



Wholesale Market Operations Update

John Dumas

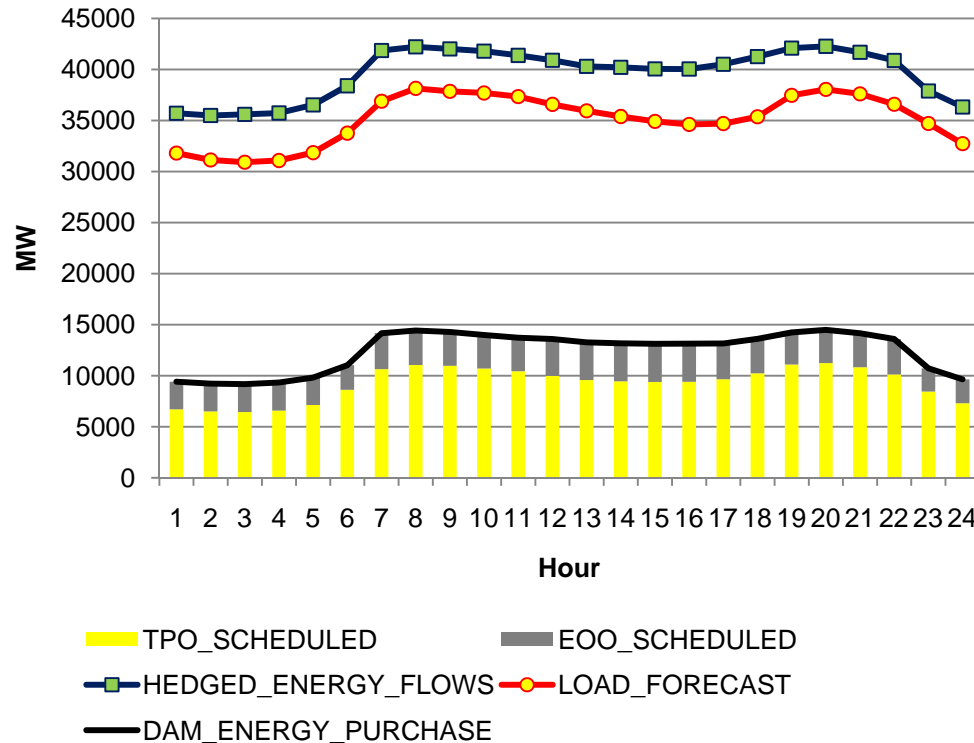
Director Wholesale Market Operations

ERCOT Board of Directors

March 22, 2011

Day-Ahead Schedule

Average DAM Schedule During February 2011

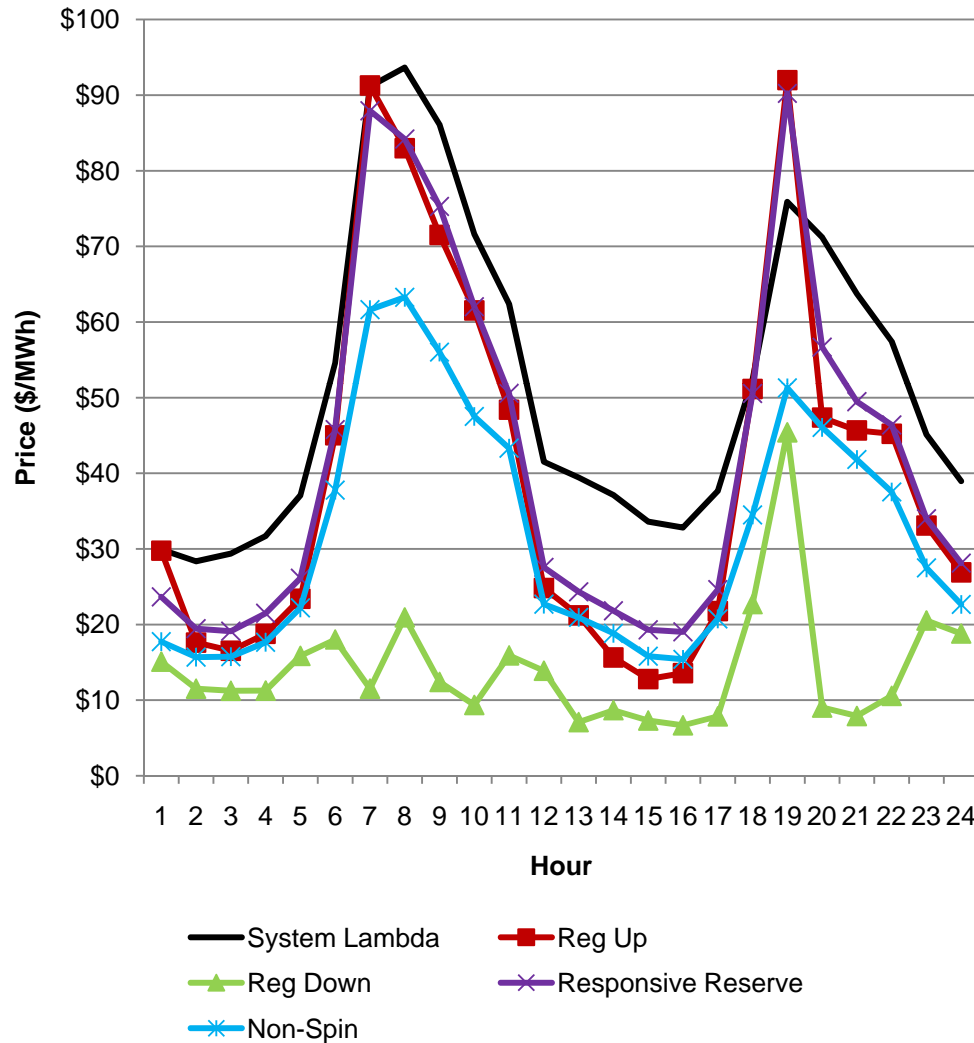


- Hedged Energy exceeded the day ahead load forecast on average for all 24 hours
- Indicating a conservative approach

Acronym : TPO - Three Part Offer; EOO – Energy Only Offer;
 Hedged Energy = Energy purchased /sold in Day-Ahead Market plus Point –to-Point Obligations and Options carried forward to real-time.

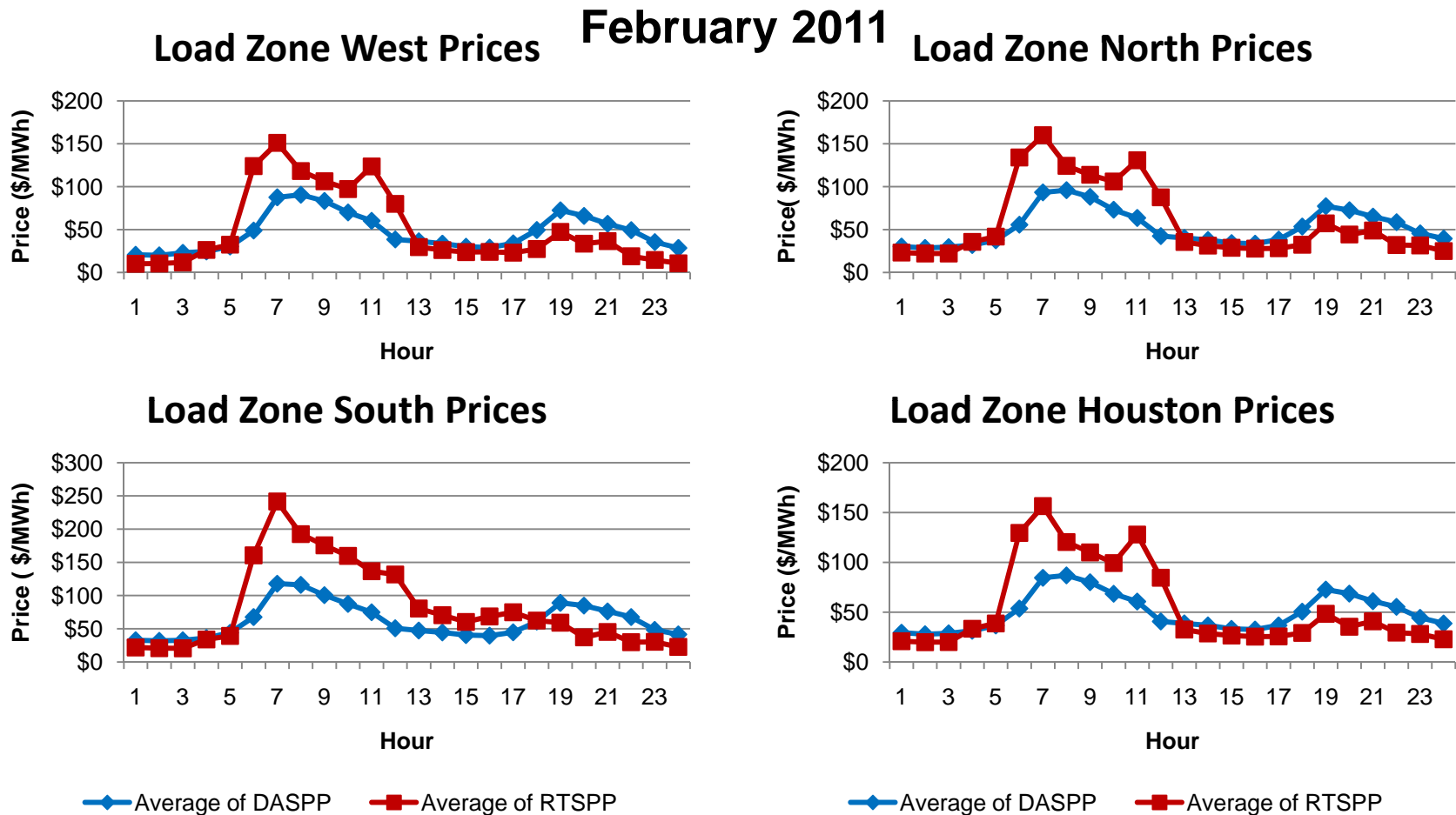
Day-Ahead Electricity And Ancillary Service Hourly Average Prices

February 2011



- Compared to Dec 2010 and Jan 2011, Energy Prices and Ancillary Service Prices for Feb 2010 were much higher on average due to a few days of extreme weather condition during that month.

Day-Ahead Vs Real-Time Load Zone SPP (Hourly Average)

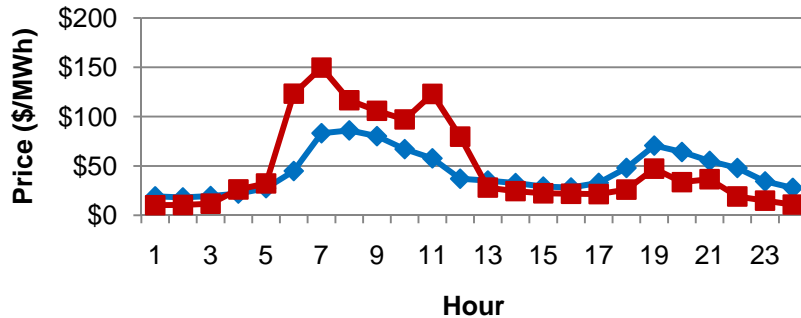


- Day Ahead prices and Real-Time prices were closely correlated and follow the load profile.
- Real-Time prices were slightly higher on peak hours due to ramp rate and transmission constraints.
- Compared to Dec 2010 and Jan 2011, Load Zone SPPs of Feb 2011 were much higher on average during peak hours due to a few days of extreme weather condition in that month.

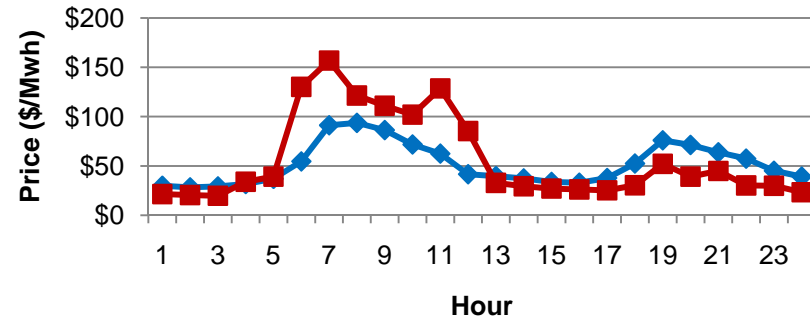
Day-Ahead vs Real-Time HUB SPP (Hourly Average)

February 2011

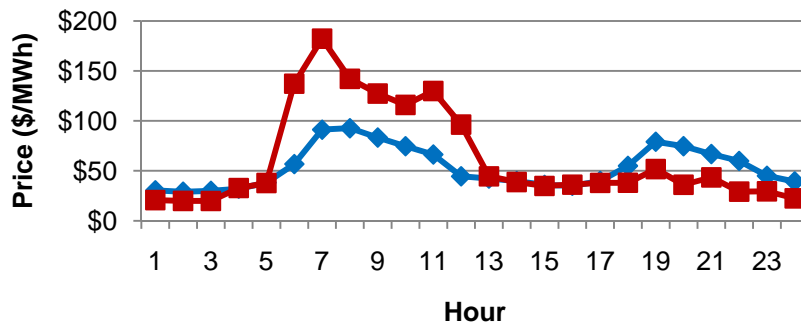
Hub West Prices



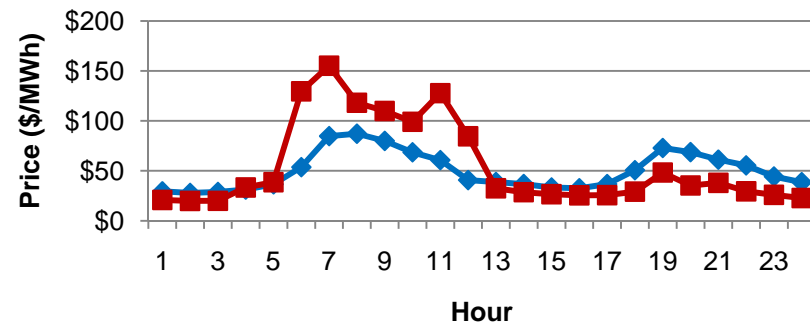
Hub North Prices



Hub South Prices



Hub Houston Prices

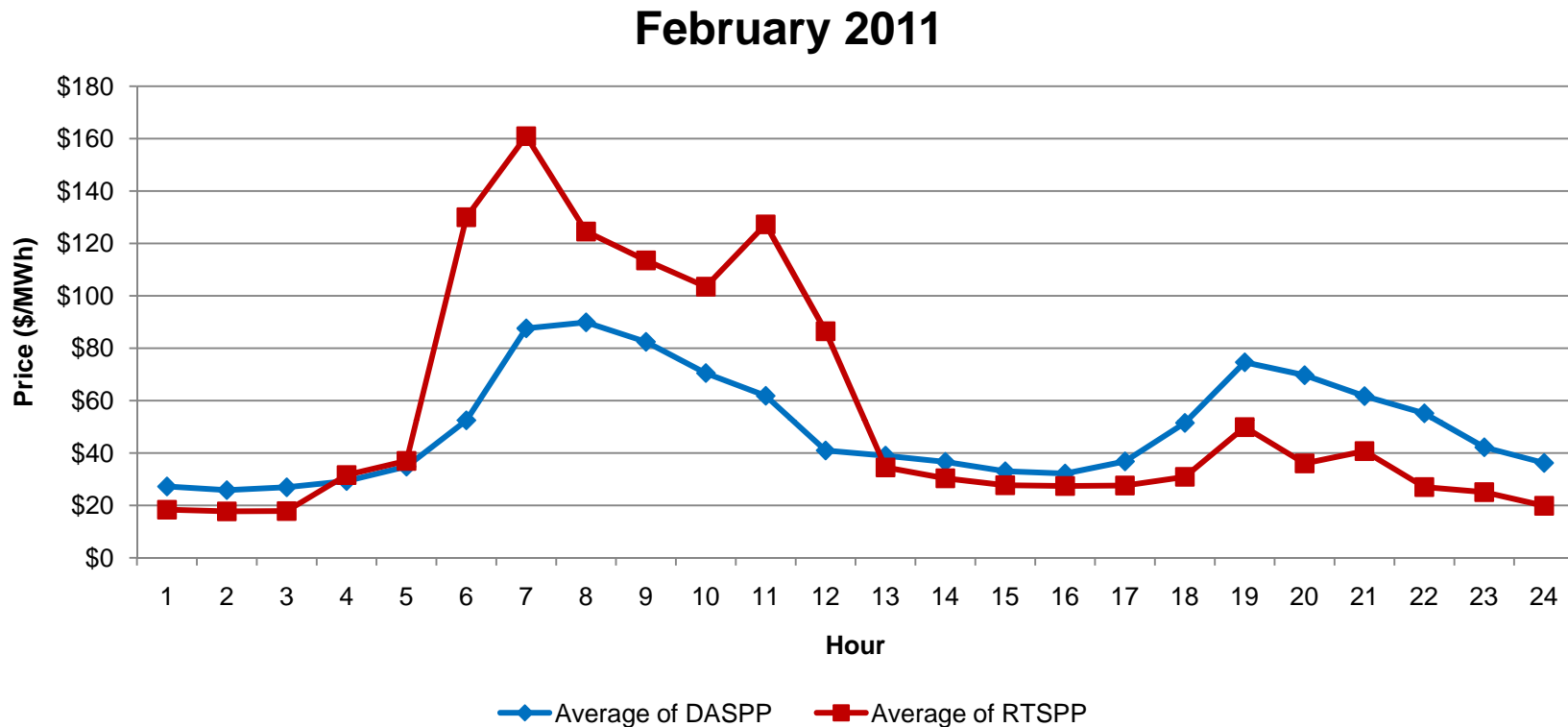


◆ Average of DASPP ■ Average of RTSP

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- Real-Time prices were slightly higher on peak hours due to transmission and ramp rate constraints.
- Compared to Dec 2010 and Jan 2011, Load Zone SPPs of Feb 2010 were much higher on average during peak hours due to a few days of extreme weather condition in that month.

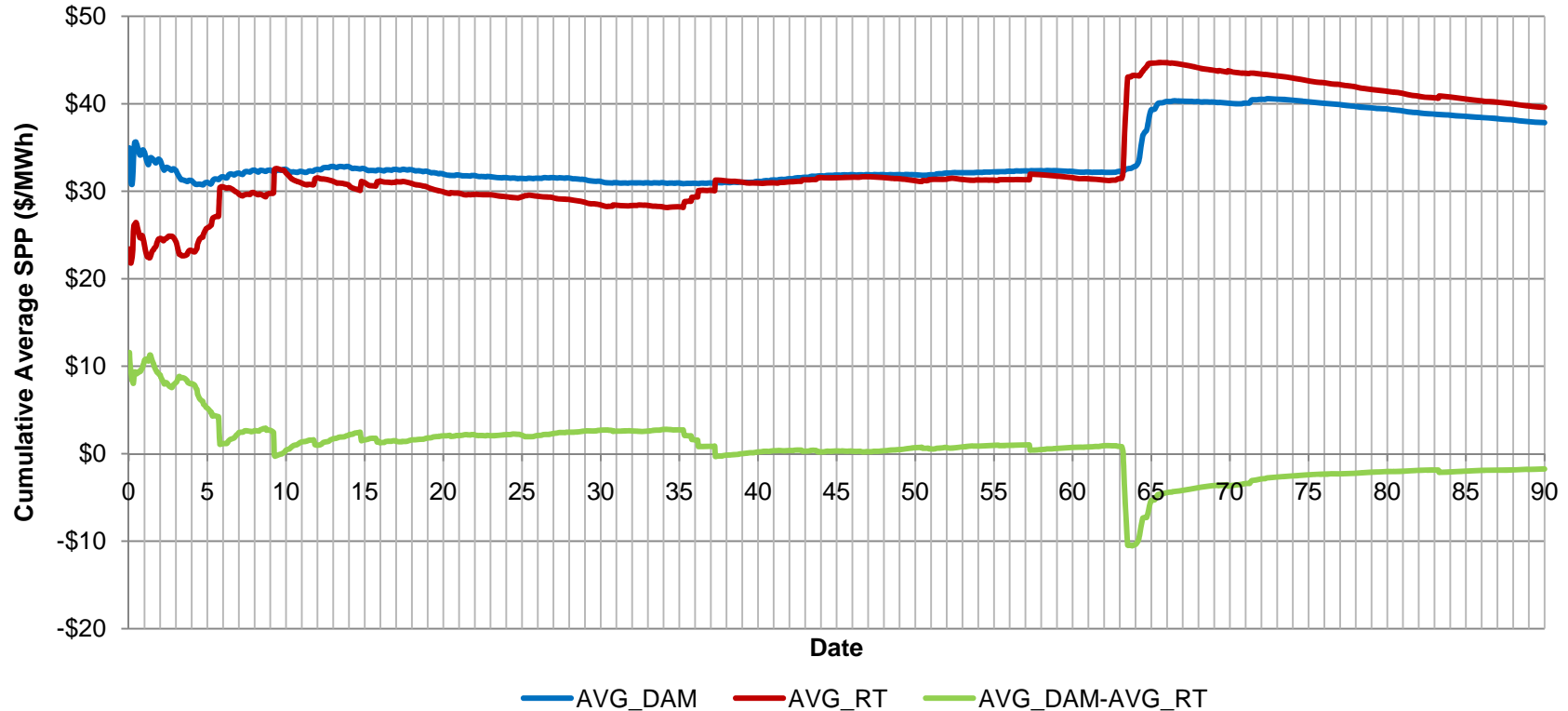
Day-Ahead Vs Real-Time Hub Average SPP (Hourly Average)



- The average real-time and day-ahead prices for the four Hubs
- Day Ahead prices follow the hourly load profile more closely than real-time prices
- Real-Time prices are dependent on real-time ramp rate capability
- Compared to Dec 2010 and Jan 2011, average Hub SPPs of Feb 2010 were much higher at peak hours due to a few days of extreme weather condition during that month.

Day-Ahead Vs Real-Time Cumulative Average

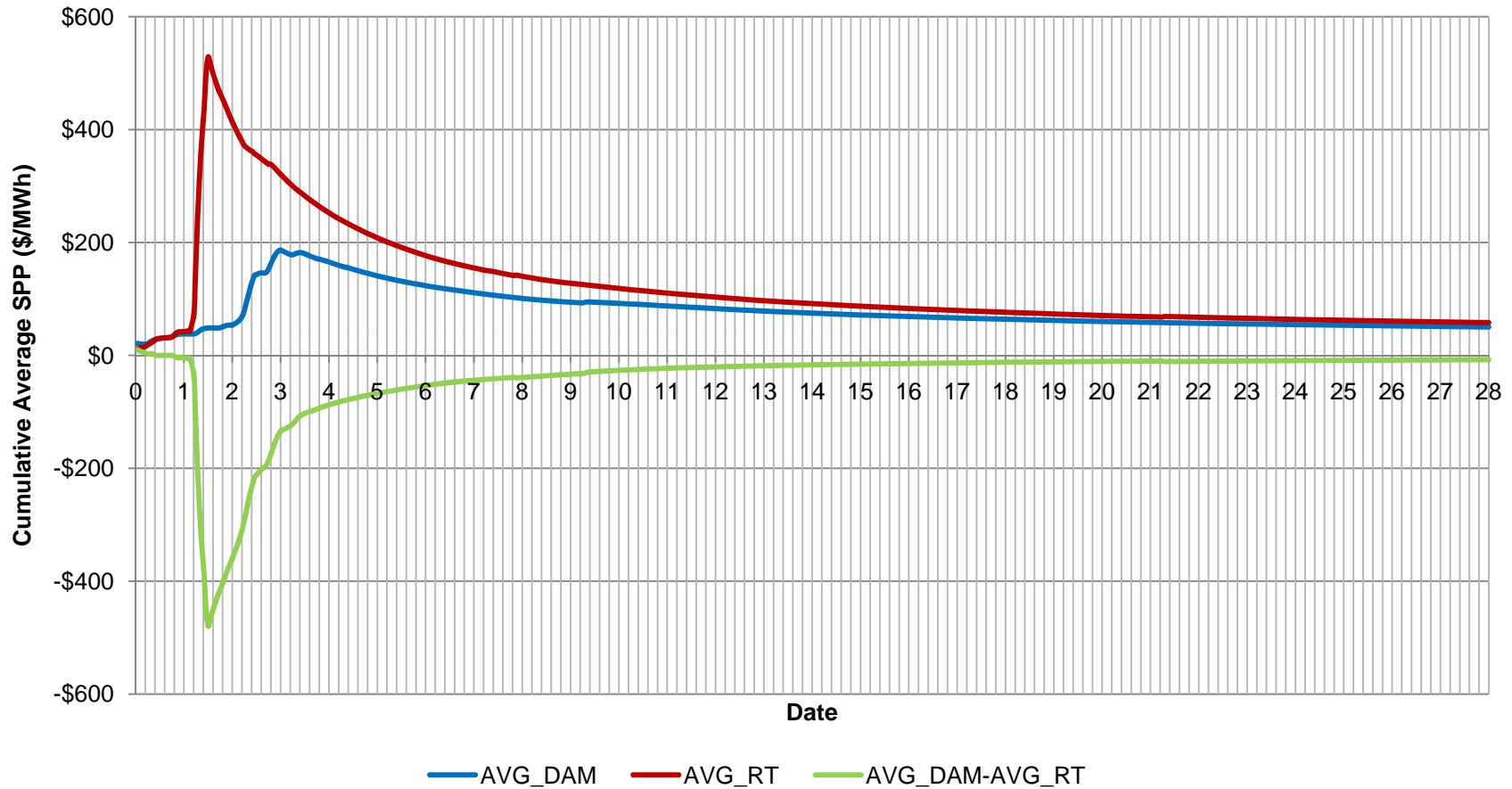
Simple Average Prices During Dec 2010 and Jan & Feb 2011



- Day Ahead prices and Real-Time prices converged nicely after the first few days of the market open.
- Due to extreme weather condition happened in early February,
 - The simple average prices of February were much higher than the other two months.
 - The average RT prices were higher than the average DAM prices.

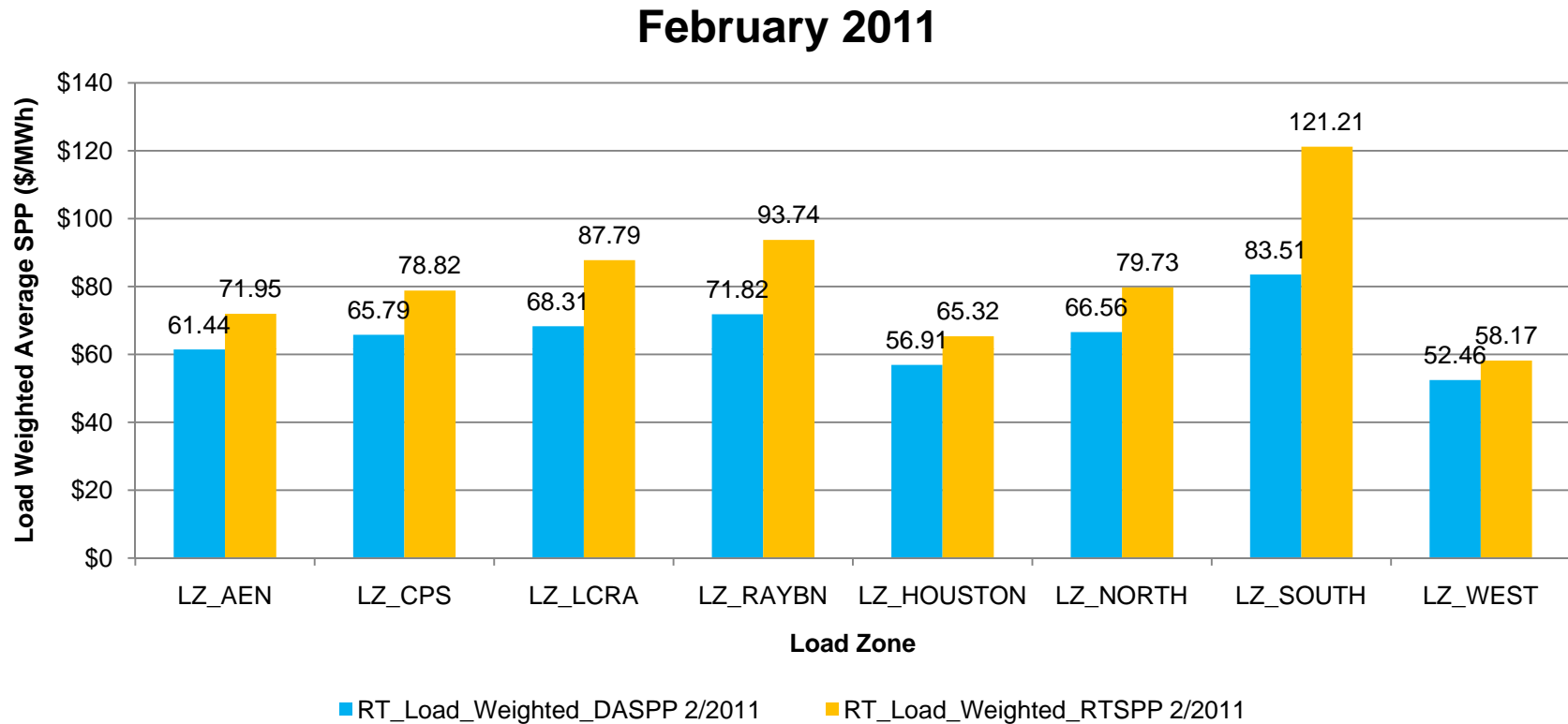
Day-Ahead Vs Real-Time Cumulative Average SPP

Simple Average Prices During February 2011



- The under generation in Real Time due to extreme weather caused most of the price divergence during first week of February.

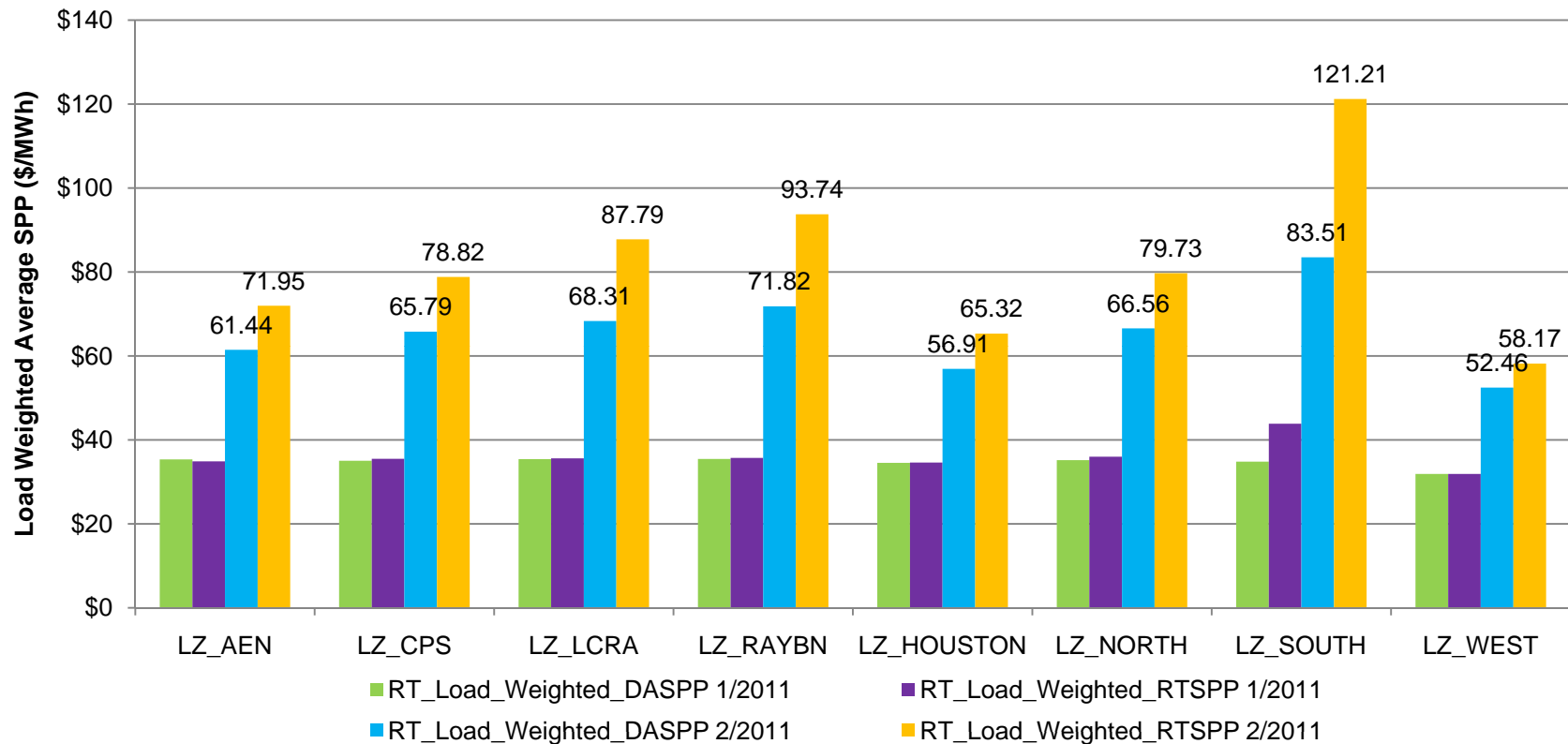
Load Weighted Average SPP



- The table shows the RT load weighted average prices for Load Zones for February
- Due to extreme weather condition that happened in early February, the load weighted average RT SPPs were higher than the load weighted average DAM SPPs.

Load Weighted Average SPP

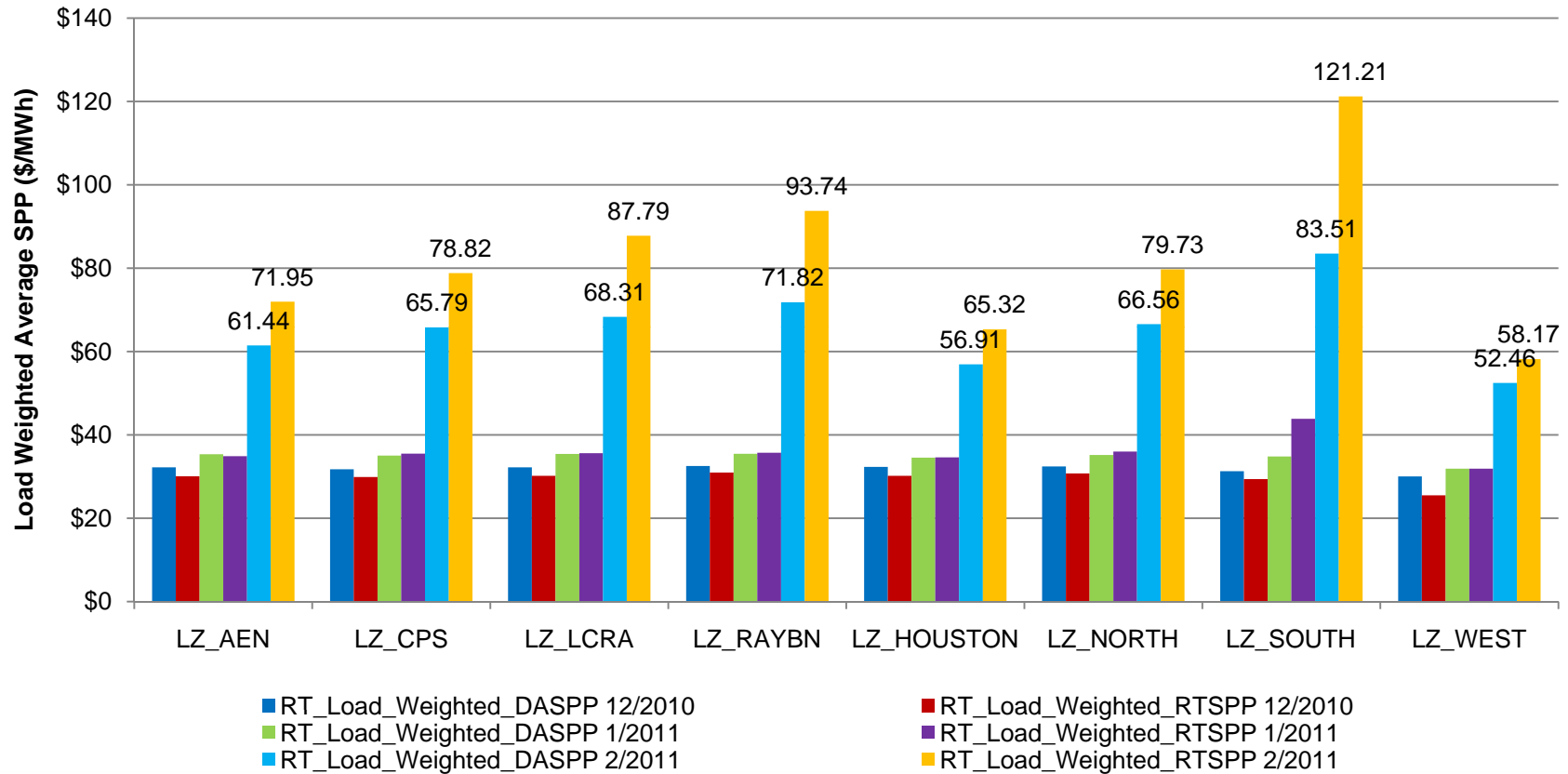
Jan and Feb 2011



- Due to extreme weather condition that happened in early February, the load weighted average DAM and RT SPPs of February were much higher than January.

Load Weighted Average SPP

Dec 2010 and Jan & Feb 2011

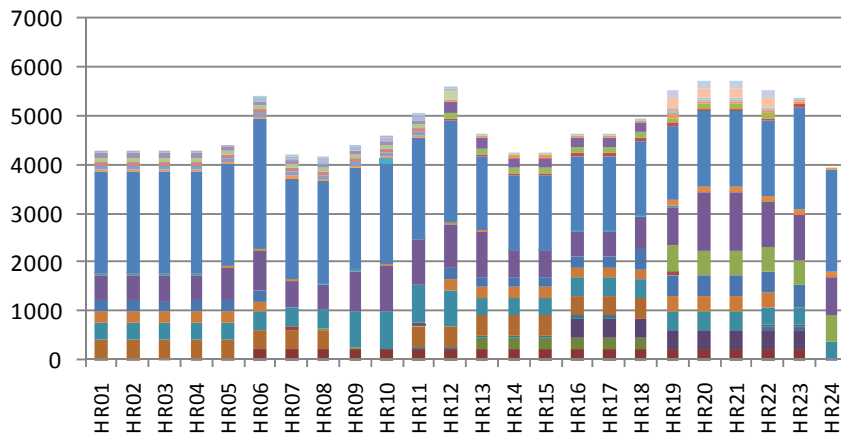


- Due to extreme weather condition that happened in early February, the load weighted average DAM and RT SPPs of February were much higher than the last two months.

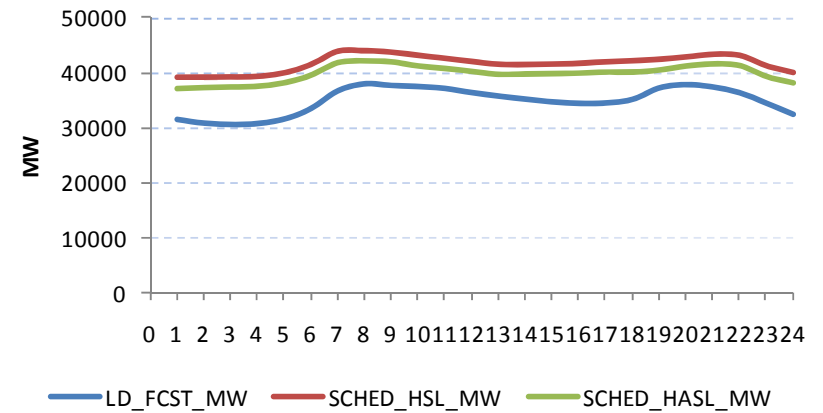
DRUC

- **27 executions (4 published after 1600; 0 published after 1800)**
- **DRUC ran on 02/04 for OD 02/05 missed due to DAM solution delay**
- **21 min average execution time**
- **Resource commit/decommit**
 - 113676 MWh committed (37 resources for 536 hours)
 - no DRUC de-commitment

Net committed capacity in DRUC (Feb 2011)



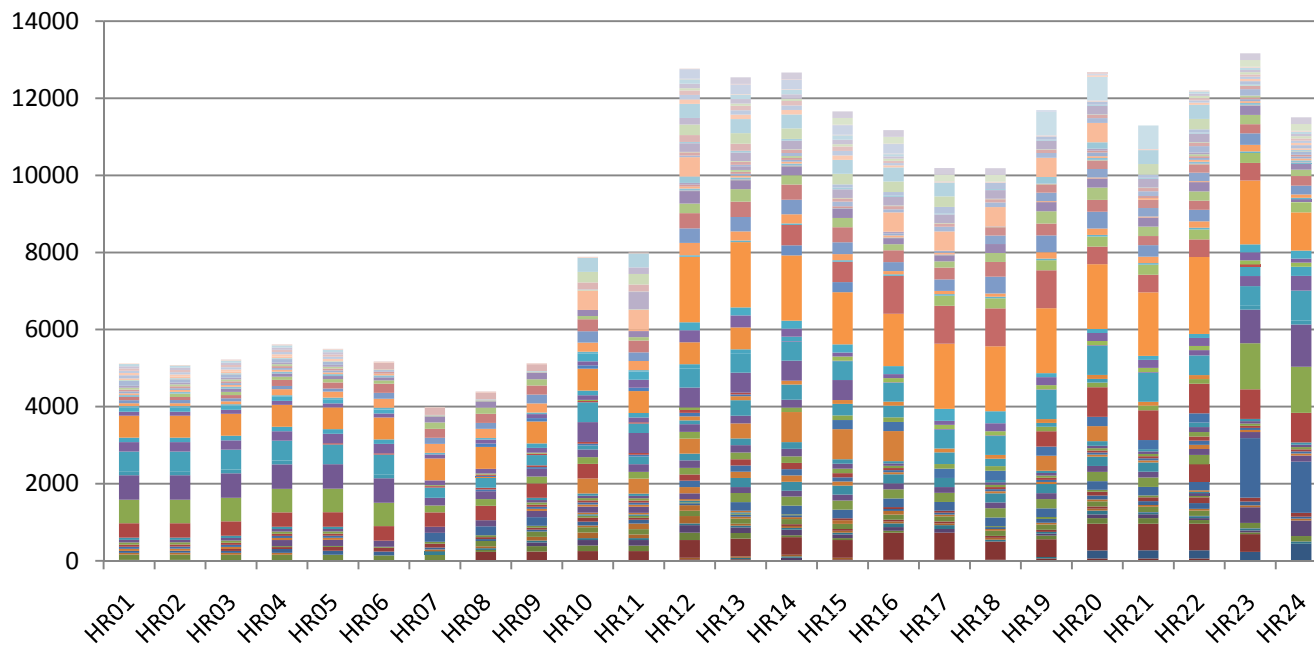
DRUC Average QSE scheduled capacity/load forecast (Feb 2011)



HRUC

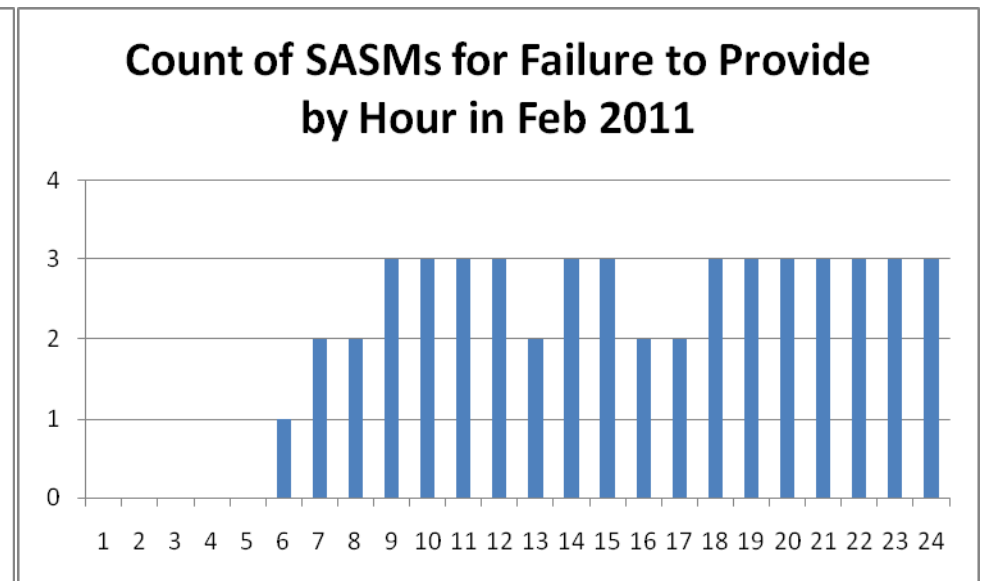
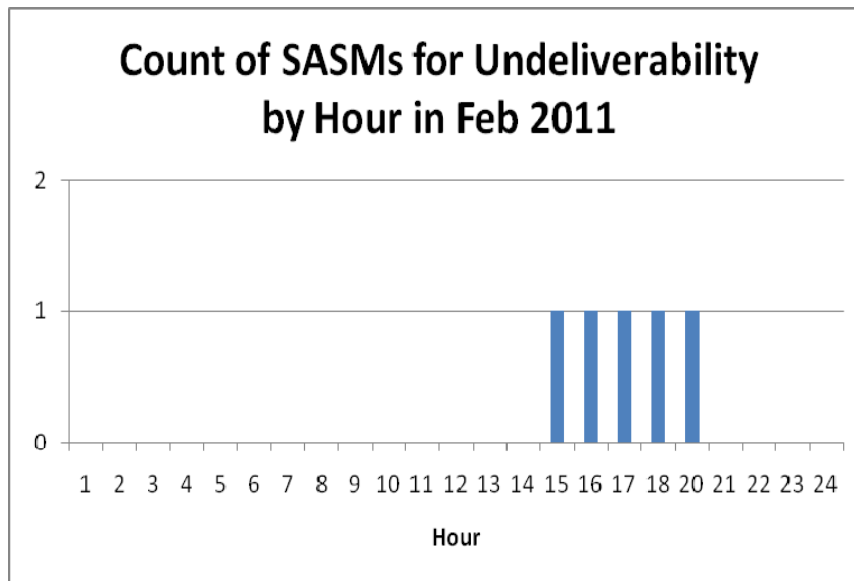
- **664 executions (8 missed)**
- **15 min average execution time**
- **Resource commit/de-commit**
 - no HRUC de-commitment

Net committed capacity in HRUC (Feb 2011)



Supplemental Ancillary Service Market (SASM)

- **9 SASMs were run in February, 2011**
 - **2 for undeliverable AS**
 - **7 for AS failure to provide**



CRR Auction for Operating Month February 2011

- **158,560 Bids**
- **23,660 Auction Awards**
 - **781,075.6 MW**
 - **262,344.2 Peak WD**
 - **258,940.8 Peak WE**
 - **259,790.6 Off-peak**
- **Total Auction/Allocation Revenue = \$15,110,237.27**

CRR Price Convergence

	February 2011	January 2011	December 2010
Net Amount Paid for CRRs/TCRs (Cost)	\$15.0M	\$16.4M	\$13.5M
Net Amount Paid to Account Holders for TCRs/CRRs (Value)	\$80.2M	\$17.8M	\$13.4M
Convergence (Value/Cost)	534%	109%	99%

Nodal Market Challenges after Three Months of Operations

- **Weighted Average LMP different at electrically close locations when congestion doesn't exist**
 - ✓ Addressing through NPRR 326
- **Pricing of De-energized Resource Nodes**
 1. Inconsistent pricing between DAM and Real-Time due to de-energized resource nodes getting assigned System Lambda in real-time
 - Addressed by Adding 609 Electrical Buses to 140 stations
 2. Inconsistent pricing between DAM and Real-Time due to split bus station and de-energized resource nodes getting assigned average LMP at same kV in station
 - Addressing through short term and long term approach. Short term – submit urgent NPRR to modify de-energized bus pricing logic.

Pricing Rules for De-energized Resource Nodes

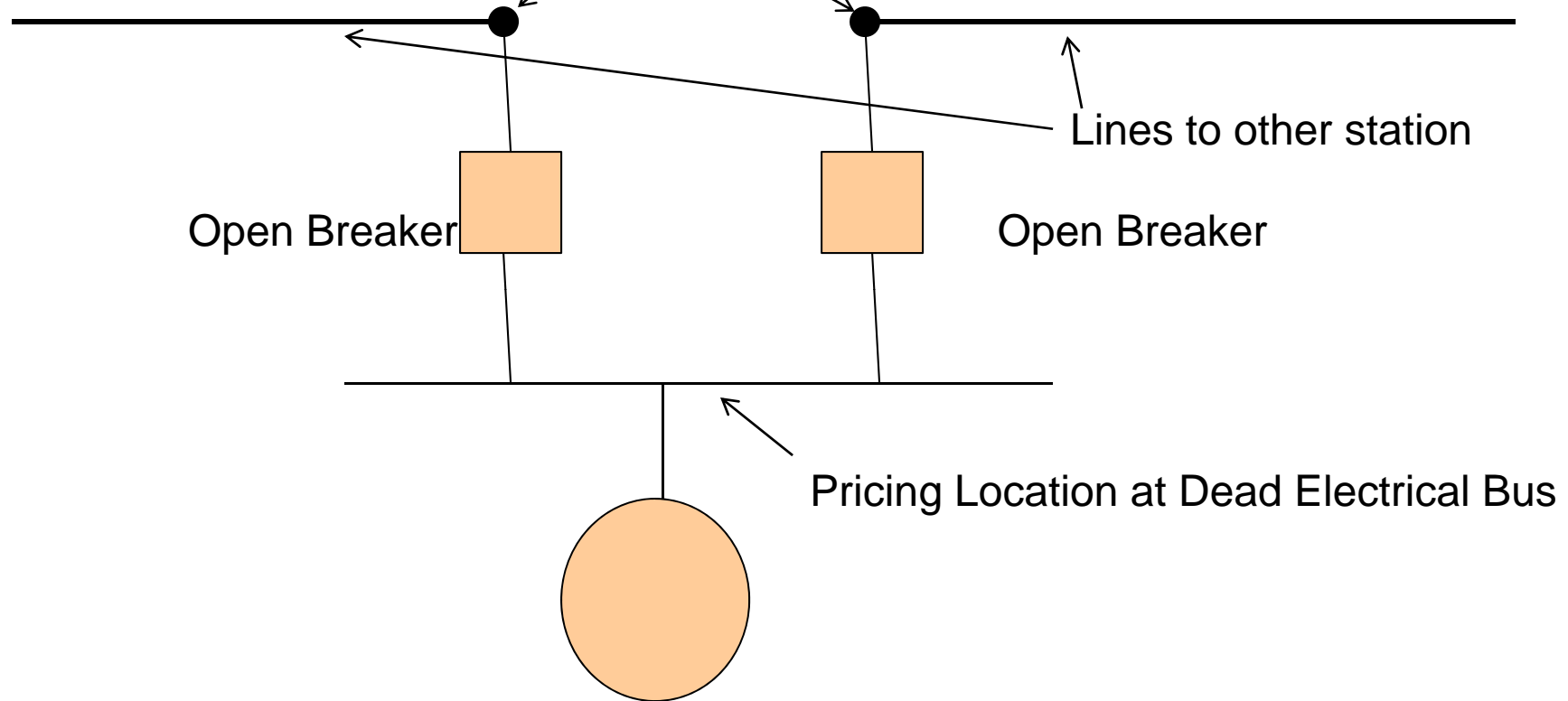
- (a) Use average LMP for Electrical Buses within the same station having the same voltage level as the de-energized Electrical Bus, if any exist.
- (b) Use average LMP for all Electrical Buses within the same station, if any exist.
- (c) Use system lambda.

Previously (eg. Permian Basin) Level (c) Caused Problems

(c) Use system lambda.

Example – Permian Basin Unit 5 in DAM

Electrical engineers think of these dots as buses, but they weren't specially designated "Electrical Buses" in the model

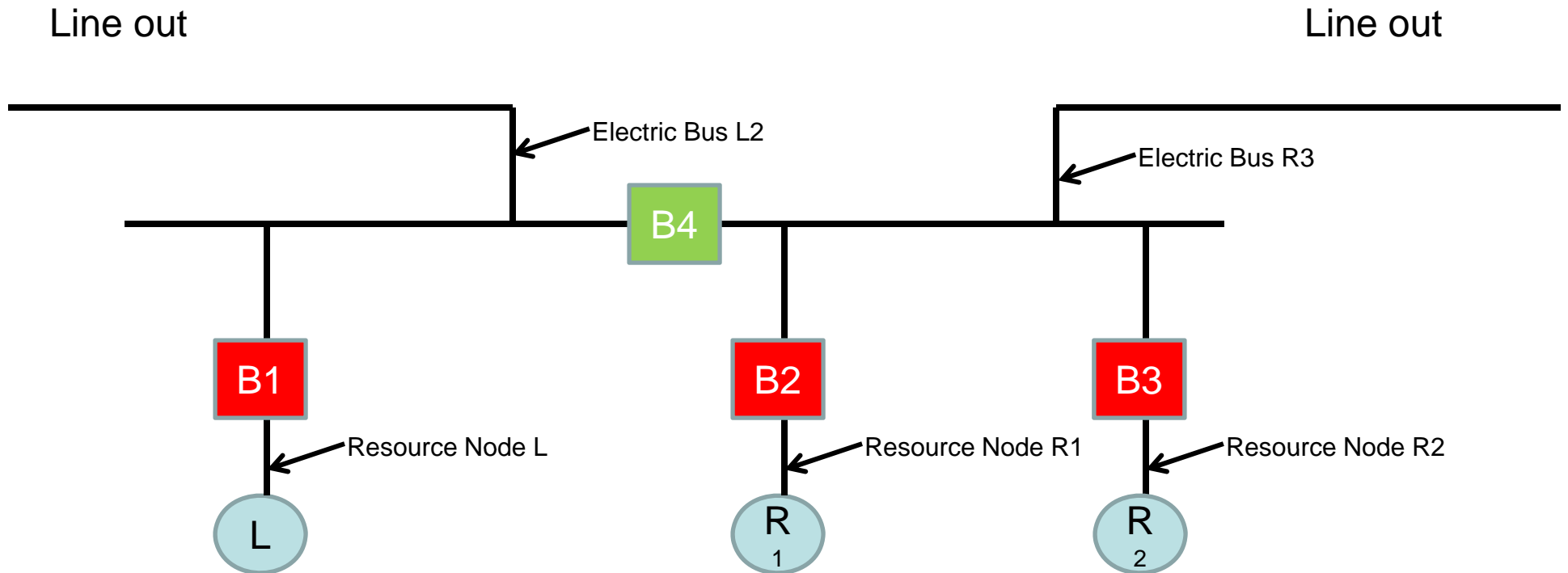


**The only "Electrical Bus" in the model was dead;
hence the system picked up "System Lambda" as the
Price-Addressed by Adding 609 Electrical Buses at 140 Stations**

Now Level (a) is Causing Issues

(a) Use average LMP for Electrical Buses within the same station having the same voltage level as the de-energized Electrical Bus, if any exist.

Situation in Day Ahead Market

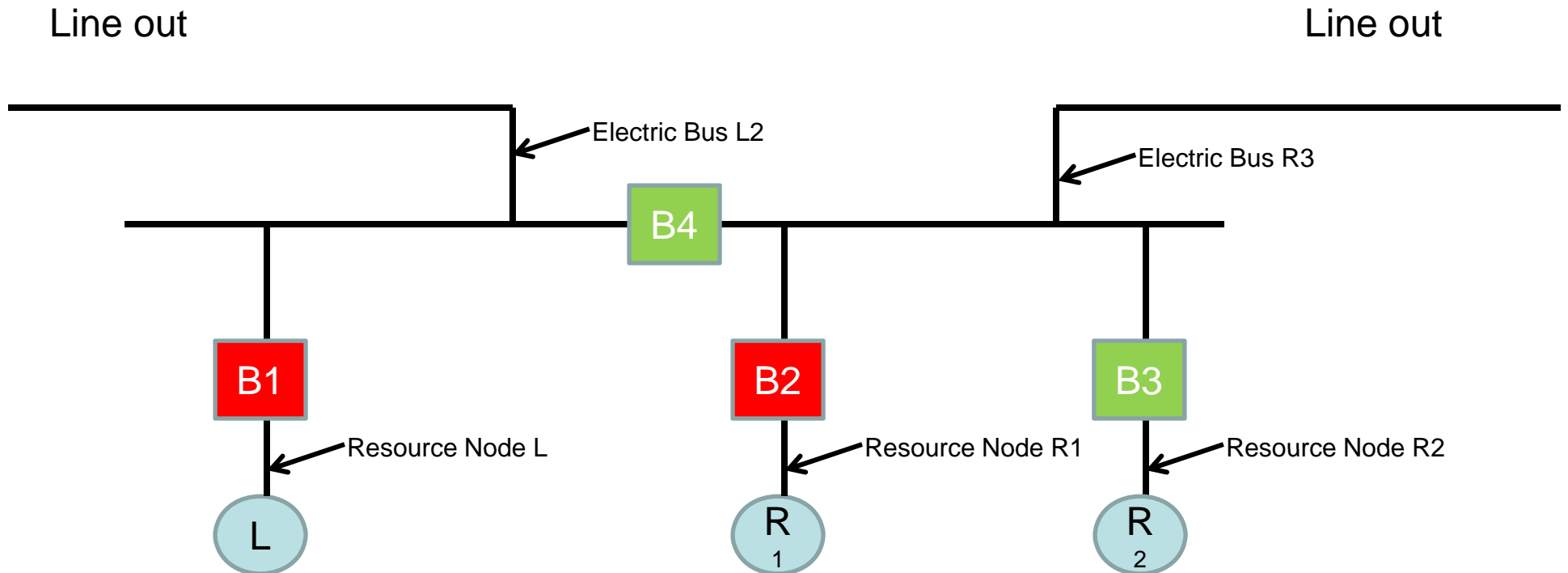


B1, B2, B3 Closed, B4 open

All Resource Nodes Energized, taking appropriate prices

PTP Obligations from R1 to R2 are \$0.

Occasional Situation in Real Time Market



B1, B2 Closed, B3, B4 open

L and R1 Resource Nodes Energized, taking appropriate prices

R2 taking average Price of {Resource Node L, Resource Node R1, Electric Bus L2, Electric Bus R3}

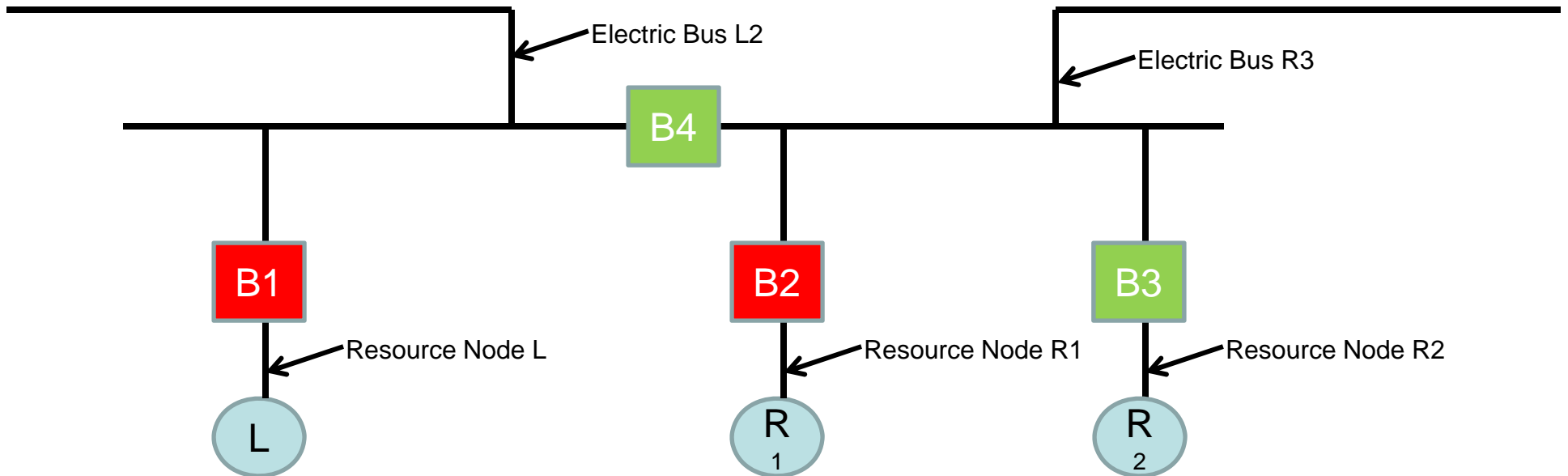
PTP Obligations from R1 to R2 have non-zero value, even though there is no congestion.

ERCOT estimates indicate ~\$3M payout on this issue.

Short Term Solution

Line out

Line out



Introduce ERCOT definable level in Pricing Heuristic
In this case, if R2 is de-energized, take price of R3