Comments of Pacific Gas and Electric Company on Regional Integration and EIM Greenhouse Gas Compliance Draft Attribution Report Materials and Next Steps

Submitted by	Company	Date Submitted
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Pacific Gas and Electric (PG&E) appreciates that CAISO has demonstrated its commitment to ongoing engagement with stakeholders as it tests and evaluates methods to refine the treatment of GHG in EIM. This is a very difficult problem and PG&E thanks CAISO for providing stakeholders the time that they need to evaluate proposed methods along with simulations that provide information to aid in their evaluations.

PG&E reiterates its belief that the method of treating GHG emissions for imports in EIM should facilitate EIM's ability to:

1. Produce an efficient market dispatch across the EIM Area consisting of CAISO and the EIM Entities.
2. Produce proper price signals that reflect the locational marginal cost of service at locations across the EIM Area and that do not give participants an incentive to "game" the market to increase their profits.
3. Account for the cost of GHG emissions resulting from secondary dispatch in EIM Entities caused by imports into California.

Each of the three objectives enables the EIM to improve real-time dispatch efficiency, provide a broader market for California renewables, and reduce overall emissions.

The discussion on December 5 focused primarily on the two-pass solution method that CAISO presented in its Revised Final Draft Proposal. The material presented provides information that is useful in evaluating the approach.

Amount of Emissions Ascribed to Imports by the Two-Pass Approach

The analysis presented focused on comparing:

- The GHG emissions ascribed to imports into California by the current one-pass method using as-bid GHG costs to select the resources in EIM Entities that are deemed to provide imports
- The GHG emissions ascribed to imports into California by the proposed two-pass method in the revised Final Draft Proposal.

The data from the simulations indicate that the two-pass approach ascribes more GHG emissions to the imports than the current one-pass approach by capturing some of the GHG emissions caused by secondary dispatch. Including the allowance costs for the GHG emissions for the amount of secondary dispatch that is captured shows that the two-pass-solution reduces the overall GHG emissions when compared to the current one-pass solution. However, imports into California occur in both the Day-Ahead and Real-Time markets. When this is considered, the analysis indicates that using the two-pass solution in EIM produced only a 0.07% decrease in GHG emissions ascribed to imports over the combined Day-Ahead and Real-Time markets when compared to the one-pass solution. While the reduction may be a larger percentage of the emissions in the Real-Time Market alone, the total reduction in emissions for imports in both Day-Ahead and Real-Time combined is quite small. The size of the benefit should be considered when modifying the market rules in a way that may affect the ability of the market operator to run the EIM and for the EIM to find an efficient solution and to set appropriate prices.

CAISO stated that other potential methods for assessing GHG emissions resulting from imports in EIM are possible. However, no data on the amount of GHG emissions that would be ascribed to imports and modeled in the Real-Time EIM market for the other methods were provided.

Prices in the Two-Pass Approach

As discussed by Professor William Hogan in his paper, the prices produced by the two-pass method may not support the dispatch. The prices produced may signal that a participant could increase its profits by modifying the incremental energy costs that it bids into EIM. A participant could collect data that it could use to modify the incremental energy costs that it bids to increase its expected profits. The participant's prediction would not have to be correct in each five-minute dispatch interval in EIM to increase its expected profits. Its modified bids would only have to result in enough increase in profits in a sufficient number of intervals to off-set any decreased profits in other intervals.

Additional analysis is needed to assess opportunities for gaming and to develop adequate safeguards. Implementing the two-pass market process without such an analysis would be irresponsible.

In addition to a single participant extracting unwarranted profits, there may be other dangers inherent in implementing a two-pass approach that produces prices that send such signals. If enough participants adjust their bids to try to increase their profits, the costs to loads in EIM Entities may rise making EIM unattractive to BAAs outside California. This could damage the viability of the EIM. Such a possibility must be studied.

Implementing EIM in Day-Ahead

CAISO is considering implementing EIM in the Day-Ahead Market. The issues described above will likely become more acute in a Day-Ahead EIM given the larger volumes of energy cleared and imported into CAISO in the Day-Ahead Market. This should be considered before selecting an approach to ascribe GHG emissions to imports. It would be best to use a common approach

to ascribe GHG emissions to imports in a Day-Ahead EIM and in the Real-Time EIM to avoid creating arbitrage opportunities that do not result from changing market conditions between the Day-Ahead Market and the Real-Time Market but rather from changing market rules between the Day-Ahead Market and the Real-Time Market.

Considering Other Approaches

CAISO recognized that other approaches could be used to address secondary emissions. One approach that CAISO mentions is implementing a bid floor in a single-pass approach. Prior to the Real-Time market CAISO could estimate the emissions from imports in the Real-Time EIM based on its forecast of bids and requirements in the EIM. This would be used to calculate a bid floor on GHG costs for imports into California from resources in EIM Entities. EIM could use the bid floor to adjust the GHG costs for resources whose as-bid GHG costs are below the floor. It is possible to show that such an approach will not have the pricing problem described above. In addition, CAISO could study the ability of such an approach to capture emissions from secondary dispatch.

More study of the alternatives is needed before selecting an approach to improve GHG modeling in EIM.