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Your Link to Power

Proxy Demand Resources and Local Market Power Mitigation

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Overview

- How Proxy Demand Resource (PDR) bids could undermine current Local Market Power Mitigation (LMPM) provisions.
- Short term solution being proposed
 - Exclude PDR bids from pre-market LMPM runs
- Preferred longer term option
 - Perform All Constraints run with mitigated bids

Pre-market LMPM runs based on merit order of bid prices rather than DEBs.

Figure 1. Pre-market LMPM Runs

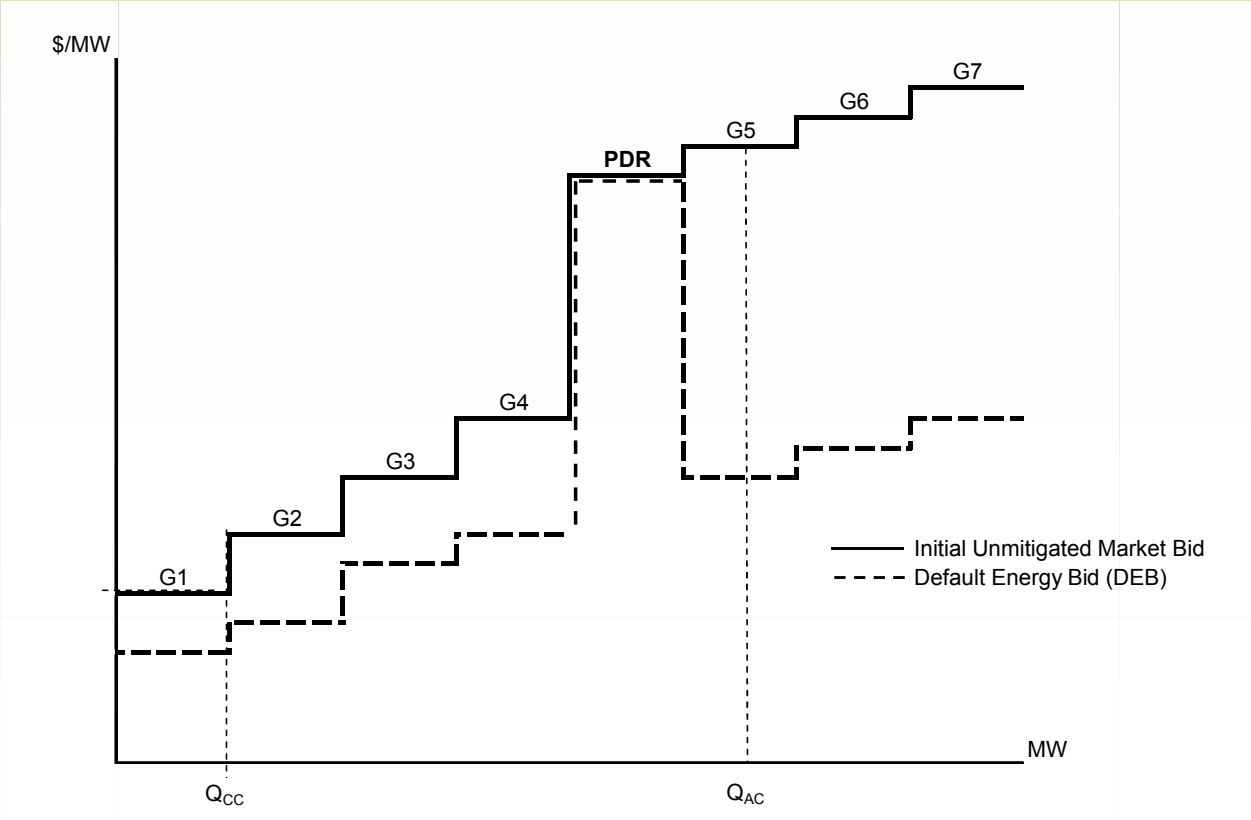
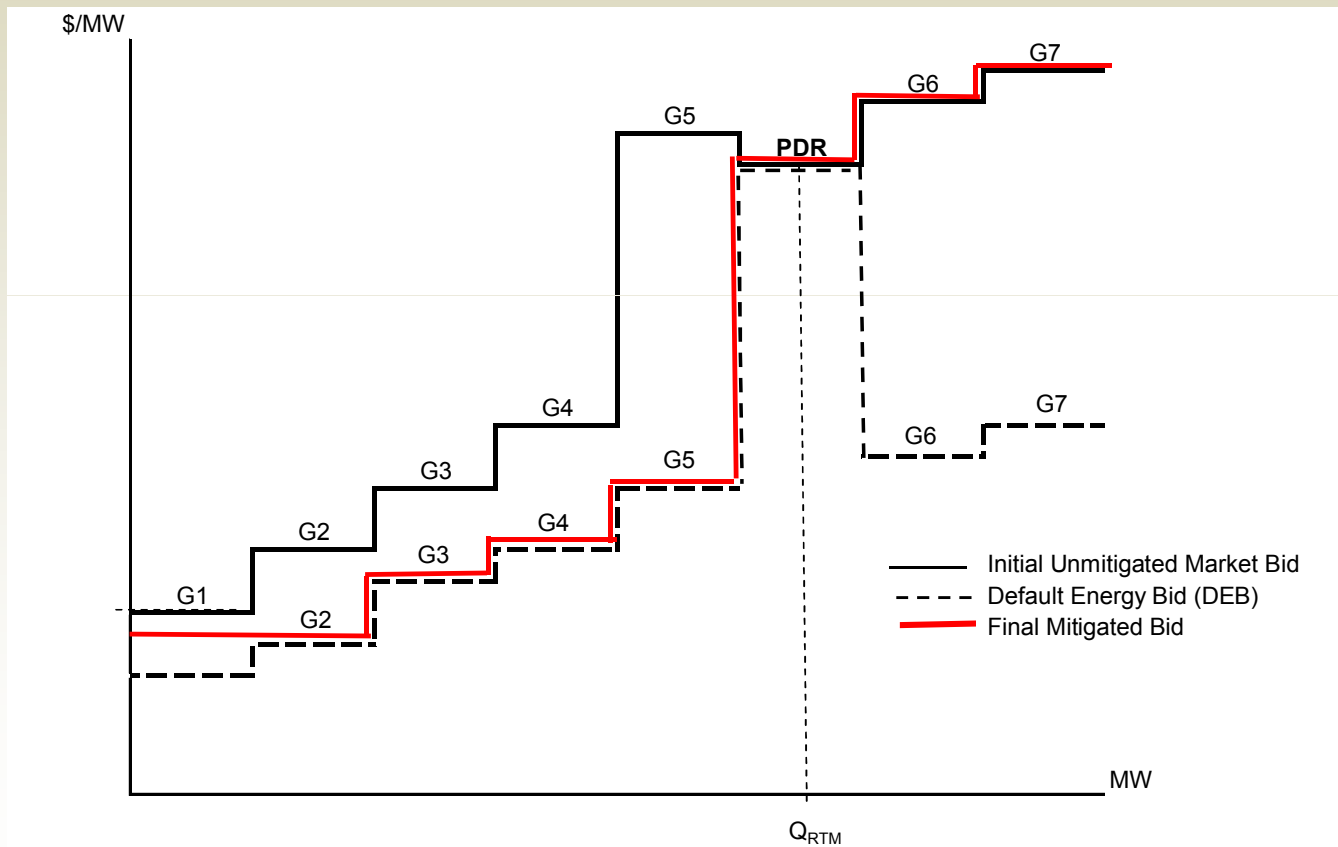


Figure 2. Real Time Market Outcome

Proxy Demand Response bids may displace generation with lower cost (DEB).

Figure 2. Market Outcome

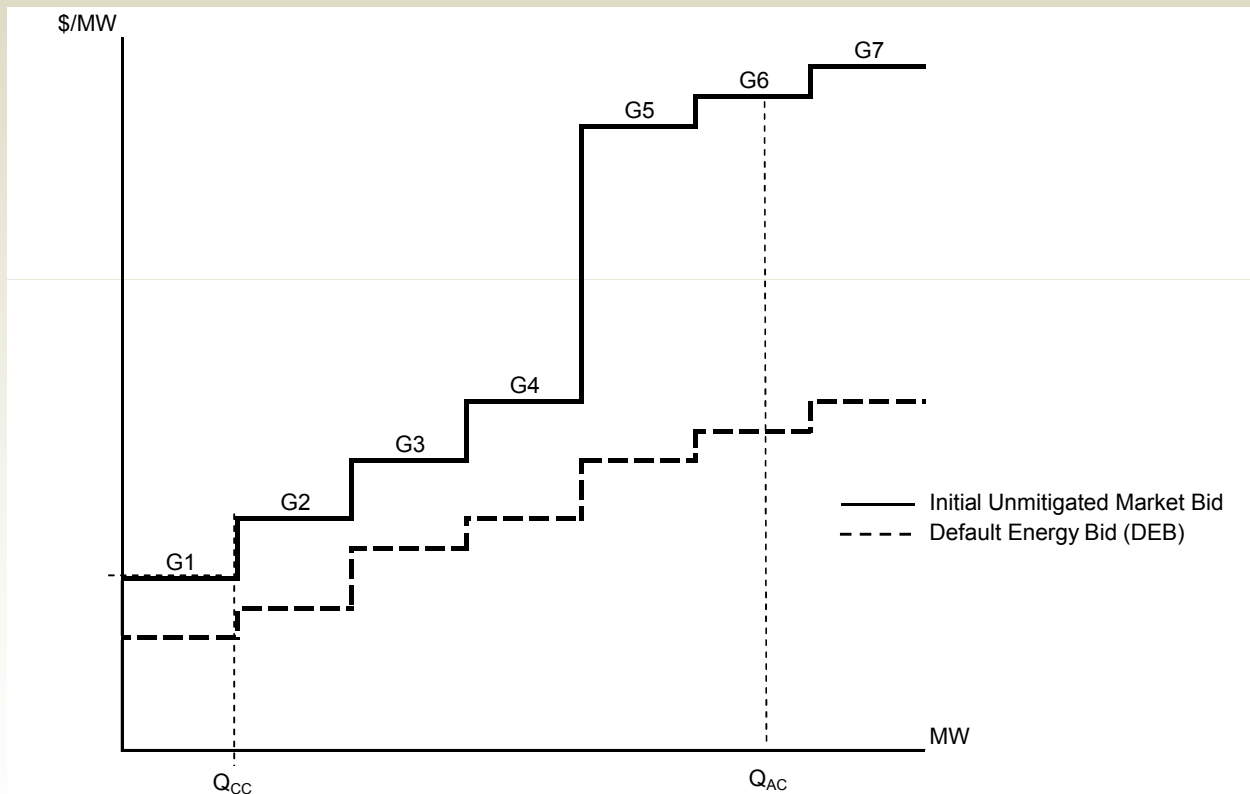


Options Considered

- **Option 1: Perform AC Run with Mitigated Bids**
 - DMM prefers this option, but ISO has indicated it would be complicated to implement at this time.
- **Option 2: Increase Load Forecast Used in AC Run**
 - May be a relatively “crude” tool for mitigating problem.
- **Option 3: Run AC Without PDR Bids**
 - Simple to implement
 - Effectively addresses problem
 - Still allows PDR to compete based on PDR bid price relative to true marginal cost of any available generation

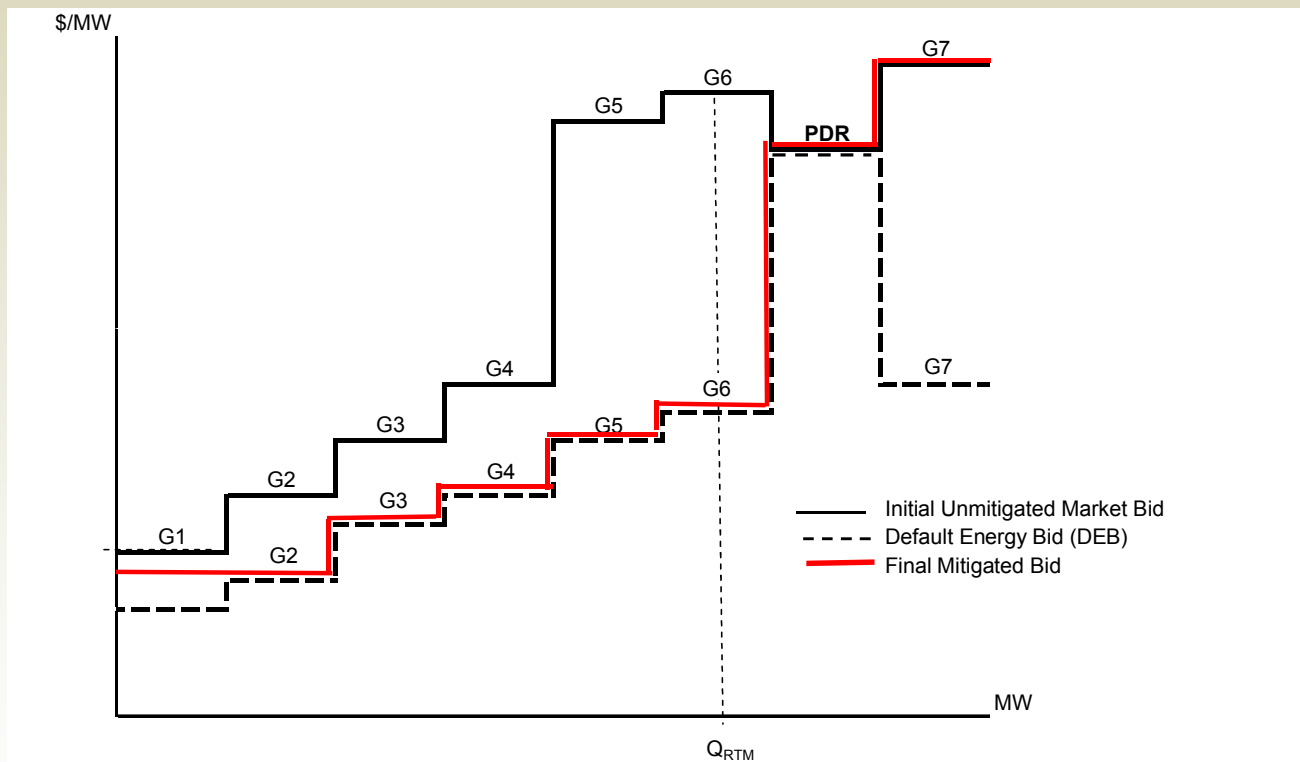
Short run solution is to exclude PDR bids from mitigation runs.

Figure 3. LMPM Runs Without PDR



PDR will still be able to compete with supply in final market clearing.

Figure 4. Market Outcome with PDR excluded from LMPM runs



PDR could still be dispatched if supply/demand conditions different than projected in LMPM runs.

The proposed solution has is variety of benefits:

- Easily implemented by May 1 PDR go live date.
- Effectively eliminates problem.
- Still allows PDR to compete based on PDR bid price relative to marginal cost (DEB) of available generation.
- Higher priced PDR could still be dispatched if supply/demand conditions different than projected in LMPM runs.

Stakeholders generally supportive of proposed modification.

- PG&E and SCE strongly support proposal as best short term option.
- Support alternative bid mitigation approach suggested by DMM in convergence bidding process as better longer term option.
 - ISO determined this approach could not be implemented in conjunction with convergence bidding in 2011.
 - ISO committed to consider this option for implementation in 2012.

Only one participant opposes the proposed modification.

- Energy Connect opposes proposal on grounds it will:
 - Reduce revenues earned by Proxy Demand Resources in constrained areas.
 - Deter development of needed demand response.
- DMM response in stakeholder process:
 - Proposal maintains proper marginal price signals, while mitigating local market power.
 - Proxy Demand Resources expected to rely heavily on other revenue sources (Resource Adequacy and Ancillary Services).
 - If additional incentives are warranted, these should be targeted at PDR resources, and not impact market dispatch and prices.

Preferred longer term LMPM option.

- Competitive Constraints (CC) run:
 - Includes all supply and demand bids (unmitigated)
 - PDR and virtual supply/demand
- All Constraints (AC) run:
 - CC run schedules “protected” with negative price-taker bids
 - Bid segments above CC schedules mitigated using current LMPM procedures.
 - Highest accepted bid in CC run used as “floor” for mitigated bid used in AC run
- Final Market Clearing:
 - Mitigated bids only used for resources with AC dispatch > CC dispatch

Base Case Example – CC Run

This base case example illustrates how PDR or virtual supply bids may undermine LMPM if included in current LMPM procedures.

Fig. 1: Local Constrained Area

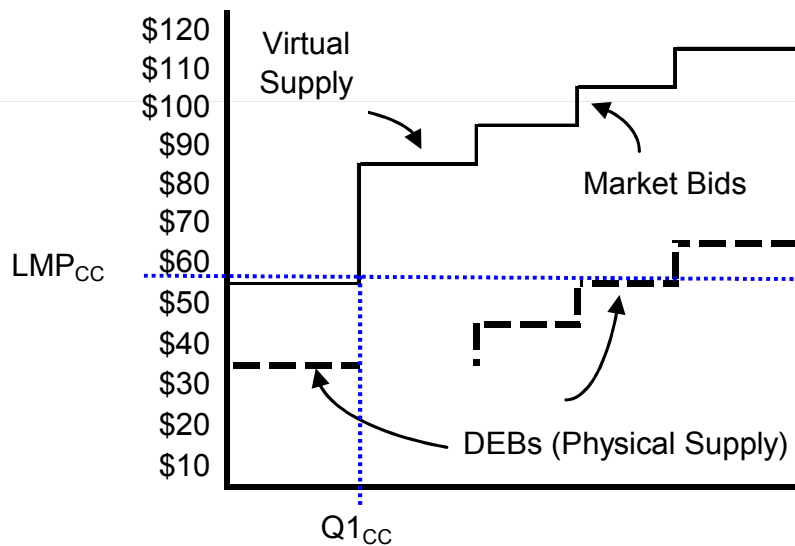
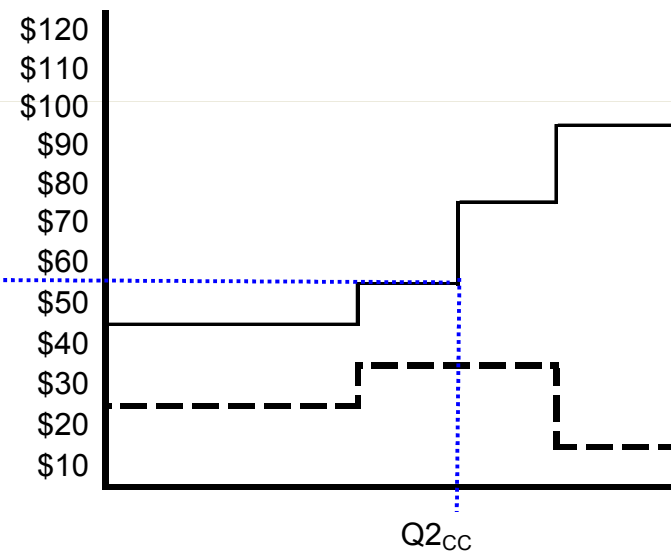


Fig. 2: Rest of System (Unconstrained)



Base Case Example – AC Run

Fig. 3: Local Constrained Area

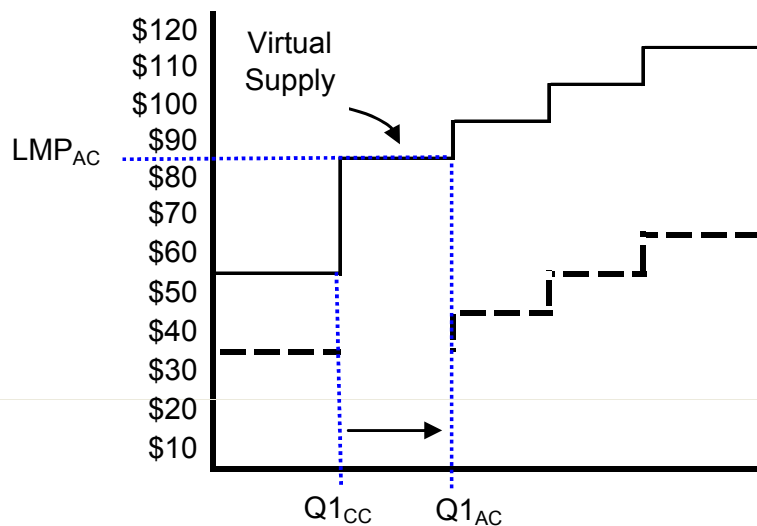
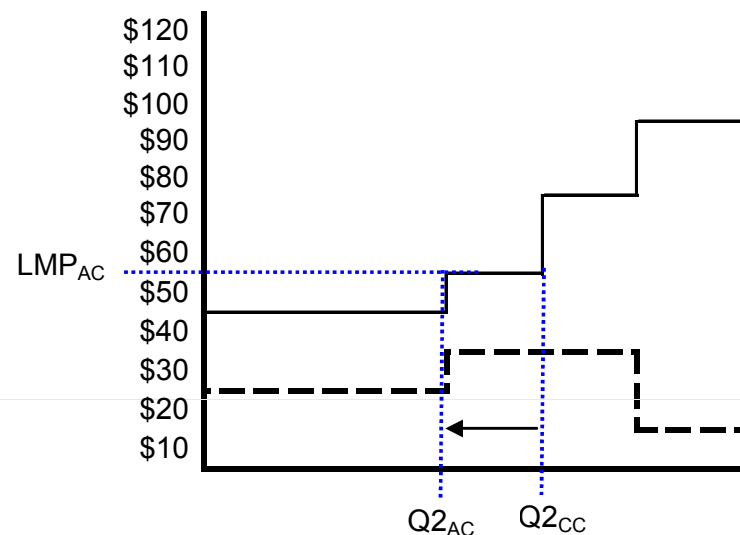


Fig. 4: Rest of System (Unconstrained)



- In AC run, non-competitive constraints are also enforced.
- Market is cleared using unmitigated bids.
- In this example, the relatively high priced virtual supply bid in local constrained area is dispatched in AC run to mitigate congestion on uncompetitive paths.
- Other physical units with high market bids (but relatively low DEBs) are not dispatched in AC run and therefore not subject to bid mitigation.

Base Case Example – Market Result

Fig. 5: Local Constrained Area

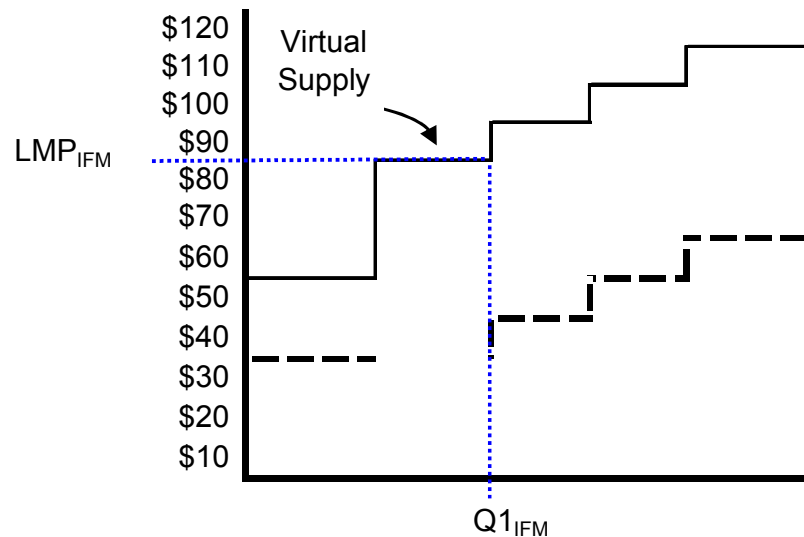
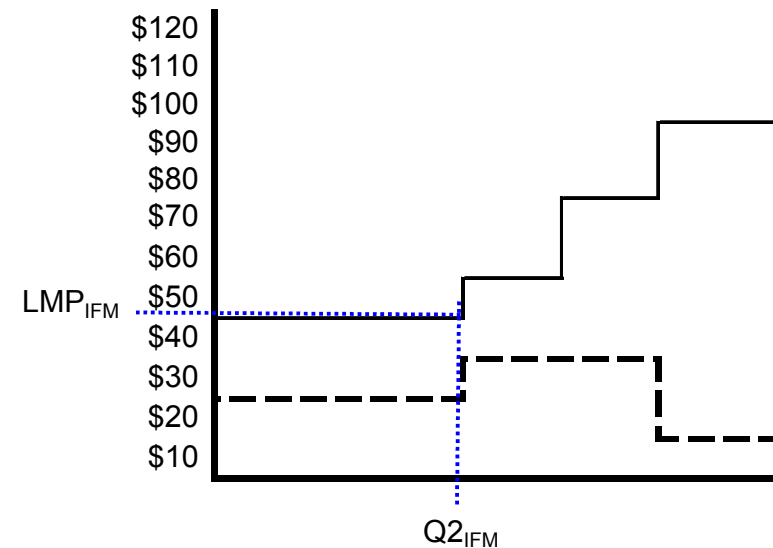


Fig. 6: Rest of System (Unconstrained)



- In IFM, the relatively high priced (unmitigated) virtual supply bid sets LPM in local constrained area.

DEB-based LMPM – CC Run

Fig. 7: Local Constrained Area

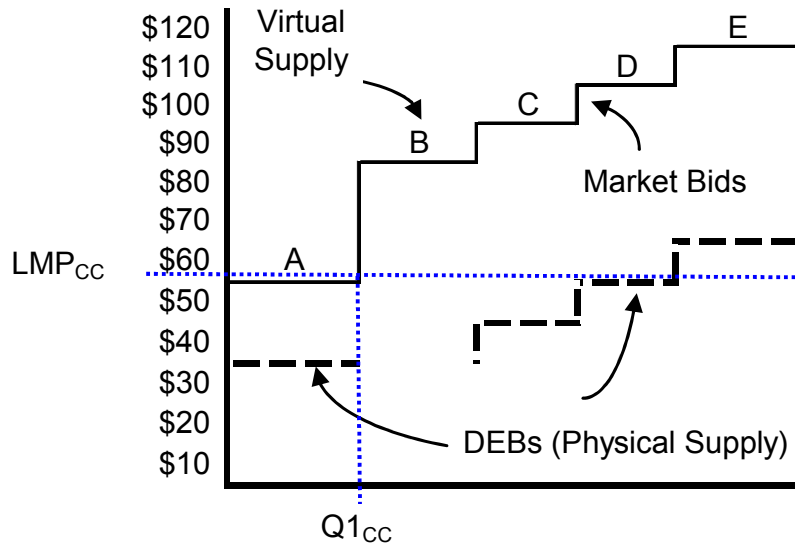
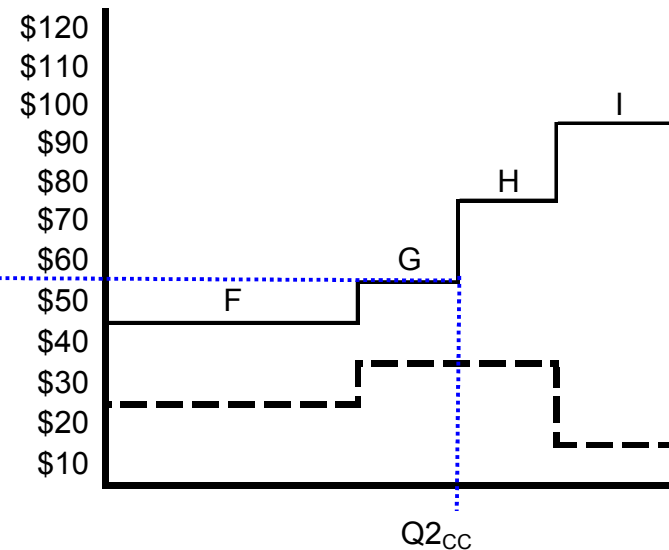


Fig. 8: Rest of System (Unconstrained)



CC run same as current LMPM approach:

- Units dispatched in merit order based on unmitigated bid price.
- Highest bid accepted in CC run set "floor" for each unit's mitigated bid in AC and IFM.

However, unlike current LMPM, dispatch levels in CC are "protected" in AC run with negative priced bids (see next slide)

DEB-based LMPM – AC Run

Fig. 9: Local Constrained Area

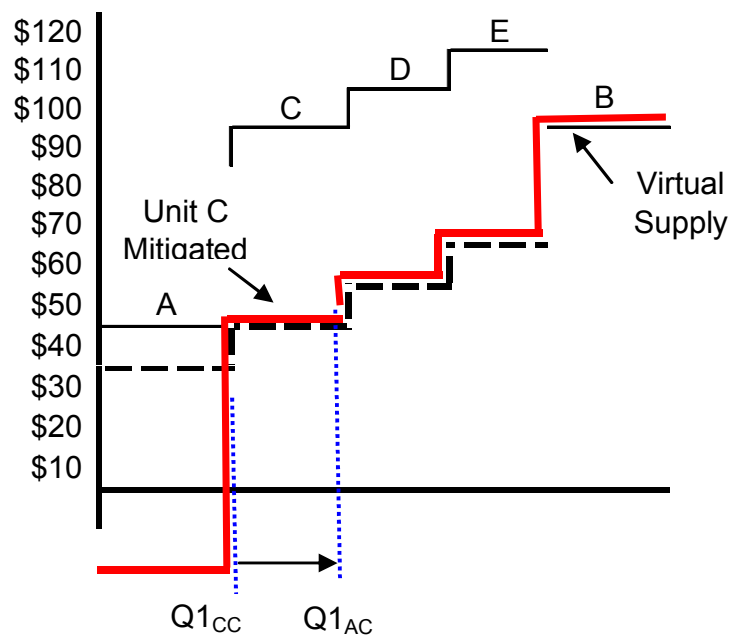
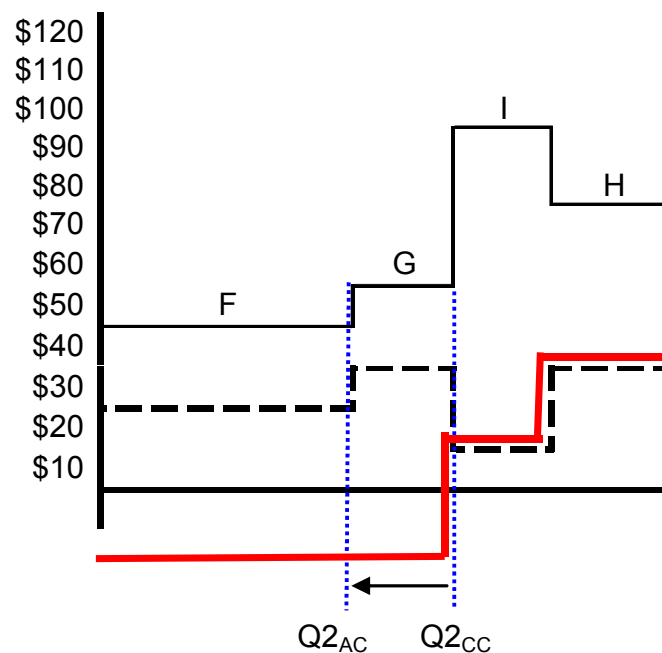


Fig. 10: Rest of System (Unconstrained)



- Mitigated bids used in AC run with uncompetitive constraints enforced:
- Negatively priced CC schedules minimize mitigation:
 - Units in constrained area are dispatched up over only as needed to relieve congestion on non-competitive constraint.
 - Outside of constrained area, units with lower DEBs not dispatched up in AC run.

DEB-based LMPM – Market Result

Fig. 11: Local Constrained Area

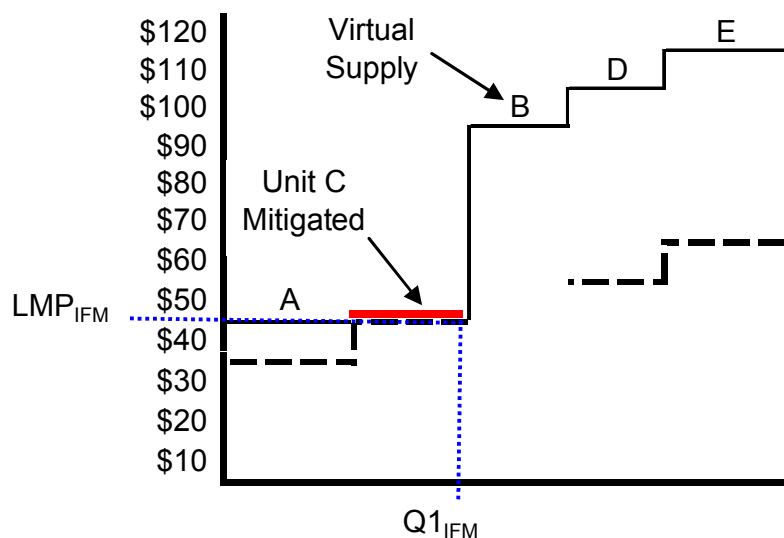
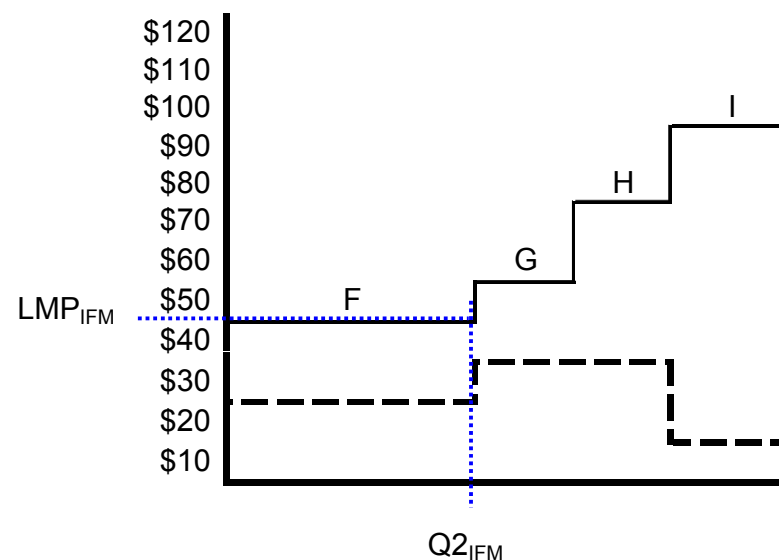


Fig. 12: Rest of System (Unconstrained)



- Only Unit C has mitigated bids used in IFM/RTM.
- Higher priced virtual supply does not set LMP in local constrained area.
- Lower priced virtual supply still free to “compete” with physical supply in CC run, AC run and IFM/RTM.

Benefits of Preferred LMPM Option

- Allows all supply and demand bids to be included in LMPM, while eliminating concerns about how virtual bids/PDR may undermine LMPM.
- Increases market efficiency by ensuring that physical supply needed to meet local uncompetitive constraints is considered in merit order of DEB (rather than market bid price).
- Allows competitively priced virtual supply/PDR to compete with physical supply based on;
 - Unmitigated bid prices of physical units on system wide basis (CC run)
 - Mitigated bid prices of physical units to meet minimum generation requirements within uncompetitive areas (AC run).
- Ensures that units subject to mitigation are subject to mitigation only at minimum level needed to resolve congestion on uncompetitive constraints in AC run.
 - More economically efficient mix of units mitigated, but would not increase total amount of capacity mitigated.

Conclusions/Recommendations

- Short term option
 - Excluding PDR from AC/CC runs avoids undermining of LMPM

- Preferred Longer term option
 - DMM requests MSC review of approach preferred by DMM
 - Any alternative approaches suggested by MSC should be identified and assessed