

Decision on FERC Order 764 Market Design Changes

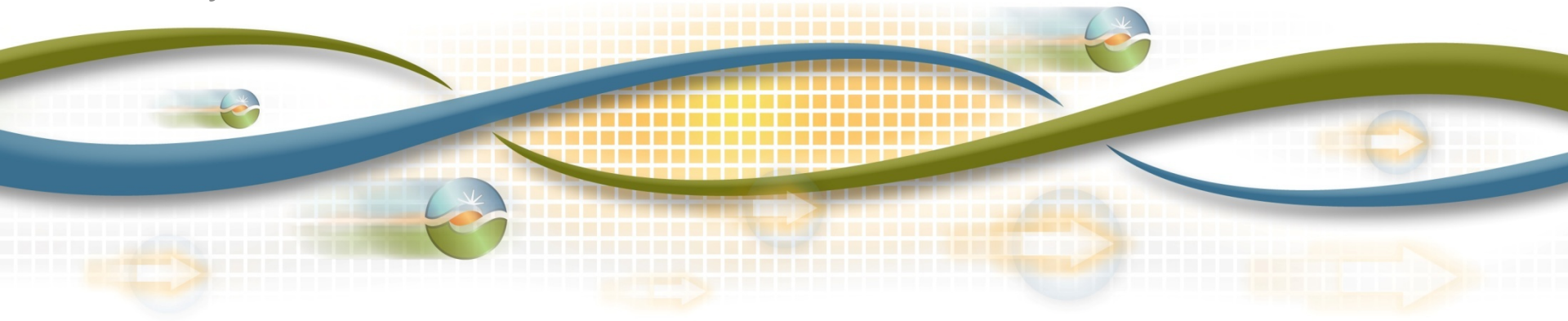
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General Session

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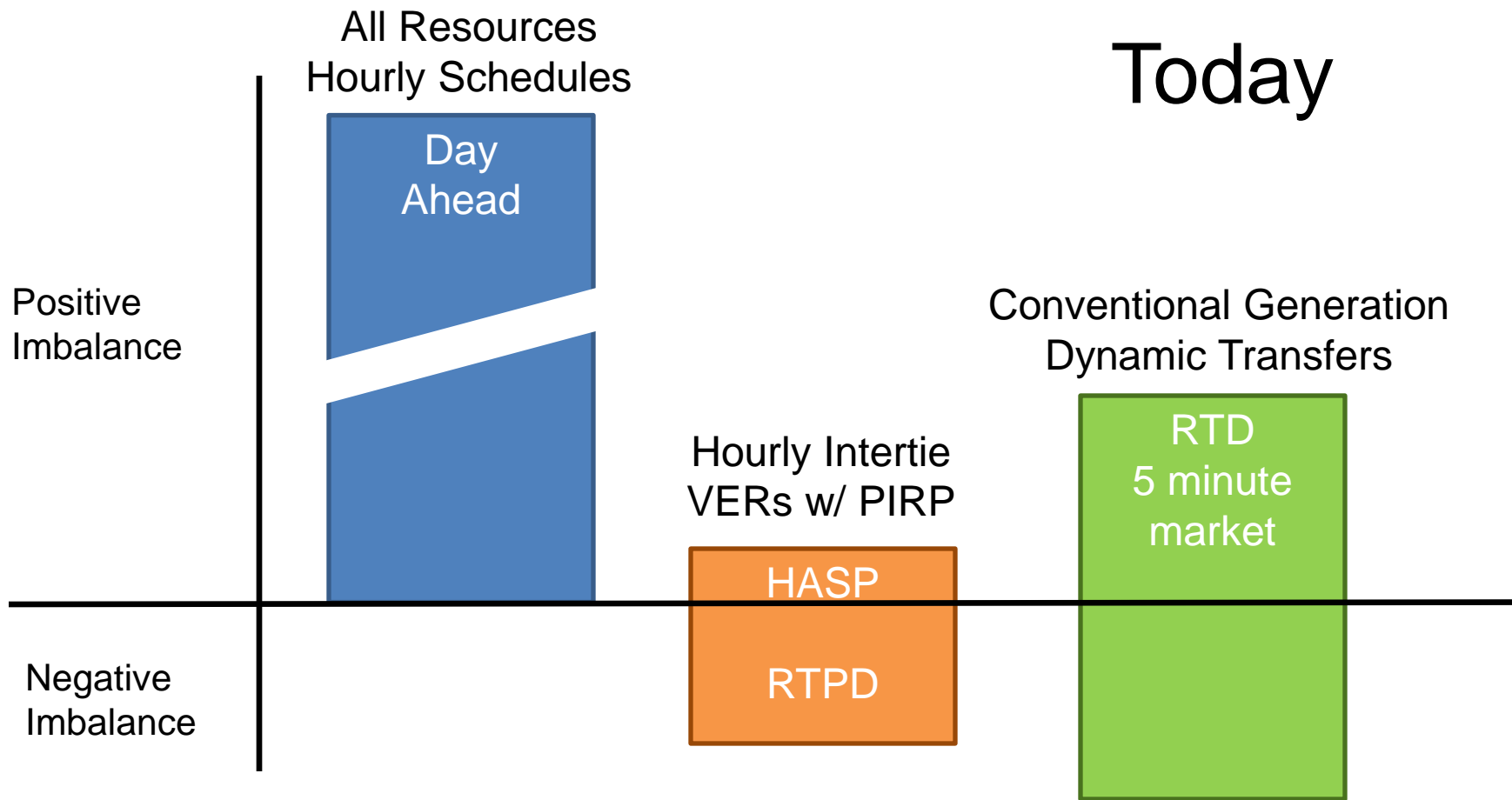
FERC Order 764 removes barriers to the integration of variable energy resources by:

1. Requiring transmission providers to offer an option to schedule energy in 15-minute increments, and
2. Requiring variable energy resources to provide meteorological and forced outage data for the purpose of power production forecasting.

Through the ISO's FERC Order 764 stakeholder process, Management sought to:

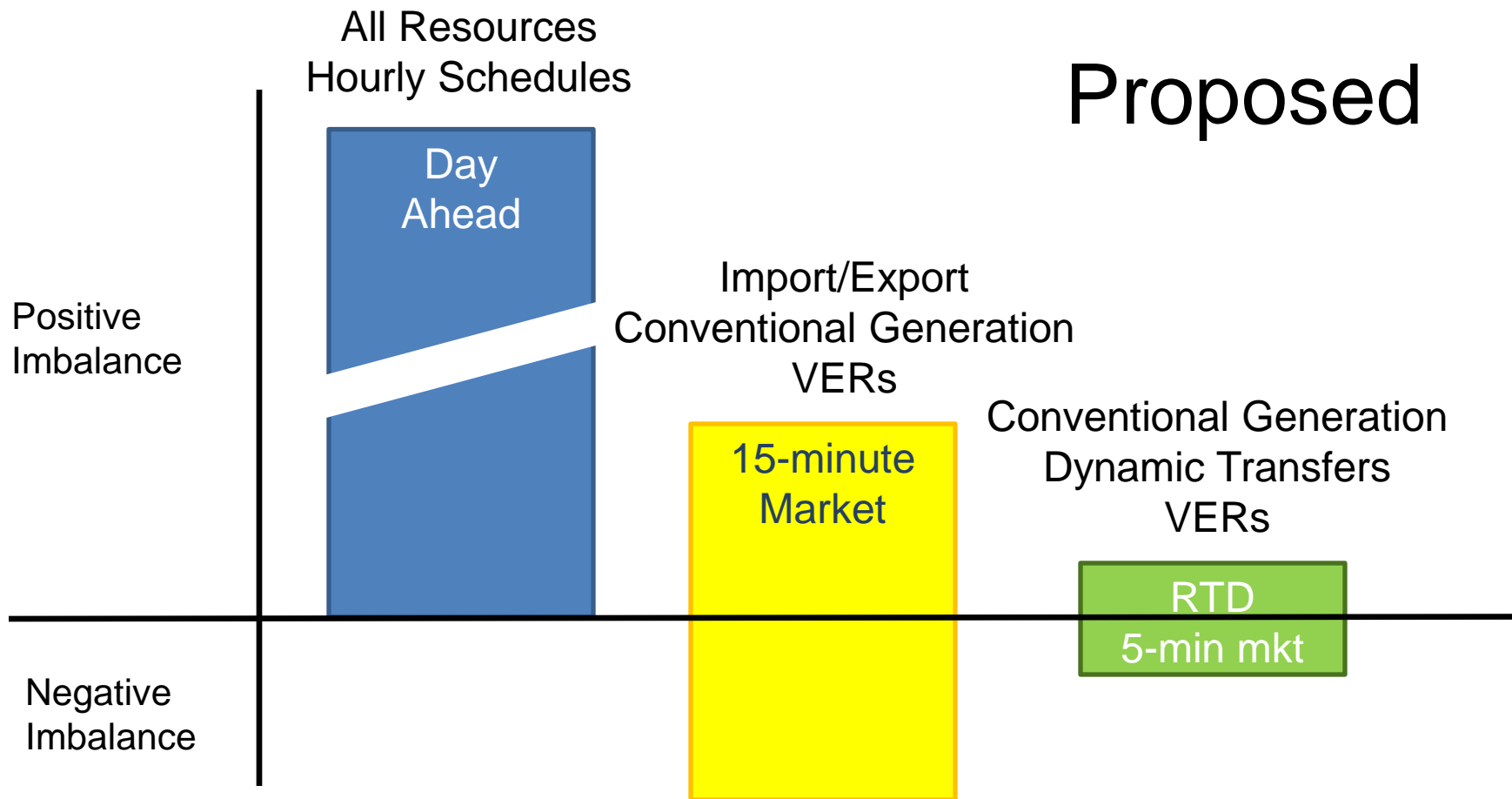
- Orient real-time market design to support participation of variable energy resources
- Provide the option for 15-minute scheduling on the interties
- Continue to support fixed hourly intertie transactions and minimize seams issues in the western interconnect
- Address market inefficiencies with the current real-time market
- Leverage existing market software to the greatest extent possible

15-minute market allows for more resources to address intra-hour variability and uncertainty



RTD manages hourly real-time schedules in addition to day-ahead deviations

15-minute market allows for more resources to address intra-hour variability and uncertainty



Since July 2010, the ISO and stakeholders have worked to orient market design around variable energy resources.

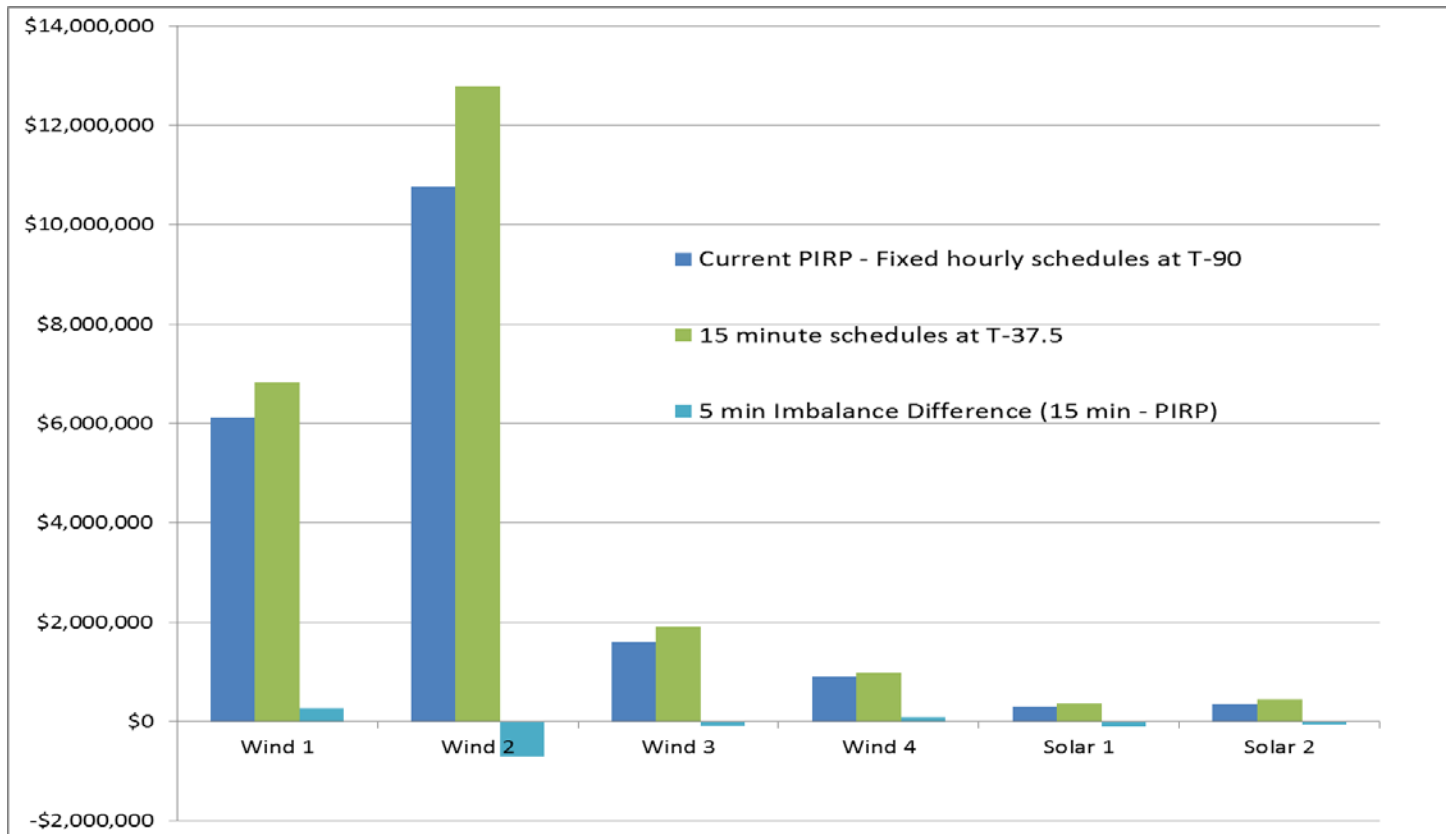
Issue	Proposed Design	
Use forecasts closer to financially binding interval	T-37.5 min forecast used in 15-min market T-7.5 min forecast used in RTD	✓
More granular forecast	Multi-hour forecast with 5-min granularity	✓
Allow economic bids	Bids can determine if forecast will be scheduled or dispatched	✓
Minimize deviations settled at more volatile RTD prices	Introduced 15-minute schedule and eligible for bid cost recovery	✓
Allow dynamic transfers to participate in PIRP	Similar treatment for internal and external resources	✓

FERC Order 764 accelerated necessary design changes

Implementation planned for Spring 2014

The proposed design provides variable energy resources with more granular and accurate 15-minute scheduling opportunities - reducing exposure to 5-minute market.

Real-time Market Revenue Comparison (July 2011 – June 2012)



Used persistence as a proxy for 15-minute forecast

Management will propose protective measures for existing PIRP resources that are unable to benefit from design due to:

1. A material portion of the existing plant's output uses technology that lacks the ability to receive and follow ISO curtailment dispatches or is contractually prohibited from curtailing output; and
2. The PIRP resource bears the imbalance market costs under its existing contract.

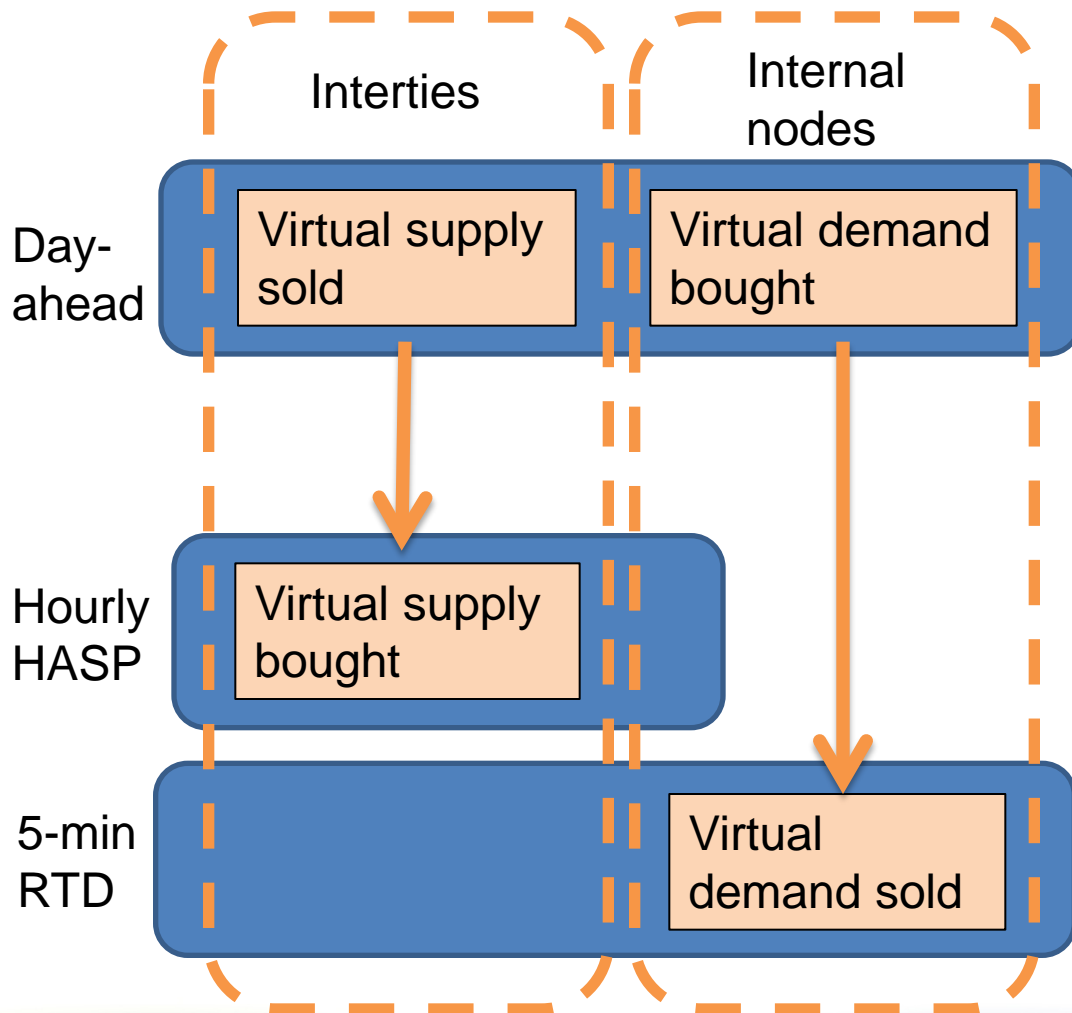
Protective measures for identified PIRP resources will be designed to address specific issues identified.

- Provide similar imbalance price risk as under current PIRP settlement (e.g., monthly netting of imbalances)
- Minimize implementation costs and complexity
- Applied until the end of the current contract term
- Concurrent filing with Order 764 market changes:
 - 30 day window to request protective measures
 - Provide opportunities for negotiations between contracting parties
 - Proposed protective measures presented for decision at September Board of Governors meeting
 - Order 764 market changes and protective measures filed with FERC in November

The proposed intertie options should incentivize transition to 15-minute schedules and preserve liquidity.

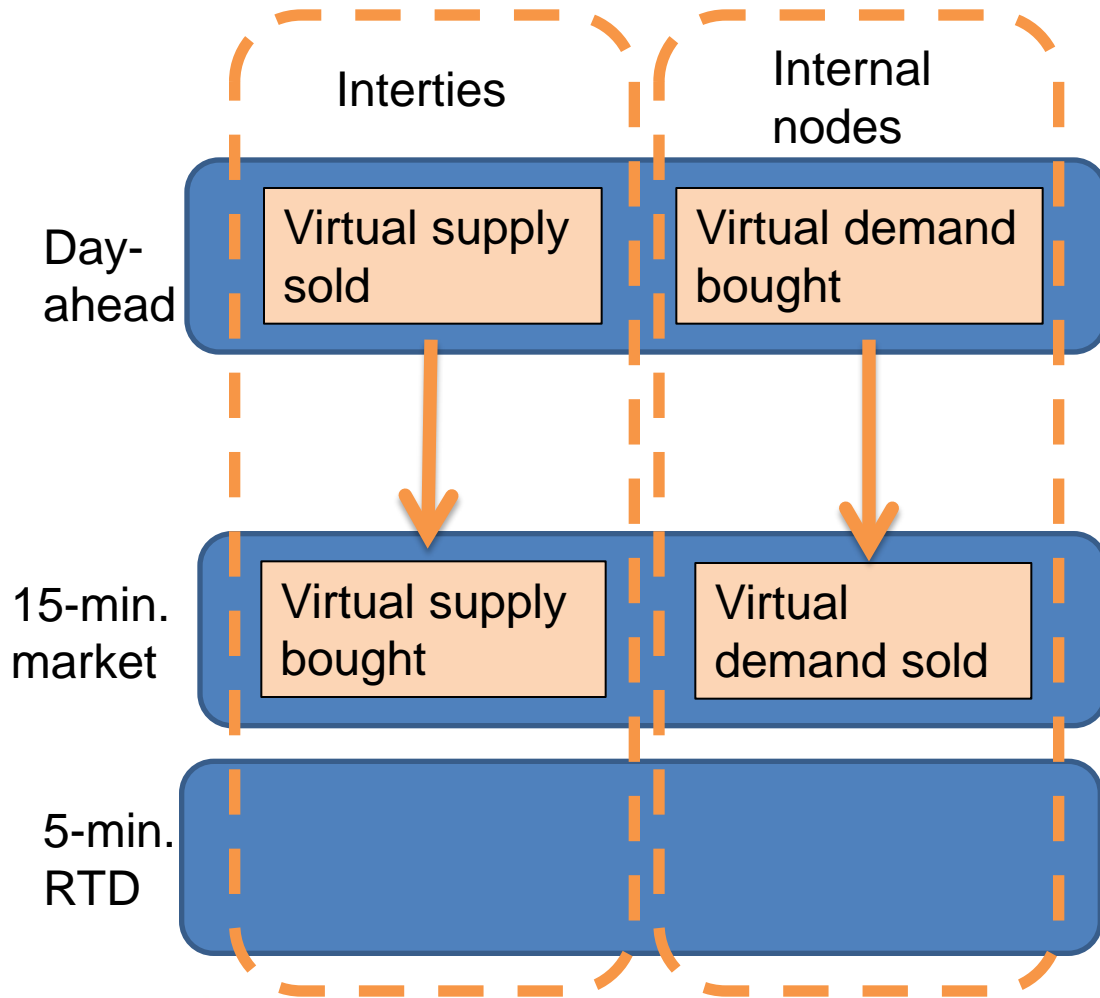
1. Economic bid with participation in 15-minute market
2. Self-scheduled variable energy resource forecast
3. Self-scheduled hourly block
4. Economic bid hourly block
5. Economic bid hourly block with single intra-hour economic schedule change
6. Dynamic transfer

Previous convergence bidding real-time settlement led to market uplifts.



- Cost to market = virtual demand sold at RTD price – virtual supply bought at HASP price
- Convergence bid cost paid by uplift charge to load
- Uplift charge to load also produced by HASP/RTD dispatch and price differences

Proposed design clears all convergence bids at 15-minute price:



- No convergence bids between 15-minute market and RTD
- Increased consistency between 15-minute and day-ahead will reduce other uplift charges to load
- Position limits will phase in intertie convergence bidding

Management proposes a transition plan to phase in convergence bidding functionality on the interties.

- Convergence bidding position limits on the interties enables the ISO to address any unanticipated market issues prior to adding complexity of convergence bidding:
 - Significant real-time market changes to scheduling and pricing of intertie transactions.
 - Energy Imbalance Market in Fall 2014 will expand real-time market to include other balancing authorities.

Position Limit	Duration
0% of intertie capacity	Implementation to 12 months
5% of intertie capacity	12 to 20 months
25% of intertie capacity	20 to 24 months
50% of intertie capacity	24 to 28 months
No Limit	28 months

Stakeholders broadly support the overall proposal but some have concerns over certain elements.

- No price certainty for fixed hourly intertie transactions
- Potential incentives for resources not to follow dispatch
- Insufficient coordination between the ISO and other balancing authorities
- Monthly netting of imbalances should continue for certain PIRP resources

Management recommends the Board approve the proposal.

- Facilitates effective integration of renewable resources
- Orients real-time market around the operational characteristics of variable energy resources
- Provides market efficiency and operational gains
- Compatible with planned Energy Imbalance Market