



Wholesale Market Operations Update

John Dumas

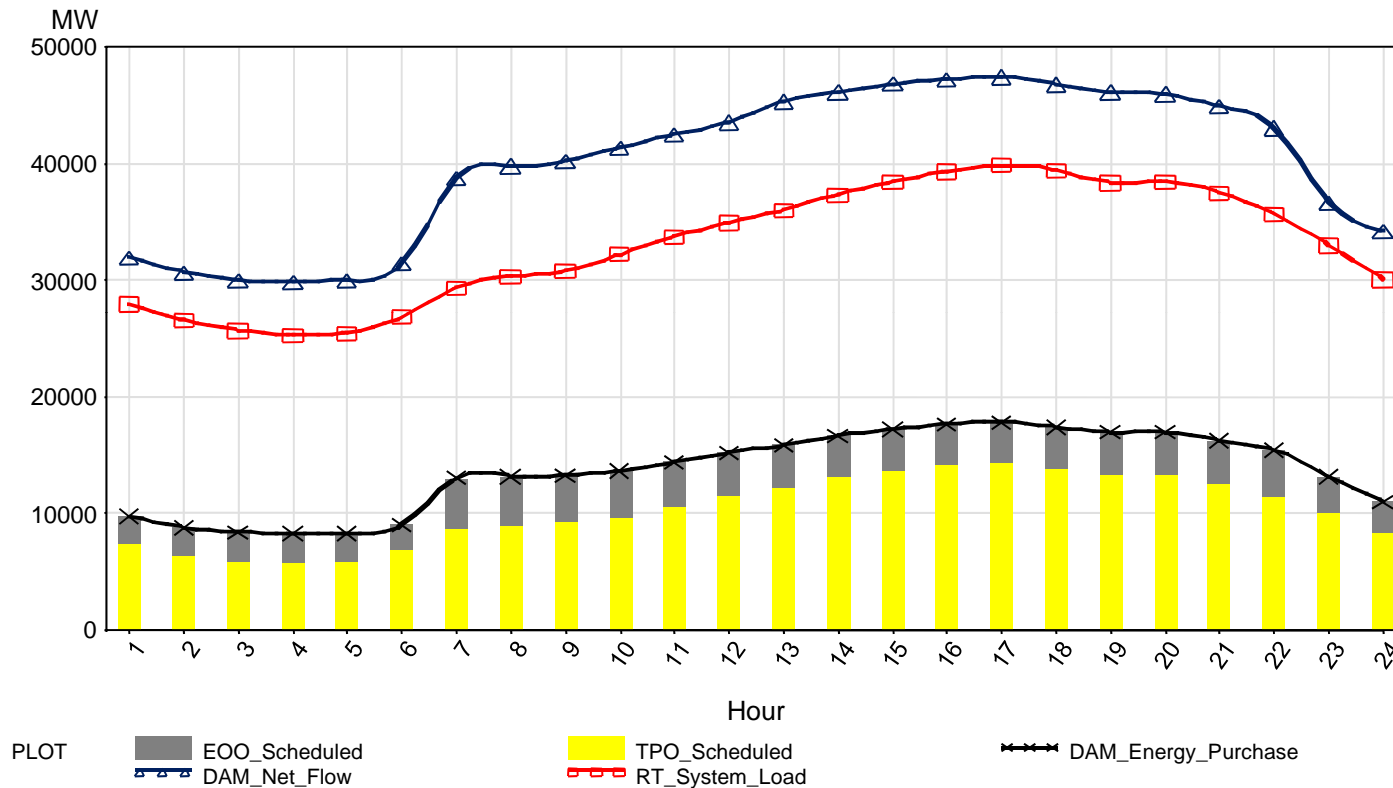
Director of Wholesale Market Operations

Board of Directors Meeting

December 12-13, 2011

Day-Ahead Schedule (October)

- On average the DAM net transmission flow (defined below) was greater than the real-time system load for all 24 hours



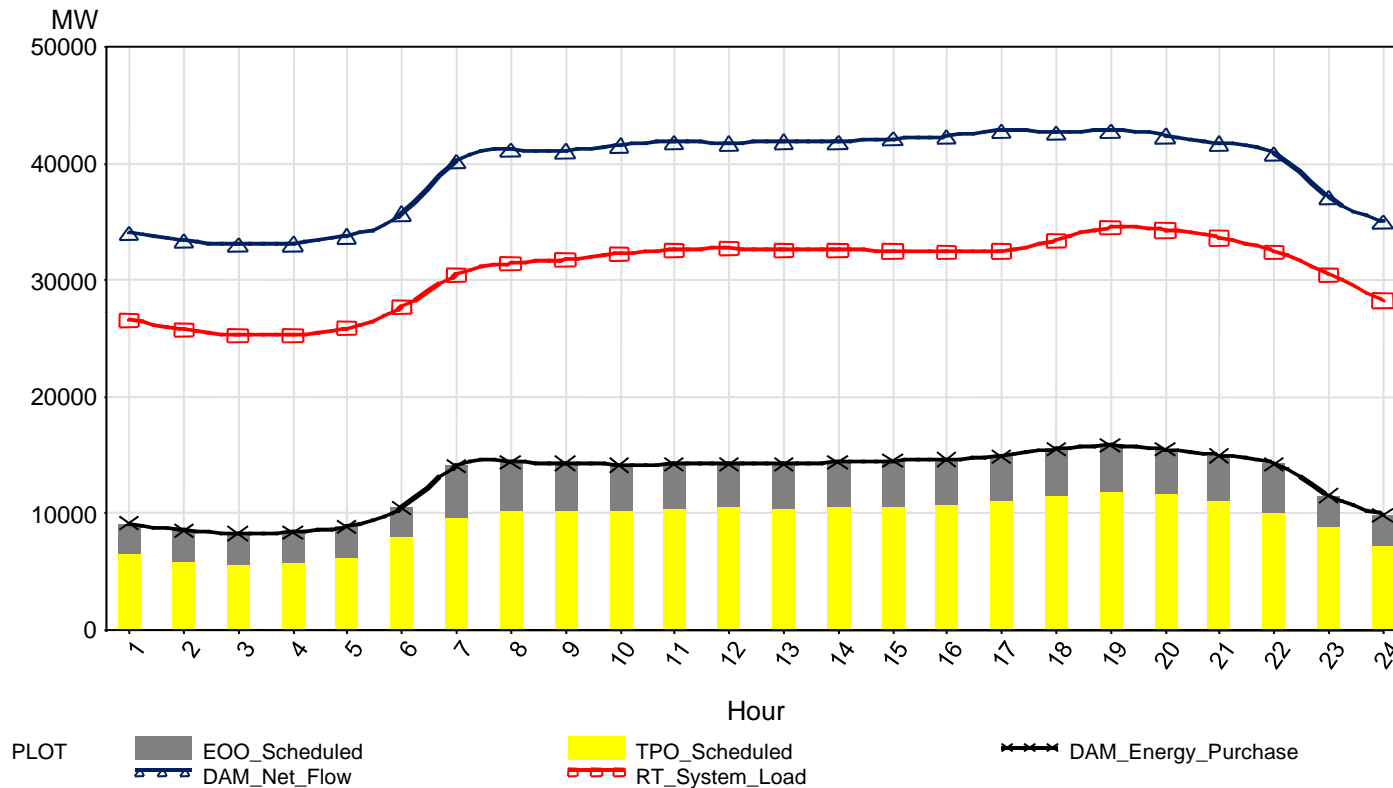
Average DAM Schedule

01OCT2011-31OCT2011

Acronym : TPO - Three Part Offer; EOO – Energy Only Offer;
 DAM_Net_Flow = Combined market transmission flow of Energy purchased/sold in Day-Ahead Market plus Point-to-Point Obligations and NOIE CRR Options carried forward to real-time.

Day-Ahead Schedule (November)

- On average the DAM net transmission flow (defined below) was greater than the real-time system load for all 24 hours

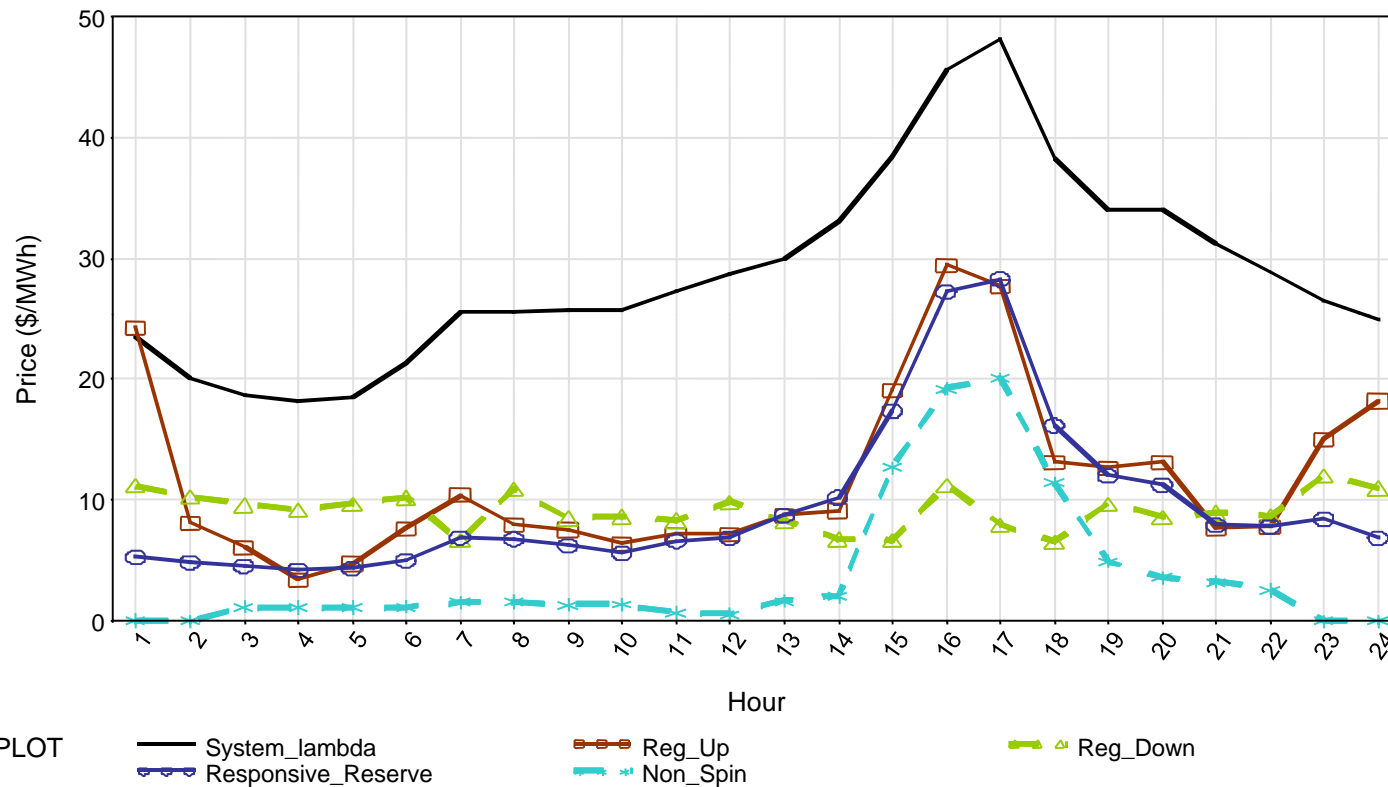


Average DAM Schedule

01NOV2011-30NOV2011

Acronym : TPO - Three Part Offer; EOO – Energy Only Offer;
 DAM_Net_Flow = Combined market transmission flow of Energy purchased/sold in Day-Ahead Market plus Point-to-Point Obligations and NOIE CRR Options carried forward to real-time.

Day-Ahead Electricity And Ancillary Service Hourly Average Prices (October)

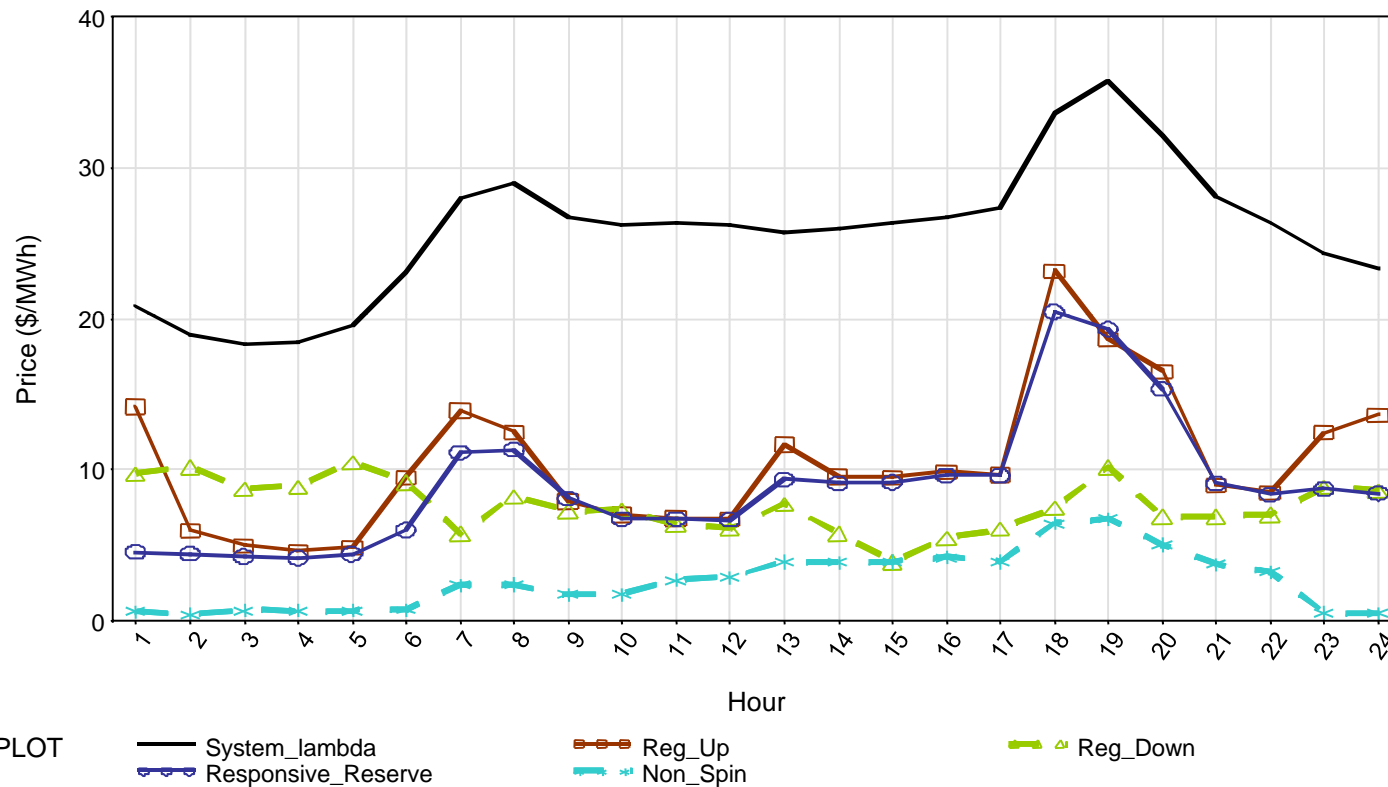


Day-Ahead Electricity and Ancillary Service Hourly Average Prices

01OCT2011-31OCT2011

- Both Energy and AS prices followed the trend of load profile on average.
- In some hours, Responsive Reserve prices were higher than Regulation Up prices.

Day-Ahead Electricity And Ancillary Service Hourly Average Prices (November)

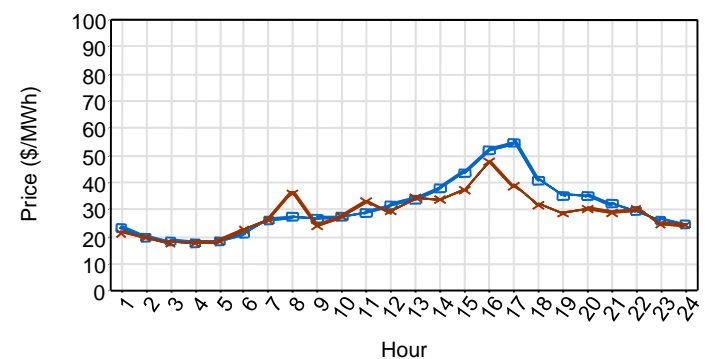
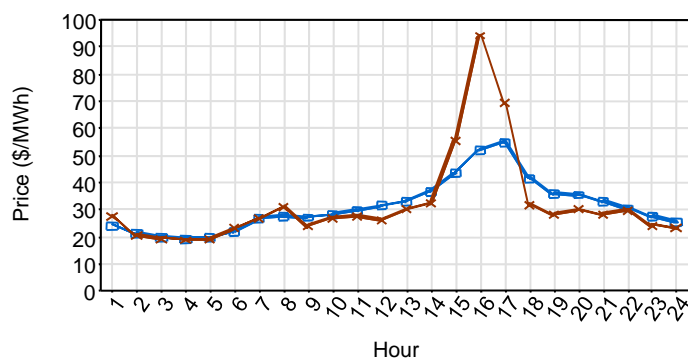
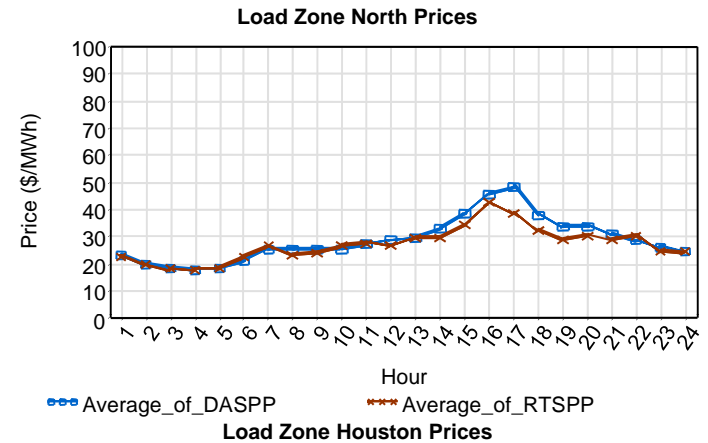
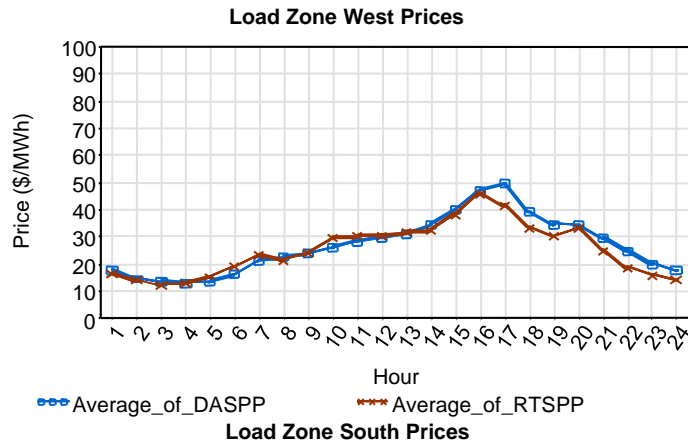


Day-Ahead Electricity and Ancillary Service Hourly Average Prices

01NOV2011-30NOV2011

- Both Energy and AS prices followed the trend of load profile on average.
- In all hours, Responsive Reserve prices were lower than or close to Regulation Up prices.

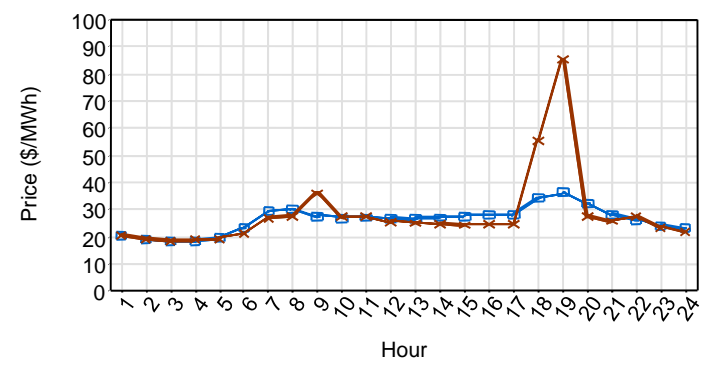
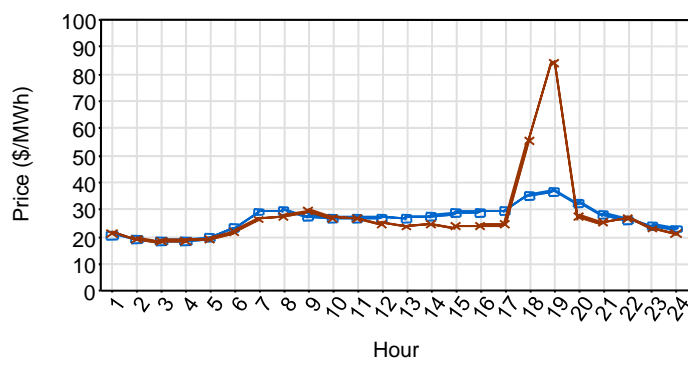
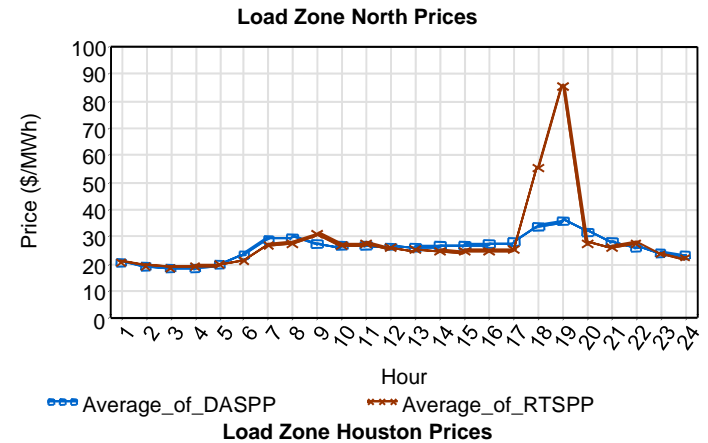
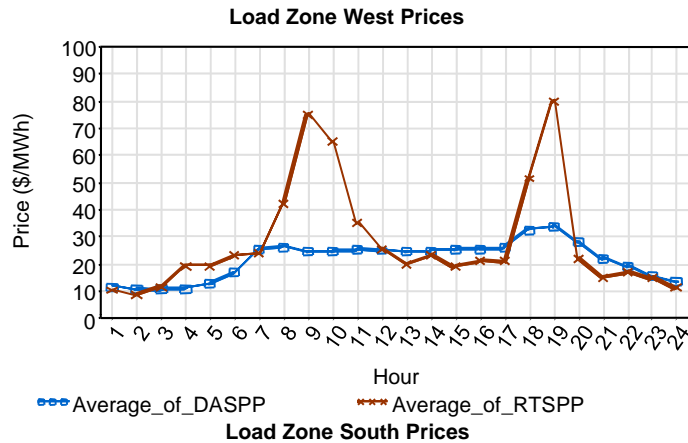
Day-Ahead Vs Real-Time Load Zone SPP (Hourly Average) (October)



DA Vs RT Hourly Average SPP Load Zone Summary

01OCT2011-31OCT2011

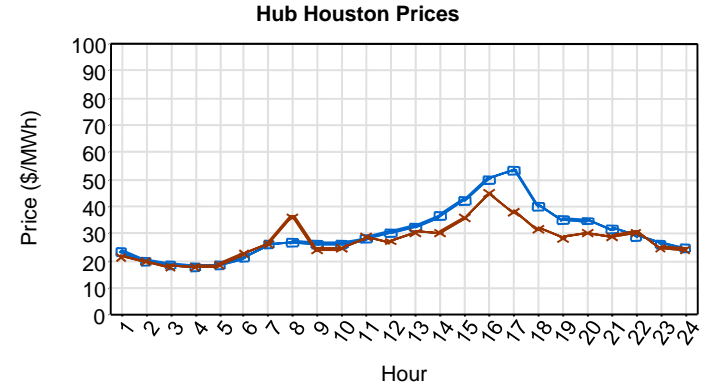
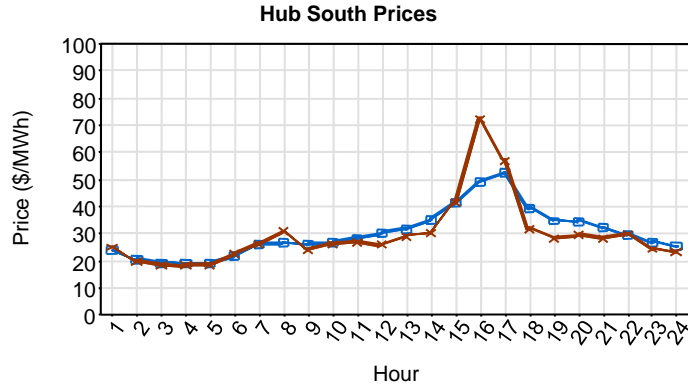
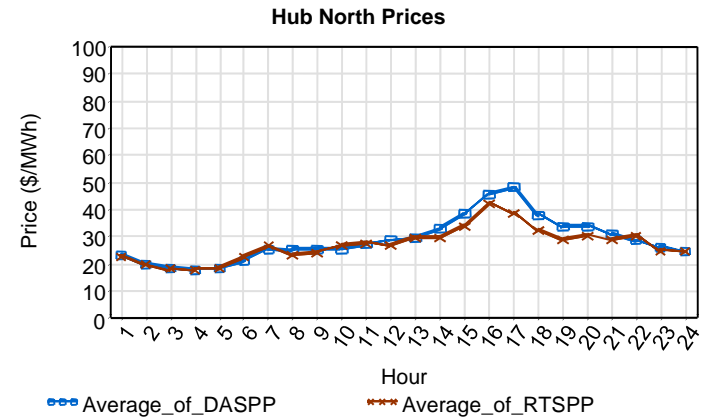
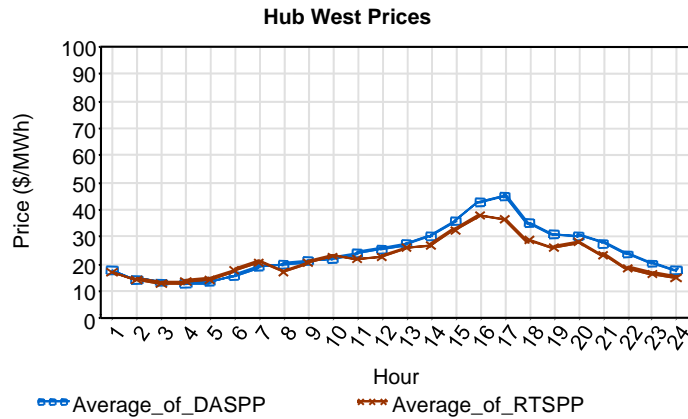
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DA Vs RT Hourly Average SPP Load Zone Summary

01NOV2011-30NOV2011

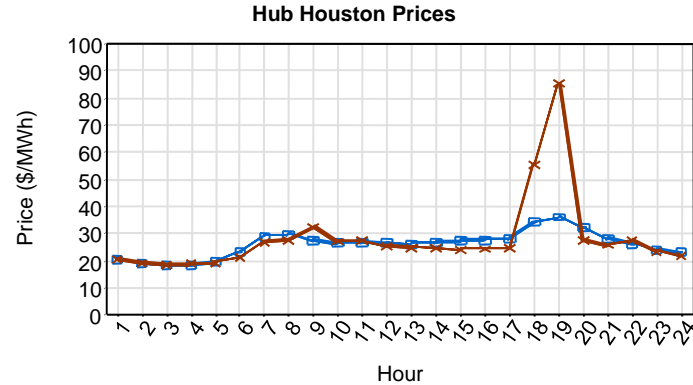
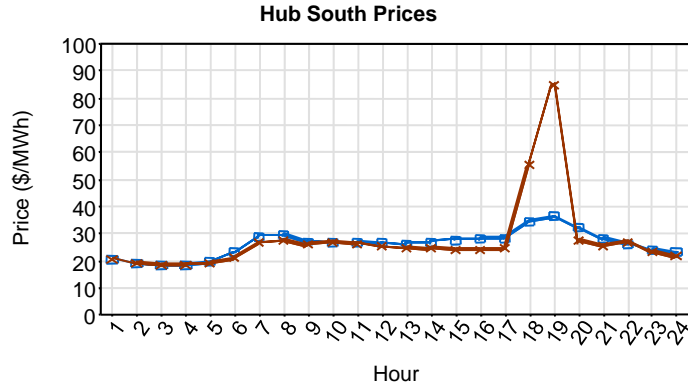
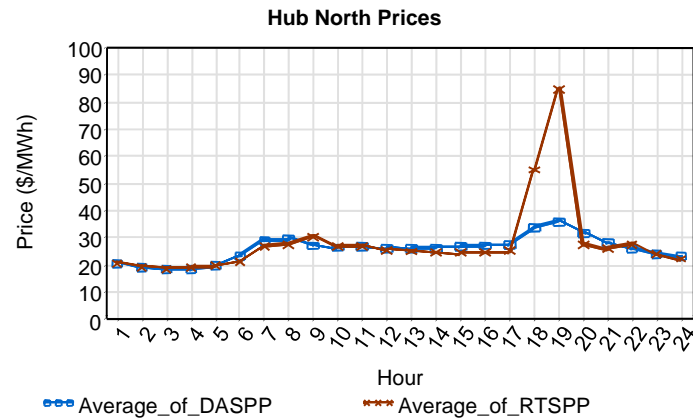
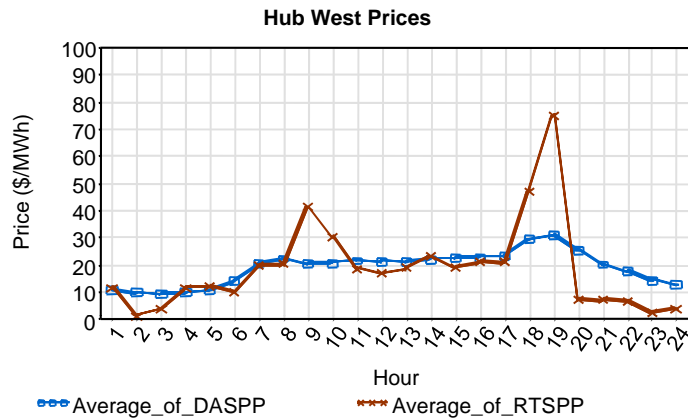
Day-Ahead vs Real-Time HUB SPP (Hourly Average) (October)



DA Vs RT Hourly Average SPP Hub Summary

01OCT2011-31OCT2011

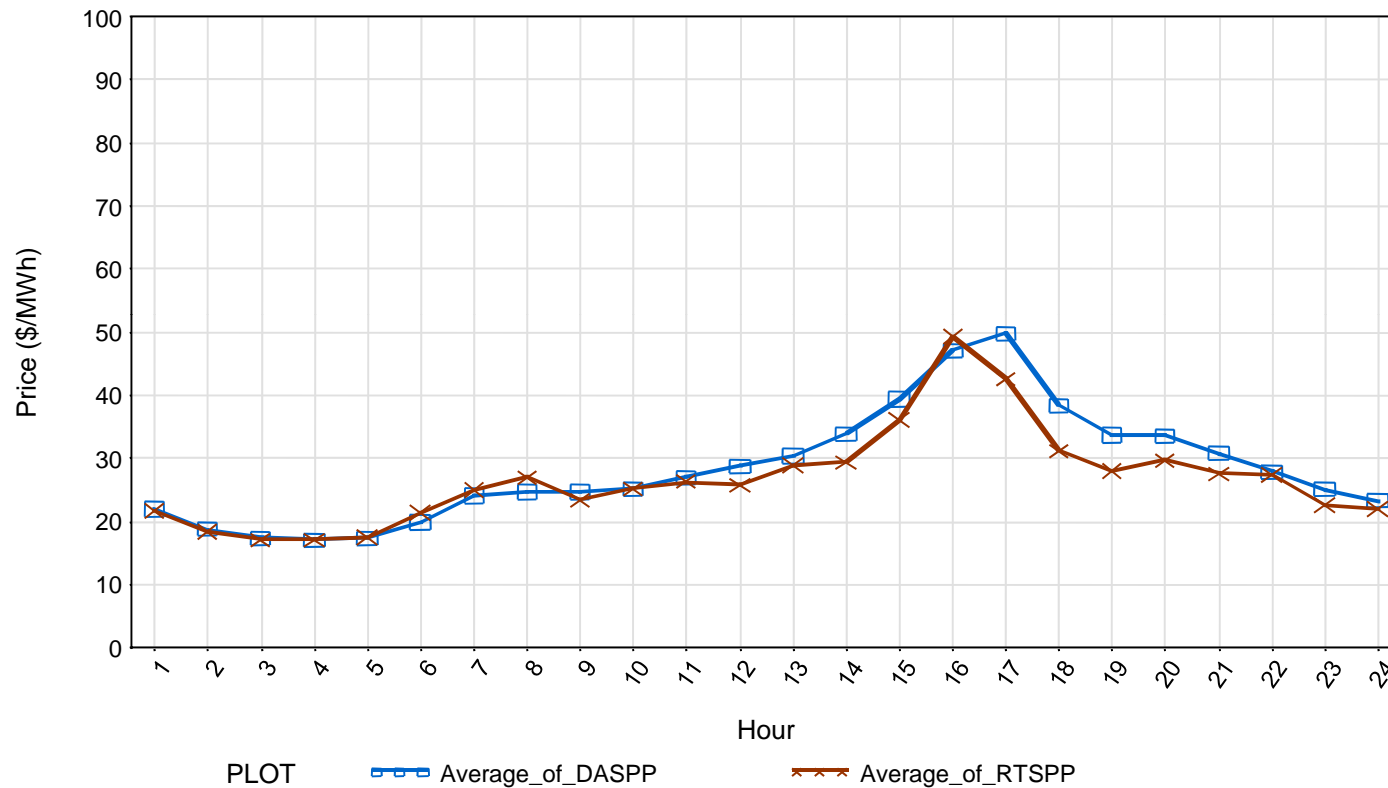
Day-Ahead vs Real-Time HUB SPP (Hourly Average) (November)



DA Vs RT Hourly Average SPP Hub Summary

01NOV2011-30NOV2011

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

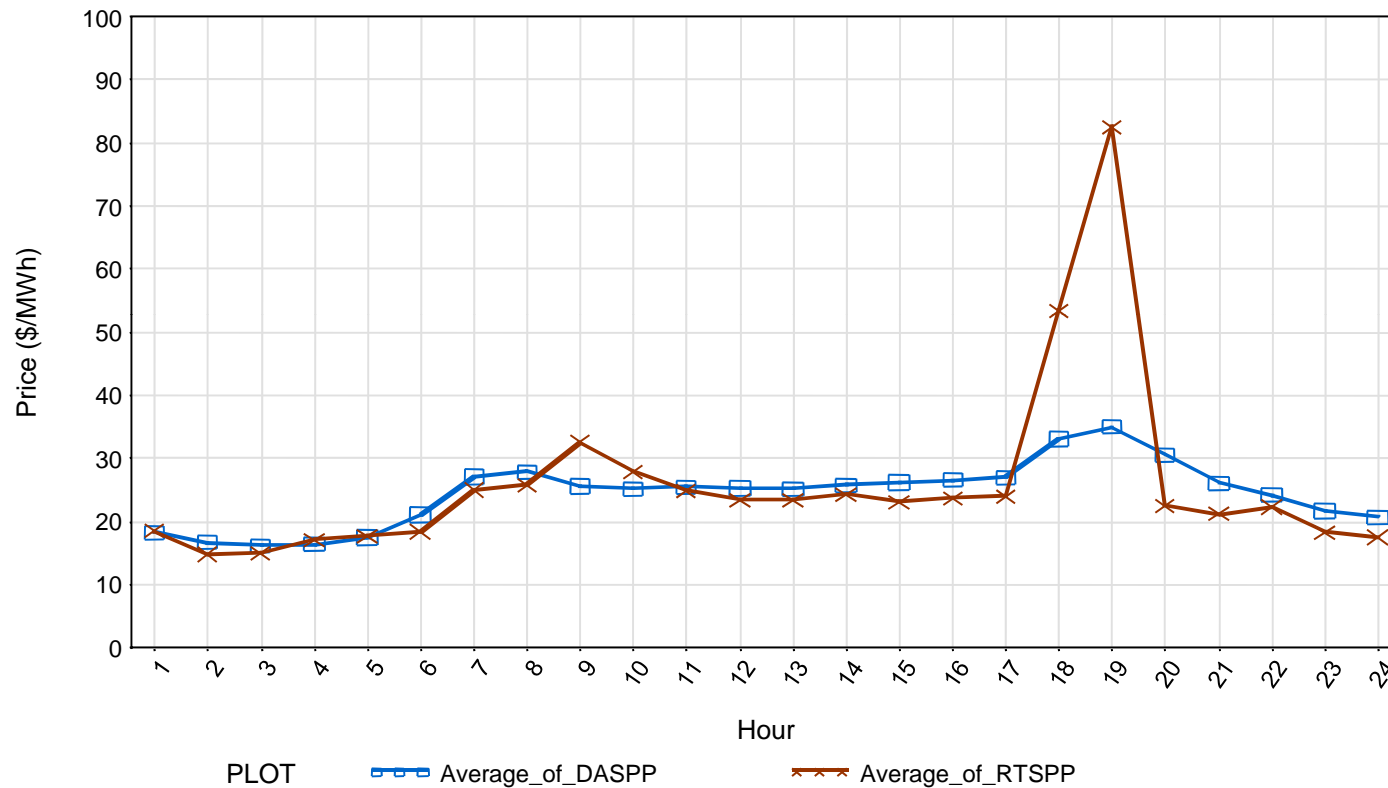


Day-Ahead Vs Real-Time Hourly Average SPP of Hub Hub-Average Prices

01OCT2011-31OCT2011

- Day Ahead prices were close to Real-Time prices, especially during off-peak hours.
- Day Ahead prices were on average higher than Real-Time prices for some peak hours.

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

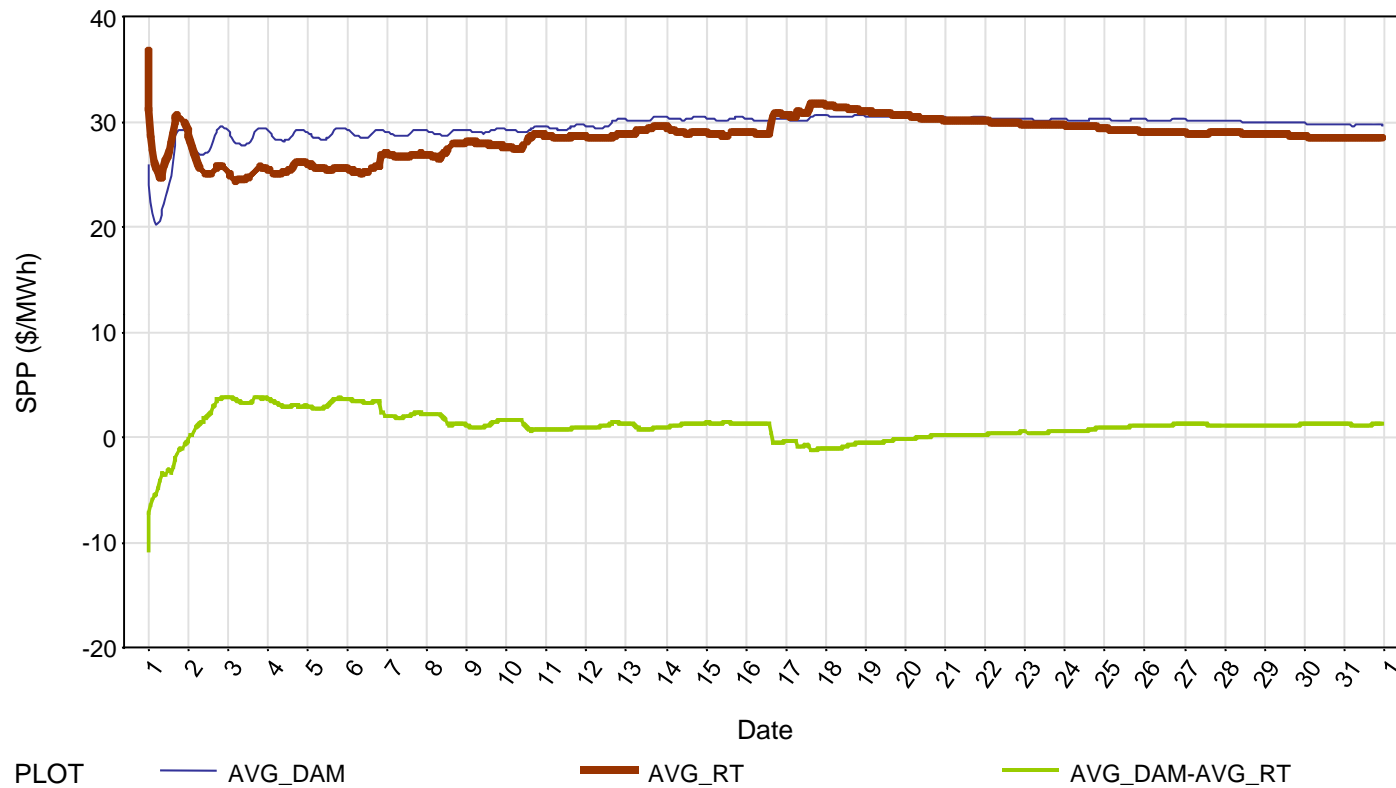


Day-Ahead Vs Real-Time Hourly Average SPP of Hub Hub-Average Prices

01NOV2011-30NOV2011

- Day Ahead prices were close to Real-Time prices, especially during off-peak hours.
- Day Ahead prices were on average higher than Real-Time prices for most peak hours.

Day-Ahead Vs Real-Time Cumulative Average SPP (October)

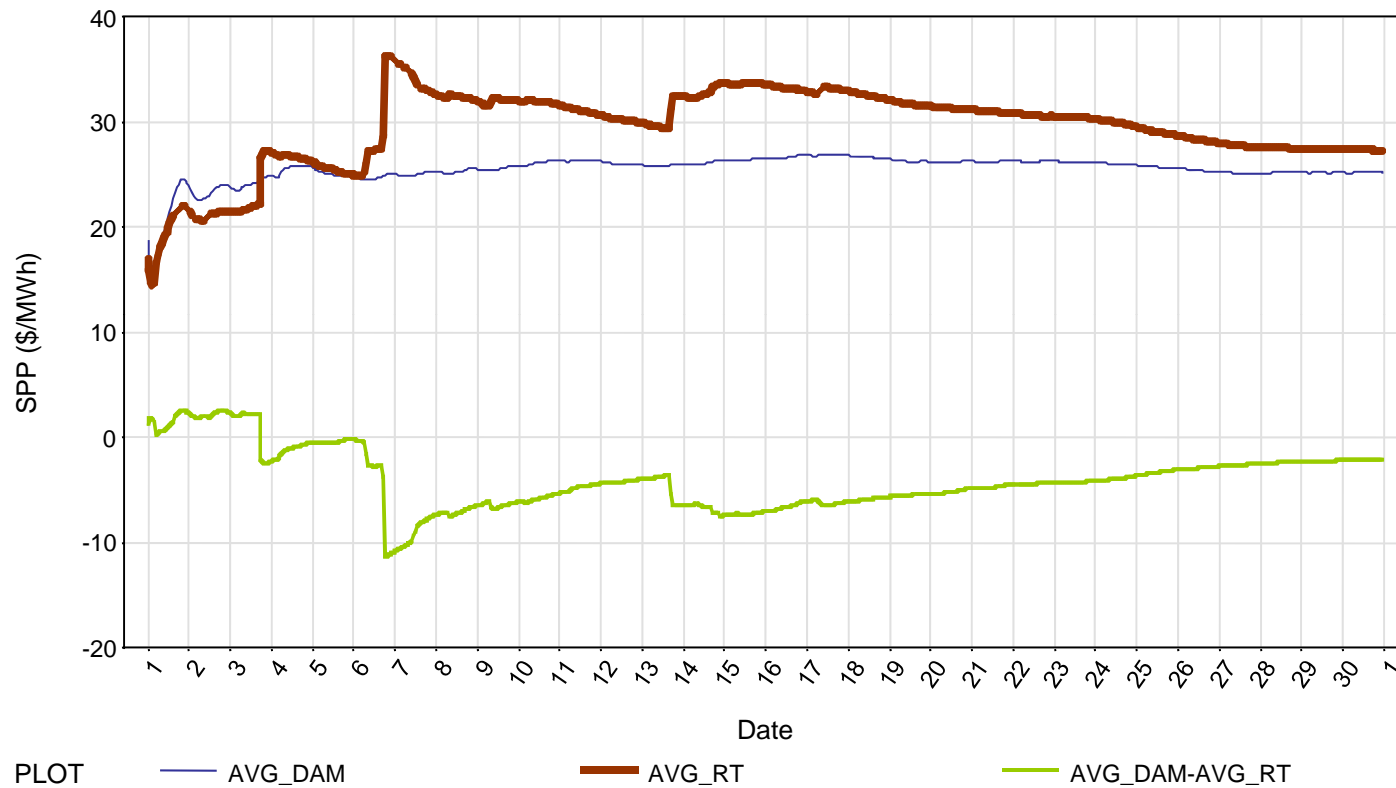


Day-Ahead Vs Real-Time Cumulative Average SPP for Simple Average Prices

01OCT2011-31OCT2011

- **The cumulative Real Time prices were typically more volatile than the Day-Ahead prices in October but the difference was decreasing over the month**

Day-Ahead Vs Real-Time Cumulative Average SPP (November)

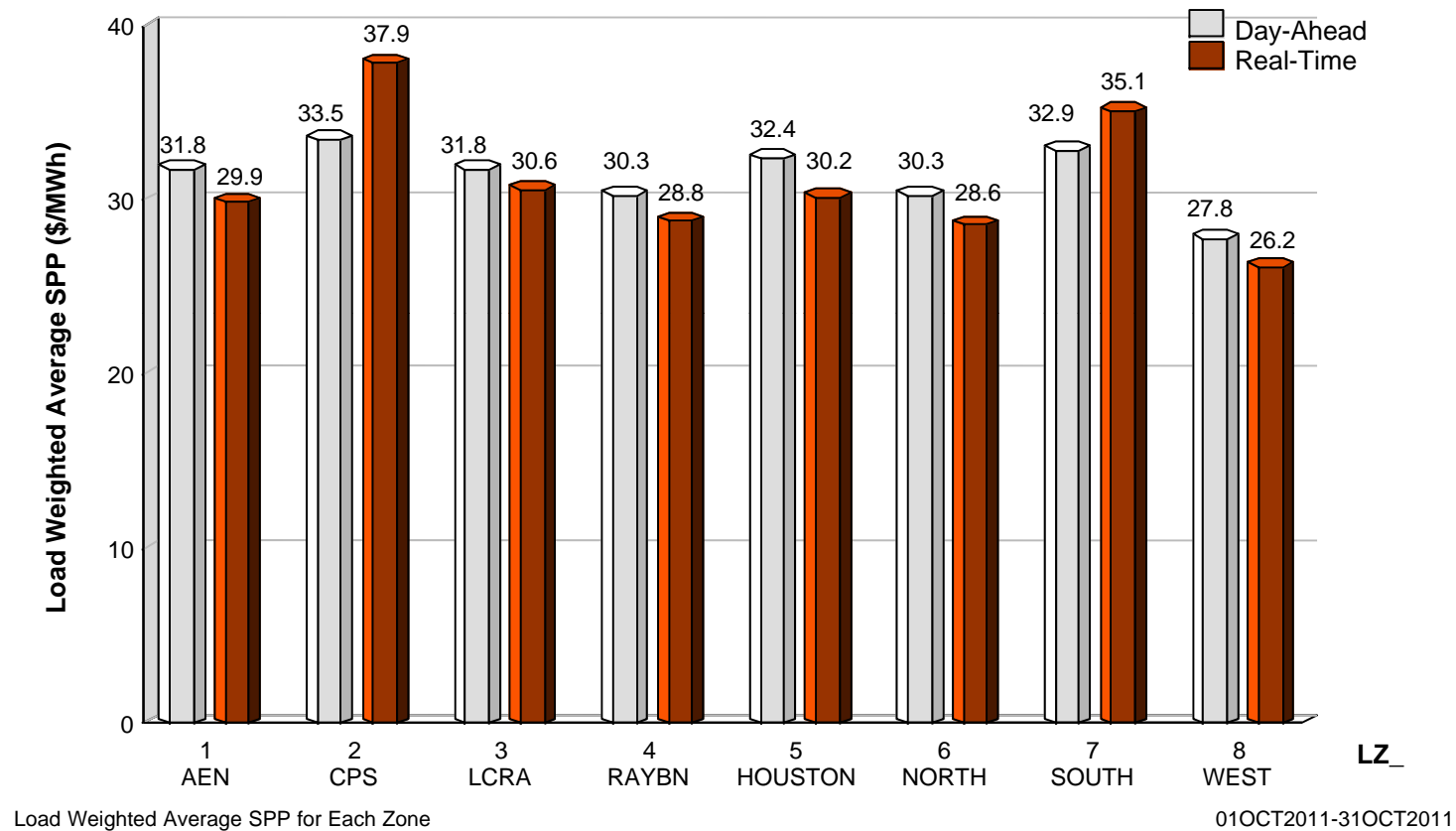


Day-Ahead Vs Real-Time Cumulative Average SPP for Simple Average Prices

01NOV2011-30NOV2011

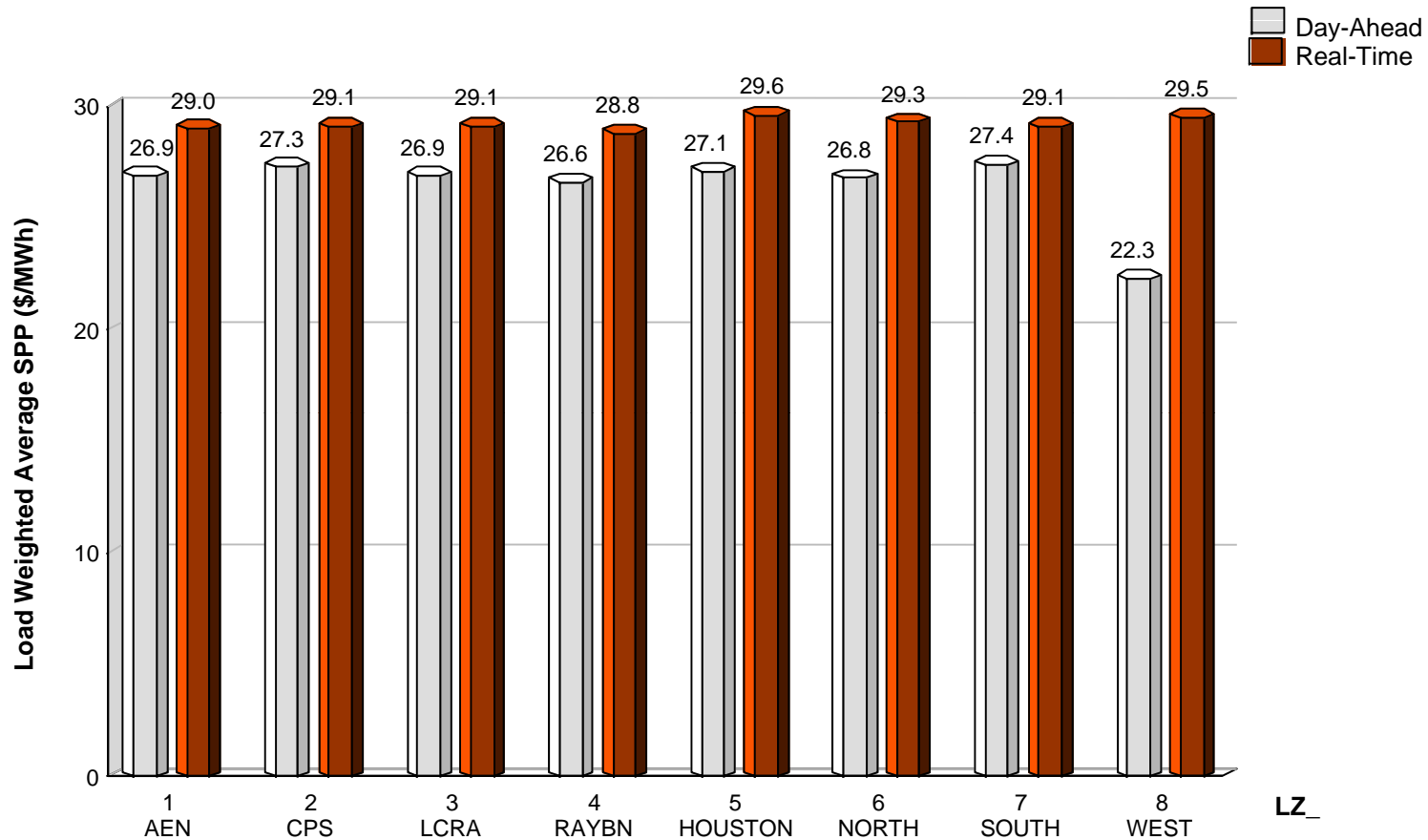
- **The cumulative Real Time prices were more volatile than the Day-Ahead prices**

Load Weighted Average SPP (October)



- The load weighted average RT SPPs were slightly higher than the load weighted average DAM SPPs in 2 load zones and lower in the other 6 load zones.

Load Weighted Average SPP (November)



Load Weighted Average SPP for Each Zone

01NOV2011-30NOV2011

- The load weighted average RT SPPs were slightly higher than the load weighted average DAM SPPs in 7 load zones.
- The load weighted average RTSPP was significantly higher than that of DASPP in LZ_WEST .

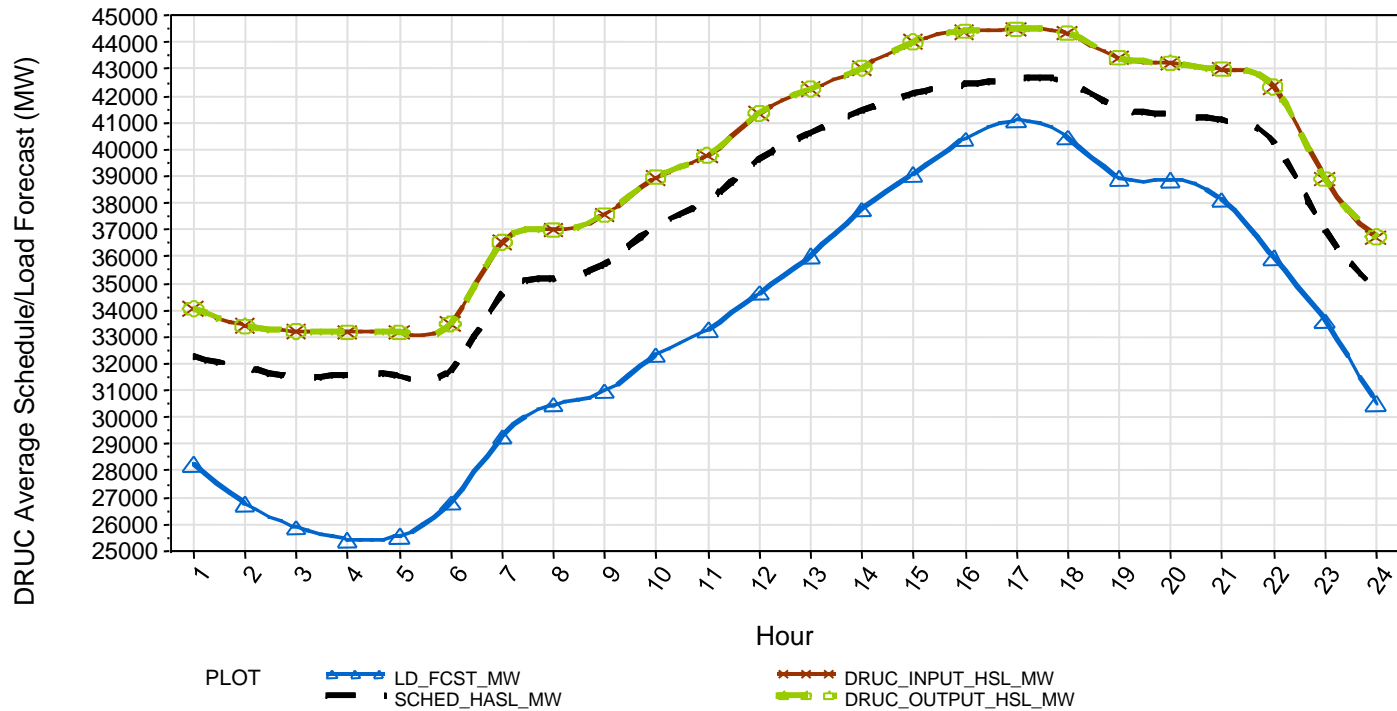
DRUC Monthly Summary (October)

31 Executions (0 Missed)

1 Published after 1600; 0 Published after 1800

9.90-Min Average Execution Time

0 MWh Committed (0 Resources for 0 Hours)



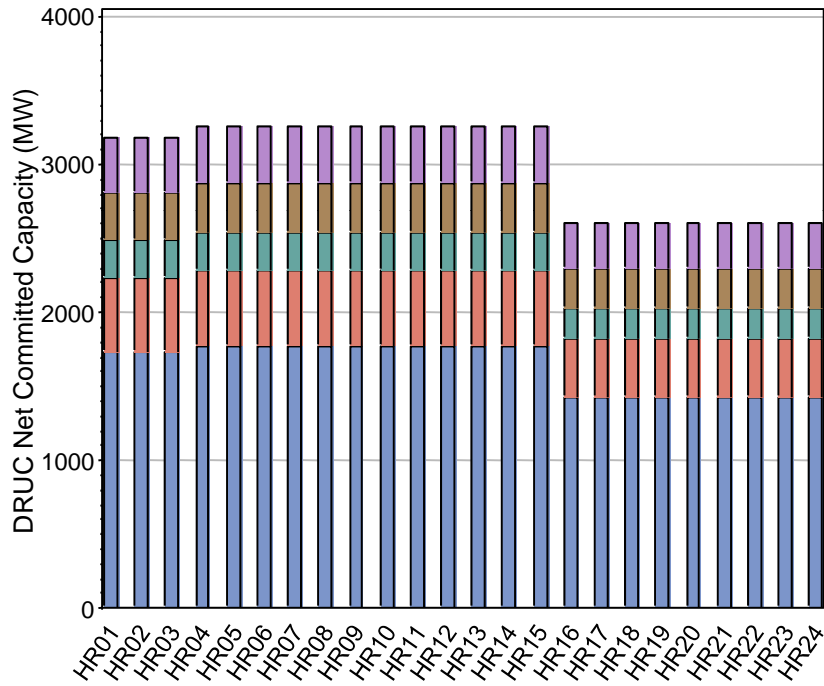
DRUC Average QSE Scheduled Capacity/Load Forecast

01OCT2011-31OCT2011

DRUC didn't commit any Resource and hence input and output HSL MW is the same

DRUC Monthly Summary (November)

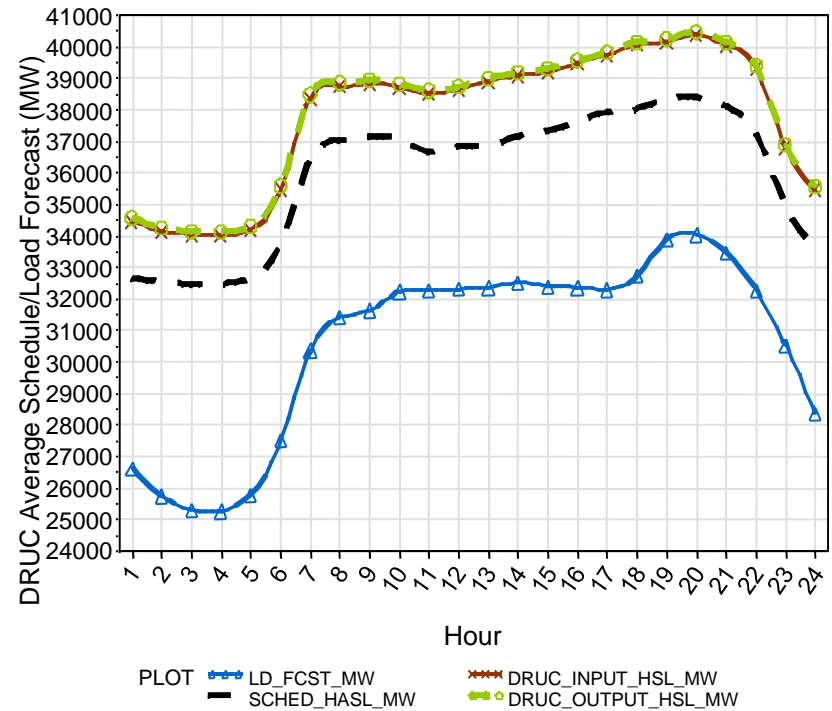
30 Executions (0 Missed)
0 Published after 1600; 0 Published after 1800
 Note: Colors Indicate Individual Resources



Net Committed Capacity in DRUC

01NOV2011-30NOV2011

6.50-Min Average Execution Time
71940 MWh Committed (5 Resources for 555 Hours)

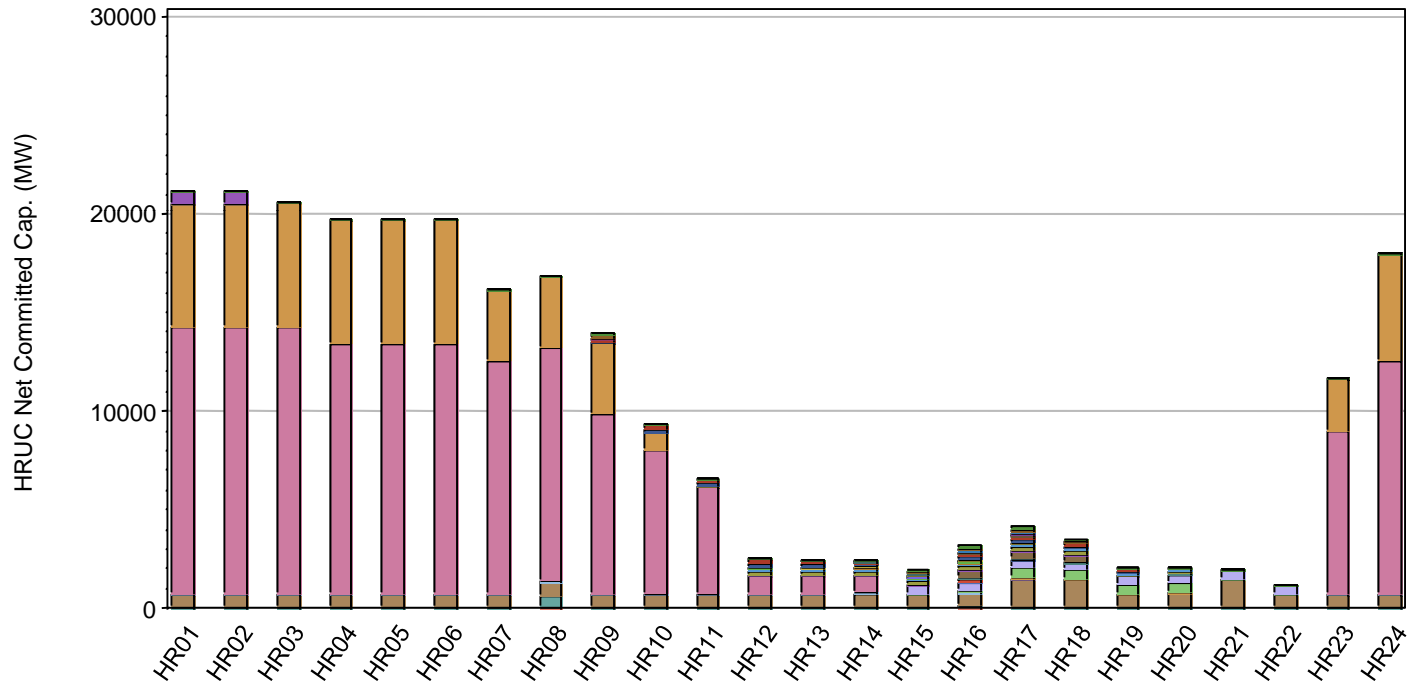


DRUC Average QSE Scheduled Capacity/Load Forecast

01NOV2011-30NOV2011

HRUC Monthly Summary (October)

742 Executions (2 Missed)
7.70-Min Average Execution Time
 Note: Colors Indicate Individual Resources

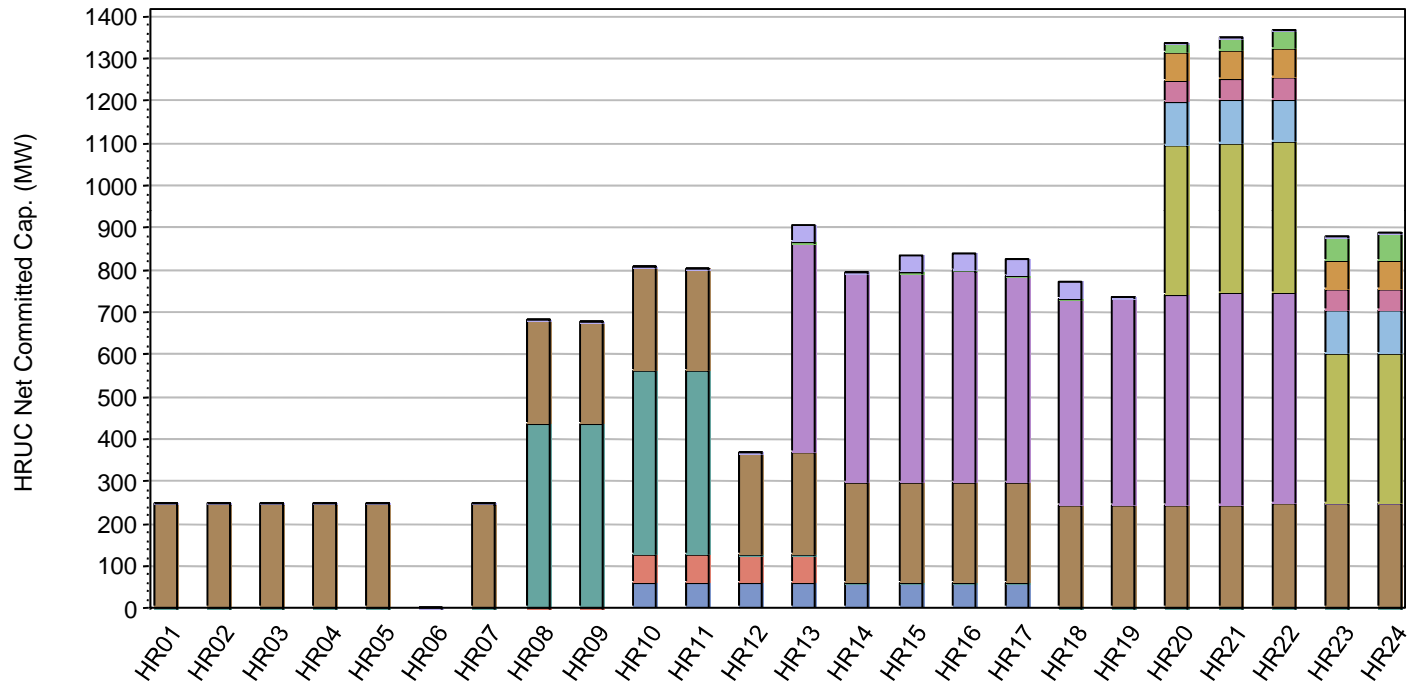


Net Committed Capacity in HRUC

01OCT2011-31OCT2011

HRUC Monthly Summary (November)

719 Executions (1 Missed)
5.20-Min Average Execution Time
 Note: Colors Indicate Individual Resources

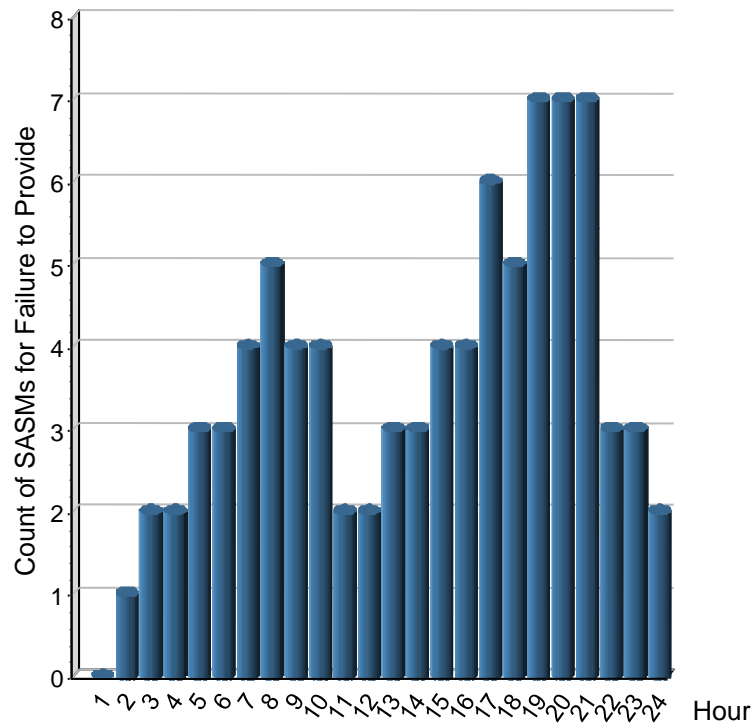


Net Committed Capacity in HRUC

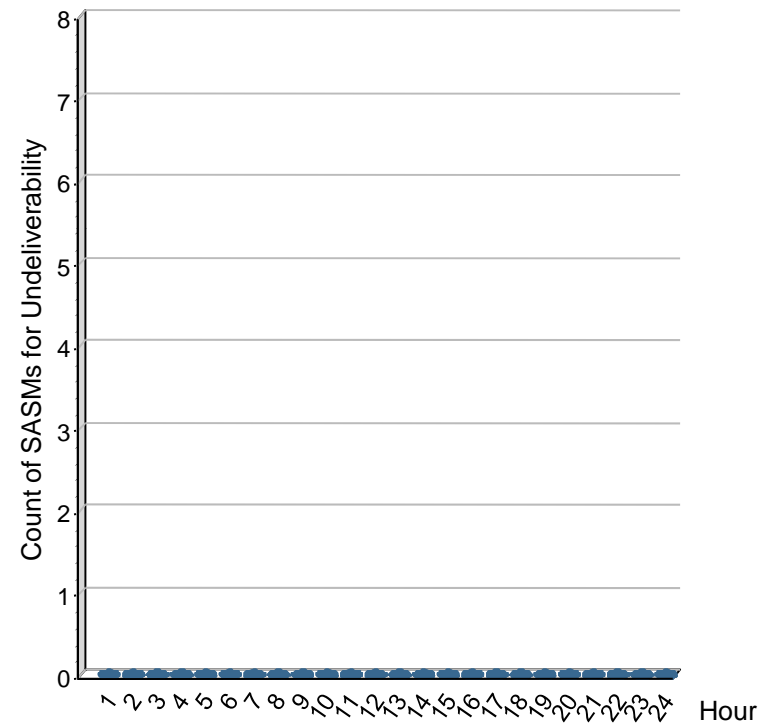
01NOV2011-30NOV2011

Supplemental Ancillary Service Market (SASM) Summary (October)

**17 SASMs in 01OCT2011-31OCT2011
For AS Failure to Provide**

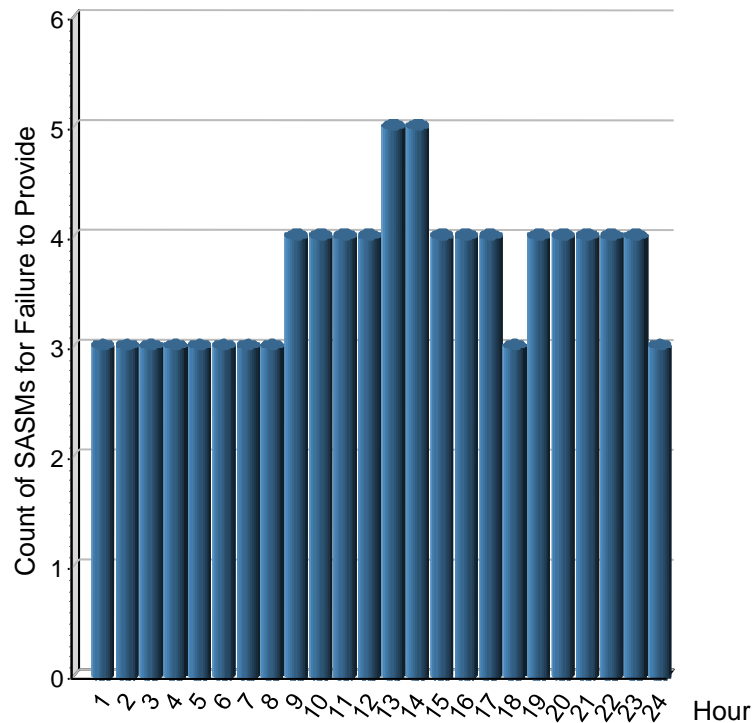


**0 SASMs in 01OCT2011-31OCT2011
For AS Undeliverability**

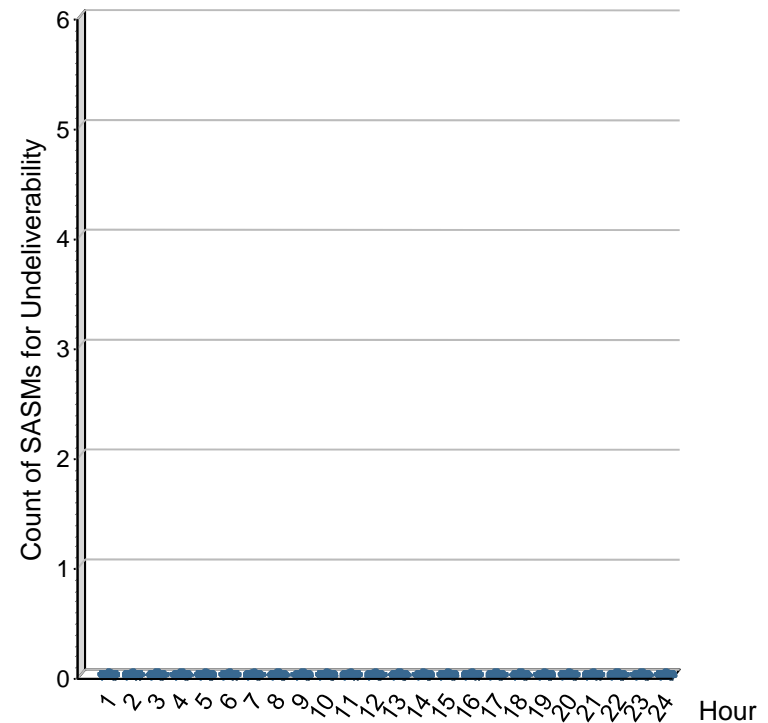


Supplemental Ancillary Service Market (SASM) Summary (November)

**7 SASMs in 01NOV2011-30NOV2011
For AS Failure to Provide**



**0 SASMs in 01NOV2011-30NOV2011
For AS Undeliverability**



Non-Spinning Reserve Service Deployment

Deployment Start	Deployment End	Deployment Duration Hours	Max Deployment MW	Reason
10/15/2011 15:08	10/15/2011 21:29	6.34	67	Congestion
10/16/2011 15:51	10/16/2011 18:59	3.14	372.6	Congestion
10/17/2011 14:30	10/17/2011 20:00	5.49	93	Congestion
10/21/2011 14:43	10/21/2011 22:00	7.27	96	Congestion
10/22/2011 11:32	10/22/2011 13:10	1.63	140	Congestion
11/1/2011 6:53	11/1/2011 19:11	12.29	147	Congestion

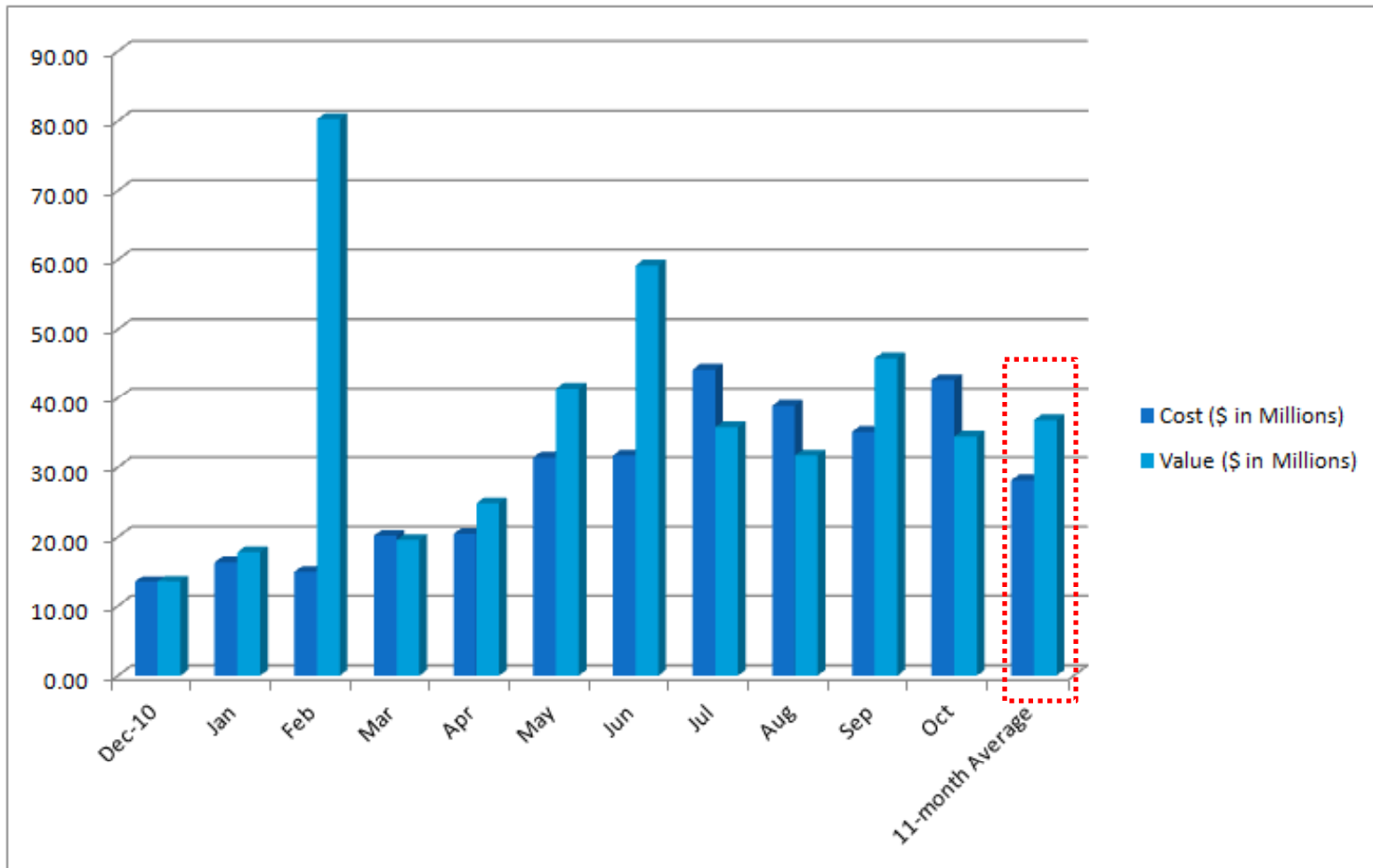
CRR Auction for Operating Month November 2011

- **127,442 Bids/Offers**
- **13,284 Auction Awards**
 - **136,144 MW Total**
 - **49,747 Peak WD**
 - **47,022 Peak WE**
 - **39,373 Off-peak**
- **Total Auction/Allocation Revenue = \$ 8.35 M**

CRR Auction for Operating Month December 2011

- **118,448 Bids/Offers**
- **11,594 Auction Awards**
 - **140,441 MW total**
 - **51,675 Peak WD**
 - **47,166 Peak WE**
 - **41,600 Off-peak**
- **Total Auction/Allocation Revenue = \$ 12.92 M**

CRR Price Convergence*



*Cost calculation uses a new method of splitting costs between months in multi-month auctions. Previous months used the same algorithm as the CRR Auction Revenue Distribution.

Annual CRR Auction for 2012/2013

2012 Annual Auction (55% of system capacity)

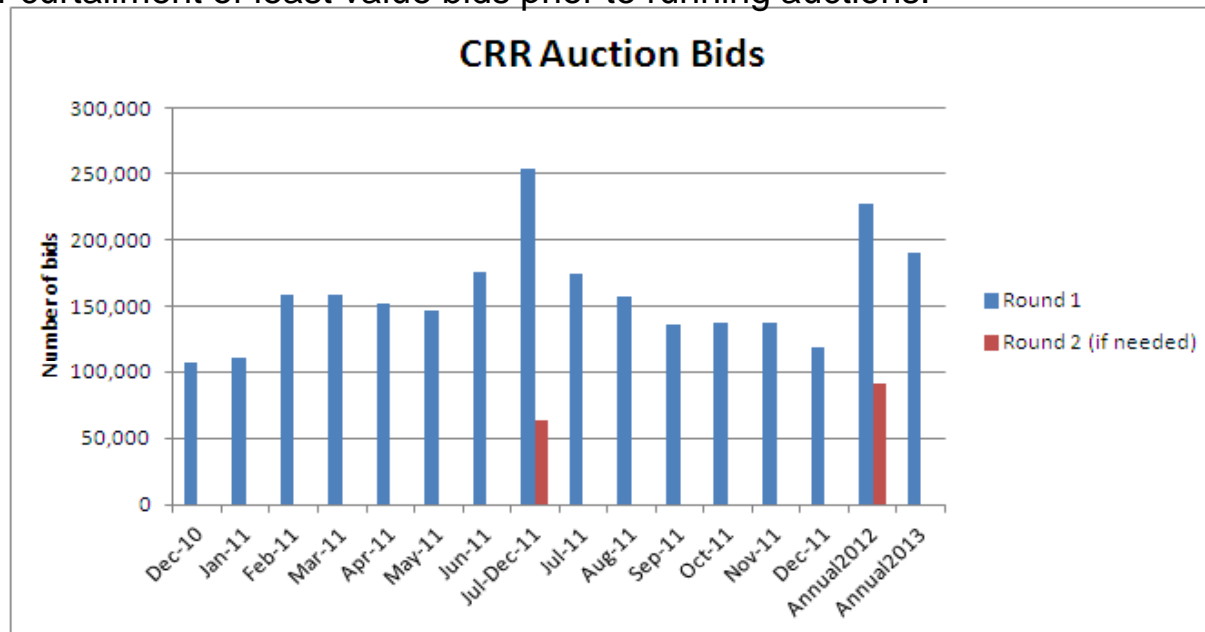
- **90,620 Bids/Offers**
- **25,514 Auction Awards**
 - **1,008,660 MW**
 - **370,880 Peak WD**
 - **350,418 Peak WE**
 - **287,362 Off-peak**
- **Total Auction/Allocation Revenue = \$ 167.5 M**
- **Credit Allocation = \$1,210,000,000**

2013 Annual Auction (15% of system capacity)

- **190,359 Bids/Offers**
- **27,292 Auction Awards**
 - **309,475 MW**
 - **114,096 Peak WD**
 - **105,745 Peak WE**
 - **89,634 Off-peak**
- **Total Auction/Allocation Revenue = \$ 60.65 M**
- **Credit Allocation = \$442,000,000**

Annual CRR Auction for 2012/2013

- Both years of Auction published on time (completed execution between Oct31- Nov16)
- Lessons learned:
 - Credit- Significant market credit hold of \$1.6 billion for 2 weeks, so team to propose changes to timing and sequence to alleviate coinciding credit collateral posting (next bullet).
 - Sequence/timing- considering with market changes to execute 2-year auction in separate bid and credit windows for each year to relieve market credit and improve analysis of results.
 - Technical- 2013 PeakWeekDay auction executed for 194 hours, so evaluating performance improvement options for next year's auction (software, servers, configuration).
 - Bid Limit of 200,000- Market was oversubscribed for 2012 so looking at alternative minimum bids prices or curtailment of least value bids prior to running auctions.



Market Enhancements Under Consideration

- **Three NPRRs were submitted on Nov 9th and approved by TAC on Dec 1st to cover discussion at PUCT Open Meeting on October 27**
 - [NPRR426](#) Standing Non-Spin Deployment in the Operating Hour for Resources Providing On-Line Non-Spin
 - [NPRR427](#) Energy Offer Curve Requirements for Generation Resources Assigned Reg-Up and RRS
 - [NPRR428](#) Energy Offer Curve Requirements for Generation Resources Assigned Non-Spin Responsibility
- **Evaluating market design improvement proposals**
 - Moving 500MW from Non-spin to RRS
 - Putting offer floor for RUC committed resources
 - Changing Power Balance penalty cost.
- **Evaluating feasibility of implementing Pilots for**
 - Fast response regulation service
 - 30 min EILS service
 - Active deployment of Load Resources participating in Non-Spin based on forecasted price
- **Demand Response**
 - EILS Proposed Rule Enhancements
 - Option to renew contract after deployment obligations are met early in a contract period
 - Adding Distributed Generation could potentially add an additional 50 – 100MW by summer
 - 30 minute EILS response could potentially add an additional 80 – 100 MW by summer
- **Look-Ahead SCED functions framed for market consideration**
 - Workshop held on November 28th to begin detail discussions of whitepaper and implementation
 - NPRR351 will represent Phase I of Implementation (indicative future prices and ramping)

Look-Ahead SCED

- **Key milestones**

- Jan –Oct 2012: Work with market on Look-Ahead SCED whitepaper and scope
- Summer 2012: Implement non-binding Phase I / NPRR351 (future prices)
- October 2012 : Market approval of protocols for subsequent Phase(s)
- Summer 2013: Potential implementation of Phase 2 (binding prices and commitment)

Phase	Timeline	Feature Implemented	Comment
Phase -1	Summer 2012	Short-Term future Advisory/Indicative Base Points and LMPs using basic version of RTD.	Will initially run in Open-Loop i.e outputs (Base Points, LMPs) are Advisory/Indicative. i.e. non-binding .
Phase-2	Summer 2013	Commitment for QSGR and Load Resources with intra-hour temporal constraints using basic version of RTC.	Will initially run in Open-Loop i.e. outputs (Commitment instructions) are Advisory/Indicative. i.e. non-binding .
Phase-3	Spring 2014	Real-Time Ancillary Service and Energy Co-optimization using RTC.	
Phase-4	Fall 2015	Transmission constraints for future intervals	