



Item 6: Independent Market Monitor (IMM) Report

Steve Reedy
Deputy Director, ERCOT IMM
sreedy@potomaceconomics.com
512-225-7139

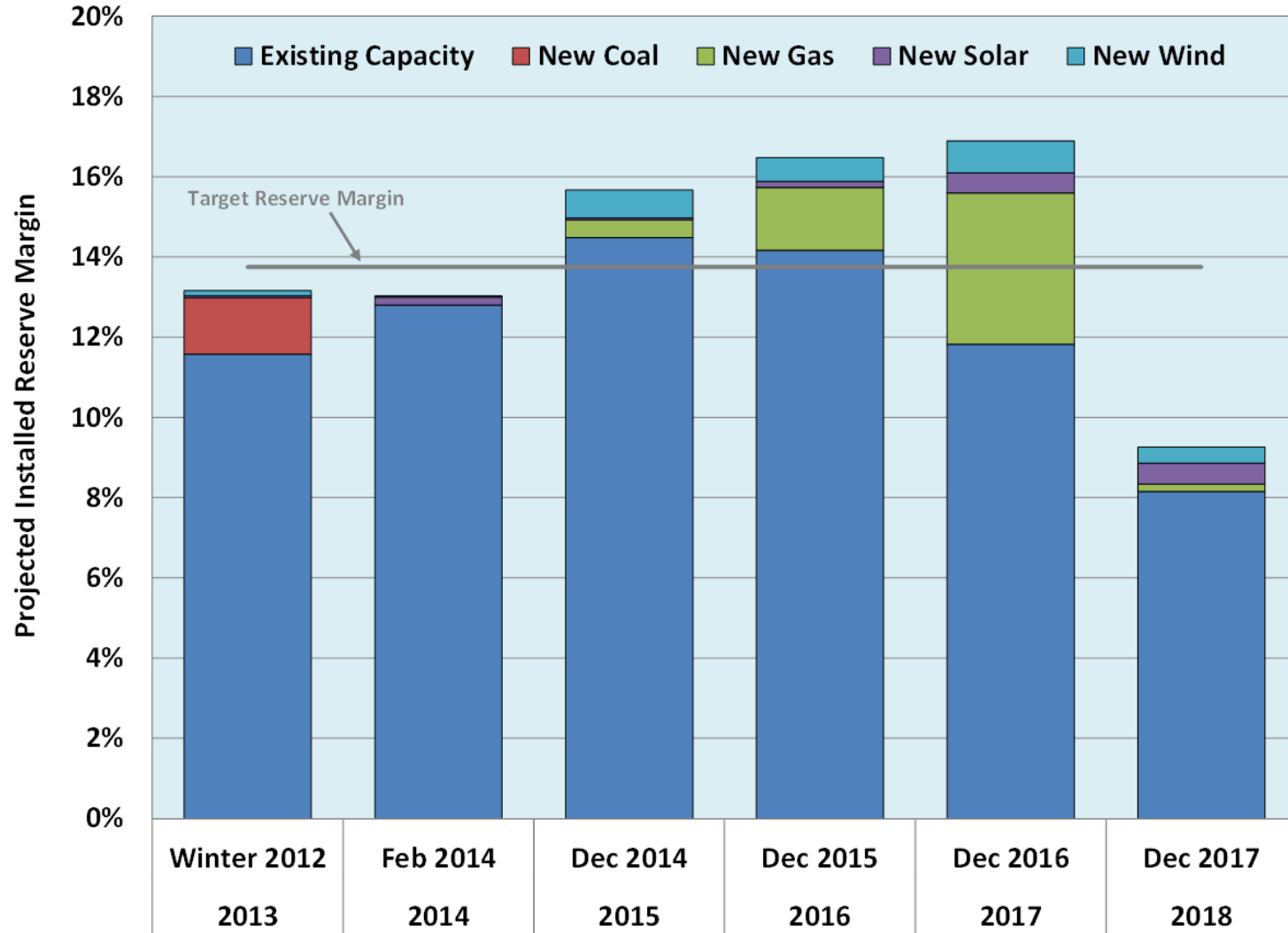
Board of Directors Meeting

ERCOT Public
October 9, 2018

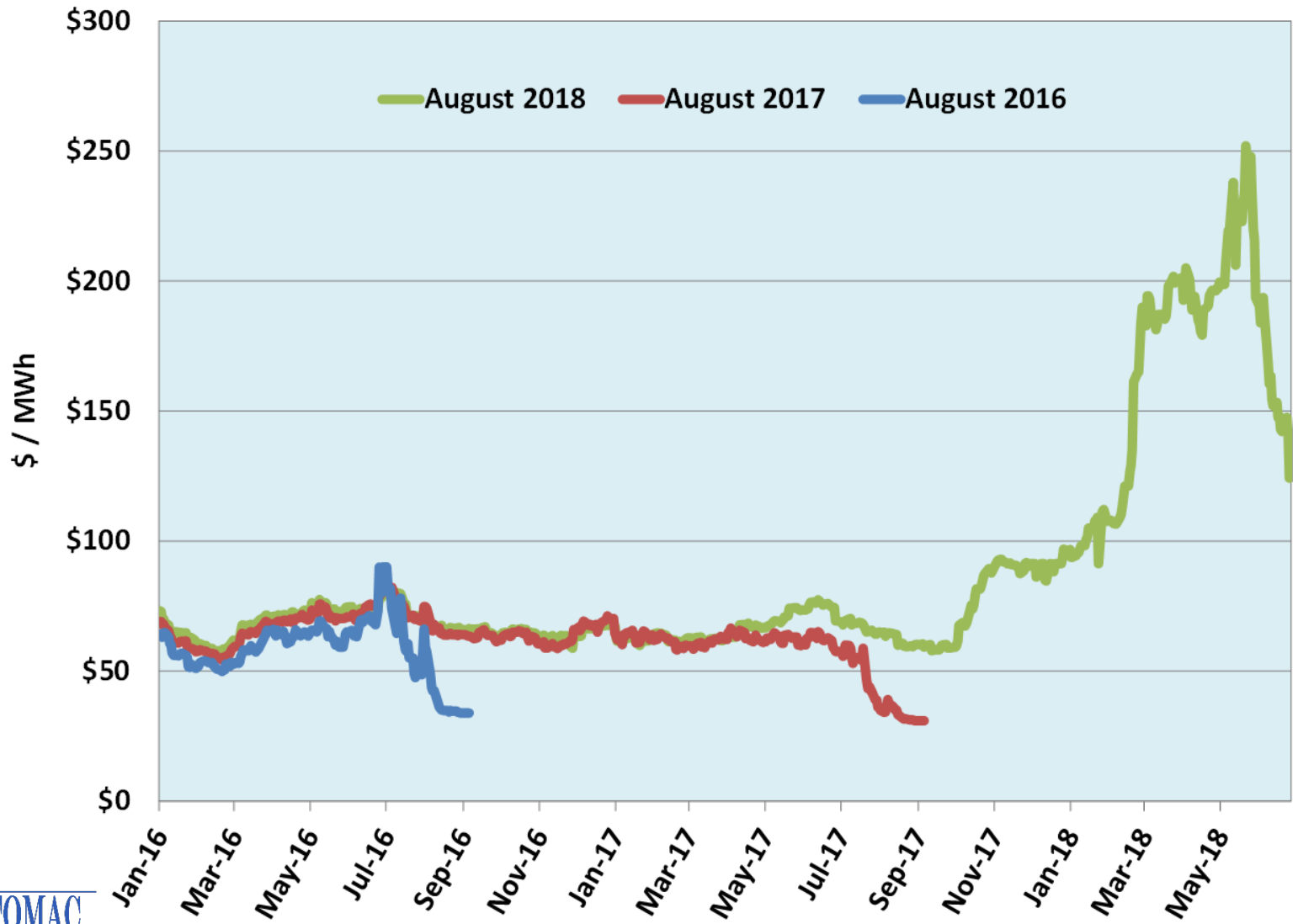
Today's topic

- Summer 2018 Market Review
 - Expectations for 2018
 - Outcomes
 - Wind
 - Generation from retired coal units replaced primarily with natural gas
 - Higher generator availability
 - Expectations for 2019

History of Summer Reserve Margin Expectations



August Forward Prices

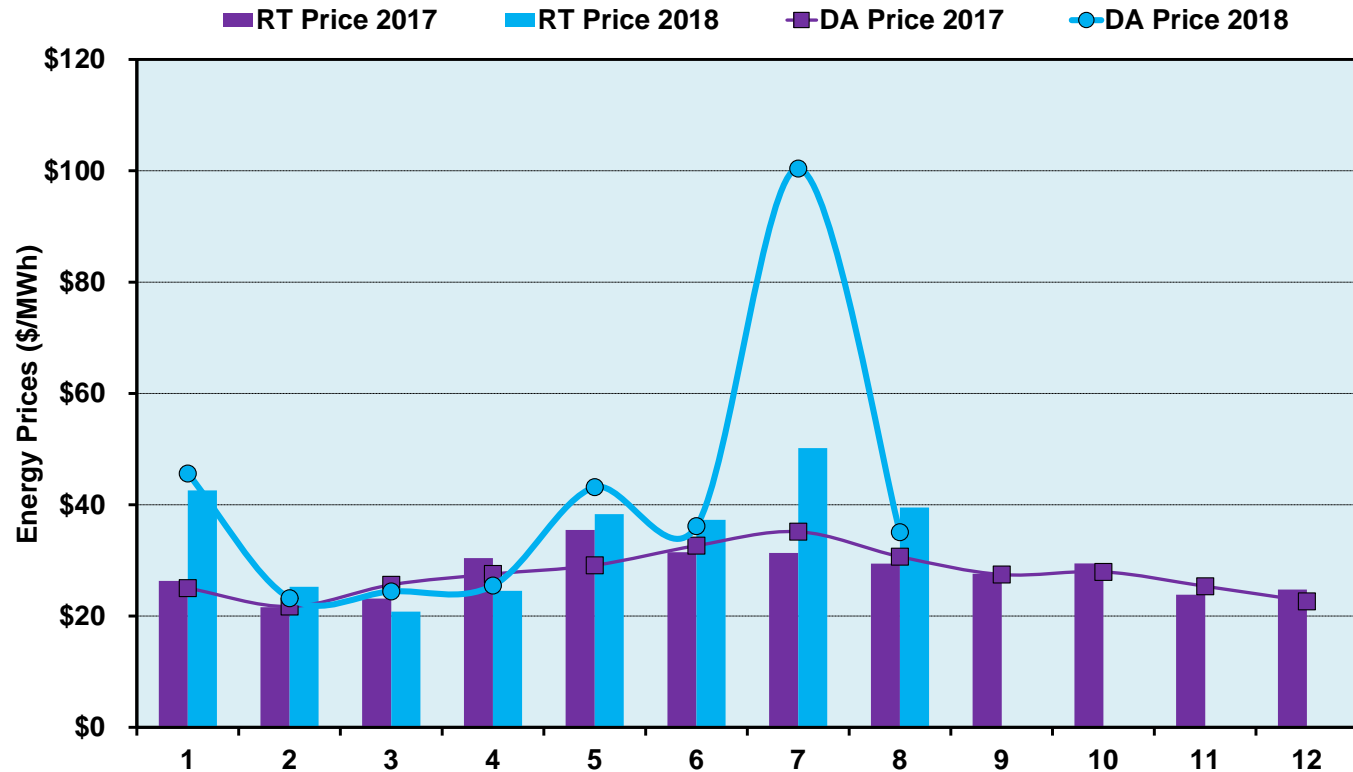


Higher Energy Prices Due to Higher Loads

Real Time Prices
8M17: \$29.1/MWh
2017: \$28.3/MWh

8M18: \$36.2/MWh
~ 25% increase

Natural Gas Prices
Have averaged
~ \$3/MBtu
for all periods



Impact to Zonal Prices is Not Consistent

2016: \$22-26/MWh

8M17: \$23-34/MWh

2017: \$25-32/MWh

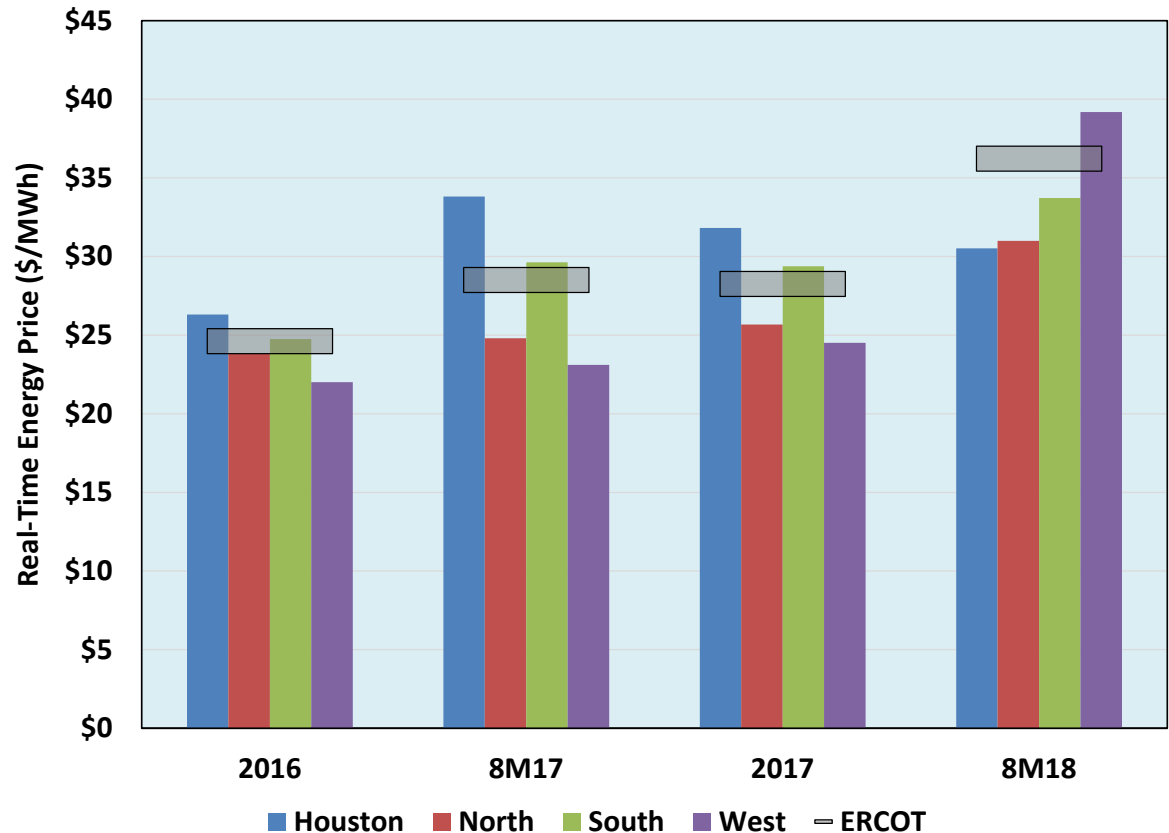
8M18: \$31-39/MWh

Houston -10%

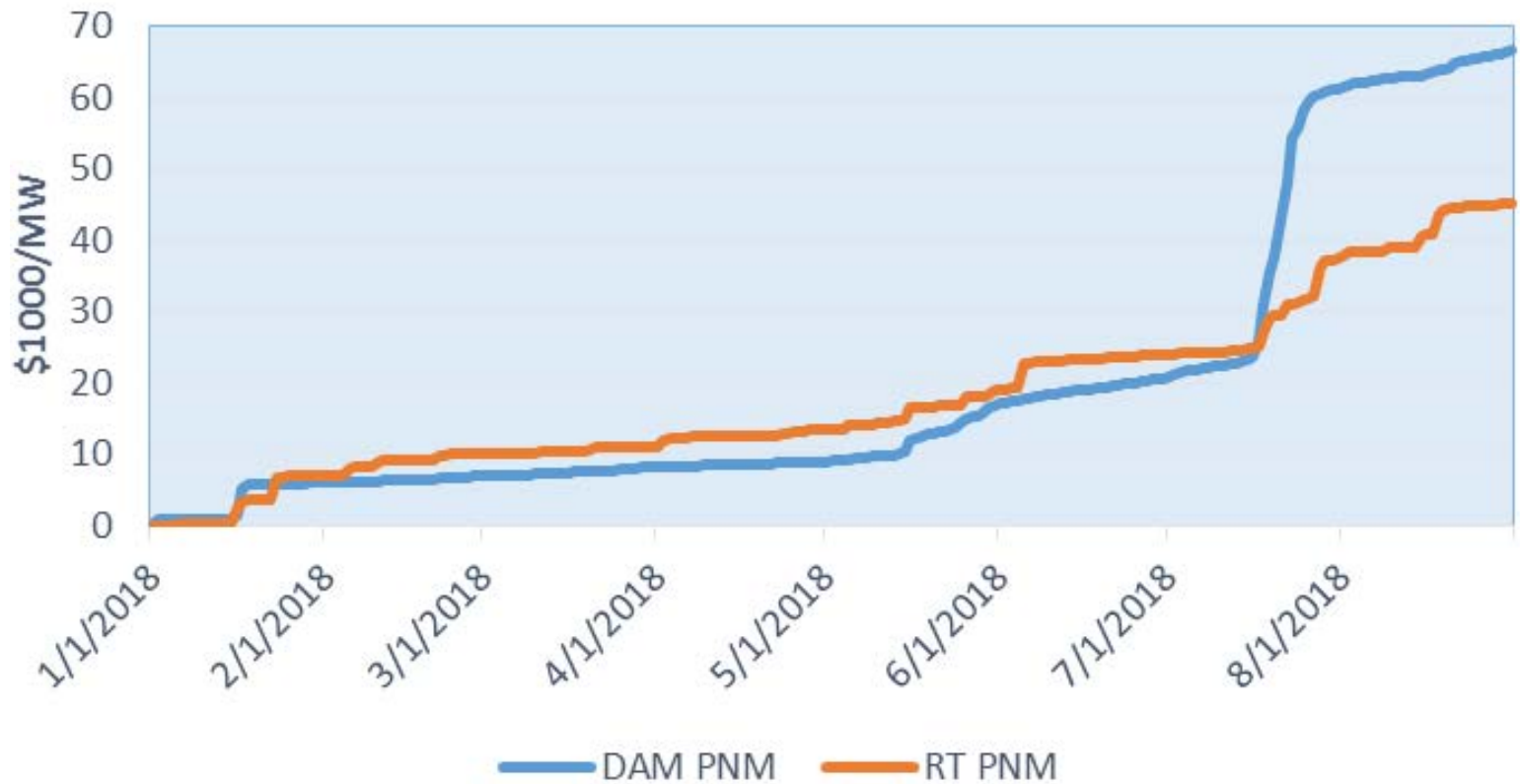
North +25%

South +14%

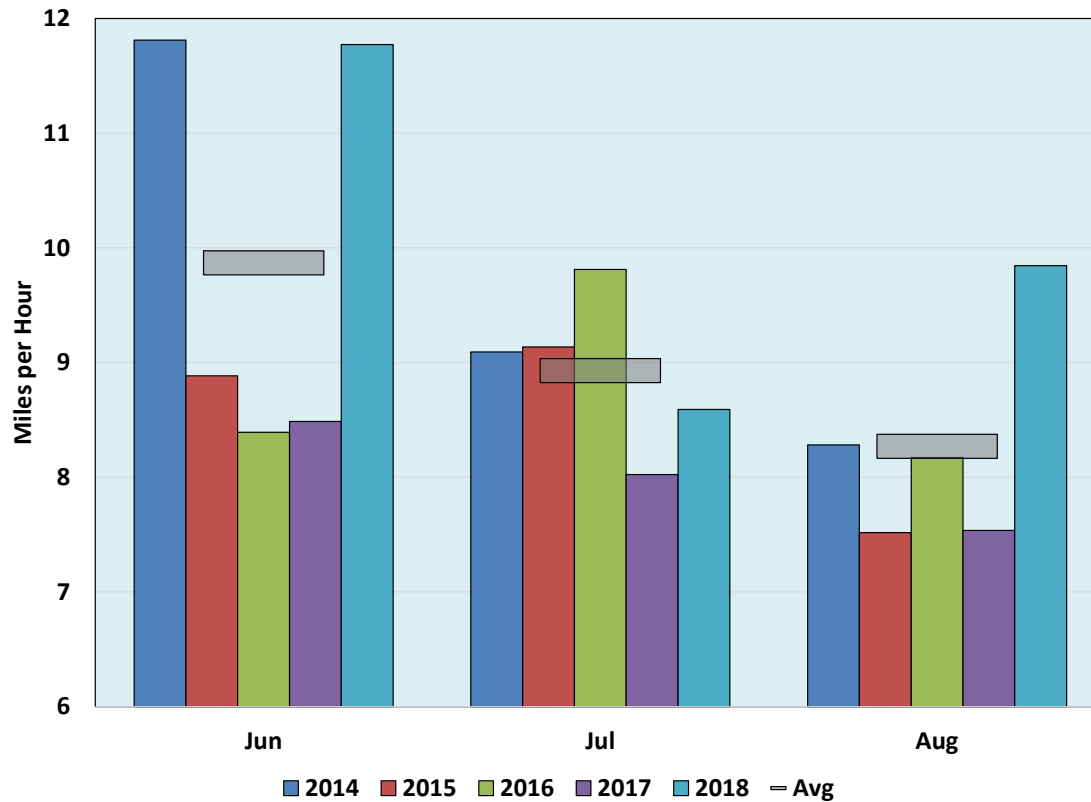
West +70%



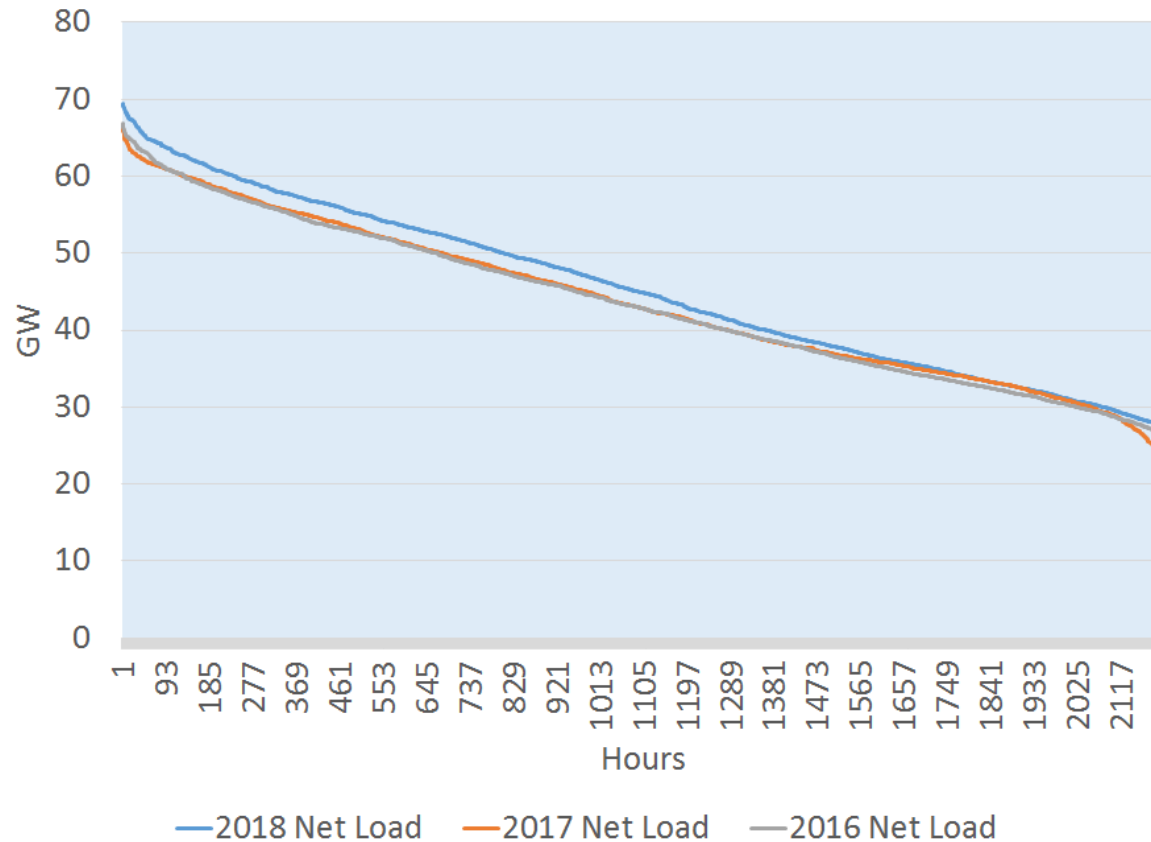
Day Ahead Peaker Net Margin in 2018



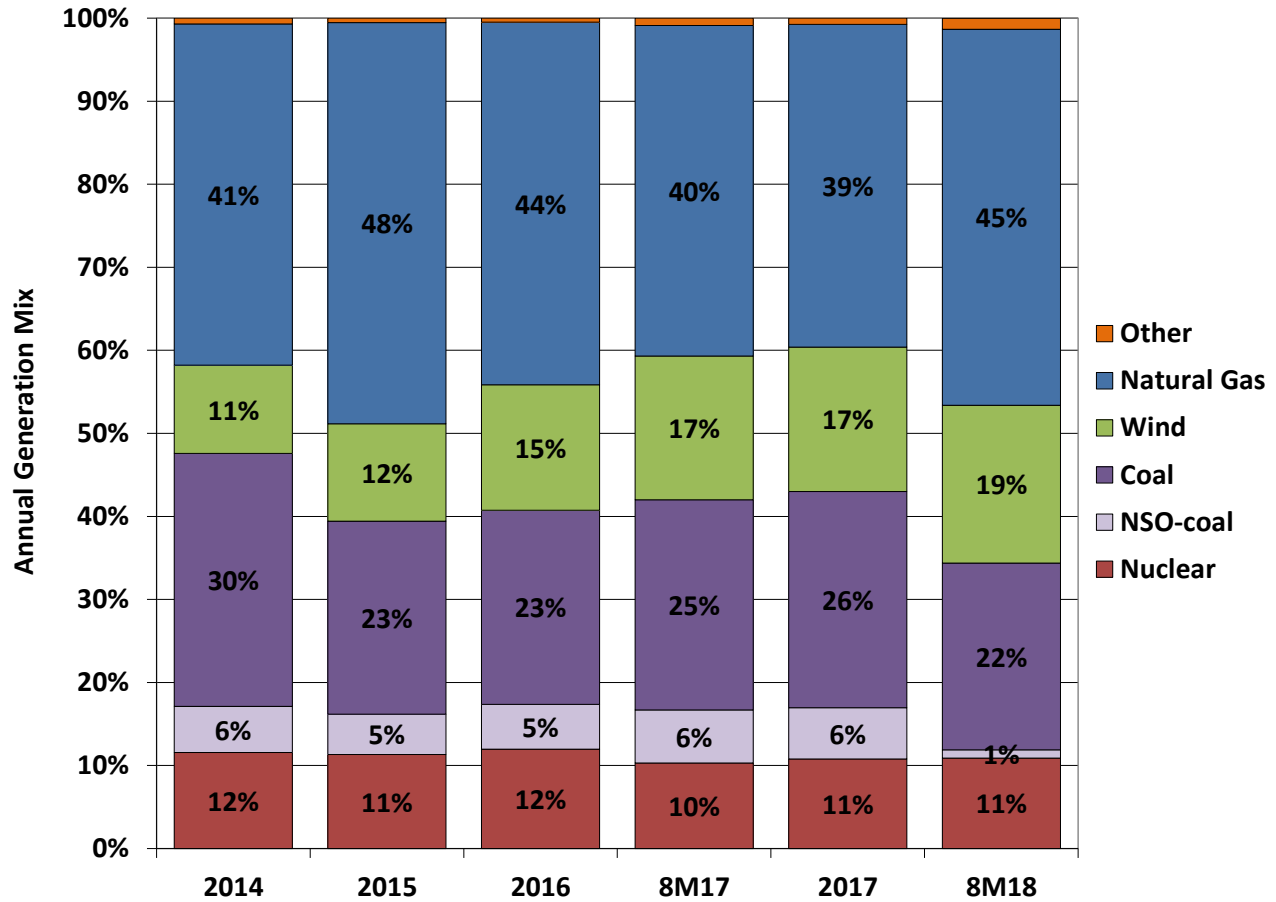
Monthly Average Wind Speeds



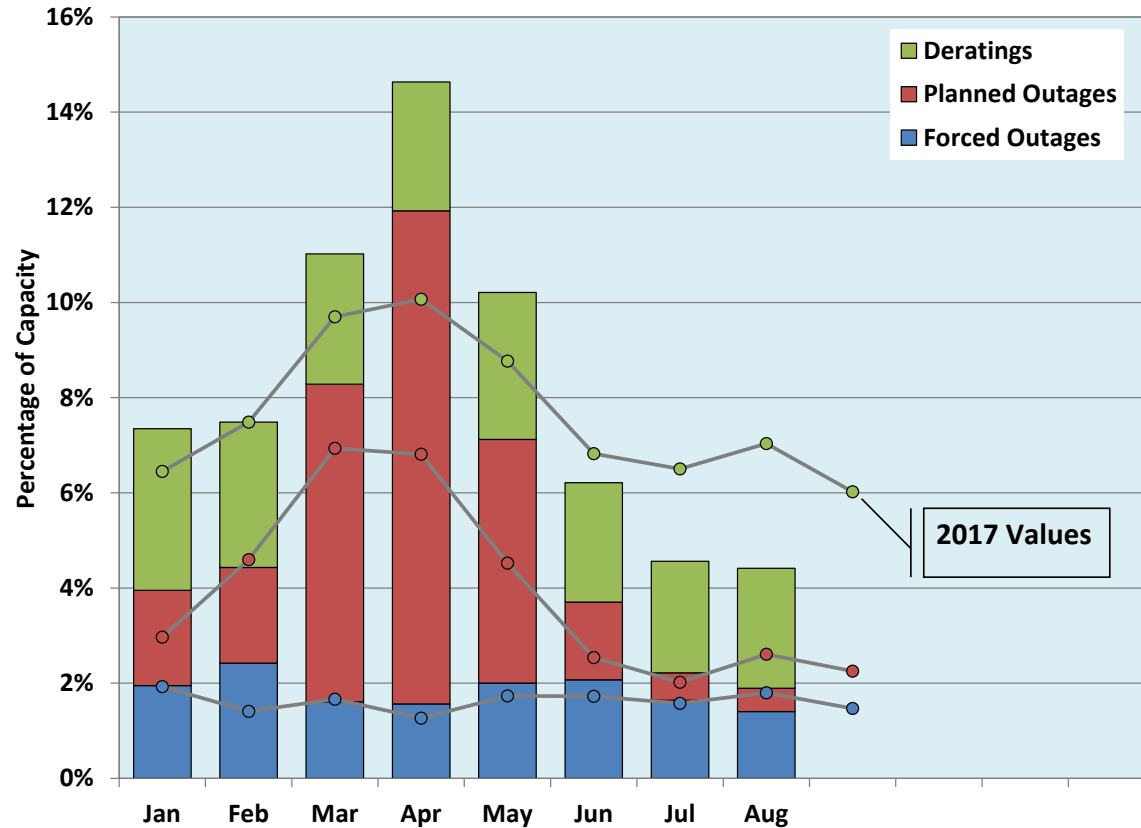
Summer 2018 Net Load Duration Curve in 2018



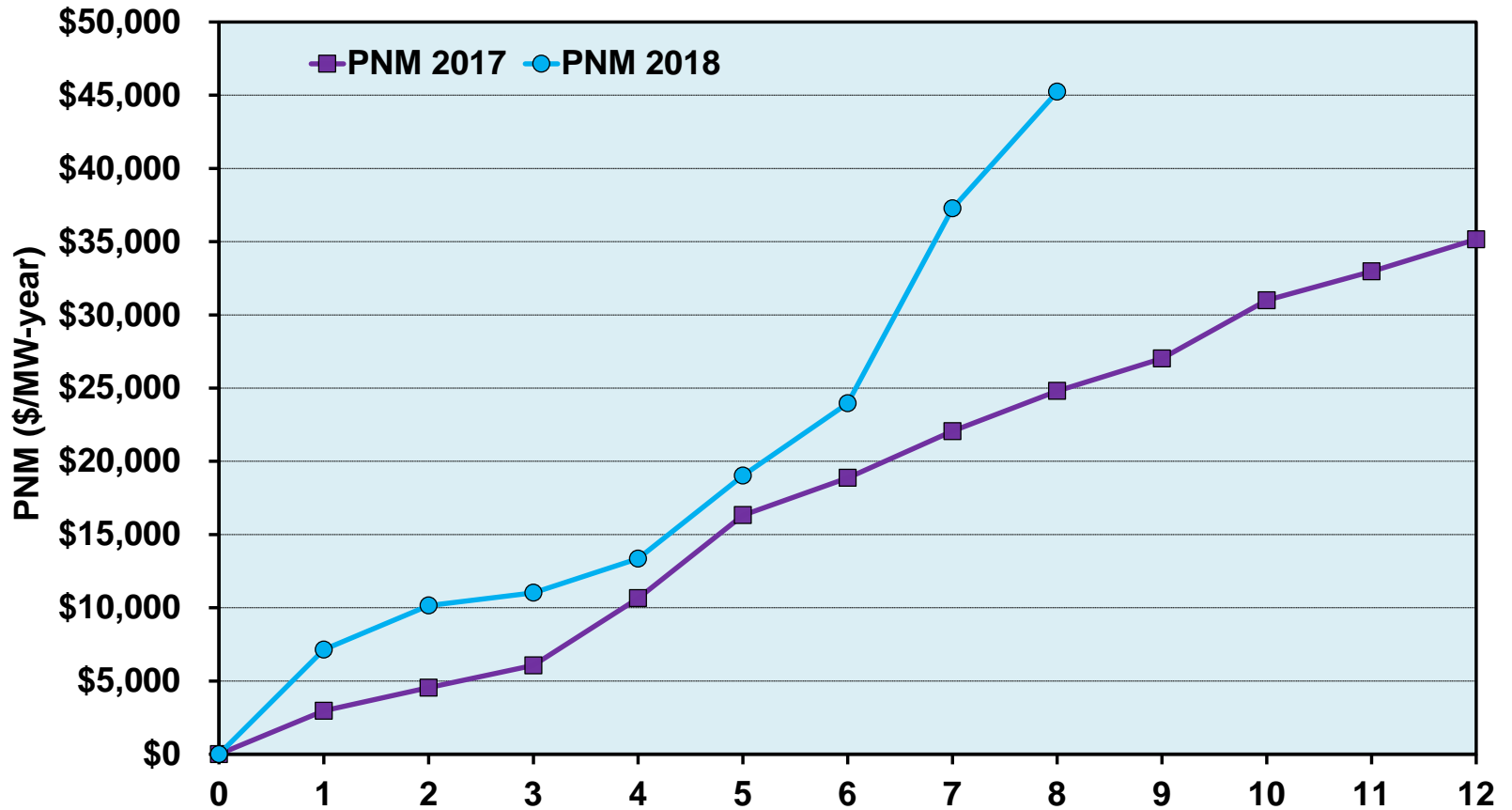
Generation by Fuel Type



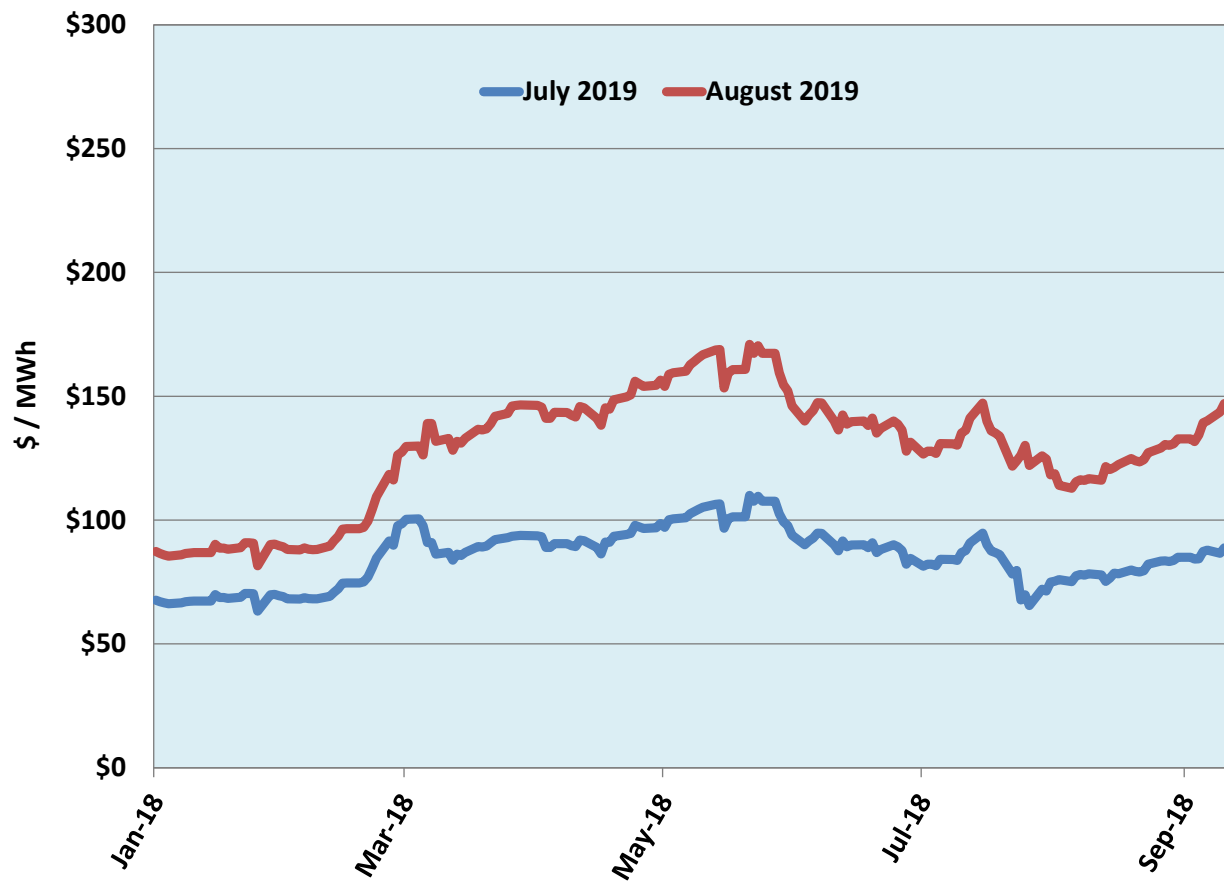
Lower Generator Outage Rates During Summer Months



Peaker Net Margin Trending Higher



Forward Prices for Summer 2019



To the Public Utility Commission of Texas

ERCOT Wholesale Electricity Market Monthly Report

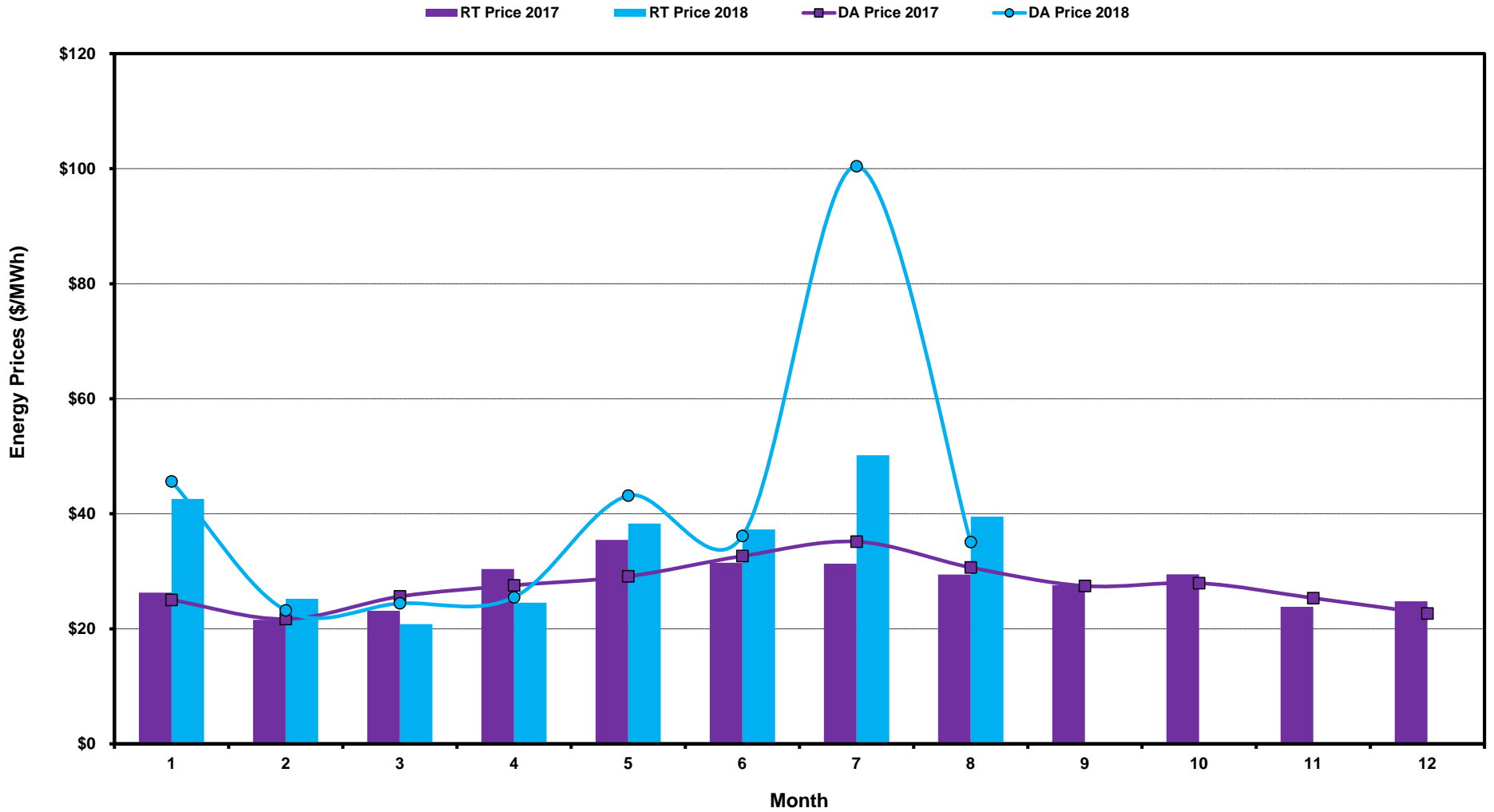
Monday, September 10, 2018

Potomac Economics, Ltd.
Independent Market Monitor

1	ERCOT-wide Average Energy Prices DA vs. RT	chart	table
2	Load Zone Load Statistics	chart	table
3	Load Zone Monthly Average Energy Prices DA vs RT	chart	table
4	ERCOT-wide Monthly Implied Heat Rates DA vs RT	chart	table
5	Load Zone Monthly Implied Heat Rates DA vs RT	chart	table
6	Daily ORDC Reserve Adder Avg. Value and Duration	chart	table
7	Monthly Ancillary Services Required MW	chart	table
8	Hourly Average of Ancillary Services Required MW	chart	table
9	Monthly Average Ancillary Services Price	chart	table
10	Monthly Average A/S Cost per MWh Load	chart	table
11	Ercot-wide Cumulative Peaker Net Margin	chart	table
12	DA vs. RT Load Forecast Error by Hour Ending	chart	table
13	Monthly Average of Wind Generation by Hour Ending	chart	table
14	RT Constraint Rankings		table
	- Top 10 Constraints by Total Congestion Value	chart	
	- Top 10 Constraints by Binding Frequency	chart	
15	DA Constraint Rankings		table
	- Top 10 Constraints by Total Congestion Value	chart	
	- Top 10 Constraints by Binding Frequency	chart	
16	CRR Pairs by Monthly Auction Value Rankings		table
	- Top 10 PTP Obligations by Total Transaction Value	chart	
	- Top 10 PTP Options by Total Transaction Value	chart	

ERCOT-wide Average Energy Prices DA vs RT

(avg. DA & RT SPPs weighted by Real Time Settlement Loads)



[Home <<](#)

[previous <<](#)

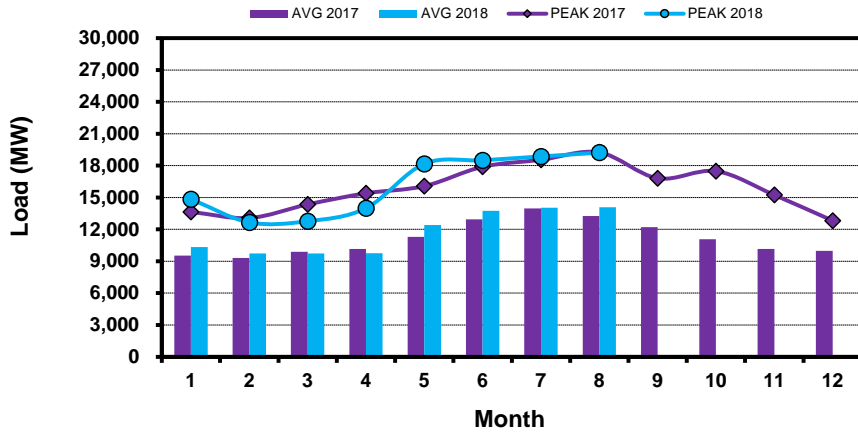
[next >>](#)

[data](#)

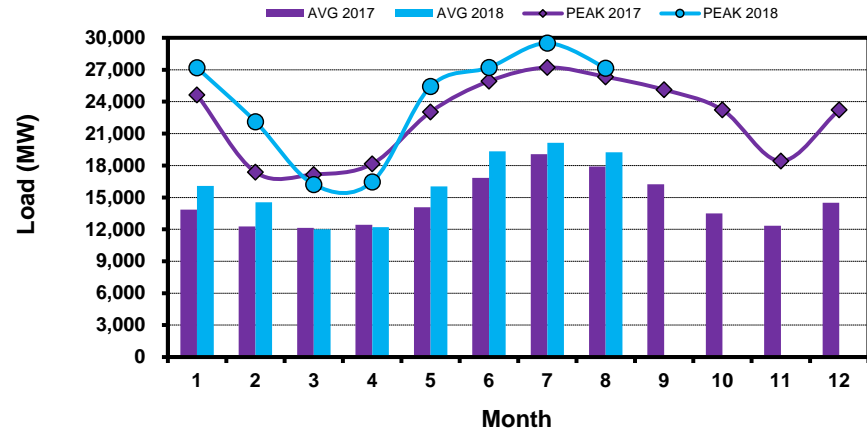
Load Zone Load Statistics

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

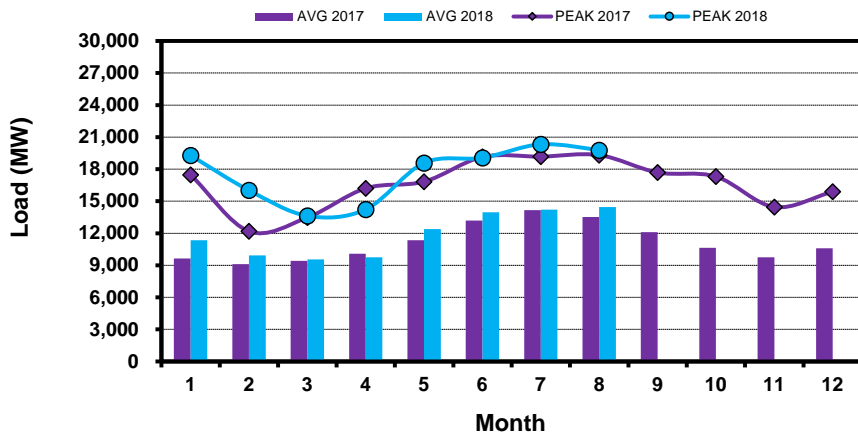
Houston Zone



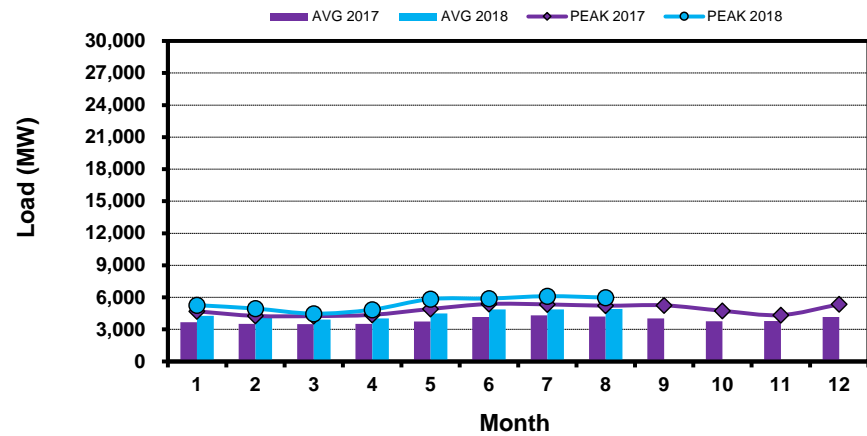
North Zone



South Zone



West Zone



[Home <<](#)

[previous <<](#)

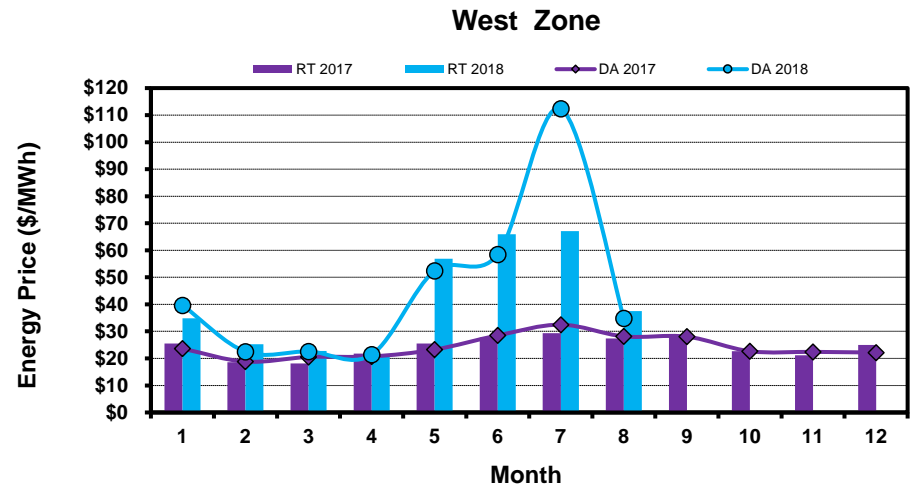
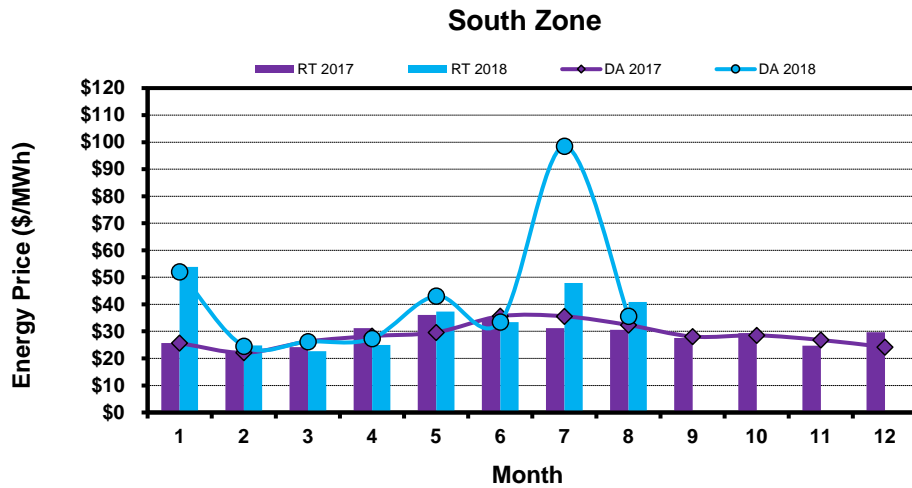
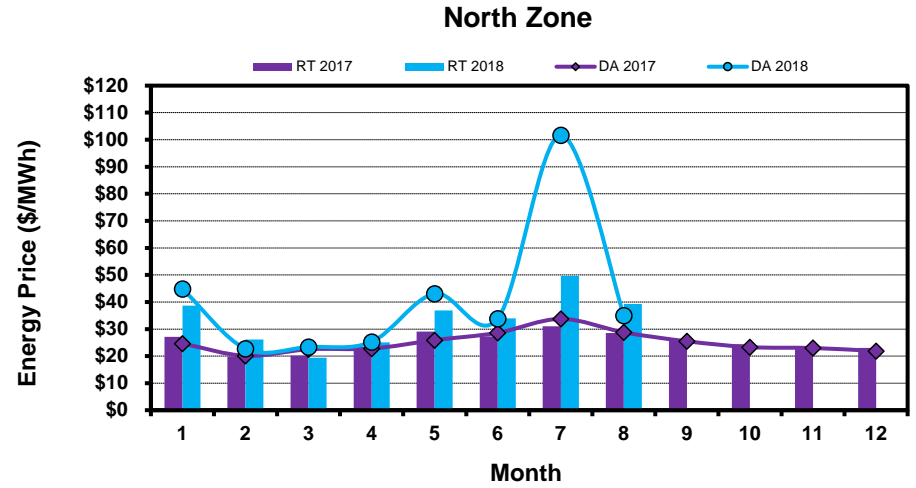
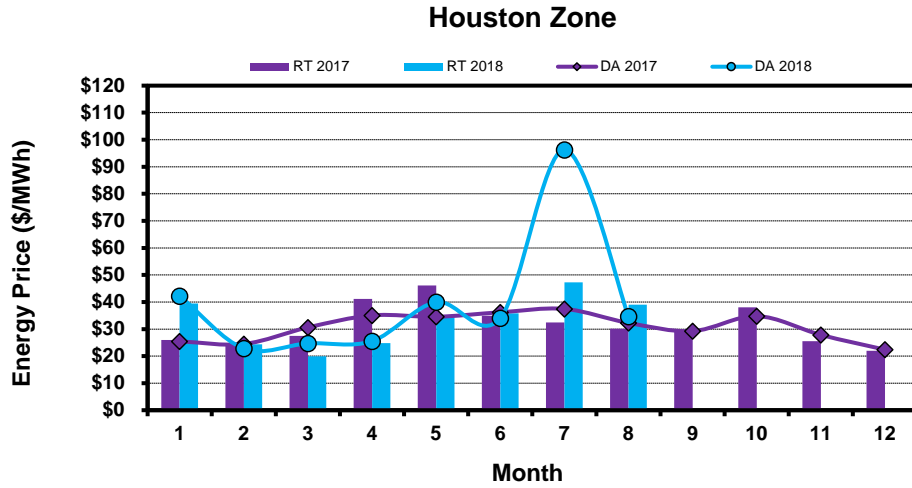
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Note: * Zonal load zone definition vs. Nodal comparable load zone definition: LZ_Houston=LZ_Houston; LZ_West=LZ_West; LZ_North=(LZ_North,LZ_RAYBN); LZ_South=(LZ_South,LZ_CPS,LZ_AEN,LZ_LCRA)

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*)



[Home <<](#)

[previous <<](#)

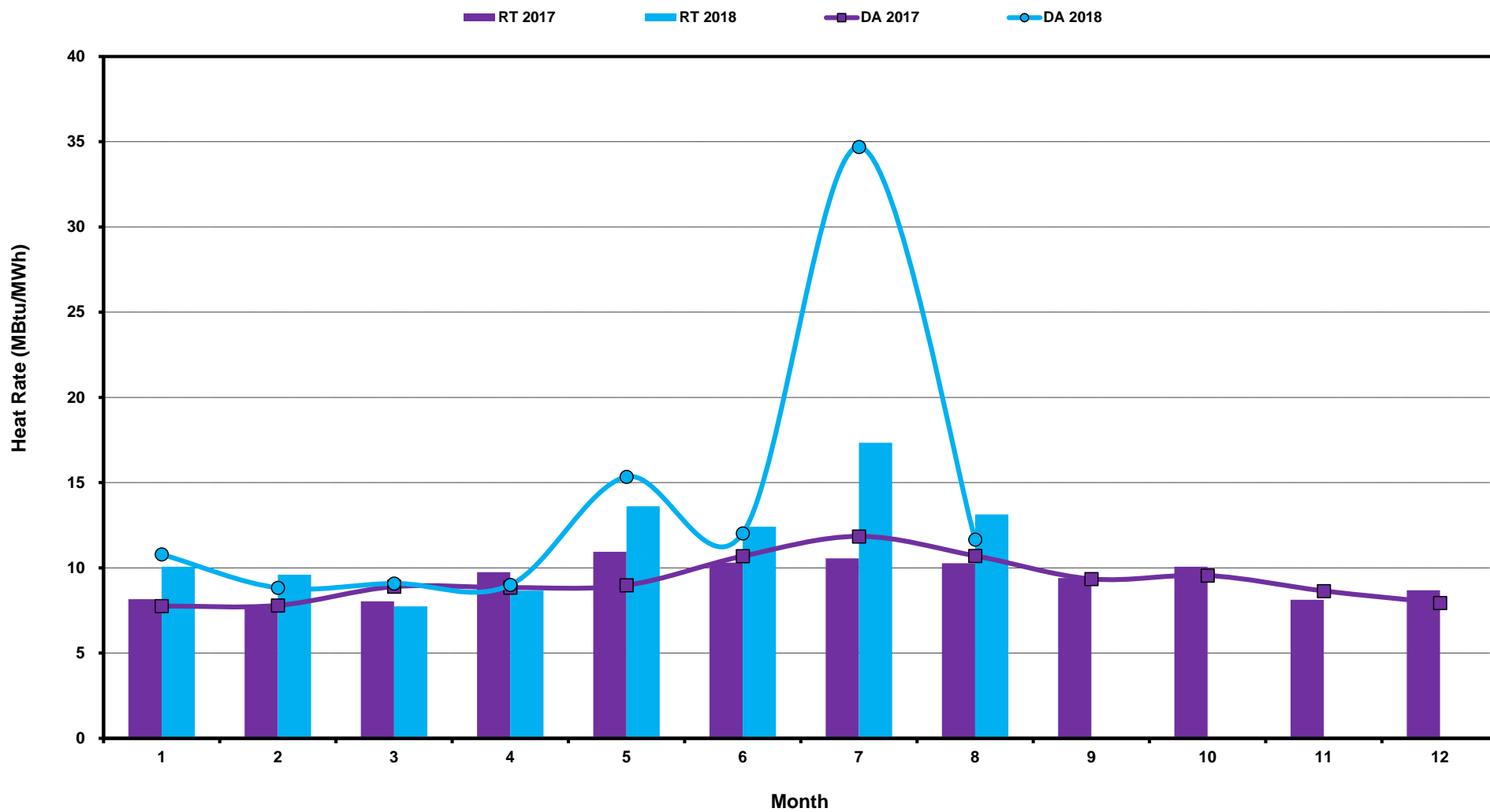
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ERCOT-wide Monthly Implied Heat Rate DA vs RT

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



[Home <<](#)

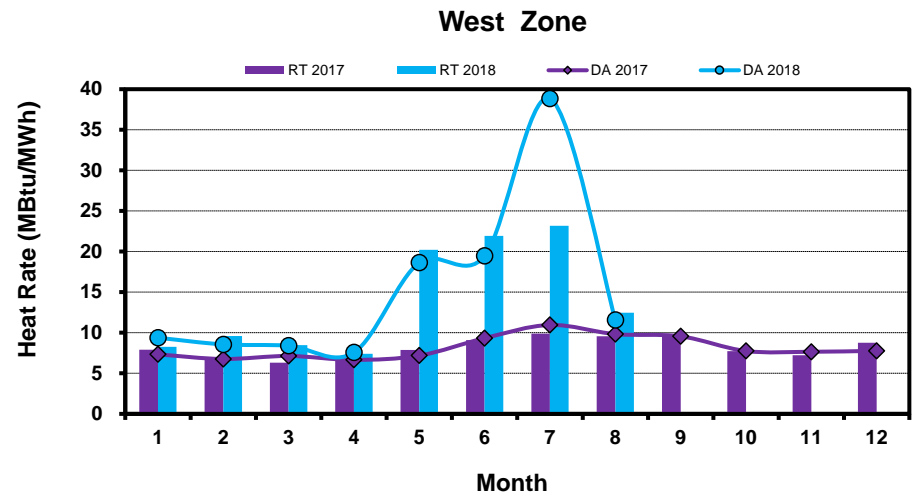
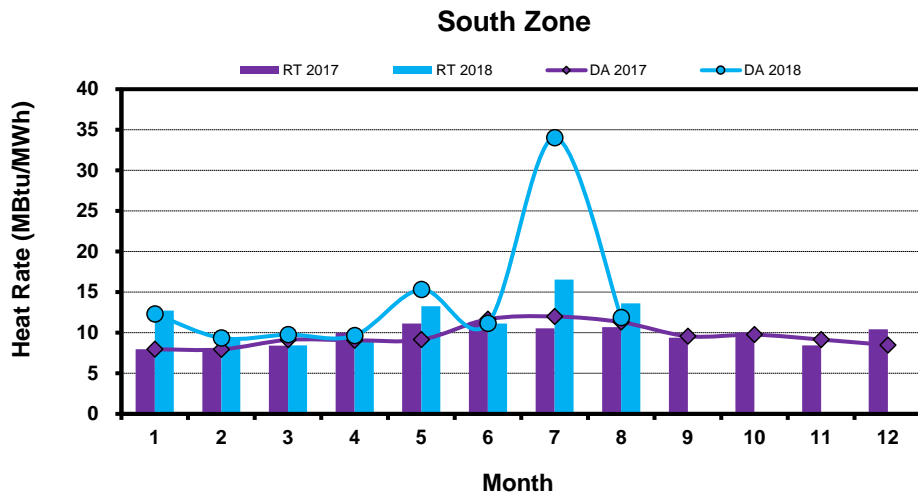
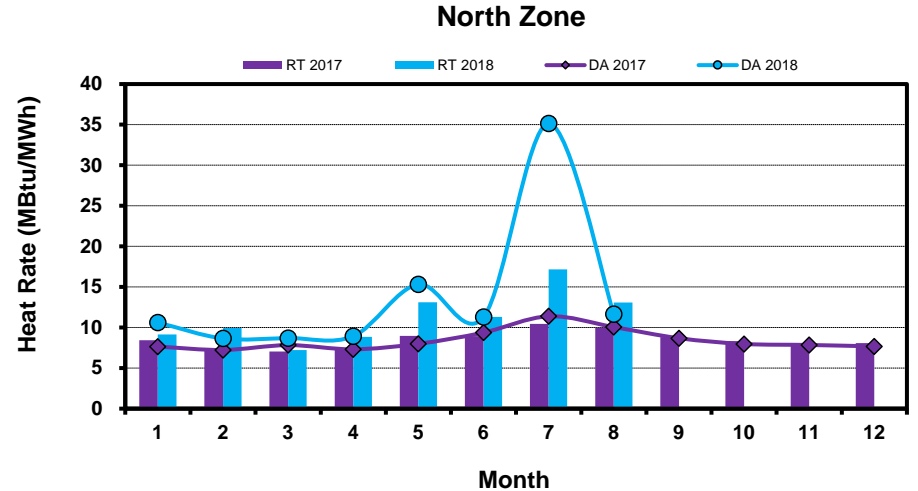
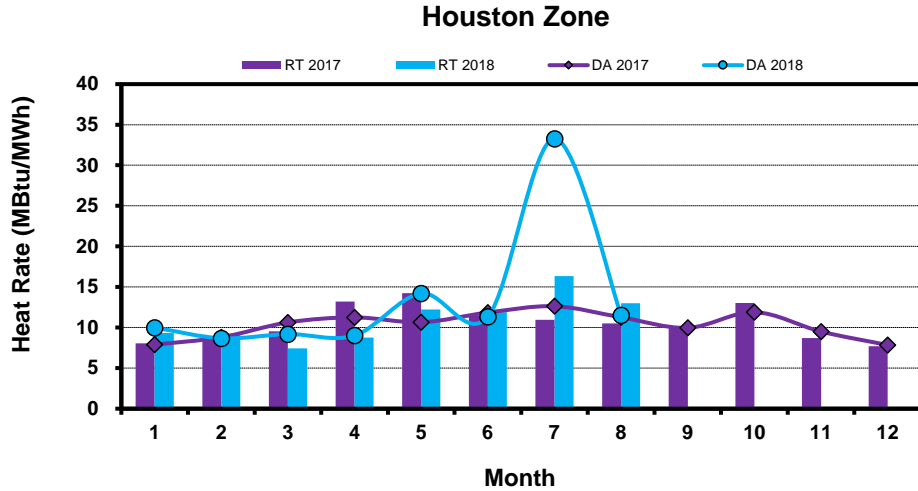
[previous <<](#)

[next >>](#)

[data](#)

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*)



[Home <<](#)

[previous <<](#)

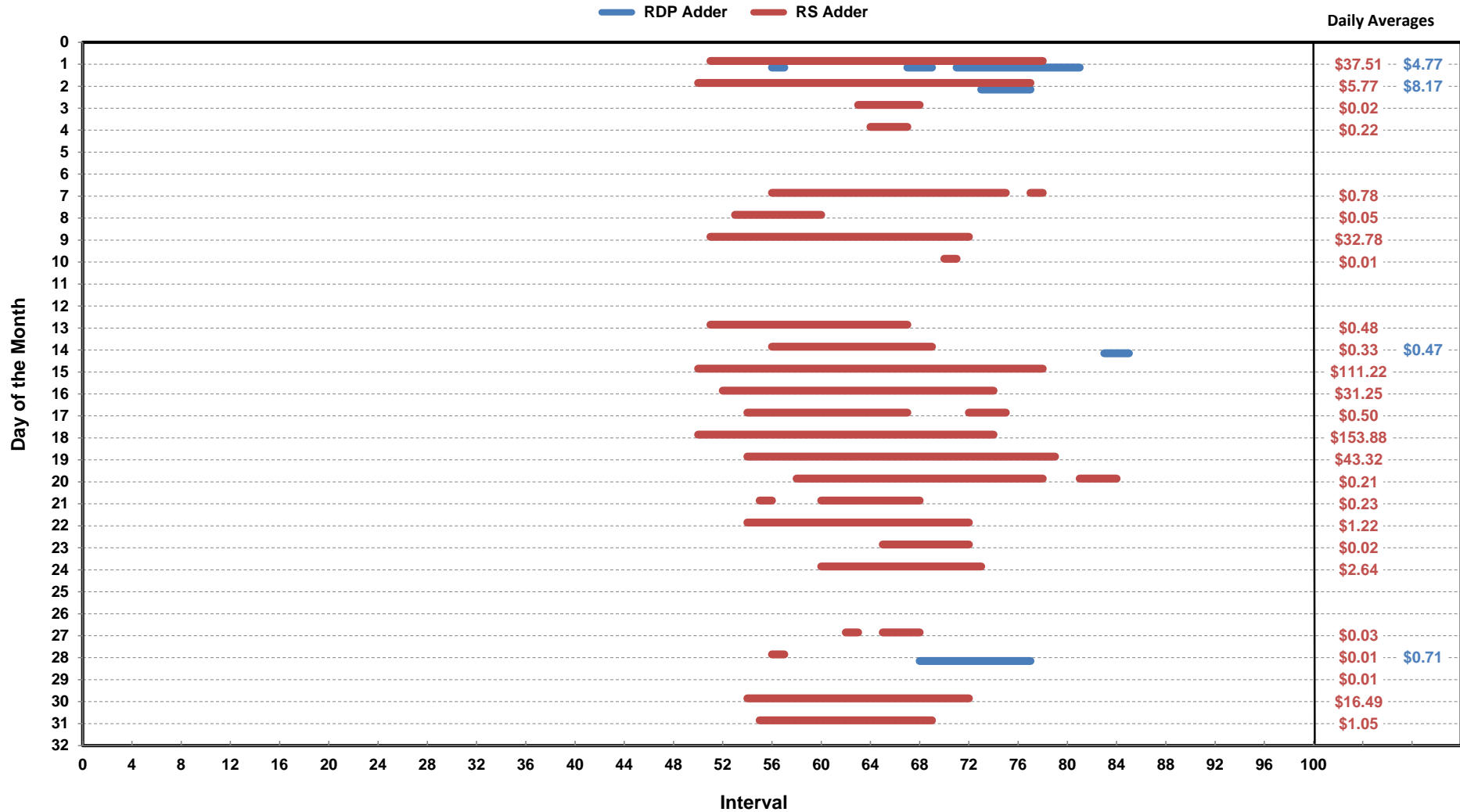
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Daily ORDC Adders Average Values and Interval Duration

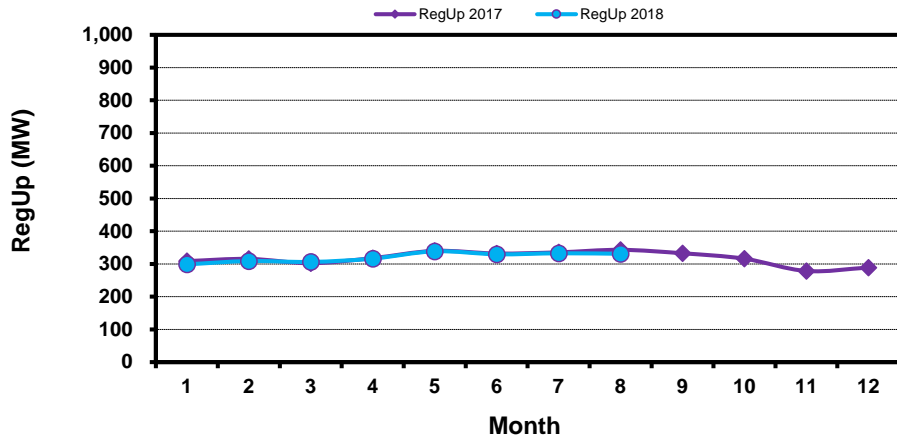
Aug-2018



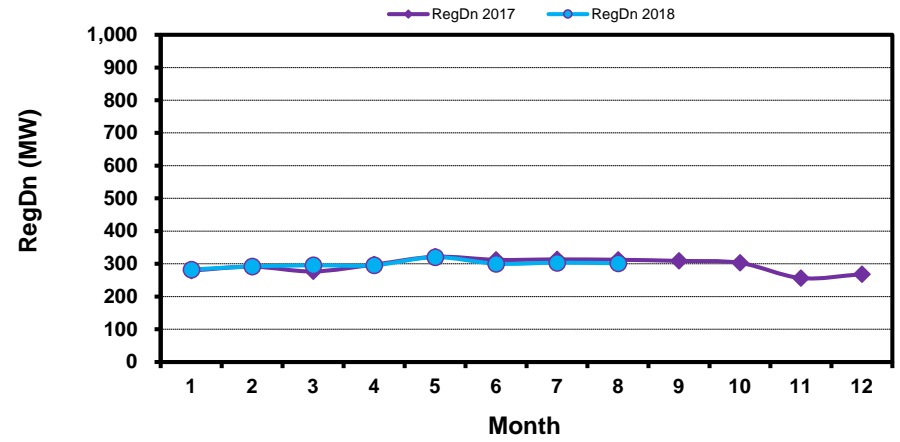
[Home <<](#)
[previous <<](#)
[next >>](#)
[data](#)

Monthly Average of Ancillary Services Required MW

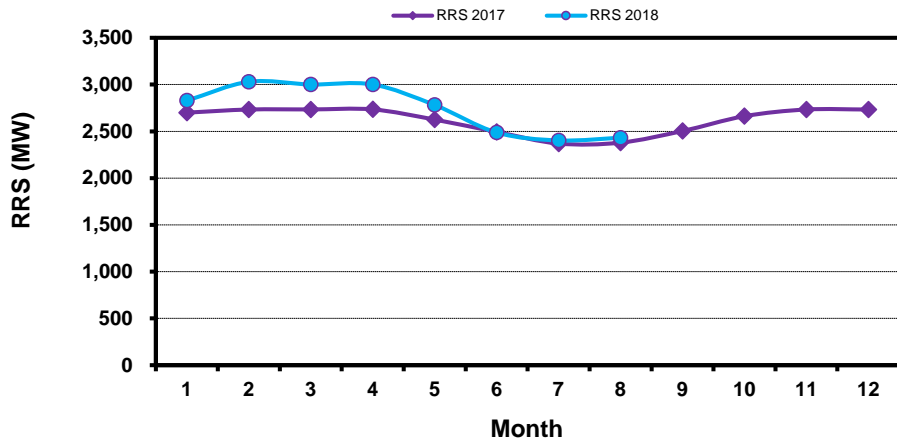
Regulation Up



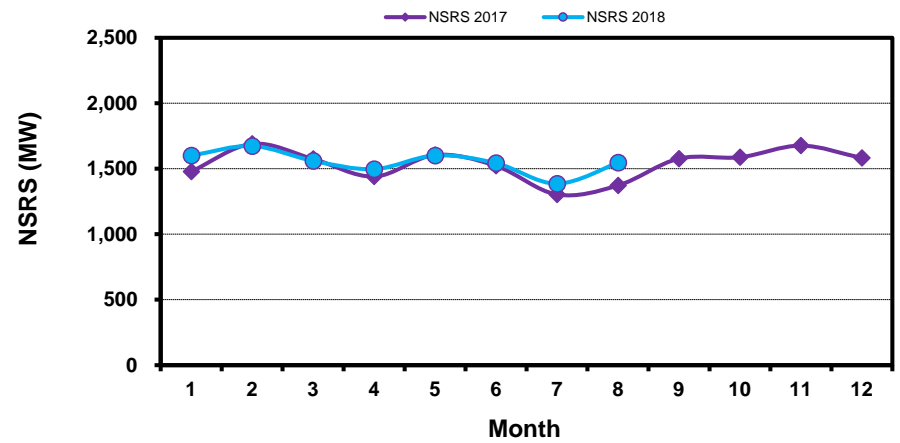
Regulation Down



Responsive Reserve



Non-Spin Reserve



[Home <<](#)

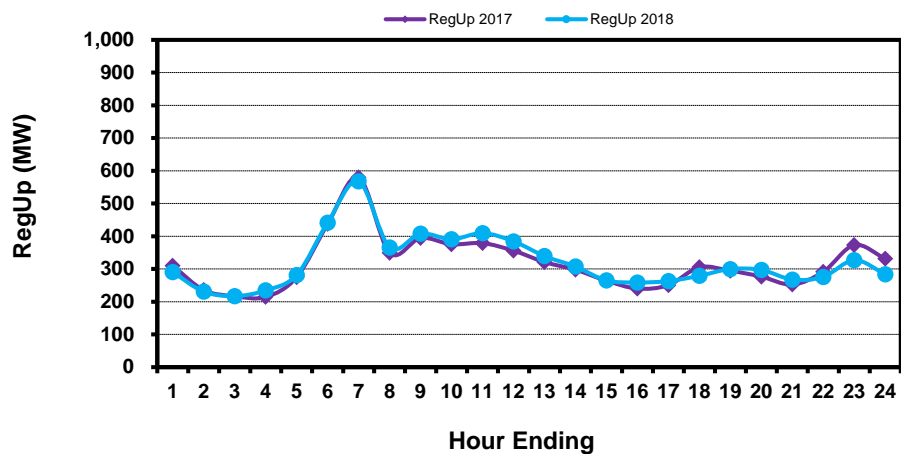
[previous <<](#)

[next >>](#)

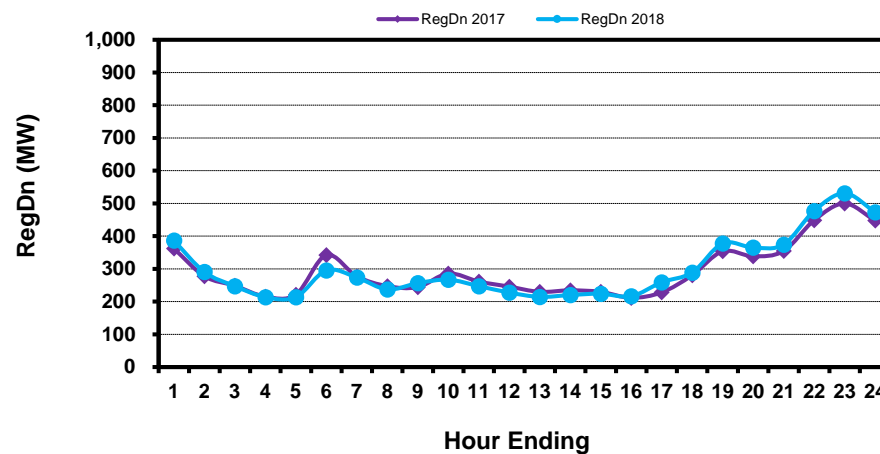
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Hourly Average of Ancillary Services Required MW

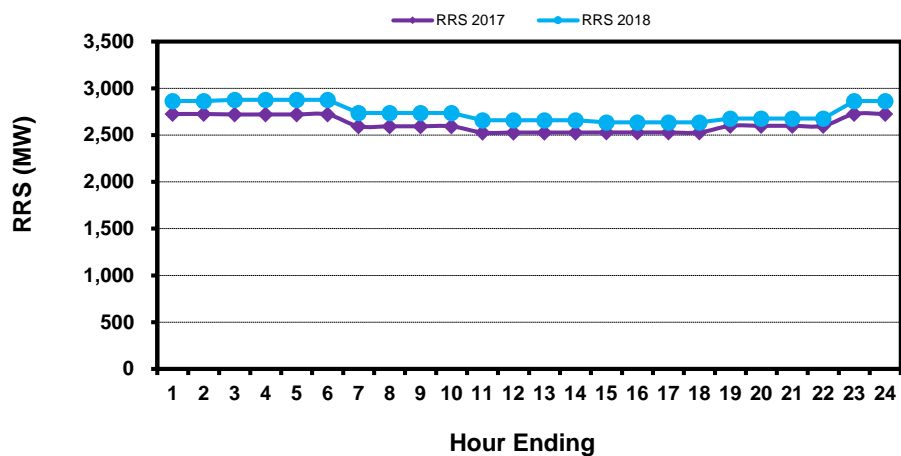
Regulation Up



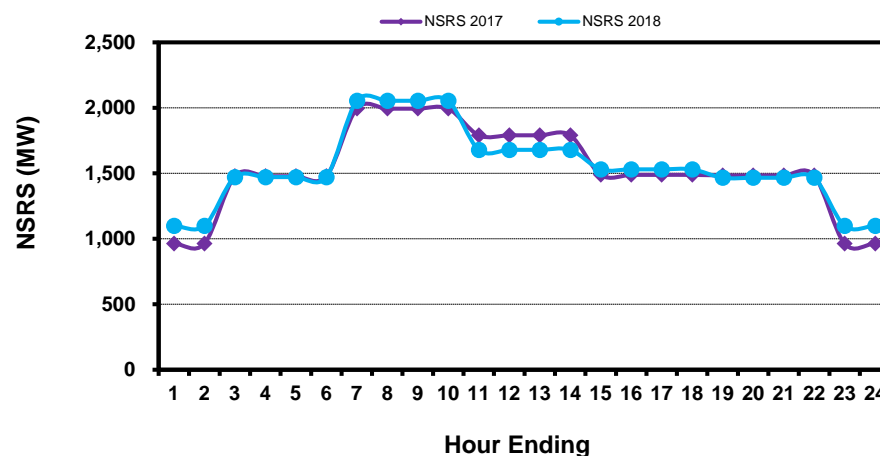
Regulation Down



Responsive Reserve



Non-Spin Reserve



[Home <<](#)

[previous <<](#)

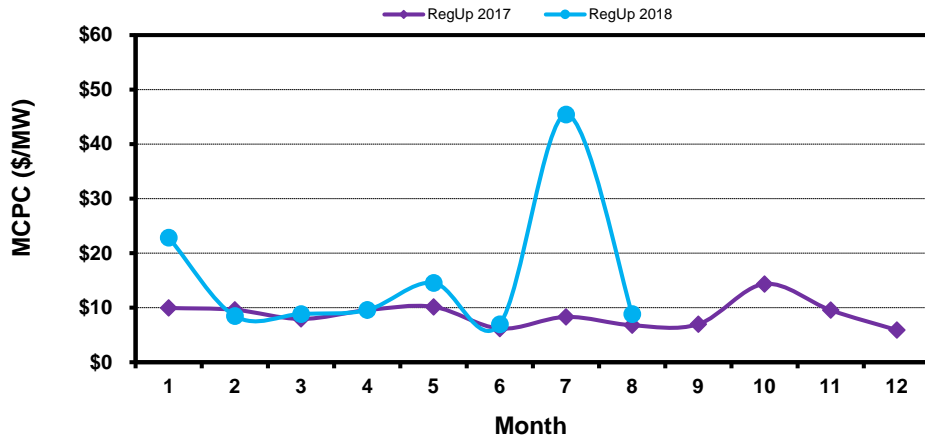
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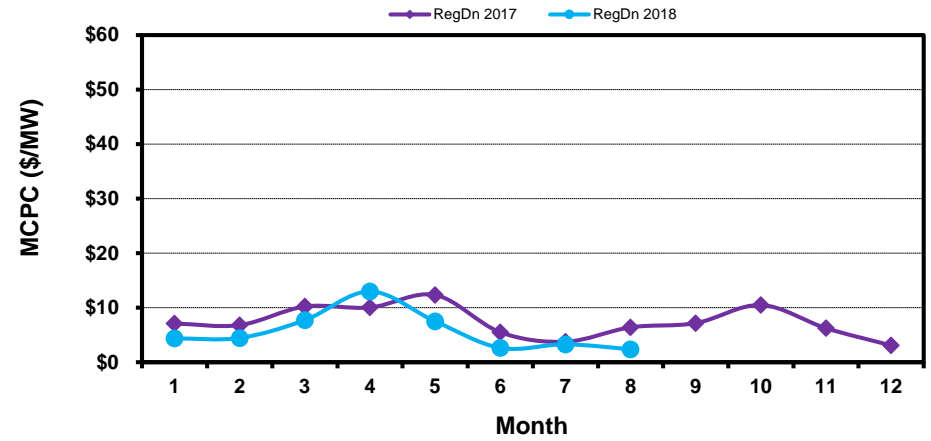
Monthly Average Ancillary Services Price

(weighted by A/S Quantities Required)

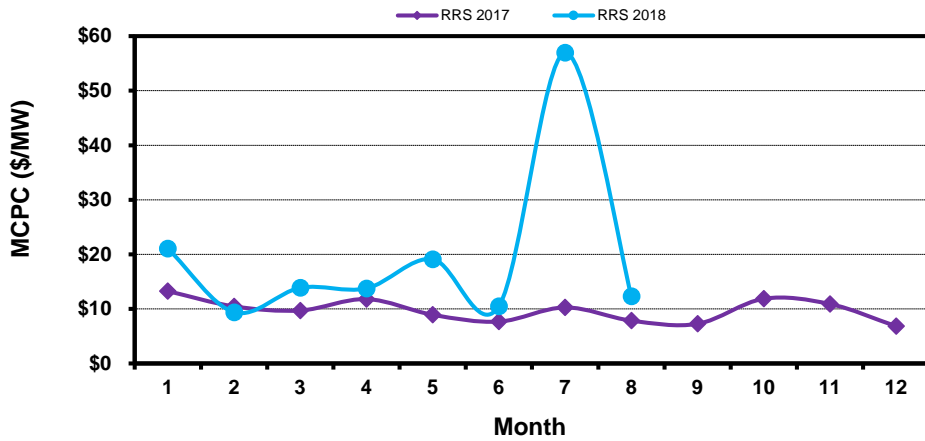
Regulation Up



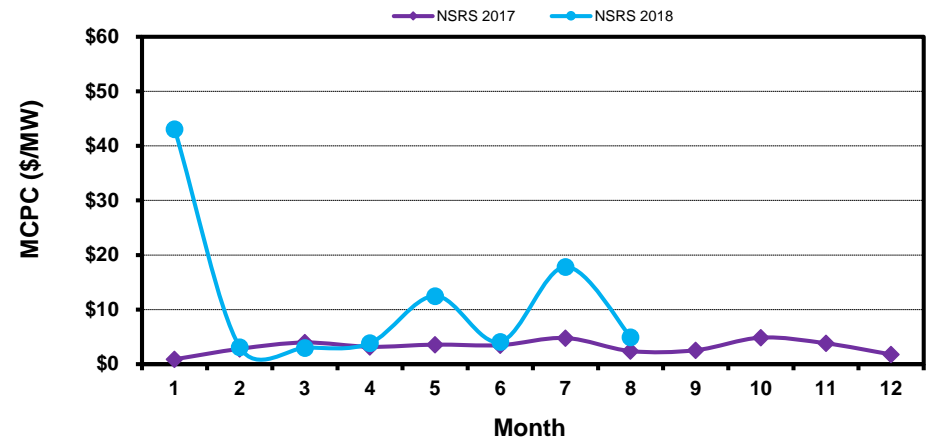
Regulation Down



Responsive Reserve



Non-Spin Reserve



[Home <<](#)

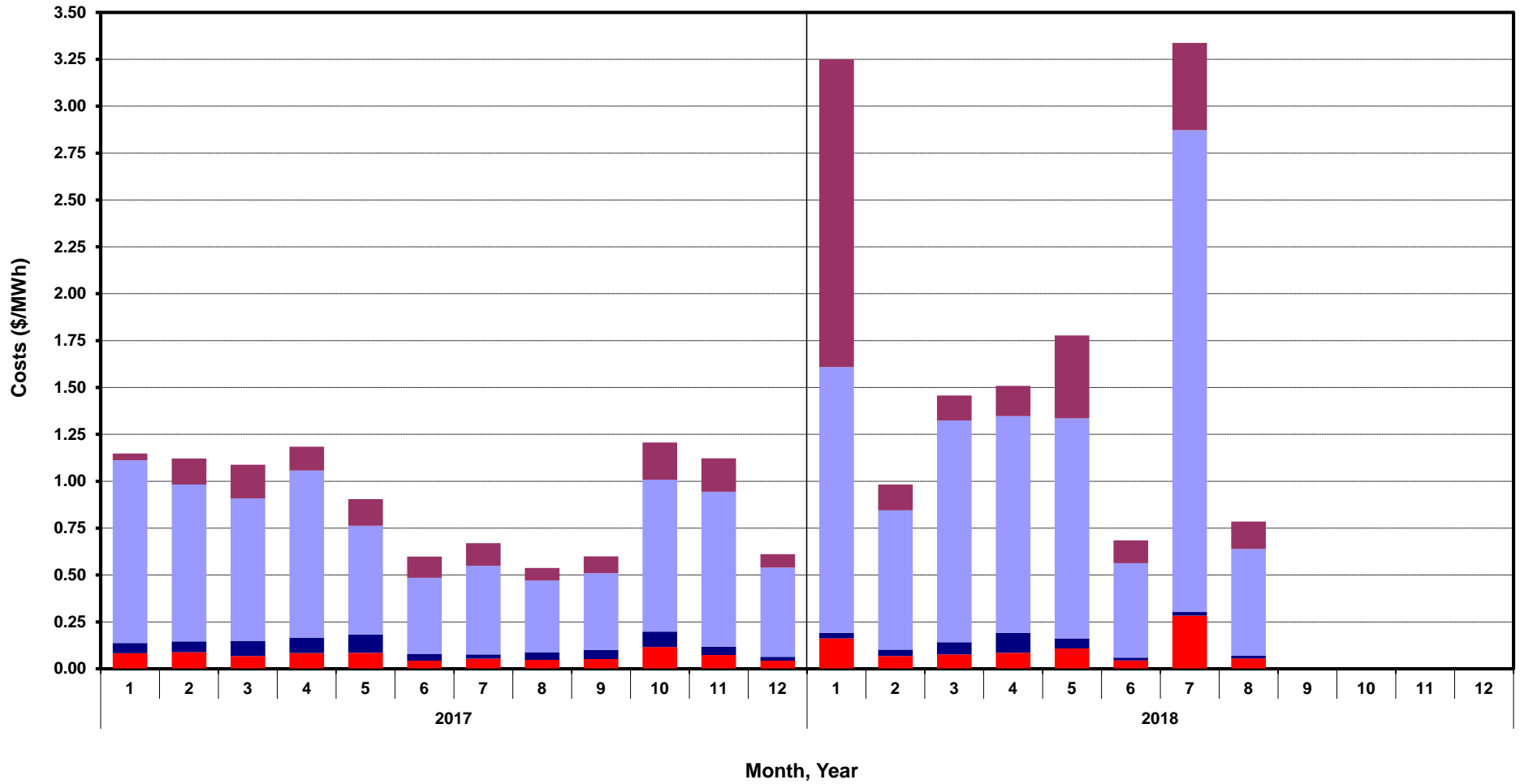
[previous <<](#)

[next >>](#)

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Monthly Average A/S Cost per MWh Load

RegUp RegDn RRS NonSpin



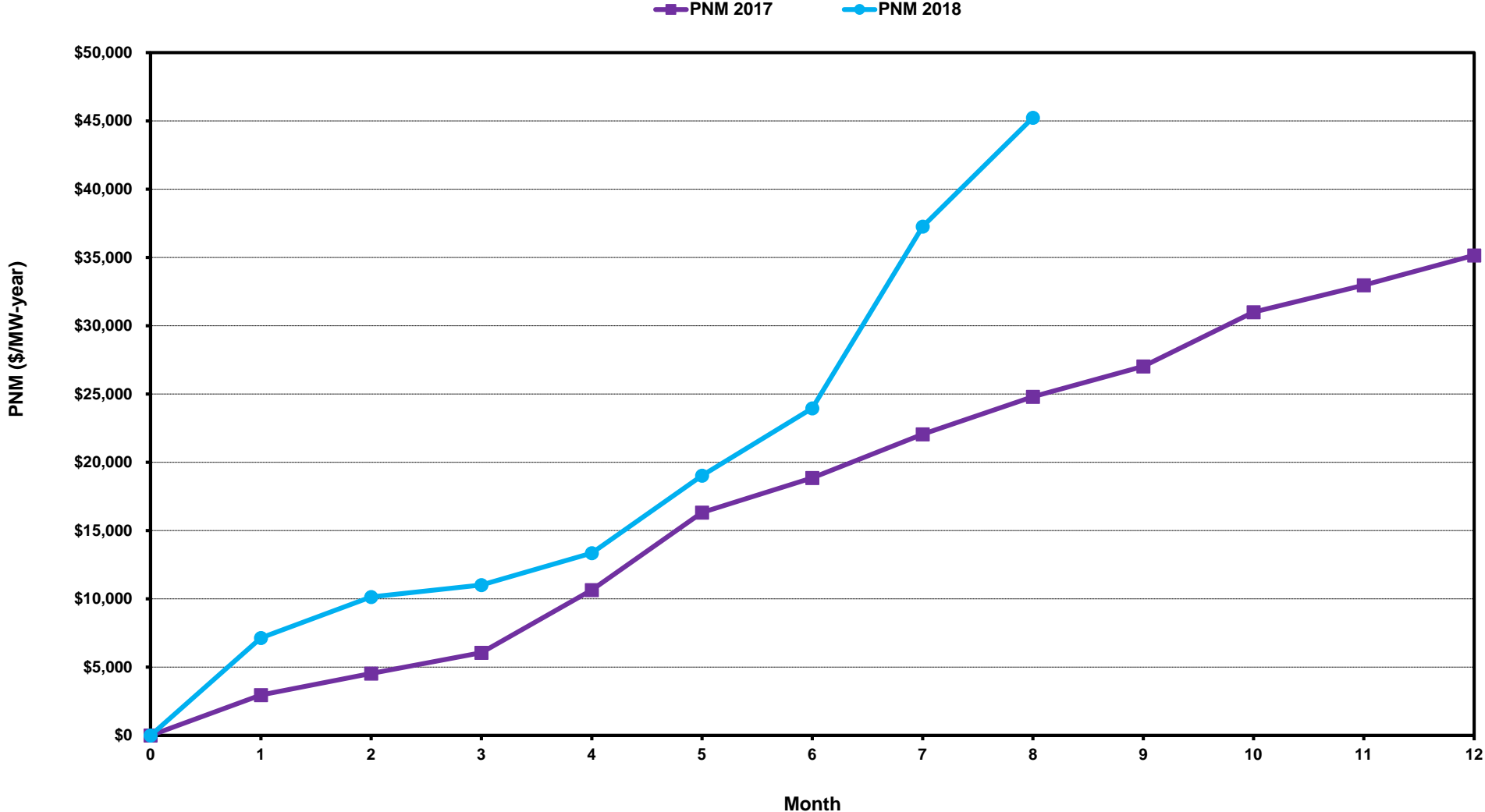
[Home <<](#)

[previous <<](#)

[next >>](#)

[data](#)

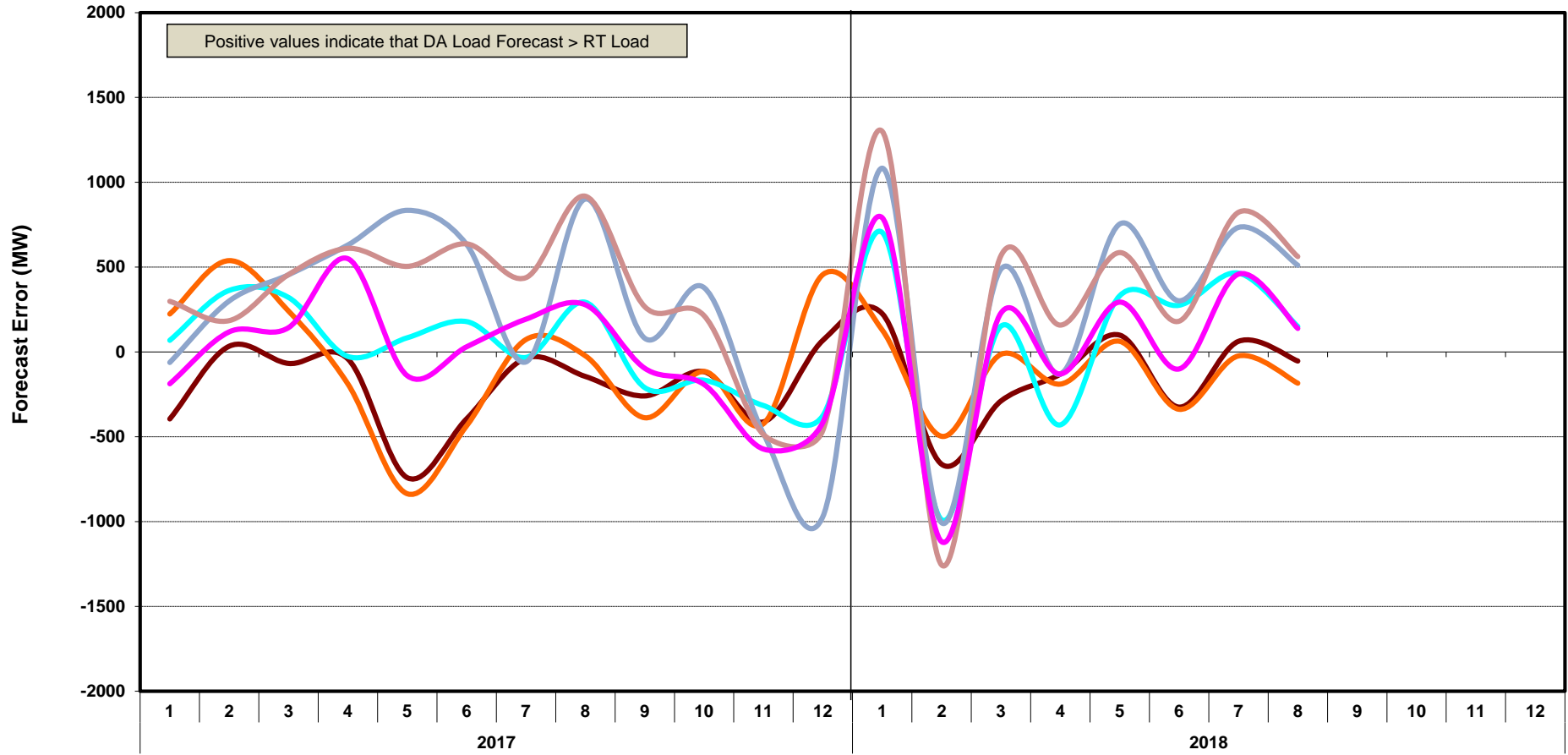
ERCOT-wide Cumulative Peaker Net Margin



[Home <<](#) [previous <<](#) [next >>](#)
[data](#)

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



Month, Year

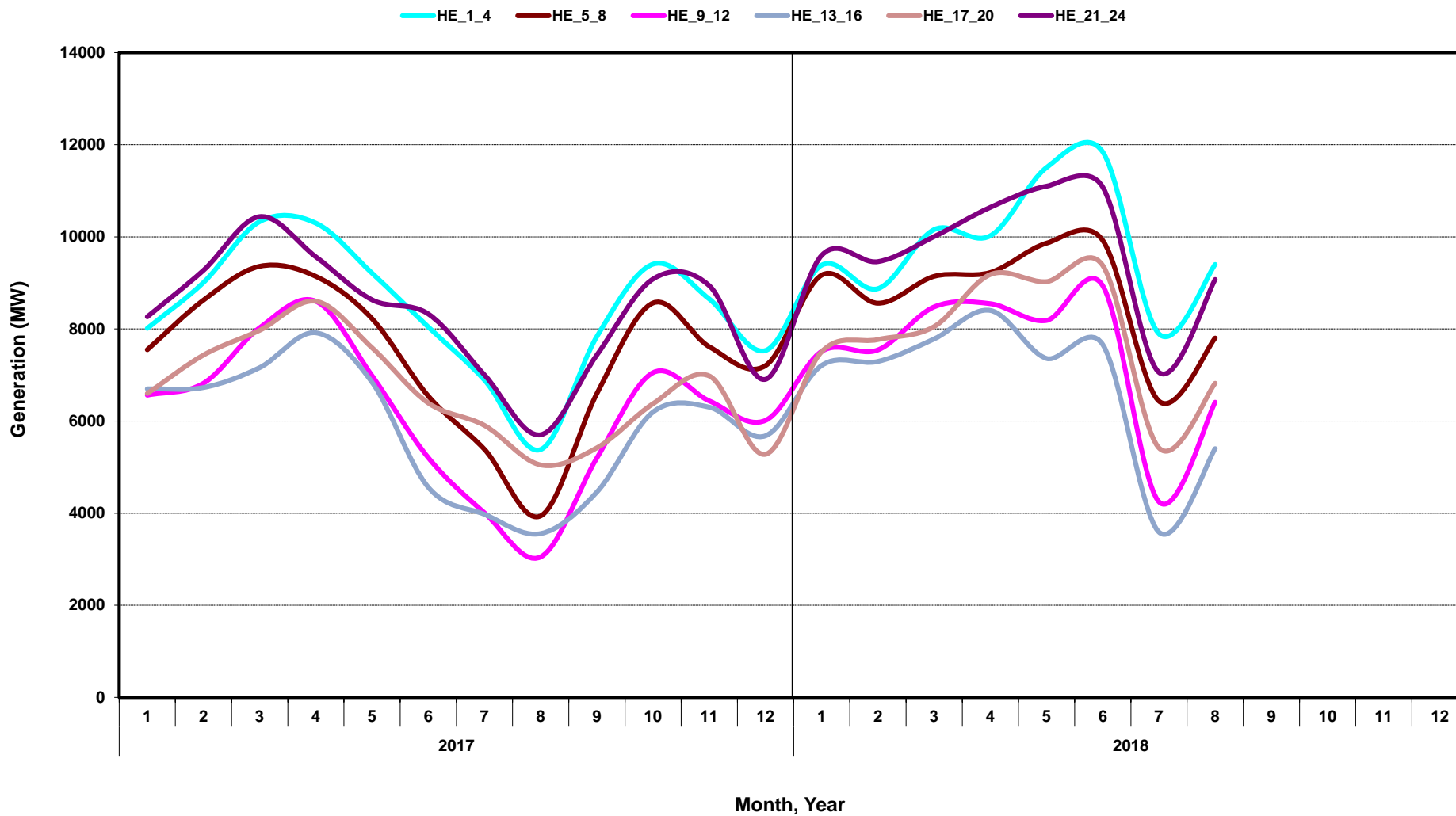
[Home <<](#)

[previous <<](#)

[next >>](#)

[data](#)

Monthly Average of Wind Generation by Hour Ending



[Home <<](#)

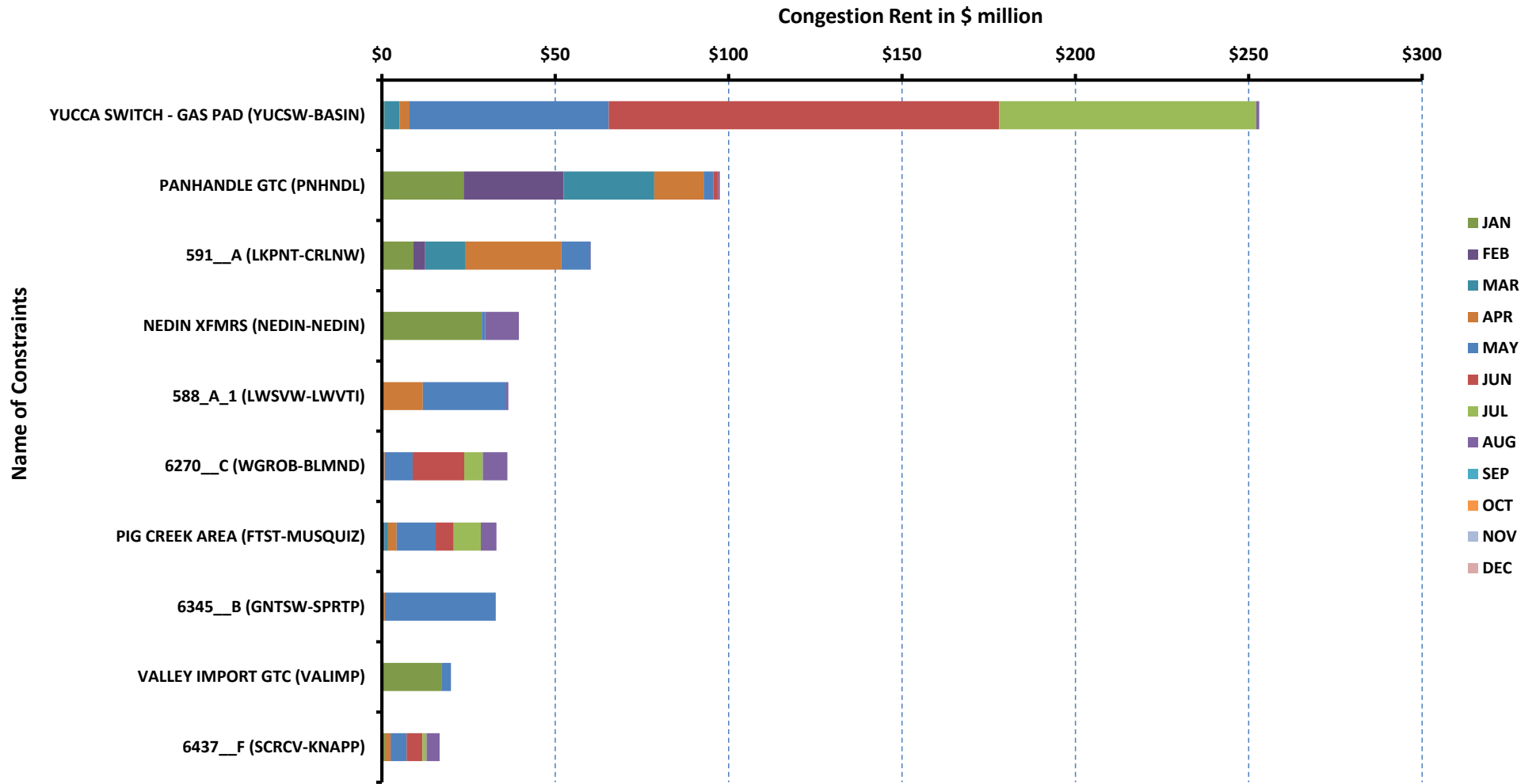
[previous <<](#)

[next >>](#)

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RT Congestion Constraint Rankings - 1

Top 10 Constraints by Total Congestion Value - 2018



[Home <<](#)

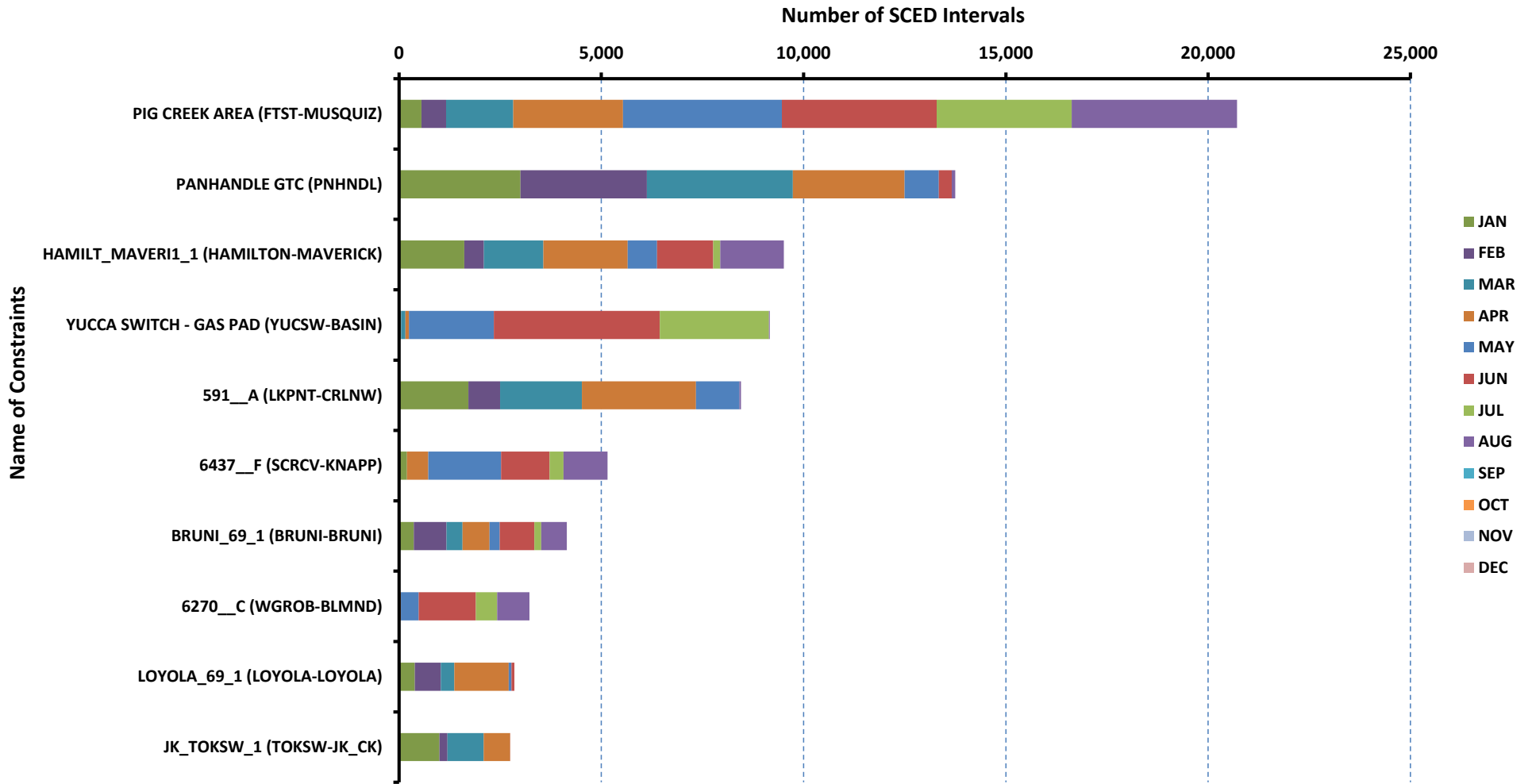
[previous <<](#)

[next >>](#)

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RT Congestion Constraint Rankings - 2

Top 10 Constraints by Binding Frequency - 2018



[Home <<](#)

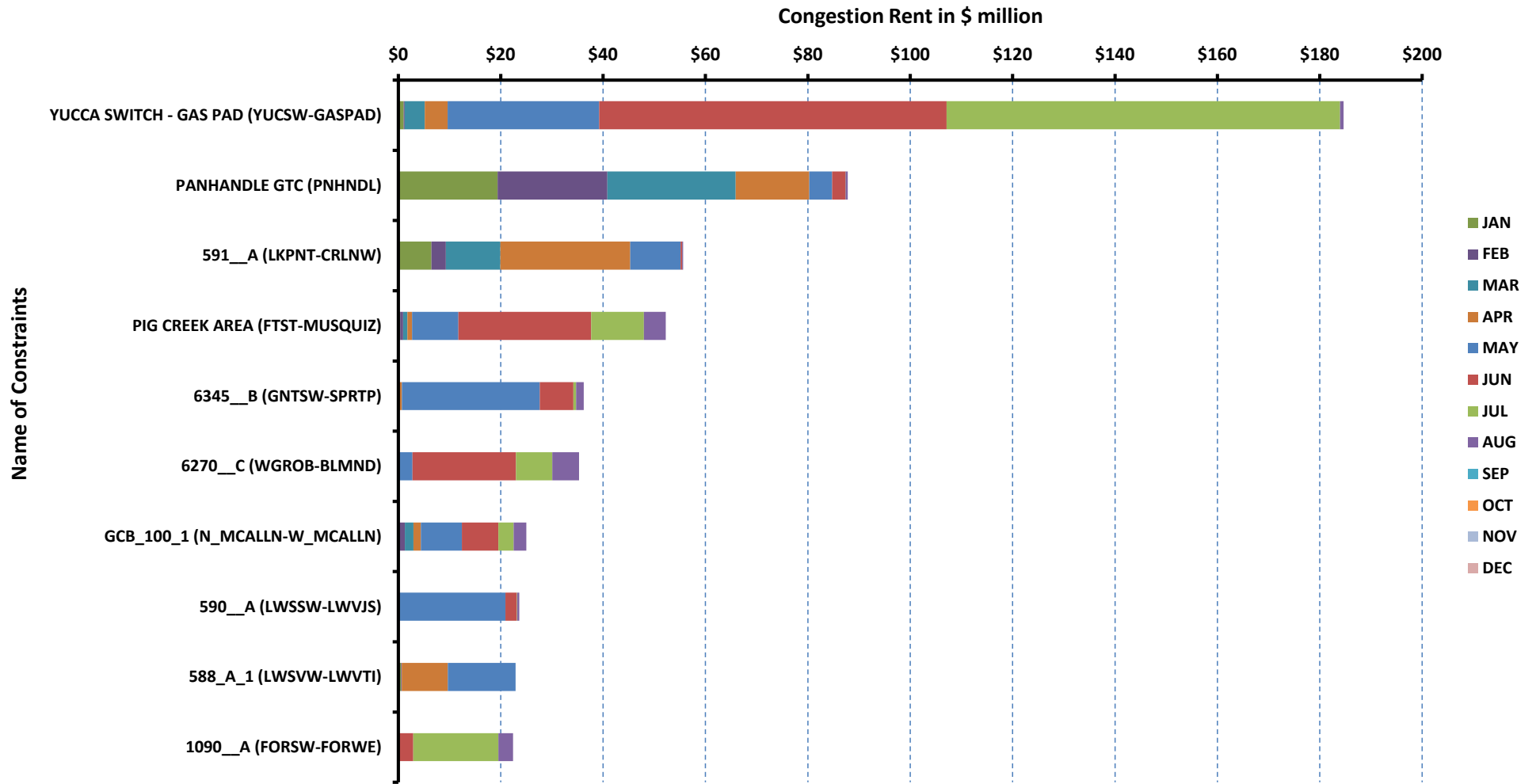
[previous <<](#)

[next >>](#)

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DA Congestion Constraint Rankings - 1

Top 10 Constraints by Total Congestion Value - 2018



[Home <<](#)

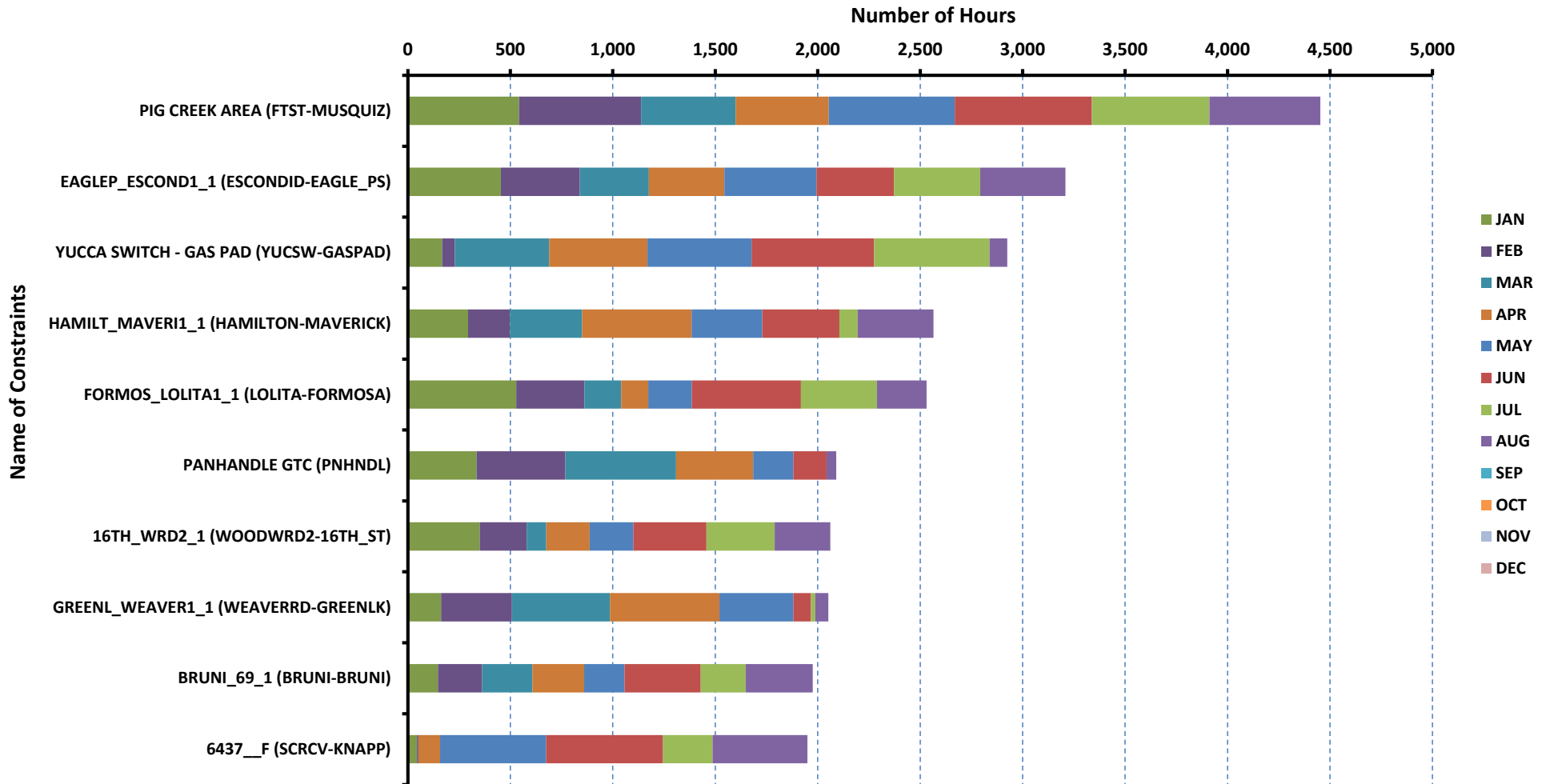
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[next >>](#)

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DA Congestion Constraint Rankings - 2

Top 10 Constraints by Binding Frequency - 2018



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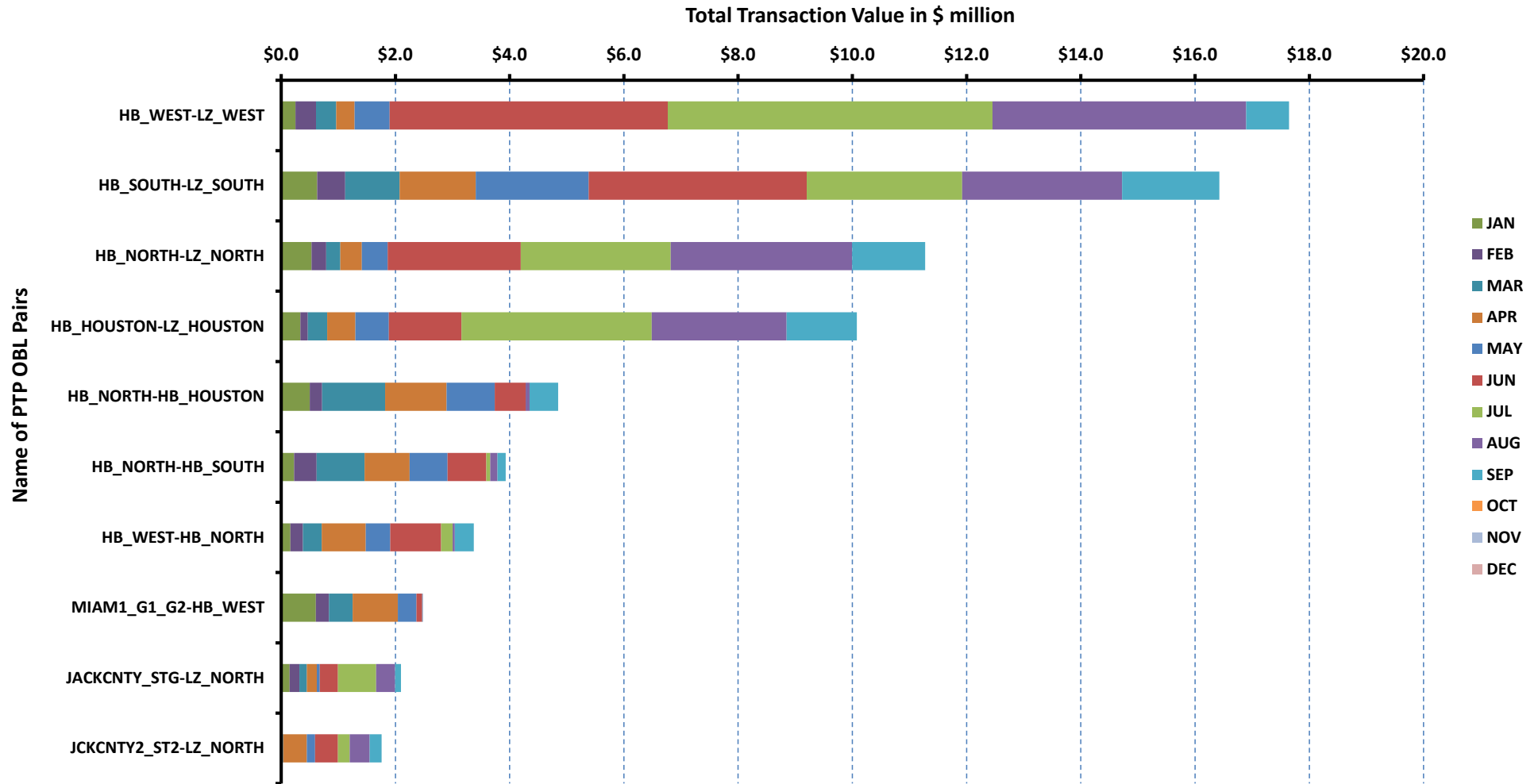
[previous <<](#)

[next >>](#)

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Top 10 CRR Pairs Ranked by Monthly Auction Values - 1

Top 10 PTP Obligations by Total Transaction Value - 2018



[Home <<](#)

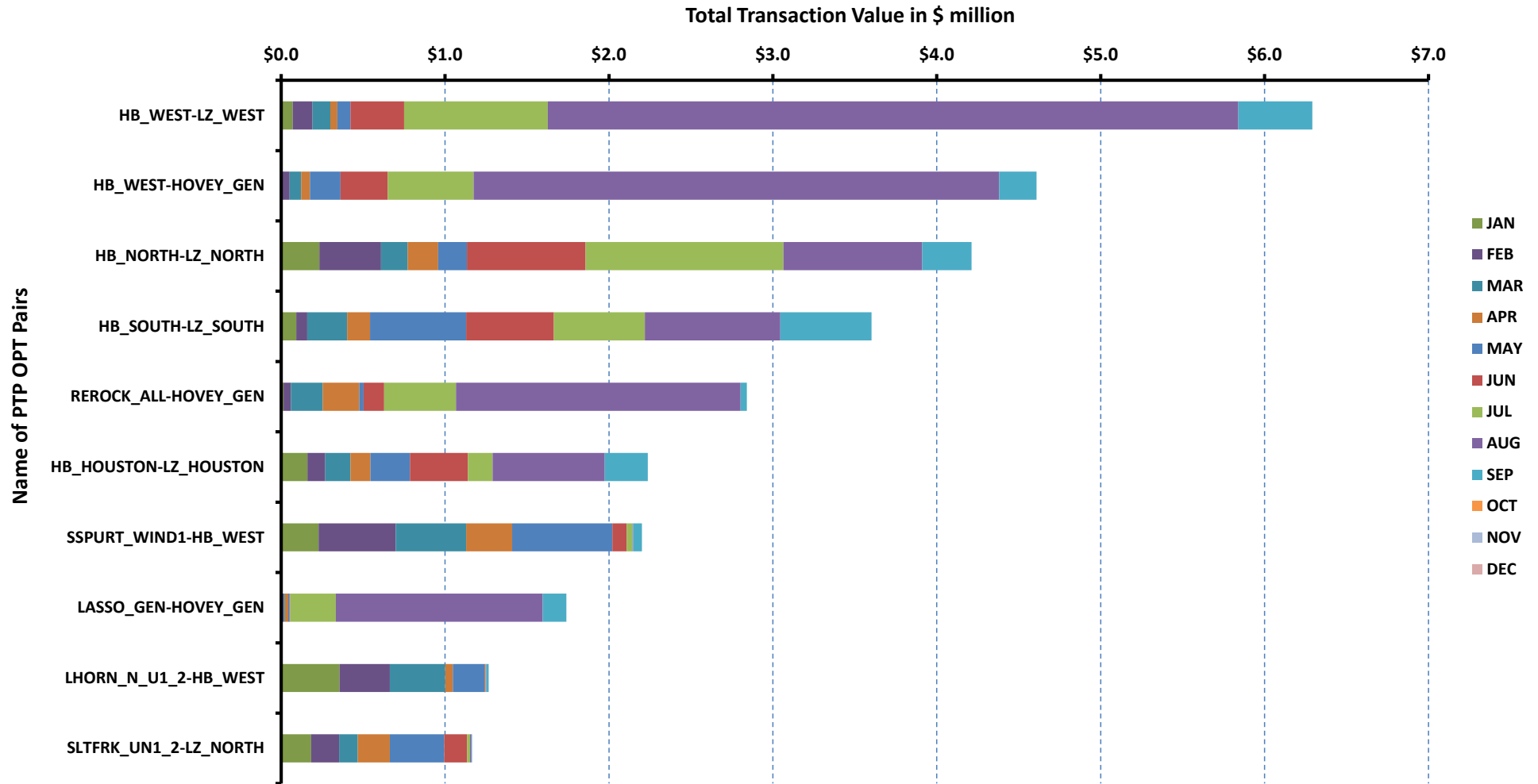
[previous <<](#)

[next >>](#)

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Top 10 CRR Pairs Ranked by Monthly Auction Values - 2

Top 10 PTP Options by Total Transaction Value - 2018



[Home <<](#)

[previous <<](#)

[next >>](#)

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ERCOT-wide Avg. Energy Price - DA vs. RT			
year	month	dam_spp	rtm_spp
2017	1	\$ 25.01	\$ 26.30
	2	\$ 21.70	\$ 21.57
	3	\$ 25.62	\$ 23.14
	4	\$ 27.56	\$ 30.40
	5	\$ 29.12	\$ 35.47
	6	\$ 32.64	\$ 31.47
	7	\$ 35.15	\$ 31.32
	8	\$ 30.67	\$ 29.43
	9	\$ 27.45	\$ 27.61
	10	\$ 27.94	\$ 29.46
	11	\$ 25.34	\$ 23.84
	12	\$ 22.66	\$ 24.77
2018	1	\$ 45.63	\$ 42.56
	2	\$ 23.21	\$ 25.24
	3	\$ 24.42	\$ 20.80
	4	\$ 25.48	\$ 24.53
	5	\$ 43.16	\$ 38.29
	6	\$ 36.14	\$ 37.29
	7	\$ 100.41	\$ 50.18
	8	\$ 35.07	\$ 39.49
	9	\$ -	\$ -
	10	\$ -	\$ -
	11	\$ -	\$ -
	12	\$ -	\$ -

[Home <<](#)

[previous <<](#)

[next >>](#)

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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	
2017	1	13,640	24,641	17,476	4,693	9,533	13,862	9,650	3,682	
	2	13,074	17,377	12,186	4,263	9,319	12,279	9,105	3,517	
	3	14,350	17,155	13,474	4,247	9,894	12,145	9,426	3,489	
	4	15,397	18,149	16,208	4,366	10,155	12,424	10,090	3,526	
	5	16,071	23,038	16,835	4,912	11,298	14,082	11,344	3,734	
	6	17,892	25,922	19,144	5,380	12,950	16,838	13,184	4,159	
	7	18,546	27,206	19,176	5,343	13,970	19,060	14,172	4,325	
	8	19,245	26,332	19,315	5,219	13,249	17,905	13,516	4,199	
	9	16,810	25,120	17,691	5,254	12,212	16,242	12,107	4,029	
	10	17,482	23,221	17,309	4,746	11,078	13,497	10,632	3,757	
	11	15,238	18,420	14,459	4,342	10,159	12,346	9,753	3,795	
	12	12,819	23,226	15,888	5,349	9,986	14,509	10,592	4,168	
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	12,766	16,219	13,632	4,476	9,739	12,003	9,550	3,928	
	4	13,993	16,462	14,234	4,851	9,764	12,217	9,757	4,018	
	5	18,173	25,422	18,587	5,840	12,418	16,031	12,381	4,504	
	6	18,505	27,210	19,060	5,893	13,748	19,325	13,975	4,868	
	7	18,864	29,496	20,326	6,110	14,035	20,131	14,204	4,882	
	8	19,222	27,155	19,784	5,979	14,073	19,236	14,454	4,910	
	9	-	-	-	-	-	-	-	-	-
	10	-	-	-	-	-	-	-	-	-
	11	-	-	-	-	-	-	-	-	-
	12	-	-	-	-	-	-	-	-	-

[Home <<](#)

[previous <<](#)

[next >>](#)

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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	
2017	1	\$ 25.97	\$ 27.15	\$ 25.69	\$ 25.52	\$ 25.45	\$ 24.65	\$ 25.65	\$ 23.62	
	2	\$ 24.14	\$ 19.84	\$ 22.43	\$ 18.59	\$ 24.48	\$ 20.12	\$ 22.10	\$ 18.81	
	3	\$ 27.46	\$ 20.23	\$ 24.18	\$ 18.15	\$ 30.61	\$ 22.53	\$ 26.24	\$ 20.54	
	4	\$ 41.17	\$ 23.37	\$ 31.21	\$ 21.80	\$ 35.06	\$ 22.79	\$ 28.27	\$ 20.73	
	5	\$ 46.16	\$ 29.05	\$ 36.05	\$ 25.54	\$ 34.55	\$ 25.91	\$ 29.64	\$ 23.27	
	6	\$ 34.90	\$ 27.27	\$ 34.65	\$ 27.77	\$ 36.20	\$ 28.63	\$ 35.60	\$ 28.49	
	7	\$ 32.45	\$ 31.01	\$ 31.24	\$ 29.34	\$ 37.45	\$ 33.75	\$ 35.58	\$ 32.49	
	8	\$ 30.09	\$ 28.53	\$ 30.59	\$ 27.37	\$ 32.27	\$ 28.79	\$ 32.36	\$ 28.14	
	9	\$ 29.74	\$ 25.89	\$ 27.59	\$ 28.11	\$ 29.25	\$ 25.48	\$ 28.08	\$ 28.05	
	10	\$ 38.08	\$ 24.35	\$ 29.37	\$ 22.64	\$ 34.79	\$ 23.32	\$ 28.53	\$ 22.66	
	11	\$ 25.52	\$ 22.59	\$ 24.71	\$ 21.14	\$ 27.86	\$ 22.99	\$ 26.83	\$ 22.42	
	12	\$ 21.95	\$ 23.05	\$ 29.70	\$ 24.99	\$ 22.39	\$ 21.88	\$ 24.16	\$ 22.17	
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	\$ 22.77	\$ 24.70	\$ 23.37	\$ 26.22	\$ 22.58	
	4	\$ 24.84	\$ 25.06	\$ 25.02	\$ 20.99	\$ 25.55	\$ 25.28	\$ 27.35	\$ 21.42	
	5	\$ 34.38	\$ 36.87	\$ 37.31	\$ 56.83	\$ 39.95	\$ 43.08	\$ 43.09	\$ 52.47	
	6	\$ 35.79	\$ 33.96	\$ 33.39	\$ 65.89	\$ 34.05	\$ 33.91	\$ 33.53	\$ 58.47	
	7	\$ 47.26	\$ 49.71	\$ 47.92	\$ 67.07	\$ 96.32	\$ 101.71	\$ 98.50	\$ 112.42	
	8	\$ 39.04	\$ 39.29	\$ 40.89	\$ 37.46	\$ 34.62	\$ 35.03	\$ 35.67	\$ 34.80	
	9	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	10	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	11	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	12	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	

[Home <<](#)

[previous <<](#)

[next >>](#)

[chart](#)

ERCOT-wide Monthly Implied Heat Rate - DA vs. RT						
year	month	gasprice	rtm_spp	HR_rtm	dam_spp	HR_dam
2017	1	\$ 3.22	\$ 26.30	8.16	\$ 25.01	7.76
	2	\$ 2.78	\$ 21.57	7.75	\$ 21.70	7.80
	3	\$ 2.88	\$ 23.14	8.04	\$ 25.62	8.90
	4	\$ 3.12	\$ 30.40	9.75	\$ 27.56	8.84
	5	\$ 3.24	\$ 35.47	10.94	\$ 29.12	8.99
	6	\$ 3.05	\$ 31.47	10.31	\$ 32.64	10.69
	7	\$ 2.97	\$ 31.32	10.56	\$ 35.15	11.85
	8	\$ 2.86	\$ 29.43	10.28	\$ 30.67	10.71
	9	\$ 2.94	\$ 27.61	9.40	\$ 27.45	9.35
	10	\$ 2.93	\$ 29.46	10.07	\$ 27.94	9.55
	11	\$ 2.93	\$ 23.84	8.13	\$ 25.34	8.65
	12	\$ 2.85	\$ 24.77	8.68	\$ 22.66	7.94
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	\$ 24.53	8.67	\$ 25.48	9.00
	5	\$ 2.81	\$ 38.29	13.61	\$ 43.16	15.34
	6	\$ 3.00	\$ 37.29	12.41	\$ 36.14	12.03
	7	\$ 2.89	\$ 50.18	17.34	\$ 100.41	34.70
	8	\$ 3.01	\$ 39.49	13.14	\$ 35.07	11.67
	9	\$ -	\$ -	-	\$ -	-
	10	\$ -	\$ -	-	\$ -	-
	11	\$ -	\$ -	-	\$ -	-
	12	\$ -	\$ -	-	\$ -	-

[Home <<](#)

[previous <<](#)

[next >>](#)

[chart](#)

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
2017	1	7.89	7.96	7.65	7.33	8.06	7.97	8.42	7.92
	2	8.80	7.94	7.23	6.76	8.68	8.06	7.13	6.68
	3	10.63	9.12	7.83	7.13	9.54	8.40	7.03	6.30
	4	11.25	9.07	7.31	6.65	13.21	10.01	7.50	7.00
	5	10.66	9.14	7.99	7.18	14.24	11.12	8.96	7.88
	6	11.85	11.66	9.37	9.33	11.43	11.35	8.93	9.09
	7	12.63	12.00	11.38	10.95	10.94	10.53	10.45	9.89
	8	11.27	11.30	10.06	9.83	10.51	10.68	9.96	9.56
	9	9.96	9.57	8.68	9.55	10.13	9.40	8.82	9.57
	10	11.90	9.75	7.97	7.75	13.02	10.04	8.33	7.74
	11	9.51	9.15	7.85	7.65	8.71	8.43	7.71	7.21
	12	7.85	8.47	7.67	7.77	7.70	10.41	8.08	8.76
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	8.47
	4	9.03	9.66	8.93	7.57	8.78	8.84	8.85	7.42
	5	14.21	15.32	15.32	18.66	12.22	13.26	13.11	20.21
	6	11.34	11.16	11.29	19.47	11.92	11.12	11.31	21.94
	7	33.28	34.04	35.15	38.85	16.33	16.56	17.18	23.18
	8	11.52	11.87	11.65	11.58	12.99	13.60	13.07	12.46
	9	-	-	-	-	-	-	-	-
	10	-	-	-	-	-	-	-	-
	11	-	-	-	-	-	-	-	-
	12	-	-	-	-	-	-	-	-

[Home <<](#)

[previous <<](#)

[next >>](#)

[chart](#)

Daily ORDC Adders Average Values and Interval Duration								
YEAR	MONTH	DAY	PRICE_RS	PRICE_RDP	RS_CNT	RDP_CNT	RS_POS	RDP_POS
2018	8	1	\$ 37.51	\$ 4.77	28	17	80	90
2018	8	2	\$ 5.77	\$ 8.17	28	6	80	90
2018	8	3	\$ 0.02	\$ -	6	0	80	90
2018	8	4	\$ 0.22	\$ -	4	0	80	90
2018	8	5	\$ -	\$ -	0	0	80	90
2018	8	6	\$ -	\$ -	0	0	80	90
2018	8	7	\$ 0.78	\$ -	22	0	80	90
2018	8	8	\$ 0.05	\$ -	9	0	80	90
2018	8	9	\$ 32.78	\$ -	22	0	80	90
2018	8	10	\$ 0.01	\$ -	2	0	80	90
2018	8	11	\$ -	\$ -	0	0	80	90
2018	8	12	\$ -	\$ -	0	0	80	90
2018	8	13	\$ 0.48	\$ -	17	0	80	90
2018	8	14	\$ 0.33	\$ 0.47	14	3	80	90
2018	8	15	\$ 111.22	\$ -	30	0	80	90
2018	8	16	\$ 31.25	\$ -	23	0	80	90
2018	8	17	\$ 0.50	\$ -	18	0	80	90
2018	8	18	\$ 153.88	\$ -	25	0	80	90
2018	8	19	\$ 43.32	\$ -	27	0	80	90
2018	8	20	\$ 0.21	\$ -	26	0	80	90
2018	8	21	\$ 0.23	\$ -	11	0	80	90
2018	8	22	\$ 1.22	\$ -	19	0	80	90
2018	8	23	\$ 0.02	\$ -	8	0	80	90
2018	8	24	\$ 2.64	\$ -	14	0	80	90
2018	8	25	\$ -	\$ -	0	0	80	90
2018	8	26	\$ -	\$ -	0	0	80	90
2018	8	27	\$ 0.03	\$ -	6	0	80	90
2018	8	28	\$ 0.01	\$ 0.71	3	10	80	90
2018	8	29	\$ 0.01	\$ -	1	0	80	90
2018	8	30	\$ 16.49	\$ -	19	0	80	90
2018	8	31	\$ 1.05	\$ -	15	0	80	90

[Home <<](#)

[previous <<](#)

[next >>](#)

[chart](#)

Monthly Average of Ancillary Services Required MW					
year	month	ASMW_REGDN	ASMW_NSPIN	ASMW_RRS	ASMW_REGUP
2017	1	279	1,479	2,700	309
	2	291	1,690	2,733	315
	3	277	1,575	2,734	302
	4	298	1,441	2,734	318
	5	322	1,605	2,626	340
	6	312	1,522	2,494	332
	7	314	1,304	2,370	335
	8	313	1,372	2,379	343
	9	309	1,578	2,504	333
	10	303	1,588	2,662	316
	11	257	1,677	2,733	279
	12	268	1,583	2,733	289
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	-	-	-	-
	10	-	-	-	-
	11	-	-	-	-
	12	-	-	-	-

[Home <<](#)

[previous <<](#)

[next >>](#)

[chart](#)

Hourly Average of Ancillary Services Required MW					
year	DELIVERY_HOUR	ASMW_REGDN	ASMW_NSPIN	ASMW_RRS	ASMW_REGUP
2017	1	362	963	2,726	310
	2	278	963	2,726	235
	3	248	1,478	2,720	217
	4	215	1,478	2,721	214
	5	221	1,478	2,721	275
	6	342	1,478	2,721	437
	7	277	1,994	2,594	580
	8	247	1,994	2,594	349
	9	244	1,994	2,594	395
	10	286	1,994	2,594	376
	11	261	1,790	2,527	379
	12	246	1,790	2,527	356
	13	230	1,790	2,527	321
	14	234	1,790	2,527	298
	15	230	1,488	2,528	264
	16	212	1,488	2,528	240
	17	228	1,488	2,528	251
	18	281	1,488	2,528	305
	19	354	1,484	2,599	295
	20	338	1,484	2,599	277
	21	355	1,484	2,599	253
	22	448	1,484	2,599	291
	23	500	963	2,726	373
	24	448	963	2,726	331
2018	1	387	1,099	2,866	290
	2	291	1,099	2,866	231
	3	247	1,471	2,876	217
	4	214	1,471	2,877	235
	5	213	1,471	2,877	282
	6	295	1,471	2,877	442
	7	274	2,054	2,737	568
	8	237	2,054	2,737	366
	9	256	2,054	2,737	408
	10	267	2,054	2,737	391
	11	247	1,679	2,658	410
	12	228	1,679	2,658	384
	13	214	1,679	2,658	339
	14	220	1,679	2,658	307
	15	224	1,530	2,637	265
	16	216	1,530	2,637	259
	17	259	1,530	2,637	263
	18	289	1,530	2,637	279
	19	378	1,466	2,678	300
	20	365	1,466	2,678	297
	21	374	1,466	2,678	268
	22	477	1,466	2,678	276
	23	531	1,099	2,866	327
	24	473	1,099	2,866	284

[Home <<](#)

[previous <<](#)

[next >>](#)

[chart](#)

Monthly Average Ancillary Services Price					
year	month	MCPC_REGDN	MCPC_NSPIN	MCPC_RRS	MCPC_REGUP
2017	1	\$ 7.10	\$ 0.89	\$ 13.26	\$ 9.94
	2	\$ 6.81	\$ 2.81	\$ 10.47	\$ 9.62
	3	\$ 10.21	\$ 3.96	\$ 9.71	\$ 7.94
	4	\$ 10.04	\$ 3.18	\$ 11.80	\$ 9.55
	5	\$ 12.33	\$ 3.58	\$ 8.92	\$ 10.16
	6	\$ 5.50	\$ 3.48	\$ 7.67	\$ 6.18
	7	\$ 3.75	\$ 4.79	\$ 10.27	\$ 8.31
	8	\$ 6.40	\$ 2.40	\$ 7.85	\$ 6.78
	9	\$ 7.17	\$ 2.55	\$ 7.26	\$ 6.98
	10	\$ 10.49	\$ 4.86	\$ 11.87	\$ 14.36
	11	\$ 6.25	\$ 3.82	\$ 10.89	\$ 9.54
	12	\$ 3.08	\$ 1.78	\$ 6.82	\$ 5.89
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	\$ -	\$ -	\$ -	\$ -
	10	\$ -	\$ -	\$ -	\$ -
	11	\$ -	\$ -	\$ -	\$ -
	12	\$ -	\$ -	\$ -	\$ -

[Home <<](#)

[previous <<](#)

[next >>](#)

[chart](#)

Monthly Average A/S Cost per MWh Load					
year	month	AScost_REGDN	AScost_NSPIIN	AScost_RRS	AScost_REGUP
2017	1	\$ 0.05	\$ 0.04	\$ 0.97	\$ 0.08
	2	\$ 0.06	\$ 0.14	\$ 0.84	\$ 0.09
	3	\$ 0.08	\$ 0.18	\$ 0.76	\$ 0.07
	4	\$ 0.08	\$ 0.13	\$ 0.89	\$ 0.08
	5	\$ 0.10	\$ 0.14	\$ 0.58	\$ 0.09
	6	\$ 0.04	\$ 0.11	\$ 0.41	\$ 0.04
	7	\$ 0.02	\$ 0.12	\$ 0.47	\$ 0.05
	8	\$ 0.04	\$ 0.07	\$ 0.38	\$ 0.05
	9	\$ 0.05	\$ 0.09	\$ 0.41	\$ 0.05
	10	\$ 0.08	\$ 0.20	\$ 0.81	\$ 0.12
	11	\$ 0.04	\$ 0.18	\$ 0.83	\$ 0.07
	12	\$ 0.02	\$ 0.07	\$ 0.48	\$ 0.04
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	\$ -	\$ -	\$ -	\$ -
	10	\$ -	\$ -	\$ -	\$ -
	11	\$ -	\$ -	\$ -	\$ -
	12	\$ -	\$ -	\$ -	\$ -

[Home <<](#)

[previous <<](#)

[next >>](#)

[chart](#)

ERCOT-wide Cumulative PNM			
year	month	pnm	pnm_accum
2017	0	\$ -	\$ -
	1	\$ 2,964.83	\$ 2,964.83
	2	\$ 1,573.68	\$ 4,538.51
	3	\$ 1,520.94	\$ 6,059.45
	4	\$ 4,590.29	\$ 10,649.74
	5	\$ 5,673.67	\$ 16,323.41
	6	\$ 2,542.93	\$ 18,866.34
	7	\$ 3,189.82	\$ 22,056.16
	8	\$ 2,749.34	\$ 24,805.50
	9	\$ 2,220.00	\$ 27,025.50
	10	\$ 3,969.18	\$ 30,994.68
	11	\$ 1,974.12	\$ 32,968.80
12	\$ 2,188.63	\$ 35,157.43	
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	\$ -	\$ -
	10	\$ -	\$ -
	11	\$ -	\$ -
12	\$ -	\$ -	

[Home <<](#)

[previous <<](#)

[next >>](#)

[chart](#)

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
2017	1	(395)	(62)	298	(188)	224	69
	2	34	300	185	118	538	363
	3	(68)	455	456	143	241	321
	4	(41)	631	611	550	(189)	(27)
	5	(741)	835	505	(140)	(836)	84
	6	(394)	634	637	30	(435)	179
	7	(36)	(59)	438	193	73	(32)
	8	(145)	902	918	278	(23)	293
	9	(259)	81	267	(96)	(388)	(210)
	10	(117)	379	213	(192)	(115)	(167)
	11	(412)	(481)	(487)	(572)	(423)	(316)
	12	68	(971)	(462)	(416)	456	(375)
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	-	-	-	-	-	-
	10	-	-	-	-	-	-
	11	-	-	-	-	-	-
	12	-	-	-	-	-	-

[Home <<](#)

[previous <<](#)

[next >>](#)

[chart](#)

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
2017	1	8,014	6,700	6,599	8,265	7,550	6,562
	2	9,009	6,729	7,434	9,274	8,627	6,821
	3	10,332	7,161	7,971	10,439	9,360	8,027
	4	10,299	7,917	8,602	9,566	9,141	8,602
	5	9,211	6,841	7,592	8,633	8,222	6,984
	6	8,043	4,563	6,393	8,327	6,543	5,205
	7	6,890	3,976	5,906	7,002	5,387	4,007
	8	5,383	3,558	5,047	5,704	3,942	3,052
	9	7,838	4,460	5,419	7,437	6,599	5,200
	10	9,408	6,198	6,379	9,086	8,565	7,053
	11	8,650	6,302	6,979	8,939	7,614	6,438
	12	7,532	5,681	5,279	6,908	7,205	6,015
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	11,099	9,863	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	-	-	-	-	-	-
	10	-	-	-	-	-	-
	11	-	-	-	-	-	-
	12	-	-	-	-	-	-

[Home <<](#)

[previous <<](#)

[next >>](#)

[chart](#)

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	2018	PIG CREEK AREA (FTST-MUSQUIZ)	20,715	1	555	606	1,661	2,711	3,928	3,830	3,337	4,087	-	-	-	-
FREQ_EXIST	2018	PANHANDLE GTC (PNHNDL)	13,750	2	2,999	3,126	3,607	2,763	846	319	-	90	-	-	-	-
FREQ_EXIST	2018	HAMILT MAVERI1_1 (HAMILTON-MAVERICK)	9,511	3	1,614	481	1,473	2,085	724	1,390	171	1,573	-	-	-	-
FREQ_EXIST	2018	YUCCA SWITCH - GAS PAD (YUCSW-BASIN)	9,162	4	47	1	109	85	2,102	4,101	2,696	21	-	-	-	-
FREQ_EXIST	2018	591_A (LKPNT-CRLNW)	8,454	5	1,714	781	2,025	2,818	1,077	-	-	39	-	-	-	-
FREQ_EXIST	2018	6437_F (SCRCV-KNAPP)	5,153	6	197	-	-	524	1,801	1,197	344	1,090	-	-	-	-
FREQ_EXIST	2018	BRUNI_69_1 (BRUNI-BRUNI)	4,147	7	365	807	398	665	253	856	170	633	-	-	-	-
FREQ_EXIST	2018	6270_C (WGR0B-BLMND)	3,223	8	-	-	-	43	444	1,409	528	799	-	-	-	-
FREQ_EXIST	2018	LOYOLA_69_1 (LOYOLA-LOYOLA)	2,851	9	387	644	332	1,345	68	75	-	-	-	-	-	-
FREQ_EXIST	2018	JK_TOKSW_1 (TOKSW-JK_CK)	2,750	10	999	199	892	654	-	6	-	-	-	-	-	-
TOP10_RENT	2018	YUCCA SWITCH - GAS PAD (YUCSW-BASIN)	\$ 253.00	1	\$ 0.68	\$ 0.04	\$ 4.36	\$ 2.89	\$ 57.44	\$ 112.58	\$ 74.16	\$ 0.85	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2018	PANHANDLE GTC (PNHNDL)	\$ 97.44	2	\$ 23.59	\$ 28.83	\$ 26.11	\$ 14.27	\$ 2.77	\$ 1.45	\$ -	\$ 0.42	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2018	591_A (LKPNT-CRLNW)	\$ 60.30	3	\$ 9.11	\$ 3.37	\$ 11.47	\$ 27.87	\$ 8.34	\$ -	\$ -	\$ 0.14	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2018	NEDIN XFMRs (NEDIN-NEDIN)	\$ 39.49	4	\$ 28.83	\$ -	\$ -	\$ -	\$ 0.99	\$ 0.08	\$ -	\$ 9.59	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2018	588_A_1 (LWSVW-LWVTI)	\$ 36.47	5	\$ -	\$ -	\$ -	\$ 11.81	\$ 24.03	\$ -	\$ -	\$ 0.63	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2018	6270_C (WGR0B-BLMND)	\$ 36.20	6	\$ -	\$ -	\$ -	\$ 0.81	\$ 8.09	\$ 14.85	\$ 5.33	\$ 7.11	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2018	PIG CREEK AREA (FTST-MUSQUIZ)	\$ 33.04	7	\$ 0.29	\$ 0.44	\$ 1.07	\$ 2.46	\$ 11.27	\$ 5.17	\$ 7.84	\$ 4.49	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2018	6345_B (GNTSW-SPRTP)	\$ 32.85	8	\$ -	\$ -	\$ -	\$ 0.88	\$ 31.88	\$ 0.01	\$ -	\$ 0.08	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2018	VALLEY IMPORT GTC (VALIMP)	\$ 19.94	9	\$ 17.31	\$ -	\$ -	\$ -	\$ 2.63	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2018	6437_F (SCRCV-KNAPP)	\$ 16.65	10	\$ 0.89	\$ -	\$ -	\$ 1.62	\$ 4.61	\$ 4.55	\$ 1.20	\$ 3.77	\$ -	\$ -	\$ -	\$ -

[Home <<](#)

[previous <<](#)

[next >>](#)

[chart 1](#)

[chart 2](#)

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	2018	PIG CREEK AREA (FTST-MUSQUIZ)	4,453	1	542	596	461	455	615	669	574	541	-	-	-	-	
FREQ_EXIST	2018	EAGLEP_ESCOND1_1 (ESCONDID-EAGLE_PS)	3,209	2	454	385	337	368	450	378	421	416	-	-	-	-	
FREQ_EXIST	2018	YUCCA SWITCH - GAS PAD (YUCSW-GASPAD)	2,925	3	167	62	461	479	508	598	563	87	-	-	-	-	
FREQ_EXIST	2018	HAMILT_MAVERI1_1 (HAMILTON-MAVERICK)	2,565	4	294	204	352	535	344	377	89	370	-	-	-	-	
FREQ_EXIST	2018	FORMOS_LOLITA1_1 (LOLITA-FORMOSA)	2,531	5	529	333	179	132	213	532	371	242	-	-	-	-	
FREQ_EXIST	2018	PANHANDLE GTC (PNHNDL)	2,090	6	335	433	541	376	196	162	-	47	-	-	-	-	
FREQ_EXIST	2018	16TH_WRD2_1 (WOODWRD2-16TH_ST)	2,061	7	351	229	95	212	214	356	333	271	-	-	-	-	
FREQ_EXIST	2018	GREENL_WEAVER1_1 (WEAVERRD-GREENLK)	2,052	8	162	346	478	534	361	86	21	64	-	-	-	-	
FREQ_EXIST	2018	BRUNI_69_1 (BRUNI-BRUNI)	1,976	9	147	215	246	252	197	372	219	328	-	-	-	-	
FREQ_EXIST	2018	6437_F (SCRCV-KNAPP)	1,950	10	45	6	-	106	517	571	242	463	-	-	-	-	
TOP10_RENT	2018	YUCCA SWITCH - GAS PAD (YUCSW-GASPAD)	\$ 184.65	1	\$ 1.03	\$ 0.19	\$ 3.95	\$ 4.46	\$ 29.60	\$ 67.86	\$ 76.87	\$ 0.70	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2018	PANHANDLE GTC (PNHNDL)	\$ 87.80	2	\$ 19.37	\$ 21.44	\$ 25.06	\$ 14.39	\$ 4.48	\$ 2.63	\$ 0.00	\$ 0.43	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2018	591_A (LKPNT-CRLNW)	\$ 55.63	3	\$ 6.45	\$ 2.83	\$ 10.65	\$ 25.37	\$ 9.85	\$ 0.28	\$ 0.00	\$ 0.19	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2018	PIG CREEK AREA (FTST-MUSQUIZ)	\$ 52.25	4	\$ 0.37	\$ 0.57	\$ 0.83	\$ 0.91	\$ 9.04	\$ 25.97	\$ 10.27	\$ 4.30	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2018	6345_B (GNTSW-SPRTP)	\$ 36.22	5	\$ -	\$ 0.02	\$ 0.05	\$ 0.64	\$ 26.92	\$ 6.57	\$ 0.53	\$ 1.48	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2018	6270_C (WGROB-BLMND)	\$ 35.29	6	\$ -	\$ 0.03	\$ 0.00	\$ -	\$ 2.71	\$ 20.25	\$ 7.09	\$ 5.20	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2018	GCB_100_1 (N_MCALLN-W_MCALLN)	\$ 25.00	7	\$ 0.21	\$ 1.04	\$ 1.69	\$ 1.45	\$ 8.02	\$ 7.12	\$ 2.99	\$ 2.47	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2018	590_A (LWSSW-LWVJS)	\$ 23.62	8	\$ -	\$ -	\$ 0.08	\$ -	\$ 20.85	\$ 2.21	\$ 0.07	\$ 0.41	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2018	588_A_1 (LWSVW-LWVTI)	\$ 22.89	9	\$ 0.52	\$ 0.09	\$ 0.04	\$ 9.00	\$ 13.24	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2018	1090_A (FORSW-FORWE)	\$ 22.39	10	\$ -	\$ -	\$ -	\$ -	\$ 0.00	\$ 2.91	\$ 16.63	\$ 2.84	\$ -	\$ -	\$ -	\$ -	

[Home <<](#)

[previous <<](#)

[next >>](#)

[chart 1](#)

[chart 2](#)

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	2018	HB WEST-LZ WEST	\$ 17.64	1	\$ 0.25	\$ 0.36	\$ 0.35	\$ 0.32	\$ 0.62	\$ 4.87	\$ 5.68	\$ 4.44	\$ 0.75	\$ -	\$ -	\$ -		
N	2018	HB SOUTH-LZ SOUTH	\$ 16.42	2	\$ 0.63	\$ 0.49	\$ 0.95	\$ 1.34	\$ 1.98	\$ 3.82	\$ 2.72	\$ 2.80	\$ 1.70	\$ -	\$ -	\$ -		
N	2018	HB NORTH-LZ NORTH	\$ 11.28	3	\$ 0.53	\$ 0.26	\$ 0.25	\$ 0.38	\$ 0.45	\$ 2.33	\$ 2.62	\$ 3.18	\$ 1.28	\$ -	\$ -	\$ -		
N	2018	HB HOUSTON-LZ HOUSTON	\$ 10.08	4	\$ 0.33	\$ 0.13	\$ 0.34	\$ 0.49	\$ 0.59	\$ 1.27	\$ 3.33	\$ 2.36	\$ 1.23	\$ -	\$ -	\$ -		
N	2018	HB NORTH-HB HOUSTON	\$ 4.85	5	\$ 0.50	\$ 0.22	\$ 1.10	\$ 1.07	\$ 0.84	\$ 0.54	\$ -	\$ 0.07	\$ 0.50	\$ -	\$ -	\$ -		
N	2018	HB NORTH-HB SOUTH	\$ 3.93	6	\$ 0.23	\$ 0.40	\$ 0.84	\$ 0.79	\$ 0.67	\$ 0.68	\$ 0.07	\$ 0.12	\$ 0.15	\$ -	\$ -	\$ -		
N	2018	HB WEST-HB NORTH	\$ 3.37	7	\$ 0.16	\$ 0.22	\$ 0.33	\$ 0.77	\$ 0.43	\$ 0.89	\$ 0.20	\$ 0.04	\$ 0.33	\$ -	\$ -	\$ -		
N	2018	MIAM1 G1 G2-HB WEST	\$ 2.48	8	\$ 0.61	\$ 0.23	\$ 0.41	\$ 0.79	\$ 0.33	\$ 0.10	\$ 0.00	\$ 0.01	\$ 0.00	\$ -	\$ -	\$ -		
N	2018	JACKCNTY STG-LZ NORTH	\$ 2.10	9	\$ 0.15	\$ 0.17	\$ 0.13	\$ 0.17	\$ 0.05	\$ 0.32	\$ 0.67	\$ 0.33	\$ 0.10	\$ -	\$ -	\$ -		
N	2018	JCKCNTY2 ST2-LZ NORTH	\$ 1.76	10	\$ -	\$ -	\$ 0.03	\$ 0.41	\$ 0.14	\$ 0.40	\$ 0.21	\$ 0.35	\$ 0.21	\$ -	\$ -	\$ -		
Y	2018	HB WEST-LZ WEST	\$ 6.29	1	\$ 0.07	\$ 0.12	\$ 0.11	\$ 0.04	\$ 0.08	\$ 0.33	\$ 0.88	\$ 4.21	\$ 0.45	\$ -	\$ -	\$ -		
Y	2018	HB WEST-HOVEY GEN	\$ 4.61	2	\$ 0.01	\$ 0.04	\$ 0.07	\$ 0.05	\$ 0.19	\$ 0.29	\$ 0.52	\$ 3.21	\$ 0.23	\$ -	\$ -	\$ -		
Y	2018	HB NORTH-LZ NORTH	\$ 4.21	3	\$ 0.23	\$ 0.38	\$ 0.16	\$ 0.19	\$ 0.18	\$ 0.72	\$ 1.21	\$ 0.85	\$ 0.30	\$ -	\$ -	\$ -		
Y	2018	HB SOUTH-LZ SOUTH	\$ 3.60	4	\$ 0.09	\$ 0.07	\$ 0.24	\$ 0.14	\$ 0.59	\$ 0.53	\$ 0.56	\$ 0.83	\$ 0.56	\$ -	\$ -	\$ -		
Y	2018	REROCK ALL-HOVEY GEN	\$ 2.84	5	\$ 0.01	\$ 0.04	\$ 0.19	\$ 0.22	\$ 0.03	\$ 0.13	\$ 0.44	\$ 1.74	\$ 0.04	\$ -	\$ -	\$ -		
Y	2018	HB HOUSTON-LZ HOUSTON	\$ 2.24	6	\$ 0.16	\$ 0.11	\$ 0.15	\$ 0.12	\$ 0.24	\$ 0.35	\$ 0.15	\$ 0.68	\$ 0.26	\$ -	\$ -	\$ -		
Y	2018	SSPURT WIND1-HB WEST	\$ 2.20	7	\$ 0.23	\$ 0.47	\$ 0.43	\$ 0.28	\$ 0.61	\$ 0.09	\$ 0.04	\$ 0.00	\$ 0.05	\$ -	\$ -	\$ -		
Y	2018	LASSO_GEN-HOVEY GEN	\$ 1.74	8	\$ 0.00	\$ 0.01	\$ 0.01	\$ 0.02	\$ 0.01	\$ 0.00	\$ 0.28	\$ 1.26	\$ 0.14	\$ -	\$ -	\$ -		
Y	2018	LHORN N U1 2-HB WEST	\$ 1.27	9	\$ 0.36	\$ 0.31	\$ 0.34	\$ 0.05	\$ 0.19	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.01	\$ -	\$ -	\$ -		
Y	2018	SLFRK_UN1 2-LZ NORTH	\$ 1.16	10	\$ 0.18	\$ 0.17	\$ 0.11	\$ 0.20	\$ 0.33	\$ 0.14	\$ 0.02	\$ 0.01	\$ 0.00	\$ -	\$ -	\$ -		

[Home <<](#)

[previous <<](#)

[chart 1](#)

[chart 2](#)