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Summer Reliability Workshop

California Energy Commission

Date: 05/29/2024



Housekeeping

- Administrative questions: Zoom Chat function
- Public comments due June 12, 2024
- CEC Docket 21-ESR-01



Comments from the Dais



Introduction – Workshop Overview

- Anticipated Summer Situation
- Summer Reliability Assessments
- Need for Contingencies
- Emergency Security Plan





Panel: Anticipated Summer Situation

Moderator: Liz Gill

- A. Westwide Weather, Amber Motley, California ISO
- B. Westwide Fire Outlook – Jeff Fuentes, CALFIRE
- C. Westwide Reliability - Branden Sudduth, WECC
- D. CPUC New Resources – Christine Root, CPUC
- E. DWR Hydro Conditions – Anthony Agustin, Department of Water Resources



California ISO

2024 Summer Meteorological Outlook – May 2024

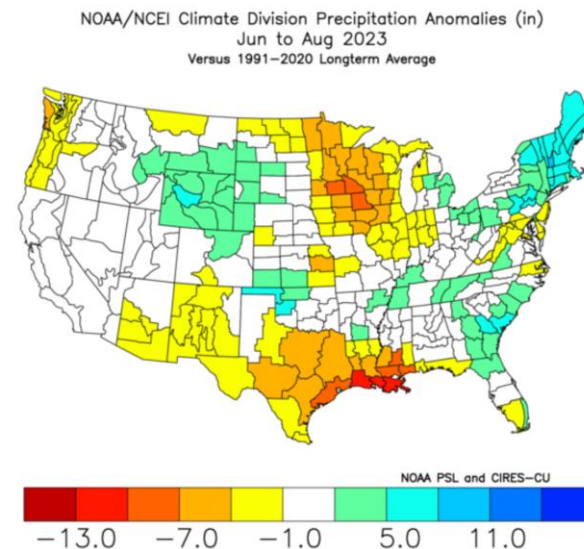
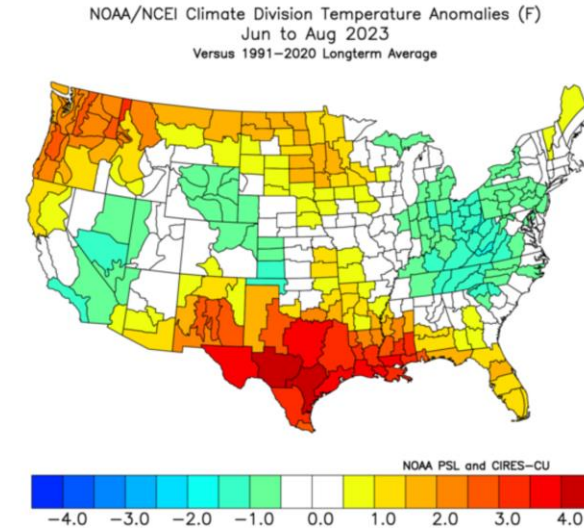
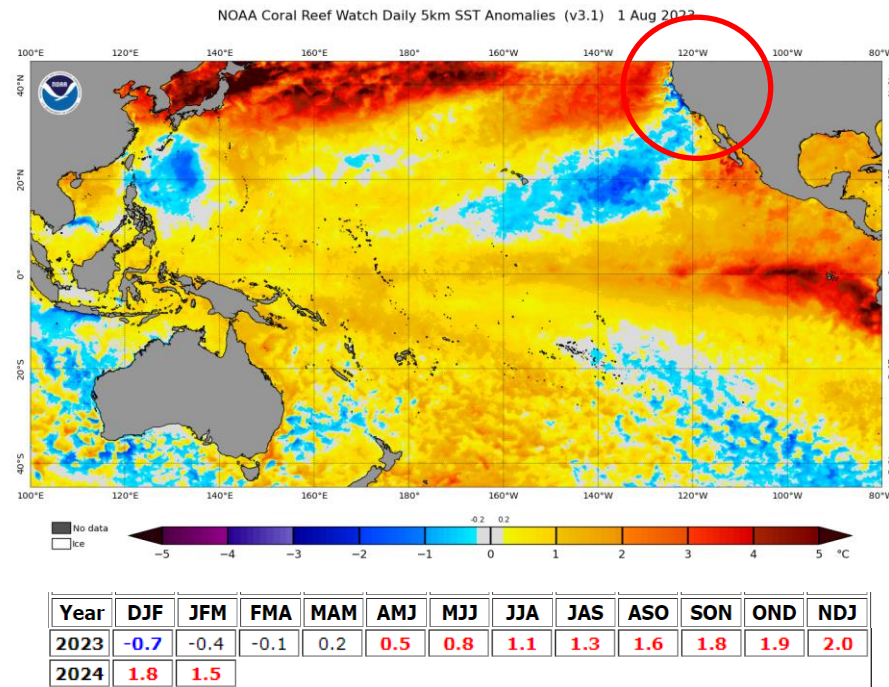
Amber Motley
Director, Short Term Forecasting



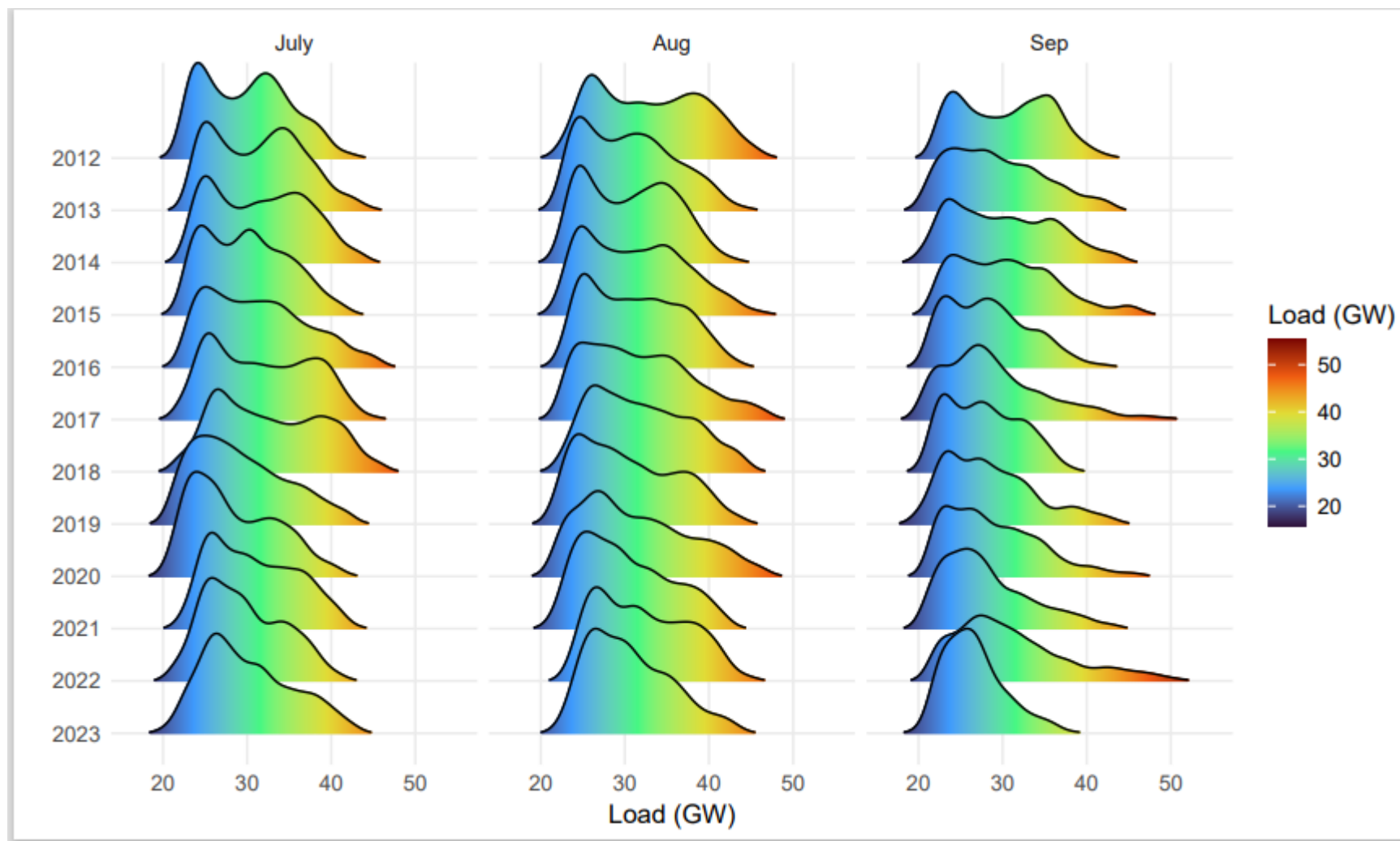
OVERVIEW OF LAST SUMMER SYSTEM CONDITIONS

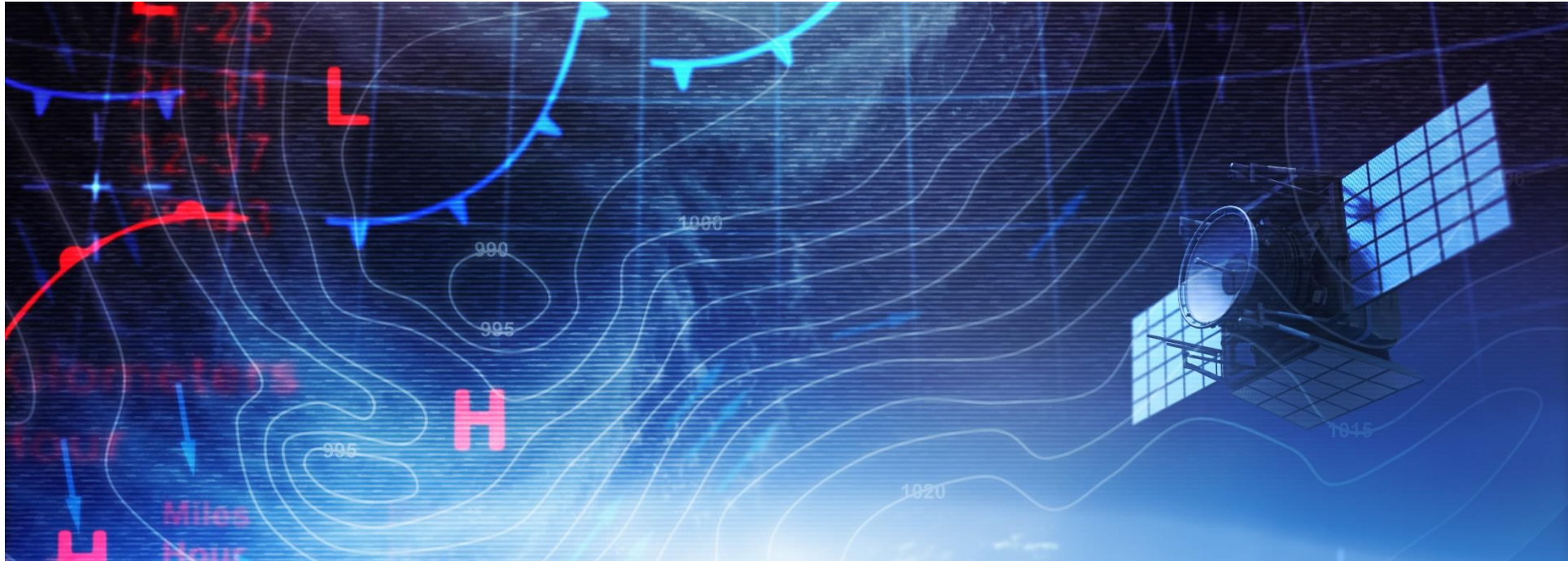
2023 Summer: Observations

- Below normal temperatures for much of California
 - Hurricane Hilary brought unusual August rain
- Above normal temperatures for Pac NW and north central



California load patterns moderated relative to September 2022

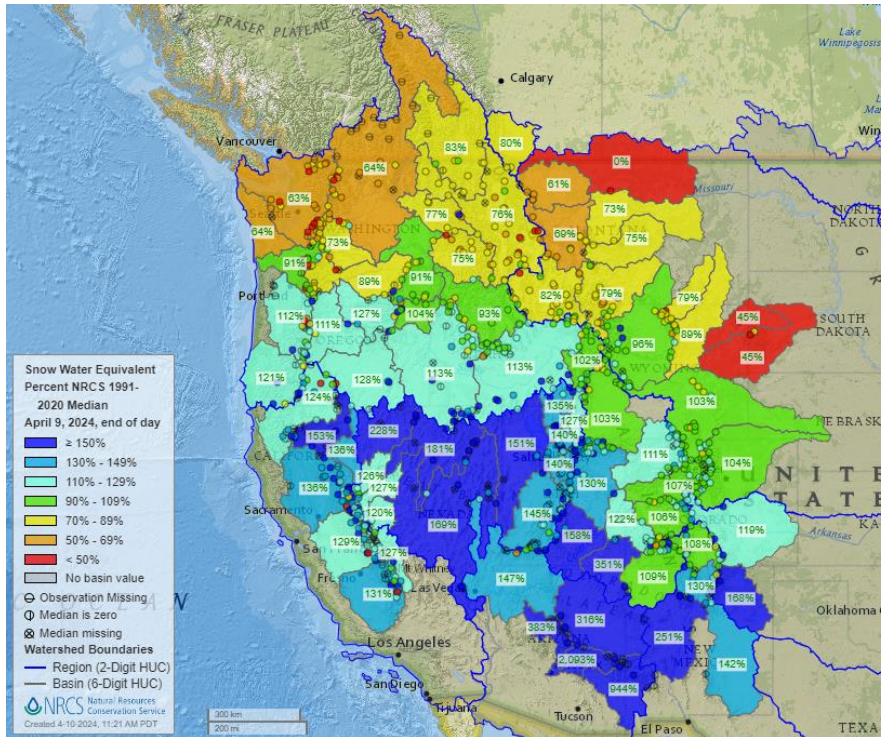




METEOROLOGICAL OUTLOOK SUMMER 2024

Above normal snow water equivalent across the central mountains, with continued dry conditions in Pacific Northwest

Snow Water Equivalent



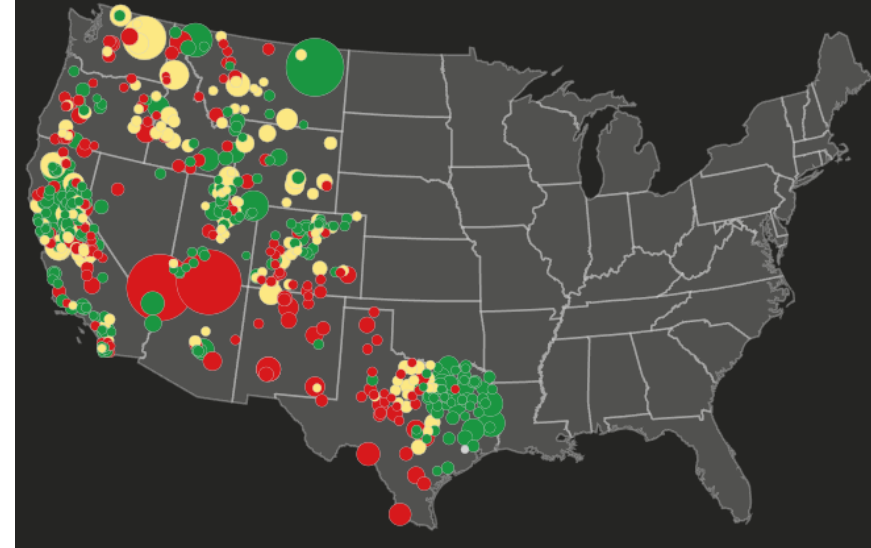
Reservoirs

Percent Full for Month Ending (March 2024), or Most Recently Available Month

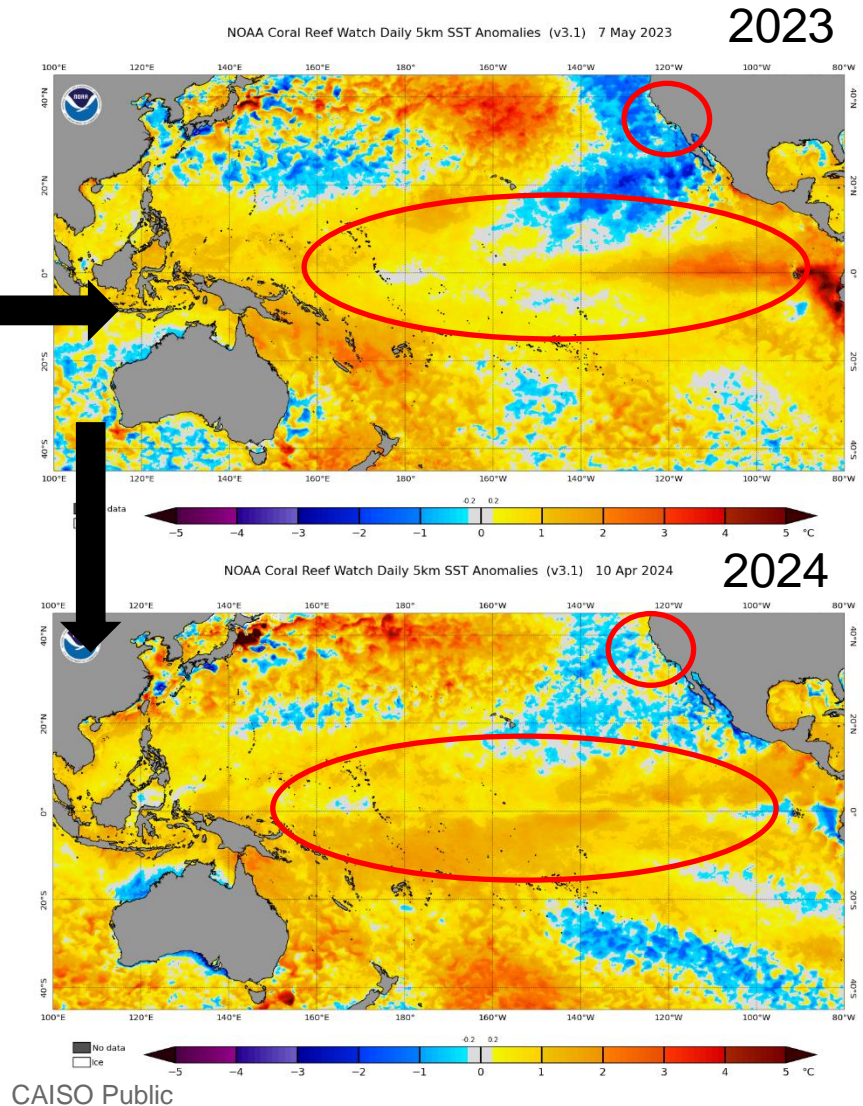
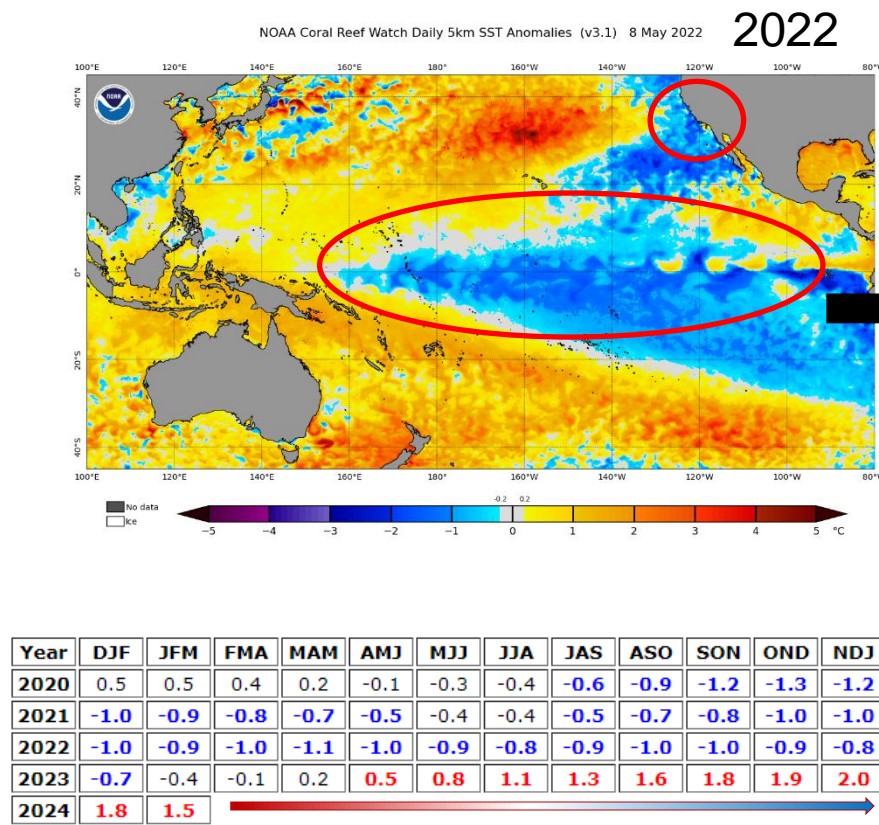
75%+ 50%+ Less than 50%

Reservoir Capacity (acre feet)

0 6,469,250 12,938,500 19,407,750 25,877,000



La Niña vs El Niño SST anomalies

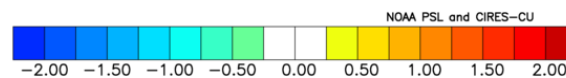
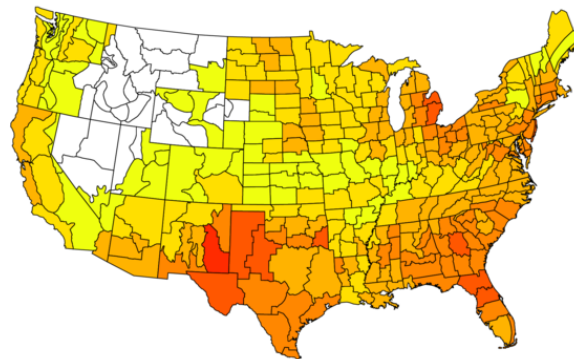


Similar pattern years: 2020, 2019, **2016**, 1998

- Focusing on years with similar SST and El Niño patterns
- Watching positioning of ridge; movement can shift the ridge of heat further west and allow for warmer temperatures in the Western US.

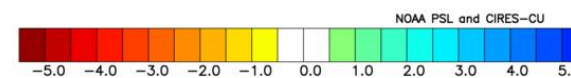
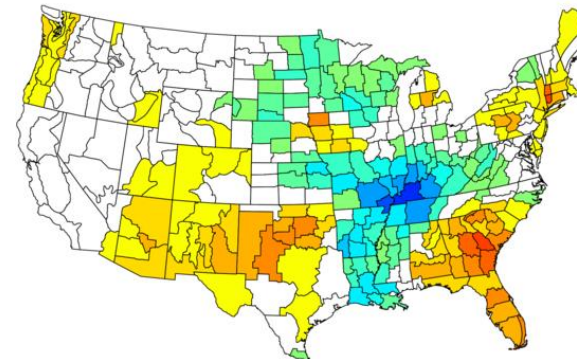
Temperature

NOAA/NCEI Climate Division Composite Temperature Anomalies (F)
Jun to Aug 2016,2020,2019,1998
Versus 1991–2020 Longterm Average



Precipitation

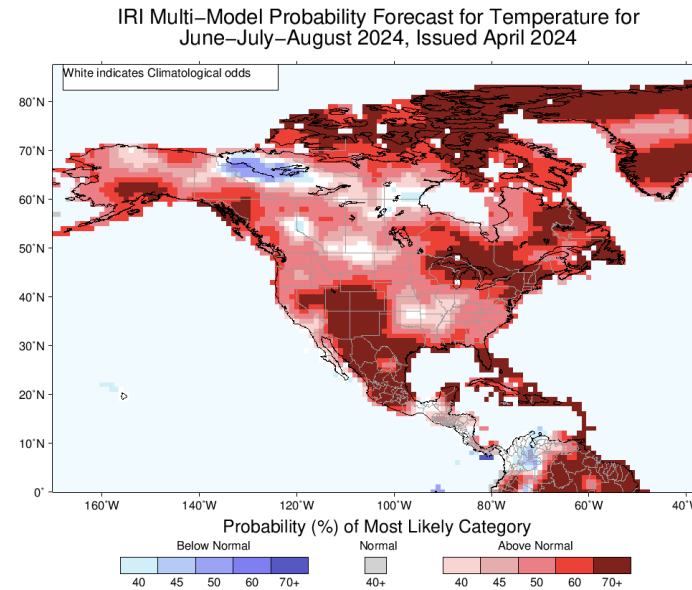
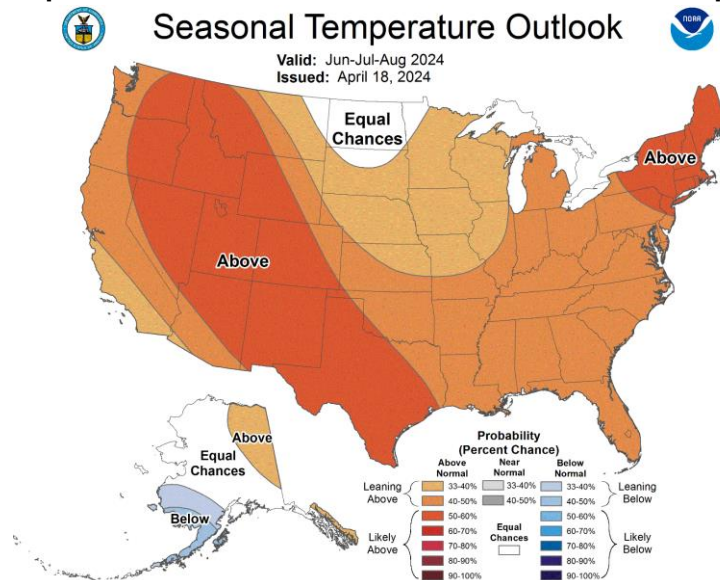
NOAA/NCEI Climate Division Composite Precipitation Anomalies (in)
Jun to Aug 2016,2020,2019,1998
Versus 1991–2020 Longterm Average



Western Weather Outlook - Temperature

June 2024 – August 2024

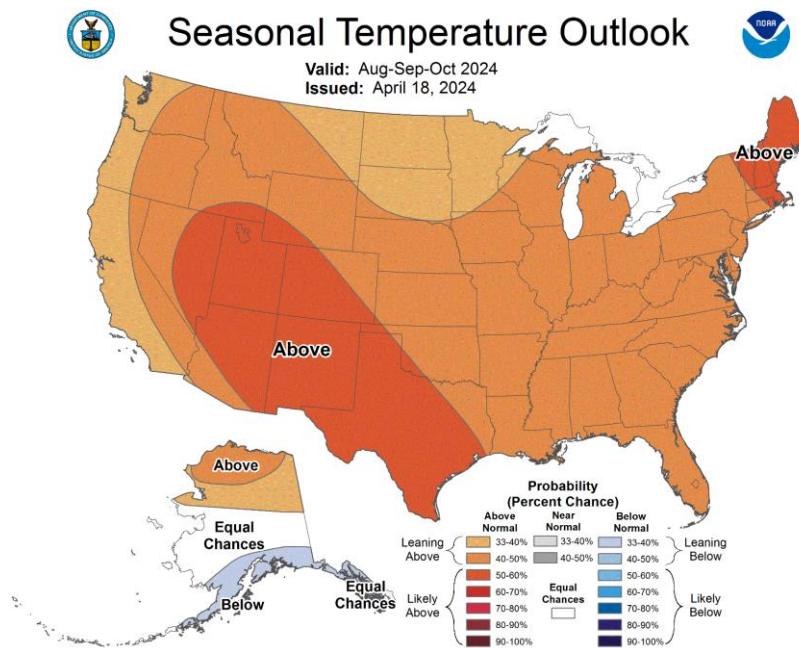
- **Temperature:**
 - Anticipating cooler June and July, heating up for August onward. Especially for interior areas across the West.
 - The probability that the average temperature will be above average is the highest throughout the Desert Southwest and Rockies region.
 - Low probability of above normal temperatures along coastal CA, with higher probabilities of above normal temperatures for interior CA.



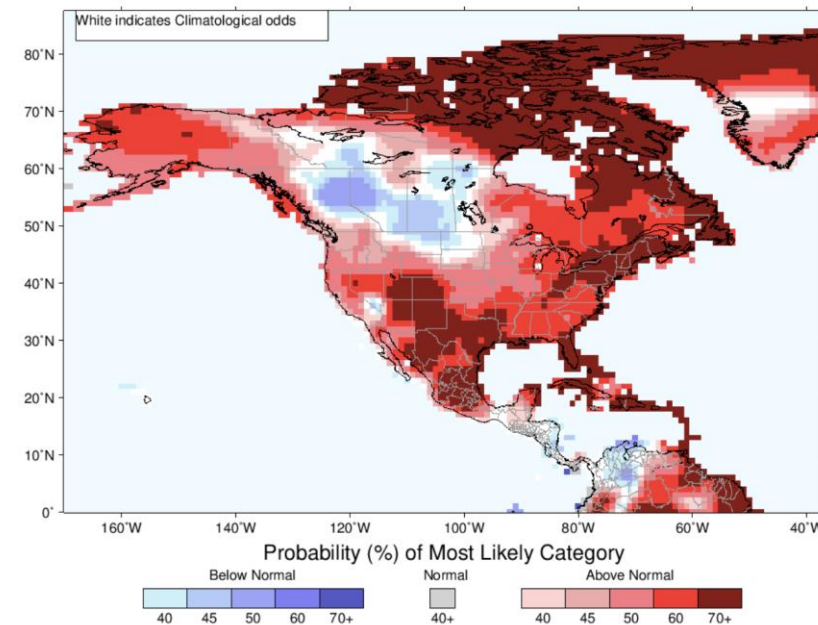
Western Weather Outlook - Temperature

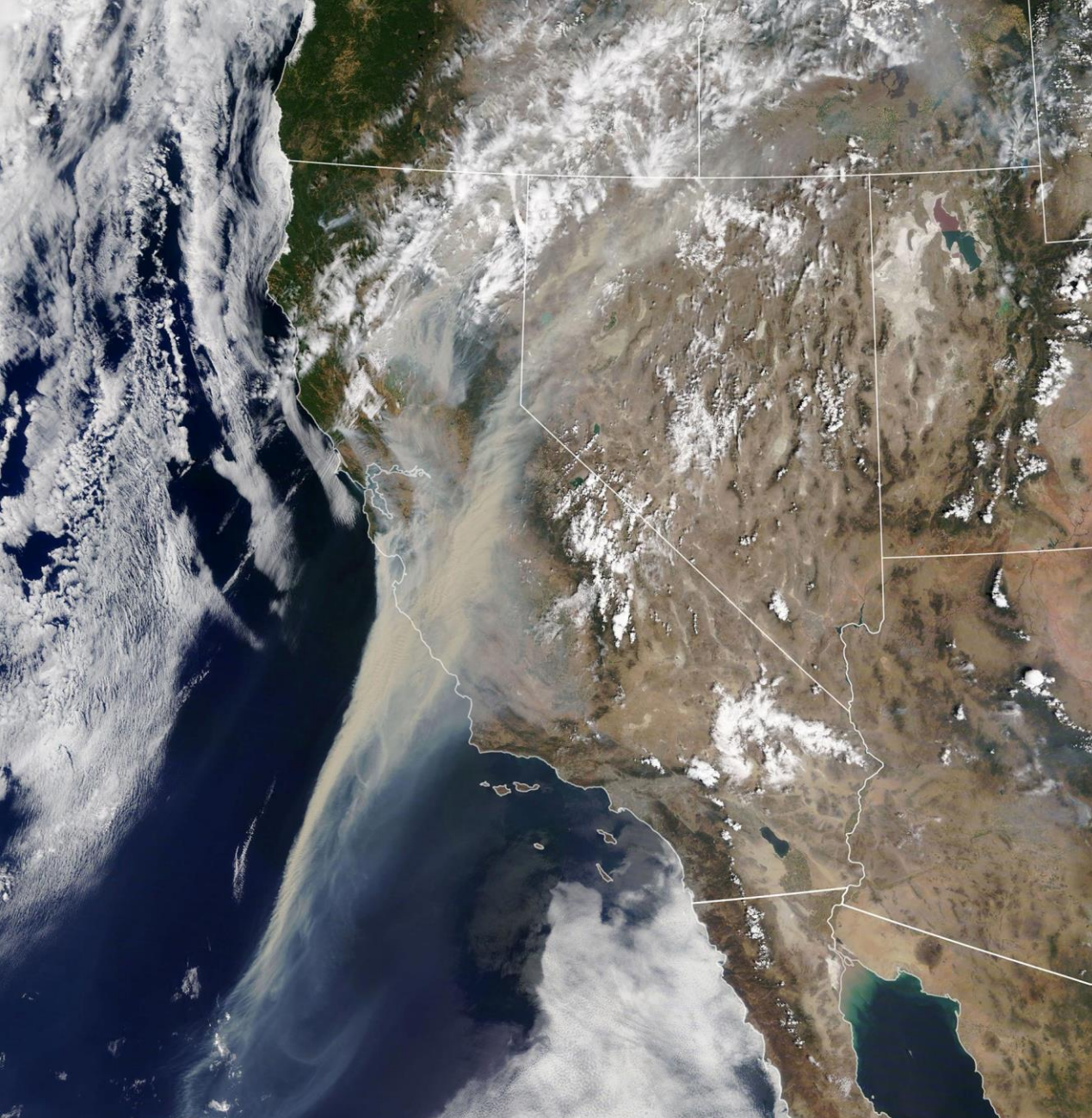
August 2024 – October 2024

- **Temperature:**
 - Potential for above normal temperatures in August and September, primarily for the Western interior centered around the four corners.
 - Lower risk for above normal temperatures throughout coastal areas.



IRI Multi-Model Probability Forecast for Temperature for August–September–October 2024, Issued April 2024





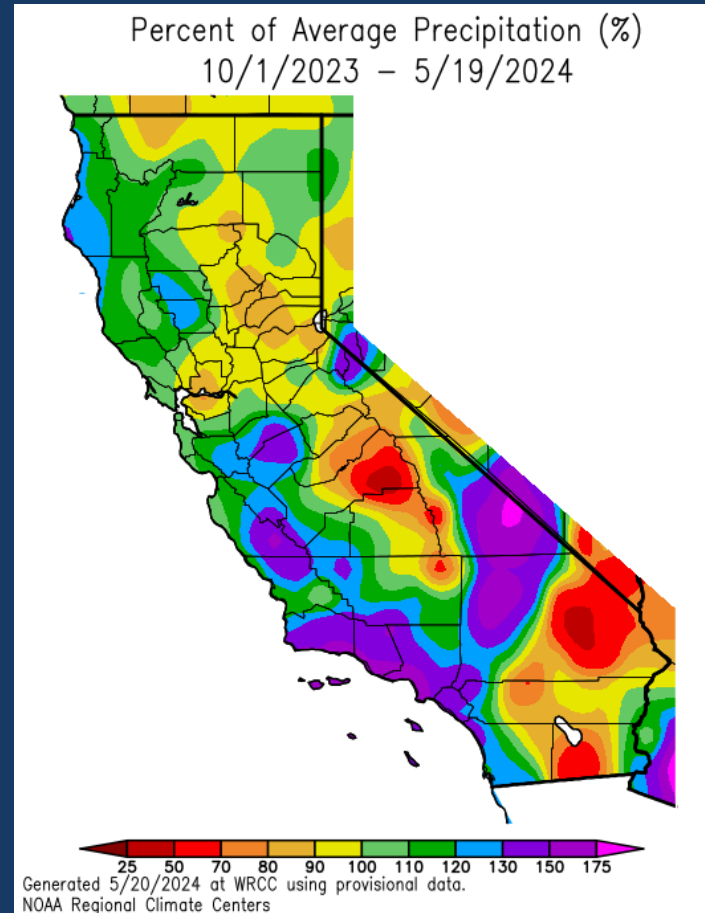
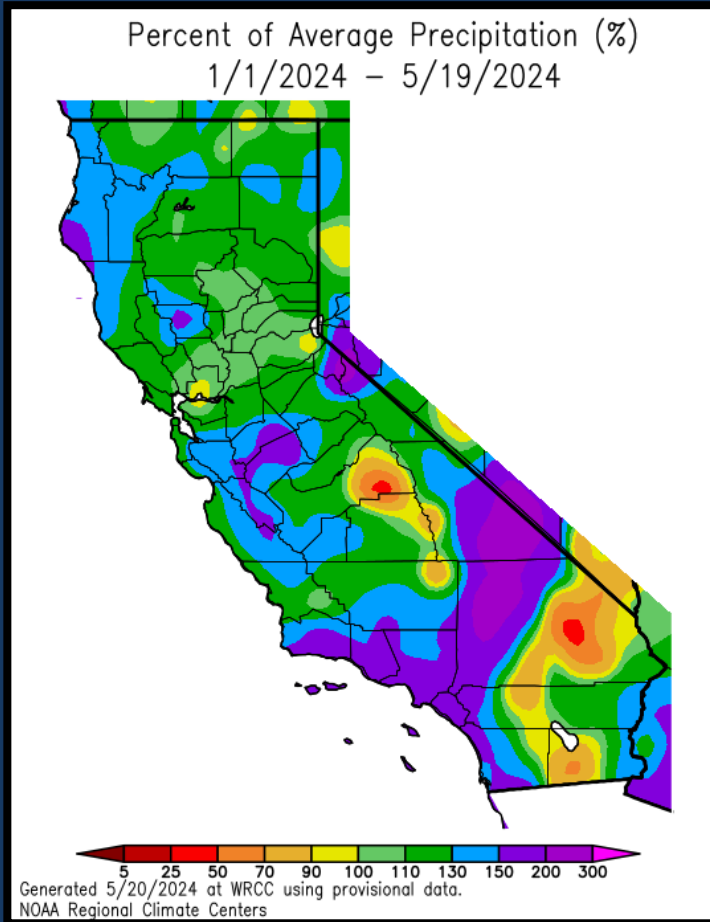
California Seasonal Outlook

May – August 2024

CEC Summer Reliability Workshop



Weather Discussion: Percent of Average Precipitation

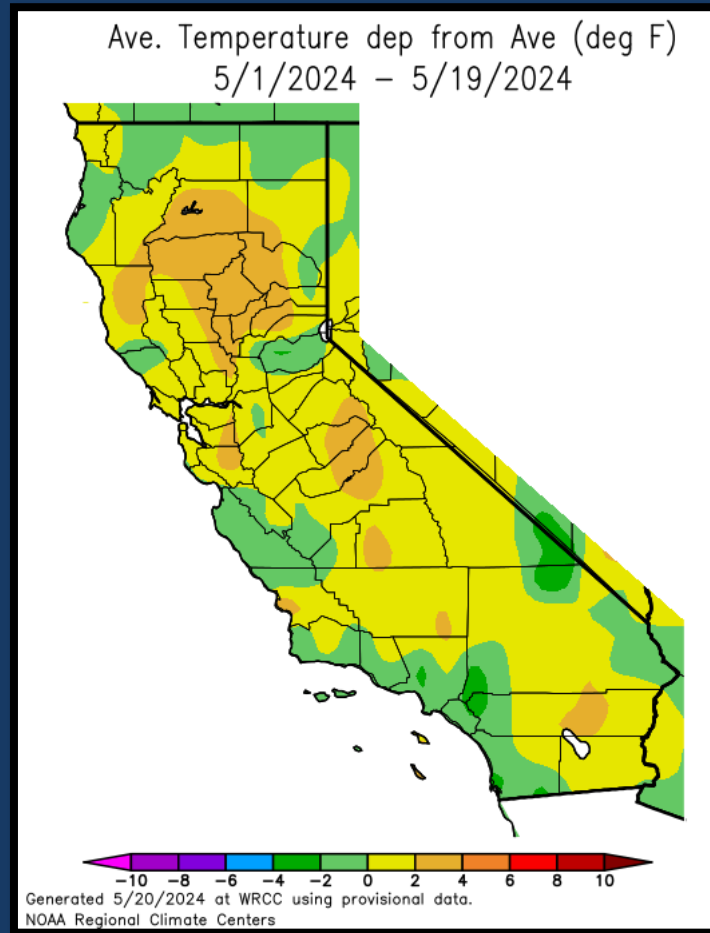
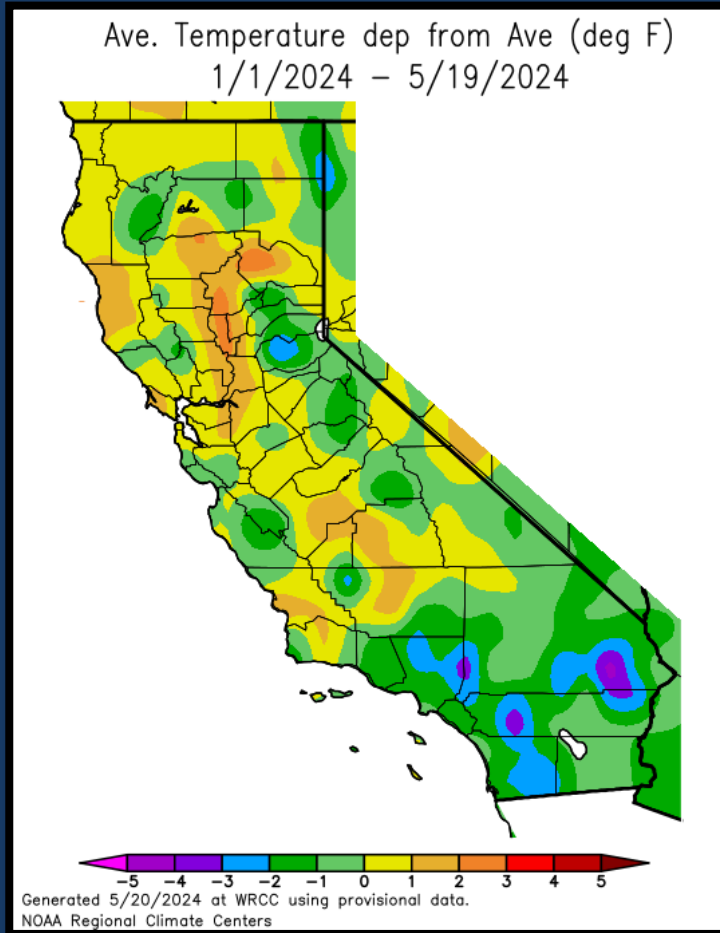


- Since January 1, most regions of the state have received normal to above normal percent of average precipitation
- For the water year, below normal precipitation in portions of the Sierra Nevada, Sacramento & San Joaquin Valleys, Tulare basin, and Desert Regions.

Precipitation

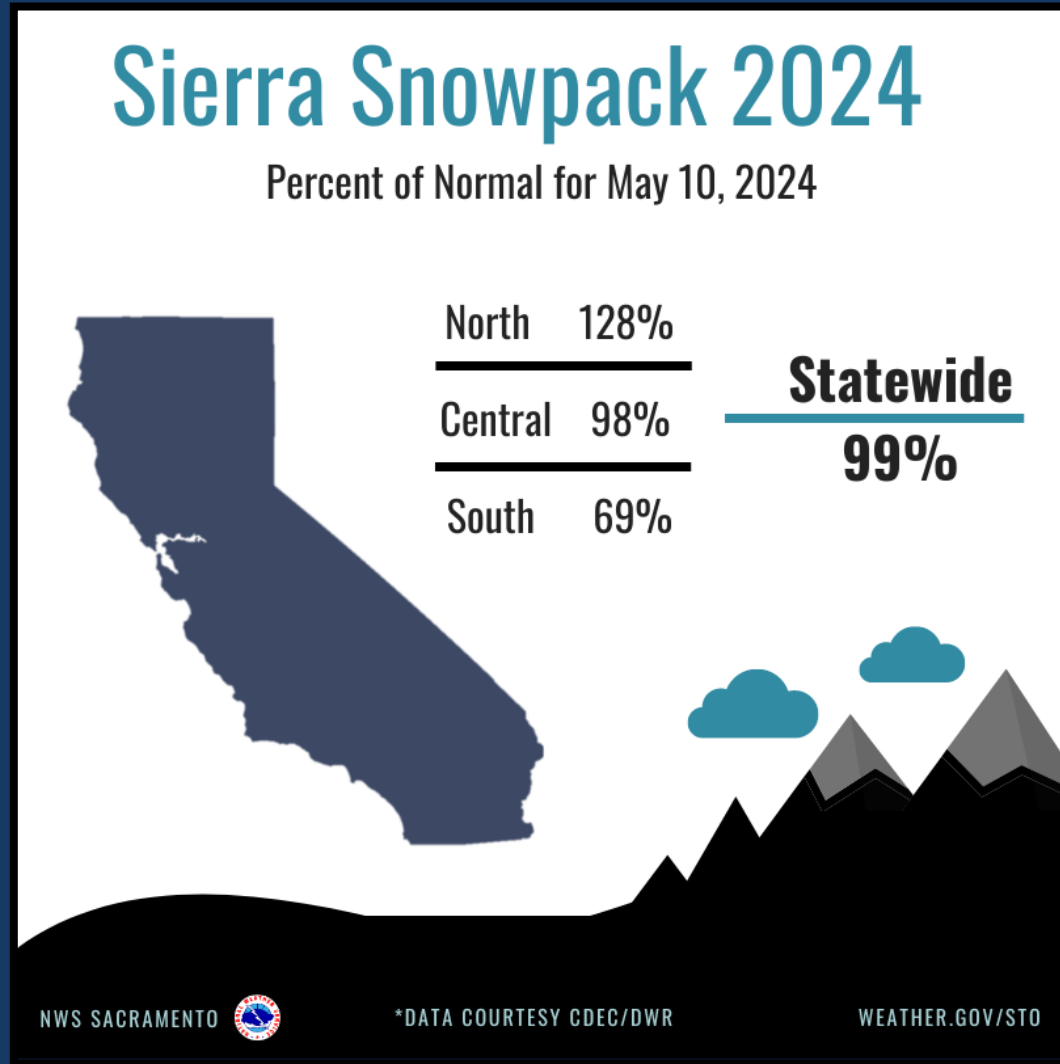
Source: [CalClim: California Climate Data Archive \(dri.edu\)](https://calclim.org/)

Weather Discussion: Percent of Average Temperature



- Temperatures below normal for large portions of Southern region. Above normal in Central and Northern California since Jan.1 2024
- For May, above average temperatures for large portions of the state.

Weather Discussion: Snowpack

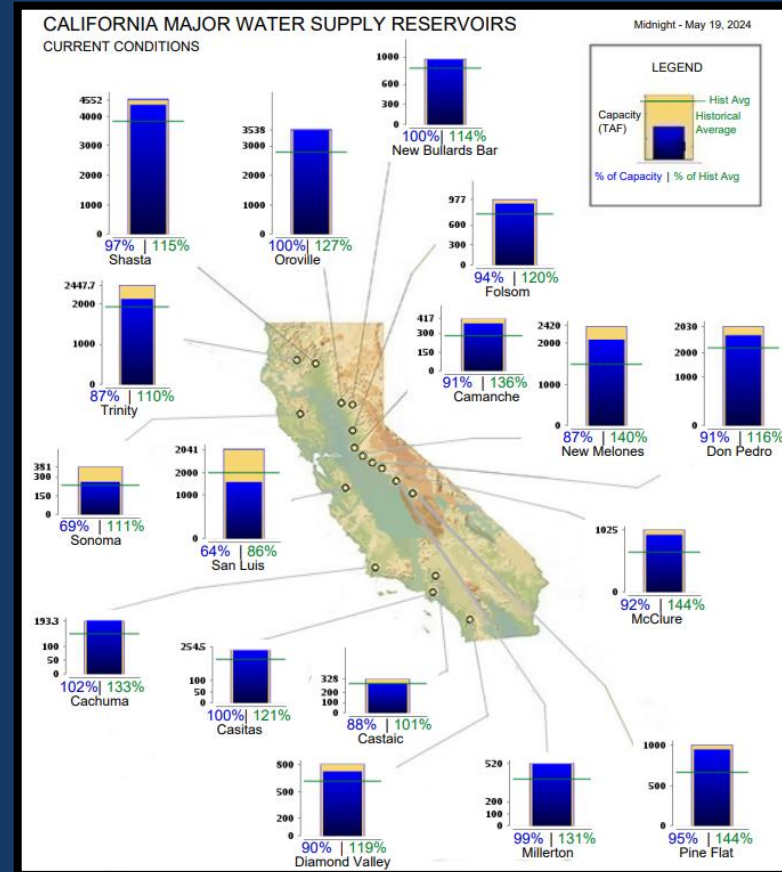


- El Niño influenced warmer storms leading to elevated snow lines early-on in winter.
- The snowpack was at 35% of normal in January before colder storms arrived allowing it to reach 'normal' levels.
- California now at 67% of its snowpack average for May 20.

Weather Discussion: Reservoir Storage



California's 2nd-largest reservoir reaches full capacity for 2nd consecutive year



- Reservoirs were in good shape at the start of the rainy season
- Plenty of runoff through the winter and seasonable snowpack assure good water storage

Reservoir Status

Source: [Visualizing California's Water Storage - Reservoirs and Snowpack - Engaging Data \(engaging-data.com\)](https://engaging-data.com/)

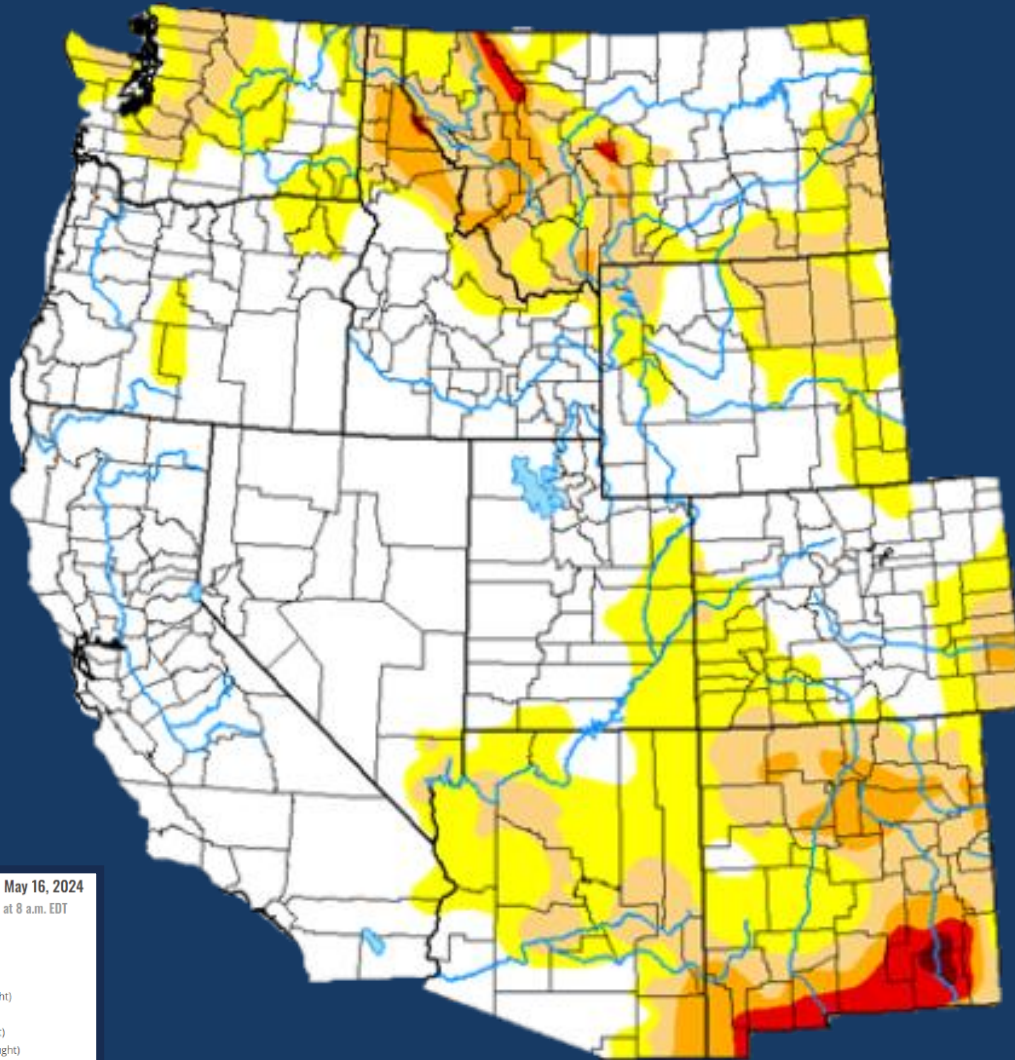
Weather Discussion: Drought Monitor

California

- Tropical moisture in the summer of 2023 along with the ‘normal’ winter has left only a small portion of the State in “Abnormally Dry”

Oregon/Washington

- Drought conditions remained mostly unchanged in comparison to 2023.
- Abnormally dry to moderate drought in many portions of Oregon and Washington.



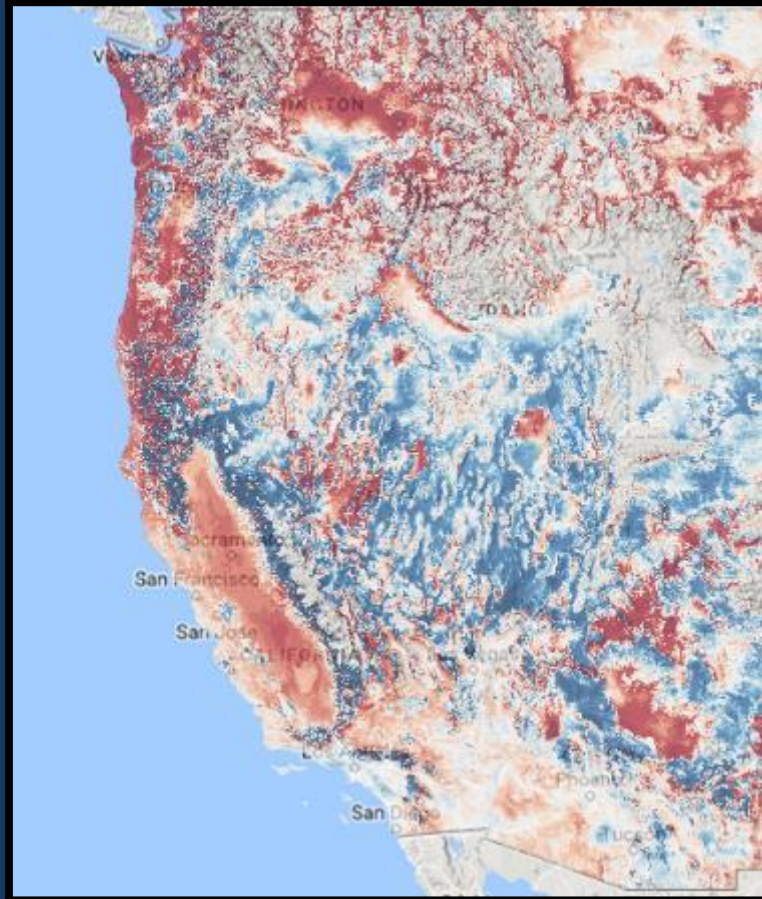
Map released: Thurs. May 16, 2024
Data valid: May 14, 2024 at 8 a.m. EDT

Intensity

None
D0 (Abnormally Dry)
D1 (Moderate Drought)
D2 (Severe Drought)
D3 (Extreme Drought)
D4 (Exceptional Drought)
No Data

Status of Spring 2024

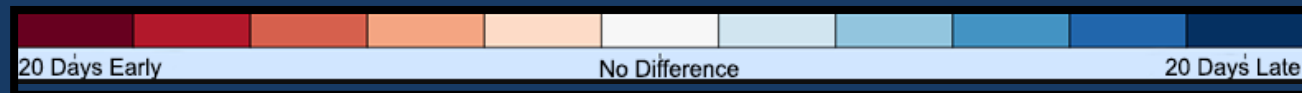
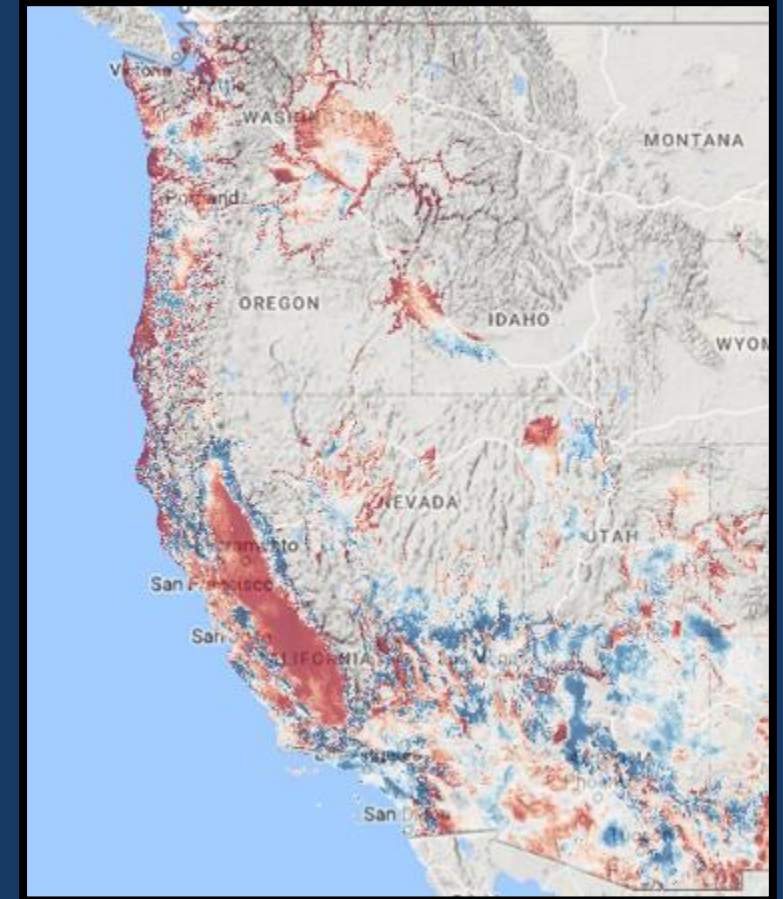
Spring Leaf Index



How does this
spring compare
to “normal”?



Spring Bloom Index

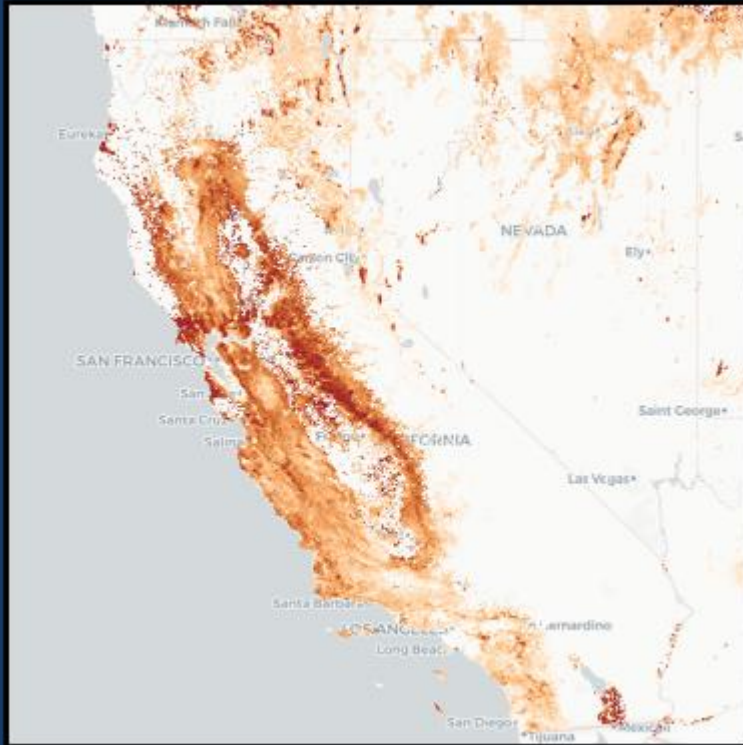


USA National Phenology Network

Source: [Status of Spring](https://usanpn.org/status-of-spring/) | [USA National Phenology Network \(usanpn.org\)](https://usanpn.org)

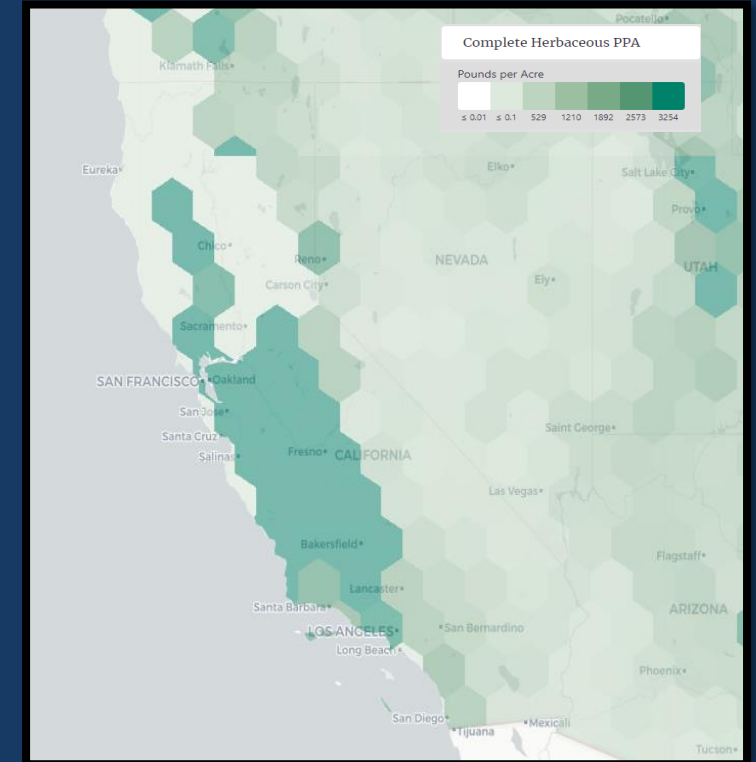
Fuels Discussion: 2024 Light Fuels

2023 Grass Fuel Load



- Last year's herbaceous grass crop remains.
- Nearly average herbaceous growth in large portions of CA.
- Grass fires will remain prevalent with rate of spread more consistent with historic rates once cured

2024 Grass Fuel Loading



Fuels Discussion: Herbaceous Growing, Drying Soon



- Annual grasses are in full flush of growth below 6,000' elevation
- San Joaquin Valley grasses cured quickly on southerly slopes and beginning on northern exposures
- Sacramento Valley grasses curing where soils are thinner and with southern exposure

Fuels Discussion: Shrub and Tree Live Fuels



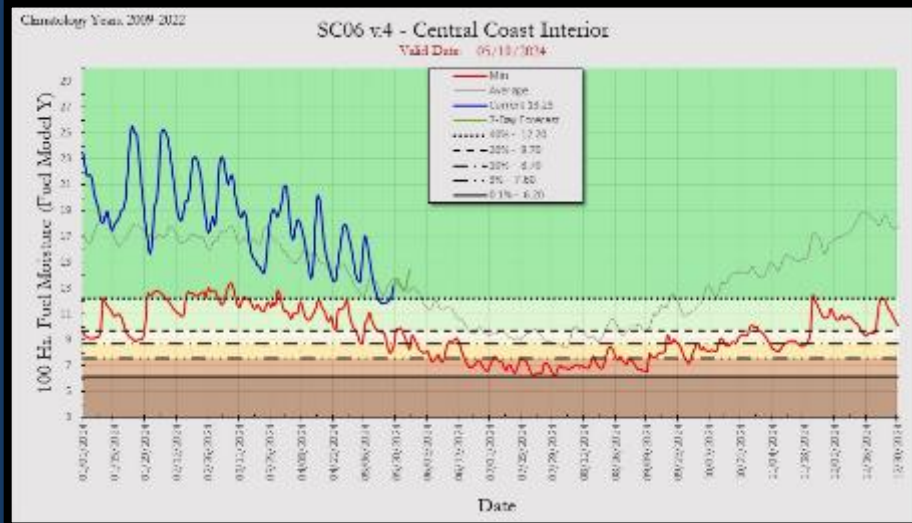
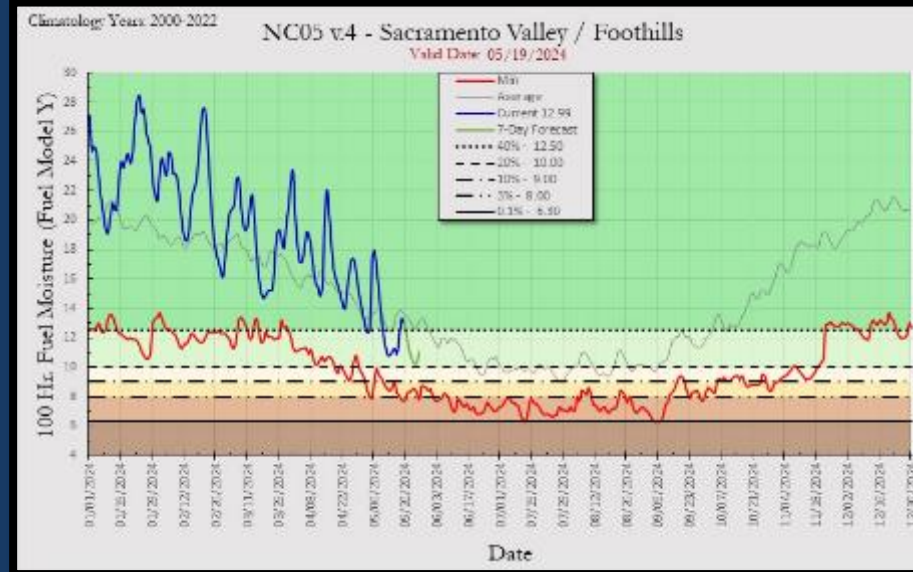
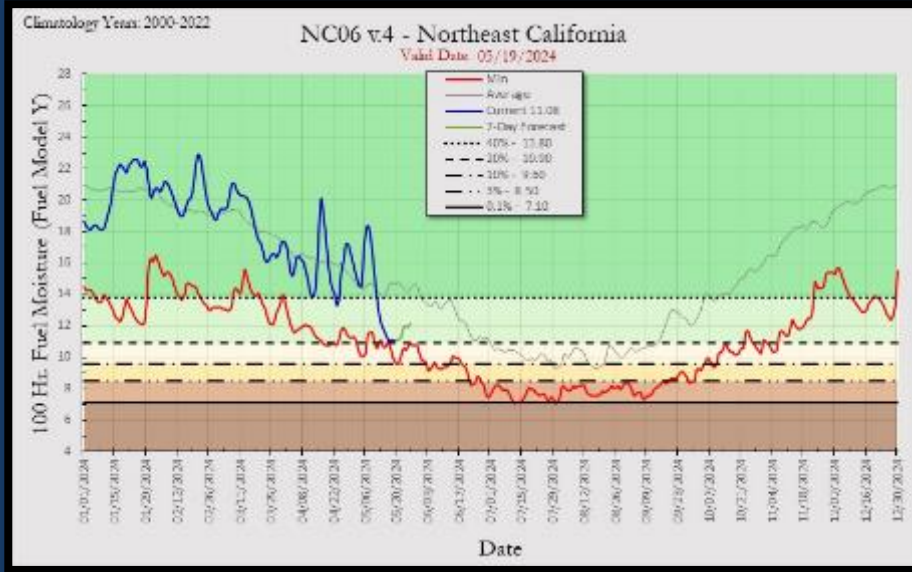
- Green-up of woody vegetation well under way below 4,000-ft; live fuel moistures trending near normal with high soil moisture levels
- Heavier live fuels should retain enough moisture to resist fire spread through June
- Favorable prescribed fire condition predicted

Fuels Discussion: Accumulated Fuel Loading



- Storm damage from last year has had a year to cure and compact
- Dead and Down vegetation still available fuel for 2024

Fuels Discussion: 100-hour Dead Fuels



- 100-hr fuels moistures are near to below normal for seasonal averages
- Fuels conditions should provide time for prescribed burning

100-hour Dead Fuels

Source: [Predictive Services, Fuels and Fire Danger \(nifc.gov\)](https://nifc.gov)

Four-month Significant Fire Potential

May – August 2024 California Highlights

- Timely cool/moist intrusions in the form of showers or higher humidity due to dominant onshore flow are expected for the next four months as El Niño is weakening and trending to a neutral state
- Problematic lightning is expected to be less this summer due to a more subdued North American Monsoon and less East Pacific tropical influences with a developing La Niña
- Herbaceous curing will be more noticeable latter half of May into June across the lowlands and likely lead to an uptick in Initial Attack fires and more growth.

Four-month Significant Fire Potential

May – August 2024 California Highlights

- With a developing La Niña in the summer, it favors a warmer and drier period especially with sea surface temperatures cooling in the Gulf of California that lessen the chance of convection forming and moving into the Four Corners region
- The prescribed fire burn window for larger projects should be favorable the rest of the spring into July as dead and live fuel moistures will remain well above normal

Four-month Significant Fire Potential



Four-month Significant Fire Potential

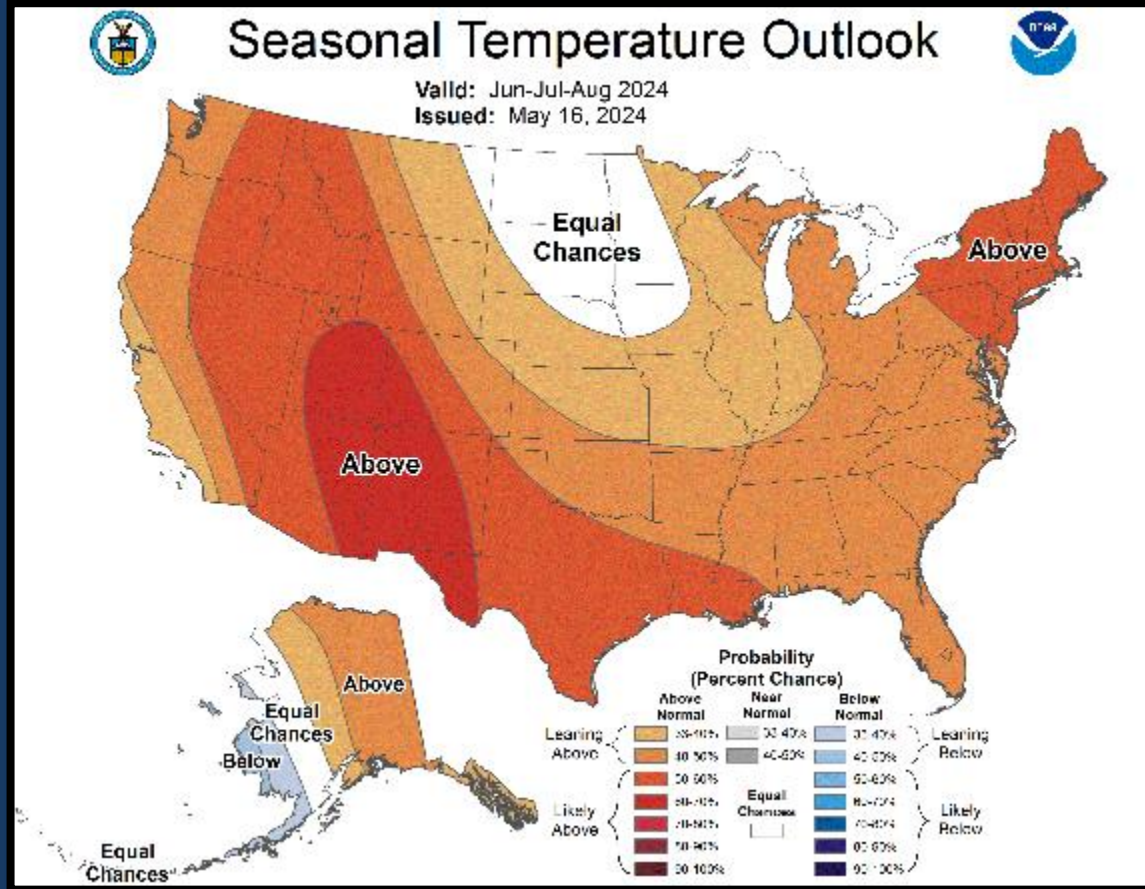


Predictive Services Areas July & August 2024

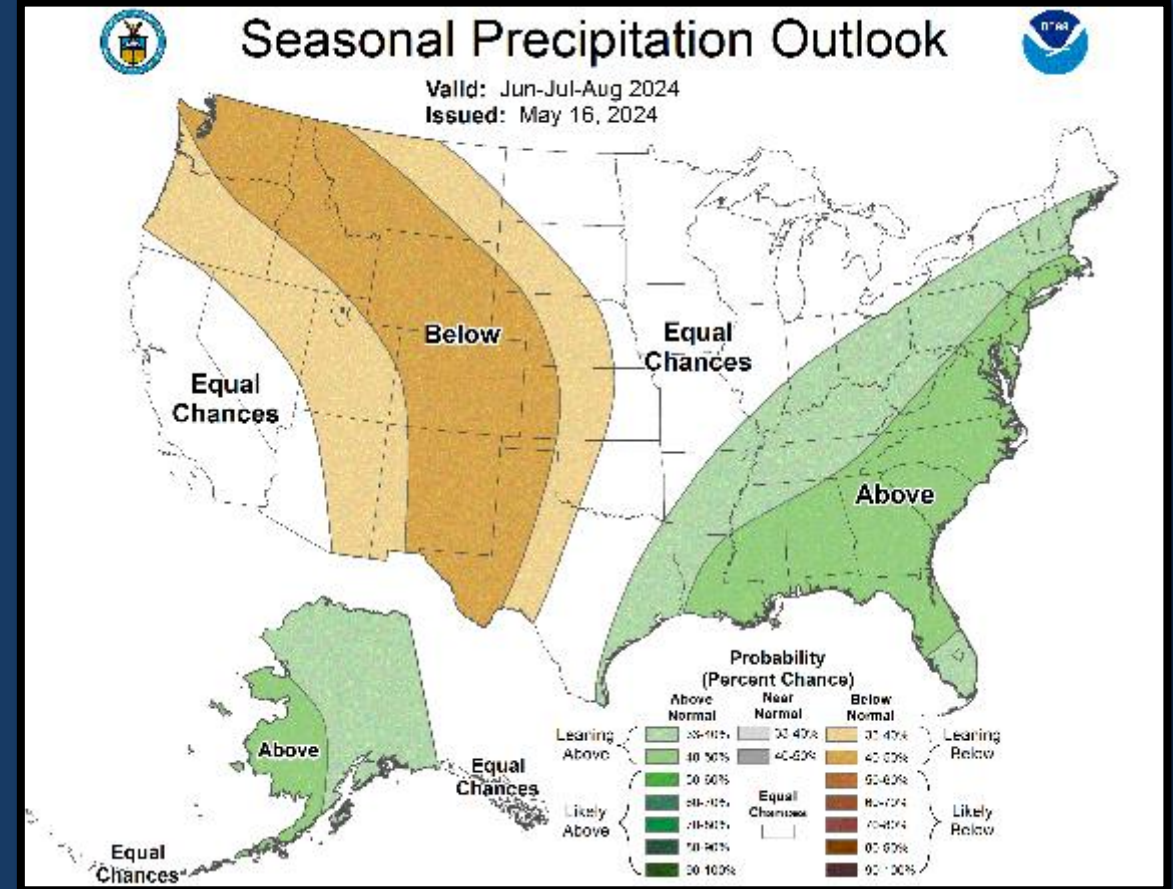
Source: [National Significant Wildland Fire Potential Outlook \(nifc.gov\)](https://www.nifc.gov)

California Outlook

Temperature Seasonal Outlook



Precipitation Seasonal Outlook



Four-month Temperature & Precipitation Outlook

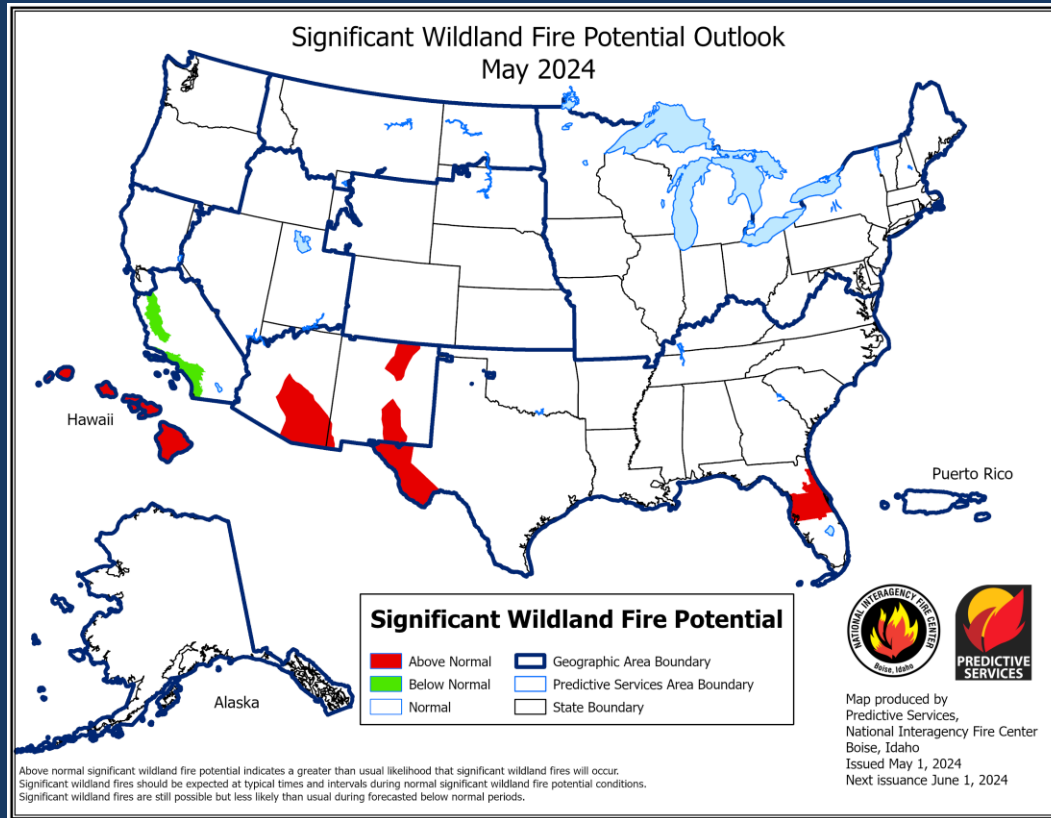
Source: [Climate Prediction Center \(noaa.gov\)](https://climatepredictioncenter.noaa.gov/)

Northwest Region Four-month Significant Fire Potential

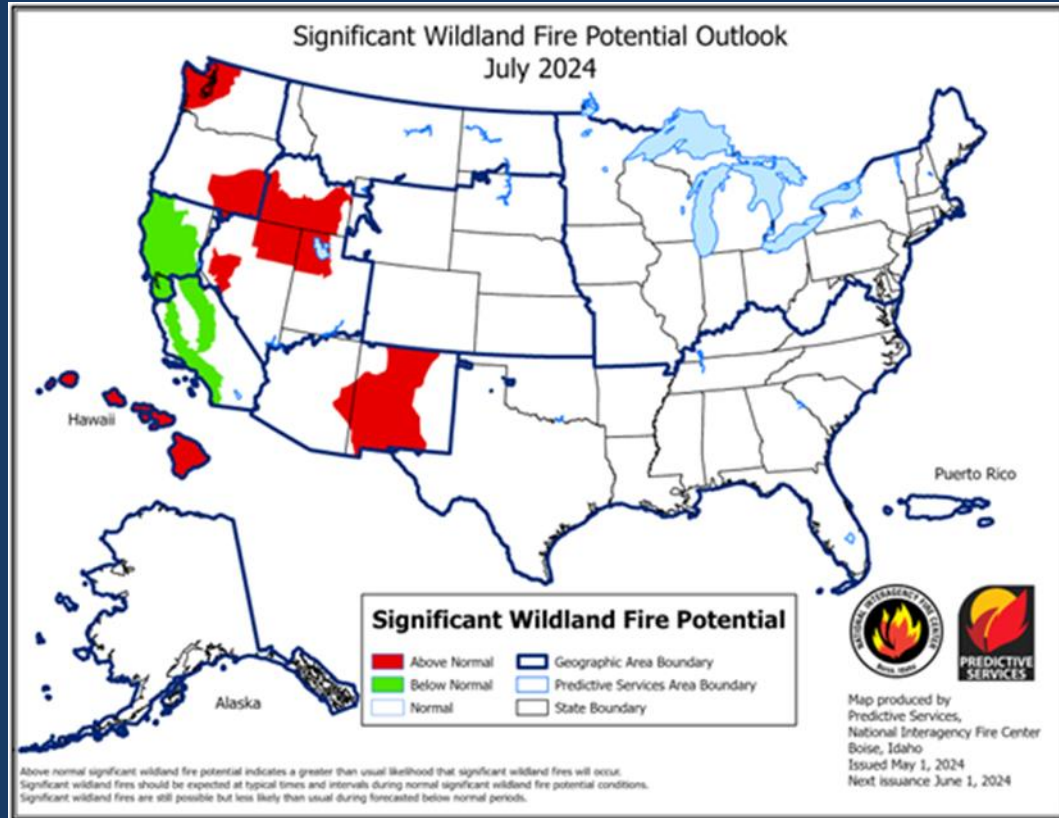
May – August 2024 Oregon/Washington Highlights

- Outlooks through May and beyond continue to suggest a transition to warmer than usual conditions during Fire Season 2023.
- Normal risk of significant fires is expected over the Northwest Area until July and August when areas of central and southeast Oregon are expected to be above average potential for significant fires.

Pacific Northwest Region Four-month Significant Fire Potential



Pacific Northwest Region Four-month Significant Fire Potential





Wildfire Forecast & Threat Intelligence Integration Center (WFTIIC)

<https://hub.wftiic.ca.gov/>



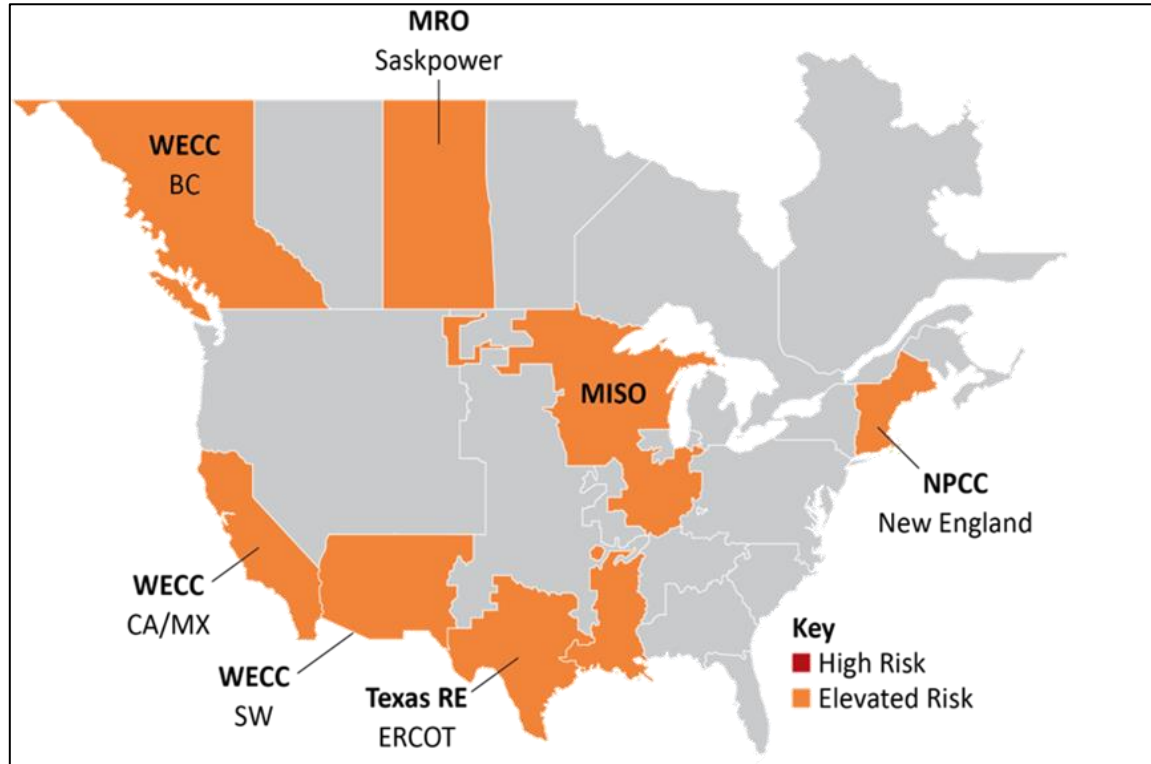


2024 Summer Reliability Outlook for the Western Interconnection

Prepared for the California Energy
Commission
May 29, 2024

Branden Sudduth
Vice President of Reliability Planning &
Performance Analysis

2024 Summer Reliability Assessment



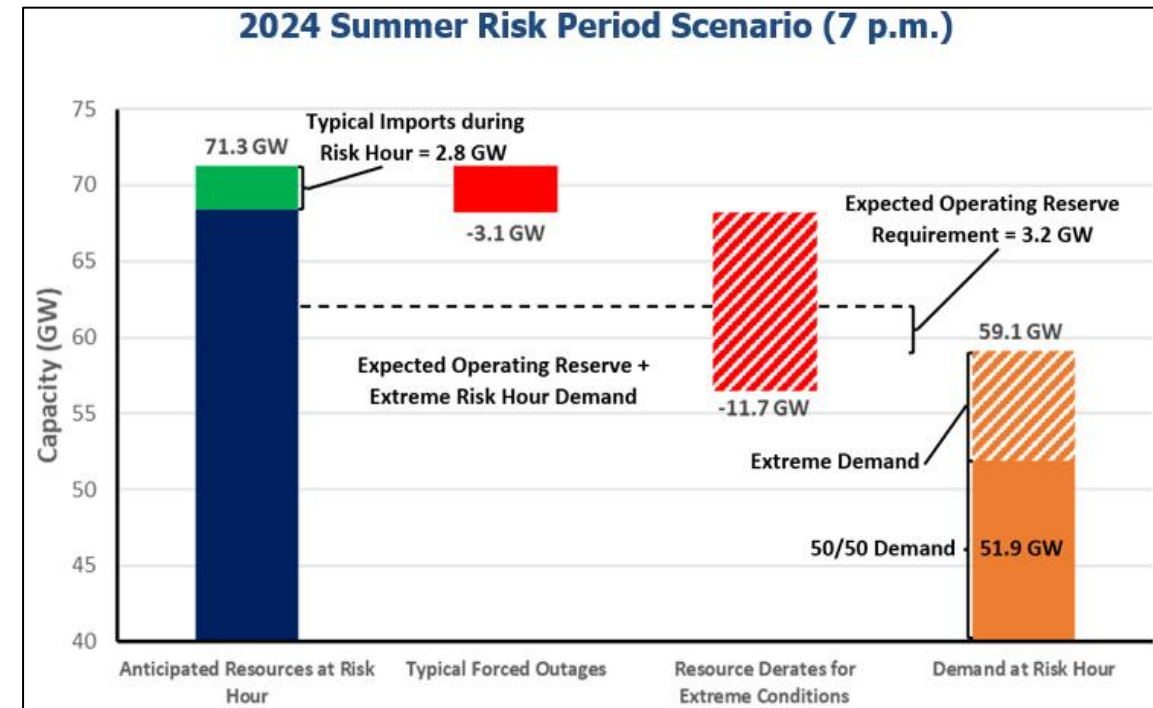
- All areas have adequate resources for normal summer demand
- British Columbia (BC), California/MX (CA/MX), and the Southwest (SW) have “Elevated Risk” under “Extreme Conditions”
- Extreme Conditions = at or above 90/10 demand forecast, historical high generator outages, and low wind/solar scenarios

Seasonal Risk Assessment Summary

High	Potential for insufficient operating reserves in normal peak conditions
Elevated	Potential for insufficient operating reserves in extreme conditions
Normal	Sufficient operating reserves expected

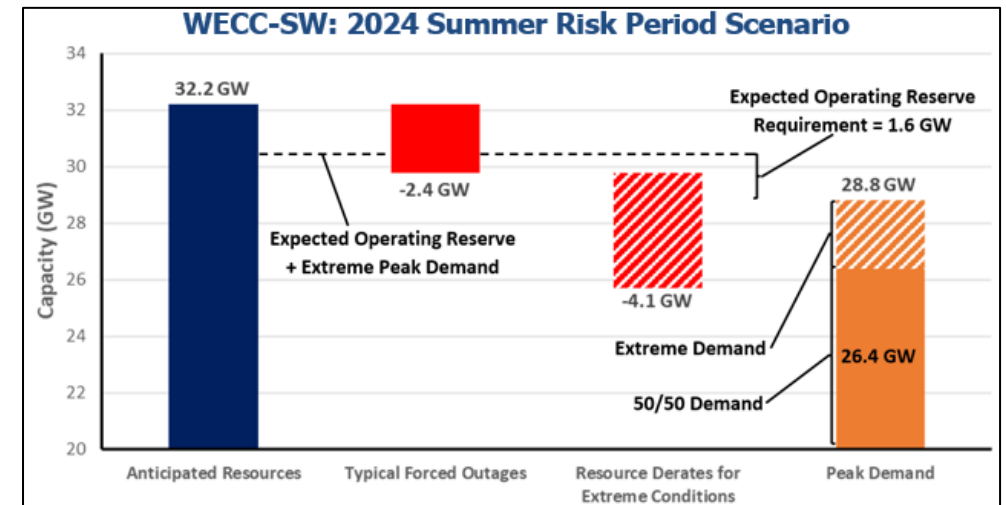
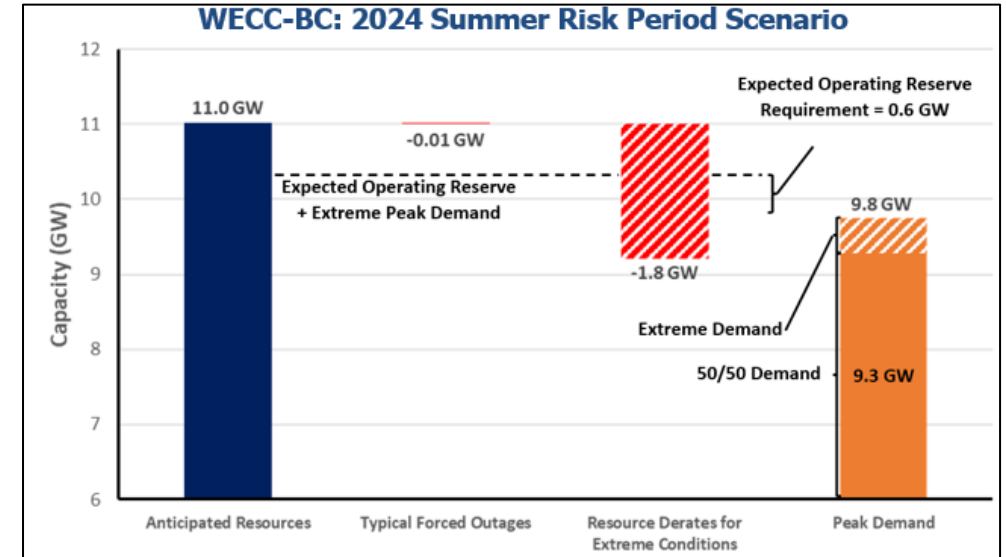
Elevated Risk: CA/MX

- Highest risk for unserved energy is at 7:00 p.m. as solar output is diminished
- No loss of load hours (LOLHs) were observed on the peak hour at 5:00 p.m.
- CA/MX is projected to have <1 LOLH. LOLHs are only observed if anticipated Tier 1 resources for this summer do not operate
- The LOLH and most unserved energy was in the MX portion of CA/MX



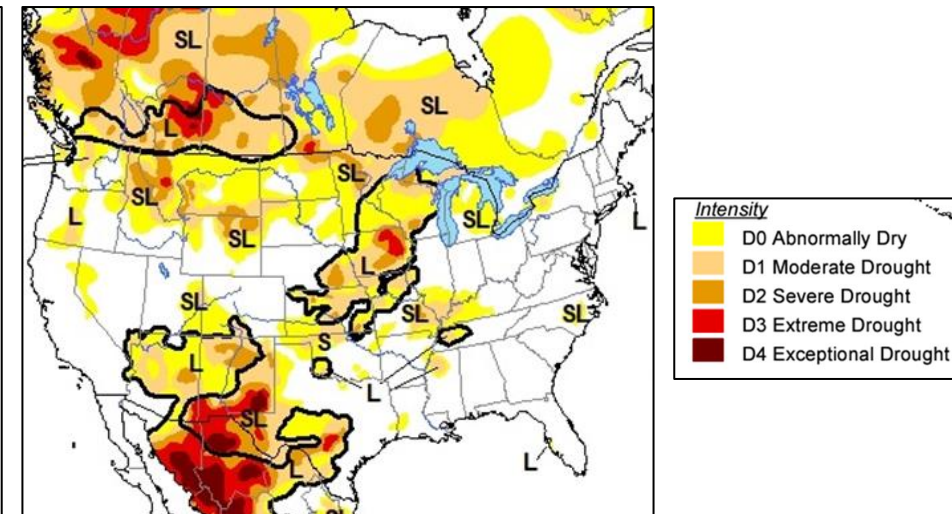
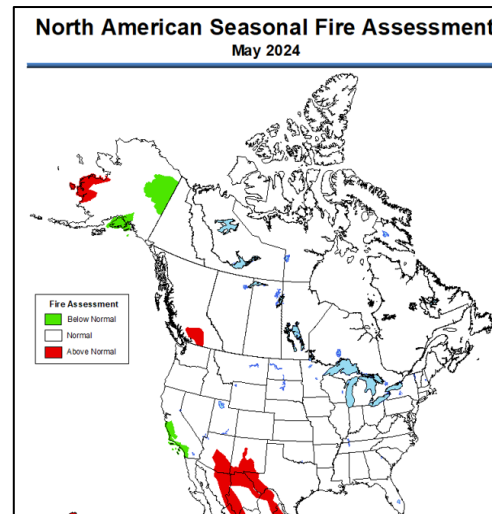
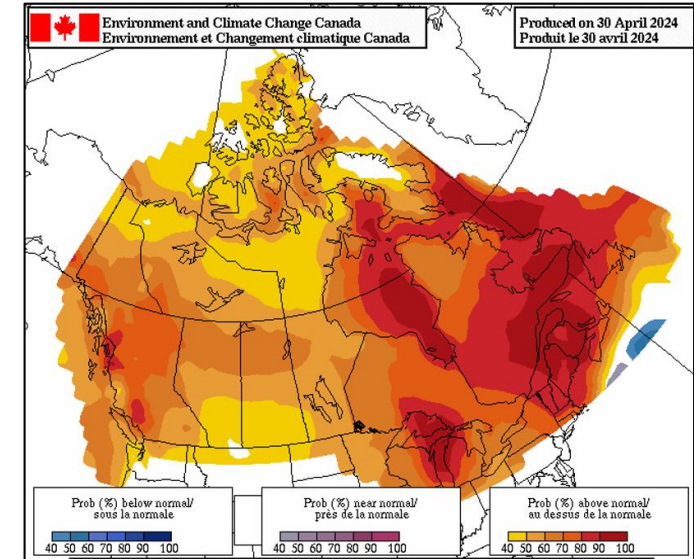
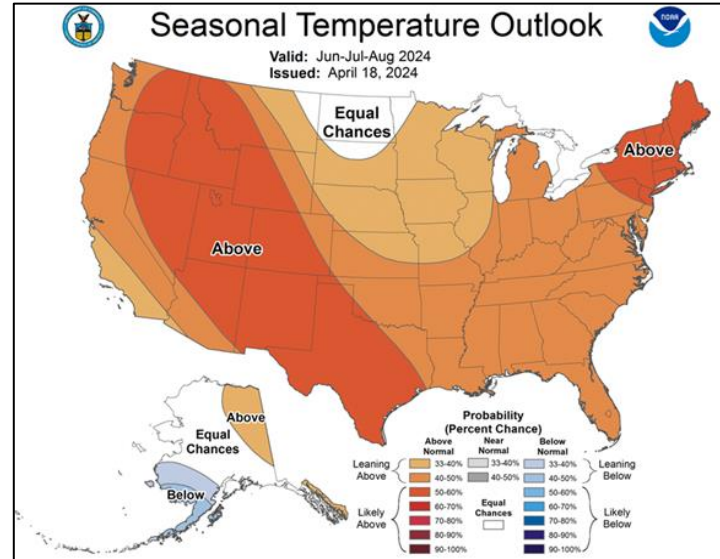
Elevated Risk: BC & SW

- Highest risk for unserved energy is at the peak hour:
 - BC Peak Hour = 6:00 p.m.
 - SW Peak Hour = 5:00 p.m.
- Neither BC nor SW show LOLH for the upcoming summer season
- BC: Above-normal demand coinciding with low hydro output could result in a reserve shortage
- SW: Above-normal demand coinciding with high forced outages and derates could result in a reserve shortage



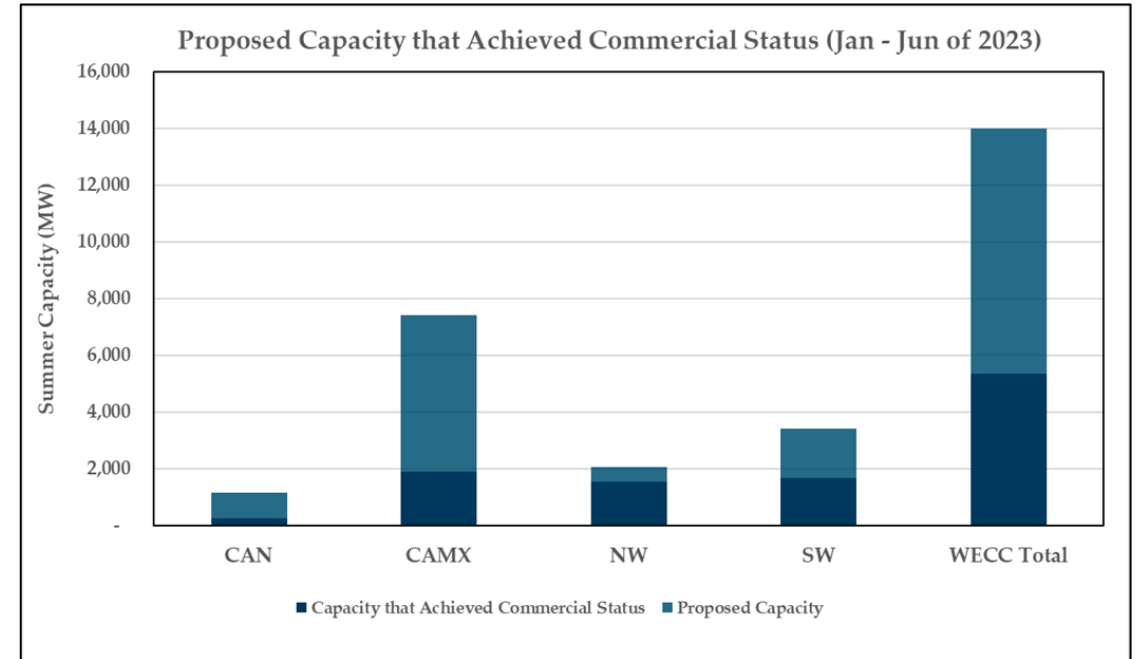
Reliability Risks Across the West

- Above-normal temperatures
- Drought
 - Primarily BC, the SW, & Montana/Idaho
 - Drought conditions in CAMX have alleviated
- Wildfires
 - Above normal risk in BC and the SW. Below normal risk in CAMX



Reliability Risks Across the West

- Supply chain—project delays
 - Transformers (10 Months–3 Years)
 - Circuit breakers (1.5–2.5 Years)
 - Switchgears (1 Year)
 - Increasing costs
 - Skilled labor shortage
- WECC 2024 summer proposed capacity additions = 17 GW



WECC: Capacity Additions*				
Region	Proposed for Summer of 2023 (MW)	Proposed Capacity that Achieved Commercial Status by Summer of 2023 (MW)	Proposed Capacity that Achieved Commercial Status by Summer of 2023 (%)	Proposed Capacity for Summer of 2024 (MW)
CAN	1,137	265	23%	2,395
CAMX	7,409	1,901	26%	5,871
NW	2,060	1,528	74%	4,991
SW	3,401	1,653	49%	3,802
WECC Total	14,007	5,347	38%	17,059

*Capacity additions of any tier between January and July of listed year.



Electric Reliability and Security for the West

www.wecc.org

Summer Reliability Workshop

May 29, 2024

Christine Root

Program and Project Supervisor, IRP Procurement Oversight



Agenda

1. New Online Energy Resources
2. Summer Reliability Snapshot
3. Recent Procurement Activity
4. Tracking Energy Development (TED) Task Force
 1. Procurement Challenges
 2. Recent Efforts

IRP Procurement Orders and Compliance Review Schedule

Table 1. CPUC Procurement Orders (MW NQC)

CPUC Orders	Total	2021	2022	2023	2024	2025	2026	2027	2028
D.19-11-016 Applies to 25 LSEs since 18/43 LSEs opted out.	3,300 MW	1,650 MW by Aug 1	825 MW by Aug 1	825 MW by Aug 1	n/a	n/a	n/a	n/a	n/a
D.21-06-035 (MTR) Applies to all CPUC-jurisdictional LSEs. No opt-outs allowed.	11,500 MW	n/a	n/a	2,000 MW by Aug 1	6,000 MW by June 1	1,500 MW ¹ by June 1	n/a ²	n/a	2,000 MW by June 1
D.23-02-040 (Supplemental MTR) Applies to all CPUC-jurisdictional LSEs. No opt-outs allowed.	4,000 MW	n/a	n/a	n/a	n/a	n/a	2,000 MW by June 1	2,000 MW by June 1	n/a
Cumulative Procurement Ordered	18,800 MW	1,650 MW	2,475 MW	5,300 MW	11,300 MW	12,800 MW	14,800 MW	16,800 MW	18,800 MW

Table 2. CPUC Review of LSE Contracting Progress

	2021	2022	2023	2024	2025	2026	2027	2028
CPUC Reviews LSE Compliance Filings and CPUC could order Backstop Procurement	February 2021	February 2022	February 2023 & December 2023	December 2024	November 2025	December 2026	December 2027	December 2028
CPUC Reviews LSE Compliance Filings only	August 2021	August 2022	August 2023 ³	June 2024	June 2025	June 2026	June 2027	June 2028

(1) D.21-06-035 required 2,500 of the 9,000 MW required between 2023-2025 to be "Diablo-Canyon Replacement".

(2) D.21-06-035 required 2,000 MW of Long-Lead Time Procurement by 2026, with an option to extend to 2028: 1,000 MW of long-duration storage and 1,000 MW of firm zero-emitting. D.23-02-040 automatically extends the procurement obligation to 2028.

(3) In August 2023, the Commission can order backstop for the for remaining D.19-11-016 procurement obligations.

(4) Per Commissioner Alice Reynolds' Amended Scoping Memo and Ruling Extending Statutory Deadline, the December 2025 filing will instead be due November 2025

Mid-Term Reliability (MTR) Procurement Requirements by Tranche and Category (NQC MW)

Procurement Category		2023	2024	2025	2026	2027	2028	Total
a	Total MTR Required Procurement by Year	2,000	6,000	1,500	2,000	2,000	2,000	15,500
b	Diablo Canyon Replacement ¹	←———— 2,500 —————→						2,500
c	Other/ General Procurement ²	←———— 7,000 —————→						11,000
d	Long Lead-Time - Long-Duration Storage						1,000	1,000
e	Long Lead-Time - Firm Zero-Emitting						1,000	1,000
= b + c + d + e Total MTR Procurement		←———— 9,500 —————→						15,500

For the purpose of this presentation the following procurement obligation years are labeled as:

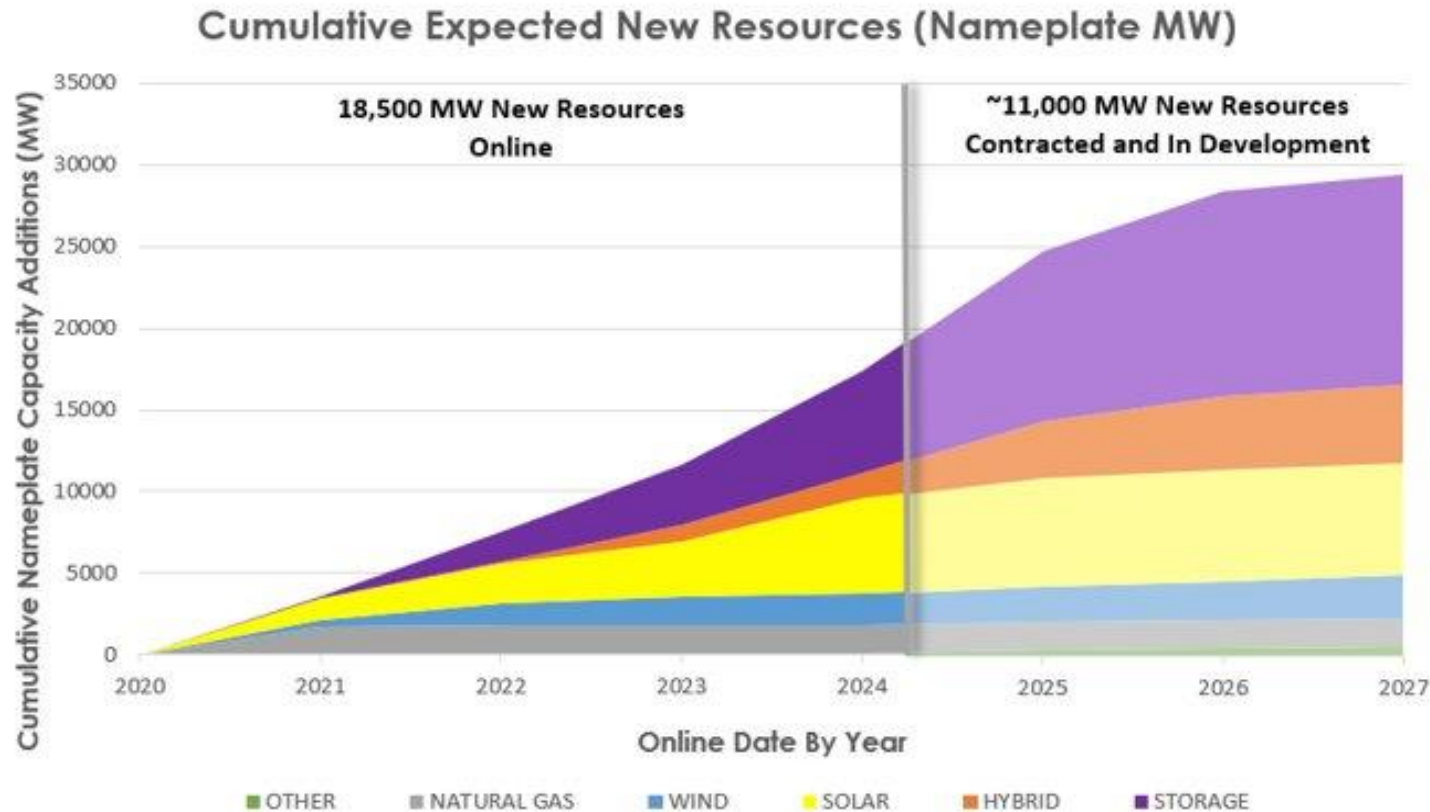
2023: Tranche 1
2024: Tranche 2
2025: Tranche 3

2026: Tranche 4
2027: Tranche 5
2028: Long Duration Storage: Tranche 6 LDES
2028: Firm Zero-Emitting: Tranche 6 Firm ZE

[1] The 2,500 MW shown in row "b" represents the portion of procurement shown in row "a" for 2023-2025 that is for the Diablo Canyon Replacement procurement obligation.

[2] The 7,000 MW shown in row "c" represents the portion of procurement shown in row "a" for 2023-2025 that is for the other/general procurement obligation.

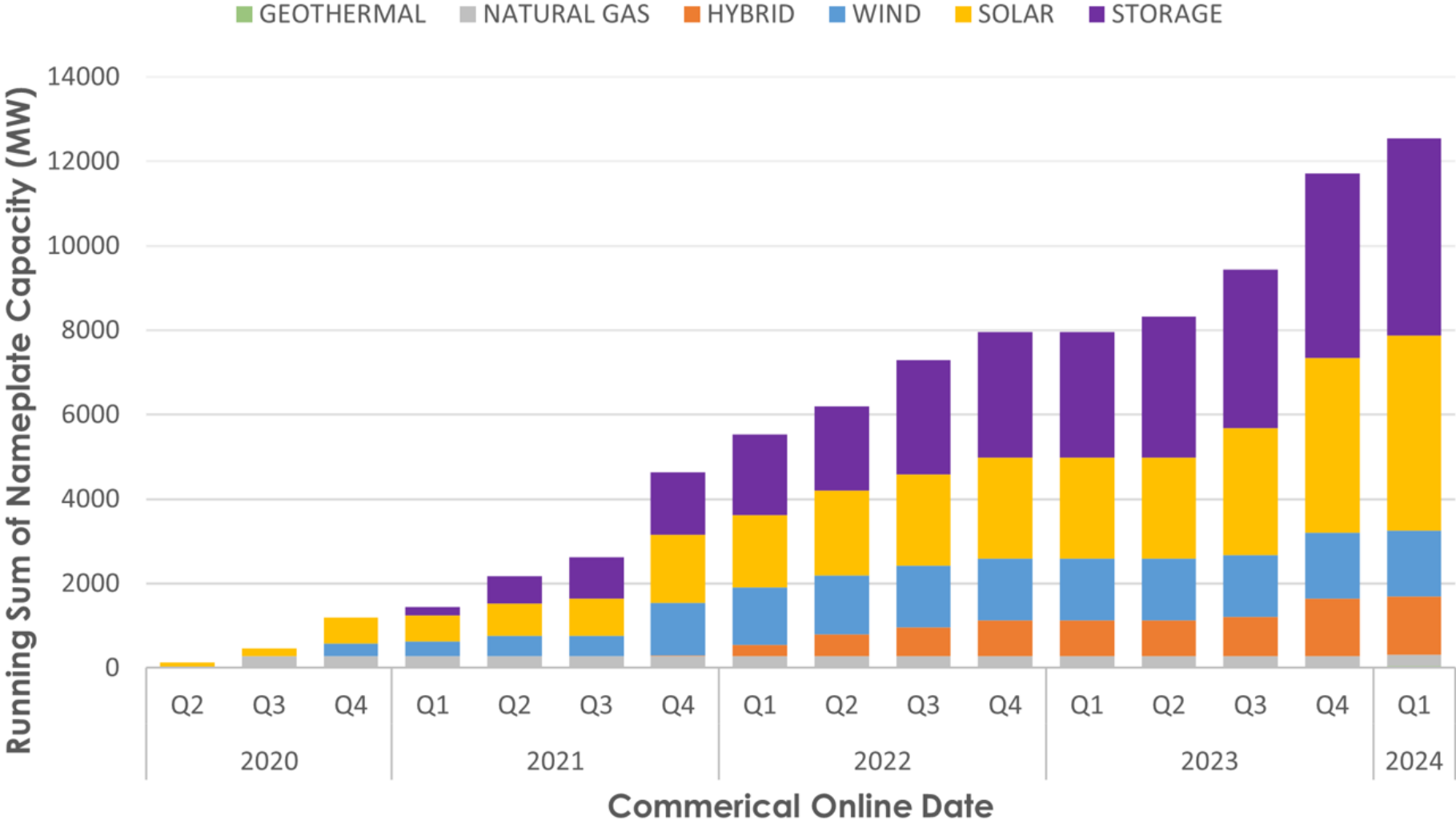
New Energy Resources MW



- **Online** – 18,500 MW of new resources were added between 2020 and 2024 to date
- **2023** - New resources installed in 2023 were over 5,700 MW, the highest clean energy year on record
- **Future** – 11,000 MW of future resource are in contract and under development; Additional contracting will be done to fully meet the CPUC IRP orders by 2028.
- **Technology** - Most of the new resources installed and expected are battery storage, solar, or hybrids (usually solar+storage).

Note: Data shown here includes new resources added to CAISO grid, including imports. "Other" resources includes geothermal, biomass, biogas, and hydropower.

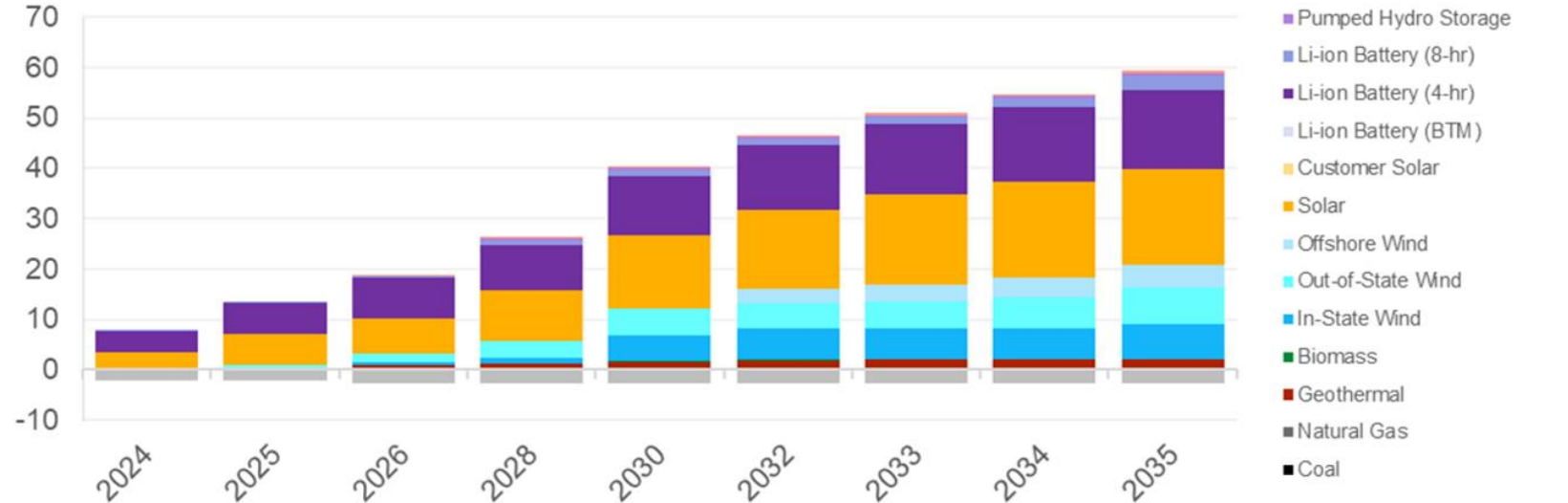
New IRP Procurement (Nameplate Capacity) COD 1/1/2020 or After



New Resource Buildout in Preferred System Plan Portfolio

- In Feb 2024, CPUC adopted a Preferred System Plan Portfolio of expected resources, that expects 55 GW of new clean energy resources will be built by 2035.
- Storage installed capacity estimates are shown in **purple**:
 - 22 GW by 2030
 - 32 GW by 2035

Generic Planned & Selected Capacity
Near- & Medium-Term
(GW)



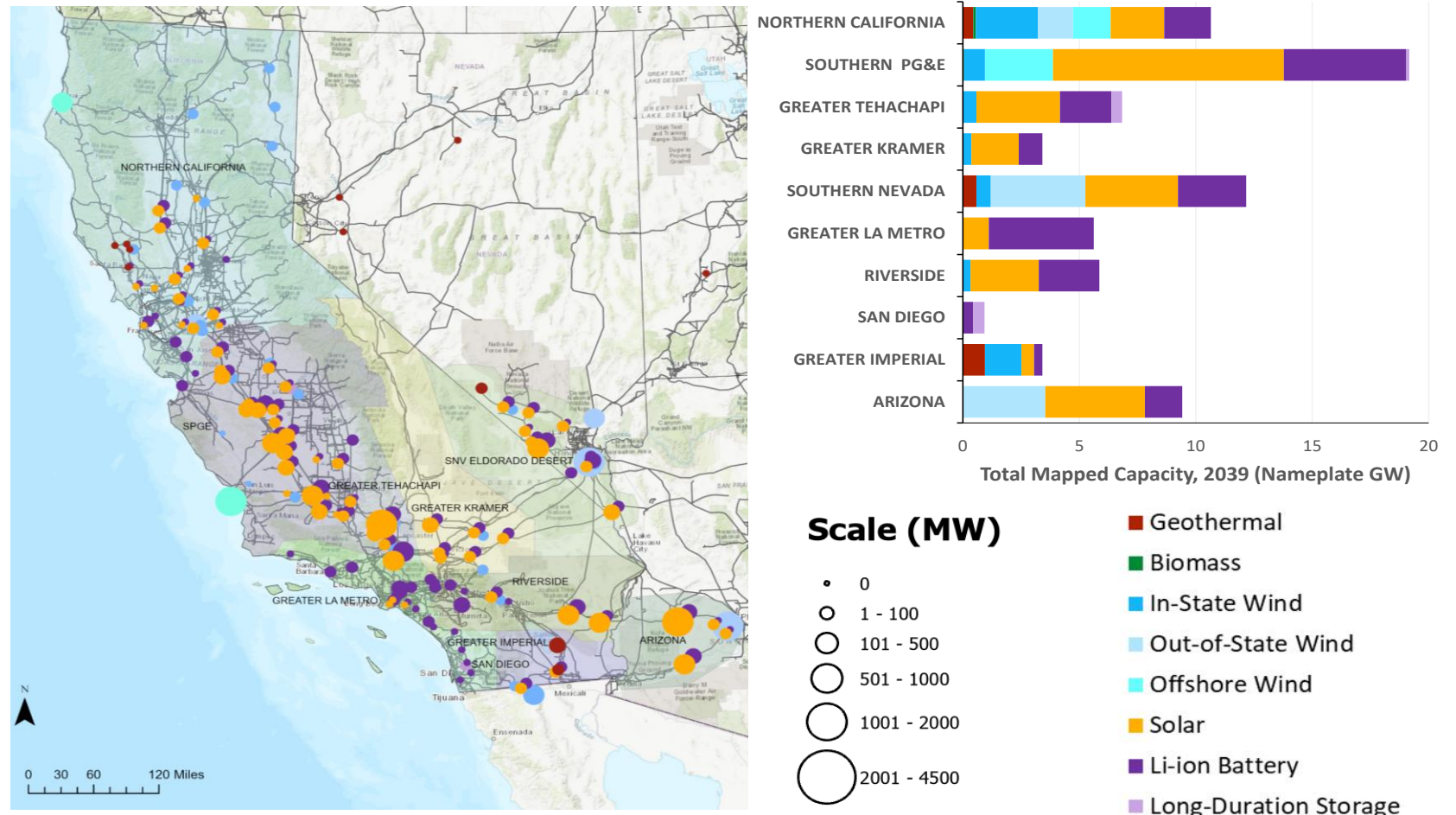
Note: All GW numbers in nameplate.

Source: <https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/integrated-resource-plan-and-long-term-procurement-plan-irp-ltpp/2023-irp-cycle-events-and-materials/2024-01-12-presentation-summarizing-updated-servm-and-resolve-analysis.pdf>

Modeled Potential Locations for Future Clean Energy Resources for Transmission Planning

CPUC transmits IRP resource portfolios to the CAISO for use in its annual Transmission Planning Process (TPP) to identify future transmission need.

2024-25 TPP Base Case Portfolio (2039) Busbar Mapping Results



Procurement Challenges & Efforts

- Local Permitting
- Interconnection and Transmission Delays
- Supply Chain Issues

Tracking Energy Development (TED) Task Force

- Joint interagency effort between the CEC, CPUC, CAISO and GO-Biz
- Provide project development support for new energy projects to come online in the near-term
- Identify challenges that may impact clean energy development and coordinate actions to address those barriers

For more information: see www.cpuc.ca.gov/trackingenergy



CEC BESS Workshop

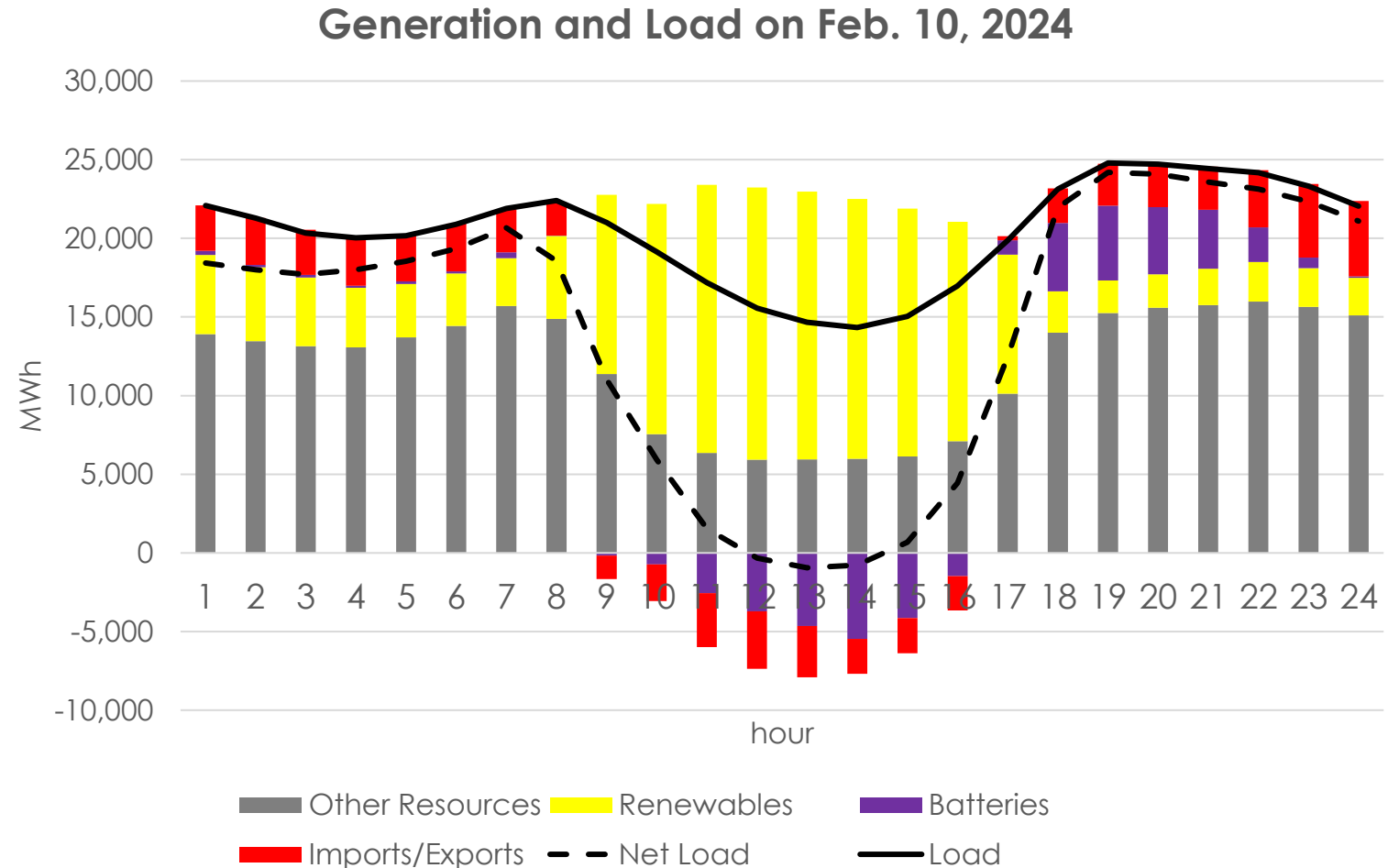
In response to community concerns regarding Battery Energy Storage System (BESS) projects that were brought to the TED Task Force, the CEC hosted a BESS workshop on February 23, 2024. This workshop covered:

- Current and future state of BESS safety
- Current and future landscape of large-scale BESS systems and an overview of state actions
- Siting and Permitting
- Design, Manufacturing, Operations and Safety
- Current Safety Standards and development
- The BESS docket log (including a link to the recording of the workshop) can be found here: <https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=24-BSS-01>

Due to the high interest in this topic, the TED Task Force is planning future BESS workshops and will announce those once they are scheduled.

Sample Day: Recent CAISO Battery Performance

- Batteries provide significant energy on a daily basis, for example over 5,000 MWh at 7 PM on Feb 10, 2024.
- Sample day shows renewables in yellow, storage in purple bars
 - Positive bars are batteries serving CAISO load during evening peak
 - Negative bars are batteries being charged during daytime by extra renewable energy



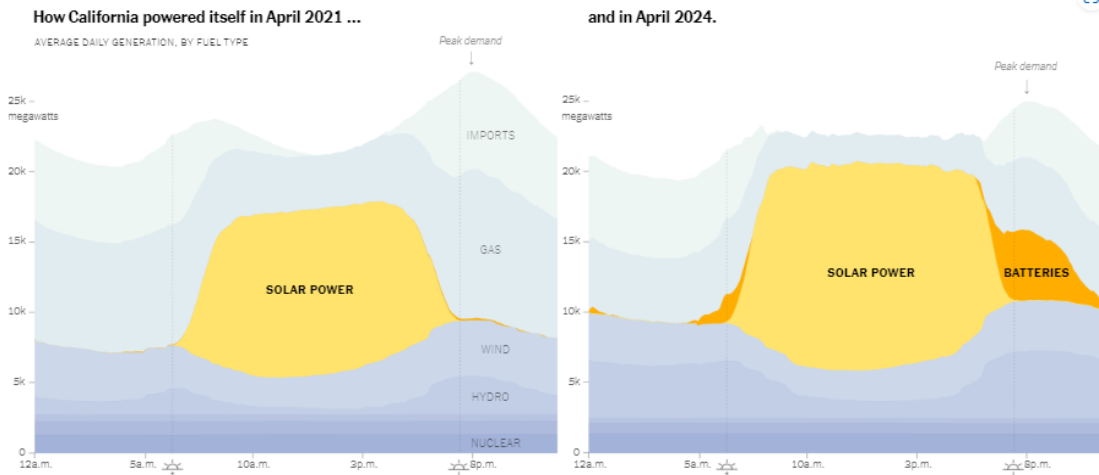
Renewables represent solar, wind, geothermal, biomass, biogas and small hydro
Other Resources represent nuclear, natural gas and large hydro
Net load represents electric load net of wind and solar
Source data: Today's Outlook at www.caiso.com

High penetration of storage supporting reliability

Giant Batteries Are Transforming the Way the U.S. Uses Electricity

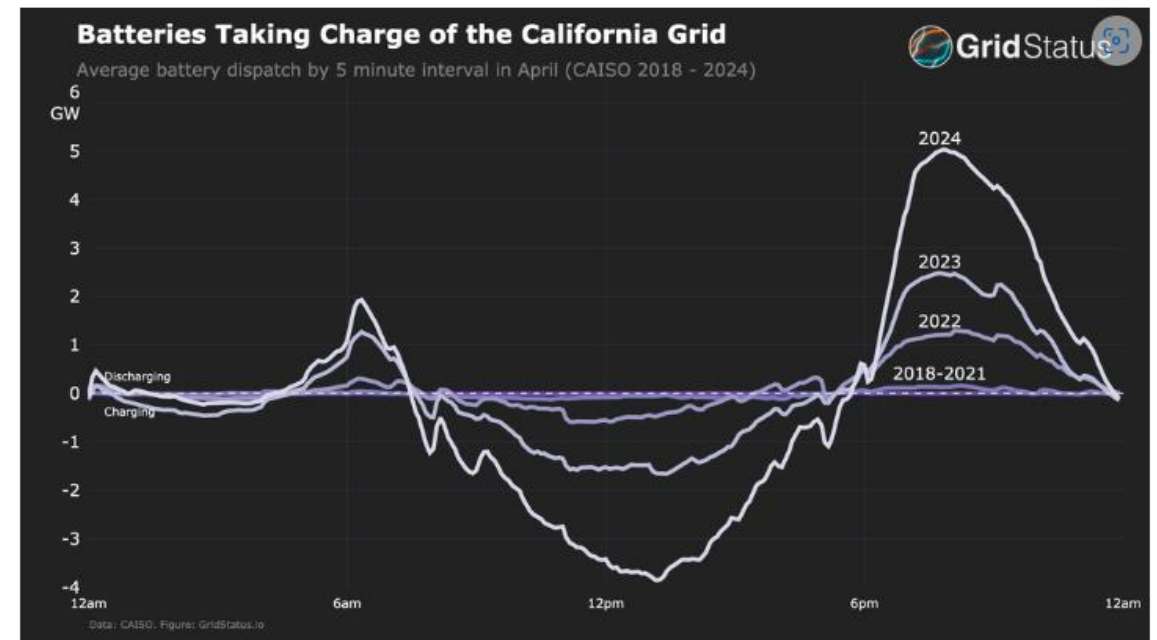
They're delivering solar power after dark in California and helping to stabilize grids in other states. And the technology is expanding rapidly.

By Brad Plumer and Nadia Popovich May 7, 2024



Source: California Independent System Operator via [Grid Status](#). Please see the bottom of this page for notes. - By The New York Times

[Giant Batteries Are Transforming the Way the U.S. Uses Electricity - The New York Times \(nytimes.com\)](#)



[GridStatus.IO blog: https://blog.gridstatus.io/caiso-batteries-apr-2024/](https://blog.gridstatus.io/caiso-batteries-apr-2024/)

Federal Funding Opportunities To Accelerate Transmission & Interconnection Projects

- As part of the Bipartisan Infrastructure Law, the DOE is administering a \$10.5 billion Grid Resilience and Innovation Partnerships (GRIP) Program to enhance grid flexibility and improve the resilience of the power system.
- A Consortium including CEC, CAISO, CPUC, PG&E, SCE, and UC Berkeley submitted a GRIP proposal on 4/17/24 for a grant of up to \$1B with \$1.1B in cost matching (mostly by PG&E and SCE) to deploy Grid Enhancing Technologies (GETs) which could increase capacity on existing transmission infrastructure by up to 5000 MW, improve grid safety, and decrease maintenance costs.
- Grant funding will also be used to make process improvements to CAISO's interconnection queue allowing renewable energy projects to come online faster.

Proposed Deployment Of Grid Enhancing Technologies

Project	Technical Overview & Purpose
Advanced Conductors	Reconductor 414 miles and build 1.25 miles of new transmission with advanced conductors. This will boost existing capacity by nearly 5,000 MWs providing a proven, cost-effective alternative to greenfield investments.
Interconnection Portal & Process Improvement	CAISO and will work with regulatory bodies, stakeholders, and transmission owners to develop its interconnection management portal, resulting in a more efficient and transparent process.
Dynamic Line Ratings	SCE will install DLR sensors on 13 major transmission lines. DLRs allow operators to actively monitor line temperatures and boost capacity and alleviate congestion. Previous demonstrations have increased capacity by up to 44% ¹ .
Short Circuit Duty Monitoring	SCE plans to install SCD monitoring in 14+ substations. Active SCD monitoring provides better awareness of fault current levels on the grid to avoid potential exceedances that could lead to damaging or maloperation of equipment.

1

APPENDIX



California Public
Utilities Commission

New Online Energy Resources

Data Vintage: March 2024

New Resources Additions, Jan 1, 2020 – March 31, 2024, Cumulative

Cumulative New Resource Additions, January 2020 through March 31, 2024			
Technology Type	Nameplate Capacity (MW)	Estimated Sept. Net Qualifying Capacity (NQC) MW	Number of Projects
STORAGE	6,605	6,134	92
SOLAR	6,291	493	91
HYBRID (STORAGE/SOLAR)	1,389	666	22
WIND	1,095	125	21
GEOTHERMAL	41	31	1
BIOGAS, BIOGAS, HYDRO (3,3,4 Projects)	39	0	10
CAISO	15,459	7,449	237
NATURAL GAS, incl. Alamitos & Huntington Beach	1,477	1,474	12
Total New Resources, IN-CAISO	16,936	8,923	249
New Imports, Pseudo-Tie or Dynamically Scheduled	1,601	777	13
Total New Resources, including Imports	18,537	9,700	262

Notes:

All data shown derived from CAISO [Master Generating Capability List](#), and CPUC [NQC Lists](#) with online dates between Jan 1, 2020 – March 31, 2024. Nameplate Capacity is shown as "Net Dependable Capacity" in the CAISO Master Generating List file. Data shown excludes imports, except where specified. All NQC values are "September NQC" and subject to change based on counting rules. "Project" is defined as a unique CAISO resource ID. "Natural Gas" includes Alamitos Unit 7 (675 MW) and Huntington Beach (674 MW) added in Feb 2020.



State Water Project's Summer 2024 Operations Outlook for CAISO's Summer Relief Opportunities

May 29, 2024



Anthony Agustin, DWR-SWP-OCO

SWP Operations – Grid Emergency Objectives

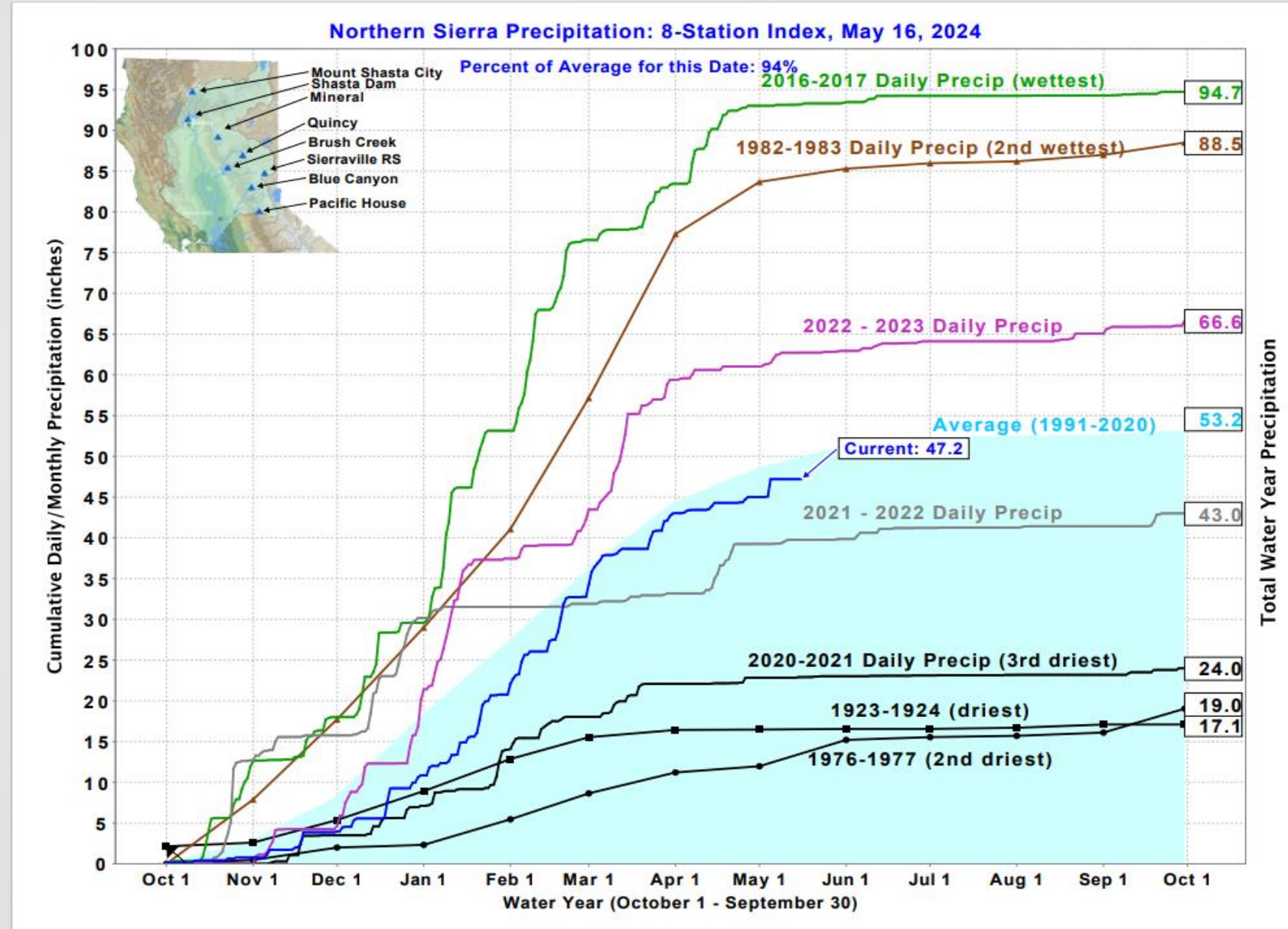
- Maintain compliance with all regulatory requirements
- Maintain water delivery to State Water Contractors
- Insofar as possible assist California Independent System Operator (CAISO) with grid operations



SWP Operations – 2024 Hydrology Outlook

Precipitation in Northern California

- Oct-Feb: Below Average
- Mar-Apr: Close to Average



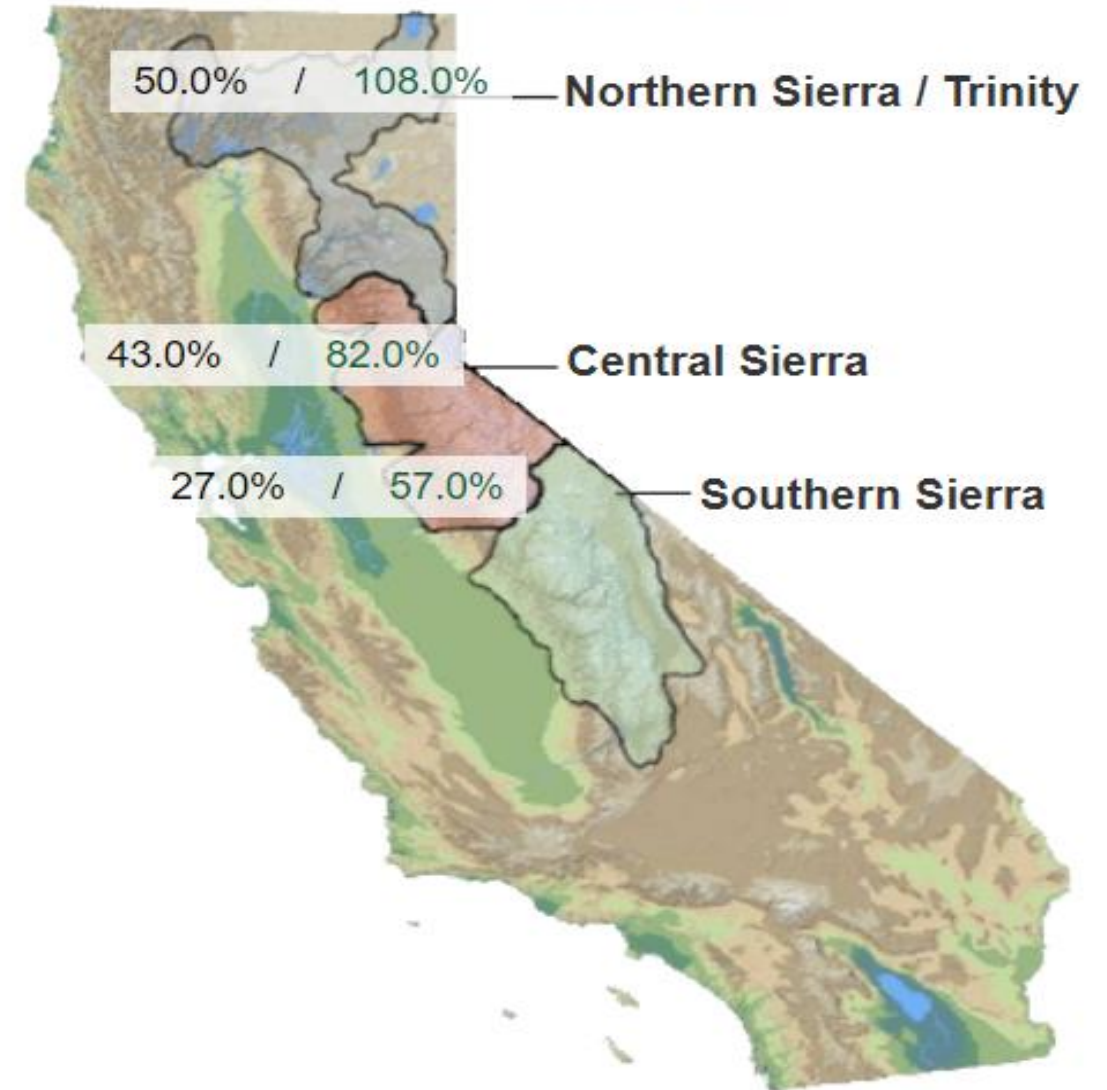
SWP Operations – 2024 Hydrology Outlook

Statewide as of 5/16/2024

- Avg. Snow water equivalent **10.7”**
- % of April 1st Average **41%**
- % of normal for this date **82%**

Data For: **16-May-2024**

% Apr 1 Avg. / % Normal for this Date



SWP Facilities

- 36 Storage Facilities
- 21 Pumping Plants
- 5 Hydro Power Plants
- 4 Pump-Gen Plants
- 700 Miles of Canals & Pipelines



CALIFORNIA DEPARTMENT OF
WATER RESOURCES



Questions?

Anthony.Agustin@water.ca.gov

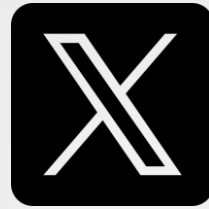


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WATER RESOURCES



Q&A



Summer 2024 Reliability Outlook

Summer Reliability Workshop

May 29, 2024



- Inform need for contingencies
- Deterministic approach
- Assess average and extreme conditions

- High demand days like summer 2020 and 2022
- Increased levels of unplanned outages
- Import availability

- Developed in collaboration with CPUC, DWR and CAISO

```

graph TD
    A[Expected New Resources] --> C[Solar, Wind, Battery Shapes]
    B[Existing Resources] --> C
    D[RA Imports] --> E[Event Equivalent Modifier (extreme conditions)]
    F[CEC 2023 Planning Demand Forecast for 2024] --> E
    C --> G[/Create Supply Stack and compare to demand/]
    E --> G
    H[Hydro Pump Load/ Gen Adjustments] --> G
    I["2024: OTC retirements  
2030: DCPD Retirement"] --> G
    G --> J[Contingency Need]
    G --> K[Surplus]
    G --> L[Supply Stack]
  
```

The flowchart illustrates the process of creating a supply stack and comparing it to demand. It starts with four input boxes at the top: "Expected New Resources", "Existing Resources", "RA Imports", and "CEC 2023 Planning Demand Forecast for 2024". "Expected New Resources" and "Existing Resources" lead to "Solar, Wind, Battery Shapes". "RA Imports" and "CEC 2023 Planning Demand Forecast for 2024" lead to "Event Equivalent Modifier (extreme conditions)". Both "Solar, Wind, Battery Shapes" and "Event Equivalent Modifier (extreme conditions)" lead to a central box labeled "Create Supply Stack and compare to demand". This central box also receives input from "Hydro Pump Load/ Gen Adjustments" and "2024: OTC retirements 2030: DCPD Retirement". From the central box, three arrows point down to "Contingency Need", "Surplus", and "Supply Stack".

70



Demand Percent Margins

Condition Relative to 1-in-2 Forecast	Operating Reserves	Outages	Demand Variability	Coincidental Fire Risk	Notes
Average Conditions: Current RA Planning Standard – 17%	6%	5%	6%	4,000 MW	17% beginning 2024
2020 Equivalent Event: Additional capacity needed to weather heat event like 2020	6%	7.5%	9%	4,000 MW	9% higher demand over median, and 2.5% higher levels of outages
2022 Equivalent Event: Additional capacity needed to weather heat event like 2022	6%	7.5%	12.5%	4,000 MW	12.5% higher demand over median, and 2.5% higher levels of outages

Source: CEC



Supply Modifications

- Wind and solar
 - Hourly profiles based on generation on high-load days from 2014-2023
- Batteries
 - Discharge limited to 4 hours across peak hours
- Demand response
 - From CPUC DR Allocations, adjusted by Load Impact Protocol and distribution loss factors
- New Resource Delay Sensitivity

	Wind			Solar			Battery		
Time PDT	Jul	Aug	Sep	Jul	Aug	Sep	Jul	Aug	Sep
4PM-5PM	0.38	0.28	0.15	0.73	0.72	0.65	0.39	0.48	0.35
5PM-6PM	0.44	0.33	0.19	0.6	0.56	0.43	0.42	0.51	0.66
6PM-7PM	0.48	0.38	0.22	0.35	0.27	0.11	0.77	0.85	1
7PM-8PM	0.51	0.42	0.28	0.07	0.03	0	1	0.98	1
8PM-9PM	0.52	0.48	0.3	0	0	0	0.84	0.71	0.64
9PM-10PM	0.54	0.51	0.32	0	0	0	0.58	0.48	0.35

Source: CEC staff with California ISO data



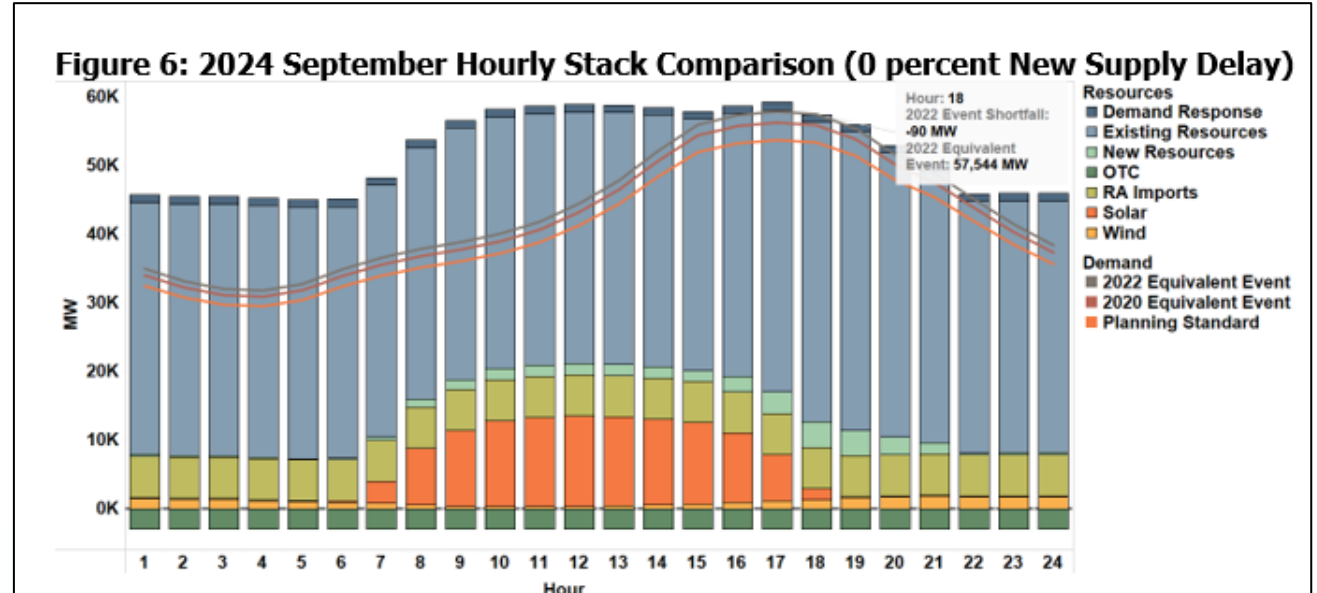
Stack Analysis

New Resource Delay Sensitivity

- Apply 20 and 40 percent capacity delay to future expected resources
- Assess the risk of resource build out delays
- Determine if contingency resources may be needed

Varying System Conditions

- Contingency needs identified in 2022 equivalent event
- Optimistic outlook under average conditions
- Coincident fire risk not included in the results but could lead to an additional 4,000 MW need for contingencies



Condition Relative to 1-in-2 Forecast	New Supply Delay Sensitivity (%)	Megawatts (MW)		
		July	August	September
2022 Equivalent Event	40	2,330	3,235	-1,593
	20	2,790	3,715	-842
	0	3,251	4,195	-90
2020 Equivalent Event	40	3,933	4,794	5
	20	4,394	5,275	757
	0	4,854	5,755	1,508
Average Conditions	40	6,453	7,245	2,517
	20	6,914	7,725	3,269
	0	7,374	8,205	4,020



Summary

Improved supply conditions

- Significant energy resource expansion from solar PV and batteries in 2023, and expected in 2024 before summer
- Hydroelectric generation and load forecasts, to be included in an update late June

Lower Median Demand Forecast

- **July Peak:** Highest peak expected in July between 4-5 PM and coincides with a time with plenty of solar PV generation – No contingency needs identified in July
- **September Peak:** Lower peak expected compared to the previous demand forecast. September is expected to have the 2nd highest peak for the year

	2024 1 st Quarter Report
Supply	
Demand Response	1,115
Existing Resources	43,556
New Batteries	3,327
Wind	1,382
Solar	1,643
RA Imports	6,000
Total (MW)	57,022
Demand	
2023 CEC Demand Forecast – 2024 Sept. Peak Demand	45,972
Pump Load Additional Adjustment at Net peak	0
Surplus/Shortfalls	
Average Conditions	4,000
2020 Equivalent Event	1,500
2022 Equivalent Event	-90

Results are for CAISO for September 2024, hour 18
Values are in megawatts



Thank you!



LOLE Analysis

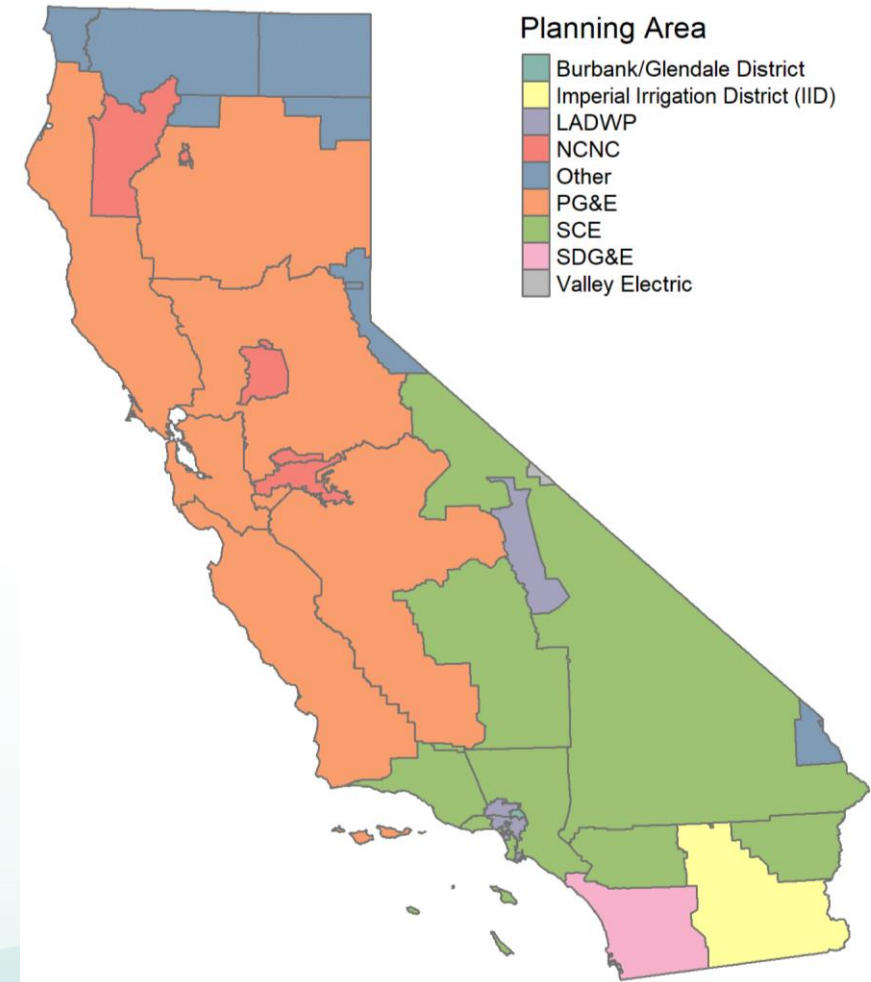
Hannah Craig, Energy Assessments Division

May 29, 2024



Statewide Model Overview

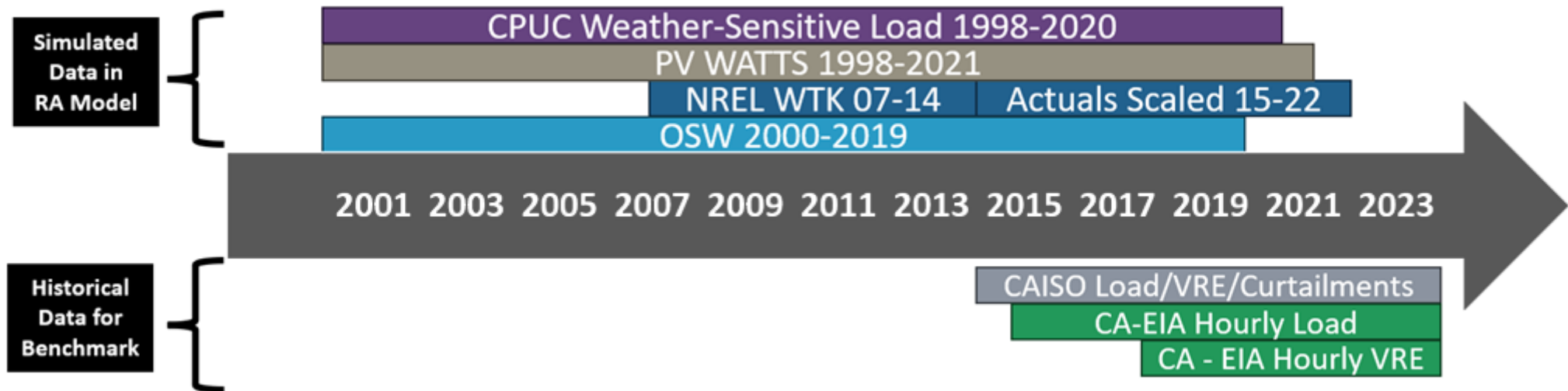
- CEC model is run in PLEXOS software, which optimizes dispatch at an hourly granularity.
- CEC model includes full detail on CA power plants.
- The rest of WECC is not modeled explicitly and is represented by generic imports.
- Results reported statewide.





Reliability Model

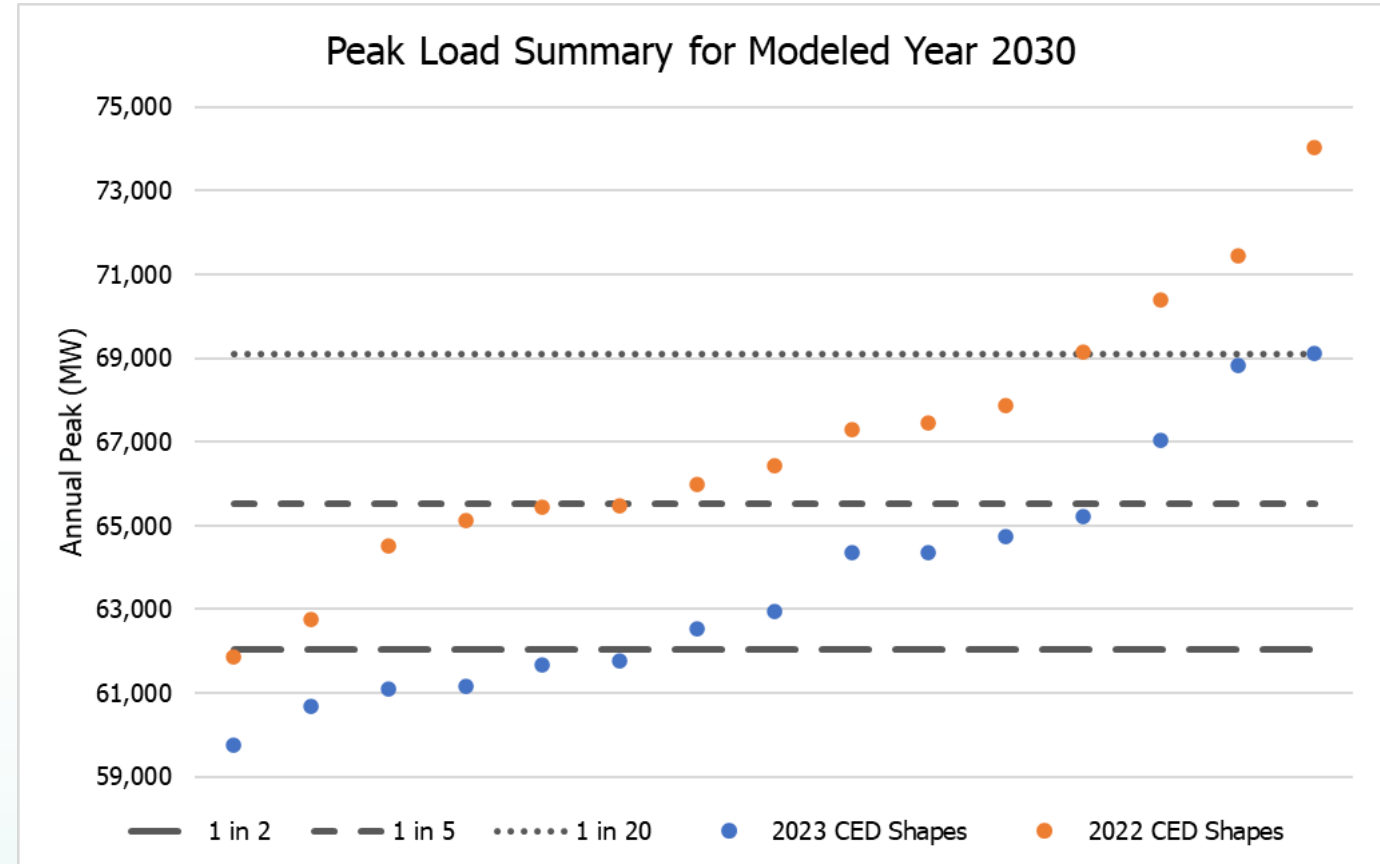
- Stochastic model utilizes 15 weather years from 2007-2021.
- Demand profiles are made by the CPUC and wind and solar shapes from NREL weather data.
- Each weather year is run with 20 outage samples, using forced outage data from GADS.





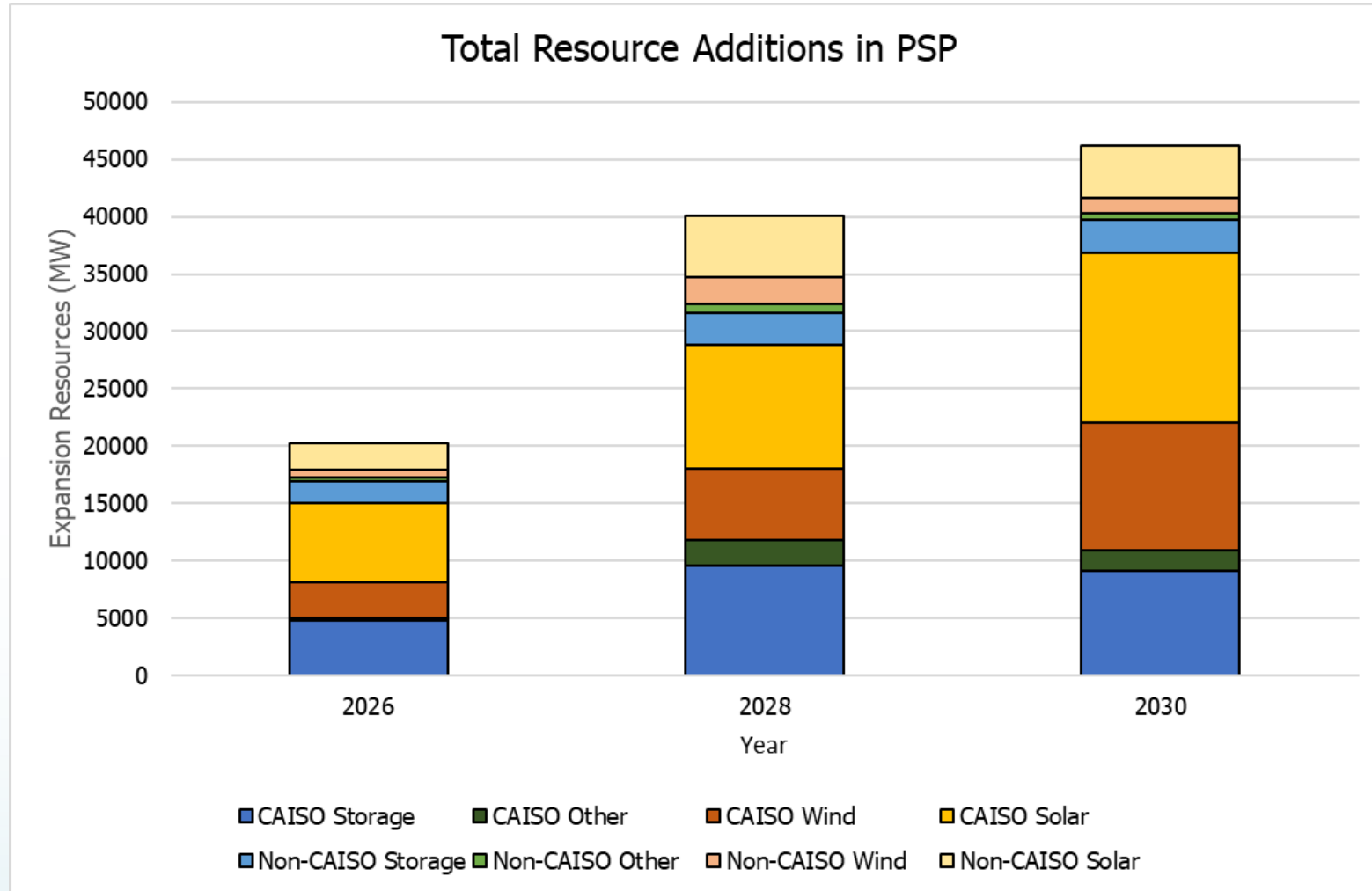
Demand Shapes

- Shapes based on the 2022 CED by the CPUC were the most recent available.
- Shapes scaled to the 2023 CED's total annual energy and 1 in 20 peak.
- 2023 CED load modifiers added on top. Load modifiers do not vary by weather year.
- 2023 forecast is substantially lower from 2024-2030 than the 2022 forecast used to build the PSP.





Anticipated New Resources



- Scenarios were run with both the full PSP and a 40% Reduction case.



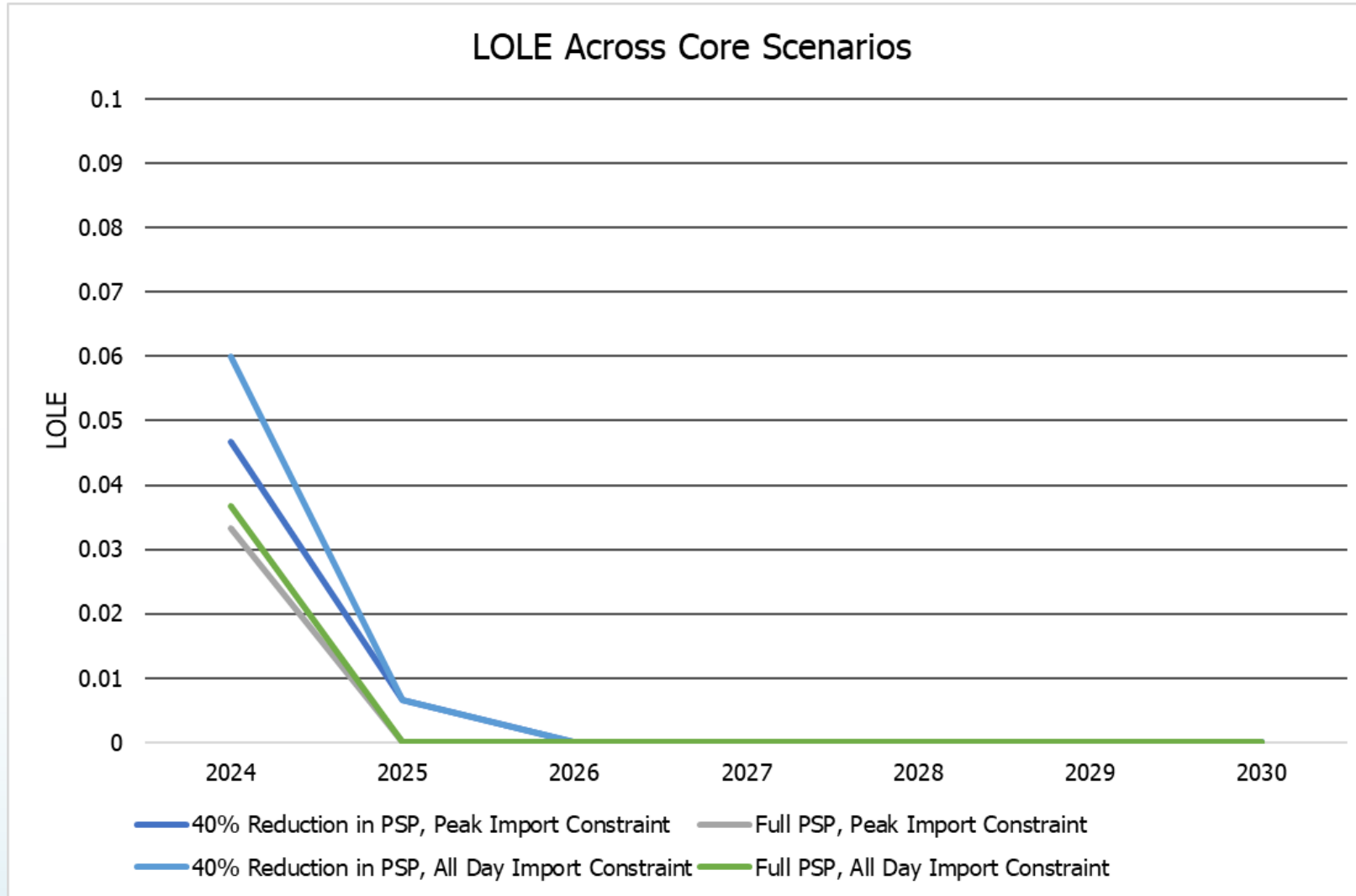
Import Scenarios

- 5,425 MW limit on the CAISO, represents 4,000 MW of unspecified imports + 1,525 MW of Hoover and Palo Verde
- 8,425 MW limit statewide developed from EIA 930 flows during summer peak hours and 12,450 MW from statewide imports in all hours.
- Additional scenarios where imports are restricted during the day and where no imports are allowed test for energy constraints and import dependence.

	CAISO Constraint	CA Constraint
Peak Constraint	5,425 MW at peak No limit off-peak	8,425 MW at peak 12,450 MW off-peak
All Day Constraint	5,425 MW all day	8,425 MW all day
No Imports	No limit all day	No imports all day

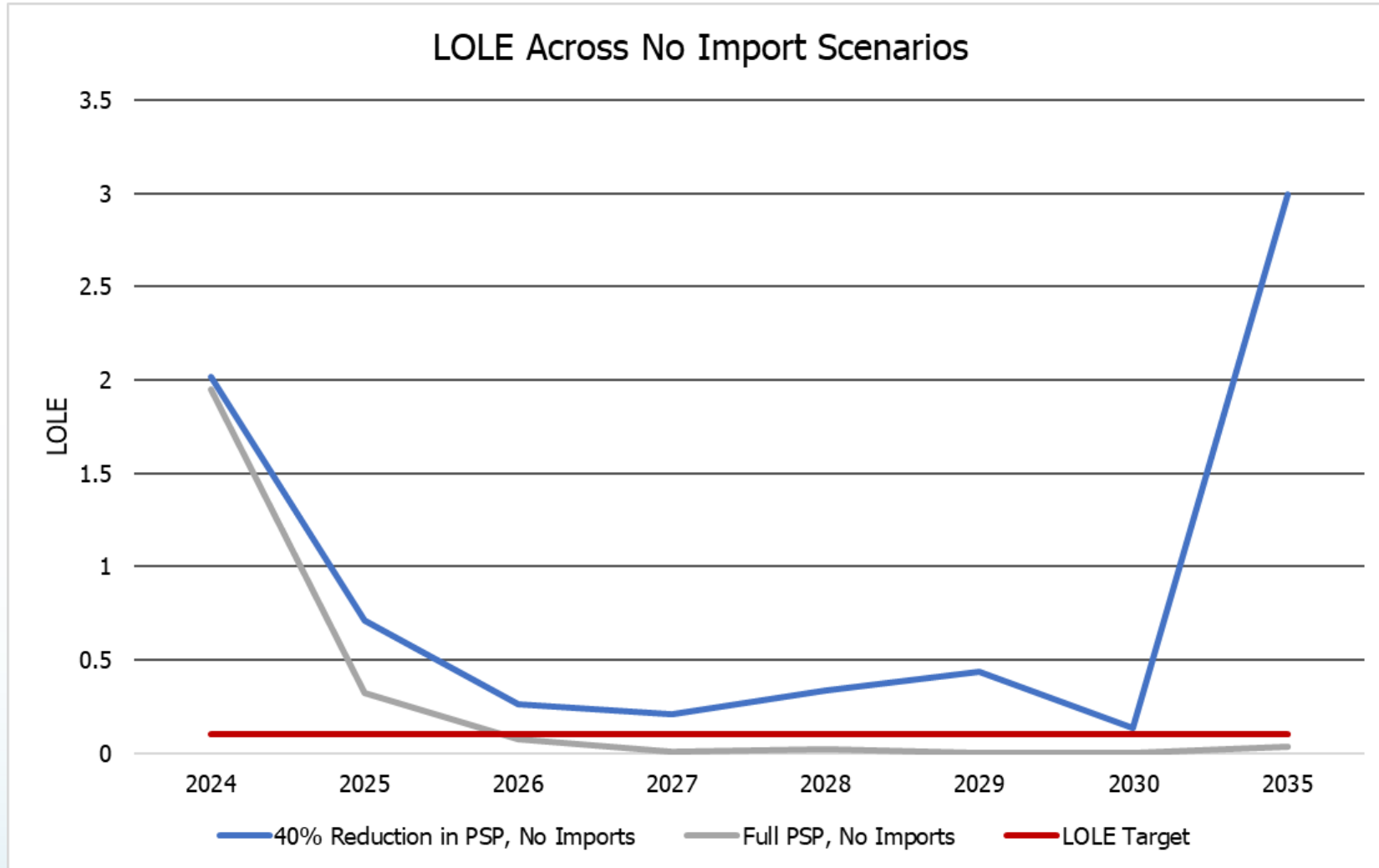


Import-Restricted Scenarios





No Import Scenarios





Conclusions

- This edition of the analysis shows substantial numbers of resources coming online all across the state and a demand forecast that is substantially lower than last year across the study period.
- The PSP meets reliability targets under expected conditions, and is robust to the studied supply and import disruptions, particularly after 2026.
- Risks remain under emergency conditions if demands end up higher than forecast, imports lower than forecast, supply is delayed past what is forecasted, or other unexpected situations.



California Energy Commission

Southern California Gas Company and PG&E Summer 2024 Reliability Assessment

Lana Wong, Gas Reliability Technical Lead

May 29, 2024



Summer 2024 Assessment Overview

Summer 2024

- SoCalGas system:
 - Analyzed supply / demand conditions
 - ❖ Inform decisionmakers about risk of curtailments
 - ❖ Review storage levels / injections for meeting peak & winter 2024-25
- PG&E system:
 - Analyzed supply / demand conditions
 - Storage
 - ❖ High level assessment



Summer 2024 Assessment

SoCalGas

- Gas balance uses CEC-produced demand scenarios
 - Two monthly demand scenarios
 - Normal temperature
 - Hot summer
 - Summer peak demand
- Hourly stochastic analysis to capture the hourly granularity and uncertainty in demand
- Hydraulic analysis of the SoCalGas system

PG&E

- Gas Balance summer peak demand
- Hydraulic analysis of the PG&E system



Results – SoCalGas Summer Peak Day Gas Balance

(MMcfd)	Summer Peak Day
Demand	
- Core	527
- Noncore-NonEG	785
- EG	1,810
TOTAL Demand	3,122
Less Available Pipeline Capacity	-2,795
Needed Withdrawal	327

Note: the available pipeline capacity represents the lowest value for July-Sept.



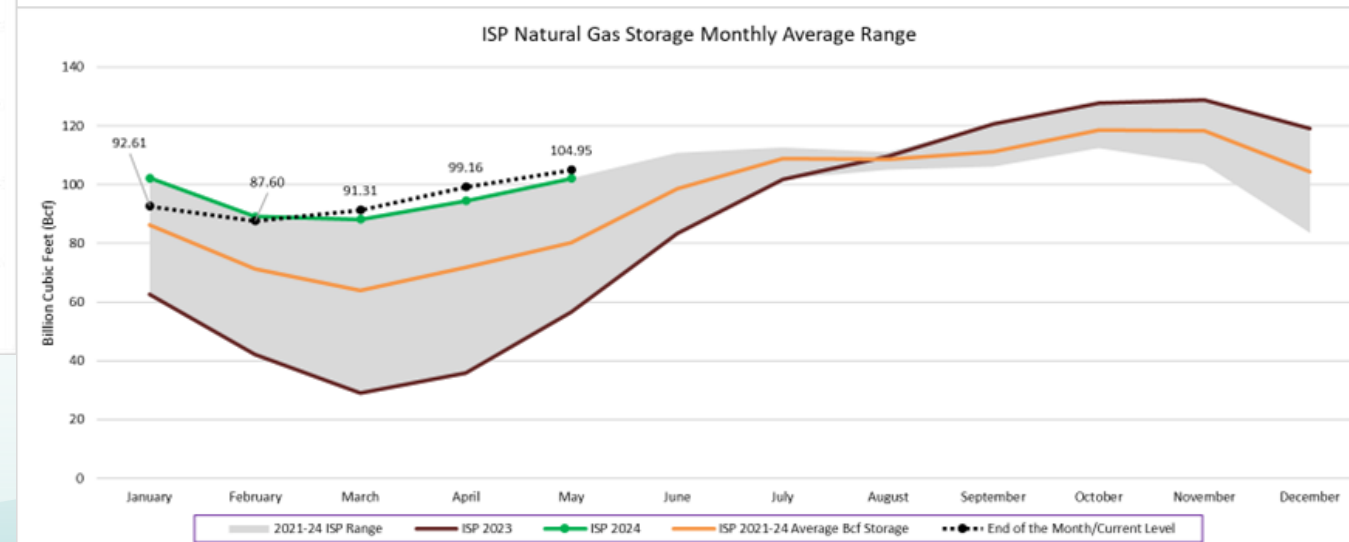
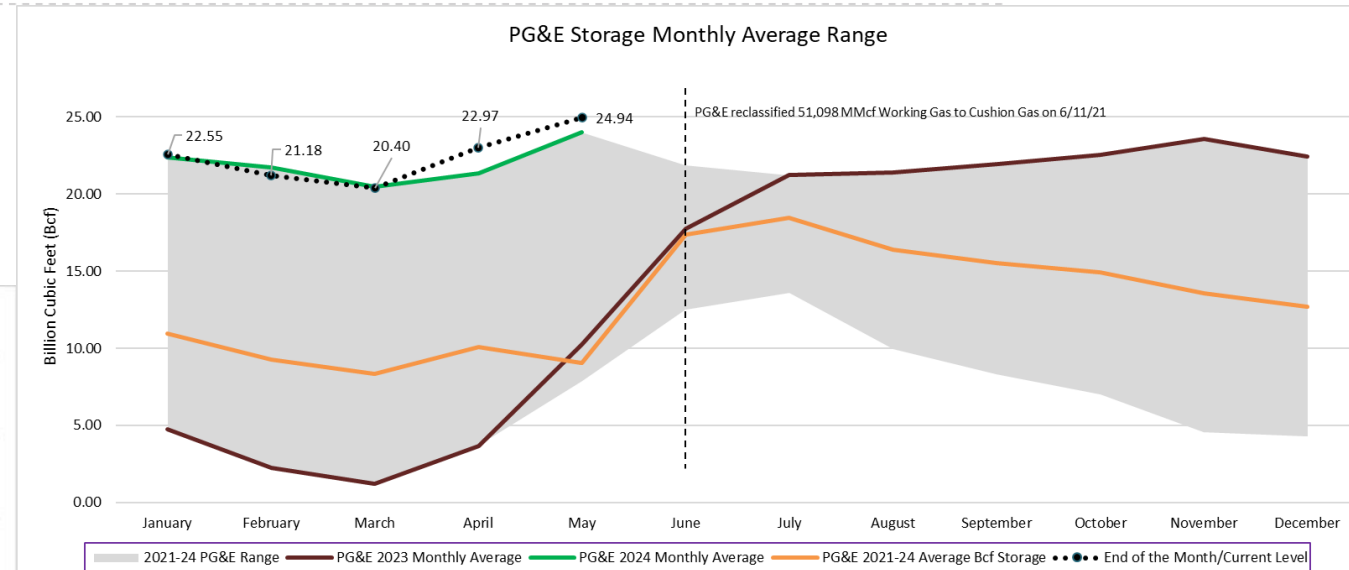
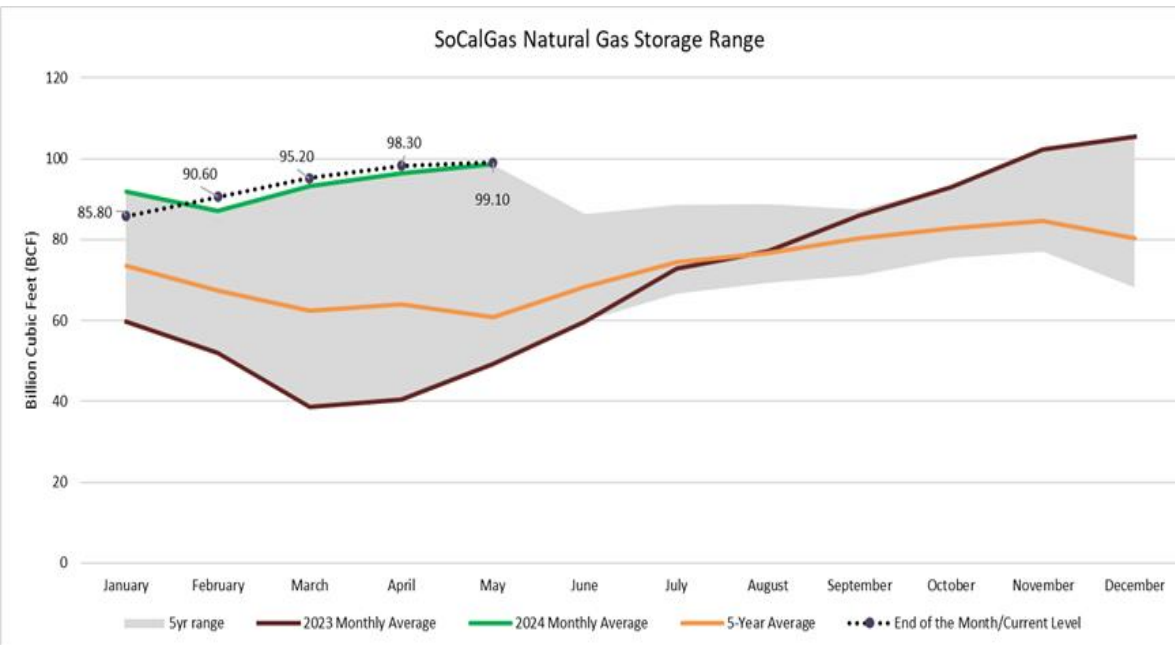
Results – PG&E Summer Peak Day Gas Balance

(MMcfd)	Summer Peak Day
Demand	
- Core	323
- Noncore-NonEG	610
- EG	927
TOTAL Demand	1,860
Less Available Pipeline Capacity	-2,880
Needed Withdrawal	0

Note: the source of the demand is the 2022 California Gas Report, and the source of the available pipeline capacity is PG&E's General Rate Case.



Natural Gas Storage Inventory





Overall Reliability Outlook

- All demand can be met in the Summer Peak Demand Cases
- Pipeline capacity is sufficient to meet demand and refill storage
- NG storage is sufficient to meet peak summer demand
- Results of gas balance are confirmed by stochastic analysis and hydraulic analysis
- Risk of curtailments is low, absent a multi-day hot weather event with additional infrastructure outages



Thank You!



California ISO

2024 Summer Loads and Resources Assessment

Aditya Jayam Prabhakar

Director, Resource Assessment and Planning

Summer Reliability Analysis

May 29, 2024

2024 Summer Outlook: Loads, Resources, and Weather

New Resource Additions

4,502 MW of capacity added through 4/1, since 9/1/2023

Expect an additional 4,569 MW of new resources by 6/30/2024

A total of 9,071 MW expected or online since 9/1/2023

2023 CEC IEPR Demand Forecast

Softening of near-term load forecasts

July peak of 46,244 MW, HE 18

Forecasted system peak shifted to July and two hours forward

Weather Outlook

Above normal temperatures are likely June through August

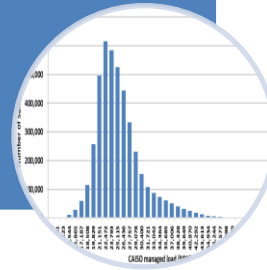
Increased chance of heat events in August and September

Average to moderately above-average hydro conditions in CA

These gains are demonstrated in both metrics the ISO is using to assess summer preparedness

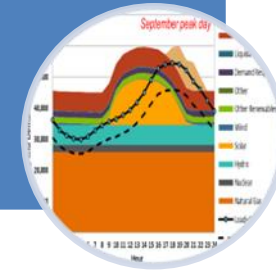
- A 2,550 MW of surplus was observed above the minimum needed to achieve target
- Note the loss of load expectation (LOLE) relates to the probability of calling on emergency measures, not actual load shed

The calculated LOLE exceeds the target 1-in-10 level



- The 18.5% reserve margin is an ISO-derived measure assessing ability to maintain operating reserve margins in reasonably stressed conditions
- Does not ensure a 1-in-10 LOLE target will be achieved

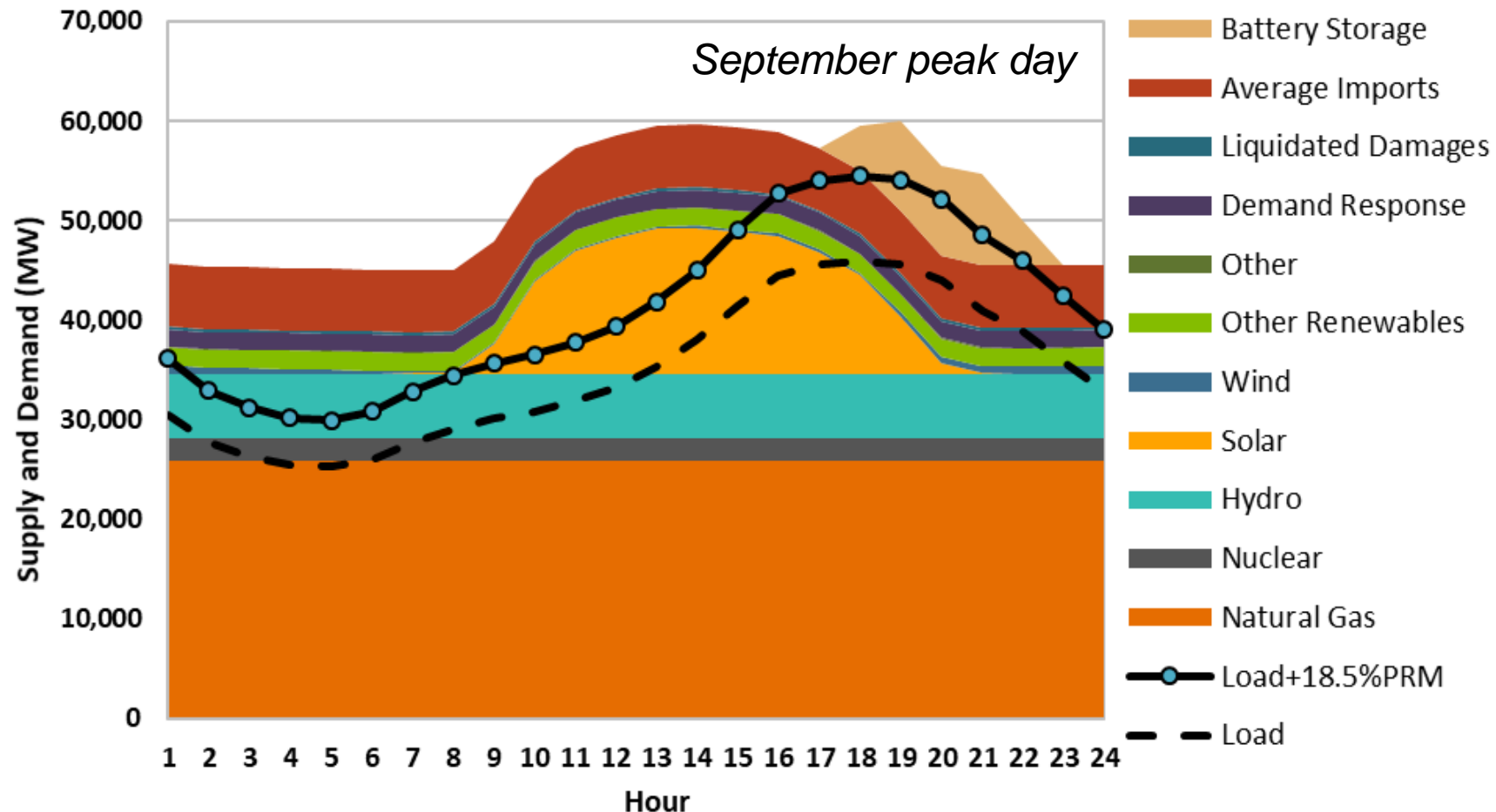
The “stack analysis” capacity analysis found a surplus of at least 3,500 MW above an 18.5% reserve margin across net peak load hours



The ISO's analysis of the adjusted CPUC's Preferred System Plan found that the portfolio achieves planning performance targets with a surplus of 2,550 MW

- The ISO assessed the level of reliability achieved by the adjusted Preferred System Portfolio (PSP, adjustments made to align with resources expected by June 30, 2024) and for 2023 CEC IEPR load forecast projections
- Measures the potential of calling on emergency measures, not actual loss of firm load
- Probabilistic simulations suggest that the adjusted PSP achieves the 1-in-10 LOLE reliability planning target with a surplus capacity of 2,550 MW

Multi-hour stack analysis indicates that expected resources are sufficient to meet forecasted demand plus an 18.5 percent reserve margin in all summer months



The ISO is showing a positive Summer Outlook for 2024 driven by new resource additions

- In addition, average hydro conditions and softening of the summer 2024 load forecast peak demand; more than offset retirements and the transition of gas-fired once-through cooling generation into the state's strategic reserves
- Extreme drought, wildfires and continued potential for widespread heat events and other disruptions continue to pose a risk for emergency conditions to the ISO grid

In order to safeguard against more extreme events, the CAISO continues to work with its state partners on the operation and sequencing of strategic reserves and emergency programs for this summer



2024 BANC Summer Load & Resource Assessment

BANC Operating Committee Meeting

Jon Olson for
Jim Shetler, General Manager, BANC

May 29, 2024



BALANCING AUTHORITY OF NORTHERN CALIFORNIA

A JOINT POWERS AUTHORITY AMONG
Modesto Irrigation District, City of Redding, City of Roseville, Trinity Public Utilities District, City of Shasta Lake, and Sacramento Municipal Utility District
6001 S Street MS D109 Sacramento CA 95852-1830
W W W . T H E B A N C . O R G

Presentation Outline

- 2024 Summer Executive Summary
- 2023 Summer Operations Review
- 2024 Summer Assessment
 - 2024 Load Forecast and Historical Load
 - Water Conditions and Generation Resource Forecast
 - Base Case Load and Resource Outlook
 - Wildfire Outlook
 - Special Operating Scenarios
 - Conclusions



BALANCING AUTHORITY OF NORTHERN CALIFORNIA

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Modesto Irrigation District, City of Redding, City of Roseville, Trinity Public Utilities District, City of Shasta Lake, and Sacramento Municipal Utility District
6001 S Street MS D109 Sacramento CA 95852-1830
WWW.THEBANC.ORG

2024 Summer Executive Summary

- Higher 1-in-2 and 1-in-10 load forecasts compared with the load forecasts developed in 2023
- “Above Normal” reservoir conditions
- No significant transmission or generation outages
- Sufficient Operating Margins for both 1-in-2 and 1-in-10 load conditions under base case analysis
- Potential risk of unserved energy under the conditions of COI N-2 outages and west-wide heatwave for 1-in-10 load.



BALANCING AUTHORITY OF NORTHERN CALIFORNIA

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2023 Summer Operations Review

- BANC reached peak demand of **4656 MW** on August 16, 2023, at 16:55 – 278 MW lower than the all-time peak demand of 4943 MW recorded in 2022.

Entity	SMUD	MID	RE	REU	Shasta Lake	Trinity PUD	WAPA footprint	BANC BA
Non-Simultaneous Peak Load (MW)	3091	685	369	237	36	30	1590	4656



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Highlights of 2024 Assessment

- Assess critical hours HE16~HE21 on peak load day to cover both gross peak load and net peak load
- Calculate hourly Effective Load Carrying Capability (ELCC) and Net Qualifying Capacity (NQC) for all generators based on actual historical data
- Evaluate hourly import availability, including firm imports and non-dependable imports, and Demand Response programs
- Calculate Operating Margins for both 1-in-2 and 1-in-10 loads
- Perform Loss of Load Probability (LOLP) analysis and special operating scenario analysis



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2024 Summer Load Forecasts

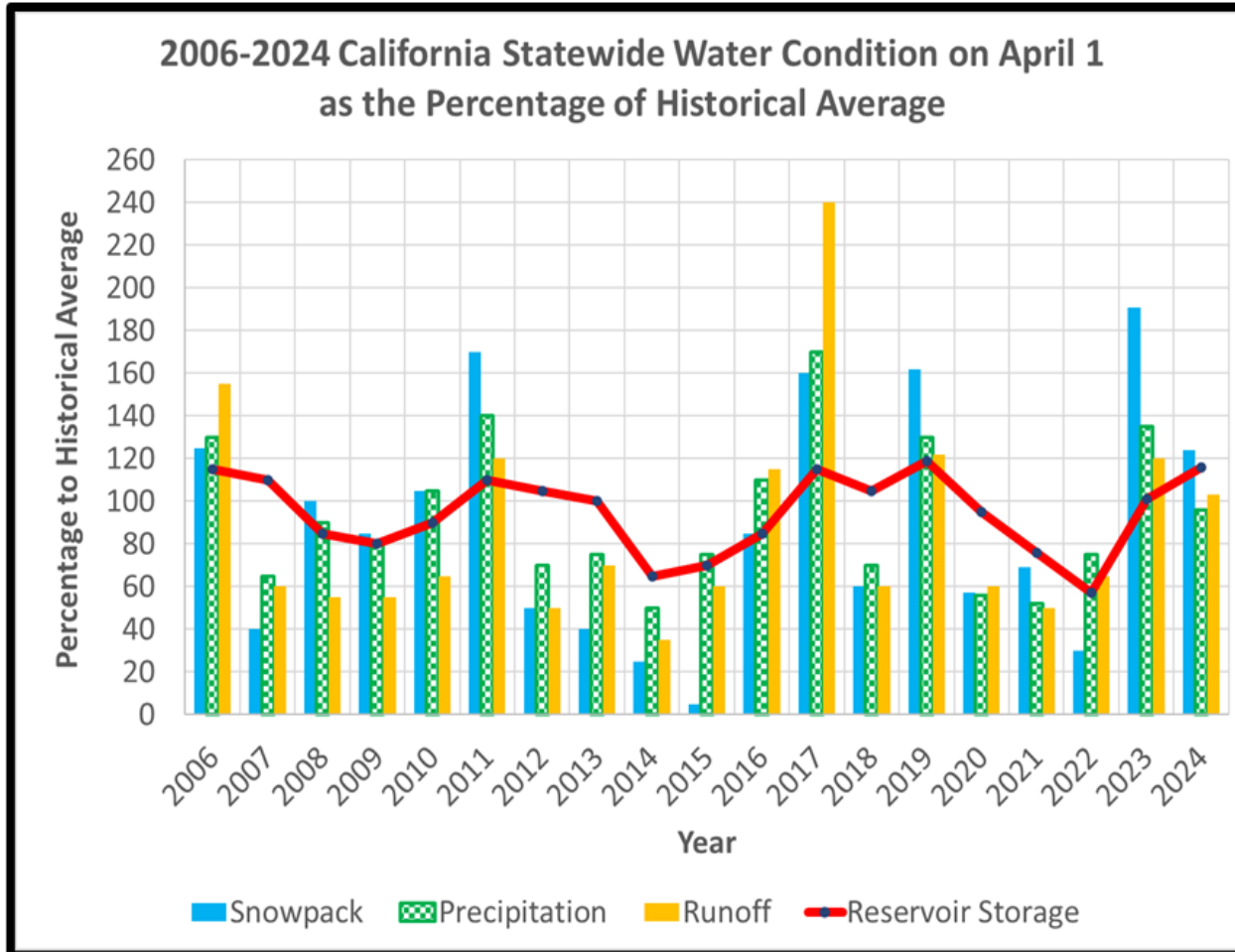
	1-in-2 Gross Peak Load Forecast (MW)	1-in-2 Net Peak Load Forecast (MW)	1-in-10 Gross Peak Load Forecast (MW)	1-in-10 Net Peak Load Forecast (MW)
SMUD	3036	2802	3271	3033
WAPA Footprint	1580	1564	1669	1655
MID	699	681	749	731
Roseville Electric	331	331	368	389
REU	232	232	235	226
Shasta Lake	38	38	38	38
Trinity PUD	27	27	27	27
BANC Total	4616	4366	4940	4688



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2024 Water Conditions



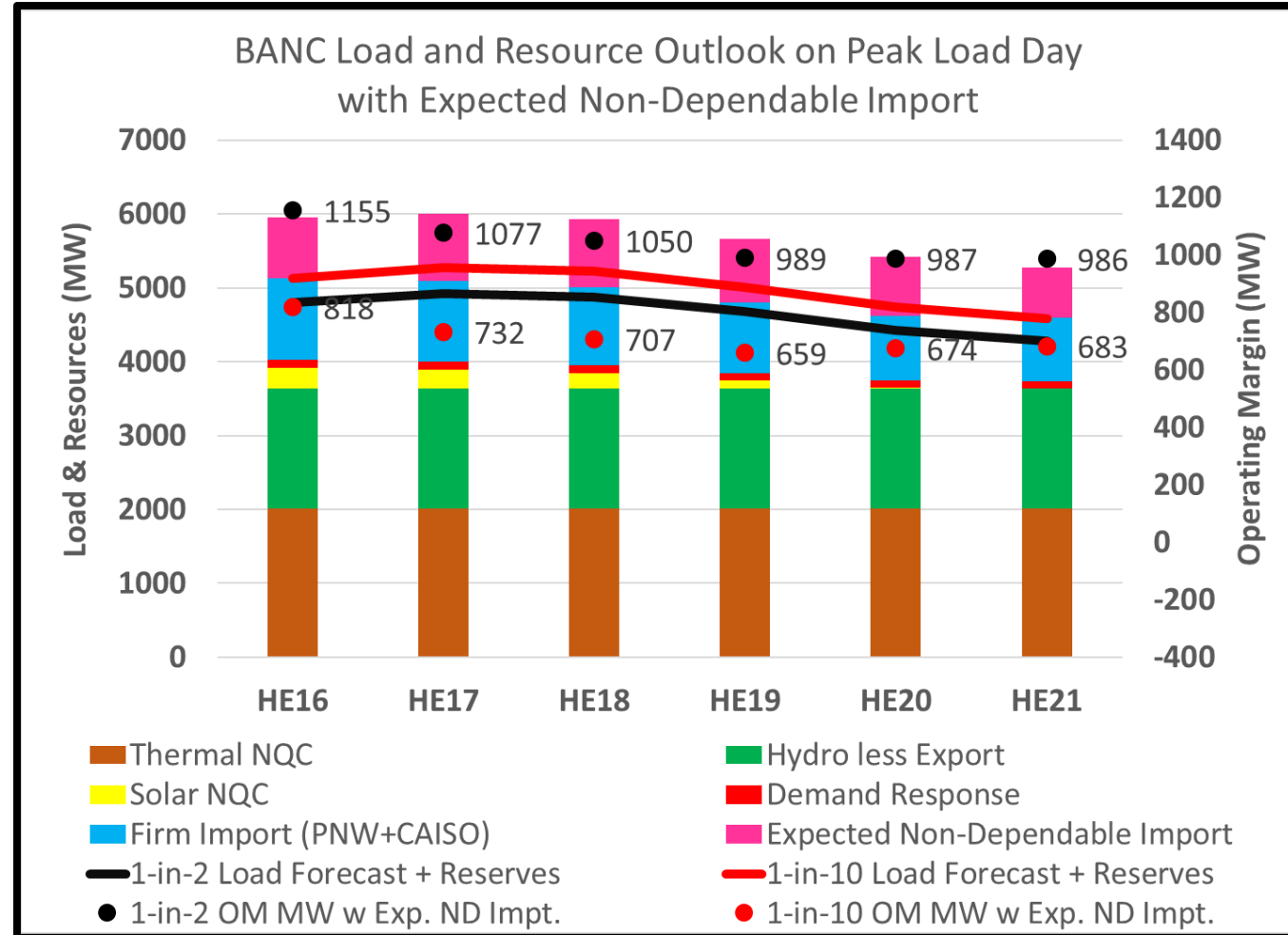
- California:
Snowpack – 126%
Precipitation – 96%
Runoff – 103%
Reservoir – 116%
- The Pacific Northwest water condition is estimated to be at 81% of normal as of 4/1/2024.



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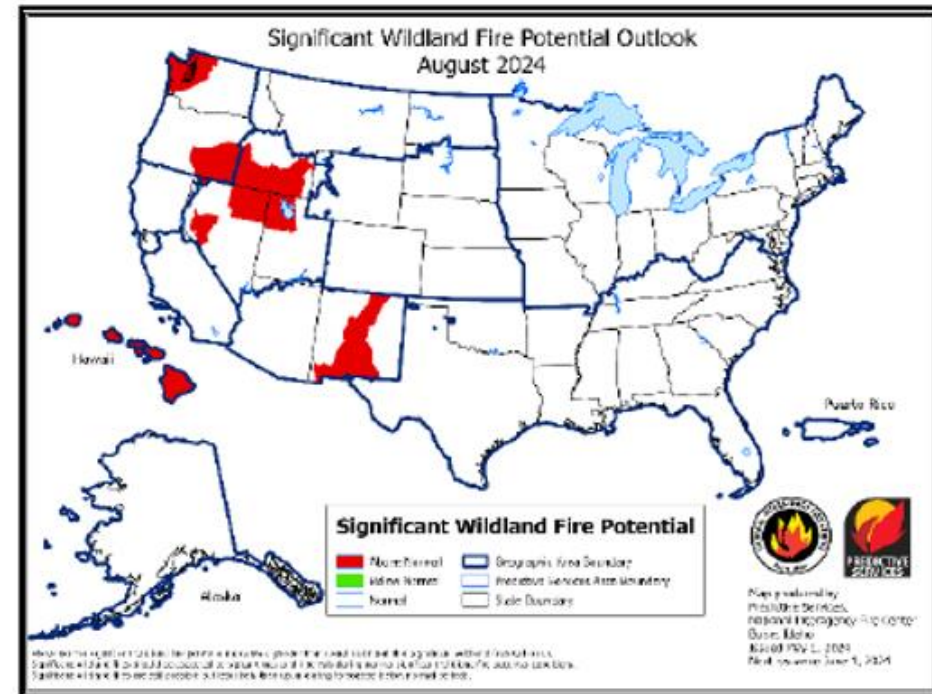
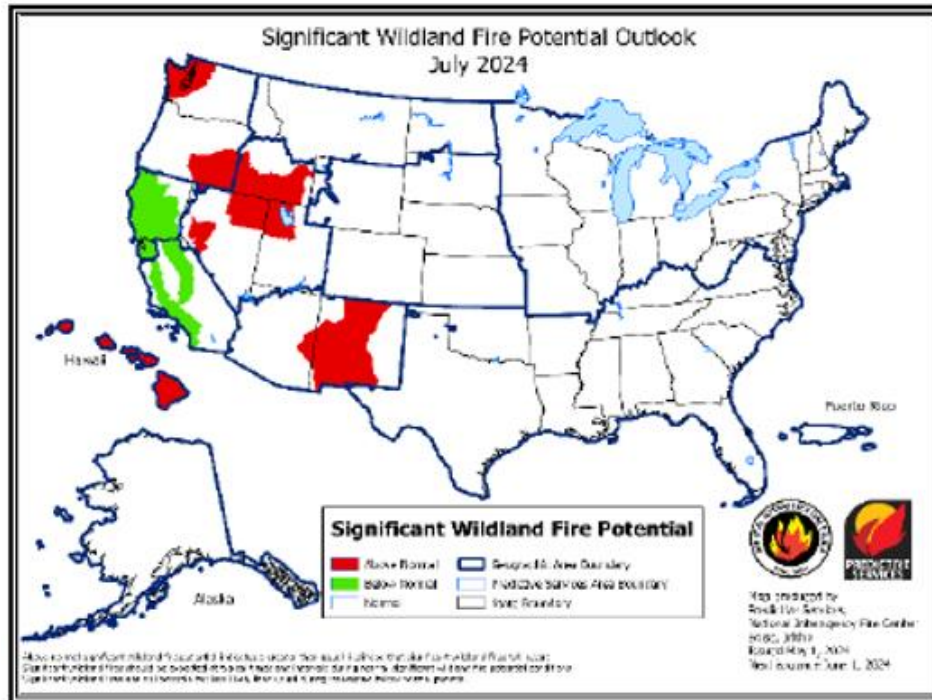
2024 Base Case Load & Resource Outlook



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2024 Summer Wildfire Outlook (July and August)



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Special Operating Scenarios

- California Oregon Intertie (COI) derate due to the loss of two 500 kV lines under wildfire condition
 - ⚡ BANC would be in EEA 3 with SMUD area having potential risk of firm load shedding under 1-in-10 load condition
- West-wide heatwave causing 1-in-20 load
 - ⚡ BANC would be in EEA 3 with SMUD area having potential risk of firm load shedding under 1-in-20 load condition
- Solar reduction due to wildfire smoke
 - ✓ Smoke reduces BANC load more than Solar
- CAISO BA in Energy Emergency Alert 3 (EEA 3)
 - ✓ Minimal import reduction (1~4%)



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Conclusions

- BANC's 1-in-2 (normal) load forecast is 4616 MW and 1-in-10 load forecast is 4940 MW.
- Although SMUD's resource supply is 200 MW higher than 2023 when counting the non-dependable import, SMUD's Operating Margins are estimated to be slightly (~1.5%) lower than 2023 due to increased load forecast.
- WAPA's resource supply is higher than 2023 due to no outages such that WAPA's Operating Margins are estimated to be slightly higher than 2023.
- Under base case condition, BANC is projected to be able to meet the forecasted 1-in-2 and 1-in-10 load demand with sufficient operating margin similar to 2023.



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Questions and Discussions



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IID

A century of service.

Imperial Irrigation District

2024 Summer Reliability Workshop

**Paul Rodriguez, P.E.,
Energy Deputy Manager
May 29, 2024**

Background

- The Imperial Irrigation District (IID) was established in 1911 and entered the power business in 1936. Proudly serving Imperial and Coachella Valleys and a portion of San Diego County, IID has a service area of **6,471 square miles with over 161,000** residential and commercial customers.



Service Territory

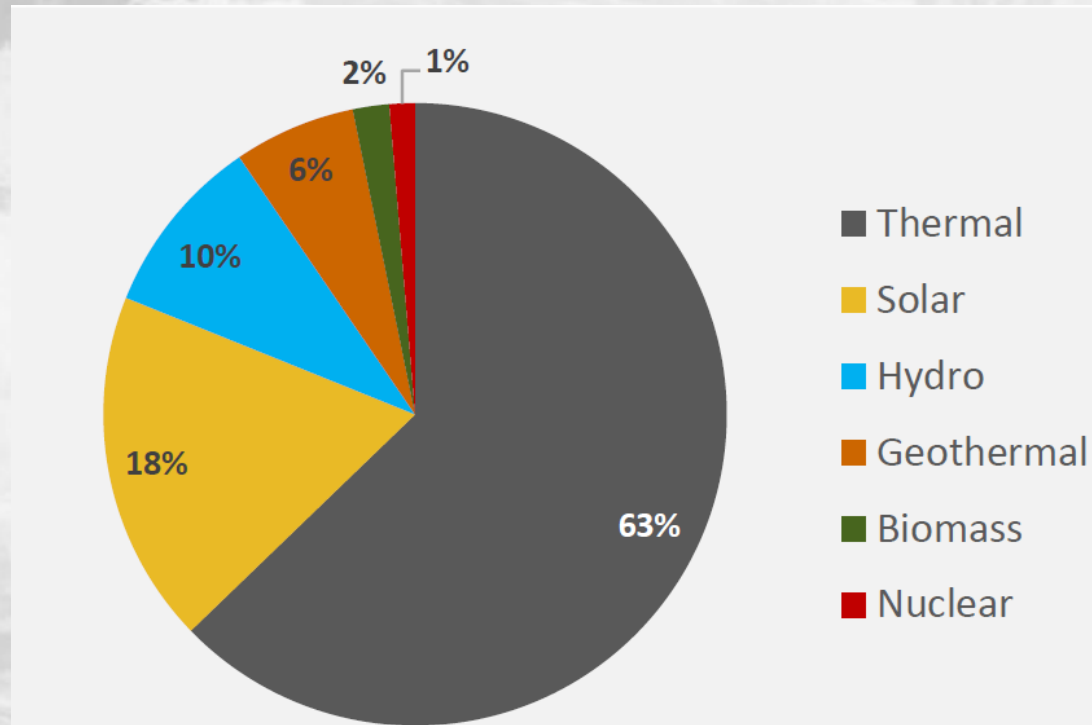
- Balancing Authority historic peak of **1,152MW** in July 2023. That was a 5.7% increase over 2022.
- 1,780-miles of transmission network and 5,004-mile distribution lines.
- Connected Generation Capacity is over 2,200MW
- Diverse resource portfolio including: geothermal, solar, hydro, biomass and emergency diesel resources
- Battery Storage
 - 30MW/20MWh Battery Storage
 - 30MW/120MWh (COD June2024)

Changes for this Summer

- 2024 summer load is projected to be lower than last year's, peak forecast is expected load expected closer to August timeframe.
- Transitioned from the SWRSG to WPP-RSG
- Upgrades:
 - *Complete Rebuild of 230kV S-line (El Centro- Imperial Valley)*
 - *Reconductored two 92kV lines the Coachella Valley area (Coachella Valley- Coachella Switching Station)*
 - *New 332MVA Transformer 230kV/92kV at El Centro Switching Station*
 - *Additional 120MWh of storage*

Generation Portfolio for 2024

- Over 130MW of distributed solar (roof top).
- Nameplate capacity of IID generation portfolio for 2024:



More Energy Storage

- 33MW/20MWh used for reliability:
 - *Spinning Reserves*
 - *Automatic Generation Control*
 - *Voltage support*
 - *Frequency Response*



- 30MW/120MWh used for reliability:
 - *Market Optimization*
 - Negative Pricing
 - Solar Ramp Hours

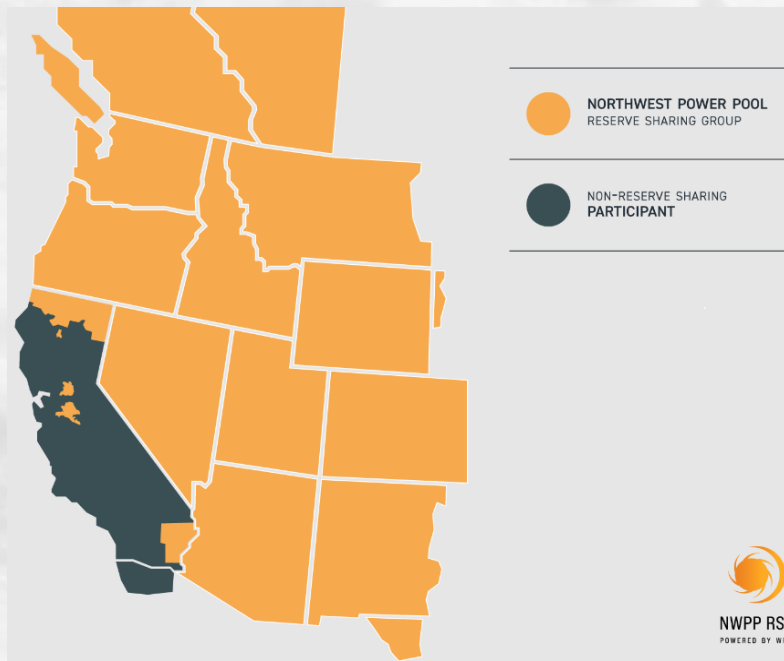
Emergency Turbines

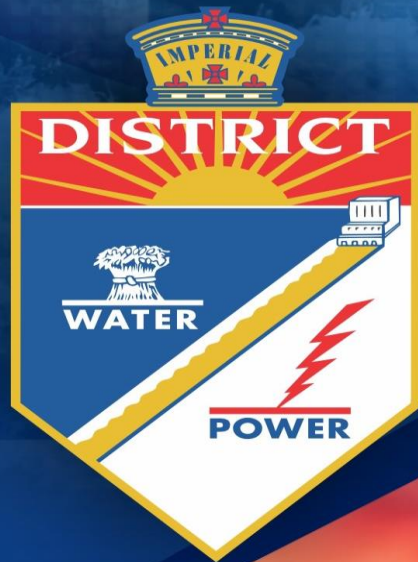
- Three 20MW (60MW) of emergency diesel turbines installed at three distribution substations.
- 5 hour Max run time air permit.



New Reserve Sharing Group

- Increase in potential MW assistance this summer based on WPP's methodology.
- More qualifying events under WPP's reserve sharing program.
- Allows for assistance request during EEA3 events.





IID

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Water & Power

California Energy Commission Summer Reliability Workshop

May 29, 2024

LADWP

Tony Skourtas – Manager of Energy Control Operations



Los Angeles
Department of
Water & Power

Load Forecast

All-time Peak

- 6502-MW on August 31, 2017

2023 Peak

- 5226-MW on August 29, 2023

2024 Load Forecast

- Base 5727-MW
- 1 in 5 6137-MW
- 1 in 10 6351-MW
- 1 in 40 6682-MW



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Generation

- Maintaining existing capacity
while transitioning to renewables
- OTC plants continue operation through 2029
coordination with SACCCWIS
- Completing maintenance and repairs for
summer readiness



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Renewables

- Over 1120-MW utility solar
- Adding 200-MW of solar generation
September-October 2024
- Wind generation approximately 425-MW
excluding PPA's
- 2025 renewable goal 55%



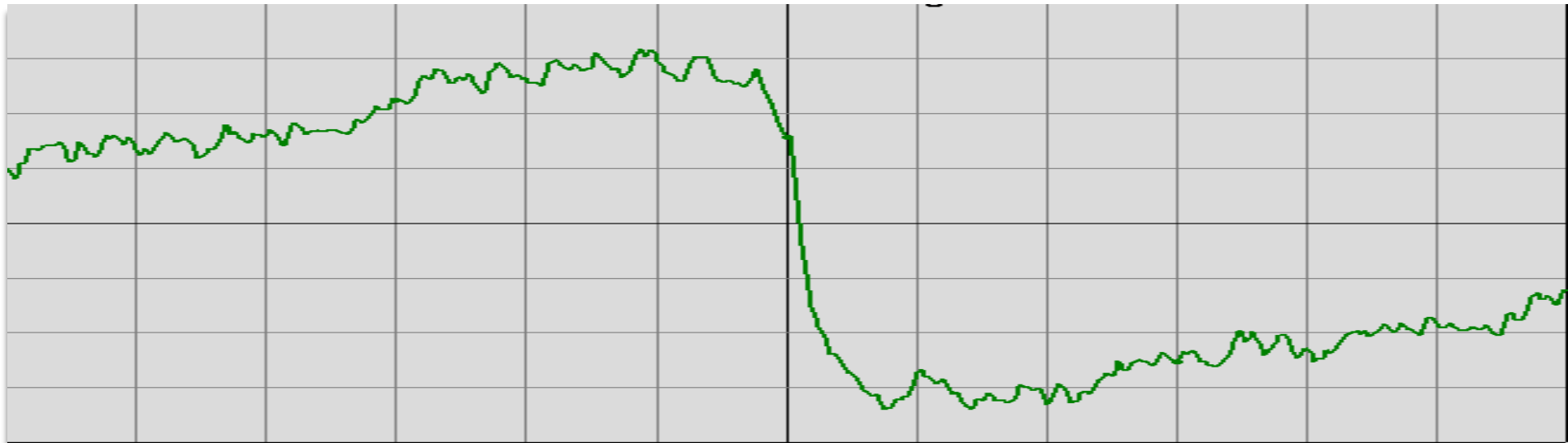
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Resource Adequacy

- Sufficient resources to meet all-time peak with necessary reserve margin.
- Available to assist California and WECC
- Concerns:
 - Wildfires (CCMC)
 - Prolonged heat event

Demand Response

- Power Savers Thermostat program
Increasing effectiveness – 120MW
- C&I Program <50MW
 - **Coordination with BA**





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Questions?



Q&A



Lunch Break





Panel: Need for Contingencies

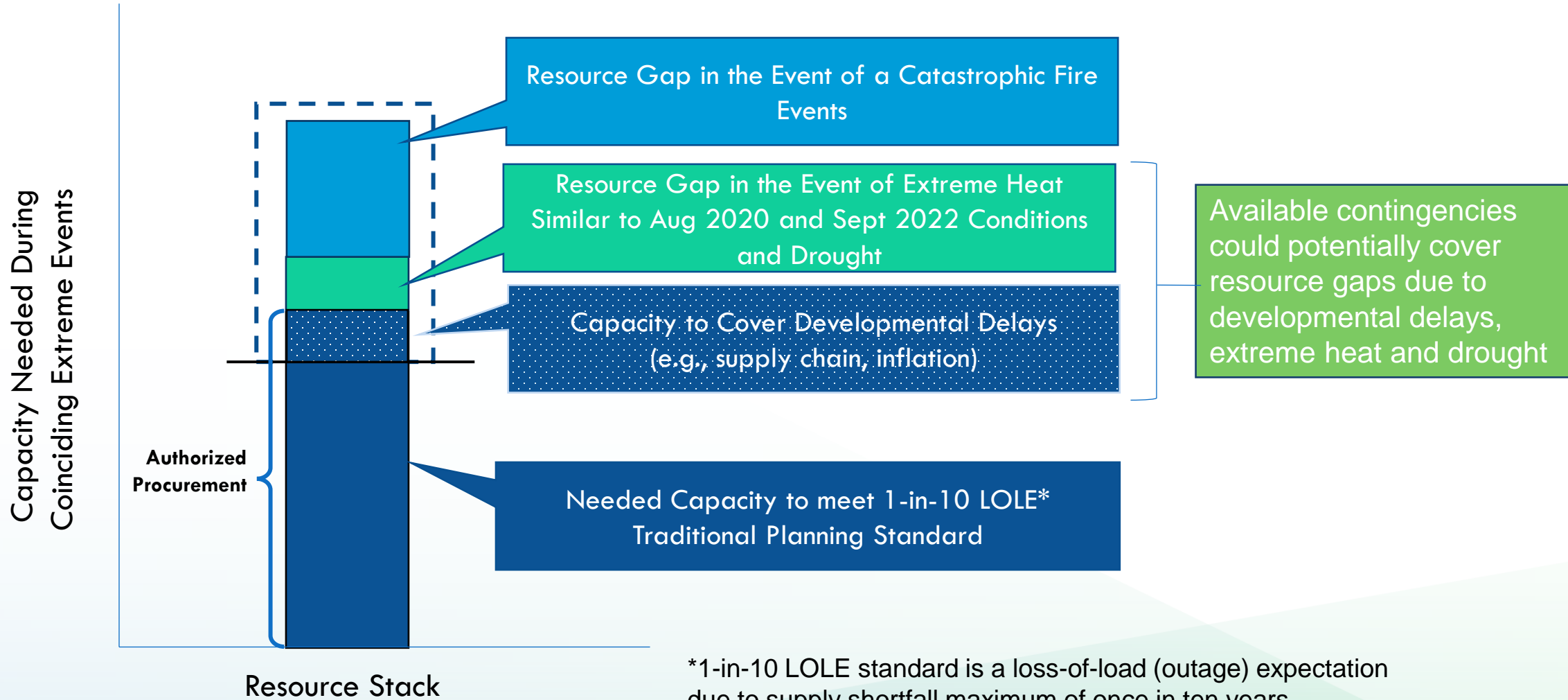
Moderator: Liz Gill

- A. Electric Supply Strategic Reliability Reserve Program – Delphine Hou, DWR
- B. Distributed Electricity Backup Assets Program & Demand Side Grid Support Program – Ashley Emery, CEC
- C. Emergency Load Reduction Program – Andrew Magie, CPUC



Electric System Reliability

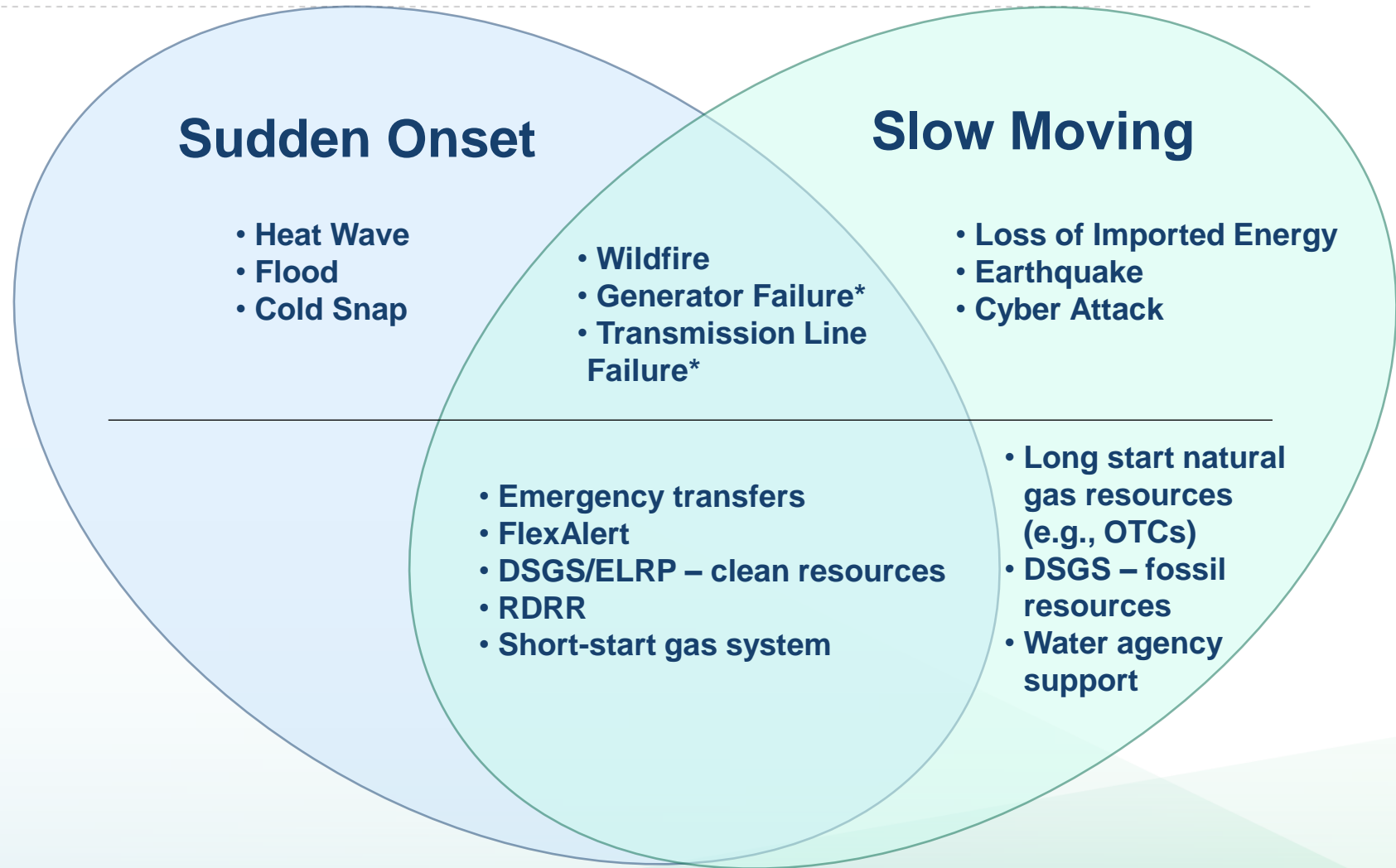
Need for Contingencies



*1-in-10 LOLE standard is a loss-of-load (outage) expectation due to supply shortfall maximum of once in ten years.



Types of Emergencies and Support Resources



Events

- Can be singular or coincident, but most are driven by climate change

Resources

- Operational characteristics impact when they are useful

*Caused by heat, wildfire, etc.



Contingencies

Type	Contingency Resource	MW Available		
		July	August	September
Strategic Reliability Reserve	DWR Electricity Supply Strategic Reliability Reserve Program	3150	3150	3150
	CEC Demand Side Grid Support ¹	225	261	297
	CEC Distributed Electricity Backup Assets ²	0	0	0
CPUC*	Ratepayer Programs (Emergency Load Reduction Program, Smart Thermostats, etc.) ³	305	333	357
	IOU Import Contracts	325	930	825
	As Available Energy from Installed Resources	119	50	39
Non-Program	Balancing Authorities Emergency Transfers	300	300	300
	Thermal Resources Beyond Limits: Gen Limits	40	40	40
	Thermal Resources Beyond Limits: Gen Limits Needing 202c	25	25	25
	Total	4489	5089	5033

Data as of 4/29/2024

¹ Adjusted to reflect availability vs enrolled participants, and additional time needed for participants to transfer from ELRP to DSGS and new clean DR aggregators to operationalize

² Nine projects were recommended for DEBA funding for a total of 296 MW

³ Based on enrollment numbers

* Numbers are from June 2023 IOU Excess Reports. Numbers will be updated for summer 2024 when IOUs submit their June 2024 Month-Ahead Showings to CPUC

Update on Electricity Supply Strategic Reliability Reserve Program

CEC Summer Reliability Workshop, May 17, 2023



Delphine Hou, Deputy Director, Statewide Water and Energy

California Benefits from Electricity Supply Strategic Reliability Reserve Program (ESSRRP)

- Acts as insurance policy and safeguards the statewide electrical grid
- Provides additional energy reserves during extreme and combined events (e.g., heat events, wildfires, and drought)
- Helps to avoid power shortages and outages for millions of Californians
- Supports California's transition to a clean energy future



DWR's Role

- Identify, prioritize and select new generation projects
- Develop/execute contracts and oversee engineering, procurement and construction of projects
- Implement state certification and environmental compliance
- Administer Electricity Supply Reliability Reserve Fund
- Coordinate with State agencies (CARB, CEC, CPUC, SWRCB, etc.) and CAISO



ESSRRP Update

	2022	2023	2024
Natural gas-fired resources ¹	120.0 MW	147.5 MW to 291.0 MW	3,150.3 MW
Diesel generators ²	82.4 MW	n/a	n/a
Firm energy import contracts ³	3,349 MW	n/a	n/a

¹Includes low emitting resources in 2023 based on similar technology that has achieved California Air Resources Board's Distributed Generation certification. <https://ww2.arb.ca.gov/our-work/programs/dgcert>

²This program was closed early in favor of lower emissions resources.

³Authorization for firm energy imports was only for summer 2022.





Demand Side Grid Support and Distributed Electricity Backup Assets

Summer Reliability Workshop - May 29, 2024

Presenter: Ashley Emery, CEC



CEC Reliability Reserve Incentive Programs (AB 205 and AB 209)

	Demand Side Grid Support (DSGS)	Distributed Electricity Backup Assets (DEBA)
Incentivized Activities	Use of existing load reduction resources during extreme events	Purchase of cleaner and more efficient distributed energy assets that would serve as on-call emergency supply or load reduction
Eligibility	Statewide	Statewide



DSGS Development Roadmap





DSGS Incentive Structures

Option 1: Emergency Dispatch

- \$2 per kWh energy payment
- \$0.25 per kWh standby payment

Option 2: Market-Integrated Incremental Demand Response

- Payments based on demonstrated capacity in excess of resource adequacy capacity commitments

Option 3: Market-Aware Storage Virtual Power Plant

- Payments based on demonstrated capacity of an aggregated virtual power plant



Program Changes in Summer 2023

Bring on Additional Clean Resources

- Dispatch cleaner resources earlier
- Market-integrated demand response incentive pilot
- Market-aware storage VPP incentive pilot
- One-time bonus incentive for remote controllable generation

Expand and Streamline Participation

- Expanded eligibility to certain IOU and CCA customers
 - ✓ Backup generation
 - ✓ Water agencies
 - ✓ Market-integrated DR and market-aware battery storage pilots
- Incorporated aggregators as DSGS providers
- Allowed direct customer enrollment (in limited circumstances)
- Contracted with Olivine, Inc., as third-party administrator



Summer 2023 Enrollment

	Option #1	Option #2	Option #3
Incentive Type	Emergency Dispatch	Incremental Market-Integrated Demand Response Pilot	Market-Aware Storage VPP Pilot
Enrolled Providers	8	3	8
Participants Enrolled	27	N/A	1,296
Capacity Enrolled	132.1 MW	N/A	10.4 MW



2024 Revised Guidelines: Incorporating Lessons Learned



- Grow participation from cleaner resources
 - Long-start resources in Option 2
 - V2X in Option 3
- Refine and clarify requirements to improve user experience
- Continue to simplify operational complexities





Summer 2024 Enrollment

	Option #1	Option #2	Option #3
Incentive Type	Emergency Dispatch	Incremental Market-Integrated Demand Response Pilot	Market-Aware Storage VPP Pilot
Enrolled Providers	8	4	14
Participants Enrolled	23	N/A	16,885
Capacity Enrolled	125.9 MW	TBD	104.1 MW

Values as of May 17, 2024



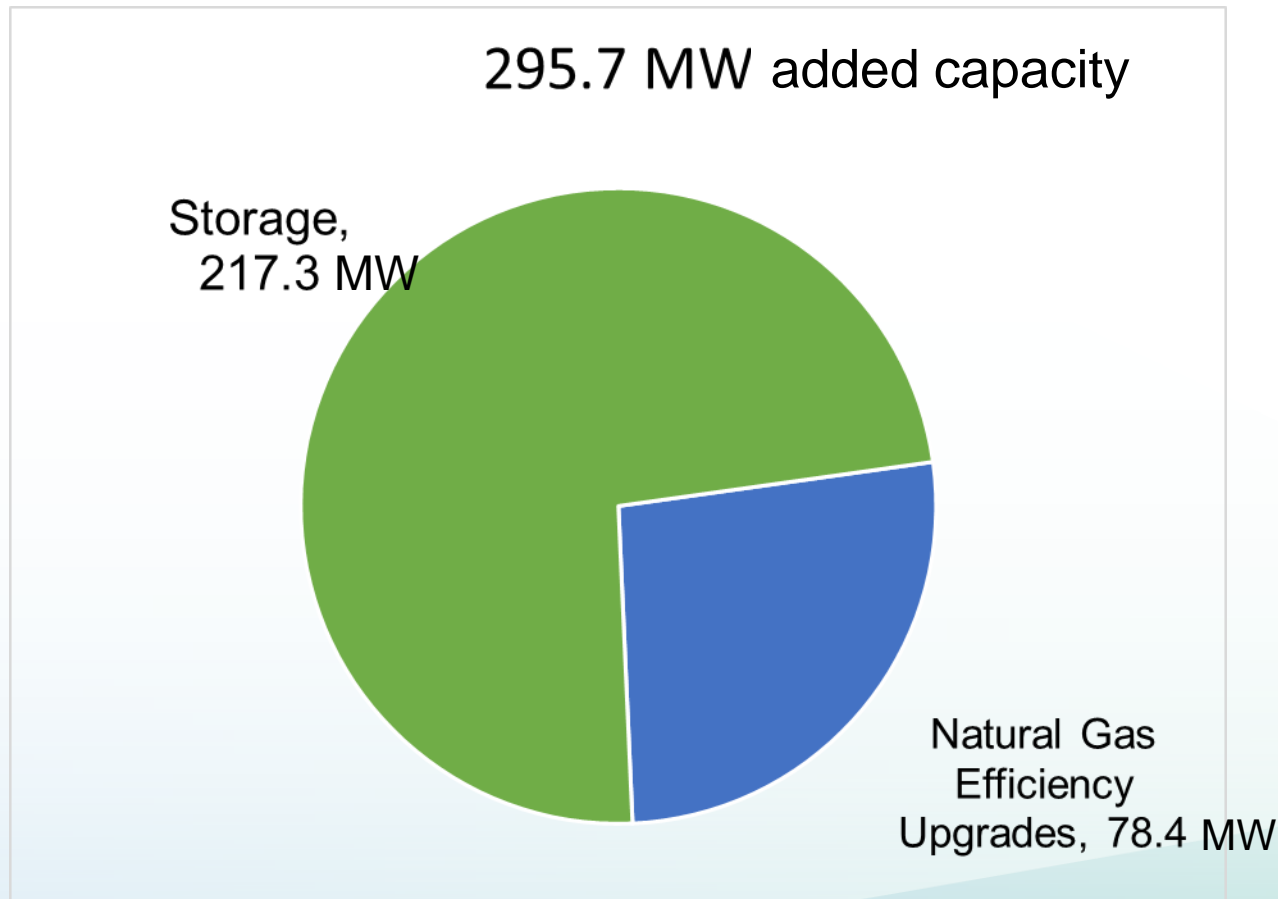
DEBA Program Overview

Eligible Projects	Description	Status	
Bulk Grid Asset Enhancements	Efficiency upgrades and capacity additions to existing bulk grid power generators	<ul style="list-style-type: none">Released \$150M Solicitation in Dec 2023Award notification released April 2024Target CEC Business Meeting July 2024	 An aerial photograph showing a large-scale solar farm with rows of photovoltaic panels in a desert landscape, adjacent to a power substation with numerous insulators and transformers.
Distributed Energy Resources (DERs)	Zero- or low-emission technologies at existing or new facilities	<ul style="list-style-type: none">Draft concept released February 2024Public Feedback March 2024Release of formal solicitation TBD	 A close-up photograph of several large, grey electrical control cabinets or inverters mounted on a wall, with a brick pillar and a black lantern-style light fixture visible on the left.



DEBA Awards for Clean and Efficient Bulk Grid Back-up Assets

\$122.8 million DEBA funds for 295.7 MW added capacity



Year Expected Online	Proposed MW
2025	43.05
2026	75.00
2027	178.90

- Notice of Proposed Awards issued April 2024
- Average award ~ \$0.42 million/MW



Next Steps for DSGS and DEBA

DSGS Program

- Grow DSGS enrollment
- Continue stakeholder process for guideline modifications for 2025 program season

DEBA Program

- Finalize agreements for Bulk Grid NOPA awardees
- Release DER grant funding opportunity, pending active state budget discussions

Emergency Load Reduction Program & Power Saver Rewards

Summer Reliability Analysis Panel

Andrew Magie – Demand Response Analyst, CPUC

May 29, 2024



California Public
Utilities Commission

What is ELRP?

- ELRP is an out-of-market but market-informed pay-for-performance, event-based, emergency demand response program established in 2021
- Program availability: May – October, 7 days a week, 4 – 9 p.m.
- Event Duration: 1 – 5 hours (A.4 & A.5 max at 3 hours)
- Annual Dispatch Limit: no more than 60 hours
- Compensation Rate: \$2/kWh of Incremental Load Reduction for nonresidential and \$1/kWh for residential
- Event Trigger: CAISO EEA-W through EEA-3, Flex Alert for residential
- Minimum Annual Dispatch: varies by subgroup

Who Participates in ELRP ?

ELRP Sub-Group	Oct 2023 MWs	May 2024 MW	2024 # Enrollments
A.1: Non-res, non-DR*	200	80.4	16,000
A.2: Non-res, Non-DR Aggregator*	2	2.1	2
A.3: Exporting DERs	0.1	0.1	1
A.4: VPP Aggregators	21	21	4^
A.5: VGI Aggregators	0.4	0.1	2^
A.6: Residential PSR	95	74.9	4 Million
B.1: Third-Party DRPs	45	42.7	1^
B.2: IOU CBP	4	2	14^
TOTALS:	367	223	4.2 Million

*Includes BIP for overlapping ELRP/BIP events.

^Number of aggregator-IOU contracts

What Makes ELRP Unique?

- A.3 Exporting DERs
 - Compensates for exported energy
- A.4 VPP
 - Compensates for exported energy (unavailable in CAISO market-integrated programs)
 - Allows the use of submetering to measure incremental load reduction (ILR)
- A.5 VGI
 - Allows the use of submetering to measure incremental load reduction
- No penalties for non- or under-performance
- Insurance against blackouts as triggered by CAISO emergency conditions

ELRP Staving Off Blackouts: 9/6/2022 September Heatwave

Hour-Ending	Nonresidential (A.1-A.5) MWh/h	Residential Power Saver Rewards (A.6) MWh/h
17	75	(55.81)
18*	73	(40.86)
19	100	294.55
20	83	42.13
21	45	(179.67)

*Text sent at 5:45 P.M. from CA Governor's Office of Emergency Services

A.4 VPP SDG&E Examples in 2023



Demand Side Analytics
DATA DRIVEN RESEARCH AND INSIGHTS



California Public Utilities Commission

Andrew.Magie@cpuc.ca.gov



Q&A



California Energy Security Program and Planning Update

Justin Cochran, Senior Nuclear Advisor and Emergency Coordinator

May 29, 2024



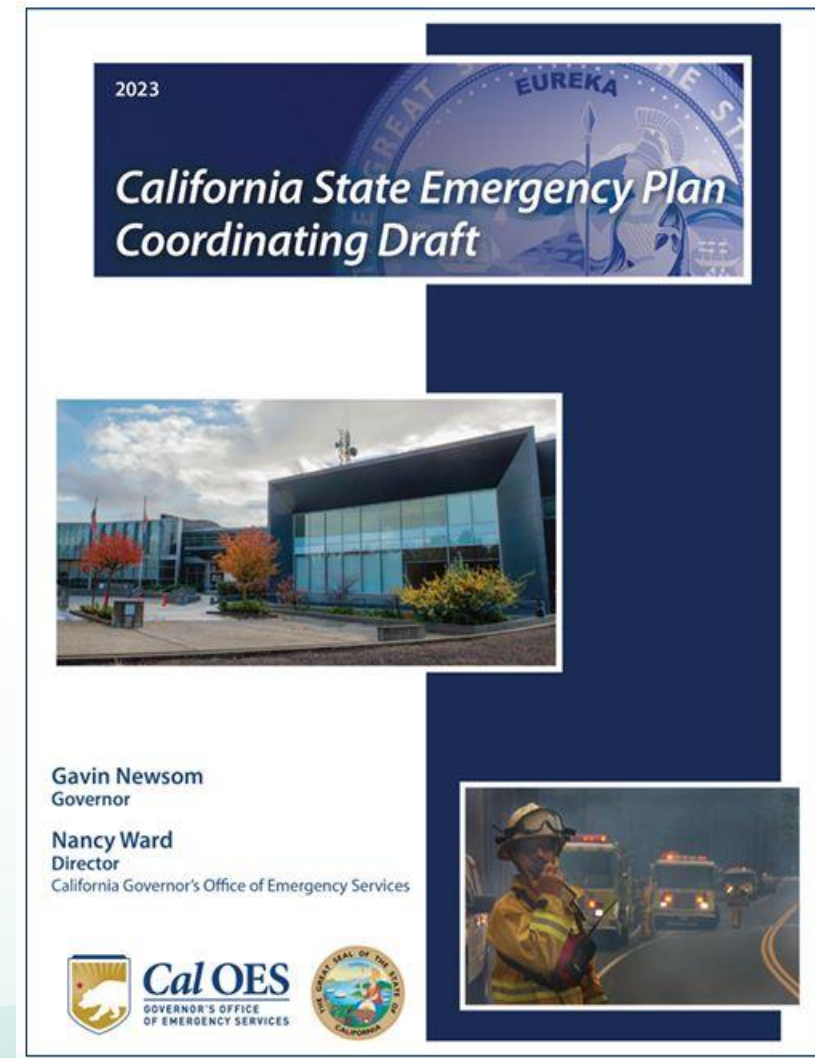
Presentation Content

Agenda Item
CEC Emergency Authority & Role
Infrastructure Investment and Jobs Act (IIJA) Provisions
Energy Security Plan Requirements
Federal and Regional Engagement
Activities & Submissions
Energy Security Plan Structure



CEC Emergency Authority

- DOE is the Lead Agency for Energy Emergencies and coordinates with the state agency designated in each state emergency plan.
- The CEC is the California State Energy Office (agency) and coordinates with multiple DOE Offices and Programs.
- Section 40108 of the IIJA requires State Energy Security Plans be updated and submitted.
 - California and most States had existing Energy Assurance Plans (older DOE program)





IIJA Provisions

IIJA requirements to receive federal financial assistance:

- Submit a State Energy Security Plan (SESP) that meets Section 40108 requirements

All 50 states have been working with the U.S Department of Energy (DOE) teams to:

- Develop working groups and resource documents.
- Update existing plans to meet the new requirements.
- Submit required documentation.





Energy Security Plan Requirements

State Energy Security Plans must:

1. Address all energy sources and energy providers.
2. Provide a state energy profile, including an assessment of energy production, transmission, distribution, and end-use.
3. Address potential physical and cybersecurity hazards to each energy sector or system.
4. Provide a risk assessment of energy infrastructure and cross-sector interdependencies.
5. Provide a risk mitigation approach to enhance reliability and end-use resilience.
6. Address multi-state and regional coordination, planning, response, and coordination with Indian Tribes with respect to planning and response.





Engagement Activities

CEC Staff engagement activities include:

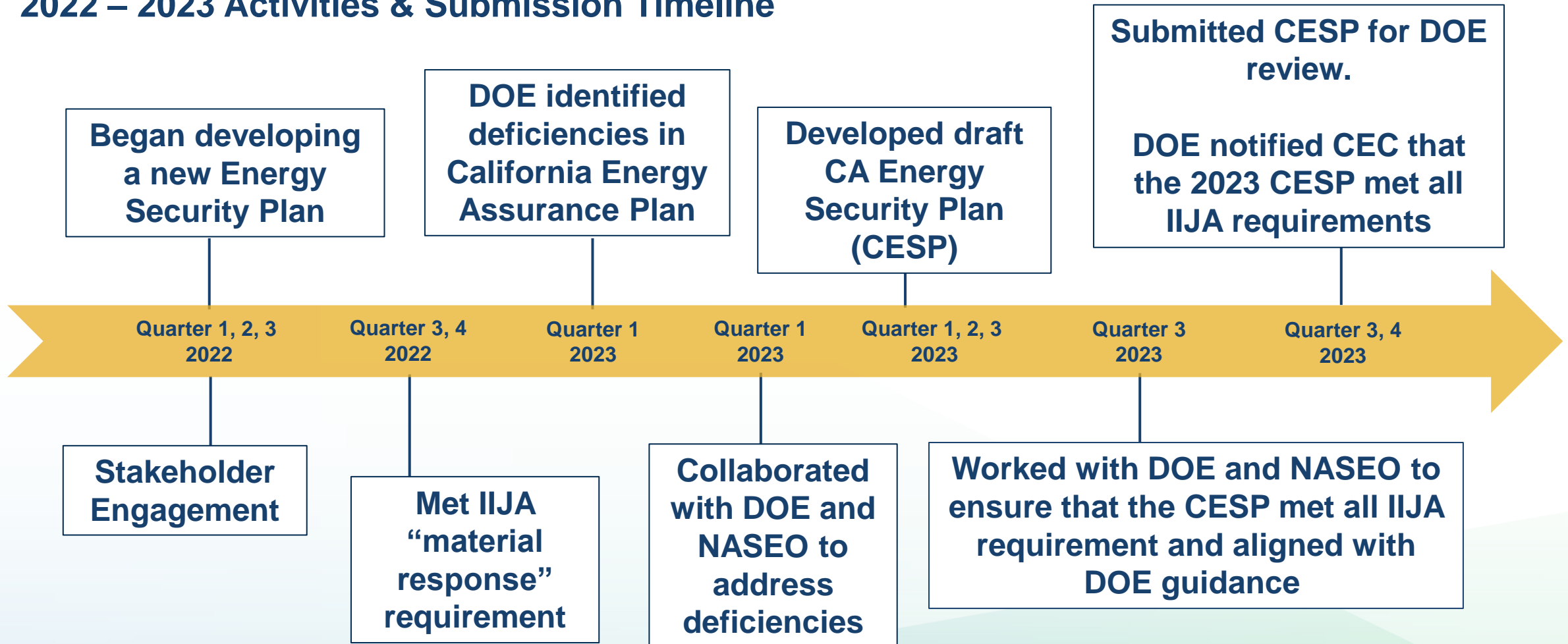
- DOE Energy Security and Grid Resilience Cohorts
- Monthly NASEO Energy Security Committee Meeting and All-Hazards meetings.
- State Regional Group meetings and Energy Security Workshops.





CEC Activities & Submissions

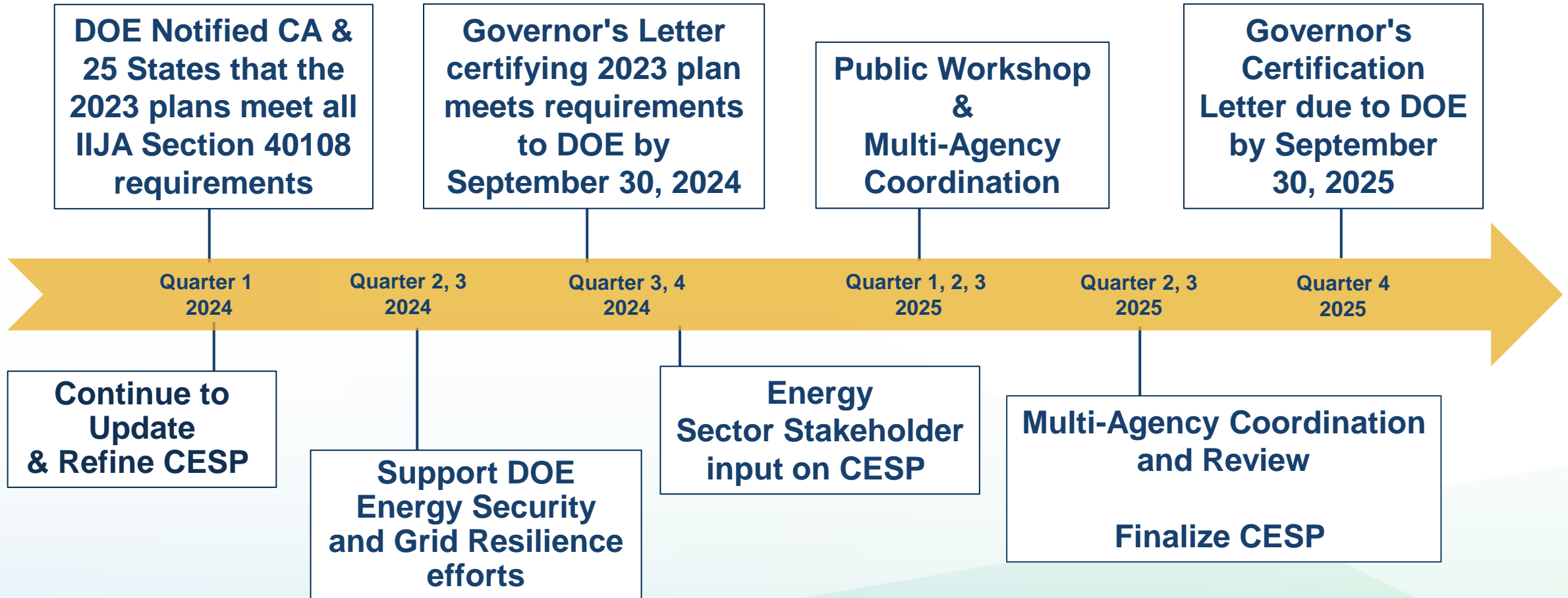
2022 – 2023 Activities & Submission Timeline





CEC Activities & Submissions

2024 – 2025 Activities & Submission Timeline





2024 CA Energy Security Plan

Chapters 1-6

(Public Facing)

Overview of:

- Plan Structure
- Energy Profile & Sector Risks
- Energy Security & Emergency Response Authorities
- Energy Security Planning & Preparedness
- Energy Emergency Response
- Energy Resiliency & Mitigation Measures

Appendices 1-13

(Official Use Only)

Detailed Information of:

- Contingency Programs
- Energy and Risk Profiles
- Organizational and Operational Structures
- Regional Coordination
- Cybersecurity
- Data & Situational Tools



Thank You!



Q&A



Public Comment

Zoom:

- Use the “raise hand” feature

Telephone:

- Dial *9 to raise your hand
- *6 to mute/unmute your phone line. You may also use the mute feature on your phone.

Zoom/phone participants, when called upon:

- Your microphone will be opened
- Unmute your line
- Spell your name for the record, begin comments

Limited to 1 representative per organization.

3-Minute Timer

