Stakeholder Comments
Regional Integration California GHG Compliance Workshop

Submitted by	Company	Date Submitted
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Southern California Edison (SCE) appreciates the opportunity to provide comments on the California Independent System Operator's (CAISO) Regional Integration California Greenhouse Gas (GHG) Compliance Technical Workshop, dated October 13, 2016[1]. SCE supports the regional integration effort as it can facilitate efficient use of resources and a competitive market in the west. On the issue of the GHG impact related to secondary dispatch effects, SCE believes the CAISO and ARB should further monitor and study the GHG impact before any solution is adopted. Based on the study, the CAISO, ARB, and stakeholders can decide whether a solution is needed and, if needed, develop a solution informed by the study.

During the workshop, the CAISO presented three options: the outside market netting (Option 1), the two-pass market run (Option 2) and the use of a residual emission rate (Option 3). The CAISO suggested Option 1 should be rejected stating that existing California Air Resource Board (ARB) regulation does not recognize intertemporal benefits. It also concluded that Option 2 is not feasible in the short term, leaving Option 3 being the only option that the CAISO recommended.

As the recent CAISO study shows, the EIM has resulted significant GHG reduction across the market footprint[2]. For the studied period, the net reduction is 292,000 metric tons of GHG emissions. Therefore, SCE believes that the EIM has been an enabling element to reach lower GHG emissions rather than an impediment to GHG reduction.

Since the EIM has resulted in net emission reduction, to reject Option 1 simply because existing ARB regulation may not recognize intertemporal benefits seems problematic for three reasons: (1) SCE does not believe that the ARB regulations and the legislation creating AB32 in any way forbid the recognition of intertemporal benefits[3], (2) important amendments to ARB regulation are being made, and can continue to be made should the need exist, and (3) GHG emission production concerns cumulative and net atmosphere effects over a time period. Simply put, emission reduction

[1] Workshop Presentation: http://www.caiso.com/Documents/UpdatedAgenda-Presentation-RegionalIntegrationCaliforniaGreenhouseGasCompliance-TechnicalWorkshop.pdf

[2] The CAISO prepared a study for the GHG impact of EIM during the first 6 months of 2016. http://www.caiso.com/Documents/EIMGreenhouseGasCounter-FactualComparison-PreliminaryResults_Jan-Jun_2016_.pdf

[3] SCE has not identified any language within the regulation or the legislation creating AB32 which prohibits netting. In fact, the concept of netting is supported by the offset program within the Cap and Trade which allows entities to procure offsetting reductions of GHG outside of California as a method to meeting their GHG obligations.

in one interval helps offset an emission increase in other intervals in terms of the total emission increase over the time period. Therefore, intertemporal netting is a crucial part to resolving this issue in an economically and environmentally sound manner.[4] Option 1 should not be ruled out, and to the contrary, more stakeholder discussions should be held on this option if a solution is found necessary. Further, SCE is concerned that any proposal that does not incorporate intertemporal netting may not be just and reasonable.

As discussed below, there are material concerns with the other two options (Options 2& 3). For example, Option 3 may lead to market inefficiencies and increase costs for California ratepayers, while Option 2 can be challenging to implement.

1. **SCE believes the CAISO and ARB should further monitor and study the GHG impact related to secondary dispatch effects before it adopts any solution. Based on the study, the CAISO, ARB, and stakeholders can decide whether a solution is needed.**

While the CAISO did not explicitly list the option of "maintain the status quo until a study reveals otherwise", SCE believes this should be the preferred option for several reasons. First, there is lack of a full year of EIM data showing the size of the GHG impact due to secondary dispatch.[5] Without sufficient information regarding the magnitude of the concern, SCE is hesitant to contemplate solutions that have a potentially large electricity market impact. The solution and its impacts must be considered in concert with the impact of the cause. Second, once this information is available, it can be used to evaluate the effectiveness and the associated cost of different options. This will ensure a solution, if necessary, is effective while not over costly. Third, if the study shows the size of the GHG impact is extremely small, the option of addressing the issue outside the market may be the best option.

The CAISO has studied the GHG impact for the first half of 2016, showing that there is net emission reduction associated with secondary dispatch in the EIM. This data for the entire year or longer will provide a more complete assessment. The emission increase associated with secondary dispatch when California (CA) is importing can be small. From Jan-June 2016 in EIM on a gross basis (i.e. before netting exports from California), the impact was approximately 350 metric-ton/month[6], equivalent to $4,600/month with a $13/mton GHG price. As a reference, this cost is less than 0.1% of the bid cost recovery payment in 2015[7]. If the emission impact at this magnitude is consistently observed through an entire year or longer, it begs the question why fundamental changes to the

[4] SCE is not suggesting that the netting period would be so long as to incur significant increases for many years to be offset by some distant future reductions. Rather, patterns of energy use and renewable production would appear to make a netting period of a year appropriate for this purpose.
[5] As mentioned earlier, during the first 6 months of EIM, there have been net GHG reductions due to CA export of clean power.
[6] http://www.caiso.com/Documents/BOGBriefing_WesternEnergyImbalanceMarket-Presentation-Aug2016.pdf
[7] The Bid Cost Recovery payment in 2015 totaled $92million in 2015, or $7.6million/month on average.

market optimization, such as Options 2 & 3 proposed by the CAISO, are justified from the cost perspective, as opposed to simply addressing the issue outside the market.

Addressing emission impact outside the market can be more cost effective to CA ratepayers while potentially meeting the ARB's concern. This approach could significantly minimize cost impacts to CA ratepayers since the current price formation of the CAISO markets can be maintained and the price that CA load pays likely won't be impacted. This compares to Option 3, under which a residual emission rate (likely administrative nature) will be applied to energy transfers into CA and all generation/load inside CA through the formation of the marginal price whenever there is energy transferred into CA[8].

Hence, SCE urges the CAISO to first consider the option of maintaining the status quo until a more complete study suggests other actions are needed. Once the study is available, the CAISO, ARB, and stakeholders can evaluate whether a solution is needed. If a solution is indeed needed, depending on the magnitude of the issue being studied, it can be further evaluated whether the emission impact can be addressed outside the market to satisfy ARB's concern and minimize cost impact to CA ratepayers.

2. SCE believes that intertemporal netting should be part of any analysis or solution. A solution that does not consider intertemporal netting may not be just and reasonable.

As demonstrated in the recent CAISO study, the EIM has resulted in net emission reductions across its market footprint during the first six months of 2016. As far as the GHG emission production related to the EIM implementation is concerned, the benefit of the net emission reduction should be recognized and fully incorporated in developing a solution. A solution that does not consider intertemporal netting may not be just and reasonable, as it would not incorporate emission reductions across the market footprint resulting from the EIM optimization, and in turn could improperly disrupt economic EIM dispatch. Further, it would not reflect the benefit to the environment of EIM electricity market trading[9]. It can be expected that the reduction of emissions under exports of clean resources from California will become even larger as California moves towards achieving its 50% RPS requirements, and in turn, the net GHG reduction will improve over time.

3. Option 1 (address the issue outside the CAISO market) should *not* be out of consideration. To the contrary, more discussions should be held on this option or variations.

As mentioned above, it seems the main reason the CAISO suggests rejecting Option 1 is that the existing ARB Regulation may not recognize intertemporal benefits. However, this assumption may

[8] After adjusting the portion of LSE-contracted resources.
[9] See also Joint Utilities Group (JUG) comments to the CARB on the 2016 Proposed Cap-and-Trade Amendments, page 5, available at https://www.arb.ca.gov/lists/com-attach/69-capandtrade16-UjgAaV01Aj8KeFcI.pdf.

not be true. SCE has not been able to identify any legislative or regulatory prohibition against accounting for the emission reductions resulting from renewable exports. It is clear that AB32 requires ARB to account for the emissions associated with imported electricity, but that same section (Health and Safety Code 38530.b.2) makes no reference to the accounting of emission reductions across the WECC resulting from zero-emission exported electricity. When zero or low emission power is exported from California to serve demand outside of California it is almost always reducing fossil fuel generation that would have run to serve the same need. The global concentration of greenhouse gases is reduced by these exports, and given the total reduction in GHG in such an instance, the accounting framework should recognize such reductions just as it is proposed to recognize increases in emissions from secondary dispatch.

Accounting for emission reductions outside of California's jurisdictional boundaries is not a new or novel idea. In fact, the offset protocols created in the Cap-and-Trade program allow entities to take credit for their actions and investments that result in emission reductions that are not geographically bound to California. With CAISO data and a subsequent verification process, it should be possible to assess the environmental benefits that renewable exports deliver to the atmosphere and net those benefits against any potential emissions increase that may result from the 'secondary emissions' effect over an annual averaging period. This temporal netting would paint a more realistic picture of the benefits of renewable exports – and a more realistic picture of California's continued participation in regional energy markets and resulting GHG benefits.

When CA has excess energy due to high renewable power output and is exporting, the emissions associated with load in the EIM outside of CA can be reduced as emitting resources outside of CA can be dispatched down or turned off. This counteracts emissions when CA is importing. This benefit in emission reduction across the entire market footprint must be fully recognized and accounted for in developing a solution. SCE understands there are details under this option that may require more stakeholder discussions, and such discussions should be informed by additional study.

4. There are several concerns with Option 3 (residual emission rate approach), which can lead to market inefficiencies and have detrimental cost impacts to CA ratepayers. Option 2 (two-pass approach with economic base) has implementation and optimization challenges.

There are several significant concerns with Option 3. The residual emission rate can increase market clearing prices for both energy transferred into CA and energy transactions inside CA whenever there is any energy transferred into CA[10]. As a result, it will only **increase** the costs to load. The inclusion of GHG as a cost within the LMP prior to EIM provided incentives for external resources to become cleaner as the marginal cost of emissions would establish the market clearing price. If the resource had the potential to be out of the market based on emissions costs, then there was an incentive to become cleaner to ensure that they were dispatched. As a result, the

[10] See Footnote 7.

price formation provided necessary cost information as well as economic incentive for a resource to become cleaner. In contrast, simply adding an administratively set adder, the incentive to become cleaner is significantly reduced as resources outside of CA are competing with an administrative hurdle rather than against other resources for the right to generate.

This option also introduces a fundamental change to the marginal price concept, as the marginal price can now be based on an administrative, average rate. Such change will likely lead to market inefficiency. For example, external clean power may not be able to serve CA load because of the residual emission rate.

Because the residual emission rate can increase energy prices for transactions inside CA through the marginal price formation, it may create perverse incentives. When entities are importing power into CA, the residual emission rate would be applied, and then prices inside CA will increase. This provides incentives for generation within CA to "create" imports to increase prices. Thus a small quantity of energy imports can lead to significant revenue to generators located in CA and inappropriate costs to CA customers.

Option 3 also puts the CAISO in a potential commercial business of purchasing emission allowances, by itself or through a third party it designates. Putting the CAISO in GHG purchasing business will introduce material changes to how GHG obligation for the power sector is met today. SCE is not convinced that the CAISO should enter into market transactions of its own accord or through the use of a third party vendor. SCE is concerned with the CAISO taking on this new role. Procurement activity is best left to those with an economic interest in the outcome.

Regarding Option 2, the option would add significant computational complexity within the real-time market processes. Incremental changes in unit commitment between the two runs under Option 2 may partially defeat the purpose of comparing the dispatch results of the two runs. Incremental changes in unit commitment can occur simply because the objective function (optimizing the total cost of islands v. optimizing the combined footprint) and the transmission capacity (no energy transfer v. allowed energy transfer up to transfer limit) are quite different in the two runs.

Conclusion

As shown in a recent CAISO study, the EIM has resulted significant net GHG reduction across its market footprint in the six months from January to June, 2016. SCE expects this benefit of GHG reduction will continue, and for all of the reasons stated above, SCE believes that further research should be performed based on at least a complete year of EIM data. Once such information is known, the CAISO, ARB, and Stakeholders should then work together to determine if there is a significant leakage concern – after considering intertemporal netting – and if so, a more targeted and appropriate solution can be reached.