

**Comments of Powerex Corp. on
Regional Integration California Greenhouse Gas Compliance and EIM Greenhouse Gas
Enhancement Straw Proposal**

Submitted by	Company	Date Submitted
Mike Benn 604.891.6074	Powerex Corp.	December 15, 2016

Powerex appreciates the opportunity to submit comments on CAISO’s November 17, 2016 *Regional Integration California Greenhouse Gas Compliance and EIM Greenhouse Gas Enhancement Straw Proposal* (“Straw Proposal”).

Powerex believes that the Straw Proposal reflects extensive and dedicated effort by CAISO staff to address the significant unintended GHG-related outcomes under the initial EIM design. CAISO has worked extensively with stakeholders to explain the underlying issues, seek input on potential improvements, and build broad support for the proposed solution. Powerex also appreciates CAISO’s recognition that these issues are not merely “accounting” problems, but actually change the manner that the EIM dispatches out-of-state resources, determines prices in CAISO’s real-time markets, and assigns GHG reporting responsibility for EIM transfers serving load in California.

As explained more fully in these comments:

- Powerex strongly supports incorporating CAISO’s proposed “Option 2” approach into the EIM as soon as possible. Powerex believes Option 2 is the most promising of the approaches identified to date for assigning GHG reporting responsibility to individual resources in the EIM. However, as CAISO has recognized, Option 2 may still result in a small amount of residual GHG emissions “leakage.” Powerex thus suggests ongoing reporting to monitor any residual leakage as well as to initiate further enhancements if this leakage becomes material.
- Powerex believes that, short of a GHG framework applied to all generation sources across the region, Option 2 is also the most promising conceptual framework for application to a regional organized market. Important aspects of the design must still be adequately addressed, including appropriate limitations on which resources can be pre-designated as “California supply.”
- Powerex encourages CAISO to evaluate strategies for implementing Option 2 in the EIM as soon as possible, in order to minimize the time that the EIM continues to operate under the initial GHG algorithm. If implementation of Option 2 will not realistically occur in 2017, Powerex requests that CAISO, working with CARB, explore interim measures that can reduce some of the adverse impacts of the current GHG algorithm while imposing minimum burden on CAISO staff.

I. Powerex supports developing Option 2 for EIM implementation

CAISO's proposed "Option 2" will modify the EIM optimization to employ a two-pass approach. The first pass determines the dispatch of out-of-state resources under a scenario in which there are no EIM Transfers into California.¹ This first pass establishes the "GHG allocation base" output for each out-of-state resource, and represents the estimated output of external resources that serves load outside of California. The second pass is the binding market run, with California loads permitted to be served by EIM Transfers from external resources. Out-of-state resources that increase output in this second pass to a level greater than the "GHG allocation base" quantity are identified as the source of EIM Transfers into California.

Powerex strongly supports implementing Option 2 in the EIM as soon as possible. This approach would replace the current EIM design, under which EIM Transfers into California are simply "deemed" to be sourced from the out-of-state resources with the lowest GHG adders, without regard to whether those resources would have run anyway to serve load outside of California. As CAISO has recognized, the current "deeming" approach can significantly alter the dispatch of out-of-state resources, lead to different EIM prices, and lead to "leakage" by understating the GHG emissions associated with EIM Transfers into California.²

Powerex believes that, by modifying the EIM optimization as proposed under Option 2, these distortions will be largely eliminated. The two-pass framework provides an objective and sound basis for determining the GHG emissions associated with increasing the output of out-of-state resources in order to support EIM Transfers into California. This is necessary in order to ensure that EIM Transfers into California properly consider the GHG emissions associated with those transfers, to properly distinguish between out-of-state resources with different GHG emission rates, and to ensure accurate pricing of energy and GHG in the CAISO's real-time markets.

While fully supportive of implementing Option 2 in the EIM, Powerex is mindful of CAISO's recognition that a residual amount of GHG leakage could still occur.³ In particular, it is Powerex's understanding that there may still be specific scenarios in which the GHG emissions of EIM Transfers into California will be understated. For instance, the binding market run (*i.e.*, the second pass of the two-pass Option 2 approach) may result in:

- An increase in the output of out-of-state resources by 700 MW over the GHG allocation base;
- A decrease in the output of different out-of-state resources by 100 MW; and

¹ In these comments, the term "EIM Transfer into California" refers to energy that is imported into California and serves load in California as a result of EIM dispatch. This is distinct from energy that flows through California (*i.e.*, is imported into and simultaneously exported out of the state), but that serves load outside of the state.

² During the December 1, 2016 stakeholder meeting, CAISO staff provided examples demonstrating the different results that are obtained depending on the design of the EIM algorithm.

³ Straw Proposal at 15. ("Several approximations will be necessary to make this method workable. These approximations reduce the precision of the GHG allocation base. This can reduce the GHG accounting accuracy since the GHG attribution is incremental to a less precise baseline.")

- A decrease in the output of California resources by 600 MW, resulting in 600 MW of EIM Transfers into California.⁴

Under this scenario, GHG responsibility for 600 MW of EIM Transfers would need to be allocated to out-of-state resources. However, this scenario includes 700 MW of increased output from out-of-state resources. The EIM software will be required to decide which of these 700 MW of incremental output should be allocated to the 600 MW of EIM Transfers. Powerex understands that, under CAISO's proposal, the GHG responsibility would be allocated to the 600 MW of additional out-of-state output with the lowest GHG adder. In other words, the GHG emissions for EIM Transfers would be based on the emissions of the lowest-emitting resources that increase output relative to the first pass, as opposed to, say, the average emissions of all the resources that increase output relative to the first pass. Thus, even under Option 2, there will remain certain circumstances under which the EIM may understate the GHG emissions associated with EIM Transfers into California.

At this time, Powerex has no reason to believe that this residual GHG leakage will occur often or that it will be material, and does not propose that CAISO make any modifications to the Option 2 proposal to address this potential concern. Powerex does believe, however, that it is important for CAISO to develop metrics to track the accuracy of the GHG allocation once Option 2 is implemented, and to publish those metrics on a regular basis.

A potential GHG allocation accuracy metric would calculate the difference between:

1. The average GHG emission rate calculated over **all** out-of-state resources that increase output in the binding market run above the GHG allocation base levels (*i.e.*, the emissions rate of the entire 700 MW of incremental output in the example above); and
2. The average GHG emission rate calculated over just those out-of-state resources actually allocated GHG responsibility for EIM Transfers into California (*i.e.*, the emission rate of just the 600 MW of out-of-state resources allocated responsibility for EIM Transfers into California).

In all intervals that the incremental out-of-state production in the binding market run is exactly equal to the quantity of EIM Transfers into California, the difference between items 1 and 2, above, will be zero. The difference will also be zero if there is no difference between the GHG emissions rates of the out-of-state resources that increase output in the binding market run. If, however, incremental out-of-state output is frequently significantly larger than the volume of EIM Transfers, and if this incremental output is from resources with a wide range of GHG emissions rates, then the potential for understating the GHG emissions of EIM Transfers into California will be significant.

Powerex is hopeful that such reporting will simply confirm that the implementation of Option 2 has, indeed, reduced GHG leakage in the EIM to *de minimis* levels. But even if it does not,

⁴ Such a situation might arise if there are transmission constraints that bind in the first pass, but do not bind under the solution in the second pass (or vice versa). The potential for such scenarios is also likely to increase as simplifications are made to make the first pass computationally feasible within the EIM timeframe, though they are possible even if no such simplifications are employed.

timely reporting will provide a valuable trigger for CAISO and CARB to consider additional steps or improvements that may be necessary.

II. Option 2 also provides a promising framework for a regional market, pending resolution of key details

Powerex believes that Option 2 is also the most promising conceptual framework for identifying out-of-state resources serving California load in a regional organized market. Powerex notes, however, that Option 2 still requires CAISO to associate specific resources with specific loads—which has proven to be a complex and challenging task—making it a “second best” approach to GHG compliance in an organized market. Indeed, one of the advantages of centralized organized markets is the elimination of the need to establish a “link” between specific sources of generation and specific loads. Thus, the most robust approach to ensuring that GHG costs are accurately incorporated in a regional market would be for *all* generation to be subject to GHG regulations at the source, since GHG costs would then be included in the cost of output from every resource, regardless of how that output is used. Such an approach would eliminate the challenges associated with CAISO attempting to link specific sources of generation to specific loads, and applying (or not applying) GHG costs depending on those links.

As a practical matter, it does not currently appear that widespread adoption of GHG regulations at the source is likely to occur across all states that might be included in a western regional organized market footprint. Consequently, development of a regional market must be explored under a construct that attempts to identify the generation sources that serve loads in states that have implemented GHG regulation. In this regard, Powerex believes that the conceptual framework that underpins Option 2 is the most promising approach identified to date.

Powerex believes it is important to recognize, however, that the treatment of GHG emissions in a day-ahead regional organized market is significantly more vulnerable to unintended consequences than in the EIM, and hence warrants a higher level of care and testing. Since inaccurate GHG treatment affect transfers into California (but generally does not distort transfers out of California) the potential consequences will be higher in markets with greater quantities of transfers into California. Transfers into California are currently—and will likely continue to be—many times greater in the day-ahead market than they are in the EIM, implying that the consequences of “getting it wrong” will be much higher in a day-ahead regional market.⁵

For these reasons, Powerex supports CAISO exploring a regional market design based on the Option 2 framework for GHG compliance, but believes that this design requires very careful consideration, testing, and post-implementation reporting to ensure it works as intended.

Powerex also believes that greater stakeholder discussion is needed regarding the pre-designation of out-of-state resources as “California supply.” Out-of-state resources pre-

⁵ For example, CAISO reports that, for the period January to June 2016, EIM Transfers into California averaged 125 GWh per month. For the same time period, CAISO reports that total day-ahead imports averaged nearly 6,000 GWh per month. (EIM Transfer data from http://www.caiso.com/Documents/MonthlyEIM_Transfer_ISO_Imbalances_MWh.xlsx; day-ahead import data from http://www.caiso.com/Documents/Monthly_ISO_Imports.xlsx.)

designated as “California supply” under the CAISO’s proposal would effectively avoid the two-pass framework for determining which specific external resources support transfers into California. Under the two-pass framework, an out-of-state resource is regarded as serving California load only to the extent that it would not have run anyway, absent transfers to California. Stated differently, the output from an out-of-state resource that is dispatched in the first pass is regarded as serving load outside of California, not inside of California. This economic test under the two-pass framework is bypassed, however, for out-of-state resources pre-designated as “California supply,” since output from resources with that designation is always regarded as serving California load.

Powerex agrees that the concept of pre-designating certain resources as “California supply” is necessary. For example, if California ratepayers have funded the construction of a new resource located outside the state—either to meet the renewable portfolio standard (“RPS”) or to provide resource adequacy—it is entirely appropriate to pre-designate that the output of such a resource does, indeed, serve California load, even if the same resource would also be economic to serve load outside of California. In fact, doing otherwise may effectively prevent California consumers from realizing the benefits of investing in low- or zero-GHG resources outside of the state, which would be inequitable as well as inefficient.

But Powerex also believes that clear rules governing which out-of-state resources may be pre-designated as “California supply” are critically important, otherwise such pre-designation could potentially be used in a manner that undermines the framework intended to ensure that California loads are not “deemed” to be served from out-of-state resources that would have existed and run anyway to serve load outside of California. For instance, a resource that sells its output to a California LSE under a day-ahead bilateral contract may be a resource that would have existed and run regardless of where or to whom it sold its output in the short-term markets. This is particularly true for renewable resources that generally have low variable operating costs and no ability to “store” their fuel. Providing broad discretion to pre-designate out-of-state resources as “California supply” could re-create the same problems that the current stakeholder process is attempting to address, which is the inaccurate and arbitrary deeming of the lowest-emitting out-of-state resources as serving California loads.

Powerex believes that the pre-designation of “California supply” needs to be available only in narrow circumstances, set out in objective criteria, and verified through documentation. It should not be a subjective pre-designation made at the discretion of a California LSE. Powerex suggests that a workable approach would be to permit out-of-state resources to be pre-designated as “California supply” if they have entered into a contract, of at least one month in duration, to provide either RPS or resource adequacy services from that resource. This criterion provides ample opportunity for California ratepayers to receive the benefit of out-of-state resources in which they have made a material investment, while protecting the integrity of the two-pass Option 2 framework for identifying out-of-state production that serves loads in California.

III. Accelerated EIM implementation of Option 2 and an interim “bridge” solution should be explored to minimize the impact of the current GHG algorithm in the EIM

As stated above, Powerex is highly supportive of CAISO’s Option 2 proposal to apply a two-pass framework to identify the out-of-state resources that are dispatched to serve California loads in the EIM. Powerex is optimistic that, once implemented, the concerns expressed about the performance of the initial EIM algorithm will be fully addressed. CAISO has stated that such implementation may not happen before 2018, however.⁶ Powerex believes it would not be appropriate to continue to apply the current EIM algorithm for such an extended period. Powerex therefore urges CAISO to explore alternatives to accelerate implementation of Option 2 in the EIM as much as possible, consistent with appropriate testing and verification of operational readiness. This will minimize the amount of time that the EIM will continue to operate under the existing design for GHG compliance.

If Option 2 cannot feasibly be implemented prior to 2018, then Powerex concurs with CAISO’s assessment that a “bridge” solution may be necessary in the interim.⁷ Powerex believes it is possible to identify a potential bridge solution that is both simple to implement—preserving CAISO resources to pursue implementation of Option 2—and that at least partially addresses the concerns raised about the current EIM algorithm. Powerex therefore requests that CAISO provide an update on the potential implementation timeline for Option 2 and on the need for—and the potential design of—a bridge solution.

⁶ CAISO December 1, 2016 stakeholder presentation, at 21. Available at http://www.caiso.com/Documents/Agenda-Presentation-RegionalIntegration-EIMGreenhouseGasCompliance-Dec1_2016.pdf.

⁷ CAISO Straw Proposal at 10. (“[S]ince it will take the ISO sometime to develop and implement option 2, there will likely be the need for a bridge solution to fully account for EIM GHG emissions until it is implemented.”)