| DOCKETED | |
|---|---|
| **Docket Number:** | 21-lEPR-04 |
| **Project Title:** | Energy Reliability |
| **TN #:** | 238984 |
| **Document Title:** | SoCalGas Comments on Summer 2021 Reliability (July Workshop) |
| **Description:** | N/A |
| **Filer:** | System |
| **Organization:** | Southern California Gas Company |
| **Submitter Role:** | Public |
| **Submission Date:** | 7/23/2021 2:43:08 PM |
| **Docketed Date:** | 7/23/2021 |

*Comment Received From: Southern California Gas Company*
*Submitted On: 7/23/2021*
*Docket Number: 21-IEPR-04*

## SoCalGas Comments on Summer 2021 Reliability (July Workshop)

*Additional submitted attachment is included below.*

N. Jonathan Peress
Senior Director
Business Strategy & Policy
555 West 5th Street
Los Angeles, CA 90013
Tel: (213) 335-1081
*NPeress@socalgas.com*

July 23, 2021

The Honorable J. Andrew McAllister
The Honorable Siva Gunda
California Energy Commission
Docket Unit, MS-4
Docket No. 21-IEPR-04
1516 Ninth Street
Sacramento, CA 95814-5512

**Subject: Comments on Summer 2021 Reliability**

Dear Commissioners McAllister and Gunda:

Southern California Gas Company (SoCalGas) appreciates the opportunity to comment on the California Energy Commission (CEC), California Public Utilities Commission (CPUC), and the California Independent System Operator (CAISO) joint workshops held on July 8 and 9. Critically important and ambitious climate policies continue to drive significant deployment of renewables which are necessary and appropriate to pursue and to achieve the State's decarbonization goals. One observable effect is an increasingly complex and convergent energy system, as between the gas and electric segments. This trendline has been gathering momentum for years and compels continuous evaluation of outcomes and future protections to address the multitude of public interest underpinnings embodied in energy policy and law. The workshops provided an important and valuable forum for better understanding and getting a grasp on the future direction and needs of the system in consideration of the black letter public interest tenets, beginning with reliability and its interplay with emissions reductions policies.

As addressed in these comments, several observations from the workshops appear clear and worthy of further regulatory policy and energy planning consideration. Arguably of most significance, the data and discussions highlight California's heavy reliance on imports and hydroelectric power, an energy system boundary condition that merits critical review, if not concern. Reliance on resources that are largely beyond the scope of California regulator, market operator and/or market participant control raises significant reliability and cost considerations. Conversely, such dependency illuminates the indispensable role of the gas grid and underground storage facilities situated within

market. These resources are not only the energy system's paramount contingency resource, providing flexibility and resiliency, but they have been and will remain for the indeterminate future the key enabler of renewable market penetration and resulting emissions reductions on the electric grid. It would not be mere hyperbole to suggest that without the gas system capabilities to balance and provide just-in-time dispatchable stored energy (including for multi-day needs), the energy system would be functionally unable to deploy *any* meaningful amount of renewable capacity. The consequence is thus axiomatic: achieving the State's climate policy imperative (including SB 100 requirements for electric load), compels continuing need for and advancement of clean gaseous fuels deployment and carbon management to achieve net zero. Planning and policies that enable and actuate development and deployment of clean fuels and carbon management technologies are needed to facilitate a robust, reliable, and resilient interdependent energy system essential to its clean energy transition and decarbonization.

Accordingly, SoCalGas' comments address and express that: **(1)** decarbonization trends in California and across the West warrant conservative assumptions regarding the availability of imports and hydroelectric power going forward as implicating the need for a clean, reliable, and resilient interdependent energy system; **(2)** the gas system and electric grid are increasingly convergent and interdependent such that a capable gas system is necessary to both decarbonize while providing for reliability; **(3)** recent climate events illuminate the need for greater energy system resiliency; **(4)** an equitable and affordable energy transition necessitates a re-examination of legacy cost allocation structures, beginning with a foundational need to identify the greatest users and beneficiaries of a robust and capable gas system; **(5)** advancing clean fuel and carbon management technologies is compulsory for the preservation of reliability with increasingly variable and intermittent resource portfolios; and **(6)** Aliso Canyon (i.e., robust in-market storage) provides indispensable benefits to California (notably, as an enabler of decarbonization) and further analysis is necessary to understand the full value of the facility to energy reliability and affordability.

## 1. Decarbonization trends in California and across the West warrant conservative assumptions regarding the availability of imports and hydroelectric power as implicating investment in a clean, reliable, and resilient interdependent California energy system.

The ongoing integration of unprecedented levels of variable renewable energy adds significant volatility to energy availability, raising public welfare-oriented considerations in light of California's heavy reliance on electric imports. Both the CAISO and workshop panelists noted that the availability of net imports is decreasing as net load is increasing, becoming more pronounced during the months of July through September.[1] Extreme weather events experienced throughout the West coupled with ambitious decarbonization goals extending outside California compel serious consideration and trepidation about the reasonableness of the State's continued reliance on imports. These market and regional dynamics necessitate a deeper examination of the appropriate

[1] *See* CEC IEPR Joint Agency Workshop on Summer 2021 Reliability, Session 1: Hydro Resources and the Drought. Available at https://www.energy.ca.gov/event/workshop/2021-07/iepr-joint-agency-workshop-summer-2021-electric-and-natural-gas-reliability

operational mix of resources California load serving entities (LSEs) need to meet the reliability demands of an evolving and increasingly clean energy system.

California has historically been a net electricity importer, with 25 percent of energy needs supplied by imports. As supply and demand changes over the western region, however, a drop in the availability of imports particularly over the net high load conditions is becoming an emerging trend concerning both the CAISO as well as LSEs who rely on imports for critical energy and resource adequacy during times when renewables are unavailable. While panelists identified greater levels of transparency and regionalization as efforts needed to increase supply, they agreed that such measures are likely to provide limited relief.[2] As more states across the West decarbonize, the need for firm, dispatchable power is becoming more acute, with scarcity around supply driving higher prices and leading to resource shortfalls. The situation is compounded by a changing resource mix in-state resulting in limited supplies of firm dispatchable generation. As a result, Southern California Edison (SCE) identified a critical contributing factor to increased outage rates given the increased reliance of in-state gas generation units. These in-state gas fired units are being pushed to their operational limits throughout the year and foregoing routine maintenance in April or October to continue supporting the electric grid.

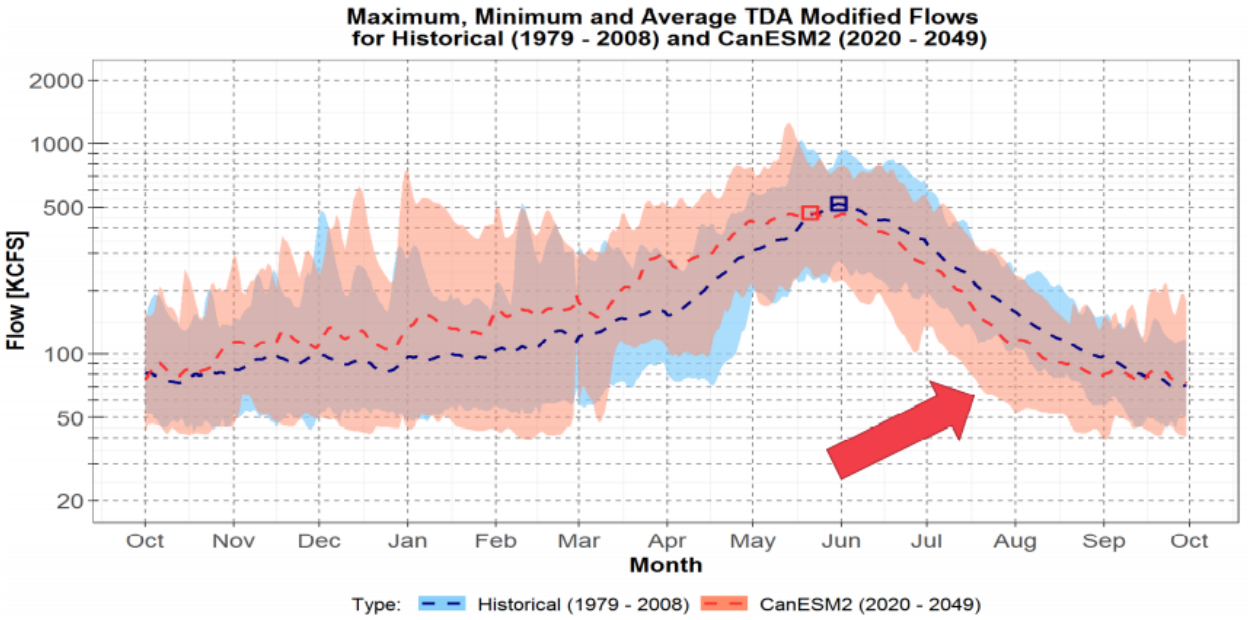
California's energy system is complicated (and becoming more so), increasingly convergent and interdependent. As CEC Commissioner Gunda and CAISO President Mainzer noted, California tends to "live right on the edge" or "margin" when managing the reliability of our electric system.[2] In SoCalGas' May 18 letter to the CEC on Summer 2021 Reliability,[3] we noted that climate change is diminishing hydro's traditional ability to support the electric grid, especially through the decreased seasonal storage capacity of snowpack. Hotter temperatures cause rain to fall in the winter, rather than snow, and dams must release this excess water in the Spring. In Session 1, Northwest Power & Conservation Council confirmed this point by presenting historical and projected data. As seen in Figure 1, January through May shows hydropower well above projections due to high rainfall in those months and less hydro power available in the hottest months from June to September.[4]

[2] *See* IEPR Joint Agency Workshop on Summer 2021 Reliability, Session 2: Imports, Demand Response, and Multi-Year Outlook. Available at https://www.energy.ca.gov/event/outreach/2021-07/iepr-joint-agency-workshop-summer-2021-electric-and-natural-gas-reliability

[3] *See* SoCalGas Comments on Summer 2021 Reliability, May 18, 2021, available at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=21-IEPR-04

[4] *See* CEC IEPR Joint Agency Workshop on Summer 2021 Reliability, Session 1: Hydro Resources and the Drought.

**Figure 1: Historic versus Projected Hydro Flows**




The lack of hydro resources during the hottest months is a significant driver of the system being on "the edge" and it will continue to get worse. It is worth noting these are not new issues as the CEC and CPUC identified the need for bulk, long duration storage and held a Joint Workshop in 2015 to identify barriers and develop recommendations.[5] The resultant staff paper, proposed five recommendations to help increase capacity and capabilities of bulk energy storage.[6] Their recommendations were as follows: valuation of pumped hydro as a grid support service for fast ramping capabilities of variable speed pumps as well as local supply during transmission failures, organizing a Bulk Storage User Committee, streamlining licensing of hydroelectric projects, develop a cost-benefit study of the value of location-specific storage, and help facilitate joint ventures to overcome the significant upfront capital costs.[7]

Climate policies are also shaping the market for how much hydropower is available both in and out-of-state. Hydroelectric generation from large facilities do not receive Renewable Portfolio Standard credit. Generation from small hydro facilities qualifies for RPS credits but compete on a levelized cost of generation basis with solar photovoltaic resulting in existing hydro resources

[5] Joint California Energy Commission and California Public Utilities Commission Long-Term Procurement Plan Workshop on Bulk Energy Storage, docket 15-MISC-05, Notice of Workshop is TN #206535 and Agenda of Workshop is TN #206690. Docket can be found at: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=15-MISC-05

[6] *See* CEC, Bulk Energy Storage in California, authors Collin Doughty, Linda Kelly, John Mathias, July 2016, CEC-200-2016-006. The report can be found at the following link: https://www.energy.ca.gov/sites/default/files/2021-06/CEC-200-2016-006.pdf

[7] Id.

being decommissioned. Stanford's Bill Lane Center for the American West published an article, *As Relicensing Looms, Aging Dams Face a Reckoning*, highlighting this challenge.[8]

Hydroelectric licenses tend to be for 30 to 50 years with many dams throughout the West up for relicensing in the 2015 to 2025 timeframe. For economic and environmental reasons, owners are forgoing the option to relicense. PG&E chose to not seek relicensing for several facilities and if no one steps forward to run the facilities, then PG&E will be compelled to develop a decommissioning plan. Because large hydro generation does not qualify for RPS support, portions of its capacity are unable to attract long-term contract arrangements. Data centers migrated to locations with excess hydroelectric supply like the Pacific Northwest and Quebec. A Politico Magazine article from 2018 stressed that digital currency mining would "suck up so much of the power surplus that is currently exported..."[9] As a result, data centers capitalizing on low-cost hydroelectric generation from large hydro facilities from out-of-state has in fact resulted in less export potential to California.

Given the changing landscape for imports and hydro power, conservative modeling assumptions around the availability of imports and hydropower are necessary and appropriate to avoid unanticipated shortfalls. In turn, investments are needed in-state to ween LSEs from their dependence on imports and make certain a robust supply of firm, dispatchable generation is available and ready to meet increasing in-state demands on the system. California increasingly relies on gas-fired generation and supporting gas infrastructure to provide needed reliability and resiliency to an increasingly interdependent and intermittent electricity grid. The ability to provide just-in-time fuel to the electric grid during times of high demand, while also facilitating quick ramp downs when needed is an operational feature anticipated to be in even greater demand as LSEs make progress towards SB100 goals and greater parts of the California economy electrify.

**2. The gas system and electric grid are increasingly convergent and interdependent such that a capable gas system is necessary to both decarbonize while providing for reliability.**

During Session 3, CEC and CPUC staff explained in detail the work that the agencies have undertaken to understand and support the functioning of California's energy system.[10] As noted by the CEC, the natural gas system is increasingly relied on in "meeting EG [electric generation] demand for large afternoon/evening ramps and net peaks as the sun sets."[11] The gas system is integral to the electric grid because the gas system is "being used to integrate renewables" by

[8] Stanford University, The Bill Lane Center for the American West, "As Relicensing Looms, Aging Dams Face a Reckoning," by Felicity Barringer. The article can be found at the following link: https://west.stanford.edu/news/blogs/and-the-west-blog/2019/green-power-source-or-fish-killer-relicensing-looms-aging-dams-face-reckoning

[9] Politico Magazine, "This is What Happens When Bitcoin Miners Take Over Your Town," by Paul Roberts, March/April 2018. The article can be found at the following link: https://www.politico.com/magazine/story/2018/03/09/bitcoin-mining-energy-prices-smalltown-feature-217230/

[10] *See* CEC IEPR Joint Agency Workshop on Summer 2021 Reliability, Session 3: Gas Reliability Issues and Polar Vortex Impacts & Implications, available at: https://www.energy.ca.gov/event/workshop/2021-07/iepr-joint-agency-workshop-summer-2021-electric-and-natural-gas-0

[11] *See* CEC, "Overview of California Gas Reliability Issues", presented at the IEPR Joint Agency Workshop on Summer 2021 Reliability, Session 3: Gas Reliability Issues and Polar Vortex.

"meet[ing] peak and net peak demand."[12] Advancement of renewable resources has changed the way electricity is generated and driven increased "inter-dependencies between gas and electric systems."[13]

In 2020, most peak hour gas deliveries from SoCalGas' system were to serve dispatchable electric generators (DEGs) and electric system ramping needs; far greater than peak hours to serve core customer thermal load. For example, of the 77 hours in 2020 when SoCalGas deliveries to either core customers or electric generators exceeded 100,000 Dekatherms/hour (Dths/hr) (equivalent to approximately 2.4 billion cubic feet/day (bcf/d) of capacity), 62 hours were to serve electric generators, while only 15 hours served core customers.[14] CEC staff acknowledged this evolution by stating that DEGs "take larger amounts [of] gas over a shorter period of time" and are needed to meet "big[] ramps and [] peak and net peak load."[15]

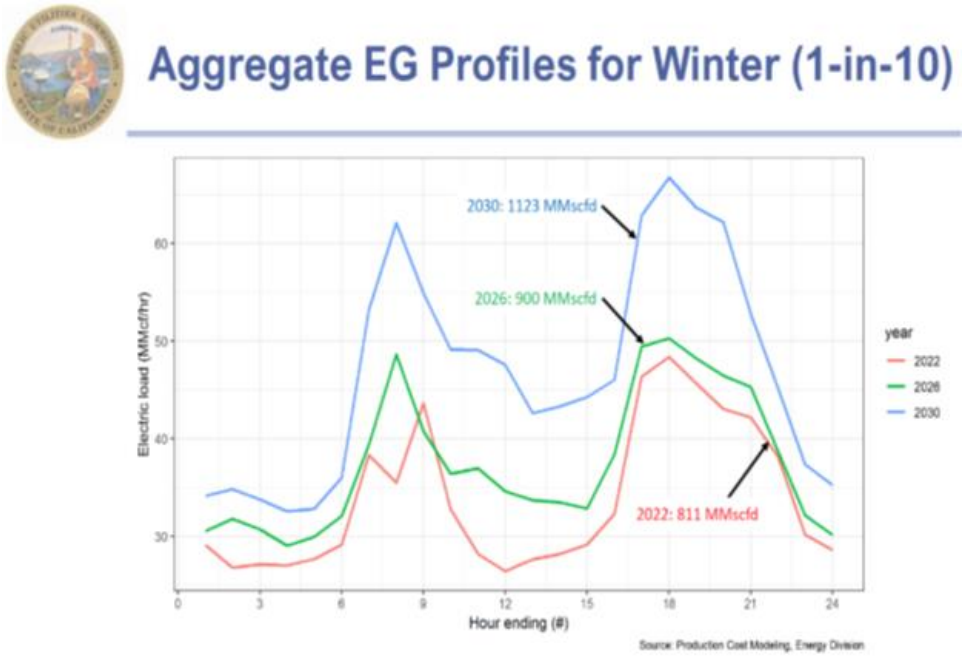
While DEG gas demand may become less frequent in the future, when called upon, it is needed quickly and in large quantities. On the gas system, this requires that gas be available in the right location when electric generators ramp up and requires a flexible gas system to manage downswings when the DEGs shut off and the DEG draw of natural gas subsides. As noted by the CEC and numerous presenters, these hourly (and sub hourly) considerations are of growing importance as the significant demands on the gas system are largely driven by DEGs.[16]

Southern California gas storage facilities are particularly valuable in responding to hour-to- hour changing demand and large swings in demand for natural gas that occur within a single day regardless of whether those large swings are upward or downward. The California Council of Science and Technology's (CCST)[17] "Technical Report on the Long-Term Viability of Underground Natural Gas Storage in California" (CCST Report) recognized this important point. The CCST noted that "[s]torage provides intraday balancing to support hourly changes in demand that the receipt point pipelines cannot accommodate. This service is essential in allowing the flexible use of gas-fired electricity generators to back up renewable generation."[18] When DEG is needed during peak demand conditions (hours and/or days), ratable pipeline deliveries are expected to increase (e.g., flowing supplies are assumed to increase). During these high demand conditions, pipeline supplies and withdrawals from storage are instrumental in supporting energy demand. When intermittent resources like solar and wind resume generation, DEG is quickly displaced.

[12] Ibid.
[13] Ibid.
[14] SoCalGas analysis of operational data.
[15] *See* CEC, "Overview of California Gas Reliability Issues", presented at the IEPR Joint Agency Workshop on Summer 2021 Reliability, Session 3: Gas Reliability Issues and Polar Vortex.
[16] *See* CEC IEPR Joint Agency Workshop on Summer 2021 Reliability, Session 3: Gas Reliability Issues and Polar Vortex Impacts & Implications, available at: https://www.energy.ca.gov/event/workshop/2021-07/iepr-joint-agency-workshop-summer-2021-electric-and-natural-gas-0
[17] The CCST is a nonpartisan, nonprofit organization that responds to the Governor, the Legislature, and other state entities who request independent and impartial assessments of public policy issues affected the State of California.
[18] CCST Report at 494.

Consequently, it is necessary to manage incoming supply flows to avoid over-pressuring the system. Management can occur via operational flow orders, forcing gas burn (which may require curtailing or exporting electricity), or underground storage injection. If storage injection is not available, the incoming gas must be used (i.e., burned), which will result in the displacement renewables. Accordingly, storage injection during renewable up-ramp is preferable because it allows DEGs to ramp down, which simultaneously manages pressure swings, mitigates operational flow orders, and promotes renewable deployment and generation and enables the availability of natural gas when needed. Through this capability, storage enables reductions in emissions by providing system flexibility, allowing more facile integration of increasing amounts of renewable intermittent resources by supporting a system that can manage pressure and demand swings especially during peak day conditions. These capabilities are likely to grow in importance. As illustrated in Figure 2, CPUC staff analysis forecasts growing and peakier natural gas demand by DEGs.

**Figure 2: Projected Electric Generation Load on SoCalGas System**



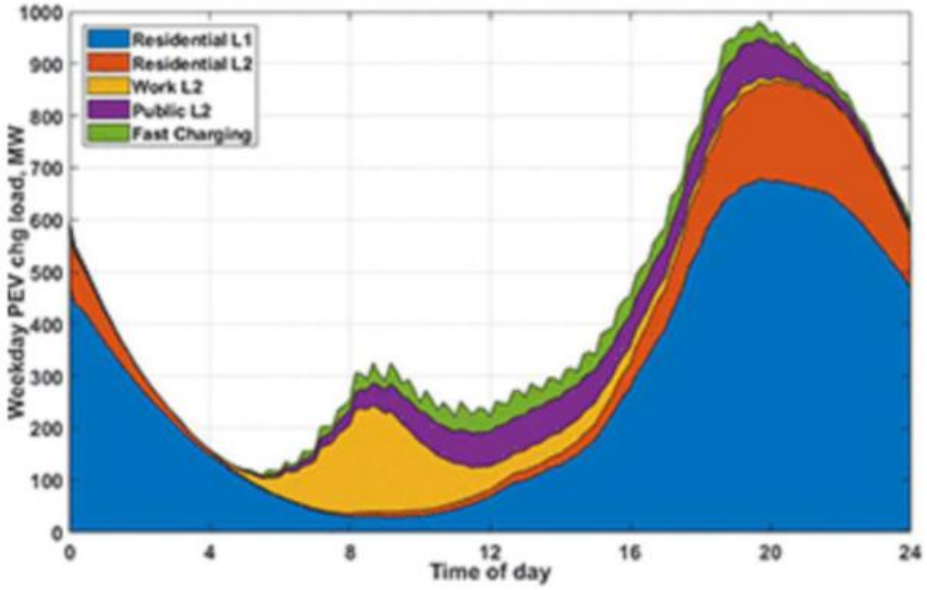

Notably, the above analysis may underestimate these growing afternoon and evening peaks as it does not fully consider or plan to consider more recent electrification developments and how growing vehicle electrification may impact demand for natural gas to support electric generation.[19]

[19] See November 17, 2020 FTI Research Presentation at Slide 9 (In CPUC Proceeding I.17-02-002) ("The modeling team is aware of the September 2020 Executive Order regarding zero-emission vehicles and its 2035 mandate. In part because limited information is available on the potential impact of the Order, and in part because of a desire to limit deviations from Phase 2 assumptions, we have chosen not to attempt to incorporate impacts in the simulations").

As noted by CEC Commissioner Monahan at the beginning of Session One, a stable grid is critical to zeroing out transportation emissions.[20]

In the CEC's recent report assessing electricity needs to meet the State's zero-emission vehicle mandates, researchers observed a new trend on the electric grid called the "dragon curve".[21] As seen in Figure 3, there are two notable increases in load during the day as passenger vehicles charge—once in the morning when commuters arrive to work and once in the evening when they return home, which "could bring some strain to the grid" when millions come home at the end of the day to charge.[22] Overall, as seen in Figure 3 below, building electrification and electric vehicle charging will likely add incremental load to the electric grid during early morning and afternoon ramp periods.

**Figure 3: The "Dragon Curve": Electricity Use from EVs in 2025**




The gas and electric systems are "deeply linked" and changing demand and supply profiles on the electric side will increasingly "becoming a driver of gas system needs and operations."[23] As

[20] *See* CEC IEPR Joint Agency Workshop on Summer 2021 Reliability, Session 1: Hydro Resources and the Drought.

[21] *See* CEC's Staff Report "California Plug-In Electric Vehicle Infrastructure Projections: 2017-2025," March 2018, pg. 4. Available at *https://efiling.energy.ca.gov/URLRedirectPage.aspx?TN=TN222986_20180316T143039_Staff_Report__California_PlugIn_Electric_Vehicle_Infrastructure.pdf* .

[22] *See* Governor's Wind and Solar Energy Coalition, "Electric vehicles should fear the 'dragon curve,' 26 April 2018. Available at *https://governorswindenergycoalition.org/electric-vehicles-should-fear-the-dragon-curve-researchers-say*

[23] *See* CEC, "Overview of California Gas Reliability Issues," presented at the IEPR Joint Agency Workshop on Summer 2021 Reliability, Session 3: Gas Reliability Issues and Polar Vortex.

evidenced by the foregoing, a flexible, resilient, and capable gas system is necessary for widespread renewable deployment and achieving decarbonization goals. Refining future modeling to include "sub-hourly" conditions, as suggested by the Los Angeles Department of Water and Power (LADWP), would help address some of the above developments and assist in optimizing strategies for energy system reliability and better understanding how DEGs are impacting and driving changes on the gas system.

**3. Recent climate events highlight the need for greater energy system resiliency**

Based on the CEC's and CPUC's analysis of Winter Storm Uri (and other extreme weather events) in Session 3, system resiliency will become increasingly important to the functioning of our energy systems. Extreme weather in and outside of California have potentially significant impacts on the operation of California's electric and gas grids.

Numerous CEC and CPUC staffers discussed the significance of California being at the "the end of the interstate pipelines" – making California "susceptible to extreme events outside California" and posing "supply risks that are beyond the state's control."[24] This is because "when supplies are tight, flows into California can be limited by upstream demand."[25] As noted by the CPUC staff presentation, "two in-state factors protect against gas supply risks" and those are "[a]ccess to diverse gas basins" and "[s]torage."[26] Notably, these same factors were highlighted in the CCST Report, which stated:

- "Gas storage could increasingly be called on to provide gas and electric reliability during emergencies caused by extreme weather and wildfires in and beyond California. Both extreme weather and wildfire conditions are expected to increase with climate change. These emergencies can threaten supply when demand simultaneously increases."[27]
- "Underground gas storage protects California from outages caused by extreme events, notably extreme cold weather that can drastically reduce out-of-state supplies."[28]

In addition to the serious safety and public welfare implications that arise from disruption of service, the intensity, frequency, and duration of weather events could cost utilities and customers

[24] *See* CEC, "Overview of California Gas Reliability Issues" and "Winter Storm Uri—Impacts of the Polar Vortex", and CPUC, "Impact of the Polar Vortex on California", presented at the IEPR Joint Agency Workshop on Summer 2021 Reliability, Session 3: Gas Reliability Issues and Polar Vortex.
[25] *See* CEC, "Overview of California Gas Reliability Issues" and "Winter Storm Uri—Impacts of the Polar Vortex", and CPUC, "Impact of the Polar Vortex on California", presented at the IEPR Joint Agency Workshop on Summer 2021 Reliability, Session 3: Gas Reliability Issues and Polar Vortex.
[26] *See* CPUC "Impact of the Polar Vortex on California", presented at the IEPR Joint Agency Workshop on Summer 2021 Reliability, Session 3: Gas Reliability Issues and Polar Vortex.
[27] CCST Report at 506; *see* Natural Gas Network Resiliency to a "ShakeOut Scenario" Earthquake, by Sandia National Laboratories (Sandia Report), available at http://prod.sandia.gov/techlib/access-control.cgi/2013/134938.pdf ("The role of natural gas storage, in general, is to provide a buffer between constant production and the highly seasonal nature of consumption. In this case, Los Angeles is fortunate to have Aliso Canyon storage facility in its backyard. At roughly 85,000 MMcf of working (or usable) gas capacity, this storage facility is one of the largest in the Unites States.").
[28] *See* CCST Report at 506.

billions, including costly damage to critical infrastructure.[29] We roughly estimate the cost of an 8-hour outage for Los Angeles County to be in the range of $2.5 billion.[30] Notably, the CPUC staff's hypothetical analysis of the dire potential impacts of a Winter Storm Uri event without Aliso Canyon indicate the importance of a resilient system, with ample in-state resources. Indeed, when CPUC staff analyzed this hypothetical (as seen in Table 1 below), they found "huge curtailments" and fairly labelled it a "catastrophe"[31] – serious and significant gas shortages, resulting in all noncore customers being curtailed on every day of the event and a significant number of core customers being curtailed.

**Table 1: "SoCalGas: What if Demand Had Been Higher and Aliso Canyon Was Closed?"**

| Flow Date | Total Receipts | Available Withdrawal Capacity | Actual Sendout | Actual Sendout Surplus/ Deficit | 1-in-10 Deficit | 1-in-35 Surplus/ Deficit |
|---|---|---|---|---|---|---|
| 2/11/2021 | 1,656 | 889 | 2,399 | 146 | 2,422 | 895 |
| 2/12/2021 | 1,733 | 887 | 2,333 | 287 | 2,347 | 820 |
| 2/13/2021 | 1,807 | 887 | 2,203 | 491 | 2,273 | 746 |
| 2/14/2021 | 1,442 | 887 | 2,166 | 162 | 2,638 | 1,111 |
| 2/15/2021 | 1,357 | 892 | 2,226 | 23 | 2,718 | 1,191 |
| 2/16/2021 | 1,314 | 890 | 2,239 | 35 | 2,763 | 1,236 |
| 2/17/2021 | 1,593 | 902 | 2,464 | 32 | 2,471 | 944 |
| 2/18/2021 | 1,952 | 905 | 2,555 | 302 | 2,110 | 583 |
| 2/19/2021 | 2,085 | 881 | 2,489 | 477 | 2,001 | 474 |
| 2/20/2021 | 2,091 | 864 | 2,515 | 440 | 2,012 | 485 |

Source: Envoy and California Gas Report. All Envoy numbers converted from Dth to MMcf.

Therefore, an event similar in gravity to that of the 2014 Polar Vortex in the Northeast United States or the 2021 Texas Storm Uri could foreseeably cause a curtailment in the availability of gas supply statewide. Such curtailments could put both electric and gas customers at risk, which could in turn lead to significant injuries and/or loss of life (as experienced in Texas during the 2021 Storm Uri). Such potentially devastating impacts to Californians are mitigated by the characteristics of the existing gas system, which is comprised of both pipelines and storage facilities.

SoCalGas' system has access to diverse sources of natural gas supply and maintains local storage resources to guard against upstream conditions, thereby enabling Californians to continue to

[29] The U.S. Government Accountability Office's (GAO's) 2021 Report found that more frequent droughts and changing rainfall patterns may adversely affect hydroelectricity while increasing wildfire activity due to warmer temperatures and drier conditions may reduce transmission capacity or damage distribution lines. See Statement of Frank Rusco, Director of U.S. Natural Resources and Environment, Before the Committee on Environment and Public Works, U.S. Senate on the U.S. Government Accountability Office's Report Electricity Grid Resilience: Climate Change Is Expected to Have Far-reaching Effects and DOE and FERC Should Take Actions, 10 March 2021, available at https://www.gao.gov/assets/gao-21-423t.pdf.

[30] Based on the Los Angeles economy of approximately $730 billion in 2020, divided by 2080 work hours / year, results in ~$350M/hour

[31] *See* CPUC "Impact of the Polar Vortex on California", presented at the IEPR Joint Agency Workshop on Summer 2021 Reliability, Session 3: Gas Reliability Issues and Polar Vortex.

receive necessary energy even when faced with extreme weather events or upstream supply or demand conditions. As the consultant from Aspen Environmental aptly noted in Session 3: "The higher reliability standard adopted, the lower the probability of a worse case occurring, so the trick is to determine what level of risk the state should bear."[32] It is vital to public welfare to minimize the risk of energy shortages and "worst-case" scenarios. SoCalGas agrees with LADWP's salient suggestion, that modeling and understanding the value of energy system resiliency is key to guarding against low frequency but high impact events.[33]

**4. An equitable and affordable energy transition necessitates a re-examination of legacy cost allocation structures, beginning with a foundational need to identify the greatest users and beneficiaries of a robust and capable gas system**

As we transition to a cleaner energy ecosystem, increased reliance on renewables necessitates a gas grid that is a capable, integral component to enable the reliability and resiliency of the electric grid and the energy system as a whole. Accordingly, as the statewide interdependence of gas and electric systems increases, considerations of the future design and architecture of energy infrastructure must consider the reliability and resilience needs of the entire energy system. As described above, the gas system is reliable and resilient to weather-related interruption of service and can compensate for operational issues to recover quickly because gas pipelines are predominately underground and protected from the elements. For example, between 2006 and 2016, gas pipelines delivered 99.79% of "firm" contractual commitments to firm transportation customers at primary delivery points.[34] Moreover, researchers have found that the natural gas system performs extremely well during times of high stress and demand, demonstrating its reliability and resilience in the most challenging weather conditions.[35] The gas grid is a key service provider of resiliency, a critical public good attribute of the energy supply system.

Various decarbonization models used to inform electric reliability and carbon neutrality proceedings/reports (e.g., CPUC Integrated Resource Planning, California Air Resources Board's Report on Achieving Carbon Neutrality in California, and the Senate Bill 100 Joint Agency Draft Report) express the need to maintain a sizable gas-fired electric generating fleet, and the consequent need for gas transportation and delivery infrastructure, under all reasonable

[32] *See* Aspen Environmental, "SoCalGas Hot Summer Demand", presented at the IEPR Joint Agency Workshop on Summer 2021 Reliability, Session 3: Gas Reliability Issues and the Polar Vortex.
[33] *See* LADWP presentation at the IEPR Joint Agency Workshop on Summer 2021 Reliability, Session 4: Aliso Canyon Reliability Impacts, available at: https://www.energy.ca.gov/event/workshop/2021-07/iepr-joint-agency-workshop-summer-2021-electric-and-natural-gas-1
[34] *See* Natural Gas Council. *Natural Gas Systems: Reliable and Resilient*. July 2017. Available at: https://www.ipaa.org/wp-content/uploads/2017/07/NGC-Reliable-Resilient-Nat-Gas-WHITE-PAPERFinal.Pdf.
[35] *See* Natural Gas Council. *Report: Weather Resilience in the Natural Gas Industry.* August 6, 2018. Available at: www.naturalgascouncil.org/weather-resilience-in-the-natural-gas-industry/.

decarbonization scenarios.[36,37,38] The gas system can act as the transport mechanism for cleaner fuels such a green hydrogen (hydrogen produced via electrolysis powered by renewable energy) and renewable gases. The gas gird can thus be capable of enabling even broader resiliency and reliability services for the energy system in high renewable scenarios, including by blending and transporting green hydrogen. This fuel and electric sector demand and supply integration would provide further flexibility to energy system operations for achieving a decarbonized end state.

To this end, SoCalGas has proposed a Renewable Balancing Services (RBS) Tariff to facilitate the efficient integration of renewables and enhance energy system resiliency.[39] With continuous growth in renewable and variable resources expected to support electrification and decarbonizing the electric grid in the State, there will be increased periodic and episodic reliance on the reliability and resiliency services provided by the gas grid. SoCalGas proposes implementing a three-tier rate structure for DEGs, developed based on DEG customer load factor (i.e., relative utilization of gas grid infrastructure and capabilities). The rate structure would be designed to be revenue neutral for DEGs in the aggregate based on the current cost allocation structure for distribution level, local transmission level, and storage services per the 2020 Triennial Cost Allocation Proceeding (TCAP) decision. The proposal would replace the current rate design whereby all DEGs take service under one amalgamated rate. SoCalGas is proposing to retain the current unbundling of Backbone Transmission Service (BTS) rates from the DEG retail rates. SoCalGas believes that implementing this rate structure element of the RBS Tariff could provide the following potential benefits:

- Improve cost allocation equity within the DEG customer segment, consistent with cost causation/cost responsibility principles
- Enhance accuracy of price formation and signals within the electricity markets for such peaking services
- Align with climate policy by expressing the system cost and value of peakier intraday DEG output and takes from SoCalGas system to enable renewable integration and decarbonization
- Lay the groundwork for future rate designs that more accurately reflect costs and better value reliability and resiliency services provided by the gas system to DEG customers (and by DEGs in turn to the electric grid)

[36] California Public Utilities Commission, *Integrated Resource Plan Reference System Plan: RESOLVE models inputs and results*, 26 March 2020. Available at https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/electric-power-procurement/long-term-procurement-planning/2019-20-irp-events-and-materials/resolve-model-inputs-and-results-used-for-2019-irp-reference-system-plan-decision.
[37] California Air Resources Board, *Achieving Carbon Neutrality in California: PATHWAYS Scenarios Developed for the California Air Resources Board*, October 2020. Available at https://ww2.arb.ca.gov/sites/default/files/2020-10/e3_cn_final_report_oct2020_0.pdf.
[38] California Energy Commission, *2021 SB 100 Joint Agency Report: Achieving 100 Percent Clean Electricity in California: An Initial Assessment*, March 2021. Available at https://efiling.energy.ca.gov/EFiling/GetFile.aspx?tn=237167&DocumentContentId=70349.
[39] See Southern California Gas Company's (U 904 G) Proposal For A Conceptual Renewable Balancing Services Tariff, CPUC Rulemaking 20-01-007, January 16, 2020.

More broadly, decarbonization and the attendant role of delivered molecules to achieve it, express the need to update and evolve legacy cost allocation structures to account for the necessary services decarbonization services provided by the gas grid. The proposed RBS would begin to move cost allocation in the direction compelled by climate policy, underpinned by and consistent with bedrock rate design principles including beneficiary pays, cost causation and allocative efficiency.

### 5. Advancing clean fuel and carbon management technologies is compulsory for the preservation of reliability with increasingly variable and intermittent resource portfolios

A flexible, resilient, and increasingly decarbonized gas grid is necessary to support California's climate and energy goals. Numerous studies and analyses have confirmed that successful energy system decarbonization depends on the integration at scale of decarbonized molecules:

- "All LA100 scenarios depend on in-basin generation fueled by storable fuels, many derived from hydrogen and stored in various forms…."[40]
- "Transport and geologic storage of CO2 are essential to achieve [] required negative emissions."[41]
- And Lawrence Berkeley National Laboratory identified numerous actions that should be taken by 2030, which include:
    - "Maintain current natural gas generating capacity for reliability"
    - "R&D for carbon capture, sequestration, and carbon neutral fuels"
    - "Build…pipelines for carbon dioxide and hydrogen gas"[42]

SoCalGas is pursuing efforts to decarbonize the gas grid, including exploring hydrogen and other low- and zero-carbon gaseous fuel infrastructure. As the studies and analyses above indicate, decarbonized fuels and carbon capture and sequestration technologies will be needed for thermal generators to support the electric grid. An important and critical step in advancing hydrogen applications for thermal generation use is to allow green hydrogen to be eligible under the State's Renewable Portfolio Standard (RPS). Allowing green hydrogen RPS eligibility will prove an important market incentive to further advance the development and deployment of a critical decarbonization tool at scale. In addition to decarbonizing the operations of an indispensable thermal generation fleet, clean fuels and carbon management strategies will be needed by other sectors as California advances towards its net-zero 2045 goal. California leads the nation in economic output from manufacturing and is home to over 35,000 firms employing 1.3 million people. [43] Industrial sectors, such as thermal load-dependent processes in manufacturing, have yet

[40] *See* LA100: The Los Angeles 100% Renewable Energy Study, National Renewable Energy Laboratory, available at: https://maps.nrel.gov/la100/report.
[41] *See* Getting To Neutral: Options for Negative Carbon Emissions in California, Lawrence Livermore National Laboratory, available at: https://www-gs.llnl.gov/content/assets/docs/energy/Getting_to_Neutral.pdf.
[42] *See* Carbon-Neutral Pathways for the United States, Lawrence Berkeley National Laboratory, available at: https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2020AV000284.
[43] *See* Governor's Office of Business and Economic Development: Manufacturing, 2021. Available at https://business.ca.gov/industries/manufacturing/

to see commercialized decarbonization solutions that can help their sectors transition to a net-zero future.

Additionally, LADWP's presentation during Session 3 highlighted the importance of integrating hydrogen into their own operations and expressed the need for the CEC and CPUC to drive hydrogen infrastructure development now. For example, LADWP stated that Scattergood will be transitioned to run on green hydrogen, there is a need to "[b]ring[] Hydrogen into the LA Basin", and the broader goal is to construct and retrofit in basin stations for hydrogen to "decarbonize & maintain reliability and resilience to fully decarbonize by 2035."[44] As the CEC and CPUC consider how to manage and guide California's energy transition, hydrogen and other low and zero-carbon gaseous fuel infrastructure are critical tools to consider and analyze.

In a separate proceeding, the CPUC is examining options to replace the services currently provided by Aliso Canyon. In examining potential future energy systems, the CPUC is modeling significant modifications to California's (and by extension the western United States') energy systems. If such modifications are to be implemented, hydrogen should be analyzed and modeled to understand the role it will play in decarbonizing the gas system and in supporting clean peaking and baseload electric generation capabilities,[45] in addition to the industrial and manufacturing sectors.

For example, new hydrogen infrastructure may be able to serve certain noncore customers in the Los Angeles Basin, potentially displacing natural gas demand and reducing the need for Aliso Canyon in the future. Investment in hydrogen infrastructure would also help catalyze the broader hydrogen economy, support further fuel diversity and resiliency, support decarbonization goals, and provide long-duration and clean storage capabilities. As explained further below, a more complete understanding of the value and benefits of Aliso Canyon is necessary, but hydrogen has the potential to help reduce use of the facility in the longer term, while promoting decarbonization and maintaining energy system reliability.

6. **Aliso Canyon (i.e. robust in-market storage) provides indispensable benefits to California (notably, as an enabler of decarbonization) and further analysis is necessary to understand the full value of the facility to energy reliability and affordability**

Earlier workshops highlighted the importance of a capable gas grid in supporting our overall energy system in both the near and long-term. In contrast, Session 4 focused on potential alternatives to one specific and significant gas grid infrastructure element – Aliso Canyon. In assessing potential alternatives to Aliso Canyon, a more complete understanding of the value and benefits conferred by Aliso Canyon is foundational to deciding how to maintain energy system reliability and affordability, while helping the State achieve longer-term decarbonization goals.

Aliso Canyon is by far the largest of SoCalGas's four storage fields in terms of inventory, injection, and withdrawal capacity. SoCalGas's natural gas transmission and distribution system was

[44] *See* LADWP presentation at the IEPR Joint Agency Workshop on Summer 2021 Reliability, Session 3

[45] It is expected that an additional option to replace Aliso Canyon will be defined and assessed as part of this CPUC proceeding; hydrogen should be considered as this additional option. *See* I.17-02-002, July 9, 2021, Amended Scoping Ruling at 5.

designed and has developed based on the availability of both a strategically located source of natural gas supply and natural gas "source of demand"[46] at Aliso Canyon.[47] Aliso Canyon plays a key role in SoCalGas's delivery of reliable energy at just and reasonable rates to over 20 million people and thousands of businesses, as well as electric generators, refineries, universities, and hospitals. Aliso Canyon further provides supply to customers in response to daily, hourly, and seasonal gas demand; provides a local and strategic supply source; and increases systemwide capacity/flexibility.

As noted by several presenters at the workshop, SoCalGas's system is at the terminus of several interstate pipelines delivering gas into California and, as a result, SoCalGas is more likely to be impacted by upstream events. There are countless events that could prevent or limit natural gas from reaching California: climate change related emergencies, such as wildfires, could restrict the capabilities of certain parts of the upstream system; freezing temperatures could cause well freeze offs in producing basins; or weather conditions east of California can and have affected the availability to downstream markets (i.e., California) of upstream supplies. When this happens, California has limited options. Today and in the past, local, underground storage serves as the system's largest contingency resource for flexibility and resiliency and is the primary safeguard against curtailments and the significant safety and economic impacts that can result.

Consistent with the above, CPUC staff's analysis of Aliso Canyon found that the facility mitigates price volatility, reduces customer bills, and reduces the price of energy (natural gas and electric generation) in California,[48] and is necessary for reliability.[49] These findings, however, do not fully describe the value, benefits, and importance of the facility.

Any assessment of alternatives to Aliso Canyon should begin with an understanding of the current value of the facility and how it supports the energy system. In determining the reliability and affordability value of the facility, the analysis should include daily and hourly peak demand needs as well as the value and benefits provided on a seasonal and multi-day, daily, and sub-hourly basis. This should include consideration of the value of Aliso Canyon's withdrawal capabilities, strategic location in-state and in-basin, and the importance of injection capacity in mitigating high operational flow orders and enabling decarbonization and renewable integration through greater system flexibility. Finally, prior analysis has indicated that Aliso Canyon not only supports

[46] Here, "source of demand" refers to the ability of Aliso Canyon to absorb (i.e., inject) on an hourly basis large amounts of natural gas during within-day periods where supplies that will be needed over the course of a day, need a place to "go" when not being used during many hours of a day; yet will be used at other hours of a day.

[47] Natural gas travels slowly—approximately 20-30 miles per hour—and SoCalGas's natural gas receipt points, located at the fringes of the service territory, are too far from the load centers to fully support customers' changing needs throughout the operating day. Natural gas supplies are delivered by interstate pipelines at a uniform hourly rate over the course of each "gas day", whereas customers' usage (both individually and in the aggregate) rarely happens at a uniform hourly rate throughout the day. This is particularly evident for electric generation (EG) customers. The situation is further complicated by the fact that California currently receives approximately 95%+ of its natural gas supply from out-of-state sources. Because there is no meaningful in-state production of natural gas, the SoCalGas system is almost wholly dependent on deliveries of gas from out-of-state, which makes the availability of local natural gas storage critical to energy reliability.

[48] *See* I.17-02-002: Phase 2 Economic Analysis Report.

[49] *See* I.17-02-002: Phase 2 Modeling Report.

Southern California, but also is an integral part of the energy systems of the western United States.[50] Climate change and public welfare do not stop at State borders, and when assessing impacts of restrictions on Aliso Canyon and potential alternatives to the facility, we recommend not limiting the analysis to California.

On July 9, the CPUC issued an amended scoping ruling for the proceeding (Investigation 17-02-002) addressing alternatives to Aliso Canyon.[51] The amended ruling expands the scope of the proceeding and raises numerous new issues for consideration. Many of these new issues will impact the CEC and IEPR. In the interest of clarity and transparency, it would be helpful to understand how the CPUC's proceeding will overlap and leverage the separate work and discussions taking place in the IEPR. Similarly, since restrictions on Aliso Canyon impact neighboring states, it would be helpful to understand what, if any, discussions the CPUC has had or plans to have with federal or other outside regulators or region-wide entities, such as the Western Electricity Coordinating Council. Finally, in expanding the scope to include a more detailed assessment of alternatives to Aliso Canyon, the CPUC should consider where and how hydrogen might present a longer-term alternative that will provide broad benefits to our energy systems.

**Conclusion**

As we collectively pursue California's imperative energy system decarbonization and public welfare goals, policymakers, market participants, and stakeholders should collaboratively prioritize the reliability, resiliency, and equity of the interdependent energy system. SoCalGas looks forward to contributing and advancing those efforts by working with the CEC, the CPUC, and sister agencies to define solutions for leveraging the fuel system and enabling the future decarbonized energy system for all Californians.

Respectfully,

*/s/ N. Jonathan Peress*

N. Jonathan Peress
Senior Director
Business Strategy & Energy Policy

[50] In September 2017, the Western Electricity Coordinating Council (WECC) commissioned Wood Mackenzie, Energy + Environmental Economics (E3), and Argonne National Laboratory to conduct a study of the gas-electric interface in the Western Interconnection to identify potential threats to grid reliability at present and in the future (WECC Study). The WECC Study recognized the critical importance of the Aliso Canyon facility and found limitations on Aliso Canyon had heightened region-wide reliability risks to the Western Interconnection (a wide area synchronous grid stretching from Western Canada south to Baja California in Mexico, reaching eastward over the Rockies to the Great Plains. June 2018, Wood Mackenzie, WECC Study at 3, available at https://www.wecc.org/Reliability/Western%20Interconnection%20Gas-Electric%20Interface%20Study%20Public%20Report.pdf.

[51] *See CPUC* July 9, 2021, Assigned Commissioner's Amended Phase 2 and Phase 3 Scoping Memo and Ruling in CPUC Investigation 17-02-002.

cc: The Honorable David Hochschild, CEC Chair
The Honorable Karen Douglas, CEC Commissioner
The Honorable Patty Monahan, CEC Commissioner
The Honorable Marybel Batjer, CPUC President
The Honorable Clifford Rechtschaffen, CPUC Commissioner
The Honorable Martha Guzman Aceves, CPUC Commissioner
The Honorable Elliot Mainzer, CAISO President and CEO