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PG&E Comments on 4-26 Workshop on Economic, Demographic and Other Assumptions for IEPR Forecasting

Additional submitted attachment is included below.

March 11, 2015

California Energy Commission
Dockets Office, MS-4
Re: Docket No. 15-IEPR-03
1516 Ninth Street
Sacramento, CA 95814-5512

FILED VIA E-FILE

Re: 2015 Integrated Energy Policy Report: Comments of Pacific Gas and Electric Company on the Lead Commissioner Workshop on Economic, Demographic, and Other Assumptions for IEPR Modeling and Forecasting Activities

I. INTRODUCTION

On February 26, 2015, the California Energy Commission (“CEC”) held a Lead Commissioner Workshop on Economic, Demographic, and Other Assumptions for the Integrated Energy Policy Report (“IEPR”) Modeling and Forecasting Activities (“Workshop”) as part of its overall 2015 IEPR process. Pacific Gas and Electric Company (“PG&E”) appreciates the opportunity to provide comments on the workshop presentations and to participate in the CEC’s collaborative approach to refining the assumptions and methodology underlying the IEPR demand forecast development.

The workshop presentations provided helpful insight into the CEC’s overall methodology and assumptions for the long-term electricity and natural gas forecast. PG&E is looking forward to the opportunity for more detailed discussions and comments in forthcoming topic-specific workshops.

PG&E strongly supports the CEC’s continuing initiatives to work closely with other key stakeholders including the California Independent System Operation (“CAISO”), the California Public Utilities Commission (“CPUC”), and the California Air Resources Board (“ARB”) as it develops the 2015 IEPR forecasts and policy recommendations. Additionally, PG&E views the continued use of the Demand Analysis Working Group (“DAWG”) as an excellent forum for the CEC, utilities and other stakeholders to work together on forecasting topics and issues.

II. PREFERRED RESOURCES: DISTRIBUTED GENERATION

PG&E appreciates the opportunity to comment on the self-generation forecast presentation. The adoption of self-generation technologies, particularly solar photovoltaic (“PV”), continues to grow at rapid rates within our service area. For example, the year-over-year

growth rate in residential retail PV adoption for PG&E's service territory was nearly 70 percent from 2013-2014. Given this growth, PG&E recognizes the importance of robust distributed generation ("DG") forecasts to enable appropriate planning for procurement, generation resources, and transmission and distribution infrastructure. We look forward to sharing with the CEC publicly available information on DG market trends, and methodological approaches for technology adoption forecasting, to help facilitate continued rigor in the CEC's forecast.

Staff's presentation outlined a number of important refinements planned for the 2015 IEPR Self-Generation forecast, including obtaining PV interconnection data from the utilities (rather than using California Solar Initiative ("CSI") incentive program data) as well as the use of more customer-specific retail rates as opposed to average sector rates to calculate bill savings from solar. PG&E is pleased that these adjustments will be made, and recommends that the CEC assess additional adjustments to the self-generation forecasting approach for the 2015 IEPR. These include using more accurate information sources on solar PV prices and modifying the current payback-based approach to predicting consumer responsiveness to solar cost-effectiveness. We suggest that these topics be addressed in consultation with the DAWG as soon as possible to allow stakeholders who utilize the CEC's forecast to make better planning decisions.

- **Solar PV Pricing Data Should Be Validated**

PG&E understands that the CEC has used reported solar PV price data from the CSI and other incentive programs for inputs to the PV adoption model. While incentive programs have provided important information on broad price and cost trends over time, a number of studies and other information sources show that the numbers reported to these programs do not appear to reflect prices seen in the market, particularly in recent years. With the predominance of solar installed through third-party-owned financing structures (e.g., Power Purchase Agreements ("PPA"), leases, zero-down loans), a number of companies participating in the CSI and other incentive programs have reported values that reflect the appraised "Fair Market Value" ("FMV") of the installed systems, which is often much higher than the price charged to the customer.

A recent study conducted by the National Renewable Energy Laboratory ("NREL") as part of the SunShot Initiative highlights the need to carefully assess solar PV prices reported through incentive programs.¹ In addition to the issue of reported prices reflecting appraised FMV values rather than prices to the customer, the report highlights other issues with incentive-program price data including a lack of validation, temporal lags, and inconsistency in project characteristics included in the reported costs (e.g., roof improvements). To assess historical prices, the NREL researchers removed data that was likely to represent appraised values rather than actual prices paid by customers.

¹ D. Feldman et. al. (2014) "PV Pricing Trends: Historical, Recent, and Near-Term Projections" <http://www.nrel.gov/docs/fy14osti/62558.pdf>

While the CSI and other incentive programs will continue to be a source of historical information on prices, the data should be carefully interpreted and additional credible resources should be consulted to better understand current and historical prices. A recent report by NREL provides important insight into PV costs and pricing in the current market. The study assesses a sample of over 1,000 solar lease contracts and shows prices paid by customers for these contracts that are significantly lower than reported prices in the CSI database.² Given that the CSI program is sun-setting, new data sources on retail PV costs and prices will need to be developed.

For future price projections, PG&E recommends that the CEC consult multiple credible sources on current and forecasted price trends, such as the national energy labs (NREL and Lawrence Berkeley National Laboratory (“LBNL”)) and other industry experts.

- **Modeling PV Adoption Using Payback Will Under-Forecast Adoption Rates**

The CEC’s current PV-adoption modeling approach predicts consumer behavior using payback to assess cost-effectiveness. This approach is no longer applicable to the majority of consumers who are currently acquiring solar through leases and zero-down loans. Because a large majority of DG adoption occurs through financial arrangements that remove the need for upfront investments by participating customers, characterizing cost-effectiveness using payback does not accurately capture the decision-making process of customers deciding whether to adopt PV.

Under the financial arrangements commonly used in today’s retail PV market, solar customers pay a monthly or \$/kilowatt hour (kWh) rate for the electricity produced by the solar system at a price that is set below electricity rates, so, in essence, the payback period is zero. The customer’s decision to install solar under a these arrangements thus is not based on a payback period, but on the ability of the solar power provider to price electricity competitively with retail rates.

A recent report by NREL researchers Sigrin and Drury (2014) evaluated what financial metrics solar customers used to assess the economics of their solar investment.³ The study was based on a survey administered to 1,234 customers in San Diego, California, who had installed solar between 2007 and 2013. The NREL study concluded that “monthly bill savings” was the primary economic measure used by all customers, even those who owned their own systems. For those who leased their solar system, 60 percent used monthly bill savings to evaluate their solar investment compared to only 16 percent who used payback time.⁴

2 Davidson et. al. 2014. “U.S. Residential Photovoltaic (PV) System Prices, Q4 2013 Benchmarks: Cash Purchase, Fair Market Value, and Prepaid Lease Transaction Prices”
NREL Technical Report NREL/TP-6A20-62671

3 Sigrin, B, and Drury, E. Diffusion into New Markets: Economic Returns Required by Households to Adopt Rooftop Photovoltaics
<http://www.aaii.org/ocs/index.php/FSS/FSS14/paper/view/9222> Accessed Jan 17, 2015.

4 Ibid., Table 3, page 41.

The NREL researchers indicate that payback may not be an appropriate measure for understanding solar consumers' economic decision-making, when they write:

“Previously, consumer behavior literature suggested that residential customers primarily use a simple payback time to evaluate a new technology (Rai and Sigrin 2013; Camerer et al. 2004; Kempton & Montgomery 1982; Kirchler et al. 2008). However, with the strong growth of third-party owned systems, we expected that leasing customers are frequently being pitched PV systems based on the monthly bill savings rather than a payback time.”

The NREL researchers also suggest that this finding has implications for adoption patterns, and that using payback to forecast adoption will under predict future adoption:

“By framing the proposition for adopting solar as a series of monthly savings – as opposed to a large upfront payment – greater portions of the general population could be enticed than if projects' returns were expressed in terms of the payback time.”

PG&E strongly recommends that for the Self-Generation Forecast, the CEC account for revised understanding of how cost-effectiveness affects solar consumers' decision-making.

III. NATURAL GAS ASSESSMENT DRIVERS`

PG&E supports the general approach used in the natural gas assessment, but suggests refinement of one input element. On the burner-tip end-user price for electric generators in Northern California, which will be calculated outside of the NAMGas Model as staff stated in the presentation, PG&E recommends that the CEC use the PG&E Citygate price plus G-EG (backbone or Local Transportation rate) plus G-SUR (where applicable). This would reflect the correct dispatch price for power plants, rather than the Malin price plus variable Redwood transport rate, which the CEC has previously used for power plants on the backbone of PG&E's pipeline system. PG&E welcomes the opportunity to discuss further with CEC staff.

IV. TRANSPORTATION ELECTRIFICATION

PG&E supports the overall framework for forecasting of transportation electrification and is looking forward to further discussion on specific inputs and assumptions, as they are developed by the CEC, including the following:

- Number of plug-in electric vehicles forecasted in each case; breakdown between plug-in hybrid and battery electric vehicles and battery size assumptions, as well as the other characteristics listed in the workshop (“vehicle prices, fuel economy, and other attributes will be provided by Sierra Research”);

- Forecast for natural gas, hydrogen fuel cell, and any other vehicles that qualify for zero-emission vehicle (“ZEV”) credits;
- How cases incorporate a phase-out of the federal tax credit (i.e., currently, tax credits for vehicles produced by an original equipment manufacturer (“OEM”) phase out after that manufacturer has produced 200,000 plug-in electric vehicles);
- How the transportation-specific demand cases map to the IEPR common cases.

It is important for all parties to have access to specific inputs and assumptions. Discussions about new policy developments (e.g., how California will meet Governor Brown’s goal of a 50-percent reduction in petroleum use by 2030) will require an understanding of how the impacts will diverge from the baseline of the IEPR forecast.

Finally, as a general comment on transportation, PG&E supports the IEPR process examining both electricity and natural gas as fuels for the transportation sector, and recommends that natural gas use in medium- and heavy-duty vehicles be considered as part of the forecast process, along with other potential uses, such as marine applications and rail.

V. CONCLUSION

PG&E greatly appreciates the willingness of the CEC staff members to share information and collaborate with stakeholders to build a broad understanding of their forecasting assumptions and approaches. PG&E is committed to working together with the Commission staff on continued incremental improvements, additions, and adjustments to the IEPR demand forecasting process.

Sincerely,

/s/

Valerie Winn

cc: C. Kavalec by email (chris.kavalec@energy.ca.gov)