



# Wholesale Market Operations Report

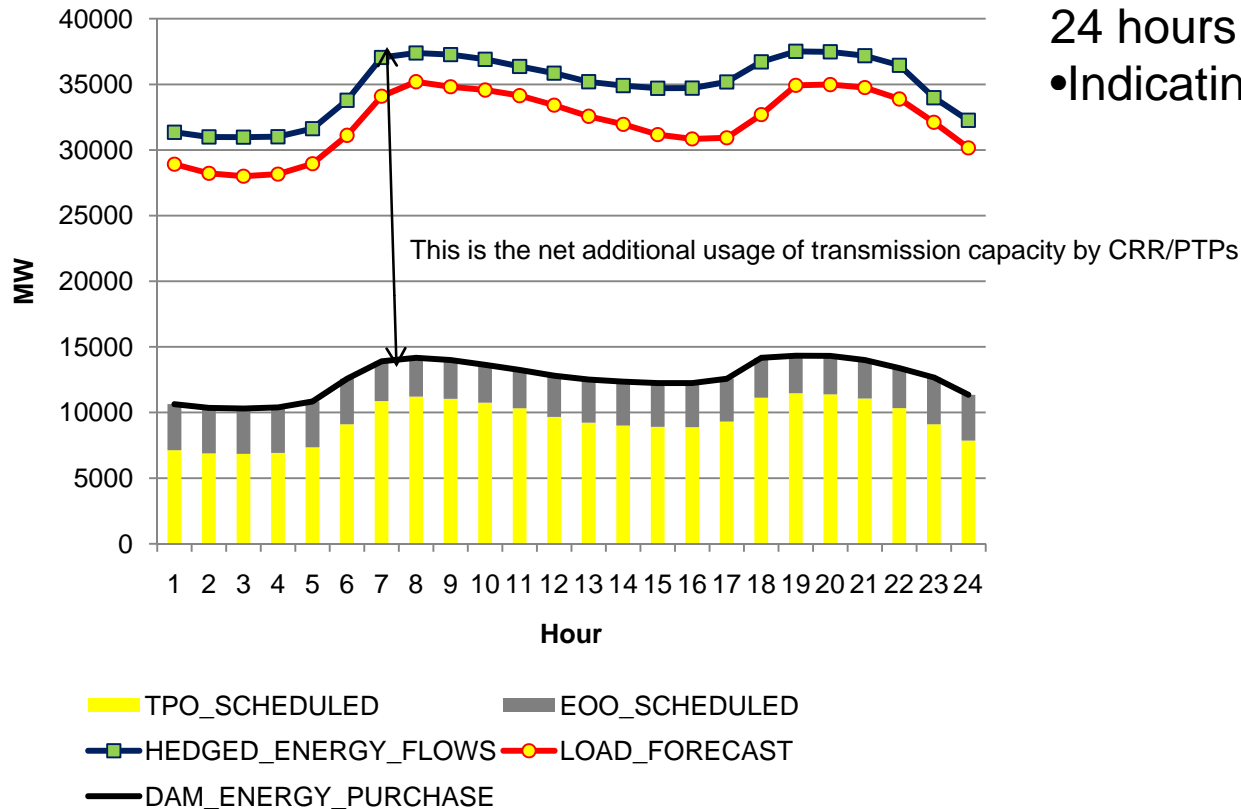
John Dumas  
Director Wholesale Market Operations

**ERCOT Board of Directors**  
**18 January 2011**

# Day-Ahead Schedule

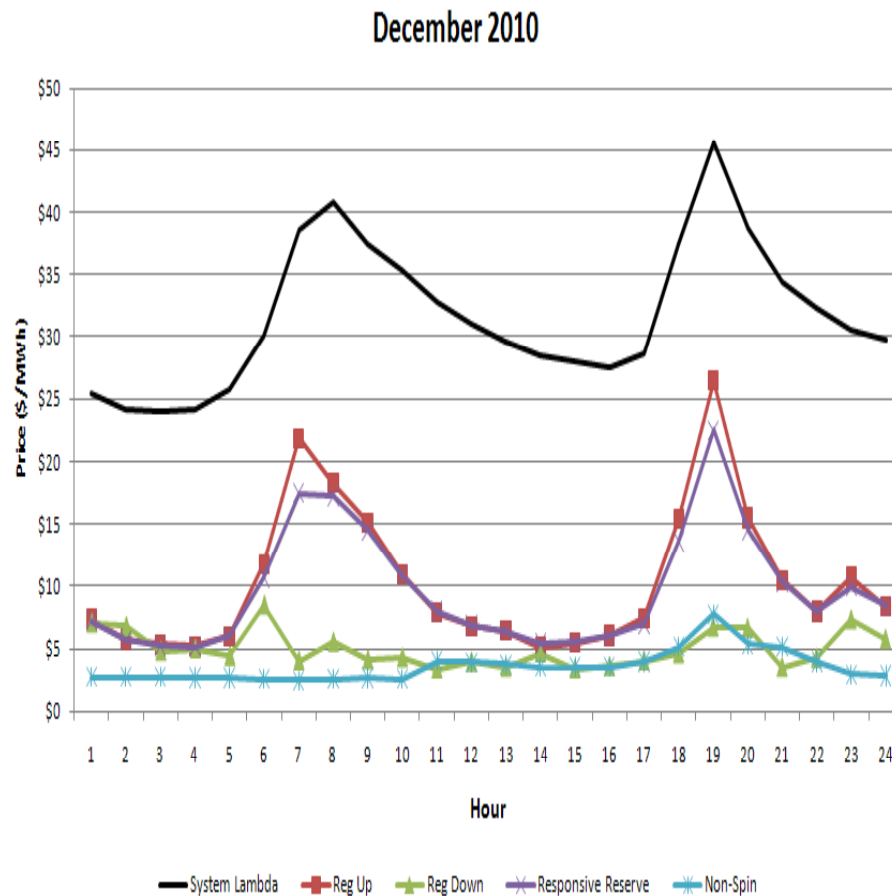
## Average Day-Ahead Market (DAM) Schedule During December 2010

- 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

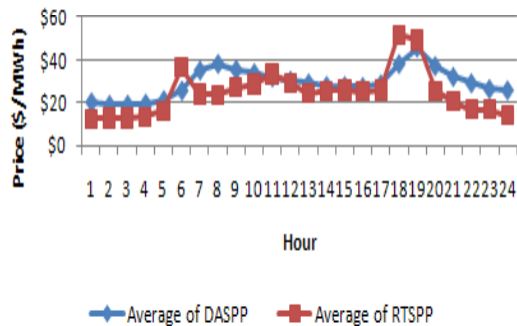


- Energy Prices and Ancillary Service Prices are correlated with the load profile

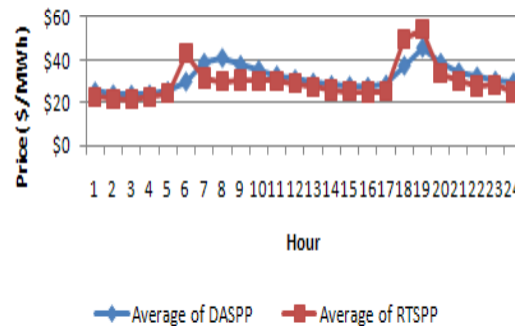
# Day-Ahead Market Price Vs Real-Time Price Hourly Average Settlement Point Price (SPP)

December 2010

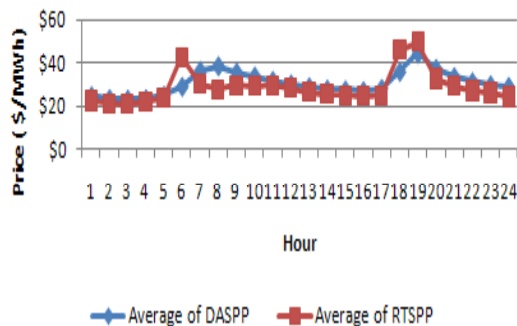
Load Zone West Prices



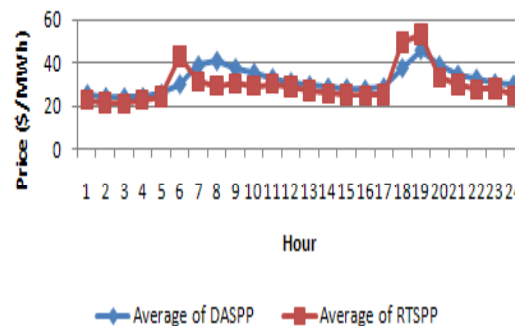
Load Zone North Prices



Load Zone South Prices



Load Zone Houston Prices



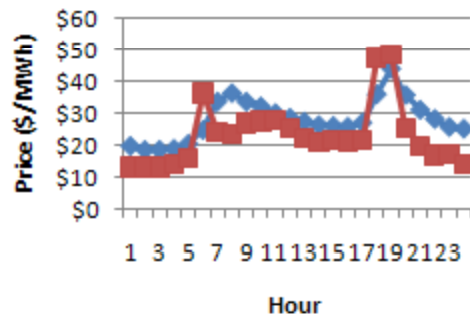
- Day Ahead prices and Real-Time prices are closely correlated and follow the load profile.
- Real-Time prices are slightly higher on peak hours due to ramp rate constraints

# Day-Ahead Market Price Vs Real-Time Price

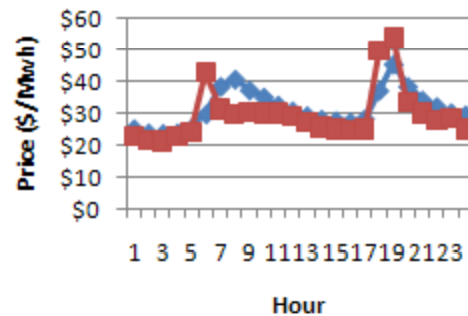
## Hourly Average HUB SPP

**December 2010**

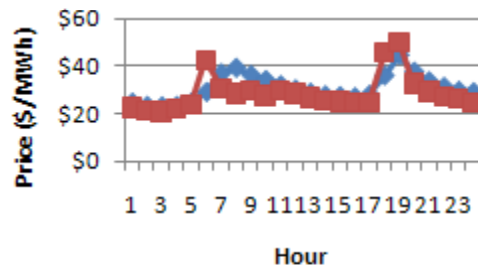
**Hub West Prices**



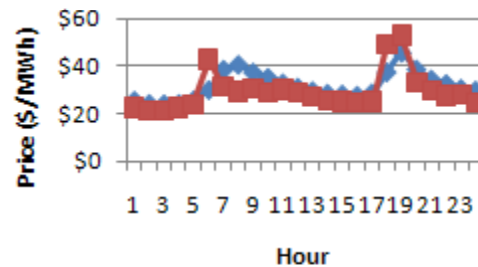
**Hub North Prices**



**Hub South Prices**



**Hub Houston Prices**

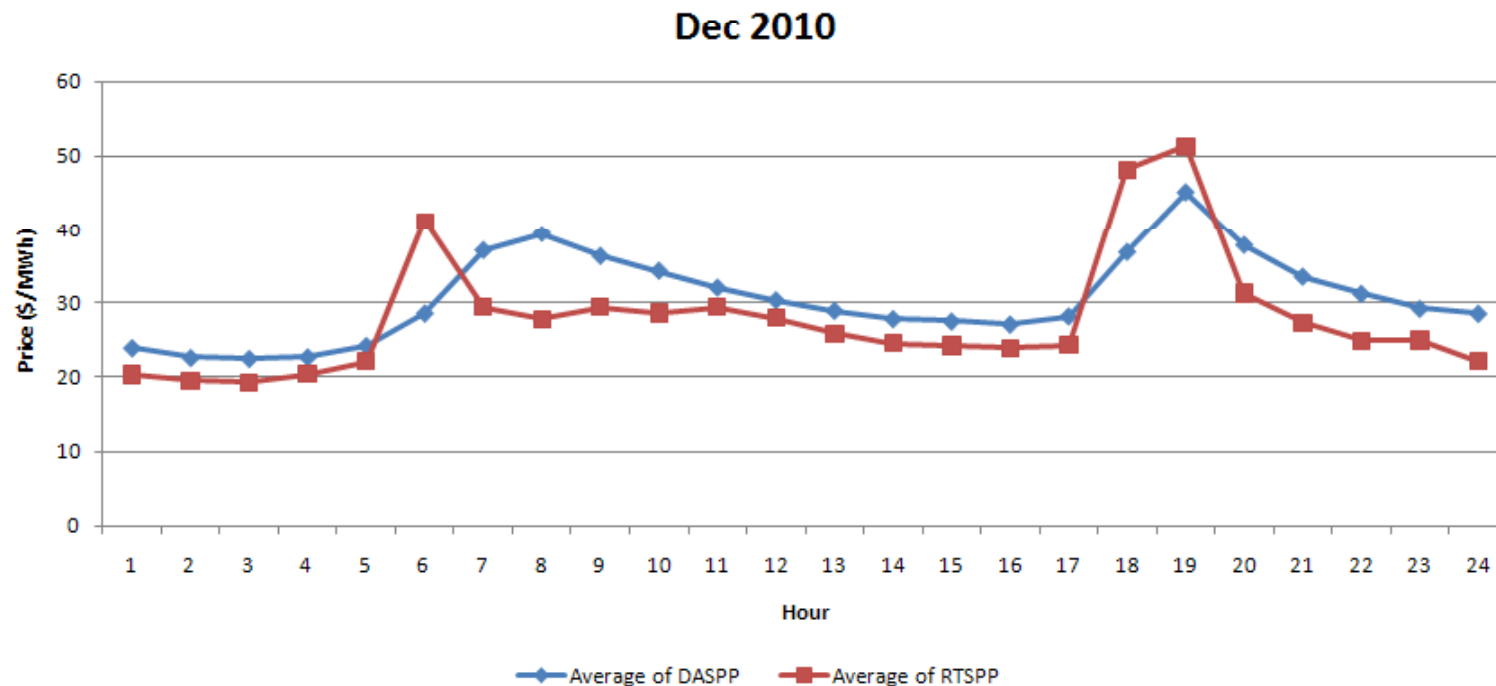


—◆— Average of DASPP  
—■— Average of RTSP

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—■— Average of RTSP

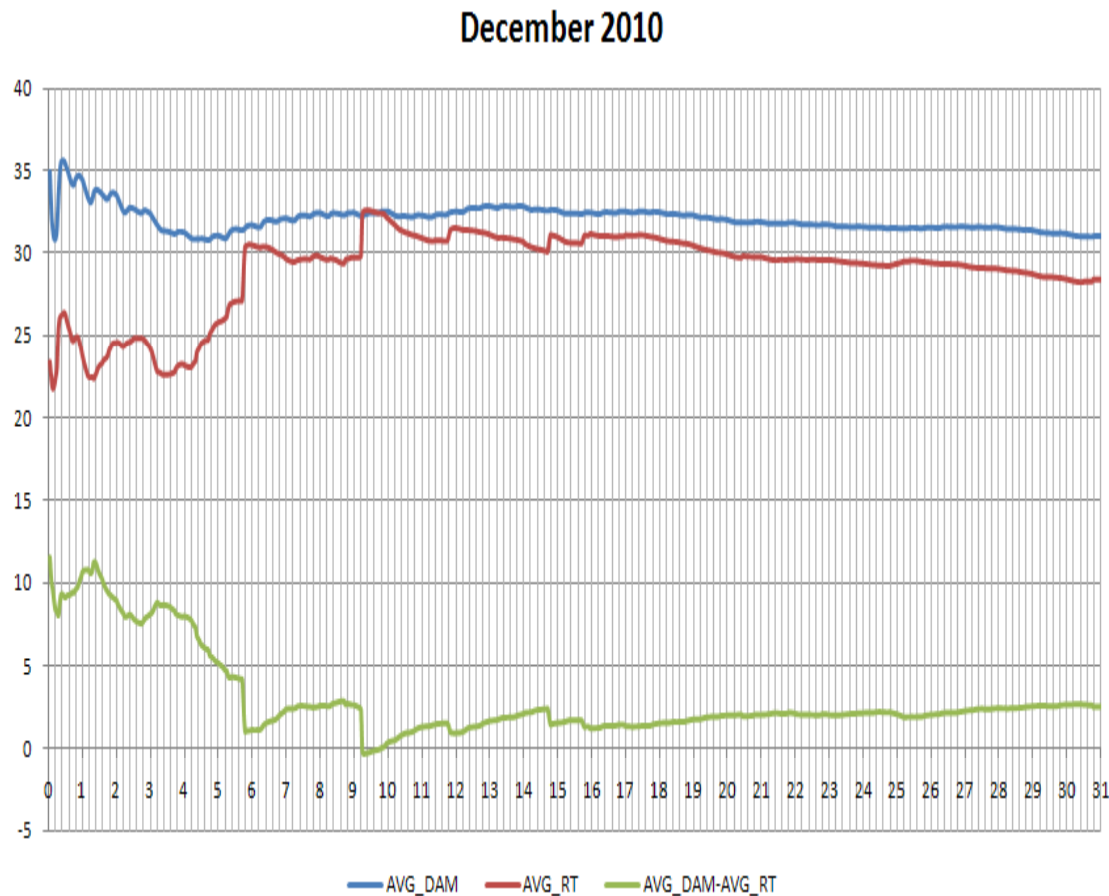
- Day Ahead prices and Real-Time prices are closely correlated and follow the load profile.
- Real-Time prices are slightly higher on peak hours due to ramp rate constraints

# Day-Ahead Market Price Vs Real-Time Price Hourly Hub Average SPP



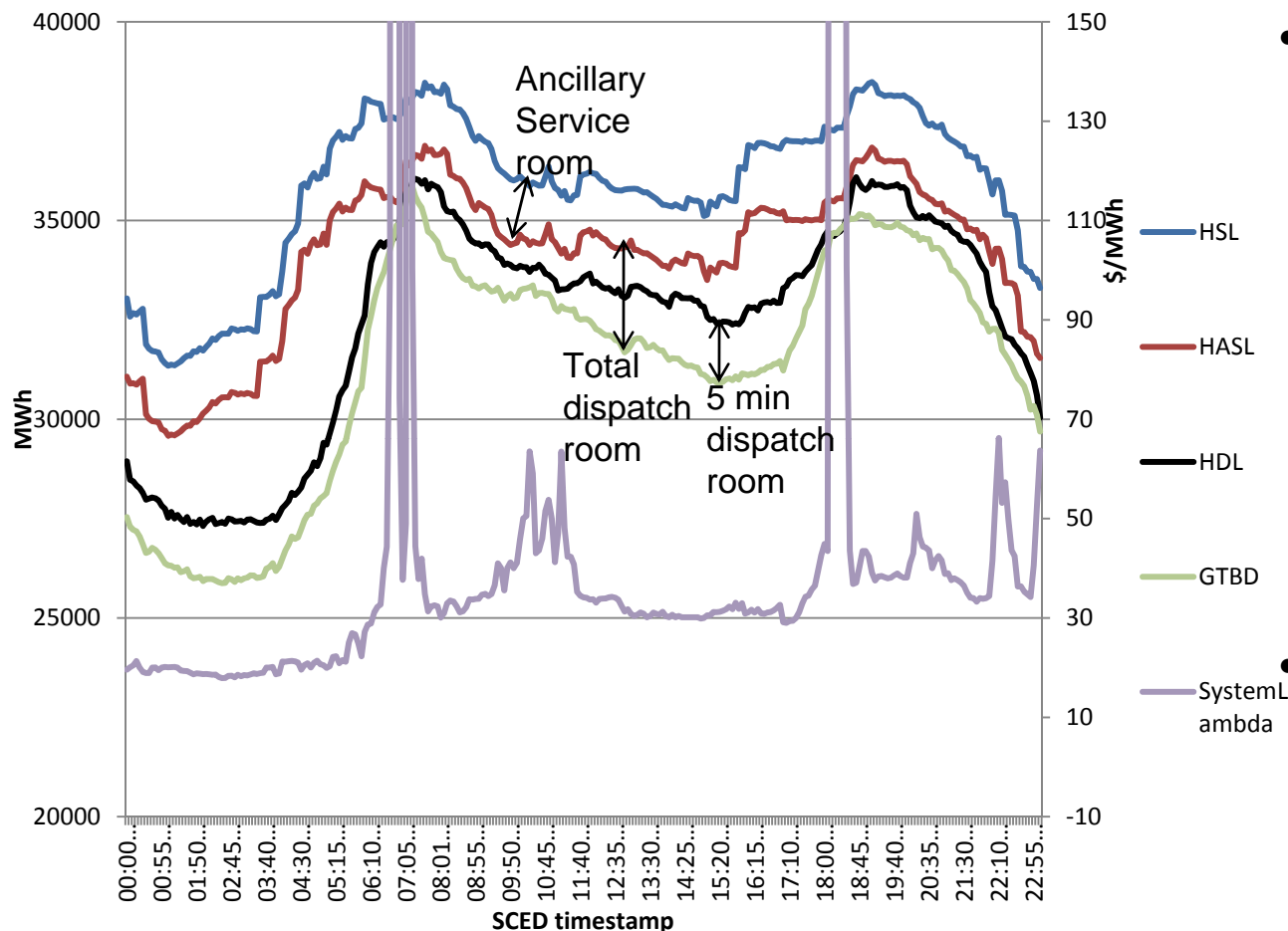
- The average real-time and day-ahead prices for the four Hubs
- Day Ahead prices follow the hourly load profile more closely than real-time prices
- Real-Time prices are dependent on real-time ramp rate capability

# Day-Ahead Market Price Vs Real-Time Price Cumulative Average SPP



- Day Ahead prices and Real-Time prices converged nicely after the first few days of the market open.

# Example of Price Spike at Peak Hours



- **During morning and evening load ramp periods, prices can spike due to the following**
  - Not enough ramp available in the system to keep up with load growth
  - Not enough Physical Responsive Capability available in the system
- **Power Balance Penalty Prices are used when Generation To Be Dispatched exceeds 5-min High Dispatch Limit**

HSL – High Sustained Limit ; HASL - High Ancillary Service Limit; HDL – High Dispatch Limit; GTBD – Generation To Be Dispatched  
System Lambda - the cost of the next MW that could be produced from dispatchable generation



# Congestion Revenue Rights Price Convergence

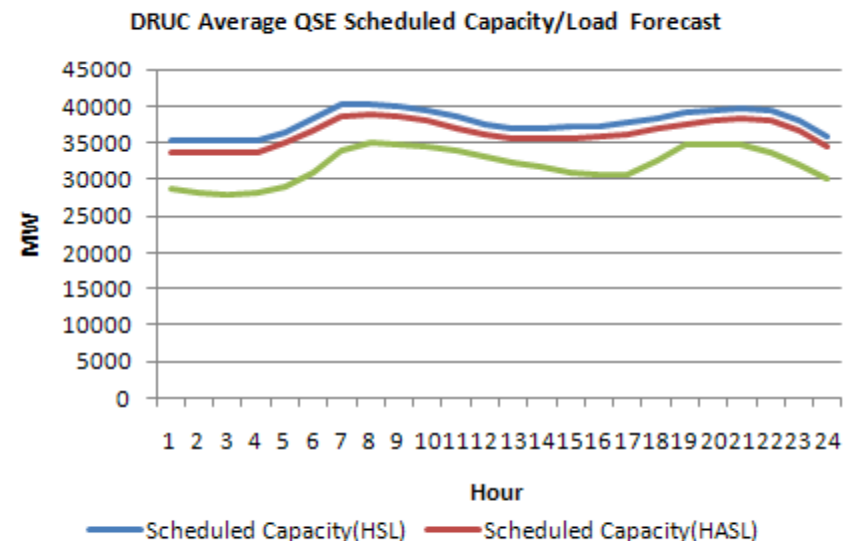
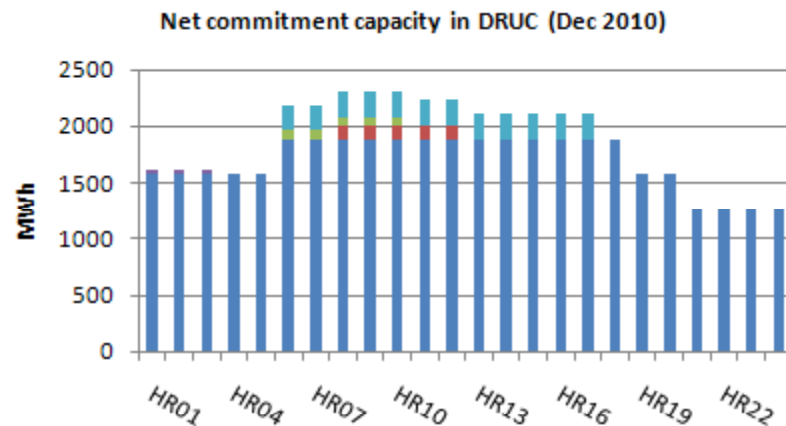
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	December 2010	December 2009	December 2008
Net Amount Paid for CRRs/TCRs (Cost)	\$13.5M	\$10.7M	\$9.8M
Net Amount Paid to Account Holders for TCRs/CRRs (Value)	\$13.4M	\$2.8M	\$14.7M
Convergence (Value/Cost)	99%	26%	150%

- Market Participants purchased CRRs at a cost of \$13.5 M.
- The value of the CRRs to the Market Participants was \$13.4 M.
- This indicates an accurate forecast of the CRR value by Market Participants
- It also indicates a good CRR model

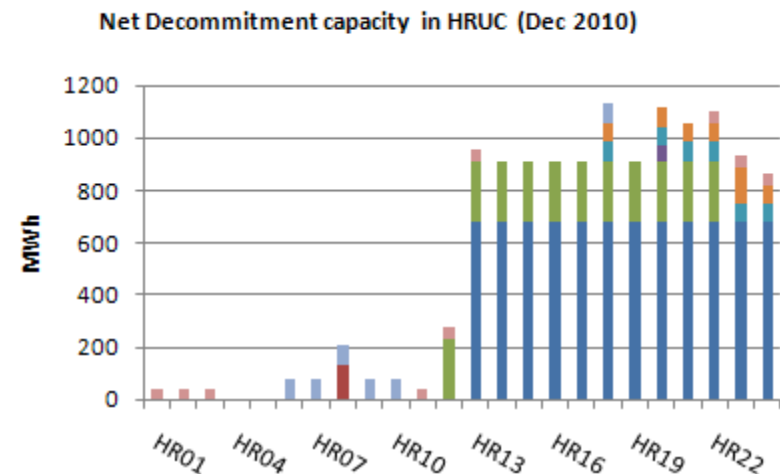
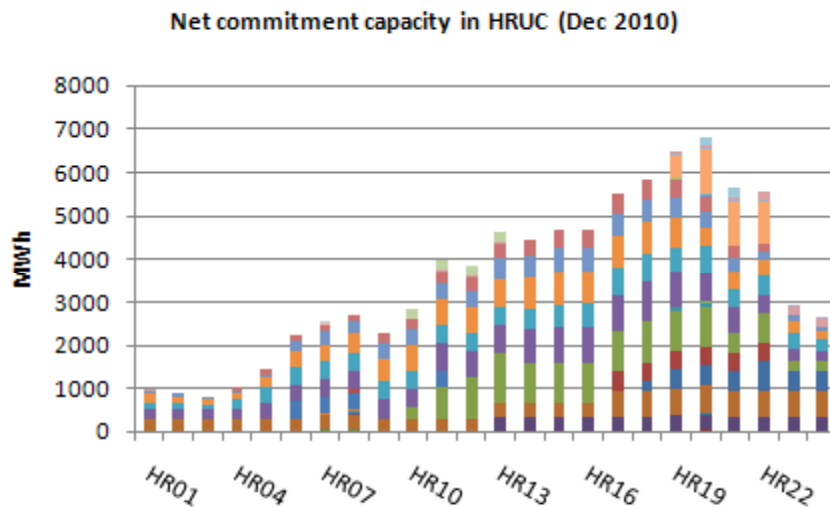
# DRUC

- **31 executions** ( 4 published after 1600)
- **11 min average execution time**
- **Resource Commitment/de-commitments**
  - 44434 MWh committed (5 Resources for 154 hrs)
  - 426 MWh de-committed (2 Resources for 20 hrs)



# HRUC

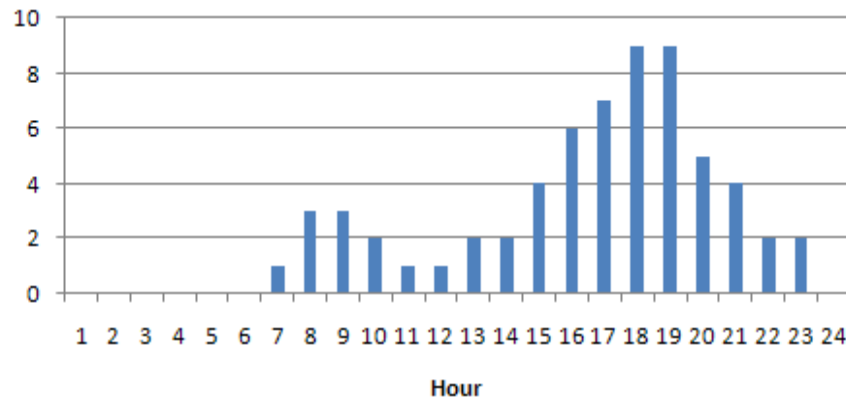
- **745 executions** ( 4 missed)
- **10 min average execution time**
- **Resource Commitment/de-commitments**
  - 85428 MWh committed (31 Resources for 810 hrs)
  - 12675 MWh de-committed (8 Resources for 53 hrs)



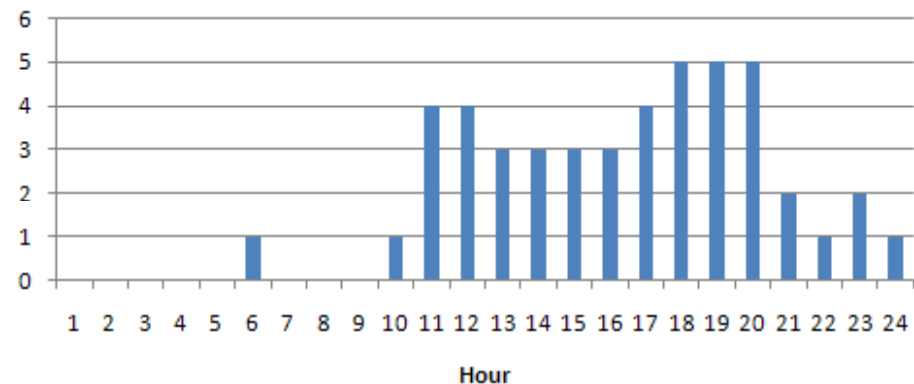
# Supplemental Ancillary Service Market (SASM)

- **25 SASMs were run**
  - 16 for un-deliverable AS
  - 9 for AS failure to provide

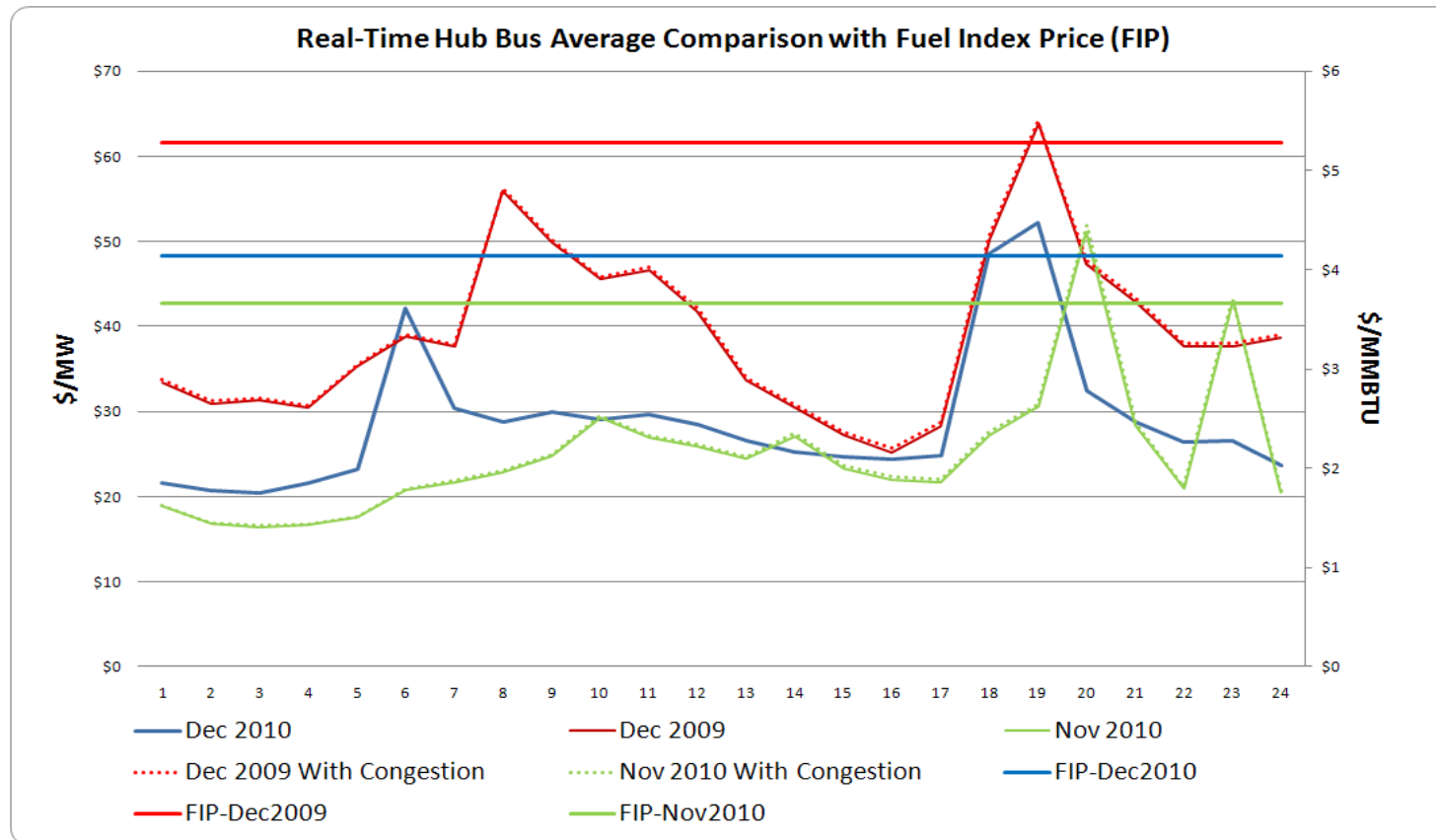
Count of SASM Runs for Undeliverability  
by hour in Dec 2010



Count of SASM Runs for Failure to  
Provide by hour in Dec 2010

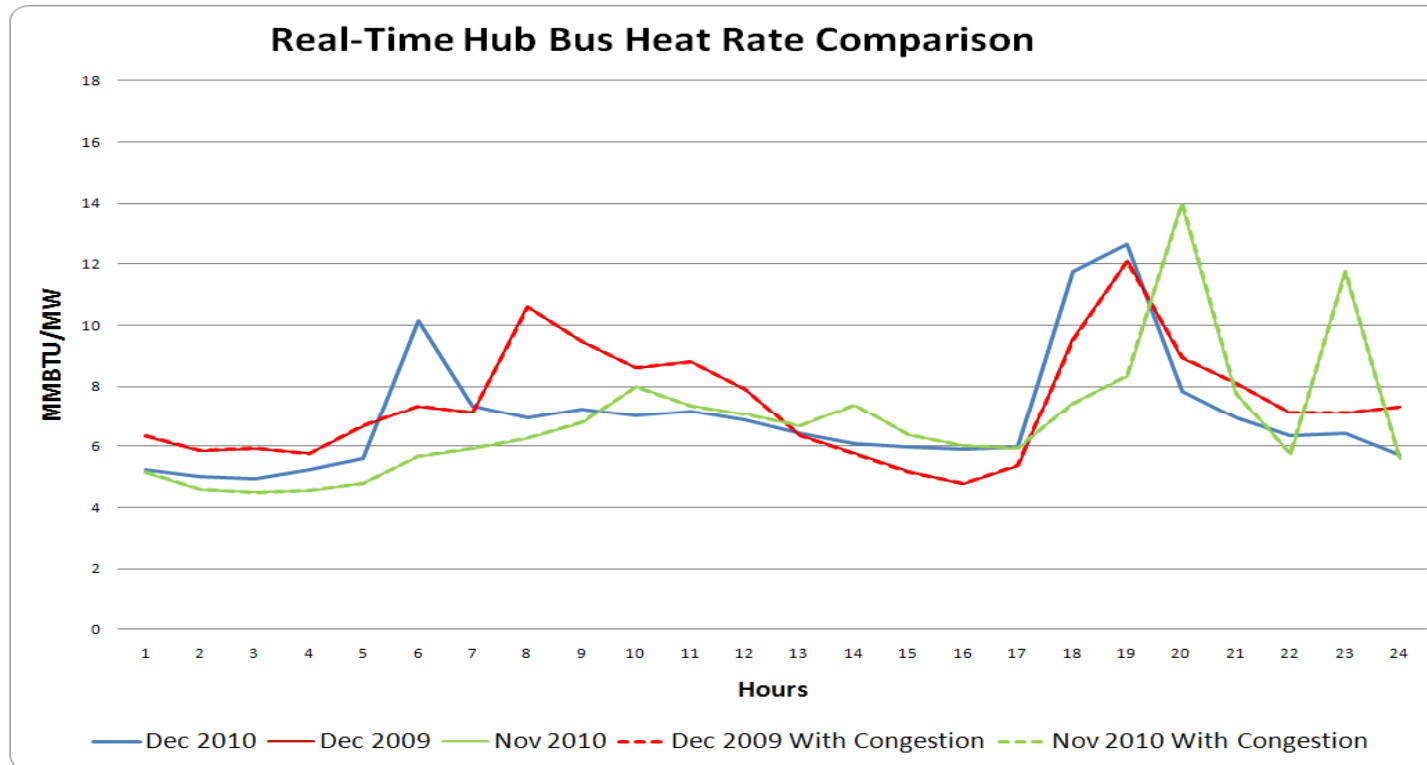


# Historical Comparison



- Zonal Market Clearing Prices for Energy were adjusted to account for unit specific Out of Merit energy deployments
- Nodal prices reflect the cost for managing congestion
- Prices are higher in December 2009 versus December 2010 due to higher Fuel Prices in December 2009

# Historical Comparison



- Zonal Market Clearing Prices for Energy were adjusted to account for unit specific Out of Merit energy deployments
- Nodal prices reflect the cost for managing congestion
- Graph reflects a conversion from \$/MW to heat rate in order to normalize the fuel cost impact on prices

# Nodal Market Challenges in First Month of Operations

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- **Controlling West to North limit**
  - **Issues with the curtailment of wind resources**
  - **Addressing through emphasis on wind resources updating High Sustainable Limits properly**
- **Real Time SPPs diverging without congestion.**
  - **Resulting from the use of energy weighted averaging of Locational Marginal Prices (LMPs) to produce 15 minute settlement point prices**
  - **Addressing at upcoming WMS meeting**
- **Day-Ahead Market did not bind on the West to North limit from December 23<sup>rd</sup> – 30<sup>th</sup>**
  - **December 22<sup>nd</sup> ABB patch introduced a bug to generic constraints**
  - **Resolved in the December 30<sup>th</sup> ABB patch**
- **Price Spikes around peak hours**
  - **Due to load ramp and generation ramp capability**
  - **Increase in prices around peak hours expected**
  - **ERCOT deploys Non-Spin Reserve when dispatch room is near depletion**
- **10pm ramp down by many generators in “ON TEST” status caused some frequency deviations**
  - **Addressed in a Market Notice issued by ERCOT on December 23<sup>rd</sup>**

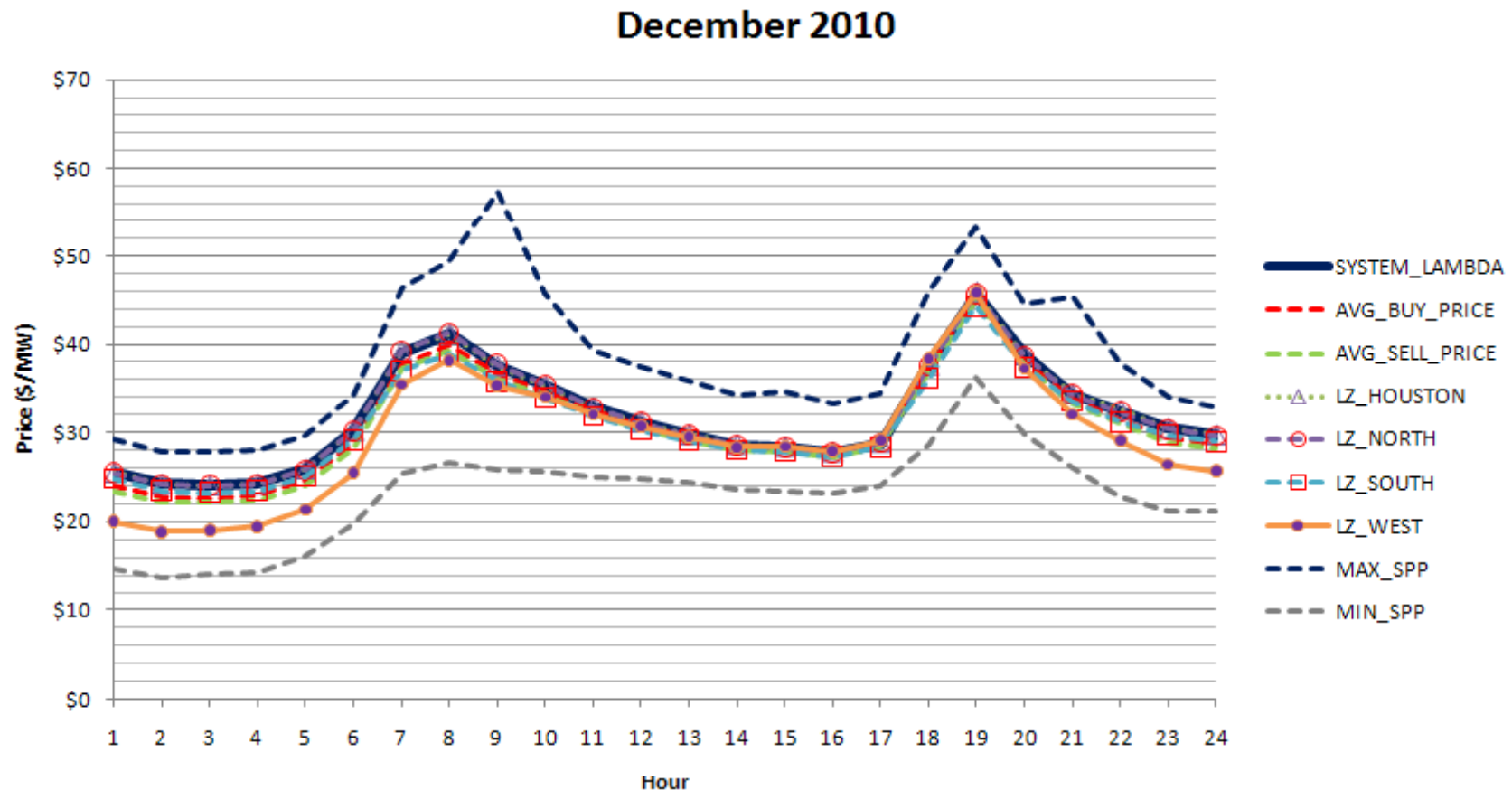
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# Appendix



# Day-Ahead Settlement Point Prices Hourly Average



System Lambda – the cost of the next MW that could be produced from dispatchable generation