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SoCalGas Comments on the CEC Workshop on Data Inputs & Assumptions for 2021 IEPR Modeling and Forecasting

Additional submitted attachment is included below.

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August 19, 2021

Commissioner J. Andrew McAllister
Commissioner Siva Gunda
Commissioner Patricia Monahan
California Energy Commission
Docket Unit, MS-4
Docket No. 21-IEPR-03
1516 Ninth Street
Sacramento, CA 95814-5512

Subject: Comments on Data Inputs and Assumptions for 2021 IEPR Modeling and Forecasting Activities

Dear Commissioners McAllister, Gunda, and Monahan,

Southern California Gas Company (SoCalGas) appreciates the opportunity to provide comments on the Workshop on Data Inputs and Assumptions for 2021 IEPR Modeling and Forecasting Activities held on August 5, 2021. SoCalGas recognizes the importance of conducting modeling to inform the 2021 California Energy Demand Forecast for the Integrated Energy Policy Report (IEPR) and appreciate the California Energy Commission's (CEC) efforts to provide transparency to the public and stakeholders on this process. Sharing details about the inputs and assumptions used in modeling and forecasting, as well as allowing public comment, allows for a wider range of stakeholder viewpoints and for concerns to be considered and addressed in the modeling results.

SoCalGas's comments on the workshop focus on the following areas: (1) Hourly and sub-hourly modeling results are needed to capture times of peak electricity load and/or demand on the grid; and (2) The CEC should include low NOx trucks fueled with RNG as a powertrain option in their medium- and heavy-duty (HD) trucks model inputs and assumptions; and (3) More transparency is needed in the rate forecast assumptions used in the 2021 IEPR modeling; and (4) Trends in hydroelectric generation should be accounted for in the 2021 IEPR modeling.

(1) Hourly and sub-hourly modeling results are needed to capture times of peak electricity load and/or demand on the grid

The preliminary 2021 IEPR simulations using PLEXOS presented natural gas demand results on a seasonal, annual, and monthly basis. However, SoCalGas respectfully submits that the CEC must look to even more granular data to accurately analyze the relationship between peak gas ramping capabilities supported by the gas system in meeting the demands of the electric grid. Hourly and sub-hourly results are needed to capture times of peak electricity load and/or demand on the grid to make certain there is sufficient firm, dispatchable energy resources ready to meet demand.

Assessing hourly and sub-hourly data (to the extent sub-hourly data is available) can aid energy system reliability planning efforts as the electric grid continues to decarbonize. As noted during the IEPR Joint Agency Summer 2021 Reliability workshops in July, the gas system is increasingly relied on in "meeting EG [electric generation] demand for large afternoon/evening ramps and net peaks as the sun sets."[1] The gas system is integral to the electric grid because the gas system is "being used to integrate renewables" by "meet[ing] peak and net peak demand."[2] In addition, advancement of renewable resources has changed the way electricity is generated and driven increased "inter-dependencies between gas and electric systems."[3]

Southern California gas storage facilities are also 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)[4] "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."[5]

Furthermore, hourly and sub-hourly modeling results are needed to optimize battery storage integration on the electric grid. While batteries are undoubtedly a critical tool in the suite of decarbonized technologies, operational characteristics, especially considering resource owner commercial interests, must be recognized. For example, on August 14, 2020, five-minute data on utility-scale battery storage technologies shows that during critical evening hours energy storage was consuming electricity rather than providing it. As seen in Figure 1, from 8PM to 9PM (e.g.,

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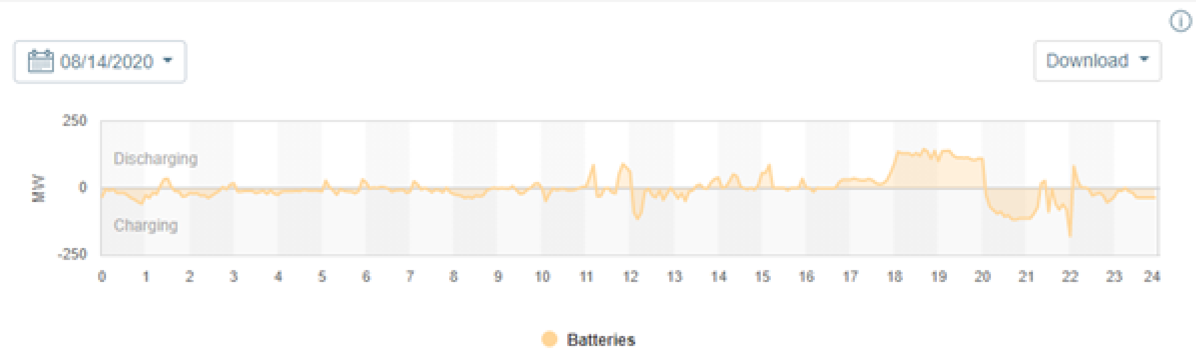
[1] "CEC IEPR Joint Agency Workshop on Summer 2021 Reliability, Session 3: Gas Reliability Issues and Polar Vortex Impacts & Implications", CEC, July 8 and 9, 2021, https://www.energy.ca.gov/event/workshop/2021-07/iepr-joint-agency-workshop-summer-2021-electric-and-natural-gas-0.
[2] Ibid.
[3] Ibid.
[4] 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.
[5] "Long-Term Variability of Underground Natural Gas Storage in California: An Independent Review of Scientific and Technical Information," CCST, February 5, 2018, p. 494, available at: https://ccst.us/reports/long-term-viability-of-underground-natural-gas-storage-in-california-an-independent-review-of-scientific-and-technical-information/.

hours 20 and 21), the aggregated battery storage resources consumed electricity (i.e., charging) rather than providing it (i.e., discharging). [6]

Figure 1: Utility Scale Battery Storage, August 14, 2020



Source: California Independent System

(2) The CEC should include low NOx trucks fueled with RNG as a powertrain option in their medium- and heavy-duty (HD) trucks model inputs and assumptions

The number of HD vehicles on the road is projected to grow through the duration of the 2021 California Energy Demand Forecast time period of 2021 to 2035.[7] California Air Resources Board (CARB) expects the number of HD trucks on the road to increase from 1.5 million in 2015 to 2 million by 2029.[8] Since trucks have a life expectancy of 20 years, the decisions on the types of HD trucks used today will have longstanding implications for climate change, air quality and public health.

Hydrogen fuel cell and diesel plug-in hybrid electric vehicles (PHEV) powertrains are included as truck choice and freight model inputs and assumptions in the 2021 IEPR analysis. While we commend the inclusion of hydrogen fuel cells in the CEC's considerations, we also urge the CEC to include low NOx trucks fueled with renewable natural gas (RNG) in these modeling parameters. RNG as a transportation fuel has the potential to reduce nitrogen oxide (NOx) and greenhouse gas (GHG) emissions if used in low NOx trucks. These technologies are commercially available today to provide these emission benefits. In fact, in 2020, RNG procured and dispensed at utility owned refueling stations had a carbon intensity (CI) of -5.845 gCO_2e/MJ, meaning the RNG is carbon

[6] "California Independent System Operator (ISO) Today's Outlook: Batteries Trend," last modified August 14, 2020, http://www.caiso.com/TodaysOutlook/Pages/supply.html.
[7] "EMFAC Model," last modified August 17, 2021, https://arb.ca.gov/emfac/.
[8] Ibid.

negative. [9, 10] This is in comparison to a CI of 82.92 gCO_2e/MJ for plug-in battery electric trucks fueled by grid electricity.[11]

A peer-reviewed study recently published by the University of California, Riverside (UCR) in the journal "Transportation Research Part D" states that heavy-duty trucks fueled with RNG should be rapidly deployed in the 2020-2040 timeframe to achieve GHG and NOx emission reduction targets, and "accelerating [the diesel trucks] fleet turnover is a more important NOx control strategy than dividing up vehicle replacements…between near-zero emissions and zero emissions vehicles."[12] Both the CEC truck choice and freight model and the UCR study used CARB's Emission Factor (EMFAC) model as the basis for model options. As low NOx trucks are an available model option in EMFAC, it seems counterproductive to omit them in the modeling given their proven potential to reduce NOx and greenhouse gas emissions. One scenario presented in the UCR study explored the benefit of replacing 10%, 30%, and 50% of conventional diesel trucks with low NOx trucks (using RNG as fuel) by 2025, 2030, and 2040, respectively. The 50% diesel replacement scenario showed significant NOx emissions reduction by 2040 due to the aggressive replacement of diesel vehicles.[13]

Additionally, low NOx trucks meet CARB's optional low NOx standard of 0.02 grams of NOx per brake horsepower hour and are commercially available today. An evaluation of natural gas vehicles showed that in-use emissions from low NOx trucks ranged from 0.001 to 0.02 g/bhp-hr during real world operation, meaning the trucks ran even cleaner than required by CARB regulations.[14] Low NOx trucks, when fueled with RNG, can "provide substantial GHG emission reductions," and are "at least 90 percent cleaner than new diesel trucks on NOx and 100 percent cleaner on cancer-causing diesel particulate matter," according to South Coast Air Quality Management District (SCAQMD).[15]

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[9] "LCFS Pathway Certified Carbon Intensities," last modified August 9, 2021, https://ww2.arb.ca.gov/resources/documents/lcfs-pathway-certified-carbon-intensities.

[10] Sanicola, Laura, "California's renewable natural gas vehicles turn carbon negative in 2020," Reuters, June 2, 2021, https://www.reuters.com/business/autos-transportation/californias-renewable-natural-gas-vehicles-turn-carbon-negative-2020-2021-06-02/.

[11] "Low Carbon Fuel Standard Annual Updates to Lookup Table Pathways," CARB, January 2020, p.2, available at: https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/fuelpathways/comments/tier2/elec_update.pdf.

[12] Arun S.K. Raju, Barry R. Wallerstein, Kent C. Johnson, "Achieving NOx and Greenhouse gas emissions goals in California's Heavy-Duty transportation sector", Transportation Research Part D: Transport and Environment, Volume 97, 2021, August 2021, https://www.sciencedirect.com/science/article/pii/S1361920921001826.

[13] Arun S. K. Raju et al., "Achieving NOx and Greenhouse gas emissions goals," p. 7.

[14] "Ultra-Low NO x Near-Zero Natural Gas Vehicle Evaluation ISX12N 400," Johnson, K., & Cavan, April 2018, p. 40, available at: https://static1.squarespace.com/static/53a09c47e4b050b5ad5bf4f5/t/5b9ff77eb8a045bc3da9ab05/1537210247037/Ultra-Low+NOx+Near-Zero+Natural+Gas+Vehicle+Evaluation.pdf.

[15] Nastri, Wayne. "Letter to Partners in Environmental Justice and Environmental Health" August 3, 2021.

(3) More transparency is needed in the rate forecast assumptions used in the 2021 IEPR modeling

SoCalGas appreciates the level of detail and comprehensiveness of topics covered during the workshop. We look forward to reviewing the all-in retail rate forecasts for natural gas and electricity that the CEC plans to use. Energy rates are one of the core drivers of increased or decreased consumption. The more transparent the CEC can be with their rate assumptions, the better it is for all interested stakeholders. Slide 9 of Lynn Marshall's presentation refers to distribution revenue requirements, which includes wildfire mitigation costs.[16] SoCalGas is interested in understanding whether this category also includes any transmission costs like undergrounding of transmission lines to reduce forest fires and Public Safety Power Shutoff (PSPS) events. SoCalGas further requests disclosure of the additional commodity cost estimates used for RNG, hydrogen, and synthetic gases. Slide 6 of the presentation also indicates modest increases through 2030 for wholesale energy costs, which are lower than those projected in the 2019 IEPR. The CAISO released their 2020 Annual Report on Market Issues & Performance, which included wholesale energy prices.[17] The report indicates that although the wholesale cost of serving load only rose by 3 percent in 2020, when adjusted for lower natural gas costs and GHG prices, the wholesale cost of electricity rose by 19 percent. The report states that increases in the prices were mainly driven by lowered hydroelectric output, increased prices during evening peak ramps, and very elevated prices during the heatwaves affecting the western United States. SoCalGas requests the CEC take into consideration data sources like CAISO's Market Issues & Performance report when using wholesale energy prices in their modeling.

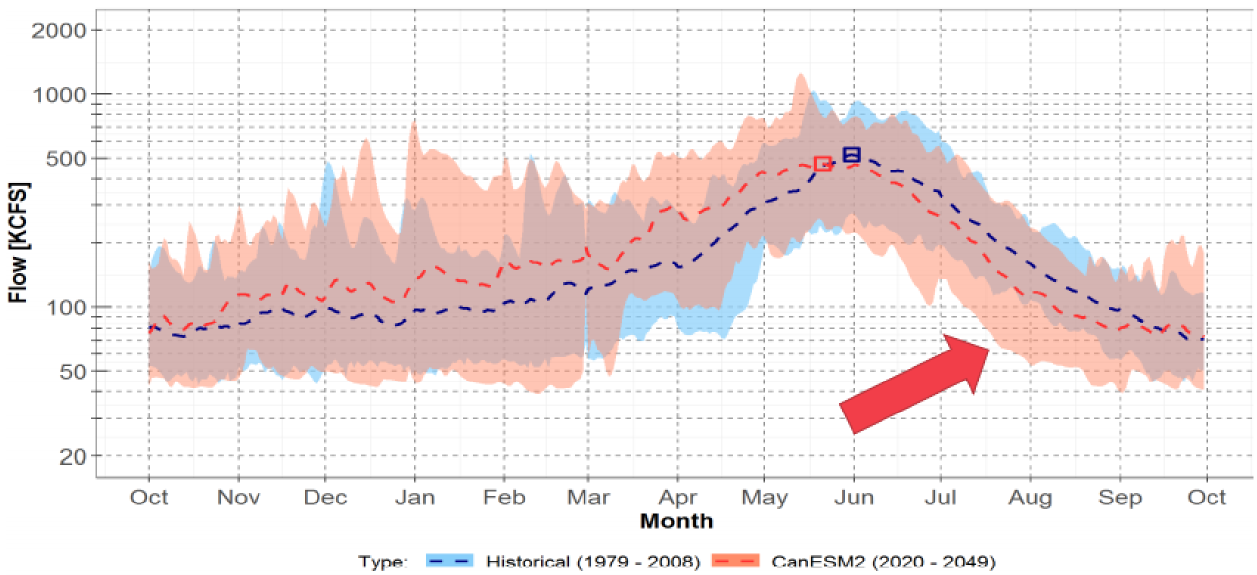
(4) Trends in hydroelectric generation should be accounted for in the 2021 IEPR modeling

SoCalGas has repeatedly highlighted the fact that the electricity system has huge storage capacity from snowpack melt and lake storage. Hydroelectric generation, pondage storage, and snowpack storage supplied a majority of the electricity in California until half a century ago. These generation sources are still a large part of the overall supply of carbon free resources today in California. However, the energy storage potential that lies held in dams and in snowpack are both dwindling as temperatures increase. Therefore, California's electricity system is losing vital long-duration storage that we have long taken for granted.

[16] "Electricity Rate Scenarios Inputs and Assumptions," Lynn Marshall, August 5, 2021, slide 9, available at: https://efiling.energy.ca.gov/getdocument.aspx?tn=239170.
[17] "2020 Annual Report on Market Issues & Performance," Department of Market Monitoring, August 2021, available at: http://www.caiso.com/Documents/2020-Annual-Report-on-Market-Issues-and-Performance.pdf.

During the IEPR workshop on Summer 2021 Electric and Natural Gas Reliability, the Northwest Power and Conservation Council corroborated this phenomenon through modeling work on the changes in seasonal hydroelectric generation.[18] As seen in Figure 2, the blue bands represent 30 years of historical hydro data and the red bands represent 30 years of modeled future generation. The red bands are much greater than the blue in January and February when heavy precipitations in the past fell mostly as snow, but increasingly are projected to fall as rain. Similarly, the April to May timeframes are projected to have increased generation as dams must release water. Conversely, the projected generation greatly decreases in the July through September timeframe.

Figure 2: Maximum, Minimum and Average TDA Modified Flows for Historical (1979-2088) and CanESM2 (2020-2049)[19]



SoCalGas notes that this trend does not seem to be reflected in the modeling work on slides 23 and 24 of the presentation titled, "Production Cost Model Preliminary Inputs, Assumptions, and Results"[20] Total hydrogeneration is assumed to stay the same in 2030 and there is no assumption of monthly generation changes in 2030. SoCalGas recommends the CEC integrate the Northwest Power and Conservation Council's updated precipitation data to reflect both the change from snowfall to rainfall and the change in timing of power generation during the year. Doing so will enable CEC's models to recognize the changed nature of California's hydroelectric generation, and its system-wide effects, more closely.

[18] "The Northwest Power and Conservation Council," Ben Kujala, July 8, 2021, slide 4, available at: https://efiling.energy.ca.gov/getdocument.aspx?tn=238747.
[19] Ibid.
[20] "Production Cost Model Preliminary Inputs, Assumptions, and Results," Hazel Aragon and Paul Deaver, August 5, 2021, slide 23 and 24, available at: https://efiling.energy.ca.gov/getdocument.aspx?tn=239170.

Conclusion

As we collectively pursue the existential need to decarbonize California's energy system and the corresponding public welfare goals, policymakers, market participants, and stakeholders should collaboratively prioritize the reliability, resiliency, and equity of our interdependent energy system. SoCalGas looks forward to contributing to and advancing those efforts by continuing to work with the CEC, the California Public Utilities Commission, and sister agencies to define solutions for leveraging the fuel system and enabling the energy transition. Thank you for consideration of our comments.

Respectfully,

/s/ Kevin Barker

Kevin Barker
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cc: David Hochschild, CEC Chair
Karen Douglas, CEC Commissioner
Aleecia Gutierrez, Deputy Director