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SoCalGas Comments on the IEPR Commissioner Workshop on Draft Load Modifier Electricity Demand Forecast Results

Additional submitted attachment is included below.

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November 21, 2024

Vice Chair Siva Gunda
California Energy Commission
Docket Unit, MS-4
Docket No. 24-IEPR-03
715 P Street
Sacramento, California 95814-5512

Subject: Comments on the IEPR Commissioner Workshop on Draft Load Modifier Electricity Demand Forecast Results

Dear Vice Chair Gunda,

Southern California Gas Company (SoCalGas) appreciates the opportunity to provide comments on the November 7, 2024 California Energy Commission's (CEC) Integrated Energy Policy Report (IEPR) Commissioner Workshop on Draft Load Modifier Electricity Demand Forecast Results (Workshop). These forecasts play a crucial role in the consideration and development of the State's energy policy, planning, and implementation and thus the public interest is served through improvements in accuracy, transparency, and understanding of such forecasts.

Our comments focus on the following topics: 1) A forecast range should be used to better account for inherent uncertainties in the Additional Achievable Fuel Substitution (AAFS) scenario assumptions; 2) Additional clarifications and stakeholder input on heat pump assumptions will improve projection and help track the State's goal; and 3) Dispatchable generation leveraging existing gas infrastructure can expedite and enable the State's electrification efforts and decarbonization goals especially as new technologies are expected to increase energy demand.

1) **A Forecast Range Should be Used to Better Account for Inherent Uncertainties in the Additional Achievable Fuel Substitution (AAFS) Scenario Assumptions.**

SoCalGas previously urged the CEC to include a forecast range to better reflect the inherent uncertainty of the pace and penetration in long-term planning for the zero-emissions appliance standards proposed by the California Air Resources Board (CARB) and South Coast Air Quality

Management District (SCAQMD), and adopted by the Bay Area Air Quality Management District (BAAQMD) in our September 1, 2023 comment letter on the CEC 2023 IEPR Workshops on Inputs and Assumptions and Load Modifier Scenario Development.[1]

In the November 15, 2023 IEPR Demand Forecast Load Modifier Workshop, CEC staff expressed a similar concern on the uncertainties in the regulatory process and compliance rates for the zero-emissions appliance standards.[2] The public hearing for Proposed Amended Rule (PAR) 1111 and 1121, which address zero-emission appliances, at the SCAQMD was recently postponed due to the need for increased transparency and public awareness of the upcoming regulatory changes that will impact the costs of home appliances.[3,4] The need for additional time to provide more opportunity for feedback on regulations with substantial impact on consumers reflects an acknowledgment of the variability in the regulatory process and, as such, might suggest a need for flexibility in the adoption rate assumptions underlying the AAFS scenarios. SoCalGas continues to strongly recommend integrating a wider range of AAFS scenarios to improve the applicability of the forecast and better inform determinations made which rely on such forecasts.

SoCalGas also would like to note a technical correction in the assumptions for the AAFS scenarios that should be incorporated: the SCAQMD compliance date for high-temperature commercial water heaters is 2033, rather than 2031 for all commercial water heaters as noted in the CEC presentation from the Workshop.[5] An update to align these dates in the assumptions of the AAFS scenarios is appropriate, if it has not already been addressed.

2) Additional Clarifications and Stakeholder Input on Heat Pump Assumptions Will Improve Projection and Help Track the State's Goal.

During the Workshop, CEC staff presented heat pump adoption forecast for the AAFS 3 and AAFS 4 scenarios for the 2024 IEPR Update, which shows significant increases over the 2023 IEPR forecast. Specifically, for the AAFS 4 scenario, the 2023 IEPR forecast showed 6.1 million statewide heat pumps installed by 2030, while the 2024 IEPR forecast is showing 10.6 million statewide heat pumps installed by 2030. This represents a 74 percent increase compared to last

[1] SoCalGas, "Comments on the 2023 IEPR Workshops on Inputs and Assumptions and Load Modifier Scenario Development," retrieved on November 12, 2024 at https://efiling.energy.ca.gov/GetDocument.aspx?tn=252112&DocumentContentId=87115

[2] CEC, "Characterizing the Incorporation of the Zero-Emission Appliance Standards to AAFS" Presentation, Slide 5, IEPR Commissioner Workshop on Draft Load Modifier Electricity Demand Forecast Results Workshop, retrieved on November 12, 2024 at: https://www.energy.ca.gov/event/2023-11/iepr-commissioner-workshop-load-modifier-scenario-results

[3] SCAQMD, PAR 1111 and 1121, available at https://www.aqmd.gov/home/rules-compliance/rules/scaqmd-rule-book/proposed-rules/rule-1111-and-rule-1121

[4] SCAQMD, November 1, 2024 Governing Board Meeting, recording at 2:12 to 2:17, available at https://www.aqmd.gov/home/news-events/webcast/live-webcast?ms=E3ObT7qORKk

[5] CEC, "Characterizing the Incorporation of the Zero-Emission Appliance Standards to AAFS" Presentation, Slide 10, IEPR Commissioner Workshop on Draft Load Modifier Electricity Demand Forecast Results Workshop, retrieved on November 12, 2024 at: https://www.energy.ca.gov/event/2023-11/iepr-commissioner-workshop-load-modifier-scenario-results

year's projection.[6] Moreover, after subtracting 1.5 million existing heat pumps, the projected new installation of heat pumps for the 2024 IEPR forecast from 2024 to 2030 would increase from 4.6 million to 9.1 million, a 98 percent increase, or nearly double last year's projection.

Given this significant difference, the public and stakeholders would benefit from additional clarification and transparency on the underlying drivers and supporting data for this increase. This would help provide a better understanding of the rationale for the increased projections. For instance, one of the main reasons for the significant increase, as CEC staff noted, is the update using CEC's 2019 Residential Appliance Saturation Study (RASS) report and the updated unit energy consumption (UEC) values and technology choices for gas appliances.[7] However, other factors should be considered such as those impacting adoption rates which are driven by a myriad of complex factors including but not limited to consumer behaviors and economic factors beyond energy efficiency and technology availability. The high upfront costs of the appliances, electric panel upgrades, and contractor labor may play a role in determining whether households will choose to purchase and install zero-emission appliances and the rate of such actions. Indeed, Tables 1 and 2 below illustrate the differences in costs between natural gas appliances and heat pumps for space and water heating as well as total lifetime costs of the appliances, as estimated by the SCAQMD in its PAR 1111 and 1121 proceedings.

[6] CEC, "Characterizing the Incorporation of the Zero-Emission Appliance Standards to AAFS" Presentation, Slide 21-25, IEPR Commissioner Workshop on Draft Load Modifier Electricity Demand Forecast Results Workshop, retrieved on November 12, 2024 at: https://www.energy.ca.gov/event/2023-11/iepr-commissioner-workshop-load-modifier-scenario-results

[7] CEC, "Characterizing the Incorporation of the Zero-Emission Appliance Standards to AAFS" Presentation, Slide 25, IEPR Commissioner Workshop on Draft Load Modifier Electricity Demand Forecast Results Workshop, retrieved on November 12, 2024 at: https://www.energy.ca.gov/event/2023-11/iepr-commissioner-workshop-load-modifier-scenario-results

Table 1: Furnace Replacement Costs[8]

Unit Type	Equipment Cost including panel upgrade[10]	Upfront Cost Difference to Consumer	Lifetime Operating Cost[9]	Overall Cost	Overall Cost Difference to Consumer
Natural Gas	$10,000		$5,932	$15,932	
Heat Pump	$18,500 +$750	$9,250	$3,982	$23,232	$7,300
Electric Resistance	$9,300 +$750	$50	$15,239	$25,289	$9,357

Table 2: Water Heater Replacement Costs[8]

Unit Type	Equipment Cost including panel upgrade[10]	Upfront Cost Difference to Consumer	Lifetime Operating Cost[11]	Overall Cost	Overall Cost Difference to Consumer
Natural Gas	$3,000		$4,776	$7,776	
Heat Pump	$5,200 + $750	$2,950	$3,376	$9,326	$1,550

[8] SCAQMD, based on Preliminary Draft Staff Report for PAR 1111 and 1121, does not include additional costs such as building modifications and emergency rental replacements, available at: https://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/1111-and-1121/par-1111-and-1121-preliminary-draft-staff-report.pdf?sfvrsn=18

[9] Based on SCAQMD estimated fuel switching cost savings of $1,950 for heat pumps and fuel switching cost of $9,307 for electric resistances, from Preliminary Draft Staff Report for PAR 1111 and 1121, available at: https://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/1111-and-1121/par-1111-and-1121-preliminary-draft-staff-report.pdf?sfvrsn=18

[10] SCAQMD, Staff estimates panel upgrades will cost $3,000 but adjust to $750 to account for panel useful life, from Preliminary Draft Staff Report for PAR 1111 & 1121, available at: https://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/1111-and-1121/par-1111-and-1121-preliminary-draft-staff-report.pdf?sfvrsn=18

[11] Based on SCAQMD estimated fuel switching cost savings of $1,400 for heat pumps, from Preliminary Draft Staff Report for PAR 1111 & 1121, available at: https://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/1111-and-1121/par-1111-and-1121-preliminary-draft-staff-report.pdf?sfvrsn=18

As seen in Tables 1 and 2 above, there are relatively significant differences in the costs of converting to heat pump and electric resistance technologies that may impact the adoption rates of these technologies. Therefore, by seeking stakeholder inputs, such as monitoring and incorporating real-world heat pump data (including but not limited to, shipment and installation data, location of the installations, and customer and building types), the CEC can help improve the quality and transparency of its forecast and help measure the progress in achieving the State's 6 million heat pump goal.

Another related clarification that would benefit public and stakeholder understanding is the residential versus commercial split of the 1.5 million existing heat pumps value given that the rest of the graphics for AAFS only reflect forecasts for residential customers.[12]

3) Dispatchable Generation Leveraging Existing Gas Infrastructure Can Expedite and Enable the State's Electrification Efforts and Decarbonization Goals Especially as New Technologies are Expected to Increase Energy Demand.

During the Workshop, CEC staff presented on several energy demand growth areas that will increase electric load, such as zero-emission appliances, electric vehicles, and data centers. These growth areas will result in significant load increases and will require more generation resources in the future.[13] The CEO of the North American Electric Reliability Corporation (NERC) said at a FERC-led conference on reliability, "While a lot of people would like to say we can solve this problem through transmission, we can solve this problem through batteries … we need generation in this country."[14] Similarly, NERC's 2023 ERO Reliability Risk Priorities Report states "[h]istorical planning and operations techniques cannot assure desired current and future performance as indicated by recent events and associated outages."[15]

Moreover, the State's gas and electric systems are interdependent and interconnected where determinations on one will necessarily have impacts on the other. As a result, dispatchable generation leveraging existing gas infrastructure will play an instrumental role in expediting and

[12] CEC, "Characterizing the Incorporation of the Zero-Emission Appliance Standards to AAFS" Presentation, Slide 21-24, IEPR Commissioner Workshop on Draft Load Modifier Electricity Demand Forecast Results Workshop, retrieved on November 12, 2024 at: https://www.energy.ca.gov/event/2023-11/iepr-commissioner-workshop-load-modifier-scenario-results

[13] CEC, IEPR Commissioner Workshop on Draft Load Modifier Electricity Demand Forecast Results Workshop, available at: https://www.energy.ca.gov/event/workshop/2024-11/iepr-commissioner-workshop-draft-load-modifier-electricity-demand-forecast

[14] E&E News, "Grid reliability problems cannot be solved through transmission fixes alone, NERC CEO says," retrieved on November 21, 2024 at https://www.eenews.net/articles/grid-reliability-problems-cannot-be-solved-through-transmission-fixes-alone-nerc-ceo-says/#:~:text=Even%20if%20enough%20transmission%20was,led%20conference%20on%20reliability%20Wednesday

[15] NERC, "2023 ERO Reliability Risk Priorities Report," available at https://www.nerc.com/comm/RISC/Related%20Files%20DL/RISC_ERO_Priorities_Report_2023_Board_Approved_Aug_17_2023.pdf

enabling the State's electrification efforts and decarbonization goals while providing a firm power supply supportive of energy system reliability and resiliency.

The gas supply will decarbonize over time through renewable natural gas (RNG) procurement authorized by SB 1440.[16] For instance, generation technologies like fuel cells and linear generators powered by RNG can expedite bulk electric demand additions like data centers in an environmentally beneficial manner. Microsoft is currently constructing its 99 MW San Jose data center, which will run on a microgrid powered by RNG.[17,18] Further, many data centers are using large diesel backup generators (BUGs) as a secondary power source in the event of a power outage, a trend recognized by the CEC in its January 2021 workshop on Clean Energy Alternatives to Diesel Backup Generator Systems.[19,20] Diesel BUGs are well-known to be a source of diesel particulate matter and NOx emissions. As previously noted in our comments to CEC's January 2021 workshop, fuel cell and linear generator microgrids powered by RNG, and in the future renewable hydrogen, are a clean energy alternative to diesel BUGs for use as backup generation as well as a potential source of primary power for data centers.[21] Dispatchable generation leveraging existing gas infrastructure can expedite the interconnection of data centers and over time contract for RNG or even hydrogen deliveries to decarbonize the fuel source.

The future energy use for data centers is still uncertain; however, even with CEC's conservative estimates, California's data center annual energy consumption is expected to triple by 2040 to a total of close to 20 GWh.[22] As new technologies drive electric consumption, dispatchable generation can play a key role in expediting the buildout of the electrified end uses by leveraging existing gas infrastructure and clean fuels.

[16] CPUC, "CPUC Sets Biomethane Targets for Utilities," available at https://www.cpuc.ca.gov/news-and-updates/all-news/cpuc-sets-biomethane-targets-for-utilities
[17] CEC, "San Jose Data Center," Docket Number 19-SPPE-04, available at https://www.energy.ca.gov/powerplant/backup-generating-system/san-jose-data-center
[18] Data Center Dynamics, "Microsoft's San Jose data center will use food waste gas for back up power," available at https://www.datacenterdynamics.com/en/news/microsofts-san-jose-data-center-will-use-food-waste-gas-for-back-up-power/
[19] Data Center Power Design Overview, March 6, 2024, available at: https://phoenixnap.com/blog/data-center-power
[20] CEC, "Workshop to Discuss Research into Clean Energy Alternatives to Diesel Backup Generator Systems, January 6, 2021, available at: https://www.energy.ca.gov/event/workshop/2021-01/workshop-discuss-research-clean-energy-alternatives-diesel-backup-generator
[21] SoCalGas Comments on Clean Energy Alternatives to Diesel Backup Generator Systems, February 12, 2021, available at: https://efiling.energy.ca.gov/GetDocument.aspx?tn=236772&DocumentContentId=69908.
[22] CEC, Scenario 2 from "Data Center Forecasts" Presentation, Slide 9, IEPR Commissioner Workshop on Draft Load Modifier Electricity Demand Forecast Results Workshop, retrieved on November 13, 2024 at: https://www.energy.ca.gov/event/workshop/2024-11/iepr-commissioner-workshop-draft-load-modifier-electricity-demand-forecast

Conclusion

The results of the CEC Demand Forecast will have far-reaching impacts across energy system planning, such as the California Public Utilities Commission (CPUC) Integrated Resource Plan (IRP) and CAISO Transmission Planning Process (TPP). It is in the public interest for the CEC Demand Forecast to reflect the most likely and realistic results with sufficient transparency to help public and stakeholder understanding. Thank you for your consideration of our comments.

Respectfully,

/s/ Kevin Barker

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