

Memorandum

To: ISO Board of Governors

From: Keith Casey, Vice President, Market and Infrastructure Development

Date: July 9, 2015

Re: **Decision on bid cost recovery and variable energy resource settlement**

This memorandum requires Board action.

EXECUTIVE SUMMARY

Management seeks Board approval to modify existing financial settlement rules to ensure fair treatment of variable energy resources that provide economic bids to the ISO market. Economic bids from variable energy resources are an important tool to efficiently integrate these resources into the operation of the grid. The proposal recognizes the operational characteristics of variable energy resources that are dispatched to a forecast in the ISO market.

Additionally, applicable to all resource types, Management proposes some minor enhancements to the calculation of the bid cost recovery mitigation measures that are used to ensure a resource's bid cost recovery payment is only based on costs for energy that it actually delivered.

These two items are further refinements to the fifteen-minute market changes and the bid cost recovery changes that went into place in May 2014.

Management proposes the following motion:

Moved, that the ISO Board of Governors approves the bid cost recovery and variable energy resource settlement proposal, as described in the memorandum dated July 9, 2015; and

Moved, that the ISO Board of Governors authorizes Management to make all necessary and appropriate filings with the Federal Energy Regulatory Commission to implement the proposed tariff change.

DISCUSSION AND ANALYSIS

Management's proposal consists of two items:

- **Item 1** – Financial settlement modifications for economically-bidding variable energy resources.
- **Item 2** - Enhancement of a bid cost recovery metric calculation used in settlement of all resources.

The following sections discuss these two items.

Item 1 - Settlement modifications for economically-bidding variable energy resources

Management's proposal for this item solves an issue in which the ISO currently settles energy from economically-bidding variable energy resources during certain periods at a resource's bid price rather than its locational marginal price. Without this proposed change, variable energy resources would have a disincentive to submit economic bids because they typically bid a low, or even a negative dollar amount that reflects their marginal opportunity cost, which is usually lower than the locational marginal price. This settlement outcome occurs because the ISO market classifies certain ramping energy as "residual imbalance energy," which it settles at a resource's bid price rather than the locational marginal price.

Management's proposal for this item also solves another issue in which normal error in the forecast output of variable energy resources currently triggers the "persistent deviation metric," which mitigates the price paid for residual imbalance energy.

To address these issues, Management proposes to:

- Pay residual imbalance energy resulting from variations in a resource's intermittent energy source at the locational marginal price, rather than at the resource's bid price. Under this circumstance, the residual imbalance energy will not be subject to mitigation measures that apply to uninstructed deviations.
- Continue to pay the resource's bid price for residual imbalance energy resulting from the ISO dispatching a variable energy resource down based on its economic bid. Under this circumstance, the residual imbalance energy will be subject to mitigation measures.

A supply resource uses its energy bids for two main purposes: first, to specify the minimum price at which it is willing to provide energy to the market; and second, to specify the maximum price it is willing to pay to "buy back" in real time energy it sold in the day-ahead market. Energy bids for the latter purpose are commonly called decremental bids because they are bids by a supplier to reduce or decrement a resource's real time output relative to its accepted energy schedule. Economically bidding variable energy resources typically bid zero or negative dollar amounts as compared to positive amounts from conventional

generators. The negative bids reflect payments such as production tax credits variable energy resources may receive outside of the ISO markets. Integrating large quantities of variable energy resources into the supply fleet creates an increased need for a liquid supply of economic bids from variable energy resources to integrate them into the ISO market and the operation of the grid.

Economically bidding variable energy resources are unique because their energy output may be driven by a change in their intermittent energy source or a change in the locational marginal price. Variable energy resources only behave like conventional generators and control their output when their energy output is driven by a price change.

Despite this difference, the ISO market's energy settlement in some aspects currently treats the energy from variable energy resources as if the output is always controllable. Economically bidding variable energy resources are treated somewhat like a conventional generator even when they are only responding to an intermittent energy source change and are not being economically dispatched by the ISO. This creates a discrepancy when paying the resource for residual imbalance energy.

“Residual imbalance energy” is energy dispatched in the real-time market attributable to ramping down from a dispatch in a previous hour, or ramping up to a dispatch in a subsequent hour. This energy type is paid based on a generator submitted bid in the previous or subsequent hour that drove the dispatch, referred to as the “reference hour bid.”

Residual imbalance energy can occur from either a change in a resource's intermittent energy source or an economic dispatch. When a resource moves pursuant to an intermittent energy source change, the current settlement rules will pay the resource based on the reference hour bid even when the locational marginal price is higher. However, the current settlement rule does not recognize that the resource is not controlling its dispatch like a conventional generator.

Management proposes to differentiate when the residual imbalance energy is driven by an intermittent energy source change versus an economic dispatch for economically bidding variable energy resources. When driven by an intermittent energy source change, the settlement will be based on the locational marginal price in recognition that the resource is a price taker. When driven by an economic dispatch, the settlement will continue to be based on the reference hour bid that drove the dispatch, consistent with a conventional generator's settlement. In this circumstance, this residual imbalance energy settlement is an important safeguard to ensure resources are not able to unjustly increase their residual energy settlement payments.

For self-scheduled variable energy resources, the residual imbalance energy is always driven by an intermittent energy supply change and is settled at the locational marginal price.

Along with these changes, Management also proposes to no longer apply bid cost recovery mitigation measures to the residual imbalance energy settlement when variable energy resources are responding to changes in their intermittent energy source. These mitigation

measures will continue to apply when variable energy resources are responding to a dispatch due to an economic bid, consistent with the settlement of conventional resources.

Item 2 - Enhancement of bid cost recovery calculation

Management's proposal for this second item solves an issue with the "day-ahead metered energy adjustment factor." The day-ahead metered energy adjustment factor is a metric applied to all resources to ensure that a resource's bid cost recovery payment is only based on costs for energy that it actually delivered. Should the resource under-deliver, the factor will reduce the amount of eligible bid cost recovery. Bid cost recovery is the process by which the ISO ensures that scheduling coordinators are able to recover start up, minimum load and energy bid costs for supply resources. The bid cost recovery calculations compare bid costs and market revenues for each resource to ascertain whether or not there is a net revenue shortfall over the course of the day-ahead and real-time markets. If so, the resource receives an uplift payment for that shortfall.

Management proposes minor enhancements to the adjustment factor so that it accurately calculates whether mitigation is appropriate. The enhancements will avoid mitigation in instances when a resource producing energy above minimum operating capacity and when a resource is fully responding to ISO dispatch. These enhancements will ensure that the mitigation is applied consistent with the original policy intent that was implemented last year.

POSITION OF THE PARTIES

Stakeholders unanimously support the modifications to the day-ahead metered energy adjustment factor.

Stakeholders support the proposed settlement changes for variable energy resources with regard to the residual imbalance energy and the application of the persistent deviation metric. Stakeholders had two additional positions described below. A detailed stakeholder matrix is attached.

Position 1: One stakeholder proposed developing new energy types specifically for variable energy resources to account for their unique operating characteristics.

Response: Management appreciates the potential merits of such an approach but believes, for now, that there is benefit to leveraging the existing settlement constructs until a plan to use differentiated settlement codes is agreed upon. The ISO may address this through a follow-on stakeholder initiative. For now, the changes provided in the proposal largely addresses the stakeholder's concerns about treatment of variable energy resources. In the meantime, the ISO can learn from the resources operating in the market to inform such an initiative.

Position 2: Stakeholders would like more implementation details during the stakeholder process.

Response: Through this initiative, the ISO has provided additional settlement examples and technical walk-throughs to bridge the gap between high-level policy development and implementation. The ISO has also coordinated with its implementation teams to clarify how the policy will be implemented.

CONCLUSION

Management recommends the Board approve the bid cost recovery and variable energy resource settlement proposal described in this memorandum. The change in settlement for residual imbalance energy recognizes the unique operating characteristics of intermittent resources and appropriately aligns the application of mitigation measures between variable energy and conventional resources. Moreover, the enhancements to the bid cost recovery calculation will appropriately consider additional conditions to ensure that bid cost recovery is provided when resources follow ISO dispatch instructions.