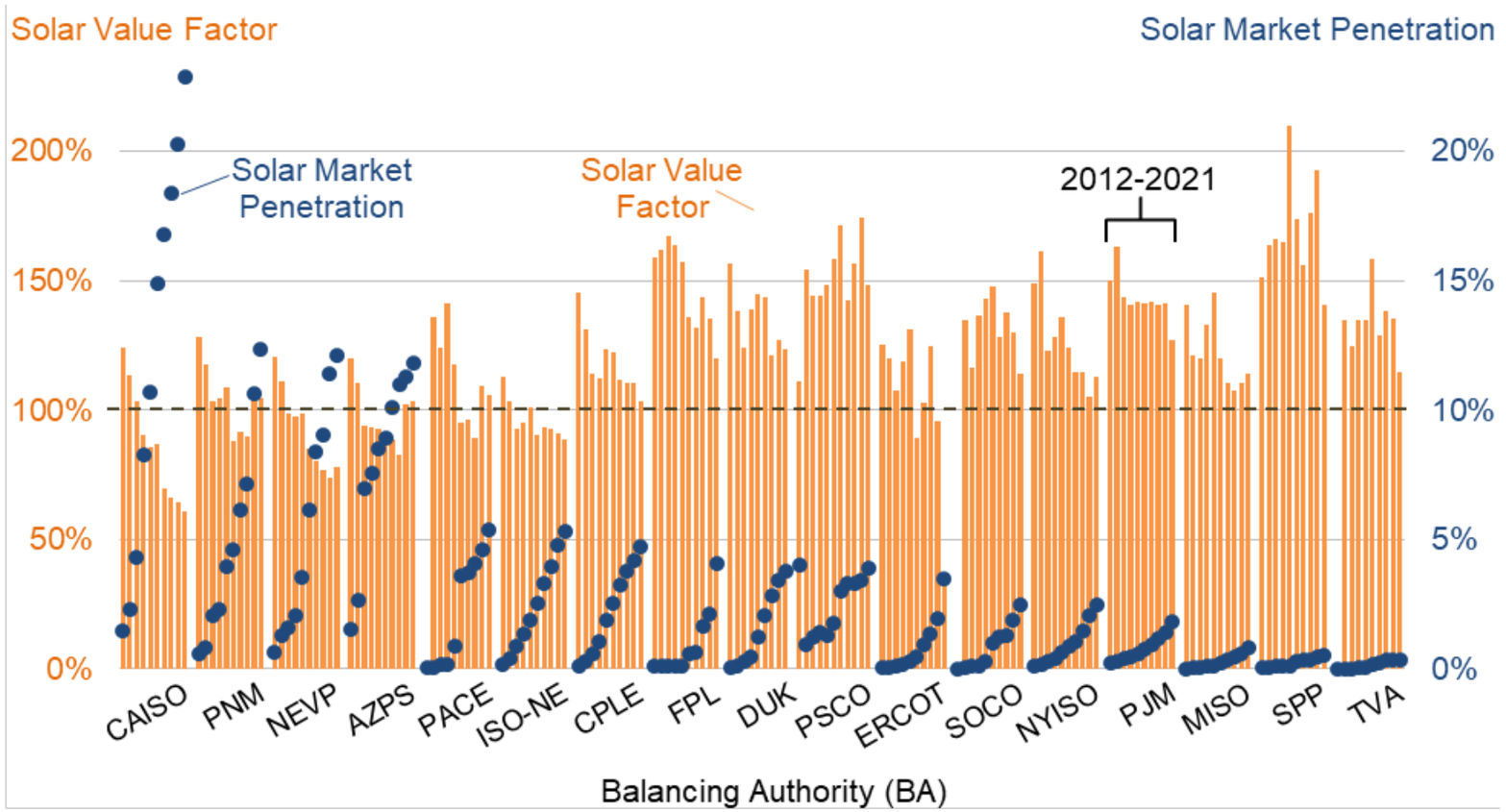
In a subset of regions for which we have sufficient PPA sample, falling PPA prices have largely kept pace with declining solar value



The green dots show the average levelized solar PPA price within each region among new contracts signed in each year as reported by Berkeley Lab, the yellow squares represent PPA price estimates by LevelTen. We do not have sufficient PPA data to present robust trends for each balancing authority.

While solar's market value within several of these regions has declined over time, falling PPA prices have largely kept pace. In 2021, rising wholesale energy prices more than compensated for moderate PPA price increases, making solar more competitive than it has ever been across the nation.

Solar provides below-average value in some regions with high solar penetration rates



The columns represent the solar value factor (left axis), the dots show growth in solar market penetration (right axis)

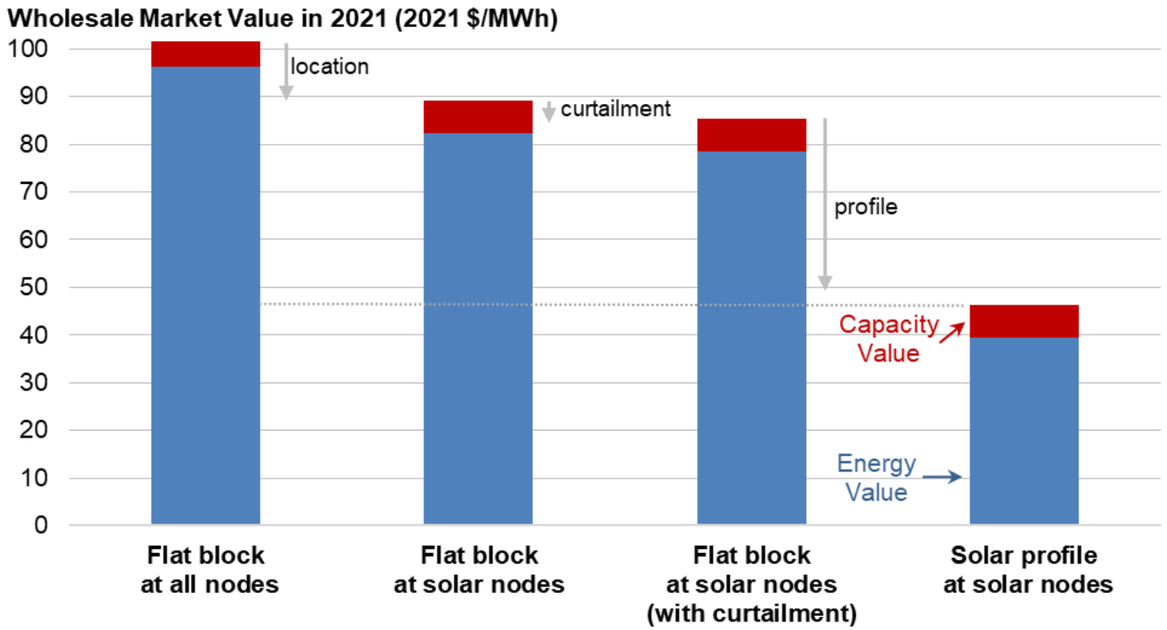
The "Value Factor" is defined as the ratio of solar's total market value (both energy and capacity) to the market value of a "flat block" (i.e., a 24x7 block) of power.

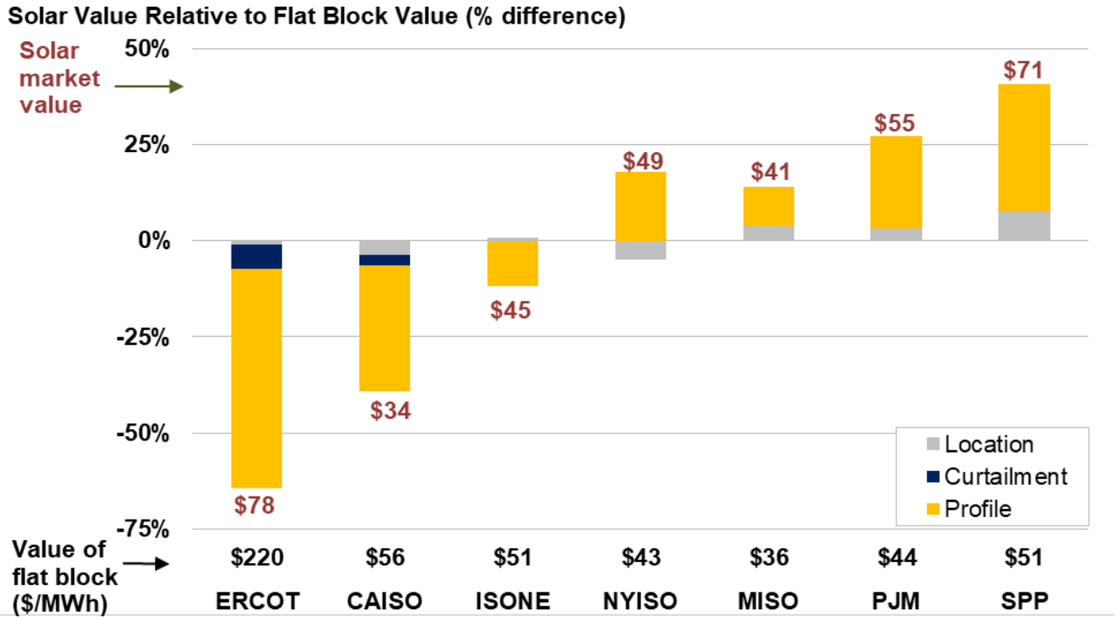
It indicates whether the total revenue captured by solar is higher (>100%) or lower (<100%) than the average wholesale price across all hours.

It controls for fluctuations in energy and capacity prices across years (and across ISOs), and focuses instead on the impact of solar's generation profile (and penetration) on value.

Most regions with the highest solar penetration rates (CAISO, NEVP, and ISO-NE) show Value Factors less than 100%. However, in PNM and AZPS solar still provided above-average value despite serving 12% of the annual load.

Solar's generation profile was the largest source of value differences between solar and a flat block in 2021





The mean energy value of a flat block across the seven ISOs increased fourfold in 2021 relative to 2020, driven by ERCOT's polar vortex event that sent energy prices above $9000/MWh. Because solar couldn't capture those high prices at night, the value impact of the solar profile appears disproportionally large.

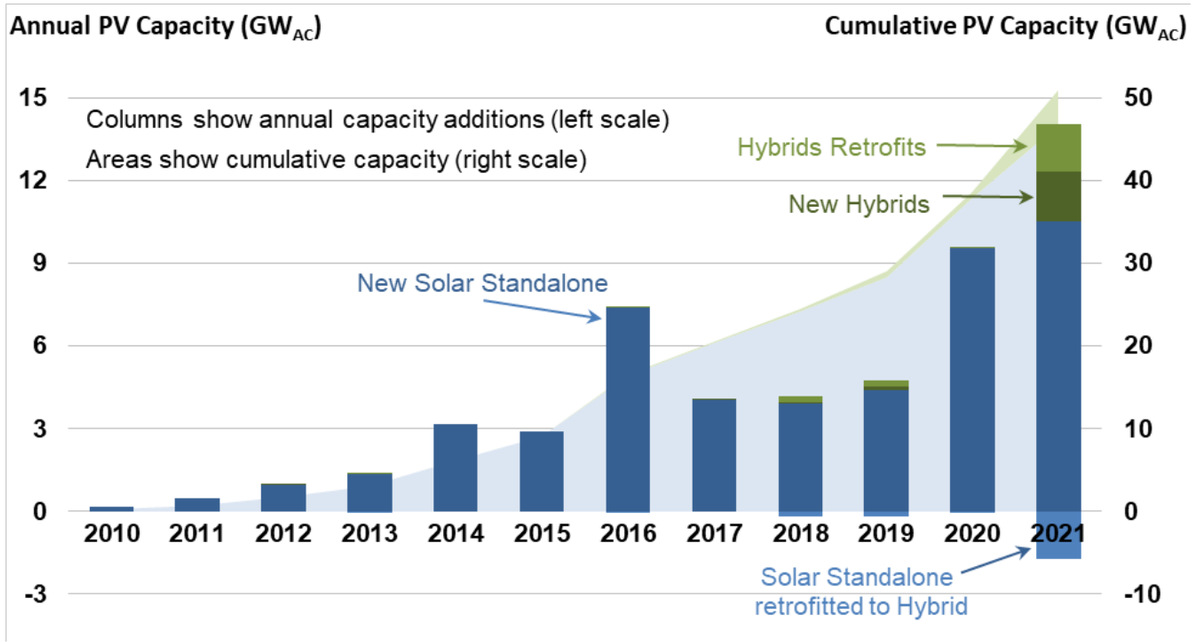
But even outside of ERCOT, solar's generation profile has the largest impact and either hurts (in CAISO and ISO-NE) or helps (in NYISO, MISO, PJM, and SPP) solar's value (relative to a flat block).

PV+Battery Hybrid Plants

(for more of Berkeley Lab's analysis of hybrid power plants, see https://emp.lbl.gov/hybrid)

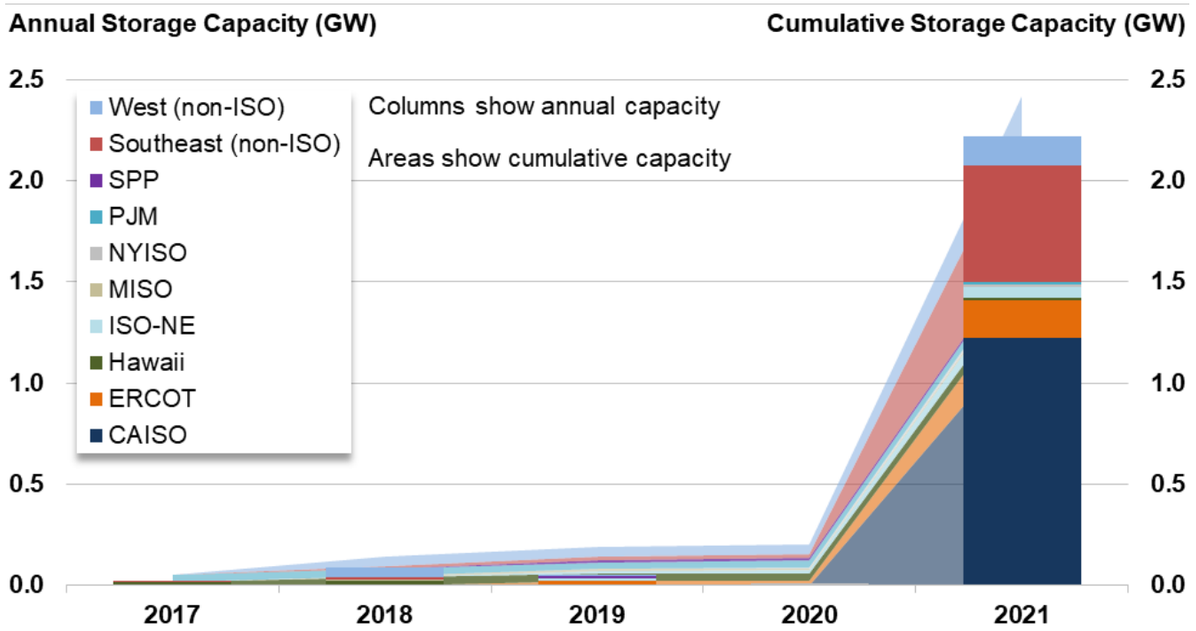
Deployment of PV-battery hybrid plants exploded in 2021

Sample: 73 projects totaling 4,210 MW_{AC} of PV, 2,218 MW_{AC} of battery capacity, and 6,949 MWh of battery energy



The large-scale PV+battery hybrid build-out started slowly in 2016, with just 1-11 plants/year built through 2020, adding storage to less than 350 MW_{AC} of solar each year.

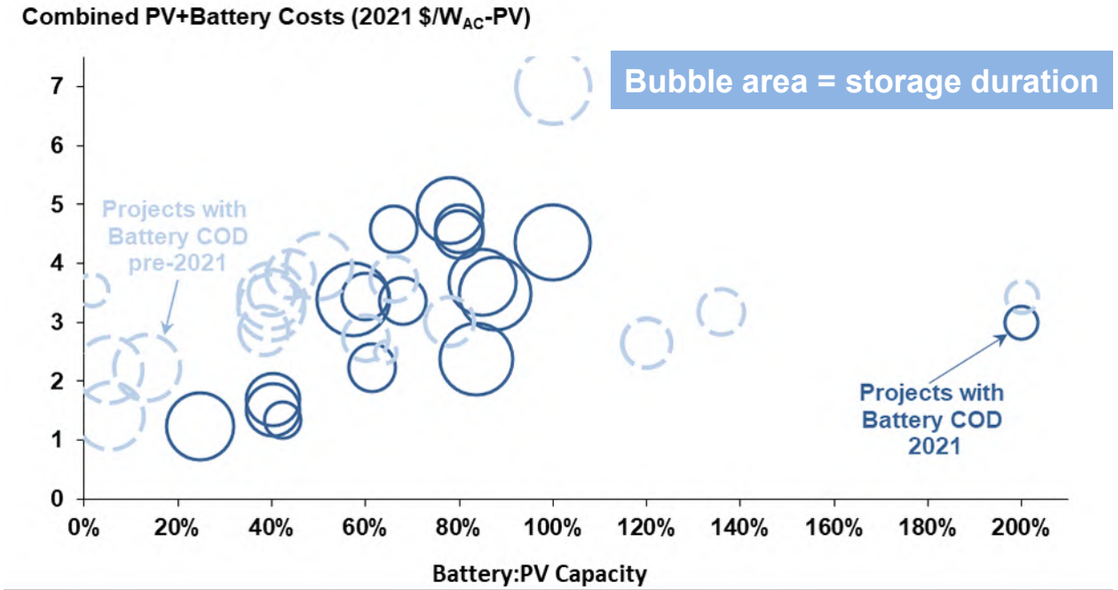
The pace accelerated in 2021, when 47 PV plants built storage, either as a retrofit to an existing PV plant (18 plants, 1.73 GW_{AC}-PV) or as a new greenfield plant (29 plants, 1.80 GW_{AC}-PV).



Most of the new storage was built in CAISO (14 plants, 1.2 GW storage capacity/4.8 GWh storage energy), Florida (4 plants, 0.5 GW capacity/1.1 GWh energy), and ERCOT (3 plants, 0.2 GW storage capacity/0.2 GWh energy). Massachusetts built smaller plants via the MA Smart program (14 plants, 51 MW capacity/460 MWh energy)

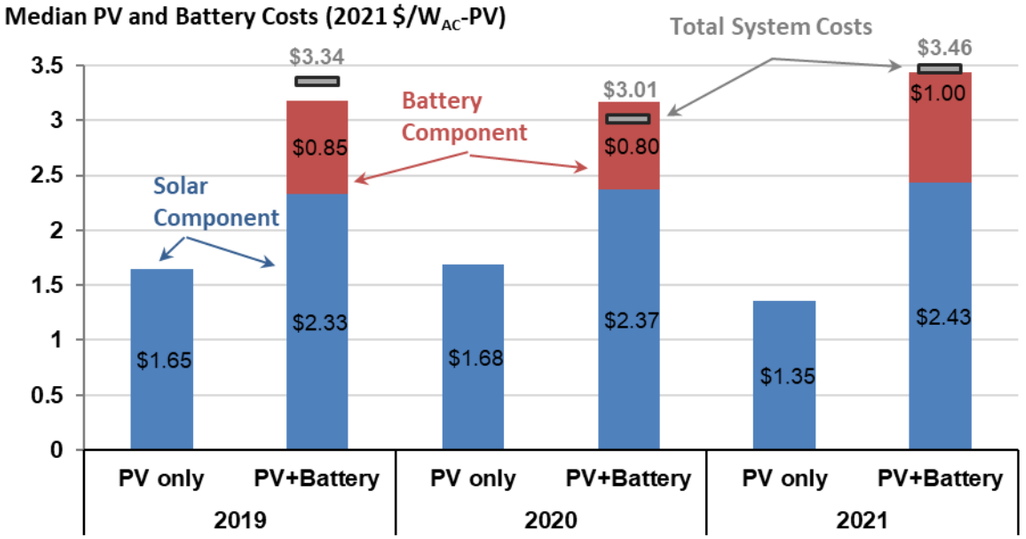
For PV+battery hybrid plants, the battery cost adder scales with increased storage capacity and duration

Sample: 52 plants totaling 2,824 MW_{AC} of PV and 1,725 MW/ 5,361 MWh of batteries with CODs from 2018-2021



Battery systems have become larger in size relative to the PV capacity (2021 median: 73%) and storage duration has increased (2021 median: 2.2 hours at rated capacity).

As a consequence, the median combined PV+battery costs are up slightly from prior years at \$3.5/W_{AC}-PV in 2021.

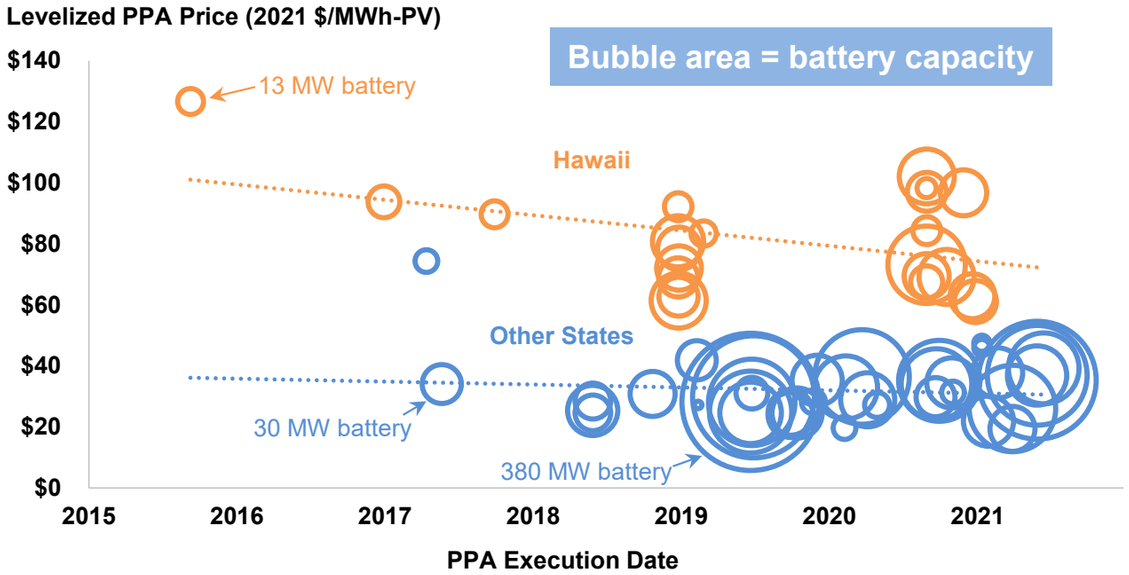


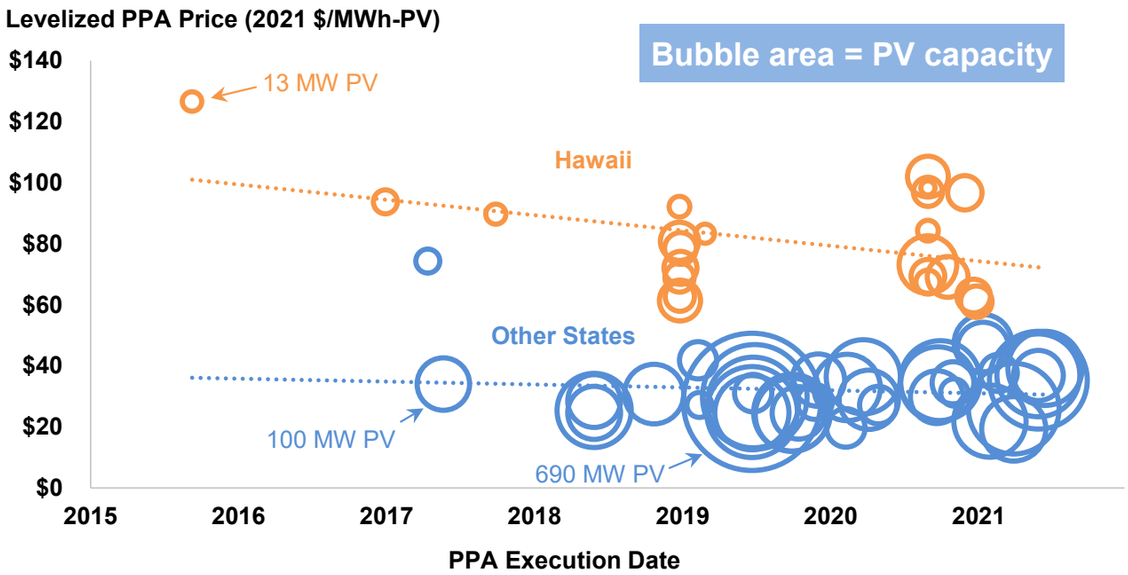
Median battery costs are \$264/kWh among the seven 2021 projects reporting component costs, representing a cost adder of \$1.0/W_{AC}-PV, or 29% of overall hybrid plant installed costs. Solar components of hybrid projects may be more costly than standalone PV due to:

- a greater inverter loading ratio (overbuilt module arrays),
- retrofits to older PV projects when solar was more expensive,
- an uneven accounting of costs between the PV and battery components.

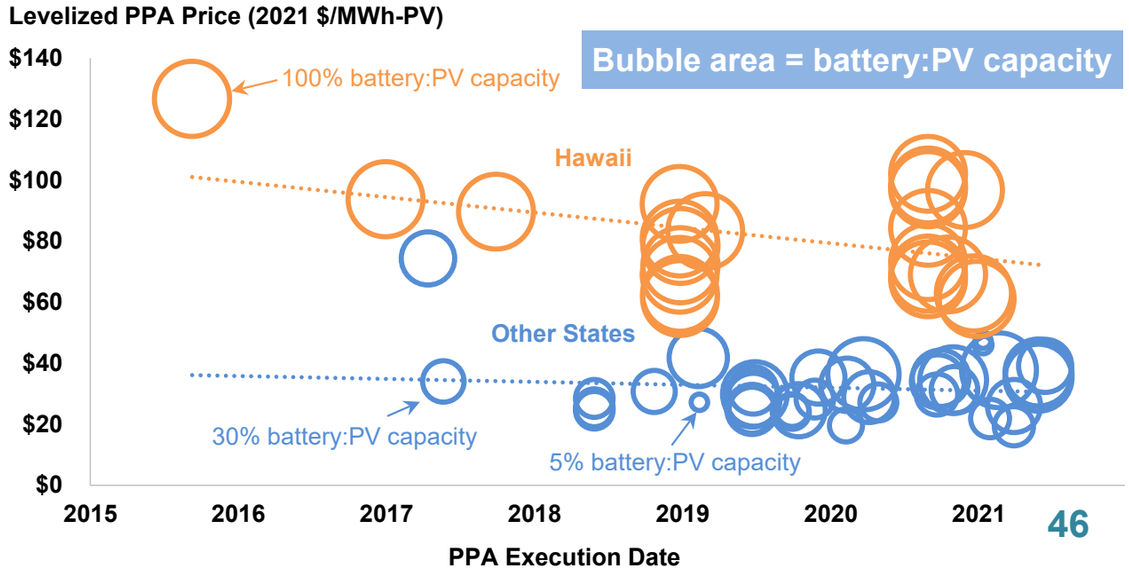
Note: The sum of median PV and battery component costs and total system costs diverge because of sample size differences. Component costs data for 2021: 7 projects ; total system costs: 20 projects

PPA prices for PV+battery hybrids have declined over time; Hawaii priced at a premium





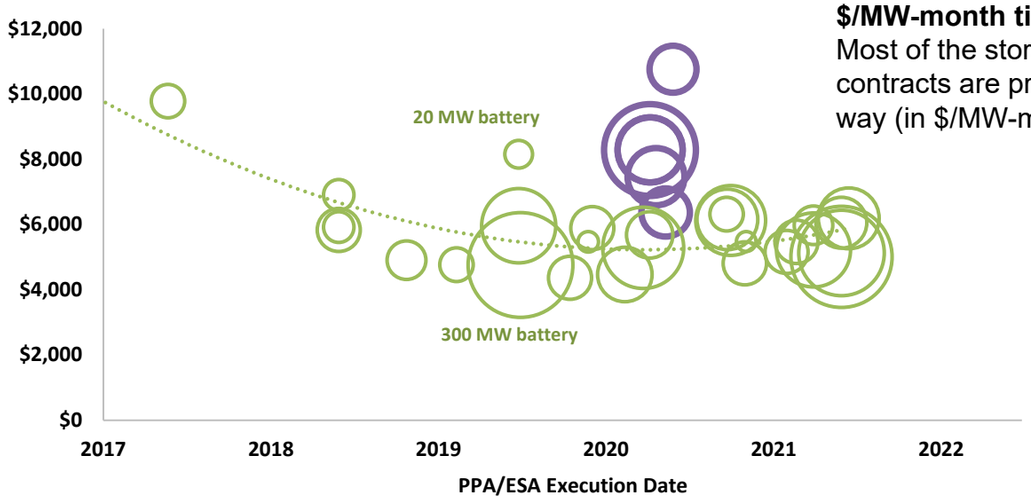
- All 3 graphs show same data from sub-sample of 61 plants (retrofits not included); the only difference is what the bubble size represents
  - Hawaii (orange): 22 plants, 0.8 GW_{AC} PV, 0.8 GW_{AC} battery
  - Other States (blue): 39 plants, 6.3 GW_{AC} PV, 3.1 GW_{AC} battery
- Downward trend over time, particularly in HI, but refinement is complicated by multi-dimensionality of these plants; other states are more heterogenous than HI in terms of solar resource
- Battery:PV capacity ratio always at 100% in HI; lower on the mainland (but increasing over time—see bottom right graph)
- Storage duration ranges from 2-8 hours; 50 of the 61 plants have 4-hour duration (other 11 are 5x2 hour, 1x3.7 hour, 4x5 hour, and 1x8 hour)



PPAs that price the PV and storage separately enable us to calculate a "levelized storage adder," shown here 4 different ways

Graphs show adders from 34 PV hybrids in CA (17), NM (8), NV (7), AZ (1) and OR (1) totaling >3 GW_{AC} of batteries, all with 4-hour duration

Levelized Storage Adder (2021 $/MW-month)



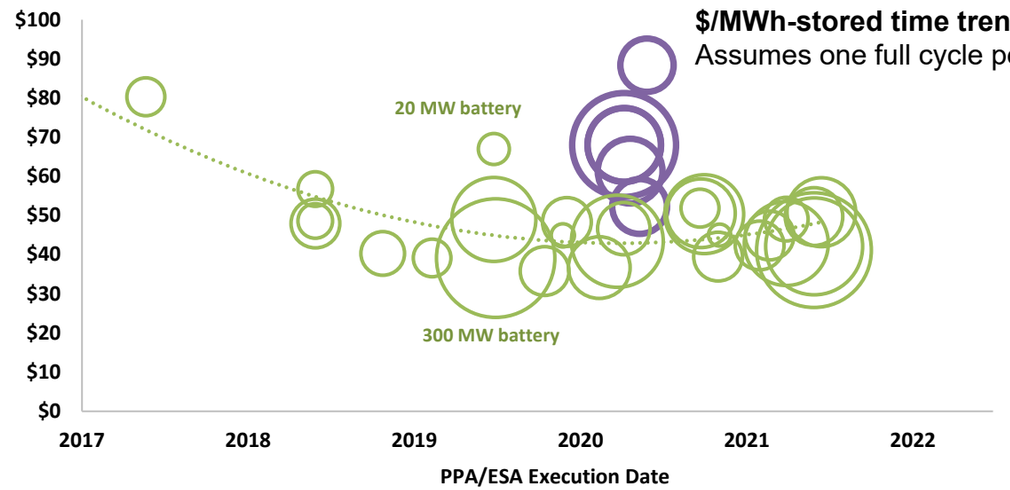
$/MW-month time trend:
Most of the storage contracts are priced this way (in $/MW-month terms)

Green = greenfield

Purple = battery retrofit

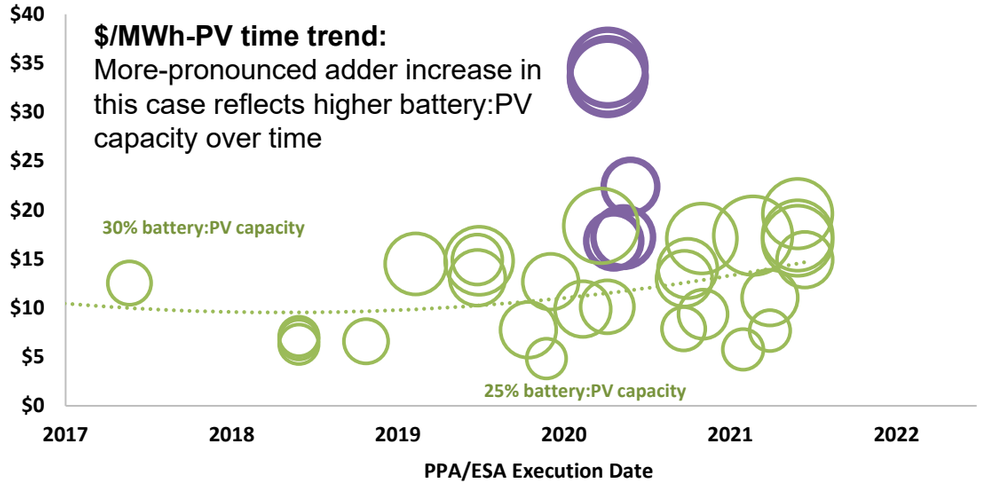
Trend lines represent greenfield plants only. Bubble size corresponds to battery capacity except in bottom-left graph, where it corresponds to battery:PV capacity.

Levelized Storage Adder (2021 $/MWh-stored)



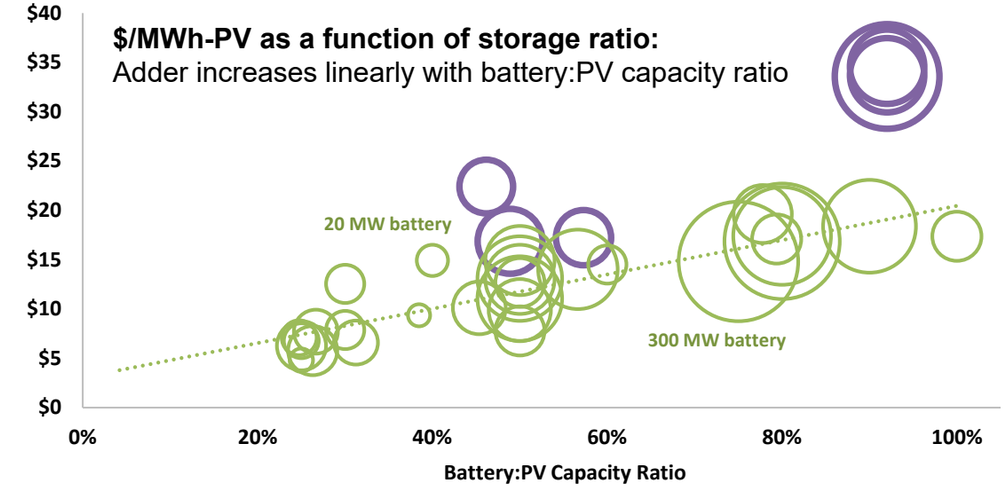
$/MWh-stored time trend:
Assumes one full cycle per day

Levelized Storage Adder (2021 $/MWh-PV)



$/MWh-PV time trend:
More-pronounced adder increase in this case reflects higher battery:PV capacity over time

Levelized Storage Adder (2021 $/MWh-PV)

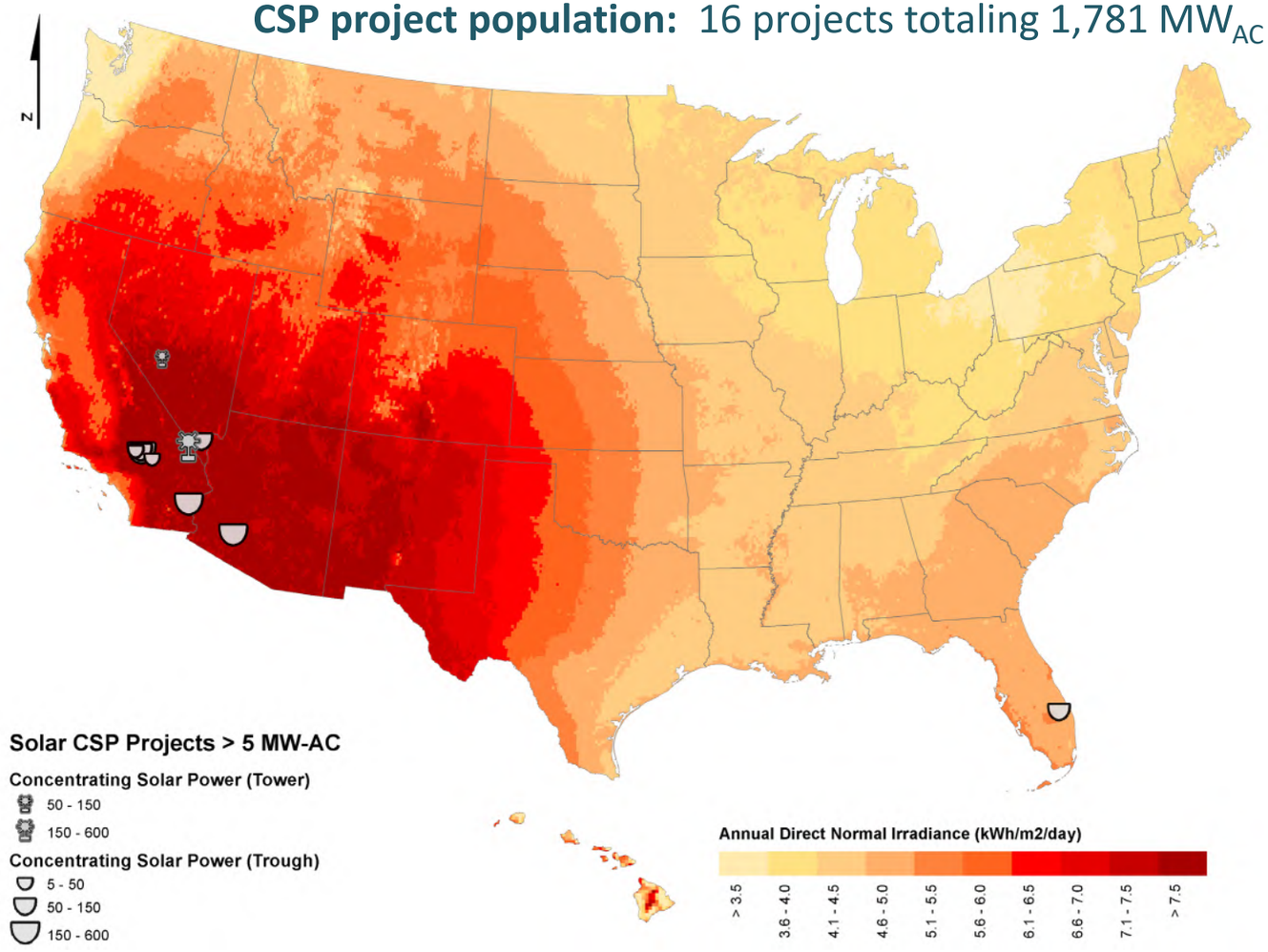


$/MWh-PV as a function of storage ratio:
Adder increases linearly with battery:PV capacity ratio

Concentrating Solar Thermal Power (CSP) Plants

Sample description of CSP projects

CSP project population: 16 projects totaling 1,781 MW_{AC}



After nearly 400 MW_{AC} built in the late-1980s (and early-1990s), no new CSP was built in the U.S. until 2007 (68 MW_{AC}), 2010 (75 MW_{AC}), and 2013-2015 (1,237 MW_{AC}).

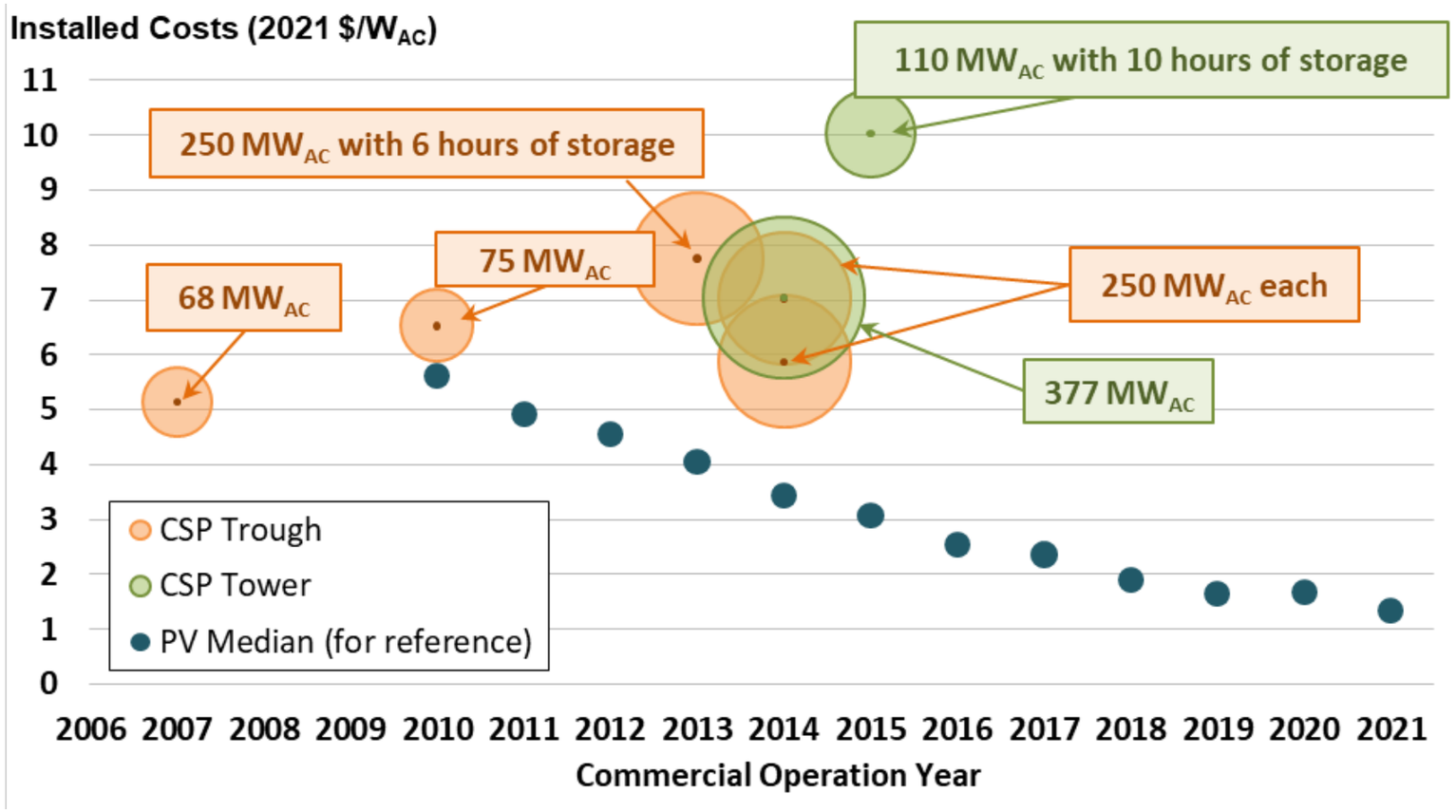
Prior to the large 2013-15 build-out, all utility-scale CSP projects in the U.S. used parabolic trough collectors.

The five 2013-2015 projects include:

- 3 parabolic troughs (one with 6 hours of storage) totaling 750 MW_{AC} (net) and
- 2 “power tower” projects (one with 10 hours of storage) totaling 487 MW_{AC} (net).

Not much movement in the installed costs of CSP

CSP cost sample: 7 projects totaling 1,381 MW_{AC}

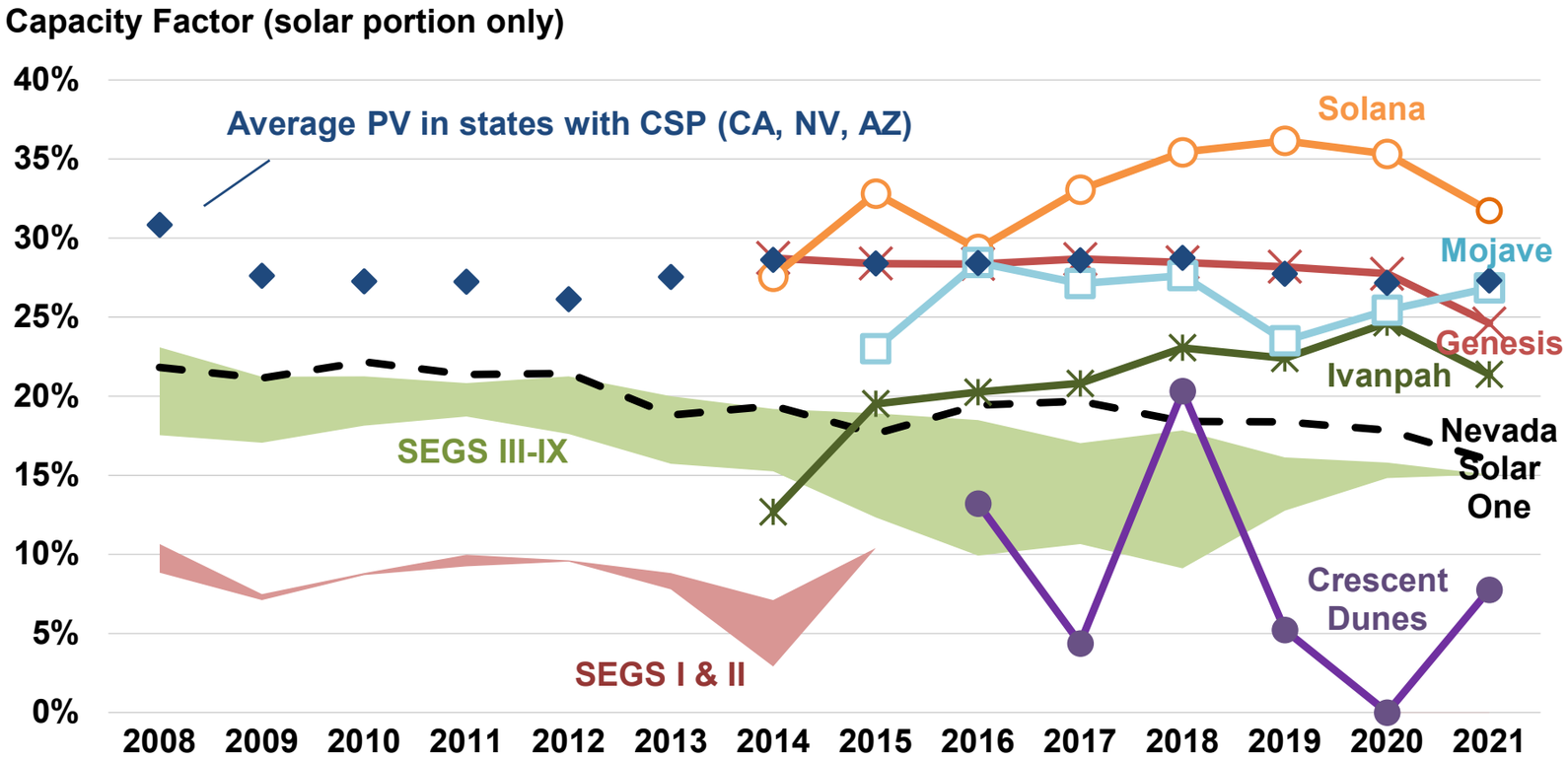


Small sample of 7 projects using different technologies makes it hard to identify trends. Newer projects (5 built in 2013-15) did not show cost declines, though some included storage or used new technology (power tower).

PV costs have continuously declined and are now far below the historical CSP costs. While international CSP projects seem to be more competitive with PV, no new CSP projects are currently under active development in the U.S.

Most newer CSP projects continue to underperform relative to long-term expectations

CSP capacity factor sample: 7 projects totaling 1,394 MW_{AC}



Power Towers: Ivanpah's (377 MW) capacity factor retreated a bit in 2021, and is still below long-term expectations of ~27%, while Crescent Dunes (110 MW with 10 hours of storage) returned to service in the second half of 2021 after not operating for >2 years.

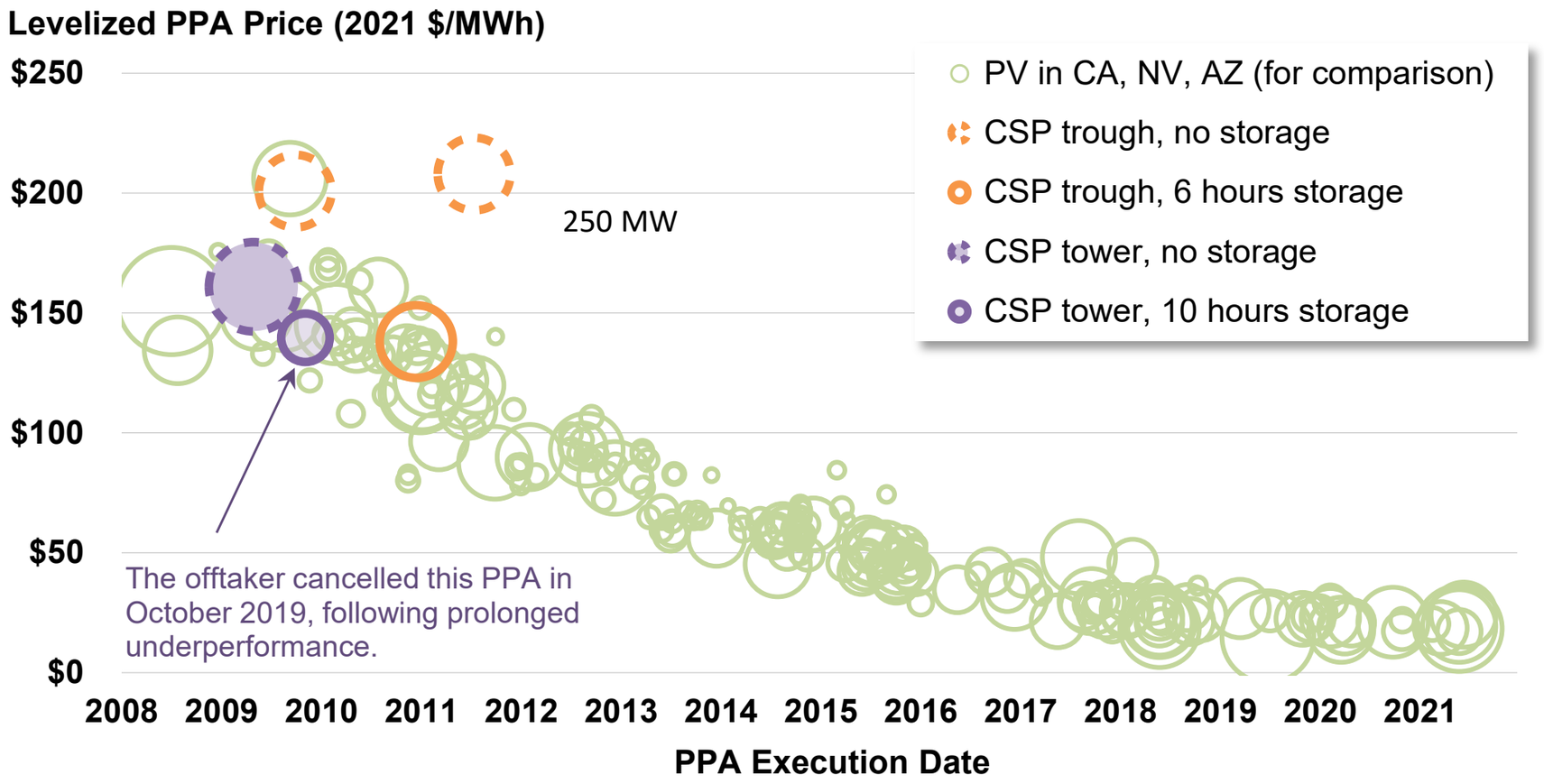
Trough with storage: Solana's (250 MW trough project with 6 hours of storage) capacity factor dropped to 32% in 2021, below long-term expectations of >40%.

Troughs without storage: Genesis and Mojave (both 250 MW net) moved in opposite directions in 2021. Both have performed better than the old SEGS projects (now decommissioned and being partially repowered with PV) and the 2007 Nevada Solar One project.

Only Solana, Genesis, and Mojave have matched or exceeded the average capacity factor among utility-scale PV projects across CA, NV, and AZ.

Though once competitive, CSP PPA prices have failed to keep pace with PV's PPA price decline

CSP PPA price sample: 5 projects totaling 1,237 MW_{AC}



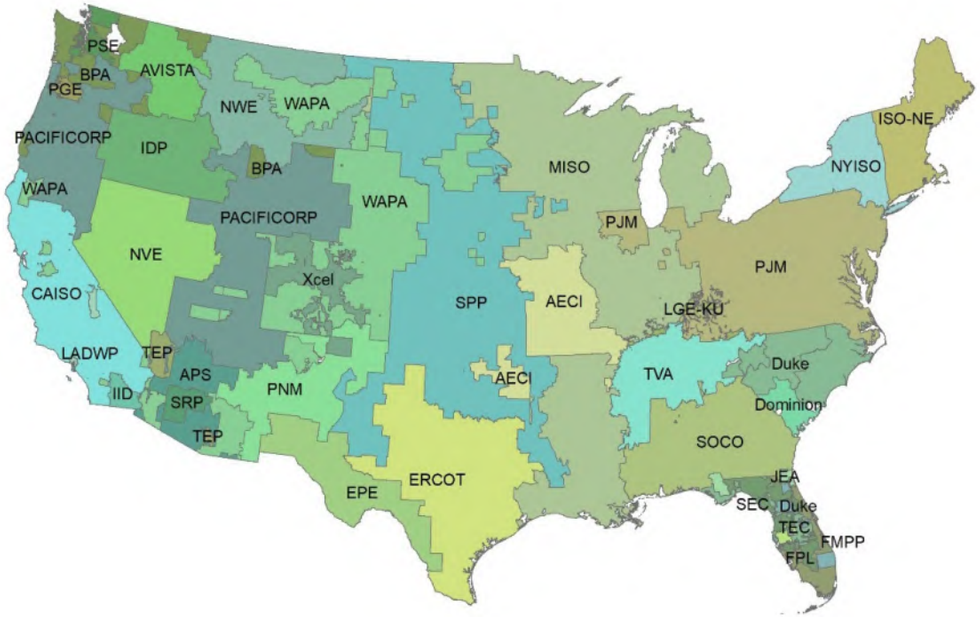
When PPAs for the most recent batch of CSP projects (with CODs of 2013-15) were signed back in 2009-2011, they were still mostly competitive with PV.

But CSP has not been able to keep pace with PV's price decline. Partly as a result, no new PPAs for CSP projects have been signed in the U.S. since 2011 – though the technology continues to advance overseas.

Capacity in Interconnection Queues

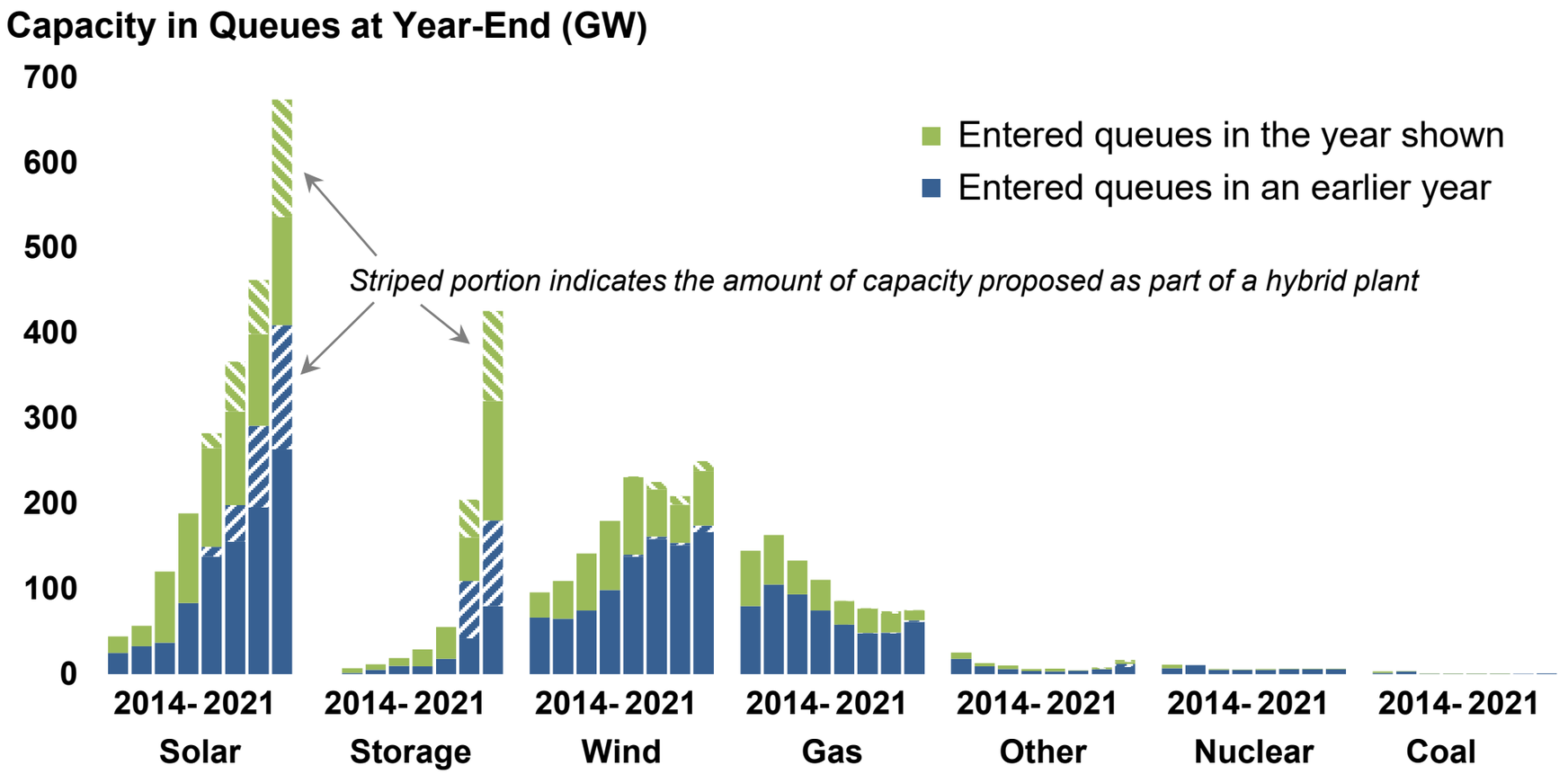
Scope of generator interconnection queue data

- Data compiled from **interconnection queues** for 7 ISOs and 35 utilities, representing ~85% of all U.S. electricity load
  - Projects that connect to the bulk power system: not behind-the-meter
  - Includes all projects in queues through the end of 2021
  - Filtered to include only "active" projects: removed those listed as "online," "withdrawn," or "suspended"
- Hybrid / co-located projects were identified and categorized
  - Storage capacity for hybrids (i.e., broken out from generator capacity) was not available in all queues
- Note that being in an interconnection queue does not guarantee ultimate construction: majority of plants are not subsequently built
- More queue data and analysis are available at: *https://emp.lbl.gov/queues*



Coverage area of entities for which data was collected
Data source: Homeland Infrastructure Foundation-Level Data (HIFLD)

Looking ahead: Strong growth in the utility-scale solar pipeline



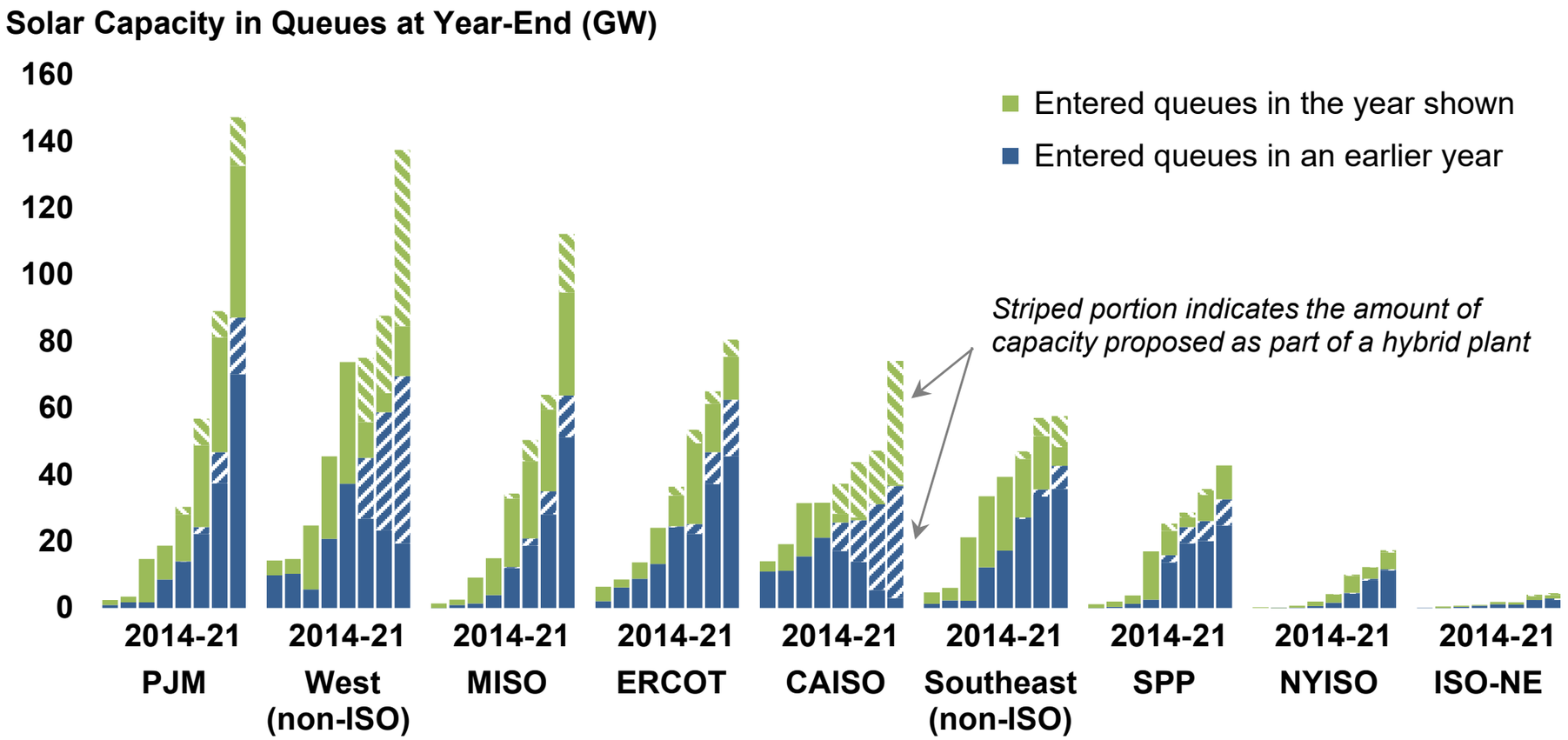
674 GW of solar was in the queues at the end of 2021—265 GW of this total entered the queues in 2021 (the remainder entered in earlier years, and remain active)

284 GW of the 674 GW of solar in the queues (i.e., 42%) includes a battery in a PV hybrid configuration

Solar (both standalone and in hybrid form) is by far the largest resource within these queues, followed by storage, wind, and natural gas (all other resources are marginal)

Graph shows solar and other capacity in 42 interconnection queues across the US:
Not all of these projects will ultimately be built!

Looking ahead: Continued broadening of the market



The growth of solar within these queues is widely distributed across most regions of the country, with PJM, the non-ISO West, and MISO leading the way

95% of the solar capacity in CAISO's queue at the end of 2021 was paired with a battery; in the non-ISO West, that number was also relatively high, at 75%

- Both regions are grappling with "duck curve" issues due to solar's relatively high market share

Graph shows solar capacity in 42 interconnection queues across the US:
Not all of these projects will ultimately be built!

Summary

Data Summary

- Utility-scale PV continued to lead solar deployment in 2021, with Texas adding the most new capacity. 75% of new projects and 90% of new capacity feature single-axis tracking.
- The median installed cost of projects that came online in 2021 fell to \$1.3/W_{AC} (\$1.0/W_{DC}), down 20% from 2020 and 76% from 2010.
- Average capacity factors range from 17% in the least-sunny regions to 32% where it is sunniest. Single-axis tracking adds roughly four percentage points to capacity factor in the regions with the strongest solar resource.
- Not including the ITC, the median LCOE from utility-scale PV has declined by 85% since 2010, to \$33/MWh in 2021. Levelized PPA prices have kept pace, and—with the benefit of the ITC—currently range from \$20/MWh in CAISO and the non-ISO West to \$30-\$40/MWh elsewhere.
- The market value of solar has increased with rising energy prices in 2021, more than compensating for modest PPA increases and making solar more competitive than it has ever been across the nation.
- Interest in hybridization (pairing PV with batteries) continued to surge in 2021, which was a breakout year in terms of new PV+battery hybrids coming online. Some of these PV+battery hybrid plants have inked PPAs in the mid-\$20/MWh-PV range.
- Across all 7 ISOs and 35 additional utilities, there were 674 GW of solar in interconnection queues at the end of 2021. More than 40% of this proposed solar capacity is paired with battery storage, with the highest concentration of these PV+battery hybrid plants in CAISO and the non-ISO West.

Data and Methods

Summary of Data and Methods (1)

Much of the analysis in this report is based on primary data, the sources of which are listed below (along with some general secondary sources) by data set. We collect data from a variety of unaffiliated and incongruous sources, often resulting in data of varying quality that must be synthesized and cleaned in multiple steps before becoming useful for analytic purposes. In some cases, we essentially create new and useful data by piecing together various snippets of information that are of less consequence on their own.

Technology Trends: Project-level metadata are sourced from a combination of Form EIA-860, FERC Form 556, state regulatory filings, interviews with project developers and owners, and trade press articles. We independently verify much of the metadata—such as project location, fixed-tilt vs. tracking, azimuth, module type—via satellite imagery. Other metadata are indirectly confirmed (or flagged, as the case may be) by examining project performance—e.g., if a project's capacity factor appears to be an outlier given what we think we know about its characteristics, then we dig deeper to revisit the veracity of the metadata.

Installed Costs: Project-level CapEx estimates are sourced from a combination of Form EIA-860, Section 1603 grant data from the U.S. Treasury, FERC Form 1, data from applicable state rebate and incentive programs, state regulatory filings, company financial filings, interviews with developers and owners, trade press articles, and data previously gathered by NREL. CapEx estimates for projects built from 2013-2020 have been cross-checked against confidential EIA-860 data obtained under a non-disclosure agreement (and we expect to receive similar data for 2021 projects and successive years going forward). The close agreement between the confidential EIA data and our other sources in most cases provides comfort that our normal data collection process (i.e., the process that we go through prior to receiving the confidential EIA data with a one-year lag) does, in fact, yield reputable CapEx estimates. That said, we do caution readers to focus more on the overall trends rather than on individual project-level data points.

Capacity Factors: We calculate project-level capacity factors using net generation data sourced from a combination of FERC Electric Quarterly Reports, FERC Form 1, Form EIA-923, and state regulatory filings. Because many projects file data with several of these sources, we are often able to cross-reference (and correct, if needed) odd-looking data across several sources, thereby providing higher confidence in the veracity of the data.

Summary of Data and Methods (2)

PPA Prices: We gather PPA price data from a combination of FERC Electric Quarterly Reports, FERC Form 1, Form EIA-923, state regulatory filings, company financial filings, and trade press articles. We only include a PPA within our sample if we have high confidence in all of the key variables such as execution date, starting date, starting price, escalation rate (if any), time-of-day factor (if any), and term. By this process of exclusion, there is very little chance for erroneous PPA price data to enter our sample. Instead, this winnowing process results in our PPA price sample being somewhat smaller than it might otherwise be—though we are typically able to add back in any "incomplete" PPAs in subsequent years, once more data have become available with the passage of time.

LCOE: Our project-level LCOE calculations draw upon the empirical project-level data presented throughout this report, including CapEx and capacity factors, and are supplemented with assumptions about financing and other items, as described in more detail in earlier slides.

Market Value: We draw from project-level modeled hourly solar generation (using NREL's *System Advisor Model* and site- and year-specific insolation data from NREL's *National Solar Radiation Database and NOAA's High Resolution Rapid Refresh Model)* and de-bias the generation leveraging ISO-reported aggregate solar generation and plant-level reported generation by EIA 923.

Energy value is the product of hourly solar generation by plant (utility-scale) or county (distributed PV) and the wholesale hourly real-time energy prices of the nearest node (for ISOs) or the system-wide energy price (other Balancing Authorities).

Capacity value relies on the same reported and constructed generation profiles as does energy value to assess the "capacity credit" of solar according to each ISO's rules in place at the time (for Balancing Authorities we examine the historical plant-level performance over the top 100 load hours over the past 3 years). We then multiply the resulting capacity credit by historical zonal capacity prices to arrive at capacity value.

For more information, see Berkeley Lab's publication: "Solar-to-Grid: Trends in System Impacts, Reliability, and Market Value in the United States with Data Through 2020." *https://emp.lbl.gov/renewable-grid-insights*

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Contact the corresponding authors:

Mark Bolinger (MABolinger@lbl.gov)

Joachim Seel (JSeel@lbl.gov)

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NEVADA DEPARTMENT OF TAXATION

Division of Local Government Services

PERSONAL PROPERTY MANUAL:

VALUATION GUIDELINES

2022-2023

Personal Property Manual: Valuation Guidelines 2022-2023

Department of Taxation
Division of Local Government Services
1550 College Parkway, Suite 144
Carson City, NV 89706
Phone 775.684.2100 ● Fax 775.684.2020

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INTRODUCTION

The schedules presented herein are interpretive guidelines for use by county assessors to establish taxable value, pursuant to the requirements of NRS 361.227(4) and NAC 361.1365 and 361.1375.

CLASSIFICATION OF PROPERTY

Personal property is defined in NRS 361.030, and includes (j) "all property of whatever kind or nature, except vehicles as defined in NRS 371.020, not included in the term "real estate." Real estate is defined in NRS 361.035, and includes land, houses, buildings, fences, ditches, structures,[1] erections, railroads, other improvements, and property rights. Real property is further defined in NAC 361.11715 as land, fixtures, improvements; on-site enhancements; and any rights, interests, benefits and privileges belonging or attached to the land.

NRS 361.333 requires that each major class of property be examined to determine whether there is equality of assessment. Uniformity and equality of assessment thus depend on proper classification. Although NRS 361.035 defines real estate and NRS 361.030 defines personal property, in practice it is sometimes difficult to tell whether an item is personal or real property. As the Attorney General stated in Opinion #41 (1963), "the classification depends on the facts of each particular case." The assessor is encouraged to consult the Division of Local Government Services and/or the District Attorney in difficult cases.

All references to statutes and regulations may be found in Appendix A of this Manual.

EXEMPT PROPERTY

NRS 361.050 through NRS 361.187 provide exemptions for assorted types of eligible property, including household goods; business inventories; property in transit; property owned by government entities, charitable organizations or veterans; and fine art for display.

Additionally, NRS 361.228(1) provides that

All intangible personal property is exempt from taxation, including, without limitation:

(a) Shares of stock, bonds, mortgages, notes, bank deposits, book accounts such as an acquisition adjustment and credits, and securities and chooses in action of like character; and

(b) Goodwill, customer lists, contracts and contract rights, patents, trademarks, trade names, custom computer programs, copyrights, trade secrets, franchises and licenses.

A complete discussion of exemptions and a cross-reference table is included in Appendix D of this manual.

[1] Structures include self-supporting structures other than buildings which carry gravity loads and resist the effects of earthquakes. They are generally not designed for continuous human occupancy and may be open to the environment, part of landscape design elements, or part of infrastructure systems (transport, water, energy). Examples of non-building structures include silos, chimneys, stacks, cooling towers, bins and hoppers, amusement structures, and monuments. *See American Society of Civil Engineers, "Minimum Design Loads for Buildings and Other Structures;" Revision of ASCE Standard 7-98, SEI/ASCE 7-02, 2nd Edition, Section 9.14, Nonbuilding Structures, p. 186. See also Bachman, Robert and Susan Dowty, "Nonstructural Component or Nonbuilding Structure," originally published in Building Safety Journal (April-May, 2008).*

PROCEDURES FOR DETERMINING TAXABLE VALUE

To calculate the taxable value of personal property, NAC 361.1371 and NAC 361.1375 require the assessor to determine four input values:

- Acquisition cost
- Acquisition year
- Expected life, and
- Cost conversion factor

The personal property declaration submitted by the taxpayer pursuant to NRS 361.265 should list the acquisition cost for each item and the year acquired. The declaration should also contain sufficient information to identify each item's industry classification (NAICS code), property type, and corresponding expected life.

Acquisition Cost

For personal property mobile or manufactured homes, acquisition cost means replacement cost when new, which equals the retail selling price to the original owner. For other types of personal property including billboards, acquisition cost means the actual cost of property to its present owner. For all personal property, acquisition cost includes any expense required to place the asset into service except sales tax--including all charges for transportation, installation, accessories, and profit and overhead, as well as additions to or renovations of the property other than routine maintenance or repairs. Observe, however, that the cost of manufactured homes does not include appurtenant improvements like outbuildings, decks, or paving. The assessor should value these separately as real property and depreciate as appropriate.

Should a taxpayer fail to file a valid personal property declaration or sufficient data is not otherwise available for the assessor to establish acquisition cost, NRS 361.265 authorizes the assessor to make an estimate of the value of the property. NAC 361.139 further requires the assessor to estimate its acquisition cost using any nationally recognized valuation technique. Because NRS 361.265(5) defines failure to file a declaration as a misdemeanor, assessors should advise taxpayers to file complete, accurate, and timely personal property declarations. In addition, if the reported acquisition cost appears inconsistent with market data, the assessor may request documentation for the cost reported and may pursue penalties for perjury if necessary.

Acquisition Year

For mobile and manufactured homes the acquisition year equals the year of the sale to the original owner, which often corresponds to the manufacturer's model year. For all other personal property the acquisition year equals the year the current owner purchased or leased the property. Observe that the acquisition year remains constant at the year first sold for manufactured homes but resets to the year acquired each time billboards or equipment change owners.

Expected life

The Life Expectancy Guidelines section assigns typical asset lives to each major industrial classification grouped by NAICS code. For example, all industries classified as *Agriculture and Forestry (NAICS .11)* have 15 year lives, while *Mining (NAICS .21)* assigns a 20 year life to *Oil and Gas Exploration (NAICS .2111)* and a 15 year life to *Mining (NAICS .2121 & .2122)*.

Certain items within industries appear separately as Itemized Equipment with specific lives that may differ from the industry norm. For example, *Agriculture and Forestry* industries with a typical 15 year life expectancy also use specialized equipment whose asset lives equal 7, 10 or 20 years. To improve accuracy, assessors should employ the itemized equipment lives whenever they can assign a specific life expectancy to a particular item.

Having identified the industry classification for the subject account the assessor then assigns its appropriate NAICS code and corresponding expected lives to its assets. *See discussion on NAICS below for current requirements.*

Readers may also use the alphabetical listing of personal property by general type found in the Index of this Manual to locate the appropriate expected life for individual items. Because some industries use similar types of business equipment, like desks or computers, readers should select the NAICS classification that best describes the subject account.

Besides these NAICS Life Expectancy Guidelines, the Personal Property Manual also contains a Special Properties section with descriptions and asset life tables for:

- Short-life property subject to rapid obsolescence;
- Items similar to real property classified as personal, like mobile and manufactured homes or billboards;
- Generic business equipment found across many industries, like furniture and trade fixtures or computers; and
- Specialized assets like high-tech medical diagnostic equipment whose economic lives differ substantially from industry norms.

Cost Conversion Factors

Based on the acquisition cost, acquisition year and expected life for an item, the assessor should select the appropriate Cost Conversion Factor from the tables published in the Personal Property Manual.

Cost Conversion Factors contain three components: Cost Index, Age and Percent Good. To satisfy the requirement of NAC 361.1375(2) the department develops Paasche indexes for manufactured homes, billboards, and business equipment derived from pertinent Marshall Swift comparative cost multiplier tables, the West Urban, All Items CPI index, and the PPI Index for Capital Equipment, Stage of Processing. These indexes inflate replacement cost new expressed in acquisition year nominal dollars into replacement cost new expressed in current year nominal dollars.

Cost indexes do not apply to mobile and manufactured homes first sold prior to July 1, 1982, whose taxable value always equals 20% of their original selling price. Cost indexes for equipment and billboards do not accrue beyond their expected lives; such items have a constant residual cost conversion factor equal to their residual percent good multiplied by the residual year cost index.

To comply with NAC 361.130(2)(b), however, cost indexes do apply to mobile and manufactured homes first sold on or after July 1, 1982. Even though mobile homes fully depreciate after sixteen years, applying the cost index to the years between the current year minus 16 and 1982 may actually produce a temporary increase in taxable value.

NAC 361.1375(4)&(5) specify declining balance depreciation with a 5% residual (salvage value) for all property types except manufactured homes and billboards, which use straight line depreciation. Unless the Department has conducted a market study or has otherwise obtained information which indicates a different residual amount, the Department currently relies on a double declining balance method for all equipment and a 5% residual; 5% per year depreciation with a 20% residual for mobile homes (16 year life), and 1.5% per year depreciation with a 25% residual for billboards (50 year life).

Percent good equals (1 - accrued depreciation) for the given asset age, where age equals the current year (first year of the biennium) minus the acquisition year. For the 2015-16 fiscal year for example, an asset acquired in 2005 has an age of seven years, a manufactured home first sold in 1992 has an age of twenty years. Although one could calculate depreciation directly, the tables reduce this process to a simple lookup.

To calculate taxable value using the Personal Property Manual, the assessor completes three steps:

- Select the appropriate expected life table,
- Look up the cost conversion factor for the given acquisition year and,
- Multiply the acquisition cost by the indicated cost conversion factor.

As usual, assessed value equals 35% of taxable value.

A NOTE ON NAICS

The North American Industry Classification System (*NAICS)* replaced the Standard Industrial Classification (SIC) in 1997. NAICS is based on a production-oriented concept, meaning that it groups establishments into industries according to similarity in the processes used to produce goods or services.

NAICS in the United States was designed for statistical purposes. However, NAICS is frequently used for various administrative, regulatory, contracting, taxation, and other non-statistical purposes.

For additional information and complete tables, readers may consult the US Census Bureau website http://www.census.gov/eos/www/naics/

The Department highly recommends assessors use the NAICS code on each personal property account. Use of the NAICS code will assist in the proper valuation of property pursuant to this Personal Property Manual because the NAICS code identifies the type of industry engaged in by the taxpayer.

In addition, the NAICS code is now a required component on the Statistical Analysis of the Roll Reports required by the Department in NRS 361.390 (3) in order to keep track of tax expenditures per NRS 360.137. For those concerned about the availability of the NAICS code to business taxpayers, use of the NAICS code will be widespread because taxpayers subject to the new Commerce Tax are required to provide the NAICS code. In addition, the NAICS code is required on applications for abatement to the Governor's Office on Economic Development and the Governor's Office on Renewable Energy. **The Department recommends assessors collect the NAICS code on Personal Property Declarations used by business taxpayers.**

2022-23 COST CONVERSION FACTORS

THREE (3) YEAR LIFE

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THREE (3) YEAR LIFE

200% DECLINING BALANCE

YEAR ACQUIRED	AGE	COST INDEX	PERCENT DEPRECIATION	PERCENT GOOD	CONVERSION FACTOR
2022	0	1.00	0.0	100.0	1.0000
2021	1	1.01	67.0	33.0	0.3333
2020	2	1.03	89.0	11.0	0.1133
2019	3	1.05	95.0	5.0	0.0525
Residual		1.05	95.0	5.0	0.0525

NEVADA DEPARTMENT OF TAXATION

FIVE (5) YEAR LIFE

200% DECLINING BALANCE

YEAR ACQUIRED	AGE	COST INDEX	PERCENT DEPRECIATION	PERCENT GOOD	CONVERSION FACTOR
2022	0	1.00	0.0	100.0	1.0000
2021	1	1.01	40.0	60.0	0.6060
2020	2	1.03	64.0	36.0	0.3708
2019	3	1.05	78.0	22.0	0.2310
2018	4	1.08	87.0	13.0	0.1404
2017	5	1.10	95.0	5.0	0.0550
Residual		1.10	95.0	5.0	0.0550

NEVADA DEPARTMENT OF TAXATION

SEVEN (7) YEAR LIFE

200% DECLINING BALANCE

YEAR ACQUIRED	AGE	COST INDEX	PERCENT DEPRECIATION	PERCENT GOOD	CONVERSION FACTOR
2022	0	1.00	0.0	100.0	1.0000
2021	1	1.01	29.0	71.0	0.7171
2020	2	1.03	49.0	51.0	0.5253
2019	3	1.05	64.0	36.0	0.3780
2018	4	1.08	74.0	26.0	0.2808
2017	5	1.10	81.0	19.0	0.2090
2016	6	1.13	88.0	12.0	0.1356
2015	7	1.13	95.0	5.0	0.0565
Residual		1.13	95.0	5.0	0.0565

NEVADA DEPARTMENT OF TAXATION

TEN YEAR LIFE

200% DECLINING BALANCE

YEAR ACQUIRED	AGE	COST INDEX	PERCENT DEPRECIATION	PERCENT GOOD	CONVERSION FACTOR
2022	0	1.00	0.0	100.0	1.0000
2021	1	1.01	20.0	80.0	0.8080
2020	2	1.03	36.0	64.0	0.6592
2019	3	1.05	49.0	51.0	0.5355
2018	4	1.08	59.0	41.0	0.4428
2017	5	1.10	67.0	33.0	0.3630
2016	6	1.13	74.0	26.0	0.2938
2015	7	1.13	79.0	21.0	0.2373
2014	8	1.14	84.0	16.0	0.1824
2013	9	1.16	90.0	10.0	0.1160
2012	10	1.17	95.0	5.0	0.0585
Residual		1.17	95.0	5.0	0.0585

NEVADA DEPARTMENT OF TAXATION

15 YEAR LIFE

200% DECLINING BALANCE

YEAR ACQUIRED	AGE	COST INDEX	PERCENT DEPRECIATION	PERCENT GOOD	CONVERSION FACTOR
2022	0	1.00	0.0	100.0	1.0000
2021	1	1.01	13.0	87.0	0.8787
2020	2	1.03	25.0	75.0	0.7725
2019	3	1.05	35.0	65.0	0.6825
2018	4	1.08	44.0	56.0	0.6048
2017	5	1.10	51.0	49.0	0.5390
2016	6	1.13	58.0	42.0	0.4746
2015	7	1.13	63.0	37.0	0.4181
2014	8	1.14	68.0	32.0	0.3648
2013	9	1.16	72.0	28.0	0.3248
2012	10	1.17	76.0	24.0	0.2808
2011	11	1.20	80.0	20.0	0.2400
2010	12	1.23	84.0	16.0	0.1968
2009	13	1.24	87.0	13.0	0.1612
2008	14	1.26	91.0	9.0	0.1134
2007	15	1.30	95.0	5.0	0.0650
Residual		1.30	95.0	5.0	0.0650

NEVADA DEPARTMENT OF TAXATION

20 YEAR LIFE

200% DECLINING BALANCE

YEAR ACQUIRED	AGE	COST INDEX	PERCENT DEPRECIATION	PERCENT GOOD	CONVERSION FACTOR
2022	0	1.00	0.0	100.0	1.0000
2021	1	1.01	10.0	90.0	0.9090
2020	2	1.03	19.0	81.0	0.8343
2019	3	1.05	27.0	73.0	0.7665
2018	4	1.08	34.0	66.0	0.7128
2017	5	1.10	41.0	59.0	0.6490
2016	6	1.13	47.0	53.0	0.5989
2015	7	1.13	52.0	48.0	0.5424
2014	8	1.14	57.0	43.0	0.4902
2013	9	1.16	61.0	39.0	0.4524
2012	10	1.17	65.0	35.0	0.4095
2011	11	1.20	69.0	31.0	0.3720
2010	12	1.23	72.0	28.0	0.3444
2009	13	1.24	75.0	25.0	0.3100
2008	14	1.26	78.0	22.0	0.2772
2007	15	1.30	80.0	20.0	0.2600
2006	16	1.34	83.0	17.0	0.2278
2005	17	1.43	86.0	14.0	0.2002
2004	18	1.47	89.0	11.0	0.1617
2003	19	1.49	92.0	8.0	0.1192
2002	20	1.50	95.0	5.0	0.0750
Residual		1.50	95.0	5.0	0.0750

NEVADA DEPARTMENT OF TAXATION

30 YEAR LIFE

200% DECLINING BALANCE

YEAR ACQUIRED	AGE	COST INDEX	PERCENT DEPRECIATION	PERCENT GOOD	CONVERSION FACTOR
2022	0	1.00	0.0	100.0	1.0000
2021	1	1.01	7.0	93.0	0.9393
2020	2	1.03	13.0	87.0	0.8961
2019	3	1.05	19.0	81.0	0.8505
2018	4	1.08	24.0	76.0	0.8208
2017	5	1.10	29.0	71.0	0.7810
2016	6	1.13	34.0	66.0	0.7458
2015	7	1.13	38.0	62.0	0.7006
2014	8	1.14	42.0	58.0	0.6612
2013	9	1.16	46.0	54.0	0.6264
2012	10	1.17	50.0	50.0	0.5850
2011	11	1.20	53.0	47.0	0.5640
2010	12	1.23	56.0	44.0	0.5412
2009	13	1.24	59.0	41.0	0.5084
2008	14	1.26	62.0	38.0	0.4788
2007	15	1.30	64.0	36.0	0.4680
2006	16	1.34	67.0	33.0	0.4422
2005	17	1.43	69.0	31.0	0.4433
2004	18	1.47	71.0	29.0	0.4263
2003	19	1.49	73.0	27.0	0.4023
2002	20	1.50	75.0	25.0	0.3750
2001	21	1.52	77.0	23.0	0.3496
2000	22	1.55	79.0	21.0	0.3255
1999	23	1.57	81.0	19.0	0.2983
1998	24	1.60	83.0	17.0	0.2720
1997	25	1.62	85.0	15.0	0.2430
1996	26	1.65	87.0	13.0	0.2145
1995	27	1.69	89.0	11.0	0.1859
1994	28	1.72	91.0	9.0	0.1548
1993	29	1.76	93.0	7.0	0.1232
1992	30	1.87	95.0	5.0	0.0935
Residual		1.87	95.0	5.0	0.0935

MOBILE HOMES SOLD ON OR AFTER JULY 1, 1982

NEVADA DEPARTMENT OF TAXATION

MOBILE HOMES SOLD ON OR AFTER JULY 1, 1982

16 YEAR STRAIGHT LINE

YEAR FIRST SOLD	AGE	COST INDEX	PERCENT DEPRECIATION	PERCENT GOOD	CONVERSION FACTOR
2022	0	1.00	0.0	100.0	1.0000
2021	1	1.04	5.0	95.0	0.9880
2020	2	1.06	10.0	90.0	0.9540
2019	3	1.11	15.0	85.0	0.9435
2018	4	1.14	20.0	80.0	0.9120
2017	5	1.15	25.0	75.0	0.8625
2016	6	1.15	30.0	70.0	0.8050
2015	7	1.15	35.0	65.0	0.7475
2014	8	1.18	40.0	60.0	0.7080
2013	9	1.21	45.0	55.0	0.6655
2012	10	1.26	50.0	50.0	0.6300
2011	11	1.30	55.0	45.0	0.5850
2010	12	1.35	60.0	40.0	0.5400
2009	13	1.40	65.0	35.0	0.4900
2008	14	1.35	70.0	30.0	0.4050
2007	15	1.37	75.0	25.0	0.3425
2006	16	1.39	80.0	20.0	0.2780
2005	17	1.47	80.0	20.0	0.2940
2004	18	1.58	80.0	20.0	0.3160
2003	19	1.62	80.0	20.0	0.3240
2002	20	1.68	80.0	20.0	0.3360
2001	21	1.69	80.0	20.0	0.3380
2000	22	1.70	80.0	20.0	0.3400
1999	23	1.70	80.0	20.0	0.3400
1998	24	1.72	80.0	20.0	0.3440
1997	25	1.73	80.0	20.0	0.3460
1996	26	1.74	80.0	20.0	0.3480
1995	27	1.84	80.0	20.0	0.3680
1994	28	1.94	80.0	20.0	0.3880
1993	29	1.96	80.0	20.0	0.3920
1992	30	1.97	80.0	20.0	0.3940
1991	31	2.02	80.0	20.0	0.4040
1990	32	2.15	80.0	20.0	0.4300
1989	33	2.16	80.0	20.0	0.4320
1988	34	2.22	80.0	20.0	0.4440
1987	35	2.29	80.0	20.0	0.4580
1986	36	2.36	80.0	20.0	0.4720
1985	37	2.45	80.0	20.0	0.4900
1984	38	2.38	80.0	20.0	0.4760
1983	39	2.38	80.0	20.0	0.4760
1982	40	2.33	80.0	20.0	0.4660
Residual		1.00	80.0	20.0	0.2000[2]

[2] For Mobile Homes Sold On or Before July 1, 1982.

B I L L B O A R D S

NEVADA DEPARTMENT OF TAXATION

BILLBOARDS

50 YEAR STRAIGHT LINE

YEAR ACQUIRED	AGE	COST INDEX	PERCENT DEPRECIATION	PERCENT GOOD	CONVERSION FACTOR
2022	0	1.00	0.0	100.0	1.0000
2021	1	1.00	1.5	98.5	0.9850
2020	2	1.04	3.0	97.0	1.0088
2019	3	1.05	4.5	95.5	1.0028
2018	4	1.07	6.0	94.0	1.0058
2017	5	1.11	7.5	92.5	1.0268
2016	6	1.13	9.0	91.0	1.0283
2015	7	1.14	10.5	89.5	1.0203
2014	8	1.15	12.0	88.0	1.0120
2013	9	1.17	13.5	86.5	1.0121
2012	10	1.20	15.0	85.0	1.0200
2011	11	1.23	16.5	83.5	1.0271
2010	12	1.26	18.0	82.0	1.0332
2009	13	1.25	19.5	80.5	1.0063
2008	14	1.27	21.0	79.0	1.0033
2007	15	1.32	22.5	77.5	1.0230
2006	16	1.37	24.0	76.0	1.0412
2005	17	1.43	25.5	74.5	1.0654
2004	18	1.51	27.0	73.0	1.1023
2003	19	1.58	28.5	71.5	1.1297
2002	20	1.61	30.0	70.0	1.1270
2001	21	1.63	31.5	68.5	1.1166
2000	22	1.65	33.0	67.0	1.1055
1999	23	1.72	34.5	65.5	1.1266
1998	24	1.74	36.0	64.0	1.1136
1997	25	1.77	37.5	62.5	1.1063
1996	26	1.79	39.0	61.0	1.0919
1995	27	1.82	40.5	59.5	1.0829
1994	28	1.87	42.0	58.0	1.0846

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BILLBOARDS

50 YEAR STRAIGHT LINE

YEAR ACQUIRED	AGE	COST INDEX	PERCENT DEPRECIATION	PERCENT GOOD	CONVERSION FACTOR
1993	29	1.97	43.5	56.5	1.1131
1992	30	2.02	45.0	55.0	1.1110
1991	31	2.07	46.5	53.5	1.1075
1990	32	2.14	48.0	52.0	1.1128
1989	33	2.21	49.5	50.5	1.1161
1988	34	2.27	51.0	49.0	1.1123
1987	35	2.32	52.5	47.5	1.1020
1986	36	2.36	54.0	46.0	1.0856
1985	37	2.43	55.5	44.5	1.0814
1984	38	2.51	57.0	43.0	1.0793
1983	39	2.61	58.5	41.5	1.0832
1982	40	2.76	60.0	40.0	1.1040
1981	41	3.00	61.5	38.5	1.1550
1980	42	3.29	63.0	37.0	1.2173
1979	43	3.61	64.5	35.5	1.2816
1978	44	3.89	66.0	34.0	1.3226
1977	45	4.25	67.5	32.5	1.3813
1976	46	4.61	69.0	31.0	1.4291
1975	47	4.98	70.5	29.5	1.4691
1974	48	5.54	72.0	28.0	1.5512
1973	49	6.03	73.5	26.5	1.5980
1972	50	6.35	75.0	25.0	1.5875
Residual		6.35	75.0	25.0	1.5875

SHORT-LIFE PROPERTY

Expected Life .....Three (3) years

Short-Life Property consists of items prone to rapid obsolescence or susceptible to breakage, loss or abnormal wear and tear. Examples include:

Linens	Uniforms
Glassware	Pots, Pans, Utensils
Barware	Motion Picture Prints
Silverware	Rental Video Tapes, DVDs, CDs

Jigs, Dies, and Molds

Patterns, jigs, dies and molds fall into this category when the type of product manufactured, industry class, use of caustic chemicals, or physical deterioration associated with production volume act to shorten their useful lives and thus require their frequent replacement. Examples include injection molds for plastic parts of high-tech devices or dies used in heavy equipment production.

Ideally, assessors should identify the industrial application and determine the actual service lives of equipment used in current production from owner declarations or surveys of average lives from individual manufacturers before classifying such property as Short-life.

Digital Cameras

Digital cameras fall into two basic categories: professional and snapshot. In recent years, consumer-grade, digital snapshot and video cameras have become a generic commodity. They offer small, flimsy LCD monitors, low image resolution, and lack advanced features like interchangeable lenses. Only snapshot cameras qualify as Short-life property.

INFORMATION SYSTEMS

Life expectancies for computers and peripherals fall into four broad categories:

PCs , tablets, and associated peripherals .....Three (3) years
Mini-computers (AS 400, VAX) .....Three (3) years
Servers ..... Five (5) years
Mainframe computers (IBM 360).....Seven (7) years

An information system consists of computers and peripheral equipment used for processing normal business transactions and the maintenance, retrieval, and analysis of business records.

A computer functions as a programmable, electronically-activated device capable of accepting information, applying prescribed processes to the information, and supplying the results of these processes with or without human intervention. It usually contains a central processing unit that provides storage, logic, arithmetic, and control capabilities. Observe that adding machines and electronic calculators do not fall into this category.

To assign appropriate expected lives to computing equipment, assessors need to recognize the differences among mainframes, servers, client computers and personal computers.

Recent advances in computing technology make differentiating mainframes, minicomputers and servers difficult, especially for laymen. When in doubt, consult manufacturer marketing divisions, service literature, or websites to determine how they classify their various product lines.

A mainframe serves as a high-performance computer used for large-scale computing environments that demand greater availability and security than smaller-scale machines can offer. Banks, government agencies, insurance companies, credit card companies, and other organizations that perform massive transaction processing typically use mainframe systems. It is also possible to obtain a server which contains many "blades," each of which is used for a single application.[2] Currently, there are blade servers that have as many as 160 blades.

Mainframes should not be confused with servers, or with a server that uses software to spin off many virtual servers, each with its own computer operating system. Servers usually cost considerably more than personal computers, have more processing power and substantial amounts of computer memory. They are therefore significantly more expensive than most personal computers and they are often kept in service longer than personal computers. Servers are often dedicated to specific tasks like

- Transaction processing (On Line Transaction or OLT servers)
- print queuing and printing (print server)
- running mission critical software, clustering, fail-over and load-balancing (application server)
- audio and video transmission (audio video server)
- exchanging short bursts of written information and opinions in an environment that offers real-time discussions (chat servers)
- sending and receiving faxes without using fax machines (fax server)
- File Transfer Protocol – moving files between computers while providing security and, organization, and transfer control (FTP server)

Historically, mainframes have been associated with centralized rather than distributed computing, although that distinction has blurred as smaller computers become more powerful and mainframes become more multi-purpose. Today, mainframes can serve both distributed users and smaller servers in computing networks. Interestingly, a mainframe actually resides within a server box.

[2] A major advantage of a blade server is that it dramatically reduces cabling requirements.

A key distinguishing feature of a mainframe is that it takes computing power away from end users and puts it in a central location. Another way to visualize a mainframe is to think of the computer as a super server, with multiple operating systems.

Here is a link to the Family Tree And Chronology of some of the older IBM Mainframes. This link will take you to the IBM page for System Z Mainframes.

By comparison, minicomputers are stand-alone computers (computer systems with attached terminals and other devices) sold to small and mid-size businesses for general business applications and to large enterprises for department-level operations. In recent years, the minicomputer has evolved into the "mid-range server" and is part of a network. IBM's AS/400e is a good example.

Peripheral equipment consists of the auxiliary machines which are designed to be placed under the control of a central processing unit. Peripheral equipment may include card readers, card punches, mass storage units, paper tape equipment, keypunches, data-entry devices, teleprinters, terminals, tape drives, disc drives, disc files, disc packs, visual image projector tubes, card sorters, plotters, collators, small inkjet printers, small laser printers, and small desktop all-in-one devices (e.g. printer/fax/scanner combination) that are sold as commodities in retail outlets and which are rapidly replaced as faster machines with new features are added.

Although one could classify computers by processor architecture, number of users supported, total system throughput, etc, ultimately the classification boils down to total system cost and the total time required to amortize the assets. Again, taxpayer records that reveal the actual service lives and disposition values of their own data processing equipment provide the best source of verifiable market data.

TAXABLE SOFTWARE (NOT ASSOCIATED WITH COMPUTER-INTEGRATED MACHINERY)

Taxable Software not associated with computer-integrated machinery..... Three (3) year life
Nevada law treats standard, prewritten software programs as tangible personal property.[3] A standard prewritten program, often called canned or off-the-shelf software, means a generic application not originally developed and produced for a specific user. This includes any programs, procedures, rules, and associated documentation pertaining to the operation of a computer system. Custom software programs consist of original, one-of-a-kind computer applications developed under contract exclusively for the particular requirements of a specific user. Custom computer programs qualify as exempt intangible personal property pursuant to NRS 361.228.

[3] **According to the IRS, "**Computer software is not a section 197 intangible even if acquired in connection with the acquisition of a business, if it meets all of the following tests.

- It is readily available for purchase by the general public.
- It is subject to a nonexclusive license.
- It has not been substantially modified.

If the software meets the tests above, it can be depreciated and may qualify for the section 179 expense deduction and the special depreciation allowance (if applicable)." http://www.irs.gov/publications/p225/ch07.html

COMPUTER-INTEGRATED MACHINERY

Expected Life: .....Seven (7) years

Computer integrated machinery, including its integrated programming or software, exhibits the following characteristics:

- The machinery and computer sell as a single unit
- The machinery cannot operate without the computer and the computer cannot perform functions outside the machinery.
- The components of the computer form an integral, structural part of the equipment itself; it is not economically or functionally feasible to replace the computer without replacing the entire machine.
- For income tax purposes, depreciation accrues to the total cost of the machine and computer as a unit.
- The capabilities of the machine cannot be expanded by substituting a more complex computer for the original.
- Embedded programming or pre-loaded software designed primarily for the function of the machine into which it is integrated runs the computer.

Examples of computer-integrated machinery include computer driven mills; computer integrated manufacturing machinery; computer integrated fabrication machinery; computerized machine lathes; and computerized assembly machinery.

COMPUTERIZED EQUIPMENT

Expected Life:

Free-standing computer system ..... Seven (7) years or
Generic personal computer .....Three (3) years
Equipment component.....NAICS industry class life

This category includes machines controlled by computers that sell as a separate unit from the machine and can perform additional functions outside the machine. The assessor should assign expected lives to the two components separately; the computer equipment has the same expected life as similar computer equipment; the machinery has the expected life assigned to its specific industry.

Examples Include:

Computerized Machine Lathes,
Computerized Assembly Machinery,
Cash Management Systems,
3-D Printers.

HIGH-TECH MEDICAL DIAGNOSTIC EQUIPMENT

Expected Life: ..... Five (5) years

High-tech medical diagnostic equipment exhibits these characteristics:

- Used in medical or dental facilities;
- Subject to accelerated functional and economic obsolescence caused by rapid technological development.

Examples include:

Cardiac Ultrasonic Scanners
CAT (Comp Tomography) Scanners
Diagnostic Ultrasounds
General Ultrasonic Scanners
MRI (Magnetic) Scanners
Nuclear Medicine Cameras
OB/GYN Ultrasonic Scanners
PET Scanners (Positron Emission)
All Portable Units of Same

HIGH-TECH ELECTRONIC MEDICAL EQUIPMENT

Expected Life:

Cardiac laser units .....Three (3) years
Other items .....Seven (7) years

High-tech electronic medical equipment exhibits these characteristics:

- Used in medical or dental facilities;
- Subject to accelerated functional and economic obsolescence caused by rapid technological development.

Examples include patient monitors of all kinds:

Anesthesia Monitors, Machines and Devices
Apnea Monitors
Blood Pressure Monitors
Chart Recorders
Defibs
Dopplers
EEG Machines
EKG Machines
External Pace Makers
Heart Rate Devices
Medical Laser Units
Neurological Monitors
Oximeters
Oxygen Analyzers
Spirometers
Systolic Monitors
Temperature Monitors

OFFICE FURNITURE, RETAIL SALES EQUIPMENT, OTHER

This category includes furniture and equipment that can be found across industries.

Description	Life in Years
Air Conditioners	15
Air Conditioners, Window	7
Cash Registers (electronic)	7
Coin-wrap Equipment	15
Copy and Duplicating Machines	5
Cabinets and Shelving	15
Check-out Counters	15
Data Processing Equipment (See Also Information Systems)	7
Décor	15
Displays, Cases, and Racks	15
Mailing Machines	7
Office Furniture (Desks, Chairs, Filing Cabinets)	15
Office Kitchen Appliances (Microwave ovens, refrigerators)	15
POS – Point-of-Sale Computer Systems[4]	7
Signs[5] (Other than billboards and electronic)	15
Signs, Electronic	7
Sound Systems (background and public address)	7

MOBILE OR MANUFACTURED HOMES

This section applies only to mobile or manufactured homes classified as personal property. Pursuant to NRS 361.561, those units identified as a "travel trailer," "utility trailer" and "van conversion," in chapter 482 of NRS and any other vehicle required to be registered with the department of motor vehicles and public safety are subject to property tax unless registered and taxed pursuant to Chapter 371 of NRS. Such unregistered units and vehicles must be taxed in the manner provided in NRS 361.562 to 361.5644, inclusive.

The sticker issued pursuant to NRS 361.5643 must be affixed to a mobile or manufactured home in such a way that the sticker is clearly visible from the street. The window decal is not required for licensed mobile units or on units considered real property and may be issued at the option of the county assessor.

[4] Point-of-Sale systems include all peripherals and handheld devices used to take electronic payments or to collect related data with the exception of smartphones, tablets and POS tablets. Smartphones, tablets and POS tablets should be given a three year life.

[5] See Appendix F to determine whether signs are real or personal property. Personal property signs include vinyl and fabric banners and sign-waving mannequins.

NRS 361.325(3) segregates mobile homes into two different categories for assessment purposes based on age. Mobile homes sold on or after July 1, 1982 shall be classified according to those factors which most closely determine their useful lives. In establishing the value of other mobile homes, the commission shall begin with the retail selling price and depreciate it by 5 percent per year, but not below 20 percent of its original amount. The assessment ratio in all cases is 35 percent of the computed taxable values. See NAC 361.130 for additional information on the calculation of value for mobile homes.

Depreciation schedules and cost conversion factors apply to the 2020-21 secured and unsecured tax rolls. The 2020-21 Cost Conversion Index for Mobile or Manufactured Homes appears on page 8 of this Manual.

BILLBOARDS

NRS 361.013 defines a billboard as ". . . a sign that directs attention to a business, commodity, service, entertainment or attraction that is sold, offered or exists at a location other than the premises on which the sign is located."

NRS 361.227 requires that depreciation of a billboard must be calculated at 1.5 percent of the cost of replacement for each year after the year of acquisition of the billboard, up to a maximum of 50 years. Additional information on the calculation of billboards may be found in NAC 361.1305.

Depreciation schedules and cost conversion factors apply to the 2020-2021 secured and unsecured tax rolls. The 2020-21 Cost Conversion Index for Billboards may be found on page 9 of this manual.

NAICS Industry Code	Description	Life in Years

11 AGRICULTURE AND FORESTRY

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

111 Crop Production 15

Personal property includes machinery and equipment such as tractors, combines, hay balers, forage harvesters, unlicensed farm vehicles including utility trailers, wagons and utensils used to grow crops mainly for food and fiber. The subsection comprises establishments, such as farms, orchards, groves, greenhouses, and nurseries, primarily engaged in growing crops, plants, vines, or trees (including Christmas trees) and their seeds.

Itemized Equipment

Fertilizer Distribution 10
Laser sending and receiving equipment 10
Seed cleaning machinery and equipment 20
Seed cleaning equipment – portable 10

112 Animal Production 15

Personal property includes machinery and equipment used to raise or fatten animals for the sale of animals or animal products. The subsection comprises establishments, such as ranches, farms, and feedlots primarily engaged in keeping, grazing, breeding, or feeding animals. These animals are kept for the products they produce or for eventual sale.

Itemized Equipment

1125 Animal Aquaculture, including nets and pens 7
11212 Dairy Production 15
1123 Egg Packing Equipment 20

113 Forestry and Logging 15

Personal property includes machinery and equipment used to: (1) cut timber; (2) cut and transport timber; and (3) produce wood chips in the field, including stationary saw mills, skidders, and log loaders.

Itemized Equipment

Chain saws 7
Portable saw mill 7

21 MINING

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

2111 Oil and Gas Extraction 20

Personal property used in oil and gas extraction are used to explore for crude petroleum and natural gas. A typical example of personal property in this category would include inventory and spare parts.

Itemized Equipment

Bolted and fiberglass tanks 15
Drilling rigs 15
Heaters, treaters, knockout dryer, separators, conditioning equipment 15
LACT units, metering devices, manifolds 15
Motors, engines, drive units 10
Secondary recovery (injection pumps, re-pressure equipment) 15
Transformers 30

2122 Metal Ore Mining 15

Personal property used in developing the mine site, mining or quarrying dimension stone. A typical example of personal property in this category would include inventory and spare parts.

Itemized Equipment

Oxygen generation 20
Mobile equipment, heavy use* 7

2123 Nonmetallic mineral mining and quarrying 15

Personal property used in developing the mine site, mining or quarrying dimension stone. A typical example of personal property in this category would include inventory and spare parts.

* Heavy use is defined as in operation for more than one shift per day, seven days a week. Mining mobile equipment eligible for this category includes haul packs, loaders, shovels, dozers, graders, backhoes, drilling trucks, and excavators.

22 UTILITIES

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

2211 Electric Power Generation, Transmission, and Distribution 30

Personal property used in generating, transmitting, and/or distributing electric power. A typical example of personal property in this category would include inventory and spare parts.

2212 Natural Gas Distribution 30

Personal property used in (1) operating gas distribution systems (e.g., mains, meters); (2) establishments known as gas marketers that buy gas from the well and sell it to a distribution system; (3) establishments known as gas brokers or agents that arrange the sale of gas over gas distribution systems operated by others; and (4) establishments primarily engaged in transmitting and distributing gas to final consumers. A typical example of personal property in this category would include inventory and spare parts.

2213 Water, Sewage, and Other Systems 30

Personal property used in establishments primarily engaged in operating water treatment plants and/or operating water supply systems. A typical example of personal property in this category would include inventory and spare parts.

221330 Steam and Air-Conditioning Supply 30

Personal property used in providing steam, heated air, or cooled air. A typical example of personal property in this category would include inventory and spare parts.

23 CONSTRUCTION

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

236 Construction of Buildings 15

237 Heavy and civil engineering construction 15

238 Specialty Trade construction 15

Personal property used primarily in the construction of buildings, major engineering projects such as highways and dams, and specialty trades such as pouring concrete, site preparation, plumbing, painting, and electrical work. Includes fixed load and mobile equipment such as:

Air compressors

Motor graders/leveling graders

238 Specialty Trade construction Cont.

Air drills
Asphalt plants
Asphalt spreaders
Backhoe/loaders
Carryalls
Cement mixers/spreaders
Crusher/crushing plant
Roadrollers/sheepsfoot rollers
Crawler cranes/ tractors
Ditchers/diggers
Earthmoving scrapers
Excavators
Fork lifts
Front end loaders / bucket loaders
Mixmobiles
Paving equipment
Portable shop
Portable storage bins
Portable storage tanks
Power hoists
Power shovels
Sand classifiers and drags
Scarifiers and rollers
Scrap metal balers
Scrubber screens and plant feeders
Welder
Wiring Equipment

Other Itemized Equipment

Cranes

Bridge 20
Jib 20
Mobile Telescopic 10
Electric generating equipment 20
Electronic controlled infrared/laser instruments 10
Power tools (saws, drills, etc.) 7
Hand tools 7
Mobile equipment, heavy use[6] 7

[6] Heavy use is defined as in operation for more than one shift per day, seven days a week

31 MANUFACTURING

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

311 Food 15

Personal property used in this industry transform livestock and agricultural products into products for intermediate or final consumption. The food products manufactured in these establishments are typically sold to wholesalers or retailers for distribution to consumers, but establishments primarily engaged in retailing bakery and candy products made on the premises not for immediate consumption are included. Includes equipment such as walk-in coolers, freezers and other refrigeration, grain tanks, bottling and canning equipment in the following industries:

3111	Animal food manufacturing
3112	Grain and oil seed milling
3113	Sugar and confectionery product manufacturing
3114	Fruit and vegetable preserving and specialty food manufacturing
31141	Frozen food manufacturing
31142	Fruit and vegetable canning
3115	Dairy product manufacturing
3116	Animal slaughtering and processing
3117	Seafood product preparation and packaging
3118	Bakeries and tortilla manufacturing
311811	Retail bakeries
311812	Commercial bakeries
3119	Other food manufacturing, such as honey processing

Itemized Equipment

Cereal manufacturing 20

Grain elevators, non-farm 20

Mechanical portion of packing and sorting line equipment 2nd view 30

Electronic portion of line equipment[7] 10

312 Beverage and Tobacco Product Manufacturing 15

Personal property used to manufacture beverages and tobacco products. Please note that ice manufacturing, while not a beverage, is included with nonalcoholic beverage manufacturing because it uses the same production process as water purification.

[7] If electronic component's original cost cannot be separated from other line assets, use 20 years.

312 **Beverage and Tobacco Product Manufacturing Cont.**

Manufacturing processes include:

31211 Soft drink manufacturing

31212 Breweries

31213 Wineries

31214 Distilleries

Itemized Equipment

Cold Storage and Ice-making equipment 20

313 **Textile Mills** **15**

Personal property used in the main processes in this industry which include preparation and spinning of fiber, knitting or weaving of fabric, and the finishing of the textile.

314 **Textile Product** **15**

Personal property used in creation of textile products. With a few exceptions, processes used in this industry are generally cut and sew (i.e., purchasing fabric and cutting and sewing to make non-apparel textile products, such as sheets and towels).

315 **Apparel Manufacturing** **15**

Personal property used in the Apparel Manufacturing industry. This industry includes a diverse range of establishments manufacturing full lines of ready-to-wear apparel and custom apparel: apparel contractors, performing cutting or sewing operations on materials owned by others; jobbers performing entrepreneurial functions involved in apparel manufacture; and tailors, manufacturing custom garments for individual clients.

316 **Leather and Allied Product Manufacturing** **15**

Personal property used to transform hides into leather by tanning or curing and fabricating the leather into products for final consumption. It also includes the manufacture of similar products from other materials, including products (except apparel) made from "leather substitutes," such as rubber, plastics, or textiles It includes dyeing or dressing furs.

321 **Wood Product Manufacturing** **15**

The production processes of the Wood Product Manufacturing sub sector include sawing, planing, shaping, laminating, and assembling of wood products starting from logs that are cut into bolts, or lumber that then may be further cut, or shaped by lathes or other shaping tools. The lumber or other transformed wood shapes may also be subsequently planed or smoothed, and assembled into finished products, such as wood containers.

322 Paper Manufacturing 15

3221 Pulp, paper and paperboards mills 15

Personal property used in the manufacturing of pulp and involves separating the cellulose fibers from other impurities in wood or used paper. The manufacturing of paper involves matting these fibers into a sheet.

3222 Converted Paper Product Manufacturing 15

Personal property used in the manufacture of paperboard containers including corrugating, cutting, and shaping machinery to form paperboard into containers. Paper bag and coated and treated paper manufacturing establishments cut and coat paper and foil. Stationery product manufacturing establishments make a variety of paper products used for writing, filing, and similar applications. Other converted paper product manufacturing includes, in particular, the conversion of sanitary paper stock into such things as tissue paper and disposable diapers.

323 Printing and related support activities 15

Personal property including presses, used to transfer an image from a plate, screen, film, or computer file to some medium, such as paper, plastics, metal, textile articles, or wood. The most prominent of these methods is to transfer the image from a plate or screen to the medium (lithographic, gravure, screen, and flexographic printing). When publishing and printing are done in the same establishment, the establishment is classified under Industry Code 51, Information.

Itemized Equipment

Digital or *non-impact printing equipment* 5

(Uses a computer file to directly "drive" the printing mechanism to create the image)

Blue Print Machines 15

Blue Print Machines – small table model 7

3-D Printers 7

324 Petroleum and Coal Products Manufacturing 20

Personal property used to transform crude petroleum and coal into usable products. The dominant process is petroleum refining that involves the separation of crude petroleum into component products through such techniques as cracking and distillation. Products such as asphalt coatings and petroleum lubricating oils are made.

325 **Chemical Manufacturing** 15

3251 **Basic Chemical Manufacturing** 15

Personal property used in both basic chemical processes, such as thermal cracking and distillation, and in petrochemical processes, such as (1) manufacturing acyclic (i.e., aliphatic) hydrocarbons such as ethylene, propylene, and butylenes made from refined petroleum or liquid hydrocarbon and/or (2) manufacturing cyclic aromatic hydrocarbons such as benzene, toluene, styrene, xylene, ethyl benzene, and cumene made from refined petroleum or liquid hydrocarbons.

3254 **Pharmaceutical and Medicine Manufacturing** 15

Personal property used in one or more of the following: (1) manufacturing biological and medicinal products; (2) processing (i.e., grading, grinding, and milling) botanical drugs and herbs; (3) isolating active medicinal principals from botanical drugs and herbs; and (4) manufacturing pharmaceutical products intended for internal and external consumption in such forms as ampoules, tablets, capsules, vials, ointments, powders, solutions, and suspensions.

3255 **Paint, Coating, and Adhesive Manufacturing** 15

Personal property used to (1) mix pigments, solvents, and binders into paints and other coatings, such as stains, varnishes, lacquers, enamels, shellacs, and water repellant coatings for concrete and masonry, and/or (2) manufacture allied paint products, such as putties, paint and varnish removers, paint brush cleaners, and frit.

326 **Plastics and Rubber Products** 15

3261 **Plastics Product Manufacturing** 15

Personal property used in processing new or spent (i.e., recycled) plastics resins into intermediate or final products, using such processes as compression molding; extrusion molding; injection molding; blow molding; and casting.

Itemized Equipment

Special tools 7

3262 **Rubber Product Manufacturing** 15

Personal property used in the industry group comprised of establishments primarily engaged in processing natural, and synthetic or reclaimed rubber materials into intermediate or final products using processes such as vulcanizing, cementing, molding, extruding, and lathe-cutting.

Itemized Equipment

Special tools 7

327 Nonmetallic Mineral Product..... 20

Personal property used to transform mined or quarried nonmetallic minerals, such as sand, gravel, stone, clay, and refractory materials, into products for intermediate or final consumption. Processes used include grinding, mixing, cutting, shaping, and honing.

3271 Clay Product and Refractory Manufacturing 15

Personal property used in shaping, molding, glazing, and firing pottery, ceramics, and plumbing fixtures made entirely or partly of clay or other ceramic materials.

3272 Glass and Glass Product Manufacturing..... 15

Personal property used in manufacturing glass and/or glass products. Establishments in this industry may manufacture glass and/or glass products by melting silica sand or cullet, or purchasing glass.

Itemized Equipment

Special tools 5

3273 Cement and Concrete Product Manufacturing 20

Personal property used in manufacturing Portland, natural, masonry, pozzalanic, and other hydraulic cements

Itemized Equipment

Quarry equipment{XE "quarry equipment} (Yahoo search)..... 15

Portable ready-mix plants 15

3274 Lime & Gypsum Product Manufacturing 20

Personal property used in manufacturing lime from calcitic limestone, dolomitic limestone, or other calcareous materials, such as coral, chalk, and shells. Lime manufacturing establishments may mine, quarry, collect, or purchase the sources of calcium carbonate.

3279 Abrasive Product Manufacturing..... 20

Personal property used in manufacturing abrasive grinding wheels of natural or synthetic materials, abrasive-coated products, and other abrasive products.

327991 Cut Stone and Stone Product Manufacturing..... 15

Personal property used in cutting, shaping, and finishing granite, marble, limestone, slate, and other stone for building and miscellaneous uses. Stone product manufacturing establishments may mine, quarry, or purchase stone.

331 Primary Metal Manufacturing..... 20

Personal property used to smelt and/or refine ferrous and nonferrous metals from ore, pig or scrap, using electrometallurgical and other process metallurgical techniques. Metal alloys and super alloys are also manufactured by introducing other chemical elements to pure metals. The output of smelting and refining, usually in ingot form, is used in rolling,

drawing, and extruding operations to make sheet, strip, bar, rod, or wire, and in molten form to make castings and other basic metal products.

Includes:

3311 Iron and Steel Mills and Ferroalloy Manufacturing

Itemized Equipment

Special Tools 7

332 Fabricated Metal Product Manufacturing 15

Personal property is used to transform metal into intermediate or end products, other than machinery, computers and electronics, and metal furniture or treating metals and metal formed products fabricated elsewhere. Important fabricated metal processes are forging, stamping, bending, forming, and machining, used to shape individual pieces of metal; and other processes, such as welding and assembling, used to join separate parts together.

Itemized Equipment

Special Tools 5

333 Machinery Manufacturing 15

Personal property used to create end products that apply mechanical force, for example, the application of gears and levers, to perform work. Some important processes for the manufacture of machinery are forging, stamping, bending, forming, and machining that are used to shape individual pieces of metal. Processes, such as welding and assembling are used to join separate parts together. Although these processes are similar to those used in metal fabricating establishments, machinery manufacturing is different because it typically employs multiple metal forming processes in manufacturing the various parts of the machine.

333314 Optical Instrument and Lens Manufacturing 15

Personal property used in: (1) manufacturing optical instruments and lens, such as binoculars, microscopes (except electron, proton), telescopes, prisms, and lenses (except ophthalmic); (2) coating or polishing lenses (except ophthalmic); and (3) mounting lenses (except ophthalmic).

334 Computer and Electronic Product Manufacturing 7

Personal property used in the manufacture of computers, computer peripherals, communications equipment, and similar electronic products and components. The design and use of integrated circuits and the application of highly specialized miniaturization technologies are common elements in the production technologies of the computer and electronic industry.

3341 Computer and Peripheral Equipment Manufacturing 7

Personal property used in manufacturing and/or assembling electronic computers, such as mainframes, personal computers, workstations, laptops, and computer servers; and computer peripheral equipment, such as storage devices, printers, monitors, input/output devices and terminals.

Personal property used in manufacturing wire telephone and data communications equipment. These products may be standalone or board-level components of a larger system. Examples of products made by these establishments are central office switching equipment, cordless telephones (except cellular), PBX equipment, telephones, telephone answering machines, LAN modems, multi-user modems, and other data communications equipment, such as bridges, hubs, routers, and gateways.

3343 Audio and Video Equipment Manufacturing 10

Personal property used in manufacturing electronic audio and video equipment for home entertainment, motor vehicle, public address and musical instrument amplifications. Examples of products made include video cassette recorders, televisions, stereo equipment, speaker systems, household-type video cameras, jukeboxes, and amplifiers for musical instruments and public address systems.

3344 Semiconductor and Other Electronic Components 5

Personal property used in manufacturing semiconductors and other components for electronic applications. Examples of products made by these establishments are capacitors, resistors, microprocessors, bare and loaded printed circuit boards, electron tubes, electronic connectors, and computer modems.

Includes:

clean room equipment, crystal growing equipment, deionized water systems, encapsulation equipment, photo mask and wafer manufacturing equipment, semiconductor chemical and gas systems, semiconductor electrical systems, and semiconductor test equipment.

3345 Navigation, Measuring, Medical, Control Instrument Manufacturing 7

Personal property used in manufacturing navigational, measuring, electro medical, and control instruments. Examples of products made by these establishments are aeronautical instruments, appliance regulators and controls (except switches), laboratory analytical instruments, navigation and guidance systems, and physical properties testing equipment.

335 Electrical Equipment, Appliance, and Component Manufacturing 15

Personal property used to manufacture products that generate, distribute and use electrical power, such as electric lamp bulbs, lighting fixtures, small and major electrical appliances,

electric motors, generators, transformers, switchgear apparatus, devices for storing electrical power (e.g., batteries), for transmitting electricity (e.g., insulated wire), and wiring devices (e.g., electrical outlets, fuse boxes, and light switches).

336 Transportation Equipment Manufacturing 15

Personal property used in production processes similar to those of other machinery manufacturing establishments - bending, forming, welding, machining, and assembling metal or plastic parts into components and finished products.

The section includes:

3361 Motor Vehicle Manufacturing

3362 Motor Vehicle Body & Trailer Manufacturing

3363 Motor Vehicle Parts Manufacturing

3365 Railroad Rolling Stock Manufacturing

3364 Aerospace Product and Parts Manufacturing..... 15

Personal property used in one or more of the following: (1) manufacturing complete aircraft, missiles, or space vehicles; (2) manufacturing aerospace engines, propulsion units, auxiliary equipment or parts; (3) developing and making prototypes of aerospace products; (4) aircraft conversion (i.e., major modifications to systems); and (5) complete aircraft or propulsion systems overhaul and rebuilding (i.e., periodic restoration of aircraft to original design specifications).

This section includes:

336412 Aircraft Engine and Engine Parts Manufacturing

337 Furniture and Related Product Manufacturing 10

Personal property used to make furniture and related articles, such as mattresses, window blinds, cabinets, and fixtures. The processes used in the manufacture of furniture include the cutting, bending, molding, laminating, and assembly of such materials as wood, metal, glass, plastics, and rattan.

339 Miscellaneous Manufacturing..... 15

Personal property used in the manufacture of products as diverse as medical equipment and supplies, jewelry, sporting goods, toys, and office supplies.

33991 Jewelry and Silverware Manufacturing 15

Personal property used in: (1) manufacturing, engraving, chasing, or etching jewelry; (2) manufacturing metal personal goods (i.e., small articles carried on or about the person, such as compacts or cigarette cases); (3) manufacturing, engraving, chasing, or etching precious metal solid, precious metal clad, or pewter cutlery and flatware; (4) manufacturing, engraving, chasing, or etching personal metal goods (i.e., small articles carried on or about the person, such

as compacts or cigarette cases); (5) stamping coins; (6) manufacturing unassembled jewelry parts and stock shop products, such as sheet, wire, and tubing; (7) cutting, slabbing, tumbling, carving, engraving, polishing, or faceting precious or semiprecious stones and gems; (8) re-cutting, re-polishing, and setting gem stones; and (9) drilling, sawing, and peeling cultured and costume pearls.

42 WHOLESALE TRADE

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

423 Wholesale Trade Fixtures and Equipment 15

Trade fixtures (as opposed to fixtures) and equipment are used in establishments engaged in wholesaling merchandise, generally without transformation, and rendering services incidental to the sale of merchandise. Wholesalers sell merchandise to other businesses and normally operate from a warehouse or office. See also separate listings for specific types of equipment.

423440 Other Commercial Equipment Merchant Wholesalers (lockers (except refrigerated) merchant wholesalers) Example: Product Delivery Lockers retail and e-commerce

423740, Refrigeration Equipment and Supplies Merchant Wholesalers (lockers, refrigerated, merchant wholesalers) Example: Product Delivery Lockers retail and e-commerce

44 RETAIL TRADE

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

Includes the personal property for the following:

441 Motor Vehicle and Parts Dealers 15
442 Furniture and Home Furnishing Stores 15
443 Electronics and Appliance Stores 15
444 Building Material and Garden Equipment and Supply Stores 15
445 Food and Beverage Stores (including Convenience Stores) 15
446 Health and Personal Care Stores 15
447 Gasoline Stations 15
448 Clothing and Clothing Accessories Stores 15

451 **Sporting Goods, Hobby, Book, and Music Stores** 15
452 **General Merchandise Stores** 15
453 **Miscellaneous Store Retailers, including** 15
4531 Florists 15
454 **Non-store Retailers** 15
See also separate listings for specific types of equipment.

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

481 Air Transportation 20

Personal property includes most airplanes; helicopters (rotorcraft); drones weighing over 50 pounds; and aircraft, all of which have a life of 20 years. There are some exceptions, which are itemized below.

Itemized Equipment

Kit built Aircraft 15
Gliders 15
Hot Air Balloons 15
Experimental Aircraft..... 15
Drones weighing 50 pounds or less..... 10

482 Rail Transportation..... 20

482112 Short Line Railroads

Itemized Equipment

Railroad Rolling Stock 20

483 Water Transportation 20

Personal property used in providing inland water transportation of passengers and/or cargo on lakes, rivers, or intracoastal waterways.

484 Truck Transportation 10

Itemized Equipment

Light Trucks 7
General freight Trucks 10
Tractor-trailers 10

485 Transit and Ground Passenger Transportation…….. 10

Personal property includes equipment used in Transit and Ground Passenger Transportation. This industry includes a variety of passenger transportation activities, such as urban transit systems; chartered bus, school bus, and interurban bus transportation and taxis.

Itemized Equipment

Buses..... 15

Automobiles, unlicensed..... 7

492 Couriers and Messengers 15

Personal property used in the provision of intercity and/or local delivery of parcels. These articles can be described as those that may be handled by one person without using special equipment. Messengers, which usually deliver within a metropolitan or single urban area, may use bicycle, foot, small truck, or van.

493 Warehousing and Storage..... 15

Personal property used in operating warehousing and storage{XE "storage:} facilities for general merchandise, refrigerated goods, and other warehouse products. These establishments provide facilities to store goods. They do not sell the goods they handle.

51 INFORMATION

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

511 Publishing Industries 15

Personal property used in the publishing of newspapers, magazines, other periodicals, and books, as well as directory and mailing list and software publishing.

512 Motion Picture Production & Sound Recording 7

Personal property used in the production and/or distribution of motion pictures, videos, television programs, or commercials; in the exhibition of motion pictures; or in the provision of postproduction and related services. Sound recording machinery and equipment is used in producing and distributing musical recordings, in publishing music, or in providing sound recording and related services.

512131 Motion Picture Theaters 15

Includes projection equipment, furniture and trade fixtures.

515 Broadcasting and Telecommunications ..... See Categories

51511 Radio Broadcasting..... 10

Personal property used in broadcasting audio signals. These establishments operate radio broadcasting studios and facilities for the transmission of aural programming by radio to the public, to affiliates, or to subscribers. In recognition of the FCC change from analog to

digital broadcasting equipment in radio, television, and cable industries, all analog equipment MAY be valued using a seven-year life. All other equipment will remain at the life indicated. The assessor will still be responsible for measuring obsolescence if any.

51511 Radio Broadcasting Cont.

Itemized Equipment

Radio Production Equipment 7

Service and Repair Equipment 10

51512 Television Broadcasting 10

Personal property used in broadcasting images together with sound. These establishments operate television broadcasting studios and facilities for the programming and transmission of programs to the public. In recognition of the FCC mandated change from analog to digital broadcasting equipment in radio, television, and cable industries, all analog equipment MAY be valued using a three-year life. All other equipment will remain at the life indicated. The assessor will still be responsible for measuring obsolescence if any.

Itemized Equipment

Television Production Equipment 7

Service and Repair Equipment 10

517 Telecommunications ..... See itemized equipment

Wired telecommunications personal property used in (1) operating and maintaining switching and transmission facilities to provide point-to-point communications via landlines, microwave, or a combination of landlines and satellite linkups or (2) furnishing telegraph and other non-vocal communications using their own facilities. Wireless telecommunications assets are used in operating and maintaining switching and transmission facilities that provide omni-directional communications via airwaves, such as cellular telephone or paging services. For handheld devices used to take electronic payments, see Point-of-Sale descriptions.

Itemized Equipment

Central Office Equipment, except computer-based switching equipment 15

Computer-based switching equipment 5

Distribution Plant (if personal property) 30

Fiber optic cable 15

Paging Systems 5

Microwave Systems, except towers 10

Station Equipment 10

Telephone equipment, including, telex, facsimile and Two-Way Radio 5
Cellular Telephones, Smartphones, Hand-helds, Tablets and POS Tablets, and PDAs..... 3

517110 Cable and Other Program Distribution..... See itemized equipment

Personal property used in distribution systems for broadcast programming. Head end assets are defined as the electronic control center -- generally located at the antenna site of a CATV system -- usually including antennas, preamplifiers, frequency converters, demodulators, modulators and other related equipment which amplify, filter and convert incoming broadcast TV signals to cable system channels. Microwave systems include assets such as antennas, transmitting and receiving equipment, and broad band microwave assets. Program origination equipment includes assets such as cameras, film chains, video tape recorders, lighting, and remote location equipment excluding vehicles. Service and test assets include oscilloscopes, field strength meters, spectrum analyzers, and cable testing equipment. Subscriber connection and distribution systems include assets such as trunk and feeder cable, connecting hardware, amplifiers, power equipment, passive devices, directional taps, pedestals, pressure taps, drop cables, matching transformers, multiple set connector equipment, and converters. In recognition of the FCC mandated change from analog to digital broadcasting equipment in radio, television, and cable industries all analog equipment MAY be valued using a seven-year life. All other equipment will remain at the life indicated. The assessor will still be responsible for measuring obsolescence if any.

Itemized Equipment

Coaxial Cable, installed inside buildings..... 15
Fiber Optic Cable..... 15
Head end Equipment, except towers..... 10
Microwave Systems, except towers..... 10
Program Origination Equipment..... 10
Satellite Dish Relay; Earth station equipment..... 10
Box converters having specialized computer components 3
Service and Test Equipment..... 10
Subscriber Connection and Distribution Systems..... 10

518 Internet Service Providers, Web Search Portals, and Data Processing Services

For life expectancy, please see Special Properties

Personal property assets used by Internet Service Providers, Web Search Portals, and Data Processing Services to provide: (1) access to the Internet; (2) search facilities for the Internet; and (3) data processing, hosting, and related services.

519 Other Information Services 15

Personal property assets used in supplying information, storing information, providing access to information, and searching and retrieving information. The main components of this group are news syndicates, libraries, and archives. It includes law and medical libraries.

53 REAL ESTATE, RENTAL, AND LEASING

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

532 Rental and Leasing Services 15

Personal property includes a wide array of tangible goods, such as automobiles, computers, consumer goods, and industrial machinery and equipment, to customers in return for a periodic rental or lease payment.

Itemized Equipment

Formal wear and costume rental 3
Bottled water Dispensers & Equipment 7
Furniture Rental & Leasing 7
Heavy equipment ..... See Construction (Code 23)
Lawn and Garden equipment 7
Linens and Uniforms 3
Musical Instrument rentals 7
Rent-to-Own Merchandise 7
Ski Equipment Rentals 7
Video Tapes ..... See Special Properties

See also separate listings for specific types of equipment.

54 PROFESSIONAL, SCIENTIFIC, AND TECHNICAL SERVICES

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

- See itemized equipment

Itemized Equipment

Laboratory equipment , except electronic & computerized 15
Laboratory equipment, electronic and computerized 7
Medical and law libraries (See also other information services)..... 15
Photography 15

54 PROFESSIONAL, SCIENTIFIC, AND TECHNICAL SERVICES CONT

Professional and scientific equipment (See also NAICS Code 3345) 7
Professional libraries..... 15

Surveying equipment

GPS 7
Non-GPS 15

56 WASTE MANAGEMENT AND REMEDIATION SERVICES

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

5616 Investigation and Security Services 15

Personal property includes burglar and fire alarms and locking devices, along with equipment necessary for installation, repair, or monitoring services or (2) remote monitoring of electronic security alarm systems.

Itemized Equipment

Closed Circuit TV – Camera System 7
Firearms 20

Locksmith equipment, including:

Mechanical and electronic locking devices 20
Safes and security vaults..... 20

5617 Services to Buildings and Dwellings 15

Includes the fixtures and equipment for the following:

56171 Exterminating and Pest Control Services
56172 Janitorial Services
56173 Landscaping Services
56174 Carpet and Upholstery Cleaning Services

Itemized Equipment

Carpet Cleaning 15

Lawn mowing Equipment 7

562 Waste Management and Remediation Services 10

Personal property used in the collection, treatment, and disposal of waste materials. This includes establishments engaged in local hauling of waste materials; operating materials recovery facilities (i.e., those that sort recyclable materials from the trash stream); providing remediation services (i.e., those that provide for the cleanup of contaminated buildings, mine sites, soil, or ground water); and providing septic pumping and other miscellaneous waste management services.

Itemized Equipment

Garbage Dumpsters..... 10

Portable toilets..... 10

62 HEALTH CARE AND SOCIAL ASSISTANCE

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

621 Ambulatory Health Care Services 15

Personal property used by health practitioners in the provision of outpatient services, with the facilities and equipment not usually being the most significant part of the production process. Includes the fixtures and equipment for the following:

6211 Offices of Physicians

6212 Offices of Dentists

6213 Offices of Other Health Practitioners, including Chiropractors, Optometrists, Mental Health Practitioners, and Physical, Occupational, and Speech Therapists

Medical and dental instruments not otherwise noted in Special Properties, include:

All Portable Units of Same

Angiographic X-ray units

Chest X-ray Units

Dental X-ray Units

Exam tables and chairs

Fluorographic X-ray Units

Lensometer

Mammographic X-ray Units

Mesoptometers

Microscopes

Portable X-ray Units

Radiographic X-ray Units

Special Procedure X-ray Units

Sterilizers

622 Hospitals 15

Personal property used to provide inpatient health services, particularly specialized facilities and equipment that form a significant and integral part of the production process. See list above for examples of equipment.

See also Special Properties for Medical Diagnostic and Medical Lab.

6244 Child Day Care Facilities 10

Personal property used in providing day care of infants or children.

71 ARTS, ENTERTAINMENT, AND RECREATION

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

711 Performing Arts, Spectator Sports, and Related 10

Includes projection equipment, furniture and trade fixtures such as movable set props, aerial and acrobatic equipment, rigging, costumes, production lighting, and special effects equipment.

Itemized Equipment

Electronic Equipment including Sound Systems 7

Seating, stages including fixed set designs, hydraulics, fountains 15

Support operations, including equipment and furniture for dressing rooms, ticket booths, snack bars, offices ..... 15[8]

Water tanks..... 20[9]

711212 Car racing – race cars 3

713 Amusement, Gambling and Recreation Industries 15

Personal property used to (1) operate facilities where patrons can primarily engage in sports, recreation, amusement, or gambling activities and/or (2) provide other amusement and recreation services, such as supplying and servicing amusement devices in places of business operated by others; operating sports teams, clubs, or leagues engaged in playing games for recreational purposes; and guiding tours without using transportation equipment.

Itemized Equipment

Amusement Park (does not include structures) 15

[8] May be considered to be real property fixtures. The cost may be established from Marshall/Swift.
[9] May be considered to be real property fixtures. The cost may be established from Marshall/Swift.

Bowling Alley Pinsetters and Other Equipment 15
Bowling Electronic Scoring Machines 7

Gaming Equipment:
Electronic, slots, or computers 7

Gaming Equipment Cont.:

Player tracking systems 7
Mechanical slots 15
Other 15
Golf Carts, electric 7
Golf Course Machinery & Equipment, except lawn mowing equipment 15
Golf Course: Lawn Mowing Equipment 7
Juke Box 15
Ski Area Equipment: Snow Cats and Packers 7
Ski Rentals 7
Video and Flipper Games 7

72 ACCOMMODATION AND FOOD SERVICES

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

721 Accommodation 15

Personal property used in: (1) traveler accommodation, (2) recreational accommodation, and (3) rooming and boarding houses.

Itemized Equipment

Apartment Furnishings 15
Hotel Furnishings 15
Outdoor Patio Furnishings 7
Fire and Security Equipment 15
Health Spa Equipment: Manual 15
Health Spa Equipment: Electronic 7
Heavy use Washers 7
Linens, glassware, silverware, and uniforms (not rented) 3
Televisions 5
Telephone Systems (See also NAICS Code 517) 5

722 Food Services and Drinking Places 15

The industry groups are full-service restaurants; limited-service eating places; special food services, such as food service contractors, caterers, and mobile food services; and drinking places.

722 Food Services and Drinking Places Cont.

Itemized Equipment

Bar 15
Coffee Brewing Equipment 15
Walk-in coolers (See Also NAICS 311) 15
Linens, glassware, silverware, and uniforms (not rented) 3
Televisions, Digital 5
Televisions, Analog 5
Vending Machines 15

81 OTHER SERVICES 15

For the purposes of this manual, the following descriptions apply only to those items which can be classified as Personal Property. The designated life does not apply to Real Property or fixtures which have been converted to Real Property.

Establishments in this sector are primarily engaged in activities, such as equipment and machinery repairing, promoting or administering religious activities, grant making, advocacy, and providing dry cleaning and laundry services, personal care services, death care services, pet care services, photofinishing services, temporary parking services, and dating services.

811 Repair and Maintenance 15

Personal property used to restore machinery, equipment, and other products to working order. These establishments also typically provide general or routine maintenance (i.e., servicing) on such products to ensure they work efficiently and to prevent breakdown and unnecessary repairs.

Includes the fixtures and equipment for the following:

8111 Automobile Repair and Maintenance
811192 Car Washes
8112 Electronic & Precision Equipment
8113 Commercial Equipment Repair and Maintenance
8114 Personal and Household Goods Repair and Maintenance

81143 Footwear and Leather Goods Repair

Itemized Equipment

Auto Repair Diagnostic Equipment (Electronic) 7
Small Tools (See Hand Tools, NAICS 423120) 7
Welding Equipment 15
EV Charging Stations 15

812 Personal and Laundry Services 15

Includes the equipment and some trade fixtures for the following (See Appendix D for determination of real or personal property):

8121 Personal Care Services
81211 Hair, nail and skin care services
81219 Other, including Diet and weight reducing – fitness
8122 Death Care Services
81221 Funeral Homes
81222 Cemeteries and Crematories
8123 Dry cleaning and Laundry Services
81231 Coin-operated Laundries and Drycleaners
81232 Dry cleaning and Laundry, except coin-operated
8129 Other Personal Services
81291 Pet Care (except Veterinary)
81292 Photo-finishing

Itemized Equipment

Coin Laundries 15
Heavy Use Washers 7
Commercial Dry Cleaning Equipment 15

APPENDIX A

2022-23 PERSONAL PROPERTY MANUAL

NEVADA REVISED STATUTES AND NEVADA ADMINISTRATIVE CODE RELATED TO PERSONAL PROPERTY

(This listing may not be comprehensive. Please consult the statutes and regulations. You may find the statutes and regulations on the internet at http://leg.state.nv.us/law1.cfm).

Nevada Revised Statutes

NRS 361.013 "Billboard" defined. "Billboard" means a sign that directs attention to a business, commodity, service, entertainment or attraction that is sold, offered or exists at a location other than the premises on which the sign is located.

(Added to NRS by 1989, 1817)

NRS 361.028 "Manufactured home" defined. "Manufactured home" has the meaning ascribed to it in NRS 489.113.

(Added to NRS by 2001, 1540)

NRS 361.029 "Mobile home" defined. "Mobile home" means a vehicular structure, built on a chassis or frame, which is designed to be used with or without a permanent foundation and is capable of being drawn by a motor vehicle. It may be used as a dwelling when connected to utilities or may be used permanently or temporarily for the advertising, sales, display or promotion of merchandise or services. The term does not include a recreational park trailer as defined in NRS 482.1005.

(Added to NRS by 1989, 169; A 2001, 1727

NRS 361.030 "Personal property" defined.

1. "Personal property" means:

(a) All household and kitchen furniture.

(b) All law, medical and miscellaneous libraries.

(c) All goods, wares and merchandise.

(d) All chattels of every kind and description, except vehicles as defined in NRS 371.020.

(e) Stocks of goods on hand.

(f) Any vehicle not included in the definition of vehicle in NRS 371.020.

(g) All locomotives, cars, rolling stock and other personal property used in operating any railroad within the State.

(h) All machines and machinery, all works and improvements, all steamers, vessels and watercraft of every kind and name navigating or used upon the waters of any river or lake within this State or having a general depot or terminus within this State.

(i) The money, property and effects of every kind, except real estate, of all banks, banking institutions or firms, bankers, moneylenders and brokers.

(j) All property of whatever kind or nature, except vehicles as defined in NRS 371.020, not included in the term "real estate" as that term is defined in NRS 361.035.

2. Gold-bearing and silver-bearing ores, quartz or minerals from which gold or silver is extracted, when in the hands of the producers thereof, shall not mean, not be taken to mean, nor be listed and assessed under the term "personal property" as used in this section, but are specially excepted therefrom, and shall be listed, assessed and taxed as provided by law. [Part 3:344:1953]—(NRS A 1963, 305, 1121; 1983, 1191; 2013, 3115)

NRS 361.035 "Real estate" and "real property" defined.

1. "Real estate" or "real property" means:

(a) All houses, buildings, fences, ditches, structures, erections, railroads, toll roads and bridges, or other improvements built or erected upon any land, whether such land is private property or property of this state or of the United States, or of any municipal or other corporation, or of any county, city or town in this state.

(b) Any mobile home, factory-built housing or manufactured home which meets the requirements of NRS 361.244.

(c) The ownership of, or claim to, or possession of, or right of possession to any lands within this state.

(d) The claim by or the possession of any person, firm, corporation, association or company to any land.

2. The property described in subsection 1 must be listed under the head of "real estate."

3. Except as otherwise provided in NRS 361.2445, when an agreement has been entered into, whether in writing or not, or when there is sufficient reason to believe that an agreement has been entered into, for the dismantling, moving or carrying away or wrecking of the property described in subsection 1, the property must be classified as personal property, and not real estate.

4. For the purposes of this chapter, "real estate" or "real property" does not include leasehold or other possessory interests in land owned by the Federal Government on which land the Federal Government is paying taxes to the State of Nevada or is, pursuant to contractual obligation, paying any sum in lieu of taxes to the State of Nevada.

[Part 3:344:1953]—(NRS A 1957, 358; 1975, 1655; 1979, 824; 1993, 1183; 1999, 3465)

NRS 361.045 Taxable property. Except as otherwise provided by law, all property of every kind and nature whatever within this state shall be subject to taxation.

[Part 1:344:1953; A 1954, 29; 1955, 340]

NRS 361.227 Determination of taxable value.

1. Any person determining the taxable value of real property shall appraise:

(a) The full cash value of:

(1) Vacant land by considering the uses to which it may lawfully be put, any legal or physical restrictions upon those uses, the character of the terrain, and the uses of other land in the vicinity.

(2) Improved land consistently with the use to which the improvements are being put.

(b) Any improvements made on the land by subtracting from the cost of replacement of the improvements all applicable depreciation and obsolescence. Depreciation of an improvement made on real property must be calculated at 1.5 percent of the cost of replacement for each year of adjusted actual age of the improvement, up to a maximum of 50 years.

2. The unit of appraisal must be a single parcel unless:

(a) The location of the improvements causes two or more parcels to function as a single parcel;

(b) The parcel is one of a group of contiguous parcels which qualifies for valuation as a subdivision pursuant to the regulations of the Nevada Tax Commission; or

(c) In the professional judgment of the person determining the taxable value, the parcel is one of a group of parcels which should be valued as a collective unit.

3. The taxable value of a leasehold interest, possessory interest, beneficial interest or beneficial use for the purpose of NRS 361.157 or 361.159 must be determined in the same manner as the taxable value of the property would otherwise be determined if the lessee or user of the property was the owner of the property and it was not exempt from taxation, except that the taxable value so determined must be reduced by a percentage of the taxable value that is equal to the:

(a) Percentage of the property that is not actually leased by the lessee or used by the user during the fiscal year; and

(b) Percentage of time that the property is not actually leased by the lessee or used by the user during the fiscal year, which must be determined in accordance with NRS 361.2275.

4. The taxable value of other taxable personal property, except a mobile or manufactured home, must be determined by subtracting from the cost of replacement of the property all applicable depreciation and obsolescence. Depreciation of a billboard must be calculated at 1.5 percent of the cost of replacement for each year after the year of acquisition of the billboard, up to a maximum of 50 years.

5. The computed taxable value of any property must not exceed its full cash value. Each person determining the taxable value of property shall reduce it if necessary to comply with this requirement. A person determining whether taxable value exceeds that full cash value or whether obsolescence is a factor in valuation may consider:

(a) Comparative sales, based on prices actually paid in market transactions.

(b) A summation of the estimated full cash value of the land and contributory value of the improvements.

(c) Capitalization of the fair economic income expectancy or fair economic rent, or an analysis of the discounted cash flow.

➥ A county assessor is required to make the reduction prescribed in this subsection if the owner calls to his or her attention the facts warranting it, if the county assessor discovers those facts during physical reappraisal of the property or if the county assessor is otherwise aware of those facts.

6. The Nevada Tax Commission shall, by regulation, establish:

(a) Standards for determining the cost of replacement of improvements of various kinds.

(b) Standards for determining the cost of replacement of personal property of various kinds. The standards must include a separate index of factors for application to the acquisition cost of a billboard to determine its replacement cost.

(c) Schedules of depreciation for personal property based on its estimated life.

(d) Criteria for the valuation of two or more parcels as a subdivision.

7. In determining, for the purpose of computing taxable value, the cost of replacement of:

(a) Any personal property, the cost of all improvements of the personal property, including any additions to or renovations of the personal property, but excluding routine maintenance and repairs, must be added to the cost of acquisition of the personal property.

(b) An improvement made on land, a county assessor may use any final representations of the improvement prepared by the architect or builder of the improvement, including, without limitation, any final building plans, drawings, sketches and surveys, and any specifications included in such representations, as a basis for establishing any relevant measurements of size or quantity.

8. The county assessor shall, upon the request of the owner, furnish within 15 days to the owner a copy of the most recent appraisal of the property, including, without limitation, copies of any sales data, materials presented on appeal to the county board of equalization or State Board of Equalization and other materials used to determine or defend the taxable value of the property.

9. The provisions of this section do not apply to property which is assessed pursuant to NRS 361.320.

(Added to NRS by 1965, 1445; A 1969, 1451; 1975, 65, 1656; 1977, 1318; 1979, 79; 1981, 788, 789; 1983, 1047, 1884, 1885; 1987, 2075; 1989, 668, 1818; 1993, 2312; 1997, 1111; 1999, 1029; 2001, 842; 2003, 2758; 2009, 1216; 2013, 3116)

NRS 361.265 Written statement concerning personal property: Demand; contents; return of statement; valuation of unlisted property claimed by absent or unknown person; penalties.

1. To enable the county assessor to make assessments, he or she shall demand from each natural person or firm, and from the president, cashier, treasurer or managing agent of each corporation, association or company, including all banking institutions, associations or firms within the county, a written statement, signed under penalty of perjury, on forms and in the format prescribed by the county assessor of all the personal property within the county, owned, claimed, possessed, controlled or managed by those persons, firms, corporations, associations or companies. The signature required by this subsection may include an electronic signature as defined in NRS 719.100.

2. The statement must include:

(a) A description of the location of any taxable personal property that is owned, claimed, possessed, controlled or managed by the natural person, firm, corporation, association or company, but stored, maintained or otherwise placed at a location other than the principal residence of the natural person or principal place of business of the firm, corporation, association or company;

(b) The cost of acquisition of each item of taxable personal property including the cost of any improvements of the personal property, such as additions to or renovations of the property other than routine maintenance or repairs, and the year in which each item of taxable personal property was acquired; and

(c) If the natural person, firm, corporation, association or company owns at least 25 mobile or manufactured homes that are being leased within the county for commercial purposes, and those homes have not been converted to real property pursuant to NRS 361.244, the year, make or model, size, serial number and location of each such mobile or manufactured home.

3. The statement must be returned not later than July 31, except for a statement mailed to the taxpayer after July 15, in which case it must be returned within 15 days after demand for its return is made. Upon petition of the property owner showing good cause, the county assessor may grant one or more 30-day extensions.

4. If the owners of any taxable property not listed by another person are absent or unknown, or fail to provide the written statement as described in subsection 1, the county assessor shall make an estimate of the value of the property and assess it accordingly. If the name of the absent owner is known to the county assessor, the property must be assessed in that name. If the name of the owner is unknown to the county assessor, the property must be assessed to “unknown

owner," but no mistake made in the name of the owner or the supposed owner of personal property renders the assessment or any sale of the property for taxes invalid.

5. If any person, officer or agent neglects or refuses on demand of the county assessor or his or her deputy to give the statement required by this section, or gives a false name, or refuses to give his or her name or sign the statement, the person, officer or agent is guilty of a misdemeanor.

[Part 5:344:1953]—(NRS A 1967, 558; 1969, 1452; 1981, 327; 1983, 519, 1193; 1985, 748; 1987, 531; 1989, 1820; 2003, 2761; 2005, 2656)

NRS 361.325 Nevada Tax Commission to establish valuations of mobile homes and land; property escaping taxation to be placed on assessment roll.

1. On or before the first Monday in June of each year, the Nevada Tax Commission shall:

(a) Fix and establish the valuation for assessment purposes of all mobile homes in the State.

(b) Classify land and fix and establish the valuation thereof for assessment purposes. The classification of agricultural land must be made on the basis of crop, timber or forage production, either in tons of crops per acre, board feet or other unit, or animal unit months of forage. An animal unit month is the amount of forage which is necessary for the complete sustenance of one animal unit for 1 month. One animal unit is defined as one cow and calf, or its equivalent, and the amount of forage necessary to sustain one animal unit for 1 month is defined as 900 pounds of dry weight forage.

2. The valuation of mobile homes and land so fixed and established is for the next succeeding year and is subject to equalization by the State Board of Equalization.

3. In establishing the value of new mobile homes sold on or after July 1, 1982, the Nevada Tax Commission shall classify them according to those factors which most closely determine their useful lives. In establishing the value of other mobile homes, the Commission shall begin with the retail selling price and depreciate it by 5 percent per year, but not below 20 percent of its original amount.

4. The Nevada Tax Commission shall cause to be placed on the assessment roll of any county property found to be escaping taxation coming to its knowledge after the adjournment of the State Board of Equalization. This property must be placed upon the assessment roll prior to the delivery thereof to the ex officio tax receiver. If such property cannot be placed upon the assessment roll of the proper county within the proper time, it must be placed upon the tax roll for the next ensuing year, in addition to the assessment for the current year, if any, and taxes thereon must be collected for the prior year in the same amount as though collected upon the prior year's assessment roll.

5. The Nevada Tax Commission shall not raise or lower any valuations established by the State Board of Equalization unless, by the addition to any assessment roll of property found to be escaping taxation, it is necessary to do so.

6. Nothing in this section provides an appeal from the acts of the State Board of Equalization to the Nevada Tax Commission.

[7:177:1917; A 1929, 299; 1939, 279; 1945, 78; 1953, 576]—(NRS A 1957, 314; 1963, 1123; 1967, 825; 1975, 1105, 1660, 1762; 1981, 859; 1983, 1195)

Nevada Administrative Code

NAC 361.1127 "Fixture" defined. (NRS 360.090, 360.250) "Fixture" means an item, other than a trade fixture, that was originally personal property which has been installed or attached to land or an improvement in a permanent manner. As used in this section, "installed or attached to land or an improvement in a permanent manner" means that:

1. Either:

(a) An item is attached to, imbedded in or permanently resting upon land or an improvement, or is attached by other means that are normally used for permanent installation, and cannot be removed without substantially damaging the item or the land or improvement with which it is being used; or

(b) The use or purpose of an item that is not otherwise physically annexed to land or an improvement is so adapted that it is:

(1) A necessary, integral or working part of the land or improvement;

(2) Designed or committed for use with the land or improvement; or

(3) So essential to the land or improvement that the land or improvement cannot perform its desired function without the nonattached item; and

2. A reasonable person would consider the item to be a permanent part of the land or improvement, taking into account annexation, adaptation and other objective manifestations of permanence, including, without limitation, whether:

(a) Removal of the item would destroy the item or cause significant damage to the real property to which it is installed or attached;

(b) The historic use of the item indicates an intention to leave the item in place;

(c) The terms of a written agreement between parties indicates the intention of a tenant or lessee to remove or transfer ownership of the item; or

(d) Ownership of the item would be conveyed with a transfer of the real property to which it is installed or attached.

(Added to NAC by Tax Comm'n by R039-10, 8-13-2010, eff. 7-1-2012; A by R068-12, 9-14-2012)

NAC 361.11715 "Real property" defined. (NRS 360.090, 360.250)

1. "Real property" has the meaning ascribed to it in NRS 361.035 and includes:

(a) Land;

(b) Fixtures;

(c) Improvements;

(d) On-site enhancements; and

(e) Any rights, interests, benefits and privileges belonging or attached to the land.

2. The term does not include a trade fixture.

(Added to NAC by Tax Comm'n by R039-10, 8-13-2010, eff. 7-1-2012; A by R068-12, 9-14-2012)

NAC 361.130 Mobile or manufactured home. (NRS 360.090, 360.250, 361.227, 361.2445, 361.325)

1. The taxable value of a mobile home or manufactured home which constitutes real property is the cost of replacement of the mobile home or manufactured home less depreciation and obsolescence.

2. In determining the taxable value of a mobile home or manufactured home which constitutes personal property, each county assessor shall, if the mobile home or manufactured home was sold as new:

(a) Before July 1, 1982, value it at its retail selling price when sold to the original owner less depreciation at 5 percent per year, to a maximum depreciated value of 20 percent of its original retail selling price.

(b) On or after July 1, 1982, value it at replacement cost, when new, less depreciation. Replacement cost when new is the retail selling price to the original owner adjusted by factors reflected in the annual *Personal Property Manual*.

➥ Depreciation must be calculated pursuant to the schedule located in the annual *Personal Property Manual*. Additional depreciation and obsolescence may be calculated separately.

3. The retail selling price of a mobile home or manufactured home includes all charges for transportation, installation, accessories, profit and overhead.

4. If the owner of a mobile home or manufactured home which has been converted to real property wishes to convert the mobile home or manufactured home back to personal property, the county assessor shall provide the owner with a form for an affidavit of conversion which has been approved by the Commission and which must be recorded in the county recorder's office pursuant to NRS 361.2445 before the mobile home or manufactured home may be removed from the tax rolls. The affidavit of conversion may include information concerning the cost of acquisition of the mobile home or manufactured home. All signatures required pursuant to NRS 361.2445 to effectuate the conversion must be notarized.

5. The county assessor shall value the mobile home or manufactured home as personal property upon satisfaction of all the requirements set forth in NRS 361.2445 if the mobile home or manufactured home remains within the jurisdiction of the county assessor.

6. If a mobile home or manufactured home which has been converted to real property is completely destroyed and removed from real property, the county assessor shall remove the mobile home or manufactured home from the tax roll.

[Tax Comm'n, Property Tax Reg. part No. 2, eff. 1-14-82]—(NAC A 10-10-83; 6-29-84; 5-16-86; R031-03, 8-4-2004; R166-07, 6-17-2008)

NAC 361.1305 Billboards. (NRS 360.090, 360.250, 361.227)

1. The taxable value of a billboard is the cost of replacement of the billboard less depreciation and obsolescence.

2. The cost of replacement of a billboard must be computed by multiplying the cost of acquisition to the current owner by the appropriate factor located in the annual *Personal Property Manual*. The factor that corresponds to the year the billboard was acquired must be used. Additional depreciation and obsolescence may be calculated separately.

(Added to NAC by Tax Comm'n, eff. 8-2-90; A by R031-03, 8-4-2004)

Determination of Taxable Value of Personal Property

NAC 361.1345 Definitions. (NRS 360.090, 360.250, 361.227) As used in NAC 361.1345 to 361.139, inclusive, unless the context otherwise requires, the words and terms defined in NAC 361.1351, 361.1355 and 361.1361 have the meanings ascribed to them in those sections.
(Added to NAC by Tax Comm'n by R034-03, eff. 12-4-2003)

NAC 361.1351 "Acquisition cost" and "original cost" defined. (NRS 360.090, 360.250, 361.227) "Acquisition cost" or "original cost" means the actual cost of property to its present owner, including, without limitation, the costs of transportation and the costs of installation.
(Added to NAC by Tax Comm'n by R034-03, eff. 12-4-2003)

NAC 361.1355 "Costs of installation" defined. (NRS 360.090, 360.250, 361.227) "Costs of installation" means the costs of direct labor, direct overhead and the capitalized expense of interest or imputed charges for interest which are necessary to make the property operational.
(Added to NAC by Tax Comm'n by R034-03, eff. 12-4-2003)

NAC 361.1361 *"Personal Property Manual"* defined. (NRS 360.090, 360.250, 361.227) *"Personal Property Manual"* means a manual for the valuation of personal property that is published by the Department annually pursuant to NAC 361.1365.
(Added to NAC by Tax Comm'n by R034-03, eff. 12-4-2003)

NAC 361.1365 *Personal Property Manual*: Publication; contents; approval; use. (NRS 360.090, 360.250, 361.227)
1. The Department will annually publish a *Personal Property Manual* which describes the methods and standards that must be used for the valuation of personal property. The manual must include, without limitation, annually updated:
(a) Cost-index factors that must be used in the conversion of acquisition cost into an estimate of replacement cost new;
(b) Expected-life schedules that indicate the category of expected life for each type of property or type of industry in which the property is used; and
(c) Percent-good tables which indicate the rate of depreciation that must be applied.
2. The *Personal Property Manual* must be approved by the Commission before publication. The Department, at least 1 month before presenting the manual to the Commission for approval, must disclose all proposed modifications to the manual and hold a public workshop on the modifications.
3. Each county assessor shall use the *Personal Property Manual* in determining the taxable value of personal property.
(Added to NAC by Tax Comm'n by R034-03, eff. 12-4-2003)

NAC 361.1371 Procedure for determination of taxable value. (NRS 360.090, 360.250, 361.227)
1. The taxable value of personal property must be determined by adjusting the acquisition cost of the property by a cost-index factor and reducing the adjusted acquisition cost by an estimate of applicable depreciation. The taxable value so determined shall be deemed to be the indicator of value of replacement cost new less depreciation.
2. In determining taxable value, a county assessor shall use the schedules in the *Personal Property Manual* that show the cost-index factors, the rates of depreciation and the percent good by year. The assessor shall use the schedules by:
(a) Selecting the appropriate expected useful life of the personal property; and
(b) Selecting the appropriate cost-index factor, based on the year of acquisition of the property, and applying it to the acquisition cost of the property.
➥ The result shall be deemed to be the replacement cost new of the property.
3. The assessor shall select the method of applying depreciation to the personal property by either:

(a) Multiplying the adjusted acquisition cost of the property by the rate of depreciation and subtracting the result from the adjusted acquisition cost; or

(b) Multiplying the adjusted acquisition cost of the property by the percent-good factor.

➥ The result from either approach shall be deemed to be the taxable value of the property.

(Added to NAC by Tax Comm'n by R034-03, eff. 12-4-2003)

NAC 361.1375 Determination of expected life, cost-index factors and depreciation. (NRS 360.090, 360.250, 361.227)

1. Personal property must be categorized by the specific type of property that it is or by the type of industry in which it is used. Each category must be assigned to a schedule of expected life which is based on commonly available sources of information, including, without limitation, the life expectancy guidelines published by the Marshall and Swift Valuation Service and any other sources published in the *Personal Property Manual*.

2. The cost-index factors published in the *Personal Property Manual* must be determined by calculating the average change in costs over time. The Department shall identify the sources used to calculate the average change.

3. For purposes of calculating the amount of applicable depreciation, personal property must be assigned to one of the following expected lives:

(a) Three-year life;

(b) Five-year life;

(c) Seven-year life;

(d) Ten-year life;

(e) Fifteen-year life;

(f) Twenty-year life; or

(g) Thirty-year life.

4. Depreciation must be calculated over the expected life of the personal property by using the declining balance method, except that tables which provide a method other than the declining balance method for calculating depreciation may be used if the tables have been approved by the Commission and included in the *Personal Property Manual*.

5. For purposes of calculating the rate of depreciation, a residual amount of 5 percent must be used. Percent-good tables using a residual amount other than 5 percent may be adopted by the Commission if the Department has conducted a market study or has otherwise obtained information which indicates that a different residual amount is appropriate for the category in which the personal property is placed pursuant to subsection 1.

(Added to NAC by Tax Comm'n by R034-03, eff. 12-4-2003)

NAC 361.138 Reported acquisition cost for leased equipment. (NRS 360.090, 360.250, 361.227) For leased equipment, the reported acquisition cost is the cost which the user of the property would incur if the equipment were purchased, less any discount customarily allowed by a seller.

(Added to NAC by Tax Comm'n, eff. 10-10-83; A by R034-03, 12-4-2003)

NAC 361.139 Personal property acquired with real property for lump sum; use of other valuation techniques. (NRS 360.090, 360.250, 361.227)

1. In determining the taxable value of personal property which was acquired with real property for a lump sum, the assessor may refer to appropriate guides which list the cost of equipment to determine the value of the personal property in relation to the value of the real property. In addition, the assessor may estimate the age of the equipment by inspecting it or discussing the approximate value of the equipment with manufacturers, dealers or other persons in the business who have knowledge of the value of the equipment. The serial number, if it exists, may enable a manufacturer to determine the date of manufacture and the original cost.

2. If sufficient data is not otherwise available to establish acquisition cost, or if the assessor determines that a reported acquisition cost is not equal to the fair market value of the property at the time of acquisition plus any costs of transportation and costs of installation, the assessor may use any nationally recognized valuation technique to determine the acquisition cost, including, without limitation:

(a) Establishing the current cost of replacement of the property with new property by reference to current manufacturing costs. If the current cost of replacement is known, the assessor shall apply depreciation to that cost to determine the taxable value.

(b) Using a guide which lists the cost or a procedure recognized by businesses which use such equipment to determine the taxable value. Before such a guide or procedure may be used, an assessor must receive approval from the Executive Director.

(c) Using information based on current market data.

3. Upon request, the Division of Local Government Services of the Department will provide information on various guides which may be used to determine original cost.

(Added to NAC by Tax Comm'n, eff. 10-10-83; A 6-29-84; R034-03, 12-4-2003; R068-12, 9-14-2012)

NAC 361.11745 "Trade fixture" defined. (NRS 360.090, 360.250) "Trade fixture" means an item of personal property that:

1. Is installed or attached nonpermanently to real property by an owner or tenant for the purpose of conducting a business or trade and not for the enhancement of the real property to which it is installed or attached; and

2. Has a unique identity and function which is related to the business or trade for which it is installed or attached and which is distinct from the real property to which it is installed or attached.

(Added to NAC by Tax Comm'n by R068-12, eff. 9-14-2012)

Excerpts from Department of Taxation Letter of Guidance

Letter dated December 02, 2004, responding to county assessors' question:

"In determining the proper amount of depreciation to be applied to personal property using the Department's Personal Property Manual, does the year of acquisition refer to a calendar year or a fiscal year?"

Short Answer

The use of the year of acquisition is dependent on the fiscal year only with regard to the correct selection of the Personal Property Manual to be used. The year of acquisition is otherwise an actual date during a calendar year that indicates the age of the property to be used in the expected life tables.

(Please ask the department for a copy of the letter if you wish to read the entire discussion.)

APPENDIX B

Methodology Used to Estimate Cost Indexes

The percent change in each index is measured between the current year and the prior year. The mean of the sum of the changes for each year of the expected life table is calculated and becomes the basis for the cost index to trend acquisition cost to a current replacement cost.

Sources Used to Estimate Cost Indexes

Producer Price Index (PPI)

The Producer Price Index (PPI) is a family of indexes that measures the average change over time in selling prices received by domestic producers of goods and services. PPIs measure price change from the perspective of the seller. This contrasts with other measures, such as the Consumer Price Index (CPI), that measure price change from the purchaser's perspective. Sellers' and purchasers' prices may differ due to government subsidies, sales and excise taxes, and distribution costs.

Data Source

- The PPI sample includes approximately 25,000 establishments providing close to 100,000 price quotations per month.
- Participating establishments report price data primarily through the mail.
- Good and services included in the PPI are weighted by value-of-shipments data contained in the 1992 economic census.
- Industries and products are systematically resampled as needed.

The producer price index series reference has been updated from a Stage of Processing ID code to a Final Demand-Intermediate Demand Goods Index. The conversion may be found in an Index Concordance Table located at http://www.bls.gov/ppi/fdidconcordance.htm, which converts SOP3200, Capital equipment, to FD41312, Private capital equipment. The PPI Index using FD41312 may be found at http://www.bls.gov/ppi/fdidsf16.htm.

Consumer Price Indexes (CPI)

The consumer price index (CPI) is a measure of the average change in prices over time of goods and services purchased by households. The Bureau of Labor Statistics publishes CPIs for two population groups: (1) the CPI for Urban Wage Earners and Clerical Workers (CPI-W), which covers households of wage earners and clerical workers that comprise approximately 32 percent of the total population and (2) the CPI for All Urban Consumers (CPI-U) and the Chained CPI for All Urban Consumers (C-CPI-U), which cover approximately 87 percent of the total population and include in addition to wage earners and clerical worker households, groups such as professional, managerial, and technical

workers, the self-employed, short-term workers, the unemployed, and retirees and others not in the labor force.

The CPI represents all goods and services purchased for consumption by the reference population (CPI-U or CPI-W). BLS has classified all expenditure items into more than 200 categories, arranged into eight major groups. Major groups and examples of categories in each are as follows:

- FOOD and BEVERAGES (breakfast cereal, milk, coffee, chicken, wine, full service meals and snacks)
- HOUSING (rent of primary residence, owners' equivalent rent, fuel oil, bedroom furniture)
- APPAREL (men's shirts and sweaters, women's dresses, jewelry)
- TRANSPORTATION (new vehicles, airlines fares, gasoline, motor vehicle insurance)
- MEDICAL CARE (prescription drugs and medical supplies, physicians' services, eyeglasses and eye care, hospital services)
- RECREATION (televisions, cable television, pets and pet products, sports equipment, admissions)
- EDUCATION AND COMMUNICATION (college tuition, postage, telephone services, computer software and accessories)
- OTHER GOODS AND SERVICES (tobacco and smoking products, haircuts and other personal services, funeral expenses)

Also included within these major groups are various government-charged user fees, such as water and sewerage charges, auto registration fees, and vehicle tolls. The CPI also includes taxes (such as sales and excise taxes) that are directly associated with the prices of specific goods and services. However, the CPI excludes taxes (such as income and Social Security taxes) not directly associated with the purchase of consumer goods and services.

The CPI does not include investment items, such as stocks, bonds, real estate, and life insurance. (These items relate to savings and not to day-to-day consumption expenses.)

The Consumer Price Index series ID reference is CUUR0400SA0, CUUS0400SA0 for area West Urban, All Items. The base period is 1982-84 = 100. The data may be found at http://data.bls.gov/pdq/SurveyOutputServlet?data_tool=dropmap&series_id=CUUR0400SA0,CUUS0400SA0.

Marshall Valuation Service

Marshall Valuation Service publishes a national average equipment cost index based on industry type. The Department measures the change in the index for each category of industry from the prior year.

Market Tests

In addition to the sources already cited, the Department conducts market tests to validate the results of applying the cost indices to particular items of personal property. The original cost of a selected sample of personal property items is trended using the proposed cost index conversion factor. The result of this calculation is compared to the actual average resale of the item obtained from various market research sources. The purpose of the market test is to ensure the proposed cost indices do not result in a value which exceeds full cash value. The market tests are also used to establish hypothetical market-based depreciation schedules. The sources of information for the market comparisons include the following:

- **N.A.D.A., The Manufactured Housing Guide Cost Online** (Online Version) The Guide provides the average retail book value by manufacturer, model, and region of mobile home, with tables for options. Values are provided for homes one to fourteen years of age, and conversion tables for homes older than 14 years.
- **Aircraft Bluebook Price Digest Online**, (Online Version) (Price Digests, Informa Business Media, Inc., Overland Park, KS). The Bluebook provides representative average retail prices of fixed wing aircraft and helicopters.
- **Grounds Maintenance Equipment Blue Book Online**, (Online Version) (Price Digests, Informa Media, Overland Park, KS). The Blue Book provides the estimated average resale or retail price, excluding options of power equipment.
- **Powersport Vehicle Blue Book**, (Online Version) (Price Digests, Informa Business Media, Inc., Overland Park, KS). The Blue Book provides pricing in the powersports industry, including snowmobiles, personal watercraft, trailers, and motorcycles.
- **The Official Tractor Blue Book Online**,(Online Version) (Price Digests, Informa Business Media, Inc., Overland Park, KS). The Blue Book provides the estimated average resale or retail price, excluding options of power equipment.
- **Green Guide for Construction Equipment**, (Online version) (Equipment Watch, 6151 Powers Ferry Road, Suite 200, Atlanta , GA 30339) The values in this guide are derived from a reporting system of equipment dealers, distributors, manufacturers, auctioneers and contractors. It is based on both surveys and averaging of actual sales. These volumes include Volume 1: Earthmoving Equipment, Volume 2: Lifting Equipment and Volume 3: Other Equipment (Compaction, Concrete and Crushers).
- **Orion Research Corporation**, (Roger Rohrs Publisher) http://www.usedprice.com. The web site /is the electronic successor to the Orion Blue Book. It determines the used prices of computers and peripherals based on dealer surveys gathered nationwide. Dealers are asked to provide the “asking price,” “Selling price,” and “days to sell.” The used price is then calculated based on what an average store could sell the product for in 30 days or less. Orion Research states that this data is updated on an ongoing basis.
- **Estimated Useful Lives of Depreciable Hospital Assets**, (Revised 2013, 2018 Edition AHA Chicago Press, Health Forum, Inc. 155 North Wacker Drive, Suite 400, Chicago IL 60606)

APPENDIX C

Methodology Used to Estimate Expected Useful Life

The Department estimates the expected useful life of different types of personal property by surveying a variety of sources. Expected useful life is defined as the amount of time an item of personal property can be expected to last before it wears out, decays, gets used up, becomes obsolete, or loses its value from natural causes. The life is measured from the time the property is first put into service until it is retired from service or permanently withdrawn from use in a trade or business, or when the production of income ceases because the property has been sold, exchanged, converted to personal use, abandoned, or otherwise destroyed.

The Department does not have the resources available to perform its own mortality or actuarial studies. However, there are other sources that do perform this service. The sources itemized below include actuarial studies of the Internal Revenue Service, Marshall and Swift Costing Service, and the California State Board of Equalization. Also included are the surveys of several western states and certain industries.

Sources Used to Estimate Expected Useful Life

Marshall Swift Valuation Service, "Residential Cost Handbook", (Marshall & Swift, L.P., December 2021) Costs ranges are based on averages created for the US and Canada, and other items listed are based on what is readily available today.

Marshall Swift Valuation Service, "Life Expectancy Guidelines," (Marshall & Swift, L.P., January 2021)

Depreciable assets are listed by industry group and are extracted from U.S. Treasury Department Internal Revenue Service Publication 534 titled "Depreciation." The Guidelines list ranges of life. In certain cases, the IRS was not the primary source. In those cases, the range of life is based on a composite of studies of equipment, bookkeeping practices and appraisers' opinions as compiled from a consensus of recognized trade groups, suppliers and other interested parties. Computers and terminals are one example of an independent study conducted by Marshall & Swift.

Department of the Treasury, Internal Revenue Service, Publication 946, "How to Depreciate Property," and Publication 534, "Depreciating Property Placed in Service Before 1987."

These two publications specifically identify types of property and the expected useful life. For instance, an example of five-year property is computers and peripheral equipment.

California:

California Assessors Equipment Index and Percent Good Factors January 2020

California Assessors Handbook Table of Contents 2020

Arizona:

Arizona Department of Revenue Personal Property Manual 2020

Montana:

State of Montana Personal Property and Livestock Reporting for Tax Year 2020

Oregon:

Oregon Department of Revenue, Personal Property Valuation Guidelines 2020

Utah:

Utah State Tax Commission 2020 Recommended Personal Property Valuation Schedules and Registered Vehicle Uniform Fees

Wyoming:

Wyoming Department of Revenue Life Expectancies for Personal Property 2019

APPENDIX D

2022-23 PERSONAL PROPERTY MANUAL: VALUATION GUIDELINES

Exemptions from Property Taxes

Article 10, Section 1 of the Nevada Constitution requires the "valuation for taxation of **all** property, real, personal and possessory...." NRS 361.045 also provides that, except as otherwise provided by law, all property of every kind and nature whatever within this state shall be subject to taxation. Other statutes, however, grant exemptions to particular types of property. Some are granted exemption at face-value, and other types of property must qualify according to specific criteria in order to receive the exemption.

The types of exemptions range from partial exemptions granted to veterans, disabled veterans, surviving spouses and blind persons to exemptions from taxation for all real and personal property granted to governmental entities, religious, charitable and non-profit organizations, and individual organizations which are specifically cited. In many cases, the statutes specifically recite that the property must be used to carry out the legitimate function of the organization, and if not, the property becomes taxable.

For the types of exemptions which must go through a qualification process, the county assessors must collect, evaluate and process the various claims for property tax exemptions. Application forms which have been approved by the Nevada Tax Commission should be made available. Each form should request information regarding taxpayer contact information, the type of exemption being claimed, the property which the exemption, if granted, would affect, a statement or statements why the property qualifies for the exemption, and supporting documentation if necessary. The purpose of any form is to provide sufficient information to help assessors make a reasoned determination to approve or deny applications.

In the event a claim for exemption is ambiguous or open to interpretation, how the property is used may indicate whether or not an exemption applies. The general rule espoused by the courts is that strict construction of exemption statutes applies to exemptions for property held in private ownership but not to exemptions for public property where exemption is the rule and taxation the exception. 2 Thomas M. Cooley, *The Law of Taxation*, § 673 at 1414-15 (4th ed. 1924). Said another way, property held in private ownership must strictly comply with all the criteria established for the exemption because “taxation is the rule and exemption the exception.” On the other hand, for property held by a public entity, the rule is reversed to say “exemption is the rule and taxation the exception.”

The purpose in establishing a broad construction of exemption for public entities is to prevent an escalating spiral of unnecessary taxation and administrative costs with no benefit to the public. 16 Eugene McQuillin, *The Law of Municipal Corporations*, § 44.57 at 206 (3rd ed. 1994). If one governmental entity chooses to tax the property of another governmental entity, the governmental entity forced to pay taxes may have to levy and collect new taxes to meet the demands of the tax. 2 Cooley, *supra*, § 621 at 1313. The effect of such a tax spiral is that the public would be taxing itself to raise money to pay itself.

In cases where it is not clear whether an exemption should be granted, assessors should solicit legal advice from the county district attorney's (D.A.) office.

The attached chart lists the current status of specific exemptions available in the statutes, in alphabetical order.

Legend:
Due Date for Application:
(1) No application required
(2) One time only until status changes. The claim must be made by June 15th. *See NRS 361.155 (1) and (3)*
(3) Annually, by June 15th. *See NRS 361.155 (1)*
(4) Annually, by July 1st. *See NAC 361.062*
(5) Annually, by December 30th. *See NRS 362.050*

Exemption Type	NRS Reference	NAC Reference	Property Type	Due Date for Application See Legend	Explanation
Airport	361.061(1)		Real	(2)	Improvement of land by the public as an airport is a municipal purpose, whether or not the airport is owned or operated by a local government.
American Land Conservancy	361.111		Real	(2)	Real property including improvements is exempt if: the property is held for acquisition by a Federal, state or local government and the said government has agreed in writing to consider acquiring said real property; or if the property will be held indefinitely and vested in the listed conservancy organization. If the property is held for purposes of conservation for any entity other than the State or local government, the land must be assessed as first class pasture. If the property is transferred for purposes other than conservation, taxes must be collected for each year it was exempt.

Exemption Type	NRS Reference	NAC Reference	Property Type	Due Date for Application See Legend	Explanation
American National Red Cross and Nevada Chapters	361.110		Both	(2)	All real and personal property is exempt, unless it is used for a purpose other than the legitimate functions of the organization. *See also YMCA, YWCA, American National Red Cross, Salvation Army Corp, GSA, Camp Fire Girls, BSA, Sierra Arts Foundation, Nevada Museum of Art, Inc.*
Apprenticeship Programs	361.106		Both	(2)	Real and personal property of an apprenticeship program is exempt if (1) the property is held in a trust created by 29 U.S.C. § 186 or (2) is owned by a local or state apprenticeship committee and the program is operated by a qualifying organization and registered and approved by the state apprenticeship council.
Archaeological Conservancy	361.111 AB 209 (2007)		Real	(2)	See explanation under American Land Conservancy.
Architectural barrier Removal for Disabled Persons	361.087		Real	(2)	Improvements to a residence occupied by a person with a disability are exempt. The person must claim the benefit by filing an affidavit setting forth the nature of the improvement and the date of making the improvement. See statute for examples.
Bank Deposits	Article 10		Personal	(1)	Articles of personal property deemed to represent an interest in real or personal property already assessed and taxed is exempt.
Bee colonies	361.068		Personal	(1)	Bee colonies are exempt personal property.
Blind Persons	361.085		Both	(3)	Property of blind persons up to an assessed value of $3,000, as modified by CPI, is exempt. The original affidavit of claim must be accompanied by a certificate from a physician certifying the person

Exemption Type	NRS Reference	NAC Reference	Property Type	Due Date for Application See Legend	Explanation
					is blind. Renewal affidavits must be completed each year.
Boats	361.068		Personal	(1)	All boats are exempt.
Bonds	Article 10		Personal	(1)	Articles of personal property deemed to represent an interest in real or personal property already assessed and taxed is exempt.
Book Accounts	Article 10		Personal	(1)	Articles of personal property deemed to represent an interest in real or personal property already assessed and taxed is exempt.
Boulder City Museum and Historical Association	361.110		Both	(2)	All real and personal property is exempt, unless it is used for a purpose other than the legitimate functions of the organization. *See also YMCA, YWCA, American National Red Cross, Salvation Army Corp, GSA, Camp Fire Girls, BSA, Sierra Arts Foundation.*
Boy Scouts of America	361.11		Both	(2)	All real and personal property is exempt, unless it is used for a purpose other than the legitimate functions of the organization. *See also Nevada Museum of Art.*
Business Inventories & Consumables	361.068	361.065	Personal	(1)	Property consumed during the operation of the business, as differentiated from a component part of a manufactured item, is exempt. The property must meet the criteria listed in NAC 361.065.
Camp Fire Girls Inc.	361.11		Both	(2)	All real and personal property is exempt, unless it is used for a purpose other than the legitimate functions of the organization. *See also Nevada Museum of Art.*
Campers, slide-in & shells	361.068		Personal	(1)	All slide-in campers and camper shells are

Exemption Type	NRS Reference	NAC Reference	Property Type	Due Date for Application See Legend	Explanation
					exempt.
Carnival, circus, convention, display, exhibition, fair	361.068		Personal	(1)	Personal property, transient in nature, owned by a non-resident and located in this state for use by or in a carnival, circus, convention, display, exhibition or fair is exempt. *See also transient personal property.*
Cost of collection	361.068		Personal	(1)	Personal property for which the annual taxes would be less than the cost of collecting those taxes is exempt. NTC determines level of cost.
Cemeteries and Graveyards - Public	361.130		Real	(1)	Exempt cemeteries and graveyards must be open to the public and no charge is made for burial.
Cemeteries and Graveyards – Private	361.132		Real	(2)	Real property of a nonprofit corporation governed by the provisions of NRS Chapter 82 formed for the purposes of procuring and holding lands to be used exclusively for a cemetery are exempt, so long as the lots or plats remain dedicated to the purpose of a cemetery.
Charitable Foundation: *See University*	361.098		Both	(2)	All property owned by the charitable foundation established by the Board of Regents of University of Nevada is exempt unless it is used for a purpose other than carrying out the legitimate functions of the foundation.
Charitable Organizations	361.135		Both	(2)	See Lodges
Charitable Corporations	361.140		Both	(2)	Property actually occupied and used by corporation meeting certain qualifying criteria is exempt.

Exemption Type	NRS Reference	NAC Reference	Property Type	Due Date for Application See Legend	Explanation
Charter School Leased Property	361.096		Both	(2)	All property leased or rented to a charter school is deemed to be used for an educational purpose and is exempt. Only the portion of the property that is used for the lease or rental to a charter school is exempt.
Churches & Chapels	361.125		Both	(2)	Buildings and personal property used for religious worship other than marriage chapels, is exempt. The property must be owned by a recognized religious society or corporation. If the property is used for other than church purposes and a rent is received, the property is not exempt.
Church Land *See also "Land Used for Worship"*	361.125		Real	(2)	Parcels of land used exclusively for worship, including without limitation, both developed and undeveloped portions of a parcel.
Counties, Town, Municipal Corp	361.060		Both	(1)	Property of counties, domestic municipal corporations, irrigation drainage, reclamation district, or town, except for certain community pastures, is exempt. *See also Nevada Rural Housing Authority, Irrigation Districts*
Conservation District	361.060		Real	(1)	Real property acquired on or after 7-1-2003 by a conservation district is exempt.
Defenders of Wildlife	361.135		Both	(2)	*See Lodges for explanation.*
Disabled Veterans	361.091		Both	(3)	Up to $20,000 assessed value of property, adjusted by CPI, may be exempt, based on a sliding scale of disability of the veteran-owner. Only the property of residents or their surviving spouses meeting certain qualifying criteria is eligible for exemption.

Exemption Type	NRS Reference	NAC Reference	Property Type	Due Date for Application See Legend	Explanation
Drainage Ditches, Canals & Irrigation Systems	361.070		Real	(1)	Drainage ditches and canals along with the lands included in the right-of-way of the ditch or canal are exempt. Each part of a permanently installed irrigation system, including pipes, concrete linings of ditches and headgates, are exempt.
Elderly & Handicapped Housing	361.086		Real and personal used for housing	(2)	All real property and mobile or modular housing and related facilities for elderly or handicapped persons are exempt if certain qualifying criteria are met.
Eagles Club	361.135		Both	(2)	*See Lodges for explanation*
Elks Club	361.135		Both	(2)	See Lodges for explanation.
Energy Systems (fka Heating & Cooling Systems)	701A.200 (fka 361.079)	361.052-361.058	Both	(1)	The value of a qualified system is not included in the assessed value of the building of which it is a part. Qualified systems in commercial or industrial buildings receiving certain other abatements or exemptions are ineligible for this exemption. System must conform to standards established by the Department.
Fine Art for public display	361.068; 361.186	361.030 – 361.044	Personal	(3)	The exemption is limited to certain kinds of works of art purchased for $25,000 or more and meets certain public display requirements. When a taxpayer collects an admission fee, the amount of exemption is reduced by the net revenue received by taxpayer. *See NRS and NAC requirements.*
Girl Scouts of America	361.11		Both	(2)	All real and personal property is exempt, unless it is used for a purpose other than the legitimate functions of the organization. *See also Nevada Museum of Art.*
Habitat for Humanity	361.115		Both	(2)	All property is exempt unless it is used for a purpose other than carrying out the legitimate

Exemption Type	NRS Reference	NAC Reference	Property Type	Due Date for Application See Legend	Explanation
					functions of the organization. *See also Nevada Children's Foundation, Nevada Heritage Association.*
Hospital	361.083		Real	(2)	Property on which stands a hospital or other charitable asylum for the care or relief of orphans or sick, infirm or indigent persons owned by a qualifying non-profit corporation, is exempt. If the property is used for a different purpose, the property is taxable. *See also orphan children.*
Household goods and furniture	361.069	361.085	Personal	(1)	Household goods, furniture except certain appliances and furniture of time-share projects, are exempt. Examples are in both statute and regulation.
Irrigation, Drainage, Reclamation District	361.060		Both	(1)	See Counties, Towns for explanation.
Knights of Pythias	361.135		Both	(2)	*See Lodges for explanation.*
Knights of Columbus	361.135		Both	(2)	*See Lodges for explanation.*
Lahontan Audubon Society	361.135		Both	(2)	*See Lodges for explanation.*
Land used for Worship	361.125		Real	(2)	*See Church Land for explanation.*
Livestock	361.068		Personal	(1)	Livestock is exempt. Livestock is defined at NAC 361A.055. See also Article 10 (6).
Lodges & other charitable organizations	361.135		Both	(2)	Funds, furniture, paraphernalia and regalia owned by certain charitable organizations as well as real estate and fixtures are exempt. If the real estate is leased, the exemption does not apply to the portion so leased or rented.
Low income housing projects	361.082	361.089	Both	(3)	That portion of real property and tangible personal property used for housing and related facilities for persons with low incomes is exempt if the property

Exemption Type	NRS Reference	NAC Reference	Property Type	Due Date for Application See Legend	Explanation
					meets certain criteria.
Masons	361.135		Both	(2)	*See Lodges for explanation.*
Mortgages	Article 10		Personal	(1)	Articles of personal property deemed to represent an interest in real or personal property already assessed and taxed is exempt.
Motor Vehicles	361.067		Personal	(1)	Vehicles defined in NRS 371.020 are exempt, except mobile homes. NRS 371.020 refers to NRS 482 and 706. Under NRS 482.210, special mobile equipment is not licensed and is therefore taxable for property tax.
Nathan Adelson Hospice	361.088		Both	(2)	All property is exempt, unless it is used for any purpose other than carrying out the legitimate functions of hospice care.
National Audubon Society	361.135		Both	(2)	*See Lodges for explanation.*
Nature Conservancy	361.111		Real	(2)	*See explanation under American Land Conservancy.*
Nevada Children's Foundation	361.115		Both	(2)	*See Habitat for Humanity for explanation.*
Nevada Heritage Association	361.115		Both	(2)	*See Habitat for Humanity for explanation.*
Nevada Land Conservancy	361.111		Real	(2)	*See explanation under American Land Conservancy.*
Nevada Museum of Art	361.11		Both	(2)	All real and personal property is exempt, unless it is used for a purpose other than the legitimate functions of the organization. *See also YMCA, YWCA, American National Red Cross, Salvation Army Corp, GSA, Camp Fire Girls, BSA, Sierra Arts Foundation.*
Nevada Rural Housing	361.060		Real	(1)	*See explanation under Counties, Cities*

Exemption Type	NRS Reference	NAC Reference	Property Type	Due Date for Application See Legend	Explanation
Authority					
Noncommercial theaters	361.145		Both	(2)	Buildings, furniture & equipment of noncommercial theaters owned and operated by nonprofit educational corporations organized for the exclusive purpose of conducting theater practice classes and the production of plays on a nonprofessional basis are exempt.
Nonprofit private schools	361.105		Both	(2)	All property is exempt from taxation.
Odd Fellows	361.135		Both	(2)	*See Lodges for explanation.*
Orphan children or sick, infirm or indigent persons	361.083		Real	(2)	Land and buildings use for the care or relief of orphans or of sick, infirm or indigent persons owned by a nonprofit corporation organized or existing pursuant to NRS 82, is exempt. *See also Hospitals.*
Patented Mining Claims	362.010-362.095		Real	(5)	Upon receipt of an affidavit from the county recorder pursuant to NRS 362.050, the assessor shall exclude from the roll the assessment against the patented mine or mining claim named in the affidavit.
Pershing County Kids, Horses, Rodeo Inc.	361.107		Both	(2)	All real and personal property is exempt, unless it is used for a purpose other than the legitimate functions of the organization.
Personal Property held for sale by merchant	361.068		Personal	(1)	Personal property held for sale by a merchant is exempt.
Personal Property held for sale by manufacturer	361.068		Personal	(1)	Personal property held for sale by a manufacturer is exempt.
Personal property in transit	361.160-361.185	361.062	Personal	(4)	Claims must be submitted to county assessor in which the warehouse is located and a certification from the warehouse as to the status of the

Exemption Type	NRS Reference	NAC Reference	Property Type	Due Date for Application See Legend	Explanation
					property must be attached.
Pipe & Irrigation Equipment	361.068		Personal	(1)	Pipe and other agricultural equipment used to convey water for the irrigation of legal crops is exempt.
Pollution control devices	361.077	361.046-361.050	Both	(3)	Property used as a facility, device, or method for the control of air or water pollution is exempt. Taxpayer must supply an annual affidavit to assessor on a form approved by Department. Certain property is not exempt per NAC 361.046.
Possessory Interest –Vending stands	361.159		Personal	(3)	The possessory interest in otherwise exempt property is taxable, except for vending stands operated by blind persons under the auspices of the Bureau of Services to the Blind – DETR.
Possessory Interest – Public Airport	361.159		Personal	(2)	The possessory interest in otherwise exempt property is taxable, except for personal property owned and used in a public airport.
Possessory Interest – Public airport, park, market, fairground	361.157(2)(a)		Real	(2)	The possessory interest in otherwise exempt property is taxable, except for real property located upon a public airport, park, market, or fairground. Certain leased property on a pubic airport made available for purposes other than the purposes of a public airport is taxable.
Possessory Interest – Federal Property	361.157(2)(b)		Real	(1)	A possessory interest in federal property for which PILT payments are made is exempt.
Possessory interest – state-supported educational institution	361.157(2)c		Real	(1)	A possessory interest in the property of any state-supported educational institution is exempt, except any part located within a TIA created pursuant to NRS 278C.155.
Possessory interest – Taylor	361.157(2)		Real	(1)	A possessory interest in property used by

Exemption Type	NRS Reference	NAC Reference	Property Type	Due Date for Application See Legend	Explanation
Grazing Act, USFS, BuRec	(d)				persons, associations or corporations according to the Taylor Grazing Act, United States Forest Service or the Bureau of Reclamation is exempt.
Possessory interest – Indian tribe	361.157(2)(e)		Real	(1)	A possessory interest in property of any Indian held in trust by the U.S. is exempt.
Possessory interest – Vending stands of the blind	361.157(2)(f)		Real	(1)	A possessory interest in vending stand locations operated by blind persons under the auspices of the Bureau of Services to the Blind and Visually Impaired – DETR, is exempt.
Possessory interest – geothermal leases	361.157(2)(g)		Real	(1)	A possessory interest in geothermal leases for resources which have not been put into commercial production, is exempt.
Possessory interest – public officer or employee	361.157(2)(h)		Real	(1)	A possessory interest in property that is leased, loaned or made available to a public officer or employee in the course of public employment, is exempt.
Possessory interest – parsonage	361.157(2)(i)		Real	(1)	A possessory interest in a parsonage owned by a recognized religious society or corporation when used exclusively as a parsonage, is exempt.
Possessory interest – Charitable or religious residence	361.157(2)(j)		Real	(1)	A possessory interest in a residence used by a person carrying out the activities of a charitable or religious organization is exempt
Possessory interest – shelter for elderly or indigent	361.157(2)(k)		Real	(1)	A possessory interest in property which is used to provide shelter at a reduced rate to the elderly or indigent is exempt.
Possessory interest – rental of meeting rooms	361.157(2)(l)		Real	(1)	A possessory interest in property used as meeting rooms or similar facilities for periods of less than 30 consecutive days is exempt.
Possessory interest – daycare	361.157(2)		Real	(1)	A possessory interest in property used as a

Exemption Type	NRS Reference	NAC Reference	Property Type	Due Date for Application See Legend	Explanation
	(m)				daycare by a nonprofit organization is exempt.
Promissory Notes	Article 10		Personal	(1)	Articles of personal property deemed to represent an interest in real or personal property already assessed and taxed is exempt.
Privately owned airports used by public	361.061(2)		Real	(2)	Privately owned airport property used for a public purpose, except areas from which income is derived, is exempt.
Privately owned parks used by public	361.0605	361.080	Real	(2)	The initial claim for exemption must be accompanied by a copy of the agreement with a local government that the property may be used by the public without charge. A sign must also be posted at each entrance to park. The exemption does not include areas from which income is derived.
Public Function Trusts	361.062		Both	(2)	Property of a trust created for the benefit of any public function pursuant to law is exempt, however, PILT monies may be paid to the beneficiary if so provided in any agreement contained in creating the trust.
Radioactive fallout shelters	361.078		Real	(3)	Residential property is exempt up to $1,000 in assessed value if it meets certain qualifying conditions.
Raw materials & components consumed in the process of manufacture	361.068		Personal	(1)	Raw materials are exempt when they are held by a manufacturer for manufacture into products. Supplies consumed in the process of manufacture are also exempt.
Salvation Army Corps	361.11		Both	(2)	All real and personal property is exempt, unless it is used for a purpose other than the legitimate functions of the organization. *See also Nevada Museum of Art.*

Exemption Type	NRS Reference	NAC Reference	Property Type	Due Date for Application See Legend	Explanation
School districts	361.065		Both	(1) school dist	All property owned by any legally created school district or charter school and devoted to public school purposes is exempt.
				(2) charter school	
Sierra Arts Foundation	361.11		Both	(2)	All real and personal property is exempt, unless it is used for a purpose other than the legitimate functions of the organization. *See also Nevada Museum of Art.*
State lands	361.055		Both	(1)	All property owned by the state, except land assigned to the Department of Wildlife, is exempt. PILT payments are made by the Department of Wildlife.
Stocks	Article 10		Personal	(1)	Articles of personal property deemed to represent an interest in real or personal property already assessed and taxed is exempt.
Surviving Spouse	361.080		Both	(3)	Property of surviving spouses up to an assessed value of $1,000, as modified by CPI, is exempt. The original affidavit of claim must be accompanied by a death certificate showing the claimant was married to the deceased at the time of their death. Renewal affidavits must be completed each year.
Surviving Spouses of Disabled Veterans	361.091		Both	(3)	See Disabled Veterans.
Transient Personal Property	361.068		Personal	(1)	Personal property owned by a non-resident and located in Nevada for purposes of a display, exhibition, convention, carnival, fair or circus is exempt. *See also Carnival, fair circus.*

Exemption Type	NRS Reference	NAC Reference	Property Type	Due Date for Application See Legend	Explanation
United States	361.050		Both	(1)	All property owned by the United States is exempt.
University Fraternities & Sororities	361.100		Real	(2)	Real property owned by fraternities and sororities whose members are students at UNR or UNLV and use the property as their home, is exempt.
University System: Charitable Foundation	361.098		Both	(2)	All property owned by a charitable foundation established by the Board of Regents of the University of Nevada is exempt, unless it is used for a purpose other than the legitimate functions of the foundation.
University System Leased Property	361.099	361.070	Both	(2)	Property leased to the Nevada System of Higher Education is exempt if the total consideration from the lease is less than 10 percent of the fair market value of the property. Certain documentation must be provided. *See NAC 361.070.*
Unpatented Mines & mining Claims	361.075		Real	(1)	Unpatented mines and mining claims are exempt, except for possessory interests in lands held by U.S. or state of Nevada.
Vehicles	361.067		Personal	(1)	*See Motor Vehicles*
Veterans	361.09		Both	(3)	Up to $2,000 assessed value, adjusted by CPI, of property may be exempt. Only the property of residents meeting certain qualifying criteria is eligible for exemption.
Veteran Organizations	361.095		Both	(2)	Up to $10,000 assessed value, adjusted by CPI, of Funds, furniture, paraphernalia and regalia owned by certain charitable organizations as well as real estate and fixtures, is exempt. If the real estate is leased, the exemption does not apply to the portion so leased or rented.

Exemption Type	NRS Reference	NAC Reference	Property Type	Due Date for Application See Legend	Explanation
Volunteer Fire Departments	361.150		Both	(2)	All property is exempt, unless it is used for any purpose other than carrying out the legitimate functions of a volunteer fire department.
Water Users' Nonprofit Associations	361.073		Both	(2)	All property is exempt, unless it is used for any purpose other than carrying out the legitimate functions of a water users' nonprofit cooperative corporation.
Young Men's Christian Association	361.110		Both	(2)	All real and personal property is exempt, unless it is used for a purpose other than the legitimate functions of the organization. *See also Nevada Museum of Art.*
Young Women's Christian Association	361.110		Both	(2)	All real and personal property is exempt, unless it is used for a purpose other than the legitimate functions of the organization. *See also Nevada Museum of Art.*

APPENDIX E

2022-23 PERSONAL PROPERTY MANUAL: VALUATION GUIDELINES

Determining Whether Fixtures are Real or Personal Property

NRS 361.333 requires that each major class of property be examined to determine whether there is equality of assessment. One of the principal classes of property is personal property, pursuant to NRS 361.227(4). Uniformity and equality of assessment thus depend on proper classification. Although NRS 361.035 defines real estate and NRS 361.030 defines personal property, in practice it is sometimes difficult to tell whether an item is personal property or a fixture that is part of the real estate. As the Attorney General stated in Opinion #41 (1963), "the classification depends on the facts of each particular case." The assessor is encouraged to consult the Division of Local Government Services and/or the District Attorney in difficult cases.

A fixture may be defined as an item that was originally personal property which has been installed or attached to land or an improvement in a permanent manner. There is an abundant amount of case law which discusses three tests often used in deciding whether an item is a fixture. The tests are:

1. Physical Annexation;
2. Constructive Annexation, also called Adaptation; and
3. Intent

Under the first test, annexation, an item is a fixture if it is attached to, imbedded in or permanently resting upon land or an improvement, or is attached by other means that are normally used for permanent installation, and cannot be removed without substantially damaging the item or the land or improvement with which it is being used. For example, an item which is attached to real property for stability and has quick disconnect attachments such as simple wiring and conduit connections may not meet the test for a permanent fixture.

Under the second test, constructive annexation, an item is a fixture if the use or purpose of an item that is not otherwise physically annexed to land or an improvement is so adapted that it is:

A. A necessary, integral or working part of the land or improvement;
B. Designed or committed for use with the land or improvement; or
C. So essential to the land or improvement that the land or improvement cannot perform its desired function without the nonattached item.

Using the constructive annexation test, if the purpose of the item is to augment the use of the improvement no matter how it is attached, such as an elevator, the item must be considered a fixture. Another example would be heating, ventilation, and air conditioning equipment (HVAC). Equipment used to heat, ventilate, or cool a structure is considered to be real property.

Permanently attached personal property may be temporarily removed for repair or renovation onsite and still be considered permanently attached. Permanently attached fixtures do not include movable tangible personal property that is attached for convenience, stability or an obviously temporary purpose.

Underlying both the physical or constructive annexation tests is a determination of intent. An assessor must consider whether the item is intended to be a permanent part of the land or improvement, taking into account physical or constructive annexation, and other objective manifestations of permanence. NAC 361.1127 provides examples of objective manifestations of permanence.

A trade fixture may be distinguished from a fixture. It is an item of personal property that is non-permanently attached to real property for the purpose of conducting a business or trade; and has a unique identity and function separate from the real property to which it is attached. NAC 361.11745 provides a definition of trade fixture.

Pursuant to NRS 361.244, a mobile or manufactured home becomes real property when the Assessor has listed it on the tax roll as real property. The classification of mobile and manufactured homes as real property may be made when the requirements enumerated in NRS 361.244(1) and (2) are met. This includes the issuance of a Real Property Notice by the Manufactured Housing Division of the Department of Business and Industry. Factory-built housing becomes real property once it is permanently affixed to the land. These housing units conform to the Uniform Building Code and are not titled. As such they are not personal property nor are they considered "conversions". These "UBC" homes do not exhibit the HUD placards found on manufactured housing. Instead they may have a placard referencing NRS 461.080 and their serial numbers may begin with the characters "UBC".

In general, personal property is defined by exception pursuant to NRS 361.030. Property that does not meet the criteria of real property is personal property. The Assessor should recognize that certain fixtures such as bars, stages, walk-in coolers, or bank drive-ups, may already be included in the real property component of the Assessor's Taxable Value. The Assessor should review the differing building occupancies of the Marshall-Swift cost manuals to ensure that a component of real or personal property is not double-assessed. The improper classification of any component of taxable property as real or personal does not render the valuation void or invalid.

For further research and explanation, please consult:

Attorney General Opinion 2012-10 (10-31-2012) (as it applies to fixtures, not to trade fixtures)
Attorney General Opinion #41 (1963)
Attorney General Opinion No. 2000-04
Marvin Arnold, Respondent, v. Goldfield Third Chance Mining Co, 32 Nev. 447; 109 P. 718 (1910)
National Advertising Co. v. State Department of Transportation, 116 Nev. Adv. Op. No. 10, (Feb. 2, 2000)
Fondren, et al, v. K/L Complex Ltd., et al., 106 Nev. 705; 800 P.2d 719; (1990)
Morse Signal Devices of California v. County of Los Angeles, 161 Cal. App. 3d 570; 207 Cal Rptr. 742 (1984)
Crocker National Bank v. City and County of San Francisco, 782 P.2d 278 (1989)
State v. Pioneer Citizens Bank of Nevada, 85 Nev. 395 (1969)
Kaiser Co. v. *Reid* (1947) 30 Cal.2d 610

References:

International Association of Assessing Officers, Standard on the Valuation of Personal Property, December, 2005. This publication may be obtained free of charge from the IAAO website at http://docs.iaao.org/media/standards/StandardValuationPersonalProperty.pdf

The Appraisal Institute: The Appraisal of Real Estate, 14th Edition, Chicago: 2013

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