

## Fact Sheet

### Background

In late August and early September 2022, California experienced an extended heat storm event that led to a historic new peak load record for California's electric grid – over 52,000 MW on September 6, 2022. In addition, in both August 2020 and July 2021, California was impacted by climate-driven extreme heat and wildfire events, which also created stressed electric grid conditions. In August 2020, California briefly initiated controlled rotating power outages of approximately 500 MW to avoid cascading unplanned rolling blackouts.

To prevent any further occurrences of rotating outages, the California Public Utilities Commission, California Energy Commission, and the California Independent System Operator have intensified their cooperation on electric grid reliability since late 2020. Most notably, the three organizations have worked expeditiously to modify electric system planning analysis and forecasts, develop additional energy resources and improve power market operations. These actions, along with others outlined below, not only supported summer electric service reliability in 2021 and 2022, but also have served to improve the outlook for grid reliability in summers 2023-2026.

All the actions undertaken are consistent with California's trajectory to achieve its 2030 greenhouse gas emission reduction and renewable energy procurement goals. The actions described herein ensure safe and reliable electric service and respond to Governor Gavin Newsom's July 30, 2021 [Emergency Proclamation](#) urging all state energy agencies to ensure there is adequate electricity to meet demand.

### California Public Utilities Commission (CPUC)

- **Procurement & Program Actions to Support Grid Reliability in 2021**
  - **Supply-Side & Demand-Side Procurement Orders & Programs:** In [February](#) and [March 2021](#), the CPUC ordered the electric investor-owned utilities (IOUs) to implement a suite of programs to decrease energy demand and increase energy supply during critical hours of the day to ensure reliability in Summers 2021 and 2022 in the case of an extreme heat event. In [December 2021](#), the CPUC expanded these authorizations.
    - These directives targeted a range of procurement (~1,000 MW) for 2021, expanded that range of procurement to 2,000-3,000 MW for 2022 and 2023. The procurement is paid for by all CPUC-jurisdictional entities, and this additional procurement was designed to be additional to the established resource adequacy program requirements that require all load serving entities (LSEs) to supply the CAISO with sufficient capacity to meet their projected load, plus 15% planning reserve margin. Therefore the additional procurement is referred to as “excess planning reserve margin” procurement.
    - These directives resulted in approximately 840 MW of new supply- and demand-side resources available to the California Independent System Operator (CAISO) by September 2021, and close two 3,000 MW by September 2022.
    - Included in the new resources was voluntary enrollment in the Emergency Load Reduction Program (ELRP) at approximately 900 MW in 2022, up from 200 MW of

enrollment in ELRP in summer 2021. One of the key drivers that supported the expansion of ELRP in 2022 was the CPUC's adoption of higher payments, (enhanced from \$1 per kWh to \$2 per kWh), the expansion of the program to electric vehicles, and the extension of the program to residential customers branded to consumers as the Power Saver Rewards program.

- As of October 2022, approximately, 4.1 million customers across the three IOUs (PG&E, SCE, SDG&E) are enrolled in the Power Saver option of ELRP. Overall enrollment in ELRP across all customer participation options in terms of potential load reduction available during grid emergencies is estimated to be about 900 MW. At this level, ELRP has now become the single largest DR program in the state.
  - Out of concern that some LSEs were unwilling or unable to meet their long-standing [resource adequacy](#) requirements, in June 2022, the CPUC raised penalties for any LSE that was short capacity. The CPUC [issues citations](#) with financial penalties for resource adequacy program infractions. In 2020, the CPUC issued 20 citations, and so far in 2022, the CPUC has issued 16 citations. The CPUC's enforcement program now includes a point system so that repeat infractions by the same load serving entities will be subject to higher penalties.
- Alongside the major demand and supply side initiatives described above, the CPUC approved a suite of other actions to support grid reliability for the summer months in December 2021. These programs launched in 2022, and will continue implementation for summer 2023 and beyond, and they include:
- **New Demand Response Programs** – Modifications were also made to enhance participation and performance of other existing demand response programs. These programs provide incentives for commercial and industrial customers to reduce their use of electricity when the grid is stressed.
  - **New Smart Thermostat Incentive Program** – Provides incentives to install smart thermostats in hot climate zones. The smart thermostats will allow customers to reduce air conditioning usage by automatically raising thermostat set points a few degrees during critical times and get paid for the energy savings, with special protection for low-income customers that qualify for the CPUC's [California Alternate Rates for Energy \(CARE\) or Family Electric Rate Assistance \(FERA\) Programs](#). To date, the two IOUs with eligible programs have only accessed these incentives dollars in a limited fashion as existing demand response programs are also serving these customers. Third-party demand response providers aggregating customers under the Demand Response Auction Mechanism have been slow to participate but we may see additional uptake through them.
  - **New Dynamic Rate Plans** – Adoption of two Dynamic Rates pilot programs to test the effectiveness of customer response to electricity dynamic rates that incorporate marginal costs for energy, generation portfolio, and distribution grid and change hourly depending on real-time grid conditions. One pilot, administered by PG&E, will shift agricultural water pumping to off-peak times in response to price signals, while the other pilot, administered by SCE, will test how dynamic rates affect customer end-uses, such as electric vehicle charging. Both pilots were launched in Summer of 2022.
  - **Flex Alert** - Continuation and extension of the Flex Alert paid media campaign to focus on the new Residential ELRP pilot and continue existing statewide Flex Alert paid messaging activities into 2022 and 2023.

- **New Energy Efficiency Programs** - A new energy efficiency program for the Summers of 2022 and 2023 for rapid deployment of energy savings at peak or net peak times, with incentive payments made based on the hourly value of energy savings measured at the meter.. Programs launched in Summer 2022. 99 aggregator companies have been approved to sell and install projects for customers, and over 1000 residential and Commercial sites are enrolled. An additional 90 large commercial projects are currently approved for installation in the coming months.
  - **Microgrids/Resiliency** - Four new energy storage microgrid projects for San Diego Gas & Electric (SDG&E) were authorized that collectively will provide a total of 39 megawatts of capacity to fill electricity supply needs starting in summer 2023.
- **New Energy Resource Development:**
    - **New Energy Resources Online:** Between January 2020 and September 2022, the CPUC orders for procurement have resulted in more than 5,000 MW of incremental net qualifying capacity (NQC) coming online at over 140 different power plants in the CAISO area. These 5,000 MW NQC of new powerplants are equivalent to over 9,000 MW nameplate, and they are predominantly clean energy resources, and do not include new imports (that represent additional new MWs.) More than 1,000 MW of additional resources are in the final stages of interconnection at the CAISO and could add to these cumulative statistics in the coming weeks.
      - New **Solar PV** Plants totaling 275 MW NQC (approximately 3,000 MW Nameplate)
      - New **Battery Storage** Plants totaling 2,800 MW NQC (approximately 3,500 MW Nameplate) and New **Hybrid Battery-Solar Plants** totaling 350 MW NQC and 750 MW Nameplate.
      - New **Wind** Plants totaling 100 MW NQC (approximately 800 MW Nameplate), and significant other new wind additions were added as imports.
      - Some existing **natural gas power plants** were incrementally added to the CAISO for reliability purposes (e.g., the 275 MW Sutter Power Plant was pseudo-tied to the CAISO grid) and in February 2020, the Alamitos Unit 7 and Huntington Beach plants came online at 675 MW each.

## New Online Energy Resources

New Resources Additions, Jan 2020 – Sept 2022, Cumulative

Technology Type	Nameplate Capacity (MW)	Estimated Sept. Net Qualifying Capacity (NQC) MW	Number of Projects
STORAGE	3,522	2,856	50
SOLAR	2,908	276	41
HYBRID (STORAGE/SOLAR)	783	359	11
WIND	820	103	19
GEOHERMAL	40	40	1
BIOGAS, BIOMAS, HYDRO	34	0	8
<b>Subtotal Total New SB100 Resources, IN-CAISO</b>	<b>8,100 Nameplate MW</b>	<b>3,634 Sept. NQC MW</b> (~2500 Sept NQC MW for IRP orders)	<b>130</b>
NATURAL GAS, incl. Alamitos & Huntington Beach	1,477	1,477	12
<b>Total New Resources, IN-CAISO</b>	<b>9,584 Nameplate MW</b>	<b>5,111 Sept. NQC MW</b>	<b>142</b>
New Imports, Pseudo-Tie or Dynamically Scheduled	1,523	685	11
<b>Total New Resources, including Imports</b>	<b>11,107 Nameplate MW</b>	<b>5,796 Sept. NQC MW</b>	<b>153</b>

**Notes:**

All data shown derived from CAISO [Master Generating Capability List](#), and CPUC [NQC Lists](#) with online dates between Jan 1, 2020 – Sept. 30, 2022. Nameplate Capacity is shown as "Net Dependable Capacity" in the CAISO Master Generating List file. Data shown excludes imports, except where specified. All NQC values are "September NQC" and subject to change based on counting rules. "Project" is defined as a unique CAISO resource ID. "Natural Gas" includes Alamitos Unit 7 (675 MW) and Huntington Beach (674 MW) added in Feb 2020.

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- **New Energy Resource Contracting:** In addition to the significant progress in the past 3 years to bringing resources online, the CPUC is continuing to monitor procurement progress by load serving entities contracting for the remaining resource capacity ordered to come online by 2026.
  - **New Supply-Side Resources by 2023:** The CPUC estimates that over 3,000 MW NQC of additional supply resources could be online by the end of 2023 and an additional 6,000 MW of NQC by the end of 2024. The new supply under contract represents a large amount of the new resources ordered online between 2021-2026 (14,800 MW of new resources) via the CPUC's IRP Decisions.
  - **New Supply-Side Contracts Approved -** The CPUC has a contract review role for the three large electric IOUs, who are only responsible for a portion of the needed energy resource procurement. The electric IOUs have submitted a range of short- and long-term contracts that support the goal of summer grid reliability. Some of these long-term contracts include:
    - In [August 2020](#), the CPUC approved seven clean energy contracts for PG&E to procure 717 MW of resource adequacy capacity, at least 50 percent of which was to be online by August 1, 2021.
    - In [March 2021](#), the CPUC approved three SCE contracts for 69 MW for incremental power plant upgrades to serve Summer 2021.
    - In [March 2021](#), the CPUC approved ten PG&E letter agreements for 135 MW to provide additional energy during emergency conditions to serve Summer 2021.
    - In [March 2021](#), the CPUC approved 250 MW of PG&E import contracts to serve Summer 2021.
    - In [March 2021](#), the CPUC approved three SDG&E contracts for 109 MW for incremental power plant upgrades and firm imports to serve Summer 2021.
    - In [August 2021](#), the CPUC approved four agreements submitted by PG&E for 270 MW of new storage capacity to be online by Summer 2022.
    - In [November 2021](#), the CPUC approved an 80 MW energy storage contract submitted by SDG&E to serve summer reliability in Summer 2022.
    - In [December 2021](#), the CPUC approved three SCE utility-owned storage projects totaling 537 MW of new resources to serve Summer 2022.
    - In [January 2022](#), the CPUC approved an SCE contract for 230 MW of co-located energy storage to be online by Summer 2022.
    - In [February 2022](#), the CPUC approved a 75 MW PG&E contract for firm imported energy to serve Summers 2022-2024.
    - In [February 2022](#), the CPUC approved three new SDG&E utility owned storage projects totaling 161 MW to serve Summer 2023.
    - In [April 2022](#), the CPUC approved 1,600 MW of new energy storage contracted with PG&E, 699 MW to be online by Summer 2023.
    - In [May 2022](#), the CPUC approved 497 MW of new energy storage contracted with SCE, 190 MW to be online by Summer 2023 and 2024.
    - In [May 2022](#), the CPUC approved a 305 MW SCE cogeneration contract to serve Summers 2022-2026.
    - In [May 2022](#), the CPUC approved a 34 MW SCE cogeneration contract to serve Summers 2022 with an option to extend through 2023.
    - In [June 2022](#), the CPUC approved twelve short-term Emergency Reliability Agreements with PG&E to serve Summer 2022.
    - In [June 2022](#), the CPUC approved 35 MW of Emergency Reliability Agreements with SDG&E to serve Summer 2022.

- In [October 2022](#), SDG&E filed an Advice Letter seeking approval for 200 MW of Midterm Reliability Agreements to be online by Summer 2023 and 2024.

- **Transmission Development Forum:**

- Starting in January 2022, the CPUC in collaboration with the CAISO started the Transmission Development Forum to create a single forum to track the status of transmission network upgrade projects that affect generators and all other transmission projects approved in the CAISO's Transmission Planning Process (TPP).
  - In these quarterly meetings, the PTOs provide status updates on transmission projects with a strong focus on delays.
  - This meeting series intends to improve the access of transmission project status information to a board stakeholder group. These meetings occur quarterly with the last one occurring on October 28, 2022.
  - Information on the Transmission Development Forum is helping generators understand when transmission projects are delayed that may impact the progress of their interconnection projects, and the quarterly slides can be found on [CAISO's User Group and Recurring Meeting page](#).

- **Tracking Energy Development Task Force:**

- The CPUC spearheaded the development of a new [Tracking Energy Development \(TED\) Task Force](#), a joint effort of staff at the CPUC, CEC, CAISO, and Governor's Office of Business and Economic Development (Go-Biz).
  - The objective of the TED Task Force is to track new energy projects that are in development and provide project development support as appropriate for individual projects, and/or identify barriers and coordinate actions across agencies to support all projects.
  - The priority focus for the TED Task Force has been near term projects, defined as those that can come online in the next 1-3 years.
  - The TED Task Force has met with load serving entities, developers, interconnection departments, local planners and other government agencies to communicate the importance of new generation projects for reliability and offer assistance, if possible and where appropriate.
    - Some projects have sought last minute assistance with interconnection, permitting, shipping and construction challenges. Reiterating the importance of pushing through normal construction complexities so that projects can reach completion and serve reliability has been extremely helpful.
    - Other projects have engaged TED Task force members in projects with more early-stage development challenges.
    - Some development challenges have affected numerous projects and threatened to derail timelines, (e.g. the Department of Commerce investigation into possible circumvention of anti-dumping solar tariffs, manufacturing and shipping shutdowns/slowdowns in China due to covid, shipping regulation changes, inflationary prices on supply materials (including panels and batteries, but extending to cement, transformers, and other balance of plant equipment).



- The TED Task Force has helped state agencies and the CAISO maintain situational awareness of the challenges facing project development in order to assess potential impacts of project delays on reliability.
- TED Task Force members are also looking for opportunities to push for other opportunities to support energy development, including: developing tools to communicate key information, looking for areas process improvements, such as the Transmission Development Forum and related Interconnection processes, and finding ways to more easily track projects from contracting through commercial operation.

## Issues Currently Impacting Energy Development

Supply Chain	Interconnection and Transmission	Permitting
<ul style="list-style-type: none"> <li>• Department of Commerce Investigation – Auxin Solar Petition (AD/CVD) – <b>June 2022 Reprieve until 2024</b></li> <li>• Manufacturing disruptions (covid lockdowns in China, labor strikes)</li> <li>• Shipping disruptions</li> <li>• Inflation/ Price increases – <b>Inflation Reduction Act</b></li> <li>• Market-tightening/ intense competition with other markets</li> <li>• Wide-ranging materials shortages, both energy-specific and all-construction projects.</li> <li>• Commodity market challenges, e.g. lithium market – <b>New Contract Structures with indexing</b></li> </ul>	<ul style="list-style-type: none"> <li>• Lengthy interconnection study processes and standard timelines for most projects</li> <li>• Long-lead timelines for transmission network upgrades and interconnection facilities upgrades – <b>Transmission Development Forum supports transparency</b></li> <li>• Complexity of managing high volume of queued projects, new projects, and project modifications – <b>Interconnection Process Enhancements Initiatives</b></li> <li>• Complex processes requiring intense coordination across interconnecting utility</li> <li>• High level of workforce expertise required</li> </ul>	<ul style="list-style-type: none"> <li>• Large volume of projects seeking permitting review – <b>many storage projects are found exempt</b></li> <li>• Projects are under development in 40 counties (100+ cities)</li> <li>• <b>Learning curves</b> across local agencies on <ul style="list-style-type: none"> <li>• Storage Technology</li> <li>• Storage fire-safety issues</li> <li>• Adding storage to existing projects</li> <li>• Permitting projects with two technologies</li> </ul> </li> <li>• <b>New CEC Permitting Option</b></li> </ul>

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### • Supply-Side Procurement Orders:

- In [November 2019](#) and [June 2021](#), the CPUC approved decisions ordering utilities to procure a combined amount of 14,800 MW NQC (equivalent to over 25,000 MW nameplate) of new electricity resources to come online between the years 2021 and 2026, enough to power approximately 3.2 million homes. The June 2021 order was for 11,500 MW, representing the largest capacity procurement ordered at a single time by the CPUC, with all new resources procured coming from preferred resources, such as distributed energy resources (including energy efficiency and demand response), renewables, and zero-emitting sources.

### California Energy Commission (CEC)

- **2021 & 2022 Summer Reliability Analyses:** The CEC developed and published these [assessments](#) as well as updates to them in August 2021 and in Fall 2021.
- **2022 Stack Analysis:** The CEC conducted an analysis of projected demand and supply for 2022 considering both an average weather year and an extreme weather year, like California experienced in 2020. The analysis considered ongoing drought conditions and potential impact on hydro generation resources. The draft analysis was presented at the August 11, 2021, Business Meeting and was approved at the September 8 Business Meeting. The results show that the state may need to access contingency measures during an extreme weather

event of up to 4,350 MW. The CPUC used the results of the analysis as they considered procurement levels in Phase 2 of its Emergency Reliability proceeding ([R.20-11-003](#)).

- **Efficiency Improvements to Existing Natural Gas Generators:** As of August 2021, all 136 MW of incremental efficiency upgrades at eight powerplants had been completed by the project owners/operators and were available for dispatch as needed for grid reliability. The CEC has identified an additional 246 MW of efficiency upgrade projects to existing natural gas generators that could support Summer 2022 grid reliability needs.
- **Energy Research Deployment & Demonstration:** The CEC's research program is funding development and demonstration of load reduction technologies – starting this summer. The research objectives are to improve the demand reduction platform and expand users. CEC has invested \$80 M over the last six years to develop technologies to support demand flexibility. Of this amount, three new CEC awards (totaling \$6.2 M) are anticipated to result in 29 MW of flexible load shift for summer 2022 and 15 MW from irrigation pumping.
- **Efforts to Maximize Demand Response:** The CEC convened two round table discussions with Demand Response Providers, CAISO, and the CPUC to discuss ways to maximize the contribution of demand response to summer reliability. The CEC worked with the CPUC to incorporate demand response recommendations into the 2021 IEPR which included the continuation of efforts aimed at restructuring the state's demand response program to shift to an approach that will take advantage of flexible-demand appliances and the Market-Informed Demand Automation Server (MIDAS).
- **Temporary & Emergency Generation Program:** In response to the July 2021 Governor's Emergency Proclamation the CEC launched this [program](#) to –
  - Expedite post-certification petitions for changes in the design, operation, or performance requirements of existing facilities under the CEC's jurisdiction; process was adopted at the CEC's August 17, 2021, Business Meeting
  - License emergency and temporary power generators of 10 MW or more; expedited process was adopted at the August 17, 2021, CEC Business Meeting, and
  - License battery storage systems of 20 MW or more that can discharge for at least two hours. An expedited process was presented at the CEC's September 8, 2021, Business Meeting.
- **Issuing Waivers for More Generation Capacity:** The CEC reviewed five projects totaling 30-40 MWs to operate beyond nameplate capacity with state waivers. CEC reviewed another three projects totaling 91 MWs to operate beyond nameplate capacity with a federal 202 c waiver. (Those projects are included within the projects listed below under the description of the "DOE Emergency Order Pursuant to Section 202 (c) of the Federal Power Act"). The CEC is monitoring the compliance of the four installed temporary power generators. Two units totaling 60 MWs at Roseville Energy Park in the city of Roseville and another two units totaling 60 MWs at the site of the Sutter Energy Center in Sutter County.
- **2021 Integrated Energy Policy Report (IEPR):** This included an assessment of longer-term issues such as the development of analytical products (updating forecasts to reflect extreme weather, statewide reliability, and resource sufficiency assessments beyond 2021) and workshops to support mid- to long-term electric reliability for the state.

- **Flexible Demand Appliance Standards (FDAS):** On December 14, 2020, the CEC held a workshop to inform a Rulemaking to establish standards and labeling requirements for appliances that promote flexible demand technologies, which can schedule, shift, or curtail electric demand of appliances to reduce greenhouse gases emitted from electricity generation. This Rulemaking was authorized by Senate Bill 49 (SB 49, Chapter 697, Statutes of 2019). Demand flexibility can also help manage energy costs and enhance grid reliability. In September 2021 the CEC issued a Request for Information from stakeholders on the development of FDAS. Comments were received in November 2021 the CEC is in the process of reviewing stakeholder input to develop implementation proposals for Phase 1 FDAS.
- **CEC 2020 CA Electricity Demand Update:** The CEC adopted the California Energy Demand 2020-2030 Forecast Update on January 25, 2021. This update to the previously adopted electricity demand forecast incorporates an additional year of historical data, more recent economic and demographic outlooks, and revised vehicle electrification, self-generation and battery storage forecasts. It also includes revised hourly and monthly peak electricity demand for the CAISO control area. In addition to the standard peak forecasts (1-in-2, 1-in-5, 1-in-10, and 1-in-20 probability weather scenarios), the 2020 forecast update also includes a 1-in-30 peak forecast (reflecting a low probability weather scenario similar to the heat event experienced in August of 2020) for situational awareness and to help support future planning improvements.

### California Independent System Operator (CAISO)

- **Capacity Procurement Mechanism (CPM) Solicitation:** Due to a combination of earlier-than-expected extreme heat throughout California and the West, diminished hydroelectric availability, and changes and uncertainties in the resource stack, the CPUC and CEC made a recommendation to the CAISO to leverage its backstop procurement authority for securing additional resources to help meet the anticipated demand during the summer months. The CAISO issued notices of CPM designations on July 9, July 13, July 23, August 3, August 12, August 17, August 30, September 1 and September 30, 2021. The designations are for 30-days, as provided under the tariff. This designation added 1,722 MW of capacity.
- **Resource Adequacy Market Rule Enhancements:** In March and May 2021, the CAISO Board of Governors and the Federal Energy Regulatory Commission (FERC) approved the first package of market enhancements. These enhancements, are designed to:
  - Strengthen compensation incentives for hourly imports to deliver during tight supply conditions
  - Provide more accurate price signals reflective of tight supply conditions and dispatch of emergency demand response
  - Establish an interim minimum state of charge requirement to ensure resource adequacy storage resources have sufficient energy available on the tightest supply days
  - Ensure sufficient capacity is procured in advance of planned outages
  - Streamline the grid interconnection process to expedite new supply
  - Modify export, load, and wheeling priorities
- **Improve Performance of Demand Response Providers:** The CAISO has been working with Proxy Demand Resources and Reliability Demand Response Resource providers to improve processes and performance expectations.



- **Credits Against Resource Adequacy Obligations:** The CAISO continues to work with the CPUC, local regulatory authorities, and stakeholders to resolve issues around resources credited against resource adequacy requirements.
- **Energy Storage Enhancements Initiative:** On April 28, 2021, the CAISO launched an initiative to explore market enhancements to continue integration of large amounts of utility-scale battery storage onto the grid over the next few years. At the end of 2020, the CAISO had about 250 MW of storage resources -- primarily 4-hour batteries -- connected to the grid. On October 28, the CAISO hosted a Storage Forum - Energy Markets for the Future. The virtual event featured an important and timely discussion on energy storage and the strategies needed to improve integration of renewable and storage resources. During the forum, leading experts shared their perspectives on energy storage development, market enhancements, new technologies, and more. Between December 2021 and mid-March 2022, the CAISO released and invited comments on a straw proposal and revised straw proposal in this initiative, which were then followed by an Energy Storage Enhancements workshop on April 13, 2022.

### **Department of Finance (DOF)**

- **California State Emergency Program:** Pursuant to the Governor's July 2021 Emergency Order, DOF created the California State Emergency Program (CSEP) to allow all electric utilities to compensate enrolled participating customers for mobilization activities or incremental load reduction (energy — kWh) activities during a specified event achieved through (1) reduced usage and/or (2) use of backup generation. This program applied to events occurring between August 15, 2021, and October 31, 2021, unless extended by a subsequent order.