

**BEFORE THE PUBLIC UTILITIES COMMISSION OF THE
STATE OF CALIFORNIA**

Order Instituting Rulemaking to Establish
Policies, Processes, and Rules to Ensure
Safe and Reliable Gas Systems in
California and perform Long-Term Gas
System Planning

Rulemaking 20-01-007
(Filed January 16, 2020)

**COMMENTS OF THE
CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION**

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I. Introduction

Pursuant to Rule 6.2 of the California Public Utilities Commission’s (Commission) Rules of Practice and Procedure, the California Independent System Operator Corporation (CAISO) provides comments on the *Order Instituting Rulemaking to Establish Policies, Processes, and Rules to Ensure Safe and Reliable Gas Systems in California and Perform Long-Term Gas System Planning* (Gas Systems Order) regarding the preliminary scope of the proceeding.

II. Discussion

The CAISO appreciates the thoughtfulness of the Commission’s Gas Systems Order and strongly agrees with the prioritization and issues to be discussed in each of the three phases. Specifically, the CAISO agrees that the first phase, Track 1A, appropriately addresses reliability standards issues such as harmonization of standards between gas companies and consideration of a “slack capacity requirement.” The second phase, to be discussed under Track 1B, will determine the regulatory changes needed to improve the coordination between gas utilities and gas-fired electric generators. The CAISO, as the only wholesale electricity market operator in California, strongly supports increased incentives to pursue firm long-term contracts or other hedging mechanisms to mitigate potential gas and electricity market price spikes. The CAISO strongly agrees that gas supply shortages increase price volatility and pose a risk to electric reliability. Lastly, the third phase, to be discussed under Track 2, will implement the long-term planning strategy. The CAISO’s comments focus on the reliance on the natural gas even while renewable penetration grows and the state transitions to a cleaner economy.

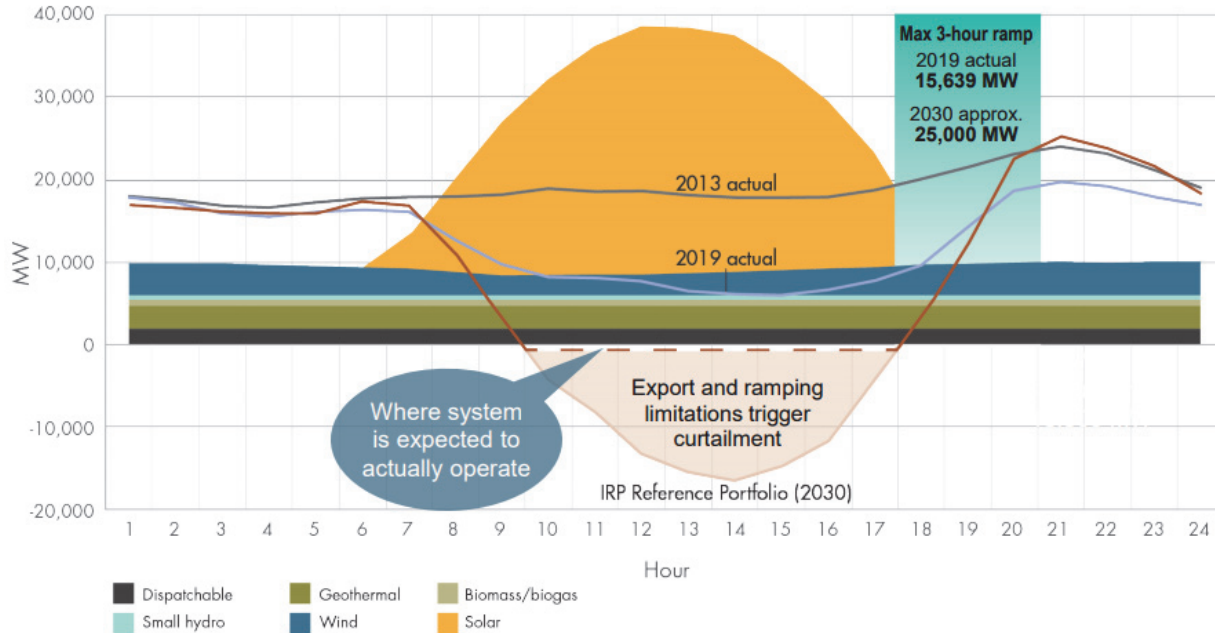
A. The Commission Should Consider Ramping and Renewable Integration Needs on an Hourly Basis in its Near- and Long-Term Planning Strategies.

The Commission rightly notes that state and local decarbonization policies will generally reduce overall gas usage over time. However, intra-day and seasonal electric sector gas usage may actually increase due to ramping and renewable integrations needs in the interim. It is imperative that the Commission consider, at minimum, the hourly gas withdrawal needs of the generation fleet and its impact on the natural gas delivery system. Specifically, the Commission should consider whether the natural gas delivery system can simultaneously serve core demand and meet the ramping requirements of gas-fired resources needed to integrate electric renewable resources. For resource adequacy capacity, this may require additional rules to procure firm gas supply for capacity awarded a CAISO day-ahead schedule to provide certainty for both the generator and gas operator regarding CAISO system needs. Over time, the Commission should incorporate similar impacts from California's regional neighbors as they also pursue decarbonization and renewable integration policies. The Commission should reflect these needs across all three phases and tracks of this proceeding.

The CAISO has identified the electric grid's year-over-year increase in ramping needs since 2012.¹ This trend is likely to increase. Based on analysis conducted by the CAISO using a preliminary base case scenario from the Commission's integrated resource planning proceeding, the maximum three-hour net load ramp may increase from the current maximum 15,639 MW, based on 2019 actual data, to approximately 25,000 MW by 2030. Solar generation production drives a significant portion of this ramping need as shown in Figure 1 below.

¹ http://www.aiso.com/Documents/FlexibleResourcesHelpRenewables_FastFacts.pdf

Figure 1: Actual and Projected Maximum Three Hour Ramp²



The electric system ramping needs and impacts of solar generation are important factors to consider in this proceeding because lower overall gas usage may not translate into a commensurate reduction in gas needs during ramping periods. In fact, this is likely to require more diligent balancing to ensure there is sufficient gas pressure and supply to support ramping needs. This is the conclusion from a recent west-wide study, known as the Woodmac Study, which the Western Electricity Coordinating Council (WECC) commissioned to review the gas-electric system. The Woodmac Study which found:

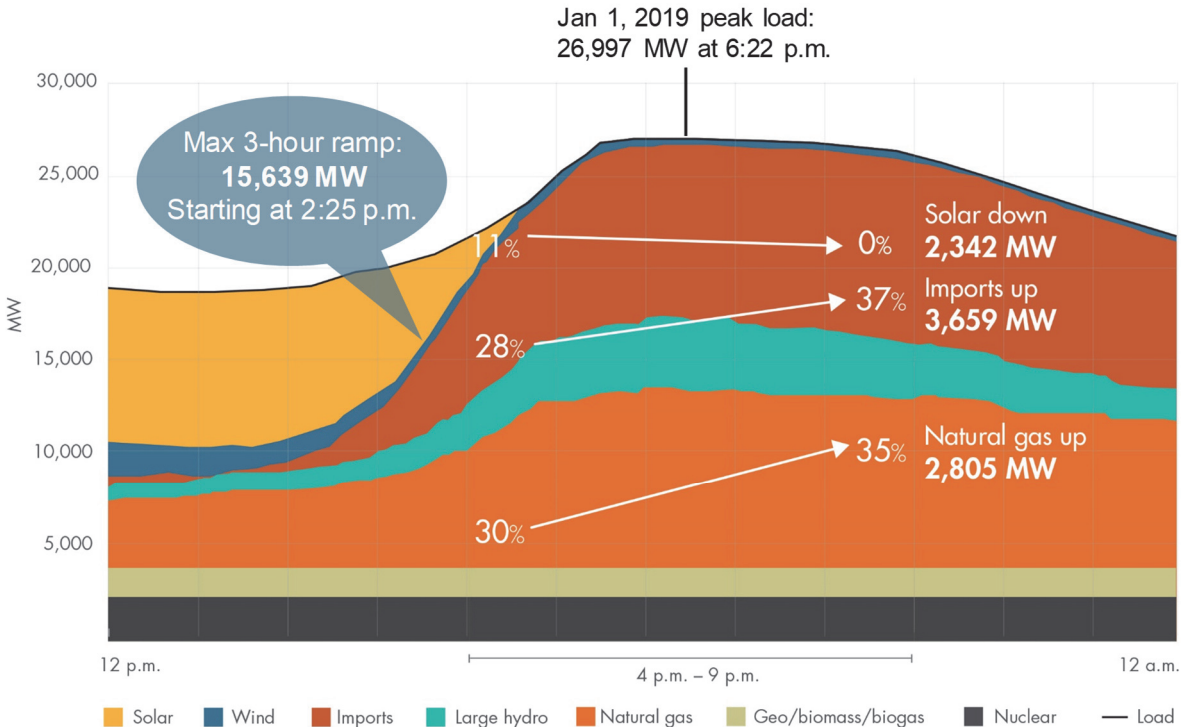
The anticipated expansion of solar PV [photovoltaic] in California creates a need for significant upward ramping capability over a relatively short times scale (approximately three hours); much of this upward ramping capability will be met by flexible natural gas generation. In an industry whose business practices and conventions are largely designed around the concept of a ratable gas day, the increasingly variable and uncertain nature of natural gas demand may create strains between pipelines and generators.³

² Slide 5 from <http://www.caiso.com/Documents/BriefingonPost2020GridOperationalOutlook-Presentation-Dec2019.pdf>

³ Wood Mackenzie, Energy + Environmental Economics, and Argonne National Laboratory, “Western Interconnection Gas – Electric Interface Study,” June 2018, p. 7. Available at: <https://www.wecc.org/Administrative/WECC%20Gas-Electric%20Study%20Public%20Report.pdf>

Today, the CAISO largely relies on natural gas resources and imports for ramping, flexibility, and renewable integration needs. Figure 2 below provides a 24-hour snapshot of January 1, 2019, the day of the largest maximum three-hour net load ramp in 2019, which occurred during the high demand season for core gas users.

Figure 2: Gas and Imports Respond to Meet Maximum Ramp⁴



The figure clearly demonstrates that imports and natural gas resources are currently important renewable integration resources. However, the Woodmac Study projects that “[s]ystem reserve margins are expected to become increasingly tight through 2026, driven by baseload coal and nuclear retirements as well as steady increases in power demand” resulting in a forecasted 30% increase in natural gas demand for power generation across the Western Interconnection by 2026.⁵ The Commission should also consider the regional impacts of electric generation gas

⁴ Slide 4 from <http://www.caiso.com/Documents/BriefingonPost2020GridOperationalOutlook-Presentation-Dec2019.pdf>

⁵ Wood Mackenzie, Energy + Environmental Economics, and Argonne National Laboratory, “Western Interconnection Gas – Electric Interface Study,” June 2018, p. 3. Available at: <https://www.wecc.org/Administrative/WECC%20Gas-Electric%20Study%20Public%20Report.pdf>

demand as the rest of the west pursues their own decarbonization and renewable integration policies.

Separately, the CAISO is addressing another operational challenge created by potential reduced solar generation and battery storage charging capability that could be caused by multiple days of persistent cloud coverage. Figure 3 below shows actual peak solar generation during the week of January 13 through 18, 2019. Figure 3 shows that peak solar output varied from 16 to 71 percent of installed capacity during that week. This significant variation and reduction in generation (especially as compared to higher solar output in the summer) occurs during the high natural gas demand season for core customers.

Figure 3: Multiple day low solar production from Jan 13 –18, 2019⁶

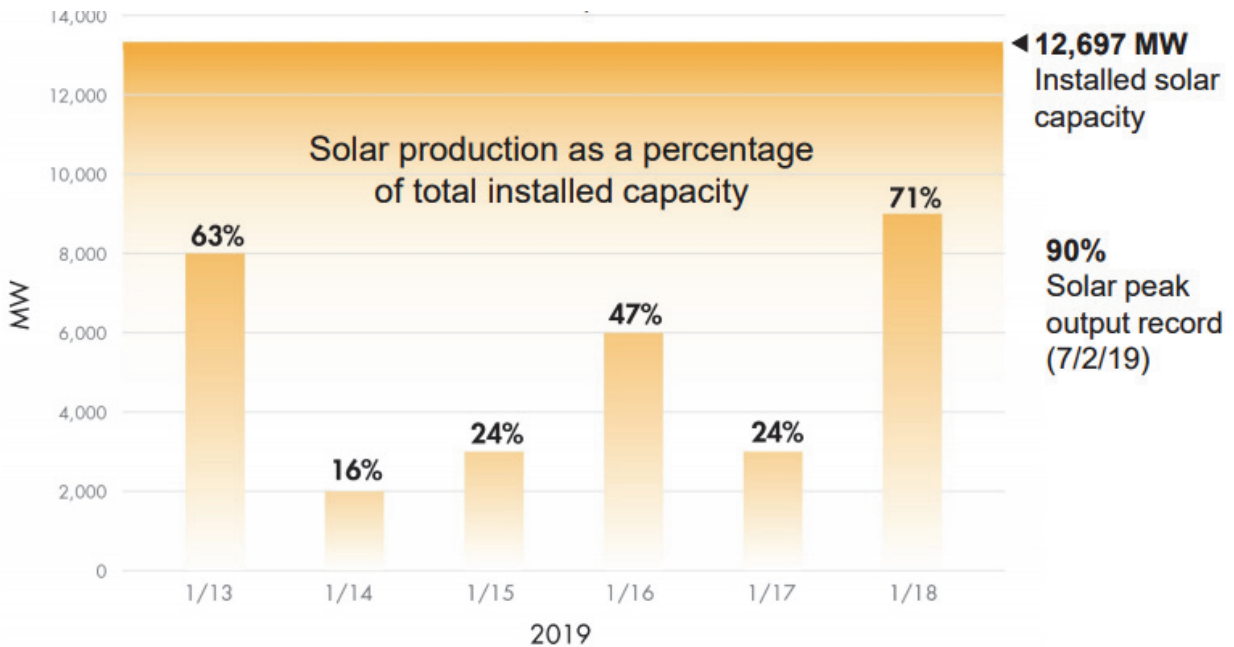


Figure 4 below compares the same week’s total electric generation profile (right side) to a week with more typical solar generation in spring (left side).

⁶ Slide 9 from <http://www.caiso.com/Documents/BriefingonPost2020GridOperationalOutlook-Presentation-Dec2019.pdf>

Figure 4: Low Versus Typical Solar Production Days⁷

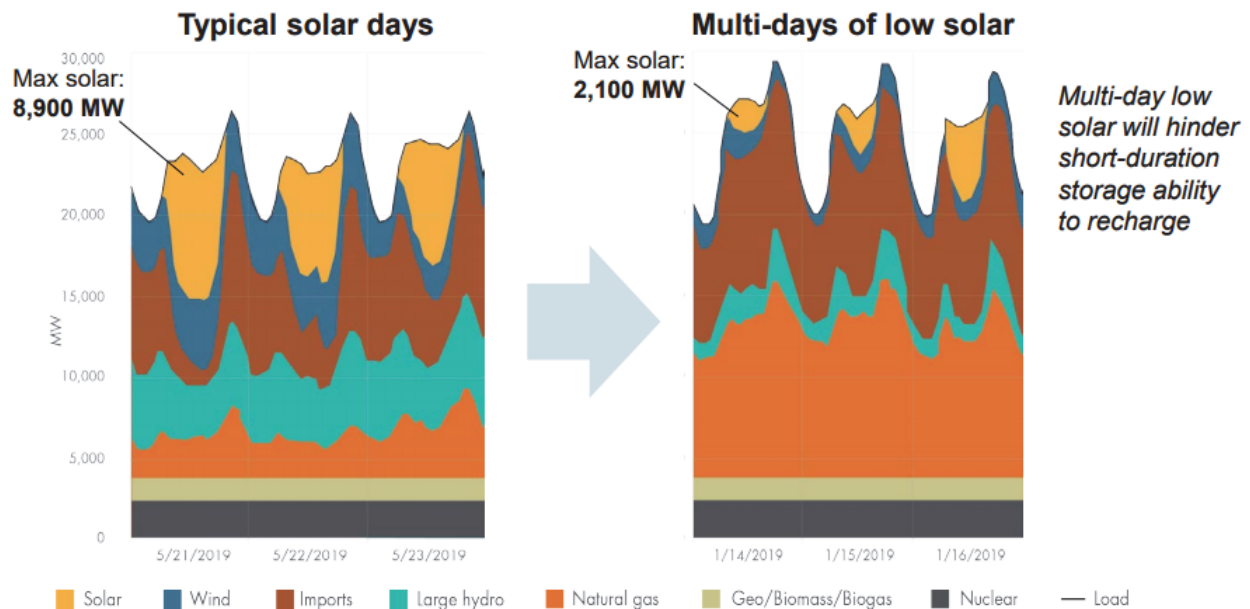


Figure 4 illustrates that the CAISO system relies on natural gas and imports to meet lost solar production similar to how they are used to meet the CAISO’s ramping needs in the hours around sunset. The Commission should also consider this scenario when there is greater transportation electrification as well as fuel substitution.

Lastly, the electricity sector is still learning to integrate and operate new resources. For example, storage resources come in a variety of materials (*e.g.*, lithium ion, sodium-based), durations (*i.e.*, short and long), and configurations (*i.e.*, hybridized with renewables or thermal resources). The Commission should strategically retain the existing gas generation fleet and a sufficient gas transportation system until the electricity sector can reliably transition away from such resources. To achieve this, a regular study process that is integrated or leverages the Commission’s integrated resource planning process may be appropriate.

III. Conclusion

The CAISO urges the Commission to consider, at minimum, the hourly gas withdrawal needs of the generation fleet and its impact on the natural gas delivery system. Specifically, the Commission should consider whether the natural gas delivery system can simultaneously serve

⁷ Slide 10 from <http://www.caiso.com/Documents/BriefingonPost2020GridOperationalOutlook-Presentation-Dec2019.pdf>

core demand and meet the ramping requirements of gas-fired resources to integrate renewables. For resource adequacy capacity, this may require additional rules to procure firm gas supply for capacity awarded a day-ahead schedule so there is certainty for both the generator and gas operator of CAISO needs. Over time, the Commission should incorporate similar impacts from California's regional neighbors as they also pursue decarbonization and renewable integration policies. The Commission should reflect these needs across all three phases and tracks of this proceeding. The CAISO looks forward to working with the Commission.

Respectfully submitted,

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