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VIA E-MAIL
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California Energy Commission
Dockets Office, MS-4
Re: Docket No. 11-IEP-1C
1516 Ninth Street
Sacramento, CA 95814-5512

Re: 2011 Integrated Energy Policy Report: Comments of Pacific Gas and Electric Company on Demand Forecast Workshop of August 30, 2011

I. INTRODUCTION

Pacific Gas and Electric Company ("PG&E") appreciates the opportunity to provide comments regarding the "2012-2022 Preliminary Staff Electricity and Natural Gas Demand Forecast." We look forward to continued collaboration with the California Energy Commission ("CEC") Staff to assess how the CEC's demand forecast methodologies are similar or different to those used by PG&E and to identify where methodological differences may significantly affect the direction of the forecast. PG&E recognizes the importance of the CEC's long-term demand forecasting efforts in providing a critical input into statewide energy infrastructure and efficiency program planning and continues to support Staff's efforts to improve model performance and transparency.

Practically speaking, we will never precisely predict customers' energy demand. PG&E is committed to achievement of the energy efficiency goals and advancing the state's position on clean energy technologies, however, there are numerous uncertainties that should be considered and evaluated to ensure that system reliability and operability are not compromised. Today, we are planning with even more uncertainty about the future, given uncertain economic conditions, uncertainty about achievement of aggressive energy efficiency goals, uncertainty about customer adoption of electric vehicles, uncertainty about new technologies like energy storage, and uncertainties about how to operate the electric grid with higher levels of intermittent renewables. The demand for energy could increase significantly, or continue recent historic trends of about 1 to 2 percent annual growth during this forecast horizon.

This level of uncertainty requires a careful balancing of public policy objectives and coordination among state agencies and collaboration with the utilities responsible for meeting

customer demand. Reliability and cost are both affected if we do not have sufficient resources to meet customer demand. Just recently, the California Independent System Operator ("CAISO") questioned whether the planning scenarios developed by the California Public Utility Commission's ("CPUC") in the 2010 Long-Term Procurement Plan ("LTPP") which reflect ambitious energy-efficiency and demand response assumptions will materialize. (See August 26 California Energy Markets, Item 2). While the results from the CPUC's planning scenarios showed no need for upward flexibility, the CAISO's results under a higher-load scenario, estimates it will need an additional 4,600 MW of upward balancing flexibility. This is a relatively broad range of differences in results based on the underlying assumptions which if not planned for appropriately could result in low reliability, and high prices, adversely effecting California's homes and businesses in the interim.

PG&E's review of the draft staff paper "Preliminary California Energy Demand Forecast 2012-2022" yielded several areas where PG&E is supportive of refinements in the CEC's methodology, as well as areas where we can work toward a greater understanding of the forecast results. These are detailed below.

II. PG&E SUPPORTS THE CEC'S ENHANCEMENTS TO THE FORECASTING PROCESS

A. Econometric methodologies: PG&E is pleased to see the CEC moving toward incorporating more econometric forecasting tools into its analysis. While PG&E acknowledges the value of the end-use modeling structure to evaluate, in particular, the impact of codes and standards on historic and future energy demand, PG&E encourages Staff to continue to move toward an econometric framework as the core of the forecasting process. As discussed in previous workshops and Demand Analysis Working Group ("DAWG") meetings, the advantages of an econometric framework are many and include: better transparency to improve stakeholder input, understanding and consensus; quicker turn-around time to make better use of Staff and Stakeholder resources and inclusion of more recent economic and demographic projections; and enhanced capability to produce statistically derived uncertainty analysis to support long-term planning applications.

B. Historic Energy Efficiency Savings Estimates: PG&E supports the view as expressed in the DAWG meetings that the CEC Staff's end-use forecasting model is not the appropriate vehicle for estimation and attribution of historic energy efficiency savings. PG&E supports the level of disaggregation of historic energy efficiency savings shown in the draft forecast report and forms as being consistent with the consensus view of DAWG participants and urges CEC Staff to maintain this level of attribution in future revisions. PG&E agrees with the Staff's statements on page 178 of the draft report that there is "… a great deal of uncertainty around any estimate of historical program impacts." However, PG&E would extend that statement to include the 2006-2008 program cycle estimates as those remain in dispute among stakeholders.

It is the position of PG&E and other stakeholders in the DAWG that it is virtually impossible to sort out with any precision the separate impacts of price, codes and standards, and voluntary programs on inducing increased energy efficiency over the historic period.[1] PG&E urges the CEC Staff to continue to show only aggregate results for historic energy efficiency savings and to resist suggestions that Staff overreach the capabilities of their models and show attribution of historic energy efficiency saving in the revised forecast report.

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[1] Kavalec, Chris. *Energy Efficiency Program Characterization in Energy Commission Demand Forecasts: Stakeholder Perspectives and Staff Recommendations*. Staff Paper, California Energy Commission, Electricity Supply Analysis Division. CEC-200-2011-010-SD, pages 20-21.

C. **Uncommitted Energy Efficiency:** PG&E supports the current construction of the Staff's high, low and medium incremental uncommitted energy efficiency scenarios with the caveat that the Big Bold Energy Efficiency Strategies ("BBEES") assumptions should be lowered in both the medium and high scenarios in the revised forecast. Currently the scalability of BBEES programs to achieve the level of projected savings in the medium and high cases is untested, the BBEES programs are largely unfunded except for pilot programs to assess feasibility, and the programs have not proven to be cost effective relative to supply side alternatives. For these reasons, and as expressed by the investor-owned utilities ("IOUs") in their workshop comments, the IOUs do not believe the level of peak megawatt (MW) savings estimated for BBEES in the medium and high cases can be characterized as "reasonably expected to occur." The Staff's reasoning for constructing the medium scenario to be consistent with the CPUC 2010 LTPP scoping memo instructions is understandable, but that sort of circular logic undermines the CEC's independent role in assessing the likely future impacts of EE savings initiatives. PG&E requests that Staff take a second look at the reasonableness of the MW savings reductions from BBEES in the medium and high incremental uncommitted savings scenarios and revise those estimates downward for the revised forecast update. PG&E also requests that Staff give consideration to the possibility that by including both reductions in demand due to price elasticity and reductions due to incremental uncommitted energy efficiency savings, demand reductions may be double counted. In a very real sense the historic impetus for both codes and standards and voluntary programs has been high energy prices. Unless Staff's price elasticity has been estimated and applied in such a way that it has corrected for the coincident impacts of price-induced codes and standards and voluntary program savings, then double counting of energy savings remains a possibility.[2]

[2] For example, the draft whitepapers submitted to the CPUC in the Macro-Consumption Metric Request for Proposal discuss the many potential problems with using statistical analysis of historic data to produce "attribution" between codes and standards, voluntary programs and other price induced reductions in demand.

D. **AB32 Implementation Plan:** As mentioned in PG&E's workshop comments, PG&E feels it would be a benefit to all stakeholders if Staff could include an analysis showing how the committed and uncommitted energy efficiency contained in the Staff's energy demand forecast compare with the amounts of energy efficiency envisioned in the California Air Resources Board's ("CARB") Assembly Bill ("AB") 32 Implementation Plan. The addition of a section with this information in the statewide energy efficiency area would help stakeholders to better understand both embedded and incremental energy efficiency savings estimates in the context of other important statewide initiatives other than the CPUC's LTPP.

E. **PV and Solar Water Heaters:** In general, the move to a more predictive methodology for installation of residential PV and solar water heaters is a refinement that PG&E supports. However, PG&E notes that models based on behavior driven by economic choice, which is the only driver in the CEC's predictive model, tend to miss other factors that affect customer adoption of technology. This is especially true in the residential sector, where adoption may be based on other, non-economic factors, like color or my neighbor has one. Further, PG&E did not perform an in-depth review of the CEC's model and is unable to determine if the assumptions in the adoption rate account appropriately for these non-economic factors. PG&E will continue to work with CEC Staff to better understand specific modeling conventions; however, a high-level review of the results indicates that the PV forecast is not inconsistent with PG&E's current observations.

F. **Climate Change:** Building climate change explicitly into the forecasting framework is an important step forward which PG&E fully supports. Many studies commissioned by the CEC and others over the past several years have confirmed that climate change will have a significant impact on energy consumption over the next several decades.[3] PG&E encourages the CEC Staff to discuss further with interested stakeholders the methodologies for developing appropriate climate change temperature statistic to capture this impact. PG&E has included climate change explicitly in its demand forecasting models for several years now and can share our experience with Staff. In particular, as PG&E mentioned in its workshop comments, PG&E suggests that the Staff move to a temperature statistic that directly incorporates the minimum daily temperature. Climate change simulations indicate that it is the minimum temperature that is most impacted during intense heat storms and these higher minimum temperatures do significantly impact peak demand. The lack of nighttime cooling during heat storms causes higher energy demand for space cooling at the same time that resistance in electrical equipment is also higher because it has not dissipated due to cooler nighttime temperatures.

III. PRELIMINARY COMMENTS ON ISSUE RESOLUTION

A. REC-Related Issues and Definitions <TBD>

B. CEC and PG&E should collaborate to assemble a "walk" of the CEC and PG&E assumptions to clearly identify impact of different assumptions on the outcome.

PG&E has taken its own forecast and that of the CEC and attempted to put them on equal footing in order to discern the similarities and differences between the two forecasts. PG&E and Staff energy forecasts are moderately close, with about a 2,000 gigawatt-hour (2%) difference in 2022. The difference in peak forecasts, however, is considerable, with the PG&E forecast about 1,450 MW (nearly 7%) above Staffs'. Part of the difference can be explained by the inclusion of BBEES in the Staff forecast, which amounts to 616 MW. Also, PG&E has attempted to place the starting point of the CEC forecast on an equivalent basis (PG&E retail service area). This produces a 2011 starting point for the CEC Staff forecast that is nearly 350 MW below the PG&E forecast. Combined, this accounts for 2/3 of the overall difference. Still, a moderate difference remains; PG&E and CEC Staff will need to have additional discussions to ensure that PG&E's interpretation of Staff assumptions are portrayed correctly.

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[3] See for example Franco and Sanstad, "Climate Change and Electricity Demand in California", February 2006.

C. **Peak Energy and Capacity:** As PG&E pointed out in its August 30 workshop presentation, it has been a long-standing observation that peak growth exceeds energy growth within PG&E's service area (see PG&E slide #5, Draft California Energy Demand 2010-2012, Workshop Comments and CEC slide #3, PG&E Planning Area Electricity and Peak Forecast). This trend in load growth has resulted from the fact that over the past 20 years, population growth, for the most part, has concentrated in inland regions within the service area. Inland areas experience far warmer summertime temperatures than the more temperate regions along the coast or within the immediate Bay Area. With air conditioning being included in almost all new construction, air conditioning saturation rates have increased amongst PG&E customer base over time. The increase in overall temperature sensitivity within this customer base has led to peak growth rates that exceed energy growth rates.

PG&E questions the CEC's draft PG&E Planning Area Forecast that shows for the period 2011-2022, growth in energy will exceed growth in peak (1.30% versus 1.17%). PG&E does not want to discount the possibility of a scenario like this occurring; however, it would take some very specific assumptions to be built into the forecast for this to occur. For example, conservation programs would have to be targeted to improving the efficiency of air conditioners, either through technical improvements or behavioral changes. Or perhaps observed growth trends of the past 20 years will switch up such that coastal and temperate areas of the services area will grow faster than inland regions. Unless assumptions such as these are spelled out, however, it seems unlikely that such a turnaround could occur.

D. **Self-generation forecasts:** The current CEC forecast adequately captures historical trends and is based on the assumption that future adoptions rates will be consistent with historic trends. There are numerous programs available that promote customer self-generation. Some of them have affected customer behavior for some time (e.g., the Self-Generation Incentive Program, the Emerging Renewables Program, the Net Metering Program, and the California Solar Initiative). However, other programs are so new that behavioral impacts would not be captured in a forecast driven by historic penetration levels. For example, the renewable Feed-in Tariff (FIT) and the combined heat and power (CHP) FIT would not have an impact on the historic adoption behavior. Finally, PG&E recognizes that there may be additional programs established to promote customer generation as a result of implementation of the ARB's Climate Change Scoping Plan and the Governor's energy proposal that includes 12,000 MW of distributed generation, some of which would be behind-the-meter generation. PG&E notes that the CEC's proposed forecast does not account for the renewable FIT, the CHP FIT, or the possibility of future programs. Given that near-term impacts of this omission are expected to be minimal, and information about program impacts is nonexistent, PG&E recommends accepting the existing forecast, while noting that the methodology must be modified in the future. PG&E expects to continue to work with CEC Staff to better understand the magnitude of self-generation included in the forecast. While some of these programs have a small impact on total customer demand today, that impact may change significantly over the next decade.

E. **End-User Natural Gas Demand Forecast:** Sustained growth in total demand of more than 1% per year is unrealistic after historic demand has been flat to declining. PG&E's most recent econometric demand forecasts are flat to declining. They project flat residential demand, and slightly declining commercial and industrial demand. The only sector with substantial growth in demand is the electric generation sector which falls outside the scope of this report. There is a logical disconnect in the CEC's residential demand forecast. The forecast shows a 16.0% increase in demand over the 2010-2022 forecast period, which does not align with the forecasted population increase of only 13.8% and a history of declining residential use per capita. It is unclear whether the effects of climate change have been incorporated into the natural gas demand forecast. PG&E encourages a switch to an econometric forecasting framework for end-user natural gas demand forecasting.

IV. CONCLUSION

PG&E is continuing to work with CEC Staff to understand elements of the demand forecast and is very appreciative of their willingness to share information and build

understanding. The improvements captured in this forecasting cycle are positive ones, and we look forward to continued, incremental improvements to the forecasting process.

Sincerely,

Valerie J. Winn

cc: Chris Kavalec by email (ckavalec@energy.state.ca.us)