

To the Public Utility Commission of Texas

# ERCOT Wholesale Electricity Market Monthly Report

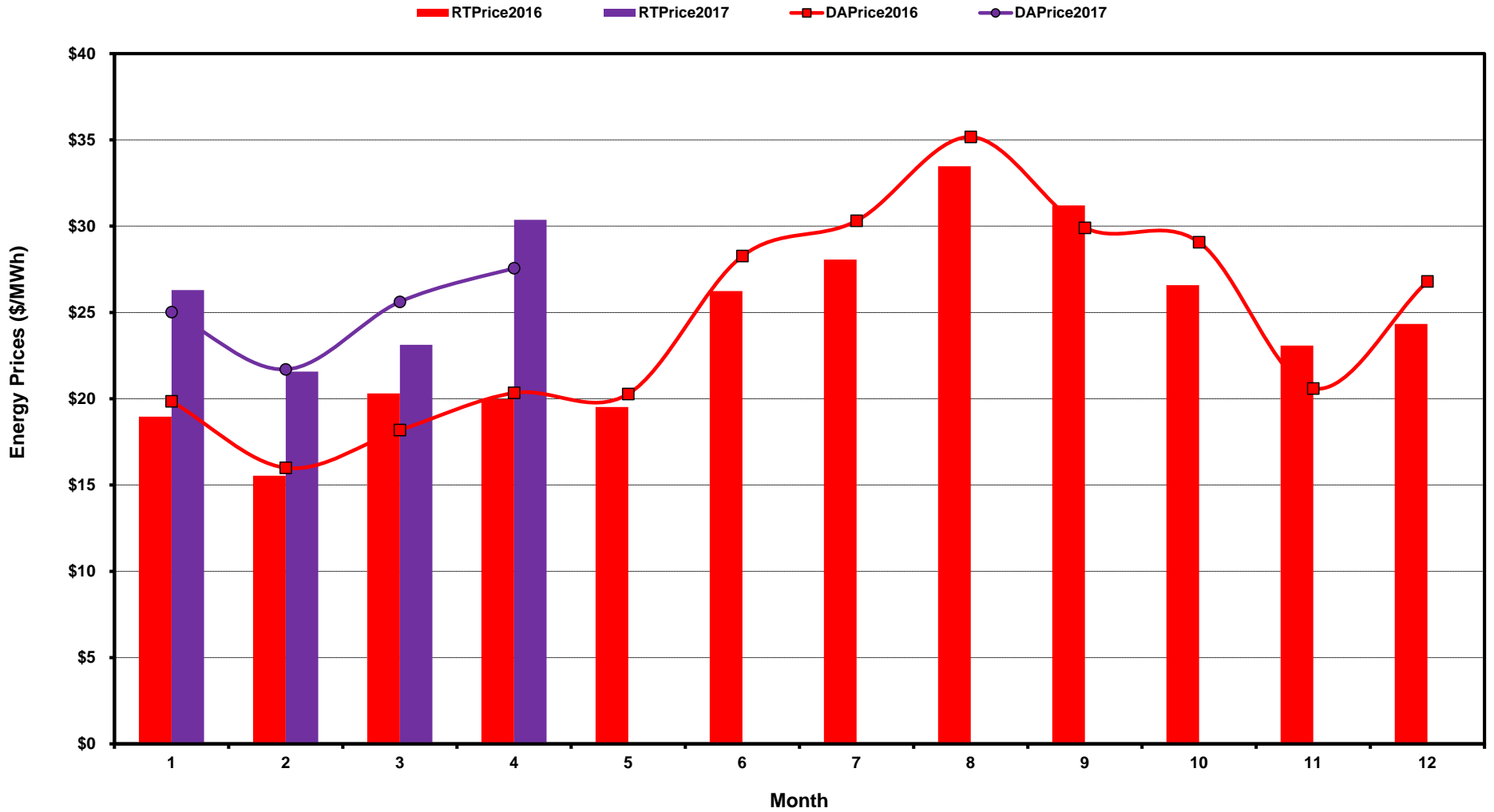
Thursday, May 11, 2017

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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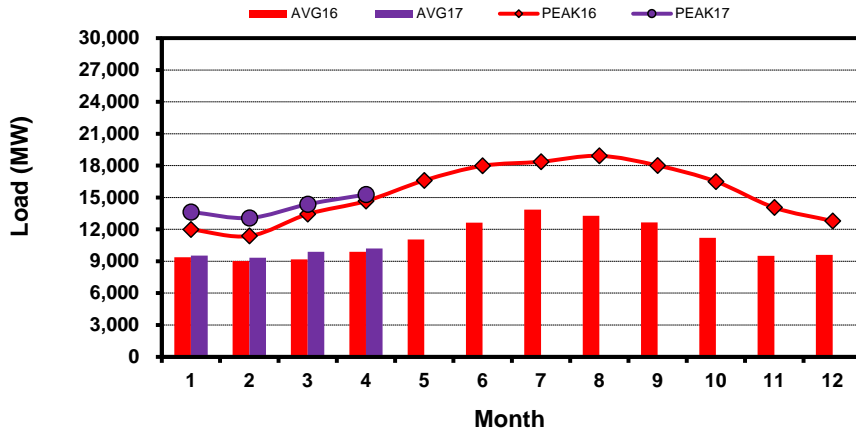
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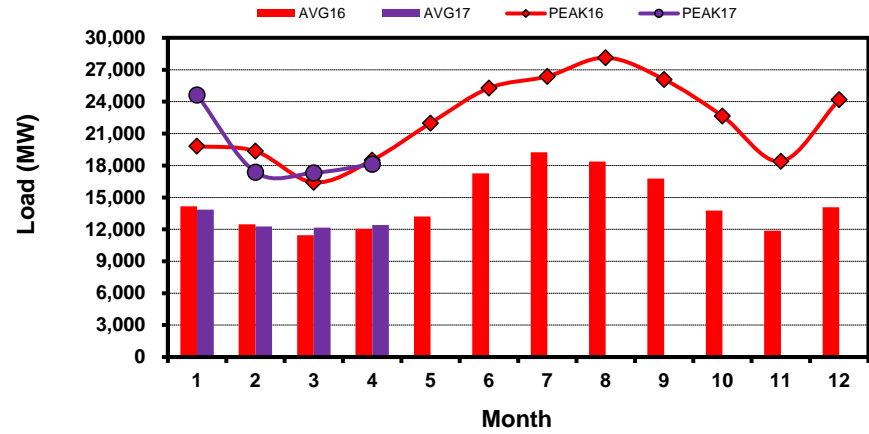
# Load Zone Load Statistics

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

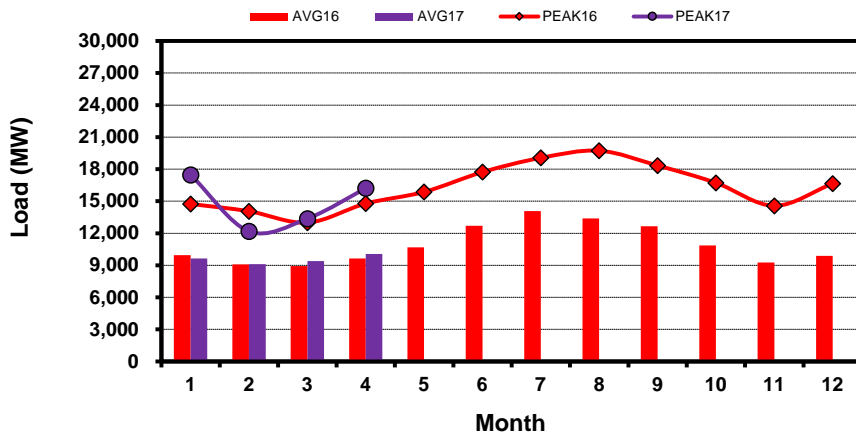
### Houston Zone



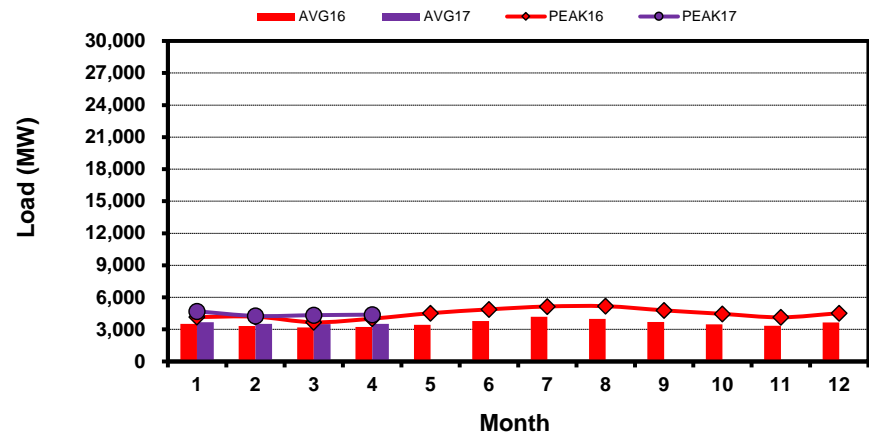
### North Zone



### South Zone



### West Zone



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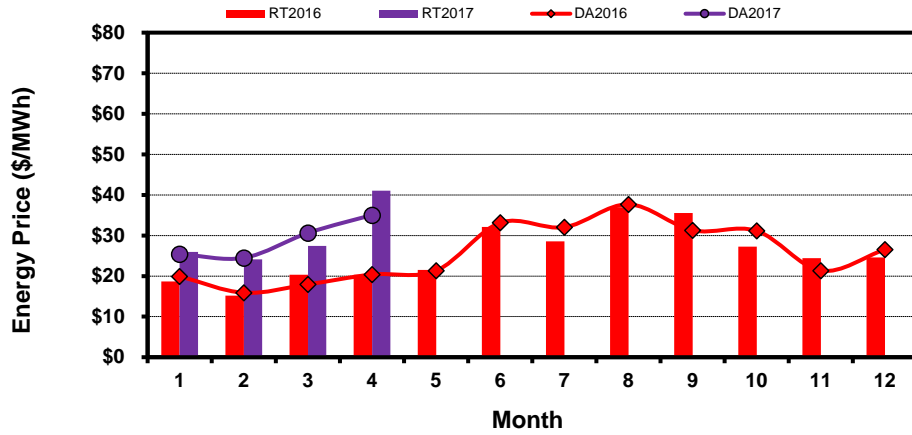
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**Note:** \* Zonal load zone definition vs. Nodal comparable load zone definition: LZ\_Houston=LZ\_Houston; LZ\_West=LZ\_West; LZ\_North=(LZ\_North,LZ\_RAYBN); LZ\_South=(LZ\_South,LZ\_CPS,LZ\_AEN,LZ\_LCRA)

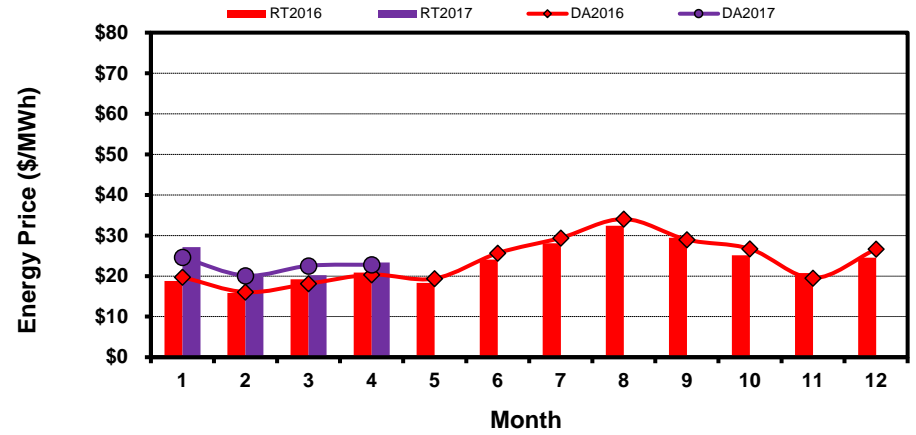
# Load Zone Monthly Average Energy Price DA vs RT

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

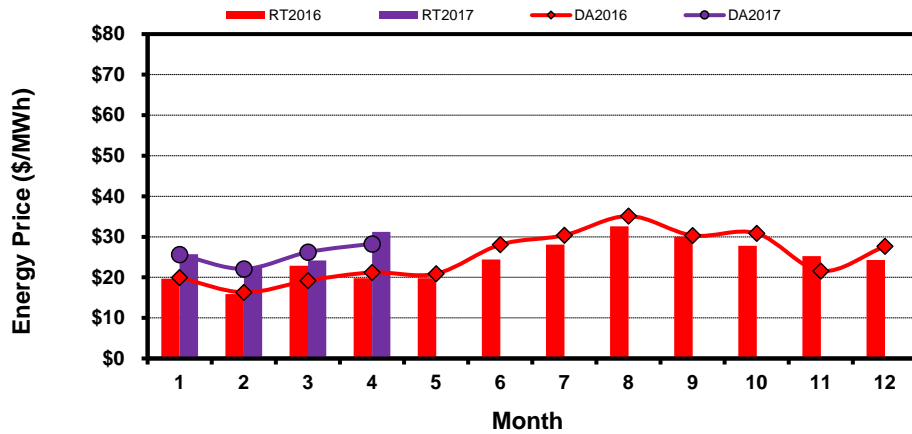
### Houston Zone



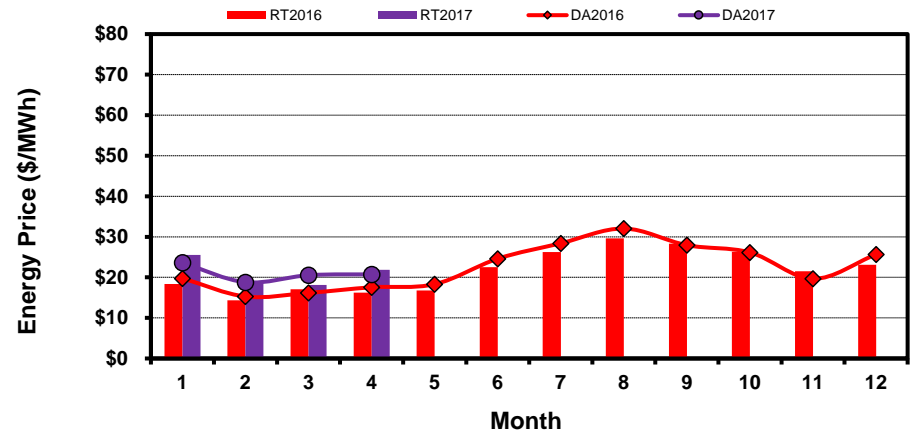
### North Zone



### South Zone



### West Zone



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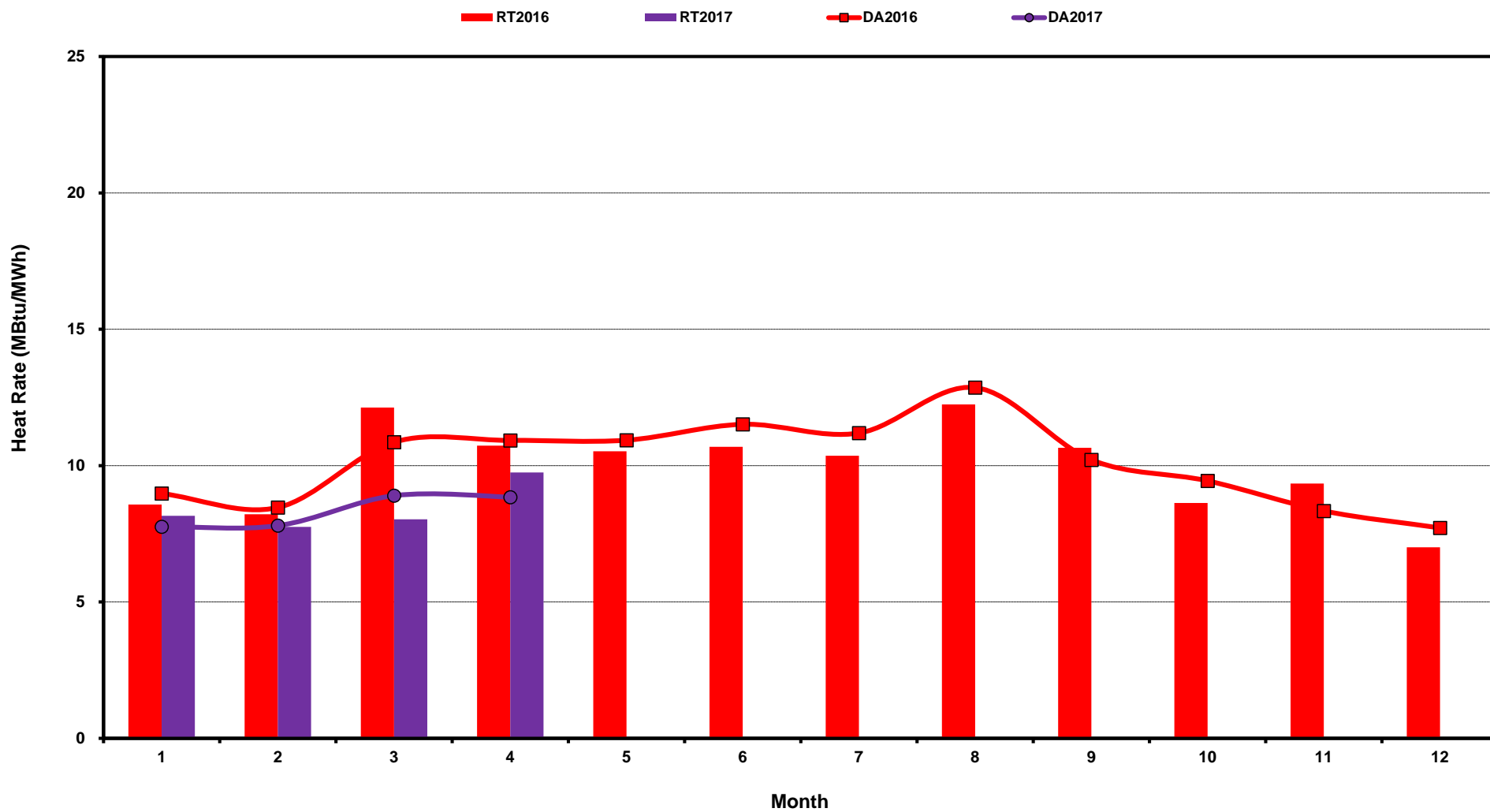
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**Note:** \* Zonal load zone definition vs. Nodal comparable load zone definition: LZ\_Houston=LZ\_Houston; LZ\_West=LZ\_West; LZ\_North=(LZ\_North,LZ\_RAYBN); LZ\_South=(LZ\_South,LZ\_CPS,LZ\_AEN,LZ\_LCRA)

# ERCOT-wide Monthly Implied Heat Rate DA vs RT

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



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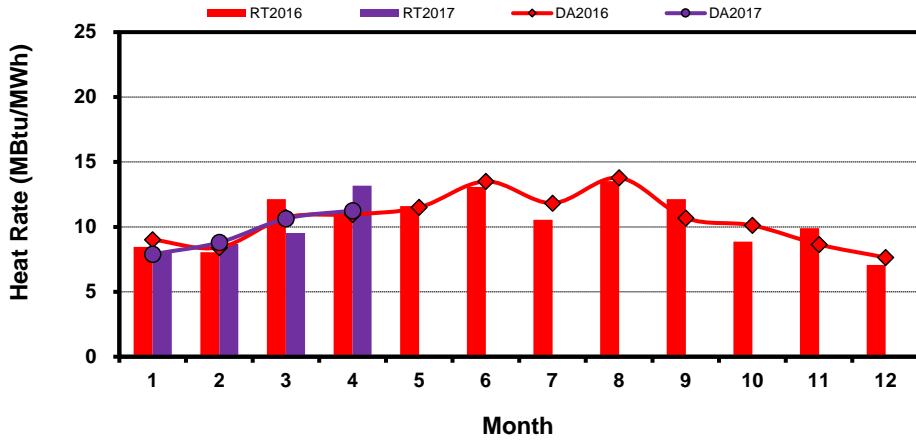
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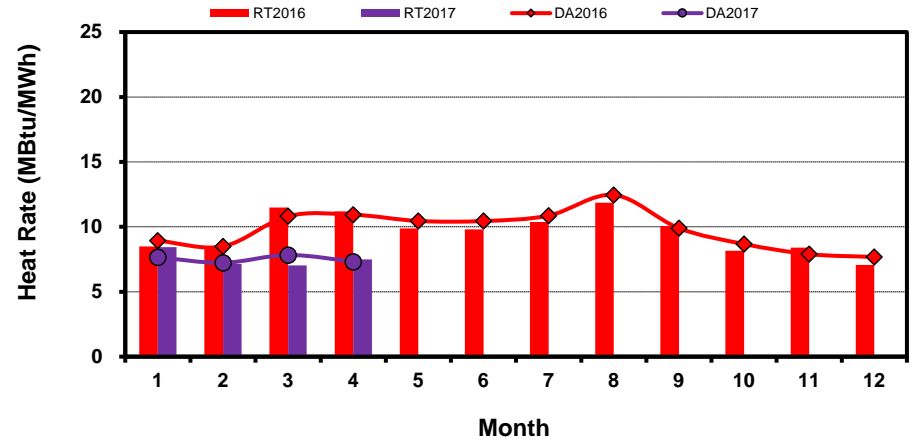
# Load Zone Monthly Implied Heat Rate DA vs RT

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

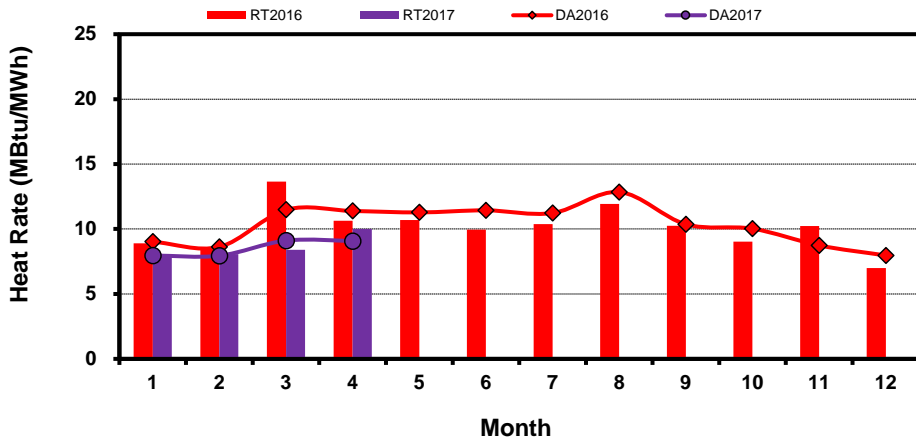
### Houston Zone



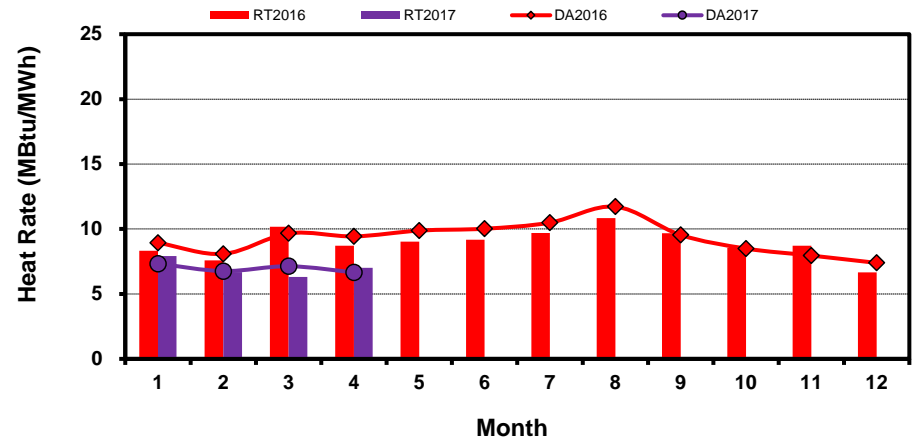
### North Zone



### South Zone



### West Zone



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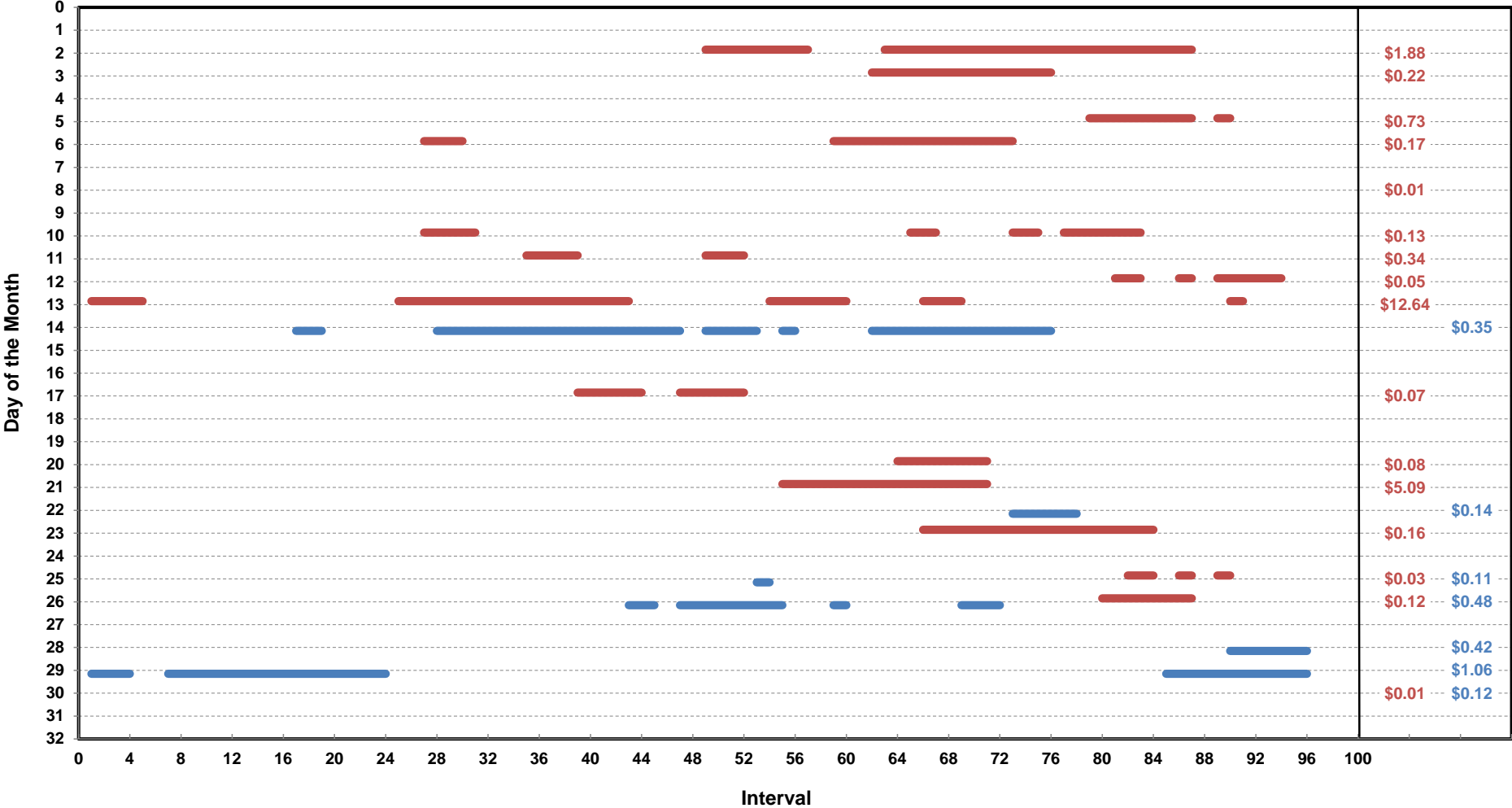
**Note:** \* Zonal load zone definition vs. Nodal comparable load zone definition: LZ\_Houston=LZ\_Houston; LZ\_West=LZ\_West; LZ\_North=(LZ\_North,LZ\_RAYBN); LZ\_South=(LZ\_South,LZ\_CPS,LZ\_AEN,LZ\_LCRA)

# Daily ORDC Adders Average Values and Interval Duration

Apr-2017

RDP Adder RS Adder

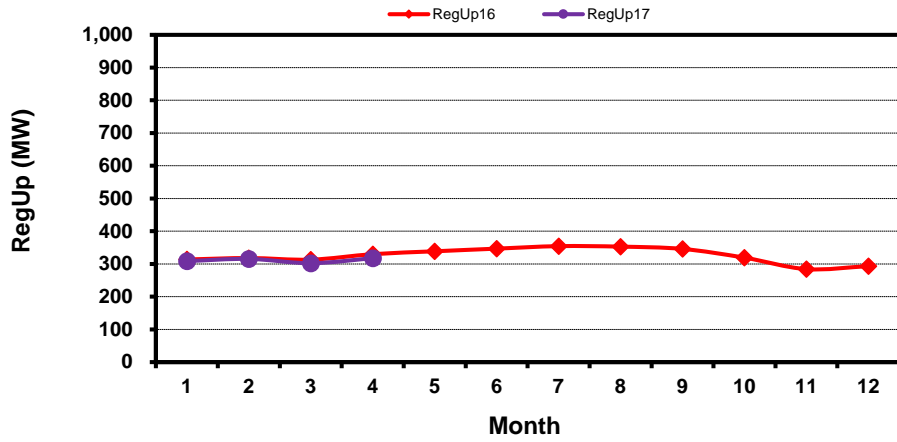
Daily Averages



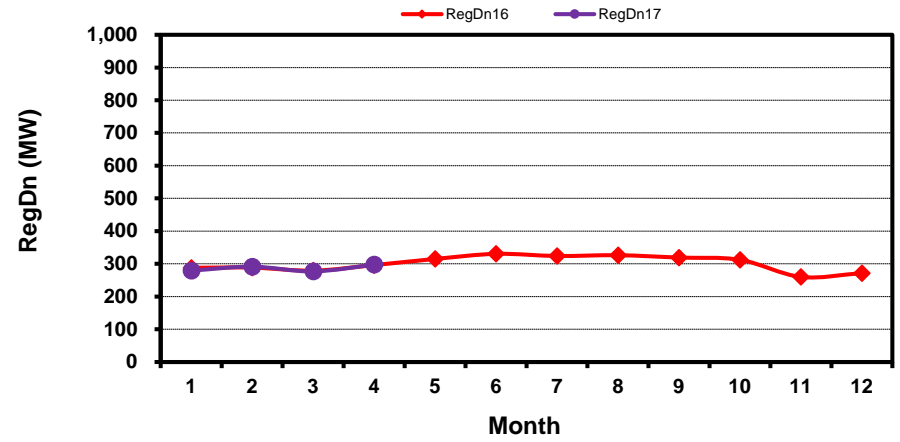
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# Monthly Average of Ancillary Services Required MW

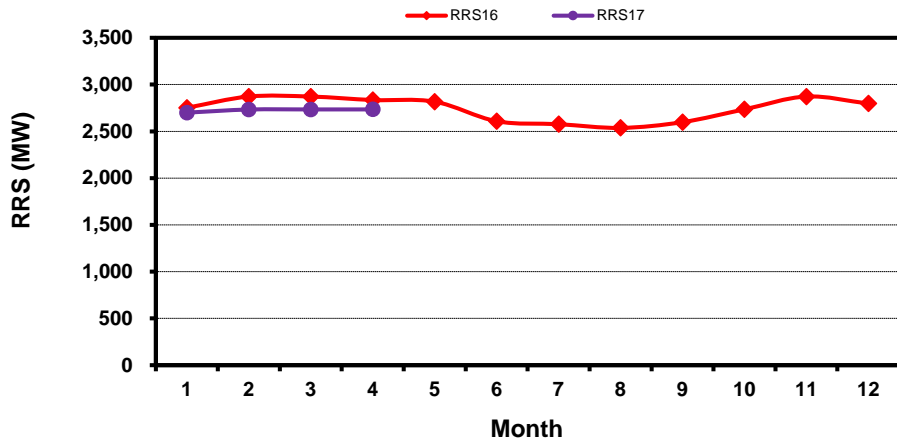
## Regulation Up



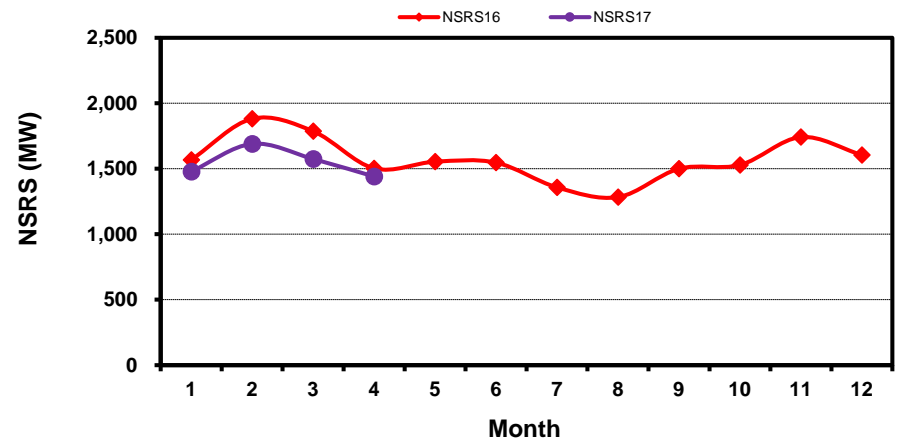
## Regulation Down



## Responsive Reserve



## Non-Spin Reserve



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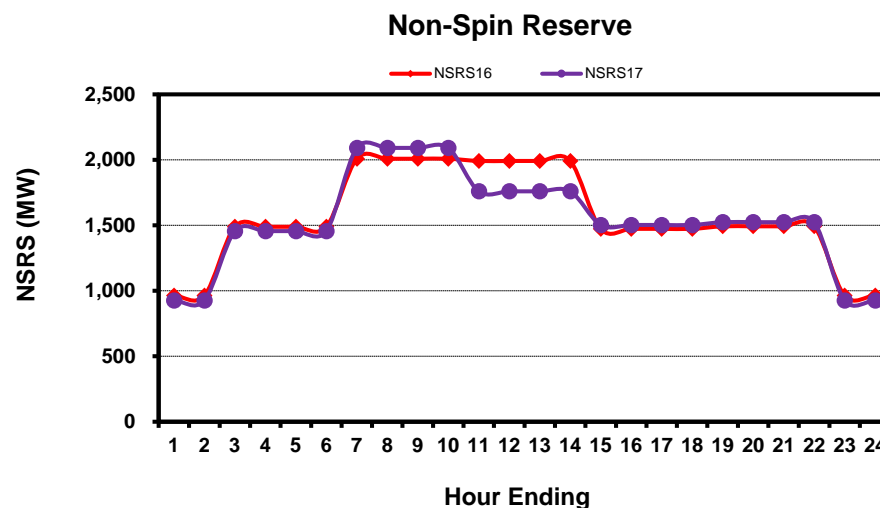
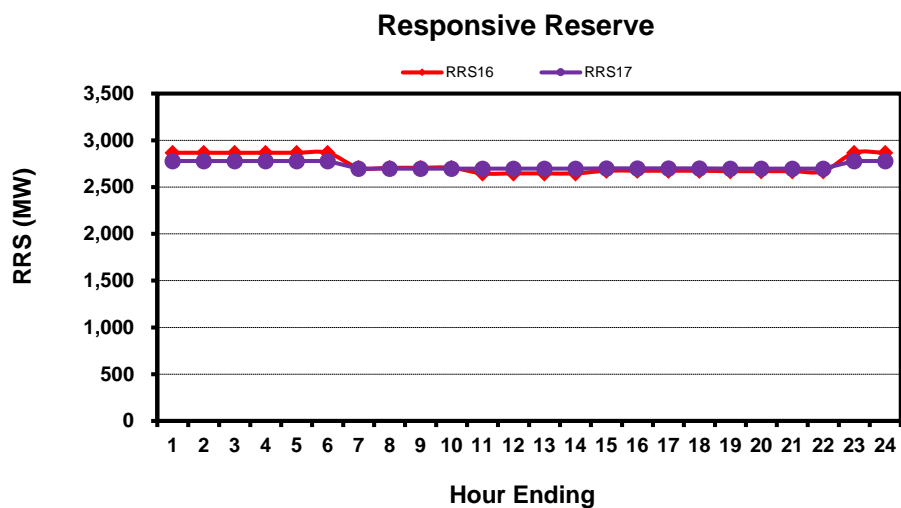
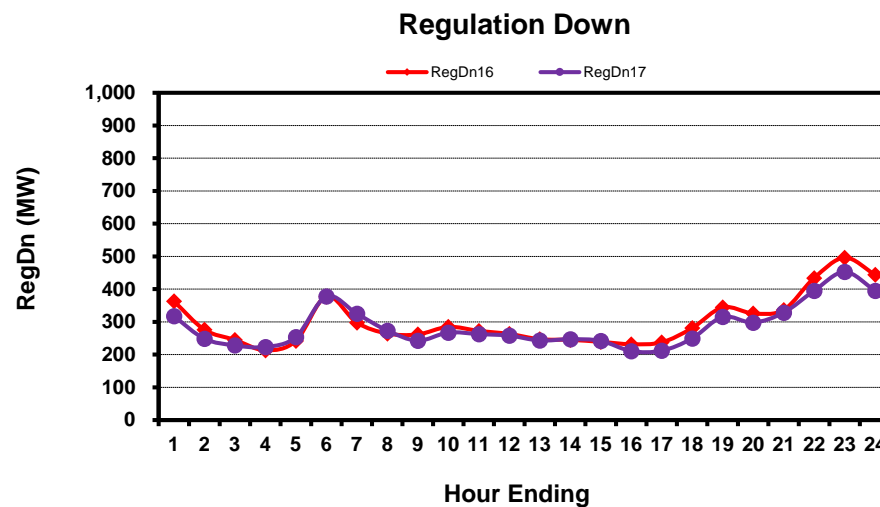
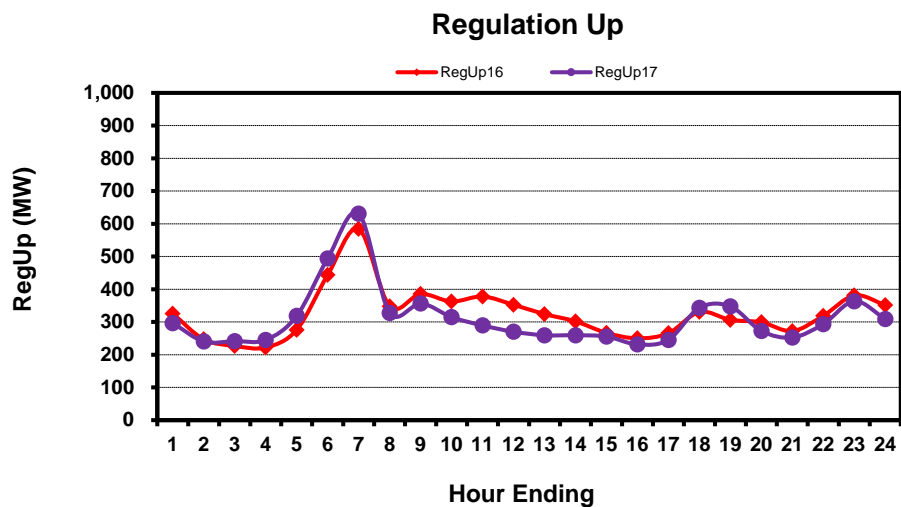
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# Hourly Average of Ancillary Services Required MW



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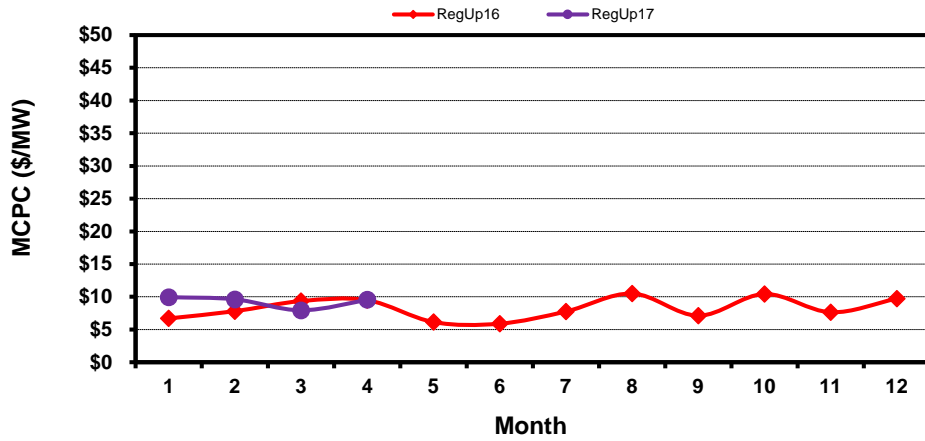
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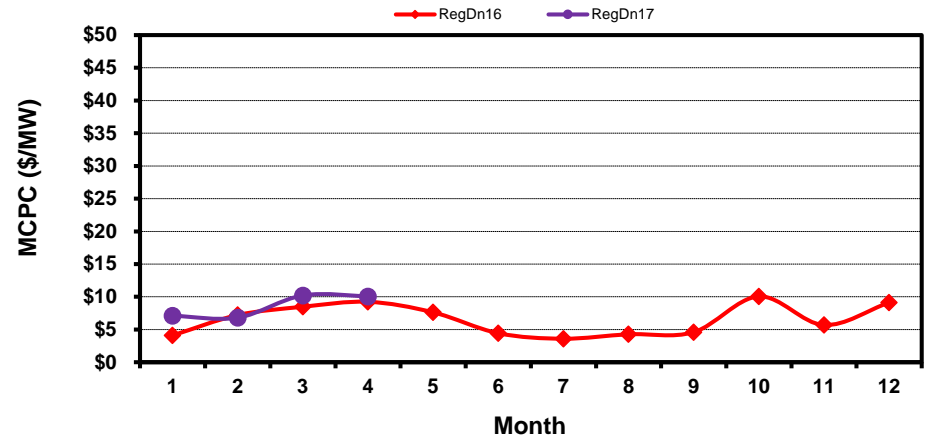
# Monthly Average Ancillary Services Price

(weighted by A/S Quantities Required)

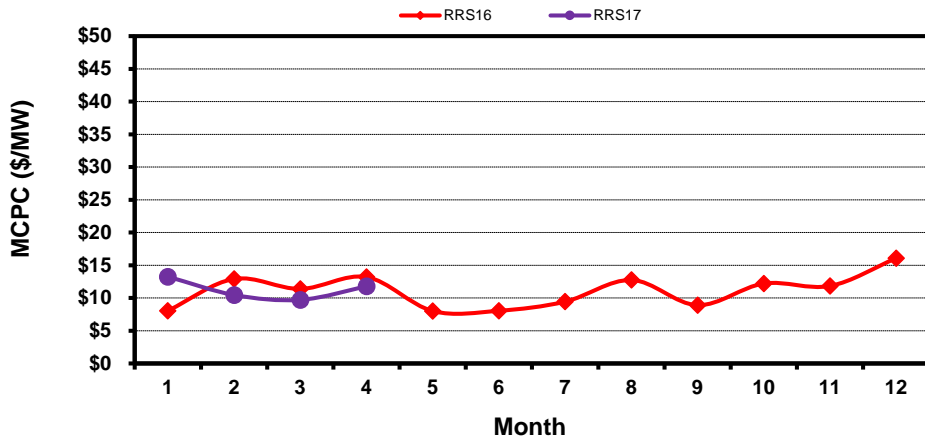
### Regulation Up



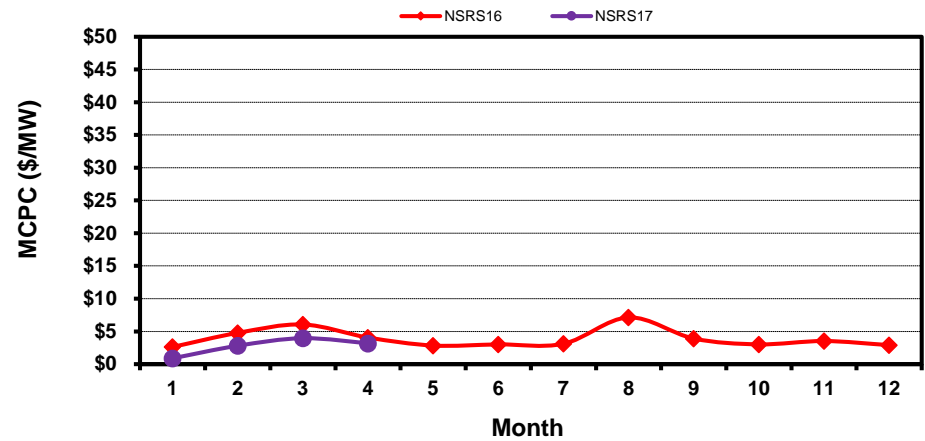
### Regulation Down



### Responsive Reserve



### Non-Spin Reserve



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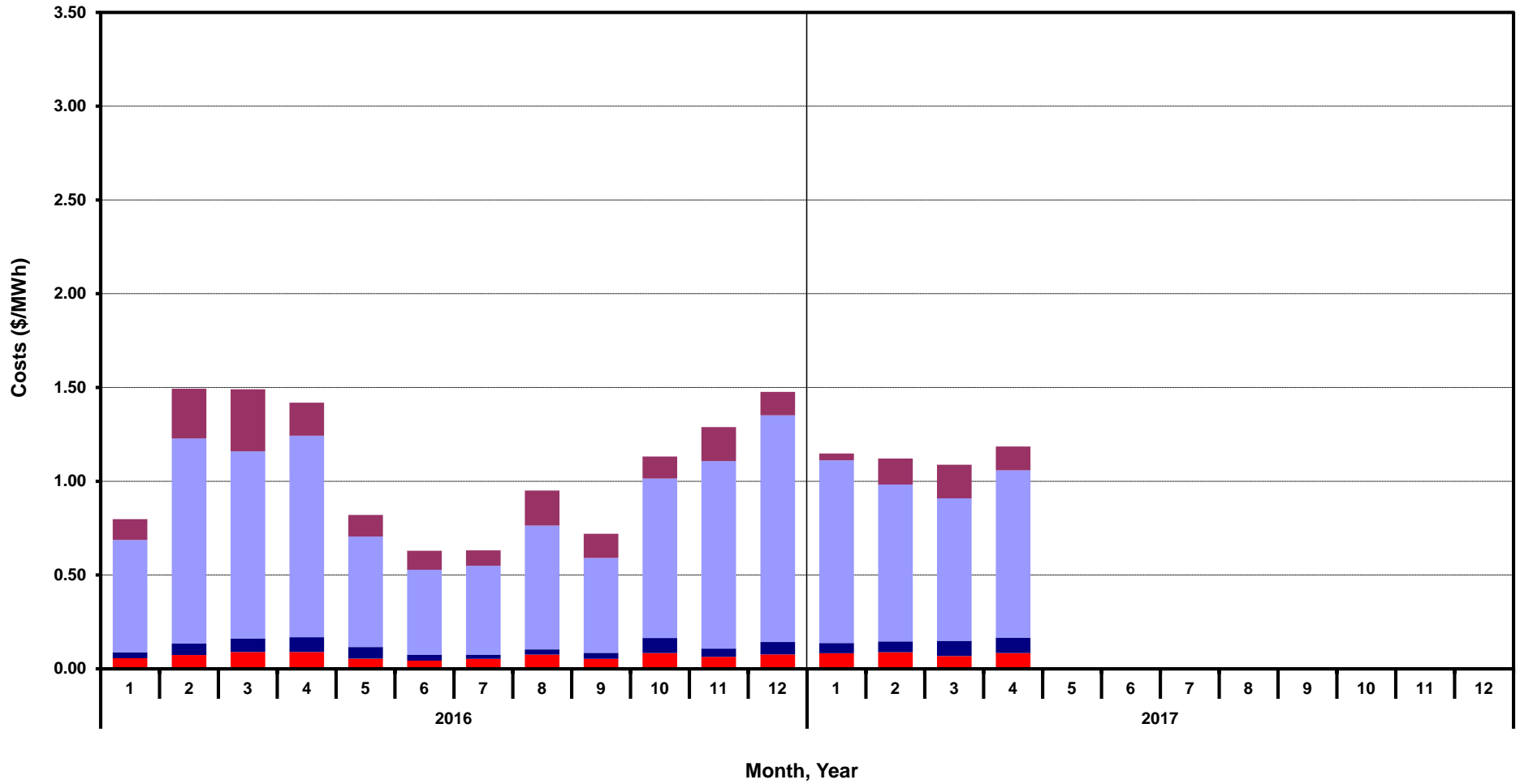
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# Monthly Average A/S Cost per MWh Load

RegUp RegDn RRS NonSpin



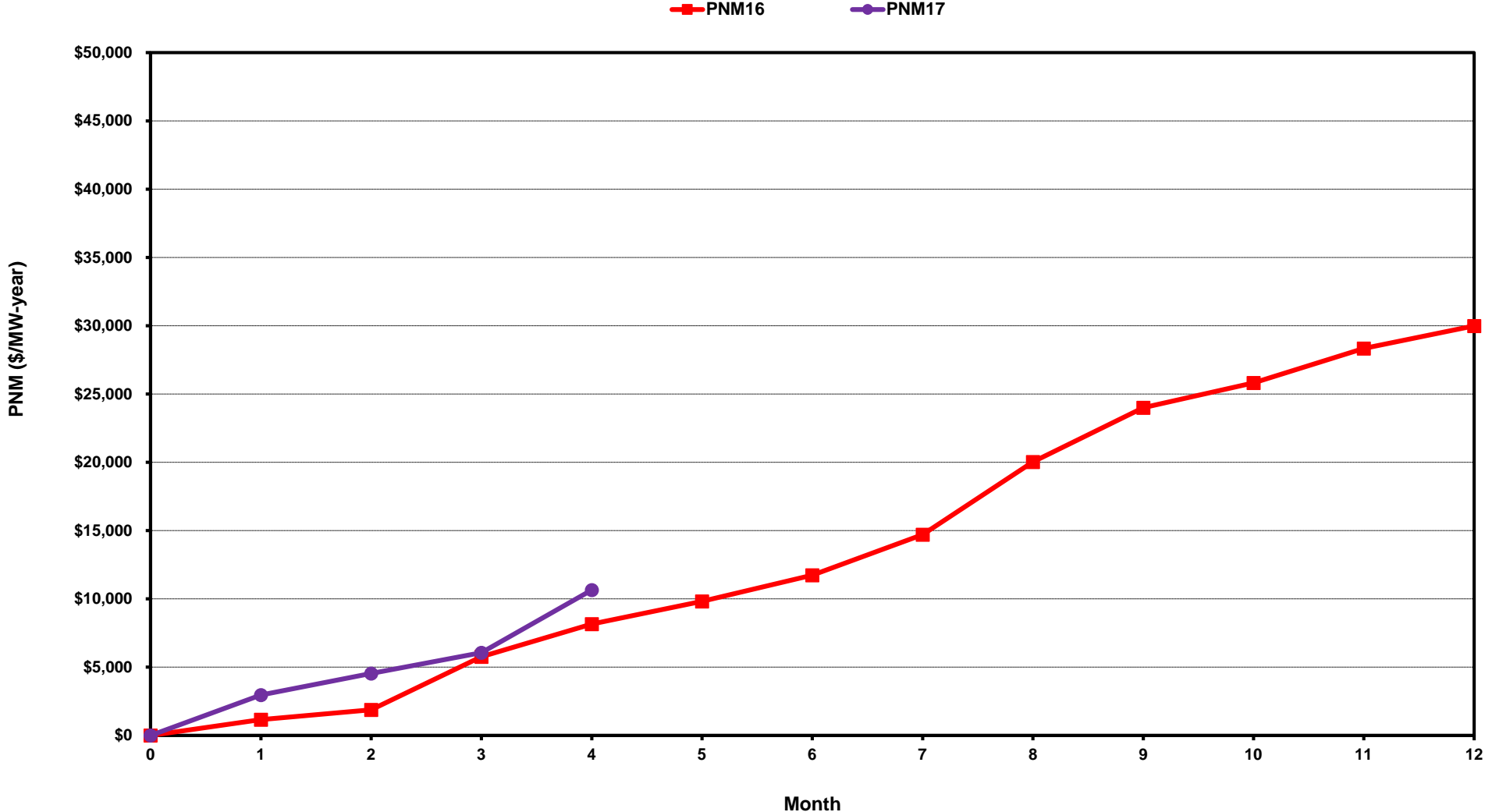
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# ERCOT-wide Cumulative Peaker Net Margin



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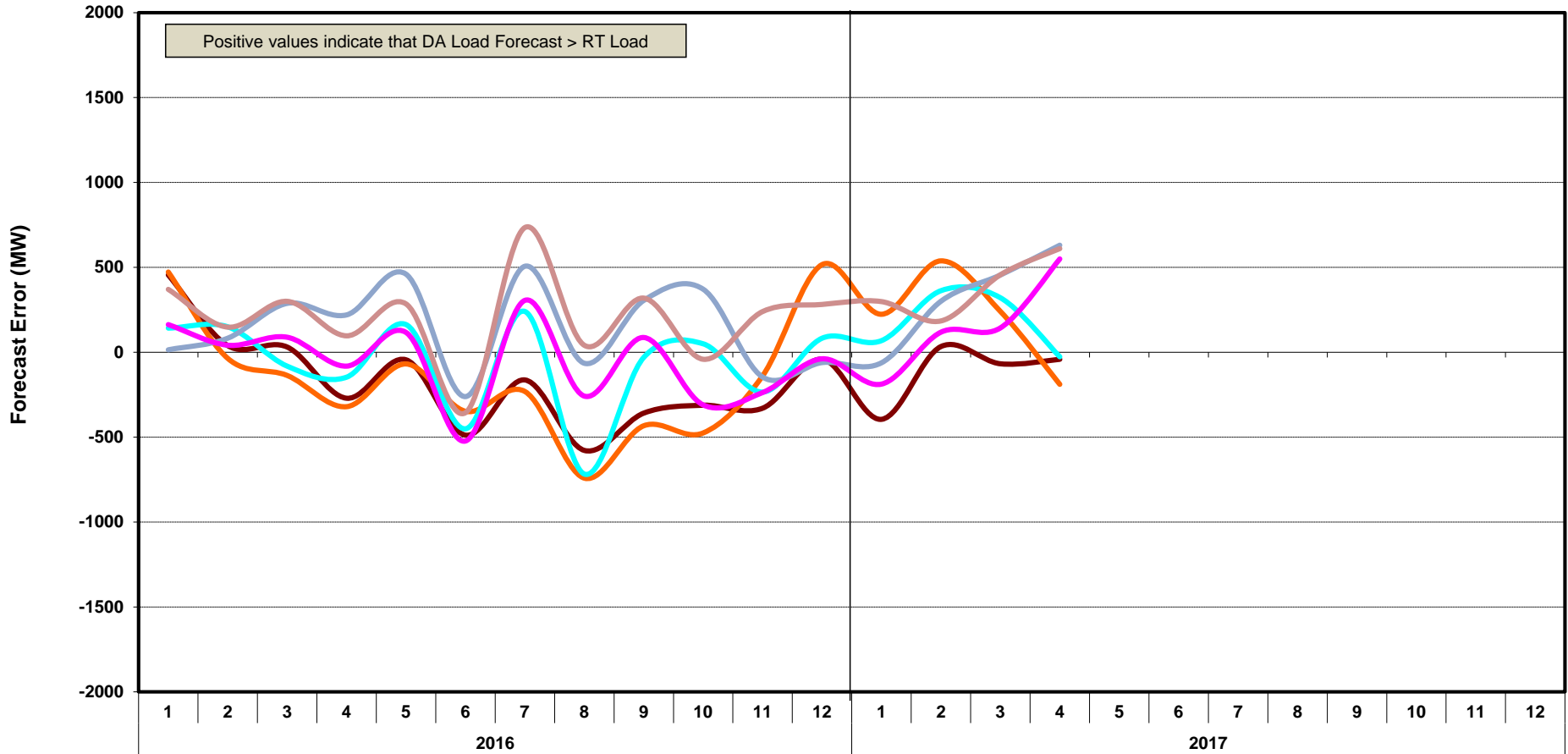
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# DA vs. RT Load Forecast Error by Hour Ending

HE\_1\_4   HE\_5\_8   HE\_9\_12   HE\_13\_16   HE\_17\_20   HE\_21\_24



Month, Year

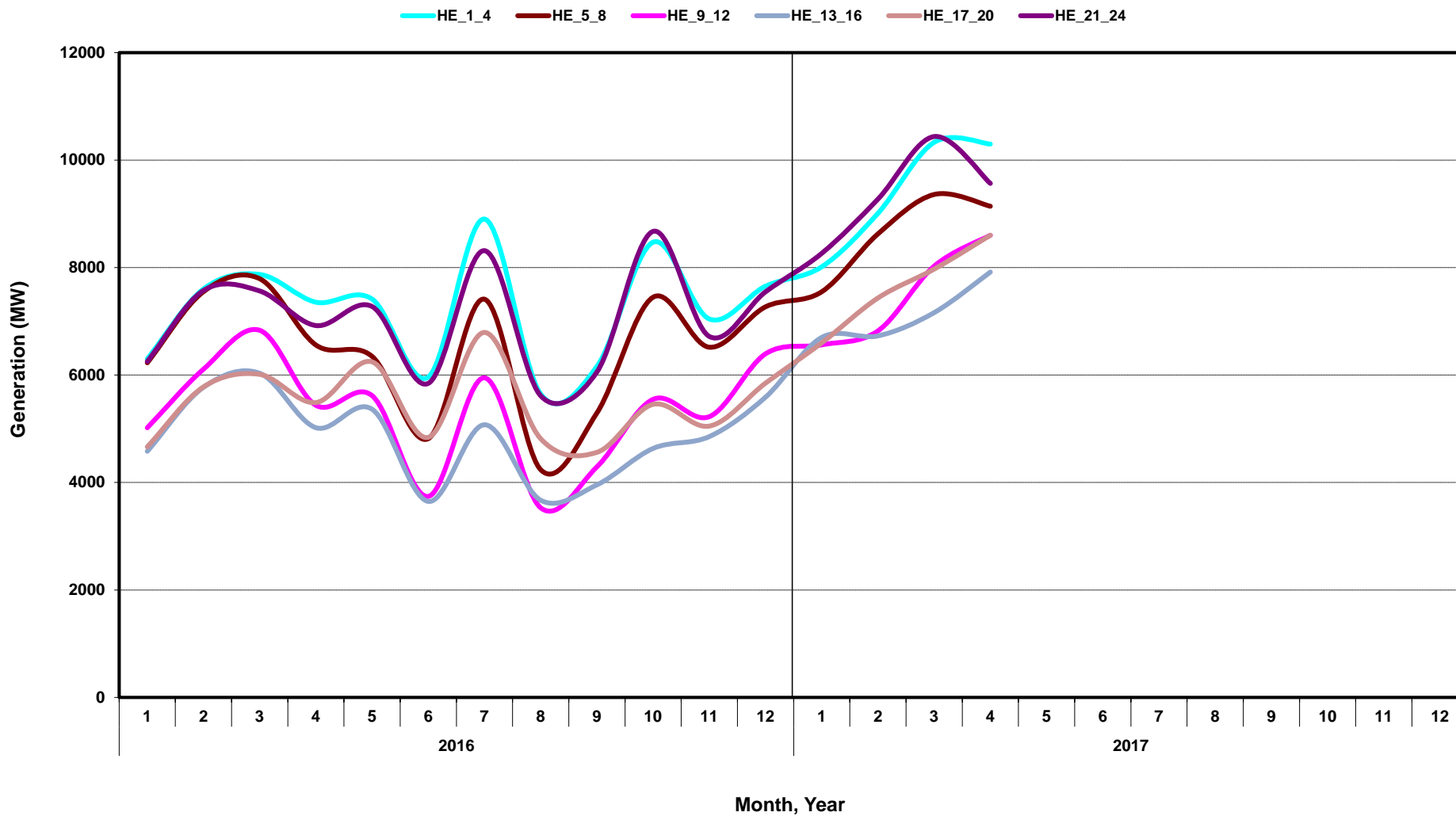
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# Monthly Average of Wind Generation by Hour Ending



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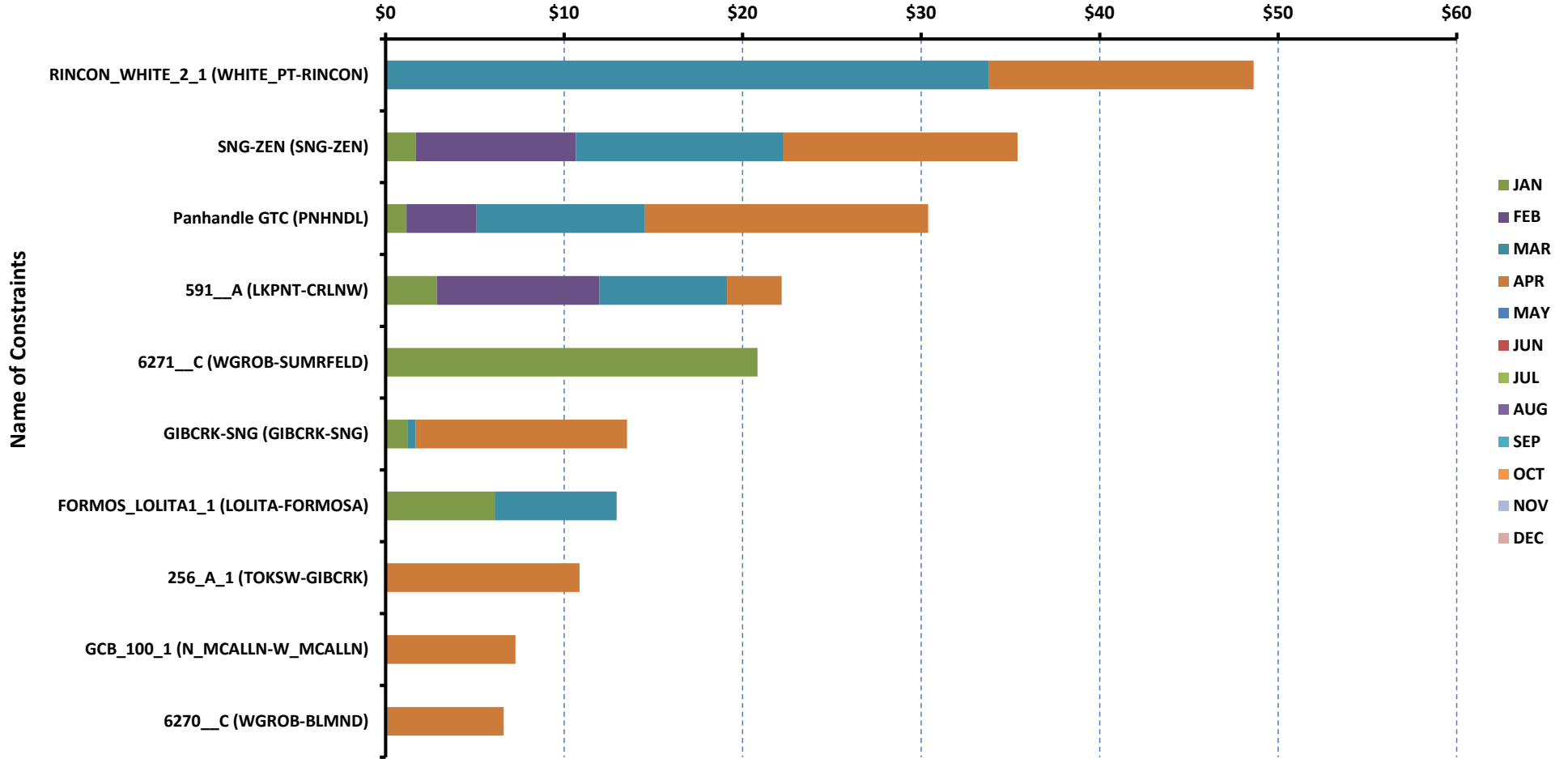
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# RT Congestion Constraint Rankings - 1

## Top 10 Constraints by Total Congestion Value

Congestion Rent in \$ million



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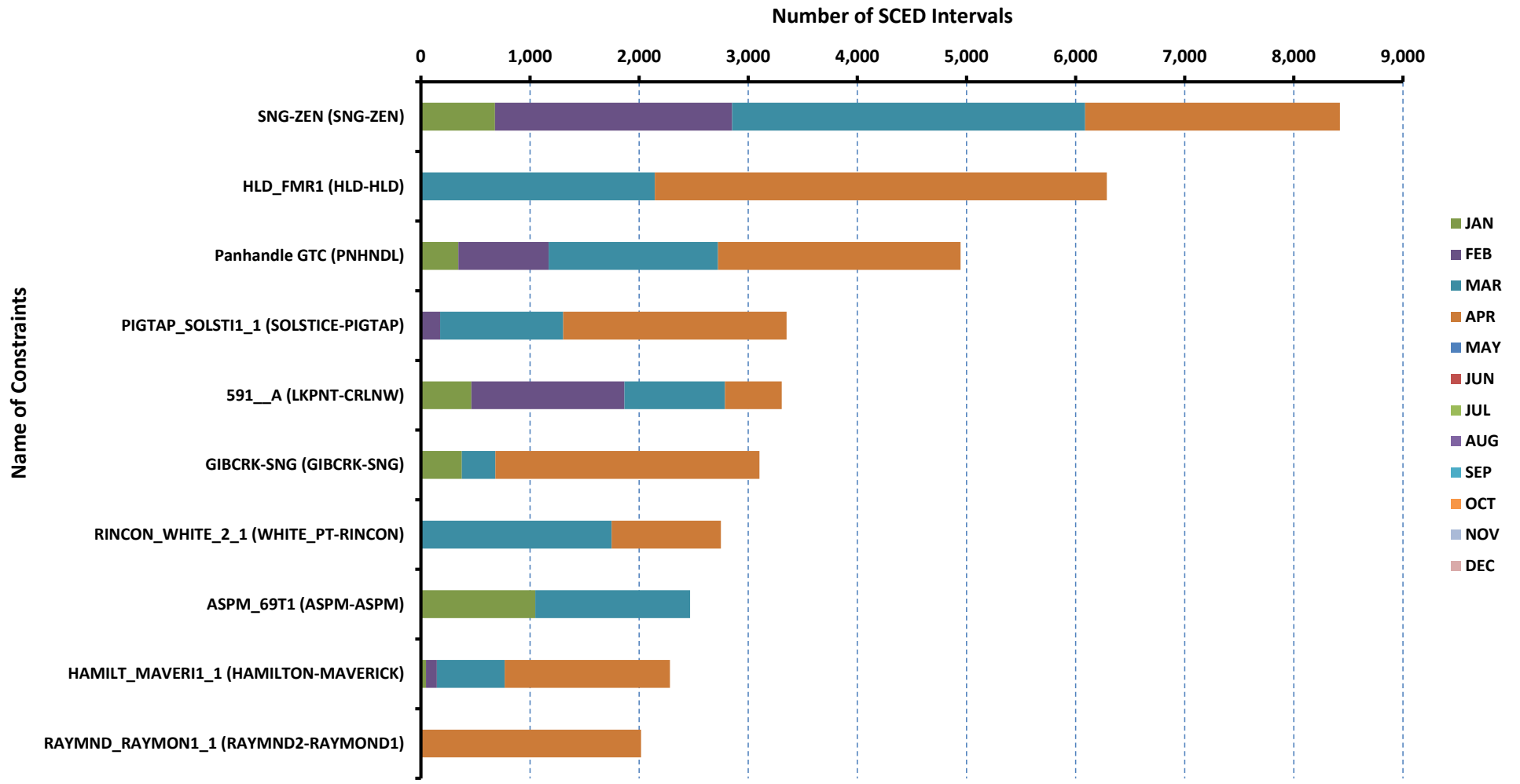
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# RT Congestion Constraint Rankings - 2

## Top 10 Constraints by Binding Frequency



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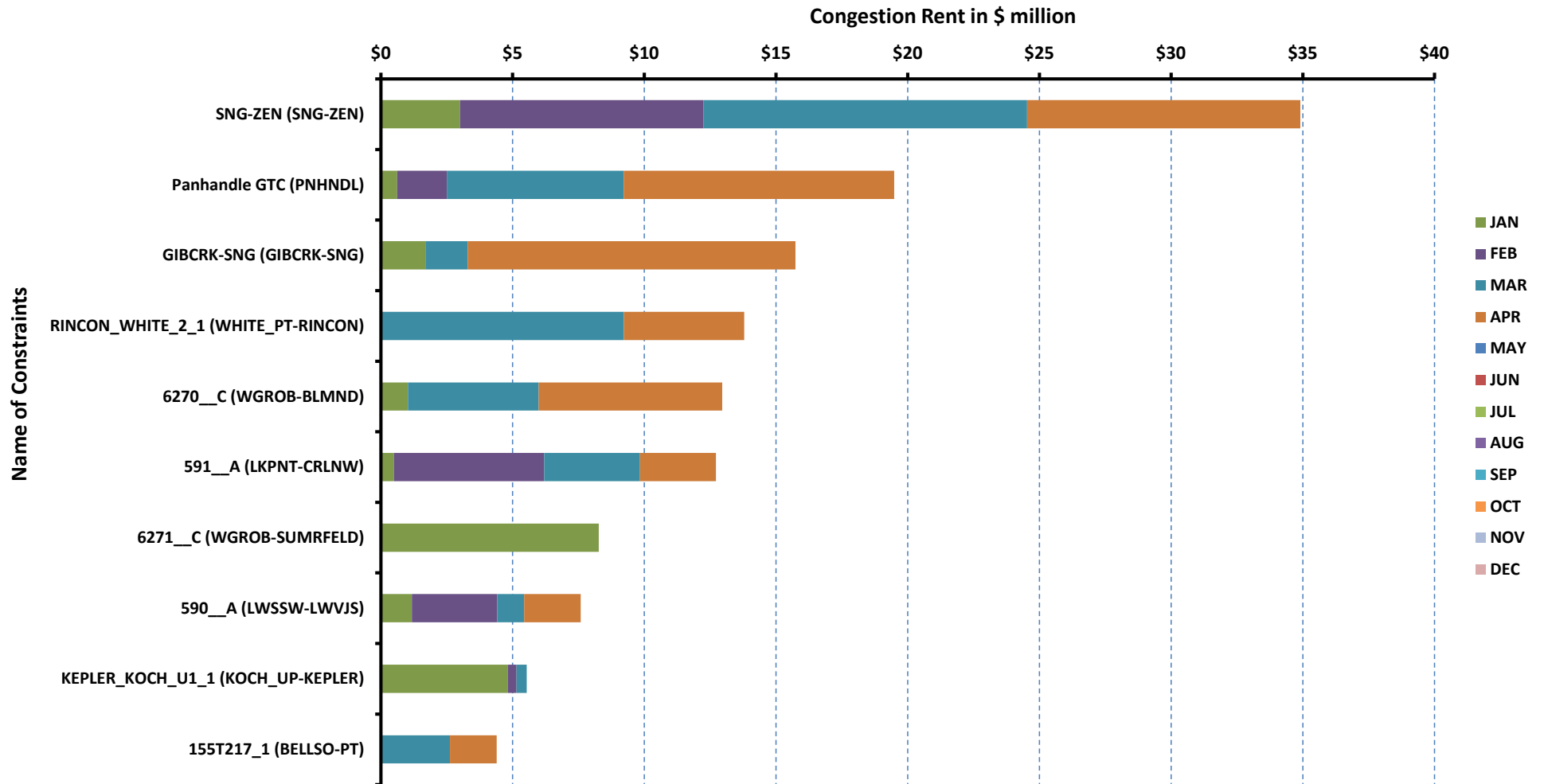
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# DA Congestion Constraint Rankings - 1

## Top 10 Constraints by Total Congestion Value



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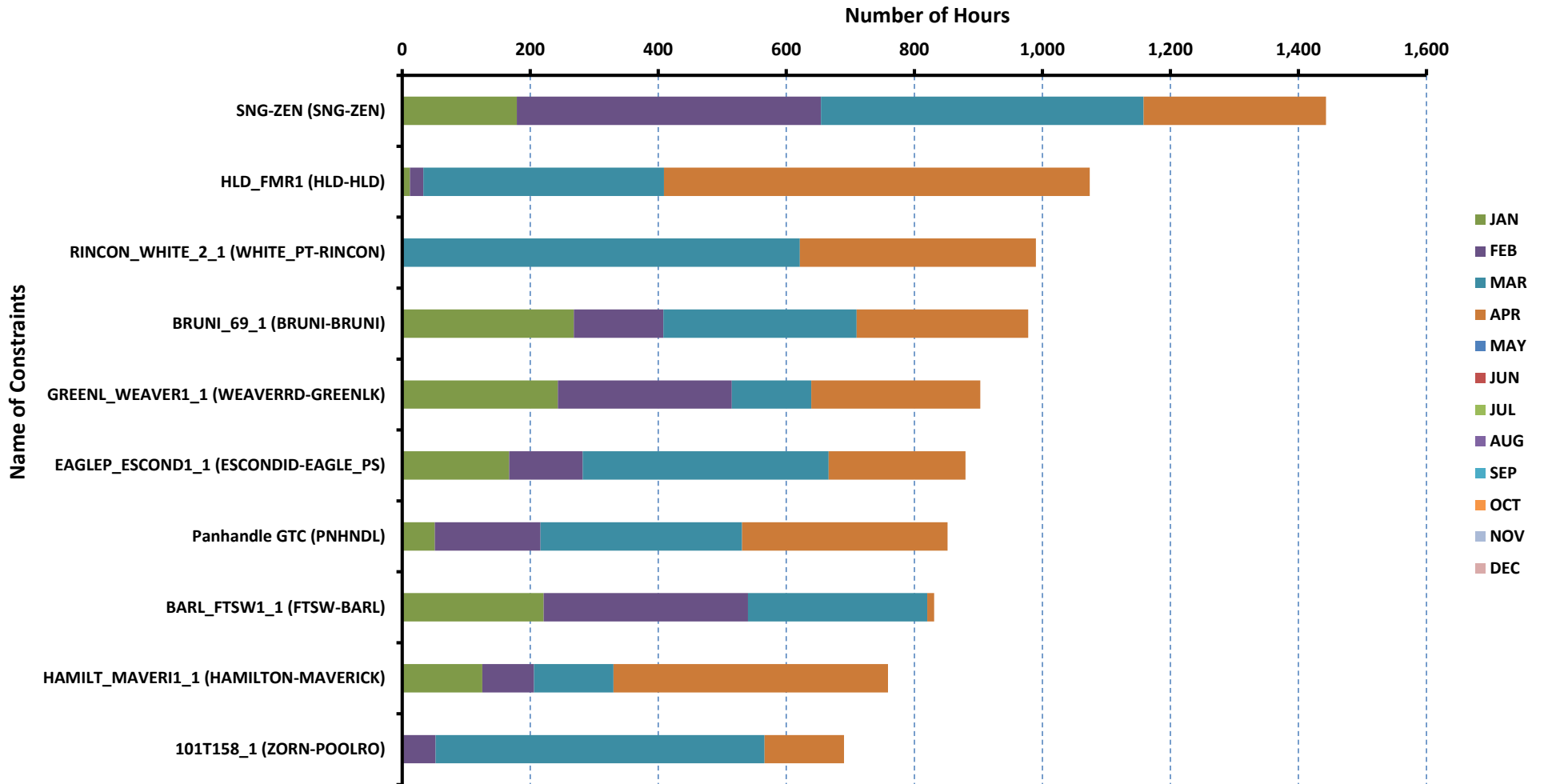
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# DA Congestion Constraint Rankings - 2

## Top 10 Constraints by Binding Frequency



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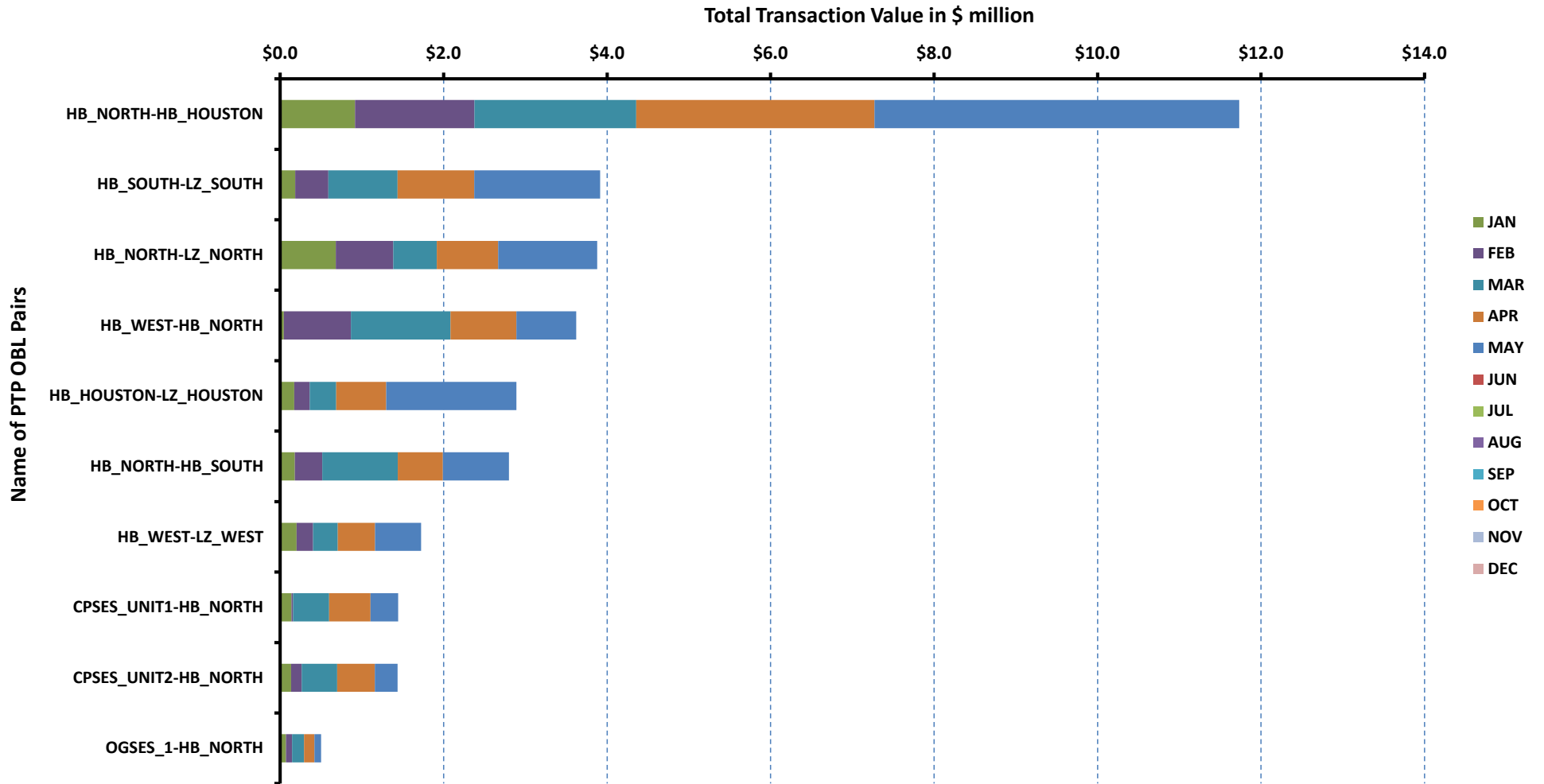
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# Top 10 CRR Pairs Ranked by Monthly Auction Values - 1

## Top 10 PTP Obligations by Total Transaction Value



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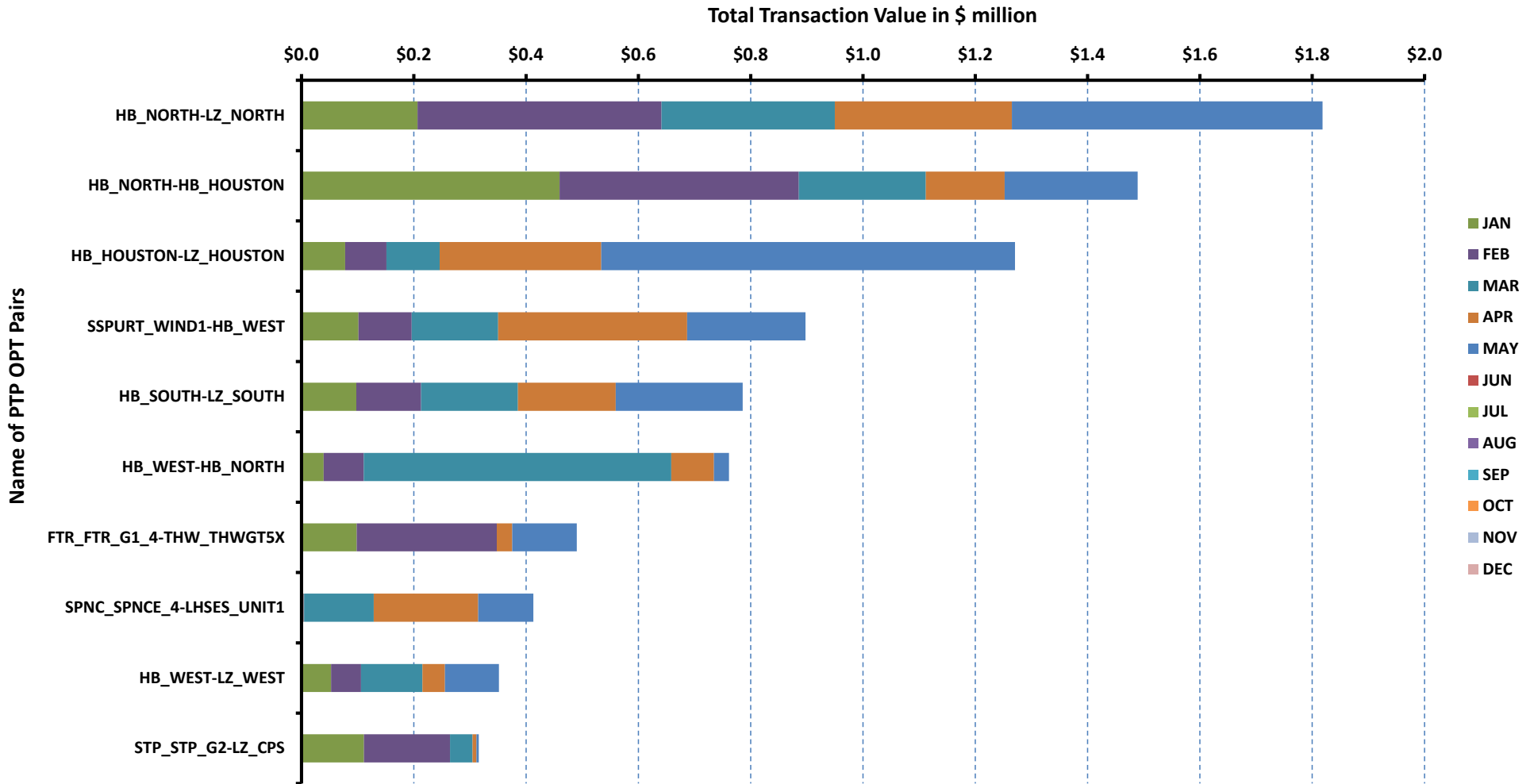
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# Top 10 CRR Pairs Ranked by Monthly Auction Values - 2

## Top 10 PTP Options by Total Transaction Value



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ERCOT-wide Avg. Energy Price - DA vs. RT			
year	month	dam_spp	rtm_spp
2016	1	\$ 19.85	\$ 18.96
	2	\$ 16.00	\$ 15.54
	3	\$ 18.18	\$ 20.30
	4	\$ 20.34	\$ 19.98
	5	\$ 20.28	\$ 19.52
	6	\$ 28.27	\$ 26.23
	7	\$ 30.31	\$ 28.06
	8	\$ 35.17	\$ 33.47
	9	\$ 29.90	\$ 31.20
	10	\$ 29.07	\$ 26.58
	11	\$ 20.59	\$ 23.07
	12	\$ 26.80	\$ 24.33
2017	1	\$ 25.01	\$ 26.30
	2	\$ 21.70	\$ 21.57
	3	\$ 25.62	\$ 23.13
	4	\$ 27.56	\$ 30.37
	5	\$ -	\$ -
	6	\$ -	\$ -
	7	\$ -	\$ -
	8	\$ -	\$ -
	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	
2016	1	11,996	19,817	14,745	4,154	9,367	14,160	9,958	3,525	
	2	11,378	19,345	14,062	4,194	9,027	12,473	9,085	3,318	
	3	13,434	16,410	12,996	3,667	9,184	11,447	8,934	3,177	
	4	14,666	18,506	14,780	4,007	9,890	12,058	9,634	3,239	
	5	16,608	21,991	15,871	4,520	11,044	13,212	10,679	3,423	
	6	17,981	25,275	17,724	4,876	12,627	17,254	12,696	3,795	
	7	18,366	26,373	19,056	5,146	13,866	19,237	14,083	4,192	
	8	18,920	28,134	19,726	5,173	13,285	18,380	13,383	3,975	
	9	18,008	26,088	18,339	4,783	12,650	16,767	12,651	3,698	
	10	16,500	22,643	16,722	4,457	11,209	13,756	10,856	3,472	
	11	14,053	18,396	14,574	4,132	9,519	11,868	9,266	3,331	
	12	12,786	24,187	16,655	4,520	9,606	14,073	9,886	3,652	
2017	1	13,641	24,638	17,478	4,696	9,534	13,864	9,650	3,680	
	2	13,075	17,382	12,185	4,263	9,321	12,283	9,102	3,514	
	3	14,361	17,310	13,370	4,336	9,897	12,158	9,389	3,503	
	4	15,278	18,123	16,221	4,381	10,193	12,400	10,061	3,525	
	5	-	-	-	-	-	-	-	-	-
	6	-	-	-	-	-	-	-	-	-
	7	-	-	-	-	-	-	-	-	-
	8	-	-	-	-	-	-	-	-	-
	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	
2016	1	\$ 18.68	\$ 18.77	\$ 19.69	\$ 18.39	\$ 19.93	\$ 19.74	\$ 19.95	\$ 19.76	
	2	\$ 15.20	\$ 15.84	\$ 15.89	\$ 14.35	\$ 15.89	\$ 16.05	\$ 16.30	\$ 15.28	
	3	\$ 20.31	\$ 19.22	\$ 22.84	\$ 17.04	\$ 17.95	\$ 18.12	\$ 19.22	\$ 16.18	
	4	\$ 20.32	\$ 20.84	\$ 19.79	\$ 16.22	\$ 20.39	\$ 20.35	\$ 21.20	\$ 17.56	
	5	\$ 21.52	\$ 18.32	\$ 19.82	\$ 16.75	\$ 21.33	\$ 19.38	\$ 20.92	\$ 18.32	
	6	\$ 32.12	\$ 24.08	\$ 24.42	\$ 22.53	\$ 33.15	\$ 25.64	\$ 28.08	\$ 24.60	
	7	\$ 28.55	\$ 28.07	\$ 28.10	\$ 26.26	\$ 32.03	\$ 29.41	\$ 30.40	\$ 28.41	
	8	\$ 36.96	\$ 32.41	\$ 32.61	\$ 29.64	\$ 37.68	\$ 34.06	\$ 35.13	\$ 32.05	
	9	\$ 35.54	\$ 29.45	\$ 30.02	\$ 28.34	\$ 31.27	\$ 28.97	\$ 30.34	\$ 27.94	
	10	\$ 27.27	\$ 25.14	\$ 27.77	\$ 26.33	\$ 31.14	\$ 26.70	\$ 30.86	\$ 26.15	
	11	\$ 24.43	\$ 20.73	\$ 25.25	\$ 21.51	\$ 21.34	\$ 19.50	\$ 21.58	\$ 19.65	
	12	\$ 24.59	\$ 24.51	\$ 24.28	\$ 23.11	\$ 26.55	\$ 26.66	\$ 27.66	\$ 25.68	
2017	1	\$ 25.97	\$ 27.15	\$ 25.69	\$ 25.53	\$ 25.44	\$ 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	\$ 18.14	\$ 30.62	\$ 22.54	\$ 26.22	\$ 20.54	
	4	\$ 41.03	\$ 23.37	\$ 31.20	\$ 21.85	\$ 35.04	\$ 22.79	\$ 28.27	\$ 20.74	
	5	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	6	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	7	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	8	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	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
2016	1	\$ 2.21	\$ 18.96	8.58	\$ 19.85	8.98
	2	\$ 1.89	\$ 15.54	8.22	\$ 16.00	8.46
	3	\$ 1.67	\$ 20.30	12.13	\$ 18.18	10.86
	4	\$ 1.86	\$ 19.98	10.73	\$ 20.34	10.92
	5	\$ 1.85	\$ 19.52	10.52	\$ 20.28	10.93
	6	\$ 2.46	\$ 26.23	10.69	\$ 28.27	11.51
	7	\$ 2.71	\$ 28.06	10.36	\$ 30.31	11.19
	8	\$ 2.73	\$ 33.47	12.24	\$ 35.17	12.86
	9	\$ 2.93	\$ 31.20	10.66	\$ 29.90	10.21
	10	\$ 3.08	\$ 26.58	8.63	\$ 29.07	9.44
	11	\$ 2.47	\$ 23.07	9.34	\$ 20.59	8.34
	12	\$ 3.47	\$ 24.33	7.00	\$ 26.80	7.72
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	\$ 23.13	8.03	\$ 25.62	8.90
	4	\$ 3.12	\$ 30.37	9.75	\$ 27.56	8.84
	5	\$ -	\$ -	-	\$ -	-
	6	\$ -	\$ -	-	\$ -	-
	7	\$ -	\$ -	-	\$ -	-
	8	\$ -	\$ -	-	\$ -	-
	9	\$ -	\$ -	-	\$ -	-
	10	\$ -	\$ -	-	\$ -	-
	11	\$ -	\$ -	-	\$ -	-
	12	\$ -	\$ -	-	\$ -	-

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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
2016	1	9.02	9.02	8.93	8.94	8.45	8.91	8.49	8.32
	2	8.41	8.62	8.49	8.08	8.04	8.41	8.38	7.59
	3	10.73	11.48	10.82	9.67	12.13	13.65	11.48	10.18
	4	10.95	11.39	10.93	9.43	10.92	10.63	11.20	8.71
	5	11.50	11.28	10.45	9.88	11.60	10.68	9.88	9.03
	6	13.50	11.44	10.44	10.02	13.08	9.95	9.81	9.18
	7	11.83	11.23	10.86	10.49	10.55	10.38	10.37	9.70
	8	13.78	12.84	12.45	11.72	13.52	11.92	11.85	10.84
	9	10.68	10.36	9.89	9.54	12.14	10.25	10.06	9.68
	10	10.11	10.02	8.67	8.49	8.86	9.02	8.16	8.55
	11	8.64	8.74	7.89	7.95	9.89	10.22	8.39	8.71
	12	7.64	7.96	7.67	7.39	7.08	6.99	7.06	6.65
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	10.64	9.11	7.83	7.13	9.54	8.40	7.03	6.30
	4	11.24	9.07	7.31	6.65	13.16	10.01	7.50	7.01
	5	-	-	-	-	-	-	-	-
	6	-	-	-	-	-	-	-	-
	7	-	-	-	-	-	-	-	-
	8	-	-	-	-	-	-	-	-
	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
2017	4	1	\$ -	\$ -	0	0	80	90
2017	4	2	\$ 1.88	\$ -	35	0	80	90
2017	4	3	\$ 0.22	\$ -	15	0	80	90
2017	4	4	\$ -	\$ -	0	0	80	90
2017	4	5	\$ 0.73	\$ -	11	0	80	90
2017	4	6	\$ 0.17	\$ -	19	0	80	90
2017	4	7	\$ -	\$ -	0	0	80	90
2017	4	8	\$ 0.01	\$ -	2	0	80	90
2017	4	9	\$ -	\$ -	0	0	80	90
2017	4	10	\$ 0.13	\$ -	18	0	80	90
2017	4	11	\$ 0.34	\$ -	10	0	80	90
2017	4	12	\$ 0.05	\$ -	11	0	80	90
2017	4	13	\$ 12.64	\$ -	39	0	80	90
2017	4	14	\$ -	\$ 0.35	0	46	80	90
2017	4	15	\$ -	\$ -	0	0	80	90
2017	4	16	\$ -	\$ -	0	0	80	90
2017	4	17	\$ 0.07	\$ -	12	0	80	90
2017	4	18	\$ -	\$ -	0	0	80	90
2017	4	19	\$ -	\$ -	0	0	80	90
2017	4	20	\$ 0.08	\$ -	8	0	80	90
2017	4	21	\$ 5.09	\$ -	17	0	80	90
2017	4	22	\$ -	\$ 0.14	0	6	80	90
2017	4	23	\$ 0.16	\$ -	20	0	80	90
2017	4	24	\$ -	\$ -	0	0	80	90
2017	4	25	\$ 0.03	\$ 0.11	7	5	80	90
2017	4	26	\$ 0.12	\$ 0.48	9	18	80	90
2017	4	27	\$ -	\$ -	0	0	80	90
2017	4	28	\$ -	\$ 0.42	0	7	80	90
2017	4	29	\$ -	\$ 1.06	0	34	80	90
2017	4	30	\$ 0.01	\$ 0.12	1	1	80	90
0	0	0	\$ -	\$ -	0	0	0	0

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Monthly Average of Ancillary Services Required MW					
year	month	ASMW_REGDN	ASMW_NSPIN	ASMW_RRS	ASMW_REGUP
2016	1	288	1,568	2,752	314
	2	289	1,882	2,872	318
	3	279	1,787	2,872	313
	4	296	1,503	2,835	330
	5	315	1,554	2,817	339
	6	331	1,547	2,608	347
	7	324	1,358	2,577	354
	8	326	1,283	2,537	353
	9	319	1,500	2,598	346
	10	312	1,529	2,735	319
	11	260	1,742	2,872	284
	12	272	1,605	2,797	293
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	-	-	-	-
	6	-	-	-	-
	7	-	-	-	-
	8	-	-	-	-
	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
2016	1	363	964	2,867	325
	2	276	964	2,867	247
	3	245	1,489	2,867	227
	4	213	1,489	2,867	222
	5	242	1,489	2,867	276
	6	378	1,489	2,867	444
	7	298	2,008	2,706	584
	8	264	2,008	2,706	348
	9	262	2,008	2,706	385
	10	285	2,008	2,706	363
	11	273	1,991	2,646	378
	12	263	1,991	2,646	353
	13	247	1,991	2,646	324
	14	245	1,991	2,646	302
	15	239	1,473	2,675	267
	16	232	1,473	2,675	250
	17	237	1,473	2,675	266
	18	281	1,473	2,675	331
	19	344	1,492	2,670	306
	20	326	1,492	2,670	299
	21	337	1,492	2,670	272
	22	434	1,492	2,670	319
	23	496	964	2,867	381
	24	444	964	2,867	352
2017	1	317	927	2,779	297
	2	249	927	2,779	240
	3	228	1,456	2,779	241
	4	223	1,456	2,779	245
	5	253	1,456	2,779	319
	6	378	1,456	2,779	494
	7	325	2,091	2,698	631
	8	273	2,091	2,698	328
	9	243	2,091	2,698	357
	10	267	2,091	2,698	315
	11	263	1,760	2,698	290
	12	258	1,760	2,698	270
	13	243	1,760	2,698	259
	14	247	1,760	2,698	259
	15	242	1,503	2,701	256
	16	211	1,503	2,701	231
	17	212	1,503	2,701	245
	18	249	1,503	2,701	343
	19	315	1,524	2,698	348
	20	298	1,524	2,698	273
	21	328	1,524	2,698	253
	22	395	1,524	2,698	294
	23	453	927	2,779	364
	24	395	927	2,779	309

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Monthly Average Ancillary Services Price					
year	month	MCPC_REGDN	MCPC_NSPIN	MCPC_RRS	MCPC_REGUP
2016	1	\$ 4.10	\$ 2.62	\$ 8.05	\$ 6.69
	2	\$ 7.21	\$ 4.77	\$ 12.91	\$ 7.80
	3	\$ 8.47	\$ 6.06	\$ 11.39	\$ 9.34
	4	\$ 9.23	\$ 4.07	\$ 13.20	\$ 9.48
	5	\$ 7.63	\$ 2.84	\$ 8.01	\$ 6.14
	6	\$ 4.43	\$ 3.02	\$ 8.05	\$ 5.89
	7	\$ 3.59	\$ 3.11	\$ 9.44	\$ 7.75
	8	\$ 4.27	\$ 7.13	\$ 12.75	\$ 10.49
	9	\$ 4.59	\$ 3.91	\$ 8.91	\$ 7.12
	10	\$ 10.06	\$ 3.02	\$ 12.21	\$ 10.42
	11	\$ 5.68	\$ 3.53	\$ 11.84	\$ 7.64
	12	\$ 9.13	\$ 2.91	\$ 16.08	\$ 9.72
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	\$ -	\$ -	\$ -	\$ -
	6	\$ -	\$ -	\$ -	\$ -
	7	\$ -	\$ -	\$ -	\$ -
	8	\$ -	\$ -	\$ -	\$ -
	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
2016	1	\$ 0.03	\$ 0.11	\$ 0.60	\$ 0.06
	2	\$ 0.06	\$ 0.26	\$ 1.09	\$ 0.07
	3	\$ 0.07	\$ 0.33	\$ 1.00	\$ 0.09
	4	\$ 0.08	\$ 0.18	\$ 1.07	\$ 0.09
	5	\$ 0.06	\$ 0.12	\$ 0.59	\$ 0.05
	6	\$ 0.03	\$ 0.10	\$ 0.45	\$ 0.04
	7	\$ 0.02	\$ 0.08	\$ 0.47	\$ 0.05
	8	\$ 0.03	\$ 0.19	\$ 0.66	\$ 0.08
	9	\$ 0.03	\$ 0.13	\$ 0.51	\$ 0.05
	10	\$ 0.08	\$ 0.12	\$ 0.85	\$ 0.08
	11	\$ 0.04	\$ 0.18	\$ 1.00	\$ 0.06
	12	\$ 0.07	\$ 0.13	\$ 1.21	\$ 0.08
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	\$ -	\$ -	\$ -	\$ -
	6	\$ -	\$ -	\$ -	\$ -
	7	\$ -	\$ -	\$ -	\$ -
	8	\$ -	\$ -	\$ -	\$ -
	9	\$ -	\$ -	\$ -	\$ -
	10	\$ -	\$ -	\$ -	\$ -
	11	\$ -	\$ -	\$ -	\$ -
	12	\$ -	\$ -	\$ -	\$ -

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ERCOT-wide Cumulative PNM			
year	month	pnm	pnm_accum
2016	0	\$ -	\$ -
	1	\$ 1,160.69	\$ 1,160.69
	2	\$ 720.57	\$ 1,881.26
	3	\$ 3,883.41	\$ 5,764.67
	4	\$ 2,389.99	\$ 8,154.66
	5	\$ 1,661.50	\$ 9,816.16
	6	\$ 1,922.76	\$ 11,738.92
	7	\$ 2,969.44	\$ 14,708.36
	8	\$ 5,321.18	\$ 20,029.54
	9	\$ 3,967.65	\$ 23,997.19
	10	\$ 1,824.61	\$ 25,821.80
	11	\$ 2,510.79	\$ 28,332.59
	12	\$ 1,658.38	\$ 29,990.97
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	\$ -	\$ -
	6	\$ -	\$ -
	7	\$ -	\$ -
	8	\$ -	\$ -
	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
2016	1	455	14	371	163	473	142
	2	39	83	148	42	(36)	150
	3	31	288	300	89	(136)	(82)
	4	(271)	220	97	(82)	(320)	(147)
	5	(44)	460	285	117	(69)	163
	6	(488)	(261)	(356)	(523)	(348)	(451)
	7	(163)	507	735	306	(231)	240
	8	(578)	(65)	41	(258)	(741)	(717)
	9	(358)	305	319	87	(433)	(30)
	10	(312)	371	(41)	(310)	(475)	50
	11	(329)	(146)	240	(237)	(139)	(234)
	12	(41)	(61)	282	(38)	516	83
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	-	-	-	-	-	-
	6	-	-	-	-	-	-
	7	-	-	-	-	-	-
	8	-	-	-	-	-	-
	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
2016	1	6,300	4,581	4,663	6,253	6,228	5,019
	2	7,602	5,772	5,779	7,573	7,552	6,109
	3	7,872	6,033	6,013	7,565	7,793	6,833
	4	7,356	5,020	5,488	6,921	6,559	5,437
	5	7,414	5,363	6,245	7,275	6,347	5,617
	6	5,963	3,648	4,840	5,845	4,816	3,741
	7	8,903	5,074	6,793	8,315	7,411	5,948
	8	5,644	3,670	4,814	5,613	4,238	3,529
	9	6,159	3,957	4,561	6,057	5,295	4,291
	10	8,472	4,634	5,455	8,674	7,449	5,548
	11	7,043	4,855	5,049	6,718	6,517	5,225
	12	7,653	5,588	5,849	7,549	7,270	6,395
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	-	-	-	-	-	-
	6	-	-	-	-	-	-
	7	-	-	-	-	-	-
	8	-	-	-	-	-	-
	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	2017	SNG-ZEN (SNG-ZEN)	8,422	1	679	2,173	3,235	2,335	-	-	-	-	-	-	-	-
FREQ_EXIST	2017	HLD_FMR1 (HLD-HLD)	6,286	2	-	-	2,143	4,143	-	-	-	-	-	-	-	-
FREQ_EXIST	2017	Panhandle GTC (PNHNDL)	4,946	3	344	826	1,553	2,223	-	-	-	-	-	-	-	-
FREQ_EXIST	2017	PIGTAP_SOLST11_1 (SOLSTICE-PIGTAP)	3,351	4	-	176	1,127	2,048	-	-	-	-	-	-	-	-
FREQ_EXIST	2017	591_A (LKPNT-CRLNW)	3,306	5	462	1,403	922	519	-	-	-	-	-	-	-	-
FREQ_EXIST	2017	GIBCRK-SNG (GIBCRK-SNG)	3,102	6	375	-	308	2,419	-	-	-	-	-	-	-	-
FREQ_EXIST	2017	RINCON_WHITE_2_1 (WHITE_PT-RINCON)	2,749	7	-	-	1,747	1,002	-	-	-	-	-	-	-	-
FREQ_EXIST	2017	ASPM_69T1 (ASPM-ASPM)	2,467	8	1,048	-	1,419	-	-	-	-	-	-	-	-	-
FREQ_EXIST	2017	HAMILT_MAVR11_1 (HAMILTON-MAVERICK)	2,283	9	47	99	621	1,516	-	-	-	-	-	-	-	-
FREQ_EXIST	2017	RAYMND_RAYMON1_1 (RAYMND2-RAYMOND1)	2,018	10	-	-	-	2,018	-	-	-	-	-	-	-	-
TOP10_RENT	2017	RINCON_WHITE_2_1 (WHITE_PT-RINCON)	\$ 48.63	1	\$ -	\$ -	\$ 33.80	\$ 14.82	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2017	SNG-ZEN (SNG-ZEN)	\$ 35.40	2	\$ 1.68	\$ 8.98	\$ 11.62	\$ 13.11	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2017	Panhandle GTC (PNHNDL)	\$ 30.39	3	\$ 1.17	\$ 3.92	\$ 9.44	\$ 15.86	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2017	591_A (LKPNT-CRLNW)	\$ 22.18	4	\$ 2.86	\$ 9.12	\$ 7.14	\$ 3.06	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2017	6271_C (WGROB-SUMRFELD)	\$ 20.83	5	\$ 20.83	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2017	GIBCRK-SNG (GIBCRK-SNG)	\$ 13.52	6	\$ 1.25	\$ -	\$ 0.42	\$ 11.85	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2017	FORMOS_LOLITA1_1 (LOLITA-FORMOSA)	\$ 12.94	7	\$ 6.11	\$ -	\$ 6.83	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2017	256_A_1 (TOKSW-GIBCRK)	\$ 10.86	8	\$ -	\$ -	\$ 0.06	\$ 10.80	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2017	GCB_100_1 (N_MCALLN-W_MCALLN)	\$ 7.27	9	\$ -	\$ -	\$ -	\$ 7.27	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2017	6270_C (WGROB-BLMND)	\$ 6.61	10	\$ -	\$ -	\$ 0.09	\$ 6.52	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

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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	2017	SNG-ZEN (SNG-ZEN)	1,443	1	179	475	504	285	-	-	-	-	-	-	-	-
FREQ_EXIST	2017	HLD_FMR1 (HLD-HLD)	1,074	2	12	21	376	665	-	-	-	-	-	-	-	-
FREQ_EXIST	2017	RINCON_WHITE_2_1 (WHITE_PT-RINCON)	990	3	-	1	620	369	-	-	-	-	-	-	-	-
FREQ_EXIST	2017	BRUNI_69_1 (BRUNI-BRUNI)	978	4	268	140	302	268	-	-	-	-	-	-	-	-
FREQ_EXIST	2017	GREENL_WEAVER1_1 (WEAVERRD-GREENLK)	903	5	243	272	124	264	-	-	-	-	-	-	-	-
FREQ_EXIST	2017	EAGLEP_ESCOND1_1 (ESCONDID-EAGLE_PS)	880	6	167	115	384	214	-	-	-	-	-	-	-	-
FREQ_EXIST	2017	Panhandle GTC (PNHNDL)	852	7	51	165	315	321	-	-	-	-	-	-	-	-
FREQ_EXIST	2017	BARL_FTSW1_1 (FTSW-BARL)	831	8	221	319	280	11	-	-	-	-	-	-	-	-
FREQ_EXIST	2017	HAMILT_MAVERI1_1 (HAMILTON-MAVERICK)	759	9	125	81	124	429	-	-	-	-	-	-	-	-
FREQ_EXIST	2017	101T158_1 (ZORN-POOLRO)	690	10	2	50	514	124	-	-	-	-	-	-	-	-
TOP10_RENT	2017	SNG-ZEN (SNG-ZEN)	\$ 34.90	1	\$ 3.00	\$ 9.25	\$ 12.28	\$ 10.37	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2017	Panhandle GTC (PNHNDL)	\$ 19.48	2	\$ 0.61	\$ 1.89	\$ 6.71	\$ 10.27	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2017	GIBCRK-SNG (GIBCRK-SNG)	\$ 15.74	3	\$ 1.68	\$ 0.01	\$ 1.60	\$ 12.45	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2017	RINCON_WHITE_2_1 (WHITE_PT-RINCON)	\$ 13.79	4	\$ -	\$ 0.00	\$ 9.22	\$ 4.57	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2017	6270_C (WGROB-BLMND)	\$ 12.96	5	\$ 1.03	\$ -	\$ 4.96	\$ 6.97	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2017	591_A (LKPNT-CRLNW)	\$ 12.72	6	\$ 0.49	\$ 5.71	\$ 3.64	\$ 2.88	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2017	6271_C (WGROB-SUMRFELD)	\$ 8.27	7	\$ 8.27	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2017	590_A (LWSSW-LWVJS)	\$ 7.58	8	\$ 1.18	\$ 3.24	\$ 1.02	\$ 2.14	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2017	KEPLER_KOCH_U1_1 (KOCH_UP-KEPLER)	\$ 5.53	9	\$ 4.82	\$ 0.32	\$ 0.39	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2017	195T217_1 (BELLSO-PT)	\$ 4.40	10	\$ -	\$ -	\$ 2.62	\$ 1.77	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

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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	2017	HB NORTH-HB HOUSTON	\$ 11.73	1	\$ 0.92	\$ 1.46	\$ 1.98	\$ 2.92	\$ 4.46	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2017	HB SOUTH-LZ SOUTH	\$ 3.91	2	\$ 0.18	\$ 0.41	\$ 0.85	\$ 0.94	\$ 1.54	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2017	HB NORTH-LZ NORTH	\$ 3.88	3	\$ 0.68	\$ 0.70	\$ 0.53	\$ 0.75	\$ 1.21	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2017	HB WEST-HB NORTH	\$ 3.62	4	\$ 0.05	\$ 0.82	\$ 1.22	\$ 0.81	\$ 0.73	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2017	HB HOUSTON-LZ HOUSTON	\$ 2.89	5	\$ 0.17	\$ 0.19	\$ 0.33	\$ 0.61	\$ 1.59	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2017	HB NORTH-HB SOUTH	\$ 2.80	6	\$ 0.18	\$ 0.34	\$ 0.92	\$ 0.55	\$ 0.81	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2017	HB WEST-LZ WEST	\$ 1.72	7	\$ 0.20	\$ 0.20	\$ 0.30	\$ 0.46	\$ 0.56	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2017	CPSES_UNIT1-HB NORTH	\$ 1.44	8	\$ 0.14	\$ 0.02	\$ 0.44	\$ 0.50	\$ 0.34	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2017	CPSES_UNIT2-HB NORTH	\$ 1.44	9	\$ 0.13	\$ 0.13	\$ 0.44	\$ 0.46	\$ 0.28	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2017	OGSES_1-HB NORTH	\$ 0.50	10	\$ 0.07	\$ 0.08	\$ 0.14	\$ 0.13	\$ 0.08	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2017	HB NORTH-LZ NORTH	\$ 1.82	1	\$ 0.21	\$ 0.43	\$ 0.31	\$ 0.32	\$ 0.55	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2017	HB NORTH-HB HOUSTON	\$ 1.49	2	\$ 0.46	\$ 0.43	\$ 0.23	\$ 0.14	\$ 0.24	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2017	HB HOUSTON-LZ HOUSTON	\$ 1.27	3	\$ 0.08	\$ 0.07	\$ 0.09	\$ 0.29	\$ 0.74	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2017	SSPURT_WIND1-HB WEST	\$ 0.90	4	\$ 0.10	\$ 0.09	\$ 0.15	\$ 0.34	\$ 0.21	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2017	HB SOUTH-LZ SOUTH	\$ 0.79	5	\$ 0.10	\$ 0.12	\$ 0.17	\$ 0.17	\$ 0.23	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2017	HB WEST-HB NORTH	\$ 0.76	6	\$ 0.04	\$ 0.07	\$ 0.55	\$ 0.08	\$ 0.03	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2017	FTR_FTR_G1_4-THW_THWGT5X	\$ 0.49	7	\$ 0.10	\$ 0.25	\$ -	\$ 0.03	\$ 0.12	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2017	SPNC_SPNCE_4-LHSES_UNIT1	\$ 0.41	8	\$ 0.00	\$ 0.00	\$ 0.12	\$ 0.19	\$ 0.10	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2017	HB WEST-LZ WEST	\$ 0.35	9	\$ 0.05	\$ 0.05	\$ 0.11	\$ 0.04	\$ 0.10	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2017	STP_STP_G2-LZ_CPS	\$ 0.32	10	\$ 0.11	\$ 0.15	\$ 0.04	\$ 0.01	\$ 0.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	

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