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California Energy Commission
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1516 Ninth Street
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Re: Docket No. 09-IEP-1G and 03-RPS-1078

Docket Office:

Please find attached PG&E's comments on the workshop held June 29, 2009, regarding "Electricity System Implications of 33 Percent Renewables."

Please contact me should you have any questions. I can be reached at 415/973-6126.

Sincerely,

Dan Patry

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Attachment

Pacific Gas and Electric Company
Response to June 29, 2009 IEPR Workshop On
Electricity System Implications of 33 Percent Renewables
Docket Number 09-IEP-1G and 03-RPS-1078

Pacific Gas and Electric Company (PG&E) is pleased to submit its written comments in response to the June 29th California Energy Commission (CEC) workshop on the system implications of moving towards a 33% Renewable Portfolio Standard (RPS). We applaud the CEC's, as well as numerous other stakeholders' hard work to help serve the public dialogue surrounding this issue. PG&E has several observations and recommendations regarding both its own analytical efforts and several broader issues related to integrating higher levels of renewables into California's grid.

I. PG&E's RENEWABLE INTEGRATION CALCULATOR

As indicated in the material provided for the workshop, PG&E has recently developed a prototype model (the Renewable Integration Calculator) to understand the operational impacts of higher levels of intermittent resources, the drivers of those impacts, and the resulting integration needs and costs of different renewable portfolios.

Planners and decision-makers need to know ahead of time, during both the planning stage and before making commitments for increased intermittent generation, what type and amount of resources are needed to integrate that intermittent generation. Rather than issuing another 33% RPS study, whose results depend on the particular inputs used and become outdated before the study is completed, PG&E's current focus is:

- Understanding the key drivers of integration needs and costs;
- Facilitating communication and learning within the industry about the integration needs and costs of intermittent generation;
- Developing both the tools to capture the major drivers of integration and the ability to quickly evaluate the integration needs for different portfolios with different penetration levels of intermittent resources.

Integrating intermittent resources requires flexible generation that can respond quickly to forecast deviations of intermittent generation. Resources available to meet reliability requirements may not be sufficient to satisfy operating requirements of additional intermittent resources. Current approaches to determine resource need to cover expected peak demand plus Planning Reserve Margin (PRM) do not account for forecast uncertainty or operating needs of load or intermittent resources. As a result, it is possible that operationally flexible resources in excess of the current PRM requirement may need to be added to enable the system to operate in a 33% RPS environment. PG&E is working with the California Independent System Operator (CAISO) and other parties, as part of its 33% RPS integration project, to determine the need for new integration resources, and whether the existing PRM is adequate to meet both traditional reliability needs as well as operational requirements associated with higher intermittent generation levels.

As part of this integration work, PG&E will also calibrate the inputs to the Renewable Integration Calculator. After that, PG&E will make the Calculator publicly available along with a description of the methodology and user manual.

II. RESPONSES TO STAFF QUESTIONS

PG&E has already responded to most of the Staff questions in the handout provided for the June 29, 2009 workshop, which are posted on the CEC website. The following responses to questions 9 through 13 were not included in PG&E's handout:

Q9. What are the potential electricity integration issues that need to be addressed in order to achieve the 33 percent renewables goal by 2020? Are any of these issues not being addressed by ongoing studies or in identified policy development proceedings?

With regard to the integration of intermittent generation, there are a few issues that need to be addressed. In the interim period, say before 2020, conventional resources are the most likely options to integrate large additions of renewables since storage projects are either experimental or have long lead times. Further effort is needed to develop planning tools to evaluate operational and reliability needs of higher levels of intermittent resources. There is also limited information about weather-specific generation profiles and forecast uncertainty for intermittent generation.

Q10. What impact will related policies, especially energy efficiency and combined heat and power goals in the ARB AB32 scoping order, have on the amount of renewable energy needed to achieve 33 percent on 2020?

There is great uncertainty about the cost, operational fit and environmental impacts of policies included in ARB's AB32 scoping memo. Targets are good, but need to be adjusted over time as we learn in order to reflect changes in technology and in our ability to implement those policies. Targets should set the direction, but need to be adjusted as we learn to manage these challenges.

The system needs increasing operational flexibility to accommodate the state preferred resources; including higher RPS, EE, and CHP goals in ARB's AB32 scoping order. Policies that promote separate silo targets for different preferred resources add unnecessary cost and may preclude reaching individual targets. For example, it may be cheaper to reduce CO2 emissions by repowering or replacing existing inefficient cogeneration than by requiring large increases in CHP base load generation, which do not add to the operational flexibility to integrate intermittent resources. PG&E contends that all options available to reduce CO2 emissions should be compared on an equal footing.

Q11. What impact will related policies have on the electricity system implications of 33 percent renewable energy by 2020?

At the current state of technology, most preferred resources do not provide the operational flexibility to integrate increased intermittent resources needed to achieve a 33% RPS target by 2020. The only exception is demand response, although much more is needed to enable demand response to truly contribute the integration of intermittent renewable resources since the existing programs are designed for use only during a few stress hours in high peak or price conditions. In order to contribute to integrating intermittent resources, demand response will need to respond quickly and continuously (not just for a few hours) to address over/under forecast deviations of intermittent generation, and be visible to the CAISO via telemetry to enable CAISO to adjust its short-term dispatch.

Therefore, additional flexible conventional gas fired generation and new storage technologies, long-lead pumped storage, or conventional resources are needed for RPS integration.

Q12. What impact will the exhaustion of above-market funding from the CPUC for two of the IOUs have on California's ability to meet the 33% RPS goal?

On May 28, 2009, the Energy Division sent a letter to PG&E notifying PG&E that its above-market funds balance is zero. Although PG&E is no longer required to procure eligible renewable resources that are priced above the Market Price Referent (MPR) because the statutorily-designated funds for payment of above-market costs have been exhausted, PG&E continues to procure power from renewable energy resources priced above the MPR on a voluntary basis, so long as the Commission has authorized the recovery of those costs in rates.

PG&E expects that legislation mandating a higher RPS goal will revisit the above-market fund framework that is currently in effect. The structure of that framework is uncertain.

Q13. What uncertainties need to be considered?

The major uncertainties associated with implementing a 33% renewable target are:

- The cost premium of renewables
- Improvements in technology, which affect renewable costs and integration challenges
- Availability of transmission
- Ability of system to operate with large amounts of intermittent generation.

III. COMMENTS ON OTHER STUDIES PRESENTED AT THE JUNE 29, 2009 WORKSHOP

A. Comments on the ICF's Impact of Variations in Renewable Generation on California's Natural Gas Infrastructure

As we understand it, ICF examines the adequacy of the natural gas infrastructure under three 33% RPS cases. Its analysis focuses on how much gas storage and transportation assets are utilized during the January peak day and January average day in 2019 and 2020. As acknowledged by ICF at the workshop, the ICF study does not address hourly variations of gas-fired generation due to intra day volatility and the forecast uncertainty of intermittent generation. As a result, this study can not be used to reach conclusions about the adequacy of the existing natural gas infrastructure under a 33% RPS world. We have encouraged the CAISO, and also encourage ICF and the CEC Staff to investigate this area as part of their 33% RPS integration work.

In addition to examining the gas system adequacy during winter peak days, PG&E recommends summer adequacy be investigated because of increased demand for gas storage, higher electric loads, and the higher production (and as a result volatility) of intermittent generation during this season. Summer storage demand will increase as more storage is added in northern California. Overall, the ICF study is a good start, but further work is needed to determine the system adequacy under 33% RPS conditions.

B. Comments on the CEC Staff Report Impact of Assembly Bill 32 Scoping Plan Electricity Goals on New Natural Gas-Fired Generation

We appreciate the efforts of the CEC staff to investigate the need for natural gas-fired generation under the AB32 Scoping Plan. We however encourage the CEC Staff to coordinate its efforts with those of other state agencies and the CAISO in this area. As acknowledged by the Staff at the workshop, the study does not account for the short-term forecast uncertainty of load or intermittent generation which drives the need for integration requirements. Therefore, the study has limited use to estimate the need for natural gas-fired resource or other flexible resources needed to operate under the AB32 Scoping Plan. We also find troubling the continued confusion about the amounts of conservation and energy efficiency (EE), and combined heat and power (CHP) that are included in the CEC load forecast used for this study. The lack of clarity suggests there may be some double-counting of CEE and CHP impacts in the analysis, which could explain the differences in conclusions about the need for natural gas-fired generation between this Staff study and a prior MRW report discussed at a prior IEPR workshop[1].

We do agree with the CEC Staff's concerns about the over-generation conditions created by the large CHP additions contemplated by the AB32 Scoping Plan, and encourage the Staff, in coordination with the CAISO integration study, to investigate the magnitude and potential remedies to manage likely over-generation conditions

[1] McClary, Steven C., Heather L. Mehta, Robert B. Weisenmiller, Mark E. Fulmer and Briana S. Kobor (MRW & Associates). 2009. Framework for Evaluating Greenhouse Gas Implications of Natural Gas-Fired Power Plants in California. California Energy Commission. CEC-700-2009-009.

C. Comments on the CPUC's 33% RPS Implementation Analysis

PG&E is in the process of reviewing the preliminary results from the CPUC's 33% RPS Implementation Analysis, and will provide comments to the CPUC's Energy Division after we have a chance to review the workpapers that Energy Division and its consultant are expected to provide in the near future.