Memorandum

To: Energy Imbalance Market Governing Body

From: Mark Rothleder, VP, Market Quality and Renewable Integration

Date: July 5, 2018

Re: **Decision on EIM Greenhouse Gas Attribution Enhancements**

This memorandum requires EIM Governing Body action.

EXECUTIVE SUMMARY

Over the last year and a half, Management has worked with stakeholders, including state regulators, western energy imbalance market (EIM) participants, and California load serving entities to address the concern that the existing EIM design does not account for the full atmospheric greenhouse gas (GHG) emission effects associated with energy transfers into the ISO balancing area. This memorandum describes Management's proposed EIM design change to address this concern.

Under California GHG regulations, supply resources that the EIM dispatches to support energy transfers serving load in the ISO balancing area have an obligation to submit compliance instruments (allowances and/or offsets) to the California Air Resources Board (ARB) for the associated GHG emissions. The market dispatches EIM participating resources to support energy transfers into the ISO balancing area based on its least-cost dispatch optimization, which minimizes the total of both energy and GHG regulation compliance costs.

The existing least-cost dispatch tends to designate lower-GHG emitting EIM resources as supporting transfers into the ISO balancing area because these resources typically bid the least expensive GHG compliance costs. When this occurs, there can also be a "secondary" dispatch of other higher-emitting resources that the market dispatches to backfill to serve load outside the ISO, effectively replacing the energy transferred into the ISO. The existing EIM design arguably under-accounts for GHG emissions associated with these transfers because the market's GHG attribution rules do not account for the emissions associated with this secondary dispatch.

Management proposes to minimize the secondary dispatch and thus enhance the accounting of the atmospheric GHG effects through a market design change that will limit the amount of an EIM resource's output that the market can designate as supporting an energy transfer to serve load in the ISO balancing area. "Base schedules" are an EIM market feature representing a resource's output that an EIM

participant is scheduling to serve a forecast load outside of the ISO. The proposed modification will enable the market to designate as supporting a transfer only an amount no greater than the headroom on a resource above its base schedule. This change will more accurately account for GHG emissions because it will recognize that a base schedule represents resource output that has already been scheduled to serve load outside the ISO balancing area and consequently should not be designated as supporting an energy transfer.[1]

These policy changes fall within the EIM Governing Body's primary approval authority as the rules they relate to are EIM specific and would not exist without the EIM.

Management proposes the following motion:

> ***Moved, that the EIM Governing Body approves the proposal for tariff clarifications enhancing the EIM greenhouse gas attribution, as described in the memorandum dated July 5, 2018, including any filings that implement the overarching initiative policy but contain discrete revisions to incorporate Federal Energy Regulatory Commission guidance in any initial ruling on the proposed tariff amendment.***

DISCUSSION

Background

Energy generated in California or imported to serve California load is subject to GHG regulations adopted by the California Air Resources Board (ARB). Under these existing regulations, the compliance obligations apply to "first deliverers," which are generation owners or energy importers. The regulations identify an EIM participating resource scheduling coordinator as an energy importer if the EIM dispatches a supply resource it controls to support an energy transfer into the ISO balancing area. These entities have a GHG compliance obligation under ARB's GHG regulations, including the obligation to submit compliance instruments for the amount of imported energy, which the entities must acquire at a cost.

ARB's GHG regulations first went into effect before the start of the EIM. To address the associated compliance costs, the ISO developed a mechanism to reflect GHG compliance costs as part of energy bids and locational marginal prices within the ISO balancing area.

As part of the EIM, the ISO implemented market provisions in which locational marginal prices outside of the EIM balancing area do not include GHG regulation compliance costs, but external resources receive an uplift payment for GHG compliance costs when

[1] A base schedule could also be to support a non-EIM import into the ISO balancing area but these imports have a separate GHG regulation reporting mechanism outside of the EIM.

the market dispatches them to support energy transfers into the ISO balancing area. This uplift payment is based on a marginal GHG compliance cost that is based on GHG bid adders reflecting GHG compliance costs, which suppliers submit for EIM participating resources along with energy bids.

When dispatching EIM resources to serve load outside the ISO balancing area, the market optimization considers only the energy bid. When dispatching EIM resources to support energy transfers into the ISO, the market optimization considers the energy bid cost plus the GHG bid adder cost. Suppliers voluntarily submit the GHG bid adders if they want their resource to be eligible to support energy transfers into the ISO balancing area and earn GHG cost uplift payments.

The EIM's resource-specific attribution of transfers into the ISO balancing authority area provides transparency regarding the resources dispatched to support EIM transfers. However, these transfers can result in a phenomenon known as secondary dispatch.

Secondary Dispatch

Under the current EIM design, the ISO's least-cost dispatch tends to dispatch lower GHG-emitting resources as supporting transfers to serve load in the ISO balancing area because these resources submit the lowest cost GHG bid adders to the market. Because all resources in an EIM balancing area are generally equally effective in supporting energy transfers to another balancing area, the market minimizes costs by designating the resources with the lowest GHG costs as supporting transfers to the ISO balancing area.

Currently, the market can designate all of a participating resource's output for which there is a corresponding GHG bid adder as supporting a transfer. This can include output corresponding to a resource's base schedule, despite that a base schedule means the supplier has already scheduled that output to serve load outside the ISO.

The market may designate a resource as supporting a transfer into the ISO even though that resource would have operated at the same output to serve load outside of the ISO without an energy transfer. The market will dispatch another resource or resources to "backfill" this dispatch to serve the load outside of the ISO that would have been served by the resource designated as supporting the transfer. This "secondary dispatch" results in greater actual atmospheric GHG emissions than what is accounted for by the market if the backfilling resource or resources have higher GHG emission rates than the resource the market designates as supporting the transfer.

This secondary dispatch effect does not occur every time there are energy transfers into the ISO. The market may have dispatched a resource above a base schedule to enable a transfer into the ISO. There would be no backfilling resource in this case. Also, the secondary dispatch may not result in increased GHG emissions if the backfilling resource has the same or lower GHG emission rate as the designated resource.

Nevertheless, some stakeholders have expressed concern that the secondary dispatch effect in the EIM results in GHG accounting that does not fully reflect the atmospheric effect of the EIM dispatching resources to support energy transfers into the ISO. The stakeholders' concern is the market optimization's least cost dispatch can designate low GHG emitting resources as supporting transfers, while not accounting for the resulting secondary dispatch of other possibly higher GHG emitting resources.

Proposal

Management proposes to address this concern by limiting the amount of a resource's output that the market can designate as supporting an energy transfer into the ISO balancing area. Management proposes to only allow the market to designate a resource as supporting a transfer in an amount no greater than the headroom on a resource above any base schedule. The market will calculate this headroom as the megawatt quantity for which the supplier has submitted an energy bid and a corresponding GHG bid adder for the resource minus the amount of any base schedule. In no case will the market designate as supporting a transfer an amount greater than the GHG bid adder submitted by the supplier. This change will reduce the magnitude of any secondary dispatch, improving the accuracy of the market attribution.

With this modification, the market optimization will limit the amount of a resource's output it designates as supporting a transfer into the ISO when the resource has already been scheduled to serve load outside the ISO through a base schedule. Since the amount will be limited, the resulting market dispatch will be different than under the current EIM design because the market will need to dispatch other resources that have capacity available above their base schedule. Consequently, the market will more appropriately account for the GHG emissions of the resources dispatched to serve load in the ISO Balancing Area.

The proposed modification reduces the potential for the secondary dispatch effect, but does not eliminate it. For example, assume that a resource had a base schedule of 80 MW and energy and GHG bid adder bids for up to 100 MW. If the market dispatched the resource to 85 MW, it could currently designate the entire 85 MW as supporting a transfer into the ISO balancing area. Since the dispatch only increased the resource's output by 5 MW from its base schedule, the potential secondary dispatch amount is 80 MW. Under the proposed modification, the market will be able to only designate 20 MW of the resource's output as supporting a transfer. Consequently, the potential secondary dispatch would only be 15 MW, representing the 20 MW that the market can designate as supporting a transfer minus the 5 MW the market dispatched the resource above its base schedule. Thus, in this example, the proposed modification reduces the magnitude of secondary dispatch from 80 MW to 15 MW.

Management's proposal outlined in this memorandum is the result of an extensive stakeholder process conducted over the last year and a half. This stakeholder process

explored several alternative modifications including one that would run a counterfactual dispatch that does not allow for transfers into the ISO, and one that would designate resources as supporting transfers using a default emission rate. These alternatives were ultimately ruled out because they would either create adverse incentives in the market, result in inappropriate pricing, or inequitably designate resources as supporting energy transfers.

POSITIONS OF THE PARTIES

Stakeholders, including the ARB, generally support Management's proposal to limit the amount of a resource's output that the market can designate as supporting a transfer into the ISO balancing area. As described above, Management's proposal is the result of weighing several alternative modifications over a lengthy and informed stakeholder process. Stakeholders' comments throughout the process highlighted the complexity of balancing the accuracy of GHG accounting with price formation and bidding incentive issues. Management will continue to work closely with ARB, in ARB's regulatory process, to address any remaining GHG under-accounting from the remaining amount of secondary dispatch that can still occur under the proposed modification.

Stakeholders also recognize continued discussions will occur regarding GHG market design to address expansion of the EIM functionality into the day-ahead market and under a possible multi-state GHG regulation paradigm.

Some stakeholders have observed that market participants may configure resources' base schedules to maximize GHG revenue as opposed to the most optimal operation of their resources. Management plans to monitor for changes in base scheduling practices, and notes that there may not be an incentive to engage in this behavior because sub-optimal base schedules will result in re-dispatch costs that may be greater than any GHG compliance cost uplift payment.

CONCLUSION

Management requests the EIM Governing Body approve Management's proposal to limit the amount of a resource's output the market can designate as supporting an energy transfer into the ISO balancing area. This modification will improve the accuracy of GHG accounting by limiting the potential amount of secondary dispatch that can occur.