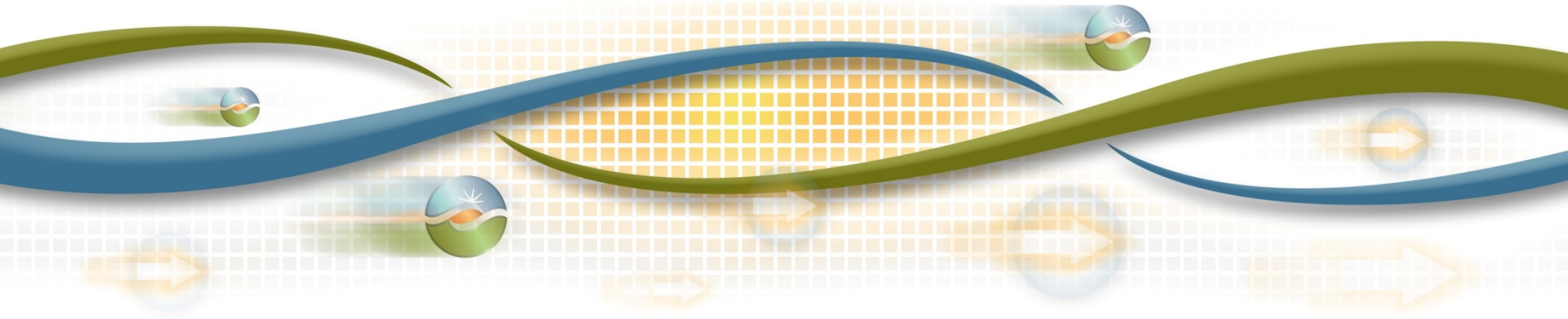


EIM market power mitigation

Department of Market Monitoring

Market Surveillance Committee Meeting
March 11, 2014



Overview

- Background on ISO EIM filing
- Example of EIM level market power
- Proposed methodology and initial results

Background

- Local market power mitigation may not address EIM BAA level market power without EIM Transfer included
- ISO filing on EIM provides for application of LMPM to EIM Transfers into EIM BAAs if:
 - DMM study concludes that EIM-level market power may exist
 - Study is presented to ISO Board
 - Board approves application of mitigation to transfer constraint
- DMM will perform competitiveness study and advise ISO management
- DMM seeking input/review from MSC on methodology and initial findings

Local market power mitigation may not address EIM BAA level market power without EIM Transfer included

- Proposed LMPM will address market power related to constraints within EIM BAA sub-areas.
- Will not address market power related to EIM Transfer constraints.
- **Scenario 1:** Illustrate impact on price when dominant supplier exercises market power in EIM BAA (despite presence of local market power mitigation).
- **Scenario 2:** Illustrate impact on uncompetitive price when include EIM Transfer in local market power mitigation process.

Scenario 1 (EIM wide market power)

- 300 MW @ \$30 (East – X,Y)
400 MW @ \$50 (West – D,E,F,G)
100 MW @ \$60 (CAISO)
300 MW @ \$999 (West – A)

EIM BAA₁ (West)
Demand = 1,100 MW
Supply = 1,000 MW

EIM BAA₁ (East)
Load = 0 MW
Supply = 600 MW

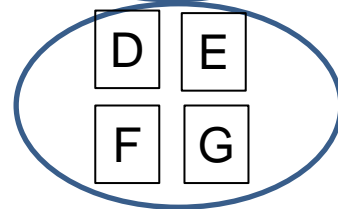
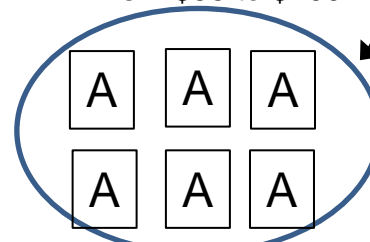
- LMP in East = \$999
LMP in West = \$999
LMP in CAISO = \$60

3. No congestion on L1

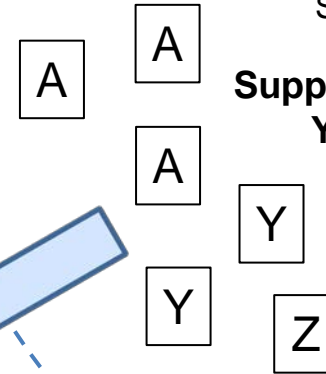
- Congestion on L2, but if L2 not included in competitiveness test then no uncompetitive congestion.

5. No mitigation

Supplier A Bids = \$999
DEBs = \$55 to \$100



Supplier A Bids = \$1,000
Y and Z Bid \$30
DEBs = \$30



L1 = 550 MW transfer capacity

Bids = \$50
DEBs = \$35

L2= 100 MW transfer capacity

CAISO

Marginal bid = \$60/MW



A = 100 MW unit controlled by supplier A to Z.

* Congestion prices based on slack bus in CAISO

Scenario 1: Market Prices

	CAISO	West	East
SMEC*	\$ 60	\$60	\$60
Congestion Shadow Price (L1)	\$ 0	\$ 0	\$ 0
<u>Congestion shadow Price (L2)</u>	<u>\$ 0</u>	<u>\$939</u>	<u>\$939</u>
Total LMP	\$ 60	\$999	\$999

Scenario 2 (Mitigation of EIM wide market power)

- 300 MW @ \$30 (East – X,Y)
400 MW @ \$50 (West – D,E,F,G)
100 MW @ \$60 (CAISO)
300 MW @ \$999 (West – A)

EIM BAA₁ (West)
Demand = 1,100 MW
Supply = 1,000 MW

EIM BAA₁ (East)
Load = 0 MW
Supply = 600 MW

- LMP in East = \$999
LMP in West = \$999
LMP in CAISO = \$60

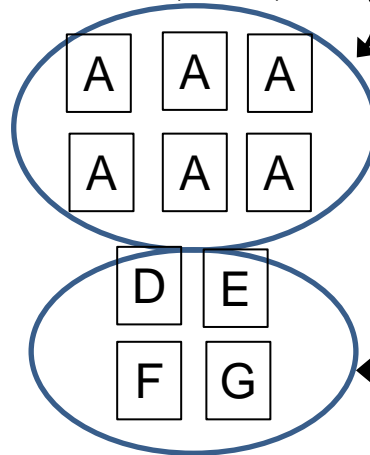
- Congestion on L2 triggers competitiveness test on EIM level.

- Demand for counterflow from EIM for L2 = 1,000 MW.

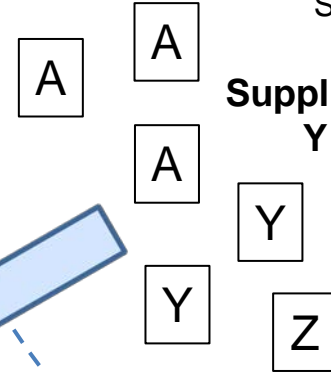
- Residual supply of counterflow excluding A, Y and Z = 400 MW

- Mitigation triggered

Supplier A Bids = \$999
DEBs = \$55 to \$100



Supplier A Bids = \$1,000
Y and Z Bid \$30
DEBs = \$30



L1 = 550 MW transfer capacity

Bids = \$50
DEBs = \$35

L2 = 100 MW transfer capacity

CAISO

Marginal bid = \$60/MW



A = 100 MW unit controlled by supplier A to Z.

* Congestion prices based on slack bus in CAISO

Scenario 2: Competitive LMP used as floor in bid mitigation

	CAISO	West	East
SMEC	\$ 60	\$60	\$60
Congestion Shadow Price (L1)	\$ 0	\$ 0	\$ 0
<u>Congestion shadow Price (L2)</u>	<u>\$ 0</u>	<u>\$939</u>	<u>\$939</u>
Total LMP	\$ 60	\$999	\$999

$$\begin{aligned}\text{Competitive LMP} &= \text{SMEC} + \text{Competitive Congestion Component} \\ &= \$60 + \$0 = \$60\end{aligned}$$

Scenario 2: Bid mitigation (EIM wide)

	Supplier A (West)	Supplier A (West)	Suppliers D, E, F and G	Supplier A (East)	Supplier Y,Z
Market bid	\$999	\$999	\$50	\$1,000	\$30
DEB	\$55	\$100	\$35	\$30	\$30
LMP _{comp}	\$60	\$60	\$60	\$60	\$60
Mitigated bid	\$60	\$100	\$50	\$60	\$30

$$\text{Mitigated bid} = \text{Min} [\text{Market bid}, \text{Max}(\text{LMP}_{\text{comp}}, \text{DEB})]$$

PAC EIM market competitiveness study

For the initial analysis, DMM plans to use hourly dominant supplier analysis:

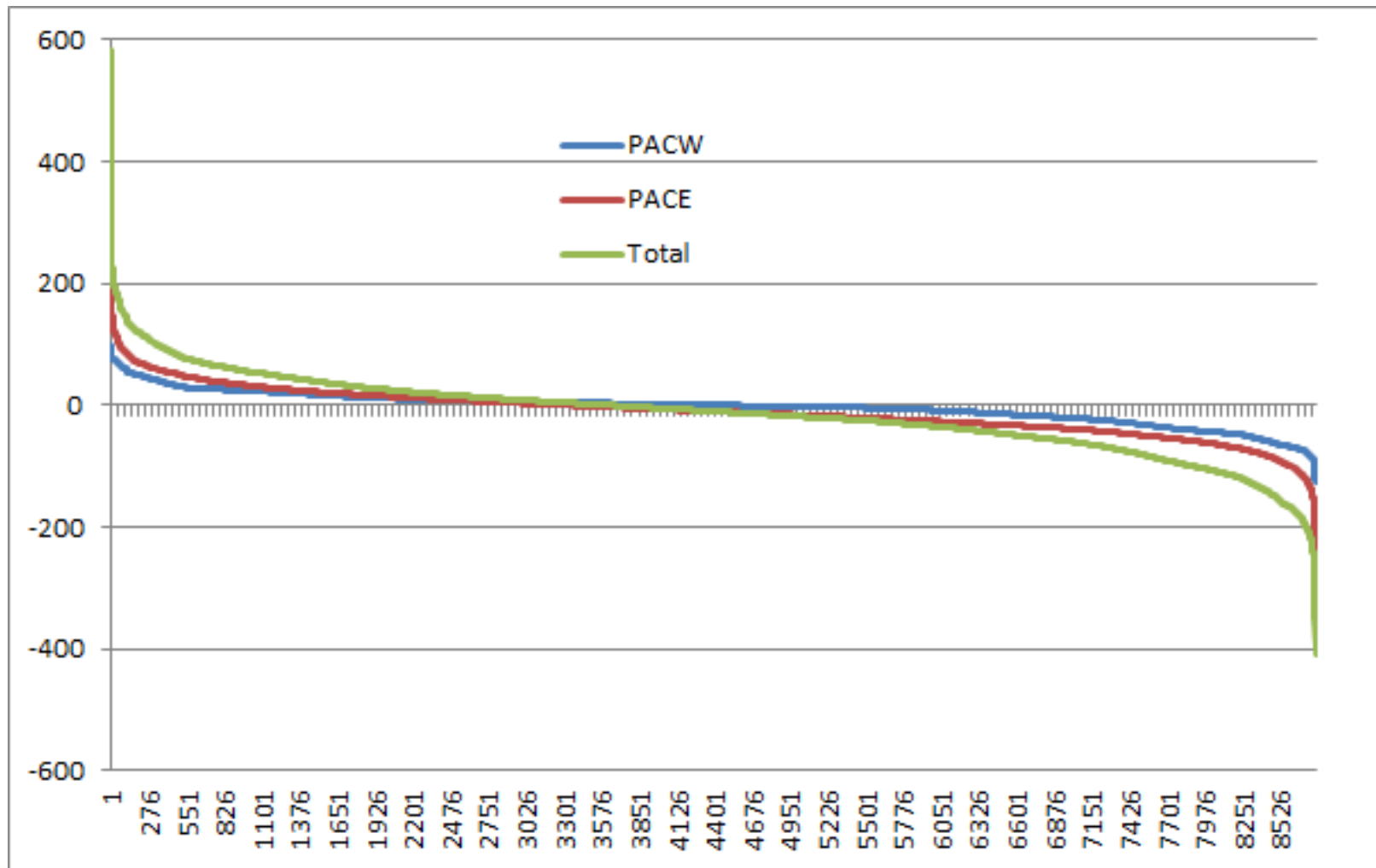
Non-PAC supply (within EIM)_t

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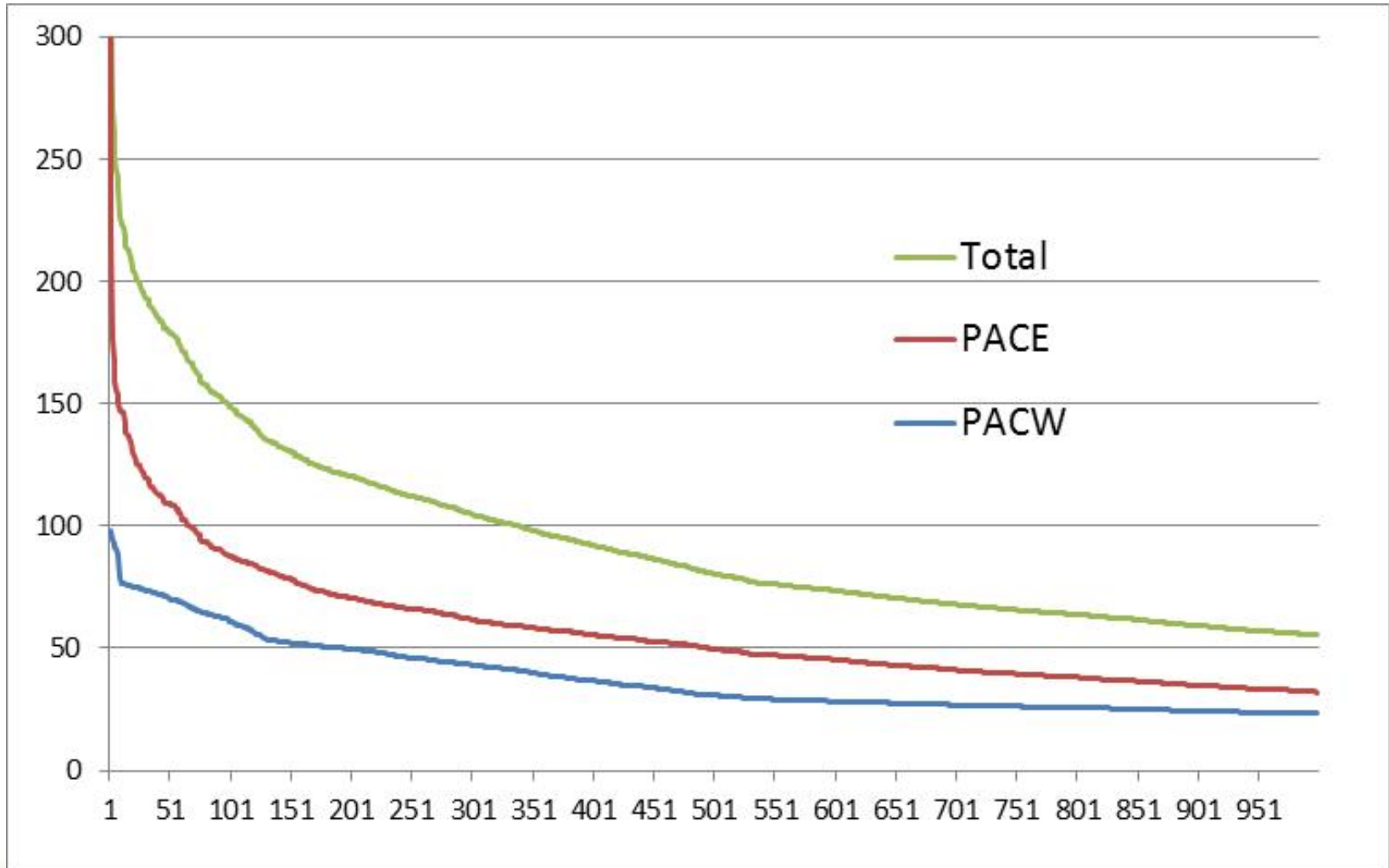
Non-PAC supply from EIM transfers_t

Non-PAC Imbalance energy demand_t

Hourly imbalance energy demand (2012) from Non-PAC entities



Hourly imbalance energy demand (2012)

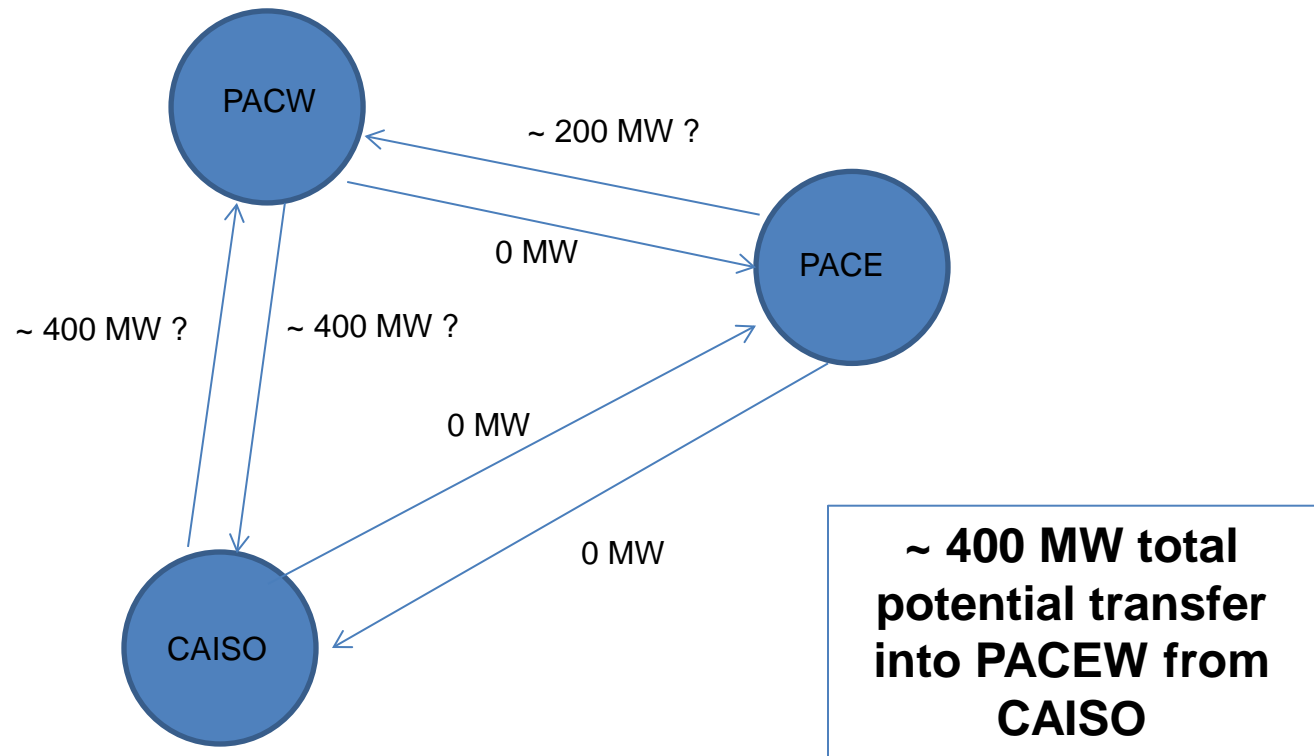


Non-PacifiCorp Supply (within EIM)

- Unclear how much (if any) non-PAC supply will be offered.
 - To date, no other entity set to participate in PACE or PACW EIM
 - Lead time to develop ability to participate may rule out participation at start of EIM. No firm data for pre-EIM analysis.
- Even if an entity is gets certified to participate, amount of excess available energy they will bid into real-time EIM is unknown.
- Appears there will be no dispatchable 15-minute intertie offers into EIM from non-EIM / non-ISO sources.

Therefore, DMM anticipates using assumption that no non-PacifiCorp supply within EIM will be available for this initial analysis

Non-PacifiCorp Supply from EIM Transfers



Non-PacifiCorp Supply from EIM Transfers

- Up to ~ 400 MW of transfer capacity from CAISO into PACW EIM may be available.
- Amount of transfer available each hour will be determined by PAC's merchant arm (not PAC EIM market operator)
- May be reduced due to a number factors:
 - Use by PAC to support imports from CAISO from purchases in IFM or bilateral transactions.
 - Use by PAC to support other schedules/transactions outside of CAISO (e.g. bilateral sales at COB, etc).
 - Sales of transmission by PAC to other entities

Therefore, DMM anticipates using assumption that no non-PacifiCorp supply from CAISO EIM transfers into PACW or PACE will be available during any specific hour.

Non-PacifiCorp Supply from EIM Transfers

- Up to 200 MW of transfer capacity from PACE to PACW may be available in EIM some hours, however
 - Amount of transfer available each hour will be determined by PAC's merchant arm (not PAC EIM market operator)
 - All or most supply in PACE available for transfer to PACW will be owned/controlled by PAC merchant.

Therefore, DMM anticipates using assumption that no non-PacifiCorp supply from EIM transfers into PACW from PACE will be available during any specific hour.

Initial conclusions

- Based on information available at this time, DMM cannot conclude that PACE or PACE EIM BAAs will be competitive.
- Analysis and approach can be refined as
 - additional empirical information becomes available,
 - modifications to EIM market structure take place
- Analysis can be performed using hourly data on actual supply and demand after first year of EIM.