California Energy Commission

STAFF PAPER

2022 Summer Stack Analysis

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ABSTRACT

The Summer 2022 Stack Analysis Report (Stack Analysis) provides near-term situational awareness in the event of westwide extreme weather and prolonged drought. The report provides a point of reference for consideration in other energy reliability-related proceedings. The report uses the CEC's Stack Analysis Tool to identify potential amounts and duration of the need for near term contingency resources. Staff will update the Stack Analysis Tool if underlying assumptions change, such as drought conditions or data on available resources.

Keywords: Stack analysis, system reliability, short-term reliability, summer 2022, supply resources, extreme weather, electricity system planning

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EXECUTIVE SUMMARY

Extreme heat events in 2020 impacted the western United States and strained electric system operations reliability in California. With climate change, extreme weather events that were previously considered low-probability events must be accounted for in near-term electric sector planning.

The California Energy Commission (CEC) developed the hourly stack analysis to assess supply conditions against average and extreme weather conditions for summer 2022. The hourly stack analysis supplements traditional planning methods and is intended to provide a snapshot of an extreme weather event and potential need to prepare for contingencies.

The Summer 2022 Stack Analysis identifies the risk of potential energy shortfalls under average and extreme weather planning reserve margins. This analysis projects potential need for contingencies resources during a few hours that could range in amount of 200 megawatts (MW) to 4,350 MW. These resources may be required to ensure electric system reliability for peak and net-peak hours during summer 2022 under extreme weather events.

Background

Extreme heat events, or heat waves, in 2020 impacted the western United States and strained electric system operations in California, resulting in rolling outages on August 14 and 15, 2020. The Final Root Cause Analysis (RCA) — prepared for Governor Gavin Newsom by the CEC, California Public Utilities Commission (CPUC), and California Independent System Operator (California ISO) and published January 13, 2021 — detailed three root causes behind the outages and identified actions to be taken by the three entities to reduce the potential for grid outages, like those that occurred in August 2020. The RCA required the CEC to develop and publish a multiyear statewide summer assessment to provide information to support reliability planning and maintain situational awareness of potential impacts to grid reliability under extreme conditions.

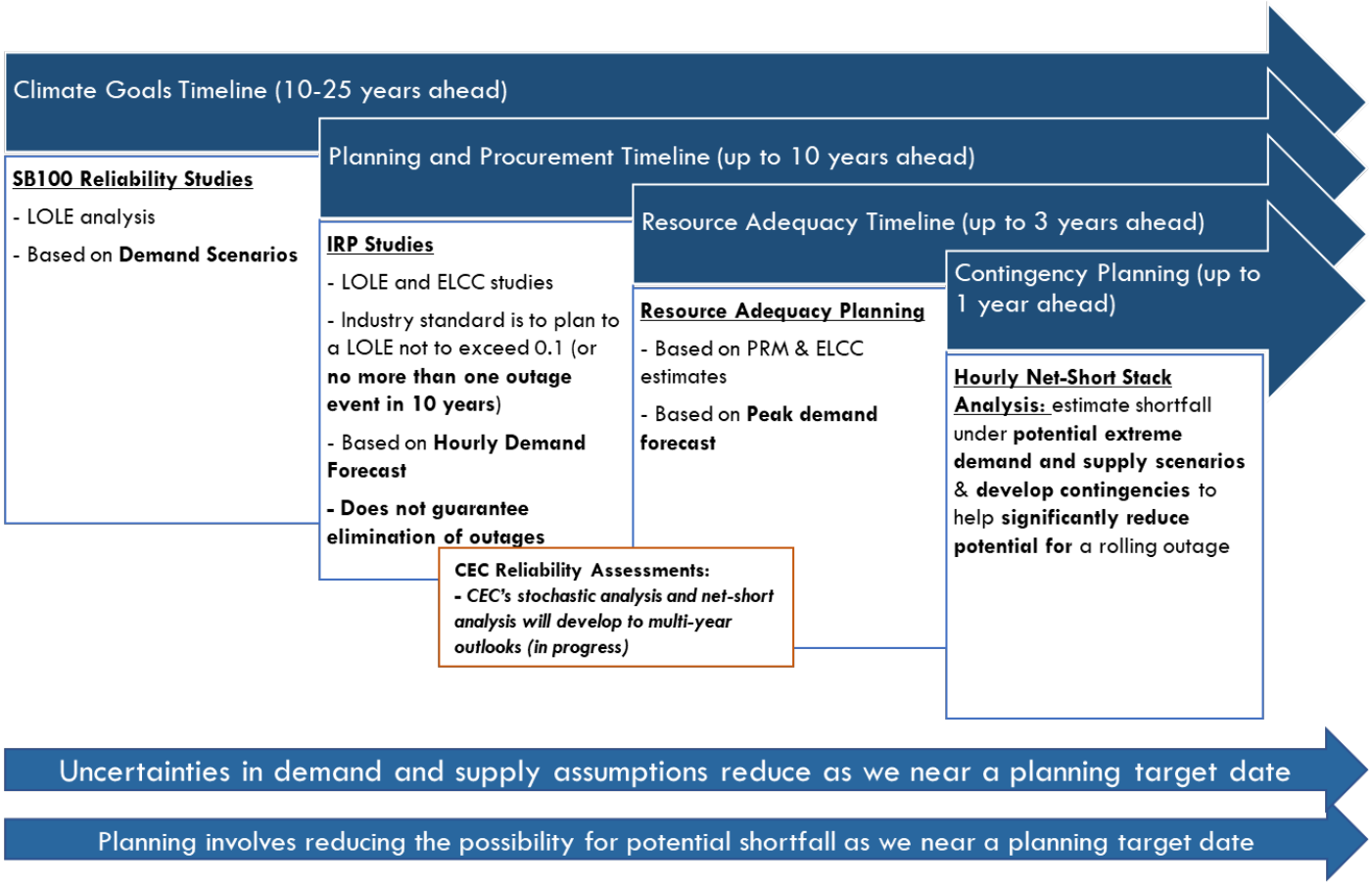
In response, the CEC began development of two reliability assessment products: 1) hourly Stack Analyses to help support contingency planning and 2) stochastic loss-of-load-expectation (LOLE) analyses to help support long-term policy studies and midterm procurement planning. The hourly Stack Analysis assesses supply conditions against average and extreme weather conditions as individual scenarios using different levels of planning reserve margins to capture demand and supply conditions. The hourly Stack Analysis supplements traditional planning methods and is intended only to provide a snapshot of a potential worst-case scenario on the California ISO system to inform the need to prepare for adequate contingencies. As such, the extreme scenario is developed to capture extreme conditions. While portions of an identified shortfall in an extreme weather scenario might be deemed necessary to be addressed by additional procurement, the intention of an hourly Stack Analysis is not to determine whether traditional procurement is needed. Traditional planning tools, such as the LOLE analysis in combination with hourly Stack Analyses, can provide a more robust picture to determine the balance between traditional procurement and contingency resources.

In this document, the CEC's preliminary outlook of summer 2022 under extreme supply-and-demand conditions helps inform potential shortfalls and develop contingencies. The CEC will continue to update the 2022 hourly Stack Analysis over the coming months as new information becomes available. A separate LOLE analysis that was developed for 2022 is expected to be published at the end of September 2021.

Reliability Analysis Across Planning Horizons

While reliability analysis has always been a core component of electric sector planning, the challenges on the electric grid in recent years brings into focus the need to maintain a complete picture of reliability risks across all time horizons. However, the specific purpose, type of analysis, and detail change as planners approach the target year. The more near-term the analysis, the less uncertainty there is in supply and demand and the greater the focus is on reducing the probability of realized supply shortfalls.

Figure 1: Reliability Analysis Across Planning Horizons



Source: California Energy Commission

Long-term studies, such as those to meet California's 2045 Senate Bill 100 (De León, Chapter 312, Statutes of 2018) goals, are focused on developing directional portfolios to meet long-term climate goals. There is significant uncertainty in demand and potential supply, so the goal of reliability studies is to determine whether the magnitude and type of resources in the portfolio are reasonable to maintain reliability.

In the planning studies, which typically have a 10-year planning horizon, portfolios are developed to provide guidance to procurements and to inform critical planning processes. The goals of reliability studies are to determine the resources needed to avoid a significant risk of supply shortfalls while balancing the cost of absolute reliability. Reliability is typically assessed through an LOLE analysis, a stochastic analysis incorporating a distribution of demand profiles, wind and solar profiles, and randomized forced outages to determine a probability of a supply shortfall. The typical standard is for the analysis to predict a loss-of-load event no more than once every 10 years.

A portfolio meeting the LOLE standard by itself does not eliminate the probability of realized outages for several reasons. First, by definition, the one-in-10-year standard does not eliminate the probability of outages. Second, the actualized probability of outages may be different than the model suggests if the inputs do not reflect conditions in the given year. For example, if the model assumes an average hydroelectric (hydro) year across all years, but in reality, there are drought conditions, the probability of a loss of load event may be higher. Another example is if the distribution of

demand profiles is wider, or more extreme, due to climate change but is not captured in the dataset that relies on historical data, the probability of a loss of load event may also be higher.

In the contingency planning time frame, a year to days ahead, the reliability analysis develops a situational awareness of available supply and demand to prepare contingency resources should conditions be tight. With changing resource supply conditions in California and the West and with increasingly extreme weather conditions due to climate change, this time frame has come into greater focus. In response to the 2020 rotating outages, the CEC has developed an hourly Stack Analysis to evaluate whether there are potential shortfalls that could occur should another extreme heat event occur, particularly as the state is experiencing drought and wildfires.

Summer 2022 Hourly Stack Analysis

As a result of the 2020 heat waves, the CEC initiated an annual reliability outlook in early 2021, which assesses anticipated supply against anticipated demand under average and extreme weather conditions. This outlook is an hourly stack of available supply given projected hourly demand for the peak day of each month, July 2021 through September 2021. The first summer 2021 Stack Analysis was presented at a May 4, 2021, joint agency Integrated Energy Policy Report (IEPR) workshop. This analysis included projections for August 2021 and September 2021 with the current information on CPUC expedited procurement and an average projection for resource adequacy imports considering average and extreme weather scenarios. The analysis showed the potential need to call on contingency resources of up to 2,300 MW during the 6 p.m. to 8 p.m. period under extreme weather. Contingency resources include voluntary and compensated customer load reductions, electricity imports from other balancing authorities, and additional thermal generation.

Shortly after the May 4, 2021, IEPR workshop, it became apparent that an update of the analysis was necessary. Significant impacts to hydro supply and demand were identified due to the 2021 drought, CPUC staff identified procurement delays, and the Russell City Energy Center, a 600 MW electric generating facility Hayward (Alameda County), went offline due to a catastrophic incident with the steam turbine generator. CEC staff updated the Stack Analysis and presented the results at a July 8, 2021, joint agency IEPR workshop. The summer 2021 analysis showed a potential to call on contingency resources of up to 3,800 MW under an extreme weather scenario.

After the July 8, 2021 IEPR workshop, the CEC, CPUC, and California Independent System Operator (California ISO) agreed to develop a preliminary Summer 2022 Stack Analysis to better inform the public about potential implications if the 2021 California drought and western extreme heat events persist into summer 2022, as current National Oceanic and Atmospheric Administration models predict.[1]

The draft 2022 Summer Stack Analysis was presented at the CEC's August 11, 2021, Business Meeting for stakeholder review and comment. Pacific Gas and Electric, Southern California Edison, and Middle River Power provided comments. Furthermore, the CEC identified additional updates to data inputs.

The commenters questioned the value of developing a Stack Analysis as opposed to a stochastic analysis. The 2022 Summer Stack Analysis is intended to provide a snapshot of the potential impact on supply and demand if drought persists and extreme weather impacts California and the rest of the West in 2022. The CEC recently developed a preliminary midterm stochastic analysis (MTR) and presented it at a CEC Lead Commissioner Workshop on August 30, 2021.[2] The MTR provides another perspective on 2022 summer reliability. The 2022 Summer Stack Analysis is within the range of possible outcomes shown in the stochastic analysis.

1 https://www.cpc.ncep.noaa.gov/products/predictions/long_range/two_class.php

2 Lead Commissioner Workshop on Midterm Reliability Analysis and Incremental Efficiency Improvements to Natural Gas Power Plants (ca.gov)

The following section provides the input assumptions and the projected July 2022 through September 2022 Stack Analysis considering both an average (15 percent) and extreme weather (22.5 percent) demand curve.

Summer 2022 Key Input Assumptions and Common Theme Stakeholder Comments

Assumptions about demand and available resources in 2022 are based on the best available data at this time. Demand is based on the 2020 CEC IEPR Update Mid-Mid Demand Case.[3] Available supply projections are based on the California ISO NQC list for 2021, with modifications based on anticipated new resources, planned retirements, and potential drought impacts persisting in 2022. Supply assumptions are intended to reflect physical resource availability and may not necessarily reflect resource adequacy or other contracts. The assumptions used in the 2022 analysis are presented in Table 1 and Table 2.

Updates to the Draft Analysis Inputs and Assumptions

The following is a summary of the updates made to the analysis and a description of public comments and CEC responses:

- **Additional Demand Response (DR) and Liquidated Damage Firm Imports**: The draft analysis did not include publicly owned utility (POU) DR and liquidated damage firm import POU programs and contracts within the California ISO footprint. These additional resources are now accounted for and outlined in Table 2.
- **Resource Availability**: CPUC staff provided updates on procurement to date and projected resources to be available for summer 2022. These are outlined in Table 2.
- **Hydro Capacity**: Stakeholders considered the 1,500 MW hydro capacity derate for 2022 as conservative. This hydro capacity derate is supported by the recently released California ISO preliminary 2022 NQC list. These preliminary NQC values for hydro capacity are about 800 to 1,000 MW lower, depending on the month, compared to 2021 NQC hydro capacity. The preliminary 2022 hydro NQC capacity represents an average of 3 (2018–2020) or 10 (2011–2020) historical years of actual hydro[4] output, which may overestimate performance in a prolonged drought year, as observed in 2021. To better represent hydro capacity during a prolonged drought, a derate for 2022 of up to 1,500 MW is reasonable.
- **Hydro Net Qualifying Capacity (NQC) That May Already Include Forced Outages**: Stakeholders commented that the use of a 7.5 percent forced outage rate was overly conservative and the hydro NQC may already account for outages. The higher 7.5 percent forced outage rate projection for the 22.5 percent planning reserve margin represents the potential impact that an extreme weather event, fire, and smoke may add to outages in the supply fleet. It is correct that hydro NQC values may already account for some forced outages. The 15 percent PRM includes a lower, 5 percent forced outage projection that does not represent the impact of persisting drought conditions and extreme weather on the supply fleet.

3 https://efiling.energy.ca.gov/getdocument.aspx?tn=236297-6

4 https://www.cpuc.ca.gov/-/media/cpuc-website/files/legacyfiles/q/6442466773-qc-manual-2020.pdf. See page 18.

- **Holding DR and Storage Contributions Static**: Stakeholders questioned why the DR and battery storage hourly capacity contributions were static for longer than four hours. This is a simplification assumed in the tool; however, it was determined that removing all the DR and battery storage in hours with no trigger contingencies did not trigger additional hours with contingencies. For future versions of the Stack Analysis Tool, this assumption will be modified to limit DR and batteries to four hours of full output, as large increases to the battery storage resource category are proposed for future years.
- **Use of Technology Factors for Wind**: Stakeholders questioned the use of technology factors, as opposed to hourly wind profiles. Wind profiles on historical extreme weather event days show highly inconsistent generation profiles. Instead of using an average profile based on historical years, the technology factor was a more robust option. The CEC will endeavor to develop and include wind profiles corresponding to extreme heat events in future versions of the tool.
- **Import Availability**: Stakeholders commented on the challenges with quantifying imports. Several noted that not all resources in the California ISO are under contract and may become exporters into other balancing authority areas, thereby effectively decreasing the import projections. Others commented that the import assumption is too low and should include economic imports. While changes were not made to this version of the Stack Analysis, the CEC will continue evaluating methods to best represent availability of reliable imports during extreme weather events.

Inputs and Assumptions

Table 1: Demand-Side Assumptions

Demand Category	Assumptions
Base Demand	Hourly IEPR 2020 Update Adopted Mid-Mid Demand for Year 2022[5]
Drought Adjustment to Demand	200 MW to 400 MW decrease in peak period demand due to water agency pumping loads, consistent with impacts in 2021

Source: California Energy Commission staff

5 https://efiling.energy.ca.gov/getdocument.aspx?tn=236297-6

Table 2: Supply-Side Assumptions

Supply Category	Assumptions
Baseline Resources	Monthly NQC values from California ISO 2021 NQC List. Solar resources are converted to an hourly shape based on CEC PLEXOS model solar profiles.
Hydro Drought Derate	Up to 1,500 MW derate to California hydro capacity, reflecting continued drought into 2022. Derate is 500 MW greater than summer 2021.
Imports	Average 2015-2020 California ISO RA showings plus POU 2021 firm liquidated damage contracts 5,372 MW July 6,426 MW August 6,240 MW September
Demand Response	IOU and POU totals decremented by 40% to account for effectiveness factors and incremented by 15% to account for reserves 1,054 MW July 1,063 MW August 1,060 MW September
New Demand Response and ELRP	176 MW carryover from 2021, incremented by 15% to account for reserves
Retirements	834 MW Redondo Beach Units 5, 6 and 8 retired
CPUC Procurement Between 2021 and 2022	CPUC Expedited Procurement carry over of 787 MW from 2021 CPUC Procurement of 1,270 MW by August 2022 CPUC Procurement of 363 MW by September 2022

Source: California Energy Commission staff

Table 3: PRM Assumptions

Demand Curve	PRM Assumptions
Extreme Weather	22.5% PRM: 6% for Operating Reserves, 7.5% for Outages, 9% for demand variability (similar to 2020 demand variability from a 1-in-2 forecast)
Average Weather	15% PRM: 6% for Operating Reserves, 5% for Outages, 4% for demand variability

Source: California Energy Commission staff

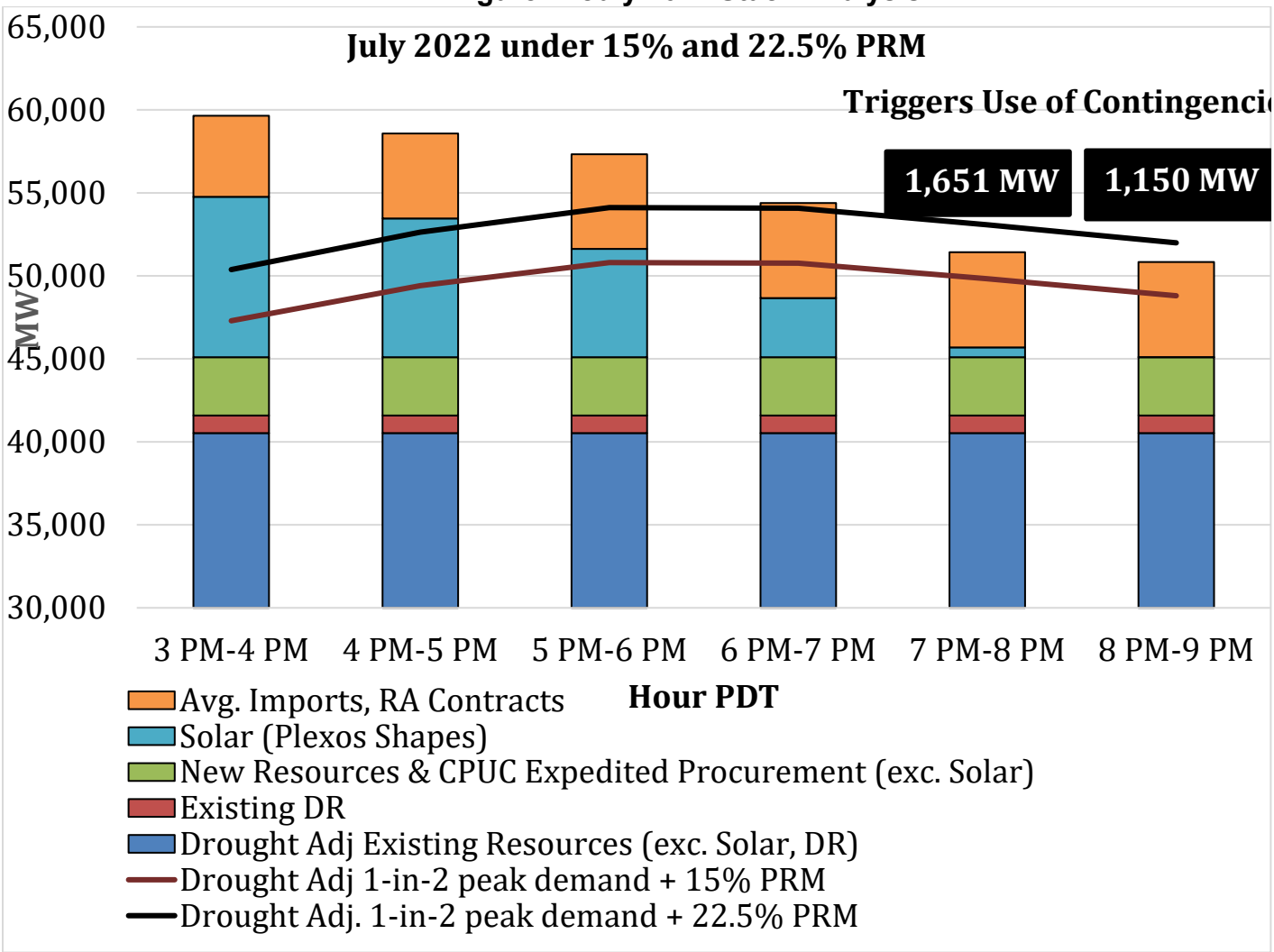
Results

With the revised assumptions outlined above, the 2022 Summer Stack Analysis tool projects smaller levels of trigger contingency requirements for 2022 compared to the CEC's Draft Stack Analysis. This projection affects the amount and duration of trigger contingencies, which are projected to be lower than in the draft analysis. Figures 1-3 display July, August, and September 2022 hourly results, respectively. There may still be a need for significant contingency resources or additional procurement in summer 2022 under the 22.5 percent PRM demand curve. The contingencies range in amount from just over 200 MW to 4,350 MW, assuming a 22.5 percent demand curve. Under a 15 percent demand curve, contingencies are projected to occur only in September in the evening, after peak-demand hours.

Conclusions

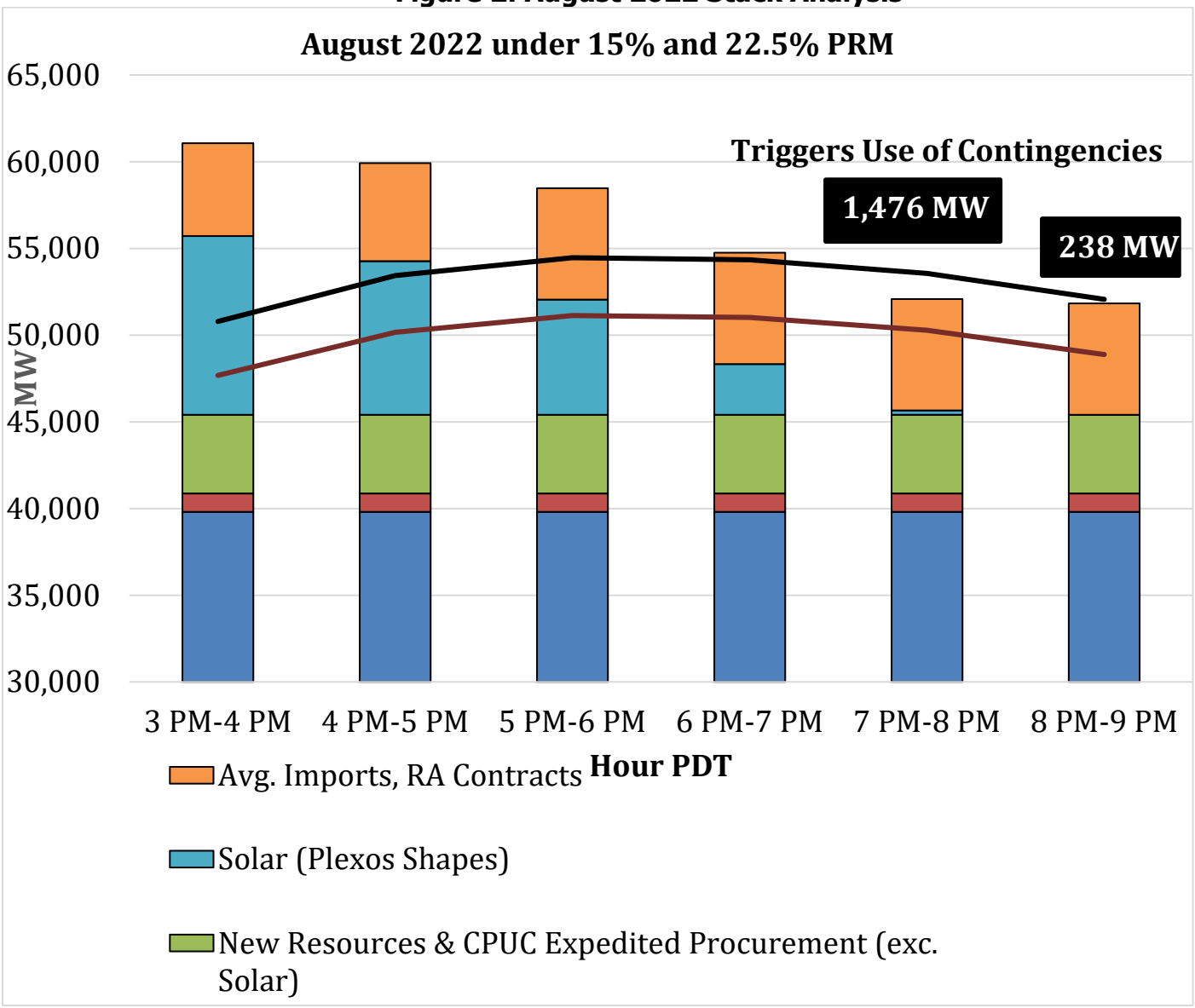
The Summer 2022 Stack Analysis identifies the risk of potential energy shortfalls under average and extreme weather planning reserve margins. This analysis projects that, assuming there is no additional procurement, an additional 200 MW to 4,350 MW of contingency resources may be required to ensure electric system reliability for peak and net-peak hours during summer 2022 under extreme weather events. Additional resources may be needed to provide electric system resilience against climate-induced drought and extreme heat events in California as well as wildfire-related outages or westwide heat events compromising interstate energy transfers.

Figure 1: July 2022 Stack Analysis



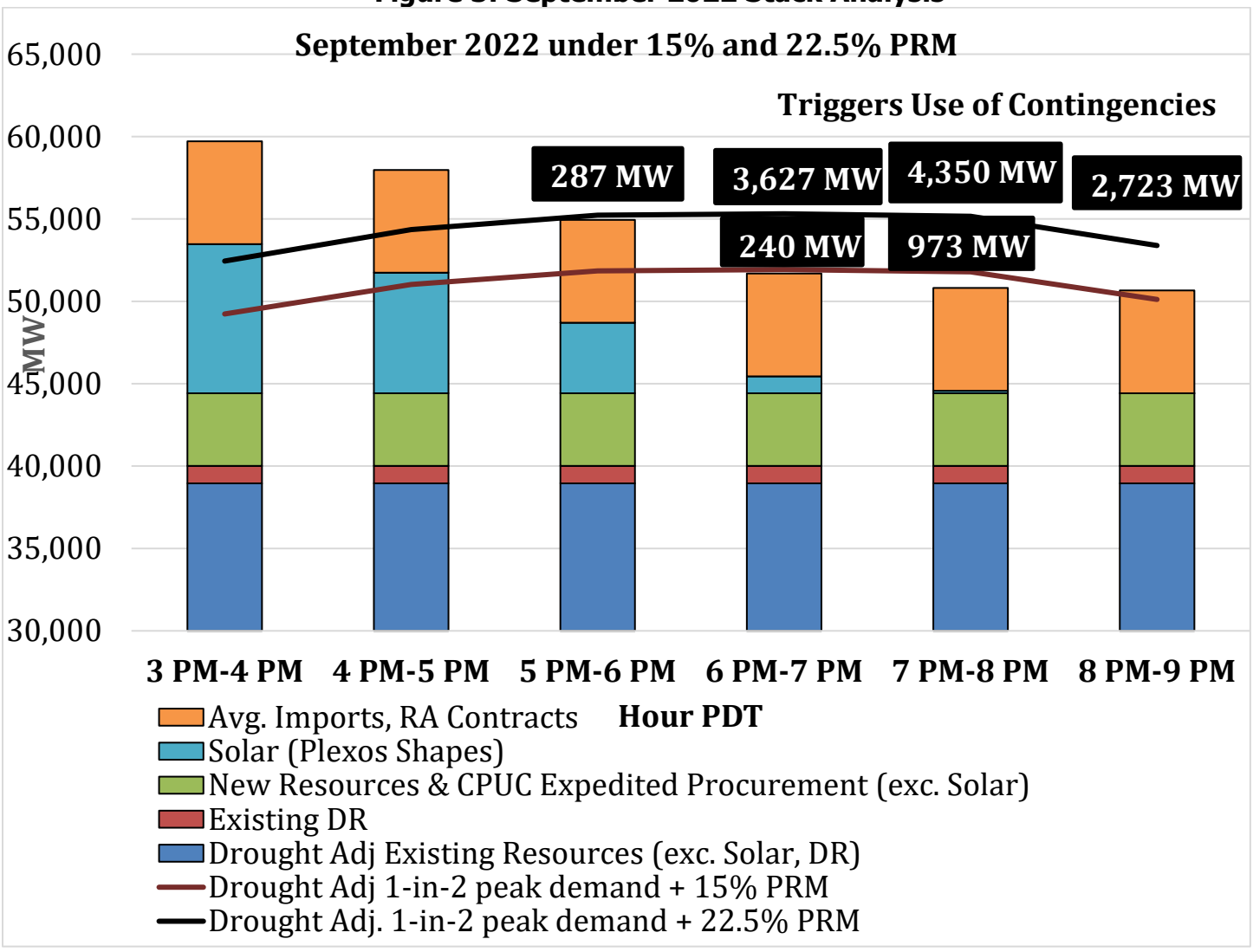
Source: California Energy Commission staff

Figure 2: August 2022 Stack Analysis



Source: California Energy Commission staff

Figure 3: September 2022 Stack Analysis



Source: California Energy Commission staff

Stakeholder Comments

Summary of Comments on CEC Draft 2022 Summer Supply Stack Analysis

Table 1: Southern California Edison

	Summary of Comments	Response to Comments
1	The shortfall of up to 5200 MW is driven by conservative assumptions, and the extreme case should be considered an upper bound. The 9% weather variability in the extreme case is equivalent to a greater than 1-in-20 weather event. SCE recommends using CEC's extreme weather demand without applying conservative assumptions to the generation stack.	Staff developed conservative assumptions and considers 9% a reasonable, but conservative, impact of extreme weather on demand. Staff also applied a conservative weather event impact on supply in the form of a 7.5% forced outage rate. This forced outage rate is intended to consider n the impact of persisting drought, wildfire and smoke impacts on the supply fleet.
2	SCE proposes using 2579 MW more supply (1500 MW hydro + 1079 MW imports).	No change recommended. The 1,000 MW hydro derate is based on DWR updated information (DWR current projections for its 3 facilities minus California ISO NQC value). The additional 500 MW derate reflects continuing drought conditions into next year, while the hydro NQC values are based on an average of historic operations. The extreme weather scenario assumes a west-wide heat event with no economic imports available to the California ISO.
3	SCE urges the state to use a stochastic loss of load expectation LOLE analysis as a check on the Draft 2022 Stack Analysis findings and inform potential supply- and demand-side actions to address emergency reliability needs in summer 2022.	Staff agree that a LOLE analysis is required and appropriate to plan for procurement. Staff iterate here that the hourly Stack Analysis was not developed to address procurement, but to plan for contingencies. CEC presented results of its stochastic analysis on August 30, which are used as a check on the results of the Stack Analysis.
4	SCE disagrees with the 1500 MW hydro derate and states that the qualifying capacity of hydro already reflects their availability during drought conditions.	See answer above, line 2.
5	Average RA import levels are not representative of import availability during peak hours or consistent with historical experience. SCE proposes including economic imports of 1079 MW (Sept. value) and states that a total of 7000 MW of imports were realized during the 2020 extreme heat event.	See answer above, line 2.
6	The retirement of Redondo Beach 834 MW should be updated once the State Water Board votes on whether to extend the OTC compliance date to December 31, 2023.	Staff agrees.
7	Using 7.5% forced outage rate in the planning reserve margin along with NQC values results in over-counting some forced outage rates. Hydroelectric and geothermal resource NQC values already account for forced outage rates. SCE does not recommend making any changes but notes that the results will be more conservative.	Staff agrees. No change recommended.
8	SCE is not clear whether Additional Achievable Energy Efficiency is included in the 2020 CEC IEPR Update Mid Demand and recommends that Managed Net Load forecast be used in the analysis.	No change recommended. The 2020 CEC IEPR Update Mid Demand with Mid Additional Achievable Energy Efficiency was used in the analysis.

Table 2: Pacific Gas and Electric Company

	Summary of Comments	Response to Comments
9	PG&E requests that the CEC clarify how this analysis will be used to enable proper review from stakeholders. Several assumptions seem conservative. PG&E is concerned about the unintended application of these results in other state agencies' proceedings.	The Stack Analysis may be referenced in other energy related proceedings as a possible data points of reference for the record, but any proceeding will consider the totality of the record in making any decision.
10	PG&E recommends that the CEC and other state agencies avoid the continued use of 22.5% planning reserve margin without validating it through a comprehensive analysis. The CPUC IRP proposed decision includes findings of fact #1, "More analysis is needed before revising the planning reserve margin for long-term planning in the IRP proceeding on a permanent basis." PG&E recommends that the joint agencies initiate this process with stakeholders in 2021 to determine a new, if applicable, PRM.	The CPUC D 21-06-035, decision requiring procurement to address mid-term reliability 2023-2026, adopts the high need scenario that effectively models a 22.5% PRM, but acknowledges it's an interim PRM to be used in the medium term. Staff believes formal revisions to the PRM will be considered in the CPUC's RA process.
11	Recent analysis by CPUC Energy Division's staff provides evidence that enforcing a 22.5% PRM results in LOLE lower than the industry standard 0.1 LOLE. This heightens the urgency to update the target LOLE and the resulting PRM through a thorough process vetted by stakeholders.	Staff acknowledges the reference to the ALJ's ruling seeking comments on the proposed preferred system plan page 20 but provides no further comment.
12	CEC should release the workpapers for stakeholders to review the assumptions. The summary of assumptions released on August 11, 2021 do not provide sufficient detail.	The Stack Analysis Tool is currently intended for internal use only, spreadsheet based with about 30 interdependent tabs. Over the next few months, time is required to make the tool, including workpapers publicly available. Until that time, when the tool can be shared publicly, staff is providing any specific data upon request.
13	The hydroelectric assumptions do not detail if the derates are from resource adequacy (RA) net qualifying capacity values or are incremental derates based on another baseline. Further, it is difficult to assess the right level of incremental hydro derates without reviewing the National Oceanic and Atmospheric Administration (NOAA) data.	See answer above, line 2.
14	The Stack Analysis includes new energy resources and appears to show these resources as being available for all six hours that were assessed. PG&E requests that CEC detail the resource mix that is expected, any forecasted delays in online dates, and the availability and time of charge and discharge for any energy storage that is included in this mix.	The Stack Analysis assumes NQC values for existing resources and new resources except for solar resources. Solar resources are captured on an hourly basis based on the PLEXOS solar shapes. Staff acknowledges that DR or batteries may not be available during the entire six-hour period from 3 pm to 9 pm, but surpluses exist between 3 pm to 5 pm. The shortfall is greatest in the single 7 pm to 8 pm hour and lower in the surrounding hours. The reduced shortfalls in the surrounding hours indicates that fewer resources such as DR and batteries will be needed. Staff assumes that DR and batteries will be optimized and not run at full output longer than 4 hours, to resolve the shortfalls.
15	The Stack Analysis indicates that PLEXOS solar profiles were used but it does not include details of the assumptions underpinning these shapes. PG&E also seeks clarification on the wind resources included in the Stack Analysis.	The PLEXOS hourly solar shapes are based on several years of historical data by geographic region. For new solar resources, staff applies the generic solar shape. Wind resources are based on wind ELCC values and staff acknowledges this shortcoming. Until that time, when wind profiles are available for the extreme weather scenario, staff will continue to use the monthly wind ELCC value.

Table 3: Middle River Power

	Summary of Comments	Response to Comments
16	MRP has an overarching concern that the Stack Analysis does not ensure whether additional procurement allows the system to meet a 0.1 loss of load expectation. The energy agencies must undertake the more thorough stochastic analysis needed to assess the reliability need and determine what resources are required to meet the 0.1 LOLE standard in the most cost-effective way.	Agree with commenter, the Stack Analysis is not intended to drive near term procurement, only to inform energy proceeding of the potential amount and duration of triggers contingencies that may be needed under extreme weather events. CEC staff presented stochastic analysis at an IEPR workshop on August 30, 2021.
17	MRP supports using PRM component higher than 1.5% to account for demand variability in the PRM. Again, MRP recommends stochastic analysis to determine whether 22.5% PRM will result in maintaining a 0.1 LOLE.	CEC staff notes the 1.5% demand variability was a mistake in the draft white paper, the 15% PRM assumes 6% reserves, 5% forced outage rate and 4% demand variability. The 22.5% PRM assumes 6% reserves, 7.5% forced outage rate and 9% demand variability.
18	The Stack Analyses appear to assume that DR is available between 3-9 pm which is questionable whether it would be available longer than 4 hours. This assumption should be amended or justified.	See above, line 14.
19	The Stack Analysis appears to mix capacity and energy. The drought-adjusted existing resources (excluding solar and DR) which includes wind and solar does not change across the hours. MRP recommends that for variable resources (i.e., solar, wind, and DR programs), the analysis should use conservative estimated hourly profiles rather than static MW capacity values associated with RA NQC values.	See above, line 14.
20	The average import values appear to be the same across the months, greater than 5000 MW. MRP supports only using RA contracted import values and no economic imports and recommends conservative assumptions be used. MRP raised concern about using historical average RA contracted imports. California ISO was a net exporter on July 9, 2021 (California ISO's peak demand to date) across its peak gross demand, and net imports were only 2000-2500 MW during net peak demand. The lower imports were due to numerous reasons such as transmission outages due to fire and high loads in neighboring states.	The average import RA values do vary across the months and are based on California ISO assumption.
21	The analysis assumes in-state generation will be available to serve California ISO load at the current levels for the indefinite future, but MRP has been approached by out-of-state load serving entities offering multi-year contracts. If in-state generation has been contracted to out-of-state LSE's, the analysis should account for the fewer resources available.	Staff does not have information on actual contracts and is not aware of in-state generation that has been contracted to out-of-state LSE's.
22	The analysis assumes that nearly 5000 MW of new resources are available for August 2022 and for a six-hour strip. If the resources are 4-hour battery storage, the analysis should reflect the shorter duration, which could result in shortfalls in other hours.	See above, line 14.

23	5000 MW are assumed for August 2022 and 4000 MW are assumed for Sept. 2022. The difference between these values is unclear if they are capacity values. If they area energy values, it is unclear why the hourly values are constant and not shaped.	The 5000 MW and 4000 MW of new resources for August and September, respectively, reflect monthly NQC values for the new resources except for a small portion of solar that is modeled on an hourly basis.
24	MRP recommends the CEC move beyond the simplistic Stack Analysis to the data rich stochastic LOLE analysis to ensure that the scenario will achieve a 0.1 LOLE.	See above, line 16. CEC staff plans to develop year ahead Stack Analysis in addition to the stochastic LOLE analysis as additional data points when considering extreme weather events.
25	The results of the Stack Analysis cannot be directly translated to revised requirements associated with the RA program and require additional steps to be converted to RA program requirements. For example, the RA program allows solar resources to count towards HE 19 to HE 20, but the Stack Analysis shows little if any contribution. Because the resource stacks for the gross load peaks may not be deficient, capacity procured to meet net load peaks may lead to a surplus of capacity to meet the gross load peaks, which could displace capacity needed to meet the gross and net load peaks.	The Stack Analysis intends to present a range of results based on an average weather conditions and extreme weather conditions, reflective of weather observed in 2020. The Stack Analysis highlights the risk during the net peak hours when solar is unavailable. Staff recognizes that using RA accounting rules for solar would undercount availability during gross peak hours and overcount availability during net peak hours, and the Stack Analysis corrects for the under and over counting of solar resources.
26	MRP requests supporting data for the graphs in numerical form with as much resource-type specific information as possible.	The Stack Analysis Tool is currently intended for internal use only, spreadsheet based with about 30 interdependent tabs. Over the next few months, time is required to make the tool, including workpapers publicly available. Until that time, when the tool can be shared publicly, staff is providing any specific data upon request.

Source: California Energy Commission staff