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BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Examine the Commission's Post-2008 Energy Efficiency Policies, Programs, Evaluation, Measurement, and Verification, and Related Issues.

Rulemaking 09-11-014
(Filed November 20, 2009)

**ADMINISTRATIVE LAW JUDGE'S RULING
ON UPDATES AND ADJUSTMENTS TO ENERGY EFFICIENCY
AVOIDED COST INPUTS AND METHODOLOGY**

1. Introduction

Today's ruling concerns updates and adjustments to the energy efficiency (EE) avoided cost inputs and methodology. In particular, this ruling sets forth a proposal by the Energy Division of the California Public Utilities Commission (Energy Division or ED), requests party comments on proposed inputs and adjustments to the EE avoided cost methodology, and poses specific questions about changes to the avoided cost methodology inputs. These changes will help inform the Commission's determinations of future EE program activities.

2. Background

In making determinations about the next EE Program portfolio cycle, a key input for the Commission's consideration is the avoided cost methodology. Avoided costs refer to the incremental costs avoided by the investor-owned utilities' EE program activity when it defers or avoids generation from existing or new utility supply-side investments or energy purchases in the market. In calculating the cost-effectiveness of EE programs, we compare the costs of those

programs with their avoided costs; these costs represent the supply-side resources that are avoided or deferred by energy and capacity savings of EE activities. The avoided cost calculations also encompass the deferral or avoidance of transmission and distribution related costs such as Greenhouse Gases, and the reduced need for Renewable Portfolio Standard generation.

The EE avoided costs methodology was adopted in April 2005 in Decision (D.) 05-04-024, and updated in D.06-06-063 and D.09-09-047. The methodology is contained in the Standard Practice Manual¹ (SPM). EE portfolios as a whole must pass the Total Resource Cost test and the Program Administrator Cost test of cost-effectiveness contained in the SPM. Also, the Commission adopted cost-effectiveness methods based on the SPM for Distributed Generation programs in D.09-08-026 and for Demand Response programs in D.10-12-024.

The latter decisions adopted a new avoided cost calculator, leading to a more accurate reflection of key components costs, including capacity, energy, greenhouse gas, transmission and distribution, and costs associated with the Renewable Portfolio Standard and the Ancillary Services market.² The November 17, 2010, Assigned Commissioner's Ruling (ACR) asked parties to comment on whether the EE cost-effectiveness methodology should be updated to be consistent with modifications made to the Demand Response and

¹ California Standard Practice Manual: Economic Analysis Of Demand-Side Programs And Projects, October 2001, as incorporated by reference in the Energy Efficiency Policy Manual, the latter of which was adopted as Attachment 1 to D.01-11-066. Standard Practice Manual, www.cpuc.ca.gov/static/industry/electric/energy+efficiency/rulemaking/resource5.doc.

² The new avoided cost calculator is available for review at: http://ethree.com/public_projects/cpuc4.html.

Distributed Generation methodologies. Based on the comments received, a second ACR was issued on December 23, 2010, directing the Energy Division and the Administrative Law Judge to develop a proposal for a cost-effectiveness update by mid-2011.³

3. Energy Division Proposal

Following the direction in the December 2010 ACR, Energy Division staff prepared a proposal to update the cost-effectiveness methodology. This proposal is included as Attachment A. Energy Division proposes the following changes to the EE avoided costs inputs and methodology:

1. Updating the data inputs used to determine the avoided costs of electricity generation;
2. Separating the avoided cost of electricity generation into several components to better reflect capacity, generation, and other costs in the short and long run; and
3. Changing the discount rate for the cost-effectiveness analysis of EE programs from the before-tax to the after-tax Weighted Average Cost of Capital.

In addition to the ED proposal in Attachment A, to facilitate the comparison of current and proposed avoided cost methodologies across demand-side scenarios, Energy Division has prepared a spread sheet-based tool entitled "Energy Efficiency Avoided Cost Scenario Comparison." This spreadsheet can be accessed at:

<http://www.cpuc.ca.gov/PUC/energy/Energy+Efficiency/Cost-effectiveness.htm>

³ December 23, 2010 ACR, at 7 the Ruling can be viewed at <http://docs.cpuc.ca.gov/efile/RULINGS/128798.pdf>.

4. Questions for Parties Comments

In response to the Proposal, we seek parties' comments on the following questions:

1. In principle, is it reasonable to make the EE avoided cost methodology consistent with the methodology for other demand-side programs?
2. Are the proposed data input updates reasonable? If not, why not?
3. If not, what would be a more accurate source of data inputs for the update?
4. Do the proposed methods for avoided costs calculation accurately capture the avoided cost of EE for each of the components below? If not, why not? What would be a more accurate method and/or data source to account for these avoided costs?
 - a. Avoided cost of energy
 - b. Avoided cost of generation capacity
 - c. Avoided cost of transmission and distribution capacity
 - d. Avoided cost of ancillary services procurement
 - e. Avoided cost of renewable procurement
5. Does the proposed change to the discount rate best represent the net present value of costs borne by ratepayer for EE activities? Is there an alternative discount rate which better reflects the cost to ratepayers of EE?
6. Are the proposed changes to the avoided costs methodology an accurate representation of the total avoided costs for EE savings? Specify any additional inputs necessary to accurately account for the total avoided costs?

In responding to these questions, please identify any assumptions used.

IT IS RULED that:

1. Parties shall serve and file comments in response to the questions above, and Attachment A, by October 17, 2011.
2. Comments shall not exceed 15 pages in length.
3. Parties shall serve and file reply comments, which shall not exceed 10 pages in length, by October 28, 2011.

Dated October 5, 2011, at San Francisco, California.

/s/ DARWIN E. FARRAR

Darwin E. Farrar
Administrative Law Judge

ATTACHMENT A

Energy Division Recommendations for Cost-Effectiveness Update

The current avoided cost calculator is based on an all-in avoided cost of generation, quantified as the sum of the total fuel, operations and maintenance, and levelized capital costs of a new Combined Cycle Gas Turbine (CCGT) running 92% of the year. This all-in cost is then shaped into an hourly profile based on the California Power Exchange day-ahead market price from 1999-2000. Capacity values are included in the hourly market price, using inputs that have not been updated since 2005.

Energy Division (ED) recommends updating the energy efficiency cost-effectiveness inputs and methodology so that the most recent avoided cost method (adopted by the Commission in Decision (D.) 10-12-024 and D.09-08-026 for Demand Response and Distributed Generation (respectively)) is used. ED recommends the following changes:

1. Updating the data inputs used to determine the avoided costs of electricity generation.
2. Separating the avoided cost of electricity generation into several components to better reflect capacity, generation, renewable procurement, and other costs in the short and long run.
3. Changing the discount rate for the cost-effectiveness analysis of Energy Efficiency programs from the before-tax to the after-tax Weighted Average Cost of Capital (WACC).

Updated Data Inputs

The data inputs in the avoided cost calculator, which were last updated in 2010, should be updated to reflect more recent market conditions. These inputs include:

- Using the New York Mercantile Exchange (NYMEX) price forecast for natural gas prices.
- Using California Energy Commission weather data such as the 2008 temperature profiles by climate zone.

- Using the Synapse Consulting forecast for carbon prices, approved in the Renewable Portfolio Standard Market Price Referent proceeding.¹

Proposed Avoided Costs

The proposed avoided cost calculator differs from the current one in that it calculates five separate avoided costs (described below), rather than the single all-in cost used in the current calculator.² This results in more precise values, particularly for generation capacity, and higher avoided costs for measures that are coincident with peak load. These avoided cost components are calculated as follows:

1. Energy

The proposed avoided cost of energy and capacity are split into long and short-run costs. The transition between long and short-run costs occurs at a point referred to as the resource balance year, which is defined as the year when the capacity and energy markets will reflect the full cost of new plants. The process to determine the resource balance year was established for the cost-effectiveness of Net Energy Metering for distributed generation in D.09-08-026.³ The capacity value for each year between 2008 and the resource balance year is calculated by linear interpolation, and the resource balance year is currently calculated for energy efficiency as 2017. It is determined by estimating loads and the current and projected capacity of resource balance models, with and without energy efficiency programs.

¹ The most recent Market Price Referent was adopted in Resolution E-4298.

² The five separate avoided costs were identified and vetted in the Demand Response Proceeding R.07-01-041. Further description of these components are described in D.10-12-024, Attachment 1, which can be viewed at http://docs.cpuc.ca.gov/word_pdf/FINAL_DECISION/128596.pdf.

³ Methodology to determine resource balance year is described in Appendix A of the Introduction to Net Energy Metering Cost Effectiveness Evaluation report, pg. 3, which can be found at http://www.cpuc.ca.gov/NR/ronlyres/0F42385A-FDBE-4B76-9AB3-E6AD522DB862/0/nem_combined.pdf.

Prior to the resource balance year, the short-run average avoided energy cost is based on NYMEX market price forecasts, where available. If the forecasts are not available, the data is obtained by interpolating between the last available NYMEX price and the long-run energy market price. The long-run energy market price, used for the resource balance year and subsequent years, is based on the 2010 Market Redesign and Technology Upgrade (MRTU) day-ahead market price and is escalated to the natural gas burner tip forecast. The annual long-run energy market price is set so that the CCGT's energy market revenue plus the capacity market payments is equal to the fixed and variable costs of the CCGT.

2. Generation Capacity

The proposed avoided costs for generation capacity include both a short-run and a long-run forecast. The short-run value of capacity is based on the 2008 resource adequacy market payments; the relatively low value (\$28 /kW-yr) reflects the large surplus of capacity currently available on the California Independent System Operator system. The long-run cost of capacity is calculated based on the cost of a simple-cycle combustion turbine (CT), instead of the CCGT used in the current avoided cost calculator.

The long-run capacity value is equal to the CT's annualized fixed cost less the net revenues (gross margins) it would earn through participation in the real-time energy and ancillary services markets – the residual capacity value. The net revenues are based on a capacity factor typical of a CCGT so as to make the model based on a marginal power plant. The residual capacity value is allocated among the top 250 load level hours of the year.

3. Transmission & Distribution (T&D) Capacity

The T&D avoided costs measure the potential for deferral of T&D network upgrades due to reduction in local peak loads. There is no change in the method used to calculate them, as they are obtained from values submitted by the utilities. Pacific Gas and Electric Company's T&D avoided costs have been updated by climate zone and are taken from its 2011 General Rate Case Phase II, January 7, 2011. Southern California Edison Company and a San Diego Gas & Electric Company use system level values which are the same as those used in the Demand Response and Distributed Generation proceedings.

4. Ancillary Services Procurement

The avoided cost of ancillary services accounts for the decrease in the additional services needed to deliver electricity, as defined by Federal Energy Regulatory Commission, due to load reductions resulting from energy efficiency. The cost has been updated to reflect MRTU value.

5. Renewable Procurement

This avoided cost is a function of the Renewable Premium, which is the incremental cost of the marginal renewable resource above the cost of conventional generation. The reduced loads resulting from energy efficiency efforts reduces supply of renewable generation needed to meet the 33% renewable requirement pursuant to SBX1 2 (2011, Simitian), which creates an additional avoided cost above the market cost of energy.

Discount Rate

The discount rate is used to determine the net present value of each cost and benefit in the Standard Practice Manual tests. For Demand Response programs, D.10-12-024 adopted the after-tax value of the WACC, finding that “the after-tax WACC best reflects the costs borne by ratepayers for demand response activities, and is therefore the appropriate discount rate.”⁴ To maintain consistency across demand side resource proceedings, ED proposes applying the same discount rate to the energy efficiency portfolio.

Comparison of Avoided Costs under Current and Proposed Methodologies

Energy Division’s Data Management and Quality Control consultants prepared a comparison analysis to evaluate the impact of the proposed avoided cost methods on the cost-effectiveness of the portfolios, included as Attachment B. This tool compares the cost-effectiveness of the energy efficiency portfolios and various program types using 2010 measure level program data from the

⁴ D.10-12-024, p. 24, can be viewed at http://docs.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/128594.htm. The WACC for PG&E, SDG&E, and SCE was determined in D.07-12-049 http://docs.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/76920.htm

Standard Practice Tracking database. Scenarios were created using different versions of the avoided cost calculator and different assumptions about the discount rate. In the comparison tool, pre-set scenarios are selected with the toggles in the upper left corner of the *First Scenario* and *Second Scenario* tabs.

The versions of the calculator include:

1. 2010 Current: Current avoided cost methodology, last updated in D.09-09-047.
2. 2010 Update: Current avoided cost methodology with updated inputs.
3. 2014 New: The proposed methodology described above, which applies the new avoided costs.

The model enables the following adjustments to the scenarios:

1. Adjustments: The investor-owned utility Submittal option sets the cost-effectiveness results based on the ex-ante values submitted in the portfolio adopted in D.09-09-047, and the Ex-Ante PD Adjusted option uses the ex-ante assumptions adopted in D.11-07-030.
2. Discount rate: Adopted Cost of Capital option applies the input used in the current avoided cost calculator, and the After Tax Estimated Cost of Capital option applies uses the proposed input adopted in for demand response programs.

To compare scenarios, select different options on the *First Scenario* tab and the *Second Scenario* tab and results are automatically refreshed. The three *Compare* tabs provide results as a percentage change and in total costs and benefits by program type and utility.

(END OF ATTACHMENT A)