



# Local Market Power Mitigation Enhancements discussion

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Market Surveillance Committee  
General Session  
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# Work accomplished prior to issue/straw proposal

- **EIM offer rules workshop**

- April 30, 2018

- (<http://www.caiso.com/Pages/documentsbygroup.aspx?GroupID=3509B16A-3A9F-4F34-B370-914AF5C85A49>)

- July 19, 2018

- (<http://www.caiso.com/Pages/documentsbygroup.aspx?GroupID=330E5E16-D226-4C3D-9B39-738FC19E7A55>)

- **MSC meeting**

- August 3, 2018

- (<http://www.caiso.com/Pages/documentsbygroup.aspx?GroupID=CC691BB1-1D0D-4EF1-8AC8-6AAA79169155>)

## Issues Identified (1 of 2)

- **Real-time market power mitigation process**
  - Flow reversal: mitigation results cause EIM BAAs to change from importing to exporting
    - Competitive LMP addresses broader market issue
  - Economic displacement: additional exports dispatched because of lowered mitigated price
    - EIM specific issue
- **Default energy bid for EIM use-limited resources**
  - Existing default energy bids may not accurately reflect opportunity costs for EIM use-limited resources

## Issues Identified (2 of 2)

- **Reference level adjustments**
  - Real-time gas volatility not always captured in reference level adjustment process
    - Broader market issue
  - Reference level adjustment process needed for new EIM use-limited default energy bid
- **Gas Price Indices**
  - Tariff cleanup of listed gas price index publishers
  - Broader market issue

# Market design principles for market power mitigation, default energy bids, and reference level adjustments (1 of 3)

- Supply should not be forced to sell power below its bid price if it cannot exert market power. Supply bids should be mitigated to marginal costs to the extent supply has market power
- EIM is a voluntary market and each balancing authority area should have sufficient supply to meet its own load and reliability responsibilities. In cases of mitigation involving EIM transfers to another balancing authority area, supply should not be forced to sell energy at a mitigated price beyond what is needed to resolve market power. The use of mitigated bids should not result in additional economic displacement of other supply

## Market design principles for market power mitigation, default energy bids, and reference level adjustments (2 of 3)

- The competitive locational marginal price in each interval should accurately reflect market conditions in each interval
- The marginal costs used to calculate default energy bids for use-limited resources should include opportunity costs for future market sales. These calculated default energy bids should have access to similar reference level adjustment process that is available to thermal resources

# Market design principles for market power mitigation, default energy bids, and reference level adjustments (3 of 3)

- Gas prices used to calculate reference levels should account for real-time gas prices volatility so that the ISO efficiently dispatches supply, resulting in accurate market prices that minimize the need for after-the-fact cost recovery

# Mitigation framework enhancements: Prevention of Flow Reversal

- Flow reversal: mitigation results cause EIM BAAs to change from importing to exporting at mitigated bid price
  - MPM is triggered when import constraint is binding
  - To protect native imbalances from market power, offer prices are replaced with mitigated bids
  - These mitigated bids are not solely used to serve native imbalance, which can result in a decrease in imports and even changing directions to an export
  - Import constraint is no longer binding, which triggered mitigation in the first place
  - Selling to other BAAs only because mitigated bids were used in market



## ISO proposes to calculate the competitive locational marginal price for each market run

- This addresses flow reversal because if the import BAA's bids are mitigated to the higher of the competitive LMP or DEB, it will not be economic to serve load outside of the import BAA
- Current rules prevent accurate use of the competitive locational marginal price, so:
  - Eliminate the balance of the hour mitigation rules in fifteen-minute market for more accurate unit commitment
  - Eliminate rule that if mitigated in FMM, mitigated in RTD
  - Eliminate the rule that if mitigated in the first or second 5-minute interval that the remaining 5-minute interval(s) in the given 15-minute interval is mitigated

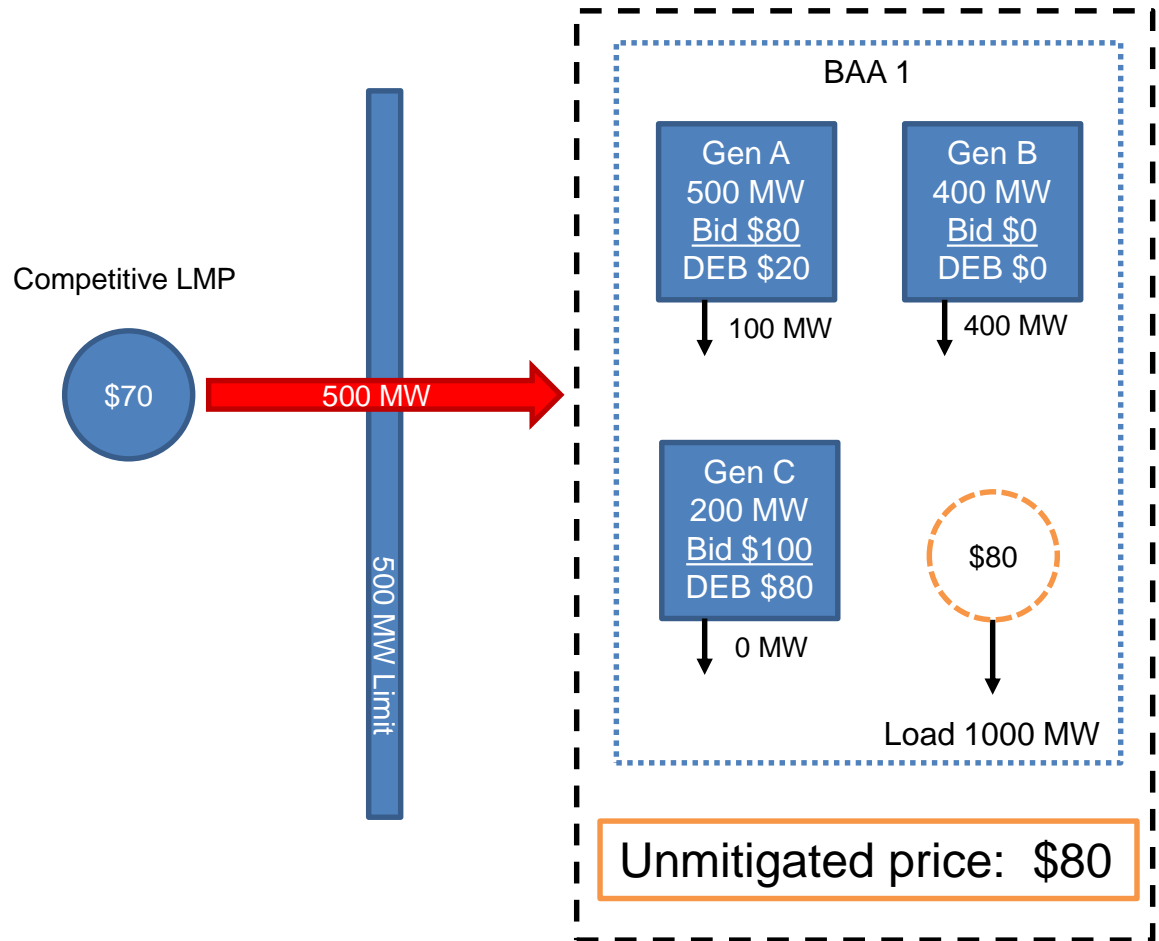
## Competitive locational marginal price adder

- To alleviate concerns that dispatch order changes could occur, the ISO is proposing implementing a nominal parameter to the mitigated bid calculation
- Ensures price separation between competitive and noncompetitive areas

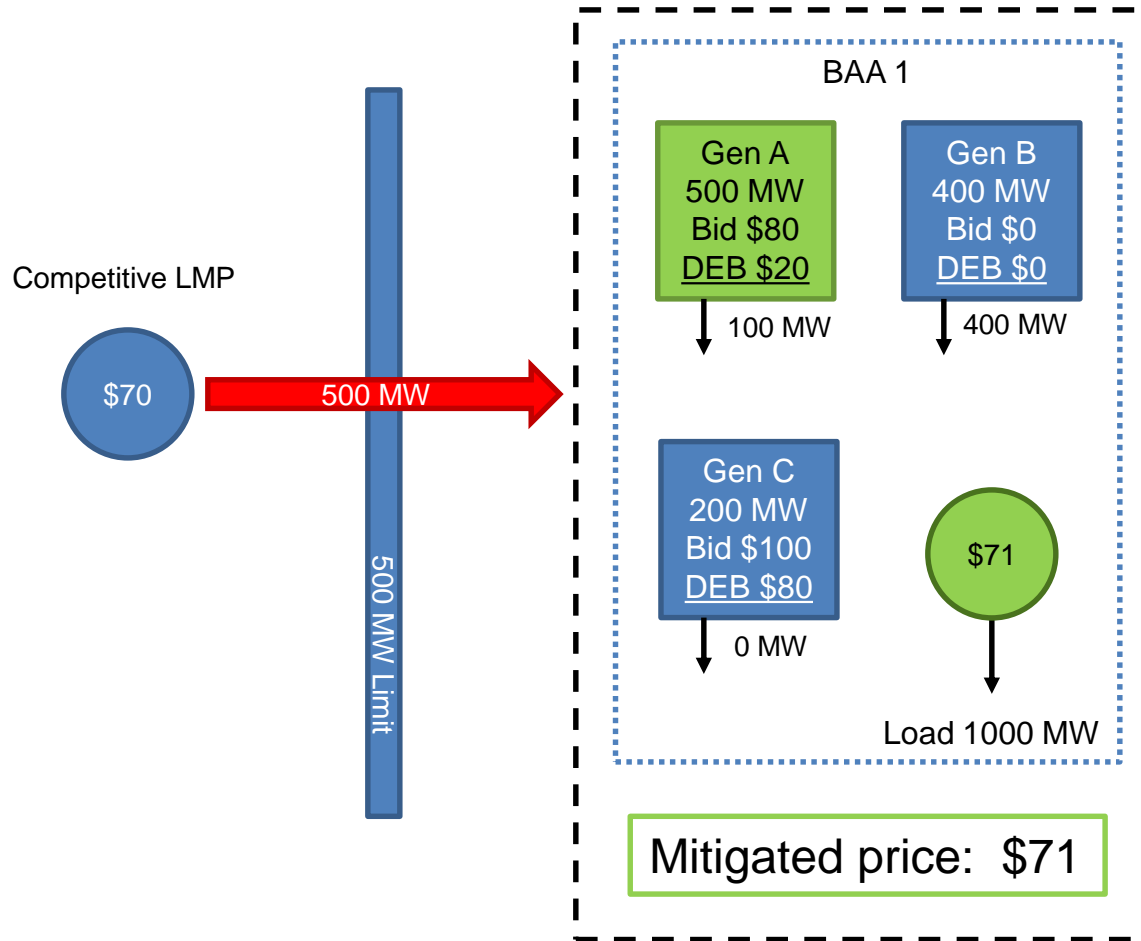
## Following examples illustrate implementation results of incorporating this rule into the mitigation framework

- Current:
  - Competitive LMP can only decrease if previously mitigated
  - Mitigated bid = MAX (DEB, Competitive LMP)
- Proposed:
  - Competitive LMP will be recalculated in each market interval
  - Mitigated bid = MAX (DEB, Competitive LMP + \$0.xx parameter)

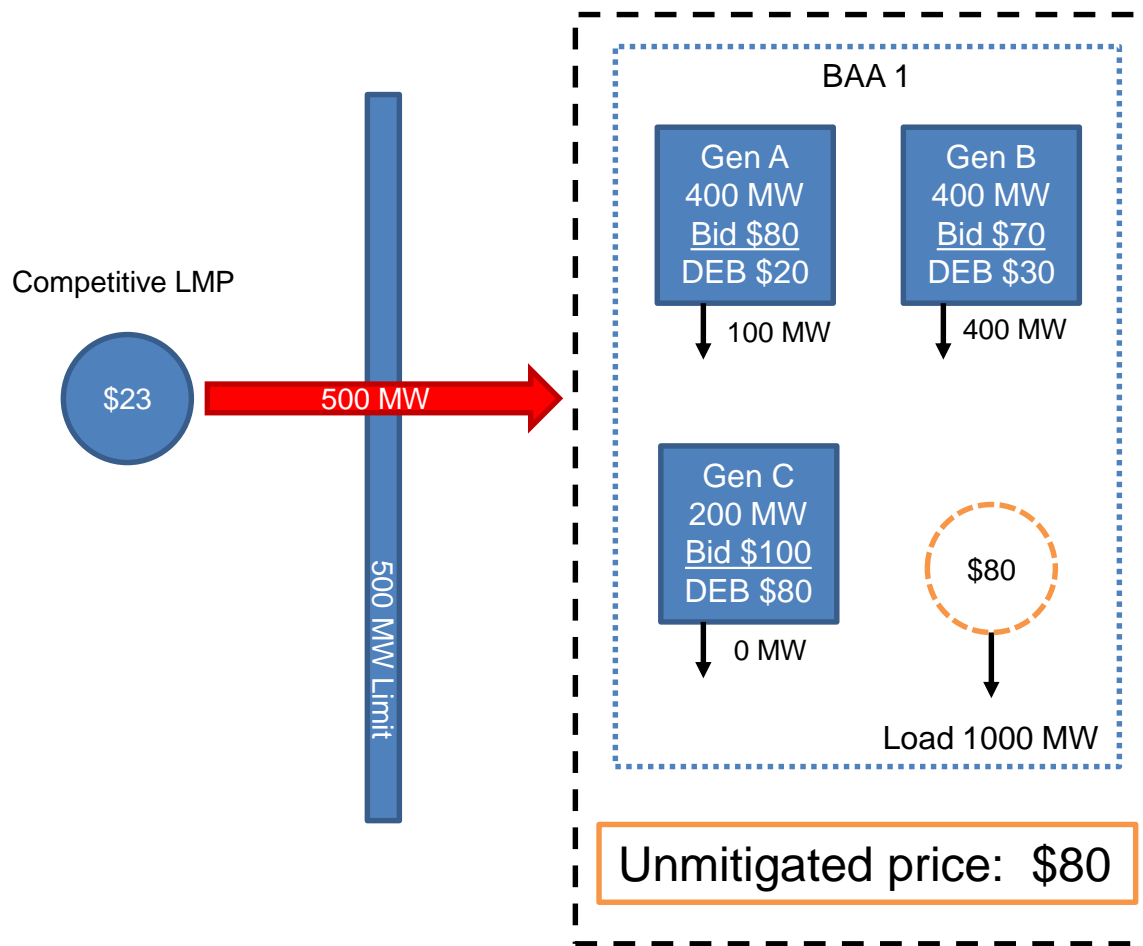
# Example A: Single BAA importing - MPM Run (1 of 2)



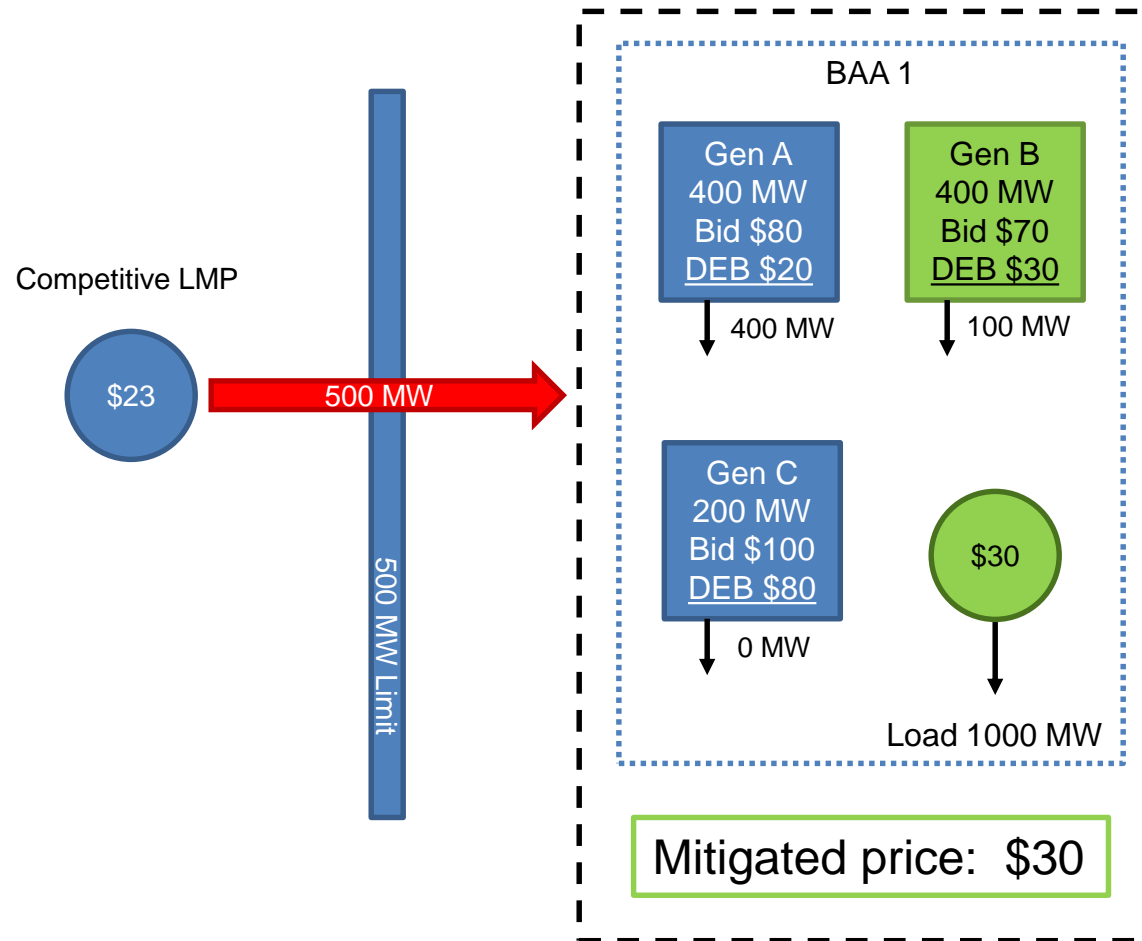
# Example A: Single BAA importing - Market Run (2 of 2)



# Example B: Single BAA importing - MPM Run (1 of 2)



# Example B: Single BAA importing - Market Run (2 of 2)

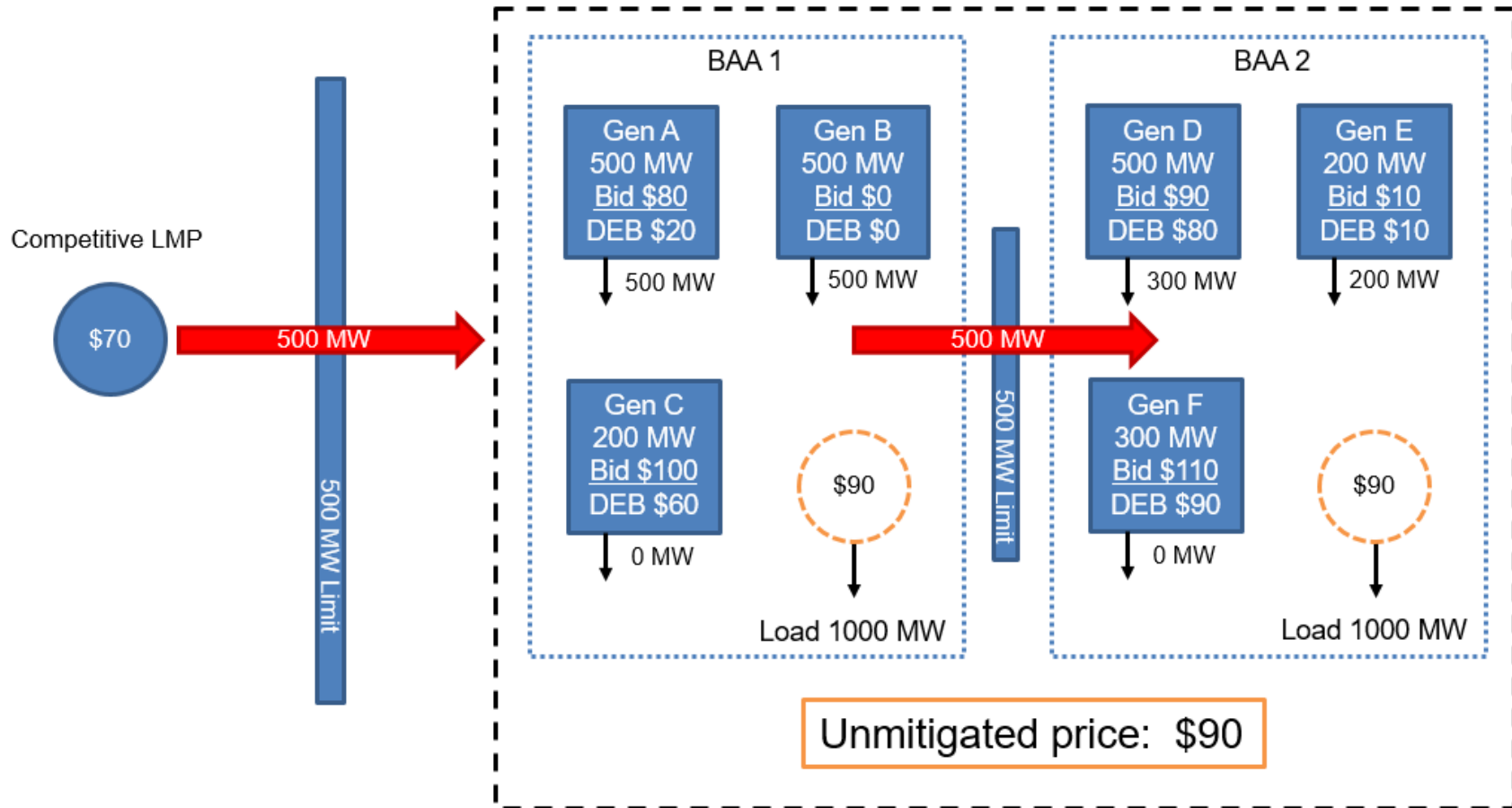


## Mitigation framework enhancements: Economic displacement prevented between mitigated BAAs

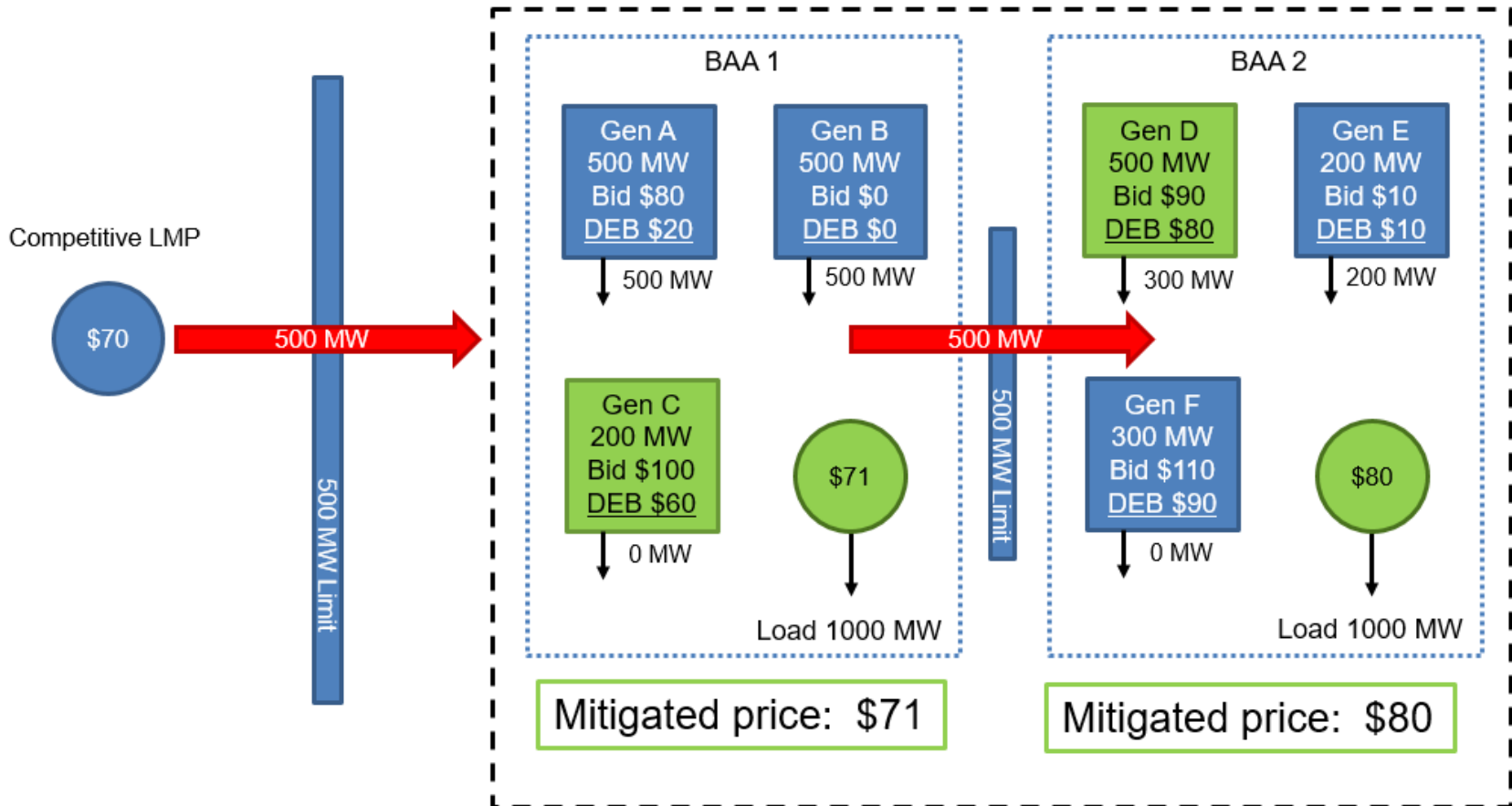
- If two or more EIM BAAs become an import constrained bubble, mitigation is triggered
  - Economic displacement using mitigated bids may occur between two BAAs within a constrained bubble
- Mitigated bids result in exports that increase, imports that decrease beyond quantities necessary to prevent the exercise of market power within the bubble
- The ISO proposes limiting transfers between EIM BAA to the scheduled quantity prior to mitigation within the bubble



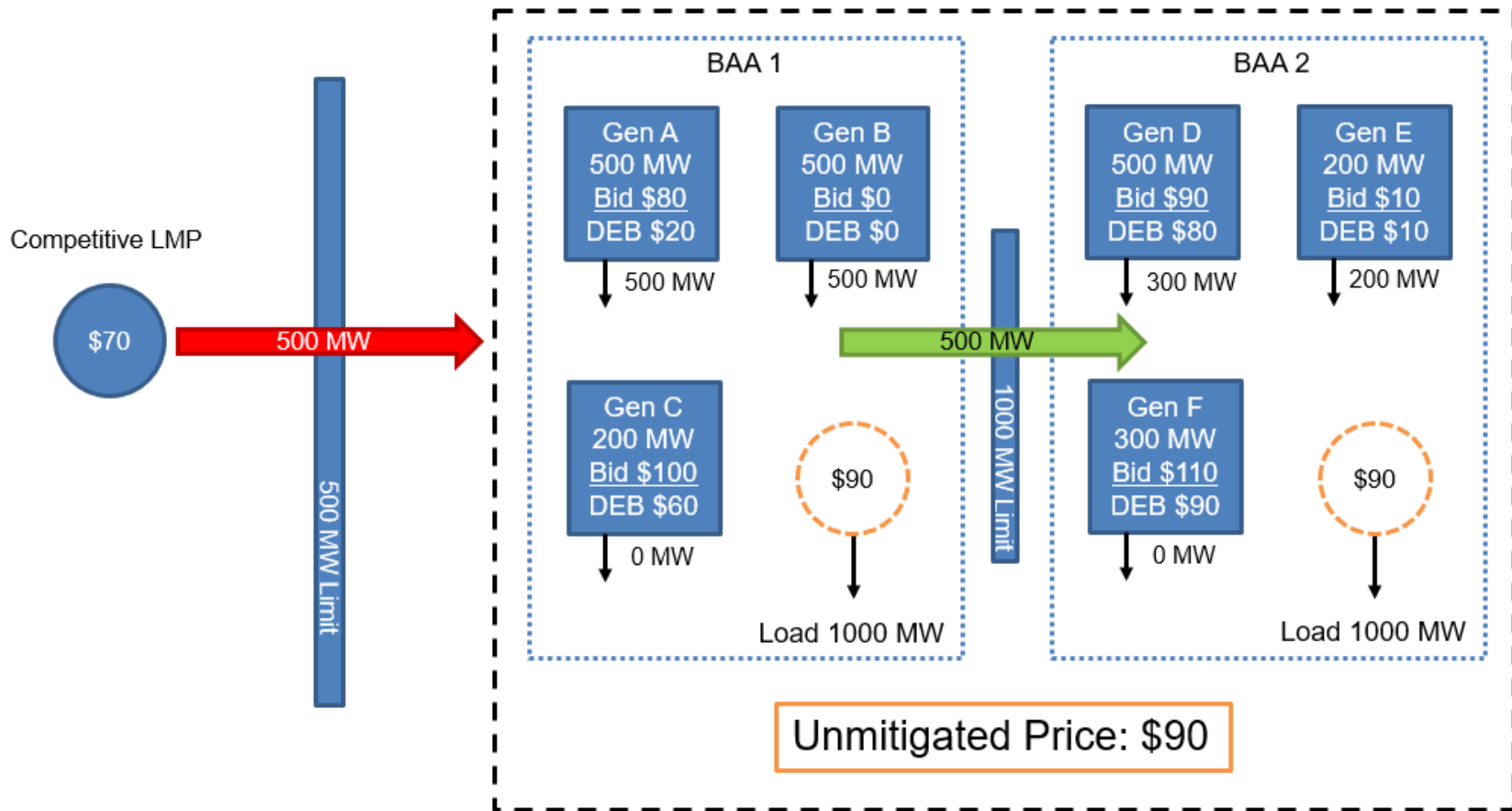
# Example C: BAA 2 importing with binding constraint - MPM Run (1 of 2)



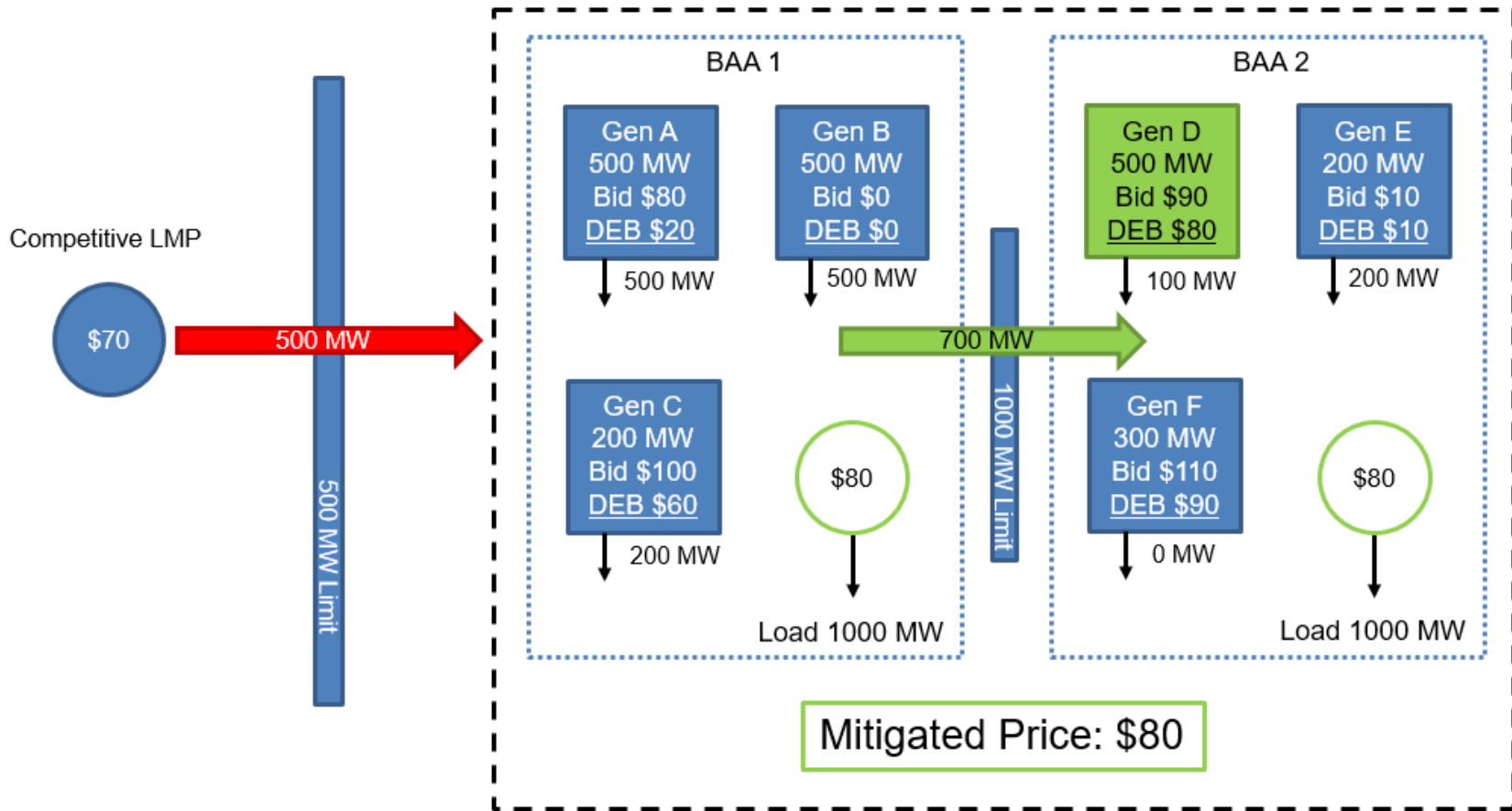
# Example C: BAA 2 importing with binding constraint – Market Run (2 of 2)



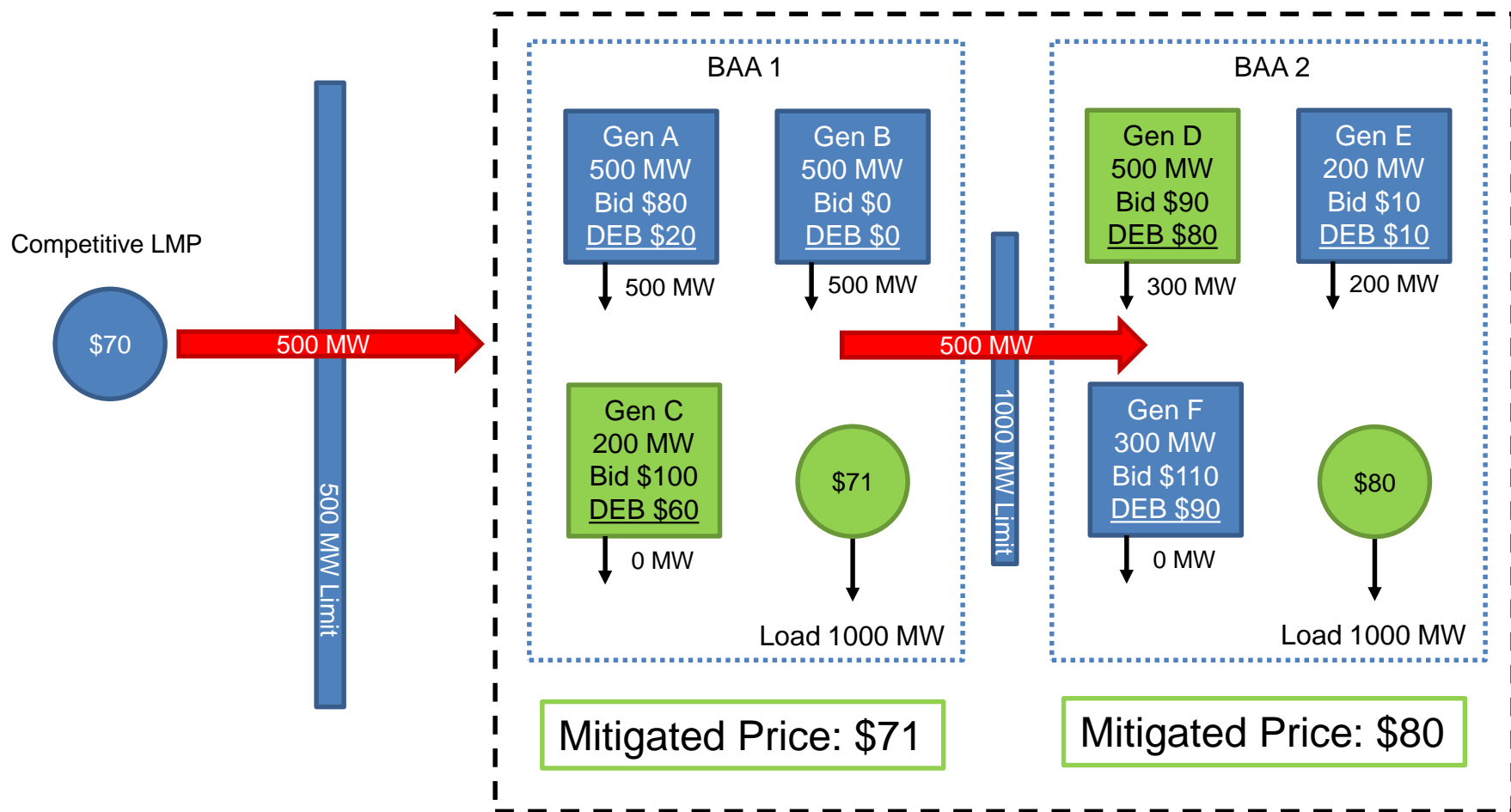
# Example D: BAA 1 Net Scheduled Interchange is importing – MPM Run (1 of 3)



# Example D: Gen C is dispatched down 200 MW to serve BAA 2s load (problematic) – Market Run (2 of 3)



# Example D: Proposed rule: Set BAA's Net Scheduled Interchange at pre-mitigation schedule (3 of 3)



## Issue remains for EIM entities when market mitigates offers to default energy bid

- Default energy bids can still be used to serve load outside the resource's BAA, but in more limited circumstances due to previous changes
- Existing opportunity cost methodology for default energy bids does not consider:
  - Bilateral prices outside of the EIM
  - Short-term limitations within the day

## EIM use-limited default energy bid proposal

$$\text{MAX} (DA \text{ Peak Index}, MA \text{ Index}_{+1}, MA \text{ Index}_{+2}, \dots, MA \text{ Index}_{+N}) \times 1.10$$

- Two components represent short-and long-term limitations:
  - *DA Peak Index* – Day-ahead (DA) peak price at a specific trading hub
  - *MA Index* – Month-ahead (MA) price at a trading hub for the successive month  $m$  after the current month
  - $N$  – The number of months of storage capability that the use-limited resource has available
- MAX used to reflect opportunity cost of generating energy today, at the highest price that energy could be sold in the future
- Peak hourly electricity prices published by index

## EIM use-limited default energy bid adder

- ISO proposes 110% adder to default energy calculation for the following reasons:
  - Mitigation only occurs if uncompetitive
    - Dynamic competitive assessment
  - ISO analysis showed 110% would still preserve a use-limited resource use for highest value in summer months
  - Proposed reference level adjustment process allows updates when real-time electricity prices spike



## Commitment costs and default energy bid enhancements policy established reference level adjustment process

- ISO reference levels based on published price information may not always be accurate
  - Suppliers request a before-the-market adjustment to reference level
- Supplier's actual costs must be more than ISO calculated reference level
  - Retain sufficient justification supporting the need for a reference level adjustment request
- Bidding up to a supplier's reasonableness threshold is not a safe harbor and reference level adjustment requests must be based on actual costs

## Reference level adjustments – gas resources proposal

- Due to recent gas market events, ISO reconsidered treatment of real-time gas price volatility in reference level adjustment process
- A supplier may request a manual consultation if reference level request exceeds the automated reasonableness threshold
- ISO to review requested amount, documentation, and observed same-day gas trading information available on trading platform
  - Approve reference level adjustment if requested amount appears to reflect current costs
  - May automatically adjust reasonableness threshold for gas region if costs apply to other resources

## Reference level adjustments – EIM use-limited resources proposal

- Day-ahead price index may not reflect actual real-time electricity prices for short-term limitations
  - Adjustments to reference level may be made to the day-ahead energy component of equation

$$\text{MAX} (\text{DA PEAK INDEX}, \text{MA INDEX}, \text{MA INDEX}_{+2}, \dots, \text{MA INDEX}_{+N}) \times 1.10$$

- Resources must demonstrate the sale of real-time energy prices is greater than day-ahead index prices
  - Real-time ICE trading information or bilateral offers to buy electricity
- Reasonableness threshold amount to be determined based on analysis examining the historical variation of index prices and hourly bilateral prices