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July 9, 2025

VIA ELECTRONIC FILING
Adam Teitzman, Commission Clerk
Division of Commission Clerk and Administrative Services
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, FL 32399-0850

Re: Docket No. 20250011-EI
Petition by Florida Power & Light Company for Base Rate Increase

Dear Mr. Teitzman:

Attached for filing on behalf of Florida Power & Light Company ("FPL") in the above-referenced docket are the rebuttal testimony and exhibits of FPL witness Arne Olson.

Please let me know if you have any questions regarding this submission.

Sincerely,

s/ Maria Jose Moncada
Maria Jose Moncada
Assistant General Counsel
Florida Power & Light Company

(Document 13 of 16)

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a true and correct copy of the foregoing has been furnished by Electronic Mail to the following parties of record this 9th day of July 2025:

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s/ Maria Jose Moncada

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Attorney for Florida Power & Light Company

BEFORE THE

FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 20250011-EI

FLORIDA POWER & LIGHT COMPANY

REBUTTAL TESTIMONY OF ARNE OLSON

Filed: July 9, 2025

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I. INTRODUCTION

Q. Please state your name, title, and business address.

A. My name is Arne Olson. I am a Senior Partner at Energy and Environmental Economics, Inc. ("E3"). My business address is 44 Montgomery Street, Suite 1500, San Francisco, California 94104.

Q. Have you previously submitted direct testimony in this proceeding?

A. No. I was, however, made available for a deposition and was deposed in this proceeding on May 29, 2025.

Q. For whom are you appearing as a rebuttal witness?

A. I am appearing as a rebuttal witness for Florida Power & Light Company ("FPL" or "the Company").

Q. Please provide a description of your relevant employment experience and other professional qualifications.

A. I have over 30 years of experience in the electric utility business in consulting and state government. Since joining E3 in 2002, I have worked extensively in the areas of resource planning, asset valuation, transmission, wholesale electricity market design, retail rate design, and energy policy. I currently lead E3's Integrated System Planning practice and contribute frequently to projects across many practice areas. I have particular expertise in the area of electric system resource adequacy and have led advisory and modeling projects on behalf of dozens of utilities, electricity system operators, and other clients across North America over the past 20 years.

Prior to joining E3 in 2002, I served for six years as an energy policy specialist in the energy policy division of the Washington State Energy Office and Department of Community, Trade and Economic Development (now the Department of Commerce). I received Master of Science degrees in International Energy Management & Policy from the University of Pennsylvania and the French Petroleum Institute's National Superior School of Petroleum and Motors (now "IFP School"), and Bachelor of Science degrees in Mathematical Sciences and Statistics from the University of Washington. The attached résumé (Exhibit AO-1) further describes my qualifications, experience, and publications.

Q. Have you ever provided testimony before the Florida Public Service Commission ("Commission") or other regulatory agencies?

A. I have not provided testimony in front of this Commission. I have provided expert witness testimony in front of state and provincial regulatory commissions or civil trial courts in Oregon, Montana, California, Colorado, New Mexico, South Carolina, Georgia, Alberta, Ontario and Nova Scotia.

Q. Are you sponsoring any rebuttal exhibits in this case?

A. Yes. I am sponsoring the following exhibits:

- Exhibit AO-1 Résumé of Arne Olson
- Exhibit AO-2 California ISO's History of Energy Emergency Alert Events
- Exhibit AO-3 2026 LOLP Analysis
- Exhibit AO-4 Corrections to Calculations of Office of Public Counsel witness Dauphinais.

Q. What is the purpose of your rebuttal testimony?

A. The purpose of my rebuttal testimony is to rebut assertions made by witness James Dauphinais on behalf of Office of Public Counsel ("OPC") and witness Karl Rábago on behalf of Intervenors Florida Rising, League of United Latin American Citizens of Florida, and Environmental Confederation of Southwest Florida, Inc. (together "FEL") regarding the stochastic loss-of-load probability study that E3 performed for FPL, and which was described in FPL witness Andrew Whitley's direct testimony. In responding to witness Dauphinais, I also provide a general description of E3's study approach, methodology, and the Renewable Energy Capacity Planning ("RECAP") model used to conduct the study.

Q. What work did FPL retain E3 to perform as relevant to this proceeding?

A. FPL retained E3 to perform a stochastic loss-of-load probability ("LOLP") study to answer three primary questions:

- What is FPL's need for resource adequacy capacity in 2027 and beyond?
- What is the aggregate contribution of all existing and planned resources toward meeting FPL's need?
- Beyond existing and planned resources, how much does each potential individual resource addition contribute to meeting FPL's need?

Q. Have you performed similar work for other utilities?

A. Yes. Under my supervision, E3 has performed dozens of similar studies for utilities and regional entities across North America. E3 has performed resource adequacy studies using RECAP for El Paso Electric, NV Energy, NorthWestern Energy, Puget Sound Energy, Portland General Electric, the Sacramento Municipal Utility District,

the Los Angeles Department of Water and Power, Black Hills Energy, Public Service Company of Colorado, Northern States Power, Omaha Public Power District, Nova Scotia Power, NB Power, Calpine Corporation, California Public Utilities Commission, California Energy Commission, California Independent System Operator, New York State Energy Research and Development Authority, New Jersey Board of Public Utilities, Massachusetts Department of Energy Resources, and others. E3 was recently selected by the California Public Utilities Commission for a 4-year contract to continue our technical and advisory support for the state's Integrated Resource Planning process.

E3 also has significant experience advising wholesale market operators on issues related to resource adequacy. Under my supervision, E3 experts advised the New York Independent System Operator ("NYISO"), PJM Interconnection ("PJM"), and the Mid-Continent Independent System Operator ("MISO") in developing reforms to their methods of determining resource adequacy need and accrediting resources toward those needs within their wholesale capacity market structures, including submission of testimony to the Federal Energy Regulatory Commission ("FERC").[1] These reforms have been approved by FERC.[2,3,4] Also under my supervision, E3 prepared studies for

[1] Midcontinent Independent System Operator, Inc., *Tariff Filing per 18 C.F.R. § 35.13(a)(2)(iii): 2024-03-28 Resource Accreditation Reform*, Tab F, Docket No. ER24-1638 (filed Mar. 28, 2024).
[2] Federal Energy Regulatory Commission, *Order Accepting Tariff Revisions Subject to Condition*, New York Independent System Operator, Inc., Docket No. ER22-772-001 (May 10, 2022). 179 FERC ¶ 61,102.
[3] Federal Energy Regulatory Commission, *Order Accepting Tariff Revisions Subject to Condition*, PJM Interconnection, L.L.C., Docket Nos. ER24-99-000 and ER24-99-001 (Jan. 30, 2024). 186 FERC ¶ 61,080.
[4] Federal Energy Regulatory Commission, *Order Accepting Proposed Tariff Revisions*, Midcontinent Independent System Operator, Inc., Docket Nos. ER24-1638-000 and ER24-1638-001 (Mar. 28, 2024). 189 FERC ¶ 61,065.

the Public Utilities Commission of Texas ("PUCT") in the aftermath of Winter Storm Uri, exploring alternative market designs to ensure resource adequacy and evaluating the potential benefits and drawbacks of various capacity market designs including the PUCT's preferred Performance Credit Mechanism ("PCM"). E3 subsequently worked for the Electric Reliability Council of Texas ("ERCOT") to develop a more detailed PCM design for the PUCT's consideration. E3 has performed similar studies for the Alberta Electric System Operator ("AESO").

E3 has evaluated the resource adequacy and stochastic loss-of-load probability studies prepared by Duke, Santee Cooper and Georgia Power in their integrated resource plans, and I provided expert witness testimony in front of the South Carolina and Georgia Public Service Commissions on resource adequacy and capacity accreditation, among other topics, on behalf of clean energy business interests. Finally, I led teams that performed operational studies of higher solar penetration for Tampa Electric Company including the award-winning 2018 study *Investigating the Economic Value of Flexible Solar Power Plant Operation*.[5]

Q. Did you recently speak at an invitation-only event hosted by NERC staff to discuss changes in resource adequacy evaluation methods?

A. Yes, I was one of ten speakers, and one of four independent experts, invited to a workshop entitled "Evaluating Resource Contributions for Reliability and Capacity Supply Workshop" hosted by NERC on June 5-6, 2025 in Washington, DC. The purpose of the workshop was to "explore methods for evaluating resource contributions

[5] https://www.ethree.com/projects/investigating-the-economic-value-of-flexible-solar-plants/

to ensure system adequacy and facilitate effective representation of expected resource performance, … assess different approaches, their strengths and limitations, and how best to measure the reliability contributions of diverse resources to support capacity planning, and … inform NERC's reliability assessments as well as existing capacity planning constructs." My presentation summarized the emerging "Critical Periods" framework for need determination and resource accreditation that has been adopted by NYISO, PJM and MISO as well as a number of utilities, and that is being proposed by ISO-NE and the California PUC. This is the same framework that E3 used to evaluate resource adequacy need for FPL.

Q. Please summarize the conclusions of your rebuttal testimony.

A. I conclude that the concerns raised by witnesses Dauphinais and Rábago about the stochastic LOLP modeling and FPL's resource need are unfounded, and that the methodology and resource need calculations are robust and appropriate for use by the Commission in evaluating FPL's proposed resource additions.

II. RECAP & STOCHASTIC LOLP MODELING

Q. OPC witness Dauphinais states that he "conceptually agree(s)" the use of stochastic LOLP analysis is the most appropriate approach for a utility system with high levels of renewable (especially solar) generation. Did E3 perform a stochastic LOLP study of the type referenced by witness Dauphinais?

A. Yes, E3 used RECAP to perform simulations of expected resource availability across multiple years of weather conditions and a wide range of potential resource outage states to derive a statistically robust estimate of the frequency of expected loss-of-load

events for FPL's system, using 2027 as a test year. E3's study used state-of-the-art techniques to evaluate the availability of FPL's portfolio of thermal, solar, battery storage and demand response resources to provide energy during periods of system stress whenever they might occur. Thus, E3's study provides robust estimates of FPL's total resource need and the contributions of individual resources, alone and in combination, toward meeting that need.

Q. OPC witness Dauphinais points to two other software packages used to perform stochastic LOLP analysis. Is RECAP similar to other loss-of-load models used in the industry?

A. Generally, yes. Other models used in the industry include SERVM[6] and GE-MARS.[7] While the models have unique features, each uses simulations of resource availability across multiple weather years and Monte Carlo draws of resource outages in a similar manner to RECAP as described below.

Q. Witness Dauphinais references a number of criteria that FPL has used to measure its resource adequacy. How should "resource adequacy" be understood?

A. Resource adequacy refers to the ability of an electric power system to meet electricity demand across a broad range of weather and system operating conditions, subject to a long-run reliability standard. The resource adequacy of a system depends on load characteristics (*e.g.*, seasonal patterns, weather sensitivity, hourly patterns) as well as resource characteristics (*e.g.*, dispatchability, outage rates, variability).

[6] https://power-gem.co/software/servm-resource-adequacy-planning/
[7] https://www.gevernova.com/consulting/planos/resource-adequacy

Q. How do utilities typically plan for resource adequacy?

A. Utilities typically plan for resource adequacy by quantifying how much firm capacity is required to meet a specified reliability standard (Total Reliability Need or "TRN"). This quantity is often compared to the expected peak load, with a planning reserve margin ("PRM") defined as the TRN divided by the median peak load, minus one. These studies are typically done using a stochastic LOLP model. Individual resources are assessed based on their ability to contribute to the system need using an Effective Load-Carrying Capability ("ELCC") approach by adding or subtracting small quantities of a given resource to the system and observing the changes in the total effective capacity provided by the portfolio of resources. Because the events that can give rise to resource shortfalls are stochastic in nature and are expected to occur very seldomly, the use of stochastic LOLP modeling to evaluate resource adequacy need is widespread.

Q. OPC witness Dauphinais references in his testimony the LOLP modeling E3 performed through RECAP. Please describe, at a high level, how RECAP functions.

A. RECAP is a stochastic LOLP model developed and maintained by E3. RECAP simulates the availability of electric supply to meet demand across a broad range of system conditions using a Monte Carlo approach, accounting for factors such as weather-driven variability of electricity demand, forced outages of power plants, the natural variability and energy limitations of resources such as wind and solar, and operating constraints for resources like storage and demand response. Observed correlations are preserved within the model to ensure appropriate statistical

relationships among load, weather, and renewable generation conditions, based on historical observations. This approach ensures that rare events that may be unlikely to occur in a single year but are highly likely to occur across a number of years are appropriately sampled. These simulations determine the frequency and magnitude of loss-of-load events – time periods during which not all energy demand can be served due to insufficient resource availability – and provide the basis for calculating the PRM and ELCC values.

Q. Has RECAP been used to study resource adequacy in other jurisdictions?

A. Yes, as described above, RECAP has been used to support utility integrated resource plans and energy procurement activities in many jurisdictions including California, Nevada, Oregon, Washington, Montana, Colorado, New Mexico, Texas, Nebraska, Minnesota, New York, New Jersey, Massachusetts, Nova Scotia and others. Additionally, E3 has used RECAP for widely-cited regional resource adequacy studies sponsored by multiple utilities or other market participants including:

1. *Virginia Data Center Study: Electric Infrastructure and Customer Rate Impacts* (2024), prepared on behalf of the Virginia Joint Legislative Audit and Review Commission (JLARC).[8]
2. *Resource Adequacy in the Desert Southwest*[9] *(2022)*, sponsored by a consortium of six electric utilities serving over 90% of the electric load in Arizona and New Mexico.

[8] https://www.ethree.com/jlarc-load-growth/
[9] https://www.ethree.com/projects/resource-adequacy-in-the-desert-southwest/

3. *Net Zero New England: Ensuring Electric Reliability in a Low-Carbon Future*[10] *(2020)*, sponsored by the Calpine Corporation and undertaken in cooperation with the Energy Futures Initiative.

4. *Long-Run Resource Adequacy in California*[11] *(2019)*, sponsored by the Calpine Corporation.

5. *Resource Adequacy in the Pacific Northwest*[12] *(2018)*, sponsored by a consortium of thirteen electric utilities serving the majority electric load in Washington, Oregon, Idaho and Montana.

Q. How were FPL's electric loads characterized in RECAP?

A. E3 developed simulated load shapes for FPL's system using an artificial neural network model based on relationships between actual load and daily high and low temperatures across 44 weather years including 1980 through 2023. The simulated load shapes were then benchmarked to ensure that the median peak load matched FPL's 2027 median peak load forecast. Multiple weather years were used to ensure that the model accurately assessed resource adequacy across a range of average, mild, and extreme conditions as well as the relative frequency with which each of these different types of conditions would be expected to occur.

Q. How were thermal generating resources characterized in RECAP?

A. Each resource was characterized by its summer and winter capacity rating, forced outage rate, mean time to failure, and mean time to repair. Thermal resources were

[10] https://www.ethree.com/new-study-evaluates-deep-decarbonization-pathways-in-new-england/
[11] https://www.ethree.com/wp-content/uploads/2019/06/E3_Long_Run_Resource_Adequacy_CA_Deep-Decarbonization_Final.pdf
[12] https://www.ethree.com/wp-content/uploads/2019/03/E3_Resource_Adequacy_in_the_Pacific-Northwest_March_2019.pdf

represented as available to generate energy at their summer and winter capacity ratings subject to either planned or forced outages. Planned outage schedules were provided by FPL. Forced outages were stochastically introduced by RECAP on a unit-by-unit level using random mean-time-to-failure and mean-time-to-repair variables, in a manner that is consistent with each unit's annual average forced outage rate. Unit-level outages were simulated for plants with multiple units, *e.g.*, 2x1 or 3x1 combined cycle plants.

Q. How were solar generating resources characterized in RECAP?

A. Solar resources were assumed to be producing energy during particular hours based on fixed solar output profiles provided by FPL. FPL provided E3 profiles for the weather years 1997 through 2020 based on locations provided by FPL for existing sites and planned sites. During the simulation, RECAP selects daily solar output shapes to match the historical weather conditions across the entire sample of weather years using an algorithm that enforces observed correlations between solar output and load to ensure an accurate representation of solar availability during the critical periods.

Q. How were energy-limited resources represented in RECAP?

A. Energy-limited resources – storage and demand response – were characterized in RECAP by: (1) a maximum charge and discharge capacity represented in MW and (2) a maximum energy capacity represented in MWh. Dividing energy capacity by discharge capacity yields the duration (in hours) that a storage resource could discharge at its maximum discharge rate before running out of energy. Storage resources were assumed to be available for dispatch whenever they were online and charged. Charging was assumed to occur in any hour in which there was more energy production capability

than electric load. Energy storage resources were also subject to roundtrip efficiency losses and an assumed forced outage rate of 5%.

Q. How were demand response programs represented in RECAP?

A. Demand response programs were dispatched in RECAP as a resource of last resort after thermal, variable renewable, and storage resources have been fully utilized. Per instruction from FPL and consistent with FPL's tariff for these programs, demand response was assumed to have a limit of 25 calls per year at a maximum duration of six hours per call.

Q. What reliability standard did the RECAP study use?

A. Under instruction from FPL, E3 used a loss load expectation ("LOLE") standard of 0.1 days per year, meaning loss-of-load events occur no more frequently than one day every ten years.

Q. Both OPC witness Dauphinais and FEL witness Rábago reference 0.1 days per year LOLE as a common standard used in the industry for resource adequacy planning. Is this accurate?

A. Yes, 0.1 days per year LOLE is a common standard used widely for resource adequacy planning across the industry. This standard is used by the vast majority of utilities and system operators across North America as summarized in Table AO-1, below.

Table AO-1: Probabilistic Standards for Resource Adequacy for Select Utilities & Jurisdictions

Utility/Jurisdiction	Metric	Current Standard
Utilities		
Alabama Power	LOLE	0.1 days per year
Arizona Public Service Co	LOLE	0.1 days per year
Avista Corporation	aLOLP	5% per year
Black Hills Energy	LOLE	0.1 days per year
Dominion Energy South Carolina	LOLE	0.1 days per year
Duke Energy Carolinas	LOLE	0.1 days per year
Duke Energy Progress	LOLE	0.1 days per year
Duke Energy Florida	LOLE	0.1 days per year
El Paso Electric Co	LOLE	0.1 days per year
Georgia Power Co	LOLE	0.1 days per year
Idaho Power Company	LOLE	0.1 days per year
Nova Scotia Power, Inc.	LOLE	0.1 days per year
NV Energy	LOLE	0.1 days per year
Portland General Electric	LOLH	2.4 hours per year
Public Service Company of Colorado	LOLE	0.1 days per year
Public Service Company of New Mexico	LOLE	0.1 days per year
Puget Sound Energy	LOLE	0.1 days per year
Tucson Electric Co	LOLE	0.1 days per year
RTOs & Resource Adequacy Programs		
California Public Utilities Commission	LOLE	0.1 days per year
ISO New England	LOLE	0.1 days per year
Midcontinent ISO	LOLE	0.1 days per year
New York ISO	LOLE	0.1 days per year
PJM	LOLE	0.1 days per year
Southwest Power Pool	LOLE	0.1 days per year
Western Resource Adequacy Program	LOLE	0.1 days per year

Q. Do any of the utilities and systems shown in Table AO-1 use stochastic loss-of-load probability modeling to determine their resource adequacy needs?

A. Yes, all of them. Stochastic loss-of-load probability modeling is the industry standard practice for determining resource adequacy needs, used by numerous electric utilities and power systems in North America including in the SERC region.

Q. Both OPC witness Dauphinais and FEL witness Rábago raise questions about how RECAP was used to model FPL's resource adequacy. Can you please explain how RECAP was used in determining FPL's resource adequacy need?

A. E3's analysis consisted of the following steps:

1. Develop a RECAP case for FPL's system using 2027 as a test year and calculate the "perfect capacity" ("PCAP") need or TRN and perfect capacity planning reserve margin ("PCAP PRM"). Perfect capacity represents a theoretical capacity resource that is always available to produce energy whenever needed, without any outages or other limitations. The perfect capacity need is the quantity of perfect capacity that would be needed to meet FPL's load, subject to the 0.1 LOLE standard. The PCAP PRM is the perfect capacity need, divided by the 1-in-2 or median peak load, minus one.
2. Calculate the portfolio ELCC provided by FPL's planned portfolio in 2027. The portfolio ELCC is the total amount of equivalent perfect capacity that can be displaced by the actual resources in FPL's portfolio.
3. Calculate the capacity shortfall for the 2027 FPL system. The capacity shortfall is equal to the perfect capacity need minus the portfolio ELCC.

4. Calculate the achieved LOLE of the 2027 FPL system. The achieved LOLE is the actual count of loss-of-load events observed in the FPL system, given the 2027 resource portfolio, expressed in days per year.
5. Calculate marginal ELCCs or "firm capacity" equivalents for each individual resource type at varying penetrations and in various combinations, expressed as a % of nameplate capacity.
6. Recalculate the 2027 capacity shortfall after the addition of 1,400 MW of battery storage resources.
7. Calculate the perfect capacity need for the additional years (2028, 2029, 2030 and 2035) through additional RECAP runs. The perfect capacity need is the median peak load forecast multiplied by (1 + PCAP PRM).
8. Calculate the Portfolio ELCC for the additional years through additional RECAP runs.
9. Calculate the capacity shortfall for each additional year by subtracting the Portfolio ELCC from the perfect capacity need.
10. Determine the marginal ELCC values in each year through reference to the marginal ELCC table described in Step 5.

Q. Why did the study use a 2027 test year?

A. Because of the computational requirements of stochastic LOLP studies, it is common to select a single "test year" for detailed simulations. Parameters such as the PRM and ELCC values derived from the test year simulations can then be used in adjacent years to calculate the total need and individual resource contributions based on changing

loads and resource penetrations. The year 2027 was selected because 2027 is the year following FPL's accelerated addition of over 1,400 MW of battery storage resources.

Q. Is the PCAP/ELCC method used by E3 to characterize the total need and the contributions of individual resources different from the methods FPL has used in the past to calculate its 20% PRM?

A. Yes, the PCAP/ELCC or "Critical Periods" framework updates and generalizes the conventional methods for assessing resource adequacy to accurately assess the contributions of dispatch-limited resources such as solar, wind, and battery storage, while also providing a more accurate assessment of the contribution of thermal resources. The updated method differs from FPL's past practice in several ways, providing a more accurate measure of the total need and the contribution of resources individually and as a portfolio:

1. The PCAP/ELCC method calculates the total reliability need assuming a portfolio consisting only of perfect capacity, whereas FPL's past practice counted all thermal resources at their nameplate capacity and solar and storage resources at a reduced capacity based on a heuristic that measured average production during high net load hours.
2. The PCAP/ELCC method measures the marginal contributions of resources individually and in combination toward meeting FPL's resource adequacy need. The loads and resources table shows the marginal ELCC values for each resource for each year's portfolio, *i.e.*, the marginal value of the next MW of capacity. The marginal value of resources with dispatch limitations such as

solar, storage, and demand response changes each year as the entire portfolio changes.

3. The difference between the portfolio ELCC and the sum of the marginal ELCCs of each individual resource type is shown as the interactive effects. This is capacity provided by the portfolio that cannot be uniquely attributed to any individual resource. The interactive effect is also equal to the difference between the highest peak load and the load during the new critical hours as the hours change due to solar saturation.

Q. What were the results of the RECAP analysis?

A. The RECAP analysis found that a PCAP PRM of 8.8% would be needed to meet a 0.1 LOLE standard. This is equivalent to an Installed Capacity ("ICAP") PRM of 24.7% in 2027 using FPL's past practice of calculating resource adequacy need and resource contributions, demonstrating that FPL's past practices would be insufficient to meet a 0.1 LOLE standard. FPL's planned portfolios had small capacity shortfalls ranging from 19 to 273 MW in 2027-2030 and a larger shortfall of 1,218 MW in 2035. Additional results are included in Exhibit AWW-1.

III. REBUTTAL TO OPC WITNESS DAUPHINAIS

Q. OPC witness Dauphinais provides seven reasons why he believes E3's resource adequacy study is "overly conservative". Have you reviewed those?

A. Yes. The seven reasons witness Dauphinais believes E3's stochastic LOLP analysis may be conservative are:

1. FPL has not called any Energy Emergency Alert ("EEA") events since 2017.

2. FPL has not provided evidence of a current resource adequacy problem on its system or an expected one in 2026.
3. The North American Electric Reliability Corporation's ("NERC") 2024 Long-Term Reliability Assessment categorized the SERC-Florida Peninsula and SERC-Southeast regions as having a Normal Risk.
4. The stochastic LOLP analysis may have been "rushed."
5. E3 modeled the FPL system as an electrical "island," without assuming FPL can rely upon its neighbors for firm capacity.
6. Not all of the workpapers for the stochastic LOLP analysis were provided in a timely manner.
7. No FPL stakeholders were given an opportunity to provide input with respect to the assumptions utilized in the analysis.

Q. Do any these reasons indicate that E3's resource adequacy study is "overly conservative"?

A. No, none of the seven reasons noted by witness Dauphinais warrant such a conclusion. I address each of his concerns in turn.

Q. Witness Dauphinais's first reason that he believes the stochastic LOLP analysis may be conservative is because FPL has not called any EEA events since 2017. Is the lack of EEA events during historical periods determinative of the lack of resource need during a future time period?

A. No. A stochastic LOLP model is a much more robust method for determining resource need than anecdotal observations of events in recent years. There are many reasons

why a lack of recent EEA events should not be construed as being determinative of the lack of future resource need, including the four following principal reasons:

1. Loss of load events are rare and are only expected to occur once every ten years. This means that many years can go by without experiencing the combination of very high electric loads and an unusual number of resource outages that can create the conditions for loss-of-load. Moreover, the frequency and magnitude of loss-of-load events increases exponentially as the resource shortfall grows. For these reasons, it is unsurprising that a system with a steadily declining reserve margin such as FPL would experience a sudden, dramatic increase in the frequency of resource shortfall events.
2. E3's study evaluated loss-of-load probability for a 2027 test year using historical weather patterns over a 44-year weather history. The analysis incorporates years prior to the recent history to which witness Dauphinais alludes, including weather years before 2010 in which loss-of-load events were observed in the simulation such as 1980, 1993, 1998, 1999, 2005 and 2009.
3. Power systems are always changing due to load growth, resource retirements, and changing resource performance. Systems with high load growth and a changing resource mix are especially susceptible to the cumulative impacts of inaccuracies in resource accreditation. For example, FPL is experiencing load growth of approximately 1.4% per year. This would add 400 MW of load per year, or nearly 1,200 MW between August 2024 and 2027 and 4,000 MW between 2017 and 2027. At the same time, FPL's solar penetration has grown

rapidly and is expected to reach 11,071 MW by 2027. In short, FPL's 2027 system will be very different from its system in 2017.

4. Annual high temperatures in FPL's system have been increasing in recent decades, and E3 used a temperature detrending analysis to create the load shapes for the 1980-2023 weather years. This means that simulated future loads would be higher in 2027 than they would have been in 2017 even under the same macroeconomic conditions, creating a higher loss-of-load probability.

Q. Do you know of any examples where a power system encountered resource adequacy issues despite having negligible recent history of EEAs?

A. Yes. The California ISO experienced rotating blackouts during a peak load event on August 13-14 of 2020 due to insufficient available capacity. As indicated in Exhibit AO-2, CAISO had only called a single EEA1 alert over the 12 years preceding the event, *i.e.*, between 2007 and 2019. California's experience provides a real-life illustration of the risks associated with failing to closely examine how changes in weather, loads and resource portfolios can add up to create resource adequacy challenges.

Q. Did California undertake studies of its power system prior to the 2020 blackouts that indicated heightened potential for loss-of-load events?

A. Yes, in 2019 the CPUC performed a stochastic LOLP analysis and a "stack analysis" based on the LOLP analysis that stressed key parameters such as expected reduced import availability and more extreme high temperatures being experienced in recent years. The studies indicated the potential for resource adequacy shortfalls as early as 2021. As a result of the studies, the CPUC ordered the procurement of 3,300 MW of

new resources by 2023 as well as the retention of 3,800 MW of existing resources that were set to retire in 2020.[13] Unfortunately, the new resources were not available in time to prevent the August 2020 events, but 4,800 MW of resources did come online in time to help prevent rotating blackouts during the EEA3 event called by CAISO on September 6, 2022.

Q. Witness Dauphinais's second concern is that FPL has not indicated a resource adequacy problem in 2026. Does this concern have any merit?

A. No. In response to intervenor testimony, E3 conducted a RECAP model run and prepared a Loads and Resources table for 2026, which is shown in Exhibit AO-3. The results indicate that FPL, prior to the addition of 1419.5 MW of battery in 2026, has a resource adequacy shortfall of 1,829 MW and an LOLE of 0.92 days in that year. These results strongly support the need for FPL's 2026 resource additions; in particular its acceleration of battery storage as proposed in its resource planning.

Q. Witness Dauphinais's third reason that he believes the stochastic LOLP analysis may be conservative is that NERC's 2024 Long-Term Reliability Assessment ("LTRA") and SERC's 2024-2034 SERC Annual Long-Term Reliability Assessment Report categorized the SERC-Florida Peninsula and SERC-Southeast regions having a Normal Risk. Does this concern have any merit?

No. While the study may indicate that sufficient capacity exists in the broader region, it is not determinative of whether any individual utility faces a resource need.

[13] CPUC, Assigned Commissioner and Administrative Law Judge's Ruling Initiating Procurement Track and Seeking Comment on Potential Reliability Issues, June 20, 2019 (R.16-02-007).

Q. Does NERC or SERC have a formal role in regulating resource adequacy or developing standards that must be used by utilities such as FPL?

A. No, NERC's formal role and primary expertise is in developing standards for interconnected system *operations*. NERC has no formal role concerning resource adequacy. SERC's role as a Regional Reliability Entity is primarily to report on and enforce standards developed by NERC.

Q. What is the role of NERC's regional long-term resource adequacy assessments in the industry?

A. NERC's long-term resource adequacy assessments are considered to be advisory in nature, and to be an indicator of the need for more detailed LOLP studies to be undertaken by individual utilities. NERC does not have primary expertise in resource adequacy or loss-of-load modeling. NERC relies on the regional reliability entities such as SERC to provide the primary analytics behind the regional assessments.

Q. Are you aware of any differences between the SERC and NERC study methodologies or data inputs as compared with E3's stochastic LOLP study?

A. Yes, with respect to SERC's loss-of-load modeling, I am aware of three major differences that may cause the SERC and NERC study results to be overly optimistic about resource adequacy as it relates to FPL:

1. First, the SERC study is using an earlier, lower load forecast for FPL than E3's study. FPL's current forecast for 2027 is 500 MW higher than the value used by SERC. If other Florida utilities are also expecting a proportionately larger amount of load, the SERC study may be underestimating load for the Florida Peninsula by approximately 1,000 MW.

2. Second, SERC treats demand response as better than a perfect capacity resource, deducting it from load before applying its 15% reserve margin and thereby accrediting it at 115% of its "nameplate" value. This would be an accurate measure for load that is perfectly interruptible, that is, load that can be interrupted instantaneously at any time and with no limitations. However, the demand response programs in the FPL system have limitations based on number of calls per year (25) and call duration (6 hours) that meaningfully constrain its ability to provide energy during critical periods, especially as the penetration of battery storage increases. These limitations require FPL to carry resources to continue to serve the host load during the instances in which the DR program does not perform. E3's methodology accredits demand response at 81% of its "nameplate" value in 2027 after the addition of FPL's planned 1,400 MW of batteries. Extrapolating to the Florida Peninsula, this implies that SERC over-accredits 2,937 MW demand response by 115%/81%, or 540 MW.

3. Third, and most importantly, SERC models the entire Southeastern region as if it were a single load-serving entity with centralized dispatch across the region, rather than modeling FPL or any other utility individually. This has significant implications for interpretation of the results, as I discuss below.

Q. Do the NERC and SERC studies use the modernized resource accounting framework adopted by the Regional Transmission Organization ("RTO") markets and used by E3 for FPL?

A. No, the NERC and SERC studies accredit solar resources based on their "on-peak" capacity, rather than using a more precise method like ELCC. Solar is accredited at a

value of 55.5% in the NERC study, whereas the E3 study shows the cumulative ELCC for a proportionate amount of solar for the FPL system dropping to 41%, with the marginal ELCC dropping to 17% by 2027. Similarly, the NERC study accredits batteries based on their peak-hour contribution, resulting in an accredited value of 97.2% for the FPL system. E3's methodology accredits storage based on its marginal contribution to meeting FPL's resource adequacy needs, which changes as a function of the portfolio, declining to 76% by 2027 and 50% by 2028. While the penetration of solar and storage in the rest of the SERC region is lower than in the FPL service area, SERC's over-accreditation of these resources is likely to mask the appearance of resource adequacy issues in the broader SERC region in a similar manner to what is observed for the FPL system, if its methodologies are not updated.

Q. How do the projected reserve margins in the NERC and SERC studies compare to the reserve margins the RECAP study shows are needed to meet a 0.1 LOLE standard for FPL's system?

A. Both SERC and NERC project approximately 25% reserve margins in 2027, which is very close to the 24.7% reserve margin that the RECAP modeling indicates is needed, using FPL's past accounting methodology. This indicates that, while the studies currently show a resource surplus for the SERC region, the realized reserve margin is close to what the region might need within a few years as solar and storage penetration grow.

Q. Is it surprising that a study of a large region like SERC would show only a small amount of lost load while a single utility within the region has a capacity shortfall?

A. No, the SERC studies look at the entire SERC region and assume that energy from any part of the region can flow to any other part of the region whenever needed, as if there were a binding resource adequacy construct and centralized dispatch of the type operated by RTOs such as PJM or MISO. In reality, there is no centralized dispatch and the utilities have no obligation to dispatch their plants for the benefit of their neighbors. The SERC studies do not specifically evaluate the resource adequacy of any individual utilities within the broader region, including FPL. A study of a large region can mask an issue with one of the utilities in the region.

Q. Are you aware of any jurisdictions that rely on the NERC assessments in lieu of utility-specific studies?

A. No, I am not aware of any jurisdiction that relies on NERC LTRAs as the definitive word on resource adequacy for its utilities. Utilities in Florida, as in other states, are required to conduct their own studies of resource adequacy needs for their own systems, and those studies are the primary evidence upon which utilities and state commissions rely.

Q. Should FPL and the Commission rely on the SERC or NERC regional studies, rather than a robust stochastic LOLP study conducted for FPL's system using FPL-specific data?

A. No, FPL and the Commission should rely on the FPL-specific study because it evaluates conditions specific to FPL including FPL-specific loads, it includes detailed information about the nature of FPL's system including unit-level outage data, and it

adopts a modernized resource adequacy framework that more accurately characterizes the performance of FPL's resources during critical periods.

Q. Witness Dauphinais's fourth reason that he believes the stochastic LOLP analysis may be conservative is that the study was "rushed". Does this concern have any merit?

A. No, E3 was allocated sufficient time to perform the resource adequacy and derive accurate study results. There is no reason to expect, and witness Dauphinais provides no evidence, that this or any other resource adequacy study is overly conservative or biased in any way due to the time frame in which the study was conducted. E3's study provides an unbiased estimate of FPL's resource adequacy needs that is fully reflective of the analytical rigor that E3 applies to each of its resource adequacy studies.

Q. Was it prudent for FPL to commission a stochastic LOLP study after learning that it may have a resource adequacy shortfall, and to bring the study results forward in support of its planned resource acquisitions?

A. Yes. Once FPL had information about an impending resource adequacy challenge, it would have been imprudent for it *not* to act on that information.

Q. In your judgment, after a utility first learns that it may be facing a reliability issue, how long should it wait before acting upon that information?

A. In my judgment, a utility has an affirmative obligation, upon learning that it may be facing a reliability issue, to act upon that knowledge *immediately* and to implement cost-effective solutions as quickly as is practicable. Any delay in addressing the challenge increases the likelihood that its customers may experience loss of power during an extreme hot or cold weather event, with the attendant health and safety risks.

The 2020 blackouts in California, as described above, provide a cautionary tale about the risks of waiting until too late to address an impending resource adequacy issue.

Q. Witness Dauphinais's fifth reason that he believes the stochastic LOLP analysis may be conservative is that E3 modeled FPL's system as an electrical "island". Does this concern have any merit?

A. No. It is a common practice for utilities not to plan to rely on non-firm imports, and I am aware of a number of utilities that assume no, or only a very small amount of, non-firm imports in their resource adequacy studies including El Paso Electric, Public Service Company of New Mexico, NV Energy, NorthWestern Energy, and Nova Scotia Power. While practices vary across the industry, my general observation is that utilities in areas with (a) robust interconnections to neighboring systems, (b) strong load and resource diversity, and (c) a liquid bilateral market for forward wholesale electricity trade tend to assume some amount of intertie support in their resource adequacy need determinations. For example, the Pacific Northwest region has many unique features that make it reasonable to assume some amount of import availability:

1. There is a liquid bilateral wholesale market for forward power trading centered around the Mid-Columbia trading hub.
2. The 500-kV regional power system is operated by the Bonneville Power Administration and serves as a common carrier for transactions to and from the Mid-Columbia hub.
3. It has some utilities that are winter-peaking and some that are summer-peaking, facilitating seasonal exchanges that reduce the total regional need.

4. There is a diversity of resources, with some utilities relying primarily or exclusively on hydroelectric power while others rely primarily on thermal generation.

By contrast, utilities in peninsular regions without strong interconnections or meaningful diversity do not plan to rely upon their neighbors. In the Desert Southwest, there is no regional transmission operator, all utilities have very high summer peaks, and all rely primarily on a combination of thermal and solar generation. Hence, utilities in that region do not plan to rely on imports in lieu of firm capacity on their own systems. Similarly, utilities located at the edge of interconnections such as El Paso Electric, NorthWestern Energy, and Nova Scotia Power have less ability to connect to neighboring systems with different characteristics and therefore plan to meet their own needs with resources that are owned or under long-term contract.

Even in the Pacific Northwest, commissions and utilities have expressed increasing concern about the practice of some utilities in the region to rely on non-firm imports in lieu of firm capacity. In response to such concerns, the utilities in the region tasked the Western Power Pool in 2019 with creating the Western Resource Adequacy Program. The purpose of the program is to eliminate the risks associated with the haphazard way in which utilities in the region made assumptions about import availability. It will do this by evaluating needs on a regional basis and establishing a binding obligation to procure resources sufficient to meet the regional needs as determined by the program, subject to financial penalties.

Q. Is it imprudent for FPL to require firm capacity resources to ensure resource adequacy for its system?

A. No, most of FPL's service area is in a geographically-constrained peninsula with very limited load or resource diversity. It is prudent for FPL to assume that its neighbors will experience high loads and challenging conditions at the same time that FPL does. It is also prudent to assume that imports from outside Florida would also be limited due to transmission constraints. Both of these factors support requiring FPL to have sufficient firm capacity resources to ensure resource adequacy for its system.

Q. Does FPL, or any other Florida utility, plan to rely on non-firm imports in lieu of firm capacity for their resource adequacy need?

A. No. As discussed by witness Whitley, the longstanding practice in Florida, including for FPL, is to rely only on firm capacity resources and not to rely on non-firm imports for meeting their resource adequacy needs.

Q. Witness Dauphinais's sixth reason that he believes the stochastic LOLP analysis may be conservative is that some workpapers were produced later in time. Does this concern have any merit?

A. No, as explained in the rebuttal testimony of FPL witness Whitley, a small number of workpapers were initially omitted from a discovery production due to a clerical error. This clerical error, which occurred long after the study was complete, did not have any bearing on the study results.

Q. OPC witness Dauphinais's seventh reason for his concern the stochastic LOLP analysis may be conservative is that stakeholders were not given opportunity to provide input in the analysis. Does this concern have any merit?

A. No, E3 has no reason to believe, and witness Dauphinais has provided no evidence, that the study is biased due to lack of third-party input. The methodologies and inputs used in a study of this nature are highly technical and idiosyncratic to the FPL system. It is unlikely that additional input from stakeholders would have meaningfully changed the stochastic LOLP methodology, input data, or results.

Q. In short, do any of witness Dauphinais' reasons for concern about the study being overly conservative have merit?

A. No, witness Dauphinais's testimony provides no evidence or any other reason to believe that E3's study results are biased and/or overly conservative.

Q. Does witness Dauphinais take issue with the use of stochastic loss-of-load probability modeling in general to determine FPL's resource adequacy need?

A. No, witness Dauphinais "conceptually agree(s) the use of stochastic LOLP analysis is the most appropriate approach for a utility system with high levels of renewable (especially solar) generation" (p. 35, lines 19-21) and recognizes that "FPL has a high level of solar generation penetration that does require a move to stochastic LOLP analysis" (p. 43, lines 14-15). Additionally, witness Dauphinais recognizes that "some amount of additional capacity beyond that which would be required to meet FPL's traditional 20% PRM criterion may be necessary to provide resource adequacy in 2027" (p. 43, lines 8-11) because of the limitations of FPL's conventional, deterministic methods and the operational challenges FPL is experiencing.

Q. Witness Dauphinais provides high-level calculations in his Exhibit JRD-5 that purport to show that "the total nameplate capacity amounts of solar generation and battery storage proposed by FPL for 2026 and 2027 with in-service dates prior to summer 2027 significantly exceed the amounts assumed in the stochastic LOLP analysis case that FPL uses to justify the need for them from a reliability perspective." Is his calculation accurate?

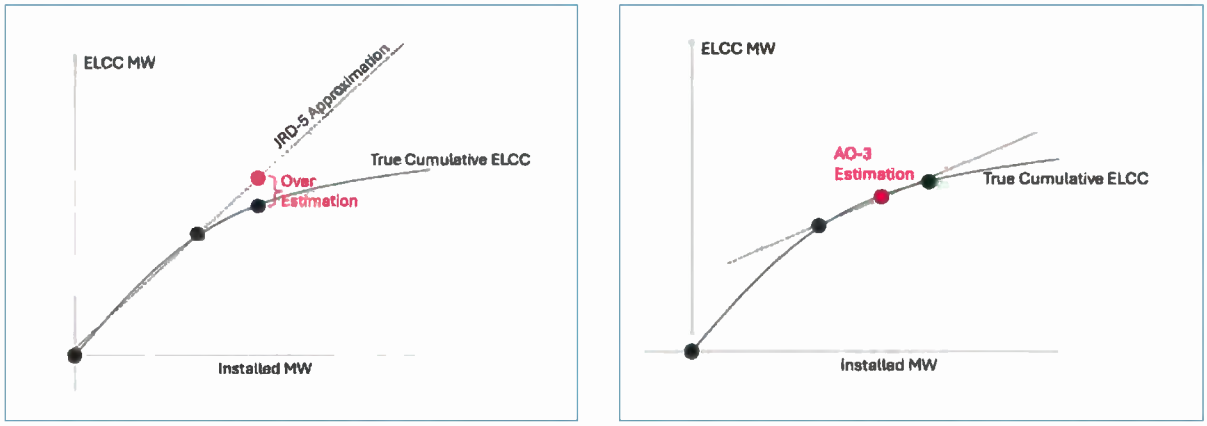
A. No. Witness Dauphinais used an incorrect method to interpolate the incremental ELCC values for the additional 476 MW of solar and 467 MW of storage with in-service dates by summer 2027 by linearly scaling up the ELCC of solar based on the quantity of storage. Specifically:

- He incorrectly calculated the cumulative ELCC of 11,071 MW of solar with 2,858 MW of storage by scaling up the cumulative ELCC of 11,071 MW of solar with 2,391 MW of storage (3,096 MW) by a ratio of 2,858/2,391. The incorrect value is 3,263 MW. He then (correctly) scales up this incorrect value using the ratio of the change in the quantity of solar. The final, incorrect value is 3,325 MW.
- The correct way to calculate the cumulative ELCC of 11,071 MW of solar with 2,858 MW of storage is to interpolate between the values published in the cumulative solar and storage ELCC tables for the cumulative ELCC value of 11,071 MW of solar with 2,858 MW of storage (3,096 MW) and the cumulative ELCC value of 11,071 MW of solar with 3,211 MW of storage (3,178 MW), which is the next largest quantity of storage modeled in RECAP. The interpolated value is 3096+(3178-3096)/(3211-2391), which yields a

cumulative solar ELCC value of 3,142 MW at 2,858 MW of storage. This can then be scaled in the same manner used by witness Dauphinais to reflect the larger amount of solar in the portfolio, to arrive at a final value of 3,205 MW. This is 120 MW lower than witness Dauphinais's incorrect value.

The conceptual error made by witness Dauphinais is illustrated in Figure 1 below: he assumed that the solar ELCC scales linearly with the quantity of storage capacity, rather than observing from the published cumulative ELCC tables that the marginal benefit of solar declines as a function of storage penetration.

Figure 1



After correcting this error, the FPL portfolio has a small capacity surplus of 84 MW in summer 2027, rather than the 204 MW calculated by witness Dauphinais. This does not show an error in FPL's analysis, but rather underscores the fact that FPL must be adding resources in the beginning of 2027 in order to meet its resource adequacy target in that year. A corrected version of witness Dauphinais's calculation is provided in Exhibit AO-4.

Q. Did witness Dauphinais make a similar error in his Exhibits JRD-6 and JRD-7, where he purports to show that FPL's 2026 and 2027 proposed solar generation additions are not necessary to meet FPL's "perfect" capacity need for 2027?

A. Yes, once again witness Dauphinais starts by incorrectly scaling up the cumulative ELCC of 7,000 MW of solar with 2,391 MW of storage (2,423 MW) by the ratio of 2,858/2,391. The incorrect scaled value is 2,538 MW. He then scales that to 10,057 MW of solar, to arrive at a value of 3,122 MW. Instead using an interpolation between published ELCC values at various levels of solar and storage results in a correct value of 3,004 MW. Whereas witness Dauphinais claims that FPL's short position without the solar additions is only 89 MW, the corrected analysis shows that FPL's short position is actually 209 MW. The corrected calculation is shown in Exhibit AO-4.

In his Exhibit JRD-7, witness Dauphinais estimates a perfect capacity surplus of 90 MW excluding only FPL's 2027 proposed solar generation additions, which he describes as "clearly a resource adequate result." A corrected calculation, provided in Exhibit AO-4, shows that FPL's portfolio actually has a small deficit of 31 MW, and is thus not quite resource adequate in 2027 without FPL's proposed 2027 solar generation additions.

IV. REBUTTAL TO FEL WITNESS RÁBAGO

Q. What is FEL witness Rábago's concern with the stochastic LOLP methodology?

A. Witness Rábago implies that the robust statistical methods employed in LOLP modeling should not be relied upon for decision-making because they inflate the likelihood of loss-of-load events, and that human judgment should be used instead.

Q. Is there any merit to this concern?

A. No. While human judgment always has the final say in cases such as electric utility investments, it is important to recognize its limits and where additional tools such as sophisticated computer models can play an important role in informing judgment. In particular, human judgment is notably deficient in understanding risks related to low-probability events. Daniel Kahneman was awarded the 2002 Nobel Memorial Prize in Economic Sciences for his work on the psychology of judgment and decision-making and its implications in behavioral economics. Kahneman's work shows that human intuition is poor at reasoning about probabilistic, low-frequency events—particularly when outcomes are complex and contingent—and that expert judgments can vary significantly between individuals, lack reproducibility, and systematically diverge from statistical models.[14]

Q. What role do sophisticated models play in informing resource adequacy needs and resource procurement or retention?

A. Sophisticated models are needed to calculate the relevant probabilities for the precise reason that human beings are likely to misperceive the likelihood of low-probability

[14] Judgment Under Uncertainty: Heuristics and Biases Daniel Kahneman, Paul Slovic & Amos Tversky (eds.) Cambridge University Press (1982).

events, such as the loss of multiple generating units coinciding with high load events. Stochastic LOLP models calculate the probability of these events happening using a "Monte Carlo" approach where outages of individual units are randomly drawn. There is extensive academic literature in the field of statistics supporting the use of Monte Carlo methods to calculate statistical problems that would be difficult or impossible to solve in closed form. Stochastic LOLP models provide invaluable information to humans to help inform their judgments about important matters such as generation resource procurement. This is why stochastic LOLP modeling is overwhelmingly the most common method used in resource adequacy analysis across the United States and Canada, including by SERC and many utilities in the SERC region.

Q. Witness Rábago provides an example of resource outages observed in the RECAP model outputs that he claims demonstrates a cumulative probability of 0.00000000004%. Is his claim accurate?

A. No, this claim is wildly inaccurate. Witness Rábago does not provide the derivation of his calculation, but I observe that 0.00000000004% is equal to 0.05^8 and assume he attempted to calculate the likelihood of eight generating units, each having a 5% forced outage rate, being simultaneously out of service. Leaving aside complexities such as outage durations, this would be an accurate calculation, using the binomial distribution and assuming a plant is either online with 95% probability or offline with 5% probability, of the likelihood that a power system with *exactly eight generating units* would suffer a simultaneous outage *of all eight units*. However, FPL's system has many more than eight units; E3 modeled 84 different thermal units including individually modeling the steam turbines and combustion turbines of combined-cycle gas plants.

The probability of any eight of these 84 generators being out of service in a given hour is much higher: in fact, using the binomial distribution and hypothetically assuming a 5% forced outage rate for each plant as witness Rábago appeared to do in his theoretical calculation, the correct probability would be 5.9%. The derivation of this probability is shown below.

Let

$$X \sim \text{Binomial}(n = 84, p = 0.05)$$

be the number of offline plants.

We seek:

$$P(X \geq 8) = 1 - P(X \leq 7) = 1 - \sum_{k=0}^{7} \binom{84}{k} (0.05)^k (0.95)^{84-k}$$

Evaluating this sum:

$$P(X \geq 8) = 1 - \left[\sum_{k=0}^{7} \binom{84}{k} (0.05)^k (0.95)^{84-k} \right] \approx 1 - 0.94096 = 0.05904$$

$$\boxed{P(X \geq 8) \approx 0.05904}$$

Q. Can you provide some additional context about the difference between a probability of 0.00000000004% and a probability of 5.9%?

A. Yes. Without ascribing any merit to it, the calculation performed by witness Rábago implies that there would only be a *1-in-25 billion* probability of eight simultaneous unit outages on FPL's system in a given hour. Using witness Rábago's theoretical paradigm, and correctly applying the binomial distribution shows that the actual probability is 1-in-17. Witness Rábago miscalculated the probability of this event occurring by a factor of 1,511,323,062. Correct application of the binomial distribution in witness Rábago's hypothetical shows that it would be expected to occur on average over 500 times each year, or more than once daily.

Q. Has E3 benchmarked the thermal outage distributions resulting from its Monte Carlo process against closed-form statistical distributions?

A. Yes, E3 regularly benchmarks all results against intuition and expected results from closed-form calculations. It must be understood that closed-form distributions such as the binomial distribution will not provide precisely accurate estimators of the results of the Monte Carlo analysis because RECAP does not use a binary variable of whether a resource is online or offline as the random variable. Rather, for each generator, it uses two random variables that more accurately reflect the impact of generator outages:

1. "Mean-time-to-failure" reflects the increasing likelihood that a resource will go offline as a function of the number of hours it has been in service.
2. "Mean-time-to-repair" reflects the increasing likelihood that a resource will come back online as a function of the number of hours it has been out of service, in effect providing a randomly-drawn outage duration.

Nevertheless, the outage distribution resulting from the Monte Carlo process should generally align with a simplified binomial distribution. Figure 2 compares the probability density function of outages from RECAP's Monte Carlo simulations for the FPL system on the left with the closed-form distribution calculated using binomial outage probabilities. Figure 3 compares the cumulative probability density function from RECAP with the closed-form distribution.

In both cases, the results are not uniform because they reflect the sizes of specific FPL generators.

Figure 2

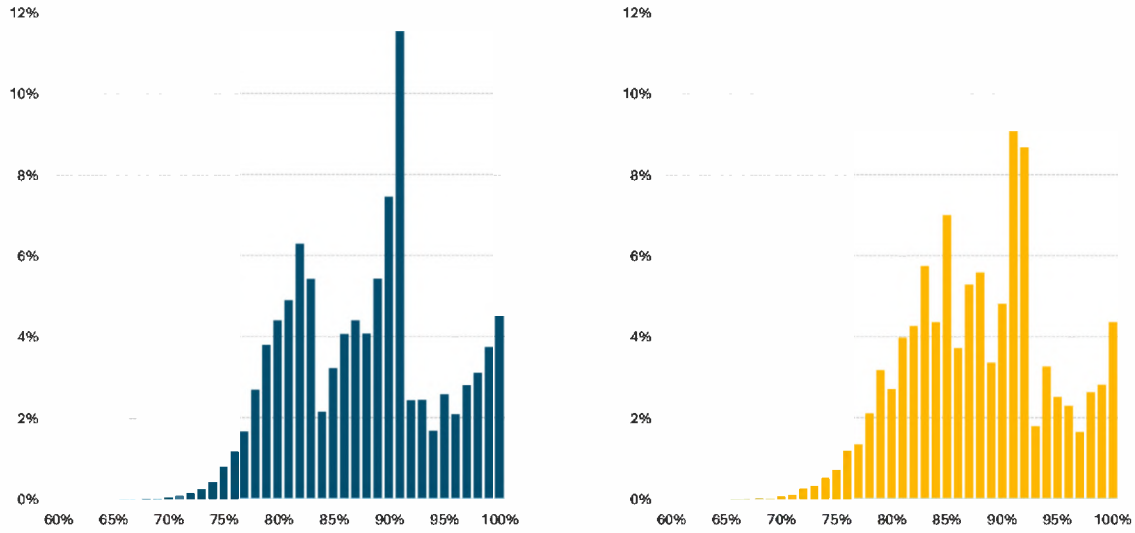
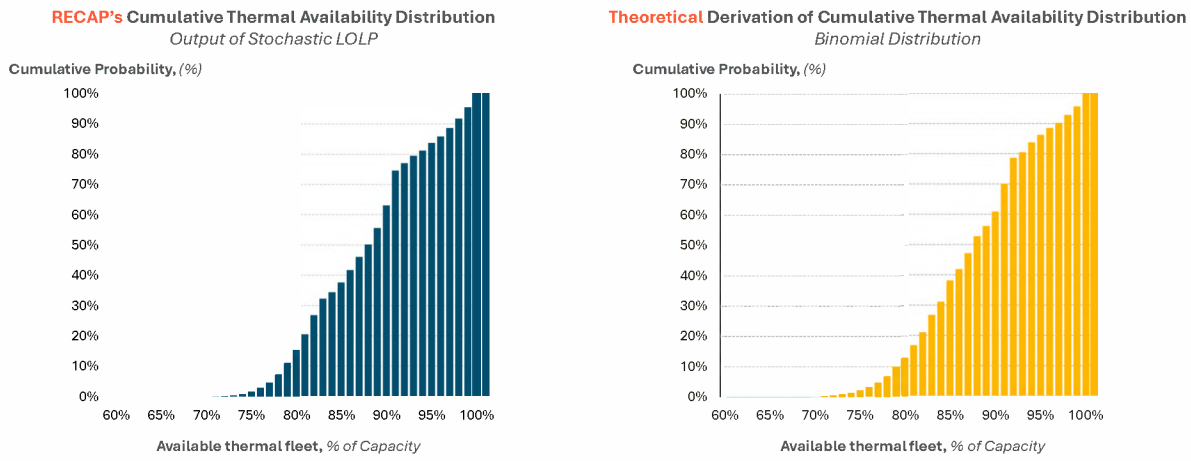


Figure 3



Q. Do the results of this analysis show that the outages simulated in RECAP are reasonable and in line with what should be expected based on their statistical properties?

A. Yes, the analysis shows that the thermal outage profiles are reasonable, in line with the underlying probabilities, and suitable to use to inform human judgment about the need for resources to meet a resource adequacy standard.

Q. What else does witness Rábago allege about generator unit outages?

A. Witness Rábago alleges that "certain generation units that contribute to calculated LOLPs that are below the target .1 day/year level always have issues of forced outages or significant reductions in output or are always out or reduced on specific days."

Q. Does this raise a legitimate concern about the results?

A. No. E3 modeled each generating unit as specified by FPL. While witness Rábago does not make any allegations that are specific enough to rebut with reference to the RECAP results, I will note that there are three reasons why specific generators might appear repeatedly on resource outage lists:

1. Each generating unit has a fixed planned maintenance outage schedule that was provided by FPL and was modeled consistently by E3 through each RECAP run.
2. Some units are always unavailable during certain seasons, *e.g.,* Manatee 1 and 2 are always unavailable during the summer season due to operating limitations.
3. Random outages are drawn once and repeated consistently for each RECAP run. This avoids introducing noise into the model results that might make interpretation difficult.

V. CONCLUSION

Q. Does this conclude your rebuttal testimony?

A. Yes.

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Senior Partner

Mr. Olson has over 30 years of experience in energy analysis. He joined E3 in 2002 and became a partner in 2010. Mr. Olson leads E3's Integrated System Planning practice area helping clients navigate changes to bulk electric system operations and investment needs brought about by increasing policy and market interest in clean and renewable energy sources. He has led a number of landmark studies of the feasibility and cost of achieving deep decarbonization and high renewable penetration goals, including studies of 100% renewable and net zero energy systems in New England, California, the Pacific Northwest and the Midwest. He consults extensively for utilities, asset owners, project developers and electricity consumers in support of resource planning and commercial transactions involving renewable, conventional and energy storage resources. He also provides technical and strategic support to numerous utility regulators, state agencies and environmental organizations. He is a frequent conference speaker and has provided expert witness testimony in regulatory and legal proceedings in California, Oregon, Montana, Colorado, New Mexico, North Carolina, South Carolina, Georgia, Alberta, Nova Scotia and Ontario. Prior to joining E3 in 2002, he served for six years in the Energy Policy Division of the Washington State Energy Office and its successor agencies.

Mr. Olson has led the development of E3's industry-leading resource planning software including the RESOLVE model that develops optimal portfolios of renewable, conventional and energy storage resources and the RECAP model that calculates Loss-of-Load Probability and related statistics to ensure that power systems can meet load reliably under high renewable penetrations. His clients have included major utilities and market participants across North America including the California Independent System Operator, Pacific Gas and Electric, Southern California Edison, Sacramento Municipal Utilities District, Los Angeles Department of Water and Power, Puget Sound Energy, PacifiCorp, Portland General Electric, the Bonneville Power Administration, NorthWestern Energy, Arizona Public Service, Salt River Project, El Paso Electric, Omaha Public Power District, Xcel Energy, Florida Power & Light, Tampa Electric Company, Nova Scotia Power, NB Power, Manitoba Hydro, SaskPower, Hydro-Quebec TransEnergie, TransElect, Long Island Power Authority, Calpine, NextEra, NRG, TransAlta, and others. He also works extensively with government agencies and industry organizations such as the California Public Utilities Commission, California Energy Commission, Oregon Public Utilities Commission, the Western Electric Coordinating Council, the Western Interstate Energy Board, the New York State Research and Development Authority, Illinois Power Authority, National Association of Regulatory Utility Commissioners, and others.

Electricity Resource Adequacy:

Mr. Olson is a prominent expert on resource adequacy issues and has led many projects that evaluate the need for effective capacity to ensure resource adequacy during the clean energy transition. Examples include:

- Led a team that prepared a Planning Reserve Margin and Effective Load-Carrying Capability study for FPL and testified on behalf of the company in 2025 in an electric rate case on the company's capacity needs and the contribution of solar, batteries, and thermal generation toward those needs.
- Led a team that prepared an ELCC study for NorthWestern Energy and testified on behalf of the company in 2025 in an electric rate case on the capacity contribution of wind, solar and energy storage resources.
- Led a team that performed a Planning Reserve Margin and ELCC study on behalf of Yukon Energy.
- Led a team that performed a Planning Reserve Margin and ELCC study on behalf of New Brunswick power and utilized those outputs to evaluate the potential value of new nuclear and other forms of generation for the company in the future.
- Led a team that performed a Planning Reserve Margin and ELCC study on behalf of El Paso Electric and used the study to inform its resource planning and procurement activities.
- Advised MISO on need determination and resource accreditation as part of a package of reforms to MISO's Planning Resource Auction.
- Advising the California Public Utilities Commission in developing a proposed Reliable Clean Power Procurement Program that would reform the way the state's Load-Serving Entities procure reliability and clean energy attributes.
- Advised the Public Utilities Commission of Texas on proposed reforms to the ERCOT market to address resource adequacy needs.
- Advised Calpine Corporation on generator accreditation issues for capacity markets in ISO-NE and PJM including addressing thermal generator limitations associated with lack of fuel availability.
- Developed new resource adequacy standards and models for the Hawaiian Electric Company's five island systems.
- Advised the New York Independent System Operator on application of ELCC concepts to renewable resources within the context of NYISO's Installed Capacity (ICAP) market.
- Prepared the study *Resource Adequacy in the Desert Southwest* on behalf of a consortium of Southwest utilities that concluded urgent action is needed to develop new resources to ensure the region can continue to provide reliable power supplies in response to returning electric load growth, planned and anticipated resource retirements, and a changing supply mix.
- Led a team that was retained by NRG and Exelon to develop a concrete proposal for a Load-Serving Entity Reliability Obligation to provide forward price signals necessary to ensure resource adequacy in the Electric Reliability Council of Texas (ERCOT) market.
- Led a team including former U.S. Energy Secretary Ernest Moniz and the Energy Futures Initiative that published *Net Zero New England*, a study of electricity system reliability under economy-wide target of net zero carbon emissions. The study included significant electric load growth due to electrification of transportation and building sector end uses along with the incorporation of vast quantities of solar and wind generation.
- Advised PJM Interconnection on application of ELCC concepts to renewable resources within the context of PJM's Reliability Pricing Model (RPM) forward capacity market.

- Leads a multi-company team that supports the California Public Utilities Commission (CPUC) staff for the Integrated Resource Planning (IRP) Proceeding. The IRP proceeding is considering the need for new capacity resources to ensure resource adequacy in California.
- Prepared a report on regional resource adequacy programs in support of the Northwest Power Pool's effort to stand up such a program in the Pacific Northwest. The study evaluated regional programs operated by each of the major market operators in North America for their potential application to the unique circumstances of the Pacific Northwest.
- Led a team that developed the Renewable Energy Capacity Planning (RECAP) Model, a loss-of-load probability (LOLP) model designed explicitly to measure the need for capacity on highly renewable electricity systems, as well as the contribution of dispatch-limited resources such as wind, solar, energy storage and demand response toward meeting those needs.
- Has led numerous teams that utilized RECAP to calculate resource needs, Planning Reserve Margins (PRMs), and Effective Load-Carrying Capability (ELCC) values for dispatch-limited resources for clients including the California ISO, California PUC, Western Electric Coordinating Councils, Portland General Electric, Hawaiian Electric Company, Los Angeles Department of Water and Power, Sacramento Municipal Utilities District, NorthWestern Energy, Northwest Power Pool, Xcel Energy, NV Energy, El Paso Electric, Nova Scotia Power, Calpine Corporation, and others.
- Evaluated the need for "clean firm" capacity to ensure reliable electric service under 100% carbon reduction scenarios for California, sponsored by the Environmental Defense Fund and the Clean Air Task Force.
- Reviewed Duke Energy Carolinas and Duke Energy Progress's IRPs on behalf of Cypress Creek Renewables and Carolinas Clean Energy Business Association and provided expert witness testimony in North Carolina and South Carolina regarding Duke's resource adequacy studies, the capacity value attributed to solar and battery storage resources, and their incorporation in Duke's capacity expansion modeling.
- Led a project team that evaluated alternative methods for calculating the capacity value of solar resources on behalf of the Oregon Public Utilities Commission staff.
- Led a team in 2019-2020 that utilized RECAP to calculate the capacity contribution of demand response and energy storage resources in California using the ELCC method on behalf of the California ISO.
- Served as expert witness in a wholesale market tariffs case for Nova Scotia Power, considering issues related to effective capacity determination for third-party resources.
- Led a team in 2019 that evaluated what types of resources would be needed to maintain resource adequacy in a deeply-decarbonized, 2050 California electricity system, in a study sponsored by the Calpine Corporation.
- For a group of 13 utilities in the Pacific Northwest, led studies in 2017 and 2018 that examined scenarios achieving 50% renewables and up to 100% carbon reductions across the region, focusing on policy mechanisms to achieve the goals at least cost and on the nature and quantity of complementary resources that are needed to maintain reliable electric service.
- For the Los Angeles Department of Water and Power, led a study that evaluated the reliability implications of closing three in-city natural gas-fired generating stations and replacing them with alternative resource portfolios including new gas, demand response, solar energy, energy storage and new transmission.
- Evaluated flexible capacity needs under high renewable penetration across the Western Interconnection on behalf of the Western Electric Coordinating Council and the Western Interstate Energy Board. The team included technical contributions from E3, NREL and Energy Exemplar.

- Performed analysis on behalf of Calpine and presented to the California Public Utilities Commission (CPUC) to recommend the use of the effective load carrying capability (ELCC) metric in the Resource Adequacy (RA) program for wind and solar resources. The CPUC ultimately adopted this recommendation along with several market design features proposed by E3.

Electricity Resource Planning and Decarbonization:

Mr. Olson has led numerous projects supporting utility system integrated resource planning efforts. Many of these projects have considered the cost, reliability and operational implications of achieving very high levels of renewables. Examples include:

- Led a team that performed a Planning Reserve Margin and ELCC study on behalf of New Brunswick power and utilized those outputs to evaluate the potential value of new nuclear and other forms of generation for the company in the future.
- Leading a team that is evaluating the potential role of offshore wind in the future energy mix of the Atlantic Canada region on behalf of Net Zero Atlantic.
- Leading a team that is providing a variety of integrated resource planning support for El Paso Electric including a PRM and ELCC study, portfolio optimization and production cost modeling in PLEXOS, RFP and bid evaluation support, resource planning to serve new large loads, and others.
- Advising SaskPower in developing their first integrated system planning process.
- Advising Manitoba Hydro in conducting their first integrated resource plan.
- Advised the Salt River Project in 2023-2024 in conducting their first integrated system plan consisting of generation, transmission, distribution and customer resource planning. E3 helped SRP design and implement the ISP process.
- Evaluated alternative policy options for achieving a deep decarbonization and high penetrations of clean energy resources across the PJM system. The study considers alternative clean energy policy mechanisms and geographic footprints.
- Led a team including former U.S. Energy Secretary Ernest Moniz and the Energy Futures Initiative that evaluated economy-wide deep decarbonization pathways for New England. The *Net Zero New England* study considers alternative scenarios for building decarbonization including High Fuels and High Electrification scenarios, as well as optimal portfolios of electricity resources to meet electric demand reliably while reducing carbon emissions to 2-3 MMT by 2050. Alternative resources considered include onshore and offshore wind, ground-mounted and rooftop solar, imported hydroelectric power, conventional and advanced nuclear power, fossil generation with carbon capture and sequestration, and hydrogen.
- Provided full modeling support for El Paso Electric Company's 2021 IRP including loss-of-load probability modeling to determine EPE's planning reserve margin, portfolio modeling using RESOLVE and PLEXOS, and evaluation of bids from EPE's subsequent all-source RFP.
- Led a team that studied regional transmission and clean energy projects on behalf of four Atlantic Canada provinces, several utilities, and Natural Resources Canada.
- Leads a team that is developed an economy-wide deep decarbonization study for a large, dual-fueled Midwestern utility.
- Provided extensive support for Nova Scotia Power's 2020 Integrated Resource Plan, which seeks to reduce carbon emissions by over 90% by replacing coal generation with a combination of in-province clean energy resources as well as potential clean imports.

- Leads a team at E3 that has supported the California Public Utilities Commission staff since 2014 in developing an electricity Reference System Plan for California and designing and implementing integrated resource planning standards for California load-serving entities.
- For the Sacramento Municipal Utilities District, led the development of their 2018 IRP which considered scenarios and resource portfolios for meeting California's and SMUD's own aggressive renewables goals including 100% renewables by 2040 and provides ongoing IRP and strategic planning support.
- For Xcel Energy, led an effort to support development of Northern States Power's 2018-19 IRP examining high renewable scenarios within the context of the company's stated goal of completely decarbonizing their electric resource portfolio by 2050.
- In 2018, led a study of the value of partially- and fully-dispatchable solar and solar+storage power plants on the Tampa Electric Company (TECO) system. The study was funded by First Solar but it involved extensive participation by a wide range of TECO staff and included detailed TECO power system data. The study was recognized by Public Utilities Fortnightly as among its 2018 Top Innovators and nominated as a finalist for the Smart Electric Power Alliance 2019 Power Players Award in the Change Agent of the Year category, and for the 2019 Platts Global Energy Awards in the Grid Edge category.
- For a group comprising the five largest utilities in California (Los Angeles Department of Water and Power, Pacific Gas and Electric Company, Sacramento Municipal Utilities District, San Diego Gas & Electric Company, and Southern California Edison), I led a landmark 2014 study of the feasibility, cost implications and complementary measures for achieving 50% renewables by 2030.
- Participated in several other E3 resource planning studies of achieving very high renewable penetrations for the Hawaiian Electric Company, the New York State Energy Research and Development Authority, and several electric utilities in the Southwest.
- For Portland Generic Electric, led a team that evaluated the need for resource adequacy capacity and flexible generation capacity in 2014-2016.
- For the Western Electric Coordinating Council and Western Interstate Energy Board, led teams that assessed electricity-natural gas infrastructure issues with regards to electric sector reliability under a changing resource mix including reduced reliance on coal generation and increased reliance on variable renewables and natural gas generation.
- For the Sacramento Municipal Utilities District, led a team that investigated the capacity contribution of new wind, solar and demand response (DR) resources.
- For the Colorado Public Utilities Commission, assisted in developing long-term scenarios to use across a range of energy infrastructure planning dockets.
- Provided expert testimony in front of the California Public Utilities Commission on rates and revenue requirements associated with several alternative portfolios of demand-side and supply-side resources, on behalf of Pacific Gas and Electric Company, Southern California Edison, and San Diego Gas & Electric.
- Served as lead investigator in assisting the California Public Utilities Commission (CPUC) in its efforts to reform the long-term procurement planning process in order to allow California to meet its aggressive renewable energy and greenhouse gas reduction policy goals.
- On behalf of the CPUC, investigated a number of strategies for achieving a 33% Renewables Portfolio Standard in California by 2020, and estimated their likely cost and rate impacts using the 33% RPS Calculator, a publicly-available spreadsheet model developed for this project.
- Served as lead investigator in developing integrated resource plans for numerous publicly-owned utilities including PNGC Power, Lower Valley Energy, Umatilla Electric Cooperative and Platte River Power Authority.

- Investigated for Bonneville Power Administration (BPA) the economics and feasibility of investing in new, long-line transmission facilities connecting load centers in the Pacific Northwest with remote areas that contain large concentrations of high-quality renewable energy resources. The study informed BPA about cost-effective strategies for procuring renewable energy supplies in order to meet current and potential future renewable renewables portfolio standards and greenhouse gas reduction targets.

Asset Valuation:

- Provides market evaluation and strategic advisory services for numerous asset owners and developers in California, the Southwest and the Pacific Northwest.
- Leads a team that develops medium- and long-term market price forecasts for energy, capacity, ancillary services and renewable energy credits (RECs) under very high renewable energy penetration at various market pricing points in the Western Interconnection.
- Led the team that developed renewable and conventional resource cost and performance characteristics for use in the WECC's Regional Transmission Expansion Planning process.
- On behalf of the Wyoming Governor's Office, developed a model of the cost of developing wind resources in Wyoming relative to neighboring states to inform policy debate regarding taxation. The model included detailed representations of state-specific taxes and capacity factors.

Transmission Planning and Pricing:

- Performed economic studies for a consortium of entities in Atlantic Canada including utilities, provincial government ministries, and Natural Resources Canada evaluating the potential economic benefits of the Atlantic Loop, a new HVDC transmission project connecting Quebec, New Brunswick and Nova Scotia.
- Provided educational and strategic advisory services to the Natural Resources Defense Council to inform their advocacy around environmentally beneficial transmission in California and the Western Interconnection.
- Provided generation and transmission asset valuation services to a number of utility and independent developer clients.
- Advising transmission developers seeking approval for projects through the CAISO's Transmission Planning Process.
- Served as technical support to the Western Electric Coordinating Council's Scenario Planning Steering Group (SPSG). The SPSG is developing scenarios for long-term transmission planning in the Western Interconnection.
- Led a team that investigated the use of Production Cost Modeling for the purpose of allocating costs of new transmission facilities on behalf of the Northern Tier Transmission Group and contributed to NTTG's Order 1000 compliance filing.
- Served as an expert witness in front of the Alberta Utilities Commission in a case regarding the Alberta Electric System Operator's proposed methodology for allocating Available Transmission Capacity among interties during times of congestion.
- Retained by a consortium of southwestern utilities and state agencies including the Wyoming Infrastructure Authority, Xcel Colorado, Public Service Company of New Mexico, and the Salt River Project to perform an economic feasibility study of the proposed High Plains Express (HPX) transmission project, a roadmap for transmission development in the Desert Southwest and Rocky Mountain regions.

- Conducted numerous screening studies of long-distance transmission lines connecting to remote renewable energy zones for multiple western utilities.
- Assisted in the development of a methodology for evaluating the renewable energy benefits of the Sunrise Powerlink transmission project in support of expert testimony on behalf of the California ISO.
- Assisted British Columbia Transmission Corporation and Hydro-Quebec TransEnergie with open access transmission tariff design.
- Provided assistance to the Seattle City Council to develop guidelines for the evaluation of large electric distribution and transmission projects by Seattle City Light (SCL). Guidelines specified the types of evaluations SCL should perform and the information the utility should present to the City Council when it seeks approval for large distribution or transmission projects.
- Led several periodic studies between 2009 and 2019 to develop generation and transmission capital cost assumptions for use in WECC's Transmission Expansion Planning and Policy Committee (TEPPC) studies.
- Contributed to a study of the benefits of North-South transmission expansion in Alberta on behalf of AltaLink.
- Performed economic studies on behalf of the BC Energy Ministry evaluating the potential benefits of a new transmission path connecting BC to the Pacific Northwest and California.
- Co-authored *Load-Resource Balance in the Western Interconnection: Towards 2020*, a study of west-wide infrastructure needs for achieving aggressive RPS and greenhouse gas reduction goals in 2020 for the Western Electric Industry Leaders (WEIL) Group, comprised of CEOs and executives from a number of utilities through the West, and presented results indicating that developing new transmission infrastructure to integrate remote renewable resources can result in cost savings for consumers under aggressive policy assumptions.

Market Analysis:

- Leads a team that is conducting an extensive modeling effort for a large group of western utilities to evaluate alternative market options available to them including CAISO's Extended Day-Ahead Market (EDAM), SPP's Markets+, and other configurations.
- Supported an effort by Pacific Northwest utilities to evaluate the benefits and costs of regional capacity planning reserve sharing mechanisms.
- Co-led a study for the California Independent System Operator in 2017 to estimate the benefits of forming an organized regional electricity market across much of the Western Interconnection. The study estimated benefits from more efficient capacity expansion, reduced operating reserves, reduced fuel and O&M costs, reduced renewable curtailment, reduced planning reserve margins, and others.
- Led a study for WECC to estimate the benefits of developing a centralized Energy Imbalance Market (EIM) across the Western Interconnection. The study estimated benefits due to increased generation dispatch efficiency resulting from reduced market barriers and increased load and resource diversity among western Balancing Authorities. Led several follow-up studies of alternative Western EIM footprints for potential EIM participants.
- Led a study to estimate the benefits of EIM participation for Seattle City Light and Chelan County Public Utilities District.
- Participated in studies of the benefits of joining the Western EIM for numerous utilities including PacifiCorp, Portland Generical Electric, Idaho Power, NorthWestern Energy, the Balancing Area of Northern California, Tucson Electric Power, Public Service Company of New Mexico, and the Bonneville Power Administration.

- Represented BC Hydro in RTO West market design process in areas of congestion management, ancillary services, and transmission pricing.

Cost of Service and Rate Design:

- Testified on behalf of Nova Scotia Power on rate designs for the Company's Back-up and Top-up service provided to wholesale customers who procure a portion of their supplies, including the appropriate rates for such service as well as the terms and conditions under which third-party supplies are deemed "firm" and therefore eligible for demand charge reductions.
- For a medium-sized Northwest public utility district, led a team that analyzed financial risks to native ratepayers of fulfilling service requests for significant new quantities of industrial electric loads.
- For a large Northwest rural electric cooperative, developed a new large load policy to provide electricity service at cost-of-service rates while minimizing upward rate pressure on existing customers.
- For a large Northwest rural electric cooperative, developed a cost-of-service model and redesigned retail electric rates to provide customers with incentives to manage growth in electric loads while equitably allocating benefits from low-cost federal hydropower resources.
- For the British Columbia Hydro and Power Authority, assisted with the developed of Stepped Rates for BC Hydro's large industrial customer class.
- For a medium-sized Northwest rural electric cooperative, led a team that evaluated the rate benefits and rate design options of merging its operations with a neighboring utility.
- For a Northwest generation and transmission cooperative, led a team that evaluated alternative options for structuring pooled generation investments, including design of the pool's wholesale rates to its member cooperatives.
- For a Northwest rural electric cooperative, evaluated the benefits of membership in alternative power pool options, including an evaluation of which design's wholesale rate structure was best suited to the utility's load characteristics.

Energy and Climate Policy:

- Developed policy themes and integrated them into the four long-term planning scenarios under consideration by WECC's Scenario Planning Steering Group.
- Led a team that developed a model of deep carbon dioxide emissions reductions scenarios in the western United States and Canada on behalf of the State-Provincial Steering Committee, a body of western state and provincial officials that provides oversight for WECC.
- Led a study of likely changes to power flows and market prices at western electricity trading hubs following California's adoption of a cap-and-trade system for regulating greenhouse gas emissions in 2013.
- For BC Hydro, evaluated the impact of BC's provincial greenhouse gas reduction policies on future electric load as part of BC Hydro's 2011 Integrated Resource Plan.
- Served as advisor, facilitator and drafter to the Interim Committee in developing Idaho's first comprehensive, statewide energy plan in 25 years. The Interim Committee and subcommittees held 18 days of public meetings and received input from dozens of members of the public in developing state-level energy policy recommendations. This process culminated in Mr. Olson drafting the 2007 Idaho Energy Plan, which was approved by the Legislature and adopted as the official state energy plan in March 2007.

- Developed a model that forecasted renewable and conventional generating resources in the WECC region in 2020 as part of an E3 project to advise the California Public Utilities Commission, California Energy Commission and California Air Resources Board about the cost and feasibility of reducing greenhouse gas emissions in the electricity and natural gas sectors.

WASHINGTON OFFICE OF TRADE AND ECONOMIC DEVELOPMENT Olympia, WA
Senior Energy Policy Specialist 1996-2002

- **Electricity Transmission**: Lead responsibility for developing and representing agency policy interests in a variety of regional forums, with a primary focus on pricing and congestion management issues. Lead negotiator on behalf of agency in IndeGO and RTO West negotiations in areas of Congestion Management, Ancillary Services, and Transmission Planning. Participated in numerous subgroups developing issues including congestion zone definition, nature of long-term transmission rights, and RTO role in transmission grid expansion.
- **Western Regional Transmission Association, 1996-2001:** Member, WRTA Board of Directors. Participated in WRTA Tariff, Access and Pricing Committee. Participated in sub-groups examining "seams" issues among multiple independent system operators in the West and developing a proposal for tradable firm transmission rights in the Western interconnection.
- **Wholesale Energy Markets:** Monitored and analyzed trends in electricity, natural gas and petroleum markets. Editor and principal author of Convergence: Natural Gas and Electricity in Washington, a survey of the Northwest's natural gas industry in the wake of the extreme price events of winter 2000-2001, and on the eve of a significant increase in demand due to gas-fired power plants. Authored legislative testimony on the ability of the Northwest's natural gas industry to meet the demand from new, gas-fired power plants.
- **Electricity Restructuring:** Co-authored Washington Electricity System Study, legislatively-mandated study of Washington's electricity system in the context of ongoing trends and potential methods of electric industry restructuring. Authored legislative testimony on the impact of restructuring on retail electricity prices in Washington, electric industry restructuring and Washington's tax system, and the interactions between restructured electricity and natural gas markets.
- **Energy Data:** Managed three-person energy data team that collected and maintained a repository of state energy data. Developed Washington's Energy Indicators, a series of policy benchmarks and key trends for Washington's energy system; second edition published in January 2001.

DECISION ANALYSIS CORPORATION OF VIRGINIA Vienna, VA
Associate 1993-1996

- **Energy Modeling and Analysis:** Developed energy demand forecasting models for Energy Information Administration's National Energy Modeling System. Results are published each year in EIA's Annual Energy Outlook.

Education

University of Pennsylvania Philadelphia, PA

Institut de Francais du Petrole — Rueil-Malmaison, France
M.S., International Energy Management & Policy

University of Washington — Seattle, WA
B.S., Mathematical Sciences, B.S. Statistics

Awards and Recognition

Energy Systems Integration Group, 2024 Excellence Award "for a broad range of innovative pathways to align customer pricing with grid needs."

Energy Systems Integration Group, 2023 Excellence Award "for leadership in the evolution and applications of tools and methodologies to enable utilities to decarbonize their systems."

Public Utilities Fortnightly Top Innovators 2018. E3's 2018 study *Investigating the Economic Benefits of Flexible Solar Power Plant Operation* was recognized by Public Utilities Fortnightly leading to an award for the project sponsors.

Expert Witness Testimony

1. *Montana Public Service Commission, 2025, testified on behalf of NorthWestern Energy regarding loss-of-load probability modeling conducted by E3 to calculate the capacity contribution of various resource types toward meeting the company's resource adequacy needs, in support of a rate case application.*

2. *Montana Public Service Commission, 2024, testified on behalf of NorthWestern Energy regarding avoided capacity costs from Qualifying Facilities in a Public Utility Regulatory Policies Act (PURPA) tariff application.*

3. *Georgia Public Service Commission, 2024, testified on behalf of the Southern Renewable Energy Alliance regarding capacity accreditation, capacity expansion modeling, and transmission planning for Georgia Power's 2023 Integrated Resource Plan Update.*

4. *South Carolina Public Service Commission, 2023, testified on behalf of Carolinas Clean Energy Business Association regarding capacity accreditation and integration costs of solar and storage resources for Santee Cooper's 2023 Integrated Resource Plan.*

5. *District Court of Denver, Colorado, 2023, testified on behalf of Xcel Energy in a civil case related to Xcel's planned early closure of the Comanche 3 coal-fired power plant in Pueblo, Colorado.*

6. *Colorado Public Utilities Commission, 2023, testified on behalf of Black Hills Energy regarding resource adequacy and resource portfolio modeling in support of its Energy Resource Plan.*

7. *Georgia Public Service Commission, 2022, testified on behalf of the Georgia Large-Scale Solar Association regarding capacity credits and integration costs attributable to solar and hybrid solar-storage resources in Georgia Power's 2022 Integrated Resource Plan.*

8. *Colorado Public Utilities Commission, 2021, testified on behalf of the Colorado Independent Energy Association regarding the benefits of Xcel Energy's proposed Colorado Pathways Project, and new transmission investment in general, for Colorado electric ratepayers in achieving Colorado's clean energy goals. The Commission approved Xcel's application to construct the project.*

9. *Nova Scotia Utility and Review Board, 2021, testified on behalf of Nova Scotia Power regarding rate designs for the Company's Back-up and Top-up service provided to wholesale customers who procure a portion of their supplies, including the appropriate rates for such service as well as the terms and conditions under which third-party supplies are deemed "firm" and therefore eligible for demand charge reductions. The Board adopted Nova Scotia Power's position in each of the areas in which I testified.*

10. *South Carolina Public Service Commissions, 2021, testified on behalf of the Carolinas Clean Energy Business Association regarding Duke Energy Carolinas and Duke Energy Progress's resource adequacy studies, the capacity value attributed to solar and battery storage resources, and their incorporation in Duke's capacity expansion modeling in their 2020 IRP processes.*

11. *Ontario Superior Court of Justice, 2021, testified on behalf of the Province of Ontario regarding Ontario's Feed-in Tariff policies and the resulting renewable energy contracts. The Court found on behalf of the Province in each area.*

12. *Georgia Public Service Commission, 2020, testified on behalf of the Georgia Large-Scale Solar Association, Georgia Power's Capacity and Energy Payments to Cogenerators Under PURPA and Georgia Power Company's Green Energy Program.*

13. *New Mexico Public Regulation Commission, 2020, testified on behalf of El Paso Electric Company regarding independent analysis that E3 performed of the Company's selection of solar, energy storage and new gas resources stemming from its 2018 all-source capacity solicitation.*

14. *Georgia Public Service Commission, 2019, testified on behalf of the Georgia Large-Scale Solar Association in Georgia Power's Integrated Resource Plan (IRP) proceeding regarding the quantity of large-scale solar energy that Georgia Power could procure in order to maximize customer benefits.*

15. *Oregon Public Utilities Commission, 2017, testified on behalf of Commission staff regarding methodologies for assessing the value of customer-owned solar resources.*

16. *Oregon Public Utilities Commission, 2016, testified on behalf of Portland General Electric Company regarding methodologies for assessing the capacity contribution of variable renewable energy resources.*

17. *Province of Ontario, Commercial Arbitration, 2015, testified regarding policies related to renewable energy procurement and determination of available transmission capacity. The Arbitrator found on behalf of the Province in each of the areas in which I testified.*

18. *California Energy Commission, 2014, testified on behalf of Abengoa and BrightSource Energy regarding the cost and feasibility of distributed generation and energy storage alternatives to a large, concentrating solar power plant project in the context of a power plant siting case.*

19. *California Energy Commission, 2013, testified on behalf of BrightSource Energy regarding the cost and feasibility of distributed generation alternatives to a large, concentrating solar power plant project in the context of a power plant siting case.*

20. *Alberta Electric Utilities Commission, 2012, testified on behalf of Powerex Corporation reviewing industry practices regarding treatment of existing transmission capacity, in the case when new transmission lines are interconnected.*

21. *California Public Utilities Commission, 2011, provided testimony on behalf of Pacific Gas and Electric Company, Southern California Edison Company, and San Diego Gas & Electric Company regarding cost, revenue requirement, average retail rates, and cost of carbon reductions from alternative resource portfolios in the Long-Term Procurement Planning Proceeding.*

22. *California Public Utilities Commission, 2010, testified on behalf of BrightSource Energy and First Solar regarding the need for the he Eldorado-Ivanpah Transmission Project (EITP) proposed by Southern California Edison (SCE) to help integrate over 1000 MW of utility-scale solar generation.*

23. *California Energy Commission, 2010, testified on behalf of BrightSource Energy regarding the cost and feasibility of distributed generation alternatives to a large, concentrating solar power plant project in the context of a power plant siting case. The case successfully resulted in a site license for the Ivanpah Solar Generating Station.*

Publications

1. *Energy Systems Integration Group. 2025. Foundations of Integrated Planning: Defining a Framework for Comprehensive Energy System Planning. A report by the Integrated Planning Task Force. https://www.esig.energy/integrated-planning/, Aaron Burdick, Arne Olson, Madeline McMillan, Debra Lew and Matt Schuerger*

2. *Energy Systems Integration Group. 2025. Optimization for Integrated Electricity System Planning: Opportunities for Integrated Planning in Capacity Expansion Models. A report by the Integrated Planning Task Force. https://www.esig.energy/integrated-planning/, Aaron Burdick, Arne Olson, Madeline McMillan, Debra Lew and Matt Schuerger*

3. *Ari Gold-Parker, Dan Aas, Arne Olson and Amber Mahone, "How targeted electrification can support a managed transition for the gas system," Utility Dive, March 15, 2024, https://www.utilitydive.com/news/targeted-electrification-natural-gas-pipeline-system-transition/710115/*

4. *Arne Olson, Nick Schlag, Greg Gangelhoff and Anthony Fratto, "Every load an island: Requiring hourly matching of clean electricity purchases would raise emissions", Utility Dive, August 29,*

2023, https://www.utilitydive.com/news/hourly-matching-clean-electricity-renewable-energy-purchases-e3/692099/

5. *Olson, A., E. Cutter, L. Bertrand, V. Venugopal, S. Spencer, K. Walter, and A. Gold-Parker. 2023. "Rate Design for the Energy Transition: Getting the Most out of Flexible Loads on a Changing Grid." A White Paper from the Retail Pricing Task Force. Reston, VA: Energy Systems Integration Group. https://www.esig.energy/aligning-retail-pricing-with-grid-needs.*

6. *Sun, Yuchi, James H. Nelson, John C. Stevens, Adrian H. Au, Vignesh Venugopal, Charles Gulian, Saamrat Kasina, Patrick O'Neill, Mengyao Yuan, and Arne Olson, "Machine learning derived dynamic operating reserve requirements in high-renewable power systems," Journal of Renewable and Sustainable Energy; Volume 14, Issue 3; June 24, 2022; https://doi.org/10.1063/5.0087144*

7. *Burdick, Aaron, Nick Schlag, Adrian Au, Roderick Go, Zachary Ming, and Arne Olson, "Lighting a Reliable Path to 100% Clean Electricity: Evolving Resource Adequacy Practices for a Decarbonizing Grid", IEEE Power and Energy Magazine; Volume: 20; Issue: 4; June 22, 2022, https://ieeexplore.ieee.org/document/9804183*

8. *Baik, Ejeong, Kiran P. Chawla, Jesse D. Jenkins, Clea Kolster, Neha S. Patankar, Arne Olson, Sally M. Benson, Jane C.S. Long, "What is different about different net-zero carbon electricity systems", Energy and Climate Change, Volume 2, December 2021, https://www.sciencedirect.com/science/article/pii/S2666278721000234*

9. *Arne Olson and Adam Simpson, "Greening the Microgrid: Moving beyond backup with cleaner sources of firm energy", Power Engineering, June 21, 2021, https://www.power-eng.com/on-site-power/greening-the-microgrid-moving-beyond-backup-with-cleaner-sources-of-firm-energy/#gref*

10. *Long, Jane C.S., Ejeong Baik, Jesse D. Jenkins, Clea Kolster, Kiran Chawla, Arne Olson, Armond Cohen, Michael Colvin, Sally M. Benson, Robert B. Jackson, David G. Victor, and Steven P. Hamburg. "Clean Firm Power is the Key to California's Carbon-Free Energy Future." Issues in Science and Technology, March 24, 2021, https://issues.org/california-decarbonizing-power-wind-solar-nuclear-gas/*

11. *Scott Burger, Marco Ferrara, Roderick Go, and Arne Olson, "To build a zero-carbon grid, we first need to model it accurately", Utility Dive, December 23, 2020, https://www.utilitydive.com/news/to-build-a-zero-carbon-grid-we-first-need-to-model-it-accurately/592704/*

12. *Nick Schlag, Zachary Ming and Arne Olson, "Adding it all up: Counting the capacity contribution of variable and duration-limited resources", Utility Dive, September 10. 2020, https://www.utilitydive.com/news/adding-it-all-up-counting-the-capacity-contribution-of-variable-and-durati/584843/*

13. *Wu, Grace; Leslie, Emily; Sawyerr, Oluwafemi; Cameron, D. Richard; Brand, Erica; Cohen, Brian; Allen, Douglas; Ochoa, Marcela; Olson, Arne, "Low-impact land use pathways to deep*

decarbonization of electricity", Environmental Research Letters, Volume 15, Number 7, 10 July 2020

14. *Arne Olson and Dan Mullen, "For a smart transition to 100% clean energy: Renewables, storage and, in some cases, new gas", Utility Dive, December 18, 2019, https://www.utilitydive.com/news/for-a-smart-transition-to-100-clean-energy-renewables-storage-and-in-so/569279/*

15. *Woo, C.K., J. Zarnikau, Y. Chen, A. Olson, J. Moore, T. Ho, Y. Liu, and X. Luo (2017) "An empirical analysis of California's hybrid capacity options" The Electricity Journal, Volume 31, Issue 2, March 2018, Pages 7-12*

16. *Woo, C.K., A. Olson, Y. Chen, J. Moore, N. Schlag, A. Ong, and T. Ho (2017) "Does California's CO2 price affect wholesale electricity prices in the Western U.S.A.?" Energy Policy, 110, 9–19*

17. *Olson, A., C.K. Woo, N. Schlag and A. Ong (2016) "What Happens in California Does Not Always Stay in California: The Effect of California's Cap-and-Trade Program on Wholesale Electricity Prices in the Western Interconnection," The Electricity Journal, 29(7), 18-22*

18. *Woo, C.K., J. Moore, B. Schneiderman, T. Ho, A. Olson, L. Alagappan, K. Chawla, N. Toyama, J. Zarnikau (2016) "Merit-order effects of renewable energy and price divergence in California's day-ahead and real-time electricity markets," Energy Policy, 92, 299-312*

19. *Woo, C.K., J. Moore, B. Schneiderman; A. Olson; R. Jones; T. Ho; N. Toyama; J. Wang; and J. Zarnikau, "Merit-order Effects of Day-ahead Wind Generation Forecast in the Hydro-rich Pacific Northwest", The Electricity Journal, Vol. 28, Issue 9, November 2015*

20. *Olson, A., A. Mahone, E. Hart, J. Hargreaves, R. Jones, N. Schlag, G. Kwok, N. Ryan, R. Orans and R. Frowd, "Halfway There: Can California Achieve a 50% Renewable Grid?", IEEE Power and Energy Magazine, Volume:13, Issue: 4, pp. 41-52, July-Aug. 2015*

21. *Olson, A., R. Jones, E. Hart and J. Hargreaves, "Renewable Curtailment as a Power System Flexibility Resource," The Electricity Journal, Volume 27, Issue 9, November 2014, pages 49-61*

22. *Hargreaves, J., E. Hart, R. Jones and A. Olson, "REFLEX: An Adapted Production Simulation Methodology for Flexible Capacity Planning," IEEE Transactions on Power Systems, Volume:30, Issue: 3, September 2014, pages 1306 - 1315*

23. *Woo, C.K., T. Hob, J. Zarnikau, A. Olson, R. Jones, M. Chait, I. Horowitz, J. Wang, "Electricity-market price and nuclear power plant shutdown: Evidence from California", Energy Policy,* 2014, vol. 73, issue C, pages 234-244

24. *Woo, C.K., Zarnikau J, Kadish J, Horowitz I, Wang J, Olson A. (2013) "The Impact of Wind Generation on Wholesale Electricity Prices in the Hydro-Rich Pacific Northwest," IEEE Transactions on Power Systems, 28(4), 4245-4253.*

25. *Orans, R., A. Olson, J. Moore, J. Hargreaves, R. Jones, G. Kwok, F. Kahrl, and C.K. Woo (2013) "Energy Imbalance Market Benefits in the West: A Case Study of PacifiCorp and CAISO," Electricity Journal, 26:5, 26-36.*

26. *Olson A., R. Jones (2012) "Chasing Grid Parity: Understanding the Dynamic Value of Renewable Energy," Electricity Journal, 25:3, 17-27.*

27. *Woo, C.K., H. Liu, F. Kahrl, N. Schlag, J. Moore and A. Olson (2012) "Assessing the economic value of transmission in Alberta's restructured electricity market," Electricity Journal, 25(3): 68-80.*

28. *DeBenedictis, A., D. Miller, J. Moore, A. Olson, C.K. Woo (2011) "How Big is the Risk Premium in an Electricity Forward Price? Evidence from the Pacific Northwest," Electricity Journal, 24:3, 72-76.*

29. *Woo, C.K., I. Horowitz, A. Olson, A. DeBenedictis, D. Miller and J. Moore (2011) "Cross-Hedging and Forward-Contract Pricing of Electricity in the Pacific Northwest," Managerial and Decision Economics, 32, 265-279.*

30. *Moore, J., C.K. Woo, B. Horii, S. Price and A. Olson (2010) "Estimating the Option Value of a Non-firm Electricity Tariff," Energy, 35, 1609-1614.*

31. *Olson A., R. Orans, D. Allen, J. Moore, and C.K. Woo (2009) "Renewable Portfolio Standards, Greenhouse Gas Reduction, and Long-line Transmission Investments in the WECC," Electricity Journal, 22:9, 38-46.*

32. *Moore, J., C.K. Woo, B. Horii, S. Price, A. Olson (2009) "Estimating the Option Value of a Non-firm Electricity Tariff," Energy, 35, 1609-1614.*

33. *Woo, C.K., I. Horowitz, N. Toyama, A. Olson, A. Lai, and R. Wan (2007) "Fundamental Drivers of Electricity Prices in the Pacific Northwest," Advances in Quantitative Analysis of Finance and Accounting, 5, 299-323.*

34. *Lusztig, C., P. Feldberg, R. Orans, and A. Olson (2006) "A survey of transmission tariffs in North America," Energy-The International Journal 31, 1017-1039.*

35. *Woo, C.K., A. Olson, I. Horowitz and S. Luk (2006) "Bi-directional Causality in California's Electricity and Natural-Gas Markets," Energy Policy, 34, 2060-2070.*

36. *Woo, C.K., I. Horowitz, A. Olson, B. Horii and C. Baskette (2006) "Efficient Frontiers for Electricity Procurement by an LDC with Multiple Purchase Options," OMEGA, 34:1, 70-80.*

37. *Woo, C.K., A. Olson and I. Horowitz (2006) "Market Efficiency, Cross Hedging and Price Forecasts: California's Natural-Gas Markets," Energy, 31, 1290-1304.*

38. *Woo, C.K., A. Olson and R. Orans (2004) "Benchmarking the Price Reasonableness of an Electricity Tolling Agreement," Electricity Journal, 17:5, 65-75.*

39. *Orans, R., A. Olson, C. Opatrny, Market Power Mitigation and Energy Limited Resources, Electricity Journal, March 2003.*

Research Reports

1. *Consequential Impacts of Voluntary Clean Energy Procurement, June 2024, https://www.ethree.com/meta-voluntary-clean-energy/*

2. *Benefits and Costs of Net Energy Metering in Washington, December 2023, https://www.ethree.com/wp-content/uploads/2023/12/E3_Benefits-and-Costs-of-Net-Energy-Metering-in-Washington_2023-12-21.pdf*

3. *"The Economics of Electrification in Nova Scotia", December 2023, https://www.ethree.com/wp-content/uploads/2023/12/E3_NS-Power_Electrification-Report.pdf*

4. *Resilience in planning: Its relationship to Reliability and a practical implementation guide, July 2023, https://www.ethree.com/wp-content/uploads/2024/02/Resilience-in-planning-Its-relationship-to-Reliability-and-a-practical-implementation-guide-1.pdf*

5. *"Analysis of Hourly & Annual GHG Emissions: Accounting for Hydrogen Production", April 2023, https://www.ethree.com/wp-content/uploads/2023/04/2023.04.19_E3-ACORE_Report_vFF_20230421update.pdf*

6. *"Assessment of Market Reform Options to Enhance Reliability of the ERCOT System", November 2022, https://www.ethree.com/wp-content/uploads/2023/05/E3-PUCT_Assessment-of-Market-Reform-Options-to-Enhance-Reliability-of-the-ERCOT-System_11.10.22-Sent.pdf*

7. *Electricity Resource Compensation Under a Net Zero Future, September 2022, https://www.ethree.com/wp-content/uploads/2020/08/E3-whitepaper_Electricity-Resource-Compensation-Under-a-Net-Zero-Future.pdf*

8. *"BPA Lower Snake River Dams Power Replacement Study", July 2022, https://www.ethree.com/wp-content/uploads/2022/07/e3-bpa-lower-snake-river-dams-power-replacement-study.pdf*

9. *Resource Adequacy in the Desert Southwest, co-author, February 2022, https://www.ethree.com/projects/resource-adequacy-in-the-desert-southwest/*

10. *Quantifying the Air Quality Impacts of Decarbonization and Distributed Energy Programs in California, January 2022, https://www.ethree.com/wp-content/uploads/2022/01/CPUC-Air-Quality-Report-FINAL.pdf*

11. *Societal Cost Test Impact Evaluation: CPUC Staff Report on the Impact of a Societal Cost Test on Resource Procurement, January 2022, https://www.ethree.com/wp-content/uploads/2022/01/CPUC-SCT-Report-FINAL.pdf*

12. *The Load-Serving Entity Reliability Obligation: A Market Design Reform to Ensure Electric Reliability in Texas, co-author, September 2021, https://www.ethree.com/new-e3-whitepaper-proposes-reform-for-texas-electricity-market/*

13. *Oregon Renewable Energy Market and Industry Assessment Report, Oregon Department of Energy, co-author, June 2021, https://www.oregon.gov/energy/energy-oregon/Documents/2022-RE-Market-Industry-Assessment-Report.pdf*

14. *Scalable Markets for the Energy Transition: A Blueprint for Wholesale Electricity Market Reform, lead author, May 2021, https://www.ethree.com/wp-content/uploads/2021/05/E3-Scalable-Clean-Energy-Market-Design-2021-05-24-vFinal.pdf*

15. *Powering a Green Nova Scotia, Together: 2020 Integrated Resource Plan, E3 project lead and contributing author, November 2020, https://irp.nspower.ca/files/key-documents/E3_NS-Power_2020_IRP_Report_final_Nov-27-2020.pdf*

16. *Net-Zero New England: Ensuring Electric Reliability in a Low-Carbon Future, Energy and Environmental Economics, Inc. and Energy Futures Initiative, project lead and contributing author, November 2020, https://www.ethree.com/wp-content/uploads/2020/11/E3-EFI_Report-New-England-Reliability-Under-Deep-Decarbonization_Full-Report_11-17-2020_Release.pdf*

17. *Pacific Northwest Zero-Emitting Resources Study, prepared for Energy Northwest, project lead and contributing author, January 2020, https://www.ethree.com/wp-content/uploads/2020/02/E3-Pacific-Northwest-Zero-Emitting-Resources-Study-Jan-2020.pdf*

18. *Least Cost Carbon Reduction Policies in PJM, project lead and contributing author, October 2020, https://www.ethree.com/wp-content/uploads/2020/10/E3-Least_Cost_Carbon_Reduction_Policies_in_PJM-1.pdf*

19. *"Capacity and Reliability Planning in the Era of Decarbonization: Practical Application of Effective Load Carrying Capability in Resource Adequacy", E3 White Paper, contributing author, August 2020, https://www.ethree.com/wp-content/uploads/2020/08/E3-Practical-Application-of-ELCC.pdf*

20. *Hydrogen Opportunities in a Low-Carbon Future: An Assessment of Long-Term Market Potential in the Western United States, June 2020, https://www.ethree.com/wp-content/uploads/2021/11/E3_MHPS_Hydrogen-in-the-West-Report_Final_June2020.pdf*

21. *Minnesota Energy Storage Cost-Benefit Analysis, December 2019, prepared for the Minnesota Department of Commerce, Division of Energy Resources, https://www.ethree.com/wp-content/uploads/2020/01/E3-Minnesota-energy-storage-cost-benefit-study-2020.pdf*

22. *Capacity Needs of the Pacific Northwest, December 2019, prepared for National Grid, https://www.ethree.com/wp-content/uploads/2019/12/E3-PNW-Capacity-Need-FINAL-Dec-2019.pdf*

23. *Exploring a Resource Adequacy Program for the Pacific Northwest, October 2019, prepared on behalf of the Northwest Power Pool, project lead and contributing author, https://www.nwpp.org/private-media/documents/2019.11.12_NWPP_RA_Assessment_Review_Final_10-23.2019.pdf*

24. *California Offshore Wind: Workforce Impacts and Grid Integration, September 2019, with the University of California – Berkeley Labor Center, contributing author, https://laborcenter.berkeley.edu/offshore-wind-workforce-grid/*

25. *Xcel Energy Low Carbon Scenario Analysis: Decarbonizing the Generation Portfolio of Xcel Energy's Upper Midwest System, July 2019, prepared on behalf of Xcel Energy, project lead and contributing author, https://www.ethree.com/wp-content/uploads/2019/08/E3_Xcel_MN_IRP_Report_2019-07_FINAL.pdf*

26. *Grace C. Wu, D. Richard Cameron, Emily Leslie, Douglas Allen, Oluwafemi Sawyerr, Erica Brand, Brian Cohen, Marcela Ochoa and Arne Olson, "Power of Place: Land Conservation and Clean Energy Pathways for California", prepared for The Nature Conservancy, San Francisco, June 2019, https://www.scienceforconservation.org/assets/downloads/Technical_Report_Power_of_Place.pdf*

27. *Electricity System Reliability Under Long-Run Deep Decarbonization Pathways in California, June 2019, prepared on behalf of the Calpine Corporation, project lead and contributing author, https://www.ethree.com/wp-content/uploads/2019/06/E3_Long_Run_Resource_Adequacy_CA_Deep-Decarbonization_Final.pdf*

28. *Resource Adequacy in the Pacific Northwest, March 2019, prepared on behalf of Puget Sound Energy, the Public Generating Pool, Avista Corporation and NorthWestern Energy, project lead and contributing author, https://www.ethree.com/wp-content/uploads/2019/03/E3_Resource_Adequacy_in_the_Pacific-Northwest_March_2019.pdf*

29. *Investigating the Economic Value of Flexible Solar Power Plants, October 2018, prepared on behalf of First Solar with the assistance of Tampa Electric Company, project lead and contributing author, https://www.ethree.com/projects/investigating-the-economic-value-of-flexible-solar-plants/*

30. *Western Interconnection Gas-Electric Interface Study, June 2018, prepared on behalf of the Western Electric Coordinating Council, contributing author, https://www.wecc.org/Administrative/WECC%20Gas-Electric%20Study%20Public%20Report.pdf*

31. *Pacific Northwest Low Carbon Scenario Analysis, December 2017, prepared on behalf of the Public Generating Pool, project lead and contributing author, https://www.ethree.com/projects/study-policies-decarbonize-electric-sector-northwest-public-generating-pool-2017-present/*

32. *2025 California Demand Response Potential Study - Charting California's Demand Response Future, March 2017, prepared on behalf of the California Public Utilities Commission, contributing author, http://eta-publications.lbl.gov/sites/default/files/lbnl-2001113.pdf*

33. *The Future of Electricity Resource Planning, Volume 6 of the Lawrence Berkeley National Laboratory Electricity Markets and Policy Group's Future Electric Utility Regulation Report Series, September 2016, https://emp.lbl.gov/publications/future-electricity-resource-planning*

34. *Senate Bill 350 Study: The Impacts of a Regional ISO-Operated Power Market on California, July 2016, prepared on behalf of the California Independent System Operator, project lead and contributing author, https://www.caiso.com/informed/Pages/RegionalEnergyMarket/BenefitsofaRegionalEnergyMarket.aspx*

35. *Western Interconnection Flexibility Assessment, December 2015, prepared on behalf of the Western Electric Coordinating Council and the Western Interstate Energy Board, project lead and contributing author, https://ethree.com/public_projects/western_interconnection_study.php*

36. *Natural Gas Infrastructure Adequacy in the Western Interconnection: An Electric Sector Perspective, July 2014, prepared on behalf of the Western Interstate Energy Board, project lead and contributing author, https://ethree.com/public_projects/wieb.php*

37. *"Capital Cost Review of Power Generation Technologies: Recommendations for WECC's 10- and 20-Year Studies, March 2014, prepared for the Western Electric Coordinating Council*

38. *Investigating a Higher Renewables Portfolio Standard for California, January 2014, prepared on behalf of the Los Angeles Department of Water and Power, Pacific Gas and Electric Company, Sacramento Municipal Utilities District, San Diego Gas & Electric, and Southern California Edison, technical lead and lead author, http://www.ethree.com/public_projects/renewables_portfolio_standard.php*

39. *Optimal Investment in Power System Flexibility, E3 White Paper, December 2013, https://ethree.com/documents/Olson_Flexibility_Investment_2013-12-23.pdf*

40. *PacifiCorp-ISO Energy Imbalance Market Benefits, March 2013, https://www.ethree.com/wp-content/uploads/2017/02/PacifiCorp-ISOEnergyImbalanceMarketBenefits-1.pdf*

41. *Cost and Performance Review of Generation Technologies: Recommendations for WECC 10- and 20-Year Study Process, October 2012, prepared on behalf of the Western Electric Coordinating Council, editor and contributing author, http://www.wecc.biz/committees/BOD/TEPPC/TAS/121012/Lists/Minutes/1/121005_GenCapCostReport_finaldraft.pdf.*

42. *Economic Assessment of North/South Transmission Capacity Expansion in Alberta, January 2012, prepared on behalf of AltaLink, contributing author.*

43. *Energy Imbalance Market Benefits Study, October 2011, prepared on behalf of the Western Electric Coordinating Council, project lead and contributing author, http://www.wecc.biz/committees/EDT/EDT%20Results/EDT%20Cost%20Benefit%20Analysis%20Report%20-%20REVISED.pdf*

44. *High Plains Express Initiative, Stage 2 Feasibility Report, April 2011, project lead and contributing author, http://www.highplainsexpress.com/site/stakeholderMeetingDocuments/HPX_Stage-2_Feasibility-report.pdf*

45. *State of Wyoming Wind Energy Costing Model, June 2010, prepared on behalf of the Wyoming Infrastructure Authority and Governor's office, author, http://legisweb.state.wy.us/2010/WyomingWindModel_7_01_2010.pdf*

46. *Recommendations for Documentation of Seattle City Light Energy Delivery Capital Expenditures, February 2010, prepared on behalf of the Seattle City Council, project lead and contributing author, http://clerk.seattle.gov/~ordpics/31219exA.pdf*

47. *California Public Utilities Commission, 33% Renewables Portfolio Standard Implementation Analysis, Preliminary Results, June 2009, project lead and contributing author, http://www.cpuc.ca.gov/NR/rdonlyres/1865C207-FEB5-43CF-99EB-A212B78467F6/0/33PercentRPSImplementationAnalysisInterimReport.pdf*

48. *California Public Utilities Commission, Energy Division Straw Proposal on LTPP Planning Standards, June 2009, project lead and contributing author, http://www.cpuc.ca.gov/NR/rdonlyres/1865C207-FEB5-43CF-99EB-A212B78467F6/0/33PercentRPSImplementationAnalysisInterimReport.pdf*

49. *California Public Utilities Commission, Survey of Utility Resource Planning and Procurement Practices for Application to Long-Term Procurement Planning in California, September 2008, http://www.cpuc.ca.gov/NR/rdonlyres/029611EA-D7C7-4ACC-84D6-D6BA8515723A/0/ConsultantsReportonUtilityPlanningPracticesandAppendices09172008.pdf.*

50. *Remote Renewable and Low-Carbon Resource Options for BPA, May 2008, prepared on behalf of the Bonneville Power Administration, author, http://www.ethree.com/public_projects/BPA_options.html*

51. *Load-Resource Balance in the Western Interconnection: Towards 2020, prepared on behalf of the Western Electric Industry Leaders Group, January 2008, contributing author, http://www.weilgroup.org/E3_WEIL_Complete_Study_2008_082508.pdf*

52. *Umatilla Electric Cooperative 2008 Integrated Resource Plan, January 2009, contributing author.*

53. *Lower Valley Energy 2007 Integrated Resource Plan Update, February 2007, contributing author.*

54. *2007 Idaho Energy Plan, January 2007, prepared on behalf of the Idaho Legislative Council Interim Committee on Energy and Technology, http://www.legislature.idaho.gov/sessioninfo/2007/energy_plan_0126.pdf*

55. *Base Case Integrated Resource Plan for PNGC Power, April 2006, author.*

56. *Integrated Resource Planning for Coos-Curry Electric Cooperative, August 2005, author.*

57. *Integrated Resource Planning for Lower Valley Energy, December 2004, author.*

58. *"A Forecast Of Cost Effectiveness: Avoided Costs and Externality Adders", prepared for the California Public Utilities Commission, February 2004, contributing author.*

59. *Stepped Rate Design Report, prepared for BC Hydro and filed with the BCUC, May 2003, contributing author.*

60. *Convergence: Natural Gas and Electricity in Washington, editor and principal author. Washington Office of Trade and Economic Development, May 2001. http://www.energy.cted.wa.gov/Papers/Convergence.htm*

61. *2001 Biennial Energy Report: Issues and Analyses for the Washington State Legislature, contributing author. Washington Office of Trade and Economic Development, February 2001. http://www.energy.cted.wa.gov/BR2001/default.htm*

62. *Study of Electricity Taxation, contributing author. Washington Department of Revenue, December 1999. http://www.energy.cted.wa.gov/papers/taxstudy.doc*

63. *Washington Energy Indicators, author. Washington Department of Community, Trade and Economic Development, February 1999. http://www.energy.cted.wa.gov/Indicators99/Contents.htm*

64. *Washington State Electricity Study, contributing author. Washington Department of Community, Trade and Economic Development and Washington Utilities and Transportation Commission, January 1999. http://www.energy.cted.wa.gov/6560/finalapp.htm*

65. *Our Energy Future: At a Crossroads. 1997 Biennial Energy Report, contributing author. Washington Department of Community, Trade and Economic Development, January 1997. http://www.energy.cted.wa.gov/BIENREPO/CONTENTS.HTM*

66. *Washington State Energy Use Profile 1996, contributing author. Washington State Energy Office, June 1996. http://www.energy.cted.wa.gov/FILES/PRFL/BASE02.HTM*

67. *Model Documentation Report: Transportation Sector Model of the National Energy Modeling System, contributing author. Decision Analysis Corporation of Virginia. Prepared for Energy Information Administration, March 1994.*

Selected Public Presentations

1. *A "Critical Periods" Reliability Framework, North American Electric Reliability Corporation, Evaluating Resource Contributions for Reliability and Capacity Supply Workshop, Washington, DC, June 5, 2025*

2. *Renewables Portfolio Standards: What are They Good For? New England Conference of Public Utilities Commissioners Symposium, Mystic, Connecticut, May 19, 2025*

3. *Capacity Accreditation and Forward Hedging, Future Power Markets Forum, May 8, 2025*

4. *California CCAs: Celebrating Success and Preparing for an Uncertain Future, Keynote address, CalCCA Annual Meeting, Irvine, California, April 29, 2025*

5. *Unlocking the Flexibility Value of Dispatchable Resources with multi-stage PLEXOS ST modeling, Xcelerate Case Study Presentation, Phoenix, Arizona, April 8, 2025*

6. *Decarb and Dams: Environmental Tradeoffs in Meeting the Northwest's Clean Energy Goals, Whitman College Community Event, Walla Walla, Washington, February 13, 2025*

7. *State of the Market: Pacific Northwest, Electric Power in the West, Law Seminars International, Seattle, Washington, January 24, 2025*

8. *The Role of Clean Energy Attribute Certificates in Reducing Carbon Emissions, GHG Accounting and Reporting in Western States, Western Interstate Energy Board Webinar, December 16, 2024*

9. *Consequential Impacts of Voluntary Clean Energy Procurement, American Council On Renewable Energy (ACORE), October 24, 2024*

10. *The Increasing Importance of Integrating System Planning, Breakthrough Energy/Energy Systems Integration Group/Global Power System Transformation Consortium, Integrated Planning Workshop, Providence, Rhode Island, October 21, 2024*

11. *State of the Market: Pacific Northwest, Renewable Northwest Fall Member Retreat, Skamania Lodge, Washington, October 15, 2024*

12. *Integrated System Planning: From Vision to Reality, ISP Webinar Series, Energy and Environmental Economics (E3), September 26, 2024*

13. *State of the California Electricity Market, Independent Energy Producers Association Annual Meeting, Fallen Leaf Lake, California, September 24, 2024*

14. *Consequential Impacts of Voluntary Clean Energy Procurement, Clean Energy Buyers Association, September 10, 2024*

15. *Consequential Impacts of Voluntary Clean Energy Procurement, Mid-Columbia Seminar, Wenatchee, Washington, July 31, 2024*

16. *Integrated System Planning: A New Planning Paradigm, ISP Webinar Series, Energy and Environmental Economics (E3) and Salt River Project (SRP), July 29, 2024*

17. *Scalable Markets for the Energy Transition: A Blueprint for Wholesale Electricity Market Reform, Energy Systems Integration Group Forecasting and Markets Workshop, Salt Lake City, Utah, June 12, 2024*

18. *Planning a Smooth Transition: How to Achieve Deep Decarbonization While Keeping the Lights on, the Heaters Cranking, and Electricity Bills Affordable, North American Energy Marketers Association 2024 Spring Conference, Palm Springs, California, April 24, 2024*

19. *"Perfect Capacity" and Other Design Considerations for Accreditation, NARUC Bulk Power System Learning Module Accounting for a Changing Resource Mix: The Latest Developments in Capacity Accreditation, April 2, 2024*

20. *"Accounting for Clean Energy and Carbon: Why Simpler is Sometimes Better, or In Defense of the Humble REC", The Energy Authority 2024 Energy Symposium, Atlantic Beach, Florida, March 6, 2024*

21. *"Accounting for Clean Energy and Carbon: Why Simpler is Sometimes Better, or In Defense of the Humble REC", Pacific Northwest Utility Conference Committee, Portland, Oregon, February 9, 2024*

22. *"Supply and Demand in the Western Interconnection", Law Seminars International, Electric Power in the West, Seattle, Washington, January 26, 2024*

23. *"California's Pathway to 2045", Silicon Valley Clean Energy Reflect and Recharge Event, Cupertino, California, December 13, 2023*

24. *"Are Markets Up to the Decarbonization Challenge?", Energy Bar Association Annual Economics and Law Forum, October 27, 2023, Calgary, Alberta*

25. *"Realistic modeling of sub-hourly flexibility and energy storage in resource planning", Energy Systems Integration Group 2023 Fall Technical Workshop, October 25, 2023, La Jolla, California*

26. *"Clean and Reliable: Ensuring Reliability During the Energy Transition", CREPC/WIRAB Meeting, Seattle, Washington, October 5, 2023*

27. *"Western Regional Markets: The Long and Winding Roads", CREPC/WIRAB Meeting, Seattle, Washington, October 4, 2023*

28. *"Electric Utility Integrated Resource Planning Best Practices", Montana Legislature, Select Committee on Energy Resource Planning and Acquisition, September 29, 2023*

29. *"Variability, Uncertainty, and Climate: Turning Up the Heat on Electric Utilities", Idaho Power Board of Directors, Boise, Idaho, September 21, 2023*

30. *"State of the California Market", Independent Energy Producers Association Annual Meeting, invited speaker, Fallen Leaf Lake, California, September 18, 2023*

31. *"The Clean Energy Frontier: Exploring Innovative Solutions", panel discussion, 3CE Annual Meeting, Paso Robles, California, September 13, 2023*

32. *"WRAP And the Role of Resource Adequacy Markets", Western Power Pool Board Workshop, July 31, 2023*

33. *"Supply and Demand in the Western Interconnection: The Impact of Climate and Climate Policy", Northwest Gas Association/Association of Western Energy Consumers, Sunriver, Oregon, June 8, 2023*

34. *"Resource Adequacy in a Decarbonizing Electricity Grid", Organization of MISO States Resource Adequacy Summit 2.0, St. Louis, Missouri, May 16, 2023*

35. *"Resource Accreditation Best Practices", ESIG Market Design Workshop, Arlington, Virginia, February 28, 2023*

36. *"Supply and Demand in the Western Interconnection: The Impact of Climate and Climate Policy", Law Seminars International, Electric Power in the West, Seattle, Washington, January 26, 2023*

37. *"Risks, Uncertainties, and Planning Focal Points", Northwest Public Power Association Power Supply Conference, Portland, Oregon, December 7, 2022*

38. *"Maintaining Resource Adequacy on a Changing Electricity System", California Energy Commission, Western Electricity System Integration Workshop, Sacramento, California, December 2, 2022*

39. *"Reliability in a Decarbonizing Electricity Grid", Massachusetts Institute of Technology, Center for Energy and Environmental Policy Research, Fall 2022 Research Workshop, Cambridge, Massachusetts, November 18, 2022*

40. *"Resource Adequacy Challenges and Their Application in Capacity Expansion Modeling", Energy Exemplar Xcelerate 2022, Dallas, Texas, November 3, 2022*

41. *"Aligning Retail Rates with the Needs of Transitioning Power Systems", Energy Systems Integration Group, Minneapolis, Minnesota, October 25, 2022*

42. *"Capacity Expansion Modeling and Transmission Planning – the E3 Experience", Energy Systems Integration Group, Minneapolis, Minnesota, October 24, 2022*

43. *"State of the California Market", Independent Energy Producers Association Annual Meeting, invited speaker, Fallen Leaf Lake, California, September 27, 2022*

44. *"Capacity Markets in the Western Context", Northwest and Independent Power Producer Coalition Annual Meeting, invited panelist, Alderbrook Resort, Washington, September 13, 2022*

45. *Federal Energy Regulatory Commission Technical Conference on Increasing Real-time and Day-ahead Market and Planning Efficiency Through Improved Software, "Using E3's RESERVE Machine Learning Model to Advance the Calculation of Subhourly Ancillary Services Needs in Deeply Renewable Grids", June 23, 2022*

46. *"Dynamic Reserve Calculation with E3's RESERVE Model," Energy Systems Integration Group: Meteorology and Market Design for Grid Services Workshop, Denver, Colorado, June 8, 2022*

47. *"Transmission Planning Overview", Washington Transmission Corridors Working Group, June 8, 2022*

48. *"Scalable Markets for the Energy Transition: A Blueprint for Wholesale Electricity Market Reform", NewsData and CJB Energy Economics, Western Electric System Transformation: Connecting The WEST, February 25, 2022*

49. *Federal Energy Regulatory Commission, Technical Conference Regarding Energy and Ancillary Services Markets, invited panelist on "Revising RTO/ISO market models, optimization, and other software elements to address operational flexibility needs", October 12, 2021*

50. *"All Hands on Deck: State of the Market in California", Independent Energy Producers Association Annual Meeting, invited speaker, Fallen Leaf Lake, California, September 21, 2021*

51. *"Scalable Markets for the Energy Transition: A Blueprint for Wholesale Electricity Market Reform", Northwest and Intermountain Power Producer Coalition Annual Meeting, Union, Washington, September 13, 2021*

52. *"Climate Change and the Energy Transition: Our Energy Infrastructure at a Crossroads", Pacific Northwest Economic Region Annual Summit Plenary Session: Overview of our Regional Infrastructure and Policy Landscape, invited speaker, August 17, 2021*

53. *"Benefits of Nuclear Energy in Achieving Zero Emissions in the Pacific Northwest", National Association of Regulatory Utility Commissioners Nuclear Energy Partnership August Webinar, invited speaker, August 6, 2021*

54. *Northwest Power Pool Resource Adequacy Symposium, "Report From the Region", invited panelist, August 3, 2021*

55. *"Scalable Markets for the Energy Transition: A Blueprint for Wholesale Electricity Market Reform", IEEE Power and Energy Society General Meeting Super Session, Impact of Climate Change on the Power Grid, invited panelist, July 29, 2021*

56. *OurEnergyPolicy Energy Leaders Webinar Series: Proposed Federal Clean Energy Standards, invited panelist, July 28, 2021, https://www.ourenergypolicy.org/the-proposed-federal-clean-energy-standard/*

57. *"Opportunities and Challenges in Achieving Pacific Northwest Climate Goals", Oregon Rural Electric Cooperative Association, invited speaker, July 13, 2021*

58. *"Rethinking Resource Adequacy in a Decarbonized World", GridForward Building the Decarbonized Grid Summit, invited panelist, June 9, 2021*

59. *"Green Hydrogen: How Production, Infrastructure and End Uses Will Power an Economic Revolution", Infocast webinar, invited panelist, June 3, 2021*

60. *"Resource Adequacy Challenges in 2021 and Beyond", Energy Systems Integration Group Spring Meeting Plenary Session, invited panelist, April 8, 2001*

61. *"Opportunities and Challenges in Achieving Pacific Northwest Climate Goals", Pacific Northwest Economic Region Forum, invited panelist, March 24, 2021*

62. *"Wholesale Electricity Market Reforms for the Clean Energy Transition: an E3 Perspective", PJM Interconnection Capacity Market Workshop, March 12, 2021*

63. *"Electric Resource Adequacy: California and the West", NewsData and CJB Energy Economics Webinar, invited speaker, January 28, 2021*

64. *"Keeping the Lights on in California", Power Markets Today Webinar, invited panelist, December 2, 2020*

65. *"Resource Adequacy: Now and in the Future", Western Electric Coordinating Council Resource Adequacy Forum, invited speaker, November 18, 2020*

66. *"Accreditation of Dispatch-Limited Resources in Organized Capacity Markets", Organization of PJM States, invited panelist, October 20, 2020*

67. *"The Role of Electricity in Meeting Economy-wide Carbon Goals", Centre for Energy Advancement through Technological Innovation (CEATI), invited panelist, October 15, 2020*

68. *Federal Energy Regulatory Commission, Technical Conference regarding Carbon Pricing in Organized Wholesale Electricity Markets, invited panelist, September 30, 2020*

69. *"California and the Western Market: Trends and Opportunities", opening speaker, Independent Energy Producers Association Annual Meeting, September 23, 2020*

70. *"Decarbonizing the Power System: Summary of Lessons Learned", opening speaker, Columbia University – Johns Hopkins University Future Power Markets Forum, Session 1, June 2, 2020*

71. *"Decarbonizing Electric Power Systems", invited speaker, Minnesota Rural Electric Association Annual Meeting, April 8, 2020*

72. *"Resource Adequacy under High Renewable Penetration", Austin Electricity Conference, invited speaker, Austin, Texas, March 5, 2020*

73. *"Long-Run Resource Adequacy under Deep Decarbonization Pathways for California", invited speaker, California Energy Commission, California Public Utilities Commission and California Air Resources Board SB100 Technologies & Scenarios Workshop, San Francisco, California, November 18, 2019*

74. *"Resource Adequacy in the Pacific Northwest: Summary of existing studies and benefits of a regional program", invited speaker, Northwest Power Pool Resource Adequacy Symposium, Portland, Oregon, October 2, 2019*

75. *"California Energy Outlook: Where Are We?", invited speaker, California Independent Energy Producers Association Annual Meeting, Fallen Leaf Lake, California, September 23, 2019*

76. *"Resource Adequacy in the Pacific Northwest", invited speaker, Northwest and Intermountain Power Producer Coalition Annual Meeting, Union, Washington, September 10, 2019*

77. *"Northwest Resource Adequacy Outlook", invited speaker, Oregon Public Utilities Commission, NW Resource Adequacy Outlook Workshop, Salem, Oregon, May 28, 2019*

78. *"Achieving New York's "Green New Deal" And Deep Decarbonization Of the Electric Sector", invited speaker, Independent Power Producers of New York 33rd Annual Spring Conference, May 8, 2019, Albany, New York*

79. *"Grid Flexible Solar: Leveraging Utility-Scale Solar for Flexible Dispatch & Operations" invited speaker, Committee on Regional Electric Cooperation and Western Interconnection Regional Advisory Board, Salt Lake City, Utah, April 18, 2019*

80. *"Resource Adequacy in a Postmodern World", invited speaker, Committee on Regional Electric Cooperation and Western Interconnection Regional Advisory Board, Salt Lake City, Utah, April 18, 2019*

81. *"The Economic & Business Implications of Energy Storage", invited panelist, Austin Electricity Conference, Austin, Texas, April 4, 2019*

82. *"Resource Adequacy and Planning Reserve Sharing in Bilateral and Organized Markets", invited speaker, Northwest Power Markets Design Informational Seminar, Portland, Oregon, October 24, 2018*

83. *"Future Energy Systems: The Role for Natural Gas in a High-Renewables, Decarbonizing World", invited speaker, Stanford Natural Gas Initiative Symposium, Palo Alto, California, October 16, 2018*

84. *"Charged, Smart and Ready: Getting the most out of new consumer technologies", invited speaker, Northwest and Intermountain Power Producers Coalition Annual Meeting, Alderbrook Resort, Union, Washington, October 9, 2018*

85. *"Getting to 100% 'Clean Energy'", invited speaker, Independent Energy Producers Association's 37th Annual Meeting, Fallen Leaf Lake, South Lake Tahoe, California, October 3, 2018*

86. *"Pacific Northwest Low Carbon Scenario Analyses: Achieving Least-Cost Carbon Emissions Reductions in the Electricity Sector", invited appearance before the Washington State Legislature Energy Supply & Energy Conservation Joint Committee, September 24, 2018*

87. *"Achieving High Renewable Penetration with Grid-Friendly Operations", invited panelist, Austin Electricity Conference, Austin, Texas, April 12, 2018*

88. *"Electric industry trends and their impacts on hydropower", invited speaker, Bonneville Power Administration Strategic Plan Implementation Public Workshop, Portland, Oregon, March 2, 2018*

89. *"Customer Engagement: An Adaptive Survival Strategy for Electric Utilities", invited speaker, Energy NewsData Utility Customer Engagement Conference, Portland, Oregon, November 17, 2017*

90. *"Grid of the Future, Industry of the Future", Platinum Seminar at the Northwest and Intermountain Power Producer Coalition Annual Meeting, Union, Washington, September 11, 2017*

91. *"California's Solar Buildout: Implications for Electricity Markets in the West", invited speaker, EPIS Electric Market Forecasting Conference, Las Vegas, Nevada, September 7, 2017*

92. *"Value of Hydro in a GHG-Constrained World", invited panelist, HydroVision International, Session 1A: How Does Hydro 'Play' in the Energy Playground? Welcome to the New Wild West, Denver, Colorado, June 28, 2017*

93. *"Resource Adequacy and Planning Reserve Margins", invited speaker, Technical Conference on Capacity Planning and Resource Adequacy, Montana Public Service Commission, Helena, Montana, June 8, 2017*

94. *"That Faint Whooshing Sound: California Solar and Changing Western Power Markets", invited speaker, Northwest Power Markets: Mapping the Road Ahead, presented by Energy NewsData and CJB Energy, Portland, Oregon, May 24, 2017*

95. *"Observations on Current Resource Adequacy Practices", invited speaker, Committee for Regional Electric Power Cooperation/Western Interconnection Regional Advisory Body, Boise, Idaho, April 13, 2017*

96. *"Assessing Flexibility Needs in Highly Renewable Systems," invited speaker, Wärtsilä Symposium, Portland, Oregon, September 27, 2016*

97. *"Review: Natural Gas Infrastructure Adequacy in the Western Interconnection," invited speaker, Committee for Regional Electric Power Cooperation/Western Interconnection Regional Advisory Body, San Diego, California, October 31, 2016*

98. *"PATHWAYS to Deep Decarbonization: California", Western Electric Coordinating Council, Transmission Expansion Planning and Policy Committee, Salt Lake City, Utah, August 17, 2016*

99. *"Renewable Euphoria and the 'Big Long': How Renewable Energy Will Impact Western Markets", invited speaker, Mid-C Seminar, Wenatchee, Washington, July 27, 2016*

100. *"The Role of Renewables in Meeting California's Greenhouse Gas Goals", invited speaker, Renewable Energy Integration Summit, San Diego Regional Chamber of Commerce, July 18, 2016*

101. *"Essential Reliability Services", invited panelist, Western Electric Coordinating Council, Western Reliability Summit, Salt Lake City, Utah, May 18, 2016*

102. *"Meeting a 50% RPS for California", invited panelist, Infocast California Energy Summit, Santa Monica, California, May 11, 2016*

103. *"The Future of Resource Planning", invited keynote speaker, Great Plains Institute's e21 Initiative, St. Paul, Minnesota, April 5, 2016*

104. *"Market Driven Distributed Generation in the Western Interconnection", invited panelist, Committee on Regional Electric Power Cooperation biennial meeting, Salt Lake City, Utah, March 22, 2016*

105. *"Is Solar the New Hydro?", invited panelist, Northwest Hydroelectric Association 2016 Annual Conference, Portland, Oregon, February 17, 2016*

106. *"The Role of Energy Storage as a Renewable Integration Solution under a 50% RPS", invited panelist, Joint California Energy Commission and California Public Utilities Commission Long-Term Procurement Plan Workshop on Bulk Energy Storage, Sacramento, California, November 20, 2015*

107. *"Planning for Variable Generation Integration Needs", invited panelist, Utility Variable-generation Integration Group, Operating Impact And Integration Studies Users Group Meeting, San Diego, California, October 13, 2015*

108. *"The Role of Renewables in a Post-Coal World", invited panelist, Energy Foundation, Beyond Coal to Clean Energy Conference, San Francisco, California, October 9, 2015,*

109. *"Implications of a 50% RPS for California", invited panelist, Argus Carbon Summit, Napa, California, October 6, 2015*

110. *"Western EIM: Status Report and Implications for Public Power", Keynote speaker, Large Public Power Council meeting, Seattle, Washington, September 16, 2015*

111. *"California's 50% RPS Goal: Opportunities for Western Wind Developers", Keynote speaker at a meeting of the Wyoming Infrastructure Authority, Berkeley, California, July 28, 2015*

112. "Western Interconnection Flexibility Assessment", Western Electric Coordinating Council Board of Directors, Salt Lake City, Utah, June 24, 2015

113. "California's New GHG Goals: Implications for the Western Electricity Grid", invited panelist, National Association of State Energy Officials, Western Regional State and Territory Energy Office Meeting, Portland, Oregon, May 14, 2015

114. "Replacing Aging Fossil Generation," invited panelist, Northwest Energy Coalition NW Clean & Affordable Energy Conference, Portland, Oregon, November 7, 2014

115. "Investing in Power System Flexibility," invited panelist, State/Provincial Steering Committee & Committee on Regional Electric Power Cooperation System Flexibility Forum, San Diego, California, October 20, 2014

116. "Opportunities and Challenges for Higher Renewable Penetration in California", invited panelist, Beyond 33%: University of California at Davis Policy Forum Series, Sacramento, California, October 17, 2014

117. "Renewable Curtailment as a Power System Flexibility Resource," Boise State University Energy Policy Research Conference, San Francisco, California, September 4, 2014

118. "Natural Gas Infrastructure Adequacy: An Electric System Perspective", Pacific Northwest Utilities Conference Committee Board of Directors, Portland, Oregon, August 8, 2014

119. "The Future of Renewables in the American West," invited panelist, Geothermal Energy Association Annual Meeting, Reno, Nevada, August 6, 2014

120. "Long-Term Natural Gas Infrastructure Needs", invited panelist, U.S. Department of Energy Quadrennial Energy Review, Public Meeting #7, Denver, Colorado, July 28, 2014

121. "Meeting the Demands of Renewables Integration—New Needs, New Technologies, Emerging Opportunities", invited panelist, InfoCast 2nd Annual California Energy Summit, San Francisco, California, May 28, 2014

122. "Power System Flexibility Needs under High Renewables", EUCI Utility Resource Planning Conference, Chicago, Illinois, May 14, 2014

123. "Natural Gas Infrastructure Adequacy: An Electric System Perspective", Western Interstate Energy Board Annual Meeting, Denver, Colorado, April 24, 2014

124. "Power System Flexibility Needs under High RPS", invited panelist, joint meeting of the Committee on Regional Electric Power Cooperation, State-Provincial Steering Committee and Western Interconnection Regional Advisory Body, Tempe, Arizona, March 26, 2014

125. *"Natural Gas Infrastructure Adequacy: An Electric System Perspective", joint meeting of the Committee on Regional Electric Power Cooperation, State-Provincial Steering Committee and Western Interconnection Regional Advisory Body, Tempe, Arizona, March 25, 2014*

126. *"Investigating a Higher Renewables Portfolio Standard for California", 19th Annual Power Conference on Energy Research and Policy, University of California Energy Institute, Berkeley, California, March 17, 2014*

127. *"Investigating a 50 Percent Renewables Portfolio Standard in California", invited panelist, Northwest Power and Conservation Council, Portland, Oregon, March 12, 2014*

128. *"Investigating a 50 Percent Renewables Portfolio Standard in California", invited panelist, Western Systems Power Pool, Spring Operating Committee Meeting, Whistler, B.C., March 5, 2014*

129. *"Investigating a Higher Renewables Portfolio Standard for California", invited speaker, Western Electric Coordinating Council, Transmission Expansion Planning and Policy Committee, Salt Lake City, Utah, February 25, 2014*

130. *"Investigating a 50 Percent Renewables Portfolio Standard in California", invited speaker, Committee on Regional Electric Power Cooperation, State-Provincial Steering Committee and Western Interconnection Regional Advisory Body, Webinar, February 12, 2014*

131. *"Flexibility Planning: Lessons From E3's REFLEX Model", EUCI Conference on Fast Ramp and Intra-Hour Market Incentives, San Francisco, California, January 29-30, 2014*

132. *"The Effect of High Renewable Penetration on California Markets and Carbon Balance", EUCI Conference on California Carbon Policy Impacts on Western Power Markets, January 27-28, San Francisco, California, 2014*

133. *"Reliance on Renewables: A California Perspective", invited panelist at Harvard Electricity Policy Group, Seventy-Third Plenary Session, Tucson, Arizona, December 13, 2013*

134. *"The Role of Renewables in Meeting Long-Term Greenhouse Gas Reduction Goals", State Bar of California, Energy and Climate Change Conference, Berkeley, California, November 14, 2013*

135. *"Benefits, Costs and Cost Shifts from Net Energy Metering", invited expert panelist at Washington Utilities and Transportation Commission Workshop on Distributed Generation, Olympia, Washington, November 13, 2013*

136. *Pacific Northwest Utilities Conference Committee (PNUCC) California Power Industry Roundtable, invited panelist, Portland, Oregon, September 6, 2013*

137. *"After 2020: Prospects for Higher RPS Levels in California", invited speaker at Northwest Power and Conservation Council's California Power Markets Symposium, Portland, Oregon, September 5, 2013*

138. *"Determining Flexible Capacity Needs for the CAISO Area", invited speaker at Northwest Power and Conservation Council's California Power Markets Symposium, Portland, Oregon, September 5, 2013*

139. *"California Climate Policy and the Western Energy System", invited speaker at the Western Interstate Energy Board annual meeting, Reno, Nevada, June 13, 2013*

140. *"Determining Power System Flexibility Need", EUCI Conference on Resource Planning and Asset Valuation, Westminster, Colorado, May 21, 2013*

141. *"California Policy Landscape and Impact on Electricity Markets", EUCI Conference on Resource Planning and Asset Valuation, Westminster, Colorado, May 21, 2013*

142. *"Determining Power System Flexibility Need", EUCI Conference on Fast and Flexi-ramp Resources, Chicago, Illinois, April 23, 2013*

143. *"State-Provincial Steering Committee WECC Low Carbon Scenarios Tool", 3 Interconnections Meeting, Washington, DC, February 6, 2013*

144. *"Distributed Generation Benefits and Planning Challenges", Committee on Regional Electric Power Cooperation/State-Provincial Steering Committee, Resource Planners' Forum, San Diego, California, October 3, 2012*

145. *"Thoughts on the Flexibility Procurement Modeling Challenge", invited speaker at the California Public Utilities Commission, Long-Term Procurement Planning Workshop, San Francisco, California, September 19, 2012*

146. *"Generation Capital Cost Recommendations for WECC 10- and 20-Year Studies", Western Electric Coordinating Council, Transmission Expansion Planning and Policy Committee, Technical Advisory Subcommittee, Webinar, August 15, 2012*

147. *"Renewable Energy Benefits", California Energy Commission, Integrated Energy Policy Report Workshop, Sacramento, California, April 12, 2012*

148. *"The Role of Policy in WECC Scenario Planning", Western Electric Coordinating Council, Scenario Planning Steering Group, San Diego, CA, November 1, 2011*

149. *"WECC Energy Imbalance Market Benefit Study", Western Electric Coordinating Council, Board of Directors, Scottsdale, Arizona, June 22, 2011*

150. *"Renewable Portfolio Standard Model Methodology and Draft Results", California Public Utilities Commission Workshop, San Francisco, California, June 17, 2010*

151. *"Draft Results from 33% Renewable Energy Standard Economic Modeling", California Air Resources Board Workshop, Sacramento, California, May 20, 2010*

152. "Market Opportunities for IPPs in the WECC", invited speaker at the Independent Power Producers of British Columbia Annual Meeting, Vancouver, British Columbia, November 2, 2009

153. "A Low-Transmission Alternative for Meeting California's 33% RPS Target", EUCI Webinar, July 31, 2009

154. "Remote Renewable and Low-Carbon Resource Options for the Pacific Northwest", Center for Research on Regulated Industries Conference, Monterey, California, June 19, 2009

155. "Engineers are from Mars, Policy-Makers are from Venus: The Effect of Policy on Long-Term Transmission Planning", invited speaker at the Western Electric Coordinating Council Long Term Transmission Planning Seminar, Phoenix, Arizona, February 2, 2009

156. "The Long-Term Path to a Stable Climate, and its Implications for BPA", invited speaker at the Bonneville Power Administration Managers' Retreat, Portland, Oregon, April 29, 2008

157. "Load-Resource Balance in the Western Interconnection: Towards 2020", Western Electric Industry Leaders Group, Las Vegas, Nevada, January 18, 2008

158. "Integrated Resource Planning for BPA Customers", invited speaker at the Bonneville Power Administration Allocation Conference, Portland, Oregon, September 19, 2006

159. "Idaho's Current Energy Picture", Energy, Environment and Technology Interim Committee, Boise, Idaho, July 11, 2006

160. "Locational Marginal Pricing – The Very Basics", Committee on Regional Electric Power Cooperation, San Diego, California, April 30, 2002

161. "Effect of 2000-2001 Energy Crisis on Washington's Economy", Conference on Business Economics, Seattle, Washington, July 19, 2001

California ISO

Summary of Restricted Maintenance Operations, Flex Alerts, Transmission and Energy Emergencies Issued from May 2022 to Present

	Flex Alert	Restricted Maintenance Operations	Transmission Emergency	EEA Watch	EEA1	EEA2	EEA3
2022	11	16	10	9	6	5	1
2023	0	6	2	2	1	0	0
2024	0	18	23	1	0	0	0
2025	0	2	1	0	0	0	0
TOTALS	**11**	**42**	**36**	**12**	**7**	**5**	**1**

Note: The count above reflects total number of days that the event lasted.

Grid Emergencies History Report

California ISO

Reference for Events that Occurred After May 2022:

Flex Alerts are a call to consumers to voluntarily conserve energy when demand for power could outstrip supply. This generally occurs during heatwaves when electrical demand is high. The ISO can declare a Flex Alert whenever there is expected stress on the system. Visit http://www.flexalert.org for more information on Flex Alerts, how to conserve energy, and to sign up for notifications.

RMO (Restricted Maintenance Operations) requires generators and transmission operators to postpone any planned outages for routine equipment maintenance, ensuring all grid assets are available for use.

EEA Watch when the Day-Ahead analysis is forecasting that one or more hours may be energy deficient.

Energy Emergency Alert 1 (EEA1) when real-time analysis is forecasting that one or more hours may be energy deficient.

Energy Emergency Alert 2 (EEA2) when all resources are in use and emergency load management programs are needed.

Energy Emergency Alert 3 (EEA3) when it has taken all actions listed above and cannot meet expected energy and contingency reserve requirements. Notice issued to utilities of potential electricity interruptions through firm load shedding.

Transmission Emergency is declared by the ISO for any event threatening or limiting transmission grid capability, including line or transformer overloads or loss. A Transmission Emergency notice can be issued on a system-wide or regional basis.

California ISO

Summary of Restricted Maintenance Operations, Alert, Warning, Emergency, and Flex Alert Notices Issued from 1998 to April 2022

	Flex Alert	Restricted Maintenance Operations	Transmission Emergency	Alert	Warning	Stage 1 Emergency	Stage 2 Emergency	Stage 3 Emergency	1-Hour Probable Load Interruptions	Voluntary Load Reduction Program
1998	N/A	8	N/A	7	8	7	5	0	N/A	N/A
1999	N/A	12	N/A	2	6	4	1	0	N/A	N/A
2000	20	77	N/A	34	85	55	36	1	N/A	N/A
2001	26	168	N/A	180	181	70	65	38	N/A	N/A
2002	1	18	N/A	3	4	2	1	0	N/A	N/A
2003	0	10	N/A	0	0	1	0	0	N/A	N/A
2004	6	16	6	1	2	1	0	0	N/A	N/A
2005	7	13	5	0	2	1	2	0	N/A	N/A
2006	18	16	0	1	5	3	1	0	N/A	3
2007	6	18	4	1	3	1	0	0	N/A	N/A
2008	3	10	0	0	1	0	0	0	N/A	N/A
2009	0	6	6	0	2	0	0	0	N/A	N/A
2010	0	8	1	0	1	0	0	0	N/A	N/A
2011	2	17	2	0	1	0	0	0	N/A	N/A
2012	2	134	0	0	0	0	0	0	N/A	N/A
2013	3	11	0	0	0	0	0	0	N/A	N/A
2014	1	8	1	0	1	0	0	0	N/A	N/A
2015	2	10	0	1	2	0	0	0	N/A	N/A
2016	3	11	0	0	0	0	0	0	0	N/A
2017	4	18	9	0	0	1	0	0	0	N/A
2018	2	22	2	0	0	0	0	0	0	N/A
2019	1	2	3	0	1	0	0	0	0	N/A
2020	10	20	2	9	7	0	6	2	1	N/A
2021	8	24	0	0	4	0	1	0	0	N/A
2022	0	0	0	0	0	0	0	0	0	N/A
TOTALS	**125**	**657**	**41**	**239**	**316**	**146**	**118**	**41**	**1**	**3**

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California ISO's History of Energy Emergency Alert Events
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Reference (were in effect before May of 2022):

Flex Alerts are a call to consumers to voluntarily conserve energy when demand for power could outstrip supply. This generally occurs during heatwaves when electrical demand is high. The ISO can declare a Flex Alert whenever there is expected stress on the system. Visit http://www.flexalert.org for more information on Flex Alerts, how to conserve energy, and to sign up for notifications.

RMO (Restricted Maintenance Operations) requires generators and transmission operators to postpone any planned outages for routine equipment maintenance, ensuring all grid assets are available for use.

Alerts Issued by 3 p.m. the day before anticipated energy deficiency. The ISO may require additional resources to avoid an emergency.

Warnings indicate that grid operators anticipate using operating reserves. Activates demand response programs (voluntary load reduction) to decrease overall demand.

Stage 1 Emergency is declared by the ISO Contingency Reserve shortfalls exist or are forecast to occur. Strong need for conservation.

Stage 2 Emergency is declared by the ISO when all mitigating actions have been taken and the ISO is no longer able to provide for its expected energy requirements. Requires ISO intervention in the market, such as ordering power plants online.

Stage 3 Emergency is declared by the ISO when unable to meet minimum contigency reserve requirements, and load interruption is imminent or in progress. Notice issued to utilities of potential electricity interruptions through firm load shedding.

Transmission Emergency is declared by the ISO for any event threatening or limiting transmission grid capability, including line or transformer overloads or loss. A Transmission Emergency notice can be issued on a system-wide or regional basis.

1-Hour Probable Load Interruptions is declared by the ISO to encourage maximum conservation efforts for the time period. Utility Distribution Companies and Metered Subsystems await further orders from the ISO. This notice is being issued in compliance with the Governor's Executive Order D-38-01.

Grid Emergencies Record For 2025

Date	Day	Region	Time Frame	AWE Event	Reason
1/18/2025	Saturday	CAISO Grid	01/20/2025 06:00 through 01/21/2025 23:59	Restricted Maintenance Operations	Subject Restricted Maintenance Operations declared for CAISO Grid, effective 01/20/2025 06:00 - 01/21/2025 23:59 Message Restricted Maintenance Operations declared for CAISO Grid, effective 01/20/2025 06:00 - 01/21/2025 23:59 - 202506079531 Notice No: 202506079531-28 The California ISO has declared Restricted Maintenance Operations for CAISO Grid, effective 01/20/2025 06:00 through 01/21/2025 23:59. Reason: Forecasted high winds and dry conditions throughout the CAISO BA footprint resulting in high fire risk. Restricted Maintenance Operations, as detailed in CAISO Operating Procedure 4420, will be in effect. Market participants are cautioned to avoid actions, which may jeopardize generator and/or transmission availability. For more information, view the Emergency Notifications fact sheet (https://www.caiso.com/documents/emergency-notifications-fact-sheet.pdf). Monitor system conditions on Today's Outlook (https://www.caiso.com/todays-outlook) and contact local electric utilities for details about their respective load reduction programs.

Grid Emergencies Record For 2025

Date	Day	Region	Time Frame	AWE Event	Reason
4/30/2025	Wedneday	Northern CA Region	04/30/2025 18:42 through 04/30/2025 20:00	Transmission Emergency	Subject Transmission Emergency declared for Northern CA Region, effective 04/30/2025 18:42 - 04/30/2025 20:00 Message Transmission Emergency declared for Northern CA Region, effective 04/30/2025 18:42 - 04/30/2025 20:00 - 202519676403 Notice No: 202519676403-78 The California ISO has declared a Transmission Emergency for Northern CA Region, effective 04/30/2025 18:42 through 04/30/2025 20:00. Reason: High Line Loading in the Rio Oso Area For more information, view the Emergency Notifications fact sheet (https://www.caiso.com/documents/emergency-notifications-fact-sheet.pdf). Monitor system conditions on Today's Outlook (https://www.caiso.com/todays-outlook) and contact local electric utilities for details about their respective load reduction programs. For grid condition developments, follow us on social media: @California_ISO. California Independent System Operator, P.O. Box 639014, Folsom, CA 95630 Unsubscribe to Emergency notification emails at https://www.caiso.com/subscriptions/unsubscribe-emergency-notifications Notice issued at: [04/30/2025 18:44:08]

Grid Emergencies Record For 2024

Date	Day	Region	Time Frame	AWE Event	Reason
2/4/2024	Sunday	Northern CA	02/04/2024 17:05 through 02/04/2024 23:00	Transmission Emergency	Transmission Emergency declared for Northern CA Region, effective 02/04/2024 17:05 - 02/04/2024 23:59 - 202436223643 Notice No: 202436223643-98 The California ISO has declared a Transmission Emergency for Northern CA Region, effective 02/04/2024 17:05 through 02/04/2024 23:59. Reason: For more information as it becomes available, monitor the System Conditions Bulletin on the caiso.com News page. For more information, view the Emergency Notifications fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. California Independent System Operator, P.O. Box 639014, Folsom, CA 95630 Unsubscribe to Emergency notification emails at https://www.caiso.com/EmergencySubscription/unsubscribe/89207b34-3f96-4a82-a3e1-1390be7f542f Notice issued at: [02/04/2024 17:21:47] ENDED: Transmission Emergency for Northern CA Region, effective 02/04/2024 17:05 - 02/04/2024 23:00 - 202436223643 Notice No: 202436223643-11 Notice issued at: [02/04/2024 23:00:00]

Grid Emergencies Record For 2024

Date	Day	Region	Time Frame	AWE Event	Reason
3/1/2024	Friday	Northern CA	03/01/2024 08:50 through 03/04/2024 20:44	Transmission Emergency	Transmission Emergency declared for Northern CA Region, effective 03/01/2024 08:50 - 03/01/2024 23:59 - 202472682443 Notice No: 202472682443-37 The California ISO has declared a Transmission Emergency for Northern CA Region, effective 03/01/2024 08:50 through 03/01/2024 23:59. Reason: Local Humboldt Region Only. For more information, view the Emergency Notifications fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. California Independent System Operator, P.O. Box 639014, Folsom, CA 95630 Unsubscribe to Emergency notification emails at https://www.caiso.com/EmergencySubscription/unsubscribe/89207b34-3f96-4a82-a3e1-1390be7f542f Notice issued at: [03/01/2024 09:01:14] ENDED: Transmission Emergency for Northern CA Region, effective 03/01/2024 08:50 - 03/04/2024 20:44 - 202472682443 Notice No: 202472682443-77 Notice issued at: [03/04/2024 20:45:38]

Grid Emergencies Record For 2024

Date	Day	Region	Time Frame	AWE Event	Reason
7/1/2024	Monday	CAISO Grid	07/03/2024 00:01 through 07/07/2024 23:59	Restricted Maintenance Operations	Restricted Maintenance Operations declared for CAISO Grid, effective 07/03/2024 00:01 - 07/03/2024 23:59 Message Restricted Maintenance Operations declared for CAISO Grid, effective 07/03/2024 00:01 - 07/03/2024 23:59 - 202467634196 Notice No: 202467634196-57 The California ISO has declared Restricted Maintenance Operations for CAISO Grid, effective 07/03/2024 00:01 through 07/03/2024 23:59. Reason: For more information as it becomes available, monitor the System Conditions Bulletin on the caiso.com News page. Restricted Maintenance Operations, as detailed in CAISO Operating Procedure 4420, will be in effect. Market participants are cautioned to avoid actions, which may jeopardize generator and/or transmission availability. For more information, view the Emergency Notifications fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. California Independent System Operator, P.O. Box 639014, Folsom, CA 95630 Unsubscribe to Emergency notification emails at https://www.caiso.com/EmergencySubscription/unsubscribe/89207b34-3f96-4a82-a3e1-1390be7f542f Notice issued at: [07/01/2024 11:15:00]

Grid Emergencies Record For 2024

Date	Day	Region	Time Frame	AWE Event	Reason
7/1/2024	Monday	CAISO Grid	07/08/2024 00:01 through 07/11/2024 23:59	Restricted Maintenance Operations	Restricted Maintenance Operations declared for CAISO Grid, effective 07/08/2024 00:01 - 07/08/2024 23:59 Message Restricted Maintenance Operations declared for CAISO Grid, effective 07/08/2024 00:01 - 07/08/2024 23:59 - 202416481118 Notice No: 202416481118-93 The California ISO has declared Restricted Maintenance Operations for CAISO Grid, effective 07/08/2024 00:01 through 07/08/2024 23:59. Reason: For more information as it becomes available, monitor the System Conditions Bulletin on the caiso.com News page. Restricted Maintenance Operations, as detailed in CAISO Operating Procedure 4420, will be in effect. Market participants are cautioned to avoid actions, which may jeopardize generator and/or transmission availability. --- PLANNED EVENTS --- Restricted Maintenance Operations - CAISO Grid: 07/03/2024 00:01 - 07/03/2024 23:59 For more information, view the Emergency Notifications fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. California Independent System Operator, P.O. Box 639014, Folsom, CA 95630

Grid Emergencies Record For 2024

Date	Day	Region	Time Frame	AWE Event	Reason
7/2/2024	Tuesday	Northern CA	07/02/2024 13:41 through 07/03/2024 23:59	Transmission Emergency	Transmission Emergency declared for Northern CA Region, effective 07/02/2024 13:41 - 07/02/2024 23:59 - 202434385548 Notice No: 202434385548-88 The California ISO has declared a Transmission Emergency for Northern CA Region, effective 07/02/2024 13:41 through 07/02/2024 23:59. Reason: Wild Fire and potential loss of local area transmission and generation. For more information as it becomes available, monitor the System Conditions Bulletin on the caiso.com News page. --- PLANNED EVENTS --- Restricted Maintenance Operations - CAISO Grid: 07/03/2024 00:01 - 07/07/2024 23:59 Restricted Maintenance Operations - CAISO Grid: 07/08/2024 00:01 - 07/10/2024 23:59 For more information, view the Emergency Notifications fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. California Independent System Operator, P.O. Box 639014, Folsom, CA 95630 Unsubscribe to Emergency notification emails at https://www.caiso.com/EmergencySubscription/unsubscribe/89207b34-3f96-4a82-a3e1-1390be7f542f Notice issued at: [07/02/2024 13:43:27]

Grid Emergencies Record For 2024

Date	Day	Region	Time Frame	AWE Event	Reason
7/3/2024	Wednesday	Northern CA	07/04/2024 00:00 through 07/10/2024 23:59	Transmission Emergency	Transmission Emergency declared for Northern CA Region, effective 07/04/2024 00:00 - 07/04/2024 23:59 Message Transmission Emergency declared for Northern CA Region, effective 07/04/2024 00:00 - 07/04/2024 23:59 - 202492588063 Notice No: 202492588063-92 The California ISO has declared a Transmission Emergency for Northern CA Region, effective 07/04/2024 00:00 through 07/04/2024 23:59. Reason: For more information as it becomes available, monitor the System Conditions Bulletin on the caiso.com News page. ---------- PLANNED EVENTS ---------- Restricted Maintenance Operations - CAISO Grid: 07/08/2024 00:01 - 07/10/2024 23:59 For more information, view the Emergency Notifications fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. California Independent System Operator, P.O. Box 639014, Folsom, CA 95630 Unsubscribe to Emergency notification emails at https://www.caiso.com/EmergencySubscription/unsubscribe/89207b34-3f96-4a82-a3e1-1390be7f542f Notice issued at: [07/03/2024 21:00:30]

Grid Emergencies Record For 2024

Date	Day	Region	Time Frame	AWE Event	Reason
7/11/2024	Thursday	Northern CA	07/11/2024 15:50 through 07/11/2024 23:59	Transmission Emergency	Transmission Emergency declared for Northern CA Region, effective 07/11/2024 15:50 - 07/11/2024 23:59 Message Transmission Emergency declared for Northern CA Region, effective 07/11/2024 15:50 - 07/11/2024 23:59 - 202468743085 Notice No: 202468743085-83 The California ISO has declared a Transmission Emergency for Northern CA Region, effective 07/11/2024 15:50 through 07/11/2024 23:59. Reason: Local area Transmission Emergency for the Rio Oso/Palermo Area. For more information as it becomes available, monitor the System Conditions Bulletin on the caiso.com News page. For more information, view the Emergency Notifications fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. California Independent System Operator, P.O. Box 639014, Folsom, CA 95630 Unsubscribe to Emergency notification emails at https://www.caiso.com/EmergencySubscription/unsubscribe/89207b34-3f96-4a82-a3e1-1390be7f542f Notice issued at: [07/11/2024 15:53:49]

Grid Emergencies Record For 2024

Date	Day	Region	Time Frame	AWE Event	Reason
7/12/2024	Friday	Northern CA	07/12/2024 15:55 through 07/12/2024 23:59	Transmission Emergency	Transmission Emergency declared for Northern CA Region, effective 07/12/2024 15:55 - 07/12/2024 23:59 Message Transmission Emergency declared for Northern CA Region, effective 07/12/2024 15:55 - 07/12/2024 23:59 - 202413591466 Notice No: 202413591466-89 The California ISO has declared a Transmission Emergency for Northern CA Region, effective 07/12/2024 15:55 through 07/12/2024 23:59. Reason: Local area Transmission Emergency for the Rio Oso/Palermo Area. For more information as it becomes available, monitor the System Conditions Bulletin on the caiso.com News page. For more information, view the Emergency Notifications fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. California Independent System Operator, P.O. Box 639014, Folsom, CA 95630 Unsubscribe to Emergency notification emails at https://www.caiso.com/EmergencySubscription/unsubscribe/89207b34-3f96-4a82-a3e1-1390be7f542f Notice issued at: [07/12/2024 15:52:40]

Grid Emergencies Record For 2024

Date	Day	Region	Time Frame	AWE Event	Reason
7/15/2024	Monday	CAISO Grid	07/15/2024 05:00 through 07/15/2024 20:00	Transmission Emergency	Transmission Emergency declared for CAISO Grid, effective 07/15/2024 05:00 - 07/15/2024 20:00 Message Transmission Emergency declared for CAISO Grid, effective 07/15/2024 05:00 - 07/15/2024 20:00 - 202476481175 Notice No: 202476481175-42 The California ISO has declared a Transmission Emergency for CAISO Grid, effective 07/15/2024 05:00 through 07/15/2024 20:00. Reason: Due to loss of transmission caused by the Lost Hills, Rancho and White Fires. For more information as it becomes available, monitor the System Conditions Bulletin on the caiso.com News page. For more information, view the Emergency Notifications fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. California Independent System Operator, P.O. Box 639014, Folsom, CA 95630 Unsubscribe to Emergency notification emails at https://www.caiso.com/EmergencySubscription/unsubscribe/89207b34-3f96-4a82-a3e1-1390be7f542f Notice issued at: [07/15/2024 04:57:26]

Grid Emergencies Record For 2024

Date	Day	Region	Time Frame	AWE Event	Reason
7/15/2024	Monday	Northern CA	07/15/2024 07:45 through 07/15/2024 22:00	Restricted Maintenance Operations	Restricted Maintenance Operations declared for Northern CA Region, effective 07/15/2024 07:45 - 07/15/2024 22:00 Message Restricted Maintenance Operations declared for Northern CA Region, effective 07/15/2024 07:45 - 07/15/2024 22:00 - 202486350593 Notice No: 202486350593-72 The California ISO has declared Restricted Maintenance Operations for Northern CA Region, effective 07/15/2024 07:45 through 07/15/2024 22:00. Reason: For the Midway area due to fires. For more information as it becomes available, monitor the System Conditions Bulletin on the caiso.com News page. Restricted Maintenance Operations, as detailed in CAISO Operating Procedure 4420, will be in effect. Market participants are cautioned to avoid actions, which may jeopardize generator and/or transmission availability. For more information, view the Emergency Notifications fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. California Independent System Operator, P.O. Box 639014, Folsom, CA 95630 Unsubscribe to Emergency notification emails at https://www.caiso.com/EmergencySubscription/unsubscribe/89207b34-3f96-4a82-a3e1-1390be7f542f Notice issued at: [07/15/2024 07:43:25]

Grid Emergencies Record For 2024

Date	Day	Region	Time Frame	AWE Event	Reason
7/18/2024	Thursday	Northern CA	07/18/2024 14:35 through 07/18/2024 23:59	Transmission Emergency	Transmission Emergency declared for Northern CA Region, effective 07/18/2024 14:35 - 07/18/2024 23:59 Message Transmission Emergency declared for Northern CA Region, effective 07/18/2024 14:35 - 07/18/2024 23:59 - 202498738338 Notice No: 202498738338-00 The California ISO has declared a Transmission Emergency for Northern CA Region, effective 07/18/2024 14:35 through 07/18/2024 23:59. Reason: Local area Transmission Emergency in the Humboldt area due to the Hill fire impacting the transmission system. For more information as it becomes available, monitor the System Conditions Bulletin on the caiso.com News page. For more information, view the Emergency Notifications fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. California Independent System Operator, P.O. Box 639014, Folsom, CA 95630 Unsubscribe to Emergency notification emails at https://www.caiso.com/EmergencySubscription/unsubscribe/89207b34-3f96-4a82-a3e1-1390be7f542f Notice issued at: [07/18/2024 14:39:23]

Grid Emergencies Record For 2024

Date	Day	Region	Time Frame	AWE Event	Reason
7/19/2024	Friday	Northern CA	07/19/2024 16:45 through 07/19/2024 23:59	Transmission Emergency	Transmission Emergency declared for Northern CA Region, effective 07/19/2024 16:45 - 07/19/2024 23:59 Message Transmission Emergency declared for Northern CA Region, effective 07/19/2024 16:45 - 07/19/2024 23:59 - 202444101175 Notice No: 202444101175-85 The California ISO has declared a Transmission Emergency for Northern CA Region, effective 07/19/2024 16:45 through 07/19/2024 23:59. Reason: A Local Transmission Emergency for the Northern California area of Palermo/Rio Oso due to high temperatures and high loading. For more information, view the Emergency Notifications fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. California Independent System Operator, P.O. Box 639014, Folsom, CA 95630 Unsubscribe to Emergency notification emails at https://www.caiso.com/EmergencySubscription/unsubscribe/89207b34-3f96-4a82-a3e1-1390be7f542f Notice issued at: [07/19/2024 16:47:16]

Grid Emergencies Record For 2024

Date	Day	Region	Time Frame	AWE Event	Reason
7/24/2024	Wednesday	CAISO Grid	07/24/2024 17:25 through 07/24/2024 23:59	EEA Watch	EEA Watch declared for CAISO Grid, effective 07/24/2024 17:25 - 07/24/2024 23:59 Message EEA Watch declared for CAISO Grid, effective 07/24/2024 17:25 - 07/24/2024 23:59 - 202455419651 Notice No: 202455419651-36 An Energy Emergency Alert (EEA) Watch has been declared for the California ISO for CAISO Grid, effective 07/24/2024 17:25 through 07/24/2024 23:59. Reason: Fire threatening Northern CA intertie and large amount of imports threatened. CAISO analysis shows that all available resources are committed or forecasted to be in use, for the specified time period, and there is potential for an energy deficiency. Entities are encouraged to offer available energy and ancillary service bids, participating customers may be directed by utilities to use generators approved for emergencies, or to reduce load according to the protocols of each utility's program. For more information, view the Emergency Notifications fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. For grid condition developments, follow us on social media: @California_ISO. Notice issued at: [07/24/2024 17:25:09] California Independent System Operator, P.O. Box 639014, Folsom, CA 95630 Unsubscribe to Emergency notification emails at https://www.caiso.com/EmergencySubscription/unsubscribe/89207b34-3f96-4a82-a3e1-1390be7f542f

Docket No. 20250011-EI
California ISO's History of Energy Emergency Alert Events
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Grid Emergencies Record For 2024

Date	Day	Region	Time Frame	AWE Event	Reason
7/24/2024	Wednesday	CAISO Grid	07/25/2024 06:00 through 07/25/2024 22:00	Restricted Maintenance Operations	Restricted Maintenance Operations declared for CAISO Grid, effective 07/25/2024 06:00 - 07/25/2024 22:00 Message Restricted Maintenance Operations declared for CAISO Grid, effective 07/25/2024 06:00 - 07/25/2024 22:00 - 202409937356 Notice No: 202409937356-60 The California ISO has declared Restricted Maintenance Operations for CAISO Grid, effective 07/25/2024 06:00 through 07/25/2024 22:00. Reason: High system load and fires limiting CAISO import capability. Restricted Maintenance Operations, as detailed in CAISO Operating Procedure 4420, will be in effect. Market participants are cautioned to avoid actions, which may jeopardize generator and/or transmission availability. For more information, view the Emergency Notifications fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. California Independent System Operator, P.O. Box 639014, Folsom, CA 95630 Unsubscribe to Emergency notification emails at https://www.caiso.com/EmergencySubscription/unsubscribe/89207b34-3f96-4a82-a3e1-1390be7f542f Notice issued at: [07/24/2024 22:13:26]

Grid Emergencies Record For 2024

Date	Day	Region	Time Frame	AWE Event	Reason
8/2/2024	Friday	CAISO Grid	08/05/2024 12:00 through 08/05/2024 22:00	Restricted Maintenance Operations	Restricted Maintenance Operations declared for CAISO Grid, effective 08/05/2024 12:00 - 08/05/2024 22:00 Message Restricted Maintenance Operations declared for CAISO Grid, effective 08/05/2024 12:00 - 08/05/2024 22:00 - 202488187580 Notice No: 202488187580-05 The California ISO has declared Restricted Maintenance Operations for CAISO Grid, effective 08/05/2024 12:00 through 08/05/2024 22:00. Reason: High forecasted loads and ongoing fires threatening transmission facilities. Restricted Maintenance Operations, as detailed in CAISO Operating Procedure 4420, will be in effect. Market participants are cautioned to avoid actions, which may jeopardize generator and/or transmission availability. For more information, view the Emergency Notifications fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. California Independent System Operator, P.O. Box 639014, Folsom, CA 95630 Unsubscribe to Emergency notification emails at https://www.caiso.com/EmergencySubscription/unsubscribe/89207b34-3f96-4a82-a3e1-1390be7f542f Notice issued at: [08/02/2024 13:42:45]

Grid Emergencies Record For 2024

Date	Day	Region	Time Frame	AWE Event	Reason
8/2/2024	Friday	CAISO Grid	08/06/2024 12:00 through 08/06/2024 22:00	Restricted Maintenance Operations	Restricted Maintenance Operations declared for CAISO Grid, effective 08/06/2024 12:00 - 08/06/2024 22:00 Message Restricted Maintenance Operations declared for CAISO Grid, effective 08/06/2024 12:00 - 08/06/2024 22:00 - 202409872014 Notice No: 202409872014-65 The California ISO has declared Restricted Maintenance Operations for CAISO Grid, effective 08/06/2024 12:00 through 08/06/2024 22:00. Reason: High forecasted loads and ongoing fires threatening transmission facilities. Restricted Maintenance Operations, as detailed in CAISO Operating Procedure 4420, will be in effect. Market participants are cautioned to avoid actions, which may jeopardize generator and/or transmission availability. --- PLANNED EVENTS --- Restricted Maintenance Operations - CAISO Grid: 08/05/2024 12:00 - 08/05/2024 22:00 For more information, view the Emergency Notifications fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. California Independent System Operator, P.O. Box 639014, Folsom, CA 95630 Unsubscribe to Emergency notification emails at

Grid Emergencies Record For 2024

Date	Day	Region	Time Frame	AWE Event	Reason
8/5/2024	Monday	CAISO Grid	08/07/2024 12:00 through 08/07/2024 22:00	Restricted Maintenance Operations	Restricted Maintenance Operations declared for CAISO Grid, effective 08/07/2024 12:00 - 08/07/2024 22:00 Message Restricted Maintenance Operations declared for CAISO Grid, effective 08/07/2024 12:00 - 08/07/2024 22:00 - 202471584456 Notice No: 202471584456-90 The California ISO has declared Restricted Maintenance Operations for CAISO Grid, effective 08/07/2024 12:00 through 08/07/2024 22:00. Reason: High forecasted loads and ongoing fires threatening transmission facilities. Restricted Maintenance Operations, as detailed in CAISO Operating Procedure 4420, will be in effect. Market participants are cautioned to avoid actions, which may jeopardize generator and/or transmission availability. --- PLANNED EVENTS --- Restricted Maintenance Operations - CAISO Grid: 08/05/2024 12:00 - 08/05/2024 22:00 Restricted Maintenance Operations - CAISO Grid: 08/06/2024 12:00 - 08/06/2024 22:00 For more information, view the Emergency Notifications fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. California Independent System Operator, P.O. Box 639014, Folsom, CA 95630

Grid Emergencies Record For 2024

Date	Day	Region	Time Frame	AWE Event	Reason
8/30/2024	Friday	CAISO Grid	09/04/2024 12:00 through 09/04/2024 22:00	Restricted Maintenance Operations	Restricted Maintenance Operations declared for CAISO Grid, effective 09/04/2024 12:00 - 09/04/2024 22:00 Message Restricted Maintenance Operations declared for CAISO Grid, effective 09/04/2024 12:00 - 09/04/2024 22:00 - 202435797804 Notice No: 202435797804-53 The California ISO has declared Restricted Maintenance Operations for CAISO Grid, effective 09/04/2024 12:00 through 09/04/2024 22:00. Reason: High forecasted temperature and high forecasted system load. Restricted Maintenance Operations, as detailed in CAISO Operating Procedure 4420, will be in effect. Market participants are cautioned to avoid actions, which may jeopardize generator and/or transmission availability. For more information, view the Emergency Notifications fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. California Independent System Operator, P.O. Box 639014, Folsom, CA 95630 Unsubscribe to Emergency notification emails at https://www.caiso.com/EmergencySubscription/unsubscribe/89207b34-3f96-4a82-a3e1-1390be7f542f Notice issued at: [08/30/2024 09:53:23]

Grid Emergencies Record For 2024

Date	Day	Region	Time Frame	AWE Event	Reason
8/30/2024	Friday	CAISO Grid	09/05/2024 12:00 through 09/05/2024 22:00	Restricted Maintenance Operations	Restricted Maintenance Operations declared for CAISO Grid, effective 09/05/2024 12:00 - 09/05/2024 22:00 Message Restricted Maintenance Operations declared for CAISO Grid, effective 09/05/2024 12:00 - 09/05/2024 22:00 - 202436984131 Notice No: 202436984131-17 The California ISO has declared Restricted Maintenance Operations for CAISO Grid, effective 09/05/2024 12:00 through 09/05/2024 22:00. Reason: High forecasted temperature and high forecasted system load. Restricted Maintenance Operations, as detailed in CAISO Operating Procedure 4420, will be in effect. Market participants are cautioned to avoid actions, which may jeopardize generator and/or transmission availability. --- PLANNED EVENTS --- Restricted Maintenance Operations - CAISO Grid: 09/04/2024 12:00 - 09/04/2024 22:00 For more information, view the Emergency Notifications fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. California Independent System Operator, P.O. Box 639014, Folsom, CA 95630 Unsubscribe to Emergency notification emails at

Grid Emergencies Record For 2024

Date	Day	Region	Time Frame	AWE Event	Reason
8/30/2024	Friday	CAISO Grid	09/06/2024 12:00 through 09/06/2024 22:00	Restricted Maintenance Operations	Restricted Maintenance Operations declared for CAISO Grid, effective 09/06/2024 12:00 - 09/06/2024 22:00 Message Restricted Maintenance Operations declared for CAISO Grid, effective 09/06/2024 12:00 - 09/06/2024 22:00 - 202486019520 Notice No: 202486019520-61 The California ISO has declared Restricted Maintenance Operations for CAISO Grid, effective 09/06/2024 12:00 through 09/06/2024 22:00. Reason: High forecasted temperature and high forecasted system load. Restricted Maintenance Operations, as detailed in CAISO Operating Procedure 4420, will be in effect. Market participants are cautioned to avoid actions, which may jeopardize generator and/or transmission availability. --- PLANNED EVENTS --- Restricted Maintenance Operations - CAISO Grid: 09/04/2024 12:00 - 09/04/2024 22:00 Restricted Maintenance Operations - CAISO Grid: 09/05/2024 12:00 - 09/05/2024 22:00 For more information, view the Emergency Notifications fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. California Independent System Operator, P.O. Box 639014, Folsom, CA 95630

Grid Emergencies Record For 2024

Date	Day	Region	Time Frame	AWE Event	Reason
9/6/2024	Friday	Southern CA Region	09/06/2024 17:24 through 09/07/2024 01:27	Transmission Emergency	Transmission Emergency declared for Southern CA Region, effective 09/06/2024 17:24 - 09/06/2024 23:59 Message Transmission Emergency declared for Southern CA Region, effective 09/06/2024 17:24 - 09/06/2024 23:59 - 202444019756 Notice No: 202444019756-54 The California ISO has declared a Transmission Emergency for Southern CA Region, effective 09/06/2024 17:24 through 09/06/2024 23:59. Reason: SCE declared a Transmission Emergency for the Mira Loma area. For more information, view the Emergency Notifications fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. California Independent System Operator, P.O. Box 639014, Folsom, CA 95630 Unsubscribe to Emergency notification emails at https://www.caiso.com/EmergencySubscription/unsubscribe/89207b34-3f96-4a82-a3e1-1390be7f542f Notice issued at: [09/06/2024 17:36:36]

Grid Emergencies Record For 2024

Date	Day	Region	Time Frame	AWE Event	Reason
9/7/2024	Saturday	CAISO Grid	09/09/2024 12:00 through 09/09/2024 22:00	Restricted Maintenance Operations	Restricted Maintenance Operations declared for CAISO Grid, effective 09/09/2024 12:00 - 09/09/2024 22:00 Message Restricted Maintenance Operations declared for CAISO Grid, effective 09/09/2024 12:00 - 09/09/2024 22:00 - 202499175849 Notice No: 202499175849-22 The California ISO has declared Restricted Maintenance Operations for CAISO Grid, effective 09/09/2024 12:00 through 09/09/2024 22:00. Reason: RMO issued for higher load forecast due to high temperatures in the CAISO BA. Restricted Maintenance Operations, as detailed in CAISO Operating Procedure 4420, will be in effect. Market participants are cautioned to avoid actions, which may jeopardize generator and/or transmission availability. For more information, view the Emergency Notifications fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. California Independent System Operator, P.O. Box 639014, Folsom, CA 95630 Unsubscribe to Emergency notification emails at https://www.caiso.com/EmergencySubscription/unsubscribe/89207b34-3f96-4a82-a3e1-1390be7f542f Notice issued at: [09/07/2024 14:13:45]

Grid Emergencies Record For 2024

Date	Day	Region	Time Frame	AWE Event	Reason
11/5/2024	Tuesday	Northern CA Region	11/05/2024 17:00 through 11/07/2024 07:00	Transmission Emergency	Transmission Emergency declared for Northern CA Region, effective 11/05/2024 17:00 - 11/07/2024 07:00 Message Transmission Emergency declared for Northern CA Region, effective 11/05/2024 17:00 - 11/07/2024 07:00 - 202468901041 Notice No: 202468901041-18 The California ISO has declared a Transmission Emergency for Northern CA Region, effective 11/05/2024 17:00 through 11/07/2024 07:00. Reason: Anticipated severe weather conditions in the Humboldt area For more information, view the Emergency Notifications fact sheet (https://www.caiso.com/documents/emergency-notifications-fact-sheet.pdf). Monitor system conditions on Today's Outlook (https://www.caiso.com/todays-outlook) and contact local electric utilities for details about their respective load reduction programs. For grid condition developments, follow us on social media: @California_ISO. California Independent System Operator, P.O. Box 639014, Folsom, CA 95630 Unsubscribe to Emergency notification emails at https://www.caiso.com/subscriptions/unsubscribe-emergency-notifications Notice issued at: [11/05/2024 15:50:41]

Grid Emergencies Record For 2023

Date	Day	Region	Time Frame	AWE Event	Reason
3/10/2023	Friday	Northern CA	03/10/2023 09:21 through 03/10/2023 23:59	Transmission Emergency	Northern CA Region TRANSMISSION EMERGENCY Notice [202302752] The California ISO hereby issues a Northern CA Region TRANSMISSION EMERGENCY Notice effective 03/10/2023 09:21 through 03/10/2023 23:59 based on conditions as of 03/10/2023 09:22. Reason: Transmission Emergency declared in the Humboldt region due to |storm conditions. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf) for additional detail. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 03/10/2023 09:22
3/11/2023	Saturday	Northern CA	03/11/2023 00:03 through 03/11/2023 23:59	Transmission Emergency	Northern CA Region TRANSMISSION EMERGENCY Notice [202302754] The California ISO hereby issues a Northern CA Region TRANSMISSION EMERGENCY Notice effective 03/11/2023 00:03 through 03/11/2023 23:59 based on conditions as of 03/11/2023 00:06. Reason: Transmission Emergency declared in the Humboldt region due to |storm conditions. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf) for additional detail. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 03/11/2023 00:06

Grid Emergencies Record For 2023

Date	Day	Region	Time Frame	AWE Event	Reason
7/20/2023	Thursday	ISO	07/20/2023 19:30 through 07/20/2023 22:00	EEA1	CAISO EEA 1 NOTICE [202302770] An Energy Emergency Alert (EEA) 1 has been declared for the California ISO for the CAISO Grid, effective 07/20/2023 19:30 through 07/20/2023 22:00. Reason: The ISO is anticipating high loads and temperatures across the |||CAISO Grid. During the effective time period, all available generation resources in the CAISO Balancing Authority are committed to meet firm load, firm transactions, and reserve commitments. CAISO is anticipating that it can maintain sufficient Contingency Reserves during this period. Conservation efforts are encouraged during this time, and entities are encouraged to offer available energy and ancillary service bids. During this time, participating customers may be directed by utilities to use generators that are approved for emergencies, or to reduce load according to the protocols of each utility's program. For more information, view the CAISO Emergency notifications fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. A news release will be distributed shortly. Notice issued at: 07/20/2023 19:39

Grid Emergencies Record For 2023

Date	Day	Region	Time Frame	AWE Event	Reason
7/25/2023	Tuesday	ISO	07/25/2023 19:26 through 07/25/2023 23:59	EEA Watch	CAISO EEA Watch NOTICE [202302772] An Energy Emergency Alert (EEA) Watch has been declared for the California ISO for the CAISO Grid, effective 07/25/2023 19:26 through 07/25/2023 23:59. Reason: The ISO is anticipating high loads and temperatures across the |CAISO Grid. CAISO analysis shows that all available resources are committed or forecasted to be in use, for the specified time period, and there is potential for an energy deficiency. Entities are encouraged to offer available energy and ancillary service bids, participating customers may be directed by utilities to use generators approved for emergencies, or to reduce load according to the protocols of each utility's program. For more information, view the CAISO Emergency notifications fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. A news release will be distributed shortly. Notice issued at: 07/25/2023 19:31

Grid Emergencies Record For 2023

Date	Day	Region	Time Frame	AWE Event	Reason
7/26/2023	Wednesday	ISO	07/26/2023 18:00 through 07/26/2023 22:00	EEA Watch	CAISO EEA Watch NOTICE [202302774] An Energy Emergency Alert (EEA) Watch has been declared for the California ISO for the CAISO Grid, effective 07/26/2023 18:00 through 07/26/2023 22:00. Reason: Due to supply uncertainty, load forecast uncertainty, high |demand across the western US, and transmission constraints. CAISO analysis shows that all available resources are committed or forecasted to be in use, for the specified time period, and there is potential for an energy deficiency. Entities are encouraged to offer available energy and ancillary service bids, participating customers may be directed by utilities to use generators approved for emergencies, or to reduce load according to the protocols of each utility's program. For more information, view the CAISO Emergency notifications fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. A news release will be distributed shortly. Notice issued at: 07/26/2023 12:20

Grid Emergencies Record For 2023

Date	Day	Region	Time Frame	AWE Event	Reason
8/15/2023	Tuesday	ISO	08/15/2023 12:00 through 08/15/2023 22:00	RMO	CAISO Grid Restricted Maintenance Operations [202302778] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 08/15/2023 12:00 through 08/15/2023 22:00. Reason: The ISO is anticipating high loads and temperatures across the |CAISO Grid. For more information, view the CAISO Emergency notifications fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Restricted Maintenance Operations, as detailed in CAISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions, which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information.
8/16/2023	Wednesday	ISO	08/16/2023 12:00 through 08/16/2023 22:00	RMO	CAISO Grid Restricted Maintenance Operations [202302779] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 08/16/2023 12:00 through 08/16/2023 22:00. Reason: The ISO is anticipating high loads and temperatures across the |CAISO Grid. For more information, view the CAISO Emergency notifications fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Restricted Maintenance Operations, as detailed in CAISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions, which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information.

Grid Emergencies Record For 2023

Date	Day	Region	Time Frame	AWE Event	Reason
8/17/2023	Thursday	ISO	08/17/2023 12:00 through 08/17/2023 22:00	RMO	CAISO Grid Restricted Maintenance Operations [202302780] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 08/17/2023 12:00 through 08/17/2023 22:00. Reason: The ISO is anticipating high loads and temperatures across the |CAISO Grid. For more information, view the CAISO Emergency notifications fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Restricted Maintenance Operations, as detailed in CAISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions, which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information.
8/28/2023	Thursday	ISO	08/28/2023 12:00 through 08/28/2023 22:00	RMO	CAISO Grid Restricted Maintenance Operations [202302784] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 08/28/2023 12:00 through 08/28/2023 22:00. Reason: The ISO is anticipating high loads and temperatures across the |CAISO Grid. For more information, view the CAISO Emergency notifications fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Restricted Maintenance Operations, as detailed in CAISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions, which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information.

Grid Emergencies Record For 2023

Date	Day	Region	Time Frame	AWE Event	Reason
8/29/2023	Friday	ISO	08/29/2023 12:00 through 08/29/2023 22:00	RMO	CAISO Grid Restricted Maintenance Operations [202302785] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 08/29/2023 12:00 through 08/29/2023 22:00. Reason: The ISO is anticipating high loads and temperatures across the |CAISO Grid. For more information, view the CAISO Emergency notifications fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Restricted Maintenance Operations, as detailed in CAISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions, which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information.
8/30/2023	Saturday	ISO	08/30/2023 12:00 through 08/30/2023 22:00	RMO	CAISO Grid Restricted Maintenance Operations [202302786] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 08/30/2023 12:00 through 08/30/2023 22:00. Reason: The ISO is anticipating high loads and temperatures across the |CAISO Grid. For more information, view the CAISO Emergency notifications fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Restricted Maintenance Operations, as detailed in CAISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions, which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information.

Grid Emergencies Record For 2022

Date	Day	Region	Time Frame	AWE Event	Reason
6/10/2022	Friday	Northern CA	20:20 - 21:12	Transmission Emergency	Northern CA Firm Load Interruption - Transmission Emergency Notice [202202608] As of 20:20 the California ISO has requested 100 MW of load in Northern California to be shed due to the Transmission Emergency. A separate notification will be made when load has been restored. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf) for additional detail. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 06/10/2022 20:41
6/25/2022	Saturday	Northern CA	16:00 - 22:00	RMO	GENERATION Restricted Maintenance Operations NOTIFICATION [202202612] The California ISO is declaring Northern CA Region GENERATION Restricted Maintenance Operations for the period from 06/25/2022 16:00 through 06/25/2022 22:00. Reason: The Restricted Maintenance is for the Bakersfield area, and |due to high temperatures. |The ISO anticipates generation resources may be inadequate |for the period covered by this notice. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Additionally, Market Participants are cautioned to avoid actions which may jeopardize generator availability. This notice does not restrict scheduled outages which do not affect generating resource availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 06/24/2022 18:30

Grid Emergencies Record For 2022

Date	Day	Region	Time Frame	AWE Event	Reason
8/15/2022	Monday	ISO	12:00 - 22:00	RMO	CAISO Grid Restricted Maintenance Operations [202202618] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 08/15/2022 12:00 through 08/15/2022 22:00. Reason: The ISO is anticipating high loads and temperatures across |the CAISO Grid. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 08/12/2022 13:25
8/16/2022	Tuesday	ISO	12:00 - 22:00	RMO	CAISO Grid Restricted Maintenance Operations [202202619] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 08/16/2022 12:00 through 08/16/2022 22:00. Reason: The ISO is anticipating high loads and temperatures across |the CAISO Grid. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 08/12/2022 13:28

Grid Emergencies Record For 2022

Date	Day	Region	Time Frame	AWE Event	Reason
8/17/2022	Wednesday	ISO	12:00 - 22:00	RMO	CAISO Grid Restricted Maintenance Operations [202202620] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 08/17/2022 12:00 through 08/17/2022 22:00. Reason: The ISO is anticipating high loads and temperatures across |the CAISO Grid. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 08/12/2022 13:30
8/17/2022	Wednesday	ISO	August 17 at 4:00 PM to August 17 at 9:00 PM	Flex Alert	The California ISO has issued a Flex Alert for the CAISO Grid effective Wednesday, August 17, 2022. Californians are urged to conserve electricity from August 17 at 4:00 PM to August 17 at 9:00 PM to avoid power disruptions. Visit our News webpage at: http://www.caiso.com/about/Pages/News/default.aspx for a news release and more information on grid conditions.

Grid Emergencies Record For 2022

Date	Day	Region	Time Frame	AWE Event	Reason
8/18/2022	Thursday	ISO	12:00 - 22:00	RMO	CAISO Grid Restricted Maintenance Operations [202202621] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 08/18/2022 12:00 through 08/18/2022 22:00. Reason: The ISO is anticipating high loads and temperatures across |the CAISO Grid. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 08/12/2022 13:31

Grid Emergencies Record For 2022

Date	Day	Region	Time Frame	AWE Event	Reason
8/19/2022	Friday	ISO	12:00 - 22:00	RMO	CAISO Grid Restricted Maintenance Operations [202202627] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 08/19/2022 12:00 through 08/19/2022 22:00. Reason: The ISO is anticipating high loads and temperatures across the |CAISO Grid. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 08/17/2022 12:25

Grid Emergencies Record For 2022

Date	Day	Region	Time Frame	AWE Event	Reason
8/31/2022	Wednesday	ISO	08/31/2022 12:00 through 08/31/2022 22:00	RMO	CAISO Grid Restricted Maintenance Operations [202202637] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 08/31/2022 12:00 through 08/31/2022 22:00. Reason: The ISO is anticipating high loads and temperatures across the |CAISO Grid. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 08/29/2022 11:35
8/31/2022	Wednesday	ISO	August 31 at 4:00 PM to August 31 at 9:00 PM	Flex Alert	The California ISO has issued a Flex Alert for the CAISO Grid effective Wednesday, August 31, 2022. Californians are urged to conserve electricity from August 31 at 4:00 PM to August 31 at 9:00 PM to avoid power disruptions. Visit our News webpage at: http://www.caiso.com/about/Pages/News/default.aspx for a news release and more information on grid conditions.

Grid Emergencies Record For 2022

Date	Day	Region	Time Frame	AWE Event	Reason
8/31/2022	Wednesday	ISO	08/31/2022 17:00 through 08/31/2022 20:00	EEA Watch	CAISO EEA Watch NOTICE [202202645] The California ISO has issued an Energy Emergency Alert (EEA) Watch Notice for the CAISO Grid, effective 08/31/2022 17:00 through 08/31/2022 20:00. Reason: The ISO is anticipating high loads and temperatures across |the CAISO Grid.||The ISO anticipates that it may not be able to support |energy exports that are bid into it's HASP Market for HE 18 |through HE 20. CAISO is forecasting an energy deficiency, with all available resources in use or forecasted to be in use, for the specified time period. Conservation efforts are encouraged during this time, and energy market participants are encouraged to offer additional supplemental energy and ancillary service bids. During this time, participating customers may be directed by utilities to use generators approved for emergencies, or to reduce load following the protocols of each utility's programs. For more information, view the CAISO System Emergency fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. Notice issued at: 08/31/2022 12:04

Grid Emergencies Record For 2022

Date	Day	Region	Time Frame	AWE Event	Reason
8/31/2022	Wednesday	ISO	08/31/2022 17:00 through 08/31/2022 20:00	EEA1	The California ISO has issued an Energy Emergency Alert (EEA) 1 Notice for the CAISO Grid, effective 08/31/2022 17:00 through 08/31/2022 20:00. Reason: The ISO is anticipating high loads and temperatures across the |CAISO Grid. CAISO is forecasting an energy deficiency, with all available resources in use or forecasted to be in use, for the specified time period. Conservation efforts are encouraged during this time, and energy market participants are encouraged to offer additional supplemental energy and ancillary service bids. During this time, participating customers may be directed by utilities to use generators approved for emergencies, or to reduce load following the protocols of each utility's programs. For more information, view the CAISO System Emergency fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. Notice issued at: 08/31/2022 15:10

Grid Emergencies Record For 2022

Date	Day	Region	Time Frame	AWE Event	Reason
9/1/2022	Thursday	ISO	09/01/2022 18:00 through 09/01/2022 19:00	EEA Watch	The California ISO has issued an Energy Emergency Alert (EEA) Watch Notice for the CAISO Grid, effective 09/01/2022 18:00 through 09/01/2022 19:00. Reason: The ISO is anticipating high loads and temperatures across |the CAISO Grid. CAISO is forecasting an energy deficiency, with all available resources in use or forecasted to be in use, for the specified time period. Conservation efforts are encouraged during this time, and energy market participants are encouraged to offer additional supplemental energy and ancillary service bids. During this time, participating customers may be directed by utilities to use generators approved for emergencies, or to reduce load following the protocols of each utility's programs. For more information, view the CAISO System Emergency fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. Notice issued at: 08/31/2022 15:22
9/1/2022	Thursday	ISO	September 1 at 4:00 PM to September 1 at 9:00 PM	Flex Alert	The California ISO has issued a Flex Alert for the CAISO Grid effective Thursday, September 1, 2022. Californians are urged to conserve electricity from September 1 at 4:00 PM to September 1 at 9:00 PM to avoid power disruptions. Visit our News webpage at: http://www.caiso.com/about/Pages/News/default.aspx for a news release and more information on grid conditions.

Grid Emergencies Record For 2022

Date	Day	Region	Time Frame	AWE Event	Reason
9/1/2022	Thursday	ISO	09/01/2022 12:00 through 09/01/2022 22:00	RMO	CAISO Grid Restricted Maintenance Operations [202202638] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 09/01/2022 12:00 through 09/01/2022 22:00. Reason: The ISO is anticipating high loads and temperatures across the |CAISO Grid. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 08/29/2022 11:37
9/2/2022	Friday	ISO	September 2 at 4:00 PM to September 2 at 9:00 PM	Flex Alert	The California ISO has issued a Flex Alert for the CAISO Grid effective Friday, September 2, 2022. Californians are urged to conserve electricity from September 2 at 4:00 PM to September 2 at 9:00 PM to avoid power disruptions. Visit our News webpage at: http://www.caiso.com/about/Pages/News/default.aspx for a news release and more information on grid conditions.

Grid Emergencies Record For 2022

Date	Day	Region	Time Frame	AWE Event	Reason
9/2/2022	Friday	ISO	09/02/2022 12:00 through 09/02/2022 22:00	RMO	CAISO Grid Restricted Maintenance Operations [202202639] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 09/02/2022 12:00 through 09/02/2022 22:00. Reason: The ISO is anticipating high loads and temperatures across the |CAISO Grid. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 08/29/2022 11:38

Grid Emergencies Record For 2022

Date	Day	Region	Time Frame	AWE Event	Reason
9/3/2022	Saturday	ISO	09/03/2022 18:00 through 09/03/2022 20:00	EEA Watch	The California ISO has issued an Energy Emergency Alert (EEA) Watch Notice for the CAISO Grid, effective 09/03/2022 18:00 through 09/03/2022 20:00. Reason: The ISO is anticipating high loads and temperatures across the |CAISO Grid. CAISO is forecasting an energy deficiency, with all available resources in use or forecasted to be in use, for the specified time period. Conservation efforts are encouraged during this time, and energy market participants are encouraged to offer additional supplemental energy and ancillary service bids. During this time, participating customers may be directed by utilities to use generators approved for emergencies, or to reduce load following the protocols of each utility's programs. For more information, view the CAISO System Emergency fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. Notice issued at: 09/02/2022 15:55
9/3/2022	Saturday	ISO	September 3 at 4:00 PM to September 3 at 9:00 PM	Flex Alert	The California ISO has issued a Flex Alert for the CAISO Grid effective Saturday, September 3, 2022. Californians are urged to conserve electricity from September 3 at 4:00 PM to September 3 at 9:00 PM to avoid power disruptions. Visit our News webpage at: http://www.caiso.com/about/Pages/News/default.aspx for a news release and more information on grid conditions.

Grid Emergencies Record For 2022

Date	Day	Region	Time Frame	AWE Event	Reason
9/3/2022	Saturday	ISO	09/03/2022 12:00 through 09/03/2022 22:00	RMO	CAISO Grid Restricted Maintenance Operations [202202640] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 09/03/2022 12:00 through 09/03/2022 22:00. Reason: The ISO is anticipating high loads and temperatures across the |CAISO Grid. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 08/29/2022 11:39
9/4/2022	Sunday	ISO	September 4 at 4:00 PM to September 4 at 9:00 PM	Flex Alert	The California ISO has issued a Flex Alert for the CAISO Grid effective Sunday, September 4, 2022. Californians are urged to conserve electricity from September 4 at 4:00 PM to September 4 at 9:00 PM to avoid power disruptions. Visit our News webpage at: http://www.caiso.com/about/Pages/News/default.aspx for a news release and more information on grid conditions.

Grid Emergencies Record For 2022

Date	Day	Region	Time Frame	AWE Event	Reason
9/4/2022	Sunday	ISO	09/04/2022 17:00 through 09/04/2022 20:00	EEA Watch	The California ISO has issued an Energy Emergency Alert (EEA) Watch Notice for the CAISO Grid, effective 09/04/2022 17:00 through 09/04/2022 20:00. Reason: The ISO is anticipating high loads and temperatures across the |CAISO Grid. CAISO is forecasting an energy deficiency, with all available resources in use or forecasted to be in use, for the specified time period. Conservation efforts are encouraged during this time, and energy market participants are encouraged to offer additional supplemental energy and ancillary service bids. During this time, participating customers may be directed by utilities to use generators approved for emergencies, or to reduce load following the protocols of each utility's programs. For more information, view the CAISO System Emergency fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. Notice issued at: 09/03/2022 15:04

Grid Emergencies Record For 2022

Date	Day	Region	Time Frame	AWE Event	Reason
9/4/2022	Sunday	ISO	09/04/2022 12:00 through 09/04/2022 22:00	RMO	CAISO Grid Restricted Maintenance Operations [202202641] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 09/04/2022 12:00 through 09/04/2022 22:00. Reason: The ISO is anticipating high loads and temperatures across the |CAISO Grid. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 08/29/2022 11:41

Grid Emergencies Record For 2022

Date	Day	Region	Time Frame	AWE Event	Reason
9/5/2022	Monday	ISO	09/05/2022 17:00 through 09/05/2022 22:00	EEA Watch	The California ISO has issued an Energy Emergency Alert (EEA) Watch Notice for the CAISO Grid, effective 09/05/2022 17:00 through 09/05/2022 22:00. Reason: The ISO is anticipating high loads and temperatures across the |CAISO Grid. CAISO is forecasting an energy deficiency, with all available resources in use or forecasted to be in use, for the specified time period. Conservation efforts are encouraged during this time, and energy market participants are encouraged to offer additional supplemental energy and ancillary service bids. During this time, participating customers may be directed by utilities to use generators approved for emergencies, or to reduce load following the protocols of each utility's programs. For more information, view the CAISO System Emergency fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. Notice issued at: 09/04/2022 15:08
9/5/2022	Monday	ISO	September 5 at 4:00 PM to September 5 at 10:00 PM	Flex Alert	The California ISO has issued a Flex Alert for the CAISO Grid effective Monday, September 5, 2022. Californians are urged to conserve electricity from September 5 at 4:00 PM to September 5 at 10:00 PM to avoid power disruptions. Visit our News webpage at: http://www.caiso.com/about/Pages/News/default.aspx for a news release and more information on grid conditions.

Grid Emergencies Record For 2022

Date	Day	Region	Time Frame	AWE Event	Reason
9/5/2022	Monday	ISO	09/05/2022 17:00 through 09/05/2022 21:00	EEA1	The California ISO has issued an Energy Emergency Alert (EEA) 1 Notice for the CAISO Grid, effective 09/05/2022 17:00 through 09/05/2022 21:00. Reason: The ISO is anticipating high loads and temperatures across the |CAISO Grid. CAISO is forecasting an energy deficiency, with all available resources in use or forecasted to be in use, for the specified time period. Conservation efforts are encouraged during this time, and energy market participants are encouraged to offer additional supplemental energy and ancillary service bids. During this time, participating customers may be directed by utilities to use generators approved for emergencies, or to reduce load following the protocols of each utility's programs. For more information, view the CAISO System Emergency fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. Notice issued at: 09/05/2022 09:57

Grid Emergencies Record For 2022

Date	Day	Region	Time Frame	AWE Event	Reason
9/5/2022	Monday	ISO	09/05/2022 18:30 through 09/05/2022 20:00	EEA2	CAISO EEA 2 NOTICE [202202677] The California ISO has issued an Energy Emergency Alert (EEA) 2 Notice for the CAISO Grid, effective 09/05/2022 18:30 through 09/05/2022 20:00. Reason: The ISO is anticipating high loads and temperatures across the |CAISO Grid. CAISO is forecasting an energy deficiency, with all available resources in use or forecasted to be in use, for the specified time period. Conservation efforts are encouraged during this time, and energy market participants are encouraged to offer additional supplemental energy and ancillary service bids. During this time, participating customers may be directed by utilities to use generators approved for emergencies, or to reduce load following the protocols of each utility's programs. To preserve grid reliability, CAISO dispatch of emergency demand response programs may be necessary during this time. Subsequently, CAISO may request Utility Distribution Companies and Metered Subsystems to voluntarily reduce electricity use. For more information, view the CAISO System Emergency fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs.

Grid Emergencies Record For 2022

Date	Day	Region	Time Frame	AWE Event	Reason
9/5/2022	Monday	Northern CA	09/05/2022 17:58 through 09/05/2022 22:00	Transmission Emergency	Northern CA Region TRANSMISSION EMERGENCY Notice [202202679] The California ISO hereby issues a Northern CA Region TRANSMISSION EMERGENCY Notice effective 09/05/2022 17:58 through 09/05/2022 22:00 based on conditions as of 09/05/2022 18:00. Reason: Emergency generation needed to relieve overloads in the |Palermo area Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf) for additional detail. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 09/05/2022 18:00
9/5/2022	Monday	ISO	09/05/2022 12:00 through 09/05/2022 22:00	RMO	CAISO Grid Restricted Maintenance Operations [202202642] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 09/05/2022 12:00 through 09/05/2022 22:00. Reason: The ISO is anticipating high loads and temperatures across the |CAISO Grid. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 08/29/2022 11:43

Grid Emergencies Record For 2022

Date	Day	Region	Time Frame	AWE Event	Reason
9/6/2022	Tuesday	ISO	September 6 at 4:00 PM to September 6 at 9:00 PM	Flex Alert	The California ISO has issued a Flex Alert for the CAISO Grid effective Tuesday, September 6, 2022. Californians are urged to conserve electricity from September 6 at 4:00 PM to September 6 at 9:00 PM to avoid power disruptions. Visit our News webpage at: http://www.caiso.com/about/Pages/News/default.aspx for a news release and more information on grid conditions.
9/6/2022	Tuesday	Northern CA	09/06/2022 13:29 through 09/06/2022 22:00	Transmission Emergency	Northern CA Region TRANSMISSION EMERGENCY Notice [202202692] The California ISO hereby issues a Northern CA Region TRANSMISSION EMERGENCY Notice effective 09/06/2022 13:29 through 09/06/2022 22:00 based on conditions as of 09/06/2022 13:30. Reason: Emergency generation needed to relieve overloads in the |Palermo area Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf) for additional detail. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 09/06/2022 13:30

Grid Emergencies Record For 2022

Date	Day	Region	Time Frame	AWE Event	Reason
9/6/2022	Tuesday	ISO	09/06/2022 17:00 through 09/06/2022 21:00	EEA Watch	The California ISO has issued an Energy Emergency Alert (EEA) Watch Notice for the CAISO Grid, effective 09/06/2022 17:00 through 09/06/2022 21:00. Reason: The ISO is anticipating high loads and temperatures across the |CAISO Grid. CAISO is forecasting an energy deficiency, with all available resources in use or forecasted to be in use, for the specified time period. Conservation efforts are encouraged during this time, and energy market participants are encouraged to offer additional supplemental energy and ancillary service bids. During this time, participating customers may be directed by utilities to use generators approved for emergencies, or to reduce load following the protocols of each utility's programs. For more information, view the CAISO System Emergency fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. Notice issued at: 09/05/2022 15:57

Grid Emergencies Record For 2022

Date	Day	Region	Time Frame	AWE Event	Reason
9/6/2022	Tuesday	ISO	09/06/2022 16:00 through 09/06/2022 21:00	EEA1	The California ISO has issued an Energy Emergency Alert (EEA) 1 Notice for the CAISO Grid, effective 09/06/2022 16:00 through 09/06/2022 21:00. Reason: The ISO is anticipating high loads and temperatures across the |CAISO Grid. CAISO is forecasting an energy deficiency, with all available resources in use or forecasted to be in use, for the specified time period. Conservation efforts are encouraged during this time, and energy market participants are encouraged to offer additional supplemental energy and ancillary service bids. During this time, participating customers may be directed by utilities to use generators approved for emergencies, or to reduce load following the protocols of each utility's programs. For more information, view the CAISO System Emergency fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. Notice issued at: 09/06/2022 10:09

Grid Emergencies Record For 2022

Date	Day	Region	Time Frame	AWE Event	Reason
9/6/2022	Tuesday	ISO	09/06/2022 16:00 through 09/06/2022 21:00	EEA2	CAISO EEA 2 NOTICE [202202693] The California ISO has issued an Energy Emergency Alert (EEA) 2 Notice for the CAISO Grid, effective 09/06/2022 16:00 through 09/06/2022 21:00. Reason: The ISO is anticipating high loads and temperatures across the |CAISO Grid. CAISO is forecasting an energy deficiency, with all available resources in use or forecasted to be in use, for the specified time period. Conservation efforts are encouraged during this time, and energy market participants are encouraged to offer additional supplemental energy and ancillary service bids. During this time, participating customers may be directed by utilities to use generators approved for emergencies, or to reduce load following the protocols of each utility's programs. To preserve grid reliability, CAISO dispatch of emergency demand response programs may be necessary during this time. Subsequently, CAISO may request Utility Distribution Companies and Metered Subsystems to voluntarily reduce electricity use. For more information, view the CAISO System Emergency fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs.

Grid Emergencies Record For 2022

Date	Day	Region	Time Frame	AWE Event	Reason
9/6/2022	Tuesday	ISO	09/06/2022 17:17 through 09/06/2022 20:00	EEA3	The California ISO has issued an Energy Emergency Alert (EEA) 3 Notice for the CAISO Grid, effective 09/06/2022 17:17 through 09/06/2022 20:00. Reason: The ISO is anticipating high loads and temperatures across the |CAISO Grid. CAISO is forecasting an energy deficiency with all available resources in use for the specified time period. Maximum conservation efforts are urged. During this time, participating customers will be directed by utilities to use generators approved for emergencies, or to reduce load following the protocols of each utility program. Utility Distribution Companies and Metered Subsystems shall stand by for operating instructions from the CAISO for load curtailments, use of Interruptible Loads and requests Out-of-Market (OOM) and Emergency Energy from all available sources. For more information, view the CAISO System Emergency fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. Notice issued at: 09/06/2022 17:26

Grid Emergencies Record For 2022

Date	Day	Region	Time Frame	AWE Event	Reason
9/6/2022	Tuesday	ISO	09/06/2022 12:00 through 09/06/2022 22:00	RMO	CAISO Grid Restricted Maintenance Operations [202202643] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 09/06/2022 12:00 through 09/06/2022 22:00. Reason: The ISO is anticipating high loads and temperatures across the |CAISO Grid. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 08/29/2022 11:43

Grid Emergencies Record For 2022

Date	Day	Region	Time Frame	AWE Event	Reason
9/7/2022	Wednesday	ISO	09/07/2022 16:00 through 09/07/2022 21:00	EEA Watch	The California ISO has issued an Energy Emergency Alert (EEA) Watch Notice for the CAISO Grid, effective 09/07/2022 16:00 through 09/07/2022 21:00. Reason: The ISO is anticipating high loads and temperatures across the ||CAISO Grid. CAISO is forecasting an energy deficiency, with all available resources in use or forecasted to be in use, for the specified time period. Conservation efforts are encouraged during this time, and energy market participants are encouraged to offer additional supplemental energy and ancillary service bids. During this time, participating customers may be directed by utilities to use generators approved for emergencies, or to reduce load following the protocols of each utility's programs. For more information, view the CAISO System Emergency fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. Notice issued at: 09/06/2022 14:35
9/7/2022	Wednesday	ISO	September 7 at 4:00 PM to September 7 at 9:00 PM	Flex Alert	The California ISO has issued a Flex Alert for the CAISO Grid effective Wednesday, September 7, 2022. Californians are urged to conserve electricity from September 7 at 4:00 PM to September 7 at 9:00 PM to avoid power disruptions. Visit our News webpage at: http://www.caiso.com/about/Pages/News/default.aspx for a news release and more information on grid conditions.

Grid Emergencies Record For 2022

Date	Day	Region	Time Frame	AWE Event	Reason
9/7/2022	Wednesday	ISO	09/07/2022 16:00 through 09/07/2022 21:00	EEA1	The California ISO has issued an Energy Emergency Alert (EEA) 1 Notice for the CAISO Grid, effective 09/07/2022 16:00 through 09/07/2022 21:00. Reason: The ISO is anticipating high loads and temperatures across the |CAISO Grid. CAISO is forecasting an energy deficiency, with all available resources in use or forecasted to be in use, for the specified time period. Conservation efforts are encouraged during this time, and energy market participants are encouraged to offer additional supplemental energy and ancillary service bids. During this time, participating customers may be directed by utilities to use generators approved for emergencies, or to reduce load following the protocols of each utility's programs. For more information, view the CAISO System Emergency fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. Notice issued at: 09/07/2022 10:05

Grid Emergencies Record For 2022

Date	Day	Region	Time Frame	AWE Event	Reason
9/7/2022	Wednesday	ISO	09/07/2022 16:00 through 09/07/2022 21:00	EEA2	CAISO EEA 2 NOTICE [202202705] The California ISO has issued an Energy Emergency Alert (EEA) 2 Notice for the CAISO Grid, effective 09/07/2022 16:00 through 09/07/2022 21:00. Reason: The ISO is anticipating high loads and temperatures across the |CAISO Grid. CAISO is forecasting an energy deficiency, with all available resources in use or forecasted to be in use, for the specified time period. Conservation efforts are encouraged during this time, and energy market participants are encouraged to offer additional supplemental energy and ancillary service bids. During this time, participating customers may be directed by utilities to use generators approved for emergencies, or to reduce load following the protocols of each utility's programs. To preserve grid reliability, CAISO dispatch of emergency demand response programs may be necessary during this time. Subsequently, CAISO may request Utility Distribution Companies and Metered Subsystems to voluntarily reduce electricity use. For more information, view the CAISO System Emergency fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs.

Grid Emergencies Record For 2022

Date	Day	Region	Time Frame	AWE Event	Reason
	Wednesday	ISO	09/07/2022 20:11 through 09/07/2022 20:30	EEA2	CAISO EEA 2 NOTICE [202202710] The California ISO has issued an Energy Emergency Alert (EEA) 2 Notice for the CAISO Grid, effective 09/07/2022 20:11 through 09/07/2022 20:30. Reason: The ISO is anticipating high loads and temperatures across t|he CAISO Grid. CAISO is forecasting an energy deficiency, with all available resources in use or forecasted to be in use, for the specified time period. Conservation efforts are encouraged during this time, and energy market participants are encouraged to offer additional supplemental energy and ancillary service bids. During this time, participating customers may be directed by utilities to use generators approved for emergencies, or to reduce load following the protocols of each utility's programs. To preserve grid reliability, CAISO dispatch of emergency demand response programs may be necessary during this time. Subsequently, CAISO may request Utility Distribution Companies and Metered Subsystems to voluntarily reduce electricity use. For more information, view the CAISO System Emergency fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. This notice supersedes notice 202202705 CAISO EEA 2 Notice issued 09/07/2022 13:20

Grid Emergencies Record For 2022

Date	Day	Region	Time Frame	AWE Event	Reason
9/7/2022		Northern CA	09/07/2022 15:25 through 09/07/2022 22:00	Transmission Emergency	Northern CA Region TRANSMISSION EMERGENCY Notice [202202706] The California ISO hereby issues a Northern CA Region TRANSMISSION EMERGENCY Notice effective 09/07/2022 15:25 through 09/07/2022 22:00 based on conditions as of 09/07/2022 15:25. Reason: Emergency generation needed to relieve overloads in the ||Palermo area Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf) for additional detail. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 09/07/2022 15:25
9/7/2022	Wednesday	ISO	09/07/2022 12:00 through 09/07/2022 22:00	RMO	CAISO Grid Restricted Maintenance Operations [202202657] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 09/07/2022 12:00 through 09/07/2022 22:00. Reason: The ISO is anticipating high loads and temperatures across the |CAISO Grid. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 09/02/2022 12:04

Grid Emergencies Record For 2022

Date	Day	Region	Time Frame	AWE Event	Reason
9/8/2022	Thursday	ISO	September 8 at 3:00 PM to September 8 at 10:00 PM	Flex Alert	The California ISO has issued a Flex Alert for the CAISO Grid effective Thursday, September 8, 2022. Californians are urged to conserve electricity from September 8 at 3:00 PM to September 8 at 10:00 PM to avoid power disruptions. Visit our News webpage at: http://www.caiso.com/about/Pages/News/default.aspx for a news release and more information on grid conditions.
9/8/2022	Thursday	ISO	09/08/2022 15:00 through 09/08/2022 22:00	EEA Watch	The California ISO has issued an Energy Emergency Alert (EEA) Watch Notice for the CAISO Grid, effective 09/08/2022 15:00 through 09/08/2022 22:00. Reason: The ISO is anticipating high loads and temperatures across the |CAISO Grid. CAISO is forecasting an energy deficiency, with all available resources in use or forecasted to be in use, for the specified time period. Conservation efforts are encouraged during this time, and energy market participants are encouraged to offer additional supplemental energy and ancillary service bids. During this time, participating customers may be directed by utilities to use generators approved for emergencies, or to reduce load following the protocols of each utility's programs. For more information, view the CAISO System Emergency fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. Notice issued at: 09/07/2022 16:27

Grid Emergencies Record For 2022

Date	Day	Region	Time Frame	AWE Event	Reason
9/8/2022	Thursday	ISO	09/08/2022 15:00 through 09/08/2022 21:00	EEA1	The California ISO has issued an Energy Emergency Alert (EEA) 1 Notice for the CAISO Grid, effective 09/08/2022 15:00 through 09/08/2022 21:00. Reason: The ISO is anticipating high loads and temperatures across the |CAISO Grid. CAISO is forecasting an energy deficiency, with all available resources in use or forecasted to be in use, for the specified time period. Conservation efforts are encouraged during this time, and energy market participants are encouraged to offer additional supplemental energy and ancillary service bids. During this time, participating customers may be directed by utilities to use generators approved for emergencies, or to reduce load following the protocols of each utility's programs. For more information, view the CAISO System Emergency fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. Notice issued at: 09/08/2022 09:38

Grid Emergencies Record For 2022

Date	Day	Region	Time Frame	AWE Event	Reason
9/8/2022	Thursday	ISO	09/08/2022 12:00 through 09/08/2022 22:00	RMO	CAISO Grid Restricted Maintenance Operations [202202658] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 09/08/2022 12:00 through 09/08/2022 22:00. Reason: The ISO is anticipating high loads and temperatures across the |CAISO Grid. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 09/02/2022 12:05

Grid Emergencies Record For 2022

Date	Day	Region	Time Frame	AWE Event	Reason
9/8/2022	Thursday	ISO	09/08/2022 16:00 through 09/08/2022 21:00	EEA2	The California ISO has issued an Energy Emergency Alert (EEA) 2 Notice for the CAISO Grid, effective 09/08/2022 16:00 through 09/08/2022 21:00. Reason: The ISO is anticipating high loads and temperatures across t|he CAISO Grid. CAISO is forecasting an energy deficiency, with all available resources in use or forecasted to be in use, for the specified time period. Conservation efforts are encouraged during this time, and energy market participants are encouraged to offer additional supplemental energy and ancillary service bids. During this time, participating customers may be directed by utilities to use generators approved for emergencies, or to reduce load following the protocols of each utility's programs. To preserve grid reliability, CAISO dispatch of emergency demand response programs may be necessary during this time. Subsequently, CAISO may request Utility Distribution Companies and Metered Subsystems to voluntarily reduce electricity use. For more information, view the CAISO System Emergency fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. Notice issued at: 09/08/2022 13:41

Grid Emergencies Record For 2022

Date	Day	Region	Time Frame	AWE Event	Reason
9/8/2022	Thursday	Northern CA	09/08/2022 14:49 through 09/08/2022 21:00	Transmission Emergency	Northern CA Region TRANSMISSION EMERGENCY Notice [202202718] The California ISO hereby issues a Northern CA Region TRANSMISSION EMERGENCY Notice effective 09/08/2022 14:49 through 09/08/2022 21:00 based on conditions as of 09/08/2022 14:55. Reason: Local area contingency mitigation in the Palermo area. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf) for additional detail. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 09/08/2022 14:55
9/9/2022	Friday	ISO	09/09/2022 12:00 through 09/09/2022 22:00	RMO	The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 09/09/2022 12:00 through 09/09/2022 22:00. Reason: The ISO is anticipating high loads and temperatures across the |CAISO Grid. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 09/06/2022 08:47

Grid Emergencies Record For 2022

Date	Day	Region	Time Frame	AWE Event	Reason
9/9/2022	Friday	ISO	09/09/2022 17:00 through 09/09/2022 18:00	EEA Watch	The California ISO has issued an Energy Emergency Alert (EEA) Watch Notice for the CAISO Grid, effective 09/09/2022 17:00 through 09/09/2022 18:00. Reason: The ISO is anticipating high loads and temperatures across the |CAISO Grid. CAISO is forecasting an energy deficiency, with all available resources in use or forecasted to be in use, for the specified time period. Conservation efforts are encouraged during this time, and energy market participants are encouraged to offer additional supplemental energy and ancillary service bids. During this time, participating customers may be directed by utilities to use generators approved for emergencies, or to reduce load following the protocols of each utility's programs. For more information, view the CAISO System Emergency fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. Notice issued at: 09/08/2022 15:15
9/9/2022	Friday	ISO	September 9 at 4:00 PM to September 9 at 9:00 PM	Flex Alert	The California ISO has issued a Flex Alert for the CAISO Grid effective Friday, September 9, 2022. Californians are urged to conserve electricity from September 9 at 4:00 PM to September 9 at 9:00 PM to avoid power disruptions. Visit our News webpage at: http://www.caiso.com/about/Pages/News/default.aspx for a news release and more information on grid conditions.

Grid Emergencies Record For 2022

Date	Day	Region	Time Frame	AWE Event	Reason
9/9/2022	Friday	ISO	09/09/2022 16:00 through 09/09/2022 20:00	EEA1	The California ISO has issued an Energy Emergency Alert (EEA) 1 Notice for the CAISO Grid, effective 09/09/2022 16:00 through 09/09/2022 20:00. Reason: The ISO is anticipating high loads and temperatures across the |CAISO Grid. CAISO is forecasting an energy deficiency, with all available resources in use or forecasted to be in use, for the specified time period. Conservation efforts are encouraged during this time, and energy market participants are encouraged to offer additional supplemental energy and ancillary service bids. During this time, participating customers may be directed by utilities to use generators approved for emergencies, or to reduce load following the protocols of each utility's programs. For more information, view the CAISO System Emergency fact sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf). Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and contact local electric utilities for details about their respective load reduction programs. Notice issued at: 09/09/2022 09:41

Grid Emergencies Record For 2022

Date	Day	Region	Time Frame	AWE Event	Reason
11/1/2022	Tuesday	Northern CA	11/01/2022 12:56 through 11/01/2022 23:59	Transmission Emergency	Northern CA Region TRANSMISSION EMERGENCY Notice [202202734] The California ISO hereby issues a Northern CA Region TRANSMISSION EMERGENCY Notice effective 11/01/2022 12:56 through 11/01/2022 23:59 based on conditions as of 11/01/2022 13:01. Reason: CAISO is declaring A transmission emergency for the Humboldt |Area. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf) for additional detail. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 11/01/2022 13:01
11/2/2022	Wednesday	Northern CA	11/02/2022 00:00 through 11/02/2022 04:00	Transmission Emergency	Northern CA Region TRANSMISSION EMERGENCY Notice [202202736] The California ISO hereby issues a Northern CA Region TRANSMISSION EMERGENCY Notice effective 11/02/2022 00:00 through 11/02/2022 04:00 based on conditions as of 11/02/2022 00:06. Reason: CAISO is declaring a transmission emergency for the Humboldt ||Area Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf) for additional detail. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 11/02/2022 00:06

Grid Emergencies Record For 2022

Date	Day	Region	Time Frame	AWE Event	Reason
12/10/2022	Saturday	Northern CA	12/10/2022 09:15 through 12/11/2022 00:18	Transmission Emergency	Northern CA Region TRANSMISSION EMERGENCY Notice [202202740] The California ISO hereby issues a Northern CA Region TRANSMISSION EMERGENCY Notice effective 12/10/2022 09:15 through 12/11/2022 16:00 based on conditions as of 12/10/2022 09:28. Reason: CAISO is declaring a Transmission Emergency in the Humboldt |area only due to weather and loss of key elements. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf) for additional detail. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 12/10/2022 09:28 CAncellation notice issued Notice issued at: 12/11/2022 00:18
12/20/2022	Tuesday	Northern CA	12/20/2022 03:21 through 12/21/2022 17:00 (12.20,2022)	Transmission Emergency	Northern CA Region TRANSMISSION EMERGENCY Notice [202202744] The California ISO hereby issues a Northern CA Region TRANSMISSION EMERGENCY Notice effective 12/20/2022 03:21 through 12/21/2022 17:00 based on conditions as of 12/20/2022 03:25. Reason: Transmission Emergency in the Humboldt area due to earthquake. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf) for additional detail. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 12/20/2022 03:25

Grid Emergencies Record For 2022

Date	Day	Region	Time Frame	AWE Event	Reason
12/20/2022	Tuesday	Northern CA	12/20/2022 03:21 through 12/21/2022 17:00 (12.21.2022)	Transmission Emergency	Northern CA Region TRANSMISSION EMERGENCY Notice [202202744] The California ISO hereby issues a Northern CA Region TRANSMISSION EMERGENCY Notice effective 12/20/2022 03:21 through 12/21/2022 17:00 based on conditions as of 12/20/2022 03:25. Reason: Transmission Emergency in the Humboldt area due to earthquake. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/Emergency-Notifications-Fact-Sheet.pdf) for additional detail. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 12/20/2022 03:25

Alert, Warning, and Emergencies Record For 2021 - April 2022

AWE Declarations

Date	Day	Region	Time Frame	AWE Event	Reason
2/12/2021	Friday	Southern CA	02/13/2021 06:00 through 02/15/2021 22:00 (2.13.2021)	RMO	Southern CA Region Restricted Maintenance Operations [202102512] The California ISO is declaring Southern CA Region RESTRICTED MAINTENANCE OPERATION for the period from 02/13/2021 06:00 through 02/15/2021 22:00. Reason: Due to extreme weather and potential impact to gas supply Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions, which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 02/12/2021 14:14

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
2/12/2021	Friday	Southern CA	02/13/2021 06:00 through 02/15/2021 22:00 (2.14.2021)	RMO	Southern CA Region Restricted Maintenance Operations [202102512] The California ISO is declaring Southern CA Region RESTRICTED MAINTENANCE OPERATION for the period from 02/13/2021 06:00 through 02/15/2021 22:00. Reason: Due to extreme weather and potential impact to gas supply Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions, which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 02/12/2021 14:14

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
2/12/2021	Friday	Southern CA	02/13/2021 06:00 through 02/15/2021 22:00 (2.15.2021)	RMO	Southern CA Region Restricted Maintenance Operations [202102512] The California ISO is declaring Southern CA Region RESTRICTED MAINTENANCE OPERATION for the period from 02/13/2021 06:00 through 02/15/2021 22:00. Reason: Due to extreme weather and potential impact to gas supply Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions, which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 02/12/2021 14:14

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
2/14/2021	Sunday	Southern CA	02/14/2021 14:43 through 02/17/2021 22:00 (2.16.2021)	RMO	Southern CA Region Restricted Maintenance Operations [202102513] The California ISO is declaring Southern CA Region RESTRICTED MAINTENANCE OPERATION for the period from 02/14/2021 14:43 through 02/17/2021 22:00. Reason: Due to extreme weather and potential impact to gas supply Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions, which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. This notice supersedes notice 202102512 Southern CA Region Restricted Maintenance Operations Notice issued 02/12/2021 14:14 Notice issued at: 02/14/2021 14:44

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
2/14/2021	Sunday	Southern CA	02/14/2021 14:43 through 02/17/2021 22:00 (2.17.2021)	RMO	Southern CA Region Restricted Maintenance Operations [202102513] The California ISO is declaring Southern CA Region RESTRICTED MAINTENANCE OPERATION for the period from 02/14/2021 14:43 through 02/17/2021 22:00. Reason: Due to extreme weather and potential impact to gas supply Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions, which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. This notice supersedes notice 202102512 Southern CA Region Restricted Maintenance Operations Notice issued 02/12/2021 14:14 Notice issued at: 02/14/2021 14:44

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
2/18/2021	Thursday	Southern CA	02/18/2021 14:58 through 02/20/2021 22:00 (2.18.2021)	RMO	Southern CA Region Restricted Maintenance Operations [202102517] The California ISO is declaring Southern CA Region RESTRICTED MAINTENANCE OPERATION for the period from 02/18/2021 14:58 through 02/20/2021 22:00. Reason: Due to extreme weather and potential impact to gas supply. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions, which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. This notice supersedes notice 202102516 Southern CA Region Restricted Maintenance Operations Notice issued 02/16/2021 15:02 Notice issued at: 02/18/2021 14:59

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
2/18/2021	Thursday	Southern CA	02/18/2021 14:58 through 02/20/2021 22:00 (2.19.2021)	RMO	Southern CA Region Restricted Maintenance Operations [202102517] The California ISO is declaring Southern CA Region RESTRICTED MAINTENANCE OPERATION for the period from 02/18/2021 14:58 through 02/20/2021 22:00. Reason: Due to extreme weather and potential impact to gas supply. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions, which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. This notice supersedes notice 202102516 Southern CA Region Restricted Maintenance Operations Notice issued 02/16/2021 15:02 Notice issued at: 02/18/2021 14:59

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
2/18/2021	Thursday	Southern CA	02/18/2021 14:58 through 02/20/2021 22:00 (2.20.2021)	RMO	Southern CA Region Restricted Maintenance Operations [202102517] The California ISO is declaring Southern CA Region RESTRICTED MAINTENANCE OPERATION for the period from 02/18/2021 14:58 through 02/20/2021 22:00. Reason: Due to extreme weather and potential impact to gas supply. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions, which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. This notice supersedes notice 202102516 Southern CA Region Restricted Maintenance Operations Notice issued 02/16/2021 15:02 Notice issued at: 02/18/2021 14:59

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
6/15/2021	Tuesday	ISO	06/15/2021 12:00 through 06/15/2021 22:00	RMO	CAISO Grid Restricted Maintenance Operations [202102530] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 06/15/2021 12:00 through 06/15/2021 22:00. Reason: The ISO is anticipating high loads and temperatures across ||the CAISO Grid. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 06/11/2021 13:55

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
6/16/2021	Wednesday	ISO	06/16/2021 12:00 through 06/16/2021 22:00	RMO	CAISO Grid Restricted Maintenance Operations [202102527] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 06/16/2021 12:00 through 06/16/2021 22:00. Reason: The ISO is anticipating high loads and temperatures across ||the CAISO Grid. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 06/11/2021 11:00

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
6/17/2021	Thursday	ISO	06/17/2021 12:00 through 06/17/2021 22:00	RMO	CAISO Grid Restricted Maintenance Operations [202102528] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 06/17/2021 12:00 through 06/17/2021 22:00. Reason: The ISO is anticipating high loads and temperatures across |the CAISO Grid. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 06/11/2021 11:02
6/17/2021	Thursday	ISO	06/17/2021 17:00 through 06/17/2021 22:00	Flex Alert	The California ISO has issued a Flex Alert for the CAISO Grid effective Thursday, June 17, 2021. Californians are urged to conserve electricity from June 17 at 5:00 PM to June 17 at 10:00 PM to avoid power disruptions. A news release is pending / has been issued. For media inquiries, email ISOMedia@caiso.com.

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
6/17/2021	Thursday	ISO	06/17/2021 19:00 through 06/17/2021 21:00	Warning	CAISO Grid WARNING NOTICE [202102535] The California ISO hereby issues a CAISO Grid WARNING Notice, effective 06/17/2021 19:00 through 06/17/2021 21:00. Reason: Energy deficiency. CAISO is forecasting a resources deficiency with all available resources in use or forecasted to be in use for the specified time period. If not already declared, CAISO may request the Reliability Coordinator to declare an EEA-1. If the Emergency Demand Response Programs are dispatched, then CAISO may request the Reliability Coordinator to declare an EEA-2. Conservation efforts are encouraged for the time period specified in this notice. Energy Market Participants are encouraged to offer additional Supplemental Energy and Ancillary Service bids. Refer to the CAISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 06/17/2021 13:22

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
6/18/2021	Friday	ISO	06/18/2021 12:00 through 06/18/2021 22:00	RMO	CAISO Grid Restricted Maintenance Operations [202102529] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 06/18/2021 12:00 through 06/18/2021 22:00. Reason: The ISO is anticipating high loads and temperatures across |the CAISO Grid. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. CAISO Grid Restricted Maintenance Operations [202102529] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 06/18/2021 12:00 through 06/18/2021 22:00. Reason: The ISO is anticipating high loads and temperatures across |the CAISO Grid. Refer to the ISO System Emergency Fact Sheet
6/18/2021	Friday	ISO	06/18/2021 18:00 through 06/18/2021 21:00	Flex Alert	The California ISO has issued a Flex Alert for the CAISO Grid effective Friday, June 18, 2021. Californians are urged to conserve electricity from June 18 at 6:00 PM to June 18 at 9:00 PM to avoid power disruptions. A news release is pending / has been issued. For media inquiries, email ISOMedia@caiso.com.
7/9/2021	Friday	ISO	07/09/2021 16:00 through 07/09/2021 21:00	Flex Alert	The California ISO has issued a Flex Alert for the CAISO Grid effective Friday, July 9, 2021. Californians are urged to conserve electricity from July 9 at 4:00 PM to July 9 at 9:00 PM to avoid power disruptions. A news release is pending. For media inquiries, email ISOMedia@caiso.com.

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
7/9/2021	Friday	ISO	07/09/2021 17:00 through 07/09/2021 22:00	Warning	CAISO Grid WARNING NOTICE [202102544] The California ISO hereby issues a CAISO Grid WARNING Notice, effective 07/09/2021 17:00 through 07/09/2021 22:00. Reason: Due to loss of resources and fire threat to the transmission| system. CAISO is forecasting a resources deficiency with all available resources in use or forecasted to be in use for the specified time period. If not already declared, CAISO may request the Reliability Coordinator to declare an EEA-1. If the Emergency Demand Response Programs are dispatched, then CAISO may request the Reliability Coordinator to declare an EEA-2. Conservation efforts are encouraged for the time period specified in this notice. Energy Market Participants are encouraged to offer additional Supplemental Energy and Ancillary Service bids. Refer to the CAISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 07/09/2021 14:05

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
7/9/2021	Friday	ISO	07/09/2021 18:32 through 07/09/2021 21:00	Stage 2	CAISO Grid Stage 2 System Emergency Notice [202102546] The California ISO hereby issues a CAISO Grid Stage 2 System Emergency Notice effective 07/09/2021 18:32 through 07/09/2021 21:00. Reason: Due to loss of resources and transmission facilities due to |fire. CAISO is forecasting an energy deficiency with all available resources in use for the specified time period. To preserve grid reliability, CAISO will take actions in 4420 sect 3.5.4 and request the Reliability Coordinator declare an EEA-3. CAISO will be calling on Utility Distribution Companies to implement their Interruptible Loads and requests maximum conservation. Energy Market Participants are encouraged to offer additional Supplemental Energy and Ancillary Service bids. Refer to the CAISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 07/09/2021 18:48

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
7/10/2021	Saturday	ISO	07/10/2021 06:00 through 07/10/2021 22:00	RMO	CAISO Grid Restricted Maintenance Operations [202102543] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 07/10/2021 06:00 through 07/10/2021 22:00. Reason: The CAISO is anticipating high loads and temperatures across| the CAISO Grid. ||**CAISO will contact Transmission Operators and Scheduling C|oordinators if scheduled work needs to be postponed or modif|ied.** Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 07/09/2021 11:28
7/10/2021	Saturday	ISO	07/10/2021 16:00 through 07/10/2021 21:00	Flex Alert	The California ISO has issued a Flex Alert for the CAISO Grid effective Saturday, July 10, 2021. Californians are urged to conserve electricity from July 10 at 4:00 PM to July 10 at 9:00 PM to avoid power disruptions. A news release is pending / has been issued. For media inquiries, email ISOMedia@caiso.com.

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
7/10/2021	Saturday	ISO	07/10/2021 17:00 through 07/10/2021 21:00	Warning	CAISO Grid WARNING NOTICE [202102550] The California ISO hereby issues a CAISO Grid WARNING Notice, effective 07/10/2021 17:00 through 07/10/2021 21:00. Reason: CAISO has lost resources due to fire and is anticipating hig|h loads. CAISO is forecasting a resources deficiency with all available resources in use or forecasted to be in use for the specified time period. If not already declared, CAISO may request the Reliability Coordinator to declare an EEA-1. If the Emergency Demand Response Programs are dispatched, then CAISO may request the Reliability Coordinator to declare an EEA-2. Conservation efforts are encouraged for the time period specified in this notice. Energy Market Participants are encouraged to offer additional Supplemental Energy and Ancillary Service bids. Refer to the CAISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 07/10/2021 12:33

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
7/12/2021	Monday	ISO	07/12/2021 16:00 through 07/12/2021 21:00	RMO	CAISO Grid Restricted Maintenance Operations [202102554] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 07/12/2021 16:00 through 07/12/2021 21:00. Reason: The CAISO is anticipating high loads and temperatures across| the CAISO Grid.|**CAISO will contact Transmission Operators and Scheduling c|oordinators if scheduled work needs to be postponed or modif|ied.** Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 07/11/2021 08:55
7/12/2021	Monday	ISO	2021-07-12 16:00:00 through 2021-07-12 21:00:00	Flex Alert	The California ISO has issued a Flex Alert for the CAISO Grid effective Monday, July 12, 2021. Californians are urged to conserve electricity from July 12 at 4:00 PM to July 12 at 9:00 PM to avoid power disruptions. A news release is pending / has been issued. For media inquiries, email ISOMedia@caiso.com.

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
7/23/2021	Friday	ISO	07/27/2021 12:00 through 07/28/2021 21:00 (7.27.2021)	RMO	CAISO Grid Restricted Maintenance Operations [202102558] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 07/27/2021 12:00 through 07/28/2021 21:00. Reason: The ISO is anticipating high loads and temperatures across t|he CAISO Grid. Transmission Operators and Generation Operato|rs will be contacted if any currently scheduled outages need| to be cancelled or revised. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 07/23/2021 12:34

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
7/23/2021	Friday	ISO	07/27/2021 12:00 through 07/28/2021 21:00 (7.28.2021)	RMO	CAISO Grid Restricted Maintenance Operations [202102558] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 07/27/2021 12:00 through 07/28/2021 21:00. Reason: The ISO is anticipating high loads and temperatures across t|he CAISO Grid. Transmission Operators and Generation Operato|rs will be contacted if any currently scheduled outages need| to be cancelled or revised. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 07/23/2021 12:34

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
7/26/2021	Monday	ISO	07/29/2021 12:00 through 07/29/2021 21:00	RMO	CAISO Grid Restricted Maintenance Operations [202102559] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 07/29/2021 12:00 through 07/29/2021 21:00. Reason: The ISO is anticipating high loads and temperatures across |the CAISO Grid. Transmission Operators and Generation |Operators will be contacted if any currently scheduled |outages needs to be cancelled or revised. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 07/26/2021 11:08
7/28/2021	Wednesday	ISO	07/28/2021 16:00 through 07/28/2021 21:00	Flex Alert	NOTICE 202102560: Flex Alert STATEWIDE 07/28/2021 16:00 through 07/28/2021 21:00 The California ISO has issued a Flex Alert for the CAISO Grid effective Wednesday, July 28, 2021. Californians are urged to conserve electricity from July 28 at 4:00 PM to July 28 at 9:00 PM to avoid power disruptions.

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
7/29/2021	Thursday	ISO	07/29/2021 18:00 through 07/29/2021 21:00	Warning	CAISO Grid WARNING NOTICE [202102563] The California ISO hereby issues a CAISO Grid WARNING Notice, effective 07/29/2021 18:00 through 07/29/2021 21:00. Reason: Forecasting an energy deficiency. CAISO is forecasting a resources deficiency with all available resources in use or forecasted to be in use for the specified time period. If not already declared, CAISO may request the Reliability Coordinator to declare an EEA-1. If the Emergency Demand Response Programs are dispatched, then CAISO may request the Reliability Coordinator to declare an EEA-2. Conservation efforts are encouraged for the time period specified in this notice. Energy Market Participants are encouraged to offer additional Supplemental Energy and Ancillary Service bids. Refer to the CAISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 07/29/2021 17:04

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
8/10/2021	Tuesday	ISO	08/11/2021 12:00 through 08/11/2021 22:00	RMO	CAISO Grid Restricted Maintenance Operations [202102566] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 08/11/2021 12:00 through 08/11/2021 22:00. Reason: The CAISO is anticipating high loads and temperatures across| the CAISO Grid. CAISO will contact Transmission Operators a|nd Scheduling Coordinators if scheduled work needs to be pos|tponed or modified. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 08/10/2021 14:40

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
8/10/2021	Tuesday	ISO	08/12/2021 12:00 through 08/12/2021 22:00	RMO	CAISO Grid Restricted Maintenance Operations [202102567] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 08/12/2021 12:00 through 08/12/2021 22:00. Reason: The CAISO is anticipating high loads and temperatures across| the CAISO Grid. CAISO will contact Transmission Operators a|nd Scheduling Coordinators if scheduled work needs to be pos|tponed or modified. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 08/10/2021 14:42

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
8/10/2021	Tuesday	ISO	08/13/2021 12:00 through 08/13/2021 22:00	RMO	CAISO Grid Restricted Maintenance Operations [202102568] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 08/13/2021 12:00 through 08/13/2021 22:00. Reason: The CAISO is anticipating high loads and temperatures across| the CAISO Grid. CAISO will contact Transmission Operators a|nd Scheduling Coordinators if scheduled work needs to be pos|tponed or modified. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 08/10/2021 14:47

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
8/12/2021	Thursday	ISO	08/16/2021 12:00 through 08/16/2021 22:00	RMO	CAISO Grid Restricted Maintenance Operations [202102570] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 08/16/2021 12:00 through 08/16/2021 22:00. Reason: The CAISO is anticipating high loads and temperatures |across the CAISO Grid. CAISO will contact Transmission |Operators and Scheduling Coordinators if scheduled work |needs to be postponed or modified. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 08/12/2021 13:58

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
9/7/2021	Tuesday	ISO	09/08/2021 12:00 through 09/08/2021 21:00	RMO	CAISO Grid Restricted Maintenance Operations [202102574] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 09/08/2021 12:00 through 09/08/2021 21:00. Reason: The ISO is anticipating high loads and temperatures across t|he CAISO Grid and gas supply concerns in Southern CA. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 09/07/2021 16:33 CAISO Grid Restricted Maintenance Operations [202102574] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 09/08/2021 12:00 through 09/08/2021 21:00.
9/7/2021	Tuesday	ISO	09/08/2021 16:00 through 09/08/2021 21:00	Flex Alert	The California ISO has issued a Flex Alert for the CAISO Grid effective Wednesday, September 8, 2021. Californians are urged to conserve electricity from September 8 at 4:00 PM to September 8 at 9:00 PM to avoid power disruptions. Visit our News webpage at: http://www.caiso.com/about/Pages/News/default.aspx for a news release and more information on grid conditions.

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
9/8/2021	Wednesday	ISO	09/09/2021 12:00 through 09/09/2021 21:00	RMO	CAISO Grid Restricted Maintenance Operations [202102576] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 09/09/2021 12:00 through 09/09/2021 21:00. Reason: The ISO is anticipating high loads and temperatures across t|he CAISO Grid and gas supply concerns in Southern CA. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 09/08/2021 08:50
9/8/2021	Wednesday	ISO	09/09/2021 16:00 through 09/09/2021 21:00	Flex Alert	The California ISO has issued a Flex Alert for the CAISO Grid effective Thursday, September 9, 2021. Californians are urged to conserve electricity from September 9 at 4:00 PM to September 9 at 9:00 PM to avoid power disruptions. Visit our News webpage at: http://www.caiso.com/about/Pages/News/default.aspx for a news release and more information on grid conditions.

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
9/9/2021	Thursday	ISO	09/10/2021 12:00 through 09/10/2021 21:00	RMO	CAISO Grid Restricted Maintenance Operations [202102580] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 09/10/2021 12:00 through 09/10/2021 21:00. Reason: The ISO is anticipating high loads and temperatures across |the CAISO Grid. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 09/09/2021 08:23

Alert, Warning, and Emergencies Record For 2020

AWE Declarations

Date	Day	Region	Time Frame	AWE Event	Reason
1/17/2020	Friday	Northern CA	01/17/2020 06:01 through 01/17/2020 23:59	Transmission Emergency	Northern CA Region TRANSMISSION EMERGENCY Notice [202002406] The California ISO hereby issues a Northern CA Region TRANSMISSION EMERGENCY Notice effective 01/17/2020 06:01 through 01/17/2020 23:59 based on conditions as of 01/17/2020 06:06. Reason: Due to weather conditions in Humboldt Area. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 01/17/2020 06:06

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
8/12/2020	Wednesday	ISO	08/14/2020 06:00 through 08/17/2020 22:00 (8.14.2020)	RMO	CAISO Grid Restricted Maintenance Operations [202002416] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 08/14/2020 06:00 through 08/17/2020 22:00. Reason: The ISO is anticipating high loads and temperatures across |the CAISO Grid. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 08/12/2020 06:55

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
8/12/2020	Wednesday	ISO	08/14/2020 06:00 through 08/17/2020 22:00 (8.15.2020)	RMO	CAISO Grid Restricted Maintenance Operations [202002416] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 08/14/2020 06:00 through 08/17/2020 22:00. Reason: The ISO is anticipating high loads and temperatures across |the CAISO Grid. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 08/12/2020 06:55

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
8/12/2020	Wednesday	ISO	08/14/2020 06:00 through 08/17/2020 22:00 (8.16.2020)	RMO	CAISO Grid Restricted Maintenance Operations [202002416] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 08/14/2020 06:00 through 08/17/2020 22:00. Reason: The ISO is anticipating high loads and temperatures across |the CAISO Grid. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 08/12/2020 06:55

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
8/12/2020	Wednesday	ISO	08/14/2020 06:00 through 08/17/2020 22:00 (8.17.2020)	RMO	CAISO Grid Restricted Maintenance Operations [202002416] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 08/14/2020 06:00 through 08/17/2020 22:00. Reason: The ISO is anticipating high loads and temperatures across |the CAISO Grid. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 08/12/2020 06:55

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
8/13/2020	Thursday	ISO	08/14/2020 17:00 through 08/14/2020 21:00	Alert	STATEWIDE ALERT NOTICE [202002418] The California ISO hereby issues a CAISO Grid ALERT Notice, effective 08/14/2020 17:00 through 08/14/2020 21:00. Reason: The CAISO is forecasting a possible system reserve deficienc|y between the hours of 1700-2100 and is requesting additiona|l Ancillary Service and energy bids. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Conservation efforts are encouraged for the time period specified in this notice. Energy Market Participants are encouraged to offer additional Supplemental Energy and Ancillary Service bids. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 08/13/2020 14:57
8/13/2020	Thursday	ISO	8/14/2020 15:00 to 8/14/2020 22:00	Flex Alert	The California ISO has issued a Flex Alert for the CAISO Grid effective Friday, August 14, 2020. Californians are urged to conserve electricity from August 14 at 3:00 PM to August 14 at 10:00 PM to avoid power disruptions. A news release has been issued. The ISO media hotline is (888)516-NEWS.

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
8/14/2020	Friday	ISO	08/14/2020 15:20 through 08/14/2020 21:00	Stage 2	CAISO Grid Stage 2 System Emergency Notice [202002423] The California ISO hereby issues a CAISO Grid Stage 2 System Emergency Notice effective 08/14/2020 15:20 through 08/14/2020 23:59. Reason: The CAISO has become reserve deficient and is taking steps to recover. |to recover. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. The ISO will be calling on UDC's to implement their Interruptible Loads* and requests maximum conservation. Energy Market Participants are encouraged to offer additional Supplemental Energy and Ancillary Service bids. Non-Spinning Reserve requirement cannot be maintained. If Non-Spinning Reserves deplete further, the ISO will declare a Stage 3 System Emergency and begin curtailing firm loads. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 08/14/2020 15:25 Cancellation issued at : 8/14/2020 21:00:00

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
8/14/2020	Friday	ISO	08/14/2020 at 18:36 through 08/14/2020 at 20:38	Stage 3	CAISO Grid STAGE 3 System Emergency Notice [202002424] The California ISO hereby issues a CAISO Grid Stage 3 System Emergency Notice effective 08/14/2020 at 18:36 through 08/14/2020 at 23:59. Reason: California ISO is Reserve Deficient. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. The ISO requires load curtailments, use of Interruptible Loads* and requests Out-of-Market (OOM) and Emergency Energy from all available sources. Maximum conservation efforts are requested. Spinning Reserves have depleted or are forecast to deplete to levels below minimum requirements. Load curtailments are required and will continue until such time as sufficient Spinning Reserves are available. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 08/14/2020 18:38 Cancellation issued at: 8/14/2020 20:38:00

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
8/14/2020	Friday	ISO	08/15/2020 17:00 through 08/15/2020 21:00	Alert	STATEWIDE ALERT NOTICE [202002422] The California ISO hereby issues a CAISO Grid ALERT Notice, effective 08/15/2020 17:00 through 08/15/2020 21:00. Reason: The CAISO is forecasting a possible system reserve deficienc|y between the hours of 1700-2100 and is requesting additiona|l Ancillary Service and energy bids. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Conservation efforts are encouraged for the time period specified in this notice. Energy Market Participants are encouraged to offer additional Supplemental Energy and Ancillary Service bids. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 08/14/2020 14:24

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
8/14/2020	Friday	ISO	08/14/2020 12:00 through 08/14/2020 23:59	Warning	CAISO Grid WARNING NOTICE [202002419] The California ISO hereby issues a CAISO Grid WARNING Notice, effective 08/14/2020 17:00 through 08/14/2020 21:00. Reason: The CISO is forecasting a possible system reserve deficiency| between the hours of 1700 – 2100 and is requesting addition|al Ancillary Service and energy bids. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Conservation efforts are encouraged for the time period specified in this notice. Energy Market Participants are encouraged to offer additional Supplemental Energy and Ancillary Service bids. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 08/14/2020 11:51

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
8/15/2020	Saturday	ISO	08/15/2020 18:15 through 08/15/2020 20:00	Stage 2	CAISO Grid Stage 2 System Emergency Notice [202002433] The California ISO hereby issues a CAISO Grid Stage 2 System Emergency Notice effective 08/15/2020 18:15 through 08/15/2020 23:59. Reason: High Temperatures and High Loads Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. The ISO will be calling on UDC's to implement their Interruptible Loads* and requests maximum conservation. Energy Market Participants are encouraged to offer additional Supplemental Energy and Ancillary Service bids. Non-Spinning Reserve requirement cannot be maintained. If Non-Spinning Reserves deplete further, the ISO will declare a Stage 3 System Emergency and begin curtailing firm loads. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 08/15/2020 18:16 Cancellation issued at:8/15/2020 20:00:00

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
8/15/2020	Saturday	ISO	08/15/2020 at 18:27 through 08/15/2020 at 18:48	Stage 3	CAISO Grid STAGE 3 System Emergency Notice [202002434] The California ISO hereby issues a CAISO Grid Stage 3 System Emergency Notice effective 08/15/2020 at 18:27 through 08/15/2020 at 23:59. Reason: California ISO is Reserve Deficient. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. The ISO requires load curtailments, use of Interruptible Loads* and requests Out-of-Market (OOM) and Emergency Energy from all available sources. Maximum conservation efforts are requested. Spinning Reserves have depleted or are forecast to deplete to levels below minimum requirements. Load curtailments are required and will continue until such time as sufficient Spinning Reserves are available. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 08/15/2020 18:28 Cancellation issued at: 8/15/2020 18:48:00

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
8/15/2020	Saturday	ISO	08/16/2020 17:00 through 08/16/2020 21:00	Alert	STATEWIDE ALERT NOTICE [202002432] The California ISO hereby issues a CAISO Grid ALERT Notice, effective 08/16/2020 17:00 through 08/16/2020 21:00. Reason: The CAISO is forecasting a possible system reserve deficienc|y between the hours of 1700-2100 and is requesting additiona|l Ancillary Service and energy bids. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Conservation efforts are encouraged for the time period specified in this notice. Energy Market Participants are encouraged to offer additional Supplemental Energy and Ancillary Service bids. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 08/15/2020 14:55

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
8/15/2020	Saturday	ISO	08/15/2020 12:00 through 08/15/2020 23:59	Warning	CAISO Grid WARNING NOTICE [202002431] The California ISO hereby issues a CAISO Grid WARNING Notice, effective 08/15/2020 12:00 through 08/15/2020 23:59. Reason: The CISO is forecasting a possible system reserve deficiency|| between the hours of 1700 – 2100 and is requesting additio|nal Ancillary Service and energy bids. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Conservation efforts are encouraged for the time period specified in this notice. Energy Market Participants are encouraged to offer additional Supplemental Energy and Ancillary Service bids. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 08/15/2020 12:26

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
8/16/2020	Sunday	ISO	08/16/2020 19:16 through 08/19/2020 22:00 (8.16.2020)	RMO	CAISO Grid Restricted Maintenance Operations [202002443] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 08/16/2020 19:16 through 08/19/2020 22:00. Reason: The ISO is anticipating high loads and temperatures across t|he CAISO Grid. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 08/16/2020 19:18

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
8/16/2020	Sunday	ISO	08/16/2020 19:16 through 08/19/2020 22:00 (8.17.2020)	RMO	CAISO Grid Restricted Maintenance Operations [202002443] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 08/16/2020 19:16 through 08/19/2020 22:00. Reason: The ISO is anticipating high loads and temperatures across t|he CAISO Grid. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 08/16/2020 19:18

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
8/16/2020	Sunday	ISO	08/16/2020 19:16 through 08/19/2020 22:00 (8.18.2020)	RMO	CAISO Grid Restricted Maintenance Operations [202002443] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 08/16/2020 19:16 through 08/19/2020 22:00. Reason: The ISO is anticipating high loads and temperatures across t|he CAISO Grid. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 08/16/2020 19:18

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
8/16/2020	Sunday	ISO	08/16/2020 19:16 through 08/19/2020 22:00 (8.19.2020)	RMO	CAISO Grid Restricted Maintenance Operations [202002443] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 08/16/2020 19:16 through 08/19/2020 22:00. Reason: The ISO is anticipating high loads and temperatures across t|he CAISO Grid. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 08/16/2020 19:18
8/16/2020	Sunday	ISO	8/16/2020 15:00 to 8/19/2020 22:00 (8.16.2020)	Flex Alert	The California ISO has issued a Flex Alert for the CAISO Grid effective Sunday, August 16, 2020. Californians are urged to conserve electricity from August 16 at 3:00 PM to August 19 at 10:00 PM to avoid power disruptions. A news release has been issued. The ISO media hotline is (888)516-NEWS.
8/16/2020	Sunday	ISO	8/16/2020 15:00 to 8/19/2020 22:00 (8.17.2020)	Flex Alert	The California ISO has issued a Flex Alert for the CAISO Grid effective Sunday, August 16, 2020. Californians are urged to conserve electricity from August 16 at 3:00 PM to August 19 at 10:00 PM to avoid power disruptions. A news release has been issued. The ISO media hotline is (888)516-NEWS.
8/16/2020	Sunday	ISO	8/16/2020 15:00 to 8/19/2020 22:00 (8.18.2020)	Flex Alert	The California ISO has issued a Flex Alert for the CAISO Grid effective Sunday, August 16, 2020. Californians are urged to conserve electricity from August 16 at 3:00 PM to August 19 at 10:00 PM to avoid power disruptions. A news release has been issued. The ISO media hotline is (888)516-NEWS.

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
8/16/2020	Sunday	ISO	8/16/2020 15:00 to 8/19/2020 22:00 (8.19.2020)	Flex Alert	The California ISO has issued a Flex Alert for the CAISO Grid effective Sunday, August 16, 2020. Californians are urged to conserve electricity from August 16 at 3:00 PM to August 19 at 10:00 PM to avoid power disruptions. A news release has been issued. The ISO media hotline is (888)516-NEWS.
8/16/2020	Sunday	ISO	08/17/2020 14:00 through 08/17/2020 21:30	Alert	STATEWIDE ALERT NOTICE [202002441] The California ISO hereby issues a CAISO Grid ALERT Notice, effective 08/17/2020 14:00 through 08/17/2020 22:00. Reason: The CAISO is forecasting a possible system reserve |deficiency between the hours of 1400-2200 and is requesting |additional Ancillary Services and energy bids. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Conservation efforts are encouraged for the time period specified in this notice. Energy Market Participants are encouraged to offer additional Supplemental Energy and Ancillary Service bids. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 08/16/2020 13:21 Cancellation notice issued at: 8/17/2020 21:30:00

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
8/16/2020	Sunday	ISO	08/16/2020 12:00 through 08/16/2020 23:59	Warning	CAISO Grid WARNING NOTICE [202002440] The California ISO hereby issues a CAISO Grid WARNING Notice, effective 08/16/2020 12:00 through 08/16/2020 23:59. Reason: The CISO is forecasting a possible system reserve deficiency|| between the hours of 1800 and 2000 and is requesting addit|i|onal Ancillary Service and energy bids. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Conservation efforts are encouraged for the time period specified in this notice. Energy Market Participants are encouraged to offer additional Supplemental Energy and Ancillary Service bids. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 08/16/2020 11:49

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
8/17/2020	Monday	ISO	08/17/2020 12:00 through 08/17/2020 21:00	Warning	CAISO Grid WARNING NOTICE [202002446] The California ISO hereby issues a CAISO Grid WARNING Notice, effective 08/17/2020 12:00 through 08/17/2020 23:59. Reason: The CAISO is forecasting a possible system reserve |deficiency between the hours of 1500 and 2200. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Conservation efforts are encouraged for the time period specified in this notice. Energy Market Participants are encouraged to offer additional Supplemental Energy and Ancillary Service bids. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 08/17/2020 11:59 Cancellation issued at: 8/17/2020 21:00:00

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
8/17/2020	Monday	ISO	08/17/2020 16:30 through 08/21/2020 22:00 (8.20.2020)	RMO	CAISO Grid Restricted Maintenance Operations [202002450] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 08/17/2020 16:30 through 08/21/2020 23:59. Reason: The ISO is anticipating high loads and temperatures across |the CAISO Grid. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. This notice supersedes notice 202002443 CAISO Grid Restricted Maintenance Operations Notice issued 08/16/2020 19:18 Notice issued at: 08/17/2020 16:10 Cancellation issued at: 8/17/2020 22:00:00

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
8/17/2020	Monday	ISO	08/17/2020 16:30 through 08/21/2020 22:00 (8.21.2020)	RMO	CAISO Grid Restricted Maintenance Operations [202002450] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 08/17/2020 16:30 through 08/21/2020 23:59. Reason: The ISO is anticipating high loads and temperatures across |the CAISO Grid. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. This notice supersedes notice 202002443 CAISO Grid Restricted Maintenance Operations Notice issued 08/16/2020 19:18 Notice issued at: 08/17/2020 16:10 Cancellation issued at: 8/17/2020 22:00:00

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
8/17/2020	Monday	ISO	08/17/2020 15:30 through 08/17/2020 19:30	Stage 2	CAISO Grid Stage 2 System Emergency Notice [202002449] The California ISO hereby issues a CAISO Grid Stage 2 System Emergency Notice effective 08/17/2020 15:30 through 08/17/2020 23:59. Reason: Resource deficiency Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. The ISO will be calling on UDC's to implement their Interruptible Loads* and requests maximum conservation. Energy Market Participants are encouraged to offer additional Supplemental Energy and Ancillary Service bids. Non-Spinning Reserve requirement cannot be maintained. If Non-Spinning Reserves deplete further, the ISO will declare a Stage 3 System Emergency and begin curtailing firm loads. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 08/17/2020 15:32 Cancellation notice issued: 8/17/2020 19:30

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
8/17/2020	Monday	ISO	08/18/2020 15:00 through 08/18/2020 20:45	Alert	STATEWIDE ALERT NOTICE [202002447] The California ISO hereby issues a CAISO Grid ALERT Notice, effective 08/18/2020 15:00 through 08/18/2020 22:00. Reason: The CAISO is forecasting a possible system reserve |deficiency between the hours of 1500-2200 and is requesting |additional Ancillary Services and energy bids. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Conservation efforts are encouraged for the time period specified in this notice. Energy Market Participants are encouraged to offer additional Supplemental Energy and Ancillary Service bids. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 08/17/2020 14:49 Cancellation issued at: 8/18/2020 20:45:00

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
8/18/2020	Tuesday	ISO	08/18/2020 11:30 through 08/18/2020 20:30	Warning	CAISO Grid WARNING NOTICE [202002458] The California ISO hereby issues a CAISO Grid WARNING Notice, effective 08/18/2020 11:30 through 08/18/2020 23:59. Reason: Resource deficiency Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Conservation efforts are encouraged for the time period specified in this notice. Energy Market Participants are encouraged to offer additional Supplemental Energy and Ancillary Service bids. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. This notice supersedes notice 202002457 CAISO Grid Warning Notice issued 08/18/2020 11:30 Notice issued at: 08/18/2020 11:40 Cancellation issued at: 8/18/2020 20:30:00

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
8/18/2020	Tuesday	ISO	08/18/2020 14:00 through 08/18/2020 19:45	Stage 2	CAISO Grid Stage 2 System Emergency Notice [202002459] The California ISO hereby issues a CAISO Grid Stage 2 System Emergency Notice effective 08/18/2020 14:00 through 08/18/2020 23:59. Reason: Estimated deficiency in Reserves from 15:00 to 22:00 PDT. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. The ISO will be calling on UDC's to implement their Interruptible Loads* and requests maximum conservation. Energy Market Participants are encouraged to offer additional Supplemental Energy and Ancillary Service bids. Non-Spinning Reserve requirement cannot be maintained. If Non-Spinning Reserves deplete further, the ISO will declare a Stage 3 System Emergency and begin curtailing firm loads. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 08/18/2020 13:59 Cancellation issued at: 8/18/2020 19:45:00

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
8/18/2020	Tuesday	ISO	08/19/2020 17:00 through 08/19/2020 20:00	Alert	STATEWIDE ALERT NOTICE [202002460] The California ISO hereby issues a CAISO Grid ALERT Notice, effective 08/19/2020 17:00 through 08/19/2020 21:00. Reason: The CAISO is forecasting a possible system reserve|deficiency between the hours of 1700-2100 and is requesting|additional Ancillary Services and energy bids. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Conservation efforts are encouraged for the time period specified in this notice. Energy Market Participants are encouraged to offer additional Supplemental Energy and Ancillary Service bids. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 08/18/2020 14:56 Cancellation issued at: 8/19/2020 20:00:00
8/18/2020	Tuesday	ISO	08/18/2020 16:10 through 08/18/2020 17:40	1-hour Notification	1-Hour Notification of Probable CAISO Grid Load Interruptions [202002461] The CAISO anticipates the need to interrupt firm load for the period 08/18/2020 16:10 through 08/18/2020 17:40 in the amount of 500 MW for each respective hour for the period CAISO Grid based on system conditions as of 08/18/2020 16:10. Maximum conservation efforts are encouraged for the time period specified in this notice. Utility Distribution Companies and Metered Subsystems await further orders from the ISO. The ISO will issue a 'Stage 3 System Emergency Notice' and 'Load Interruptions - Stage 3 System Emergency Notice' when the load interruptions have actually begun or are imminent. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. This notice is being issued in compliance with the Governor's Executive Order D-38-01.

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
8/21/2020	Friday	ISO	08/24/2020 06:00 through 08/25/2020 22:00 (8.24.2020)	RMO	CAISO Grid Restricted Maintenance Operations [202002467] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 08/24/2020 06:00 through 08/25/2020 22:00. Reason: Due to weather uncertainty and fire threats across the CAISO| grid. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 08/21/2020 08:30

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
8/21/2020	Friday	ISO	08/24/2020 06:00 through 08/25/2020 22:00 (8.25.2020)	RMO	CAISO Grid Restricted Maintenance Operations [202002467] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 08/24/2020 06:00 through 08/25/2020 22:00. Reason: Due to weather uncertainty and fire threats across the CAISO| grid. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 08/21/2020 08:30

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
9/3/2020	Thursday	ISO	09/05/2020 06:00 through 09/08/2020 22:00 (9.5.2020)	RMO	CAISO Grid Restricted Maintenance Operations [202002473] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 09/05/2020 06:00 through 09/07/2020 22:00. Reason: This is Extending the Existing CAISO Grid RESTRICTED MAINTEN|ANCE OPERATION that was due to end Sunday at 22:00 to now en|d on Monday at 22:00||The ISO is anticipating high loads and temperatures across t|he CAISO Grid. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 09/03/2020 09:29

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
9/3/2020	Thursday	ISO	09/05/2020 06:00 through 09/08/2020 22:00 (9.6.2020)	RMO	CAISO Grid Restricted Maintenance Operations [202002473] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 09/05/2020 06:00 through 09/07/2020 22:00. Reason: This is Extending the Existing CAISO Grid RESTRICTED MAINTEN|ANCE OPERATION that was due to end Sunday at 22:00 to now en|d on Monday at 22:00||The ISO is anticipating high loads and temperatures across t|he CAISO Grid. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 09/03/2020 09:29

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
9/3/2020	Thursday	ISO	09/05/2020 06:00 through 09/08/2020 22:00 (9.7.2020)	RMO	CAISO Grid Restricted Maintenance Operations [202002473] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 09/05/2020 06:00 through 09/07/2020 22:00. Reason: This is Extending the Existing CAISO Grid RESTRICTED MAINTEN|ANCE OPERATION that was due to end Sunday at 22:00 to now en|d on Monday at 22:00||The ISO is anticipating high loads and temperatures across t|he CAISO Grid. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 09/03/2020 09:29

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
9/3/2020	Thursday	ISO	09/05/2020 06:00 through 09/08/2020 22:00 (9.8.2020)	RMO	CAISO Grid Restricted Maintenance Operations [202002473] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 09/05/2020 06:00 through 09/07/2020 22:00. Reason: This is Extending the Existing CAISO Grid RESTRICTED MAINTEN|ANCE OPERATION that was due to end Sunday at 22:00 to now en|d on Monday at 22:00||The ISO is anticipating high loads and temperatures across t|he CAISO Grid. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 09/03/2020 09:29
9/3/2020	Thursday	ISO	9/5/2020 15:00 to 9/7/2020 21:00 (9.5.2020)	Flex Alert	The California ISO has issued a Flex Alert for the CAISO Grid effective Saturday, September 5, 2020. Californians are urged to conserve electricity from September 5 at 3:00 PM to September 7 at 9:00 PM to avoid power disruptions. A news release is pending / has been issued. The ISO media hotline is (888)516-NEWS.
9/3/2020	Thursday	ISO	9/5/2020 15:00 to 9/7/2020 21:00 (9.6.2020)	Flex Alert	The California ISO has issued a Flex Alert for the CAISO Grid effective Saturday, September 5, 2020. Californians are urged to conserve electricity from September 5 at 3:00 PM to September 7 at 9:00 PM to avoid power disruptions. A news release is pending / has been issued. The ISO media hotline is (888)516-NEWS.
9/3/2020	Thursday	ISO	9/5/2020 15:00 to 9/7/2020 21:00 (9.7.2020)	Flex Alert	The California ISO has issued a Flex Alert for the CAISO Grid effective Saturday, September 5, 2020. Californians are urged to conserve electricity from September 5 at 3:00 PM to September 7 at 9:00 PM to avoid power disruptions. A news release is pending / has been issued. The ISO media hotline is (888)516-NEWS.

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
9/5/2020	Saturday	ISO	09/06/2020 16:00 through 09/06/2020 21:00	Alert	STATEWIDE ALERT NOTICE [202002475] The California ISO hereby issues a CAISO Grid ALERT Notice, effective 09/06/2020 16:00 through 09/06/2020 21:00. Reason: High Temperatures and High Demand Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Conservation efforts are encouraged for the time period specified in this notice. Energy Market Participants are encouraged to offer additional Supplemental Energy and Ancillary Service bids. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 09/05/2020 14:22
9/5/2020	Saturday	ISO	09/05/2020 17:19 through 09/05/2020 20:35	Warning	CAISO Grid WARNING NOTICE [202002476] The California ISO hereby issues a CAISO Grid WARNING Notice, effective 09/05/2020 17:19 through 09/05/2020 23:00. Reason: High Temperatures and High Demand Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Conservation efforts are encouraged for the time period specified in this notice. Energy Market Participants are encouraged to offer additional Supplemental Energy and Ancillary Service bids. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 09/05/2020 17:20 Cancellation issued: 9/5/2020 20:35

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
9/5/2020	Saturday	ISO	09/05/2020 17:49 through 09/05/2020 20:32	Stage 2	CAISO Grid Stage 2 System Emergency Notice [202002477] The California ISO hereby issues a CAISO Grid Stage 2 System Emergency Notice effective 09/05/2020 17:49 through 09/05/2020 23:00. Reason: Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. The ISO will be calling on UDC's to implement their Interruptible Loads* and requests maximum conservation. Energy Market Participants are encouraged to offer additional Supplemental Energy and Ancillary Service bids. Non-Spinning Reserve requirement cannot be maintained. If Non-Spinning Reserves deplete further, the ISO will declare a Stage 3 System Emergency and begin curtailing firm loads. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 09/05/2020 17:50 Cancellation issued at: 9/5/2020 20:32:00

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
9/6/2020	Sunday	ISO	09/06/2020 16:00 through 09/06/2020 20:23	Warning	CAISO Grid WARNING NOTICE [202002480] The California ISO hereby issues a CAISO Grid WARNING Notice, effective 09/06/2020 16:00 through 09/06/2020 21:00. Reason: High Temperatures and High System Load Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Conservation efforts are encouraged for the time period specified in this notice. Energy Market Participants are encouraged to offer additional Supplemental Energy and Ancillary Service bids. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 09/06/2020 12:00 Cancellation issued:9/6/2020 20:23:00

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
9/6/2020	Sunday	ISO	09/06/2020 17:53 through 09/06/2020 20:21	Stage 2	CAISO Grid Stage 2 System Emergency Notice [202002481] The California ISO hereby issues a CAISO Grid Stage 2 System Emergency Notice effective 09/06/2020 17:53 through 09/06/2020 23:59. Reason: Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. The ISO will be calling on UDC's to implement their Interruptible Loads* and requests maximum conservation. Energy Market Participants are encouraged to offer additional Supplemental Energy and Ancillary Service bids. Non-Spinning Reserve requirement cannot be maintained. If Non-Spinning Reserves deplete further, the ISO will declare a Stage 3 System Emergency and begin curtailing firm loads. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 09/06/2020 17:54 Cancalletion isuued: 9/6/2020 20:21:00

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
9/30/2020	Wednesday	ISO	10/01/2020 18:00 through 10/01/2020 19:00	Alert	STATEWIDE ALERT NOTICE [202002489] The California ISO hereby issues a CAISO Grid ALERT Notice, effective 10/01/2020 18:00 through 10/01/2020 19:00. Reason: High temperatures and high demand Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Conservation efforts are encouraged for the time period specified in this notice. Energy Market Participants are encouraged to offer additional Supplemental Energy and Ancillary Service bids. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 09/30/2020 14:54

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
9/30/2020	Wednesday	ISO	10/01/2020 06:00 through 10/01/2020 22:00	RMO	CAISO Grid Restricted Maintenance Operations [202002490] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 10/01/2020 06:00 through 10/01/2020 22:00. Reason: The ISO is anticipating high loads and temperatures across ||the CAISO Grid. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 09/30/2020 15:06
9/30/2020	Wednesday	ISO	10/1/2020 15:00:00 through 22:00:00	Flex Alert	The California ISO has issued a Flex Alert for the CAISO Grid effective Thursday, October 1, 2020. Californians are urged to conserve electricity from October 1 at 3:00 PM to October 1 at 10:00 PM to avoid power disruptions. A news release is pending / has been issued. The ISO media hotline is (888)516-NEWS.

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
10/14/2020	Wednesday	ISO	10/15/2020 16:00 through 10/15/2020 18:00	Alert	STATEWIDE ALERT NOTICE [202002496] The California ISO hereby issues a CAISO Grid ALERT Notice, effective 10/15/2020 16:00 through 10/15/2020 18:00. Reason: Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Conservation efforts are encouraged for the time period specified in this notice. Energy Market Participants are encouraged to offer additional Supplemental Energy and Ancillary Service bids. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 10/14/2020 17:33
10/14/2020	Wednesday	ISO	10/15/2020 15:00 through 10/15/2020 22:00	Flex Alert	NOTICE 202002495: Flex Alert STATEWIDE 10/15/2020 15:00 through 10/15/2020 22:00 The California ISO has issued a Flex Alert for the CAISO Grid effective Thursday, October 15, 2020. Californians are urged to conserve electricity from October 15 at 3:00 PM to October 15 at 10:00 PM to avoid power disruptions. A news release is pending / has been issued. The ISO media hotline is (888)516-NEWS.

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
10/14/2020	Wednesday	ISO	10/15/2020 06:00 through 10/15/2020 22:00	RMO	CAISO Grid Restricted Maintenance Operations [202002497] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 10/15/2020 06:00 through 10/15/2020 22:00. Reason: The ISO is anticipating high loads and temperatures across |the CAISO Grid. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 10/14/2020 17:57

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
10/15/2020	Thursday	ISO	10/16/2020 06:00 through 10/16/2020 22:00	RMO	CAISO Grid Restricted Maintenance Operations [202002498] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 10/16/2020 06:00 through 10/16/2020 22:00. Reason: The ISO is anticipating high loads and temperatures across t|he CAISO Grid. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 10/15/2020 10:24

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
12/3/2020	Thursday	Southern	12/03/2020 10:58 through 12/03/2020 22:00	RMO	Southern CA Region Restricted Maintenance Operations [202002505] The California ISO is declaring Southern CA Region RESTRICTED MAINTENANCE OPERATION for the period from 12/03/2020 10:58 through 12/03/2020 22:00. Reason: San Diego area only. Due to fires in the Southern CA |Region. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions, which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 12/03/2020 11:00 Cancellation notice issued at: 12/03/2020 22:00
12/13/2020	Sunday	ISO	12/13/2020 07:48 through 12/13/2020 14:20	Transmission Emergency	CAISO Grid TRANSMISSION EMERGENCY Notice [202002509] The California ISO hereby issues a CAISO Grid TRANSMISSION EMERGENCY Notice effective 12/13/2020 07:48 through 12/13/2020 23:59 based on conditions as of NoticePostDate. Reason: Currently the ISO is in open loop conditions, while open at |P26. Cause is under investigation. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 12/13/2020 07:51 Cancellation notice issued at 14:20

Alert, Warning, and Emergencies Record For 2019

AWE Declarations

Date	Day	Region	Time Frame	AWE Event	Reason
6/11/2019	Tuesday	ISO	08:00 - 22:00	RMO	CAISO Grid Restricted Maintenance Operations [201902386] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 06/11/2019 08:00 through 06/11/2019 22:00. Reason: The ISO is anticipating high loads and temperatures across t|he CAISO Grid. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 06/11/2019 08:07
6/11/2019	Tuesday	ISO	16:00 - 22:00	Flex Alert	The California ISO has issued a Flex Alert for the CAISO Grid effective Tuesday, June 11, 2019. Californians are urged to conserve electricity from June 11 at 4:00 PM to June 11 at 10:00 PM to avoid power disruptions. A news release has been issued. The ISO media hotline is (888)516-NEWS.

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
7/28/2019	Sunday	ISO	17:45 - 23:59	Warning	The COI lines are being forced out of service due to a fire |threat. There is a safety concern for onsite personnel. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Conservation efforts are encouraged for the time period specified in this notice. Energy Market Participants are encouraged to offer additional Supplemental Energy and Ancillary Service bids. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 07/28/2019 17:47
7/28/2019	Sunday	ISO	18:48 - 23:59	Transmission Emergency	The Malin - Round Mountain #1 and #2 500kV lines forced out |of service and threat to Captain Jack - Olina 500kV due to |fire. There is a safety concern for onsite personnel. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 07/28/2019 18:52
7/29/2019	Monday	ISO	14:42 - 23:59	Transmission Emergency	Two lines of COI/Path 66 forced out of service due to fire, |with remaining line under threat of Open-Loop. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. Notice issued at: 07/29/2019 14:48

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
7/29/2019	Monday	ISO	19:30 - 23:59	Transmission Emergency	Two lines of COI/Path 66 forced out of service due to fire, |with remaining line under threat of Open-Loop. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. This notice supersedes notice 201902394 CAISO Grid Transmission Emergency issued 07/29/2019 14:48 Notice issued at: 07/29/2019 19:30
8/15/2019	Thursday	ISO	08:00 - 22:00	RMO	The ISO is anticipating high loads and temperatures across t|he CAISO Grid. Refer to the ISO System Emergency Fact Sheet (http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf) for additional detail. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Monitor system conditions on Today's Outlook (http://www.caiso.com/TodaysOutlook/Pages/default.aspx) and check with local electric utilities for additional information. This notice supersedes notice 201902399 CAISO Grid Restricted Maintenance Operations Notice issued 08/14/2019 12:29 Notice issued at: 08/14/2019 12:31

Alert, Warning, and Emergencies Record For 2018

AWE Declarations

Date	Day	Region	Time Frame	AWE Event	Reason
2/20/2018	Tuesday	Southern CA	07:24 - 22:00	RMO	The California ISO is declaring Southern CA Region RESTRICTED MAINTENANCE OPERATION for the period from 02/20/2018 07:24 through 02/20/2018 22:00. Reason: Higher then forecasted loads and natural gas curtailments in the Southern California area. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Notice issued at: 02/20/2018 07:30
2/21/2018	Wednesday - Thursday	Southern CA	00:01 - 23:59	RMO	The California ISO is declaring Southern CA Region RESTRICTED MAINTENANCE OPERATION for the period from 02/21/2018 00:01 through 02/22/2018 23:59. Reason: The ISO is anticipating higher then forecasted loads and natural gas curtailments in the Southern California area. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Notice issued at: 02/20/2018 09:46
2/22/2018	Wednesday - Thursday	Southern CA	00:01 - 23:59	RMO	The California ISO is declaring Southern CA Region RESTRICTED MAINTENANCE OPERATION for the period from 02/21/2018 00:01 through 02/22/2018 23:59. Reason: The ISO is anticipating higher then forecasted loads and natural gas curtailments in the Southern California area. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Notice issued at: 02/20/2018 09:46
2/24/2018	Saturday - Wednesday	Southern CA	06:00 - 22:00	RMO	The California ISO is declaring Southern CA Region GENERATION Restricted Maintenance Operations for the period from 02/24/2018 06:00 through 02/28/2018 22:00. Reason: Natural gas curtailments in the Southern California area. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Additionally, Market Participants are cautioned to avoid actions which may jeopardize generator availability. This notice does not restrict scheduled outages which do not affect generating resource availability. This notice supersedes notice 201802324 Southern CA Region Restricted Maintenance Operations Notice issued 02/23/2018 08:43 Notice issued at: 02/23/2018 13:49

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
2/25/2018	Saturday - Wednesday	Southern CA	06:00 - 22:00	RMO	The California ISO is declaring Southern CA Region GENERATION Restricted Maintenance Operations for the period from 02/24/2018 06:00 through 02/28/2018 22:00. Reason: Natural gas curtailments in the Southern California area. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Additionally, Market Participants are cautioned to avoid actions which may jeopardize generator availability. This notice does not restrict scheduled outages which do not affect generating resource availability. This notice supersedes notice 201802324 Southern CA Region Restricted Maintenance Operations Notice issued 02/23/2018 08:43 Notice issued at: 02/23/2018 13:49
2/26/2018	Saturday - Wednesday	Southern CA	06:00 - 22:00	RMO	The California ISO is declaring Southern CA Region GENERATION Restricted Maintenance Operations for the period from 02/24/2018 06:00 through 02/28/2018 22:00. Reason: Natural gas curtailments in the Southern California area. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Additionally, Market Participants are cautioned to avoid actions which may jeopardize generator availability. This notice does not restrict scheduled outages which do not affect generating resource availability. This notice supersedes notice 201802324 Southern CA Region Restricted Maintenance Operations Notice issued 02/23/2018 08:43 Notice issued at: 02/23/2018 13:49
2/27/2018	Saturday - Wednesday	Southern CA	06:00 - 22:00	RMO	The California ISO is declaring Southern CA Region GENERATION Restricted Maintenance Operations for the period from 02/24/2018 06:00 through 02/28/2018 22:00. Reason: Natural gas curtailments in the Southern California area. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Additionally, Market Participants are cautioned to avoid actions which may jeopardize generator availability. This notice does not restrict scheduled outages which do not affect generating resource availability. This notice supersedes notice 201802324 Southern CA Region Restricted Maintenance Operations Notice issued 02/23/2018 08:43 Notice issued at: 02/23/2018 13:49
2/28/2018	Saturday - Wednesday	Southern CA	06:00 - 22:00	RMO	The California ISO is declaring Southern CA Region GENERATION Restricted Maintenance Operations for the period from 02/24/2018 06:00 through 02/28/2018 22:00. Reason: Natural gas curtailments in the Southern California area. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Additionally, Market Participants are cautioned to avoid actions which may jeopardize generator availability. This notice does not restrict scheduled outages which do not affect generating resource availability. This notice supersedes notice 201802324 Southern CA Region Restricted Maintenance Operations Notice issued 02/23/2018 08:43 Notice issued at: 02/23/2018 13:49

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
3/1/2018	Wednesday - Thursday	Southern CA	22:00 - 23:59	RMO	The California ISO is declaring Southern CA Region RESTRICTED MAINTENANCE OPERATION for the period from 02/28/2018 22:00 through 03/01/2018 23:59. Reason: Natural gas curtailments in the Southern California area. Outages are not being cancelled at this time but need to follow the scheduled times to avoid cancellation. If outages need to be cancelled, a separate RMO notice will be issued with additional information. The California ISO will be using a gas nomogram in the Day Ahead & Real-Time markets, along with approved outages, for the identified regions based on gas burn limits from the gas companies. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions, which may jeopardize generator and/or transmission availability. Notice issued at: 02/28/2018 10:08
3/2/2018	Friday	Southern CA	06:00 - 22:00	RMO	The California ISO is declaring Southern CA Region RESTRICTED MAINTENANCE OPERATION for the period from 03/02/2018 06:00 through 03/02/2018 22:00. Reason: Natural gas curtailments in the Southern California area. Outages are not being cancelled at this time but need to follo|w the scheduled times to avoid cancellation. If outages need| to be cancelled, a separate RMO notice will be issued with |additional information. The California ISO will be using a gas nomogram in the Day Ahead & Real-Time markets, along with approved outages, for the identified regions based on gas burn limits from the gas companies. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Notice issued at: 03/01/2018 17:48
3/3/2018	Saturday	Southern CA	06:00 - 22:00	RMO	The California ISO is declaring Southern CA Region RESTRICTED MAINTENANCE OPERATION for the period from 03/03/2018 06:00 through 03/03/2018 22:00. Reason: Natural gas curtailments in the Southern California area. Outages are not being cancelled at this time but need to follow the scheduled times to avoid cancellation. If outages need to be cancelled, a separate RMO notice will be issued with additional information. The California ISO will be using a gas nomogram in the Day Ahead & Real-Time markets, along with approved outages, for the identified regions based on gas burn limits from the gas companies. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Notice issued at: 03/02/2018 01:36
3/4/2018	Sunday	Southern CA	06:00 - 22:00	RMO	The California ISO is declaring Southern CA Region RESTRICTED MAINTENANCE OPERATION for the period from 03/04/2018 06:00 through 03/04/2018 22:00. Reason: Natural gas curtailments in the Southern California area. Outages are not being cancelled at this time but need to follow the scheduled times to avoid cancellation. If outages need to be cancelled, a separate RMO notice will be issued with additional information. The California ISO will be using a gas nomogram in the Day Ahead & Real-Time markets, along with approved outages, for the identified regions based on gas burn limits from the gas companies. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Notice issued at: 03/02/2018 01:52

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
3/5/2018	Monday	Southern CA	06:00 - 22:00	RMO	The California ISO is declaring Southern CA Region RESTRICTED MAINTENANCE OPERATION for the period from 03/05/2018 06:00 through 03/05/2018 22:00. Reason: Natural gas curtailments in the Southern California area. Outages are not being cancelled at this time but need to follow the scheduled times to avoid cancellation. If outages need to be cancelled, a separate RMO notice will be issued with additional information. The California ISO will be using a gas nomogram in the Day Ahead & Real-Time markets, along with approved outages, for the identified regions based on gas burn limits from the gas companies. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Notice issued at: 03/04/2018 08:40
7/3/2018	Tuesday	Southern CA	06:00 - 22:00	RMO	Southern CA Region Restricted Maintenance Operations [201802345] The California ISO is declaring Southern CA Region RESTRICTED MAINTENANCE OPERATION for the period from 07/06/2018 06:00 through 07/06/2018 22:00. Reason: The ISO is anticipating high loads and temperatures across |the Southern CA Region. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions, which may jeopardize generator and/or transmission availability. Notice issued at: 07/03/2018 10:05
7/6/2018	Friday	Southern CA	06:00 - 22:00	RMO	Southern CA Region Restricted Maintenance Operations [201802345] The California ISO is declaring Southern CA Region RESTRICTED MAINTENANCE OPERATION for the period from 07/06/2018 06:00 through 07/06/2018 22:00. Reason: The ISO is anticipating high loads and temperatures across |the Southern CA Region. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions, which may jeopardize generator and/or transmission availability. Notice issued at: 07/03/2018 10:05
7/7/2018	Saturday	Southern CA	06:00 - 22:00	RMO	Southern CA Region Restricted Maintenance Operations [201802346] The California ISO is declaring Southern CA Region RESTRICTED MAINTENANCE OPERATION for the period from 07/07/2018 06:00 through 07/07/2018 22:00. Reason: The ISO is anticipating high loads and temperatures across |the Southern CA Region. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions, which may jeopardize generator and/or transmission availability. Notice issued at: 07/06/2018 08:49

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
7/18/2018	Wednesday	Northern CA	20:51 - 23:59	Transmission Emergency	Northern CA Region TRANSMISSION EMERGENCY Notice [201802349] The California ISO hereby issues a Northern CA Region TRANSMISSION EMERGENCY Notice effective 07/18/2018 20:51 through 07/18/2018 23:59 based on conditions as of 07/18/2018 20:55. Reason: Humboldt local area loading issues. Monitor system conditions on the California ISO Website at www.caiso.com and check with local electric utilities for additional information. Notice issued at: 07/18/2018 20:55
7/23/2018	Monday	ISO	06:00 - 22:00	RMO	CAISO Grid Restricted Maintenance Operations [201802352] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 07/23/2018 06:00 through 07/23/2018 22:00. Reason: The ISO is anticipating high loads and temperatures across t|he CAISO Grid. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Notice issued at: 07/19/2018 10:23
7/24/2018	Tuesday	ISO	17:00 - 21:00	Flex Alert	The California ISO has issued a Flex Alert for the CAISO Grid due to high temperatures across the western U.S., high fire risk and tight gas supplies in Southern California effective Tuesday, July 24, 2018. Californians are urged to conserve electricity from July 24 at 5:00 PM to July 24 at 9:00 PM to avoid power disruptions. A news release is pending. The ISO media hotline is (888)516-NEWS.
7/25/2018	Wednesday	ISO	17:00 - 21:00	Flex Alert	The California ISO has issued a Flex Alert for the CAISO Grid due to high temperatures across the western U.S., high fire risk and tight gas supplies in Southern California effective Wednesday, July 25, 2018. Californians are urged to conserve electricity from July 25 at 5:00 PM to July 25 at 9:00 PM to avoid power disruptions. A news release is pending. The ISO media hotline is (888)516-NEWS.
7/25/2018	Wednesday	ISO	06:00 - 22:00	RMO	CAISO Grid Restricted Maintenance Operations [201802354] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 07/25/2018 06:00 through 07/25/2018 22:00. Reason: The ISO is anticipating high loads and temperatures across t|he CAISO Grid. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Notice issued at: 07/19/2018 10:30

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
7/26/2018	Thursday	ISO	06:00 - 22:00	RMO	CAISO Grid Restricted Maintenance Operations [201802358] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 07/26/2018 06:00 through 07/26/2018 22:00. Reason: The ISO is anticipating high loads and temperatures across t|he CAISO Grid. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Notice issued at: 07/24/2018 09:15
7/27/ - 7/30/2018	Friday - Saturday - Sunday - Monday	Northern CA	18:52 - 08:00	Transmission Emergency	Northern CA Region TRANSMISSION EMERGENCY Notice [201802364] The California ISO hereby issues a Northern CA Region TRANSMISSION EMERGENCY Notice effective 07/27/2018 18:52 through 07/27/2018 23:59 based on conditions as of 07/27/2018 18:57. Reason: This Local Area TRANSMISSION EMERGENCY Notice is for the |Ukiah area due to wildfires in the area. Monitor system conditions on the California ISO Website at www.caiso.com and check with local electric utilities for additional information. Notice issued at: 07/27/2018 18:57 Northern CA Region TRANSMISSION EMERGENCY Notice [201802366] The California ISO hereby issues a Northern CA Region TRANSMISSION EMERGENCY Notice effective 07/28/2018 22:26 through 07/29/2018 08:00 based on conditions as of 07/28/2018 22:29. Reason: This Local Area TRANSMISSION EMERGENCY Notice is for the |Ukiah area due to wildfires in the area. Monitor system conditions on the California ISO Website at www.caiso.com and check with local electric utilities for additional information. Notice issued at: 07/28/2018 22:29 Northern CA Region TRANSMISSION EMERGENCY Notice [201802368] The California ISO hereby issues a Northern CA Region TRANSMISSION EMERGENCY Notice effective 07/29/2018 14:44 through 07/30/2018 08:00 based on conditions as of 07/29/2018 14:46. Reason: Ukiah area due to wildfires in the area Monitor system conditions on the California ISO Website at www.caiso.com and check with local electric utilities for additional information. Notice issued at: 07/29/2018 14:46 CAISO Grid Restricted Maintenance Operations [201802369] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the

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Date	Day	Region	Time Frame	AWE Event	Reason
7/30/2018	Monday	ISO	06:00 - 22:00	RMO	CAISO Grid Restricted Maintenance Operations [201802369] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 07/30/2018 06:00 through 07/30/2018 22:00. Reason: The ISO is anticipating high loads and temperatures across |the CAISO Grid combined with wildfire threats and loss of |resources. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Notice issued at: 07/29/2018 22:04
7/31/2018	Tuesday	ISO	06:00 - 22:00	RMO	CAISO Grid Restricted Maintenance Operations [201802371] The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 07/31/2018 06:00 through 07/31/2018 22:00. Reason: The ISO is anticipating high loads and temperatures across |the CAISO Grid combined with wildfire threats and loss of |resources. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Notice issued at: 07/30/2018 09:17

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
8/6/2018	Monday	Southern CA	06:00 - 22:00	RMO	Southern CA Region Restricted Maintenance Operations [201802374] The California ISO is declaring Southern CA Region RESTRICTED MAINTENANCE OPERATION for the period from 08/06/2018 06:00 through 08/06/2018 22:00. Reason: The ISO is anticipating high loads and temperatures across |the Southern CA Region and has lost resources in the area. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions, which may jeopardize generator and/or transmission availability. Notice issued at: 08/05/2018 08:55

Alert, Warning, and Emergencies Record For 2017

AWE Declarations

Date	Day	Region	Time Frame	AWE Event	Reason
1/3/2017	Tuesday	ISO	00:00 - 12:00	RMO	Effective Tuesday, 01/03/17 00:00 - 12:00, the ISO BA is declaring a System wide Restricted Maintenance Operations. This is due to extremely low forecast temperatures throughout the Western United States including the CAISO area. Notice issued at: 12/30/16 14:07, Cancelled at: 1/2/17 at 10:20
5/3/2017	Wednesday	ISO	19:01 - 23:59	Stage 1	Operating Reserves are currently, or forecast to be, less than amounts required by the Western Electricity Coordinating Council. If Operating Reserves deplete further, the ISO will declare a Stage 2 System Emergency and may begin curtailing Interruptible Loads*. * Interruptible Loads are comprised of customers from Southern California Edison, San Diego Gas & Electric and Pacific Gas & Electric who opt for service under "Interruptible Rate Schedules" and "Emergency Curtailment" tariffs authorized by the California Public Utilities Commission that provide for periodic curtailments by the California ISO. The ISO will also curtail loads that elect to participate in California ISO Load Interruption Programs, described in Operating Procedure 4510. Notice issued at: 05/03/17 19:04, Cancelled at: 5/3/17 at 21:00
6/19/2017	Monday	ISO	00:01 - 22:00	RMO	The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 06/19/2017 00:01 through 06/22/2017 22:00. Reason: The ISO is anticipating high loads and temperatures across the CAISO Grid. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Notice issued at: 06/18/2017 14:26, Cancelled at: 6/22/2017 22:00
6/20/2017	Tuesday	ISO	00:01 - 22:00	RMO	The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 06/19/2017 00:01 through 06/22/2017 22:00. Reason: The ISO is anticipating high loads and temperatures across the CAISO Grid. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Notice issued at: 06/18/2017 14:26, Cancelled at: 6/22/2017 22:00
6/20/2017	Tuesday	ISO	14:00 - 21:00	Flex Alert	The California ISO has issued a Flex Alert for the CAISO Grid effective Tuesday, June 20, 2017. Californians are urged to conserve electricity from June 20 at 2:00 PM to June 20 at 9:00 PM to avoid power disruptions. Notice issued at: 6/20/2017 08:00, Cancelled at: 6/20/2017 21:00
6/21/2017	Wednesday	ISO	00:01 - 22:00	RMO	The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 06/19/2017 00:01 through 06/22/2017 22:00. Reason: The ISO is anticipating high loads and temperatures across the CAISO Grid. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Notice issued at: 06/18/2017 14:26, Cancelled at: 6/22/2017 22:00

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
6/21/2017	Wednesday	ISO	14:00 - 21:00	Flex Alert	The California ISO has issued a Flex Alert for the California ISO Grid effective Wednesday, June 21, 2017. Californians are urged to conserve electricity from June 21 at 2:00 PM to June 21 at 9:00 PM to avoid power disruptions. Notice issued at: 6/21/2017 07:38, Cancelled at: 6/21/2017 21:00
6/22/2017	Thursday	ISO	00:01 - 22:00	RMO	The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 06/19/2017 00:01 through 06/22/2017 22:00. Reason: The ISO is anticipating high loads and temperatures across the CAISO Grid. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Notice issued at: 06/18/2017 14:26, Cancelled at: 6/22/2017 22:00
7/7/2017	Friday	ISO	07:00 - 22:00	RMO	The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 07/07/2017 07:00 through 07/07/2017 22:00. Reason: The ISO is anticipating high loads and temperatures across the CAISO Grid. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Notice issued at: 07/06/2017 08:36
8/1/2017	Tuesday	ISO	06:00 - 22:00	RMO	The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 08/01/2017 06:00 through 08/01/2017 22:00. Reason: The ISO is anticipating high loads and temperatures across the CAISO Grid. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Notice issued at: 07/31/2017 08:33
8/2/2017	Wednesday	ISO	06:00 - 22:00	RMO	The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 08/02/2017 06:00 through 08/02/2017 22:00. Reason: The ISO is anticipating high loads and temperatures across the CAISO Grid. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Notice issued at: 07/31/2017 08:36
8/3/2017	Thursday	ISO	06:00 - 22:00	RMO	The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 08/03/2017 06:00 through 08/03/2017 22:00. Reason: The ISO is anticipating high loads and temperatures across the CAISO Grid. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Notice issued at: 08/01/2017 12:56
8/21/2017	Monday	ISO	06:00 - 20:00	RMO	The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 08/21/2017 06:00 through 08/21/2017 20:00. Reason: As a part of the California ISO Operational Readiness plan |for the upcoming solar eclipse, a Restricted Maintenance Operations for Monday August 21, 2017 from 6:00 a.m. to 8:00 p.m. is being issued. Notice issued at: 08/04/2017 15:22

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
8/28/2017	Monday	ISO	06:00 - 22:00	RMO	The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 08/28/2017 06:00 through 08/28/2017 22:00. Reason: The ISO is anticipating high loads and temperatures across the CAISO Grid. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Notice issued at: 08/25/2017 08:54 Notice Update issued at: 08/28/2017 15:17 The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 08/29/2017 22:00 through 08/31/2017 22:00.This restricted maintenance is an extension of the active ongoing restricted maintenance that began on 08/28/2017.
8/29/2017	Tuesday	ISO	06:00 - 22:00	RMO	The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 08/28/2017 06:00 through 08/28/2017 22:00. Reason: The ISO is anticipating high loads and temperatures across the CAISO Grid. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Notice issued at: 08/25/2017 08:54 Notice Update issued at: 08/28/2017 15:17 The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 08/29/2017 22:00 through 08/31/2017 22:00.This restricted maintenance is an extension of the active ongoing restricted maintenance that began on 08/28/2017.
8/30/2017	Wednesday	ISO	06:00 - 22:00	RMO	The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 08/28/2017 06:00 through 08/28/2017 22:00. Reason: The ISO is anticipating high loads and temperatures across the CAISO Grid. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Notice issued at: 08/25/2017 08:54 Notice Update issued at: 08/28/2017 15:17 The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 08/29/2017 22:00 through 08/31/2017 22:00.This restricted maintenance is an extension of the active ongoing restricted maintenance that began on 08/28/2017.

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
8/31/2017	Thursday	ISO	06:00 - 22:00	RMO	The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 08/28/2017 06:00 through 08/28/2017 22:00. Reason: The ISO is anticipating high loads and temperatures across the CAISO Grid. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Notice issued at: 08/25/2017 08:54 Notice Update issued at: 08/28/2017 15:17 The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 08/29/2017 22:00 through 08/31/2017 22:00.This restricted maintenance is an extension of the active ongoing restricted maintenance that began on 08/28/2017.
8/29/2017	Tuesday	ISO	14:00 - 22:00	Flex Alert	The California ISO has issued a Flex Alert for the California ISO Grid effective Tuesday, August 29, 2017. Californians are urged to conserve electricity from August 29 at 2:00 PM to August 29 at 9:00 PM to avoid power disruptions. A news release has been issued. The ISO media hotline is (888)516-NEWS.
8/31/2017	Thursday	ISO	22:00 - 22:00	RMO	The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 08/31/2017 22:00 through 09/01/2017 22:00. Reason: The ISO is anticipating high loads and temperatures across |the CAISO Grid. This is an extension of the active and ongoing Restricted Maintenance that began on 8/29/2017. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Notice issued at: 08/29/2017 15:50
9/1/2017	Friday	ISO	22:00 - 22:00	RMO	The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 08/31/2017 22:00 through 09/01/2017 22:00. Reason: The ISO is anticipating high loads and temperatures across |the CAISO Grid. This is an extension of the active and ongoing Restricted Maintenance that began on 8/29/2017. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Notice issued at: 08/29/2017 15:50
9/1/2017	Friday	ISO	13:00 - 22:00	Flex Alert	The California ISO has issued a Flex Alert for the CAISO Grid effective Friday, September 1, 2017. Californians are urged to conserve electricity from September 1 at 1:00 PM to September 1 at 10:00 PM to avoid power disruptions. A news release is pending / has been issued. The ISO media hotline is (888)516-NEWS.
9/2/2017	Saturday	ISO	22:00 - 22:00	RMO	The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 09/01/2017 22:00 through 09/03/2017 22:00. Reason: The ISO is anticipating high loads and temperatures across the CAISO Grid. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Notice issued at: 08/31/2017 09:31

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
9/3/2017	Sunday	ISO	22:00 - 22:00	RMO	The California ISO is declaring CAISO Grid RESTRICTED MAINTENANCE OPERATION for the period from 09/01/2017 22:00 through 09/03/2017 22:00. Reason: The ISO is anticipating high loads and temperatures across the CAISO Grid. Restricted Maintenance Operations, as detailed in ISO Operating Procedure 4420, will be in effect. Market Participants are cautioned to avoid actions which may jeopardize generator and/or transmission availability. Notice issued at: 08/31/2017 09:31
12/4/2017	Monday	Southern CA	22:11 - 23:59	Transmission Emergency	The California ISO hereby issues a Southern CA Region TRANSMISSION EMERGENCY Notice effective 12/04/2017 22:11 through 12/05/2017 23:59 based on conditions as of 12/04/2017 22:16. Reason: Local transmission emergency due to fires in the Ventura area. Notice issued at: 12/04/2017 22:16 Updated notices sent multiple times to extend Emergency through 12/12 23:59
12/5/2017	Tuesday	Southern CA	22:11 - 23:59	Transmission Emergency	The California ISO hereby issues a Southern CA Region TRANSMISSION EMERGENCY Notice effective 12/04/2017 22:11 through 12/05/2017 23:59 based on conditions as of 12/04/2017 22:16. Reason: Local transmission emergency due to fires in the Ventura area. Notice issued at: 12/04/2017 22:16 Updated notices sent multiple times to extend Emergency through 12/12 23:59
12/6/2017	Wednesday	Southern CA	22:11 - 23:59	Transmission Emergency	The California ISO hereby issues a Southern CA Region TRANSMISSION EMERGENCY Notice effective 12/04/2017 22:11 through 12/05/2017 23:59 based on conditions as of 12/04/2017 22:16. Reason: Local transmission emergency due to fires in the Ventura area. Notice issued at: 12/04/2017 22:16 Updated notices sent multiple times to extend Emergency through 12/12 23:59
12/7/2017	Thursday	Southern CA	22:11 - 23:59	Transmission Emergency	The California ISO hereby issues a Southern CA Region TRANSMISSION EMERGENCY Notice effective 12/04/2017 22:11 through 12/05/2017 23:59 based on conditions as of 12/04/2017 22:16. Reason: Local transmission emergency due to fires in the Ventura area. Notice issued at: 12/04/2017 22:16 Updated notices sent multiple times to extend Emergency through 12/12 23:59
12/8/2017	Friday	Southern CA	22:11 - 23:59	Transmission Emergency	The California ISO hereby issues a Southern CA Region TRANSMISSION EMERGENCY Notice effective 12/04/2017 22:11 through 12/05/2017 23:59 based on conditions as of 12/04/2017 22:16. Reason: Local transmission emergency due to fires in the Ventura area. Notice issued at: 12/04/2017 22:16 Updated notices sent multiple times to extend Emergency through 12/12 23:59
12/9/2017	Saturday	Southern CA	22:11 - 23:59	Transmission Emergency	The California ISO hereby issues a Southern CA Region TRANSMISSION EMERGENCY Notice effective 12/04/2017 22:11 through 12/05/2017 23:59 based on conditions as of 12/04/2017 22:16. Reason: Local transmission emergency due to fires in the Ventura area. Notice issued at: 12/04/2017 22:16 Updated notices sent multiple times to extend Emergency through 12/12 23:59

AWE Grid History Report

Date	Day	Region	Time Frame	AWE Event	Reason
12/10/2017	Sunday	Southern CA	22:11 - 23:59	Transmission Emergency	The California ISO hereby issues a Southern CA Region TRANSMISSION EMERGENCY Notice effective 12/04/2017 22:11 through 12/05/2017 23:59 based on conditions as of 12/04/2017 22:16. Reason: Local transmission emergency due to fires in the Ventura area. Notice issued at: 12/04/2017 22:16 Updated notices sent multiple times to extend Emergency through 12/12 23:59
12/11/2017	Monday	Southern CA	22:11 - 23:59	Transmission Emergency	The California ISO hereby issues a Southern CA Region TRANSMISSION EMERGENCY Notice effective 12/04/2017 22:11 through 12/05/2017 23:59 based on conditions as of 12/04/2017 22:16. Reason: Local transmission emergency due to fires in the Ventura area. Notice issued at: 12/04/2017 22:16 Updated notices sent multiple times to extend Emergency through 12/12 23:59
12/12/2017	Tuesday	Southern CA	22:11 - 23:59	Transmission Emergency	The California ISO hereby issues a Southern CA Region TRANSMISSION EMERGENCY Notice effective 12/04/2017 22:11 through 12/05/2017 23:59 based on conditions as of 12/04/2017 22:16. Reason: Local transmission emergency due to fires in the Ventura area. Notice issued at: 12/04/2017 22:16 Updated notices sent multiple times to extend Emergency through 12/12 23:59

Alert, Warning, and Emergencies Record For 2016

AWE Declarations

Date	Day	Region	Time Frame	AWE Event	Reason
2/6/2016	Saturday	Northern CA	12:52 - 23:59	RMO	This notice will be in effect for the following counties due to special events across the region:San Mateo, San Francisco, Solano, San Joaquin, Stanislaus, Alameda, Santa Clara, and Contra Costa.
6/20/2016	Monday	ISO	00:00 - 23:59	Generation RMO	The ISO is anticipating high loads and temperatures across the CAISO Grid. Notice issued at: 06/15/2016 16:44
6/21/2016	Tuesday	ISO	00:00 - 23:59	Generation RMO	The ISO is anticipating high loads and temperatures across the CAISO Grid. Notice issued at: 06/15/2016 16:44
6/20/2016	Monday	Southern CA	10:00 - 21:00	Flex Alert	Southern Californians are urged to conserve electricity from June 20 at 10:00 AM to 9:00 PM to avoid power disruptions. Notice issued at: 06/19/2016 14:00
6/28/2016	Tuesday	ISO	06:00 - 22:00	RMO	The ISO is anticipating high loads and temperatures across the CAISO Grid. Notice issued at: 06/24/2016 09:30
7/27/2016	Wednesday	ISO	06:00 - 22:00	Generation RMO	The ISO anticipates generation resources may be inadequate for the period covered by this notice. Notice issued at: 7/26/2016 18:57
7/27/2016	Wednesday	ISO	14:00 - 21:00	Flex Alert	Californians are urged to conserve electricity from July 27 at 2:00 PM to 9:00 PM to avoid power disruptions. Notice issued at: 7/27/2016 12:03
7/28/2016	Thursday	ISO	06:00 - 22:00	Generation RMO	The ISO anticipates generation resources may be inadequate for the period covered by this notice. Notice issued at: 7/27/2016 14:02
7/28/2016	Thursday	ISO	14:00 - 21:00	Flex Alert	Californians are urged to conserve electricity from July 27 at 2:00 PM to 9:00 PM to avoid power disruptions. Notice issued at: 7/28/2016 9:05
7/29/2016	Friday	ISO	12:00 - 22:00	Generation RMO	The ISO anticipates generation resources may be inadequate for the period covered by this notice. Notice issued at: 7/28/2016 9:50
8/17/2016	Wednesday	Southern CA	06:00 - 22:00	RMO	Due to the loss of transmission in the Southern CA Blue Cut Fire. Notice issued at: 8/16/16 21:07
8/17/2016	Wednesday	Southern CA	06:00 - 22:00	Generation RMO	The ISO anticipates generation resources may be inadequate for the period covered by this notice. Notice issued at: 8/16/16 21:10
8/18/2016	Thursday	Southern CA	06:00 - 22:00	RMO	Due to the loss of transmission in the Southern CA Blue Cut Fire. Notice issued at: 8/17/16 18:50

8/18/2016	Thursday	Southern CA	06:00 - 22:00	Generation RMO	The ISO anticipates generation resources may be inadequate for the period covered by this notice. Notice issued at: 8/17/16 18:52

Alert, Warning, and Emergencies Record For 2015

AWE Declarations

Date	Day	Region	Time Frame	AWE Event	Reason
6/30/2015	Tuesday	ISO	0:00-23:59	RMO	The ISO is anticipating high loads and temperatures across |the CAISO Grid.
6/30/2015	Tuesday	ISO	07:31-23:59	Warning	High temperatures, high forecast peak load, southern (California gas pipeline capacity concerns in the Los |Angeles basin, and much lower than historically available |CAISO Balancing Authority Area energy imports.
6/30/2015	Tuesday	ISO	14:00-21:00	Flex Alert	Californians are urged to conserve electricity to avoid power disruptions.
6/30/2015	Tuesday	ISO	0:00-23:59	RMO	The ISO is anticipating high loads and temperatures across |the CAISO Grid.
7/1/2015	Wednesday	ISO	0:00-23:59	RMO	The ISO is anticipating high loads and temperatures across |the CAISO Grid.
7/1/2015	Wednesday	ISO	14:00-21:00	Flex Alert	Californians are urged to conserve electricity to avoid power disruptions.
7/29/2015	Wednesday	ISO	07:00-22:00	RMO	The ISO is anticipating high loads and temperatures across |the CAISO Grid.
7/30/2015	Thursday	ISO	07:00-22:00	RMO	The ISO is anticipating high loads and temperatures across |the CAISO Grid.
8/14/2015	Friday	Southern CA	06:00-22:00	RMO	The ISO is anticipating high loads and temperatures across the Southern CA Region.
8/15/2015	Saturday	ISO	06:00-22:00	RMO	The ISO is anticipating high loads and temperatures across the Southern CA Region.
8/16/2015	Sunday	ISO	06:00-22:00	RMO	The ISO is anticipating high loads and temperatures across the Southern CA Region.
8/17/2015	Monday	ISO	06:00-22:00	RMO	The ISO is anticipating high loads and temperatures across the Southern CA Region.
9/8/2015	Tuesday	ISO	07:00-23:59	RMO	The ISO is anticipating high loads and temperatures across the CAISO Grid.
9/8/2015	Tuesday	ISO	12:00-22:00	Alert	Higher than expected loads and loss of resources
9/11/2015	Friday	ISO	00:01-22:00	RMO	The ISO is anticipating high loads and temperatures across |the CAISO Grid.
10/13/2015	Tuesday	Southern CA	16:32-22:00	Warning	Loss of resources and load forecast deviation.

Alert, Warning, and Emergencies Record For 2014

AWE Declarations

Date	Day	Region	Time Frame	AWE event	Reason
2/6/2014	Thursday	ISO	0656-2359	RMO	The ISO is anticipating gas curtailments in Southern California. Market Participants are cautioned to avoid actions, which may jeopardize generator and/or transmission availability.
2/6/2014	Thursday	ISO	1300-2200	Flex Alert	Californians are urged to conserve electricity to avoid power disruptions.
2/6/2014	Thursday	ISO	1300-2200	Warning	Due to cold weather across the Western United States, Southern California Gas Company issued "Emergency Curtailments" to several generation resources in Southern California. To avoid further generator "Emergency Curtailments", the gas companies have asked the California ISO to reduce gas consumption at the generating stations in the San Diego and Southern California Edison systems. Conservation efforts are encouraged. Energy Market Participants are encouraged to offer additional Supplemental Energy and Ancillary Service bids.
2/7/2014	Friday	Southern CA	0001-2359	RMO	A shortage of natural gas triggered by extreme cold weather in much of the United States and Canada is impacting fuel supplies to Southern CA power plants and reducing electricity generation.
5/14/2014	Wednesday	Southern CA	1219-2359	RMO	The ISO is experiencing high loads and temperatures across the Southern CA Region along with threatening fires to ISO facilities. "Restricted Maintenance Operations is for the San Diego Service area Only".
5/14/2014	Wednesday	Southern CA	1407-2200	Transmission Emergency	Emergency is for San Diego area ONLY due to brush fires threatening the ISO transmission system.
5/15/2014	Thursday	Southern CA	0000-2359	RMO	The ISO anticipates high loads and temperatures across the Southern CA Region along with threatening fires to ISO facilities. "Restricted Maintenance Operations is for the San Diego Service area Only".
5/16/2014	Friday	Southern CA	0000-2359	RMO	The ISO anticipates high loads and temperatures across the Southern CA Region along with threatening fires to ISO facilities. "Restricted Maintenance Operations is for the San Diego Service area Only".

9/15/2014	Monday	Southern CA	0800-2200	RMO	The ISO is anticipating high loads and temperatures across the Southern CA Region.
9/16/2014	Tuesday	Southern CA	0800-2200	RMO	The ISO is anticipating high loads and temperatures across the Southern CA Region.
11/1/2014	Saturday	ISO	0300-2359	RMO	Effective 0300 to 2359 CAISO declares Restricted Maintenance Operation Due to Transmission Limitations.

Alert, Warning, and Emergencies Record For 2013

AWE Declarations

Date	Day	Region	Time Frame	AWE event	Reason
4/16/2013	Tuesday	Northern CA	1000-2359	Flex Alert	Due to transmission outages.
4/25/2013	Thursday	Southern CA	0840-2200	RMO	Due to transmission system work in the SDG&E area.
4/26/2013	Friday	Southern CA	0840-2200	RMO	Due to transmission system work in the SDG&E area.
5/30/2013	Thursday	ISO	1617-2359	RMO	Due to loss of and threat to Transmission Facilities and fires within the CAISO Grid.
7/1/2013	Monday	ISO	0001-2359	RMO	Anticipation of high loads and temperatures across CAISO Grid.
7/2/2013	Tuesday	ISO	0001-2359	RMO	Anticipation of high loads and temperatures across CAISO Grid.
7/1/2013	Monday	Northern CA	1200-1900	Flex Alert	Northern Californians are urged to conserve electricity to avoid power disruptions.
7/2/2013	Tuesday	Northern CA	1200-1900	Flex Alert	Northern Californians are urged to conserve electricity to avoid power disruptions.
8/29/2013	Thursday	Southern CA	0937-1510	RMO	Anticipation of high loads and temperatures across San Diego region.
8/30/2013	Friday	Southern CA	1110-2100	RMO	Anticipation of high loads and temperatures across San Diego region.
12/9/2013	Monday	Southern CA	0444-2359	RMO	The ISO anticipates generation resources may be inadequate in the San Diego area due to gas supply issues.
12/9/2013	Monday	Southern CA	2039-2359	RMO	The ISO anticipates generation resources may be inadequate in the San Diego and SCE areas due to gas supply issues.
12/10/2013	Tuesday	Southern CA	0001-2359	RMO	The ISO anticipates generation resources may be inadequate in the San Diego and SCE areas due to gas supply issues.
12/11/2013	Wednesday	Southern CA	0001-2359	RMO	The ISO anticipates generation resources may be inadequate in the San Diego and SCE areas due to gas supply issues.

Alert, Warning, and Emergencies Record For 2012

AWE Declarations

Date	Day	Region	Time Frame	AWE event	Reason (for RMO or above)
1/25/2012	Wednesday	Southern CA	0735-0932	RMO	Loss of Midway-Vincent #2 500kv line and with Midway-Vincent #1 500kv line out of service.
1/31/2012	Tuesday	Southern CA	1630-2359	RMO	Loss of resources in Southern California.
2/1/2012	Wednesday	Southern CA	0600-2359	RMO	Due to loss of generation resources.
2/2/2012	Thursday	Southern CA	Jan-59	RMO	Due to loss of generation resources.
2/3/2012	Friday	Southern CA	0000-2359	RMO	Due to loss of generation resources.
2/4/2012	Saturday	Southern CA	Jan-59	RMO	Due to loss of generation resources.
2/4/2012	Saturday	Northern CA	0900-1323	RMO	Due to current transmission work within CAISO in Northern California at COI.
2/5/2012	Sunday	Southern CA	0000-2359	RMO	Due to loss of generation resources.
2/6/2012	Monday	Southern CA	0000-2359	RMO	Due to loss of generation resources.
2/7/2012	Tuesday	Southern CA	Mar-59	RMO	Due to loss of generation resources.
2/8-2/29/2012	22 days	Southern CA	0000-2359	RMO	Due to loss of generation resources.
3/1-3/31/2012	31 days	Southern CA	0000-2359	RMO	Due to loss of generation resources.
4/1-4/30/2012	30 days	Southern CA	0000-2359	RMO	Due to loss of generation resources.
4/30-5/31/2012	31 days	Southern CA	2300-2359	RMO	Due to loss of generation resources.
8/9/2012	Thursday	ISO	1000-2000	RMO	Due to high temperatures and loads.
8/10/2012	Friday	ISO	1000-2000	RMO	Due to high temperatures and loads.
8/10/2012	Friday	ISO	1200-1800	Flex Alert	-
8/13/2012	Monday	ISO	0600-2200	RMO	Anticipation of high loads and temperatures across CAISO Grid.
8/14/2012	Tuesday	ISO	0600-2200	RMO	Anticipation of high loads and temperatures across CAISO Grid.
8/14/2012	Tuesday	ISO	1100-1800	Flex Alert	-
8/15/2012	Wednesday	ISO	0600-2200	RMO	Anticipation of high loads and temperatures across CAISO Grid.
8/29/2012	Wednesday	Southern CA	1000-1900	RMO	Due to high temperatures and loads in Southern CA.
9/10/2012	Monday	Southern CA	1200-1720	RMO	Due to higher than forecasted loads in Southern CA.
9/14/2012	Friday	Southern CA	1450-2100	RMO	Anticipation of high loads and temperatures across the Southern CA and Southwest Region.
10/1/2012	Monday	ISO	1000-1930	RMO	Anticipation of high loads and high temperatures across the CAISO Grid.
11/21/2012	Wednesday	ISO	0840-2300	RMO	Forced transmission limitations.

Alert, Warning, and Emergencies Record For 2011

AWE Declarations

Date	Day	Region	Time Frame	AWE event	Reason (for RMO or above)
2/3/2011	Thursday	Southern CA	1201-1200	RMO	Due to potential gas curtailments in the San Diego and Imperial County area
2/4/2011	Friday	Southern CA	1201-1200	RMO	Due to potential gas curtailments in the San Diego and Imperial County area
7/6/2011	Wednesday	ISO	0800-2000	RMO	Anticipation of higher than forecasted temperatures and associated loads across the CAISO Grid.
9/7/2011	Wednesday	ISO	1149-2200	Flex Alert	-
9/7/2011	Wednesday	ISO	1147-2200	Warning	-
9/7/2011	Wednesday	ISO	0904-2200	RMO	Higher than anticipated temperatures and loads across the CAISO Grid.
9/8/2011	Thursday	ISO	1620-2359	RMO	Major System Disturbance in Southern California, San Diego area.
9/8/2011	Thursday	Southern CA	1617-2359	Transmission Emergency	Major System Disturbance in Southern California, San Diego area.
9/9/2011	Friday	ISO	0000-0956	Flex Alert	-
9/9/2011	Friday	Southern CA	0000-0957	Transmission Emergency	Major System Disturbance in Southern California, San Diego area.
9/9/2011	Friday	ISO	0000-1220	RMO	Due to a transmission emergency in Southern California.
9/9/2011	Friday	Southern CA	1224-0958	RMO	Due to the Grid events of 9/8/2011 resulting in reduced generating capacity in the Southern CA Region.
10/1/2011	Saturday	Southern CA	0500-2041	RMO	Scheduled So. Cal. gas company pipeline outage.
10/8/2011	Saturday	Southern CA	0600-2336	RMO	Scheduled So. Cal. gas company pipeline outage.
10/15/2011	Saturday	Southern CA	0600-2250	RMO	Scheduled So. Cal. gas company pipeline outage.
10/22/2011	Saturday	Southern CA	0600-2056	RMO	Scheduled So. Cal. gas company pipeline outage.
10/29/2011	Saturday	Southern CA	0600-0355	RMO	Scheduled So. Cal. gas company pipeline outage.
10/30/2011	Sunday	Southern CA	0600-0355	RMO	Scheduled So. Cal. gas company pipeline outage.
11/5/2011	Saturday	Southern CA	0600-1331	RMO	Scheduled So. Cal. gas company pipeline outage.
11/12/2011	Saturday	Southern CA	0600-2150	RMO	Scheduled So. Cal. gas company pipeline outage.
11/19/2011	Saturday	Southern CA	0600-2103	RMO	Scheduled So. Cal. gas company pipeline outage.
12/8/2011	Thursday	Southern CA	0847-1138	RMO	Scheduled So. Cal. gas company pipeline outage.

Alert, Warning, and Emergencies Record For 2010

AWE Declarations

Date	Day	Region	Restricted Maintenance Operations	Alert	Warning	Flex Alert	Transmission Emergency	Stage 1	Stage 2	Stage 3	VLRP
01/19/10	Tue	ISO	1640-1959		1640-1822						
01/19/10	Tue	ISO	1953-2259								
01/20/10	Wed	ISO	1953-2259								
7/29-31/10	Thu-Sat	ISO	2030-2359								
07/30/10	Sat	ISO					0000-2359				
07/31/10	Sun	ISO	0003-2359								
08/25/10	Wed	ISO	1130-2100								
09/27/10	Mon	ISO	0627-2130								
09/28/10	Tue	ISO	0643-2200								
Total Declarations			**8**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**

Stage 1 Emergency Notice is declared by the ISO any time it is clear that an Operating Reserve shortfall (less than WECC requirement minimum) is unavoidable or, when in real-time operations, the Operating Reserve is forecast to be less than minimum after using available resources Continuously recalculated, between 6 0% and 7 0% Can be issued on a system-wide or regional basis

Stage 2 Emergency Notice is declared by the ISO any time it is clear that an Operating Reserve shortfall (less than 5%) is unavoidable or, when in real-time operations, the Operating Reserve is forecast to be less than 5% after dispatching all available resources Can be issued on a system-wide or regional basis

Stage 3 Emergency Notice is declared by the ISO any time the Spinning Reserve portion of Operating Reserves deplete or are anticipated to drop below the WECC Requirement and cannot be restored Continuously recalculated, between 1 5% and 3 0% Can be issued on a system-wide or regional basis

Transmission Emergency Notice is declared by the ISO for any event that threatens, harms, or limits capabilities of any element of the transmission grid and threatens grid reliability Can be issued on a system-wide or regional basis

Alert, Warning, and Emergencies Record For 2009

AWE Declarations

Date	Day	Region	Restricted Maintenance Operations	Alert	Warning	Flex Alert	Transmission Emergency	Stage 1	Stage 2	Stage 3	VLRP
04/17/09	Fri	So. Cal					1150-1518				
05/27/09	Wed	ISO	1551-2100								
06/10/09	Wed	No. Cal					1918-2005				
07/16/09	Thur	So. Cal					1227-1312				
08/13/09	Thur	No. Cal	1738-2200								
08/28/09	Fri	So. Cal	0830-1900								
08/30/09	Sun	So. Cal	1130-1900								
09/08/09	Tue	So. Cal					0852-0900				
10/13/09	Tue	No. Cal					1338-1745				
10/27/09	Tue	ISO					0603-0607				
10/30/09	Fri	So. Cal	1823-1845								
12/07/09	Mon	ISO			1805-1915						
12/08/09	Tue	ISO	0245-1728		0634-0900						
Total Declarations			**6**	**0**	**2**	**0**	**6**	**0**	**0**	**0**	**0**

Stage 1 Emergency Notice is declared by the ISO any time it is clear that an Operating Reserve shortfall (less than WECC requirement minimum) is unavoidable or, when in real-time operations, the Operating Reserve is forecast to be less than minimum after using available resources.

Stage 2 Emergency Notice is declared by the ISO any time it is clear that an Operating Reserve shortfall (less than 5%) is unavoidable or, when in real-time operations, the Operating Reserve is forecast to be less than 5% after dispatching all available resources.

Stage 3 Emergency Notice is declared by the ISO any time the Spinning Reserve portion of Operating Reserves deplete or are anticipated to drop below the WECC Requirement and cannot be restored.

Transmission Emergency Notice is declared by the ISO for any event that threatens, harms, or limits capabilities of any element of the transmission grid and threatens grid reliability.

Alert, Warning, and Emergencies Record For 2008

AWE Declarations

Date	Day	RMO	Alert	Warning	Flex Alert	Transmission Emergency	Stage 1	Stage 2	Stage 3	VLRP
06/11/08	Wednesday	1430-2359##								
06/20/08	Friday	0630-2359								
06/21/08	Saturday	1120-2359								
06/27/08	Friday	1209-2359##								
06/28/08	Saturday	0800-2200##								
07/07/08	Monday	1355-2200								
07/08/08	Tuesday	0600-2200			X					
07/09/08	Wednesday	0600-2200			X					
07/10/08	Thursday				X					
08/29/08	Friday	1435-2200								
10/08/08	Wednesday			1521-1716						
11/17/08	Monday	1406-2000								
Total Declarations		**10**	**0**	**1**	**3**	**0**	**0**	**0**	**0**	**0**

Southern California ## Northern California **Note**: If there is no designation of area (# or ##), declaration was for entire CAISO Controlled Grid

Stage 1 Emergency Notice is declared by the ISO any time it is clear that an Operating Reserve shortfall (less than WECC requirement minimum) is unavoidable or, when in real-time operations, the Operating Reserve is forecast to be less than minimum after utilizing available resources.

Stage 2 Emergency Notice is declared by the ISO any time it is clear that an Operating Reserve shortfall (less than 5%) is unavoidable or, when in real-time operations, the Operating Reserve is forecast to be less than 5% after dispatching all available resources.

Stage 3 Emergency Notice is declared by the ISO any time the Spinning Reserve portion of Operating Reserves deplete or are anticipated to drop below the WECC Requirement and cannot be restored.

Transmission Emergency Notice is declared by the ISO for any event threatens, harms, or limits capabilities of any element of the transmission grid and threatens grid reliability.

Alert, Warning, and Emergencies Record For 2007

AWE Declarations

Date	Day	RMO	Alert	Warning	Flex Alert	Transmission Emergency	Stage 1	Stage 2	Stage 3	VLRP
01/15/07	Monday	0946-2100								
05/08/07	Tuesday	0930-1800 (Gen.)								
07/03/07	Tuesday	0800-2000			X					
07/04/07	Wednesday				X					
07/05/07	Thursday				X					
08/29/07	Wednesday	0600-2000		1500-2000	X		1520-1723			
08/30/07	Thursday	0600-2000	0745-1730	1400-1700	X					
08/31/07	Friday	0550-2359		1245-1700	X					
09/03/07	Monday	1254-1900								
09/04/07	Tuesday	0900-1900#								
10/21/07	Sunday	1604-2359#								
		1608-2359 (Gen)#								
10/22/07	Monday	0001-2359#				1408-2200				
		0001-2359(Gen)#								
10/23/07	Tuesday	0001-2359#				0556-2359				
		0001-2359(Gen)#								
10/24/07	Wednesday	0001-2359#				0640-2359				
		0001-2359(Gen)#								
10/25/07	Thursday	0001-1900#				0001-1900				
		0001-1900(Gen)#								
Total Declarations		**18**	**1**	**3**	**6**	**4**	**1**	**0**	**0**	**0**

Southern California ## Northern California

Stage 1 Emergency Notice is declared by the ISO any time it is clear that an Operating Reserve shortfall (less than MORC minimum) is unavoidable or, when in real-time operations, the Operating Reserve is forecast to be less than minimum after utilizing available resources.

Stage 2 Emergency Notice is declared by the ISO any time it is clear that an Operating Reserve shortfall (less than 5%) is unavoidable or, when in real-time operations, the Operating Reserve is forecast to be less than 5% after dispatching all available resources.

Stage 3 Emergency Notice is declared by the ISO any time the Spinning Reserve portion of Operating Reserves deplete or are anticipated to drop below the MORC Requirement and cannot be restored,

Transmission Emergency Notice is declared by the ISO when any transmission component within the ISO controlled grid has exceeded its maximum facility rating.

AWE Grid History Report

Alert, Warning, and Emergencies Record For 2006

Load Reduction Data

Date	Day	Forecasted Peak Demand (MW)	Actual Peak* Demand (MW)	Load (MW)**		
				Non-Firm	Firm	CDWR/MWD
07/24/06	Monday	52,366	50,270	855		

***Actual Peak Demand does not include interrupted load values.**

****Load includes both Interruptible (Non-Firm) and Firm load (customer and pump load), and is an APPROXIMATE value based on Real Time operating information.**

AWE Declarations

Date	Day	RMO	Alert	Warning	Power Watch	Transmission Emergency	Stage 1	Stage 2	Stage 3	VLRP
06/16/06	Friday			1452-1900						
06/22/06	Thursday				X					
06/23/06	Friday				X					
06/24/06	Saturday				X					
06/25/06	Sunday				X					
06/26/06	Monday	1000-2000			X					
06/27/06	Tuesday				X					
06/28/06	Wednesday				X					
07/13/06	Thursday	1200-2200								
07/14/06	Friday	0700-2200			X					
07/15/06	Saturday				X					
07/16/06	Sunday				X					
07/17/06	Monday	0600-2000	1300-1900		X					
07/18/06	Tuesday	0600-2000			X					
07/19/06	Wednesday	0600-2000			X					
07/20/06	Thursday	0600-2000								
07/21/06	Friday	0600-2000		1330-2000	X					
07/22/06	Saturday	0600-2000		1200-2000	X		1312-2000			X
07/23/06	Sunday	0600-2000			X					
07/24/06	Monday	0600-2000		0730-2100	X		1000-2100	1300-2100		X
07/25/06	Tuesday	0600-2000		1000-2000	X		1300-2000			X
07/26/06	Wednesday	0600-2000								
07/27/06	Thursday	0600-2000								
09/05/06	Tuesday	1208-2000#								
09/06/06	Wednesday	0600-2000#								
Total Declarations		**16**	**1**	**5**	**18**	**0**	**3**	**1**	**0**	**3**

Southern California ## Northern California

Stage 1 Emergency Notice is declared by the ISO any time it is clear that an Operating Reserve shortfall (less than MORC minimum) is unavoidable or, when in real-time operations, the Operating Reserve is forecast to be less than minimum after utilizing available resources

Stage 2 Emergency Notice is declared by the ISO any time it is clear that an Operating Reserve shortfall (less than 5%) is unavoidable or, when in real-time operations, the Operating Reserve is forecast to be less than 5% after dispatching all available resources

Stage 3 Emergency Notice is declared by the ISO any time it is clear that the Spinning Reserve portion of Operating Reserve is less than the ISO's single largest resource or when, in real-time operations, the Operating Reserve is forecast to be less than the single largest resource

Transmission Emergency Notice is declared by the ISO when any transmission component within the ISO controlled grid has exceeded its maximum facility rating

AWE Grid History Report

Alert, Warning, and Emergencies Record For 2005

Load Reduction Data

Date	Day	Forecasted Peak Demand (MW)	Actual Peak* Demand (MW)	Load (MW)**		
				Non-Firm	Firm	CDWR/MWD
07/21/05	Thursday	45,294	44,652	230		
07/22/05	Friday	45,754	44,048	200		294
08/25/05	Thursday	38,357	41,786	700	900	55

***Actual Peak Demand does not include interrupted load values.**

****Load includes both Interruptible (Non-Firm) and Firm load (customer and pump load), and is an APPROXIMATE value based on Real Time operating information.**

AWE Declarations

Date	Day	RMO	Alert	Warning	Power Watch	Transmission Emergency	Stage 1	Stage 2	Stage 3
04/12/05	Tuesday					0434-0508			
07/12/05	Tuesday	0800-2159							
07/13/05	Wednesday	0600-2200							
07/14/05	Thursday	0600-2200			X				
07/15/05	Friday	0600-2200							
07/18/05	Monday	0700-2200			X				
07/19/05	Tuesday	0600-2200							
07/20/05	Wednesday	1045-2200							
07/21/05	Thursday	0800-2200			X	1430-2100#		1432-1730#	
07/22/05	Friday	0800-2200		1115-2000#	X			1354-1800#	
07/23/05	Saturday				X	1656-1730			
07/24/05	Sunday				X				
7/25/2005	Monday				X				
8/25/2005	Thursday	1130-2000#		1305-2000#		1552-2359#			
9/28/2005	Wednesday	1450-2000#							
9/29/2005	Thursday	0800-2000							
10/14/2005	Friday	1109-1824#					1425-1715		
12/21/2005	Wednesday					1136-1308#			
Total Declarations		**13**	**0**	**2**	**7**	**5**	**1**	**2**	**0**

Southern California ## Northern California

Stage 1 Emergency Notice is declared by the ISO any time it is clear that an Operating Reserve shortfall (less than MORC minimum) is unavoidable or, when in real-time operations, the Operating Reserve is forecast to be less than minimum after utilizing available resources

Stage 2 Emergency Notice is declared by the ISO any time it is clear that an Operating Reserve shortfall (less than 5%) is unavoidable or, when in real-time operations, the Operating Reserve is forecast to be less than 5% after dispatching all available resources

Stage 3 Emergency Notice is declared by the ISO any time it is clear that the Spinning Reserve portion of Operating Reserve is less than the ISO's single largest resource or when, in real-time operations, the Operating Reserve is forecast to be less than the single largest resource

Transmission Emergency Notice is declared by the ISO when any transmission component within the ISO controlled grid has exceeded its maximum facility rating

California ISO Declared Emergencies For 2004

Date	Day	Forecasted Peak Demand (MW)	Actual Peak* Demand (MW)	Load (MW)**			Stage 1	Stage 2	Stage 3	Trans.
				Non-Firm	Firm	CDWR/MWD				
01/12/04	Monday	30,167	30,774							0005-0200
02/03/04	Tuesday	30,325	30,792							1139-1151
03/08/04	Monday	30,682	31,777	50	250					1822-1900
03/29/04	Monday	32,064	32,649				1350-1929			
05/03/04	Monday	37,460	40,565	628		68				1420-1900
07/20/04	Tuesday	43,414	44,330	300		40				1950-2359
09/14/04	Tuesday	38,040	36,670	8						1010-1700
Total Declarations							**1**	**0**	**0**	**6**

***Actual Peak Demand does not include interrupted load values.**

****Load includes both interruptible (Non-Firm) and Firm load and is an approximate value based on information obtained from the ISO log.**

Stage 1 Emergency Notice is declared by the ISO any time it is clear that an Operating Reserve shortfall (less than MORC minimum) is unavoidable or, when in real-time operations, the Operating Reserve is forecast to be less than minimum after utilizing available resources.

Stage 2 Emergency Notice is declared by the ISO any time it is clear that an Operating Reserve shortfall (less than 5%) is unavoidable or, when in real-time operations, the Operating Reserve is forecast to be less than 5% after dispatching all available resources.

Stage 3 Emergency Notice is declared by the ISO any time it is clear that the Spinning Reserve portion of Operating Reserve is less than the ISO's single largest resource or when, in real-time operations, the Operating Reserve is forecast to be less than the single largest resource.

Transmission Emergency Notice is declared by the ISO when any transmission component within the ISO controlled grid has exceeded its maximum facility rating.

AWE Grid History Report

Declared Restricted Maintenance Operations*, Alert, Warning, Power Watch, or Transmission Emergency Days for 2004

RMO*	Alert	Warning	Power Watch	Transmission Emergency
				01/12/04
				02/03/04
				03/08/04
03/29/04		03/29/04		
04/26/04	04/26/04			
04/27/04				
05/03/04				05/03/04
07/19/04				
07/20/04				07/20/04
07/21/04				
07/22/04				
07/26/04			07/26/04	
07/27/04				
			08/09/04	
			08/10/04	
08/11/04				
08/12/04				
			09/06/04	
09/07/04				
09/08/04				
09/09/04				
09/10/04		09/10/04	09/10/04	
			09/14/04	09/14/04
16	**1**	**2**	**6**	**6**

*** Restricted Maintenance Operations. Formerly referred to as "No-Touch Day"**

California ISO Declared Emergencies For 2003

Date	Day	Forecasted Peak Demand (MW)	Actual Peak Demand (MW)	Interruptible Load (MW)**			Stage 1	Stage 2	Stage 3
				Non-Firm	Firm	CDWR			
5/28/2003	Wednesday	35,012	39,577	0	0	0	1500-1759		
							1	0	0

***** **Actual Peak Demand includes the Interruptible Load.**

****** **Interruptible Load is approximate and based on information provided by the UDCs.**

Stage 1 Emergency Notice is declared by the ISO any time it is clear that an Operating Reserve shortfall (less than MORC minimum) is unavoidable or, when in real-time operations, the Operating Reserve is forecast to be less than minimum after utilizing available resources.

Stage 2 Emergency Notice is declared by the ISO any time it is clear that an Operating Reserve shortfall (less than 5%) is unavoidable or, when in real-time operations, the Operating Reserve is forecast to be less than 5% after dispatching all available resources.

Stage 3 Emergency Notice is declared by the ISO any time it is clear that Operating Reserve is less than the ISO's single largest resource or when, in real-time operations, the Operating Reserve is forecast to be less than the single largest resource

AWE Grid History Report

Declared Restricted Maintenance Operations*, Alert, Warning or Power Watch Days for 2003

RMO*	Alert	Warning	Power Watch
3/21/2003			
3/22/2003			
3/23/2003			
3/24/2003			
3/25/2003			
3/26/2003			
3/27/2003			
3/28/2003			
5/28/2003			
5/29/2003			
10	**0**	**0**	**0**

*** Restricted Maintenance Operations. Formerly referred to as "No-Touch Day"**

California ISO Declared Emergencies For 2002

Date	Day	Forecasted Peak Demand (MW)	Actual Peak Demand (MW)	Interruptible Load (MW)**			Stage 1	Stage 2	Stage 3
				Non-Firm	Firm	CDWR			
6/18/2002	Tuesday	34,651	34,845	0	0	326			
7/9/2002	Tuesday	40,402	41,838	0	0	0	14:40-19:00		
7/10/2002	Wednesday	42,564	42,441	1320	0	204	14:30-17:59	15:00-17:59	
9/3/2002	Tuesday	38,934	40,835	792	0	110			
							2	1	0

***** Actual Peak Demand includes the Interruptible Load.

****** Interruptible Load is approximate and based on information provided by the UDCs.

Stage 1 Emergency Notice is declared by the ISO any time it is clear that an Operating Reserve shortfall (less than MORC minimum) is unavoidable or, when in real-time operations, the Operating Reserve is forecast to be less than minimum after utilizing available resources.

Stage 2 Emergency Notice is declared by the ISO any time it is clear that an Operating Reserve shortfall (less than 5%) is unavoidable or, when in real-time operations, the Operating Reserve is forecast to be less than 5% after dispatching all available resources.

Stage 3 Emergency Notice is declared by the ISO any time it is clear that Operating Reserve is less than the ISO's single largest resource or when, in real-time operations, the Operating Reserve is forecast to be less than the single largest resource

AWE Grid History Report

Declared Restricted Maintenance Operations*, Alert, Warning or Power Watch Days for 2002

RMO*	Alert	Warning	Power Watch
5/30/2002			
6/6/2002			
6/27/2002			
6/28/2002			
7/1/2002		7/1/2002	
7/9/2002		7/9/2002	
7/10/2002	7/10/2002	7/10/2002	7/10/2002
7/11/2002	7/11/2002		
7/12/2002			
7/15/2002	7/15/2002		
7/18/2002			
7/24/2002			
8/12/2002			
8/13/2002			
9/2/2002		9/2/2002	
9/3/2002			
9/4/2002			
9/5/2002			
18	**3**	**4**	**1**

*** Restricted Maintenance Operations. Formerly referred to as "No-Touch Day"**

California ISO Declared Emergencies For 2001

Date	Day	Forecasted Peak Demand (MW)	Actual Peak Demand (MW)	Interruptible Load (MW)**			Stage 1	Stage 2	Stage 3
				Non-Firm	Firm	CDWR			
1/8/2001	Monday	32386	32265	None	None		1606-2200	None	None
1/9/2001	Tuesday	32322	31680*	1131	None		0645-2300	1715-2300	None
1/10/2001	Wednesday	32488	32623*	264	None		0700-2359	1530-2359	None
1/11/2001	Thursday	32589	31239*	833	None		0319-2359	0500-2359	0850-2359
1/12/2001	Friday	31729	30824	None	None		0001-2359	0001-2200	0017-0300
1/14/2001	Sunday	28825	27959	None	None		1920-2359	1920-2359	None
1/15/2001	Monday	31883	31711	None	None		0910-2359	0925-2359	None
1/16/2001	Tuesday	32315	30979*	1146	None	318	0030-2359	0030-2359	0720-2359
1/17/2001	Wednesday	32279	29727*	841	500		0001-2359	0001-2359	0145-2359
1/18/2001	Thursday	31856	29537*	927	1000	307	0001-2359	0001-2359	0001-2359
1/19/2001	Friday	30798	29258*	1171	None		0001-2359	0001-2359	0001-2359
1/20/2001	Saturday	28166	27112*	257	None		0001-2359	0001-2359	0001-2359
1/21/2001	Sunday	27925	27657*	234	101		0001-2359	0001-2359	0001-2359
1/22/2001	Monday	32187	30315	None	None		0001-2359	0001-2359	0001-2359
1/23/2001	Tuesday	31883	30938	None	None		0001-2359	0001-2359	0001-2359
1/24/2001	Wednesday	31701	31405	None	None		0001-2359	0001-2359	0001-2359
1/25/2001	Thursday	31109	31357	None	None		0001-2359	0001-2359	0001-2359
1/26/2001	Friday	30559	29485*	1054	None		0001-2359	0001-2359	0001-2359
1/27/2001	Saturday	27620	27648	None	None		0001-2359	0001-2359	0001-2359
1/28/2001	Sunday	27830	26429	None	None		0001-2359	0001-2359	0001-2359
1/29/2001	Monday	31217	30789	None	None		0001-2359	0001-2359	0001-2359
1/30/2001	Tuesday	31223	30937	None	None		0001-2359	0001-2359	0001-2359
1/31/2001	Wednesday	30760	30753	None	None		0001-2359	0001-2359	0001-2359
2/1/2001	Thursday	30864	30284	None	None		0001-2359	0001-2359	0001-2359
2/2/2001	Friday	29594	29268	None	None		0001-2359	0001-2359	0001-2359
2/3/2001	Saturday	27115	26789	None	None		0001-2359	0001-2359	0001-2359
2/4/2001	Sunday	27413	27623	None	None		0001-2359	0001-2359	0001-2359
2/5/2001	Monday	30874	30276	None	None		0001-2359	0001-2359	0001-2359
2/6/2001	Tuesday	30848	30307	None	None		0001-2359	0001-2359	0001-2359
2/7/2001	Wednesday	31000	30611	None	None		0001-2359	0001-2359	0001-2359
2/8/2001	Thursday	30493	30457	None	None		0001-2359	0001-2359	0001-2359
2/9/2001	Friday	29949	29910*	None	None	79	0001-2359	0001-2359	0001-2359
2/10/2001	Saturday	27650	27606	None	None		0001-2359	0001-2359	0001-2359
2/11/2001	Sunday	28196	28164	None	None		0001-2359	0001-2359	0001-2359
2/12/2001	Monday	31236	30683*	312	None		0001-2359	0001-2359	0001-2359
2/13/2001	Tuesday	31340	29947*	252	None		0001-2359	0001-2359	0001-2359
2/14/2001	Wednesday	30896	29312*	257	None		0001-2359	0001-2359	0001-2359
2/15/2001	Thursday	29840	29818*	196	None		0001-2359	0001-2359	0001-2359
2/16/2001	Friday	28800	28411	None	None		0001-2359	0001-2359	0001-2359
2/17/2001	Saturday	26945	25441	None	None		0001-2359	0001-2359	None
2/18/2001	Sunday	27263	25994	None	None		0001-2359	0001-2359	None

California ISO Declared Emergencies For 2001

Date	Day	Forecasted Peak Demand (MW)	Actual Peak Demand (MW)	Interruptible Load (MW)**			Stage 1	Stage 2	Stage 3
				Non-Firm	Firm	CDWR			
2/19/2001	Monday	29772	28994	None	None		0001-2359	0001-2359	None
2/20/2001	Tuesday	30867	29619	None	None		0001-2359	0001-2359	None
2/21/2001	Wednesday	29737	29448	None	None		0001-2359	0001-1159	None
2/22/2001	Thursday	29706	29787	None	None		0001-0900	None	None
2/28/2001	Wednesday	29285	29552*	179	None		1000-2359	1000-2000	None
3/1/2001	Thursday	29058	29474	None	None		0650-1000	0650-1000	None
3/5/2001	Monday	30264	29778	None	None		0800-2359	None	None
3/15/2001	Thursday	28675	28882*	313	None		1030-2159	1030-2159	None
3/19/2001	Monday	29348	29476*	246	1000		0600-2359	0600-2359	1146-2059
3/20/2001	Tuesday	29952	29691*	189	500		0001-2159	0001-2159	0917-1430
3/21/2001	Wednesday	29443	29657	None	None		0626-2259	None	None
3/27/2001	Tuesday	29285	29410*	291	None		1320-2159	1320-2159	None
3/28/2001	Wednesday	29331	29548*	135	None		1052-2359	1115-2359	None
3/29/2001	Thursday	29468	29496	None	None		1010-2359	None	None
3/30/2001	Friday	28661	29279*	149	None		0900-2359	0900-1700	None
3/31/2001	Saturday	26617	26394*	250	None		1130-2000	1130-2000	None
4/2/2001	Monday	29119	28783*	156	None		0840-2359	0840-2359	None
4/3/2001	Tuesday	28465	28710*	103	None		0001-1300	0001-1300	None
4/9/2001	Monday	28462	28559	None	None		0750-1045	0750-1045	None
4/24/2001	Tuesday	29903	30975	None	None		1337-2359	1405-2359	None
4/25/2001	Wednesday	30550	31770	None	None		1518-2159	1518-2159	None
5/7/2001	Monday	32010	33446*	863	300	300	0804-2359	1000-2359	1643-1800
5/8/2001	Tuesday	34469	34455*	938	400	300	0815-2359	1115-2300	1510-1730
5/9/2001	Wednesday	35499	33839*	863	None		1015-2359	1145-2230	None
5/10/2001	Thursday	33806	33693*	913	None		1300-2359	1300-2359	None
5/30/2001	Wednesday	34353	35749	None	None		1130-2359	1400-2359	None
5/31/2001	Thursday	36229	37808*	783	None		0900-2300	1132-2215	None
7/2/2001	Monday	39558	40586	None	None		1332-1800	1435-1724	None
7/3/2001	Tuesday	39231	41192*	826	None		1120-1800	1140-1720	None

*** Actual Peak Demand includes the Interruptible Load.**

**** Interruptible Load is approximate and based on information provided by the UDCs.**

Stage 1 Emergency Notice is declared by the ISO any time it is clear that an Operating Reserve shortfall (less than MORC minimum) is unavoidable or, when in real-time operations, the Operating Reserve is forecast to be less than minimum after utilizing available resources.

Stage 2 Emergency Notice is declared by the ISO any time it is clear that an Operating Reserve shortfall (less than 5%) is unavoidable or, when in real-time operations, the Operating Reserve is forecast to be less than 5% after dispatching all available resources.

Stage 3 Emergency Notice is declared by the ISO any time it is clear that Operating Reserve is less than the ISO's single largest resource or when, in real-time operations, the Operating Reserve is forecast to be less than the single largest resource all available resources.

AWE Grid History Report

Declared No Touch, Alert, Warning and Power Watch Days for 2001

No Touch	Alert	Warning	Power Watch
1/1/2001	1/1/2001	1/1/2001	1/11/2001
1/2/2001	1/2/2001	1/2/2001	1/12/2001
1/3/2001	1/3/2001	1/3/2001	1/17/2001
1/4/2001	1/4/2001	1/4/2001	1/20/2001
1/5/2001	1/5/2001	1/5/2001	1/21/2001
1/6/2001	1/6/2001	1/6/2001	1/22/2001
1/7/2001	1/7/2001	1/7/2001	1/23/2001
1/8/2001	1/8/2001	1/8/2001	1/24/2001
1/9/2001	1/9/2001	1/9/2001	1/25/2001
1/10/2001	1/10/2001	1/10/2001	1/26/2001
1/11/2001	1/11/2001	1/11/2001	1/27/2001
1/12/2001	1/12/2001	1/12/2001	1/28/2001
1/13/2001	1/13/2001	1/13/2001	1/29/2001
1/14/2001	1/14/2001	1/14/2001	1/30/2001
1/15/2001	1/15/2001	1/15/2001	1/31/2001
1/16/2001	1/16/2001	1/16/2001	
1/17/2001	1/17/2001	1/17/2001	
1/18/2001	1/18/2001	1/18/2001	
1/19/2001	1/19/2001	1/19/2001	
1/20/2001	1/20/2001	1/20/2001	
1/21/2001	1/21/2001	1/21/2001	
1/22/2001	1/22/2001	1/22/2001	
1/23/2001	1/23/2001	1/23/2001	
1/24/2001	1/24/2001	1/24/2001	
1/25/2001	1/25/2001	1/25/2001	
1/26/2001	1/26/2001	1/26/2001	
1/27/2001	1/27/2001	1/27/2001	
1/28/2001	1/28/2001	1/28/2001	
1/29/2001	1/29/2001	1/29/2001	
1/30/2001	1/30/2001	1/30/2001	
1/31/2001	1/31/2001	1/31/2001	
2/1/2001	2/1/2001	2/1/2001	2/1/2001
2/2/2001	2/2/2001	2/2/2001	2/2/2001
2/3/2001	2/3/2001	2/3/2001	2/3/2001
2/4/2001	2/4/2001	2/4/2001	2/4/2001
2/5/2001	2/5/2001	2/5/2001	2/5/2001
2/6/2001	2/6/2001	2/6/2001	2/6/2001
2/7/2001	2/7/2001	2/7/2001	2/7/2001
2/8/2001	2/8/2001	2/8/2001	2/8/2001
2/9/2001	2/9/2001	2/9/2001	
2/10/2001	2/10/2001	2/10/2001	
2/11/2001	2/11/2001	2/11/2001	
2/12/2001	2/12/2001	2/12/2001	
2/13/2001	2/13/2001	2/13/2001	2/13/2001
2/14/2001	2/14/2001	2/14/2001	
2/15/2001	2/15/2001	2/15/2001	2/15/2001
2/16/2001	2/16/2001	2/16/2001	
2/17/2001	2/17/2001	2/17/2001	
2/18/2001	2/18/2001	2/18/2001	

AWE Grid History Report

Declared No Touch, Alert, Warning and Power Watch Days for 2001

No Touch	Alert	Warning	Power Watch
2/19/2001	2/19/2001	2/19/2001	
2/20/2001	2/20/2001	2/20/2001	
2/21/2001	2/21/2001	2/21/2001	
2/22/2001	2/22/2001	2/22/2001	
2/23/2001	2/23/2001	2/23/2001	
2/24/2001	2/24/2001	2/24/2001	
2/25/2001	2/25/2001	2/25/2001	
2/26/2001	2/26/2001	2/26/2001	
2/27/2001	2/27/2001	2/27/2001	
2/28/2001	2/28/2001	2/28/2001	
3/1/2001	3/1/2001	3/1/2001	
3/2/2001	3/2/2001	3/2/2001	
3/3/2001	3/3/2001	3/3/2001	
3/4/2001	3/4/2001	3/4/2001	
3/5/2001	3/5/2001	3/5/2001	
3/6/2001	3/6/2001	3/6/2001	
3/7/2001	3/7/2001	3/7/2001	
3/8/2001	3/8/2001	3/8/2001	
3/9/2001	3/9/2001	3/9/2001	
3/10/2001	3/10/2001	3/10/2001	
3/11/2001	3/11/2001	3/11/2001	
3/12/2001	3/12/2001	3/12/2001	
3/13/2001	3/13/2001	3/13/2001	
3/14/2001	3/14/2001	3/14/2001	
3/15/2001	3/15/2001	3/15/2001	
3/16/2001	3/16/2001	3/16/2001	
3/17/2001	3/17/2001	3/17/2001	
3/18/2001	3/18/2001	3/18/2001	
3/19/2001	3/19/2001	3/19/2001	
3/20/2001	3/20/2001	3/20/2001	
3/21/2001	3/21/2001	3/21/2001	
3/22/2001	3/22/2001	3/22/2001	
3/23/2001	3/23/2001	3/23/2001	
3/24/2001	3/24/2001	3/24/2001	
3/25/2001	3/25/2001	3/25/2001	
3/26/2001	3/26/2001	3/26/2001	
3/27/2001	3/27/2001	3/27/2001	
3/28/2001	3/28/2001	3/28/2001	
3/29/2001	3/29/2001	3/29/2001	
3/30/2001	3/30/2001	3/30/2001	
3/31/2001	3/31/2001	3/31/2001	
4/1/2001	4/1/2001	4/1/2001	
4/2/2001	4/2/2001	4/2/2001	
4/3/2001	4/3/2001	4/3/2001	
4/4/2001	4/4/2001	4/4/2001	
4/5/2001	4/5/2001	4/5/2001	
4/6/2001	4/6/2001	4/6/2001	
4/7/2001	4/7/2001	4/7/2001	

AWE Grid History Report

Declared No Touch, Alert, Warning and Power Watch Days for 2001

No Touch	Alert	Warning	Power Watch
4/8/2001	4/8/2001	4/8/2001	
4/9/2001	4/9/2001	4/9/2001	
4/10/2001	4/10/2001	4/10/2001	
4/11/2001	4/11/2001	4/11/2001	
4/12/2001	4/12/2001	4/12/2001	
4/13/2001	4/13/2001	4/13/2001	
4/14/2001	4/14/2001	4/14/2001	
4/15/2001	4/15/2001	4/15/2001	
4/16/2001	4/16/2001	4/16/2001	
4/17/2001	4/17/2001	4/17/2001	
4/18/2001	4/18/2001	4/18/2001	
4/19/2001	4/19/2001	4/19/2001	
4/20/2001	4/20/2001	4/20/2001	
4/21/2001	4/21/2001	4/21/2001	
4/22/2001	4/22/2001	4/22/2001	
4/23/2001	4/23/2001	4/23/2001	
4/24/2001	4/24/2001	4/24/2001	
4/25/2001	4/25/2001	4/25/2001	
4/26/2001	4/26/2001	4/26/2001	
4/27/2001	4/27/2001	4/27/2001	
4/28/2001	4/28/2001	4/28/2001	
4/29/2001	4/29/2001	4/29/2001	
4/30/2001	4/30/2001	4/30/2001	
5/1/2001	5/1/2001	5/1/2001	
5/2/2001	5/2/2001	5/2/2001	
5/3/2001	5/3/2001	5/3/2001	
5/4/2001	5/4/2001	5/4/2001	
5/5/2001	5/5/2001	5/5/2001	
5/6/2001	5/6/2001	5/6/2001	
5/7/2001	5/7/2001	5/7/2001	
5/8/2001	5/8/2001	5/8/2001	
5/9/2001	5/9/2001	5/9/2001	
5/10/2001	5/10/2001	5/10/2001	
5/11/2001	5/11/2001	5/11/2001	
5/12/2001	5/12/2001	5/12/2001	
5/13/2001	5/13/2001	5/13/2001	
5/14/2001	5/14/2001	5/14/2001	
5/15/2001	5/15/2001	5/15/2001	
5/16/2001	5/16/2001	5/16/2001	
5/17/2001	5/17/2001	5/17/2001	
5/18/2001	5/18/2001	5/18/2001	
5/19/2001	5/19/2001	5/19/2001	
5/20/2001	5/20/2001	5/20/2001	
5/21/2001	5/21/2001	5/21/2001	
5/22/2001	5/22/2001	5/22/2001	
5/23/2001	5/23/2001	5/23/2001	
5/24/2001	5/24/2001	5/24/2001	
5/25/2001	5/25/2001	5/25/2001	

AWE Grid History Report

Declared No Touch, Alert, Warning and Power Watch Days for 2001

No Touch	Alert	Warning	Power Watch
5/26/2001	5/26/2001	5/26/2001	
5/27/2001	5/27/2001	5/27/2001	
5/28/2001	5/28/2001	5/28/2001	
5/29/2001	5/29/2001	5/29/2001	
5/30/2001	5/30/2001	5/30/2001	
5/31/2001	5/31/2001	5/31/2001	
6/1/2001	6/1/2001	6/1/2001	
6/2/2001	6/2/2001	6/2/2001	
6/3/2001	6/3/2001	6/3/2001	
6/4/2001	6/4/2001	6/4/2001	
6/5/2001	6/5/2001	6/5/2001	
6/7/2001	6/6/2001	6/6/2001	
6/17/2001	6/7/2001	6/7/2001	
6/18/2001	6/8/2001	6/8/2001	
6/19/2001	6/9/2001	6/9/2001	
6/20/2001	6/10/2001	6/10/2001	
6/21/2001	6/11/2001	6/11/2001	
6/22/2001	6/12/2001	6/12/2001	
	6/13/2001	6/13/2001	
	6/14/2001	6/14/2001	
	6/15/2001	6/15/2001	
	6/16/2001	6/16/2001	
	6/17/2001	6/17/2001	6/17/2001
	6/18/2001	6/18/2001	
	6/19/2001	6/19/2001	
	6/20/2001	6/20/2001	
	6/21/2001	6/21/2001	
	6/22/2001	6/22/2001	
	6/23/2001	6/23/2001	
	6/24/2001	6/24/2001	
	6/25/2001	6/25/2001	
	6/26/2001	6/26/2001	
7/2/2001	7/2/2001	7/2/2001	
7/3/2001	7/3/2001	7/3/2001	
7/5/2001	7/5/2001	7/5/2001	
8/8/2001		8/8/2001	
8/28/2001			
168	**180**	**181**	**26**

California ISO Declared Emergencies For 2000

Date	Day	Forecasted Peak Demand (MW)	Actual Peak Demand (MW)	Interruptible Load (MW)**		Stage 1	Stage 2	Stage 3
				Non-Firm	Firm			
5/22/2000	Monday	39000	40862*	1054	0	1030-1800	1230-1700	None
6/13/2000	Tuesday	44756	42318	0	0	1600-1826	None	None
6/14/2000	Wednesday	45329	44239*	509	100	1300-2030	None	None
6/26/2000	Monday	41063	43300*	300	0	1510-1745	1542-1715	None
6/27/2000	Tuesday	43042	43793*	1000	0	1000-2020	1330-1900	None
6/28/2000	Wednesday	43953	43911*	1000	0	1200-1900	1415-1745	None
6/29/2000	Thursday	42754	41743	0	0	1330-1830	None	None
7/19/2000	Wednesday	39752	42610*	930	0	1450-1900	1450-1800	None
7/20/2000	Thursday	41405	41781	0	0	1100-2000	None	None
7/24/2000	Monday	42945	43537	0	0	1100-1800	None	None
7/25/2000	Tuesday	42737	42292	0	0	1530-1900	None	None
7/28/2000	Friday	40292	41504	0	0	1415-1800	None	None
7/31/2000	Monday	45391	45245*	1995	0	1101-2000	1318-1800	None
8/1/2000	Tuesday	46245	45281*	1778	0	1100-2100	1200-1900	None
8/2/2000	Wednesday	45723	45069*	2190	0	1100-2000	1200-1830	None
8/3/2000	Thursday	44776	43018	0	0	1100-1900	1400-1800	None
8/4/2000	Friday	40297	42050	0	0	1400-1800	None	None
8/11/2000	Friday	41833	40474	0	0	1400-2000	1430-1700	None
8/14/2000	Monday	42635	43087*	746	0	1400-1800	1500-1730	None
8/15/2000	Tuesday	42830	42927*	681	0	1100-2000	1300-1930	None
8/16/2000	Wednesday	43617	45494*	1710	0	1100-1900	1238-1900	None
8/17/2000	Thursday	41973	43360	0	0	1100-1800	1415-1730	None
8/22/2000	Tuesday	38399	38358	0	0	1430-1900	None	None
8/25/2000	Friday	39683	40246	0	0	1404-1900	None	None
8/26/2000	Saturday	35809	36237	0	0	1515-1800	None	None
9/12/2000	Tuesday	38987	39908	0	0	1620-1800	None	None
9/13/2000	Wednesday	39750	41728*	1169	0	1410-1800	1454-1700	None
9/14/2000	Thursday	40482	40926	0	0	1100-2000	1400-1800	None
9/16/2000	Saturday	40613	37552	0	0	1537-1742	None	None
9/18/2000	Monday	43187	43740*	1697	0	1100-2100	1300-1700	None
9/19/2000	Tuesday	44827	43105	0	0	1100-2200	None	None
9/20/2000	Wednesday	42865	40985	0	0	1300-2000	None	None
11/13/2000	Monday	32820	34384*	1840	0	1658-2046	1713-2048	None

California ISO Declared Emergencies For 2000

Date	Day	Forecasted Peak Demand (MW)	Actual Peak Demand (MW)	Interruptible Load (MW)**		Stage 1	Stage 2	Stage 3
				Non-Firm	Firm			
11/14/2000	Tuesday	32900	33440*	1377	0	1600-2200	1700-1900	None
11/15/2000	Wednesday	33587	32730*	1147	0	0700-2300	1600-2000	None
11/16/2000	Thursday	32906	32486	0	0	1600-2200	None	None
11/19/2000	Sunday	29042	29323	0	0	0915-2200	None	None
11/20/2000	Monday	32416	31892	0	0	0520-2100	1645-1900	None
12/4/2000	Monday	34275	34088*	1289	0	0657-2200	1600-2159	None
12/5/2000	Tuesday	34498	33076*	1379	0	0535-2200	1600-2100	None
12/6/2000	Wednesday	34226	34115*	1379	0	0615-2400	0700-2200	None
12/7/2000	Thursday	33839	33197*	1393	200***	0100-2400	0400-2400	1715-1930
12/8/2000	Friday	33033	32624	0	0	0001-2400	0001-2400	None
12/9/2000	Saturday	30404	30428	0	0	0700-2200	0912-2200	None
12/10/2000	Sunday	30899	30519*	200	0	1115-2200	1646-2200	None
12/11/2000	Monday	33952	33719*	367	0	0930-2300	1640-2300	None
12/12/2000	Tuesday	34225	33710*	0	400***	0001-2200	1710-2200	None
12/13/2000	Wednesday	34152	33668	0	0	0600-2400	1415-2200	None
12/14/2000	Thursday	33752	33262	0	0	0001-2400	0001-2300	None
12/18/2000	Monday	34330	33738	0	0	1300-2400	None	None
12/19/2000	Tuesday	33307	33782	0	0	0130-2400	0915-2400	None
12/20/2000	Wednesday	33720	32834	0	0	0915-2400	1410-2400	None
12/21/2000	Thursday	33695	32937	0	0	0001-2400	0730-2400	None
12/23/2000	Saturday	30484	29134	0	0	0022-2200	0022-2200	None
12/24/2000	Sunday	30271	27689	0	0	0920-2200	None	None

*** Actual Peak Demand includes the Interruptible Load.**

**** Interruptible Load is approximate and based on information provided by the UDCs.**

***** CDWR dropped pump load.**

Stage 1 Emergency Notice is declared by the ISO any time it is clear that an Operating Reserve shortfall (less than MORC minimum) is unavoidable or, when in real-time operations, the Operating Reserve is forecast to be less than minimum after utilizing available resources.
Stage 2 Emergency Notice is declared by the ISO any time it is clear that an Operating Reserve shortfall (less than 5%) is unavoidable or, when in real-time operations, the Operating Reserve is forecast to be less than 5% after dispatching all resources available.

Stage 3 Emergency Notice is declared by the ISO any time it is clear that Operating Reserve is less than the ISO's single largest resource or when, in real-time operations, the Operating Reserve is forecast to be less than the single largest resource all available resources.

California ISO Declared Emergencies for 1999

Date	Day	Forecasted Peak Demand (MW)	Actual Peak Demand (MW)	Interruptible Load (MW)** Non-Firm	Firm	Stage 1	Stage 2	Stage 3
6/29/1999	Tuesday	38522	40556	0	0	1445-1800	None	None
7/12/1999	Monday	45617	45884	0	0	1415-2000	None	None
8/26/1999	Thursday	43020	41548	0	0	1020-1620	None	None
9/30/1999	Thursday	37662	41227*	1155	0	1428-2000	1625-1734	None

***** **Actual Peak Demand includes the Interruptible Load.**

****** **Interruptible Load is approximate and based on information provided by the UDCs.**

Stage 1 Emergency Notice is declared by the ISO any time it is clear that an Operating Reserve shortfall (less than MORC minimum) is unavoidable or, when in real-time operations, the Operating Reserve is forecast to be less than minimum after utilizing available resources.

Stage 2 Emergency Notice is declared by the ISO any time it is clear that an Operating Reserve shortfall (less than 5%) is unavoidable or, when in real-time operations, the Operating Reserve is forecast to be less than 5% after dispatching all resources available.

Stage 3 Emergency Notice is declared by the ISO any time it is clear that Operating Reserve is less than the ISO's single largest resource or when, in real-time operations, the Operating Reserve is forecast to be less than the single largest resource all available resources.

California ISO Declared Emergencies for 1998

Date	Day	Forecasted Peak Demand (MW)	Actual Peak Demand (MW)	Interruptible Load (MW)**		Stage 1	Stage 2	Stage 3
				Non-Firm	Firm			
7/27/1998	Monday	41776	43382*	1940	0	1445-1900	1450-1705	None
8/4/1998	Tuesday	45532	44707	0	0	1352-2200	1500-1917	None
8/31/1998	Monday	44836	45676*	1337	0	1405-2200	1505-1710	None
9/1/1998	Tuesday	44810	44726*	320	0	0810-2100	1300-1645	None
9/2/1998	Wednesday	45523	43527	0	0	1300-2004	None	None
9/3/1998	Thursday	45523	44376	0	0	1328-1900	None	None
12/21/1998	Monday	32684	33664*	400	0	0720-1006	1006-1900	None

*** Actual Peak Demand includes the Interruptible Load.**

**** Interruptible Load is approximate and based on information provided by the UDCs.**

Stage 1 Emergency Notice is declared by the ISO any time it is clear that an Operating Reserve shortfall (less than MORC minimum) is unavoidable or, when in real-time operations, the Operating Reserve is forecast to be less than minimum after utilizing available resources.

Stage 2 Emergency Notice is declared by the ISO any time it is clear that an Operating Reserve shortfall (less than 5%) is unavoidable or, when in real-time operations, the Operating Reserve is forecast to be less than 5% after dispatching all resources available.

Stage 3 Emergency Notice is declared by the ISO any time it is clear that an Operating Reserve shortfall (less than 1 1/2%) is unavoidable or when in real-time operations, the Operating Reserve is forecast to be less than 1 1/2% after dispatching all resources available.

Declared No Touch, Alert, Warning and Power Watch Days for 1998 Through 2000

No Touch

1998	1999	2000
27-Jul	12-Jul	1-Jan
24-Aug	13-Jul	2-Jan
25-Aug	14-Jul	3-Jan
1-Sep	23-Aug	4-Jan
2-Sep	24-Aug	5-Jan
3-Sep	25-Aug	21-May
4-Sep	26-Aug	22-May
7-Sep	27-Aug	23-May
9	28-Sep	13-Jun
	28-Oct	14-Jun
	30-Dec	15-Jun
	31-Dec	16-Jun
	12	22-Jun
		26-Jun
		27-Jun
		28-Jun
		29-Jun
		19-Jul
		20-Jul
		24-Jul
		25-Jul
		26-Jul
		31-Jul
		1-Aug
		2-Aug
		4-Aug
		5-Aug
		6-Aug
		7-Aug
		11-Aug
		12-Aug
		31

Alert

1998	1999	2000
30-May	12-Jul	22-May
26-Jul	1-Oct	23-May
27-Jul	**2**	13-Jun
24-Aug		14-Jun
2-Sep		15-Jun
3-Sep		27-Jun
4-Sep		28-Jun
7		29-Jun
		19-Jul
		20-Jul
		24-Jul
		25-Jul
		31-Jul
		1-Aug
		2-Aug
		3-Aug
		4-Aug
		6-Aug
		7-Aug
		14-Aug
		16-Aug
		17-Aug
		18-Aug
		14-Sep
		15-Sep
		18-Sep
		19-Sep
		20-Sep
		15-Nov
		16-Nov
		17-Nov
		31

Warning

1998	1999	2000
27-Jul	12-Jul	22-May
28-Jul	25-Aug	23-May
23-Aug	26-Aug	13-Jun
24-Aug	27-Aug	14-Jun
1-Sep	30-Sep	15-Jun
2-Sep	28-Oct	21-Jun
3-Sep	**6**	26-Jun
4-Sep		27-Jun
8		28-Jun
		29-Jun
		18-Jul
		19-Jul
		20-Jul
		24-Jul
		25-Jul
		28-Jul
		31-Jul
		1-Aug
		2-Aug
		3-Aug
		4-Aug
		5-Aug
		9-Aug
		10-Aug
		11-Aug
		14-Aug
		15-Aug
		16-Aug
		17-Aug
		18-Aug
		19-Aug

Power Watch

1998*	1999*	2000
N/A	N/A	22-May
		13-Jun
		14-Jun
		15-Jun
		27-Jun
		28-Jun
		29-Jun
		19-Jul
		24-Jul
		25-Jul
		31-Jul
		1-Aug
		2-Aug
		3-Aug
		14-Aug
		15-Aug
		16-Aug
		17-Aug
		18-Sep
		19-Sep
		20

* Power Watch was implemented in 2000

Declared No Touch, Alert, Warning and Power Watch Days for 1998 Through 2000

No Touch

1998	1999	2000
		13-Aug
		14-Aug
		15-Aug
		16-Aug
		17-Aug
		18-Aug
		23-Aug
		24-Aug
		13-Sep
		14-Sep
		15-Sep
		18-Sep
		19-Sep
		20-Sep
		14-Nov
		15-Nov
		16-Nov
		17-Nov
		20-Nov
		21-Nov
		22-Nov
		27-Nov
		4-Dec
		5-Dec
		6-Dec
		7-Dec
		8-Dec
		9-Dec
		10-Dec
		11-Dec
		12-Dec
		13-Dec

Alert

1998	1999	2000
		20-Nov
		5-Dec
		6-Dec
		34

Warning

1998	1999	2000
		22-Aug
		24-Aug
		25-Aug
		26-Aug
		11-Sep
		12-Sep
		13-Sep
		14-Sep
		15-Sep
		16-Sep
		17-Sep
		18-Sep
		19-Sep
		20-Sep
		13-Nov
		14-Nov
		15-Nov
		16-Nov
		17-Nov
		18-Nov
		19-Nov
		20-Nov
		21-Nov
		22-Nov
		28-Nov
		29-Nov
		30-Nov
		3-Dec
		4-Dec
		5-Dec
		6-Dec
		7-Dec

Power Watch

1998*	1999*	2000

* Power Watch was implemented in 2000

Declared No Touch, Alert, Warning and Power Watch Days for 1998 Through 2000

No Touch

1998	1999	2000
		14-Dec
		15-Dec
		19-Dec
		20-Dec
		21-Dec
		22-Dec
		23-Dec
		24-Dec
		25-Dec
		26-Dec
		28-Dec
		29-Dec
		30-Dec
		31-Dec
		77

Alert

1998	1999	2000

Warning

1998	1999	2000
		8-Dec
		9-Dec
		10-Dec
		11-Dec
		12-Dec
		13-Dec
		14-Dec
		15-Dec
		16-Dec
		19-Dec
		20-Dec
		21-Dec
		22-Dec
		23-Dec
		24-Dec
		25-Dec
		26-Dec
		27-Dec
		28-Dec
		29-Dec
		30-Dec
		31-Dec
		85

Power Watch

1998*	1999*	2000

Reliability Results Summary

Model Year	Median Peak Load	Perfect Capacity Reserve Margin Target	Total Reliability Need	Portfolio Capacity Value (ELCC Methodology)	Capacity Shortfall	Achieved Loss of Load Expectation
	MW	*% of Peak*	*Firm MW*	*Firm MW*	*Firm MW*	*Days per Year*
2026 TYP	29,463	8.8%	32,056	30,227	(1,829)	0.92
2027 TYP	29,708		32,322	30,659	(1,663)	0.74
2027 TYP *+1,400MW Batteries*	29,708		32,322	32,049	(273)	0.11
2028	30,283		32,948	32,929	(19)	0.10
2029	30,831		33,544	33,440	(104)	0.13
2030	31,344		34,102	33,991	(112)	0.13
2035	34,847		37,914	36,696	(1,218)	0.33
Derivation:	*A*	*B*	*C = A x (1+B)*	*D*	*E = D – C*	*F*

Load & Resource Table 2026 – Ten-Year Site Plan (TYP) Portfolio

	LOLP-Derived Methodology	2026		
		Nameplate Capacity (MW)	Firm Capacity (MW)	Firm Capacity (% of Nameplate)
1	Thermal + Kingfisher 1/2	28,252	25,171	89%
2	Utility Solar (Fixed + Tracking)	6,711	1,644	24%
3	Behind-the-meter (BTM) Solar[1]	1,722	198	12%
4	Storage	469	441	94%
5	Demand Response (DR)	1,957	1,722	88%
6	Portfolio Effect/Peak to Net Load Shift		1,051	
7	**Portfolio ELCC** *(E3 Methodology)*	39,111	30,227	
8	Median Peak Demand **(Grossed up for BTM PV & Net of Energy Efficiency)**	29,463		
9	Median Peak Demand less DR	Not used		
10	**PCAP** Planning Reserve Margin (PRM)	8.80%		
11	Total Firm MW Requirement	32,056		
12	Firm Capacity Surplus / Shortfall	*-1829*		

1) MW AC, assuming ILR = 1/0.85

Exhibit AO-4

Prepared by

Energy+Environmental Economics

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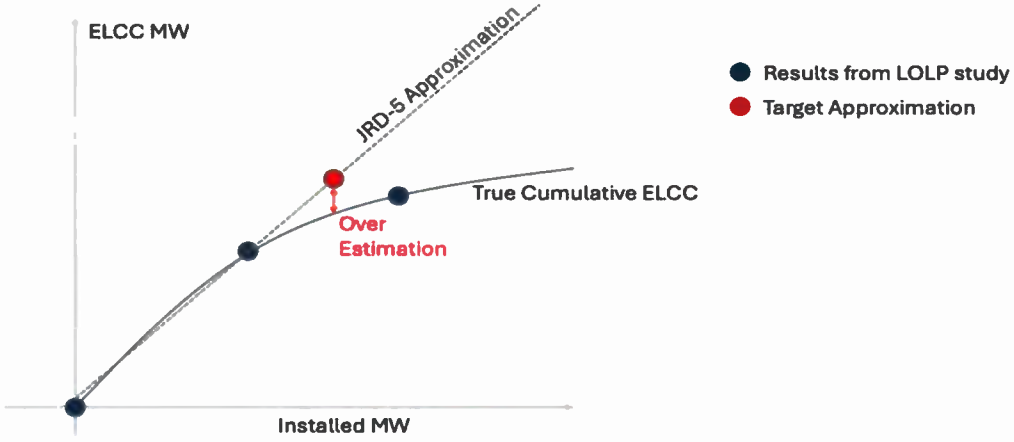
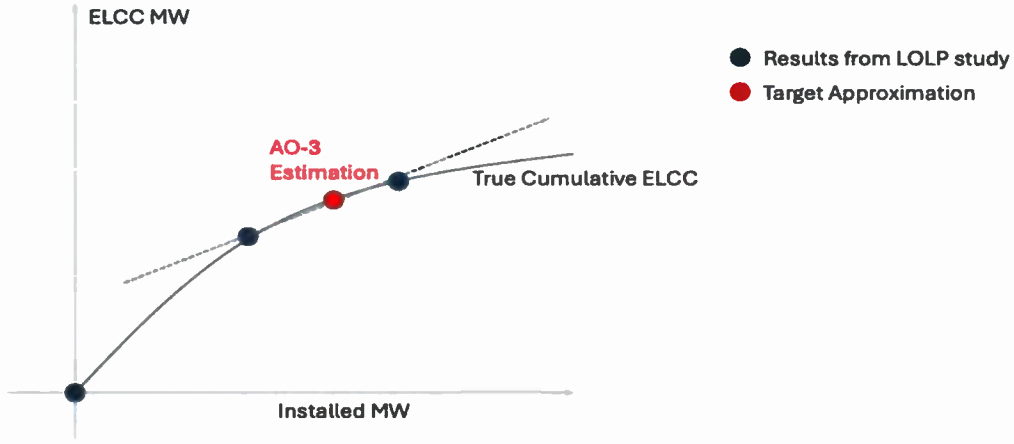

ELCC MW
JRD-5 Approximation
True Cumulative ELCC
Over
Estimation
Installed MW
Results from LOLP study
Target Approximation


ELCC MW
AO-3
Estimation
True Cumulative ELCC
Installed MW
Results from LOLP study
Target Approximation

FLORIDA POWER & LIGHT COMPANY
DOCKET NO. 20250011-EI

Estimated Stochastic LOLP Analysis Results for "TYP Portfolio + 1,400 MW of Storage" Adjusted to Reflect FPL's Proposed Pre-Summer 2027 Resource Additions

	AWW-1		JRD-5		Corrected JRD-5		
	2027 - TYP Portfolio + 1,400 of Storage (Exhibit AWW-1, p. 22)		FPL's Proposed 2027 Portfolio with All Pre-Summer 2027 In-Service Resources Included (Estimated Results)		FPL's Proposed 2027 Portfolio with All Pre-Summer 2027 In-Service Resources Included (Estimated Results)		
	Nameplate Capacity (MW)	Cumulative Firm Capacity (MW)	Nameplate Capacity (MW)	Cumulative Firm Capacity (MW)	Nameplate Capacity (MW)	Cumulative Firm Capacity (MW)	Over / (under)-estimate
Utility Solar (Fixed + Tracking)	8,946		9,422		9,422		
Behind-the-meter (BTM) Solar	2,125		2,125		2,125		
Total Solar	11,071	3,096	11,547	3,325	11,547	3,205	121
Total Storage	2,391	1,904	2,858	2,151	2,858	2,152	(1)
Thermal + Kingfisher 1/2	28,281		28,281		28,281		
Demand Response (DR)	1,951		1,951		1,951		
Total Thermal, Kingfisher + DR	30,232	27,050	30,232	27,050	30,232	27,050	0
Portfolio ELCC *(E3 Methodology)*	43,694	32,049	44,637	32,526	44,637	32,406	120
Median Peak Demand (Grossed up for BTM PV & Net of Energy Efficiency)		29,708		29,708		29,708	0
PCAP Planning Reserve Margin (PRM)		8.8%		8.8%		8.8%	0
Total Firm MW Requirement		32,322		32,322		32,322	0
Firm Capacity Surplus / (Shortfall)		(273)		204		84	120
Achieved Loss of Load Expectation (Days per Year)		0.105		0.097			

Solar Cumulative ELCC, Firm MW (JRD-6)

	(1) 0 GW Storage	(2) 2.3GW Storage	(3) Extrapolation of (1) and (2)
Solar Nameplate	0 MW of Storage	2,391 MW of Storage	2,858 MW of Storage
-	-	-	
1,000	420	640	683
4,000	1,335	1,655	1,718
7,000	1,840	2,424	2,538
10,177	2,174	2,986	3,145
11,071	2,237	3,096	3,264
12,433	2,330	3,259	3,440
14,746	2,447	3,443	3,637
17,046	2,548	3,594	3,799
31,761	2,915	4,011	4,225
36,000	2,973	4,062	4,274
		812	159

Storage Cumulative ELCC, Firm MW (JRD-6)

	(1) 0 GW Solar	(2) 11GW Solar	(3) Extrapolation of (1) and (2)
Storage Nameplate	0 MW of Solar	11,071 MW of Solar	11,547 MW of Solar
-	-	-	
250	173	227	230
1,000	630	915	927
1,841	1,051	1,564	1,586
2,391	1,286	1,904	1,930
3,211	1,587	2,288	2,318
3,807	1,792	2,553	2,586
4,403	2,013	2,772	2,805
7,383	3,266	3,827	3,851
9,000	3,810	4,296	4,317

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Corrections to Calculations of
OPC witness Dauphinais
Exhibit AO-4, Page 3 of 8

Incremental Storage Nameplate MW	467
Incremental Solar Nameplate MW	476

Corrected Solar Cumulative ELCC, Firm MW (Using Marginal ELCC S+S Surface from AWW-1 Workpaper)

	(1)	(2)	(3) = Interpolate between Marginal S+S Surface Slices	
	2,391	3,211	2858	
Solar Nameplate	Solar Cumulative ELCC with 2,391MW Storage	Solar Cumulative ELCC with 3,211MW Storage	Approximate Solar ELCC with 2858 MW of Storage	Solar Cumulative ELCC difference between E3 Study and Dauphinais Workpaper
-				
1,000				
4,000				
7,000				
10,177	2,986.25	3,047.26	3,021.00	123.81
11,071	3,095.88	3,178.33	3,142.84	120.73
12,433	3,258.85	3,365.81	3,319.77	120.59
14,746	3,442.63	3,577.16	3,519.25	117.76
17,046	3,594.33	3,780.08	3,700.12	98.67
31,761	4,011.37	4,195.54	4,116.26	109.17
36,000	4,061.50	4,238.22	4,162.15	112.04

Corrected Storage Cumulative ELCC, Firm MW (Using Marginal ELCC S+S Surface from AWW-1 Workpaper)

	(3)	(3)		
	11071	12433	11547	
Storage Nameplate	Storage Cumulative ELCC with 11,071MW	Storage Cumulative ELCC with 12,433MW	Approximate Storage ELCC with 11,547 MW of Solar	Storage Cumulative ELCC difference between E3 Study and Dauphinais Workpaper
-				
250				
1,000				
1,841				
2,391	1,904	1,974	1,928.34	1.85
3,211	2,288	2,383	2,321.09	(3.15)
3,807	2,553	2,626	2,578.60	7.15
4,403	2,772	2,860	2,802.88	2.07
7,383	3,827	3,908	3,855.09	(4.15)
9,000	4,296	4,397	4,331.14	(14.53)
			-	-

FLORIDA POWER & LIGHT COMPANY
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Estimated Stochastic LOLP Analysis Results without FPL's 2026 and 2027 Proposed Solar Generation Additions

	AWW-1		JRD-6		Corrected JRD-6		
	2027 - TYP Portfolio + 1,400 of Storage (Exhibit AWW-1, p. 22)		FPL's Proposed 2027 Portfolio without FPL's 2026 and 2027 Solar Additions (Estimated Results)		FPL's Proposed 2027 Portfolio without FPL's 2026 and 2027 Solar Additions (Estimated Results)		
	Nameplate Capacity (MW)	Cumulative Firm Capacity (MW)	Nameplate Capacity (MW)	Cumulative Firm Capacity (MW)	Nameplate Capacity (MW)	Cumulative Firm Capacity (MW)	Over / (under)- estimate
Utility Solar (Fixed + Tracking)	8,946		7,932		7,932		
Behind-the-meter (BTM) Solar	2,125		2,125		2,125		
Total Solar	11,071	3,096	10,057	3,122	10,057	3,004	117
Total Storage	2,391	1,904	2,858	2,061	2,858	2,059	2
Thermal + Kingfisher 1/2	28,281		28,281		28,281		
Demand Response (DR)	1,951		1,951		1,951		
Total Thermal, Kingfisher + DR	30,232	27,050	30,232	27,050	30,232	27,050	0
Portfolio ELCC *(E3 Methodology)*	43,694	32,049	43,147	32,233	43,147	32,114	120
Median Peak Demand (Grossed up for BTM PV & Net of Energy Efficiency)		29,708		29,708		29,708	0
PCAP Planning Reserve Margin (PRM)		8.8%		8.8%		8.8%	0
Total Firm MW Requirement		32,322		32,322		32,322	0
Firm Capacity Surplus / (Shortfall)		(273)		(89)		(209)	120
Achieved Loss of Load Expectation (Days per Year)		0.105		0.101			

Solar Cumulative ELCC, Firm MW (JRD-6)

	(1) 0 GW Storage	(2) 2.3GW Storage	(3) Extrapolation of (1) and (2)
Solar Nameplate	**0 MW of Storage**	**2,391 MW of Storage**	**2,858 MW of Storage**
-	-	-	
1,000	**420**	640	683
4,000	**1,335**	1,655	1,718
7,000	**1,840**	2,424	2,538
10,177	**2,174**	2,986	3,145
11,071	**2,237**	3,096	3,264
12,433	**2,330**	3,259	3,440
14,746	2,447	3,443	3,637
17,046	2,548	3,594	3,799
31,761	2,915	4,011	4,225
36,000	2,973	4,062	4,274

Storage Cumulative ELCC, Firm MW (JRD-6)

	(1) 0 GW Solar	(2) 11GW Solar	(3) Extrapolation of (1) and (2)
Storage Nameplate	**0 MW of Solar**	**11,071 MW of Solar**	**11,547 MW of Solar**
-	-	-	
250	173	227	230
1,000	630	915	927
1,841	**1,051**	1,564	1,586
2,391	**1,286**	1,904	1,930
3,211	1,587	2,288	2,318
3,807	1,792	2,553	2,586
4,403	2,013	2,772	2,805
7,383	3,266	3,827	3,851
9,000	3,810	4,296	4,317

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Corrections to Calculations of
OPC witness Dauphinais
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Incremental Storage Nameplate MW	467
Incremental Solar Nameplate MW	(1,014)

Corrected Solar Cumulative ELCC, Firm MW (Using Marginal ELCC S+S Surface from AWW-1 Workpaper)

	(1)	(2)	(3) = Interpolate between Marginal S+S Surface Slices	
	2,391	3,211	2858	
Solar Nameplate	Solar Cumulative ELCC with 2,391MW Storage	Solar Cumulative ELCC with 3,211MW Storage	Approximate Solar ELCC with 2858 MW of Storage	Solar Cuimulative ELCC difference between E3 Study and Dauphinais Workpaper
-				
1,000				
4,000				
7,000				
10,177	2,985.79	3,047.26	3,020.80	124.01
11,071	3,095.42	3,178.33	3,142.64	120.93
12,433	3,258.39	3,365.81	3,319.57	120.79
14,746	3,442.17	3,577.16	3,519.05	117.96
17,046	3,593.87	3,780.08	3,699.92	98.87
31,761	4,010.91	4,195.54	4,116.06	109.37
36,000	4,061.04	4,238.22	4,161.95	112.24

Corrected Storage Cumulative ELCC, Firm MW (Using Marginal ELCC S+S Surface from AWW-1 Workpaper)

	(3)	(3)		
	11071	12433	11547	
Storage Nameplate	Storage Cumulative ELCC with 11,071MW	Storage Cumulative ELCC with 12,433MW	Approximate Storage ELCC with 11,547 MW of Solar	Storage Cuimulative ELCC difference between E3 Study and Dauphinais Workpaper
-				
250				
1,000				
1,841				
2,391	1,904	1,974	1,850.94	79.25
3,211	2,288	2,383	2,216.87	101.07
3,807	2,553	2,626	2,498.62	87.13
4,403	2,772	2,860	2,707.20	97.76
7,383	3,827	3,908	3,766.55	84.39
9,000	4,296	4,397	4,220.32	96.29
			-	-

FLORIDA POWER & LIGHT COMPANY
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Estimated Stochastic LOLP Analysis Results without FPL's 2027 Proposed Solar Generation Additions

	AWW-1		JRD-7		Corrected JRD-7		
	2027 - TYP Portfolio + 1,400 of Storage (Exhibit AWW-1, p. 22)		FPL's Proposed 2027 Portfolio without FPL's 2027 Solar Additions (Estimated Results)		FPL's Proposed 2027 Portfolio without FPL's 2027 Solar Additions (Estimated Results)		
	Nameplate Capacity (MW)	Cumulative Firm Capacity (MW)	Nameplate Capacity (MW)	Cumulative Firm Capacity (MW)	Nameplate Capacity (MW)	Cumulative Firm Capacity (MW)	Over / (under)-estimate
Utility Solar (Fixed + Tracking)	8,946		8,826		8,826		
Behind-the-meter (BTM) Solar	2,125		2,125		2,125		
Total Solar	11,071	3,096	10,951	3,248	10,951	3,126	121
Total Storage	2,391	1,904	2,858	2,115	2,858	2,115	0
Thermal + Kingfisher 1/2	28,281		28,281		28,281		
Demand Response (DR)	1,951		1,951		1,951		
Total Thermal, Kingfisher + DR	30,232	27,050	30,232	27,050	30,232	27,050	0
Portfolio ELCC *(E3 Methodology)*	43,694	32,049	44,041	32,413	44,041	32,291	122
Median Peak Demand (Grossed up for BTM PV & Net of Energy Efficiency)		29,708		29,708		29,708	0
PCAP Planning Reserve Margin (PRM)		8.8%		8.8%		8.8%	0
Total Firm MW Requirement		32,322		32,322		32,322	0
Firm Capacity Surplus / (Shortfall)		(273)		90		(31)	122
Achieved Loss of Load Expectation (Days per Year)		0.105		0.098			

Solar Cumulative ELCC, Firm MW (JRD-6)

	(1) 0 GW Storage	(2) 2.3GW Storage	(3) Extrapolation of (1) and (2)
Solar Nameplate	**0 MW of Storage**	**2,391 MW of Storage**	**2,858 MW of Storage**
-	-	-	
1,000	420	640	683
4,000	1,335	1,655	1,718
7,000	1,840	2,424	2,538
10,177	2,174	2,986	3,145
11,071	2,237	3,096	3,264
12,433	2,330	3,259	3,440
14,746	2,447	3,443	3,637
17,046	2,548	3,594	3,799
31,761	2,915	4,011	4,225
36,000	2,973	4,062	4,274

Storage Cumulative ELCC, Firm MW (JRD-6)

	(1) 0 GW Solar	(2) 11GW Solar	(3) Extrapolation of (1) and (2)
Storage Nameplate	**0 MW of Solar**	**11,071 MW of Solar**	**11,547 MW of Solar**
-	-	-	
250	173	227	230
1,000	630	915	927
1,841	1,051	1,564	1,586
2,391	1,286	1,904	1,930
3,211	1,587	2,288	2,318
3,807	1,792	2,553	2,586
4,403	2,013	2,772	2,805
7,383	3,266	3,827	3,851
9,000	3,810	4,296	4,317

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Corrections to Calculations of
OPC witness Dauphinais
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Incremental Storage Nameplate MW	487
Incremental Solar Nameplate MW	(120)

Corrected Solar Cumulative ELCC, Firm MW (Using Marginal ELCC S+S Surface from AWW-1 Workpaper)

	(1)	(2)	(3) = Interpolate between Marginal S+S Surface Slices	
	2,391	3,211	2858	
Solar Nameplate	Solar Cumulative ELCC with 2,391MW Storage	Solar Cumulative ELCC with 3,211MW Storage	Approximate Solar ELCC with 2858 MW of Storage	Solar Cuimulative ELCC difference between E3 Study and Dauphinais Workpaper
-				
1,000				
4,000				
7,000				
10,177	2,985.79	3,047.26	3,020.80	124.01
11,071	3,095.42	3,178.33	3,142.64	120.93
12,433	3,258.39	3,365.81	3,319.57	120.79
14,746	3,442.17	3,577.16	3,519.05	117.96
17,046	3,593.87	3,780.08	3,699.92	98.87
31,761	4,010.91	4,195.54	4,116.06	109.37
36,000	4,061.04	4,238.22	4,161.95	112.24

Corrected Storage Cumulative ELCC, Firm MW (Using Marginal ELCC S+S Surface from AWW-1 Workpaper)

	(3)	(3)		
	11071	12433	11547	
Storage Nameplate	Storage Cumulative ELCC with 11,071MW	Storage Cumulative ELCC with 12,433MW	Approximate Storage ELCC with 11,547 MW of Solar	torage Cuimulative ELCC difference between E3 Study and Dauphinais Workpaper
-				
250				
1,000				
1,841				
2,391	1,904	1,974	1,897.38	32.81
3,211	2,288	2,383	2,279.40	38.53
3,807	2,553	2,626	2,546.60	39.14
4,403	2,772	2,860	2,764.61	40.34
7,383	3,827	3,908	3,819.67	31.26
9,000	4,296	4,397	4,286.81	29.80
			-	-