# Dispatch and Pricing of Peaking Resources in ERCOT

Presented to:

ERCOT Board Meeting

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# Introduction

- There are many differences between how the markets facilitate the operation of the system in ERCOT compared to other RTOs.

- These differences include:

    ✓ Joint optimization of energy and ancillary service products;

    ✓ The definition and use of regulation and reserves;

    ✓ The use of make-whole payments; and

    ✓ The processes to commit and dispatch peaking resources.

- Improving the commitment and dispatch of peaking resources (and other resources that can respond quickly) is the focus of one of the State of the Market report recommendations.

- This presentation will discuss the differences in how peaking resources are utilized and compensated in ERCOT versus other RTO markets.

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# The Value of Peaking Resources

- Peaking resources that can start within 30 minutes, most of which are gas turbines, provide substantial value to the system by:

  - ✓ Allowing operators to respond to unexpected changes in load, wind output, or other factors;

  - ✓ Providing the reserves necessary to secure the system after a contingency while offline, avoiding the need to commit other resources for reserves;

  - ✓ Providing a source of energy when the system is temporarily "ramp constrained" (i.e., other units are ramping up as quickly as possible).

- In addition to their reliability benefits, gas turbines can be an economic source of energy even though they tend to be on the higher-cost portion of the supply stack.

- Realizing the benefits of the peaking resources is affected by how they are dispatched and compensated.

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# Processes to Utilize Peaking Resources

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- Gas turbines are committed in one of three ways:
  - ✓ Suppliers may indicate they are "online" to allow the real-time 5-minute market to dispatch them, which does not consider operating restrictions and commitment costs. Hence, the it market will often make the wrong choice.
  - ✓ Suppliers may self-commit their resources when they believe real-time prices may more than cover their costs.
  - ✓ ERCOT may deploy offline supplemental reserves.
- Suppliers are not assured of recovering their costs when they self-commit resources or receive volatile dispatch instructions from the real-time market.
  - ✓ Supplier's must adjust their offers to account for their economic risks.

MISO and NYISO

- Most gas turbines committed using a real-time economic commitment model that runs every 15 minutes.
- Commitments costs and operating restrictions are fully considered.
- Suppliers are guaranteed to recover their as-offered costs if committed.

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# Effects on Offers and Dispatch

- The following three figures show how these differences affect suppliers' offers and the dispatch of the gas turbines.

- The first figure shows offer prices, including start-up costs, for the gas turbines in MISO on May 29, 2015.

  - ✓ More than half of the units have offers less than $75; and

  - ✓ No resources have offers above $300.

- The second figure shows the same data for ERCOT.

  - ✓ A large share of the resources offer at prices less than $50 per MWh.

  - ✓ Almost 40 percent of the resources offer above $1000.

- The last figure shows the average quantity of gas turbines that are utilized by ERCOT and MISO in each month in 2014.

  - ✓ The lower-priced offers and commitment process in MISO results in fuller utilization of its peaking resources (even after recognizing the difference in market size and quantity of peaking resources).
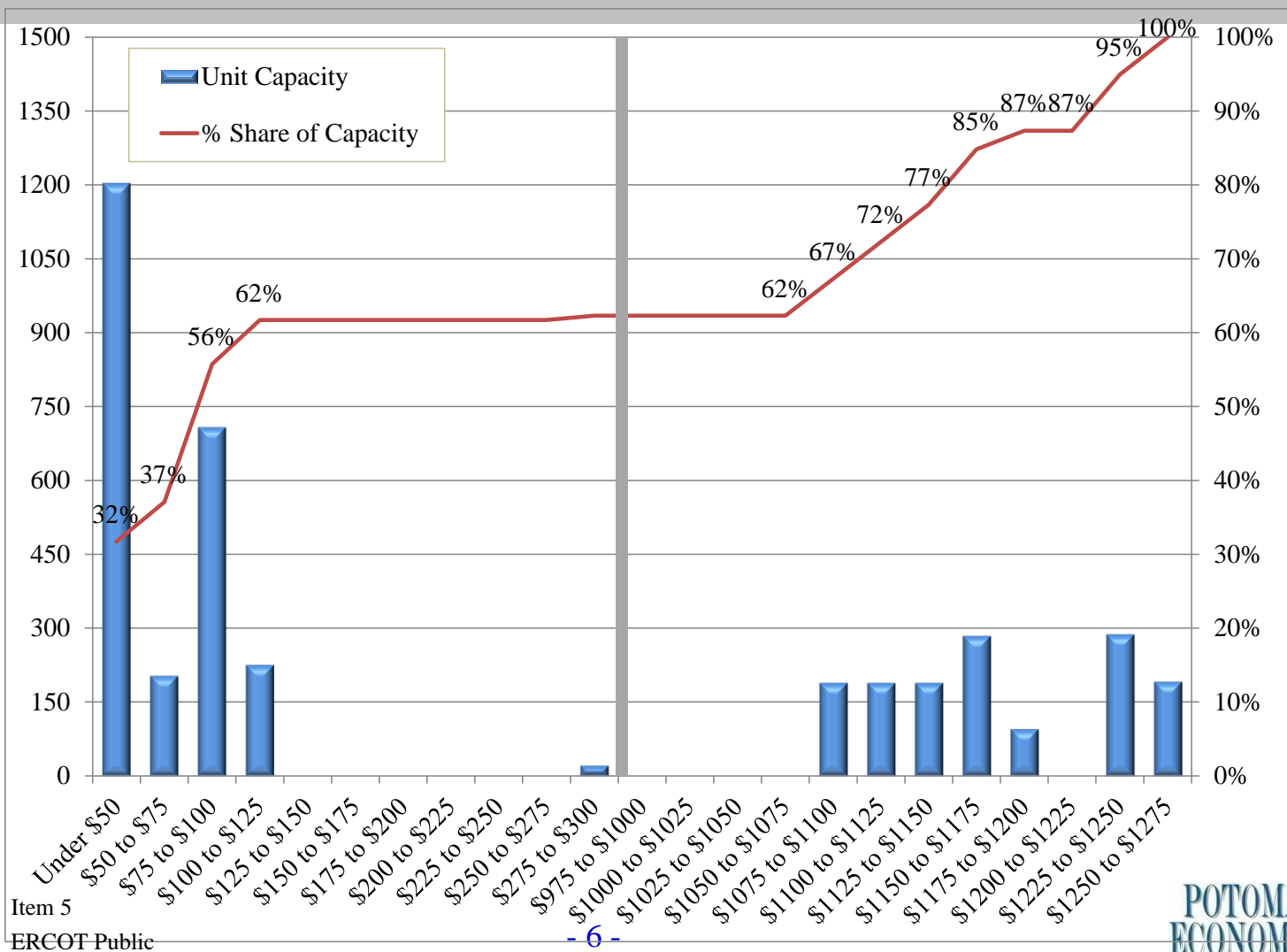
POTOMAC ECONOMICS
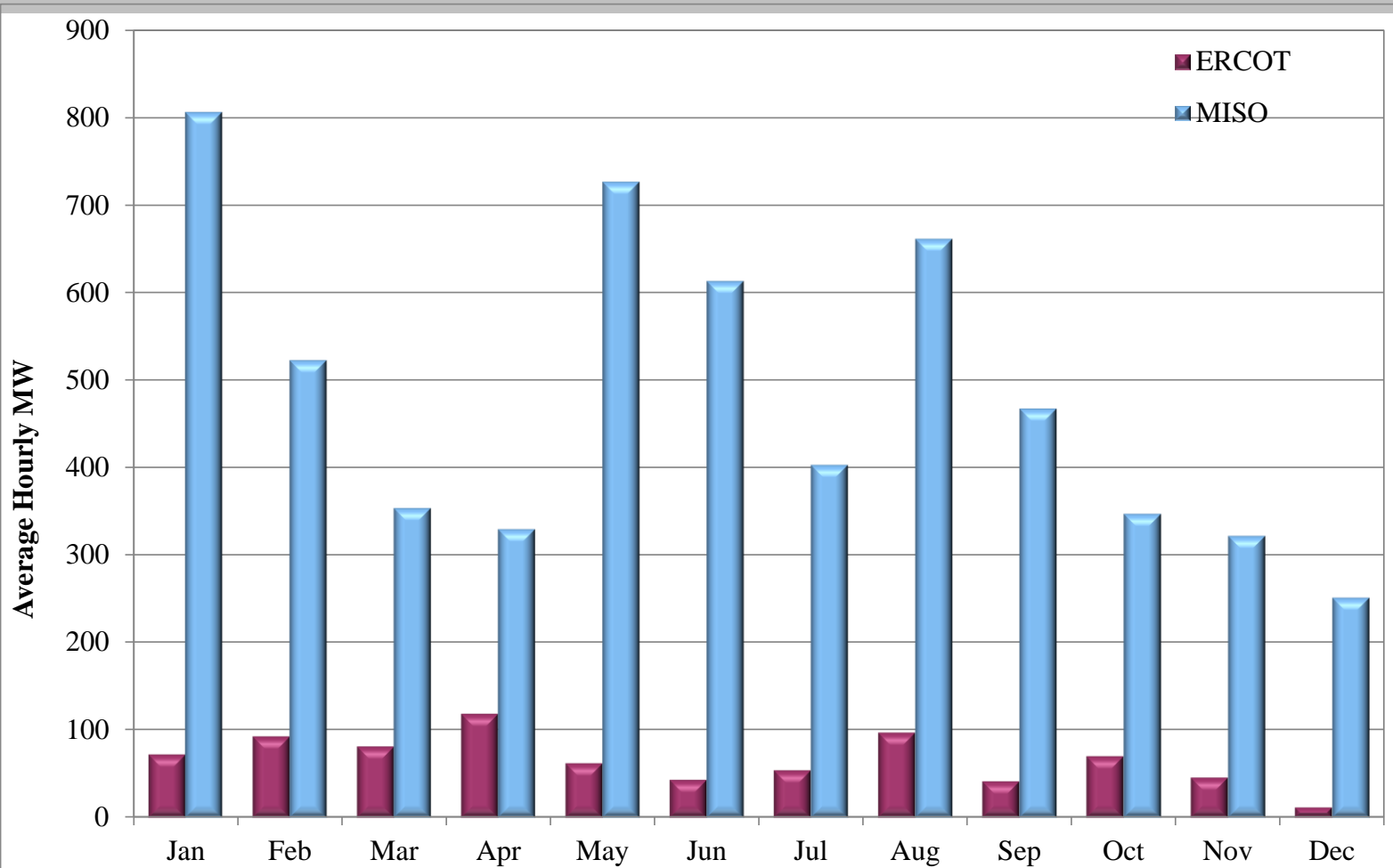
# Peaking Resource Offers in MISO
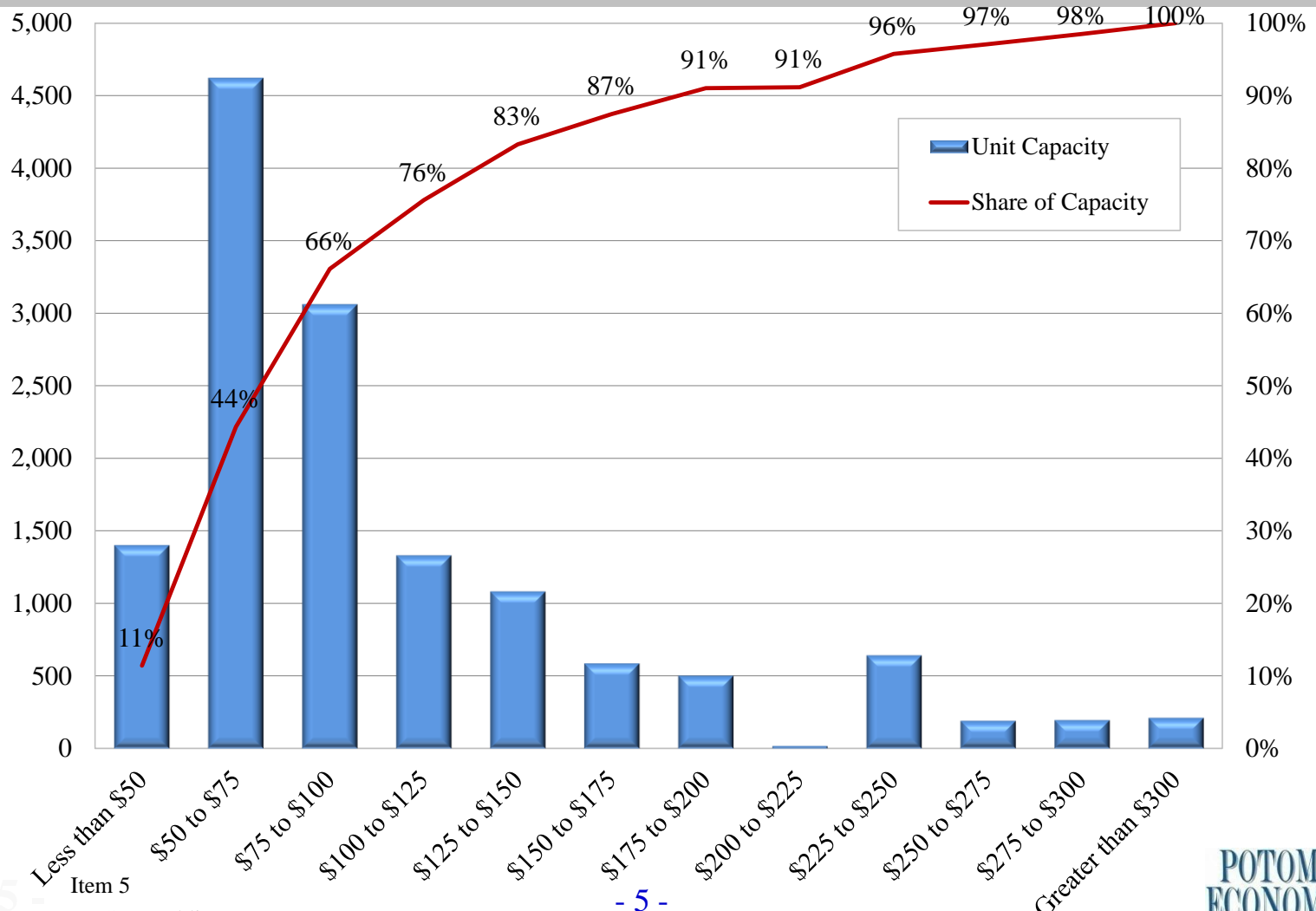
# Peaking Resource Offers in ERCOT

# Utilization of Gas Turbines

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# Conclusions

- Examining differences in the design and operation of the RTO markets can uncover opportunities to improve the markets' performance and lower costs.

- The utilization of fast-response resources is one example of such an opportunity for ERCOT.

- Likewise, ERCOT has market design features that would benefit other RTOs, including:

  - ✓ Day-ahead transmission scheduling (point to point obligation).

  - ✓ Shortage pricing more in line with the value of lost load.

- We will continue to evaluate these differences to support future recommendations.

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**To the Public Utility Commission of Texas**

# ERCOT Wholesale Electricity Market Monthly Report

Monday, July 20, 2015

Potomac Economics, Ltd.
Independent Market Monitor

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# ERCOT-Wide Average Energy Prices DA vs RT
**(avg. DA & RT SPPs weighted by Real Time Settlement Loads)**

Legend: ■ RTPrice2014　■ RTPrice2015　■ DAPrice2014　—○— DAPrice2015



Y-axis: Energy Prices ($/MWh) — $0 to $70

X-axis: Month — 1 through 12
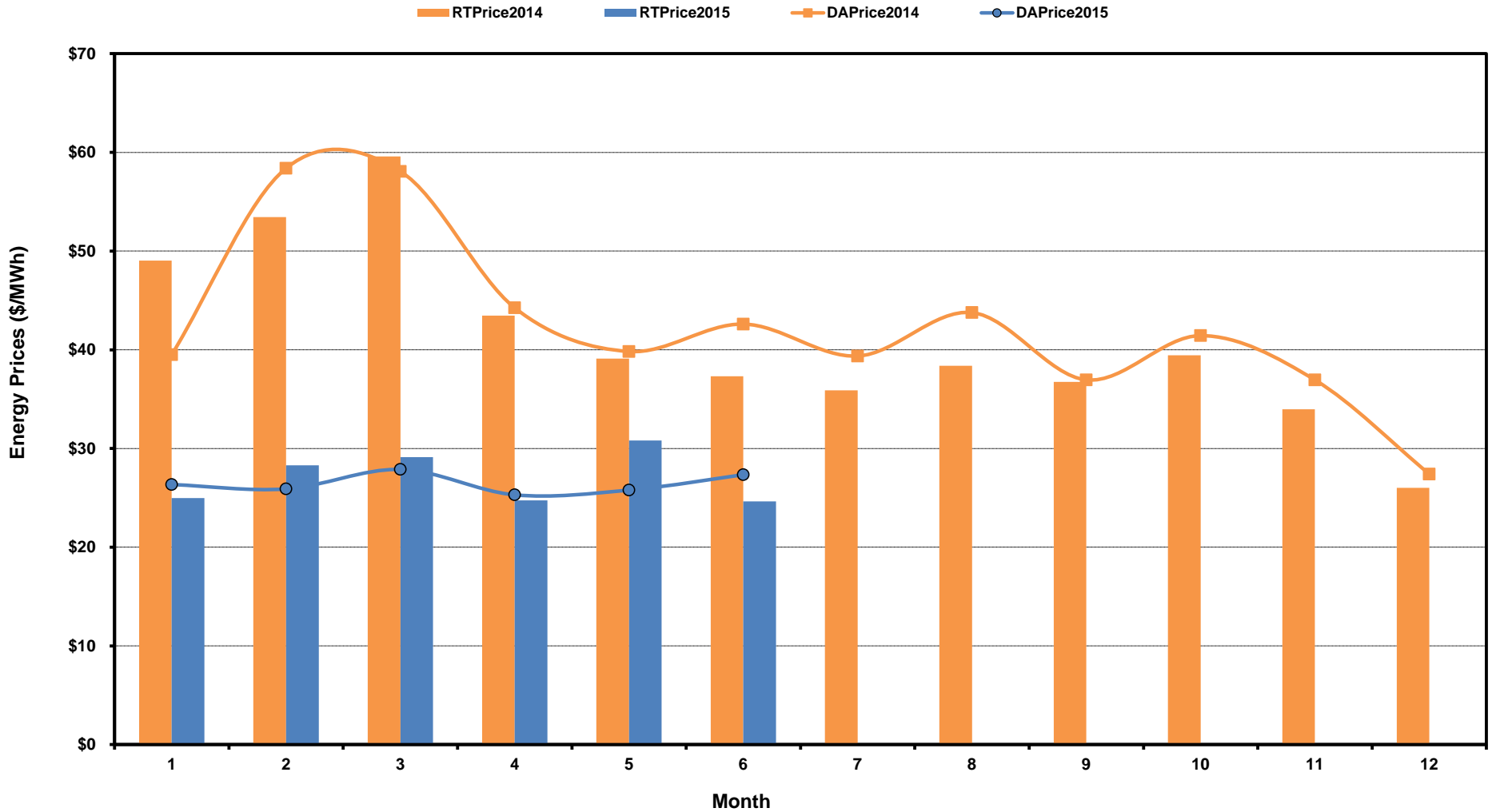
# Load Zone Load Statistics

### (Nodal load zone made comparable to zonal sytem Load Zone definitions*)
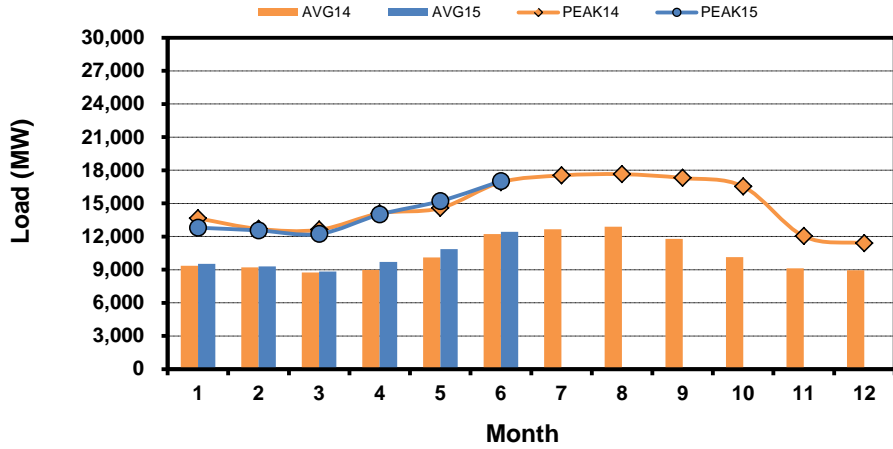
## Houston Zone

Legend: AVG14, AVG15, PEAK14, PEAK15



## North Zone

Legend: AVG14, AVG15, PEAK14, PEAK15



## South Zone

Legend: AVG14, AVG15, PEAK14, PEAK15



## West Zone

Legend: AVG14, AVG15, PEAK14, PEAK15

**Note:** * Zonal load zone definition vs. Nodal comparable load zone definition: LZ_Houston=LZ_Houston; LZ_West=LZ_West; LZ_North=(LZ_North,LZ_RAYBN); LZ_South=(LZ_South,LZ_CPS,LZ_AEN,LZ_LCRA)

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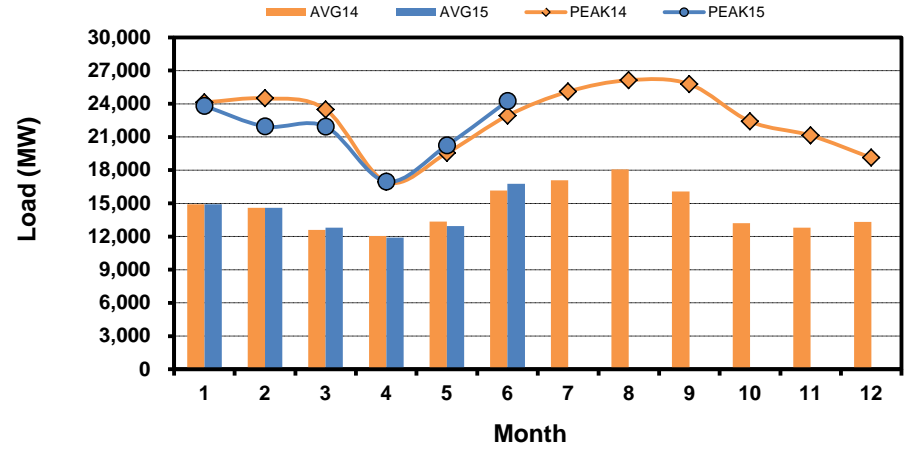
# Load Zone Monthly Average Energy Price DA vs RT

**(avg. DA & RT SPPs weighted by Real Time Settlement Loads)**
**(Nodal load zone made comparable to zonal sytem Load Zone definitions*)**
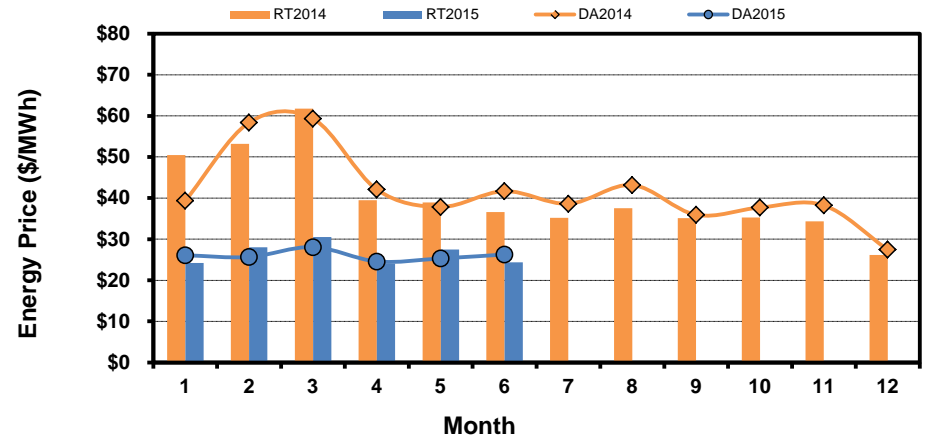


## Houston Zone

## North Zone

## South Zone
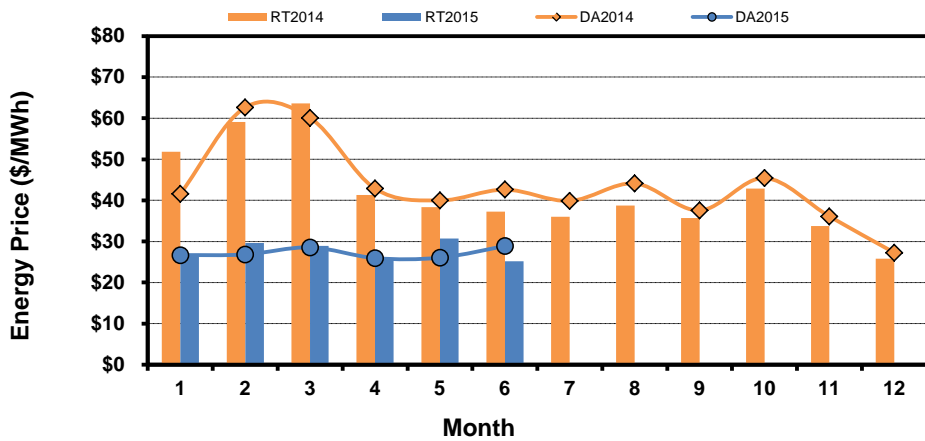
## West Zone
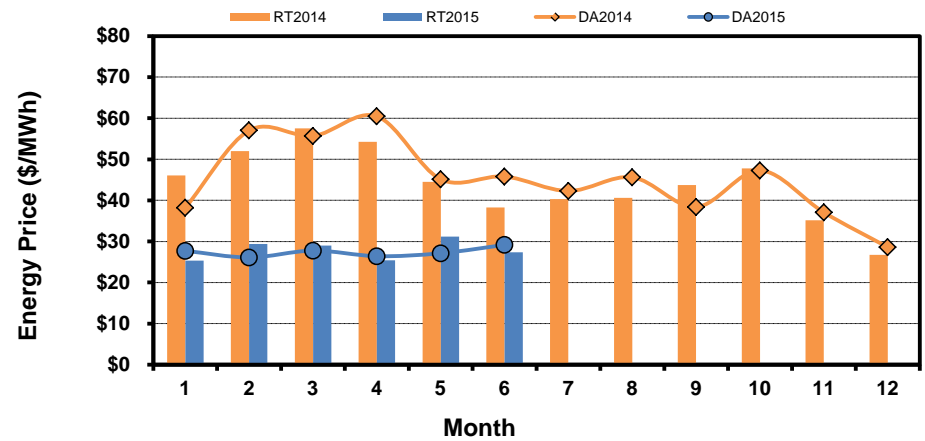
**Note:** * Zonal load zone definition vs. Nodal comparable load zone definition: LZ_Houston=LZ_Houston; LZ_West=LZ_West; LZ_North=(LZ_North,LZ_RAYBN); LZ_South=(LZ_South,LZ_CPS,LZ_AEN,LZ_LCRA)

# ERCOT-Wide Monthly Implied Heat Rate DA vs RT

**(avg. heat rates weighted by Real Time Settlement Loads)**

Legend: RT2014, RT2015, DA2014, DA2015



Y-axis: Heat Rate (MBtu/MWh)

X-axis: Month
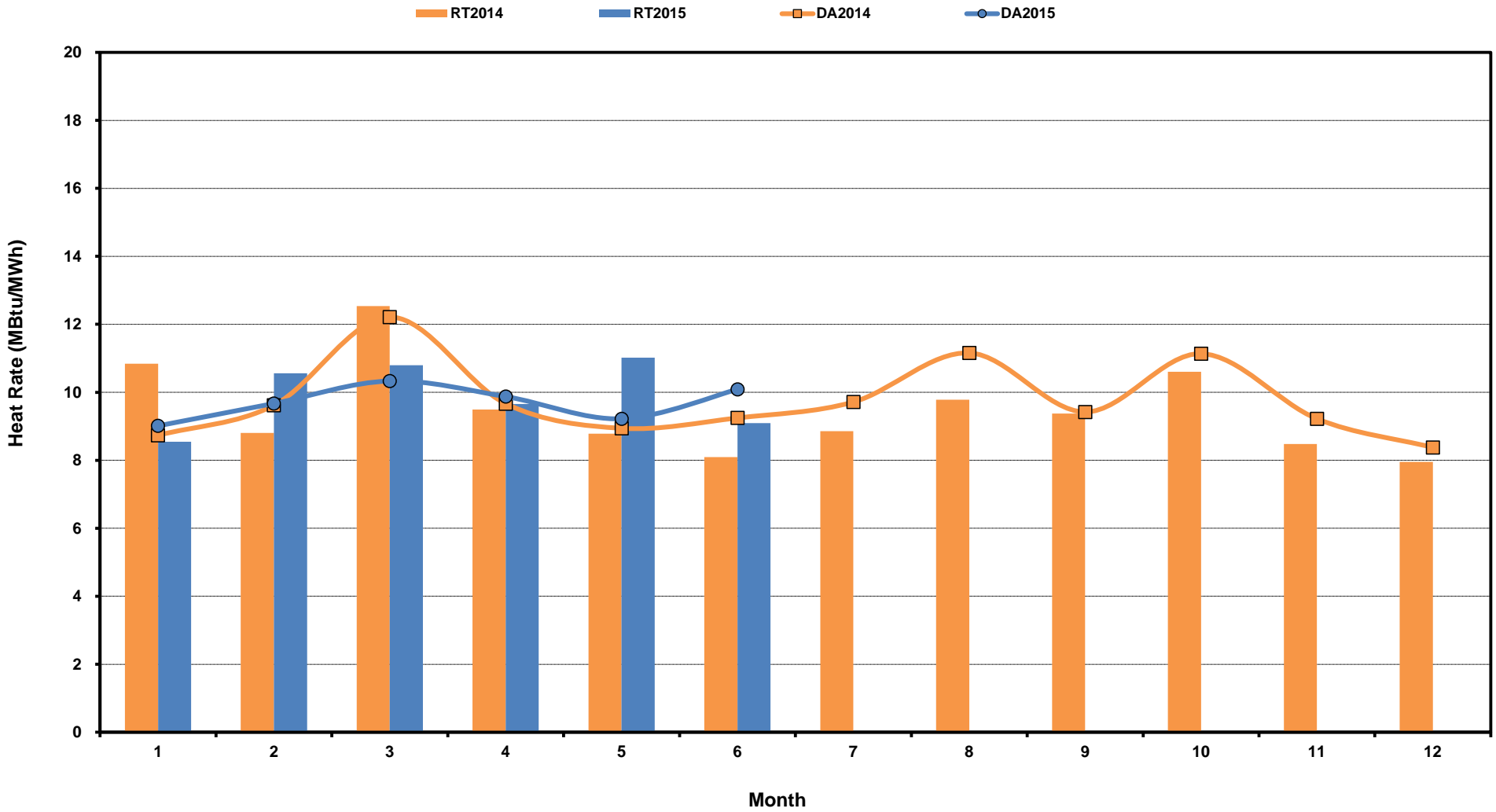
# Load Zone Monthly Implied Heat Rate DA vs RT

**(avg. heat rates weighted by Real Time Settlement Loads)**
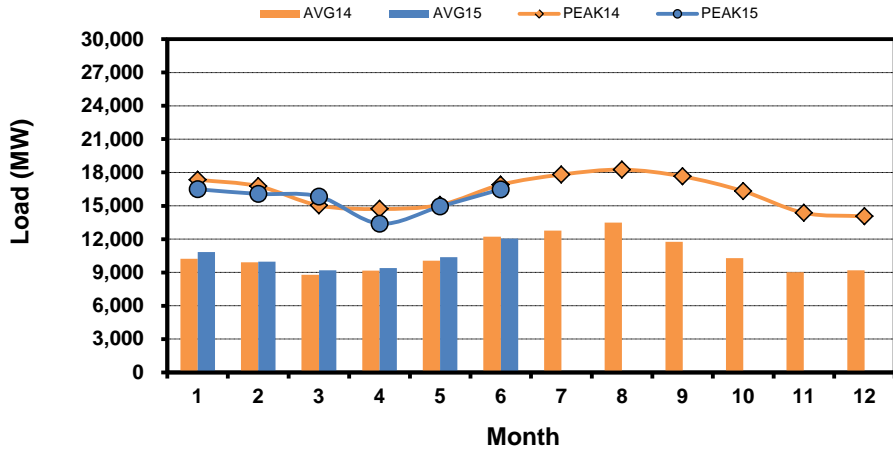**(Nodal load zone made comparable to zonal sytem Load Zone definitions\*)**
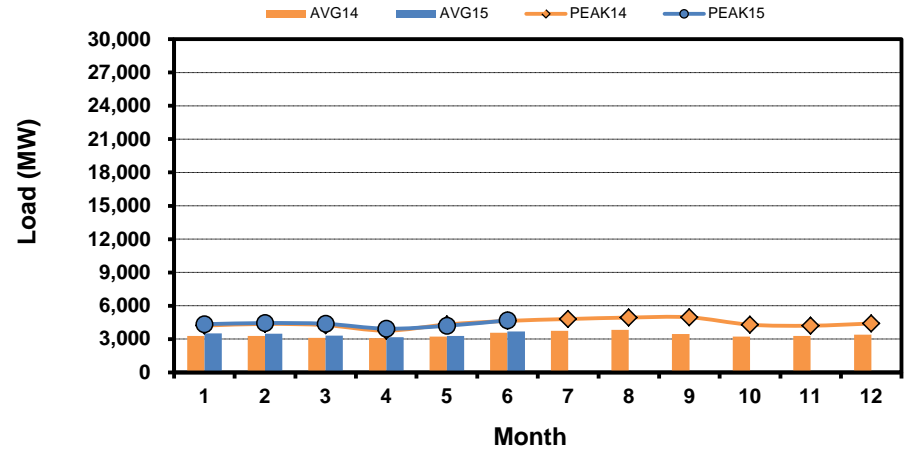
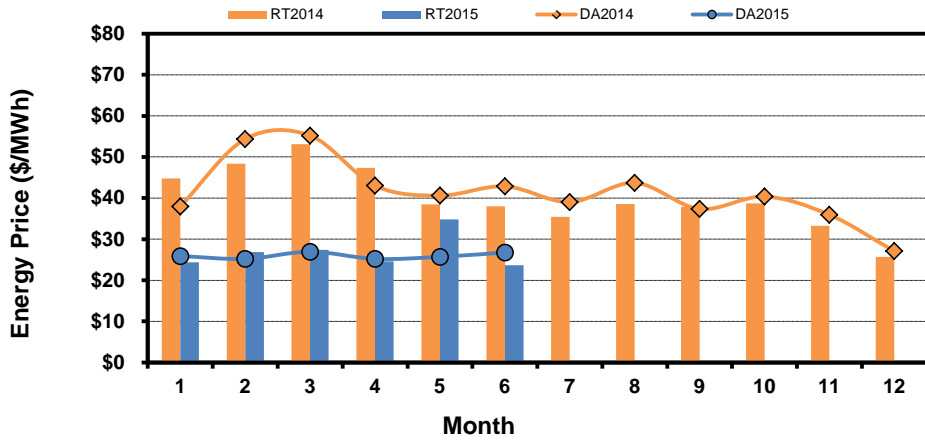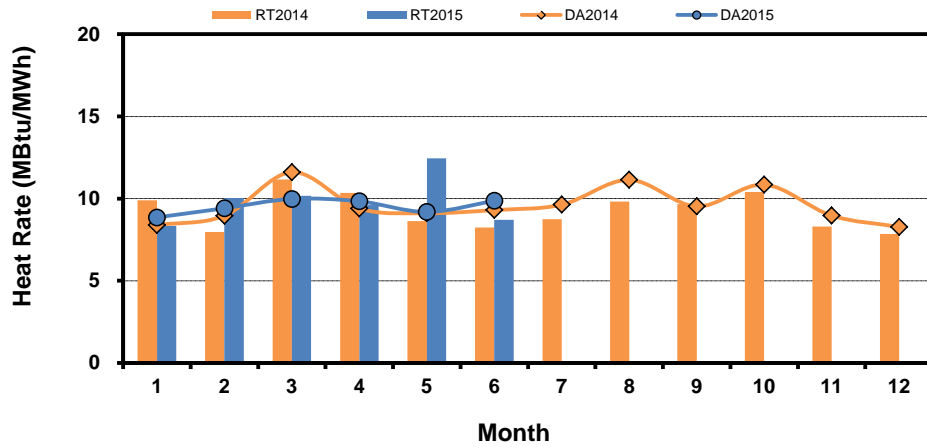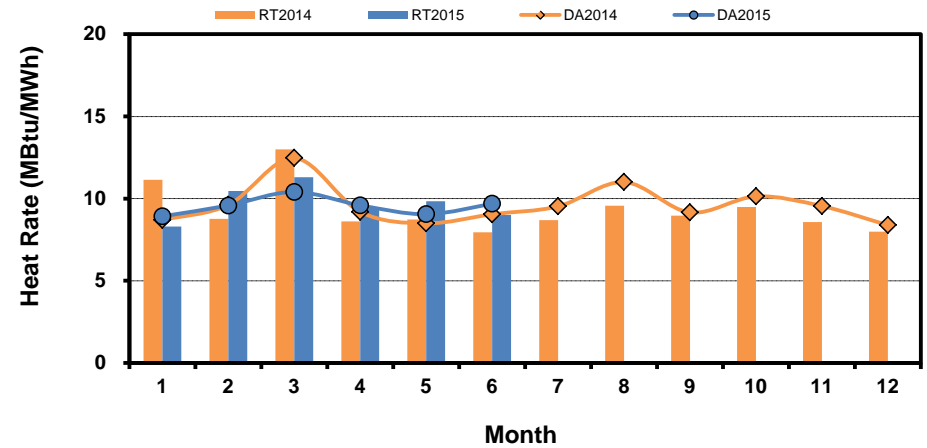### Houston Zone



### North Zone



### South Zone
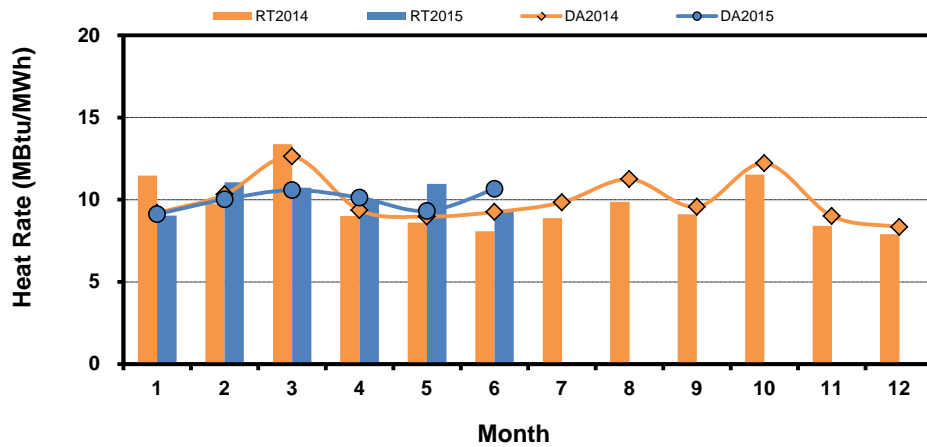


### West Zone
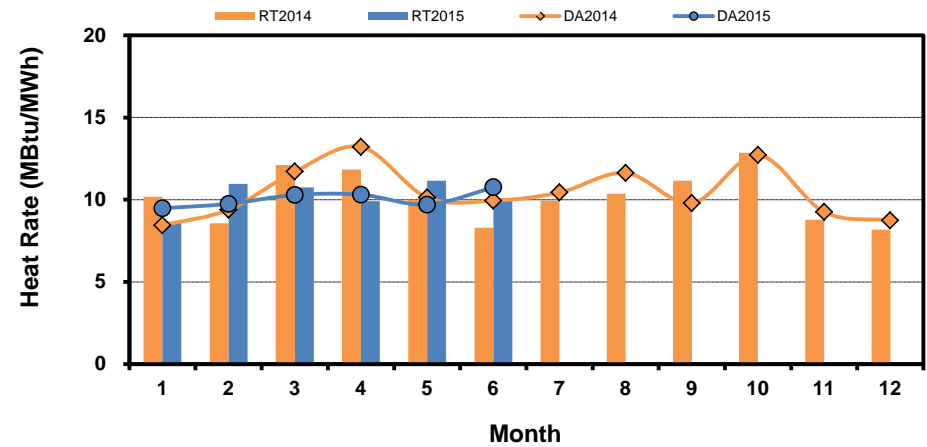
**Note:** \* Zonal load zone definition vs. Nodal comparable load zone definition: LZ_Houston=LZ_Houston; LZ_West=LZ_West; LZ_North=(LZ_North,LZ_RAYBN); LZ_South=(LZ_South,LZ_CPS,LZ_AEN,LZ_LCRA)

# Daily Average Reserve Adder Value and Duration
## Jun-2015



■ Number of Intervals  ●— AVG non-zero Reserve Adder

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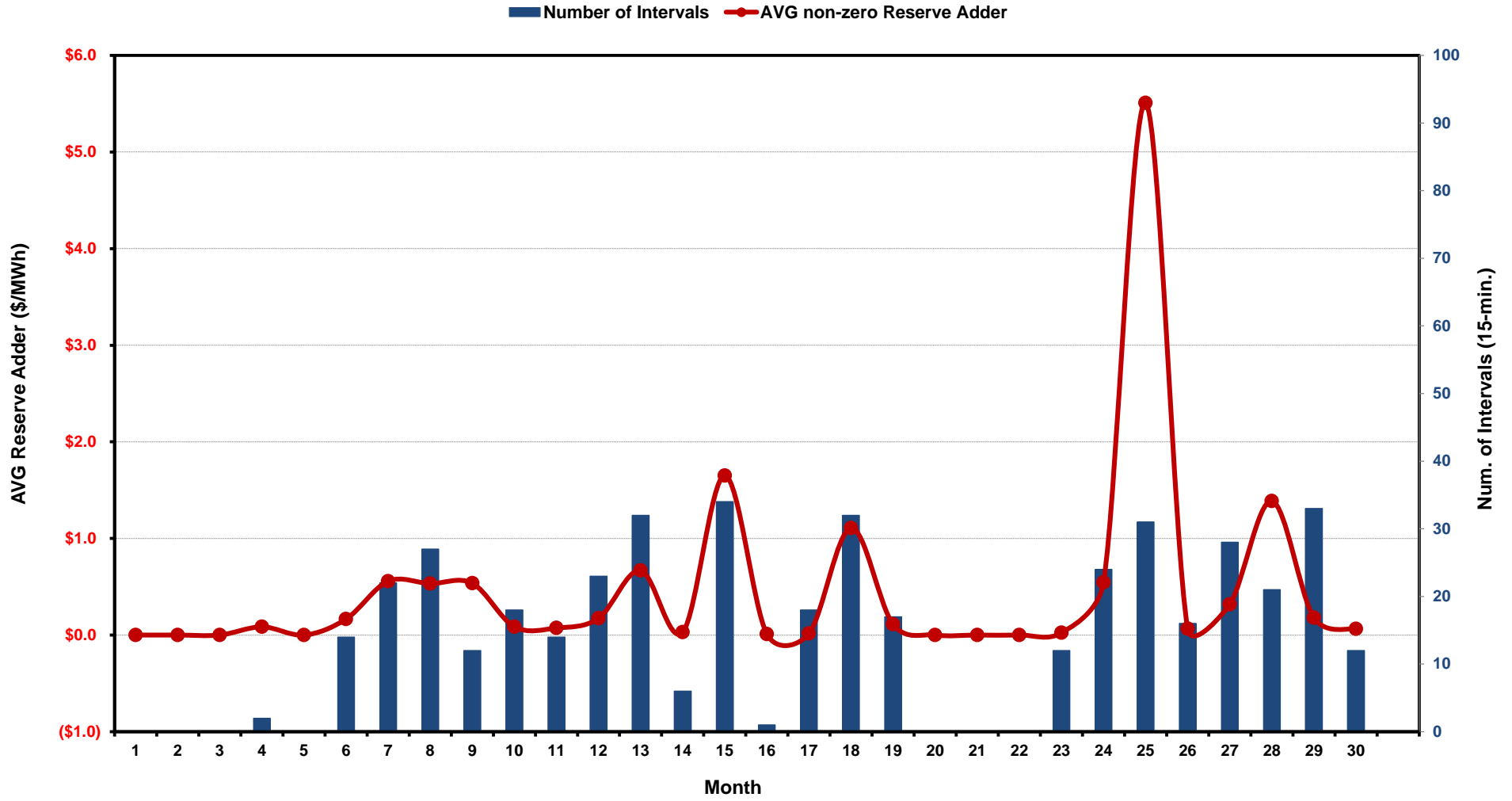
# Monthly Average of Ancillary Services Required MW

## Regulation Up



## Regulation Down



## Responsive Reserve



## Non-Spin Reserve

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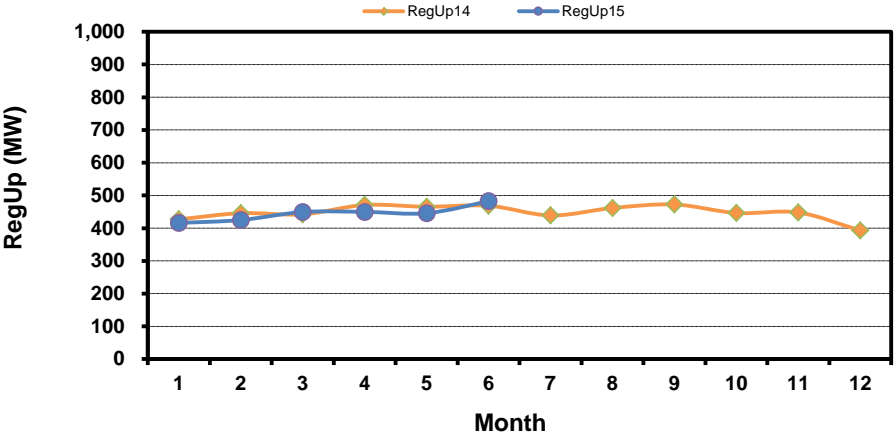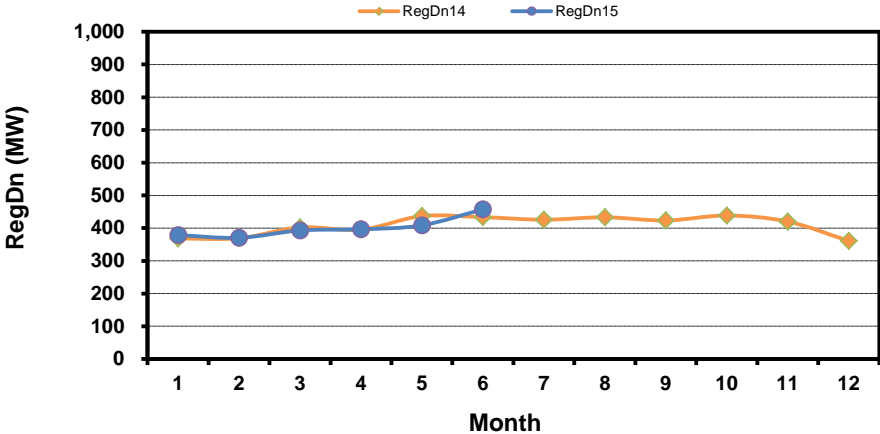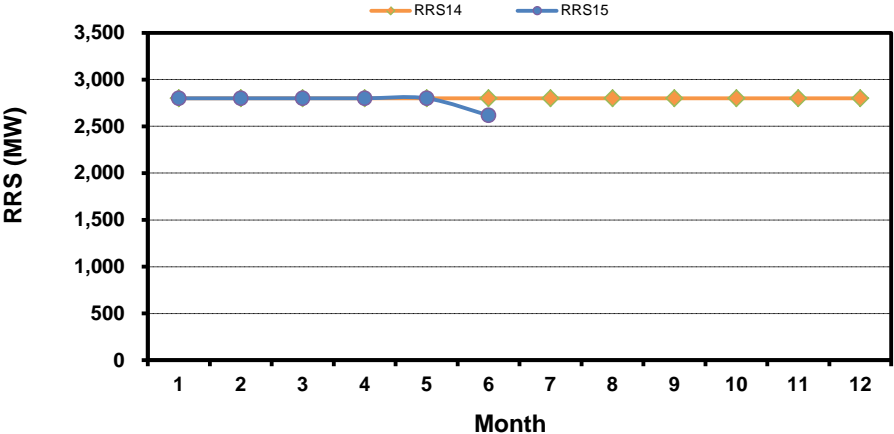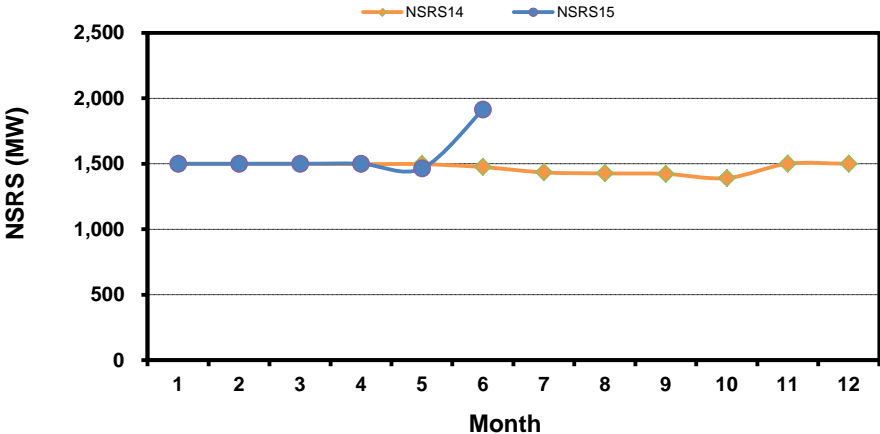
# Hourly Average of Ancillary Services Required MW
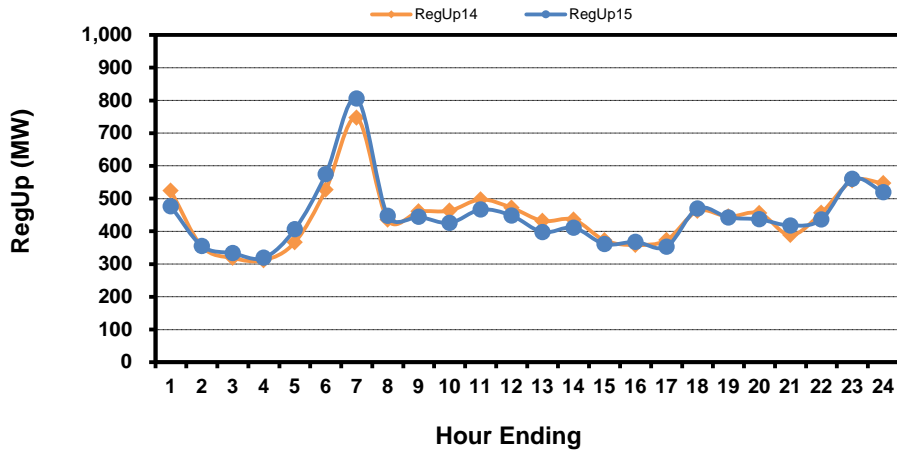
## Regulation Up



## Regulation Down



## Responsive Reserve



## Non-Spin Reserve

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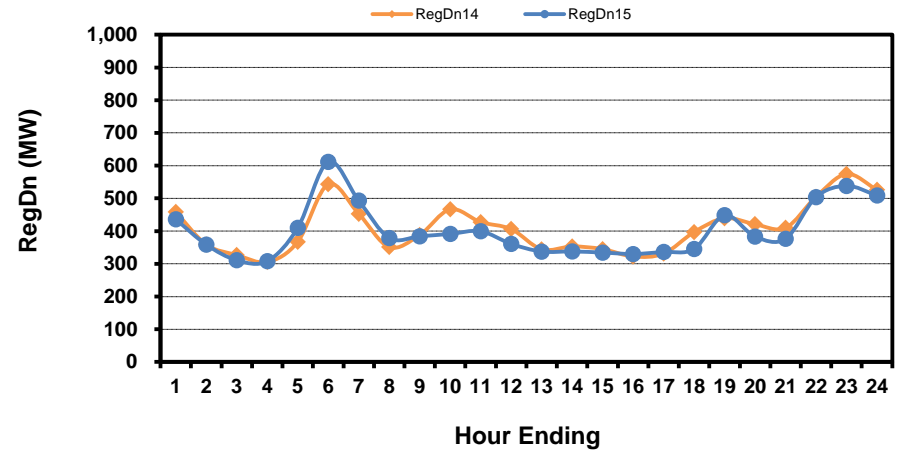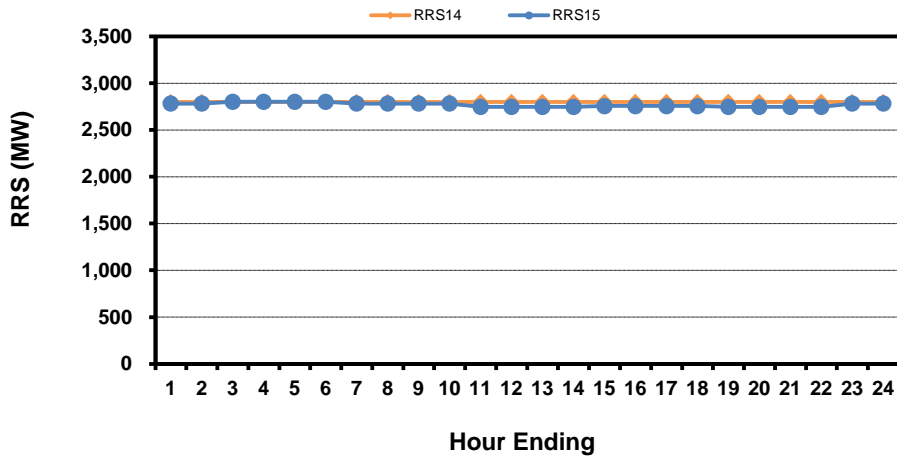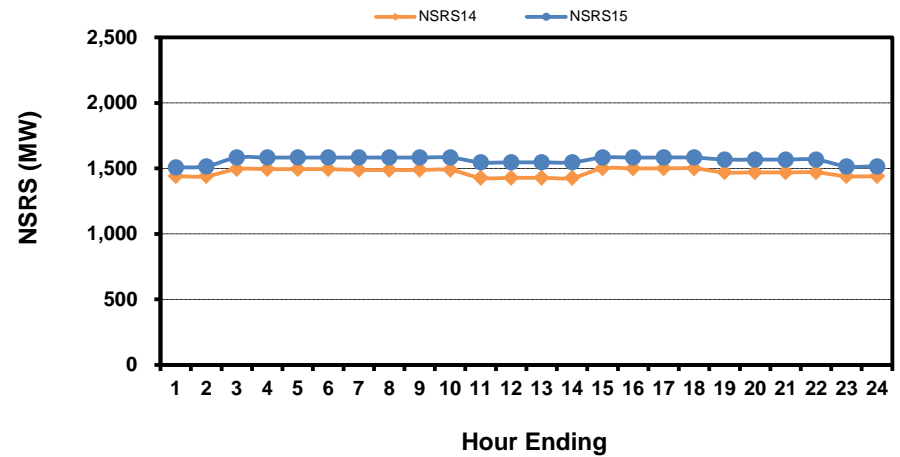
# Monthly Average Ancillary Services Price

**(weighted by A/S Quantities Required)**



## Regulation Up
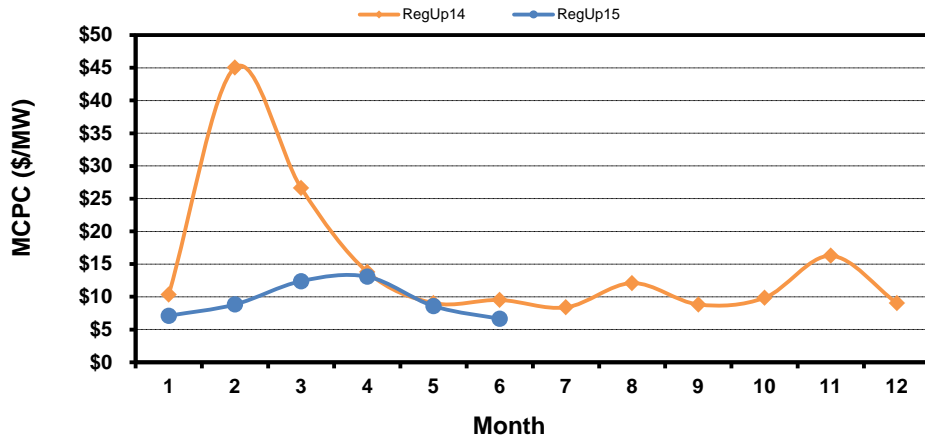
MCPC ($/MW) vs Month — series: RegUp14, RegUp15

## Regulation Down

MCPC ($/MW) vs Month — series: RegDn14, RegDn15

## Responsive Reserve

MCPC ($/MW) vs Month — series: RRS14, RRS15

## Non-Spin Reserve

MCPC ($/MW) vs Month — series: NSRS14, NSRS15

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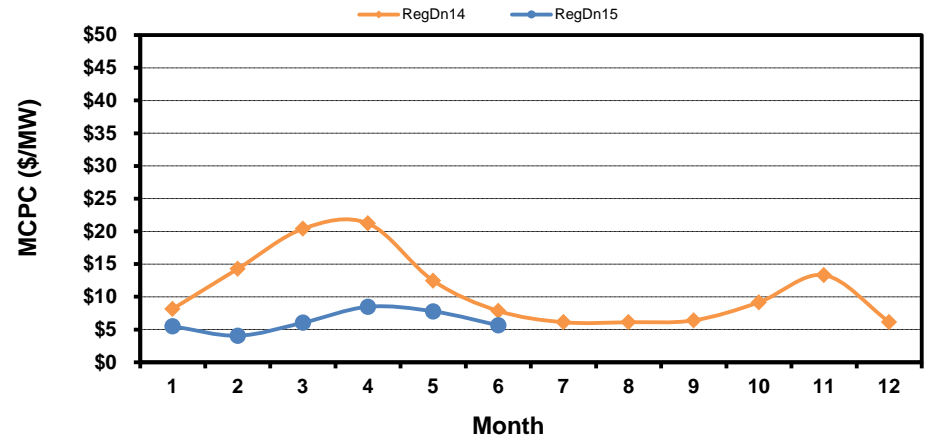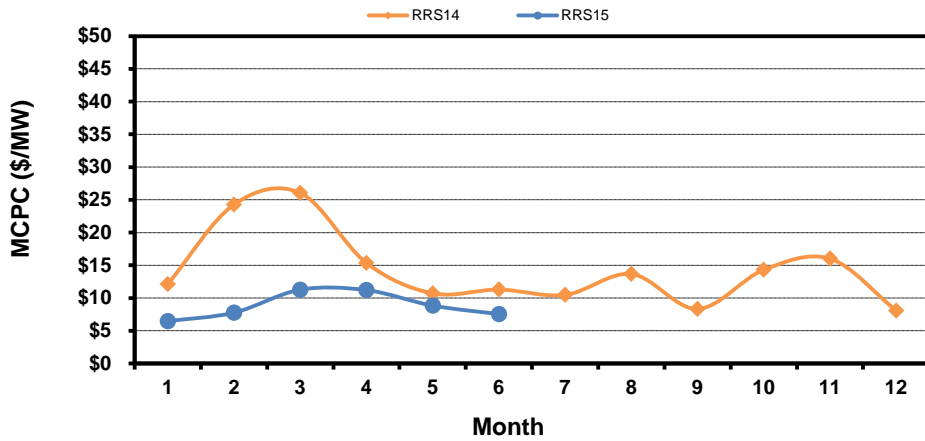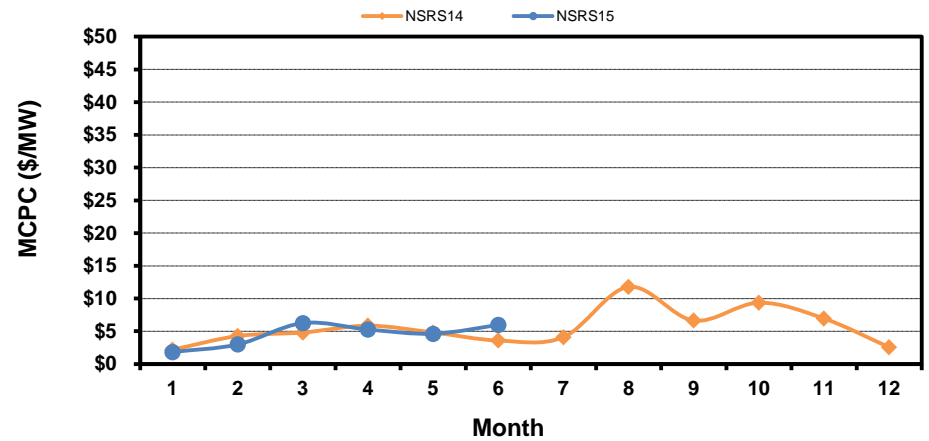
# Monthly Average A/S Cost per MWh Load



**■ RegUp  ■ RegDn  ■ RRS  ■ NonSpin**

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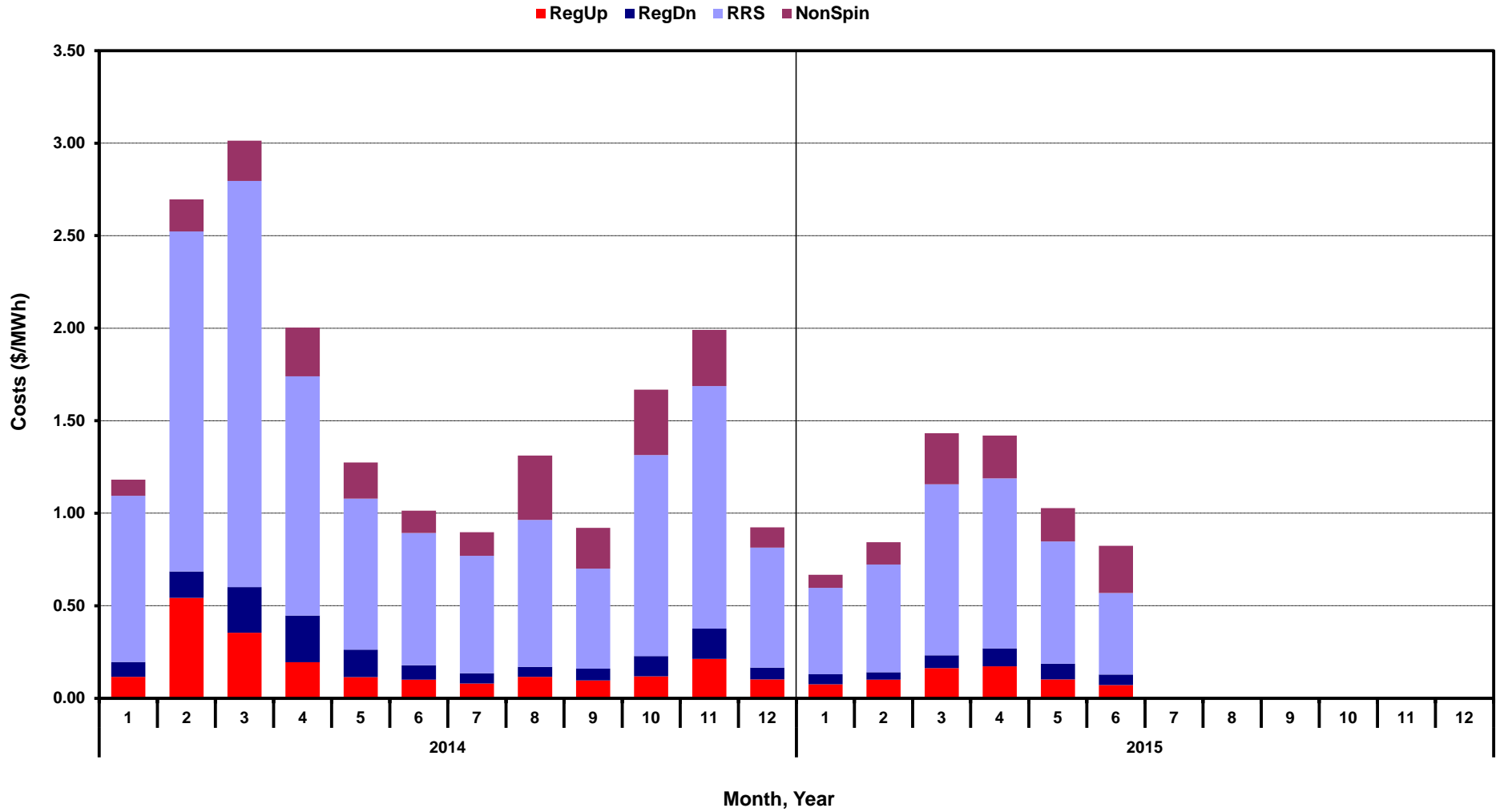
# ERCOT-Wide Cumulative Peaker Net Margin

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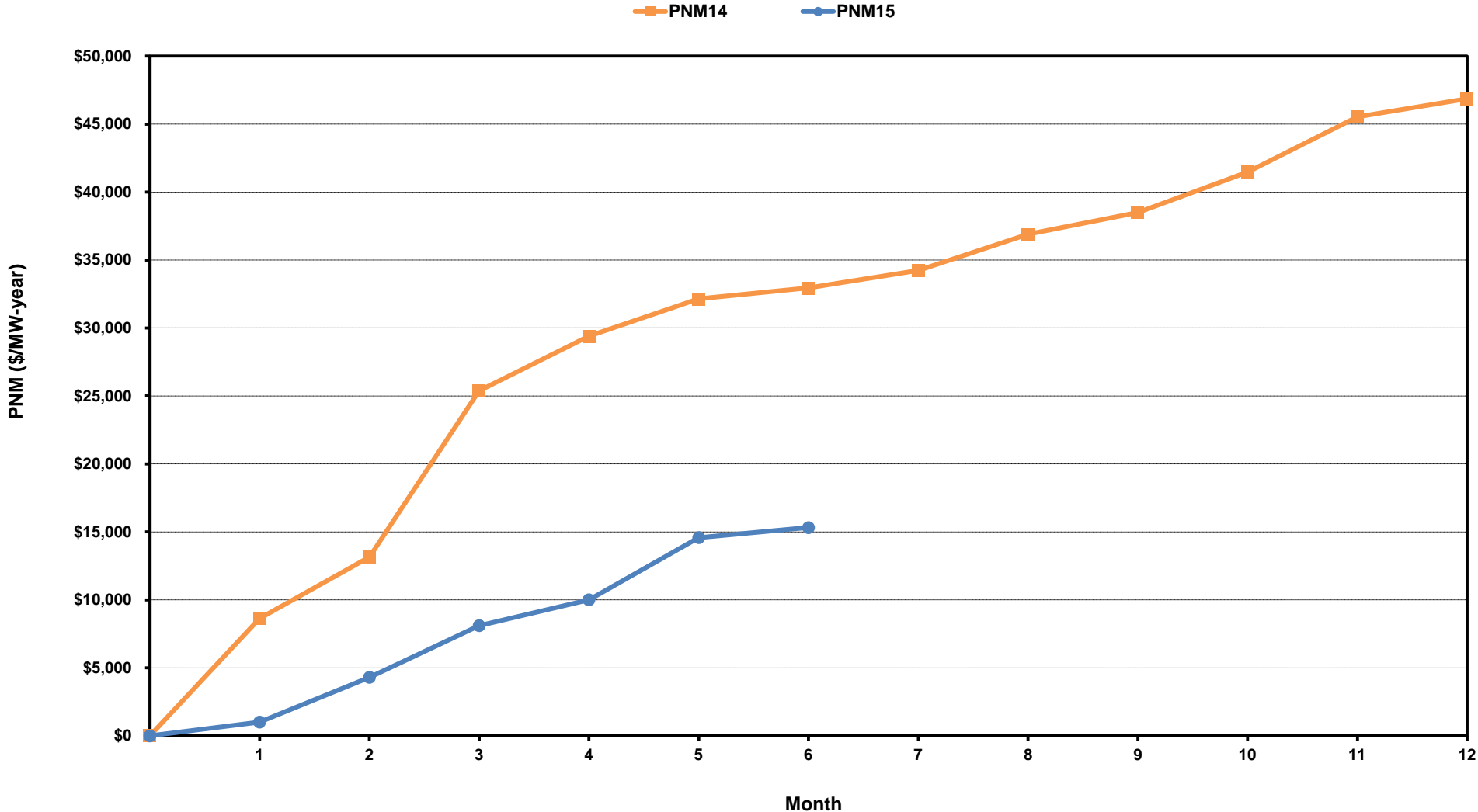
# DA vs. RT Load Forecast Error by Hour Ending

**HE_1_4** — **HE_5_8** — **HE_9_12** — **HE_13_16** — **HE_17_20** — **HE_21_24**



Positive values indicate that DA Load Forecast > RT Load

Y-axis: Forecast Error (MW) — values: 2,000.00 / 1,500.00 / 1,000.00 / 500.00 / - / (500.00) / (1,000.00) / (1,500.00) / (2,000.00)

X-axis: Months 1–12 (2014), 1–12 (2015)

X-axis label: Month, Year
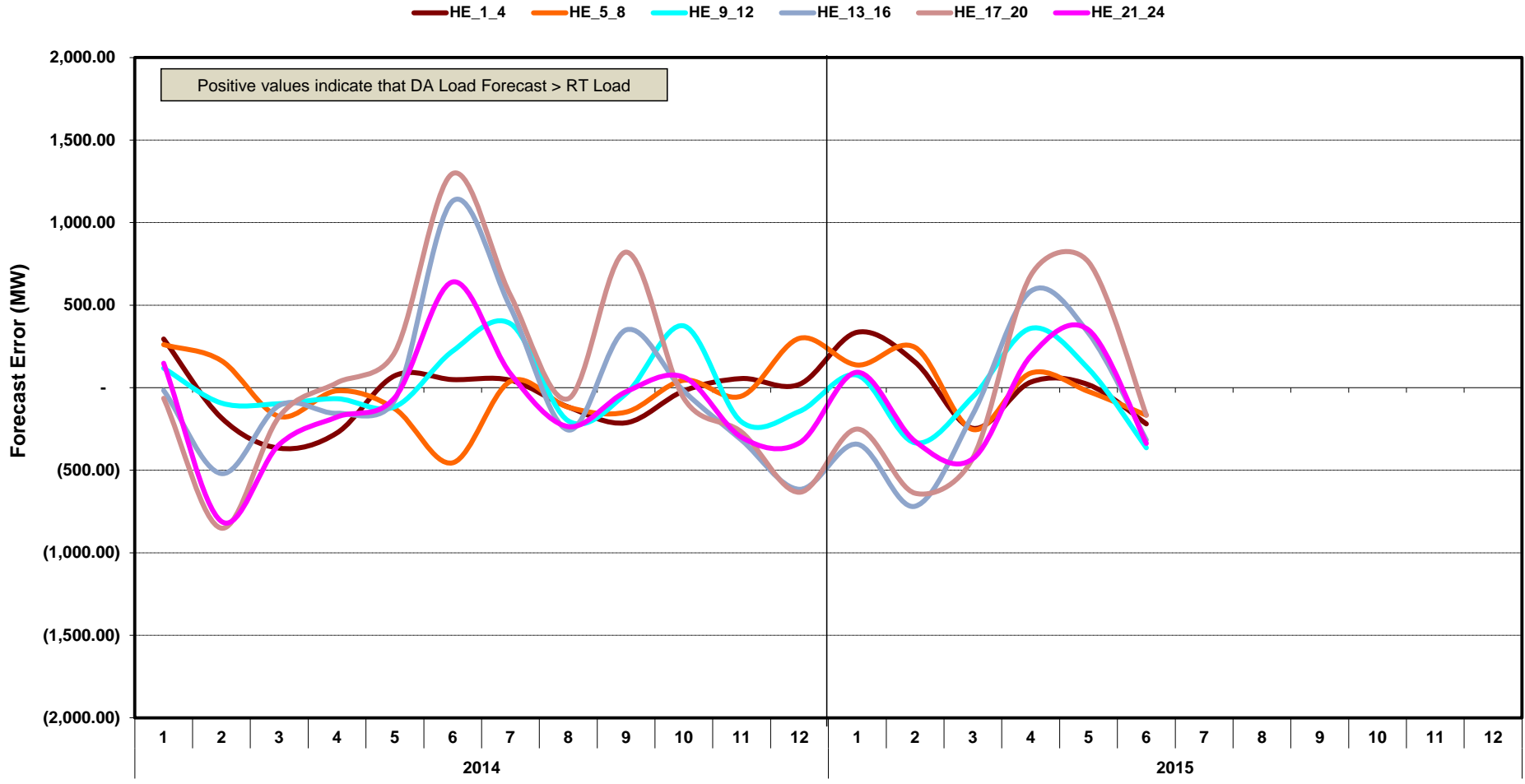
# Monthly Average of Wind Generation by Hour Ending
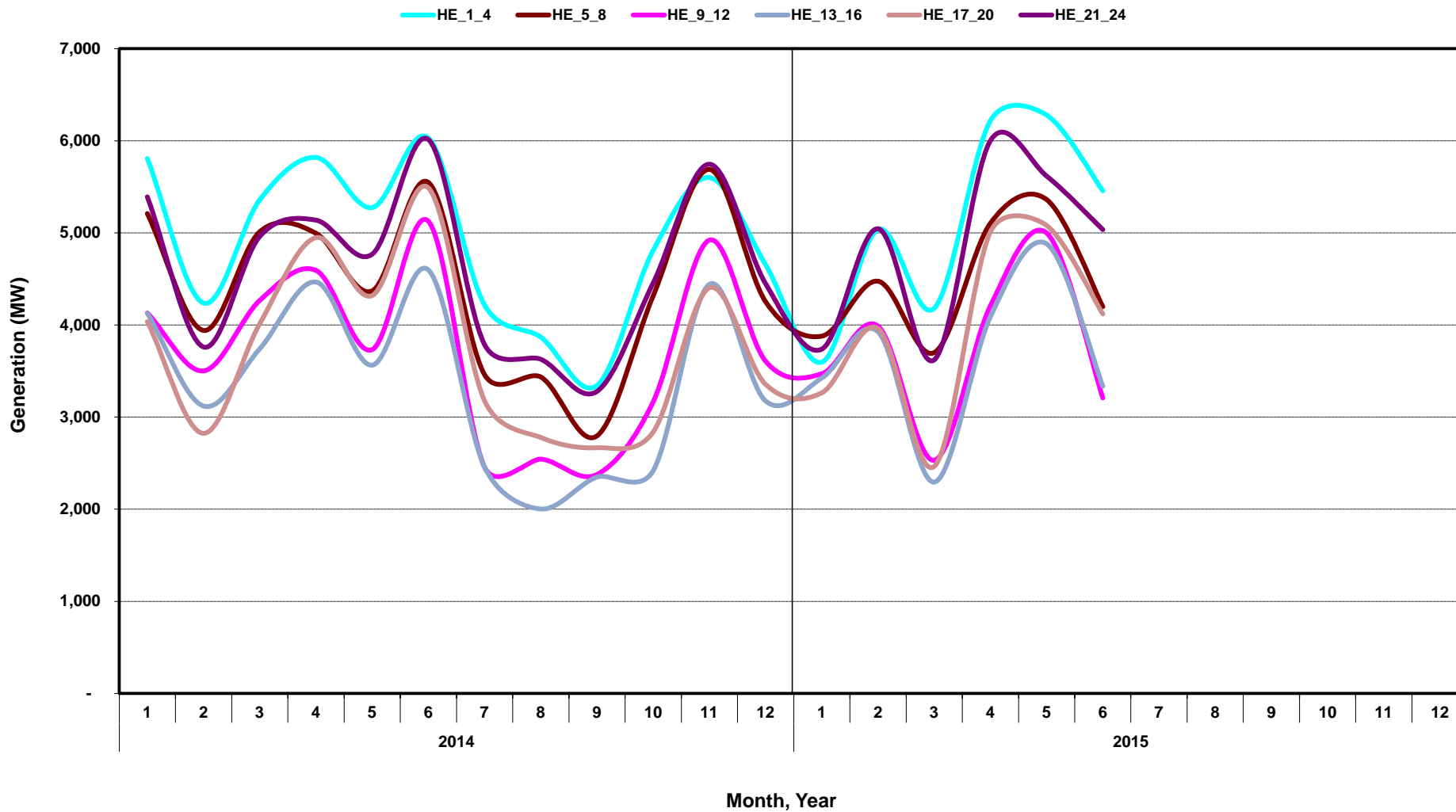


Legend: HE_1_4, HE_5_8, HE_9_12, HE_13_16, HE_17_20, HE_21_24

Y-axis: Generation (MW)

X-axis: Month, Year (2014, 2015)

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# RT Congestion Constraint Rankings - 1

## Top 10 Constraints by Total Congestion Rent



Congestion Rent in $ million

Name of Constraints

Legend: JAN, FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP, OCT, NOV, DEC

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# RT Congestion Constraint Rankings - 2

## Top 10 Constraints by Binding Frequency

# DA Congestion Constraint Rankings - 1

## Top 10 Constraints by Total Congestion Rent

**Congestion Rent in $ million**



**Name of Constraints**

Constraints (top to bottom):
- LA_PAL_VCAVAZ1_1 (LA_PALMA-VCAVAZOS)
- ROCKPORT_69A1 (ROCKPORT-ROCKPORT)
- 6090__D (HLTSW-AMMFT)
- LON_HI_SMITH1_1 (LON_HILL-SMITH)
- 211T147_1 (GILLCR-MCNEIL_)
- SACH_69T1 (SACH-SACH)
- 6596__F (HLTSW-EMATP)
- LYTTON_S_AT1 (LYTTON_S-LYTTON_S)
- ADERHO_ELSA1_1 (ADERHOLD-ELSA)
- MAR_SKY_1 (MARION-SKYLINE)

Legend:
- JAN
- FEB
- MAR
- APR
- MAY
- JUN
- JUL
- AUG
- SEP
- OCT
- NOV
- DEC

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# DA Congestion Constraint Rankings - 2

## Top 10 Constraints by Binding Frequency

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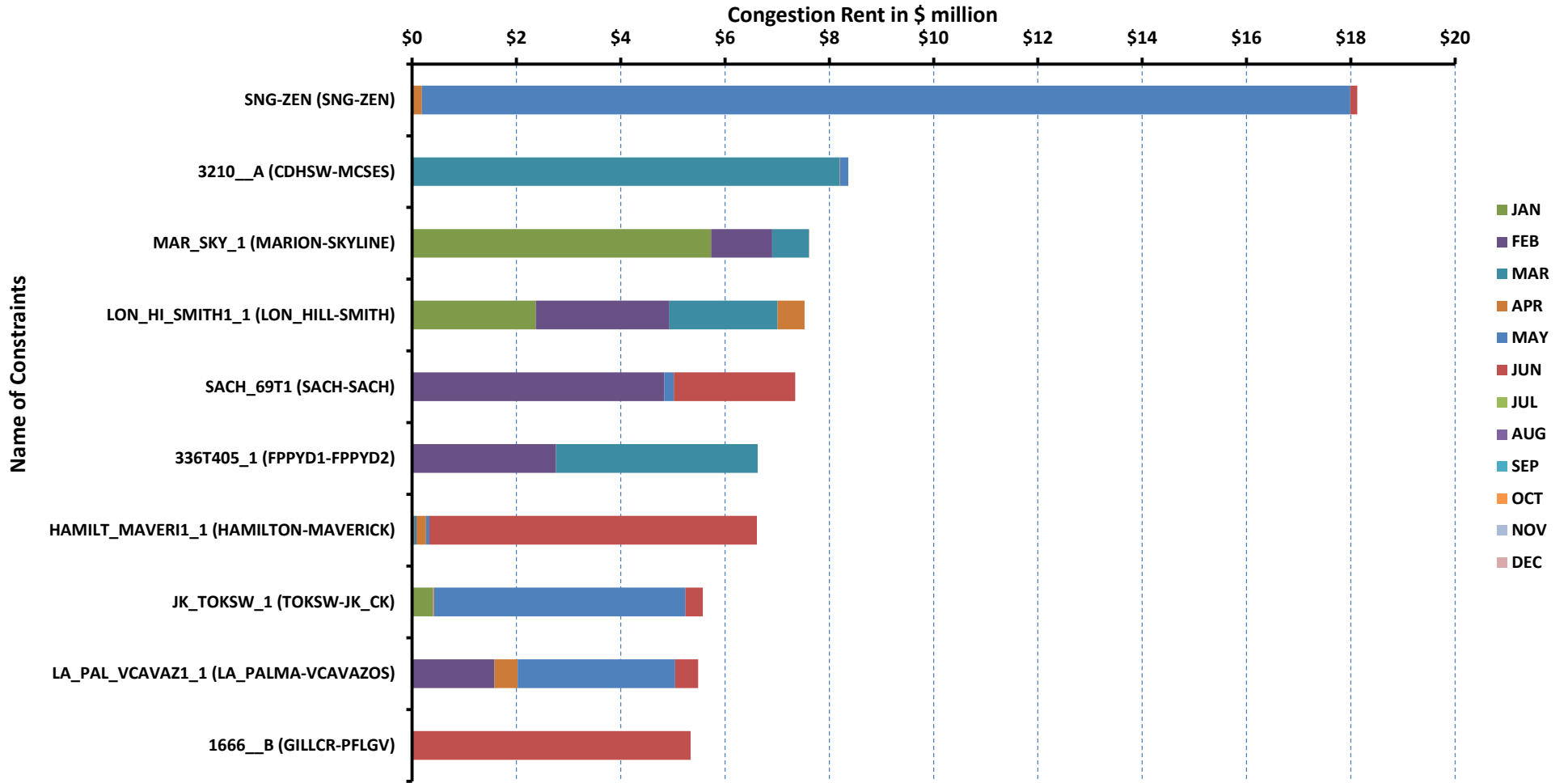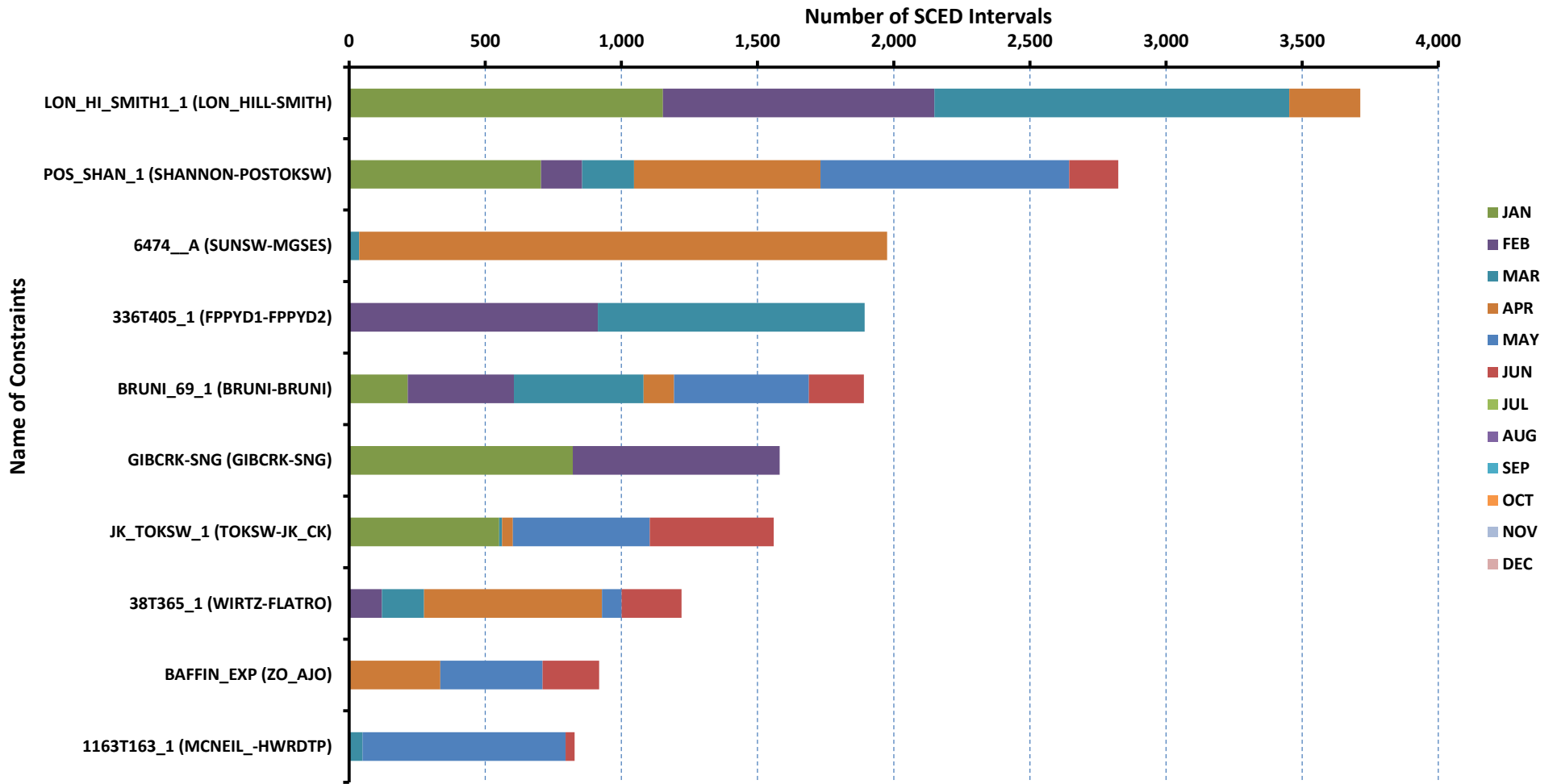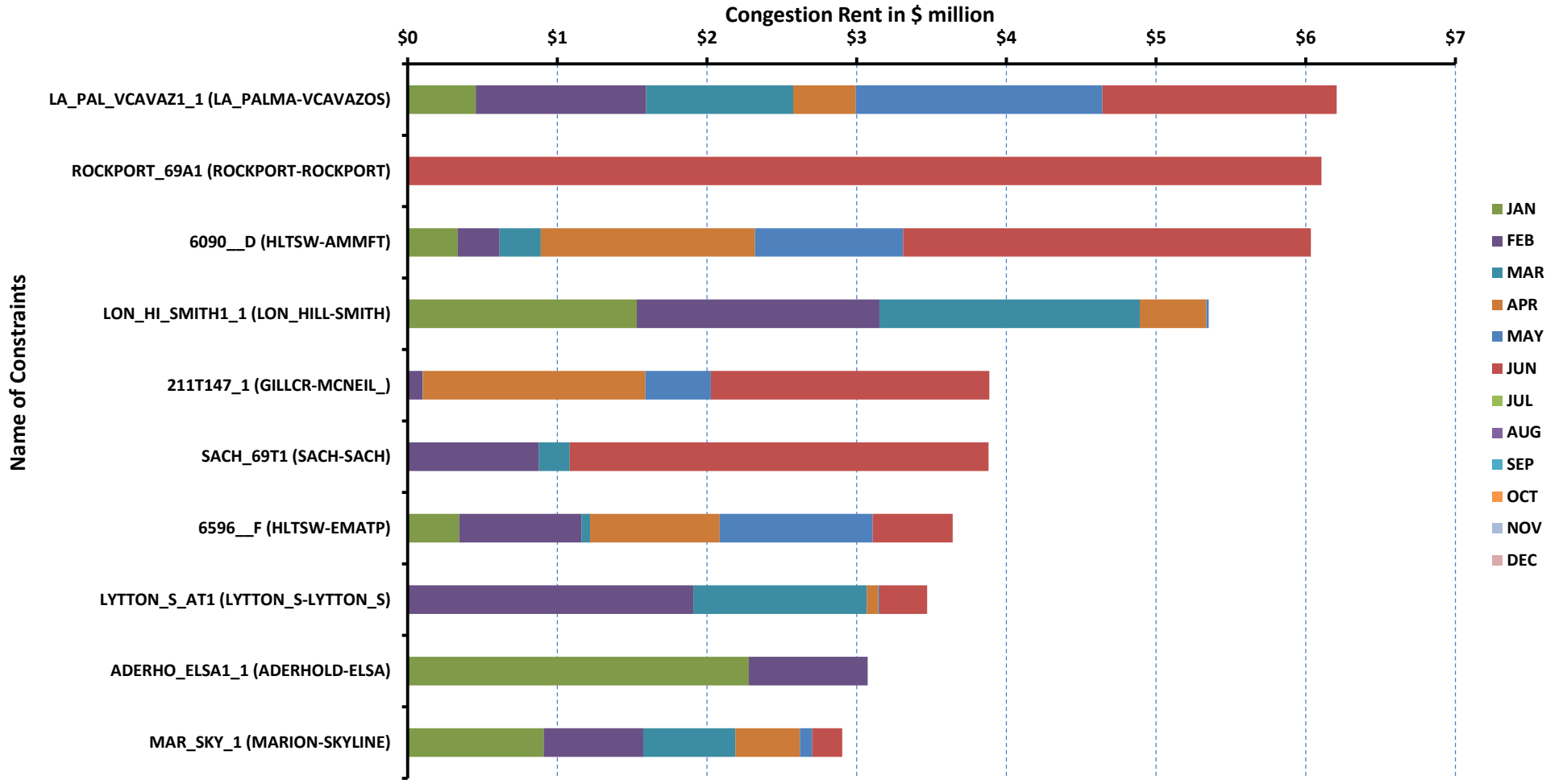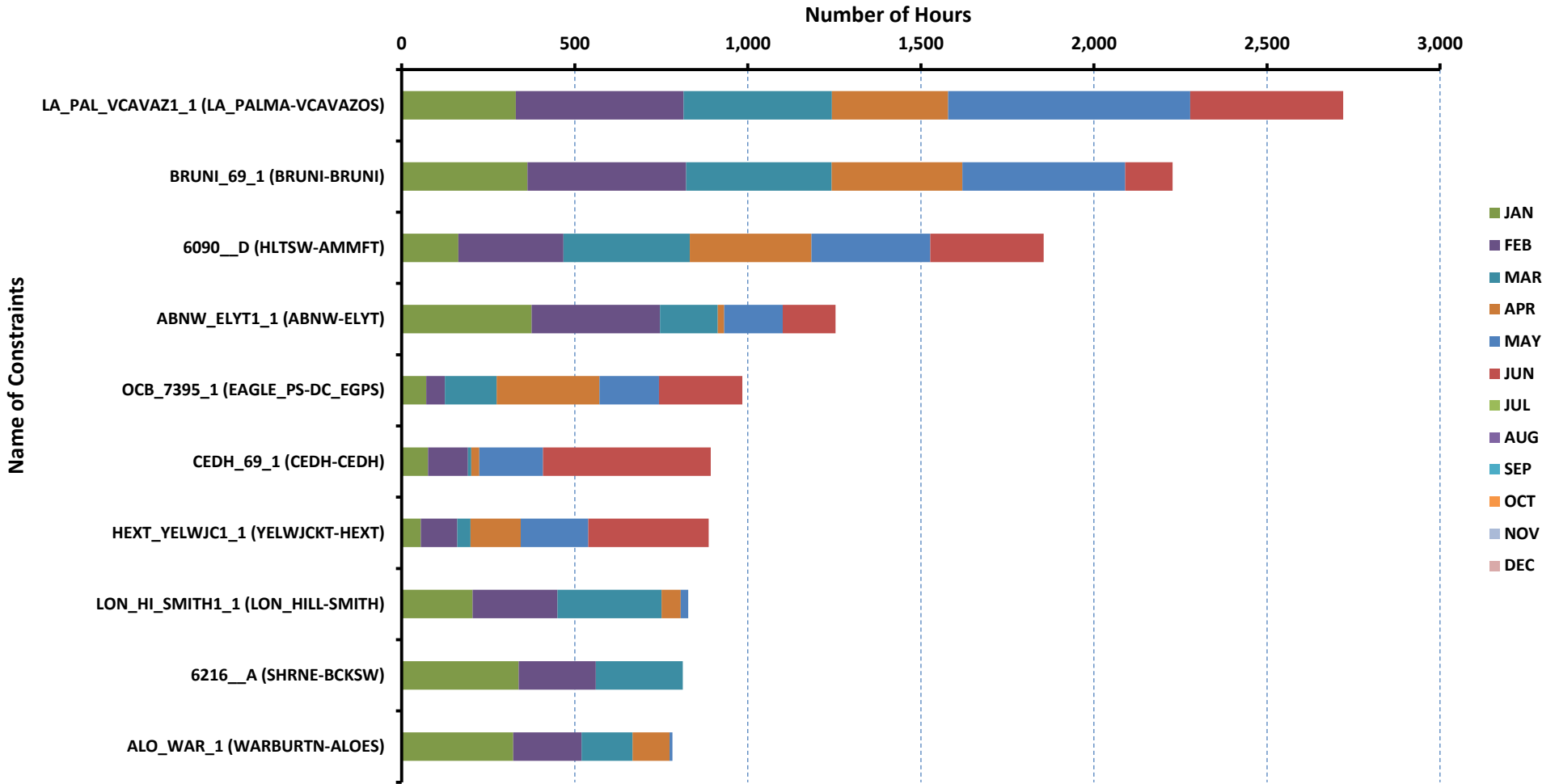
# Top 10 CRR Pairs Ranked by Monthly Auction Values - 1

## Top 10 PTP Obligations by Total Transaction Value
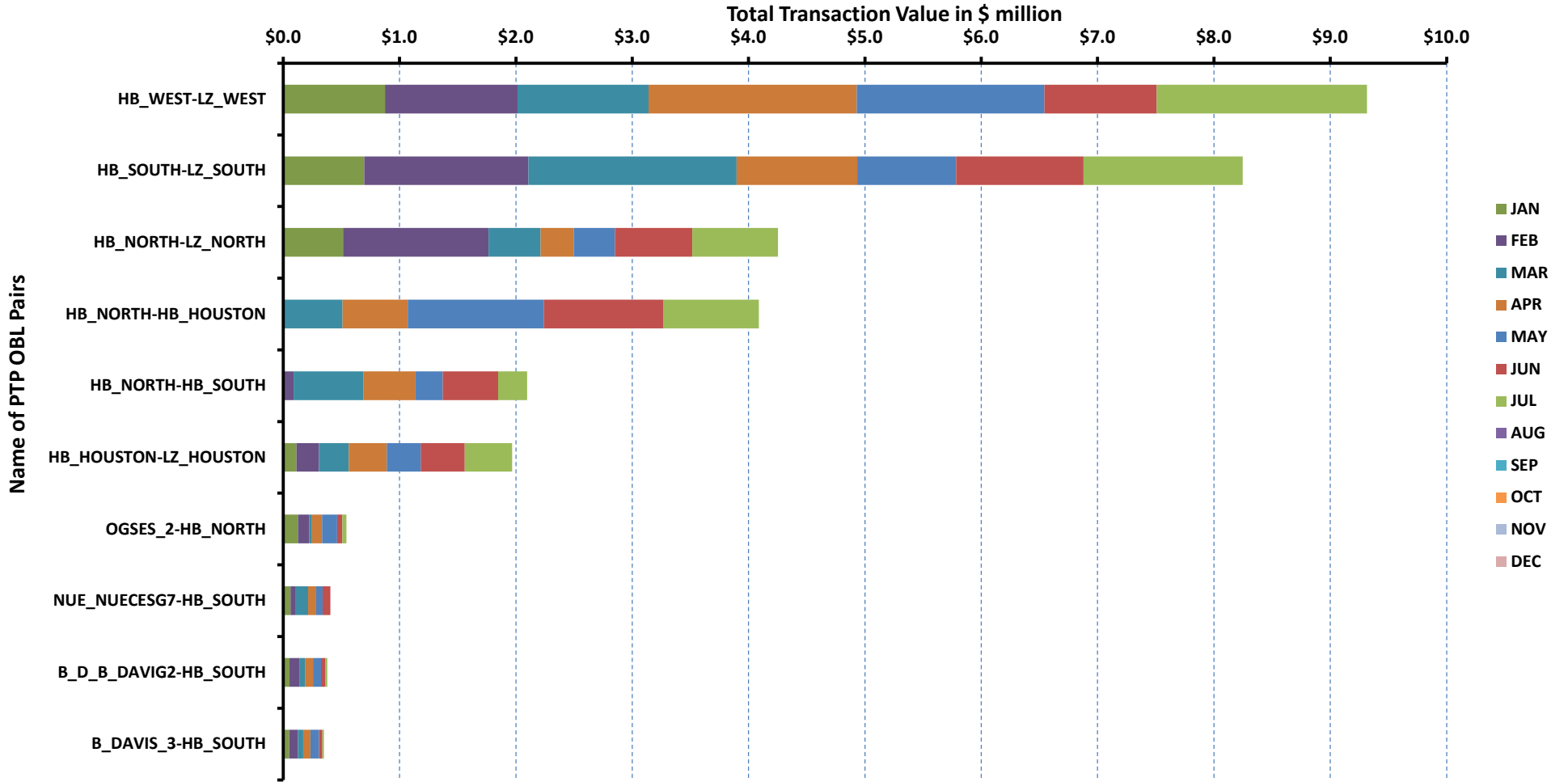
# Top 10 CRR Pairs Ranked by Monthly Auction Values - 2

## Top 10 PTP Options by Total Transaction Value



**Total Transaction Value in $ million**

Legend:
- JAN
- FEB
- MAR
- APR
- MAY
- JUN
- JUL
- AUG
- SEP
- OCT
- NOV
- DEC
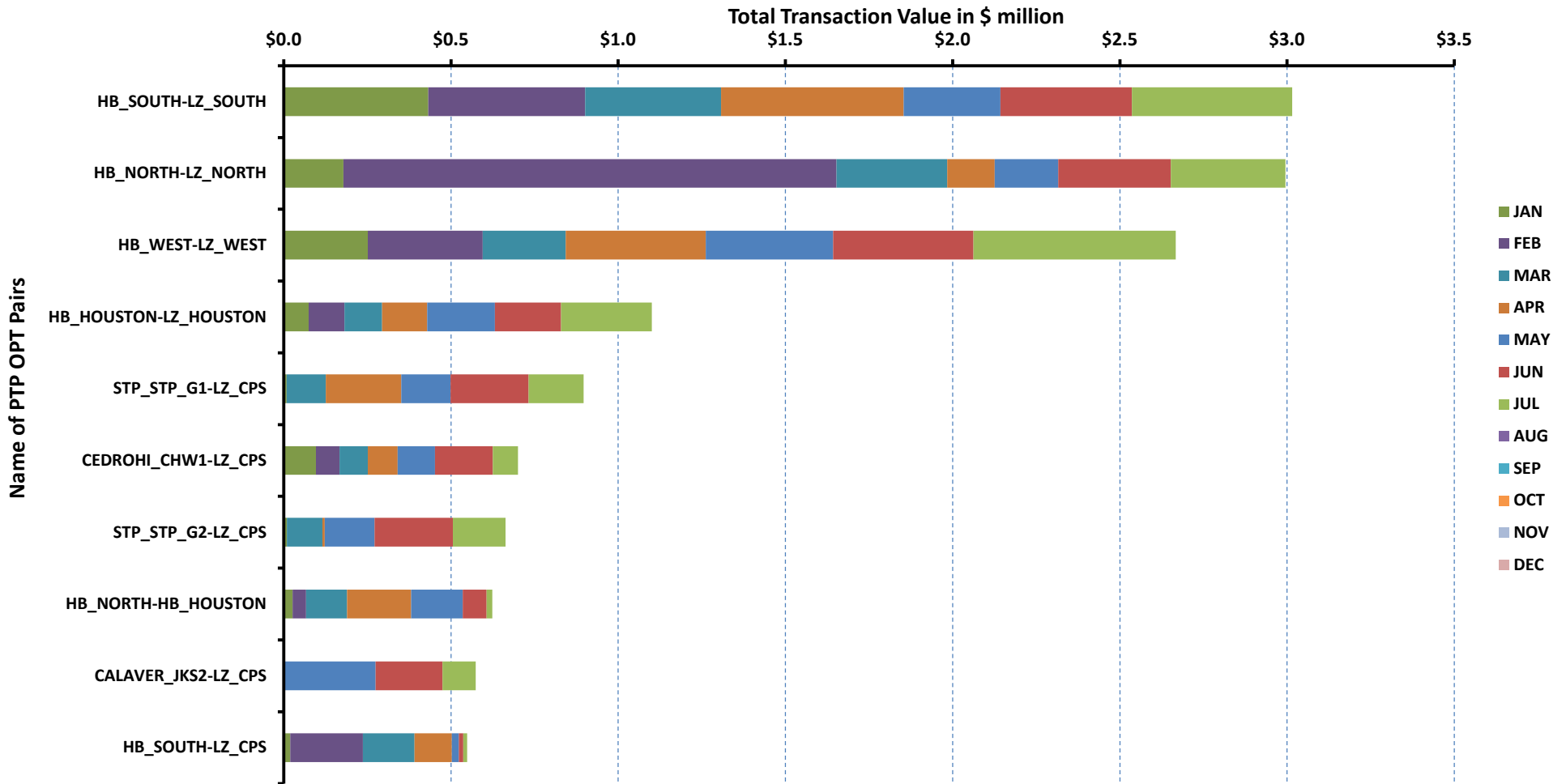
Name of PTP OPT Pairs:
- HB_SOUTH-LZ_SOUTH
- HB_NORTH-LZ_NORTH
- HB_WEST-LZ_WEST
- HB_HOUSTON-LZ_HOUSTON
- STP_STP_G1-LZ_CPS
- CEDROHI_CHW1-LZ_CPS
- STP_STP_G2-LZ_CPS
- HB_NORTH-HB_HOUSTON
- CALAVER_JKS2-LZ_CPS
- HB_SOUTH-LZ_CPS

| year | month | dam_spp | rtm_spp |
|------|-------|---------|---------|
| 2014 | 1 | $ 39.50 | $ 49.04 |
| 2014 | 2 | $ 58.39 | $ 53.46 |
| 2014 | 3 | $ 58.07 | $ 59.59 |
| 2014 | 4 | $ 44.25 | $ 43.45 |
| 2014 | 5 | $ 39.83 | $ 39.12 |
| 2014 | 6 | $ 42.60 | $ 37.31 |
| 2014 | 7 | $ 39.37 | $ 35.89 |
| 2014 | 8 | $ 43.77 | $ 38.37 |
| 2014 | 9 | $ 36.95 | $ 36.75 |
| 2014 | 10 | $ 41.43 | $ 39.45 |
| 2014 | 11 | $ 36.94 | $ 33.97 |
| 2014 | 12 | $ 27.41 | $ 26.02 |
| 2015 | 1 | $ 26.35 | $ 24.97 |
| 2015 | 2 | $ 25.90 | $ 28.28 |
| 2015 | 3 | $ 27.88 | $ 29.14 |
| 2015 | 4 | $ 25.30 | $ 24.74 |
| 2015 | 5 | $ 25.78 | $ 30.81 |
| 2015 | 6 | $ 27.35 | $ 24.64 |
| 2015 | 7 | | |
| 2015 | 8 | | |
| 2015 | 9 | | |
| 2015 | 10 | | |
| 2015 | 11 | | |
| 2015 | 12 | | |

| year | month | loadPEAK_Houston | loadPEAK_North | loadPEAK_South | loadPEAK_West | loadAVG_Houston | loadAVG_North | loadAVG_South | loadAVG_West |
|---|---|---|---|---|---|---|---|---|---|
| 2014 | 1 | 13,651 | 24,123 | 17,347 | 4,213 | 9,355 | 14,910 | 10,232 | 3,290 |
| 2014 | 2 | 12,694 | 24,490 | 16,765 | 4,362 | 9,207 | 14,594 | 9,914 | 3,284 |
| 2014 | 3 | 12,611 | 23,478 | 15,028 | 4,252 | 8,752 | 12,605 | 8,776 | 3,106 |
| 2014 | 4 | 14,099 | 16,946 | 14,714 | 3,755 | 8,989 | 12,038 | 9,164 | 3,078 |
| 2014 | 5 | 14,573 | 19,552 | 15,082 | 4,314 | 10,120 | 13,354 | 10,049 | 3,231 |
| 2014 | 6 | 16,916 | 22,925 | 16,896 | 4,633 | 12,227 | 16,153 | 12,205 | 3,571 |
| 2014 | 7 | 17,531 | 25,096 | 17,809 | 4,803 | 12,655 | 17,081 | 12,765 | 3,749 |
| 2014 | 8 | 17,644 | 26,131 | 18,256 | 4,934 | 12,904 | 18,071 | 13,482 | 3,823 |
| 2014 | 9 | 17,300 | 25,777 | 17,645 | 4,960 | 11,777 | 16,075 | 11,756 | 3,452 |
| 2014 | 10 | 16,529 | 22,406 | 16,314 | 4,295 | 10,147 | 13,211 | 10,299 | 3,219 |
| 2014 | 11 | 12,029 | 21,132 | 14,367 | 4,204 | 9,112 | 12,791 | 9,018 | 3,284 |
| 2014 | 12 | 11,384 | 19,117 | 14,050 | 4,399 | 8,953 | 13,319 | 9,199 | 3,391 |
| 2015 | 1 | 12,803 | 23,814 | 16,491 | 4,340 | 9,537 | 14,916 | 10,831 | 3,499 |
| 2015 | 2 | 12,559 | 21,957 | 16,072 | 4,443 | 9,309 | 14,607 | 9,983 | 3,480 |
| 2015 | 3 | 12,238 | 21,942 | 15,840 | 4,375 | 8,827 | 12,808 | 9,183 | 3,319 |
| 2015 | 4 | 14,000 | 16,971 | 13,396 | 3,935 | 9,708 | 11,898 | 9,403 | 3,174 |
| 2015 | 5 | 15,211 | 20,244 | 14,937 | 4,195 | 10,875 | 12,947 | 10,381 | 3,275 |
| 2015 | 6 | 17,024 | 24,249 | 16,483 | 4,686 | 12,417 | 16,775 | 12,050 | 3,693 |
| 2015 | 7 | | | | | | | | |
| 2015 | 8 | | | | | | | | |
| 2015 | 9 | | | | | | | | |
| 2015 | 10 | | | | | | | | |
| 2015 | 11 | | | | | | | | |
| 2015 | 12 | | | | | | | | |

| year | month | avgRTMp_Houston | avgRTMp_North | avgRTMp_South | avgRTMp_West | avgDAMp_Houston | avgDAMp_North | avgDAMp_South | avgDAMp_West |
|------|-------|-----------------|---------------|---------------|--------------|-----------------|---------------|---------------|--------------|
| 2014 | 1 | $ 44.80 | $ 50.43 | $ 51.86 | $ 46.03 | $ 37.96 | $ 39.34 | $ 41.58 | $ 38.18 |
| 2014 | 2 | $ 48.35 | $ 53.20 | $ 59.07 | $ 51.96 | $ 54.35 | $ 58.37 | $ 62.62 | $ 57.02 |
| 2014 | 3 | $ 53.10 | $ 61.78 | $ 63.63 | $ 57.56 | $ 55.19 | $ 59.29 | $ 60.04 | $ 55.67 |
| 2014 | 4 | $ 47.32 | $ 39.44 | $ 41.30 | $ 54.24 | $ 43.02 | $ 42.08 | $ 42.87 | $ 60.46 |
| 2014 | 5 | $ 38.47 | $ 38.90 | $ 38.32 | $ 44.48 | $ 40.59 | $ 37.85 | $ 39.98 | $ 45.14 |
| 2014 | 6 | $ 38.02 | $ 36.62 | $ 37.24 | $ 38.26 | $ 42.87 | $ 41.69 | $ 42.62 | $ 45.81 |
| 2014 | 7 | $ 35.43 | $ 35.19 | $ 35.99 | $ 40.30 | $ 39.02 | $ 38.61 | $ 39.87 | $ 42.28 |
| 2014 | 8 | $ 38.53 | $ 37.51 | $ 38.74 | $ 40.65 | $ 43.70 | $ 43.16 | $ 44.12 | $ 45.61 |
| 2014 | 9 | $ 37.93 | $ 35.14 | $ 35.73 | $ 43.72 | $ 37.35 | $ 35.92 | $ 37.54 | $ 38.39 |
| 2014 | 10 | $ 38.71 | $ 35.30 | $ 42.89 | $ 47.81 | $ 40.37 | $ 37.70 | $ 45.44 | $ 47.29 |
| 2014 | 11 | $ 33.28 | $ 34.32 | $ 33.73 | $ 35.19 | $ 35.93 | $ 38.23 | $ 36.09 | $ 37.07 |
| 2014 | 12 | $ 25.71 | $ 26.15 | $ 25.84 | $ 26.76 | $ 27.08 | $ 27.44 | $ 27.26 | $ 28.60 |
| 2015 | 1 | $ 24.37 | $ 24.24 | $ 26.39 | $ 25.31 | $ 25.89 | $ 26.09 | $ 26.67 | $ 27.71 |
| 2015 | 2 | $ 26.86 | $ 28.03 | $ 29.60 | $ 29.36 | $ 25.21 | $ 25.66 | $ 26.83 | $ 26.11 |
| 2015 | 3 | $ 27.42 | $ 30.50 | $ 28.92 | $ 29.02 | $ 26.93 | $ 28.08 | $ 28.55 | $ 27.76 |
| 2015 | 4 | $ 24.59 | $ 24.08 | $ 25.53 | $ 25.39 | $ 25.21 | $ 24.58 | $ 25.94 | $ 26.41 |
| 2015 | 5 | $ 34.79 | $ 27.49 | $ 30.68 | $ 31.19 | $ 25.69 | $ 25.31 | $ 26.04 | $ 27.12 |
| 2015 | 6 | $ 23.63 | $ 24.40 | $ 25.20 | $ 27.36 | $ 26.77 | $ 26.27 | $ 28.89 | $ 29.17 |
| 2015 | 7 | | | | | | | | |
| 2015 | 8 | | | | | | | | |
| 2015 | 9 | | | | | | | | |
| 2015 | 10 | | | | | | | | |
| 2015 | 11 | | | | | | | | |
| 2015 | 12 | | | | | | | | |

| year | month | gasprice | rtm_spp | HR_rtm | dam_spp | HR_dam |
|------|-------|----------|---------|--------|---------|--------|
| 2014 | 1 | $ 4.52 | $ 49.04 | 10.84 | $ 39.50 | 8.73 |
| 2014 | 2 | $ 6.07 | $ 53.46 | 8.81 | $ 58.39 | 9.62 |
| 2014 | 3 | $ 4.75 | $ 59.59 | 12.53 | $ 58.07 | 12.21 |
| 2014 | 4 | $ 4.58 | $ 43.45 | 9.49 | $ 44.25 | 9.67 |
| 2014 | 5 | $ 4.45 | $ 39.12 | 8.78 | $ 39.83 | 8.94 |
| 2014 | 6 | $ 4.61 | $ 37.31 | 8.10 | $ 42.60 | 9.25 |
| 2014 | 7 | $ 4.05 | $ 35.89 | 8.86 | $ 39.37 | 9.71 |
| 2014 | 8 | $ 3.92 | $ 38.37 | 9.78 | $ 43.77 | 11.16 |
| 2014 | 9 | $ 3.92 | $ 36.75 | 9.37 | $ 36.95 | 9.42 |
| 2014 | 10 | $ 3.72 | $ 39.45 | 10.60 | $ 41.43 | 11.14 |
| 2014 | 11 | $ 4.01 | $ 33.97 | 8.48 | $ 36.94 | 9.22 |
| 2014 | 12 | $ 3.27 | $ 26.02 | 7.95 | $ 27.41 | 8.38 |
| 2015 | 1 | $ 2.92 | $ 24.97 | 8.54 | $ 26.35 | 9.01 |
| 2015 | 2 | $ 2.68 | $ 28.28 | 10.56 | $ 25.90 | 9.67 |
| 2015 | 3 | $ 2.70 | $ 29.14 | 10.80 | $ 27.88 | 10.33 |
| 2015 | 4 | $ 2.56 | $ 24.74 | 9.66 | $ 25.30 | 9.87 |
| 2015 | 5 | $ 2.80 | $ 30.81 | 11.02 | $ 25.78 | 9.22 |
| 2015 | 6 | $ 2.71 | $ 24.64 | 9.09 | $ 27.35 | 10.09 |
| 2015 | 7 | | | | | |
| 2015 | 8 | | | | | |
| 2015 | 9 | | | | | |
| 2015 | 10 | | | | | |
| 2015 | 11 | | | | | |
| 2015 | 12 | | | | | |

| year | month | HRdam_Houston | HRdam_South | HRdam_North | HRdam_West | HRrtm_Houston | HRrtm_South | HRrtm_North | HRrtm_West |
|------|-------|---------------|-------------|-------------|------------|---------------|-------------|-------------|------------|
| 2014 | 1 | 8.39 | 9.19 | 8.70 | 8.44 | 9.90 | 11.47 | 11.15 | 10.18 |
| 2014 | 2 | 8.95 | 10.32 | 9.62 | 9.39 | 7.96 | 9.73 | 8.76 | 8.56 |
| 2014 | 3 | 11.61 | 12.63 | 12.47 | 11.71 | 11.17 | 13.38 | 12.99 | 12.11 |
| 2014 | 4 | 9.40 | 9.36 | 9.19 | 13.21 | 10.34 | 9.02 | 8.62 | 11.85 |
| 2014 | 5 | 9.11 | 8.98 | 8.50 | 10.13 | 8.64 | 8.60 | 8.73 | 9.98 |
| 2014 | 6 | 9.30 | 9.25 | 9.05 | 9.94 | 8.25 | 8.08 | 7.95 | 8.30 |
| 2014 | 7 | 9.63 | 9.84 | 9.53 | 10.43 | 8.74 | 8.88 | 8.68 | 9.94 |
| 2014 | 8 | 11.14 | 11.25 | 11.00 | 11.63 | 9.82 | 9.88 | 9.56 | 10.36 |
| 2014 | 9 | 9.52 | 9.57 | 9.16 | 9.79 | 9.67 | 9.11 | 8.96 | 11.15 |
| 2014 | 10 | 10.85 | 12.21 | 10.13 | 12.71 | 10.40 | 11.53 | 9.49 | 12.85 |
| 2014 | 11 | 8.97 | 9.01 | 9.54 | 9.25 | 8.31 | 8.42 | 8.57 | 8.78 |
| 2014 | 12 | 8.28 | 8.33 | 8.39 | 8.74 | 7.86 | 7.90 | 7.99 | 8.18 |
| 2015 | 1 | 8.86 | 9.12 | 8.92 | 9.48 | 8.34 | 9.03 | 8.29 | 8.66 |
| 2015 | 2 | 9.41 | 10.02 | 9.58 | 9.75 | 10.03 | 11.05 | 10.47 | 10.96 |
| 2015 | 3 | 9.98 | 10.58 | 10.41 | 10.29 | 10.16 | 10.72 | 11.30 | 10.76 |
| 2015 | 4 | 9.84 | 10.12 | 9.59 | 10.31 | 9.60 | 9.96 | 9.40 | 9.91 |
| 2015 | 5 | 9.19 | 9.31 | 9.05 | 9.70 | 12.44 | 10.97 | 9.83 | 11.15 |
| 2015 | 6 | 9.88 | 10.66 | 9.69 | 10.76 | 8.72 | 9.30 | 9.00 | 10.10 |
| 2015 | 7 | | | | | | | | |
| 2015 | 8 | | | | | | | | |
| 2015 | 9 | | | | | | | | |
| 2015 | 10 | | | | | | | | |
| 2015 | 11 | | | | | | | | |
| 2015 | 12 | | | | | | | | |

Item 5
ERCOT Public

| YEAR | MONTH | DAY | Intervals | RS_Adder |
|------|-------|-----|-----------|----------|
| 2015 | 6 | 1 | 0 | $ - |
| 2015 | 6 | 2 | 0 | $ - |
| 2015 | 6 | 3 | 0 | $ - |
| 2015 | 6 | 4 | 2 | $ 0.09 |
| 2015 | 6 | 5 | 0 | $ - |
| 2015 | 6 | 6 | 14 | $ 0.17 |
| 2015 | 6 | 7 | 22 | $ 0.56 |
| 2015 | 6 | 8 | 27 | $ 0.53 |
| 2015 | 6 | 9 | 12 | $ 0.54 |
| 2015 | 6 | 10 | 18 | $ 0.09 |
| 2015 | 6 | 11 | 14 | $ 0.07 |
| 2015 | 6 | 12 | 23 | $ 0.17 |
| 2015 | 6 | 13 | 32 | $ 0.67 |
| 2015 | 6 | 14 | 6 | $ 0.03 |
| 2015 | 6 | 15 | 34 | $ 1.65 |
| 2015 | 6 | 16 | 1 | $ 0.01 |
| 2015 | 6 | 17 | 18 | $ 0.02 |
| 2015 | 6 | 18 | 32 | $ 1.11 |
| 2015 | 6 | 19 | 17 | $ 0.11 |
| 2015 | 6 | 20 | 0 | $ - |
| 2015 | 6 | 21 | 0 | $ - |
| 2015 | 6 | 22 | 0 | $ - |
| 2015 | 6 | 23 | 12 | $ 0.02 |
| 2015 | 6 | 24 | 24 | $ 0.55 |
| 2015 | 6 | 25 | 31 | $ 5.51 |
| 2015 | 6 | 26 | 16 | $ 0.07 |
| 2015 | 6 | 27 | 28 | $ 0.32 |
| 2015 | 6 | 28 | 21 | $ 1.39 |
| 2015 | 6 | 29 | 33 | $ 0.18 |
| 2015 | 6 | 30 | 12 | $ 0.06 |

| year | month | ASMW_REGDN | ASMW_NSPIN | ASMW_RRS | ASMW_REGUP |
|------|-------|-----------|-----------|---------|-----------|
| 2014 | 1 | 368 | 1,500 | 2,800 | 427 |
| 2014 | 2 | 369 | 1,500 | 2,800 | 446 |
| 2014 | 3 | 402 | 1,500 | 2,800 | 442 |
| 2014 | 4 | 396 | 1,497 | 2,800 | 471 |
| 2014 | 5 | 437 | 1,497 | 2,800 | 465 |
| 2014 | 6 | 434 | 1,475 | 2,800 | 469 |
| 2014 | 7 | 426 | 1,434 | 2,800 | 439 |
| 2014 | 8 | 433 | 1,427 | 2,800 | 462 |
| 2014 | 9 | 423 | 1,423 | 2,800 | 472 |
| 2014 | 10 | 439 | 1,391 | 2,800 | 446 |
| 2014 | 11 | 420 | 1,500 | 2,800 | 448 |
| 2014 | 12 | 361 | 1,500 | 2,800 | 393 |
| 2015 | 1 | 379 | 1,500 | 2,800 | 416 |
| 2015 | 2 | 370 | 1,500 | 2,800 | 425 |
| 2015 | 3 | 393 | 1,500 | 2,800 | 449 |
| 2015 | 4 | 396 | 1,500 | 2,800 | 450 |
| 2015 | 5 | 409 | 1,464 | 2,800 | 446 |
| 2015 | 6 | 458 | 1,915 | 2,616 | 483 |
| 2015 | 7 | | | | |
| 2015 | 8 | | | | |
| 2015 | 9 | | | | |
| 2015 | 10 | | | | |
| 2015 | 11 | | | | |
| 2015 | 12 | | | | |

| year | DELIVERY_HOUR | ASMW_REGDN | ASMW_NSPIN | ASMW_RRS | ASMW_REGUP |
|---|---|---|---|---|---|
| 2014 | 1 | 458 | 1,440 | 2,800 | 524 |
| 2014 | 2 | 359 | 1,440 | 2,800 | 354 |
| 2014 | 3 | 327 | 1,494 | 2,800 | 318 |
| 2014 | 4 | 306 | 1,494 | 2,800 | 312 |
| 2014 | 5 | 367 | 1,494 | 2,800 | 366 |
| 2014 | 6 | 543 | 1,494 | 2,800 | 527 |
| 2014 | 7 | 453 | 1,488 | 2,800 | 747 |
| 2014 | 8 | 351 | 1,488 | 2,800 | 435 |
| 2014 | 9 | 388 | 1,488 | 2,800 | 461 |
| 2014 | 10 | 467 | 1,488 | 2,800 | 463 |
| 2014 | 11 | 427 | 1,428 | 2,800 | 497 |
| 2014 | 12 | 406 | 1,428 | 2,800 | 472 |
| 2014 | 13 | 344 | 1,428 | 2,800 | 432 |
| 2014 | 14 | 353 | 1,428 | 2,800 | 436 |
| 2014 | 15 | 345 | 1,500 | 2,800 | 372 |
| 2014 | 16 | 322 | 1,500 | 2,800 | 358 |
| 2014 | 17 | 331 | 1,500 | 2,800 | 373 |
| 2014 | 18 | 397 | 1,500 | 2,800 | 462 |
| 2014 | 19 | 439 | 1,469 | 2,800 | 445 |
| 2014 | 20 | 421 | 1,469 | 2,800 | 455 |
| 2014 | 21 | 410 | 1,469 | 2,800 | 388 |
| 2014 | 22 | 505 | 1,469 | 2,800 | 456 |
| 2014 | 23 | 574 | 1,440 | 2,800 | 555 |
| 2014 | 24 | 526 | 1,440 | 2,800 | 547 |
| 2015 | 1 | 436 | 1,507 | 2,783 | 476 |
| 2015 | 2 | 359 | 1,516 | 2,783 | 355 |
| 2015 | 3 | 311 | 1,583 | 2,801 | 333 |
| 2015 | 4 | 308 | 1,583 | 2,801 | 319 |
| 2015 | 5 | 410 | 1,583 | 2,801 | 406 |
| 2015 | 6 | 612 | 1,583 | 2,801 | 575 |
| 2015 | 7 | 493 | 1,583 | 2,783 | 806 |
| 2015 | 8 | 379 | 1,583 | 2,783 | 447 |
| 2015 | 9 | 384 | 1,583 | 2,783 | 444 |
| 2015 | 10 | 392 | 1,583 | 2,783 | 426 |
| 2015 | 11 | 399 | 1,546 | 2,747 | 466 |
| 2015 | 12 | 361 | 1,546 | 2,747 | 448 |
| 2015 | 13 | 338 | 1,546 | 2,747 | 397 |
| 2015 | 14 | 338 | 1,546 | 2,747 | 411 |
| 2015 | 15 | 334 | 1,583 | 2,757 | 361 |
| 2015 | 16 | 330 | 1,583 | 2,757 | 368 |
| 2015 | 17 | 336 | 1,583 | 2,757 | 353 |
| 2015 | 18 | 345 | 1,583 | 2,757 | 470 |
| 2015 | 19 | 448 | 1,567 | 2,747 | 442 |
| 2015 | 20 | 383 | 1,567 | 2,747 | 437 |
| 2015 | 21 | 376 | 1,567 | 2,747 | 418 |
| 2015 | 22 | 504 | 1,567 | 2,747 | 436 |
| 2015 | 23 | 538 | 1,516 | 2,783 | 560 |
| 2015 | 24 | 509 | 1,516 | 2,783 | 520 |

| year | month | MCPC_REGDN | MCPC_NSPIN | MCPC_RRS | MCPC_REGUP |
|------|-------|-----------|-----------|----------|-----------|
| 2014 | 1 | $ 8.15 | $ 2.20 | $ 12.12 | $ 10.32 |
| 2014 | 2 | $ 14.28 | $ 4.28 | $ 24.28 | $ 45.03 |
| 2014 | 3 | $ 20.40 | $ 4.81 | $ 26.05 | $ 26.63 |
| 2014 | 4 | $ 21.21 | $ 5.86 | $ 15.35 | $ 13.80 |
| 2014 | 5 | $ 12.45 | $ 4.82 | $ 10.71 | $ 9.04 |
| 2014 | 6 | $ 7.84 | $ 3.59 | $ 11.29 | $ 9.51 |
| 2014 | 7 | $ 6.11 | $ 4.11 | $ 10.47 | $ 8.38 |
| 2014 | 8 | $ 6.12 | $ 11.79 | $ 13.67 | $ 12.10 |
| 2014 | 9 | $ 6.40 | $ 6.64 | $ 8.33 | $ 8.82 |
| 2014 | 10 | $ 9.16 | $ 9.37 | $ 14.31 | $ 9.85 |
| 2014 | 11 | $ 13.31 | $ 6.95 | $ 16.01 | $ 16.26 |
| 2014 | 12 | $ 6.14 | $ 2.56 | $ 8.08 | $ 9.01 |
| 2015 | 1 | $ 5.49 | $ 1.84 | $ 6.47 | $ 7.10 |
| 2015 | 2 | $ 4.05 | $ 3.00 | $ 7.77 | $ 8.83 |
| 2015 | 3 | $ 6.04 | $ 6.26 | $ 11.27 | $ 12.39 |
| 2015 | 4 | $ 8.47 | $ 5.27 | $ 11.21 | $ 13.08 |
| 2015 | 5 | $ 7.78 | $ 4.63 | $ 8.84 | $ 8.58 |
| 2015 | 6 | $ 5.63 | $ 5.98 | $ 7.56 | $ 6.65 |
| 2015 | 7 | | | | |
| 2015 | 8 | | | | |
| 2015 | 9 | | | | |
| 2015 | 10 | | | | |
| 2015 | 11 | | | | |
| 2015 | 12 | | | | |

| year | month | AScost_REGDN | AScost_NSPIN | AScost_RRS | AScost_REGUP |
|------|-------|--------------|--------------|------------|--------------|
| 2014 | 1 | $ 0.08 | $ 0.09 | $ 0.90 | $ 0.12 |
| | 2 | $ 0.14 | $ 0.17 | $ 1.84 | $ 0.54 |
| | 3 | $ 0.25 | $ 0.22 | $ 2.19 | $ 0.35 |
| | 4 | $ 0.25 | $ 0.26 | $ 1.29 | $ 0.20 |
| | 5 | $ 0.15 | $ 0.20 | $ 0.82 | $ 0.11 |
| | 6 | $ 0.08 | $ 0.12 | $ 0.72 | $ 0.10 |
| | 7 | $ 0.06 | $ 0.13 | $ 0.63 | $ 0.08 |
| | 8 | $ 0.05 | $ 0.35 | $ 0.79 | $ 0.12 |
| | 9 | $ 0.06 | $ 0.22 | $ 0.54 | $ 0.10 |
| | 10 | $ 0.11 | $ 0.35 | $ 1.09 | $ 0.12 |
| | 11 | $ 0.16 | $ 0.30 | $ 1.31 | $ 0.21 |
| | 12 | $ 0.06 | $ 0.11 | $ 0.65 | $ 0.10 |
| 2015 | 1 | $ 0.05 | $ 0.07 | $ 0.47 | $ 0.08 |
| | 2 | $ 0.04 | $ 0.12 | $ 0.58 | $ 0.10 |
| | 3 | $ 0.07 | $ 0.28 | $ 0.92 | $ 0.16 |
| | 4 | $ 0.10 | $ 0.23 | $ 0.92 | $ 0.17 |
| | 5 | $ 0.08 | $ 0.18 | $ 0.66 | $ 0.10 |
| | 6 | $ 0.06 | $ 0.25 | $ 0.44 | $ 0.07 |
| | 7 | | | | |
| | 8 | | | | |
| | 9 | | | | |
| | 10 | | | | |
| | 11 | | | | |
| | 12 | | | | |

| year | month | pnm | pnm_accum |
|------|-------|-----|-----------|
| 2014 |    | $         - | $         - |
| 2014 | 1  | $    8,628 | $    8,628 |
| 2014 | 2  | $    4,513 | $   13,142 |
| 2014 | 3  | $   12,232 | $   25,374 |
| 2014 | 4  | $    4,025 | $   29,399 |
| 2014 | 5  | $    2,749 | $   32,148 |
| 2014 | 6  | $      803 | $   32,951 |
| 2014 | 7  | $    1,288 | $   34,239 |
| 2014 | 8  | $    2,656 | $   36,895 |
| 2014 | 9  | $    1,600 | $   38,494 |
| 2014 | 10 | $    2,975 | $   41,469 |
| 2014 | 11 | $    4,063 | $   45,532 |
| 2014 | 12 | $    1,345 | $   46,877 |
| 2015 |    | $         - | $         - |
| 2015 | 1  | $    1,010 | $    1,010 |
| 2015 | 2  | $    3,289 | $    4,299 |
| 2015 | 3  | $    3,801 | $    8,099 |
| 2015 | 4  | $    1,901 | $   10,000 |
| 2015 | 5  | $    4,579 | $   14,579 |
| 2015 | 6  | $      738 | $   15,317 |
| 2015 | 7  |    |    |
| 2015 | 8  |    |    |
| 2015 | 9  |    |    |
| 2015 | 10 |    |    |
| 2015 | 11 |    |    |
| 2015 | 12 |    |    |

| year | month | HE_1_4 | HE_13_16 | HE_17_20 | HE_21_24 | HE_5_8 | HE_9_12 |
|------|-------|--------|----------|----------|----------|--------|---------|
| 2014 | 1 | 295.09 | (16.43) | (64.17) | 148.12 | 261.13 | 118.43 |
| | 2 | (182.99) | (520.15) | (851.12) | (810.35) | 163.44 | (93.02) |
| | 3 | (366.45) | (107.40) | (174.94) | (343.99) | (174.20) | (96.86) |
| | 4 | (273.46) | (154.90) | 30.34 | (177.42) | (18.89) | (66.78) |
| | 5 | 72.77 | (72.69) | 215.55 | (59.14) | (128.09) | (115.22) |
| | 6 | 49.16 | 1,131.18 | 1,297.39 | 640.74 | (454.87) | 222.09 |
| | 7 | 45.09 | 484.34 | 559.22 | 84.72 | 38.71 | 387.67 |
| | 8 | (117.03) | (256.24) | (66.57) | (235.55) | (118.07) | (201.01) |
| | 9 | (212.53) | 350.15 | 821.30 | (24.37) | (147.66) | (35.89) |
| | 10 | (19.03) | (20.80) | (64.71) | 63.58 | 45.20 | 374.23 |
| | 11 | 55.57 | (318.40) | (269.27) | (300.93) | (50.47) | (208.02) |
| | 12 | 20.67 | (615.58) | (633.45) | (334.32) | 299.33 | (143.23) |
| 2015 | 1 | 336.03 | (342.28) | (250.53) | 93.44 | 137.44 | 75.46 |
| | 2 | 154.88 | (718.24) | (639.31) | (324.92) | 244.06 | (334.07) |
| | 3 | (245.99) | (160.01) | (425.43) | (429.77) | (253.32) | (54.32) |
| | 4 | 33.62 | 584.51 | 679.96 | 191.93 | 88.35 | 359.49 |
| | 5 | 18.14 | 330.45 | 761.37 | 350.16 | (22.99) | 114.08 |
| | 6 | (219.39) | (316.61) | (166.26) | (337.55) | (166.60) | (364.09) |
| | 7 | | | | | | |
| | 8 | | | | | | |
| | 9 | | | | | | |
| | 10 | | | | | | |
| | 11 | | | | | | |
| | 12 | | | | | | |

| year | month | HE_1_4 | HE_13_16 | HE_17_20 | HE_21_24 | HE_5_8 | HE_9_12 |
|------|-------|--------|----------|----------|----------|--------|---------|
| 2014 | 1 | 5,808 | 4,127 | 4,036 | 5,391 | 5,211 | 4,131 |
|      | 2 | 4,238 | 3,120 | 2,824 | 3,762 | 3,941 | 3,502 |
|      | 3 | 5,359 | 3,742 | 4,014 | 4,962 | 5,013 | 4,267 |
|      | 4 | 5,819 | 4,467 | 4,949 | 5,139 | 4,996 | 4,593 |
|      | 5 | 5,275 | 3,564 | 4,320 | 4,769 | 4,371 | 3,733 |
|      | 6 | 6,030 | 4,599 | 5,489 | 6,014 | 5,549 | 5,127 |
|      | 7 | 4,216 | 2,459 | 3,177 | 3,787 | 3,461 | 2,457 |
|      | 8 | 3,869 | 2,003 | 2,779 | 3,629 | 3,436 | 2,544 |
|      | 9 | 3,344 | 2,350 | 2,668 | 3,280 | 2,796 | 2,377 |
|      | 10 | 4,810 | 2,418 | 2,839 | 4,457 | 4,317 | 3,166 |
|      | 11 | 5,601 | 4,442 | 4,404 | 5,746 | 5,689 | 4,922 |
|      | 12 | 4,654 | 3,175 | 3,356 | 4,449 | 4,254 | 3,607 |
| 2015 | 1 | 3,597 | 3,424 | 3,264 | 3,738 | 3,879 | 3,471 |
|      | 2 | 5,036 | 3,927 | 3,961 | 5,045 | 4,476 | 3,988 |
|      | 3 | 4,182 | 2,295 | 2,465 | 3,622 | 3,701 | 2,532 |
|      | 4 | 6,218 | 4,090 | 5,011 | 6,002 | 5,105 | 4,209 |
|      | 5 | 6,280 | 4,882 | 5,081 | 5,617 | 5,362 | 5,000 |
|      | 6 | 5,457 | 3,335 | 4,120 | 5,036 | 4,199 | 3,209 |
|      | 7 | | | | | | |
|      | 8 | | | | | | |
|      | 9 | | | | | | |
|      | 10 | | | | | | |
|      | 11 | | | | | | |
|      | 12 | | | | | | |

| category | year | item | rankvar | rank | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FREQ_EXIST | 2015 | LON_HI_SMITH1_1 (LON_HILL-SMITH) | 3,713 | 1 | 1,153 | 996 | 1,303 | 261 | - | - | 0 | 0 | 0 | 0 | 0 | 0 |
| FREQ_EXIST | 2015 | POS_SHAN_1 (SHANNON-POSTOKSW) | 2,825 | 2 | 705 | 151 | 190 | 685 | 913 | 181 | 0 | 0 | 0 | 0 | 0 | 0 |
| FREQ_EXIST | 2015 | 6474__A (SUNSW-MGSES) | 1,976 | 3 | - | - | 37 | 1,939 | - | - | 0 | 0 | 0 | 0 | 0 | 0 |
| FREQ_EXIST | 2015 | 336T405_1 (FPPYD1-FPPYD2) | 1,893 | 4 | - | 914 | 979 | - | - | - | 0 | 0 | 0 | 0 | 0 | 0 |
| FREQ_EXIST | 2015 | BRUNI_69_1 (BRUNI-BRUNI) | 1,890 | 5 | 216 | 389 | 476 | 112 | 495 | 202 | 0 | 0 | 0 | 0 | 0 | 0 |
| FREQ_EXIST | 2015 | GIBCRK-SNG (GIBCRK-SNG) | 1,581 | 6 | 822 | 759 | - | - | - | - | 0 | 0 | 0 | 0 | 0 | 0 |
| FREQ_EXIST | 2015 | JK_TOKSW_1 (TOKSW-JK_CK) | 1,559 | 7 | 551 | - | 11 | 40 | 502 | 455 | 0 | 0 | 0 | 0 | 0 | 0 |
| FREQ_EXIST | 2015 | 38T365_1 (WIRTZ-FLATRO) | 1,221 | 8 | - | 121 | 154 | 654 | 72 | 220 | 0 | 0 | 0 | 0 | 0 | 0 |
| FREQ_EXIST | 2015 | BAFFIN_EXP (ZO_AJO) | 918 | 9 | - | - | - | 335 | 376 | 207 | 0 | 0 | 0 | 0 | 0 | 0 |
| FREQ_EXIST | 2015 | 1163T163_1 (MCNEIL_-HWRDTP) | 828 | 10 | - | - | 50 | - | 745 | 33 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOP10_RENT | 2015 | SNG-ZEN (SNG-ZEN) | $ 18.13 | 1 | $ 0.00 | $ - | $ - | $ 0.19 | $ 17.80 | $ 0.13 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOP10_RENT | 2015 | 3210__A (CDHSW-MCSES) | $ 8.36 | 2 | $ - | $ - | $ 8.20 | $ 0.01 | $ 0.15 | $ - | 0 | 0 | 0 | 0 | 0 | 0 |
| TOP10_RENT | 2015 | MAR_SKY_1 (MARION-SKYLINE) | $ 7.61 | 3 | $ 5.73 | $ 1.17 | $ 0.70 | $ 0.00 | $ - | $ - | 0 | 0 | 0 | 0 | 0 | 0 |
| TOP10_RENT | 2015 | LON_HI_SMITH1_1 (LON_HILL-SMITH) | $ 7.53 | 4 | $ 2.37 | $ 2.56 | $ 2.08 | $ 0.52 | $ - | $ - | 0 | 0 | 0 | 0 | 0 | 0 |
| TOP10_RENT | 2015 | SACH_69T1 (SACH-SACH) | $ 7.35 | 5 | $ - | $ 4.83 | $ - | $ - | $ 0.18 | $ 2.33 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOP10_RENT | 2015 | 336T405_1 (FPPYD1-FPPYD2) | $ 6.62 | 6 | $ - | $ 2.76 | $ 3.86 | $ - | $ - | $ - | 0 | 0 | 0 | 0 | 0 | 0 |
| TOP10_RENT | 2015 | HAMILT_MAVERI1_1 (HAMILTON-MAVERICK) | $ 6.61 | 7 | $ 0.02 | $ 0.03 | $ 0.03 | $ 0.19 | $ 0.06 | $ 6.28 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOP10_RENT | 2015 | JK_TOKSW_1 (TOKSW-JK_CK) | $ 5.57 | 8 | $ 0.40 | $ - | $ 0.00 | $ 0.02 | $ 4.82 | $ 0.33 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOP10_RENT | 2015 | LA_PAL_VCAVAZ1_1 (LA_PALMA-VCAVAZOS) | $ 5.49 | 9 | $ - | $ 1.58 | $ - | $ 0.45 | $ 3.02 | $ 0.44 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOP10_RENT | 2015 | 1666__B (GILLCR-PFLGV) | $ 5.34 | 10 | $ - | $ - | $ - | $ - | $ - | $ 5.34 | 0 | 0 | 0 | 0 | 0 | 0 |

| category | year | item | rankvar | rank | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FREQ_EXIST | 2015 | LA_PAL_VCAVAZ1_1 (LA_PALMA-VCAVAZOS) | 2,720 | 1 | 330 | 484 | 429 | 336 | 699 | 442 | 0 | 0 | 0 | 0 | 0 | 0 |
| FREQ_EXIST | 2015 | BRUNI_69_1 (BRUNI-BRUNI) | 2,227 | 2 | 363 | 459 | 420 | 378 | 470 | 137 | 0 | 0 | 0 | 0 | 0 | 0 |
| FREQ_EXIST | 2015 | 6090__D (HLTSW-AMMFT) | 1,855 | 3 | 164 | 303 | 365 | 352 | 343 | 328 | 0 | 0 | 0 | 0 | 0 | 0 |
| FREQ_EXIST | 2015 | ABNW_ELYT1_1 (ABNW-ELYT) | 1,253 | 4 | 375 | 371 | 167 | 19 | 169 | 152 | 0 | 0 | 0 | 0 | 0 | 0 |
| FREQ_EXIST | 2015 | OCB_7395_1 (EAGLE_PS-DC_EGPS) | 984 | 5 | 71 | 54 | 149 | 297 | 172 | 241 | 0 | 0 | 0 | 0 | 0 | 0 |
| FREQ_EXIST | 2015 | CEDH_69_1 (CEDH-CEDH) | 893 | 6 | 76 | 115 | 10 | 23 | 184 | 485 | 0 | 0 | 0 | 0 | 0 | 0 |
| FREQ_EXIST | 2015 | HEXT_YELWJC1_1 (YELWJCKT-HEXT) | 887 | 7 | 55 | 106 | 38 | 145 | 195 | 348 | 0 | 0 | 0 | 0 | 0 | 0 |
| FREQ_EXIST | 2015 | LON_HI_SMITH1_1 (LON_HILL-SMITH) | 828 | 8 | 205 | 245 | 301 | 55 | 22 | - | 0 | 0 | 0 | 0 | 0 | 0 |
| FREQ_EXIST | 2015 | 6216__A (SHRNE-BCKSW) | 812 | 9 | 338 | 223 | 251 | - | - | - | 0 | 0 | 0 | 0 | 0 | 0 |
| FREQ_EXIST | 2015 | ALO_WAR_1 (WARBURTN-ALOES) | 782 | 10 | 322 | 198 | 147 | 107 | 8 | - | 0 | 0 | 0 | 0 | 0 | 0 |
| TOP10_RENT | 2015 | LA_PAL_VCAVAZ1_1 (LA_PALMA-VCAVAZOS) | $ 6.21 | 1 | $ 0.45 | $ 1.14 | $ 0.98 | $ 0.42 | $ 1.65 | $ 1.57 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOP10_RENT | 2015 | ROCKPORT_69A1 (ROCKPORT-ROCKPORT) | $ 6.11 | 2 | $ - | $ - | $ - | $ - | $ - | $ 6.11 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOP10_RENT | 2015 | 6090__D (HLTSW-AMMFT) | $ 6.03 | 3 | $ 0.33 | $ 0.28 | $ 0.28 | $ 1.43 | $ 0.99 | $ 2.72 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOP10_RENT | 2015 | LON_HI_SMITH1_1 (LON_HILL-SMITH) | $ 5.35 | 4 | $ 1.53 | $ 1.62 | $ 1.74 | $ 0.44 | $ 0.02 | $ - | 0 | 0 | 0 | 0 | 0 | 0 |
| TOP10_RENT | 2015 | 211T147_1 (GILLCR-MCNEIL_) | $ 3.89 | 5 | $ 0.00 | $ 0.10 | $ 0.00 | $ 1.49 | $ 0.44 | $ 1.86 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOP10_RENT | 2015 | SACH_69T1 (SACH-SACH) | $ 3.88 | 6 | $ - | $ 0.88 | $ 0.21 | $ - | $ - | $ 2.80 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOP10_RENT | 2015 | 6596__F (HLTSW-EMATP) | $ 3.64 | 7 | $ 0.35 | $ 0.81 | $ 0.06 | $ 0.87 | $ 1.02 | $ 0.54 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOP10_RENT | 2015 | LYTTON_S_AT1 (LYTTON_S-LYTTON_S) | $ 3.47 | 8 | $ 0.00 | $ 1.91 | $ 1.16 | $ 0.08 | $ 0.01 | $ 0.32 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOP10_RENT | 2015 | ADERHO_ELSA1_1 (ADERHOLD-ELSA) | $ 3.07 | 9 | $ 2.28 | $ 0.79 | $ 0.00 | $ - | $ - | $ - | 0 | 0 | 0 | 0 | 0 | 0 |
| TOP10_RENT | 2015 | MAR_SKY_1 (MARION-SKYLINE) | $ 2.90 | 10 | $ 0.91 | $ 0.67 | $ 0.61 | $ 0.43 | $ 0.08 | $ 0.20 | 0 | 0 | 0 | 0 | 0 | 0 |

Item 5

| ftr_option | year | pair | total_value | rank | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| N | 2015 | HB_WEST-LZ_WEST | $ 9.32 | 1 | $ 0.88 | $ 1.14 | $ 1.13 | $ 1.79 | $ 1.61 | $ 0.97 | $ 1.81 | 0 | 0 | 0 | 0 | 0 |
| N | 2015 | HB_SOUTH-LZ_SOUTH | $ 8.25 | 2 | $ 0.70 | $ 1.41 | $ 1.79 | $ 1.04 | $ 0.85 | $ 1.09 | $ 1.37 | 0 | 0 | 0 | 0 | 0 |
| N | 2015 | HB_NORTH-LZ_NORTH | $ 4.25 | 3 | $ 0.51 | $ 1.25 | $ 0.45 | $ 0.29 | $ 0.35 | $ 0.67 | $ 0.74 | 0 | 0 | 0 | 0 | 0 |
| N | 2015 | HB_NORTH-HB_HOUSTON | $ 4.09 | 4 | $ - | $ - | $ 0.51 | $ 0.56 | $ 1.17 | $ 1.03 | $ 0.82 | 0 | 0 | 0 | 0 | 0 |
| N | 2015 | HB_NORTH-HB_SOUTH | $ 2.10 | 5 | $ - | $ 0.09 | $ 0.60 | $ 0.45 | $ 0.23 | $ 0.48 | $ 0.25 | 0 | 0 | 0 | 0 | 0 |
| N | 2015 | HB_HOUSTON-LZ_HOUSTON | $ 1.97 | 6 | $ 0.11 | $ 0.19 | $ 0.26 | $ 0.33 | $ 0.29 | $ 0.38 | $ 0.41 | 0 | 0 | 0 | 0 | 0 |
| N | 2015 | OGSES_2-HB_NORTH | $ 0.54 | 7 | $ 0.13 | $ 0.10 | $ 0.02 | $ 0.09 | $ 0.13 | $ 0.04 | $ 0.03 | 0 | 0 | 0 | 0 | 0 |
| N | 2015 | NUE_NUECESG7-HB_SOUTH | $ 0.41 | 8 | $ 0.06 | $ 0.04 | $ 0.11 | $ 0.07 | $ 0.06 | $ 0.07 | $ - | 0 | 0 | 0 | 0 | 0 |
| N | 2015 | B_D_B_DAVIG2-HB_SOUTH | $ 0.38 | 9 | $ 0.05 | $ 0.08 | $ 0.05 | $ 0.07 | $ 0.07 | $ 0.04 | $ 0.02 | 0 | 0 | 0 | 0 | 0 |
| N | 2015 | B_DAVIS_3-HB_SOUTH | $ 0.35 | 10 | $ 0.05 | $ 0.08 | $ 0.04 | $ 0.06 | $ 0.07 | $ 0.03 | $ 0.01 | 0 | 0 | 0 | 0 | 0 |
| Y | 2015 | HB_SOUTH-LZ_SOUTH | $ 3.02 | 1 | $ 0.43 | $ 0.47 | $ 0.41 | $ 0.55 | $ 0.29 | $ 0.39 | $ 0.48 | 0 | 0 | 0 | 0 | 0 |
| Y | 2015 | HB_NORTH-LZ_NORTH | $ 3.00 | 2 | $ 0.18 | $ 1.47 | $ 0.33 | $ 0.14 | $ 0.19 | $ 0.34 | $ 0.34 | 0 | 0 | 0 | 0 | 0 |
| Y | 2015 | HB_WEST-LZ_WEST | $ 2.67 | 3 | $ 0.25 | $ 0.34 | $ 0.25 | $ 0.42 | $ 0.38 | $ 0.42 | $ 0.60 | 0 | 0 | 0 | 0 | 0 |
| Y | 2015 | HB_HOUSTON-LZ_HOUSTON | $ 1.10 | 4 | $ 0.07 | $ 0.11 | $ 0.11 | $ 0.14 | $ 0.20 | $ 0.20 | $ 0.27 | 0 | 0 | 0 | 0 | 0 |
| Y | 2015 | STP_STP_G1-LZ_CPS | $ 0.90 | 5 | $ 0.01 | $ - | $ 0.12 | $ 0.23 | $ 0.15 | $ 0.23 | $ 0.16 | 0 | 0 | 0 | 0 | 0 |
| Y | 2015 | CEDROHI_CHW1-LZ_CPS | $ 0.70 | 6 | $ 0.10 | $ 0.07 | $ 0.08 | $ 0.09 | $ 0.11 | $ 0.17 | $ 0.08 | 0 | 0 | 0 | 0 | 0 |
| Y | 2015 | STP_STP_G2-LZ_CPS | $ 0.66 | 7 | $ 0.01 | $ - | $ 0.11 | $ 0.01 | $ 0.15 | $ 0.23 | $ 0.16 | 0 | 0 | 0 | 0 | 0 |
| Y | 2015 | HB_NORTH-HB_HOUSTON | $ 0.62 | 8 | $ 0.03 | $ 0.04 | $ 0.12 | $ 0.19 | $ 0.15 | $ 0.07 | $ 0.02 | 0 | 0 | 0 | 0 | 0 |
| Y | 2015 | CALAVER_JKS2-LZ_CPS | $ 0.57 | 9 | $ - | $ - | $ 0.00 | $ 0.00 | $ 0.27 | $ 0.20 | $ 0.10 | 0 | 0 | 0 | 0 | 0 |
| Y | 2015 | HB_SOUTH-LZ_CPS | $ 0.55 | 10 | $ 0.02 | $ 0.22 | $ 0.15 | $ 0.11 | $ 0.02 | $ 0.01 | $ 0.01 | 0 | 0 | 0 | 0 | 0 |