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**PG&E Comments RE IEPR Commissioner Workshop on Load
Modifier Forecast Results**

Additional submitted attachment is included below.



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California Energy Commission
Docket Number 25-IEPR-03
715 P Street
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RE: CEC Workshop IEPR Commissioner Workshop on Load Modifier Energy Demand Forecast Results

Pacific Gas and Electric Company (PG&E) appreciates the opportunity to comment on the California Energy Commission's (CEC) Integrated Energy Policy Report (IEPR) Commissioner Workshop on Load Modifier Energy Demand Forecast Results held on November 13, 2025. PG&E applauds the CEC's responsiveness to evolving policy landscapes and supports continued analysis of uncertainties underlying the load modifier forecasts. Additionally, PG&E understands the challenges of forecasting electricity demand from nascent technologies and markets. PG&E looks forward to additional continued collaboration on the development of these forecasts and shared transparency around assumptions and results.

Below, PG&E offers eight comments, representing requests and recommendations to improve the IEPR.

PG&E recommends reducing the light-duty Additional Achievable Transportation Electrification (AATE) 3 scenario or adopting AATE 2 for the Planning Forecast to account for policy uncertainty and weaker near-term electric vehicle (EV) sales signals.

PG&E recommends the CEC revise the light duty AATE 3 scenario downward in the 2025 IEPR relative to the 2024 IEPR to reflect recent policy developments and market conditions that materially weaken near-term EV sales trajectories. This adjustment would better align the forecast with the CEC's stated-intent to capture policy uncertainty in the 2025 IEPR. As Commissioner Andrew McCallister recognized during the IEPR Commissioner Workshop, the 2025 outlook shows limited differentiation from 2024 notwithstanding meaningful federal policy changes and incentive adjustments. Consequently, considering tariff headwinds, federal incentive changes, and current market signals, reducing the 2025 AATE 3 scenario would help to avoid overstating EV adoption.

In the absence of any changes to AATE 3, PG&E recommends the CEC adopt AATE 2 as the Planning Forecast for light-duty transportation electrification in the 2025 IEPR. AATE 2 appropriately balances present day policies with potential future outcomes while there is increased uncertainty around medium- and long-term impacts from federal policy headwinds like tariffs and revocation of the federal EV tax credit. It seems premature to maintain AATE 3 as the Planning Scenario since this represents a

“high growth”¹ scenario. The IEPR Commissioner Workshop presented AATE 2 as a balanced scenario between present-day realities and future policies. PG&E supports adopting the light-duty AATE 2 forecast for the Planning Scenario and keeping the light-duty AATE 4 forecast, which matches the light-duty AATE 3 forecast, for the Local Reliability Scenario.

Furthermore, PG&E requests the CEC publicly present its forecast results for EV sales market share for each of the AATE scenarios. This additional information will facilitate comparisons with market share-based policy targets like Advanced Clean Cars II and Advanced Clean Trucks.

PG&E recommends revising the Additional Achievable Fuel Substitution (AAFS) 3 scenario downward or adopting the AAFS 2 scenario for the Planning Scenario to better reflect current heat pump adoption trends and avoid overstating appliance conversions.

PG&E recommends reducing the AAFS 3 scenario to reflect current uncertainty in electric appliance adoption rates. The California Heat Pump Partnership (CAHPP) released its blueprint report in March 2025 which states California will fall “2 million units short of the state’s 6 million heat pump target,” assuming “the current rate of heat pump adoption.”² CAHPP projects 2 million new heat pumps will be installed from baseline sales, planned programs, and adopted codes and standards between 2025 and 2030. These projections and underlying assumptions align reasonably well with the heat pump forecast in Programs and Incremental Codes & Standards (PiCS) AAFS 2, suggesting that the AAFS 3 scenario may overstate appliance conversions. The adoption trajectory assumed in AAFS 3, which aligns with the California Air Resources Board (CARB) Scoping Plan, may be overly optimistic and risks overstating the pace of fuel substitution and heat pump deployment. CEC has typically described the Planning Scenario as intending to represent current policies, and with the recent changes to zero-emissions appliance standards (ZEAS) from CARB and Bay Area Air District (BAAD), there is not a clear connection between current policies and AAFS 3. Since the CEC has typically used AAFS 3 for the Planning Scenario, PG&E recommends revising down the AAFS 3 forecast to better reflect the current state of electric appliance adoption, or instead adopting the AAFS 2 forecast for the Planning Scenario for the 2025 IEPR.

Furthermore, to better understand how the CEC’s forecast scenarios compare to regional air district and state ZEAS and industry benchmarks like the CAHPP blueprint, PG&E requests that the CEC present electric appliance market share and electric appliance breakdowns by new construction versus replace-on-burnout.

PG&E recommends the CEC revise data center confidence level assumptions to represent greater project specificity and capture a broader range of uncertainty.

As mentioned in the October 30th Demand Analysis Working Group (DAWG) meeting, PG&E suggests the CEC adjust data center confidence level assumptions in various ways. First, because the CEC is narrowing its definition of Group 1 projects, (from the 2024 IEPR to the 2025 IEPR), to only those with signed agreements for electric service – representing a more certain subset of projects – it seems reasonable to assume a higher confidence level compared to what was assumed in the 2024 IEPR. Currently, what the CEC has proposed for Group 1 projects in the Mid scenario for the 2025 IEPR is the same as what it

¹ California Energy Commission. 2025. [Draft Transportation Energy Demand Forecast for the 2025 Integrated Energy Policy Report](#). Slide 6.

² California Heat Pump Partnership. 2025. [California Heat Pump Partnership Blueprint: Scaling California’s Heat Pump Market: The Path to Six Million](#).

assumed for the 2024 IEPR (70%). Second, given fundamental differences between transmission-level and distribution-level data center projects, PG&E proposes the CEC consider different confidence levels for transmission and distribution projects to increase project specificity in its forecasting. Finally, PG&E recommends the CEC conduct scenario analysis to assess the impact of the largest data centers in the application queue, as this will capture a broader range of uncertainty.

PG&E recommends the CEC differentiate data center capacity utilization assumptions between the Planning Forecast and Local Reliability scenario.

PG&E recommends the CEC vary its data center capacity utilization assumption between the Planning Forecast and Local Reliability Scenario. Capacity utilization is a highly impactful assumption in the data center forecast, yet researchers have identified the range of forecasting uncertainty is high for numerous reasons, including data center type, maintenance and redundancy, differences between nameplate capacity and real-world usage, inconsistent data center workloads, oversizing and ramp-up, hardware fragility, and synchronous sensitivity.³ The 67% capacity utilization currently used in both the Planning Forecast and Local Reliability Scenario represents a high-end estimate from data centers in Silicon Valley Power's (SVP) service territory. This may not reflect typical operational patterns for data centers, especially in the earlier years of the forecast horizon, when new data centers are ramping up and may be evaluating different operational practices. Additionally, Lawrence Berkeley National Laboratory (LBNL) research illustrates how typical server utilization varies by data center type, spanning a range of approximately 15% to 85%, as shown in Figure 1 below.⁴

While server utilization and capacity utilization are not directly comparable, they are closely related, and server utilization can inform capacity utilization estimates. Therefore, PG&E supports differentiating the capacity utilization assumption between the Planning Forecast and Local Reliability Scenario given the high uncertainty and high impact of the assumption. PG&E welcomes additional discussions with the CEC to decide on an alternate estimate for the Planning Forecast, as well as continued collaboration on this assumption as new data becomes available.

³ Norris, T. 2025. [The Puzzle of Low Data Center Utilization Rates](#)

⁴ Shehabi, A., Smith, S.J., Hubbard, A., Newkirk, A., Lei, N., Siddik, M.A.B., Holecek, B., Koomey, J., Masanet, E., Sartor, D. 2024. 2024 United States Data Center Energy Usage Report. Lawrence Berkeley National Laboratory, Berkeley, California. LBNL-2001637

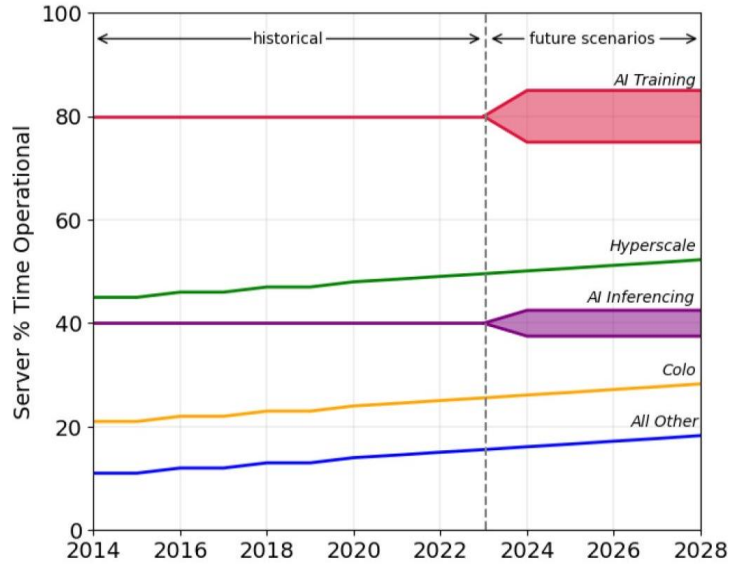


Figure 1: Operational time of servers given data center type. Source: Lawrence Berkeley National Laboratory, 2024 United States Data Center Energy Usage Report.

PG&E recommends that the CEC evaluate the performance of its photovoltaic (PV) and storage forecast models for forecasting 2024 and 2025 to inform any adjustments on forecasting 2026 onward.

PG&E has observed notable discrepancies in CEC’s PV and storage forecasting for 2024 and 2025. For example, actual Q1-Q3 2025 adoption of residential PV and non-residential PV exceeds the 2024 IEPR forecast for calendar year 2025 by over 70% (Table 1). In contrast, non-residential storage adoption in Q1-Q3 is one quarter of the forecasted adoption for calendar 2025 (Table 1).

Table 1. Comparison of 2024 IEPR Forecast to Actual PV and Storage Adoption in PG&E Area

A	B	C	D	E
	2025 Forecast, 2024 IEPR Planning Forecast	Q1-Q3 2025 Actual Adoption (Cal DG Stats)	Difference [Col C - Col B]	% Difference [Col D / Col B]
BTM PV Installed Capacity (MW)				
<i>Residential</i>	207	355	148	71%
<i>Non-residential</i>	175	310	135	77%
BTM Storage Installed Capacity (MW)				
<i>Residential</i>	143	190	47	33%
<i>Non-residential</i>	92	23	-69	-75%

Given these discrepancies between forecasted and observed PV and storage adoption, PG&E recommends that CEC evaluate the performance of their models against actuals in 2024 and 2025 to

understand the causes of the discrepancies. For residential PV, PG&E suspects that the discrepancy may be connected to CEC's change in how CEC is forecasting PV price, which was changed in the 2024 IEPR forecast. For example, in the 2024 IEPR forecast, CEC changed its base residential PV cost from \$3.30/Watt to \$3.91/Watt.⁵ PG&E suspects that CEC's PV adoption model is highly sensitive to PV cost, and PG&E suspects that such a large change in cost could have unintentionally large impacts if the Bass Diffusion model was not recalibrated after making such a change. For non-residential storage adoption, since the large discrepancy is apparent for both calendar years 2024 and 2025, PG&E suspects that the discrepancy may be related to CEC's transition to the dGen model for non-residential storage adoption as part of the 2023 IEPR forecast cycle.

PG&E supports CEC's continued assumption that residential storage attachment rates are 70-80%.

PG&E supports CEC's continued use of assuming a residential storage attachment rate on the order of 70-80%, which aligns with the recent behavior PG&E observed in 2024-2025 for installations of residential PV+Storage systems operating under Net Billing Tariff.

PG&E recommends the Additional Achievable Energy Efficiency (AAEE) drivers of forecast change be quantified, rather than simply listed, and their respective quantitative impacts presented more thoroughly.

PG&E appreciates that load modifier forecasting is complicated, and multiple drivers can create change from a prior forecast vintage. These drivers can effect change in different magnitudes and directions, and without knowing those quantitative impacts, it is often difficult to understand how to interpret a given forecast. In the case of AAEE, four different significant updates were listed in the IEPR workshop presentation:

- New 2025 California Municipal Utilities Association (CMUA) potential study
- California Assembly Bill 130 pause on new residential standards for the 2028 cycle
- Federal appliance standards
- Inflation Reduction Act (IRA) funding eliminated end of 2025 rather than 2034

While it is helpful to see these significant updates listed, including a quantitative assessment of impact would be more informative. In addition, the main driver of change between the 2023 IEPR and 2025 IEPR AAEE forecasts – Title 24 modeling changes after 2030 and new appliance standards measures, (both leading to greater C&S savings), as mentioned by Dr. Ingrid Neumann in the October 30th DAWG meeting – was not present on the list of significant updates. Additionally, it is surprising that codes & standards savings increased so much, relative to the 2023 IEPR, despite significant [federal appliance standard deregulation](#).⁶ Consequently, PG&E recommends presenting the quantitative impacts of AAEE forecast drivers explicitly.

PG&E welcomes collaboration with the CEC on the development of the known loads forecast included in the 2025 IEPR.

⁵ California Energy Commission. 2024. [Behind-the-Meter Distributed Generation Forecast Results](#)

⁶ United States Department of Energy. 2025. [Energy Department Slashes 47 Burdensome and Costly Regulations, Delivering First Milestone in America's Biggest Deregulatory Effort](#).

PG&E appreciates and supports the CEC's efforts to include known loads in the 2025 IEPR forecast. PG&E recommends increased collaboration with the CEC on the following topics to ensure these loads are properly accounted for:

- Developing a clear and standardized process for providing known load data to the CEC on a regular cadence and sharing assumptions around data inputs for transparency and quality assurance review.
- Establishing customer-requested load discount factors that balance capacity risk with the ability for customers to ramp up over several years.
- Determining the accurate placement of known loads onto transmission buses and the appropriate load start years.
- Aligning with CEC and California Independent System Operator (CAISO) on how these loads will be incorporated into local area studies.
- Discussing the treatment of known loads across different forecast scenarios (1-in-2, 1-in-5, and 1-in-10).
- Addressing the non-coincident nature of these loads, given their diverse shapes and the limitations of a single-hour representation.

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PG&E appreciates the opportunity to comment on this workshop and looks forward to continuing to collaborate with the CEC. Please reach out to me if you have any questions.

Sincerely,

Josh Harmon
State Agency Relations