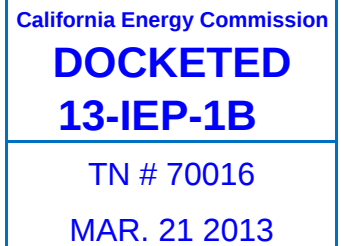


March 21, 2013

**VIA E-MAIL DOCKET@ENERGY.
CA.GOV**California Energy Commission
Dockets Office, MS-4
Re: Docket No. 13-IEP-1B
1516 Ninth Street
Sacramento, CA 95814-5512

Re: 2013 Integrated Energy Policy Report: Comments of Pacific Gas and Electric Company on the Staff Workshop on the Cost of New Renewable and Fossil-Fueled Generation in California

I. INTRODUCTION

Pacific Gas and Electric Company (PG&E) appreciates the opportunity to provide comments on the California Energy Commission (CEC) Staff Workshop on the Cost of New Renewable and Fossil-Fueled Generation in California (Workshop).

This 2013 Cost-of-Generation (COG) Model Update, as described by CEC Staff at the March 7 Workshop, will focus on the cost of new renewable and fossil-fueled generation in California. PG&E supports this direction and believes that this emphasis will provide the greatest value for COG Model users. By using only likely technologies and California based costs, the CEC enhances the relevance of the COG Model to various State planning processes. Additionally, the inclusion of sensitivity analysis and the derivation of high and low ranges using Analytica is an improvement over previous COG Model versions.

In addition to these changes, PG&E strongly supports the Staff's decision to maintain the COG Model's focus on determining the Levelized Cost of Energy (LCOE) at the point of connection to the transmission system. System costs, while an important planning consideration, should not be incorporated into the COG Model. Combining system cost analysis with LCOE analysis creates a number of potential challenges. For example, system cost elements such as integration costs are too complex for LCOE analysis. In addition, consensus has not yet been reached about the appropriate level of integration and other system costs. As a result, there would likely not be a consensus about the accuracy and value of LCOE estimates based on these additional elements. LCOE analysis currently incorporates numerous assumptions and adding an additional layer of complexity would diminish the use of these estimates and would likely not provide any additional benefit to system cost analysis. System cost analysis and LCOE analysis are both

important for PG&E and many other entities in California. PG&E believes that the value of both sets of analyses would be maximized by maintaining the current scope for the LCOE analysis, and allowing the work on system cost and need analysis to proceed through the California Public Utilities Commission's (CPUC) Long-term Procurement Plan and the California Independent System Operator's (CAISO) Renewable Integration Studies.

However, PG&E does recommend that the CEC make COG Model users aware that, while the LCOE is an important tool for analyzing busbar costs, actual resource planning and investment decisions are affected by a number of factors. These include system costs such as the cost of transmission upgrades and the integration of intermittent resources, as well as values such as upward ramping capacity or the ability to provide flexibility reserves. Traditional power stations, even when equivalent in LCOE, provide more grid stability compared to renewable generating facilities, such as wind and solar. The CEC could help place the COG Model in a proper context by better describing the Model's appropriate uses and limitations.

Finally, in its comments, PG&E is outlining specific areas of agreement and concern related to the COG Model. It should be understood however, given the volume and complexity of information presented at the Workshop, that PG&E cannot review all, or even most, of the changes to the COG Model. To facilitate further stakeholder review, the CEC may wish to create a COG Model Working Group, which could be modeled after the successful Demand Analysis Working Group (DAWG).

II. ISSUES THAT DESERVE FURTHER REVIEW AND ANALYSIS

In addition to PG&E's comments above, PG&E has the following specific comments and recommendations about aspects of the 2013 COG Model update, as listed below:

- **The Relative Cost of Combined Cycles vs. Combustion Turbines:** The installed costs of both the Combined Cycles and Combustion Turbines (CT) are significantly higher than previous versions, especially the \$1800 per kilowatt (kW) for a CT. Historically higher capital costs were a trade-off for higher efficiency when comparing a combined cycle against a CT. This number can have a significant impact on the cost of capacity and cost-effectiveness calculations in various CPUC proceedings, and therefore warrants further review.
- **Federal Tax Depreciation Rates:** 2013 Federal Tax depreciation rates do not appear to reflect the 50 percent bonus depreciation available to capital investments during this period.
- **Wind Capacity Factors:** In the summary of technology input parameters for wind units, the capacity factors (Mid Cost Case) listed for Class 3 and Class 4 wind sites are 42 percent and 39 percent respectively. Given that Class 4 wind sites represent higher quality wind than Class 3 sites, the Class 3 value should be no higher than the capacity factor used for the Class 4 sites. For presentation purposes, PG&E also suggests that Capacity Factors (CFs)

presented should also be shown as P50 “net” capacity factors representative of power available to the grid after reflecting the gross to net adjustment for losses.

- Financial Assumptions for Investor Owned Utilities:** At the Workshop, Richard McCann and William A. Monsen presented on the financial assumptions for the COG Model. Specifically, Slide 13 covered the financial parameters for investor-owned utilities (IOUs), merchant developers, and publicly-owned utilities (POUs).¹ The cost and ratios of equity and debt for IOUs (i.e., PG&E, Southern California Edison [SCE] and San Diego Gas and Electric [SDG&E]) should reflect the most recent Cost of Capital decision by the CPUC,² as shown below:

Table 1: Cost of Capital for Investor-Owned Utilities

	<i>PG&E</i>	<i>SCE</i>	<i>SDG&E</i>
Capitalization Rates:			
Long-term debt	47.00%	43.00%	45.25%
Preferred stock	1.00%	9.00%	2.75%
Common stock	52.00%	48.00%	52.00%
Cost of Capital:			
Long-term debt	5.52%	5.49%	5.00%
Preferred stock	5.60%	5.79%	6.22%
Common stock	10.40%	10.45%	10.30%
WACC (Pre-Tax)	8.06%	7.90%	7.79%
WACC (Post-Tax)	7.0%	6.9%	6.9%

Notes: “WACC” stands for Weighted Average Cost of Capital.

- Wind and Solar Economic Book Life:** In the 2013 COG Model update, the CEC Mid Cost Case assumes a 30 year economic book life for all solar and wind technologies.³ Notably, for solar technologies, this is an increase from the current COG Model, which assumes a 20 year book life.⁴ Solar panel component and turbine manufacturers will typically warrant solar and wind equipment for a period of 25 years. Moreover, other components, such as inverters (solar) and gearboxes (wind) have even shorter lives and would typically be replaced during a facility’s 25 year operating life. PG&E recommends that the CEC use a book life of 25

¹ McCann, Richard and Monsen, William. 2013. Cost of Generation Workshop: Financing Assumptions, website: http://www.energy.ca.gov/2013_energy_policy/documents/2013-03-07_workshop/presentations/. Slide 13.

² Decision of Test Year 2013 Cost of Capital for the Major Energy Utilities, D.12-12-034 (California Public Utilities Commission December 20, 2012), website: <http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M040/K655/40655308.PDF>

³ Klein, Joel. 2013. Handout Package for March 7, 2013 COG Workshop. Page 10.

⁴ Klein, Joel. 2009. *Comparative Costs of California Center Station Electricity Generation Technologies*, California Energy Commission, CEC-200-2009-017-SD. Page 61.

years for solar and wind technologies or provide additional information justifying a 30 year economic life.

- **Wind and Solar Operation and Maintenance:** Most lenders require that wind and solar maintain reserves for capital equipment replacement; however it is unclear whether the Model incorporates this cost. Additionally, the wind project operation and maintenance Low, Mid and High Cost Cases are the same, which is not an accurate assumption.
- **Renewable Tax Credits:** Based on the Workshop, it is unclear whether federal tax credits available for renewable generation have been incorporated into the COG Model. The model should explicitly state the tax credits assumed in each of the Low, Mid, and High cases. Specifically, the Production Tax Credit (PTC), a credit for producers of electricity from renewable resources, and the Investment Tax credit (ITC), a credit for capital expenditures of renewable energy-producing equipment placed in service on or before December 31, 2016, should be reflected in the COG Model where applicable.
- **Merchant Installed Cost for Solar PV:** At the Workshop, information was presented suggesting that the installed cost for Solar Photovoltaic (PV) continues to decline through 2022 based on a learning curve trajectory. While PG&E believes that cost declines may continue, at some point in the future, the cost decline is likely to level-off as the declining cost of panels and modules may be offset by the increasing costs of environmental, permitting, land, interconnections, labor and balance of plant.

III. CONCLUSION

PG&E is committed to continuing to work with CEC Staff and stakeholders throughout the 2013 Integrated Energy Policy Report (IEPR) proceeding to assess the COG Model. The improvements captured in this iteration are positive ones, and we look forward to continued, incremental improvements in the COG Model.

Sincerely,

/s/

Matthew Plummer

cc: I. Rhyne (Ivin.Rhyne@energy.ca.gov)