Company	**Date**	**Submitted By**
AWEA	-	-

Comments:

Education and Outreach, Including Baseline Education on California's Existing GHG Program

AWEA and Interwest appreciate the ISO's outreach and education efforts in the *Regional Integration: California GHG Compliance Stakeholder Initiative* ("the initiative") and other regional integration initiatives. However, it is important to note that not all stakeholders in the West have been deeply involved in the California Air Resource Board's (CARB) GHG compliance program and/or developments in the Energy Imbalance Market (EIM). Therefore, AWEA and Interwest feel it would be valuable if the ISO would provide additional context and background in its presentations and publications to aid fulsome stakeholder understanding of the key components this initiative.

In particular, entities in the PacifiCorp states tend to be far less familiar with the details of CARB's program. These entities must develop a foundational understanding of CARB's GHG program in order to understand and participate effectively this initiative and to gain confidence that they can understand how the ISO's ultimate proposals will impact their interests. It is critical for all stakeholders to comprehend how both the ISO and the EIM treat associated GHG costs, in order to understand what may need to be changed to successfully implement GHG associated costs into a regional market, without imposing GHG costs on states that do not have carbon reduction programs and without creating a situation that violates CARB's rules by not fully accounting for atmospheric impacts associated with electricity used to serve California's needs.

AWEA and Interwest believe that facilitating solid stakeholder understanding of these key concepts will yield insightful comments and increased stakeholder engagement and, ultimately, increase support for the proposed approach to GHG compliance. To accomplish this level of understanding, AWEA and Interwest recommend that the ISO consider jointly hosting a public workshop with CARB to describe how the current cap-and-trade program works and how the GHG adder functions in the EIM, including the issues that have been identified within the EIM framework. Additionally, in future stakeholder meetings, the ISO needs to be prepared to provide more background and context for all stakeholders interested in this initiative while understanding that a number of stakeholders have little or no experience with CARB's rules and regulations on GHG emissions.

ISO Response

The ISO provides additional documentation regarding the GHG market design in the EIM Business Practice Manual. See sections 11.3.3.1 and 11.3.3.2. In addition, the ISO will be reviewing the examples in the business practice manual at the upcoming stakeholder meeting on October 13, 2016.

Comments:

Revisiting the Stakeholder Engagement Approach for Regional Initiatives

AWEA and Interwest understand the typical CAISO stakeholder process, under which CAISO staff is responsible for developing proposals, with input received through stakeholder comments. However, AWEA and Interwest question whether this traditional ISO approach is the most efficient and effective method for key regional integration initiatives, such as this initiative, which have potentially broad reaching impacts across the region process for regional integration initiatives. Specifically, AWEA and

Interwest recommend creating small teams, with diverse backgrounds and regional perspectives, to help develop solutions and proposals in this stakeholder initiative, and in other regional integration initiatives. Under this approach, designated small teams would work in concert with the ISO staff in developing proposals put forward in the regional initiative stakeholder processes. The small teams could especially help in sorting through foundational issues by helping to create pros and cons lists for various options, which could be presented to all stakeholders.

AWEA and Interwest believe that creating small, diverse groups of stakeholders (similar to the Transitional Committee contemplated for regional governance) to work hand in hand with ISO staff on key issues could offer a number of benefits. Small teams, composed of various experts and/or stakeholders in the West, would promote broader engagement throughout the region and help create a sense of ownership of the ultimate proposal among a wider group of stakeholders. Moreover, AWEA and Interwest feel that utilizing the talents and diversity of a small team would encourage creative problem-solving and foster greater regional collaboration. Without significant, active input from stakeholder across the West, there is a higher chance that the ultimate proposals resulting from the regional integration initiatives will be opposed by a large number of stakeholders.

ISO Response

The ISO does not believe that stakeholder led committees or small teams are the most efficient approach to develop proposal to address all policy matters. For policy related issues involving highly technical market design, the ISO must consider
the implementation realities for any propose change. The ISO strives to keep stakeholders informed of design limitations associated with any policy development.

Comments:

Transparency

AWEA and Interwest appreciate the ISO's desire to engage stakeholders and encourage transparency with respect to GHG tracking and accounting. As mentioned in the Issue Paper, "As more trading models are supported, the complexity will increase and transparency will decrease, which is very likely to lead to a less-efficient achievement of carbon reduction goals." Transparency is an essential component in strengthening regional collaboration and garnering wide support for the ultimate GHG compliance proposal. AWEA and Interwest urge the ISO to take the necessary steps to maintain a level of transparency that facilitates broad stakeholder understanding and participation.

ISO Response

The ISO will strive to ensure its stakeholder process and market design remains transparent. If multiple states develop stand-alone GHG tracking and accounting approaches that need to be accurately reflected in the ISO's market optimization, this fact will add complexity to the ISO's market design and would decrease the transparency for market participants to understand and validate the dispatch and settlement of their resources and loads.

Comments:

Prevention of Double Counting

AWEA and Interwest encourage the ISO to evaluate, as it develops future proposals in this initiative, whether those proposals would potentially allow any double-counting of renewable energy used to

achieve GHG reductions. AWEA and Interwest hope the ISO will continue to work to ensure that there is not double counting of renewable generation.

ISO Response

The ISO agrees that double counting must be avoided.

Comments:

Compatibility Across States

AWEA and Interwest feel it is important for the ISO to ensure that the ultimate solution is compatible with different carbon pricing programs that may exist under the Clean Power Plan. The ultimate GHG compliance solution should also be compatible with other states' individual existing or contemplated GHG reduction programs. The GHG compliance solution should ensure that individual state GHG reduction programs and goals are not diminished and that states can continue to comply with their own GHG programs, however they are designed. Moreover, AWEA and Interwest feel it is vital to ensure that costs are not imposed on states that lack carbon reduction programs. AWEA and Interwest believe it is critical to guarantee the GHG compliance mechanism is compatible with other states' unique approaches to help ensure that the interests of states outside of California would be preserved in an expanded ISO.

ISO Response

The ISO believes that developing the ability to track energy flows between each state in a multi-state balancing authority is necessary to support multiple carbon pricing programs.

Comments:

In-Depth Examples and (where appropriate) Production Cost Modeling Analysis

In implementing the CARB GHG compliance requirements across a regional footprint, the ISO is facing a unique challenge which, to AWEA and Interwest's knowledge, has never been addressed in other ISOs or RTOs. The ISO is faced with the challenge of implementing GHG prices on some generation and some imports, but not others, and creating a framework which will allow multiple GHG prices, which may be implemented under the Clean Power Plan, to be considered. This is different than other ISOs/RTOs which have generally implemented a single GHG compliance program (with a uniform GHG price) within their boundaries (e.g. PJM).

Due to the unique nature of this problem, it will be critical to test the proposed solution, create in-depth examples and try to best understand any potential consequences prior to enabling the solution in a functional regional market. Therefore, as potential GHG compliance solutions are developed, AWEA and Interwest encourage the ISO to consider running production cost modeling scenarios to better understand how various solutions might interact with the market. AWEA and Interwest feel it will be important for the ISO to clearly demonstrate to stakeholders that the implementation of the proposed solution will not result in resource shuffling, leakage, unintended consequences, or perverse economic incentives. AWEA and Interwest believe that the development of modeling and examples will be critical to the success of this initiative and encourages the ISO to take the necessary steps to develop such models and examples.

ISO Response

The ISO performs robust market simulation as part of its standard product development lifecycle. The ISO includes examples of issues that are being addressed is discussions in the stakeholder process,

and there are opportunities for stakeholders to observe outcomes of market simulation in the later stages that lead to implementation.

Company	Date	Submitted By
Bonneville Power Administration	9/19/19	Mark Gendron

Comments:

BPA appreciates that ARB and CAISO are proposing to address the issue of emissions leakage resulting from the CAISO EIM cost optimization algorithm. BPA supports the accurate reporting of greenhouse gases and recognizes that the EIM algorithm likely needs to be reviewed and improved to better differentiate base schedules from incremental EIM dispatch signals and compliance obligations. Given the complexities of the leakage issue, BPA recommends that the ARB and CAISO jointly develop a long-term solution that will resolve the flaws already identified by the CAISO and ARB in the EIM algorithm, with the goal being to accurately assign GHG compliance to EIM participants and equitably treat the GHG compliance obligation between the EIM and CAISO market participants. A single coordinated process to further explore the issue with a unified statement of the problem can better assure that the ISO is properly solving ARB's concerns in a manner that the ISO is able to timely implement.

BPA understands that such a process will take some time and that in the meantime it might be desirable for ARB to implement a short-term fix. Such an interim solution could include all EIM designated imports being assigned the Unspecified carbon emissions rate.

Lastly, BPA urges the ARB to ensure consistent and equitable treatment of electricity imported into California across all electricity markets. This should include the continued application of the Safe Harbor provision to all short-term transactions, including EIM dispatch and algorithmic GHG compliance obligations.

ISO Response

The ISO is continuing to work closely with CARB through their regulatory process.

Company	Date	Submitted By
Carnegie Science	9/20/16	Danny Cullenward

Comments:

1. **Successful CAISO regionalization depends on California developing a legally robust post-2020 carbon pricing policy.**

As discussed in the Issue Paper, CAISO regionalization implicitly assumes that California's carbon market will continue to exist and therefore produce a carbon price signal that can be used in economic dispatch algorithms—*e.g.*, as is done in the CAISO Energy Imbalance Market (EIM) GHG

Bid Adder.[2]

My concern is that in the absence of a legally robust basis for post-2020 carbon pricing in California state law, CAISO regionalization could work at cross purposes with California's climate strategy. Accordingly, I respectfully urge the CAISO stakeholder community to carefully examine the prospects for post-2020 carbon pricing under California state law.

As most stakeholders are likely aware, the California Air Resources Board (CARB) has formally proposed extending the cap-and-trade program through 2030, with interim targets all the way through 2050. Such a program would very likely produce carbon prices that are sufficient to accomplish California's climate goals while simultaneously enabling a regional wholesale market operator to integrate state-level carbon pricing into its economic dispatch algorithm.

However, CARB's proposed cap-and-trade regulation does not confront a very serious legal problem: that CARB may not actually have the necessary statutory authority to proceed with a post-2020 cap-and-trade program at this time. Notably, CARB's proposal does not discuss how the original provision of AB 32 that authorized the cap-and-trade program appears to be time-limited. Section 38562(c) states:

> In furtherance of achieving the statewide greenhouse gas emissions limit, by January 1, 2011, the state board may adopt a regulation that establishes a system of market-based declining annual aggregate emission limits for sources or categories of sources that emit greenhouse gas emissions, **applicable from January 1, 2012, to December 31, 2020, inclusive,** that the state board determines will achieve the maximum technologically feasible and cost-effective
> reductions in greenhouse gas emissions, in the aggregate, from those sources or categories of sources. [Emphasis added.]

As my colleague Michael Wara and I detail in a comment letter submitted yesterday to CARB, a reviewing court would most likely conclude that this provision forecloses any argument that CARB is authorized to continue cap-and-trade in the post-2020 period.

These concerns persist despite some very positive climate policy developments in California. State lawmakers have recently established strong post-2020 climate targets via SB 32, which Governor Brown recently signed into law. SB 32 sets a target of reducing statewide greenhouse gas emissions to 40% below their 2020 levels by 2030.

Although SB 32 is a critical milestone in state climate policy, it likely cannot be used to authorize post-2020 cap-and-trade because it passed by only a simple legislative majority. Under the provisions of Proposition 26, which are codified in the California Constitution, a 2/3 legislative supermajority is now required for "any change in statute" that raises taxes. For the purposes of analyzing Proposition 26's requirements, a "tax" is broadly defined as "any levy, charge, or exaction of any kind imposed by the State." The current cap-and-trade program includes the periodic auction of government-owned allowances, which raise revenue for the state and therefore almost certainly constitute a "tax" for the purposes of Proposition 26. Since the current cap-and-trade system appears to be a "tax" under Proposition 26, and because SB 32 passed by only a simple majority, SB 32 likely cannot extend the cap-and-trade program.

Unfortunately, Proposition 26 makes it more difficult for the Legislature to authorize market-based climate policies—whether in the form of carbon taxes/fees or cap-and-trade. As SB 32 illustrates, however, a simple legislative majority can authorize ARB to regulate its way toward a climate target. Yet without a post-2020 carbon price, it is difficult to imagine a regional wholesale electricity market design that is consistent with California's climate goals.

In the future, CAISO regionalization discussions may wish to explicitly consider a range of post-2020 carbon pricing options in California. Based on my understanding of the CAISO EIM and FERC's approval of the EIM Tariff, it would appear that the form of a state-based carbon price is not particularly important—such that the EIM and further regionalization could function whether California law provides for an economy-wide cap- and-trade system, a carbon tax/fee, or even some sort of electricity sector- specific carbon price. Critically, there must be a legally robust basis for long-term carbon pricing.

The good news is that both the Governor's office and key Legislative leaders have publicly announced their intention to revisit ARB's post-2020 authority to use market-based measures in the 2017 legislative session—or, if necessary, at the ballot box via future propositions.

Meanwhile, I urge CAISO and other stakeholders to independently assess

(1) whether they believe ARB has the authority to proceed with cap-and- trade after 2020, and (2) if not, what would be required to establish authority to impose a post-2020 carbon price within the constraints of Proposition 26.

ISO Response

The ISO appreciates your comments and continued participation in this stakeholder initiative. The ISO intends for the proposals resulting from this stakeholder process to be applicable in a variety of regulatory structures that may be adopted in other states, and this necessarily results in flexibility that may be needed as California's GHG policies evolve.

Comments:

2. The legal and policy risks of regionalization will vary on the basis of critical market design details, and therefore future stakeholder discussions would benefit from more specific proposals.

As the CAISO Issue Paper observes, there has been some controversy as to the net greenhouse gas emissions impact of electricity dispatches in the EIM.[10] CARB has expressed concern that so-called "secondary dispatch" that "backfills" relatively clean EIM deliveries to California is causing in emissions leakage in the state's cap-and-trade market. In turn, CARB has proposed a number of adjustments to the calculation of imported electricity for the purposes of cap-and-trade program compliance and proposed eliminating the safe harbor exemption to the prohibition on resource shuffling that current applies to the EIM. In response, CAISO has proposed calculating net greenhouse gas emissions benefits when excess renewable generation from California is exported to and replaces CO_2-emitting generation in neighboring states.

Reconciling these concerns will take hard work, so I am grateful for the cooperation CARB and CAISO have both pledged. But these cross-border emissions accounting issues also highlight the

need for CAISO to develop specific regionalization proposals that include sufficient detail to evaluate the legal and policy risks with which they are associated. Indeed, as CAISO recognizes in the Issue Paper, each option for managing leakage in a regional market "has legal/regulatory risk and market inefficiency impacts that need careful evaluation." Without further detail on what these options are, as well as how they would interact with a regional ISO governance structure, it is difficult for other stakeholders to assess the spectrum of legal and policy risks.

A key overarching question is whether CAISO views regionalization as taking the basic form of the EIM market, which I refer to as a "two- bucket" system: there is a market that is subject to California's cap-and- trade system (current-day CAISO territory), and there is a market outside of California that is not. Under this model, and subject to the FERC- approved EIM Tariff, participating EIM resources elect via their bids whether or not they would be willing to be dispatched to the California market, and therefore make their power deliveries subject to the cap-and- trade program's compliance obligations.

In contrast to the two-bucket system, there is the standard ISO/RTO market design—a "one-bucket" system in which the market operator dispatches resources within its territory without concern for variation across participating states' climate policies (or lack thereof). This kind of system may have additional economic efficiencies (leaving aside the external costs of greenhouse gas pollution), but comes at the cost of not being able to accommodate substantive differences between states on climate policy.

I hesitate to characterize the CAISO Issue Paper as favoring one model over another; however, in Section 6, the Issue Paper assumes "for discussion purposes" that the EIM market's two-bucket model is preferred. Additional clarification from CAISO would be welcome.

If stakeholders wish to pursue a one-bucket system, it would be particularly helpful to describe how a regional governance system might operate in light of the divergent views on climate policy across western states. Presumably a one-bucket system would require a carbon price that applies equally to all participating resources; but because this might also require all participating jurisdictions to agree to such a price, it may be more politically plausible to pursue the two-bucket model.

In either case, it will be necessary to quantitatively model—with significant geographic and temporal detail—how the likely dispatch of regional generation would affect (1) region-wide CO_2 emissions as well as (2) CO_2 emissions from power deemed, under regional market rules, to be delivered to California. While such analysis should be technically feasible using CAISO data, the critical analytical variables depend on the specific market structure concepts under discussion.

ISO Response

The ISO stakeholder process will develop additional market design details during the straw proposal phase. The purpose of the issue paper is to identify the policy issues that must be addressed such as the need to address multiple carbon program in the market optimization. The discussion of the EIM design was to highlight an existing approach that isolates the California carbon program to load within CAISO. The ISO does believe a similar approach could be scaled to additional programs; however, this will greatly increase the complexity of the market design.

Comments:

Finally, I would like to highlight the need for additional analysis regarding the legal risks that may accompany different forms of regionalization. I note that Professors Ann Carlson of UCLA and William Boyd of the University of Colorado have analyzed some of these issues in a recent study commissioned by CAISO. They find that an assessment of the legal risks is "straightforward"—and specifically, that"

> [I]nclusion of PacifiCorp assets in CAISO … would not alter the constitutionality of California's environmental and clean energy laws under the Commerce Clause of the United States Constitution because the policies are already subject to Commerce Clause scrutiny.

With respect to Professors Carlson and Boyd, I believe this conclusion is premature. Without a tangible regional market design to analyze—and perhaps most critically, one that includes a specified interaction between the wholesale market design and California's greenhouse gas accounting system—the constitutional risks under the dormant Commerce Clause are particularly difficult to anticipate. Simply put, to the extent California's energy and climate laws have been subject to Commerce Clause scrutiny, that scrutiny could take new forms in a regional market.

These concerns apply even though California enjoys a strong precedent from the Ninth Circuit Court of Appeals, which has previously recognized the state's right to even-handedly apply a domestic carbon price to imported energy (as Professors Carlson and Boyd observe) Specifically, the nuances of a regional electricity market where dispatch algorithms automatically assign least-cost outcomes reflecting differences in carbon prices across participating jurisdictions calls for deeper analysis. By design, these kinds of dispatch algorithms preferentially assign low-carbon resources to jurisdictions that price carbon, and high-carbon resources to jurisdictions that do not. It is even possible that jurisdictions with low- carbon generation assets could preferentially export these resources to California and replace them with higher-carbon alternatives for domestic consumption, further complicating the task of accounting for the net emissions associated with imports into California.

Should it become necessary to adjust the emissions profile of deemed deliveries into California to account for the "secondary dispatch" leakage concerns CARB has raised, such a response could raise new dormant commerce clause concerns. Similar concerns may arise if policymakers decide to prohibit certain kinds of cross-border transactions to avoid these kinds of impacts. In both cases, the form of California's efforts to account for interstate activity could potentially edge closer to impermissible extraterritorial regulation under the dormant Commerce Clause —though of course the analysis depends on the details.

None of this is to prejudge the merits of regionalization or to advise against one particular model or another. Rather, it is a call for more information to better evaluate the policy options—precisely because the details matter.

ISO Response

The ISO appreciates your comments and continued participation in this stakeholder initiative.

Company	Date	Submitted By
CMUA	-	Tony Braun

Comments:

CMUA submits the following guideposts for consideration

The Market Should Incentivize Behavior. The market design should incent appropriate market participant behavior, not simply attribute costs. Similar to the views expressed by CMUA in discussions on the proposed Air Resources Board regulations on Energy Imbalance Market carbon cost attribution, simply creating an obligation without a means to modify behavior to reduce emissions does little to achieve policy objectives, namely reduce carbon emissions. One such example of potential market distortion is allowing the ISO market to cover the cost of compliance obligations via an uplift collected from California ISO load to address leakage concerns due to the so-called "secondary dispatch." CMUA's concern is that uplift payments can adversely affect market outcomes, undermine the effectiveness of price signals and potentially reduce market efficiency. CMUA would urge the CAISO to prioritize possible market design solutions that incorporate carbon costs into the optimization which would affect dispatch decisions through market participant bidding.

ISO Response

The ISO believes that significant uplift to address the "secondary dispatch" would be unwanted, but the magnitude of the potential uplift must be balance against implementation complexity and cost or including the market optimization. That being said, the ISO does agree that to extent possible the cost of complying with a carbon program should be reflected in the market optimization.

Comments:

Unhedged Cost Exposure. Any design should be cognizant of new cost exposure for smaller entities, some of whom may not be covered entities under ARB rules. The design should also not create exposure that cannot be hedged or otherwise mitigated due to the fact that the source of the cost exposure is largely outside of the entities' control.

ISO Response

The ISO agrees that reflecting the GHG compliance cost in the market optimization allows the cost exposure hedged by existing approaches to manage exposure to spot market energy prices.

Comments:

Market Power. Design solutions should recognize that in certain regions or Load Aggregation Points there will be a high degree of concentration of generation. While not fully articulated yet, CMUA is concerned that overly complex bidding and default pricing rules, coupled by the high degree of generation concentration in certain regions, will leave the design vulnerable to strategic behavior. Any process for developing rules as part of this initiative should include thorough vetting with the Department of Market Monitoring and the Market Surveillance Committee.

ISO Response

The ISO agrees with the need to balance complexity of the market design with the efficiency gains for doing so through the market optimization.

Comments:
Economic Impacts on Generation. CMUA is concerned that disparate rules for resources in a single optimization will discriminate against California-based resources and contributed to reduced market revenues for those resources. Policy should encourage the substitution of the relatively clean California thermal fleet for higher emitting resources in other portions of the West. That may include new rules that could modify carbon obligations for California resources that are serving out of state load. This critical issue must be addressed head on in policy development.
ISO Response
The ISO seeks to have comparable treatment for resources located within California and outside California while recognizing the California generation does have a GHG compliance obligation and generation outside of California has a GHG compliance obligation when serving California load, but generation outside of California does not have a GHG compliance obligation with CARB when serving non-California, however, it may be subject to another state's carbon program.
Comments:
The Issue Paper at 11 states that "The market optimization will attribute which internal resources of the multi-state balancing authority area and imports to the entire footprint that serve California load." CMUA requests a full narrative and mathematical explanation of how the optimization software will attribute generation dispatch to particular imbalances within a single optimization.
ISO Response
The ISO will develop this material in the straw proposal phase of the stakeholder initiative.

Company	**Date**	**Submitted By**
CPUC	9/20/16	Amy Mesrobian, Meredith Younghein, Maria Sotero
Comments:		
As we understand it, the goal for this initiative is for the CAISO market to reflect the costs associated with compliance with the California Cap-and-Trade Program in energy prices under a fully integrated regional energy market. CAISO aims to determine how costs to comply with California's Cap-and-Trade Program will be treated in the expanded regional integrated forward market (IFM). The energy imbalance market currently has a methodology that enables generation resources to include GHG compliance costs in their offers to supply California load. Similar provisions must be developed for the IFM to address GHG compliance costs for new participating transmission owners outside of California. CPUC Staff observe however, that before a treatment for costs can be determined, fundamental issues related to GHG accounting must be discussed and resolved, both through the California Air Resources Board's (CARB's) regulatory process and through a CAISO initiative. This Issue Paper focuses much more on cost treatment in bid formation than it does on discussing issues related to the calculation of actual GHG emissions and how they would be attributed to energy delivered into California under a fully integrated regional market.		

The Issue Paper states that CAISO will build on the methodology developed for GHG accounting and costs in the EIM as the basis for a method for the IFM. At a high level, that method currently calculates the GHG compliance obligation as follows:

- Point of regulation is the EIM Participating Resource Scheduling Coordinator.
- Imported electricity is defined to include dispatches designated by the CAISO's optimization model as electricity imported to serve retail customers' load located in the state of California.
- Currently being reported as "specified power" from participating resources identified by model.

However, as we discuss below, there are unresolved issues with this method, and until those are resolved, it does not seem that the current method should be under consideration as the base to build upon for a fully integrated regional market GHG mechanism.

CARB is in the process of developing amendments to the Cap-and-Trade Regulation and the Mandatory Reporting Regulation. As part of this rulemaking process, CARB staff have discussed treatment of EIM imports in the Cap-and-Trade Program, and bringing the GHG accounting for imports from the EIM into alignment with CARB's GHG accounting policy under Cap-and-Trade. This implies that until CARB's rulemaking process is completed, CARB will consider the current EIM practices to be mis-aligned with EIM GHG accounting. CPUC staff are aware of two concerns that CARB Staff has expressed in presentations and Staff Reports: one that emissions may not be accurately attributed to imports because the EIM does not allow for attribution to specific generation units, and two, that there may be secondary GHG emissions impacts from "secondary dispatch" effects. We explain each of these in more detail below, based on our understanding of them.

ISO Response

This initiative will develop an approach that will support all state carbon programs within the new multi-state balancing authority area. Since currently only California has a carbon program, the paper discussed how this was managed as part of the Energy Imbalance Market design.

The ISO is working with CARB to address their concerns regarding "secondary dispatch" that can occur in some intervals of the EIM. The current EIM design does attribute to specific generation resources outside CAISO when there is an EIM transfer into the CAISO.

Comments:

Accuracy of Emissions Attribution

As explained in CARB's July 19, 2016 Staff Report on Proposed Amendments to the Mandatory Reporting Regulation,3 there are multiple aspects of current EIM emissions accounting that CARB Staff think need to be changed. First, CARB Staff proposes that "delivered electricity must be disaggregated by generation source when known" (p. 39) and that "unspecified imports must be reported by generation source, or first point of receipt if generation source is unknown"(p.41). CARB Staff also summarize broader concerns with EIM accounting: "in some cases, the difference between the actual metered versus tagged or EIM model (MWh) amounts can be significant. Such inaccuracies do not allow for accurate GHG accounting. Significant discrepancies have resulted . . ."(p.44).

CPUC Staff observes that these concerns seem equally relevant to a full regional market

optimization, and therefore suggests that they receive further discussion and resolution before CAISO uses the EIM method as a basis for GHG accounting under regional integration. This may require delaying this initiative until they are resolved.

ISO Response

Individual generators located within the EIM footprint do not submit individual tags if the resource is dispatch and an EIM transfer occurs between balancing authority areas in the EIM footprint. Only the aggregated energy transfers between balancing authority areas are tagged in order to comply with WECC energy accounting procedures. In the event that there is an EIM transfer into the ISO, the market optimization identifies via resource GHG bid adders which resource to attribute as supporting EIM transfer.

Comments:

Secondary Dispatch

Another issue raised by CARB, but not yet addressed through its current Staff Proposal, is the issue of so-called secondary dispatch. CAISO presented on this issue at CARB's June 24, 2016 workshop. CARB is concerned that "EIM optimization results may not in all cases report the full GHG emissions burden experienced by the atmosphere as a consequence of electricity consumed in CA," because the EIM does not capture the emissions that may result when another generator adjusts its output to serve load outside California. CARB suggests that perhaps this increase in emissions should be attributable in some way to the EIM dispatch of energy into California. As CAISO summarized in its presentation, "least cost dispatch can have effect of sending low emitting resources to CAISO, while not accounting for secondary dispatch of other resource to serve external demand." It seems that full regional integration would only expand the potential scope of these secondary effects, and therefore these concerns might be even more prevalent.

The Issue Paper focuses mostly on how the marginal GHG compliance cost could be calculated for regionalization but we believe a more robust discussion is necessary regarding how GHG emissions would be attributed to dispatches in an IFM, especially on the issues that are still unresolved from the EIM stakeholder processes.

ISO Response

The ISO continues to work with CARB to address their concerns regarding "secondary dispatch". Any market design changes necessary to assist CARB will also consider the scalability to a multi-state balancing authority area. The current "secondary dispatch" can be observed because the imbalance energy is relative to either the day-ahead schedule or hourly base schedule. In the IFM, the total settlement is from zero so there is no forward schedule to compare to which is needed to observe a "secondary dispatch"

Comments:

E-tags as means of tracking generation emissions

The CAISO Issue Paper states that "[u]nder a multi-state balancing authority area, energy flows within the balancing authority area will not use e-tags to identify their contract path or for interchange management" (p. 3). It is CPUC staff's understanding that NERC e-tags are not required for transactions within a balancing authority. However, we would like to understand whether an e-tag could still be created (even though not required), or if a similar tracking mechanism could be

used. On the September 6, 2016 stakeholder call, stakeholders asked why e-tags could not be used to track electricity imported into California, and therefore to attribute emissions accordingly. CAISO's response indicated that because the CAISO boundary would no longer be at the California border (or approximately), e-tags would no longer be used. CPUC Staff would appreciate CAISO's Straw Proposal further explaining whether it would be possible to use e-tags (or some similar mechanism), and what alternatives might be available. If CAISO needs to track generation for any other purposes, such as RPS compliance, the Straw Proposal could explore other tracking options to meet multiple tracking needs.

ISO Response

There is no need to tag individual resources within a multi-state balancing authority area. Today in the ISO's current footprint we do not tag energy flows between individual generators and load serving entities. However, the ISO can model various regions within the BAA boundary and observe flows between regions. This initiative will develop addition tracking criteria which can modeled in order to support different state carbon programs.

Comments:

In conclusion, CPUC Staff hopes that CAISO will consider many of these issues before developing a straw proposal in this initiative, and will acknowledge that the unresolved nature of the issues related to GHG accounting for the EIM may mean that the schedule proposed for this initiative is not workable. CARB has a public hearing happening imminently on its proposed regulatory changes, so at a minimum, new CARB requirements may get finalized in the next few months. We recommend that CAISO's Straw Proposal for GHGs under regional integration fully address the current GHG concerns in the EIM, and propose a path forward for resolving the EIM issues as part of this initiative. This would allow CAISO to ensure consistency with the results of CARB's rulemaking. We understand this would likely require delaying the timelines for this initiative, and we think that delay would be wise to avoid reaching an incompatible result.

ISO Response

The ISO continues to work with CARB to address their concerns regarding "secondary dispatch". Any market design changes necessary to assist CARB will also consider the scalability to a multi-state balancing authority area.

Company	Date	Submitted By
ORA	9/20/16	-

Comments:

Accurately tracking greenhouse gas (GHG) emissions in an expanded ISO is critically important. California must ensure that it remains on track to achieve its GHG reduction goals and comply with California Cap-and-Trade Program requirements in an expanded ISO.

Ensuring that the CAISO resource scheduling process accurately assigns and accounts for GHG

emissions associated with the participating resources in both the Energy Imbalance Market (EIM) and under an expanded ISO is necessary for California to meets its GHG goals at the lowest possible cost. Failure to do so could increase GHG costs to ratepayers without providing commensurate benefits in the form of GHG reductions. If the current GHG accounting procedures of the EIM are scalable for use in an expanded ISO, such an approach would likely be less costly to implement than an entirely new set of GHG accounting procedures. It will be important for the CAISO and the California Air Resources Board (CARB) to align their definition of terms and requirements for GHG accounting in an expanded ISO (such as the treatment of GHG emissions and associated costs).

The CAISO acknowledges that the CARB is concerned that the current EIM GHG accounting procedures do not adequately account for the secondary dispatch of higher GHG-emitting resources outside of California. These concerns should be resolved before finalizing the GHG accounting procedures for an expanded ISO.

ISO Response

The ISO continues to work with CARB to address their concerns regarding "secondary dispatch". Any market design changes necessary to assist CARB will also consider the scalability to a multi-state balancing authority area.

Comments:

The CAISO's September 6, 2016 stakeholder workshop addressed some of ORA's questions about the Issue Paper, but additional clarification would be useful.

- How do the GHG accounting procedures used for the EIM define imports to and exports from California? Does the CAISO anticipate defining imports to and exports from California in the same way for purposes of GHG accounting in the expanded ISO? Do these definitions align with the CARB definitions of imports to and exports from California?

ISO Response

CARB modified their regulation when the EIM was developed. This was needed because unlike traditional imports (exports) which can identify a specific generator (or load) as the source (sink) individual generators that are dispatch in the EIM are not tagged. In the EIM, EIM transfers in (out) are tagged between balancing authority areas in the EIM footprint enable energy accounting consistent with WECC practices. EIM transfers are not the same as traditional imports and exports which is why CARB modified its regulation to use the ISO market optimization results to identify which resources outside of ISO have a GHG compliance obligation with CARB because there was and EIM transfer in to the ISO.

Comments:

- Is there a difference between the meaning of the GHG bid adder as compared to the GHG compliance cost adder?

ISO Response

The terms have the same meaning.

Comments:

- It would be helpful to provide examples of the use of the GHG bid adder and/or the GHG compliance cost adder under the current EIM structure, as compared to the potential application of the GHG bid adder and/or GHG compliance cost adder under an expanded

ISO.
ISO Response
The ISO provides additional documentation regarding the GHG market design in the EIM Business Practice Manual. See sections 11.3.3.1 and 11.3.3.2. In addition, the ISO will be reviewing the examples in the business practice manual at the upcoming stakeholder meeting on October 13, 2016.
Comments:
Going forward, it would be helpful if the CAISO provided examples of the GHG accounting procedures it proposes, including any modification to the Security Constrained Economic Dispatch, so that stakeholders can understand the impact of the proposed GHG accounting procedures on California's GHG compliance obligations and the costs to ratepayers.
ISO Response
The additional detail requested are developed through the straw proposal phase of the ISO's stakeholder process.
Comments:
ORA also recommends that the CAISO point out any potential misalignment between its treatment of energy imported and/or exported to California, including associated GHG compliance obligations, with the current CARB regulations
ISO Response
The ISO identified in the issue paper that changes are most likely needed since imports/exports with a new multi-state balancing authority area cannot be assumed to be California as is currently done in the ISO.

Company	Date	Submitted By
PacifiCorp	9/20/16	-
Comments: -		
In the Issue Paper, the ISO indicates a need to modify how the market determines which resources are serving load in various states so that the market can reflect the costs associated with compliance with the California Cap-and-Trade Program in energy prices for transactions subject to that program. The remainder of the Issue Paper largely focuses on how the market will address and accommodate the California's existing method for regulating greenhouse gases associated with serving California load. PacifiCorp appreciates the significance of this issue and agrees that, for the purposes of tracking greenhouse gases for California's program, a different approach is needed in the context of a broader organized energy market because e-Tags will no longer be submitted to support energy schedules into California. With respect to this exercise, it is critically important to the ultimate success of the development of a Regional System Operator ("RSO") that any methodology for assigning emissions to California load adhere to the principle that market participants outside of California should not impacted by California's policies nor will they become subject to the Cap-and-Trade Program unless they are importing energy to California.		

Though PacifiCorp shares the ISO's concern with how California's programs are applied in the context of an RSO, the ISO should consider state environmental policies more broadly in the context of a multi-state balancing area. The RSO will be required to accommodate more than California environmental policies—it will also need to consider all of the impacted environmental policies in states that are participating in the RSO.

Environmental policies that must be considered may include policies that are not direct carbon regulations. For example, Oregon and Washington currently have renewable portfolio standards (RPS) that require compliance through the retirement of renewable energy credits (RECs). Both states define RECs as including all of the environmental attributes associated with one megawatt-hour of renewable energy.[1] Typically, these environmental attributes are inclusive of the avoided emissions value or zero-carbon component of the renewable energy. To avoid double counting of environmental attributes, an entity may be precluded from using a single megawatt-hour of renewable generation to receive credit for RPS purposes as well as a benefit under a cap- and-trade program by reporting power as zero-emitting. The Western Climate Initiative (WCI) has suggested that, in a capped jurisdiction, the avoided emissions value of a REC is zero. Under this interpretation, RECs are used for RPS compliance and have no avoided emissions value and there is no double counting if a renewable resource is accounted for as zero-emitting under a cap- and-trade program.[2] However, given the nature of the interconnected electric system, it is not the case that a renewable resource in a capped jurisdiction necessarily displaces resources in that same jurisdiction. It is also unclear as to how this issue will be addressed when one state's policies interact or even conflict with another state's polices. In this example, Oregon and Washington REC definitions are in tension with California requirements regarding the reporting of specified resources, which do not currently allow the reporting of null power.

In the Energy Imbalance Market (EIM), entities cannot currently bid RECs along with energy as part of the market bidding processes. Because PacifiCorp does not know beforehand which resources will be deemed delivered to California, it is not possible to bid any zero-emitting resources into the market for delivery to California without risking rendering the associated RECs unusable for RPS compliance in Oregon and Washington. In an RSO, as in the EIM, this issue may create inefficiencies and increased costs unless states work together to adopt policies that reflect the regional and integrated nature of the market.

As another example, Washington recently adopted the Clean Air Rule, which regulates greenhouse gases from point sources located in Washington State. Natural gas plants in Washington are subject to this rule and must accordingly limit their production beginning in 2017 using a 2012-2016 average as the baseline. PacifiCorp owns and operates one natural gas combined cycle unit in Washington—the Chehalis Generating Facility. Other utilities, such as Puget Sound Energy, who intend to join the EIM, also own and operate natural gas facilities in Washington. If energy from those resources are identified as having been imported into California, the emissions associated with that energy will be subject to double regulation: Once at the source by Washington and once when the energy is deemed imported to California. Entities may opt not to allow their resources to be imported into California to avoid this double regulation, thus further limiting market flexibility.

The above examples are relatively simple compared to the potential complexity if another state

adopted a program regulating electricity imports but chose not to link to California's program. Since a large portion of the benefits of an RSO are expected to come with increased transfer capability, it is not optimal for entities to be limiting transfers to some states and not others. Though PacifiCorp understands that the ISO's effort is intended to be mindful of the potential need to support multiple greenhouse gas trading programs in the West, it is not clear that an organized energy market need for accurate price signals and transparency can accommodate the potential complexity of multiple state policy regimes that are similar to California's. The ISO briefly acknowledges this in the Issue Paper, that if additional programs require additional price differentiation, the number of components of the locational marginal price have the potential to become unmanageable. PacifiCorp suggests that it may not be possible for the market to efficiently reflect multiple state policy regimes. It may be simpler and more effective, in some circumstances, for states to modify their environmental policies to reflect the realities of an RSO and state policy interactions.

Accordingly, rather than attempting to create what is likely to be a very complex market solution to solve the near-term and relatively narrow challenge of California's accounting of greenhouse gas emissions, the ISO should engage in a broader dialogue around state policy interactions with a regional market. This dialogue should be conducted as part of broader governance discussions and should be aimed at creating a framework for aligning state environmental policy objectives and programs with state energy market objectives.

ISO Response

The ISO agrees that the market design to reflect individual state's carbon programs must ensure that the energy prices in one state (or collection of states in the same program) does not adversely affect energy prices in another state (or collection of states).

The issue regarding REC accounting illustrates the continued need for resources to opt out for consideration for when attributing which resource's energy met another state's energy needs. The current EIM approach allows a resource to opt out and the resource will not be considered for attribution if there is an EIM transfer into the ISO. Additional measures may also need to be developed to address double counting especially if the number of state carbon programs that must be reflected in the market optimization in large.

The ISO appreciates PacifiCorp's comments that implementation complexity must be balance with individual state carbon program objective. All parties should strive to reflect the compliance cost in the market optimization, but also recognize that the market optimization's, namely the 5-minute real-time dispatch, primary purpose is to reliably balance generation with load.

Company	Date	Submitted By
PG&E	9/20/16	Hannah Kaye

Comments:

PG&E assessment of the issues in this initiative is guided by three objectives: (1) Affordability for

California utility customers; (2) Efficient functioning of the wholesale market; and (3) Reducing GHG emissions in California and the larger market in which California is participating. PG&E urges the CAISO to also evaluate the affordability, market functionality, and emissions impacts of any potential approach, and to drive toward solutions that incorporate all three objectives.

At this stage in the process, PG&E recommends that the CAISO divide the scope of the Regional Integration California GHG Compliance initiative into two phases:

1. Addressing issues in the current EIM, in coordination with relevant CARB processes; followed by
2. Developing an EIM-aligned approach to reflect non-California GHG compliance requirements in a multi-state balancing authority area.

Two-phase approach

PG&E recommends that the CAISO work with stakeholders to address GHG regulatory compliance issues first in the current EIM and then in a potential multi-state balancing authority area. EIM design must be consistent with any day-ahead designs adopted in the future, and, as the CAISO notes, "resolution of [EIM] concerns may inform how to address similar concerns in connection with day-ahead GHG market design." Focusing first on existing issues within EIM will allow the CAISO and stakeholders to construct a solid foundation on which to build appropriate mechanisms for a multi-state day-ahead market.

ISO Response

Comments:

Phase one

The first phase should focus on the current EIM, in which only California has GHG requirements at this time, and address:

- Ongoing coordination with CARB to address secondary emissions, or leakage. This work should include:
  - Clarifying, in consultation with CARB, a definition of leakage. PG&E suggests that an EIM leakage definition should align with the following: EIM leakage refers to GHG emissions that result from changes to the dispatch of resources in EIM Entities to support imports into California. EIM leakage includes (1) dispatch changes to provide energy to serve load in the EIM Entities that could have been served economically by the energy imported into the CAISO, and (2) dispatch changes to make transmission capacity available to allow EIM to dispatch resources whose energy is imported. Leakage should not include emissions resulting from changes to EIM dispatch made solely to optimize schedules across EIM Entities and not to support imports into California.
  - Incorporating the cost of leakage into EIM optimization. EIM outcomes should reflect the cost of leakage. The cost of leakage should be incorporated into the optimization so that EIM schedules imports into CAISO that are economic considering the GHG costs of leakage and the EIM prices faced by California load reflect the cost of leakage.
- Extending the leakage concept to a multi-state balancing authority area, if that expanded footprint is created but GHG regulation is not uniform across western states.

By the end of phase one, the CAISO, in consultation with CARB and stakeholders, will have settled outstanding GHG issues in EIM. Given the importance of maintaining consistency across EIM and an expanded day-ahead market, the phase-one process should also ensure that any solutions identified could be carried into a multi-state balancing authority area

ISO Response

The ISO agrees with the need for a two phase approach. The ISO continues to work with CARB to address their concerns regarding "secondary dispatch" in the EIM. Any market design changes necessary to assist CARB will also consider the scalability to a multi-state balancing authority area.

Comments:

Phase two

A second phase is the more appropriate venue in which to consider treatment of non-California GHG reduction programs in a multi-state balancing authority area.

PG&E shares the CAISO's concern that, as more GHG programs within the expanded balancing authority area are adopted, "the complexity will increase and the transparency will decrease, which is very likely to lead to a less efficient achievement of carbon reduction goals." Though PG&E supports the CAISO's endeavor to anticipate and respond proactively to these challenges, it is unclear how the CAISO and stakeholders can effectively design a market to accommodate GHG reduction programs that do not yet exist. Until states participating in the multi-state balancing authority area adopt GHG programs, it is premature to develop methods that attempt to incorporate potential compliance requirements. Attempting to develop a market structure that would be flexible enough to accommodate an unknown range of GHG programs would be exceptionally difficult.

ISO Response

The ISO believes that developing methods to model energy flows between states will be foundational to including different state's carbon programs into the market optimization. While individual state carbon programs or a collection of states carbon programs may have different elements that will need to be addressed in the market optimization the need to track and model energy flows on a state or regions basis will be needed in a multi-state balancing authority area.

Comments:

Within these phases, PG&E encourages the CAISO to focus on two principles:

1. The importance of consistency across EIM and a multi-state balancing authority area; and
2. Ensuring that the approach developed easily facilitates efforts between states to capture efficiencies by harmonizing GHG programs.

Principles

Throughout its efforts to address GHG in any multi-state construct, the CAISO should be guided by two key principles:

(1) It is critical to ensure consistent application of GHG regulation across both EIM and the day-ahead market of a multi-state balancing authority area.

PG&E urges the CAISO to apply any GHG mechanisms consistently to both the EIM and the day- ahead market of an expanded ISO footprint.

Systematic differences in treatment of GHG regulations in the day-ahead market in an expanded CAISO and in the real-time markets in EIM (and expanded CAISO) could lead to participants engaging in strategic bidding to exploit the differences, leading to inefficient outcomes. For example:

- EIM calculates GHG allowance requirements arising from flows into California, and incorporates the impacts in market prices. The day-ahead market in an expanded CAISO will also calculate GHG allowance requirements arising from flows into California, and incorporate the impacts in market prices. If the two mechanisms differ fundamentally, the ensuing systematic differences in results of the day-ahead and real-time markets could be exploited by market participants engaging in strategic bidding behaviors. By ensuring the day-ahead market in an expanded CAISO and the real-time market in EIM/expanded ISO treat and price GHG requirements on imports into California in a consistent fashion, this concern should be eliminated, or at least significantly mitigated

- EIM is working to allow participants to offer energy at ties to external areas. Those participants will also be able to import energy into California. As such, they will be able to specify their GHG compliance cost for their emissions. A regional market should also allow participants to offer energy at ties to external areas. Those participants should be able to allow their energy to be imported into California and specify their cost of GHG allowances for their emissions. The mechanisms used in EIM and the expanded CAISO market should be consistent to prevent strategic bidding to exploit differences.

ISO Response

The ISO agrees with the principle that the GHG mechanism is consistent, to the maximum extent possible, between the day-ahead market and energy imbalance market. The ISO also agrees that intertie transactions should have similar participation rules as generation within a given state.

Comments:

(2) Any approach developed should easily facilitate efforts between states to capture efficiencies by harmonizing GHG programs.

PG&E recognizes the potential complexity a regional ISO could face when incorporating multiple GHG programs in a single market. In addition to thinking through possible electric market design issues, PG&E also encourages consideration of electric market implementation issues when state GHG programs are being designed. In particular, PG&E encourages western states to consider consistent, linked GHG regulatory programs to meet EPA's Clean Power Plan (CPP) requirements and for the ISO to provide technical support to any such efforts, consistent with the role other ISOs (e.g., PJM, MISO) have performed. Such a consistent, linked program is likely to achieve given GHG goals at lower cost, ensure environmental integrity, and to make for simpler and more transparent implementation in electric markets.

If and when states participating in the multi-state balancing authority area plan to adopt GHG regulatory programs, and it therefore becomes possible to develop market design components to accommodate such changes, it will be critical that the CAISO help to highlight any potential for duplicative GHG costs, and make adjustments as needed

ISO Response

The ISO agrees with facilitating other states carbon program while highlighting areas than can improve market efficiency and effectiveness of the various programs.

Company	Date	Submitted By
PGP	9/20/16	Therese Hampton

Comments:

PGP has provided comments to the Air Resources Board regarding GHG accounting in the EIM and believes the underlying principles are relevant to the development of the Regional ISO straw proposal.

The current EIM algorithm allows Participating Resources to establish a limit on the amount of resource output that can be considered "deemed delivered" to California. However, the current algorithm does not provide the ability for a Participating Resource to designate that the deemed delivered output is *only* from incremental dispatch above the base schedule. PGP believes the algorithm's instruction to assume base schedules as "deemed delivered" to California enables carbon leakage and creates unique opportunities for "redispatch" and market pricing in the EIM that are not available in the day-ahead or other real-time markets.

In order to eliminate these consequences, PGP believes the EIM algorithm should be modified to allow EIM Participating Resources to designate that only the incremental generation above their base schedules be "deemed delivered." This concept should also be applied to any approach considered for Regional Integration California GHG Compliance proposals. Specifically,

- Participating Resources are provided the ability to set limits on what portion of their output is delivered to California or other states with specific carbon obligations, and
- The treatment of carbon obligations and associated dispatch is consistent across all markets; bilateral, day-ahead integrated market, and real-time integrated market.

While PGP recognizes that modifications to the approach to GHG in the EIM may have implications for the Regional Integration California GHG Compliance approach, PGP requests that the EIM solution proceed promptly and that it not be delayed for coordination with the Regional Integration process.

ISO Response

The ISO market optimization does not solve simply for imbalance energy or for changes in energy output between intervals. In each market run, the optimal output level for all generation units is determined recognizing resource limitations and transmission constraints needed to meet the load forecast in that interval. When the ISO provides dispatch instructions, it provides generators a dispatch operating target in total megawatts, the ISO does not ask for the resource to increase a certain number of MWs. For example, a resource would be dispatched to 100MW to balance 100MW in load. Only for purposes of recognizing a resource's operational limitations is the current output of the resource considered.

Therefore, it is not appropriate or consistent with security constrained economic dispatch to only attribute GHG awards to dispatches above base through a single optimization run. Also, base schedules from EIM entities are not economically optimized and changes in base schedule may occur to resolve congestion or lower the overall system cost independent of any load change. Requiring the optimization to only use incremental dispatches when attributing which resource supports an EIM transfer into the ISO can result in an energy price reflecting outside the ISO the need for creating an incremental dispatch instruction to an external resource.

In order to consider incremental dispatches, the market optimization must be performed twice. Once to determine economically efficient schedules without allowing EIM transfers with the ISO. These economically efficient schedules can then be used to award GHG to resource that have incremental dispatches when EIM transfers are allowed with the ISO. This would address the issue above where the energy price outside of the ISO is inappropriately impacted, but may not be feasible in practice and will be compared to other alternatives.

Company	Date	Submitted By
PIO	-	-

Market Rules and Modeling

In particular, the following priorities related to GHG should be considered:

- Clear and effective tracking methods;
- Minimizing leakage, re-dispatch, and resource shuffling; and
- Replicability of design.

1. Clear and Effective GHG Tracking Method

A regional ISO should track greenhouse (GHG) emissions associated with all generation attributable to load within the entire regional ISO. This transparent tracking mechanism is in addition and separate from a mechanism to price carbon in accordance with any state's policy to regulate carbon, and will provide useful data to ensure accountability. Region-wide GHG accounting is possible, as illustrated by current ISO-NE activities to measure and report generation and fuel usage on a monthly basis.1 This type of system sophistication can in turn reinforce additional priorities, including minimizing leakage, re-dispatch, and resource shuffling, as well as replicability of design.

Our organizations also support the need to create a market mechanism to enable bidders to attach a price to carbon for California load, to support the state's cap and trade program. CAISO's Issue Paper identifies this need, and we commend CAISO and CARB for focusing awareness on these important issues and providing context and learnings gained through EIM design and operations. Indeed, although there are significant differences in scope and context, the EIM experience can provide a helpful guidepost when building a multistate RSO. The EIM market's GHG adder can, to this end, serve as a useful starting point in designing a mechanism capable of tracking GHGs day-ahead and hour-ahead markets, as well as the inclusion of GHG compliance costs in start-up and minimum load costs for generators, or equivalent mechanism. This new mechanism must, however, also have a clear and

sophisticated flagging and tracking mechanism to account for power from fossil fuels dispatches into particular states to achieve necessary accountability.

Confronting and determining the right technology solution at the outset will provide long-term accessibility, accountability, transparency, and replicability benefits

ISO Response

The ISO will be publishing region wide GHG emission levels for the EIM and when we become a multi-state balancing authority area for informational purposes. The ISO has also posted an analysis of the emission reduction benefits already observed in the EIM. See the presentation available at the following link: http://www.caiso.com/Documents/EIMGreenhouseGasCounter-FactualComparison-PreliminaryResults_Jan-Jun_2016_.pdf

Comments:

2. Minimizing Leakage, Re-dispatch, and Resource Shuffling

Leakage, re-dispatch, and resource shuffling concerns, as articulated in the CAISO Issue Paper, may become more pronounced in a regional ISO. More information as to how the market optimization will monitor and track resources to minimize leakage, re-dispatch, and resource shuffling is thus necessary to ensure that state public policies within the ISO footprint can be meaningfully effectuated. Clear and effective tracking mechanisms, as described above, may be necessary to better understand the full breadth of this issue. We understand that this issue is currently the subject of study by both CAISO and CARB, and we both commend this analysis and look forward to its consideration in an RSO context.

ISO Response

The ISO continues to work with CARB to address their concerns regarding “secondary dispatch” in the EIM. Any market design changes necessary to assist CARB will also consider the scalability to a multi-state balancing authority area.

Comments:

3. Replicability of Design

RSO operations should be designed to allow any state within the RSO footprint wishing to utilize particular RSO design elements the necessary access. The objective should be to maximize market efficiency and minimize complexity by building a single, flexible, and transparent program which eliminates multiple compliance processes and costs. THE EIM design allows for a GHG bid adder on a per-day basis, which helps improve bidding behaviors and identification of resources within state boundaries. The bid flag for GHG of zero MW has proven an effective tool in this context.

The CAISO Issue Paper contemplates, however, that other states within a regional ISO may implement state public policies that require CAISO operational response. In such a case, where multiple and varying GHG bid adders are required, a bid flag for GHG of zero MW may not suffice. EIM tagging, having the multi- zone bids, and accounting for the correct resource may be the right basis upon which to move forward. However, the CAISO should consider now how to integrate varying state public policies into design, and whether such tagging can be extended and replicated

ISO Response

The ISO agrees with facilitating other states carbon program while highlighting areas than can improve market efficiency and effectiveness of the various programs.

Company	Date	Submitted By
Powerex Corp.	9/20/16	Mike Benn

Comments:

Powerex believes that a regional organized market may present a significant opportunity to advance California's environmental objectives regarding GHG emissions associated with production of electricity to serve load in the state. Currently, the tracking and reporting of GHG emissions of out-of-state resources for imports of electricity into California relies, in part, on schedules and e-Tags submitted by market participants to establish the "link" between a source outside of California and a sink inside of California. In a regional organized market, however, the e-Tag scheduling framework will be entirely eliminated for energy flows within the expanded organized market footprint. Market participants will no longer establish a transaction-specific relationship, nor submit an e-Tag, between a specific resource that produces electricity and specific loads that consume it. Instead, the market operator will be required to make—through the administration of its tariff, business practices and power flow model—any determinations regarding which specific resources are dispatched to serve specific loads across the regional organized market footprint.

A regional organized market therefore offers an important opportunity to develop an improved, highly objective and uniformly applied approach for identifying the specific out-of-state GHG emissions associated with serving California load. In Powerex's view, a well-designed GHG framework could significantly increase the effectiveness of the California Air Resources Board's ("CARB") programs in reducing emissions for energy procured from out-of-state resources.

The magnitude of the potential environmental benefits from a well-designed regional organized market is substantial, since these benefits will accrue from the operational decisions of all resources across a large geographic area and in all market timeframes. But the large scope and scale that drive these potential benefits also imply considerable risk if the regional market utilizes an approach that does not identify GHG emissions accurately or that is otherwise inconsistent with CARB's regulations and objectives. For example, a regional organized market that is designed in a manner to simply "deem" the cleanest out-of-state resources in the footprint as serving load in California—even if those resources would have run anyway to serve out-of-state load—would severely undermine California's environmental policy of reducing emissions and promoting use of lower-emitting resources. Such an approach could give the *appearance* that all electricity imports into California were from zero- or low-GHG resources, when in fact the dispatch of out-of-state resources may entail significant GHG emissions. Effectively, the regional market's dispatch of out-of-state resources would not reflect CARB's efforts to encourage the use of lower-emitting out-of-state resources to serve California load, and the market outcomes would be no different than if CARB's GHG regulations did not exist at all.

ISO Response

The ISO appreciates your comments and continued participation in this stakeholder initiative.

Comments:

Powerex understands that CARB's GHG regulations are intended to lead to (1) accurate tracking of out-of-state GHG emissions to serve California load; and (2) economic incentives to dispatch lower-emitting out-of-state resources to serve California load. Powerex believes that a regional organized market that is designed to support both of these outcomes is essential to achieving the efficiency benefits of centralized unit commitment and dispatch across an expanded geographic footprint while also fully supporting California's environmental goal of promoting the use of lower-emitting resources to serve California load.

Powerex recognizes the challenge of developing such a model, and believes the regional stakeholder process is well suited to examine the potential advantages and drawbacks of one or more approaches. In these comments, Powerex outlines a potential two-step process to identify the dispatch from specific out-of-state resources associated with imports that serve load in California. In addition to the formal stakeholder meetings already scheduled, additional technical discussions between CAISO and stakeholders may prove valuable for developing, testing and refining this approach and any others that carry the substantial potential to achieve the goals outlined above. Powerex believes it will be vital for CARB to participate in the stakeholder evaluation of potential designs, since ultimately CARB must be satisfied that the GHG framework is consistent with its GHG regulations and with its environmental policy objectives. If CAISO ultimately determines that this type of approach is not technically feasible or is otherwise impractical, alternative but less desirable approaches may need to be considered. For example, a simplified approach might apply more aggregated average GHG emission rates to the net energy flows into California.

At the same time, Powerex strongly cautions against a regional market design that simply applies the existing EIM approach, in which GHG responsibility is algorithmically assigned to the out-of-state resources that submit the lowest GHG adders. Such an approach serves primarily to minimize the *reporting* of GHG emissions, and systematically understates the GHG emissions of the out-of-state resources that increase output when EIM imports serve California load. This approach—which has been described as "efficient resource shuffling" by a prominent industry academic1—may well achieve the least-cost technical compliance with CARB's current regulations, but it does not achieve the policy objective of encouraging the dispatch of lower-emitting out-of-state resources to serve California load.

Indeed, as applied to the relatively limited volume of California load served by imports in the EIM, the algorithmic model has already raised substantial concerns over "leakage." GHG emissions in a regional organized market must be treated as more than just an accounting problem that is solved by allocating the lowest-emitting out-of-state resources to serving California load, while allocating higher-emitting resources to out-of-state load.

Extending this same approach to the much larger volume of transactions that would occur in a multi-state organized energy market would render CARB's GHG regulations largely inconsequential and, in Powerex's view, would create unnecessary tension between regionalization efforts and California's environmental goals. Powerex therefore strongly supports the pursuit of a more accurate and robust approach.

ISO Response

The ISO continues to work with CARB to address their concerns regarding "secondary dispatch" in the EIM. Any market design changes necessary to assist CARB will also consider the scalability to a multi-state balancing authority area.

Company	Date	Submitted By
PPC	9/20/16	Nancy Baker

Comments:

In regard to designing compliance measures for the multi-state Energy Imbalance Market, the ISO has taken constructive steps to facilitate the California greenhouse gas program while preserving the ability of generators to bid into the EIM without making sales into California and ensuring that loads outside that state do not pay costs arising from that program.

The Issue Paper notes that "to support a multi-state balancing authority area, the design must be mindful of the potential need to support multiple GHG trading programs in the West." We agree and respectfully suggest that the ISO should state as explicit goals in seeking and making rule changes that the following two principles must be met:

1. Each state's policies and authority will be accommodated and implemented by the ISO's market rules; and

ISO Response

The ISO agrees that since each state may have different GHG programs the market optimization needs to be able to reflect each program while determining the most efficient dispatch. This is why the energy transfers between states in the multi-state balancing authority must be modeled such that the market results can be used to facilitate the implementation of a state's or group of states carbon objectives.

Comments:

1. The market rules must prevent costs attributed to one state's policies or program from being paid by loads or generators in located in another state.

ISO Response

The ISO agrees that efforts must be made to minimize one state's carbon program from negatively impacting another state while balancing the increased complexity through the market optimization needed to "guarantee" or completely prevent interplay.

Comments:

The ISO's governance proposal acknowledges that protection and expression of state sovereignty is a critical matter for the various states whose consumers would be affected by the ISO were it to expand. To be meaningful that principle must also extend into the ISO's market rules; in order to treat each state as a peer, the market rules must respect and facilitate each state's policies on greenhouse gas regulation within that state. Incorporation of the second

principle is an important extension of the substance of the first. Consumers should not be forced to pay costs that are not their responsibility and do not correspond to a direct economic benefit that they acquire. This type of basic equity in the allocation of costs and benefits underlies of much FERC rate and cost allocation principles.

ISO Response

The ISO agrees that to the extent possible the market optimization should seek to ensure one state's program does not negatively impact another state. But, in doing so, perfection in meeting this objective may lead to added market complexity which could reduce other market benefits from a multi-state balancing authority area. As such, the total benefits of regionalization should also be considered when compromises are needed to have the market reflect individual state policies.

Company	Date	Submitted By
SCE	9/20/16	Wei Zhou

Comments:

1) Optimization framework to support the single-Balancing Authority Area (BAA) market
One key question that the CAISO and the stakeholders should consider is, under the integrated market, how resources located in multiple states are optimized once those states join as one BAA, given the California GHG compliance. As depicted by the CAISO presentation2, interties connecting CA and a neighboring state will no longer exist once the state joins the ISO market. Resources within the neighboring state will become internal resources to the expanded market. During the September 7, 2016 stakeholder call, the CAISO staff implied that, to achieve the most optimal market solution, all internal resources will be optimized based on economics under a flowed-based approach.

SCE seeks more clarity on this approach and how it is different than the existing approach under the EIM design, especially on two aspects: the GHG constraint and EIM Energy Transfer Limit, as described below.

ISO Response

The ISO will provide additional detail on the market design when the straw proposal is developed.

Comments:

Under the EIM design, there is a single GHG constraint that applies to all EIM Entity Areas3. Under the integrated market, since EIM Entity Areas may not apply in the Day-Ahead Market (DAM) but apply in the EIM, how will the modeling of this constraint need to be altered? For example, suppose there are multiple states incorporated in the DAM and additional multiple EIM Entity Areas in the Real-Time Market (RTM). Would a GHG constraint in the DAM be expanded to cover EIM Entity Areas in the RTM? Does the GHG constraint cover different geographic areas between DAM and RTM? If so, would it create issues to prices and resource awards from the DAM?

ISO Response:

As the ISO stated in the issue paper, the current EIM paradigm is based individual balancing authority areas with only the ISO being subject to a GHG program. Under a multi-state balancing authority area, the defined areas will need to change from each balancing authority area to each individual state. Once the modeling approach for establish the boundaries for a specific region or state, then

energy transfers between regions or states can be observed in the market optimization as is done in the EIM today.

Comments:

Regarding EIM Transfer Limits, the EIM design constraints imports into/exports from an EIM Entity Area within Energy Transfer Limits designated by the EIM Entity4. An Energy Transfer Limit represents a contractual-type of limit, and is modeled in the form of the power balance constraint, i.e., the power consumed and generated in an EIM Entity Area considering losses and energy transfer nets to zero. There can be multiple power balance constraints in the EIM. When multiple states join the CAISO market, the control and operation of transmission facilities are handed over to the CAISO. Therefore, the modeling of Energy Transfer Limits may no longer be needed. Instead, the boundary of the states within the BAA will be modeled based on physical flow, i.e., a flow-based approach that uses shift factors in the model to ensure physical flow on a path not exceeding its physical limits. SCE would like to know whether this understanding is correct. Further, would there be any contractual rights on a third-party facility (a facility of non-participant transmission owner such as BPA) that would require different treatment under the flow-based approach?

ISO Response:

SCE's understanding is correct. In addition, when a balancing authority area merges with the ISO there may be contractual rights on a third party BAA whose management of such rights is now performed by the ISO. The ISO currently enforces both schedule limits and physical limits to efficiently dispatch resources in the ISO market to serve load with the available transmission.

Comments:

2) The complexity under the scenario that different states may have different GHG programs

As stated by the CAISO, under this scenario, where different states may have different GHG programs, trying to reflect those GHG costs in new components in LMP may eventually become unmanageable. It should be subject to discussion whether such design can lead to undesired outcomes, such as difficulty in price discovery and cost hedge, market delay and/or increased instances of DC solutions. Given the complexity, to the extent possible, if the magnitude of the problem associated with differences in those programs is small, the option of addressing the problem outside the electricity market should be included for stakeholder's discussion, along with other options.

ISO Response

The ISO does believe that if each state in a multi-state balancing authority developed its own GHG program independently that this would be the least efficient approach to achieve individual state climate objectives and would undermine the benefits from a centralized, least cost dispatch.

Comments:

3) Schedule change from day-ahead to real-time under the new paradigm

The new paradigm of a single-BAA market with a multi-state footprint will likely bring changes to resource scheduling and tracking. For example, under the integrated market, e-tags may no longer be used to track power from one state to another. For a resource that is deemed to serve CA load in the day-ahead market but with its award revised later in the real-time market (due to market conditions, bidding, unit outage or other factors), how will its CA GHG compliance quantity will be determined? How will a schedule change from day-ahead to real-time be settled? Examples would certainly be helpful to illustrate the changes under the new paradigm.

ISO Response

The ISO will develop examples as the market design proposal is developed. Currently, resources within the ISO BAA have a CARB GHG compliance obligation based upon the metered output of the resource. This is independent of the day-ahead schedule, FMM schedule, or real-time dispatch. The ISO does not anticipate any changes to this accounting approach. What does change is what constitutes an CA generator cannot be based upon the BAA it resides in when we move to a multi-state balancing authority area.

Comments:

4) Regarding a potential rule that self-scheduled generation in one state cannot support load in another state

To maximize the market efficiency, ideally load should be served with the least cost of generation, including self-scheduled generation in a different state6. The question whether this rule is over-restrictive should be part of stakeholder's discussion, considering that under this rule, potential excess self-scheduling in one state could lead to significant curtailment in that state and/or extreme prices that are not at economic levels

ISO Response

The ISO will discuss as the straw proposal is developed any needed bidding rules to implement tracking of energy transfer between regions. As the ISO has continued to working through the potential design, the practice of self-scheduling should be able to maintained, but there may be instances where a separate GHG bid is needed. The refining of bidding rules to facilitate the tracking of energy transfers between regions and states will be refined as the straw proposal evolves.

Comments:

5) Regarding attributing imports (or a portion) to a specific state

Under the regional integration, it may be desired to differentiate the sink of an import, since if the import is serving CA load, it would incur CA GHG compliance cost while this cost does not exist if it is serving non-CA load. Otherwise the import is part of a wheel through which does not support CA load. In designing a mechanism to achieve that, one should consider that imports are not subject to market power mitigation and no resource-specific information (e.g. heat rate or emission rate) may be available to calculate a GHG bid cap, and therefore, different rules may be necessary for imports compared to internal resources.

ISO Response

The ISO agrees. The refining of bidding rules to facilitate the tracking of energy transfers between regions and states will be refined as the straw proposal evolves.

Comments:

6) Regarding CA power exports and GHG treatment

Under the EIM design today, power exported from CA to an EIM Entity Area does not need to be treated differently, i.e., power exported from CA will be selected to serve non-CA load by the optimization if its cost is lower than the cost of the marginal resource in the EIM Entity Area, regardless whether the exported power has CA GHG compliance cost or not. However, under the potential scenario that different states may have different GHG programs, it should be subject to discussion whether such treatment for the CA-exports today is sufficient for proper optimization.

ISO Response

SCE highlights that when different states have carbon programs with different entities that have compliance obligations, the potential for double counting, double compliance, or other inefficiencies could occur. The ISO believes that foundational to addressing this issue is the rules need to allow the market optimization to track transfers between states. As individual state programs are developed, the ISO may need to make design changes to implement a given states' program while integrating the individual state policy as efficiently as possible within multi-state market optimization.

Comments:

7) Regarding CARB's leakage concerns to account for atmospheric effects of EIM's least cost dispatch

As this issue is stilled being worked on, information on a resolution applied to the EIM market will likely be relevant under this initiative. With more information available, the performance of such a resolution can be assessed within the EIM market and then can be further evaluated whether it can be applied to the day-ahead market.

ISO Response

The ISO agrees that when CARB's concerns regarding "secondary dispatch" are still being worked. As a solution is reached, it will be important to ensure that any market design changes could be scalable to the day-ahead market and remain feasible within a multi-state balancing authority area.

Comments:

8) Interaction with convergence bids

In the material7 presented to the market surveillance committee on Sept 19th, the CAISO brought up the issue of the treatment of convergence bids. SCE agrees that the interaction with convergence bids must be part of the scope of this initiative. Particularly the topic regarding how virtual flow created by convergence bids interacts with deemed flow, sourcing from physical generation, in the day-ahead market and then unwound in the real-time market should be further explored.

ISO Response

The ISO agrees. The refining of bidding rules to facilitate the tracking of energy transfers between regions and states will be refined as the straw proposal evolves.

Company	Date	Submitted By
SDG&E	9/20/16	Dave Barker - (858) 654-1865 Greg Anderson – (858) 654-1717

Comments:

San Diego Gas & Electric ("SDG&E") respectfully submits the following comments in response to the California Independent System Operator's ("CAISO") request for stakeholder input on its Regional Integration California Greenhouse Gas ("GHG") Compliance Issue Paper ("Issue Paper") released August 29, 2016 and its September 6, 2016 stakeholder conference call. SDG&E is supportive of the CAISO expansion from the perspective that efficient markets should reduce GHG overall by better integrating renewables. Reduction of renewable curtailments in

California, smoothing the morning and afternoon ramps, and the reduced use of higher emitting combustion turbines are potential GHG benefits of the CAISO expansion.

ISO Response

The ISO appreciates your comments and continued participation in this stakeholder initiative.

Comments:

Deemed Delivered

As noted in the Issue Paper, the cap-and-trade regulation as adopted by the California Air Resources Board ("ARB") applies to both generation of electricity within California and imports of electricity into California.

The cap-and-trade regulations require imported renewables to include the retired renewable energy credits ("REC") associated with the electricity delivered. In recent years, ARB has not required that retired RECs be included for renewable energy deemed delivered to California. Instead, ARB relies on e-tags to determine "delivery" of out-of-state firmed and shaped renewables. This can occur when the e-tags indicate that the source of the energy entering California is from out-of-state nuclear, hydroelectric or renewable resources and, at the same time, out-of-state carbon-emitting resources are operating to ensure a region-wide load resource balance.

In 2014, CAISO expanded the real-time Energy Imbalance Market ("EIM") to include out-of-state load serving entities (LSEs) in addition to the Valley Electric Association (VEA). It is the opinion of ARB Staff that this market expansion has resulted in an incomplete accounting of the GHG emissions associated with imported power that serves California's load. ARB Staff states that CAISO's EIM creates a secondary emissions effect for which California-located EIM purchasers should have a compliance obligation: "Clean resources with a lower deemed-delivery bid price are selected for 'deemed-delivery' to California, while higher-emitting power plants with a higher deemed-delivery bid may be the actual plants dispatching to serve California load."

The CAISO EIM market optimization is guided by ARB and Federal Energy Regulatory Commission ("FERC") regulations. ARB regulations, as implemented, assign a zero GHG compliance obligation to imported power whose e-tags indicate the energy was generated from out-of-state resources with no emissions, including from out-of-state renewable resources that do not have the associated RECs. FERC requires CAISO to cap the GHG cost bid at the expected GHG compliance cost as determined by the ARB cap-and-trade regulation. The CAISO computer model then determines imported EIM energy by selecting the lowest cost out-of-state electricity willing to be "deemed delivered" to California and receive a cap-and-trade compliance obligation corresponding to the exercised GHG cost bids.

If this electricity is "deemed delivered" to California for consumption by California electric load, then, following ARB's rules, there are no "secondary emissions." The only GHG emitting power "delivered" to California is that which is delivered pursuant to the "delivery" requirements of ARB's own rules. ARB's use of e-tags to assign zero GHG to "delivered" out-of-state renewable power is responsible for the "secondary emissions" effect ARB is concerned with, not the CAISO's EIM market. Requiring two after-the-fact unknown uplift charges for EIM purchasers is not the appropriate solution. What is needed for EIM and for regional expansion is for ARB to either accept the deemed delivered result as

consistent with its regulations, or change the GHG compliance cost to unspecified or that of an asset-controlling suppler unless the power has associated RECs.

ISO Response:

The ISO continues to work closely with ARB to ensure their program and the ISO market optimization are aligned. The ISO agrees that the compliance costs should be reflected in the market optimization to the extent possible in order to avoid uplift costs.

Comments:

Self-scheduling

SDG&E disagrees with the statement, "self-scheduling generation in one state cannot support load in another state." As indicated on the September 6th Stakeholder Call, there are many long-term contracts between (i) generators in states other than California, and (ii) purchasers in California. SDG&E believes that if the existing EIM market mechanism, which includes a GHG export allocation constraint, is implemented at the day-ahead level in an expanded ISO, GHG compliance obligations will be properly identified for self-scheduled out-of-state generation. Because the CAISO's market mechanisms treat self-scheduled generation as price-takers (i.e., an offer price of negative infinity), it is very likely that the self-scheduled amount produced through the meter during the time interval generation will receive a final schedule, even with a non-zero GHG cost bid. Of course, self-scheduled generation is at risk for operating during time periods when lower operating cost alternatives are available in the market. However, this is a choice the self-scheduling entity is free to make.

ISO Response:

The ISO agrees that self-scheduled supply can use the GHG bid adder which can then all the market optimization to determine if the energy serves California load or non-California load.

Comments:

Existing CAISO Interties

The existing CAISO interties that remain should be considered within a zone where the GHG price is already embedded, with the LMPs reflecting the implicit GHG cost.

ISO Response

The ISO believes we should strive for comparable treatment of all intertie scheduling points of the new multi-state balancing authority area. This would result in all intertie scheduling points having a separate GHG bid. As highlighted in the self-schedule comment above, a more appropriate distinction the actual location of the supply is if the supply is used or contracted to serve California load.

Comments:

Attributing Imports

The CPP is based on electricity production in each state under the mass-based plan, so attributing imports is only required for the California cap-and-trade and rate-based plans. Self-scheduling of contracts in an expanded ISO's day-ahead market, along with the opportunity to submit a GHG cost bid, allows out-of-state self-scheduled generation to be tracked under California's cap-and-trade

program through ARB's "deemed delivery" mechanism. Through self-scheduling of renewable contracts, states using a rate-based approach to tracking GHG can track imports of renewables for purposes of the CPP.

ISO Response

The ISO agrees that the need to attribute imports is based upon the existing California cap-and-trade program. However, as noted if other CPP regimes are implemented in the West, the "deemed delivery" mechanism will need to reflect the state's program and its treatment on imported power.

Comments:

Attributing Exports

Since California does not allow for reductions of statewide GHG for exported power, exports do not need to be tracked. Mass-based programs under the CPP are based on electricity production in each state, so exports will increase measured GHG, but there is no need to track GHG of the exported power because the GHG is included by the state where the exported power is produced. States using a rate-based approach for tracking may only need to account for imports of renewables; there does not seem to be a need to track exported power.

ISO Response

The ISO agrees that export tracking may not be needed to implement either a mass based or rate based CPP program. The ability for individual resources to opt out of participating in any state's program outside of the state the generation is located will remain a key design element that can implement the need to have imports of renewable only support a give state.

Company	Date	Submitted By
Sierra Club	9/19/16	Travis Ritchie

Comments:

I. LEAKAGE IS OCCURRING THROUGH THE EIM

CAISO's analysis of GHG emissions in the EIM suggests that there is a net climate benefit from the market due to California exports displacing out of state fossil generation. However, from a policy standpoint, the EIM's impact on GHG emissions must be considered in two parts: (1) during periods of export from California, and (2) during periods of import into California. Under the first condition, during periods of export, CARB appears to be properly accounting for the energy generated within the system because those resources are either non- emitting, such as California solar, or their GHG emissions have already been identified and incorporated into their cost of production as in-state generation with a compliance obligation.

In contrast, during periods of import, there is a distortion in the market occurring due to the failure of the EIM's GHG bid adder regulation. The GHG adder in the EIM was conceived to provide a mechanism that would allow California to identify out-of-state sources of GHG emissions that are attributable to California consumption, and to require those sources to obtain carbon allowances. However, determining when an out-of-state resource provides energy to California in the multi-state

market is complicated; when CAISO directs a resource to provide or withhold imbalance energy, there is no clear path between the resource providing the energy and the load served. The GHG adder mechanism attempted to address this problem by allowing "bid adders" for out-of-state resources that *might* be subject to GHG charges if their energy is sold into the California market. If the energy is "deemed" to be sold into California, the energy is dispatched at a higher price that covers the bid adders and the sellers' GHG compliance obligation. If it is "deemed" to be for out-of-state use, it is dispatched without consideration of the bid adder.

This process of "deeming" energy flows is severely flawed because it is divorced from the actual energy production and emissions to the atmosphere that are due to redispatch through the EIM. CAISO and CARB conducted a workshop on June 24, 2016 to address significant shortcoming in the GHG adder mechanism. CARB raised the concern that, "EIM optimization results may not in all cases report full GHG burden experienced by the atmosphere as a consequence of electricity consumed in CA." CAISO further explained how the mechanism may be failing: "Least cost dispatch can have effect [sic] of sending low emitting resources to CAISO, while not accounting for secondary dispatch of other resource [sic] to serve external demand." In fact, while the ISO's counter-factual analysis shows that the vast majority of redispatch to meet EIM imports in the period January-June 2016 came from gas-fired generation, the EIM MWh imported into California during the same period were about 65% "deemed" to come from non-emitting resources.

This type of resource shuffling could similarly undermine the effect of state environmental policies in a regional market. For example, coal plants may dispatch more frequently within the region as a result of the opportunity to serve California load, but may avoid compliance with California's GHG rules by replacing low emitting resources that are nominally redirected to serve California load. California would be "served" by the low-emitting resources, but the increased emissions to the atmosphere would reflect a physical increase in fossil unit dispatch.

The failure of the GHG adder mechanism in the EIM is concerning. Even though the overall effect of imports and exports in the EIM appears at this time to be a net reduction in GHGs, California's GHG regulations do not, and should not, consider such system-wide netting effects in its carbon allowance market. To the contrary, AB 32 expressly directs CARB to minimize "leakage," which is precisely what is occurring in the EIM during periods of import. This leakage means that California ratepayers are inadvertently and perversely supporting higher-emitting resources through the state's clean-air rules. The problem of leakage is likely to grow as the EIM expands, and it could become a much larger problem in a full day-ahead regional market. There are unintended consequences of this regulatory failure:

- Out-of-state fossil resources are receiving a windfall due to higher energy prices. The CAISO's accounting system credits imports of lower marginal cost clean energy into California when these resources would have otherwise dispatched to serve out-of-state load but for the EIM. As a result, overall energy prices and output are increased for fossil resources outside of California, giving these resources a competitive advantage.
- The price signal to support investment in new out-of-state zero-emissions resources is severely muted because the additional demand for these resources in California is being met through reshuffling of existing resources, with no emissions benefit, rather than through the development of new clean resources.

If and when the CAISO expands to include out-of-state entities in its simultaneous optimal dispatch process, these problems associated with the enforcement of California's GHG laws will be magnified. An expanded RSO would require accounting for emissions from a much larger quantity of energy— many times larger than EIM transactions— that are sold into California but dispatched as undifferentiated energy into the regional pool. At the same time, in a multi-state RSO, California's ability to regulate such emissions from power plants outside the state will be constrained by federal law. These issues should therefore be resolved with specific plans for how GHG accounting will be implemented in both the current EIM and any expanded RSO configuration before such expansion occurs.

ISO Response

The Sierra Club correctly observes that EIM has provide tangible environmental benefits since its beginning by allowing the integration of additional renewable energy resources. Over a given time period, the curtailment of renewable resources is minimized by sharing their intermittency across a broader regional footprint, which reduces the output of carbon emitting resources. The same climate benefits also apply when balancing authority area become for geographically diverse by merging into a larger jointly managed system. The concerns Sierra Club are focused on GHG accounting which the ISO is working with CARB to address potential for secondary dispatch. Since the potential for secondary dispatch exists in a least cost dispatch, there may be residual emission that are not being accounted for through the current EIM design.

Sierra Club inappropriately concludes that resource shuffling is occurring. Resource shuffling, as defined by ARB, is a "plan, scheme, or artifice undertaken by a First Deliverer of Electricity to substitute electricity deliveries from sources with relatively lower emissions for electricity deliveries from sources with relatively higher emissions to reduce its emissions compliance obligation." ISO market dispatches do not meet this definition because they are not a plan, scheme or artifice undertaken by a first deliverer of electricity.

The issue of secondary dispatch can occur in a least cost dispatch because one area has a cap-and-trade program and the other area does not have a program that requires generation to surrender carbon allowances. The Sierra Club incorrectly claims that emitting resources receive a windfall and non-emitting resource lose their price signal that would drive investment. The current optimization results in higher profits and incentives for non-emitting resources than emitting resources. When the ISO has EIM transfers into its BAA, the system marginal energy cost (which is the same at all nodes across the EIM footprint) includes the costs of carbon embedded in the energy bids of resources within ISO. If the marginal resource that is deemed delivered to the ISO is emitting, its GHG bid adder will result in different energy prices between the ISO and the rest of the EIM footprint. Since the GHG bid are cost based, the emitting resource's cost of ARB compliance equals the payment from the market. That resource's "GHG" profit is zero. However, since a non-emitting resource's ARB compliance costs zero, this resource's "GHG price" is the marginal GHG price set by the emitting resource. For example, assume the GHG clearing price is $5.00, the system marginal energy price is $35.00, and there is no congestion or losses. The price load pays in the ISO is $35.00. All generation in the ISO is paid $35.00. The price load pays outside the ISO is $30.00. All generation outside the ISO is paid $30.00 for energy. The emitting resource is paid $5.00 for each MW deemed delivered to ISO which exactly covers its compliance cost after meeting its ARB compliance obligation, but not

additional profit. It is paid the same as any other generator outside the ISO. The non-emitting resource is paid $5.00 for each MW deemed delivered. Since its ARB compliance cost is zero, the payment for the non-emitting resource is $5.00, resulting in the resource having $5.00 more profit that the other resources outside the ISO. This is the exact incentive that Sierra Club claims to desire.

But since the California's cap-and-trade program creates incentives for clean resources, when you create this incentive in the least-cost dispatch of the optimization there can be instances of secondary dispatch. The objective to minimize secondary dispatch naturally conflicts with prioritizing non-emitting resources to serve ISO load and with allowing external resources to be dispatched to serve load outside of the California which is not subject to the California cap-and-trade program. The secondary dispatch can lead to instances, which were previously unobservable in the real-time market, where the accounting for what the "atmosphere feels" is not aligned directly with the market dispatch to serve the ISO. Thus, an accounting difference can be observed and if needed included in the optimization. The ISO is prepared to discuss enhancements to the optimization that more fully account for the atmospheric effects of serving load from external resources. But this is not the result of an inaccurate market dispatch, but rather an enhancement request by ARB to account for this now observable phenomenon.

Comments:

II. POTENTIAL SOLUTIONS TO GHG LEAKAGE IN A REGIONAL MARKET

There are various proposed responses to address the leakage occurring in the EIM market. Of the proposed solutions, Sierra Club recommends that CARB focus on the following core principles when determining optimal amendments to its GHG regulations:

- The GHG regulations must create a clear short-term price signal that allows consumers and/or the market to select clean generating resources over fossil generating resources.
- The GHG regulations must create a clear and predictable long-term price signal that will support investment in clean energy resources throughout the region, with the confidence that the California's willingness to pay for these resources will not be subverted by accounting gimmicks.
- CARB and CAISO must work together on an accounting system that maintains the integrity and effectiveness of California's existing GHG regulations.
- The solution(s) should be workable in both the EIM and the potential day-ahead regional market.
- The solution should be scalable so that it can accommodate the expansion to more balancing authorities and more states in the region for both the EIM and the potential day-ahead market.

With these core principles in mind, Sierra Club addresses various alternatives

ISO Response

The ISO agrees that we should strive to meet these principles. But we should also bear in mind that the ISO market optimization's primary purpose is to reliable dispatch generation to serve load. While

the ISO's market optimization can be leverage to improve GHG accounting, GHG accounting cannot be done at the expense of grid reliability.

Comments:

A. Uniform Carbon Adder in the Dispatch

The distortions in the EIM that are resulting in unaccounted for secondary dispatch of high-GHG resources are the result of having a single market with varying GHG price signals in that market. While all resources within the market receive the same energy clearing price, along with a locational component that reflects physical constraints on the system, a two-tiered, non- physical system of carbon price and no-carbon price will inevitably create distortions such as those evidenced in the EIM. As the market continues to grow, it is likely, if not inevitable, that additional tiers will be necessary as different states pursue different carbon pricing policies. The simplest method to avoid these distortions is to remove multi-tier carbon pricing within the market.

A uniform carbon adder, implemented by the regional operator, has been suggested in other regional markets as a method of meeting state carbon policies in a just and reasonable manner.[10] The broad concept would be to incorporate each specific generating source's carbon emissions profile into the dispatch algorithm for the market. For example, each generating resource in the market would be assigned a ton per megawatt hour ("ton/MWh") profile based on unit-specific emission rates. The clearing price in the market would be the combination of the locational energy price plus the carbon price. This would allow the dispatch algorithm to optimize the entire system based on both energy and carbon prices, which sends a consistent price signal to generators regardless of where they originate from or where they dispatch to. Generators would be paid the clearing price times their electrical output, less the dollar-per-ton carbon price times their actual emissions.

CAISO (or the RSO in a multi-state regional market) would collect the difference between the clearing price and the amount paid to carbon-emitting resources, which would create a pool of money based on a uniform carbon price for all power dispatched anywhere in the system. CAISO could then distribute the money collected from the uniform carbon price in a manner that respected each state's climate policies. In other words, CAISO could remit the collected carbon proceeds back to the purchasers in each state based on the tons/MWh attributable to the power delivered to each state. Each state could then apply their own carbon regulations to the utilities or other purchasers in their own jurisdiction in accordance with state policies.

California could implement its carbon policy by assigning a compliance obligation to its own utilities based on their consumption of carbon emitting resources in the market. Those utilities would be responsible for a compliance obligation, but they would remain whole because they would have already been compensated by the CAISO for the cost of carbon delivered to them. In contrast, states without carbon policies could simply direct their utilities to refund the carbon proceeds to ratepayers in order to offset the increase in the market clearing price for energy. As long as generators are prevented from manipulating their energy bids to offset their carbon prices, the appropriate price signal would be sent to all dispatch in the system. This method of applying a uniform carbon price would be relatively simple to administer, and it would eliminate leakage in the system.

ISO Response

The ISO agrees that a single carbon program across the WECC would be the most efficient approach to meeting climate goals. Placing a price on carbon and requiring each generator to reflect its carbon costs in its energy bids would result in the least cost dispatch being the most economically efficient carbon dispatch. For resources not subject to a carbon program, a mechanism would be needed to refund this additional cost because it need not be provided to those resource because they do not need to incur a cost to procure compliance instruments. It is unclear if such an approach could be imposed without the individual states having this carbon approach as its policy.

Comments:

B. Assigning GHG Costs Only to California Purchasers

CARB's proposed amendments contemplate a solution that would assign the costs of GHG emissions due to secondary dispatch to purchases inside California. This method would first identify all of the unaccounted for out-of-state GHG emissions in the EIM (i.e. secondary dispatch emissions). Purchasers in California, such as California's utilities, would then be assessed a cost based on the total unaccounted for GHG emissions in the market. This solution would address the issue of price suppression in California's carbon allowance market because it would account for and assign costs to the out-of-state emissions that currently are not being tracked. This would reduce or eliminate the effect of suppressing carbon allowance prices due to flooding the market with non-emitting resources.

Although the integrity of the price for carbon allowances would benefit, this solution raises some concerns. First, there would be no price signal in the market that would allow California purchasers to avoid exposure to a compliance obligation. The dispatch of high and low carbon resources would still be managed by CAISO, and the market distortions causing secondary dispatch of fossil resources outside of California would continue. In other words, a California utility would have no control over the number of allowances it would be required to purchase to offset its consumption in the EIM market. That compliance obligation would be assigned after-the-fact. It also means that out-of-state fossil generation would continue to receive a windfall by benefitting from higher out-of-state energy prices without any requirement to pay a compliance obligation to California.

The problem of a "California Purchaser" compliance obligation also becomes more problematic in an expanded day-ahead market. For example, the current plan to transform CAISO into a multi-state RSO would begin with PacifiCorp, which in 2015 generated over 60% of its power from coal. California purchases could be exposed to substantial compliance obligations in a market that integrated PacifiCorp if CARB determines that there is an increased dispatch of those coal resources anywhere in the region that is attributable to California consumption. Moreover, those California purchasers would have little or no ability to avoid purchasing coal-heavy power in such a market, and the out-of-state generators would not face any disincentive to selling high GHG resources into the market

ISO Response

Until there is a single carbon program within WECC, there will be a conflict between incentivizing non-emitting resources and the accounting of emissions (both observed and unable to be observed).

Comments:

C. Apply the Unspecified Power GHG Rate to All Out-of-State Generation

This proposed solution would apply a uniform GHG adder to all out-of-state generation that is

imported into California, regardless of the source of that generation. This method attempts to approximate the current treatment of unspecified power resources into California markets; it also is a closer approximation to the actual GHG emissions of resources that are dispatched into the EIM. This method is problematic for several reasons.

First, this method would reduce the incentive to provide low or non-emitting resources to California. All out-of-state resources, including wind and solar, would face the same carbon price. This would provide the perverse incentive of disadvantaging non-emitting generation with a carbon price, while at the same time providing a relative advantage for coal generation because coal emits at a much higher rate than the unspecified power rate.

While this may be a palatable interim solution in the EIM, this solution would be unworkable in a day-ahead regional market. Applying a GHG cost to out-of-state renewable resources would reduce or eliminate one of the primary benefits touted by proponents of the regional market, which is the ability to acquire low-cost out-of-state renewable resources to meet California's RPS requirements. While those resources would still be available, adding a carbon price to zero emission wind from Wyoming or New Mexico would drive up the cost of those resources.

ISO Response

The ISO is considering variations to this approach that would reflect the lower carbon output for non-emitting resources scheduled to meet California load. For example, resources under contract to California load serving entities could be included in the market without applying the uniform GHG adder as there would be no secondary dispatch associated with the transfer of these resources' output to California.

Comments:

Require CAISO to Dispatch EIM Based Only on Incremental Out-of-State Production

In its September 9, 2016 comments to CARB, Powerex Corp. proposed a solution that would limit "deemed deliveries" in the EIM only to the incremental production from out-of-state resources.[11] Under this method, the CAISO algorithm would treat base schedules as being unavoidable for dispatch into the EIM. This method would reduce the extent of secondary dispatch in the market because it could only select clean resources for dispatch into California if those clean resources had not been previously scheduled to provide out-of-state power. Consequently, there would be smaller gaps to "backfill" with dirty power.

Although this method offers a potential solution to consider in the EIM, one which would require more analysis to understand how the market would respond, the limitation of the market to only consider incremental production would not be feasible in a day-ahead market. In contrast to the EIM, which is an optimized balancing market that only serves residuals from day-ahead commitments, the day-ahead market would schedule all of the available resources within the system and there would be no distinction between base schedules and incremental production. This method could therefore apply only to the EIM and would not address the problems of leakage that would occur in a larger day-ahead market.

ISO Response

This approach would require running the market optimization twice. As discussed in response to an earlier comment, base schedules in the EIM are not optimized prior to the start of the EIM. In addition, the market optimization does not solve for incremental dispatch, it solves the total dispatch

level needed to serve load. Base schedule in the EIM are used for settlement purposes only. Optimization across the market footprint can produce outcomes where some resources are decremented if based only on conditions outside California, but can be the least cost and least emitting resources when California needs are included, thus returning these resources to their base schedules. Thus, allowing only incremental dispatch would be contrary to the goal of least cost and least emitting dispatch.

Company	Date	Submitted By
Six Cities	09/19/16	Bonnie Blair

Comments:

These comments use the terms "GHG compliance" or "GHG compliance obligations" to refer generally to any applicable rules or regulations relating to reduction in carbon emissions from resources dispatched, available for dispatch, or scheduled through the RISO.

There is a clear tension between optimization of resource dispatch and tracking utilization of energy from resources so as to correctly assign responsibility for GHG compliance. Moreover, the complexity of addressing GHG compliance obligations will expand dramatically to the extent portions of the RISO BAA are subject to different GHG compliance obligations imposed by multiple states. The RISO dispatch optimization process must be able to recognize and accurately reflect the cost impacts of GHG compliance obligations, and the RISO must be able to produce data that will allow resource owners and LSEs to achieve and demonstrate compliance with applicable obligations. Further, the RISO market design should ensure that resources and LSEs bear the costs for compliance obligations that are applicable to them but not for compliance obligations applicable only to market participants in other states.

The Six Cities are unable to offer a comprehensive set of recommendations to address these highly complex and potentially contentious issues.

ISO Response

The ISO appreciates your comments and continued participation in this stakeholder initiative.

Comments:

However, the Six Cities recommend that the following principles be incorporated in any proposed GHG compliance framework for a RISO:

1) There must be an institutionalized and continuing process for coordination and collaboration among the RISO market design and operating staff and all state regulators responsible for developing and enforcing GHG policy and regulations applicable to market participants in any part of the RISO. The RISO cannot simply be reactive but must take on the primary responsibility for establishing and maintaining these coordination processes. For example, if the CPP becomes effective, the RISO should work proactively to coordinate and harmonize CPP compliance efforts across the states included in its footprint. The RISO market design and operating practices should seek to ensure that market

participants are not put at risk of facing penalties or uncompensated costs as a result of RISO activities over which the market participants have no control. At the same time, the collaboration and coordination processes among the RISO and state regulators should provide for participation by interested market participants and members of the public and should be as transparent as possible.
ISO Response
The ISO agrees that as individual states develop CPP, the market optimization will need to reflect those programs when in the market optimization so that energy transfers between the states reflect the cost of complying with the state's CPP compliance efforts.
Comments:
(2) To maximize efficiency of resource utilization, to facilitate achievement of clean energy objectives, and to ensure that LSEs receive accurate information regarding their supply costs, the RISO's bidding rules must allow suppliers to capture in their bids the full costs of meeting GHG compliance obligations. A corollary principle is that the RISO's optimization processes must accurately reflect the costs for GHG compliance.
ISO Response
The ISO agrees that bidding rules will need to be developed in this initiative.
Comments:
3) If there are aspects of GHG rules or regulations that cannot be monetized and reflected in bids, then the RISO's dispatch processes must include functionality to respect such non-economic restrictions.
ISO Response
The ISO agrees that to the extent possible functionality to respect non-economic restriction. The ISO also believes that state's when developing their CPP should include flexibility within the state's program to recognize that perfectly reflecting their CPP design may not be feasible in the market optimization. The primary purpose of the ISO's market optimization, particularly the real-time dispatch, is the reliably manage the grid and not to administer a GHG accounting program.
Comments:
4) To facilitate compliance with GHG obligations by LSEs and suppliers, the RISO market processes must be able to track, maintain, and provide to market participants all data necessary to enable and demonstrate compliance with all applicable GHG regulations.
ISO Response
The ISO agrees.
Comments:
5) Specific to the California Air Resources Board ("CARB") regulations applicable to entities in California, the RISO must ensure that its dispatch processes respect prohibitions against resource shuffling as well as compliance with other GHG obligations.
ISO Response
The ISO continues to work closely with CARB.

Comments:
6) With respect to the question at the bottom of page 9 in the Issue Paper, it would not be appropriate for the ISO to impose a rule that all energy self-schedules in the non-California zone serve only load outside of California. Such a rule not only would restrict the ability of LSEs in California to make beneficial use of external resources to which they have entitlements but also could expose them to accusations of resource shuffling. Documenting self-schedules for external resources contracted to California LSEs appears to be straightforward, and the GHG compliance obligation would be the responsibility of the entity submitting the self-schedule.
ISO Response
The ISO agrees. The refining of bidding rules to facilitate the tracking of energy transfers between regions and states will be refined as the straw proposal evolves.

Company	Date	Submitted By
SMUD	9/21/16	Andrew Meditz

Comments:
In the CAISO Regional Integration California Greenhouse Gas Compliance Issue Paper dated August 29, 2016 (Issue Paper), the CAISO asks whether the CAISO should require a rule "to prohibit load aggregation points from crossing state boundaries or a rule requiring that all energy self-schedules in the non-California zone serve only load outside of California?" Issue Paper at 9. In the September 6, 2016 Regional Integration California Greenhouse Gas Compliance web conference/presentation (Presentation), the CAISO further suggests a possible rule that "[s]elf-scheduled generation in one state cannot support load in another state." Presentation at Slide 10. And furthermore, this rule would "need a new mechanism to determine which generation and imports support load and exports." *Id.* at Slide 11. The discussion on September 6, 2016 centered on the concern that a self-scheduled generator has an implicit greenhouse gas compliance cost of zero. The CAISO reasoned that this implicit zero compliance cost should therefore preclude that generator from receiving the marginal greenhouse gas compliance cost implicit in the market clearing price. SMUD observes that it is not clear that one should assume a zero implicit greenhouse gas compliance cost when a generator submits a self-schedule. If the resource was procured for consumption by load in California, then it should be entitled to the marginal greenhouse gas compliance cost implicit in the market clearing price. Given the amount of out-of-state resources that California load serving entities import, with probably much of that self-scheduled into California, it would be incorrect to assume *de facto* that the output of an out-of-state self-scheduled generator would not deliver its power to another state.
ISO Response
The refining of bidding rules to facilitate the tracking of energy transfers between regions and states will be refined as the straw proposal evolves.

Comments:
The CAISO will need a way of tracking which generators have commercial commitments to load serving entities in other states, and which are thereby entitled to the greenhouse gas premium associated with the compliance obligation of that other state that is implicit in the market clearing price. This requirement could be enforced equally for generators in the expanded regional balancing authority area footprint, as well as to generators selling into the market from outside the footprint.
ISO Response
The ISO agrees that external resource to a state boundary may have commercial commitments to serve load in another state and that where will need to be bidding rules that reflect this reality.

Company	Date	Submitted By
TURN	9/20/16	Matthew Freedman and Kevin Woodruff

Comments:

CAISO SHOULD DEVELOP AND MAINTAIN DATA NEEDED FOR OTHER ENTITIES TO DOCUMENT REGIONAL MAREKT'S GHG IMPACTS AND VALIDATE COMPLIANCE WITH STATE GHG POLICIES

TURN supports the California Air Resources Board's ("CARB's") efforts to measure and mitigate the emissions of Greenhouse Gases ("GHGs") attributable to the resources that meet California's electric loads. TURN also appreciates the CAISO's efforts to enable CARB to perform such responsibilities in its design and management of the Energy Imbalance Market ("EIM") and, potentially, an expanded Day-Ahead energy market ("Regional DAM").

However, when developing GHG monitoring and mitigation measures for a possible Regional DAM, the CAISO must not limit its vision to California GHG policies alone. Rather, the CAISO should develop market and data retention policies to enable the development and administration of multiple state GHG mitigation and tracking policies, including some policies that may not be in place if and when a Regional DAM is implemented. Further, any Regional DAM must monitor GHG emissions in the aggregate across such a market's footprint; such monitoring should include both actual GHG emissions and estimates of the impact of the Regional DAM on such emissions.

More specifically, TURN recommends that the CAISO:

- Implement GHG Monitoring with the Start of Any Regional DAM: The CAISO should have a comprehensive GHG monitoring approach, as described herein, in place for the start of any Regional DAM.2 Such action would contrast favorably with the CAISO's apparent failure to monitor the full GHG impacts of the EIM.

ISO Response

The ISO will seek to include compliance costs within the market optimization so that individual state carbon policies can be supported by the market dispatch. The ISO, as it is doing currently with CARB, will work with other states to ensure their carbon programs can be reflected in the market.

Comments:

- Maintain Comprehensive GHG "Data Store": If a Regional DAM is implemented, the CAISO should maintain comprehensive records regarding GHG emissions that enable states and other non-market participating entities to implement state GHG policies and audit such policies' results. Such data should include estimates of the impact of the Regional DAM on GHG emissions; GHG emissions by generating unit (including units outside the Regional DAM's footprint that deliver into the Regional DAM); attributions of specific generators, and their related GHGs, to specific loads and Load-Serving Entities ("LSEs"); and the data and algorithms used to develop such results

ISO Response

The ISO is unsure as to what is meant by "data store". As stated above, the objective is to have the ISO's market optimization reflect various state carbon programs to the best extent feasible.

Comments:

- Enable States to Implement and Manage their Own GHG Policies: The Regional DAM and data store should allow states to implement and manage their own GHG policies and to audit such policies' results, even though such state policies may differ from California's GHG management approach. TURN recognizes that providing the states such tools may expand the complexity of the Regional DAM and data store. TURN also recognizes that the estimated GHG impacts of differing state policies may not match the CAISO's estimate of footprint-wide GHG impacts. If so, it is imperative that such differences be made known so that policy-makers can respond appropriately.

ISO Response

The ISO agrees that individual states will maintain the ability to implement their own carbon programs.

Comments:

CAISO SHOULD CLARIFY EIM'S CURRENT METHOD FOR ATTRIBUTING GENERATION TO LOAD AND JUSTIFY ITS FITNESS FOR USE FOR GHG ACCOUNTING IN A REGIONAL DAM

The CAISO's Issue Paper and presentation slides both cite the current means that the EIM uses to "attribute" which generation from outside the CAISO serves load inside the CAISO for purposes of computing the EIM's GHG impacts and suggests that this or a similar method could be used for the same purpose in a Regional DAM. Though this methodology is explained in various CAISO documents, TURN believes the CAISO should provide some examples in this initiative process of how the attribution process works to clarify discussion of future GHG accounting methods.

More importantly, the CAISO should justify the use of this "EIM attribution methodology" for attributing generation to loads in a Regional DAM. The CAISO's own analysis appears to show that its estimates of incremental GHG emissions may not be tied to the GHG emissions of the generating units that are incrementally dispatched by the EIM. Whatever the basis for adopting this attribution method, it does not seem to provide accurate estimates of the impact of the EIM's incremental

generation dispatches on incremental GHG emissions. Further, the EIM attribution methodology may allocate more cost-effective GHG reductions to California customers than it does to customers in other states. Such allocations of GHG reductions may matter greatly as other states adopt their own GHG compliance programs. Any bias in such allocations will not be tenable in the GHG attribution mechanism of a Regional DAM.

In sum, when developing policies regarding "GHG compliance" in a Regional DAM, the CAISO should not focus only on meeting CARB's current data needs; the CAISO must also prepare to provide complete data regarding GHG emissions to the states and other entities.

ISO Response

The ISO recognizes that the solution to address CARB's concerns regarding secondary dispatch must be scalable to the day-ahead market within a multi-state balancing authority area.

Comments:

CAISO SHOULD CLARIFY WHETHER PROPOSED METHOD(S) FOR ATTRIBUTING GENERATION TO LOAD CAN BE USED TO ATTRIBUTE RENEWABLE ENERGY GENERATION TO CALIFORNIA AND OTHER STATES' LOADS

One critical issue related to California's participation in a Regional DAM is how renewable resources in such a market would be counted in California's current Procurement Content Categories ("PCCs") or "buckets". The CAISO should explain whether its proposed method(s) for attributing specific resources to specific loads in a Regional DAM could also be used to attribute out-of-California renewable energy resources to California loads. Further, the CAISO should clarify the operational practices needed to ensure "delivery" of energy by non-CAISO resources to CAISO loads in order to receive credit as a Category 1 RPS resource under the California RPS program.

ISO Response

The ISO's market optimization ensures both physical and schedule limits are honored when determine the least cost dispatch.

Company	Date	Submitted By
VEA	9/20/16	Daniel Tillman

Comments:

VEA is supportive of the direction the CAISO is taking in addressing the design required for a multi-state RTO. No longer can it be assumed that a MW of electricity imported into the CAISO sinks with California load nor that a MW that serves regional load from the CAISO came from a California generator. Traditional contract-path-based tags into the CAISO cannot properly account for the electricity that is consumed in the CAISO if there is more than only California load participating in the CAISO's markets.

VEA appreciates the CAISO's perspective that some sort of attribution regime akin to that being used in the EIM today is necessary. VEA supports a method that aligns the treatment in the EIM and traditional ISO markets, and one in which recognizes net flows not gross schedules.

ISO Response
The ISO appreciates your comments and continued participation in this stakeholder initiative.
Comments:
VEA offers additional feedback on two design features raised by the CAISO • Self-Schedules: VEA encourages the CAISO to continue exploring treatment of self-schedules. The possibility raised by the CAISO in its issue paper about presuming that a self-schedule only sinks in its state of origin is problematic for a number of reasons, and such a limitation would unnecessarily constrain the market and reduce market efficiency. VEA recommends that the CAISO consider maintaining a GHG bid adder paradigm wherein Scheduling Coordinators (SCs) can both (1) express a preference to self-schedule an energy delivery and (2) express a cost/price preference for having their energy serve California load (and thereby incur a carbon obligation). As with the economic bids in the EIM, such bid adder is separable from the resource's energy bid. Creating this separate ability to express GHG bid adders on self-schedules allows SCs to continue to self-scheduled energy to manage resource constraints yet choose the manner in which the ISO treats the availability of this energy to be delivered to California or not. For example, VEA may self-schedule its Western Federal hydro resources given water constraints, yet VEA would like the option of indicating how much (and at what price) that energy can be made available to serve California load. That is, the need to self-schedule often arises given constraints on the resource's production but not necessarily given constraints as to where that energy has to sink.
ISO Response
The ISO agrees. The refining of bidding rules to facilitate the tracking of energy transfers between regions and states will be refined as the straw proposal evolves. With regards to self-schedules, it may be necessary to understand which load serving entity the resource or import is serving in order to accurately determine the difference between a zone's load and generation.
Comments:
• Existing Interties – Existing interties should not – by default – be deemed to be "inside California" as the CAISO suggested in its issue paper. VEA's import point of Mead is a good example; VEA delivers its energy schedules to Mead to serve its Nevada load. If Mead were assumed to be a California internal intertie this likely would continue to preclude proper GHG treatment of VEA's imports and load service through h the CAISO.
ISO Response
The treatment of various interties scheduling point will be discussed further as the straw proposals is developed.

Company	Date	Submitted By
WPTF	9/19/16	Ellen Wolfe
Comments:		
We note that issues regarding the assignment of electricity and associated emissions to California		

load that arising in the EIM will also need to be resolved for regional ISO. Incentives to send lowest cost/lowest emissions resources to California is inherent in CA cap and trade program without similar programs in the West. It may not be possible to overcome these incentives through a California-only program, while also avoiding the imposition of carbon costs on non-California markets and still achieving efficient market outcomes.

WPTF is concerned that the regional GHG design will require both the CAISO and the California Air Resources Board (ARB) to approve the policies. While WPTF appreciates the ISO's initiative WPTF believes it critical that ARB participate in parallel with the design process such that adopted policies will be supported at both organizations. WPTF would like the ISO to reach out to ARB and for the organizations to collectively arrive upon a process timeline that has the ARB also processing and approving the policies as they work their way through the development process.

ISO Response

The ISO continues to work with CARB to address their concerns regarding "secondary dispatch" in the EIM. Any market design changes necessary to assist CARB will also consider the scalability to a multi-state balancing authority area.

Comment:

WPTF would find it helpful to have more information about gross flows through California that are tagged through the CAISO and expect that other stakeholders may also find this information useful.

WPTF would like to request that the CAISO provide monthly gross, aggregated final (or FMM) tagged interchange quantities for CAISO interchanges between non-California BAAs and excluding - or separately identifying – wheeled through quantities, and excluding EIM transfers. This information will be helpful in parties' understanding of the differences between gross and net carbon accounting.

ISO Response:

The ISO has included the requested data in the presentation material for the October 13th technical workshop.

Comments:

Given that the CAISO is designing a GHG mechanism that is envisioned to be sustainable into the future for some time WPTF believes certain fundamental principles should be upheld. These include the following.

Electricity Import rules should be consistent across power markets. Rules for the treatment of electricity imports into California have already been changed to accommodate the Energy Imbalance Market. (EIM). This has led to disparate treatment of imports across the electricity markets: emission obligations are assigned on the basis of NERC e-tags, and contracts for energy imported via California Independent System Operator markets (non-EIM) and bilaterally; emission obligations for energy imported via the EIM are attributed to specific resources based on a computer algorithm. The CAISO and ARB should work to ensure consistent and equitable treatment of electricity imported into the state across all markets in order to provide appropriate carbon price signals, avoid electricity market distortion, and avoid incentives for external resources to participate in one market instead of another to reduce carbon obligations.

ISO Response

The ISO agrees that consistency needs to be maintained between day-ahead and real-time when the ISO expands. This will mean that the market optimization will attribute which supply is serving a given state's load versus using out-of-market evidence such as tags.

Comments:

Rules for attribution of electricity to California/non-California load should not discriminate. Rules for attribution of electricity to California/non-California load should not discriminate between California and external resources in providing opportunity to serve California load to the extent possible. A rule that assigns the least cost energy bid or the least emission bid to non- California load first, could discriminate against the ability of low emission resources to get to California and capture the carbon premium. If such a rule were implemented, then for fairness we should have a rule that also allows a resource to bid to serve load in California only.

ISO Response

The ISO agrees with this principle and that it should be strived for "to the extent possible"

Comments:

GHG policies should not result in an increase in carbon over the footprint. Policies aimed at assignment of carbon costs and allocation of dispatched electricity to serve California load should avoid an increase in emissions in the market footprint due *solely* to displacement of generation from a California resource to a non-California resource based on carbon adders.

ISO Response

The ISO agrees that the benefit of a larger multi-state balancing authority area is the ability to integrate additional renewable resources which naturally leads to a lower carbon footprint.

Comments:

User's Choice. Determination of whether and what portion of the output of a resource may be deemed delivered to California should be made by bidder, not by administrative rules.

ISO Response

The ISO agrees that participation should remain voluntary as it currently is within the EIM.

Comments:

Net interchange - WPTF supports the CAISO's pursuit of an approach of net interchange accounting for assignment of electricity to California load consistent with the current EIM treatment across all markets. WPTF recognizes this requires some collaboration with ARB to address their concerns. We ask the ISO to take on this issue directly and to develop a strategy for working with ARB on what policy changes may be needed on their end in support.

ISO Response

The ISO has highlighted the treatment of imports/exports when determining the attribution of resource serving a give state's load as an issue to be address in this initiative and in consultation with CARB.

Comments:

Self Schedules – WPTF cautions against firm administrative rules that deem in a binary way what self schedules are used for by SCs. WPTF agrees that treatment of self schedules requires some additional consideration given their lack of economic bids. We encourage the CAISO to consider the possibility of

a bid adder structure on self schedules despite their lack of economic bidding for the energy. The treatment of self schedules certainly requires further consideration.

ISO Response

The ISO agrees. The refining of bidding rules to facilitate the tracking of energy transfers between regions and states will be refined as the straw proposal evolves.

Comments:

Existing Interties – WPTF does not believe that existing interties can – by default – be deemed to be "inside California". At a minimum there is load that currently exists outside of California that is served through existing ties. As such a solution that treats all ties universally rather than deeming some "inside" or "outside" California is appropriate.

ISO Response

The ISO will address this issue as the straw proposal is developed.

Comments:

• **Addressing multiple States' GHG Programs** – WPTF offers two points related to concerns that the CAISO may need to have varying structures for differing states' GHG programs.

- There should be no reason for multiple bid adders. The need for a bid adder is only driven by California carbon requirement on imports to California and is independent of what other states are doing. Because of that only one bid adder should be required irrespective of which other state the energy is imported from.
- The CAISO may need to be cognizant of other states' GHG programs when clearing the market if it has local market power mitigation that would mitigate a bid to a cost basis. If a resource in another state has a carbon obligation in its own state the CAISO would need to recognize this fact in its own market power mitigation regimes.

ISO Response

The ISO believes that as individual states develop CPP, the market optimization will need to reflect those programs when in the market optimization so that energy transfers between the states reflect the cost of complying with the state's CPP compliance efforts. The implementation may require the need for multiple bid adders.