

To the Public Utility Commission of Texas

ERCOT Wholesale Electricity Market Monthly Report

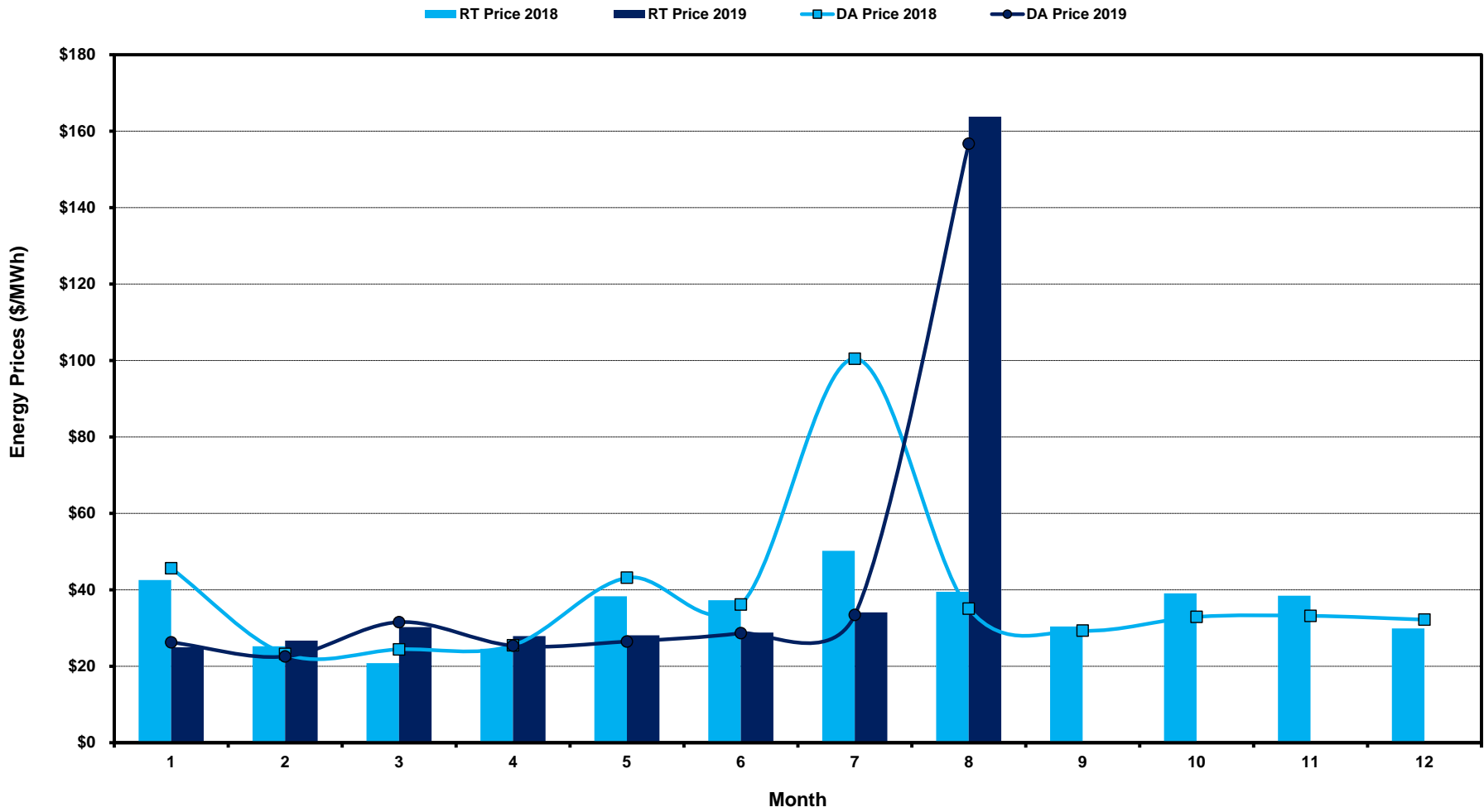
Monday, September 9, 2019

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)



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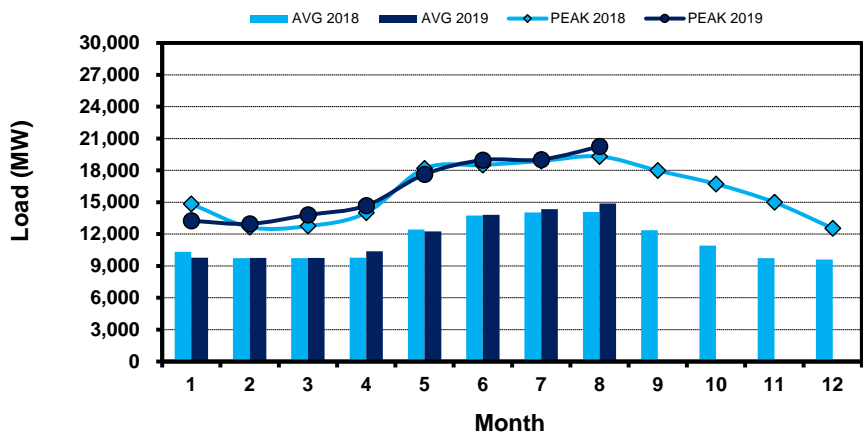
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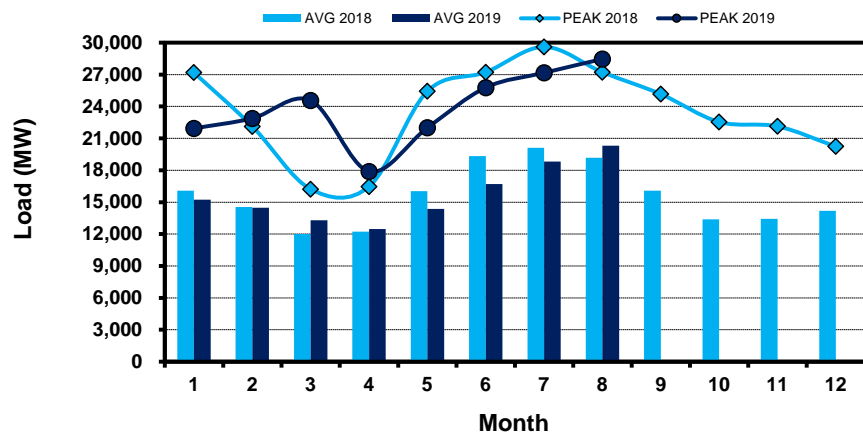
Load Zone Load Statistics

(Nodal load zone made comparable to zonal system Load Zone definitions*)

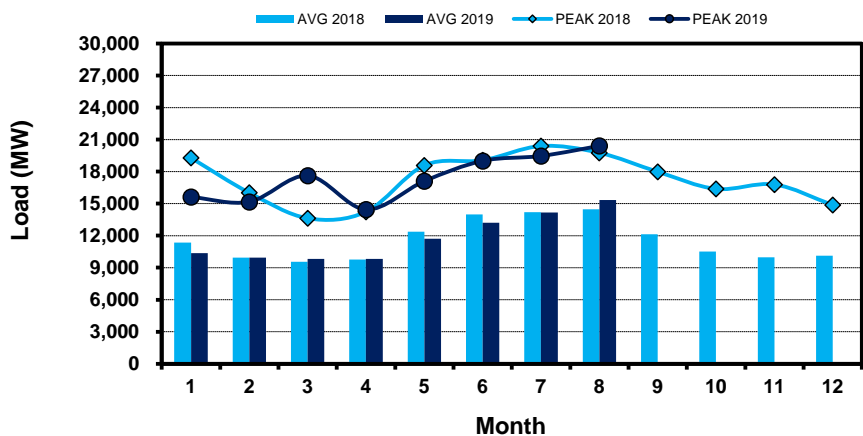
Houston Zone



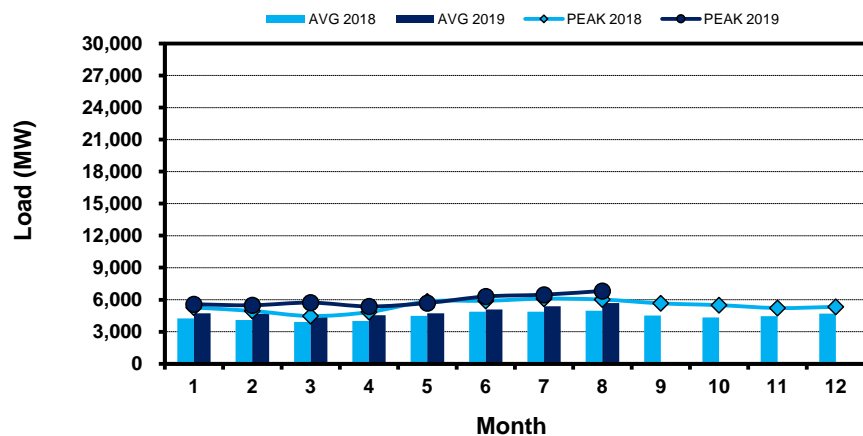
North Zone



South Zone



West Zone



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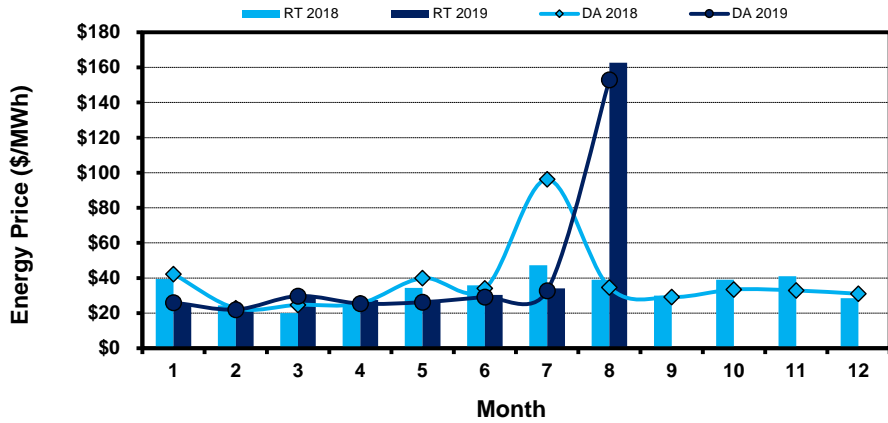
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Note: * Zonal load zone definition vs. Nodal comparable load zone definition: LZ_Houston=LZ_Houston; LZ_West=LZ_West; LZ_North=(LZ_North,LZ_RAYBN); LZ_South=(LZ_South,LZ_CPS,LZ_AEN,LZ_LCRA)

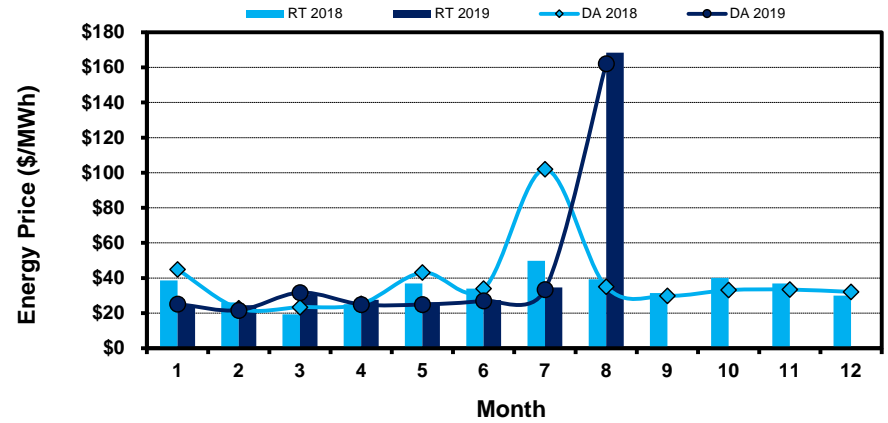
Load Zone Monthly Average Energy Price DA vs RT

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

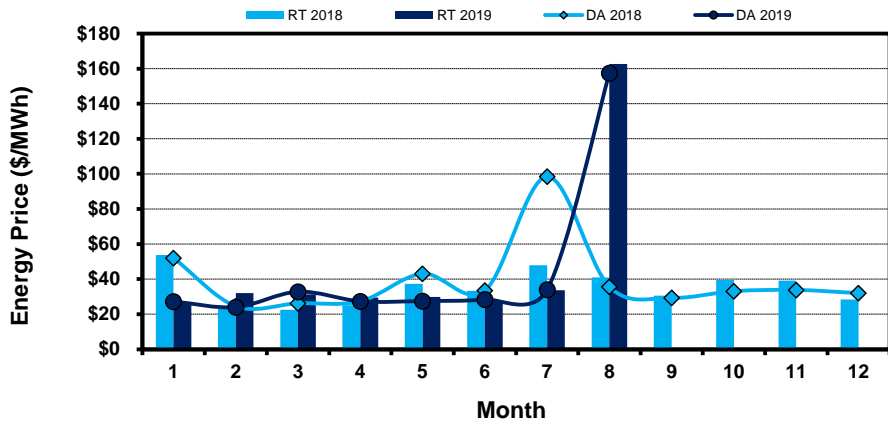
Houston Zone



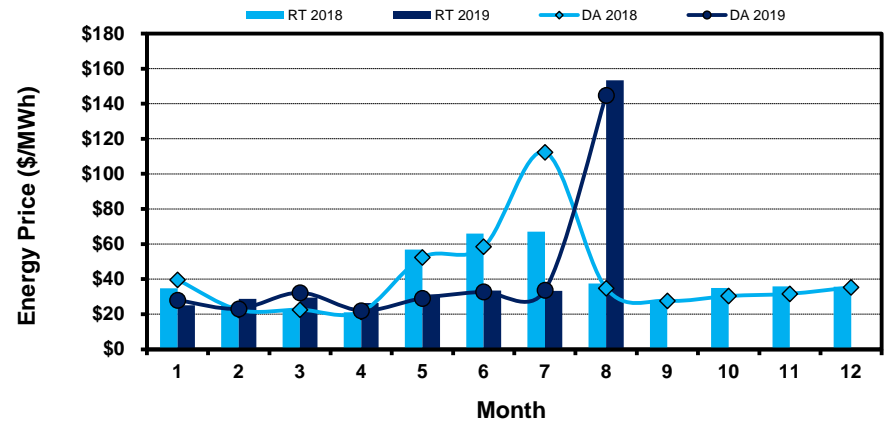
North Zone



South Zone



West Zone



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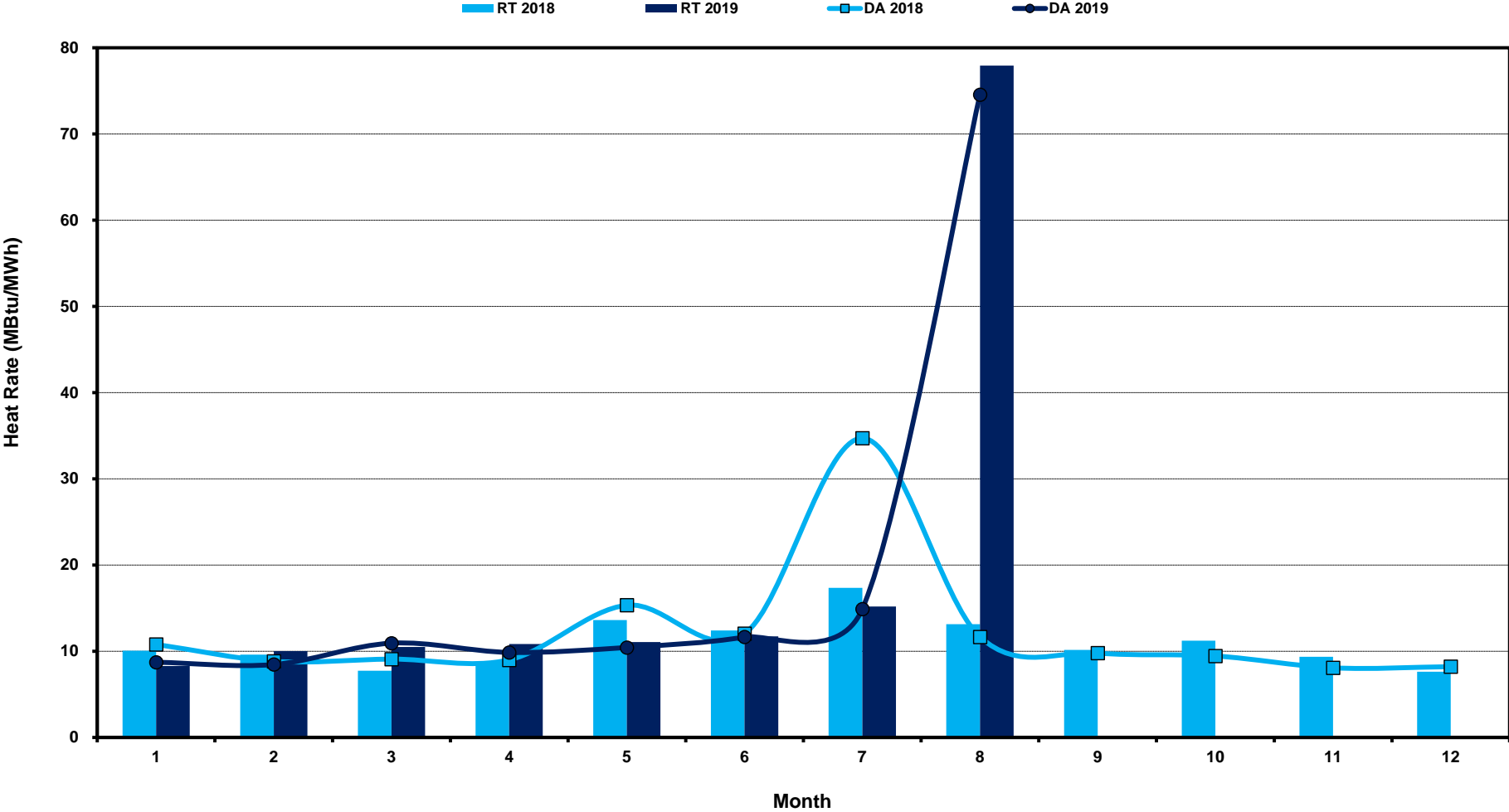
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Note: * Zonal load zone definition vs. Nodal comparable load zone definition: LZ_Houston=LZ_Houston; LZ_West=LZ_West; LZ_North=(LZ_North,LZ_RAYBN); LZ_South=(LZ_South,LZ_CPS,LZ_AEN,LZ_LCRA)

ERCOT-wide Monthly Implied Heat Rate DA vs RT

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



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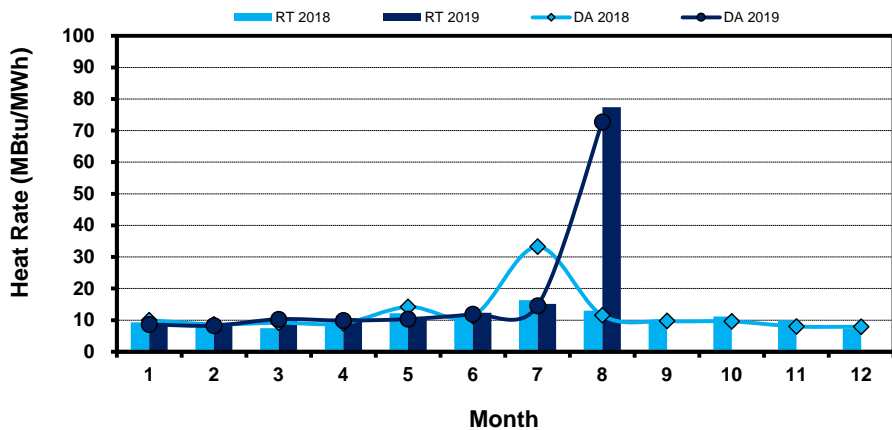
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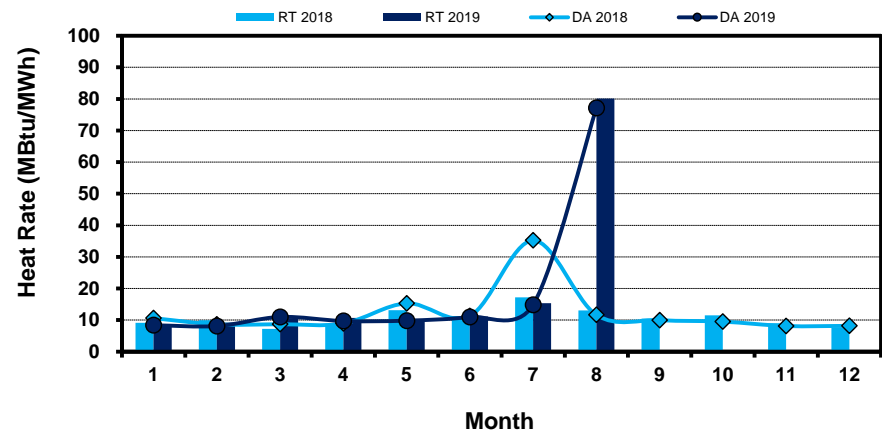
Load Zone Monthly Implied Heat Rate DA vs RT

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

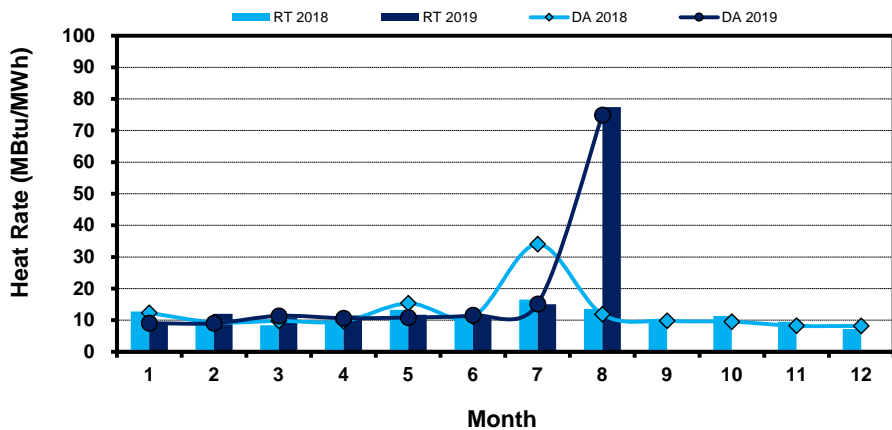
Houston Zone



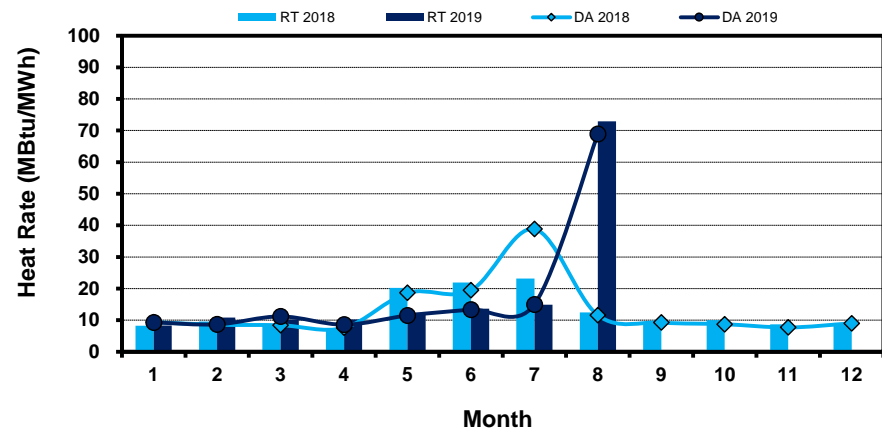
North Zone



South Zone



West Zone



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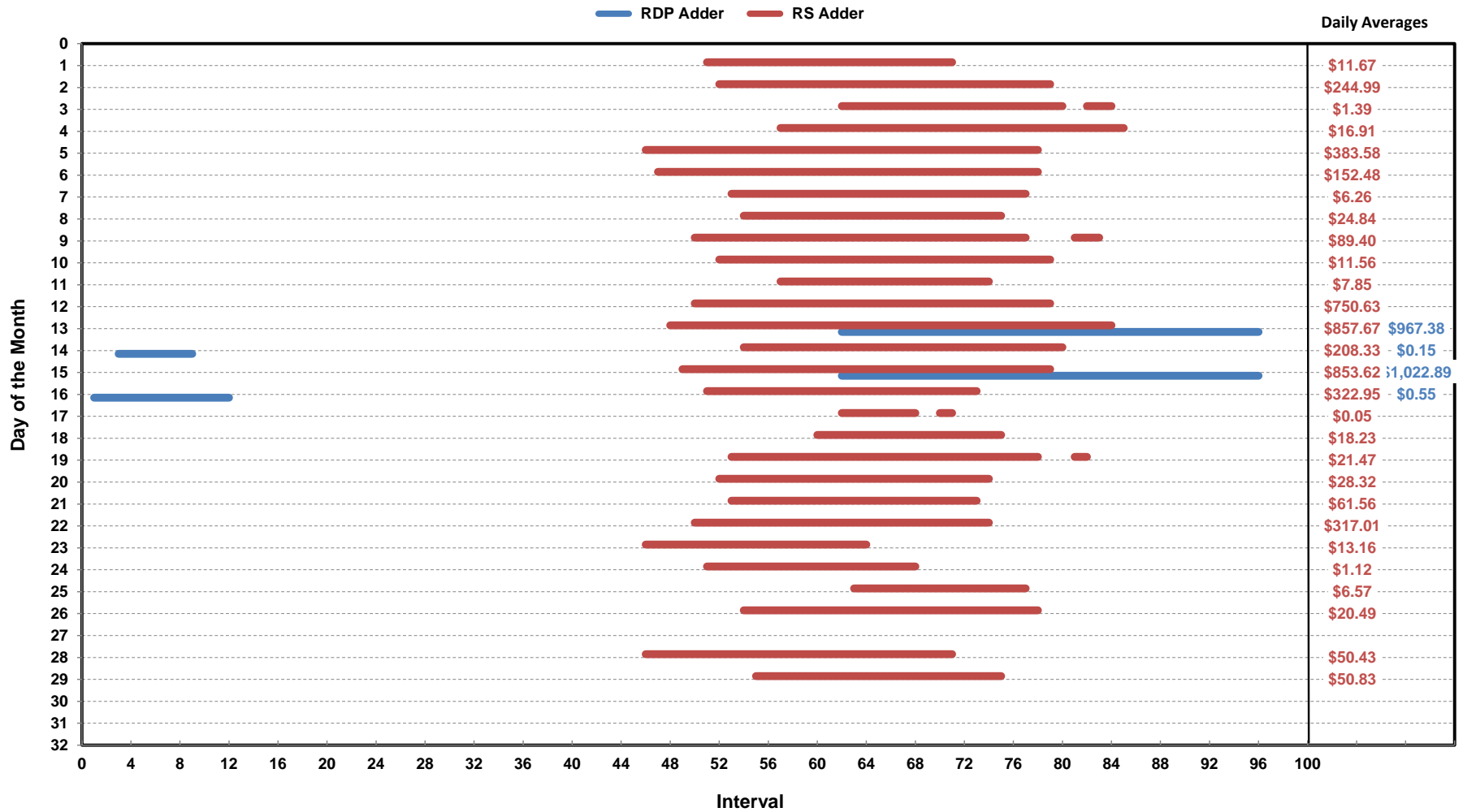
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Note: * Zonal load zone definition vs. Nodal comparable load zone definition: LZ_Houston=LZ_Houston; LZ_West=LZ_West; LZ_North=(LZ_North,LZ_RAYBN); LZ_South=(LZ_South,LZ_CPS,LZ_AEN,LZ_LCRA)

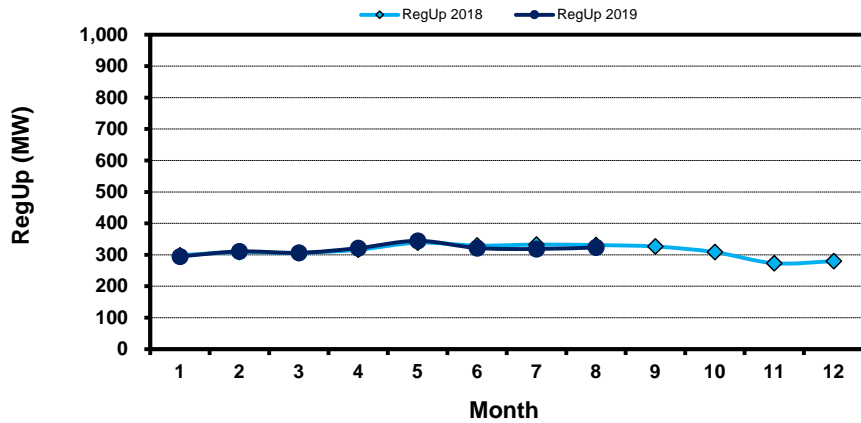
Daily ORDC Adders Average Values and Interval Duration Aug-2019



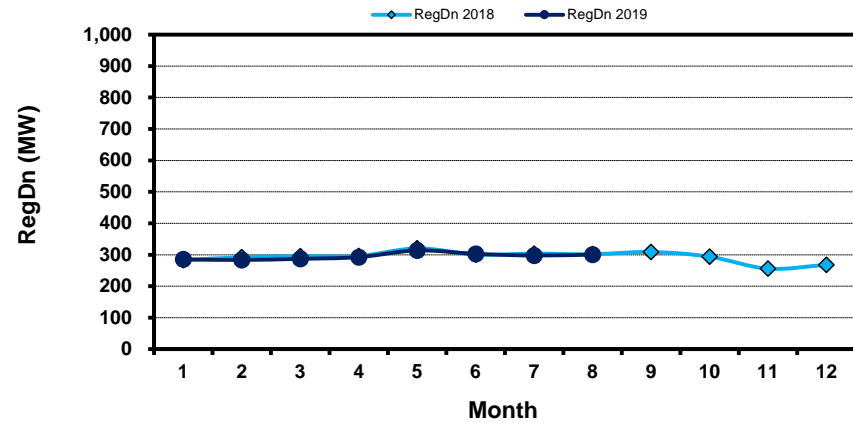
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Monthly Average of Ancillary Services Required MW

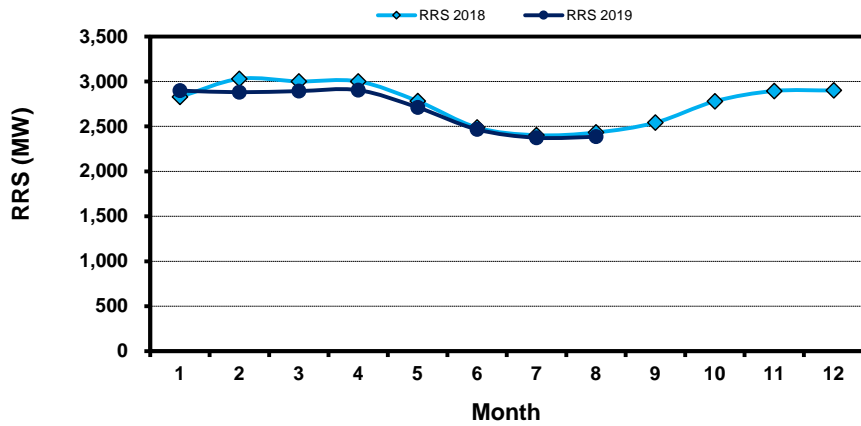
Regulation Up



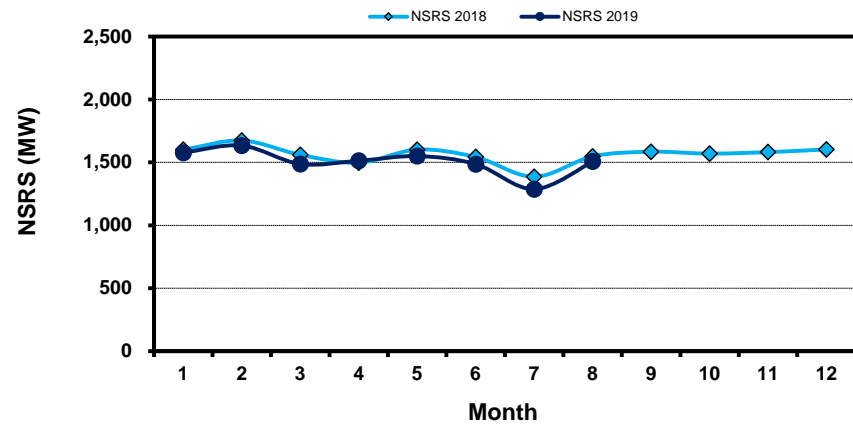
Regulation Down



Responsive Reserve



Non-Spin Reserve



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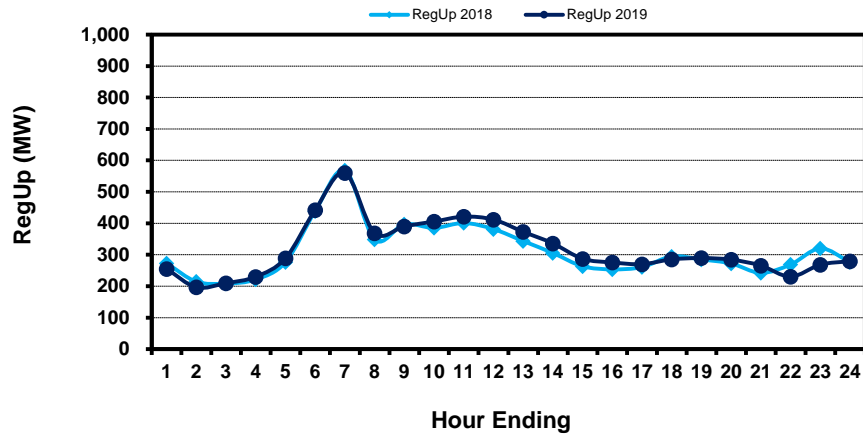
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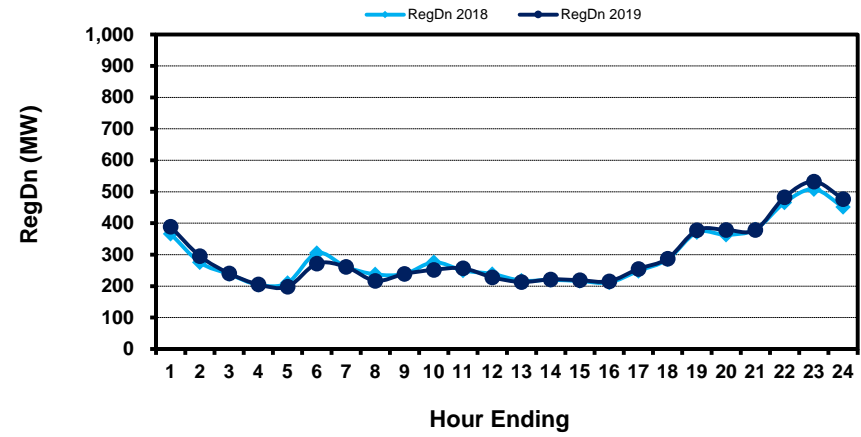
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Hourly Average of Ancillary Services Required MW

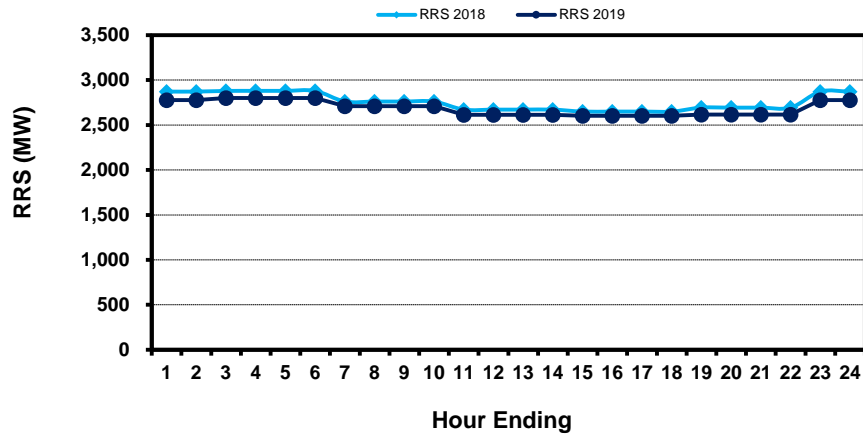
Regulation Up



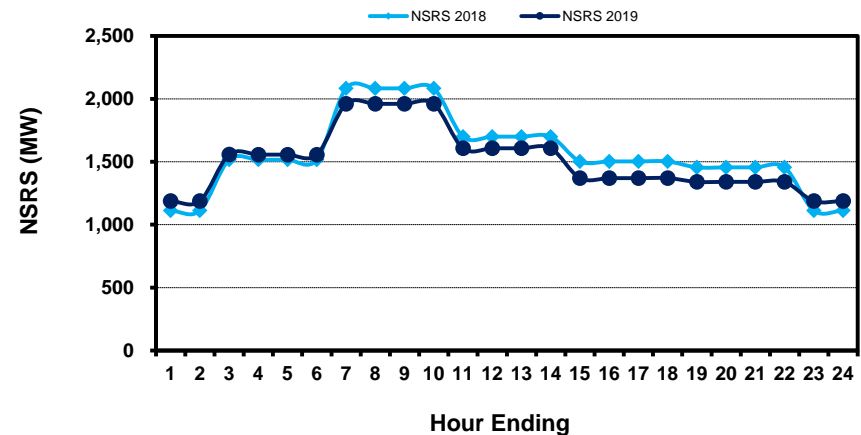
Regulation Down



Responsive Reserve



Non-Spin Reserve



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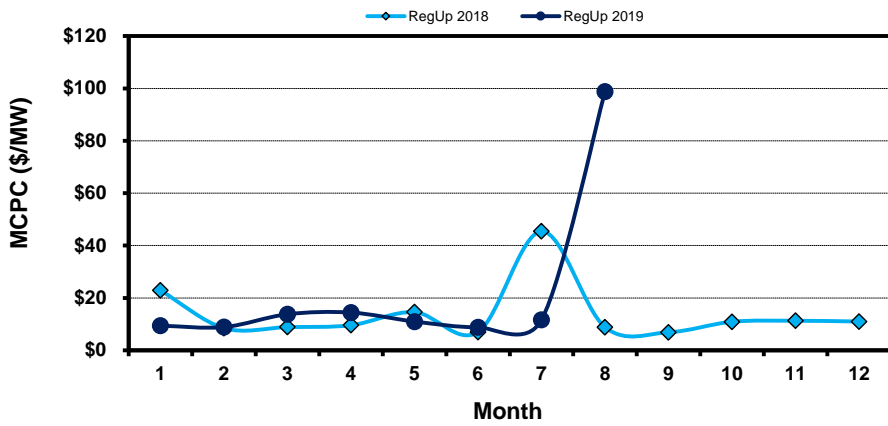
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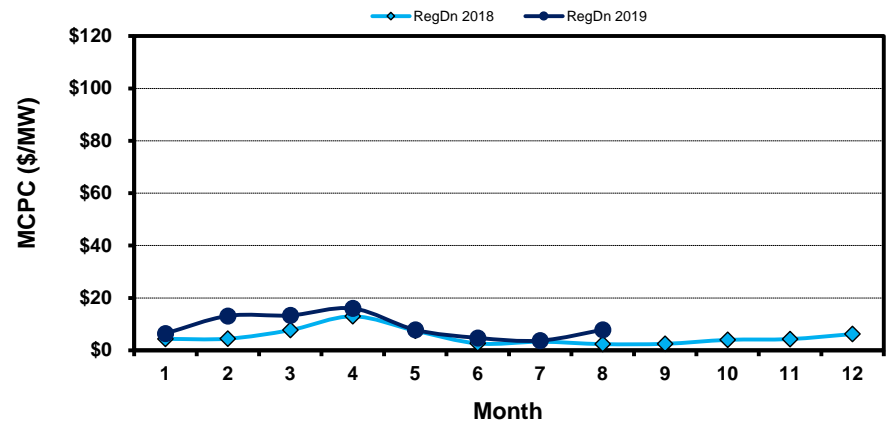
Monthly Average Ancillary Services Price

(weighted by A/S Quantities Required)

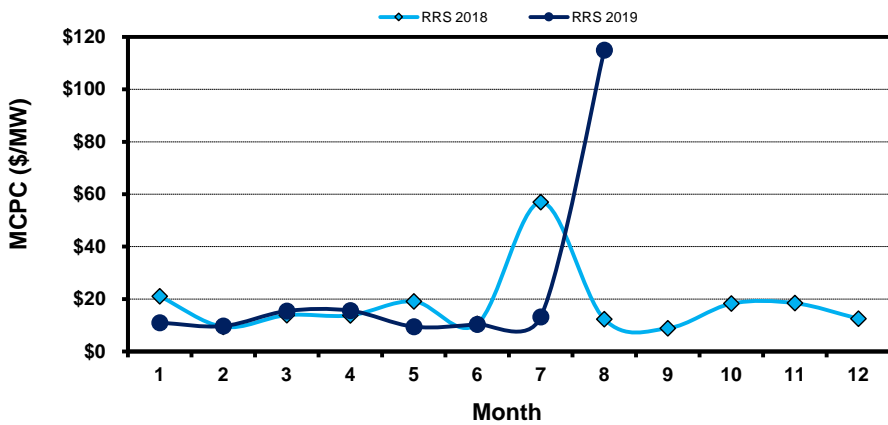
Regulation Up



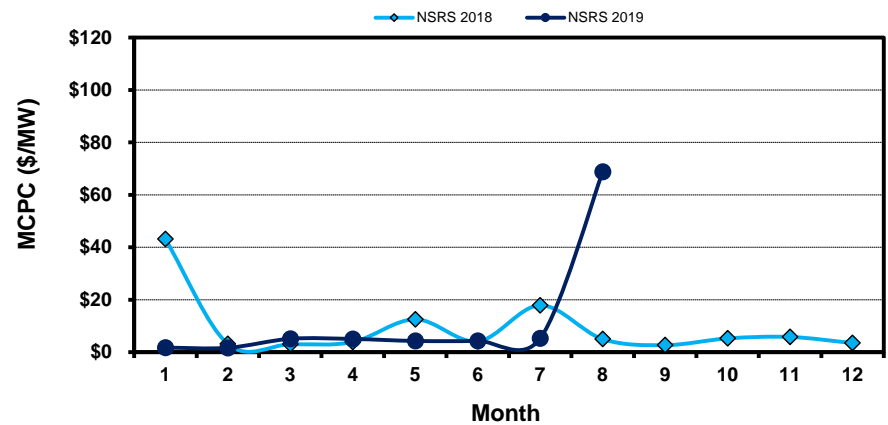
Regulation Down



Responsive Reserve



Non-Spin Reserve



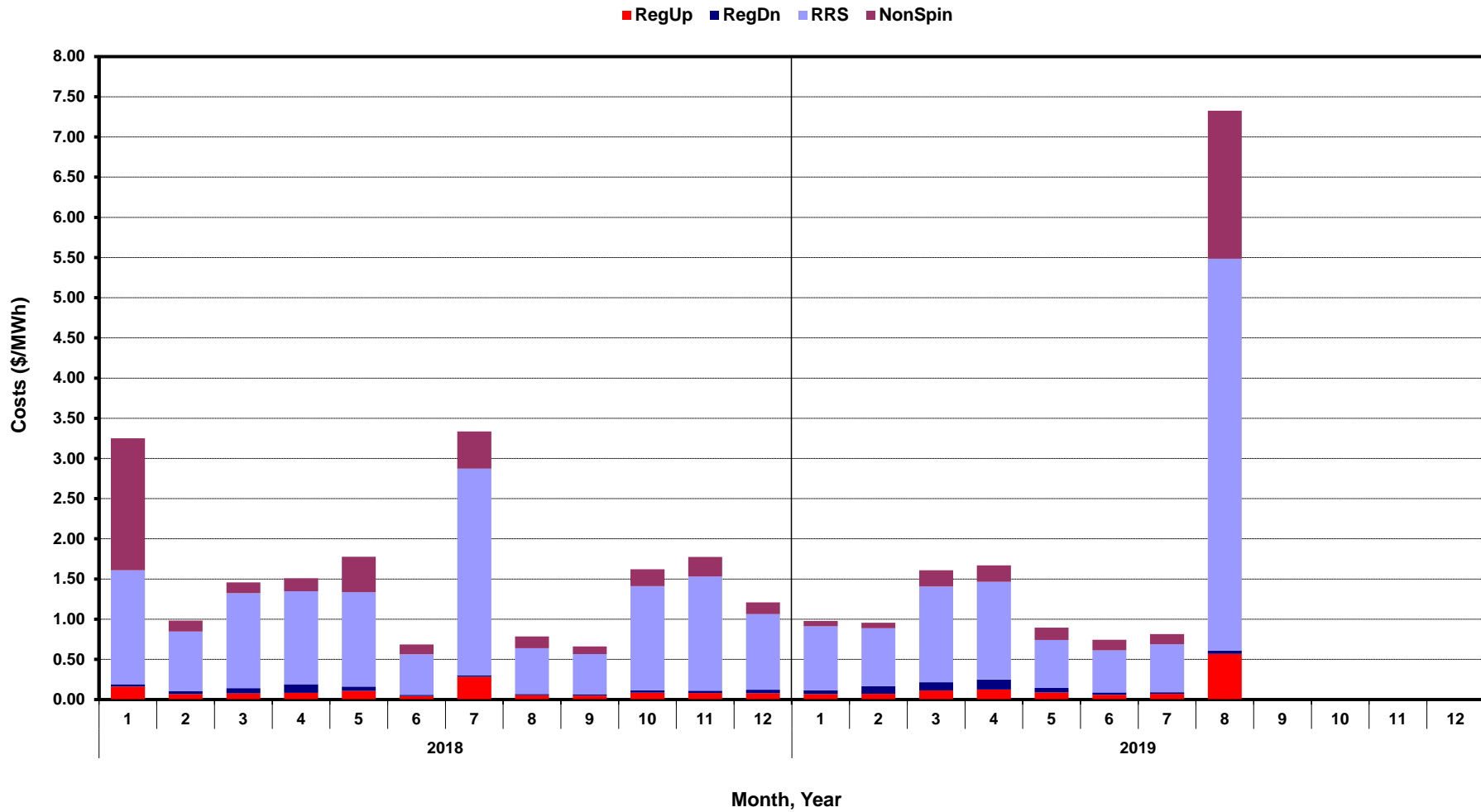
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Monthly Average A/S Cost per MWh Load



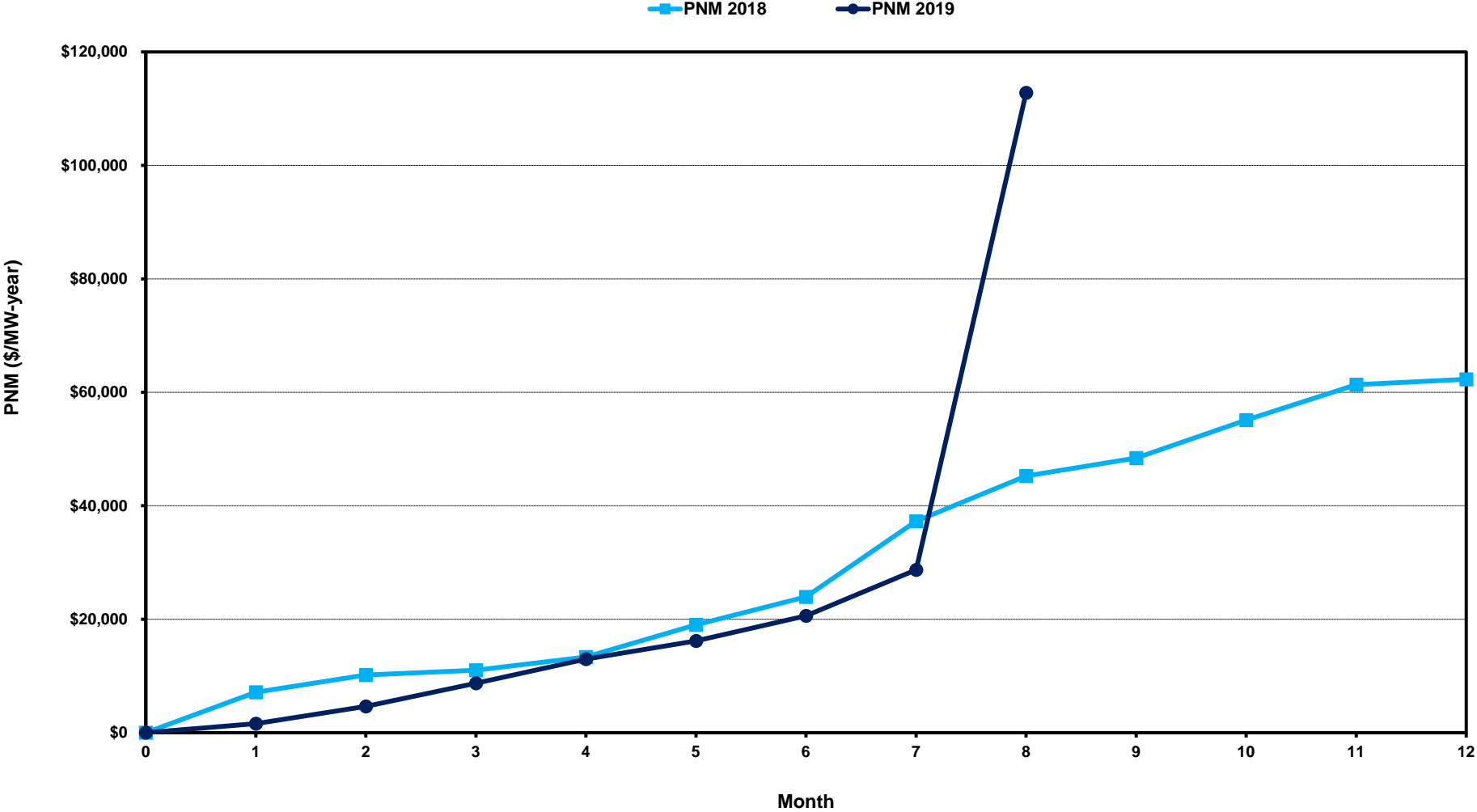
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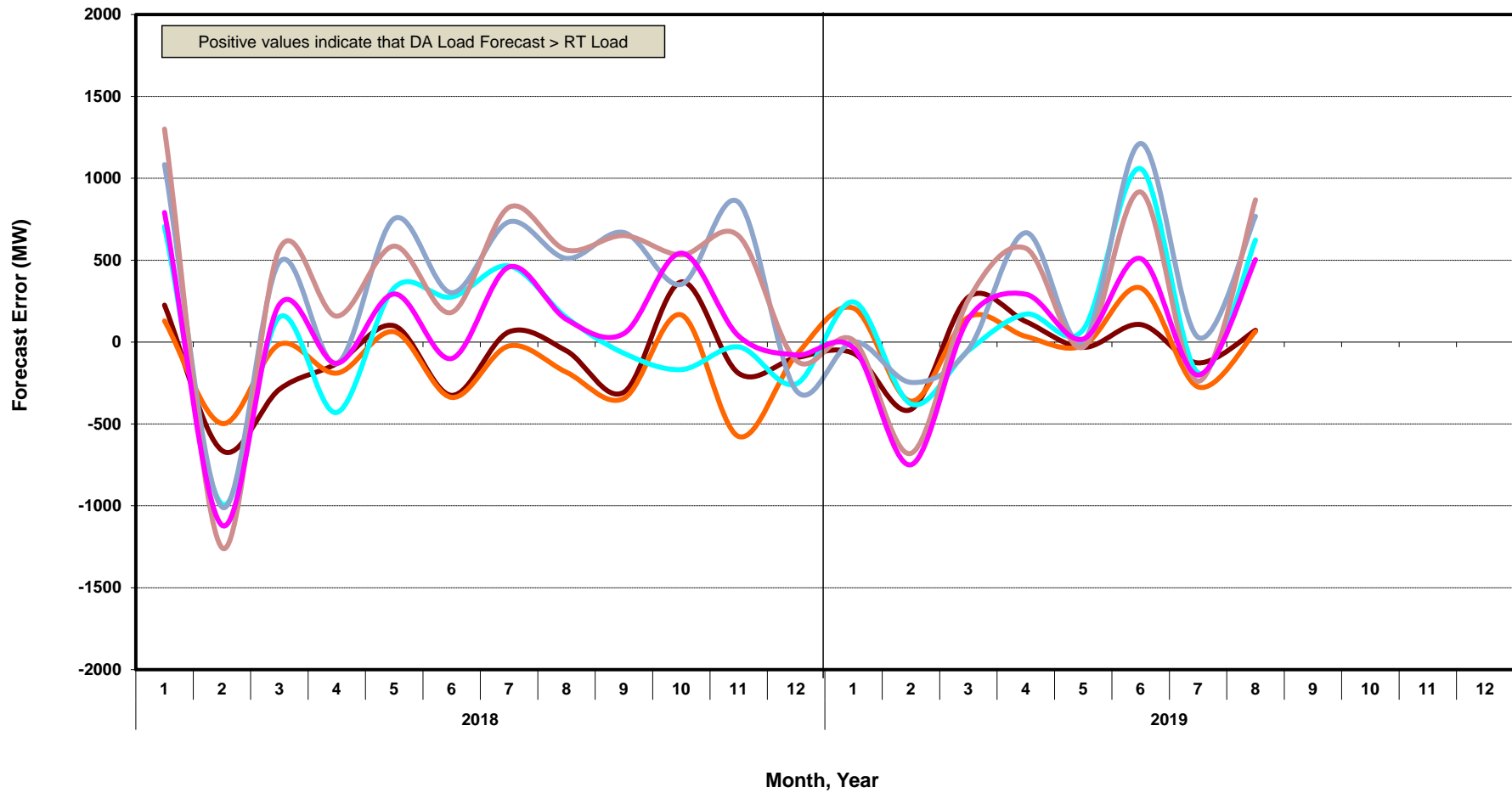
ERCOT-wide Cumulative Peaker Net Margin



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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



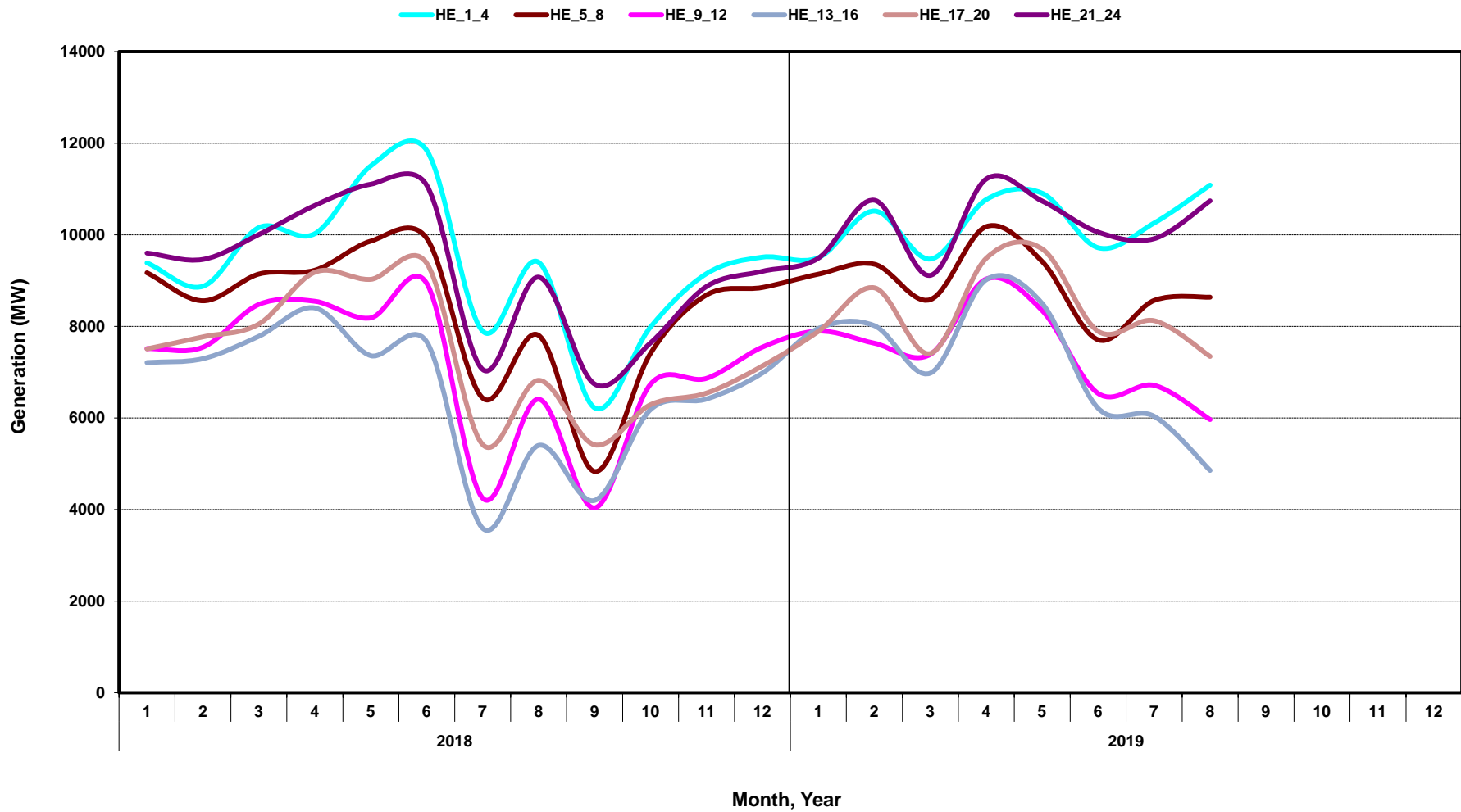
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Monthly Average of Wind Generation by Hour Ending



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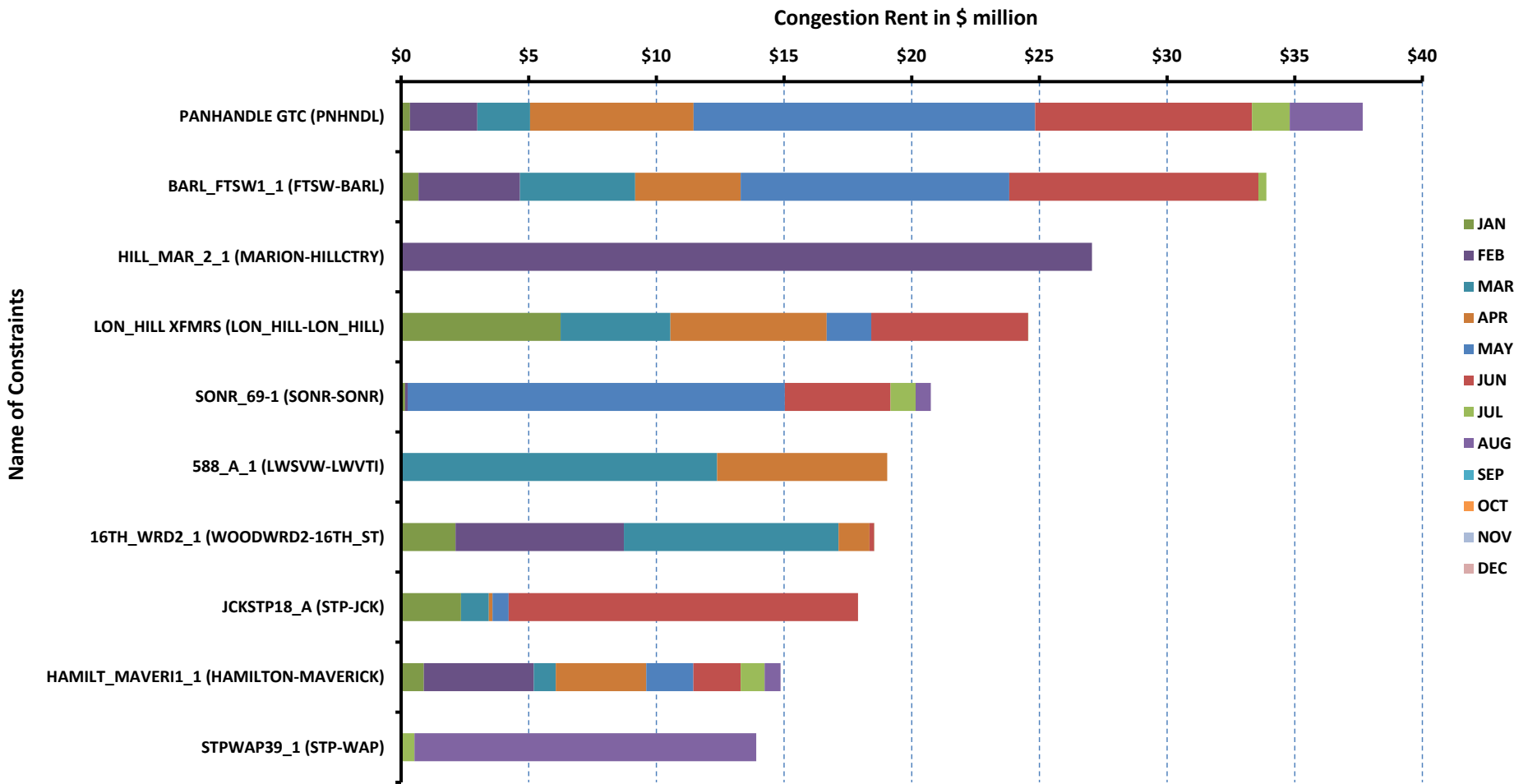
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RT Congestion Constraint Rankings - 1

Top 10 Constraints by Total Congestion Value - 2019



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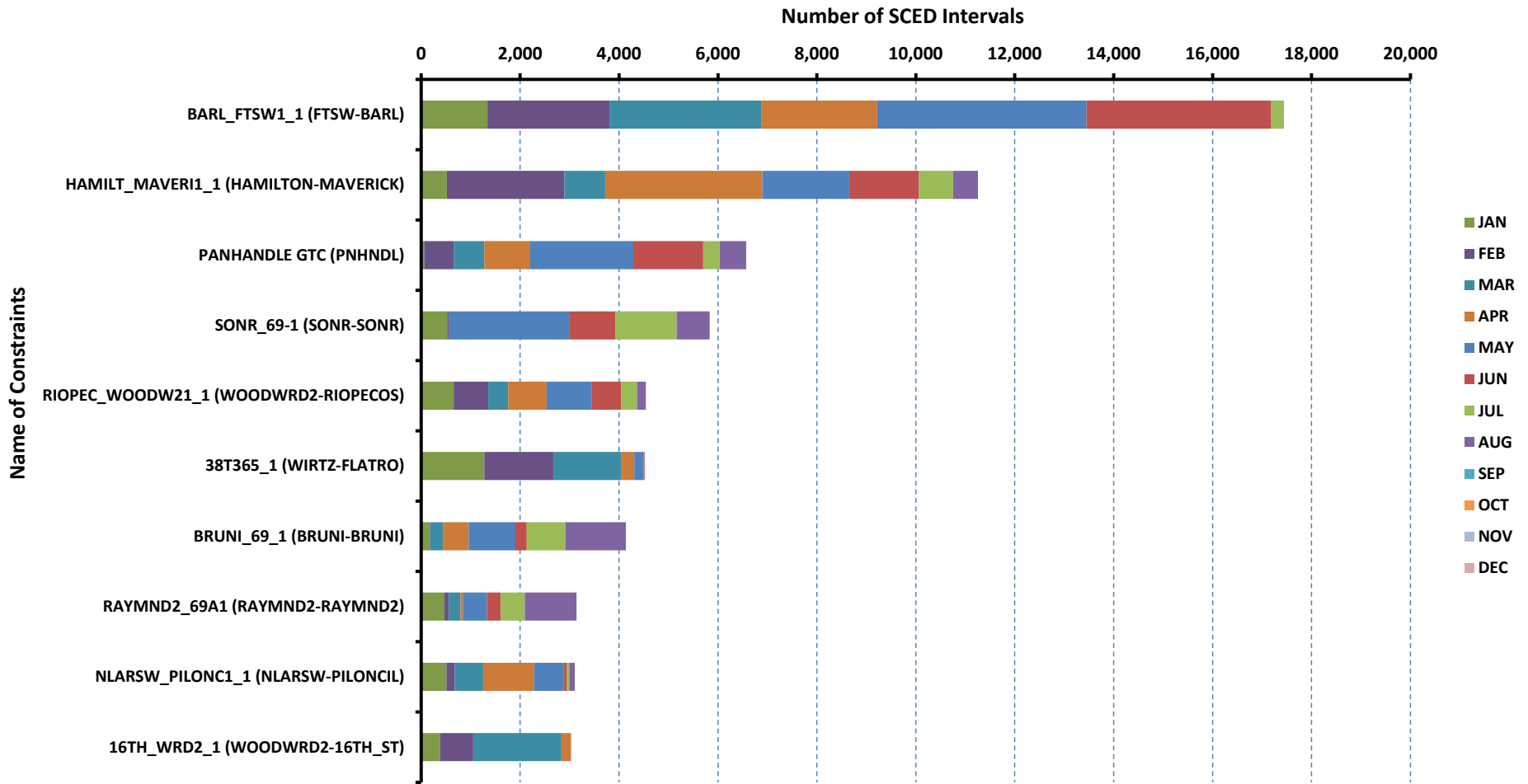
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RT Congestion Constraint Rankings - 2

Top 10 Constraints by Binding Frequency - 2019



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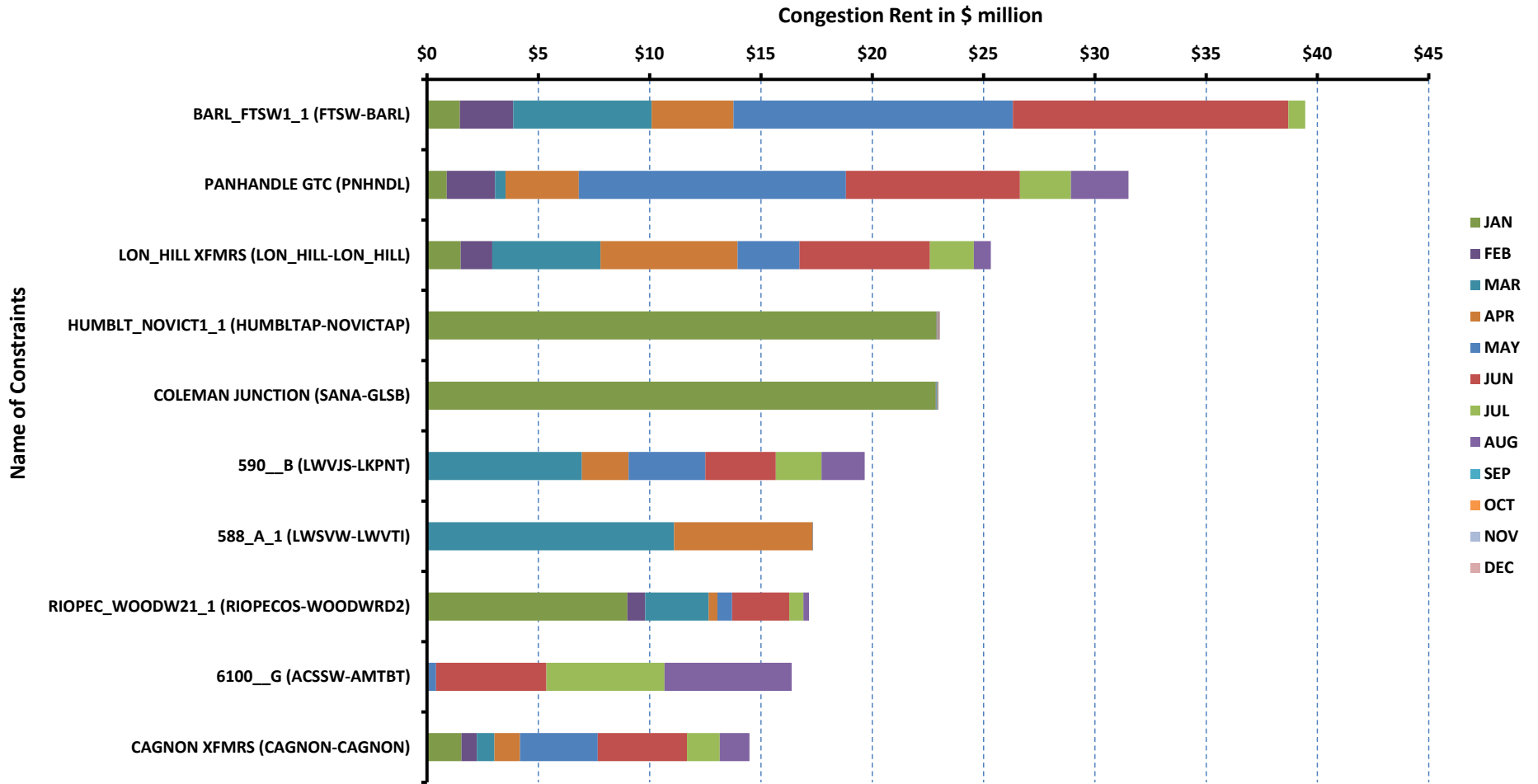
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DA Congestion Constraint Rankings - 1

Top 10 Constraints by Total Congestion Value - 2019



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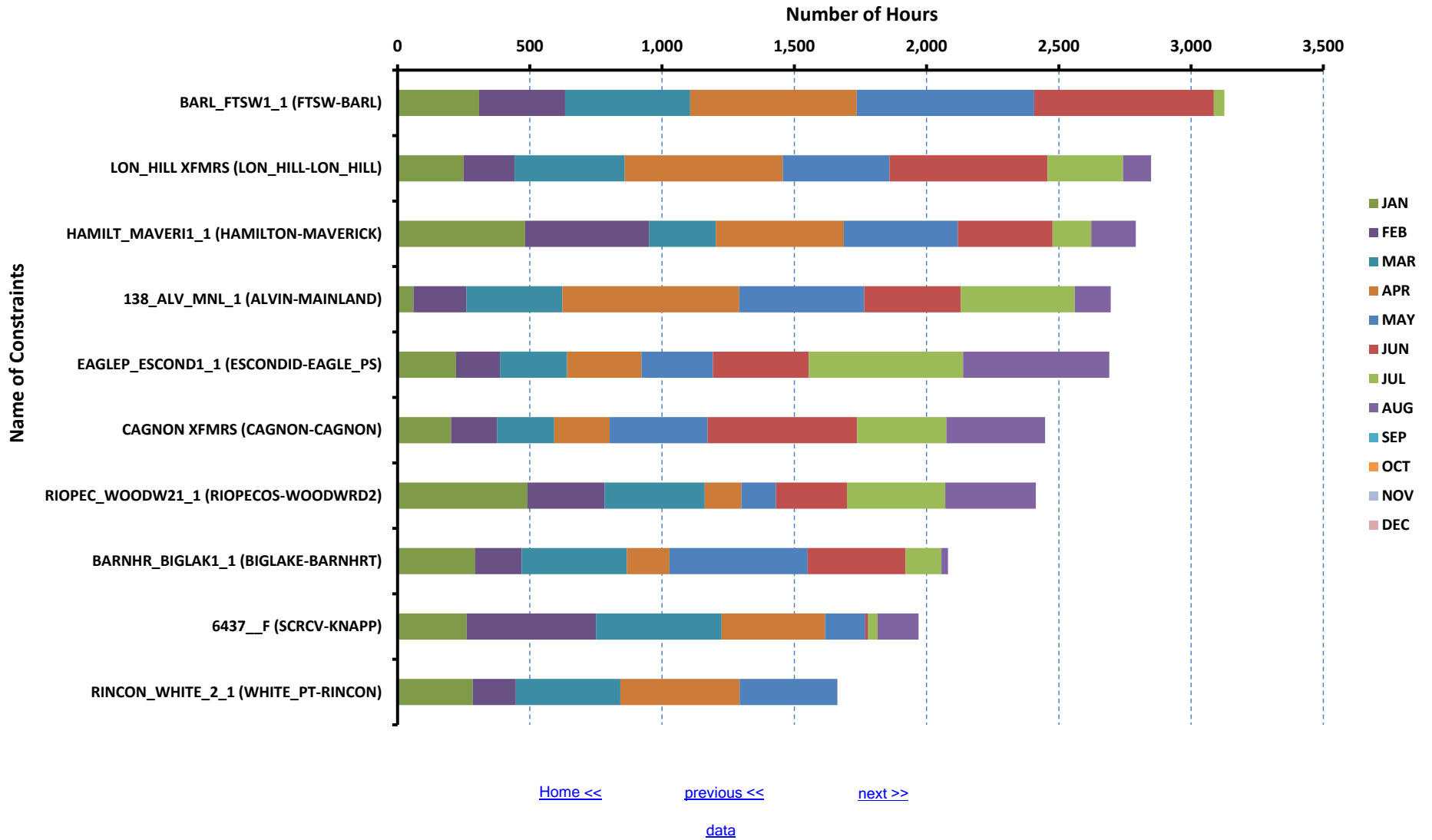
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DA Congestion Constraint Rankings - 2

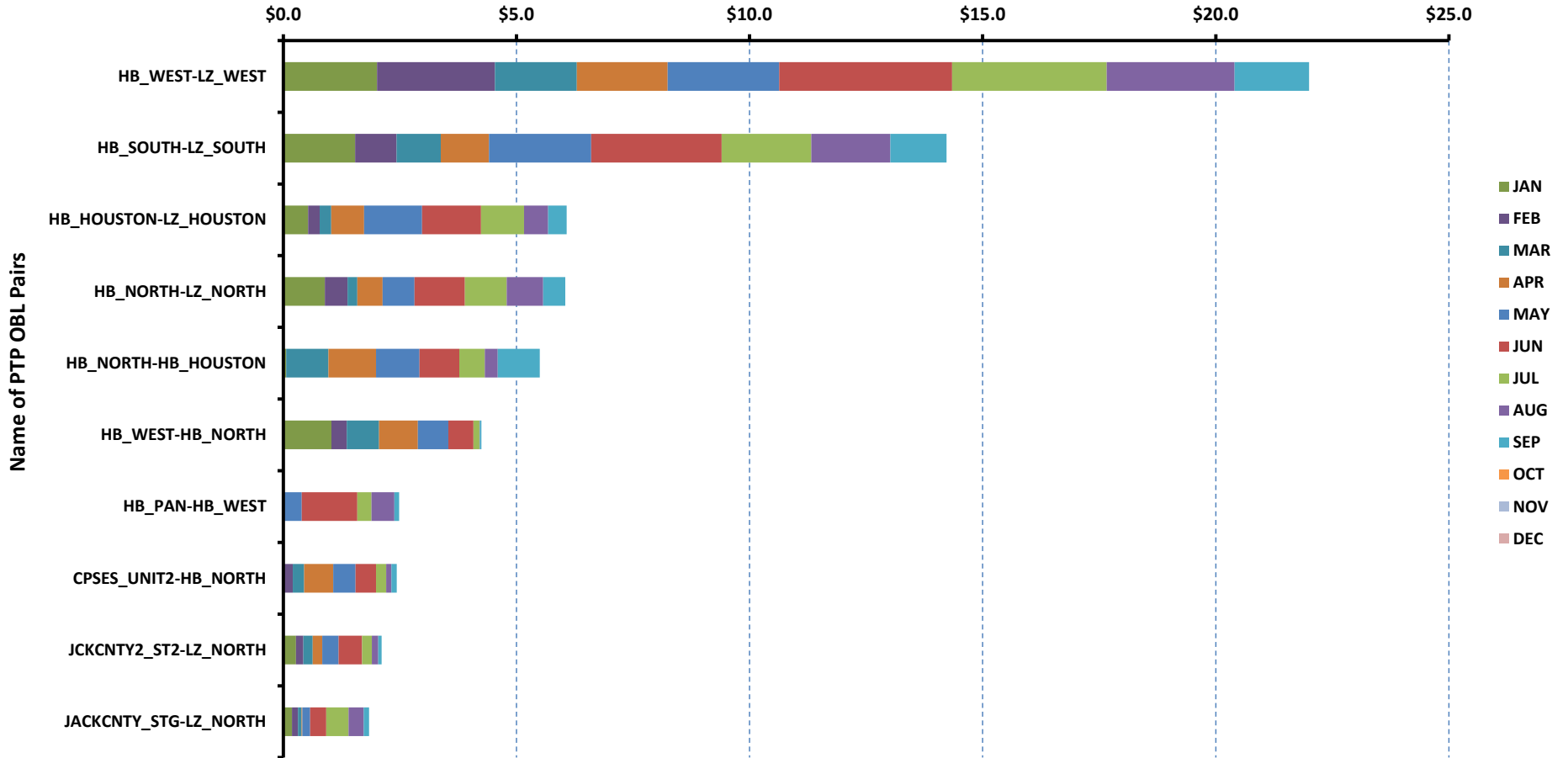
Top 10 Constraints by Binding Frequency - 2019



Top 10 CRR Pairs Ranked by Monthly Auction Values - 1

Top 10 PTP Obligations by Total Transaction Value - 2019

Total Transaction Value in \$ million



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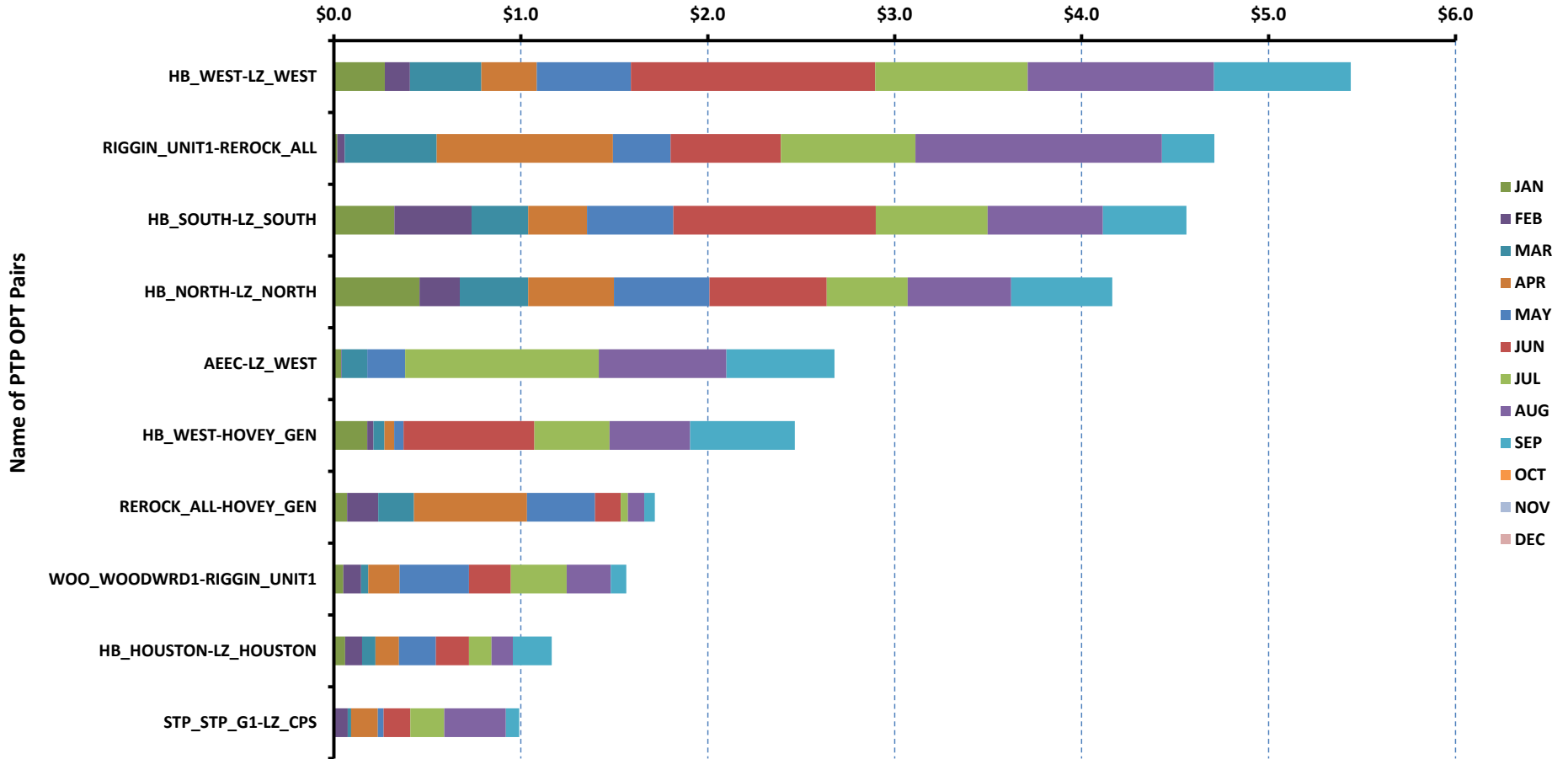
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Top 10 CRR Pairs Ranked by Monthly Auction Values - 2

Top 10 PTP Options by Total Transaction Value - 2019

Total Transaction Value in \$ million



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| ERCOT-wide Avg. Energy Price - DA vs. RT | | | |
|--|-------|-----------|-----------|
| year | month | dam_spp | rtm_spp |
| 2018 | 1 | \$ 45.63 | \$ 42.56 |
| | 2 | \$ 23.21 | \$ 25.24 |
| | 3 | \$ 24.42 | \$ 20.80 |
| | 4 | \$ 25.49 | \$ 24.54 |
| | 5 | \$ 43.15 | \$ 38.28 |
| | 6 | \$ 36.15 | \$ 37.29 |
| | 7 | \$ 100.46 | \$ 50.22 |
| | 8 | \$ 35.08 | \$ 39.51 |
| | 9 | \$ 29.31 | \$ 30.40 |
| | 10 | \$ 32.92 | \$ 39.09 |
| | 11 | \$ 33.19 | \$ 38.44 |
| | 12 | \$ 32.19 | \$ 29.90 |
| 2019 | 1 | \$ 26.27 | \$ 24.96 |
| | 2 | \$ 22.55 | \$ 26.69 |
| | 3 | \$ 31.55 | \$ 30.25 |
| | 4 | \$ 25.38 | \$ 27.90 |
| | 5 | \$ 26.47 | \$ 28.07 |
| | 6 | \$ 28.65 | \$ 28.82 |
| | 7 | \$ 33.43 | \$ 34.09 |
| | 8 | \$ 156.70 | \$ 163.79 |
| | 9 | \$ - | \$ - |
| | 10 | \$ - | \$ - |
| | 11 | \$ - | \$ - |
| | 12 | \$ - | \$ - |

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| Load Zone Load Statistics | | | | | | | | | | | |
|---------------------------|-------|------------------|----------------|----------------|---------------|-----------------|---------------|---------------|--------------|---|--|
| year | month | loadPEAK_Houston | loadPEAK_North | loadPEAK_South | loadPEAK_West | loadAVG_Houston | loadAVG_North | loadAVG_South | loadAVG_West | | |
| 2018 | 1 | 14,841 | 27,183 | 19,284 | 5,270 | 10,346 | 16,082 | 11,354 | 4,263 | | |
| | 2 | 12,660 | 22,124 | 16,019 | 4,952 | 9,740 | 14,553 | 9,933 | 4,101 | | |
| | 3 | 12,755 | 16,224 | 13,632 | 4,474 | 9,738 | 12,000 | 9,549 | 3,934 | | |
| | 4 | 14,008 | 16,467 | 14,236 | 4,842 | 9,773 | 12,219 | 9,759 | 4,009 | | |
| | 5 | 18,179 | 25,425 | 18,585 | 5,840 | 12,436 | 16,042 | 12,382 | 4,477 | | |
| | 6 | 18,501 | 27,219 | 19,059 | 5,898 | 13,746 | 19,328 | 13,975 | 4,872 | | |
| | 7 | 18,885 | 29,606 | 20,395 | 6,101 | 14,046 | 20,118 | 14,207 | 4,890 | | |
| | 8 | 19,311 | 27,221 | 19,761 | 6,017 | 14,083 | 19,181 | 14,463 | 4,965 | | |
| | 9 | 17,980 | 25,161 | 17,984 | 5,661 | 12,364 | 16,072 | 12,140 | 4,532 | | |
| | 10 | 16,718 | 22,540 | 16,381 | 5,492 | 10,919 | 13,391 | 10,514 | 4,336 | | |
| | 11 | 14,989 | 22,127 | 16,793 | 5,224 | 9,739 | 13,438 | 9,986 | 4,462 | | |
| | 12 | 12,545 | 20,233 | 14,873 | 5,332 | 9,601 | 14,187 | 10,136 | 4,685 | | |
| 2019 | 1 | 13,254 | 21,938 | 15,626 | 5,577 | 9,787 | 15,227 | 10,361 | 4,720 | | |
| | 2 | 12,967 | 22,880 | 15,171 | 5,483 | 9,754 | 14,467 | 9,950 | 4,662 | | |
| | 3 | 13,805 | 24,563 | 17,622 | 5,730 | 9,761 | 13,293 | 9,836 | 4,554 | | |
| | 4 | 14,685 | 17,893 | 14,451 | 5,371 | 10,374 | 12,469 | 9,822 | 4,555 | | |
| | 5 | 17,630 | 21,996 | 17,110 | 5,694 | 12,250 | 14,367 | 11,706 | 4,741 | | |
| | 6 | 18,971 | 25,775 | 19,006 | 6,303 | 13,823 | 16,703 | 13,220 | 5,098 | | |
| | 7 | 19,018 | 27,165 | 19,462 | 6,472 | 14,358 | 18,820 | 14,170 | 5,391 | | |
| | 8 | 20,254 | 28,460 | 20,411 | 6,825 | 14,892 | 20,319 | 15,340 | 5,701 | | |
| | 9 | - | - | - | - | - | - | - | - | - | |
| | 10 | - | - | - | - | - | - | - | - | - | |
| | 11 | - | - | - | - | - | - | - | - | - | |
| | 12 | - | - | - | - | - | - | - | - | - | |

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| Load Zone Monthly Average Energy Price - DA vs. RT | | | | | | | | | | |
|--|-------|-----------------|---------------|---------------|--------------|-----------------|---------------|---------------|--------------|--|
| year | month | avgRTMp_Houston | avgRTMp_North | avgRTMp_South | avgRTMp_West | avgDAMp_Houston | avgDAMp_North | avgDAMp_South | avgDAMp_West | |
| 2018 | 1 | \$ 39.47 | \$ 38.65 | \$ 53.81 | \$ 34.86 | \$ 42.24 | \$ 44.85 | \$ 52.06 | \$ 39.65 | |
| | 2 | \$ 24.34 | \$ 26.14 | \$ 24.82 | \$ 25.22 | \$ 22.81 | \$ 22.74 | \$ 24.57 | \$ 22.50 | |
| | 3 | \$ 19.97 | \$ 19.38 | \$ 22.64 | \$ 22.79 | \$ 24.70 | \$ 23.37 | \$ 26.22 | \$ 22.58 | |
| | 4 | \$ 24.84 | \$ 25.06 | \$ 25.02 | \$ 21.02 | \$ 25.55 | \$ 25.28 | \$ 27.35 | \$ 21.42 | |
| | 5 | \$ 34.38 | \$ 36.88 | \$ 37.31 | \$ 56.83 | \$ 39.95 | \$ 43.08 | \$ 43.09 | \$ 52.45 | |
| | 6 | \$ 35.79 | \$ 33.97 | \$ 33.39 | \$ 65.89 | \$ 34.05 | \$ 33.91 | \$ 33.53 | \$ 58.47 | |
| | 7 | \$ 47.28 | \$ 49.79 | \$ 47.92 | \$ 67.06 | \$ 96.21 | \$ 101.92 | \$ 98.48 | \$ 112.38 | |
| | 8 | \$ 39.07 | \$ 39.32 | \$ 40.89 | \$ 37.46 | \$ 34.63 | \$ 35.04 | \$ 35.67 | \$ 34.80 | |
| | 9 | \$ 29.92 | \$ 31.42 | \$ 30.61 | \$ 27.56 | \$ 29.11 | \$ 29.87 | \$ 29.36 | \$ 27.71 | |
| | 10 | \$ 38.98 | \$ 40.11 | \$ 39.61 | \$ 34.97 | \$ 33.45 | \$ 33.12 | \$ 33.15 | \$ 30.40 | |
| | 11 | \$ 40.99 | \$ 36.95 | \$ 39.15 | \$ 35.80 | \$ 32.91 | \$ 33.42 | \$ 33.83 | \$ 31.67 | |
| | 12 | \$ 28.56 | \$ 29.93 | \$ 28.42 | \$ 35.76 | \$ 31.02 | \$ 32.07 | \$ 32.04 | \$ 35.32 | |
| 2019 | 1 | \$ 24.67 | \$ 24.09 | \$ 26.47 | \$ 25.06 | \$ 26.05 | \$ 25.20 | \$ 27.25 | \$ 28.00 | |
| | 2 | \$ 23.30 | \$ 24.58 | \$ 32.09 | \$ 28.80 | \$ 22.05 | \$ 21.64 | \$ 24.07 | \$ 23.14 | |
| | 3 | \$ 29.20 | \$ 30.43 | \$ 31.39 | \$ 29.53 | \$ 29.73 | \$ 31.70 | \$ 32.83 | \$ 32.28 | |
| | 4 | \$ 27.42 | \$ 27.57 | \$ 29.52 | \$ 26.42 | \$ 25.42 | \$ 24.98 | \$ 27.36 | \$ 22.09 | |
| | 5 | \$ 27.41 | \$ 26.16 | \$ 29.80 | \$ 31.34 | \$ 26.23 | \$ 24.93 | \$ 27.53 | \$ 29.12 | |
| | 6 | \$ 30.40 | \$ 27.46 | \$ 27.07 | \$ 33.55 | \$ 29.22 | \$ 27.10 | \$ 28.39 | \$ 32.84 | |
| | 7 | \$ 34.09 | \$ 34.56 | \$ 33.74 | \$ 33.39 | \$ 32.77 | \$ 33.40 | \$ 34.02 | \$ 33.71 | |
| | 8 | \$ 162.69 | \$ 168.38 | \$ 162.68 | \$ 153.31 | \$ 152.95 | \$ 162.17 | \$ 157.50 | \$ 144.88 | |
| | 9 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | |
| | 10 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | |
| | 11 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | |
| | 12 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | |

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| ERCOT-wide Monthly Implied Heat Rate - DA vs. RT | | | | | | |
|--|-------|----------|-----------|--------|-----------|--------|
| year | month | gasprice | rtn_spp | HR_rtn | dam_spp | HR_dam |
| 2018 | 1 | \$ 4.23 | \$ 42.56 | 10.07 | \$ 45.63 | 10.79 |
| | 2 | \$ 2.63 | \$ 25.24 | 9.61 | \$ 23.21 | 8.83 |
| | 3 | \$ 2.69 | \$ 20.80 | 7.74 | \$ 24.42 | 9.09 |
| | 4 | \$ 2.83 | \$ 24.54 | 8.67 | \$ 25.49 | 9.00 |
| | 5 | \$ 2.81 | \$ 38.28 | 13.61 | \$ 43.15 | 15.34 |
| | 6 | \$ 3.00 | \$ 37.29 | 12.42 | \$ 36.15 | 12.03 |
| | 7 | \$ 2.89 | \$ 50.22 | 17.35 | \$ 100.46 | 34.71 |
| | 8 | \$ 3.01 | \$ 39.51 | 13.14 | \$ 35.08 | 11.67 |
| | 9 | \$ 2.99 | \$ 30.40 | 10.16 | \$ 29.31 | 9.79 |
| | 10 | \$ 3.48 | \$ 39.09 | 11.22 | \$ 32.92 | 9.45 |
| | 11 | \$ 4.11 | \$ 38.44 | 9.35 | \$ 33.19 | 8.07 |
| | 12 | \$ 3.92 | \$ 29.90 | 7.62 | \$ 32.19 | 8.21 |
| 2019 | 1 | \$ 3.01 | \$ 24.96 | 8.29 | \$ 26.27 | 8.73 |
| | 2 | \$ 2.67 | \$ 26.69 | 10.01 | \$ 22.55 | 8.46 |
| | 3 | \$ 2.88 | \$ 30.25 | 10.49 | \$ 31.55 | 10.94 |
| | 4 | \$ 2.57 | \$ 27.90 | 10.85 | \$ 25.38 | 9.87 |
| | 5 | \$ 2.54 | \$ 28.07 | 11.07 | \$ 26.47 | 10.44 |
| | 6 | \$ 2.46 | \$ 28.82 | 11.72 | \$ 28.65 | 11.65 |
| | 7 | \$ 2.25 | \$ 34.09 | 15.18 | \$ 33.43 | 14.89 |
| | 8 | \$ 2.10 | \$ 163.79 | 77.92 | \$ 156.70 | 74.55 |
| | 9 | \$ - | \$ - | - | \$ - | - |
| | 10 | \$ - | \$ - | - | \$ - | - |
| | 11 | \$ - | \$ - | - | \$ - | - |
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| Load Zone Monthly Implied Heat Rate - DA vs. RT | | | | | | | | | |
|---|-------|---------------|-------------|-------------|------------|---------------|-------------|-------------|------------|
| year | month | HRdam_Houston | HRdam_South | HRdam_North | HRdam_West | HRrtm_Houston | HRrtm_South | HRrtm_North | HRrtm_West |
| 2018 | 1 | 9.99 | 12.31 | 10.61 | 9.38 | 9.34 | 12.73 | 9.14 | 8.25 |
| | 2 | 8.68 | 9.35 | 8.65 | 8.56 | 9.26 | 9.44 | 9.95 | 9.60 |
| | 3 | 9.19 | 9.76 | 8.70 | 8.40 | 7.43 | 8.42 | 7.21 | 8.48 |
| | 4 | 9.02 | 9.66 | 8.93 | 7.57 | 8.77 | 8.84 | 8.85 | 7.42 |
| | 5 | 14.20 | 15.32 | 15.32 | 18.65 | 12.22 | 13.27 | 13.11 | 20.20 |
| | 6 | 11.34 | 11.16 | 11.29 | 19.47 | 11.92 | 11.12 | 11.31 | 21.94 |
| | 7 | 33.25 | 34.03 | 35.22 | 38.83 | 16.34 | 16.56 | 17.20 | 23.17 |
| | 8 | 11.52 | 11.86 | 11.66 | 11.57 | 13.00 | 13.60 | 13.08 | 12.46 |
| | 9 | 9.73 | 9.81 | 9.98 | 9.26 | 10.00 | 10.23 | 10.50 | 9.21 |
| | 10 | 9.60 | 9.52 | 9.51 | 8.73 | 11.19 | 11.37 | 11.52 | 10.04 |
| | 11 | 8.01 | 8.23 | 8.13 | 7.70 | 9.97 | 9.52 | 8.99 | 8.71 |
| | 12 | 7.91 | 8.17 | 8.18 | 9.00 | 7.28 | 7.25 | 7.63 | 9.12 |
| 2019 | 1 | 8.65 | 9.05 | 8.37 | 9.30 | 8.19 | 8.79 | 8.00 | 8.32 |
| | 2 | 8.27 | 9.03 | 8.12 | 8.68 | 8.74 | 12.04 | 9.22 | 10.80 |
| | 3 | 10.31 | 11.38 | 10.99 | 11.19 | 10.12 | 10.88 | 10.55 | 10.24 |
| | 4 | 9.88 | 10.64 | 9.71 | 8.59 | 10.66 | 11.48 | 10.72 | 10.27 |
| | 5 | 10.35 | 10.86 | 9.83 | 11.49 | 10.81 | 11.75 | 10.32 | 12.36 |
| | 6 | 11.88 | 11.55 | 11.02 | 13.36 | 12.36 | 11.01 | 11.17 | 13.64 |
| | 7 | 14.59 | 15.15 | 14.87 | 15.01 | 15.18 | 15.02 | 15.39 | 14.87 |
| | 8 | 72.77 | 74.93 | 77.15 | 68.93 | 77.40 | 77.40 | 80.11 | 72.94 |
| | 9 | - | - | - | - | - | - | - | - |
| | 10 | - | - | - | - | - | - | - | - |
| | 11 | - | - | - | - | - | - | - | - |
| | 12 | - | - | - | - | - | - | - | - |

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| Daily ORDC Adders Average Values and Interval Duration | | | | | | | | |
|--|-------|-----|-----------|-------------|--------|---------|--------|---------|
| YEAR | MONTH | DAY | PRICE_RS | PRICE_RDP | RS_CNT | RDP_CNT | RS_POS | RDP_POS |
| 2019 | 8 | 1 | \$ 11.67 | \$ - | 21 | 0 | 80 | 90 |
| 2019 | 8 | 2 | \$ 244.99 | \$ - | 28 | 0 | 80 | 90 |
| 2019 | 8 | 3 | \$ 1.39 | \$ - | 22 | 0 | 80 | 90 |
| 2019 | 8 | 4 | \$ 16.91 | \$ - | 29 | 0 | 80 | 90 |
| 2019 | 8 | 5 | \$ 383.58 | \$ - | 33 | 0 | 80 | 90 |
| 2019 | 8 | 6 | \$ 152.48 | \$ - | 32 | 0 | 80 | 90 |
| 2019 | 8 | 7 | \$ 6.26 | \$ - | 25 | 0 | 80 | 90 |
| 2019 | 8 | 8 | \$ 24.84 | \$ - | 22 | 0 | 80 | 90 |
| 2019 | 8 | 9 | \$ 89.40 | \$ - | 31 | 0 | 80 | 90 |
| 2019 | 8 | 10 | \$ 11.56 | \$ - | 28 | 0 | 80 | 90 |
| 2019 | 8 | 11 | \$ 7.85 | \$ - | 18 | 0 | 80 | 90 |
| 2019 | 8 | 12 | \$ 750.63 | \$ - | 30 | 0 | 80 | 90 |
| 2019 | 8 | 13 | \$ 857.67 | \$ 967.38 | 37 | 35 | 80 | 90 |
| 2019 | 8 | 14 | \$ 208.33 | \$ 0.15 | 28 | 8 | 80 | 90 |
| 2019 | 8 | 15 | \$ 853.62 | \$ 1,022.89 | 31 | 35 | 80 | 90 |
| 2019 | 8 | 16 | \$ 322.95 | \$ 0.55 | 23 | 12 | 80 | 90 |
| 2019 | 8 | 17 | \$ 0.05 | \$ - | 9 | 0 | 80 | 90 |
| 2019 | 8 | 18 | \$ 18.23 | \$ - | 16 | 0 | 80 | 90 |
| 2019 | 8 | 19 | \$ 21.47 | \$ - | 28 | 0 | 80 | 90 |
| 2019 | 8 | 20 | \$ 28.32 | \$ - | 23 | 0 | 80 | 90 |
| 2019 | 8 | 21 | \$ 61.56 | \$ - | 21 | 0 | 80 | 90 |
| 2019 | 8 | 22 | \$ 317.01 | \$ - | 25 | 0 | 80 | 90 |
| 2019 | 8 | 23 | \$ 13.16 | \$ - | 19 | 0 | 80 | 90 |
| 2019 | 8 | 24 | \$ 1.12 | \$ - | 18 | 0 | 80 | 90 |
| 2019 | 8 | 25 | \$ 6.57 | \$ - | 15 | 0 | 80 | 90 |
| 2019 | 8 | 26 | \$ 20.49 | \$ - | 25 | 0 | 80 | 90 |
| 2019 | 8 | 27 | \$ - | \$ - | 0 | 0 | 80 | 90 |
| 2019 | 8 | 28 | \$ 50.43 | \$ - | 26 | 0 | 80 | 90 |
| 2019 | 8 | 29 | \$ 50.83 | \$ - | 23 | 0 | 80 | 90 |
| 2019 | 8 | 30 | \$ - | \$ - | 0 | 0 | 80 | 90 |
| 2019 | 8 | 31 | \$ - | \$ - | 0 | 0 | 80 | 90 |

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| Monthly Average of Ancillary Services Required MW | | | | | |
|---|-------|------------|------------|----------|------------|
| year | month | ASMW_REGDN | ASMW_NSPIN | ASMW_RRS | ASMW_REGUP |
| 2018 | 1 | 283 | 1,601 | 2,829 | 299 |
| | 2 | 292 | 1,674 | 3,030 | 309 |
| | 3 | 296 | 1,560 | 3,001 | 306 |
| | 4 | 296 | 1,497 | 3,001 | 316 |
| | 5 | 320 | 1,601 | 2,782 | 339 |
| | 6 | 301 | 1,543 | 2,488 | 330 |
| | 7 | 304 | 1,386 | 2,403 | 333 |
| | 8 | 302 | 1,548 | 2,433 | 331 |
| | 9 | 309 | 1,585 | 2,543 | 326 |
| | 10 | 294 | 1,570 | 2,780 | 309 |
| | 11 | 256 | 1,582 | 2,895 | 273 |
| | 12 | 268 | 1,603 | 2,900 | 280 |
| 2019 | 1 | 285 | 1,578 | 2,898 | 295 |
| | 2 | 283 | 1,634 | 2,881 | 311 |
| | 3 | 287 | 1,487 | 2,893 | 306 |
| | 4 | 292 | 1,513 | 2,904 | 321 |
| | 5 | 314 | 1,550 | 2,712 | 345 |
| | 6 | 303 | 1,486 | 2,467 | 322 |
| | 7 | 298 | 1,287 | 2,374 | 319 |
| | 8 | 300 | 1,507 | 2,386 | 323 |
| | 9 | - | - | - | - |
| | 10 | - | - | - | - |
| | 11 | - | - | - | - |
| | 12 | - | - | - | - |

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| Hourly Average of Ancillary Services Required MW | | | | | |
|--|---------------|------------|------------|----------|------------|
| year | DELIVERY_HOUR | ASMW_REGDN | ASMW_NSPIN | ASMW_RRS | ASMW_REGUP |
| 2018 | 1 | 366 | 1,112 | 2,872 | 273 |
| | 2 | 275 | 1,112 | 2,872 | 215 |
| | 3 | 238 | 1,516 | 2,880 | 208 |
| | 4 | 204 | 1,516 | 2,880 | 221 |
| | 5 | 210 | 1,516 | 2,880 | 276 |
| | 6 | 305 | 1,516 | 2,880 | 439 |
| | 7 | 261 | 2,083 | 2,761 | 568 |
| | 8 | 237 | 2,083 | 2,761 | 348 |
| | 9 | 239 | 2,083 | 2,761 | 397 |
| | 10 | 276 | 2,083 | 2,761 | 385 |
| | 11 | 250 | 1,700 | 2,672 | 401 |
| | 12 | 239 | 1,700 | 2,672 | 382 |
| | 13 | 217 | 1,700 | 2,672 | 344 |
| | 14 | 220 | 1,700 | 2,672 | 306 |
| | 15 | 216 | 1,503 | 2,650 | 263 |
| | 16 | 212 | 1,503 | 2,650 | 254 |
| | 17 | 248 | 1,503 | 2,650 | 261 |
| | 18 | 285 | 1,503 | 2,650 | 295 |
| | 19 | 371 | 1,456 | 2,694 | 285 |
| | 20 | 363 | 1,456 | 2,694 | 272 |
| | 21 | 380 | 1,456 | 2,694 | 242 |
| | 22 | 465 | 1,456 | 2,694 | 269 |
| | 23 | 508 | 1,112 | 2,872 | 320 |
| | 24 | 451 | 1,112 | 2,872 | 276 |
| 2019 | 1 | 389 | 1,188 | 2,778 | 255 |
| | 2 | 296 | 1,188 | 2,778 | 197 |
| | 3 | 241 | 1,557 | 2,800 | 210 |
| | 4 | 205 | 1,557 | 2,801 | 230 |
| | 5 | 198 | 1,557 | 2,801 | 289 |
| | 6 | 271 | 1,557 | 2,801 | 442 |
| | 7 | 261 | 1,960 | 2,710 | 561 |
| | 8 | 217 | 1,960 | 2,710 | 369 |
| | 9 | 239 | 1,960 | 2,710 | 390 |
| | 10 | 252 | 1,960 | 2,710 | 405 |
| | 11 | 257 | 1,607 | 2,613 | 421 |
| | 12 | 228 | 1,607 | 2,613 | 412 |
| | 13 | 213 | 1,607 | 2,613 | 373 |
| | 14 | 221 | 1,607 | 2,613 | 336 |
| | 15 | 219 | 1,370 | 2,603 | 287 |
| | 16 | 215 | 1,370 | 2,603 | 276 |
| | 17 | 255 | 1,370 | 2,603 | 270 |
| | 18 | 288 | 1,370 | 2,603 | 285 |
| | 19 | 378 | 1,340 | 2,617 | 290 |
| | 20 | 379 | 1,340 | 2,617 | 284 |
| | 21 | 378 | 1,340 | 2,617 | 266 |
| | 22 | 483 | 1,340 | 2,617 | 230 |
| | 23 | 532 | 1,188 | 2,778 | 268 |
| | 24 | 477 | 1,188 | 2,778 | 280 |

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| Monthly Average Ancillary Services Price | | | | | |
|--|-------|------------|------------|-----------|------------|
| year | month | MCPC_REGDN | MCPC_NSPIN | MCPC_RRS | MCPC_REGUP |
| 2018 | 1 | \$ 4.36 | \$ 43.10 | \$ 21.06 | \$ 22.87 |
| | 2 | \$ 4.45 | \$ 3.14 | \$ 9.40 | \$ 8.48 |
| | 3 | \$ 7.71 | \$ 3.01 | \$ 13.87 | \$ 8.86 |
| | 4 | \$ 12.98 | \$ 3.86 | \$ 13.76 | \$ 9.59 |
| | 5 | \$ 7.51 | \$ 12.51 | \$ 19.12 | \$ 14.58 |
| | 6 | \$ 2.62 | \$ 4.10 | \$ 10.51 | \$ 6.98 |
| | 7 | \$ 3.28 | \$ 17.86 | \$ 56.96 | \$ 45.45 |
| | 8 | \$ 2.37 | \$ 4.98 | \$ 12.34 | \$ 8.85 |
| | 9 | \$ 2.49 | \$ 2.67 | \$ 8.86 | \$ 6.90 |
| | 10 | \$ 3.99 | \$ 5.24 | \$ 18.25 | \$ 10.91 |
| | 11 | \$ 4.30 | \$ 5.80 | \$ 18.44 | \$ 11.28 |
| | 12 | \$ 6.21 | \$ 3.48 | \$ 12.53 | \$ 11.00 |
| 2019 | 1 | \$ 6.43 | \$ 1.71 | \$ 11.01 | \$ 9.40 |
| | 2 | \$ 13.14 | \$ 1.66 | \$ 9.70 | \$ 8.88 |
| | 3 | \$ 13.34 | \$ 5.10 | \$ 15.43 | \$ 13.77 |
| | 4 | \$ 16.00 | \$ 5.03 | \$ 15.59 | \$ 14.42 |
| | 5 | \$ 7.83 | \$ 4.27 | \$ 9.47 | \$ 11.00 |
| | 6 | \$ 4.76 | \$ 4.30 | \$ 10.39 | \$ 8.82 |
| | 7 | \$ 3.71 | \$ 5.25 | \$ 13.23 | \$ 11.65 |
| | 8 | \$ 7.87 | \$ 68.75 | \$ 114.97 | \$ 98.80 |
| | 9 | \$ - | \$ - | \$ - | \$ - |
| | 10 | \$ - | \$ - | \$ - | \$ - |
| | 11 | \$ - | \$ - | \$ - | \$ - |
| | 12 | \$ - | \$ - | \$ - | \$ - |

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| Monthly Average A/S Cost per MWh Load | | | | | |
|---------------------------------------|-------|--------------|---------------|------------|--------------|
| year | month | AScost_REGDN | AScost_NSPIIN | AScost_RRS | AScost_REGUP |
| 2018 | 1 | \$ 0.03 | \$ 1.64 | \$ 1.42 | \$ 0.16 |
| | 2 | \$ 0.03 | \$ 0.14 | \$ 0.74 | \$ 0.07 |
| | 3 | \$ 0.06 | \$ 0.13 | \$ 1.18 | \$ 0.08 |
| | 4 | \$ 0.11 | \$ 0.16 | \$ 1.16 | \$ 0.08 |
| | 5 | \$ 0.05 | \$ 0.44 | \$ 1.17 | \$ 0.11 |
| | 6 | \$ 0.02 | \$ 0.12 | \$ 0.50 | \$ 0.04 |
| | 7 | \$ 0.02 | \$ 0.46 | \$ 2.57 | \$ 0.28 |
| | 8 | \$ 0.01 | \$ 0.15 | \$ 0.57 | \$ 0.06 |
| | 9 | \$ 0.02 | \$ 0.09 | \$ 0.50 | \$ 0.05 |
| | 10 | \$ 0.03 | \$ 0.21 | \$ 1.30 | \$ 0.09 |
| | 11 | \$ 0.03 | \$ 0.24 | \$ 1.42 | \$ 0.08 |
| | 12 | \$ 0.04 | \$ 0.14 | \$ 0.94 | \$ 0.08 |
| 2019 | 1 | \$ 0.05 | \$ 0.07 | \$ 0.80 | \$ 0.07 |
| | 2 | \$ 0.10 | \$ 0.07 | \$ 0.72 | \$ 0.07 |
| | 3 | \$ 0.10 | \$ 0.20 | \$ 1.19 | \$ 0.11 |
| | 4 | \$ 0.13 | \$ 0.20 | \$ 1.22 | \$ 0.12 |
| | 5 | \$ 0.06 | \$ 0.15 | \$ 0.60 | \$ 0.09 |
| | 6 | \$ 0.03 | \$ 0.13 | \$ 0.52 | \$ 0.06 |
| | 7 | \$ 0.02 | \$ 0.13 | \$ 0.60 | \$ 0.07 |
| | 8 | \$ 0.04 | \$ 1.84 | \$ 4.88 | \$ 0.57 |
| | 9 | \$ - | \$ - | \$ - | \$ - |
| | 10 | \$ - | \$ - | \$ - | \$ - |
| | 11 | \$ - | \$ - | \$ - | \$ - |
| | 12 | \$ - | \$ - | \$ - | \$ - |

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| ERCOT-wide Cumulative PNM | | | |
|---------------------------|-------|--------------|---------------|
| year | month | pnm | pnm_accum |
| 2018 | 0 | \$ - | \$ - |
| | 1 | \$ 7,139.99 | \$ 7,139.99 |
| | 2 | \$ 3,011.86 | \$ 10,151.85 |
| | 3 | \$ 870.03 | \$ 11,021.88 |
| | 4 | \$ 2,333.76 | \$ 13,355.64 |
| | 5 | \$ 5,671.10 | \$ 19,026.74 |
| | 6 | \$ 4,930.69 | \$ 23,957.43 |
| | 7 | \$ 13,313.16 | \$ 37,270.59 |
| | 8 | \$ 7,965.15 | \$ 45,235.74 |
| | 9 | \$ 3,181.93 | \$ 48,417.67 |
| | 10 | \$ 6,676.58 | \$ 55,094.25 |
| | 11 | \$ 6,257.98 | \$ 61,352.23 |
| | 12 | \$ 941.00 | \$ 62,293.23 |
| 2019 | 0 | \$ - | \$ - |
| | 1 | \$ 1,594.61 | \$ 1,594.61 |
| | 2 | \$ 3,042.70 | \$ 4,637.31 |
| | 3 | \$ 4,087.75 | \$ 8,725.06 |
| | 4 | \$ 4,232.61 | \$ 12,957.67 |
| | 5 | \$ 3,234.19 | \$ 16,191.86 |
| | 6 | \$ 4,409.46 | \$ 20,601.32 |
| | 7 | \$ 8,110.34 | \$ 28,711.66 |
| | 8 | \$ 84,095.03 | \$ 112,806.69 |
| | 9 | \$ - | \$ - |
| | 10 | \$ - | \$ - |
| | 11 | \$ - | \$ - |
| | 12 | \$ - | \$ - |

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| DA vs. RT Load Forecast Error by Hour Ending | | | | | | | |
|--|-------|--------|----------|----------|----------|--------|---------|
| year | month | HE_1_4 | HE_13_16 | HE_17_20 | HE_21_24 | HE_5_8 | HE_9_12 |
| 2018 | 1 | 226 | 1,083 | 1,300 | 791 | 129 | 705 |
| | 2 | (662) | (1,007) | (1,256) | (1,119) | (497) | (990) |
| | 3 | (289) | 489 | 568 | 229 | (14) | 152 |
| | 4 | (131) | (131) | 158 | (130) | (190) | (430) |
| | 5 | 99 | 754 | 586 | 294 | 63 | 331 |
| | 6 | (325) | 302 | 181 | (100) | (338) | 275 |
| | 7 | 62 | 734 | 823 | 459 | (23) | 465 |
| | 8 | (54) | 511 | 562 | 138 | (184) | 150 |
| | 9 | (306) | 669 | 650 | 52 | (344) | (68) |
| | 10 | 367 | 352 | 532 | 543 | 166 | (168) |
| | 11 | (191) | 853 | 648 | 37 | (577) | (30) |
| | 12 | (96) | (296) | (112) | (79) | (80) | (255) |
| 2019 | 1 | (69) | 2 | 10 | (37) | 207 | 245 |
| | 2 | (412) | (246) | (679) | (749) | (361) | (378) |
| | 3 | 275 | (45) | 258 | 142 | 152 | (52) |
| | 4 | 125 | 668 | 573 | 292 | 35 | 171 |
| | 5 | (32) | 5 | (31) | 19 | (21) | 76 |
| | 6 | 107 | 1,213 | 916 | 510 | 330 | 1,059 |
| | 7 | (127) | 29 | (239) | (201) | (273) | (188) |
| | 8 | 72 | 768 | 869 | 503 | 64 | 623 |
| | 9 | - | - | - | - | - | - |
| | 10 | - | - | - | - | - | - |
| | 11 | - | - | - | - | - | - |
| | 12 | - | - | - | - | - | - |

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| Monthly Average of Wind Generation by Hour Ending | | | | | | | |
|---|-------|--------|----------|----------|----------|--------|---------|
| year | month | HE_1_4 | HE_13_16 | HE_17_20 | HE_21_24 | HE_5_8 | HE_9_12 |
| 2018 | 1 | 9,387 | 7,209 | 7,508 | 9,601 | 9,171 | 7,514 |
| | 2 | 8,876 | 7,295 | 7,771 | 9,462 | 8,559 | 7,545 |
| | 3 | 10,159 | 7,784 | 8,052 | 10,006 | 9,143 | 8,480 |
| | 4 | 10,025 | 8,403 | 9,183 | 10,641 | 9,227 | 8,549 |
| | 5 | 11,505 | 7,360 | 9,027 | 11,105 | 9,862 | 8,186 |
| | 6 | 11,843 | 7,661 | 9,377 | 11,080 | 9,922 | 8,937 |
| | 7 | 7,895 | 3,590 | 5,418 | 7,058 | 6,434 | 4,248 |
| | 8 | 9,401 | 5,402 | 6,821 | 9,075 | 7,803 | 6,410 |
| | 9 | 6,222 | 4,201 | 5,415 | 6,741 | 4,833 | 4,036 |
| | 10 | 7,988 | 6,184 | 6,290 | 7,640 | 7,413 | 6,738 |
| | 11 | 9,151 | 6,413 | 6,543 | 8,872 | 8,685 | 6,866 |
| | 12 | 9,512 | 6,983 | 7,137 | 9,202 | 8,850 | 7,547 |
| 2019 | 1 | 9,500 | 7,954 | 7,892 | 9,491 | 9,141 | 7,897 |
| | 2 | 10,520 | 8,015 | 8,843 | 10,755 | 9,358 | 7,631 |
| | 3 | 9,471 | 6,980 | 7,408 | 9,114 | 8,585 | 7,389 |
| | 4 | 10,770 | 9,020 | 9,488 | 11,220 | 10,180 | 9,034 |
| | 5 | 10,907 | 8,497 | 9,689 | 10,736 | 9,414 | 8,343 |
| | 6 | 9,717 | 6,210 | 7,891 | 10,058 | 7,706 | 6,535 |
| | 7 | 10,258 | 6,036 | 8,124 | 9,915 | 8,568 | 6,712 |
| | 8 | 11,086 | 4,854 | 7,343 | 10,742 | 8,638 | 5,965 |
| | 9 | - | - | - | - | - | - |
| | 10 | - | - | - | - | - | - |
| | 11 | - | - | - | - | - | - |
| | 12 | - | - | - | - | - | - |

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| RT Congestion Constraint Rankings - Top 10 Constraints by Binding Frequency and Top 10 Constraints by Total Congestion Rent | | | | | | | | | | | | | | | | |
|---|------|--------------------------------------|----------|------|---------|----------|----------|---------|----------|----------|---------|----------|------|------|------|------|
| category | year | item | rankvar | rank | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
| FREQ_EXIST | 2019 | BARL_FTSW1_1 (FTSW-BARL) | 17,441 | 1 | 1,340 | 2,467 | 3,067 | 2,346 | 4,230 | 3,737 | 254 | - | - | - | - | - |
| FREQ_EXIST | 2019 | HAMILT_MAVERI1_1 (HAMILTON-MAVERICK) | 11,258 | 2 | 520 | 2,373 | 827 | 3,178 | 1,756 | 1,410 | 691 | 503 | - | - | - | - |
| FREQ_EXIST | 2019 | PANHANDLE_GTC (PNHNDL) | 6,571 | 3 | 61 | 594 | 623 | 928 | 2,083 | 1,411 | 338 | 533 | - | - | - | - |
| FREQ_EXIST | 2019 | SONR_69-1 (SONR-SONR) | 5,832 | 4 | 528 | 37 | - | - | 2,423 | 941 | 1,235 | 668 | - | - | - | - |
| FREQ_EXIST | 2019 | RIOPEC_WOODW21_1 (WOODWRD2-RIOPECOS) | 4,540 | 5 | 658 | 698 | 401 | 779 | 908 | 598 | 322 | 176 | - | - | - | - |
| FREQ_EXIST | 2019 | 38T365_1 (WIRTZ-FLATRO) | 4,517 | 6 | 1,277 | 1,393 | 1,371 | 267 | 191 | 18 | - | - | - | - | - | - |
| FREQ_EXIST | 2019 | BRUNI_69_1 (BRUNI-BRUNI) | 4,139 | 7 | 173 | 5 | 261 | 523 | 941 | 231 | 781 | 1,224 | - | - | - | - |
| FREQ_EXIST | 2019 | RAYMND2_69A1 (RAYMND2-RAYMND2) | 3,140 | 8 | 471 | 86 | 236 | 51 | 483 | 280 | 487 | 1,046 | - | - | - | - |
| FREQ_EXIST | 2019 | NLARSW_PILONC1_1 (NLARSW-PILONCIL) | 3,103 | 9 | 511 | 171 | 569 | 1,031 | 601 | 55 | 54 | 111 | - | - | - | - |
| FREQ_EXIST | 2019 | 16TH_WRD2_1 (WOODWRD2-16TH_ST) | 3,031 | 10 | 386 | 666 | 1,783 | 184 | - | 9 | 3 | - | - | - | - | - |
| TOP10_RENT | 2019 | PANHANDLE_GTC (PNHNDL) | \$ 37.66 | 1 | \$ 0.35 | \$ 2.64 | \$ 2.06 | \$ 6.40 | \$ 13.38 | \$ 8.49 | \$ 1.48 | \$ 2.86 | \$ - | \$ - | \$ - | \$ - |
| TOP10_RENT | 2019 | BARL_FTSW1_1 (FTSW-BARL) | \$ 33.89 | 2 | \$ 0.68 | \$ 3.97 | \$ 4.52 | \$ 4.13 | \$ 10.52 | \$ 9.76 | \$ 0.32 | \$ - | \$ - | \$ - | \$ - | \$ - |
| TOP10_RENT | 2019 | HILL_MAR_2_1 (MARION-HILLCTRY) | \$ 27.06 | 3 | \$ - | \$ 27.06 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| TOP10_RENT | 2019 | LON_HILL_XFMRS (LON_HILL-LON_HILL) | \$ 24.57 | 4 | \$ 6.25 | \$ 0.00 | \$ 4.29 | \$ 6.12 | \$ 1.75 | \$ 6.15 | \$ 0.01 | \$ - | \$ - | \$ - | \$ - | \$ - |
| TOP10_RENT | 2019 | SONR_69-1 (SONR-SONR) | \$ 20.75 | 5 | \$ 0.15 | \$ 0.10 | \$ - | \$ - | \$ 14.77 | \$ 4.14 | \$ 0.98 | \$ 0.60 | \$ - | \$ - | \$ - | \$ - |
| TOP10_RENT | 2019 | 588_A_1 (LWSVW-LWVT) | \$ 19.04 | 6 | \$ - | \$ - | \$ 12.37 | \$ 6.67 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| TOP10_RENT | 2019 | 16TH_WRD2_1 (WOODWRD2-16TH_ST) | \$ 18.54 | 7 | \$ 2.13 | \$ 6.59 | \$ 8.41 | \$ 1.21 | \$ - | \$ 0.18 | \$ 0.00 | \$ - | \$ - | \$ - | \$ - | \$ - |
| TOP10_RENT | 2019 | JCKSTP18_A (STP-JCK) | \$ 17.89 | 8 | \$ 2.34 | \$ - | \$ 1.10 | \$ 0.14 | \$ 0.63 | \$ 13.68 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| TOP10_RENT | 2019 | HAMILT_MAVERI1_1 (HAMILTON-MAVERICK) | \$ 14.86 | 9 | \$ 0.89 | \$ 4.31 | \$ 0.86 | \$ 3.55 | \$ 1.85 | \$ 1.85 | \$ 0.94 | \$ 0.62 | \$ - | \$ - | \$ - | \$ - |
| TOP10_RENT | 2019 | STPWAP39_1 (STP-WAP) | \$ 13.91 | 10 | \$ - | \$ - | \$ - | \$ - | \$ 0.00 | \$ - | \$ 0.52 | \$ 13.39 | \$ - | \$ - | \$ - | \$ - |

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| DA Congestion Constraint Rankings - Top 10 Constraints by Binding Frequency and Top 10 Constraints by Total Congestion Rent | | | | | | | | | | | | | | | | | |
|---|------|--------------------------------------|----------|------|----------|---------|----------|---------|----------|----------|---------|---------|------|------|------|------|--|
| category | year | item | rankvar | rank | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | |
| FREQ_EXIST | 2019 | BARL_FTSW1_1 (FTSW-BARL) | 3,126 | 1 | 308 | 325 | 473 | 630 | 671 | 679 | 40 | - | - | - | - | - | |
| FREQ_EXIST | 2019 | LON_HILL_XFMRS (LON_HILL-LON_HILL) | 2,849 | 2 | 250 | 192 | 417 | 597 | 404 | 597 | 286 | 106 | - | - | - | - | |
| FREQ_EXIST | 2019 | HAMILT_MAVERT1_1 (HAMILTON-MAVERICK) | 2,791 | 3 | 482 | 469 | 252 | 484 | 431 | 358 | 147 | 168 | - | - | - | - | |
| FREQ_EXIST | 2019 | 138_ALV_MNL_1 (ALVIN-MAINLAND) | 2,696 | 4 | 60 | 200 | 363 | 669 | 472 | 365 | 431 | 136 | - | - | - | - | |
| FREQ_EXIST | 2019 | EAGLEP_ESCOND1_1 (ESCONDID-EAGLE_PS) | 2,691 | 5 | 221 | 166 | 254 | 281 | 270 | 363 | 583 | 553 | - | - | - | - | |
| FREQ_EXIST | 2019 | CAGNON_XFMRS (CAGNON-CAGNON) | 2,448 | 6 | 202 | 175 | 215 | 210 | 370 | 565 | 338 | 373 | - | - | - | - | |
| FREQ_EXIST | 2019 | RIOPEC_WOODW21_1 (RIOPECOS-WOODWRD2) | 2,413 | 7 | 491 | 292 | 378 | 139 | 131 | 268 | 372 | 342 | - | - | - | - | |
| FREQ_EXIST | 2019 | BARNHR_BIGLAK1_1 (BIGLAKE-BARNHRT) | 2,081 | 8 | 294 | 175 | 398 | 161 | 522 | 371 | 135 | 25 | - | - | - | - | |
| FREQ_EXIST | 2019 | 6437_F (SCRCV-KNAPP) | 1,970 | 9 | 261 | 489 | 475 | 391 | 152 | 11 | 36 | 155 | - | - | - | - | |
| FREQ_EXIST | 2019 | RINCON_WHITE_2_1 (WHITE_PT-RINCON) | 1,863 | 10 | 284 | 163 | 395 | 451 | 369 | - | - | 1 | - | - | - | - | |
| TOP10_RENT | 2019 | BARL_FTSW1_1 (FTSW-BARL) | \$ 39.45 | 1 | \$ 1.48 | \$ 2.39 | \$ 6.22 | \$ 3.68 | \$ 12.55 | \$ 12.38 | \$ 0.75 | \$ - | \$ - | \$ - | \$ - | \$ - | |
| TOP10_RENT | 2019 | PANHANDLE_GTC (PNHNDL) | \$ 31.51 | 2 | \$ 0.89 | \$ 2.17 | \$ 0.47 | \$ 3.29 | \$ 12.00 | \$ 7.82 | \$ 2.29 | \$ 2.59 | \$ - | \$ - | \$ - | \$ - | |
| TOP10_RENT | 2019 | LON_HILL_XFMRS (LON_HILL-LON_HILL) | \$ 25.33 | 3 | \$ 1.51 | \$ 1.42 | \$ 4.86 | \$ 6.15 | \$ 2.78 | \$ 5.86 | \$ 1.98 | \$ 0.77 | \$ - | \$ - | \$ - | \$ - | |
| TOP10_RENT | 2019 | HUMBLT_NOVICT1_1 (HUMBLTAP-NOVICTAP) | \$ 23.04 | 4 | \$ 22.89 | \$ 0.01 | \$ 0.02 | \$ 0.03 | \$ 0.04 | \$ 0.02 | \$ 0.01 | \$ 0.01 | \$ - | \$ - | \$ - | \$ - | |
| TOP10_RENT | 2019 | COLEMAN_JUNCTION (SANA-GLSB) | \$ 22.96 | 5 | \$ 22.86 | \$ 0.02 | \$ 0.05 | \$ 0.02 | \$ 0.01 | \$ 0.00 | \$ 0.00 | \$ 0.00 | \$ - | \$ - | \$ - | \$ - | |
| TOP10_RENT | 2019 | 590_B (LWVJS-LKPNT) | \$ 19.66 | 6 | \$ - | \$ - | \$ 6.96 | \$ 2.10 | \$ 3.44 | \$ 3.17 | \$ 2.06 | \$ 1.93 | \$ - | \$ - | \$ - | \$ - | |
| TOP10_RENT | 2019 | 588_A_1 (LWSVW-LWVTI) | \$ 17.35 | 7 | \$ - | \$ - | \$ 11.10 | \$ 6.22 | \$ 0.02 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | |
| TOP10_RENT | 2019 | RIOPEC_WOODW21_1 (RIOPECOS-WOODWRD2) | \$ 17.16 | 8 | \$ 9.00 | \$ 0.80 | \$ 2.85 | \$ 0.40 | \$ 0.66 | \$ 2.57 | \$ 0.63 | \$ 0.26 | \$ - | \$ - | \$ - | \$ - | |
| TOP10_RENT | 2019 | 6100_G (ACSSW-AMTBT) | \$ 16.38 | 9 | \$ - | \$ - | \$ 0.02 | \$ 0.06 | \$ 0.33 | \$ 4.96 | \$ 5.31 | \$ 5.71 | \$ - | \$ - | \$ - | \$ - | |
| TOP10_RENT | 2019 | CAGNON_XFMRS (CAGNON-CAGNON) | \$ 14.49 | 10 | \$ 1.55 | \$ 0.69 | \$ 0.79 | \$ 1.15 | \$ 3.49 | \$ 4.01 | \$ 1.48 | \$ 1.33 | \$ - | \$ - | \$ - | \$ - | |

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| Top 10 CRR Pairs Ranked by Monthly Auction Values - Top 10 PTP Obligations by Total Transaction Values and Top 10 PTP Options by Total Transaction Values | | | | | | | | | | | | | | | | | |
|---|--------|------|---------------------------|-------------|------|---------|---------|---------|---------|---------|---------|---------|---------|---------|------|------|------|
| fr | option | year | pair | total value | rank | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
| N | 2019 | | HB WEST-LZ WEST | \$ 22.00 | 1 | \$ 2.01 | \$ 2.53 | \$ 1.75 | \$ 1.95 | \$ 2.39 | \$ 3.71 | \$ 3.32 | \$ 2.74 | \$ 1.60 | \$ - | \$ - | \$ - |
| N | 2019 | | HB SOUTH-LZ SOUTH | \$ 14.22 | 2 | \$ 1.54 | \$ 0.89 | \$ 0.95 | \$ 1.03 | \$ 2.19 | \$ 2.80 | \$ 1.92 | \$ 1.70 | \$ 1.20 | \$ - | \$ - | \$ - |
| N | 2019 | | HB HOUSTON-LZ HOUSTON | \$ 6.07 | 3 | \$ 0.53 | \$ 0.25 | \$ 0.25 | \$ 0.70 | \$ 1.24 | \$ 1.27 | \$ 0.92 | \$ 0.52 | \$ 0.39 | \$ - | \$ - | \$ - |
| N | 2019 | | HB NORTH-LZ NORTH | \$ 6.05 | 4 | \$ 0.89 | \$ 0.49 | \$ 0.21 | \$ 0.54 | \$ 0.69 | \$ 1.08 | \$ 0.90 | \$ 0.78 | \$ 0.47 | \$ - | \$ - | \$ - |
| N | 2019 | | HB NORTH-HB HOUSTON | \$ 5.50 | 5 | \$ 0.06 | \$ 0.00 | \$ 0.91 | \$ 1.02 | \$ 0.93 | \$ 0.86 | \$ 0.55 | \$ 0.28 | \$ 0.90 | \$ - | \$ - | \$ - |
| N | 2019 | | HB WEST-HB NORTH | \$ 4.25 | 6 | \$ 1.03 | \$ 0.33 | \$ 0.69 | \$ 0.83 | \$ 0.66 | \$ 0.54 | \$ 0.13 | \$ 0.01 | \$ 0.04 | \$ - | \$ - | \$ - |
| N | 2019 | | HB PAN-HB WEST | \$ 2.48 | 7 | \$ - | \$ - | \$ - | \$ - | \$ 0.39 | \$ 1.19 | \$ 0.30 | \$ 0.49 | \$ 0.10 | \$ - | \$ - | \$ - |
| N | 2019 | | CPSES_UNIT2-HB NORTH | \$ 2.43 | 8 | \$ - | \$ 0.20 | \$ 0.24 | \$ 0.62 | \$ 0.48 | \$ 0.44 | \$ 0.22 | \$ 0.11 | \$ 0.12 | \$ - | \$ - | \$ - |
| N | 2019 | | JCKCNTY2_ST2-LZ NORTH | \$ 2.11 | 9 | \$ 0.27 | \$ 0.15 | \$ 0.20 | \$ 0.20 | \$ 0.35 | \$ 0.50 | \$ 0.21 | \$ 0.14 | \$ 0.07 | \$ - | \$ - | \$ - |
| N | 2019 | | JACKCNTY_STG-LZ NORTH | \$ 1.84 | 10 | \$ 0.19 | \$ 0.13 | \$ 0.08 | \$ 0.01 | \$ 0.17 | \$ 0.35 | \$ 0.48 | \$ 0.32 | \$ 0.12 | \$ - | \$ - | \$ - |
| Y | 2019 | | HB WEST-LZ WEST | \$ 5.44 | 1 | \$ 0.27 | \$ 0.13 | \$ 0.38 | \$ 0.30 | \$ 0.50 | \$ 1.31 | \$ 0.82 | \$ 1.00 | \$ 0.73 | \$ - | \$ - | \$ - |
| Y | 2019 | | RIGGIN_UNIT1-REROCK_ALL | \$ 4.71 | 2 | \$ 0.02 | \$ 0.04 | \$ 0.49 | \$ 0.94 | \$ 0.31 | \$ 0.59 | \$ 0.72 | \$ 1.32 | \$ 0.28 | \$ - | \$ - | \$ - |
| Y | 2019 | | HB SOUTH-LZ SOUTH | \$ 4.56 | 3 | \$ 0.32 | \$ 0.41 | \$ 0.30 | \$ 0.31 | \$ 0.46 | \$ 1.08 | \$ 0.60 | \$ 0.62 | \$ 0.45 | \$ - | \$ - | \$ - |
| Y | 2019 | | HB NORTH-LZ NORTH | \$ 4.16 | 4 | \$ 0.46 | \$ 0.22 | \$ 0.37 | \$ 0.46 | \$ 0.51 | \$ 0.63 | \$ 0.43 | \$ 0.55 | \$ 0.54 | \$ - | \$ - | \$ - |
| Y | 2019 | | AEEC-LZ WEST | \$ 2.68 | 5 | \$ 0.04 | \$ 0.00 | \$ 0.14 | \$ - | \$ 0.20 | \$ - | \$ 1.03 | \$ 0.68 | \$ 0.58 | \$ - | \$ - | \$ - |
| Y | 2019 | | HB WEST-HOVEY_GEN | \$ 2.47 | 6 | \$ 0.18 | \$ 0.03 | \$ 0.06 | \$ 0.05 | \$ 0.05 | \$ 0.70 | \$ 0.40 | \$ 0.43 | \$ 0.56 | \$ - | \$ - | \$ - |
| Y | 2019 | | REROCK_ALL-HOVEY_GEN | \$ 1.72 | 7 | \$ 0.07 | \$ 0.17 | \$ 0.19 | \$ 0.60 | \$ 0.36 | \$ 0.14 | \$ 0.04 | \$ 0.09 | \$ 0.06 | \$ - | \$ - | \$ - |
| Y | 2019 | | WOO_WOODWRD1-RIGGIN_UNIT1 | \$ 1.56 | 8 | \$ 0.05 | \$ 0.10 | \$ 0.04 | \$ 0.17 | \$ 0.37 | \$ 0.22 | \$ 0.30 | \$ 0.24 | \$ 0.08 | \$ - | \$ - | \$ - |
| Y | 2019 | | HB HOUSTON-LZ HOUSTON | \$ 1.16 | 9 | \$ 0.06 | \$ 0.09 | \$ 0.07 | \$ 0.13 | \$ 0.20 | \$ 0.18 | \$ 0.12 | \$ 0.11 | \$ 0.21 | \$ - | \$ - | \$ - |
| Y | 2019 | | STP_STP_G1-LZ CPS | \$ 0.99 | 10 | \$ - | \$ 0.07 | \$ 0.02 | \$ 0.14 | \$ 0.03 | \$ 0.14 | \$ 0.18 | \$ 0.33 | \$ 0.07 | \$ - | \$ - | \$ - |

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