Local market power mitigation enhancements discussion

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Summary of Proposals – Revised Straw Proposal

Mitigation that leads to **flow reversal** between BAAs	Eliminate balance-of-the-hour mitigation and recalculate mitigated bid price based on current competitive LMP
Mitigation that leads to **economic displacement** between EIM BAAs	Limit additional transfers beyond market power mitigation run or FRP-Up requirement quantities
Cases when **mitigated bids** are **below** a resource's **estimated marginal opportunity costs**	Introduce alternative DEB option, reference level adjustment process, modification to Monday DAM index

Local Market Power Mitigation Enhancements

HYDRO DEFAULT ENERGY BID

The ISO constructed a default energy bid to capture opportunity costs for some hydro resources

- Hydro systems may be very complex and a relatively “simple” equation may not be sufficient to capture all opportunity costs
- The availability of energy from a resource may change on a daily basis, or within a day
- The ISO constructed a default energy bid that will be available for hydro resources in EIM or the ISO
  - Transparent methodology for all hydro resources
- This default energy bid may not be sufficient to meet all opportunity costs for hydro resources during all intervals but may meet most opportunity costs for some resources

Proposed hydro DEB includes short-term and long-term components

- Resources with storage duration up to 1 month would be eligible for the following default energy bid:

$$MAX(Gas\ Floor, DA\ Index, BOM\ Index, M\ Index_{+1}, M\ Index_{+2}, M\ Index_{+3}) * 1.35$$

$$Gas\ Floor = Gas\ Heat\ Rate\ * GPI$$

Where,

- *DA Index* – Day-ahead (DA) peak price at the local trading hub
- *BOM Index* – Balance-of-month (BOM) futures price
- *M Index*$_{+N}$ – Monthly futures index price *N* months in the future
- *Gas Heat Rate* – Average heat rate for a typical gas resource
- *GPI* – Gas price index for the specific resource

Proposed hydro DEB includes short-term and long-term components

- Resources with storage duration beyond 3 months would be eligible for the following default energy bid:

$$MAX(ST\ DEB, MAX(M\ Index_{+4}, M\ Index_{+5} \ldots M\ Index_{+12}) * 1.1)$$

And,

- *ST DEB* – The short-term component, outlined on the prior slide
- *M Index*$_{+N}$ – Monthly futures index price *N* months in the future

- Resources will specify a maximum storage duration and will only be eligible for those monthly futures prices
- This is similar to existing DEBs, and calculated daily

There are two terms that are customizable inputs for this default energy bid

- Customizable inputs:
  - Maximum storage horizon
  - Long term bilateral hubs
- These inputs will be established through consultation with the ISO
  - Storage will be bound between one and 12 months
- Data for the bilateral hub will need to be re-submitted on an annual basis, or as rights ownership changes

Our analysis used data from October 2017 through September 2018

1. Calculated the default energy bid for each day
   - Used Mid-Columbia bilateral hub
   - Used gas price index reflecting the Sumas hub
   - Used one and three month storage horizons
2. Compared the daily default energy bid to real-time FMM prices in the PacifiCorp West balancing area
   - Determined that a resource would be dispatched any time EIM prices are greater than the default energy bid*
   - Aggregated dispatch on a daily and weekly basis
3. Compared estimated dispatch with predefined targets

Percent a 1-month storage resource is dispatched less than potential daily energy availability

Scalar	Energy Availability (Hours/Day; Appx percent of intervals)				
	2.3 Hrs. (10%)	3.5 Hrs. (15%)	4.8 Hrs. (20%)	6 Hrs. (25%)	8 Hrs. (33.3%)
116%	65%	78%	85%	91%	95%
122%	72%	83%	89%	95%	98%
130%	81%	89%	95%	97%	99%
143%	88%	95%	98%	99%	100%
165%	95%	99%	100%	100%	100%

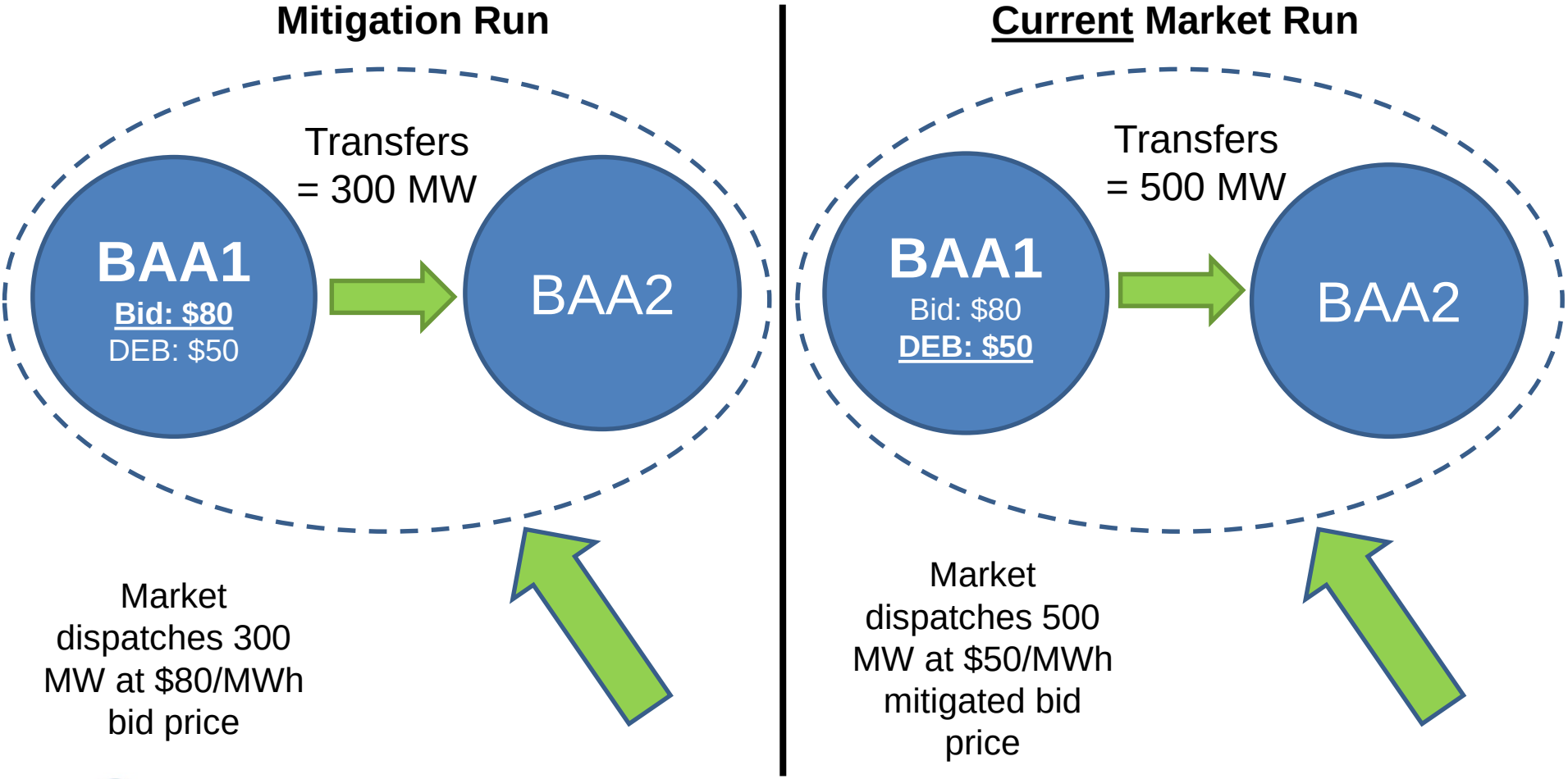
Percent a 3-month storage resource is dispatched less than potential weekly energy availability

Scalar	Energy Availability (Hours/Week)				
	16.8 Hrs. (10%)	25 Hrs. (15%)	33.5 Hrs. (20%)	42 Hrs. (25%)	50.3 Hrs. (30%)
101%	55%	72%	83%	91%	94%
105%	62%	83%	91%	96%	96%
110%	75%	87%	94%	96%	98%
115%	81%	94%	100%	100%	100%
131%	96%	100%	100%	100%	100%

Local Market Power Mitigation Enhancements

ECONOMIC DISPLACEMENT

Economic Displacement – current framework

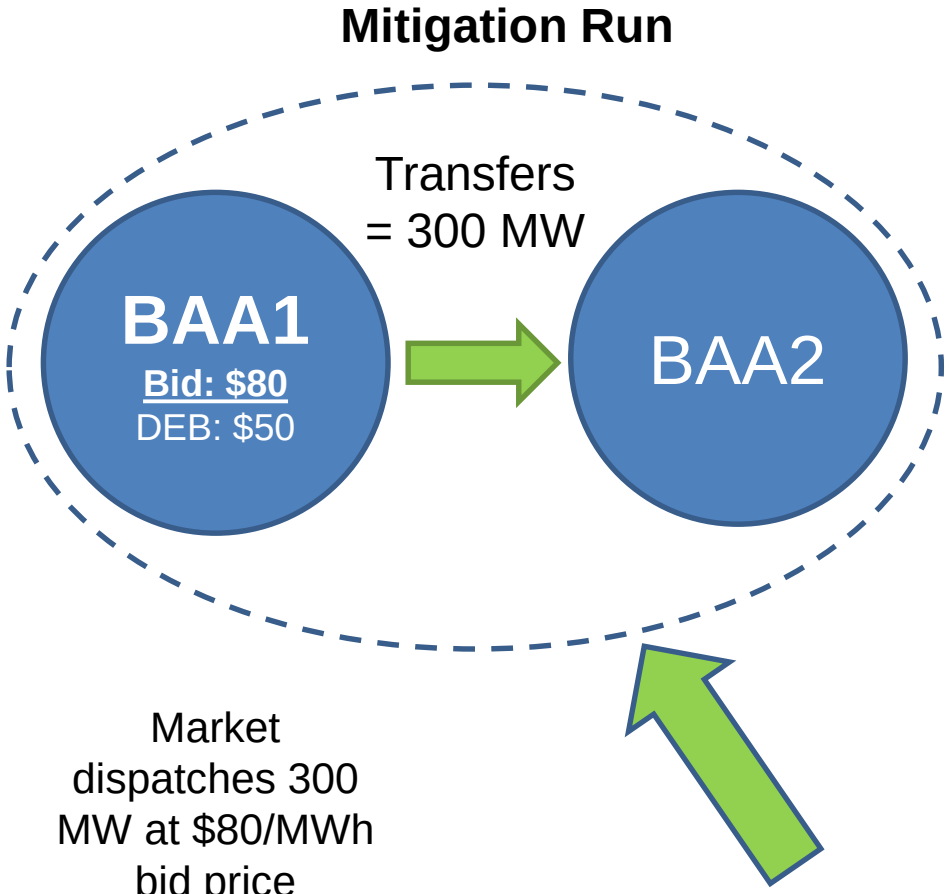


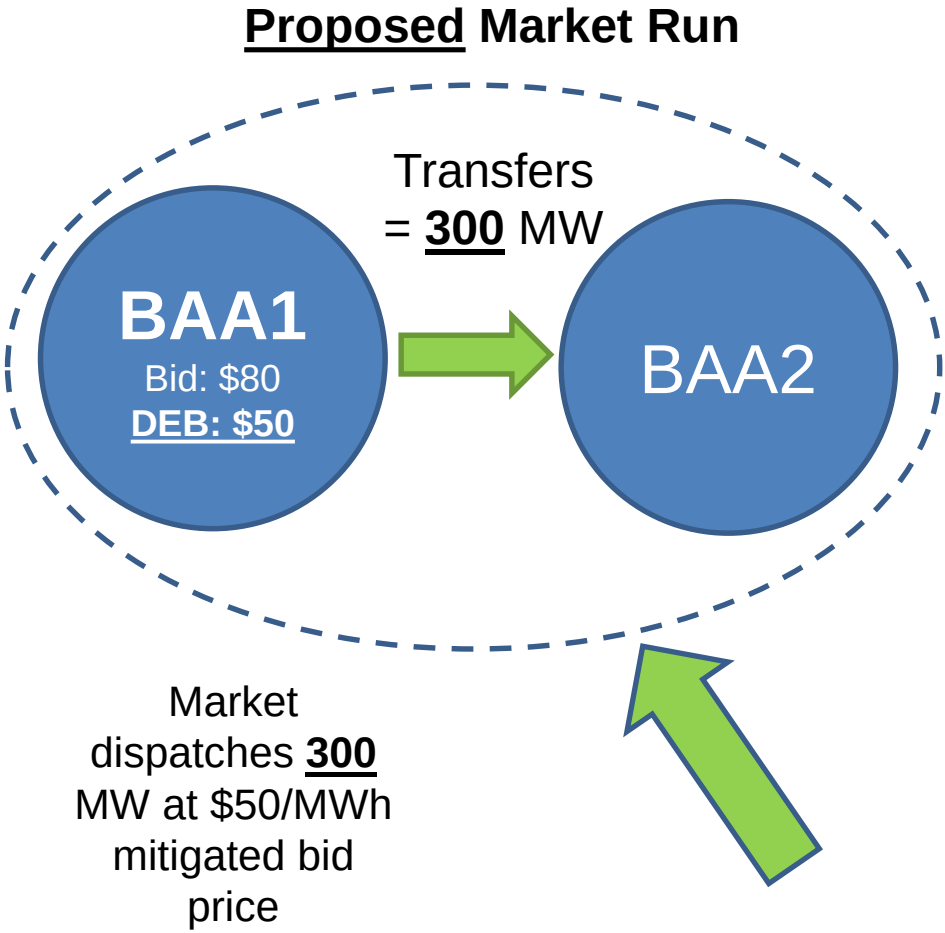
Economic Displacement – proposed optional rule (selected by EIM entity for transfers out of their BAA)

- Limits transfers to the greater of:
  - Base Transfers
  - Exports scheduled in the market power mitigation run
    - Using a lower amount would contradict market results and potentially result in the importing BAA with insufficient resources to meet its imbalance energy requirement
  - The exporting BAA's flexible ramp-up award
    - EIM participation assumes sharing of flexible ramping capacity between balancing authority areas
- Expressed formulaically:

$$\text{Export Limit} = \text{MAX}\left[\text{Exports}_{\text{Base}}, \text{Exports}_{\text{MPM}}, \Sigma(FRU_{MPM\ Award})\right]$$

Economic Displacement – Proposed optional rule

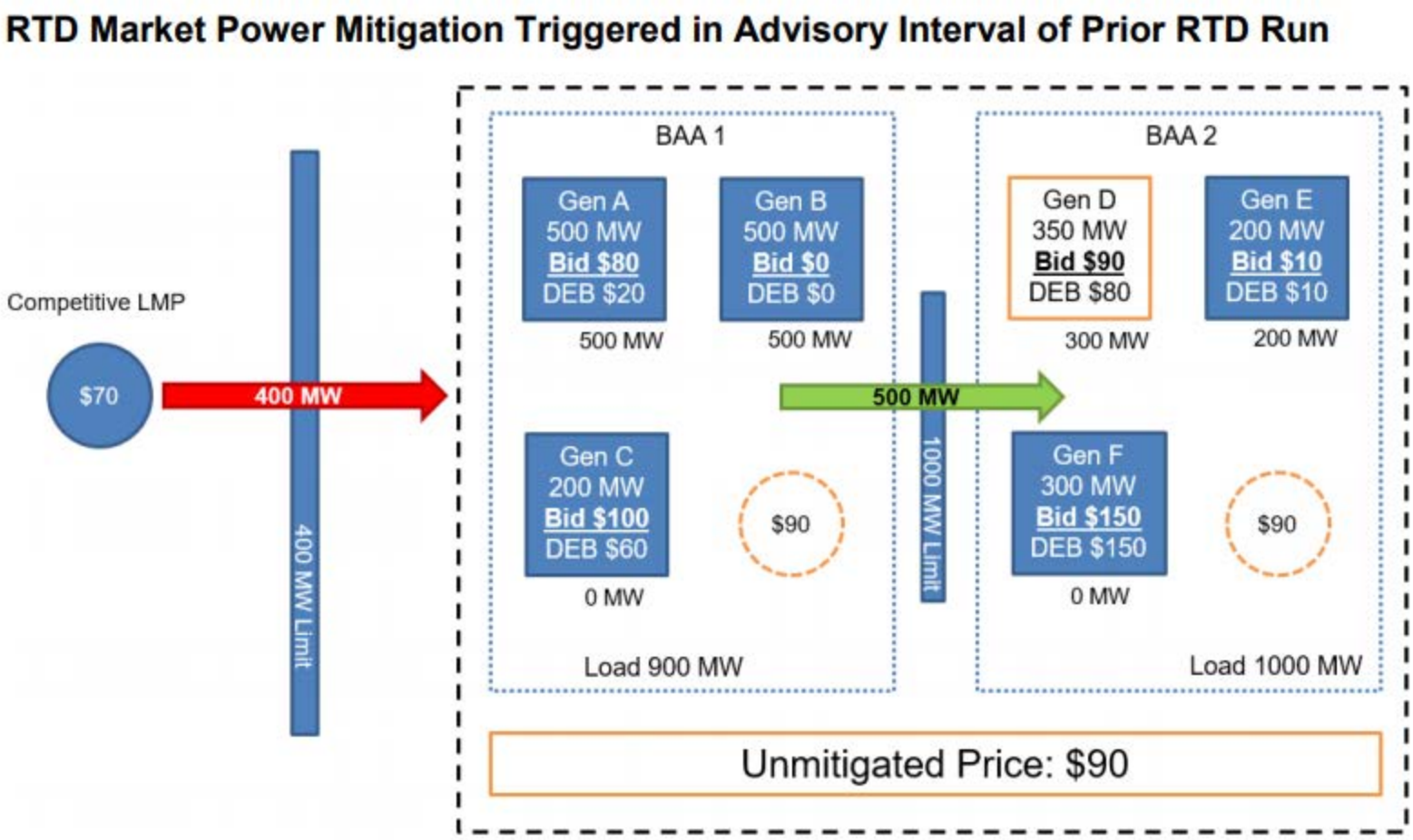




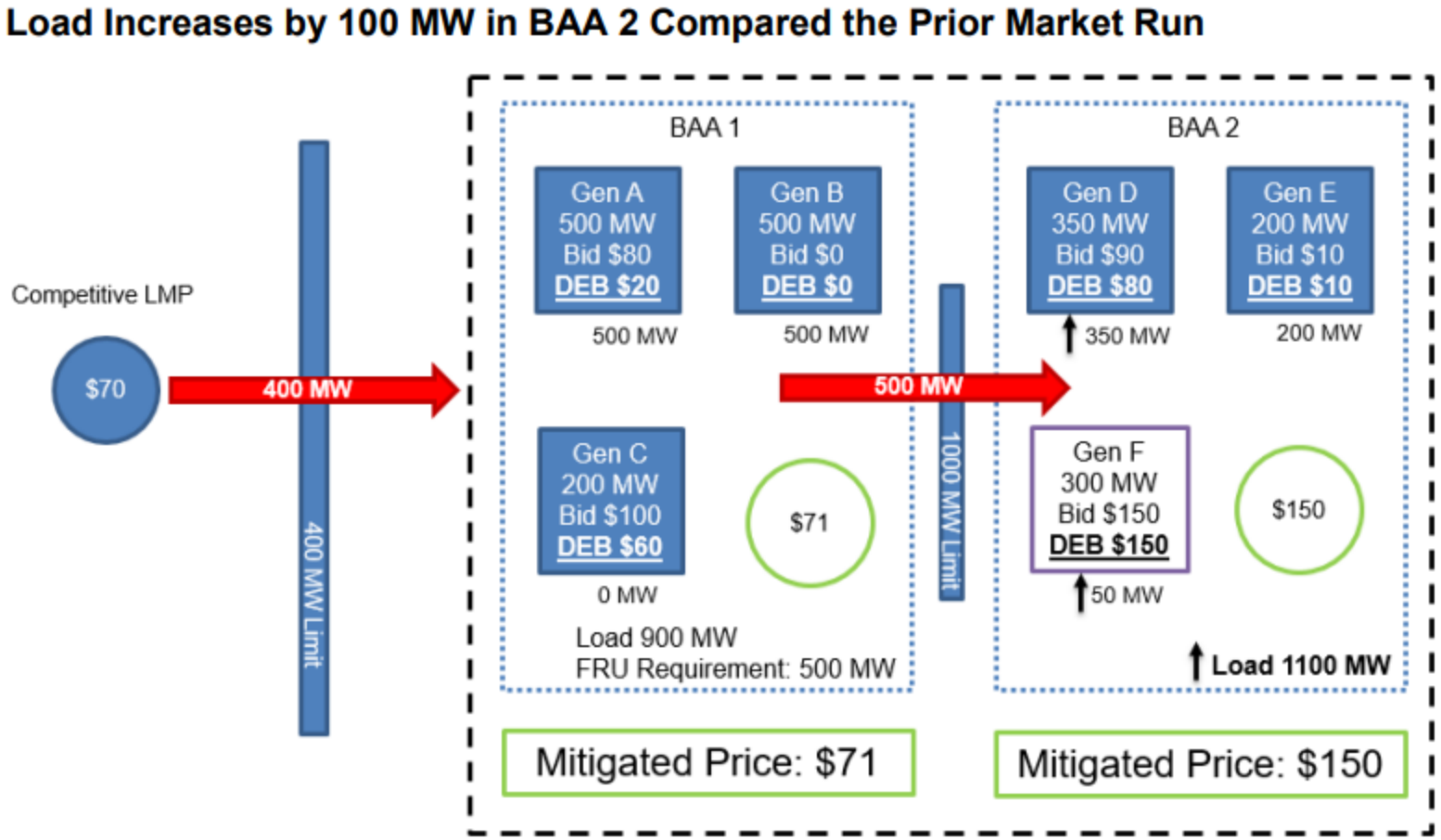
Congestion rents resulting from proposed optional rule

- The exporting BAA will receive congestion rents created by limiting transfers
  - Consistent with current EIM treatment for congestion rents, accrued to the BAA where the constraint is located

Economic Displacement – proposed optional rule with load changes between advisory and RTD (1 of 2)



Economic Displacement – proposed optional rule with load changes between advisory and RTD (2 of 2)



Economic Displacement – proposed optional rule with load changes between advisory and RTD

- The ISO acknowledges concerns; however, there is an inherent shortcoming of using the advisory interval for mitigation purposes in the real-time dispatch
- Overall impacts expected to be low given that RTD runs every 5 minutes
  - Importing BAA should have sufficient internal resources to balance their load
  - Exporting BAA in hindsight may have wanted to sell additional exports