



March 21, 2013

California Energy Commission
Docket Office, MS-4
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Re: California Energy Commission Docket No. 13-IEPR-1B Cost of New Renewable
and Fossil-Fueled Generation in California

To Whom It May Concern:

On March 7, 2013, the California Energy Commission (“Energy Commission”) held a Staff Workshop on the Cost of New Renewable and Fossil-Fueled Generation in California (“the Workshop”). The Workshop was part of the Energy Commission’s 2013 Integrated Energy Policy Report (“2013 IEPR”) process. Southern California Edison Company (“SCE”) participated in the Workshop and appreciates the opportunity to provide these written comments.

SCE appreciates the Energy Commission’s decision to undertake this effort to update the 2009 Cost of Generation Model and Report (“the Report”). The Report, which is one of the few public sources of estimates for the cost of central station generation in California, helps to ensure that consistent cost assumptions are used across the various regulatory energy policy decision making forums in the state. In light of the Report’s broad impact, its accuracy is essential, particularly with respect to the Report’s approach to reporting levelized costs. SCE also recommends that the Energy Commission expand the scope of the Report to include costs associated with emerging resource planning issues. Finally, the Energy Commission should revisit some specific cost and operating assumptions in the Report.

With respect to levelized costs, SCE noted several issues with the Report’s current approach that can lead users to inaccurate conclusions. Specifically, the Report only estimates developer costs and does not account for differences in value among the resources studied. In addition to modeling differences in developer costs (e.g. cost of capital, component costs, operation and maintenance) among the technologies studied, the Report should properly account for the following differences in value:

1. Capacity value - The generation technologies studied in the Report have varying levels of availability during times of system stress. Excluding these differences will underestimate the cost of energy from resources, such as wind and solar, with relatively lower availability during times of system stress.

2. Energy value - Without any associated storage technology, wind and solar resources cannot optimize energy production relative to market prices. Excluding these differences will overestimate the cost of energy from dispatchable resources, such as simple cycle and combined cycle combustion turbines.
3. Asset life - Longer-lived assets provide economic value over a longer period of time than shorter-lived assets. Excluding these differences will underestimate the value of longer-lived assets relative to shorter-lived assets.
4. Integration costs - Intermittent, must-take resources require additional balancing services (i.e. regulation and following) to ensure that system load and generation are balanced at all times. Excluding these differences will underestimate the cost of energy from intermittent resources, such as wind and solar.

As SCE demonstrated in its May 16, 2011 presentation to the Energy Commission, without quantitative estimates for these values, users of the Report may have a fundamental misunderstanding of the costs associated with generation, which may, in turn, ultimately diminish the value of the Report. Correcting the Report will enhance its usefulness by providing its users with a better understanding of the resource selection process, enabling a more sophisticated and thoughtful dialogue regarding energy policy, and enhancing the ability of regulators to make sound decisions.

Accordingly, during its May 16, 2011 presentation, SCE provided the Energy Commission with a straightforward methodology for addressing all of these items.¹ Energy and Environmental Economics (“E3”) utilized a similar approach to SCE’s for adjusting levelized costs to account for differences in capacity value in its modeling work for the California Public Utilities Commission.² SCE recommends that the Energy Commission adopt E3’s or SCE’s approach or another similar approach for incorporating value differences in its updated Report.

SCE also suggests that the Energy Commission expand the scope of the Report to explore two emerging resource planning issues. First, the Energy Commission should study how costs differ between gas-fired systems with varying ramp rates and start up times. Going forward, potential resource plans may require varying degrees of flexibility from the natural gas generation fleet. For instance, advanced storage applications could be used to provide balancing services to intermittent generation and therefore, reduce the amount of investment needed in highly flexible natural gas generation. The Long-Term Procurement Plan proceeding, which is exploring the total cost of various resource portfolios, is one forum in which such information would be useful. A public source of natural gas system costs that considers differences in flexible attributes will enable policymakers and stakeholders to more completely evaluate variations in cost among different resource plans.

¹ http://energy.ca.gov/2011_energypolicy/documents/2011-05-16_workshop/presentations/Southern_California_Edison_2011-05-03.pdf

² http://ethree.com/documents/GHG%203.11.10/GHG%20Calculator_v3b_Appendix%20A%20and%20B_March2010.pdf

Second, the Energy Commission should expand beyond central station generation and address distributed solar applications in both urban and rural environments. In SCE's experience, the cost to construct, including interconnection and land acquisition, can vary substantially depending on location. Given the State's interest in exploring distributed generation, a public source for solar photovoltaic costs that considers these differences will help policymakers and stakeholders evaluate the cost implications of various decisions in this area.

Finally, SCE suggests that the Energy Commission revisit some specific cost calculations and operating assumptions presented at the Workshop. With respect to cost calculations, based on SCE's perception of industry knowledge, the Energy Commission's survey average instant and fixed operation and maintenance costs for the simple cycle and combined cycle gas turbines³ may be high. SCE's understanding, which is based on information generated by reputable external consultants who are presently engaged in the development, engineering, and cost estimation of power generation facilities within California, is more closely correlated with Aspen's Low Cost Case.⁴ It is possible that in some cases the survey averages may neither capture nor reflect the declines in plant capital costs for the period since the first quarter of 2008.⁵ Without further disclosure of how Aspen Consulting and the Energy Commission used the survey numbers to develop their estimates, SCE cannot explain these differences but is willing to work with Staff to refine these figures.

Likewise, SCE cautions that the Energy Commission may want to revisit its zero variable operation and maintenance estimated cost for geothermal because SCE expected that the value be between 25 and 30 \$/MWh.⁶

SCE also believes that the Energy Commission should use the utility incremental cost of capital unadjusted for the tax impacts of debt, as opposed to the developer weighted average cost of capital adjusted for the tax impacts of debt, as the discount rate. SCE's current incremental cost of capital is 10%. The utility incremental cost of capital, in this case 10%, is the rate a utility must pay to obtain funds in the capital markets for its long-term investments. As such, it represents the opportunity cost for deploying capital. This discount rate is also consistent with the 7% real social discount rate that the United States government uses for benefit-to-cost evaluation of projects when adjusted for inflation.⁷ If the Energy Commission uses the incremental cost of capital as the discount rate, the Report's discount rate will reflect a customer or system perspective in its levelized cost estimates and ensure that project cash flows are discounted appropriately.

³ http://energy.ca.gov/2013_energypolicy/documents/2013-03-07_workshop/presentations/Gas-Fired_Plants_Costs_Survey_Section_for_CEC_Workshop_2013-03-05.pdf

⁴ *Ibid.*

⁵ <http://press.ihc.com/press-release/energy-power/power-plant-construction-costs-cost-pressures-returning>

⁶ http://energy.ca.gov/2013_energypolicy/documents/2013-03-07_workshop/presentations/Gas-Fired_Plants_Costs_Survey_Section_for_CEC_Workshop_2013-03-05.pdf

⁷ See *Office of Management and Budget Circular A-94*, "Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs"

As for operating assumptions, the “Cost of Generation Model Worksheet”⁸ assumes a 1% capacity factor for the Investor-Owned Utility (“IOU”) combustion turbines, but conversely assumes a range of 2.5 to 7 % for Merchant-Owned combustion turbines. There is no basis for making this distinction between IOU and merchant generators. Ownership is irrelevant because both IOU and merchant generators dispatch generation units in response to market prices. This assumption is also inconsistent with the survey results provided by Aspen Consulting in its workshop presentation materials and should be changed to reflect the same capacity factors as the merchant-owned combustion turbines.

In conclusion, SCE appreciates the Energy Commission’s consideration of these comments and looks forward to collaborating with the Energy Commission to develop a Cost of Generation Model and Report that remains a relevant and useful report for industry stakeholders and policymakers in California. Please do not hesitate to contact me at (916) 441-2369 regarding any questions or concerns you may have.

Very truly yours,

/S/ Manuel Alvarez

Manuel Alvarez

⁸ http://www.energy.ca.gov/2013_energypolicy/documents/2013-03-07_workshop/CEC_COG_Model_Version_3_62_Workshop.xlsm