



Item 5: Independent Market Monitor (IMM) Report

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Board of Directors Meeting

ERCOT Public

August 8, 2017

Mid-Year Market Review

- Higher prices
- More frequent and more costly congestion
- More wind and coal, less gas
- Lower ancillary services costs
- Less RUC activity
- Peaker Net Margin trending higher

Higher energy prices due to higher gas prices

Real Time Prices

1H16: \$20.41/MWh

2016: \$24.62/MWh

1H17: \$28.50/MWh

~ 40% increase

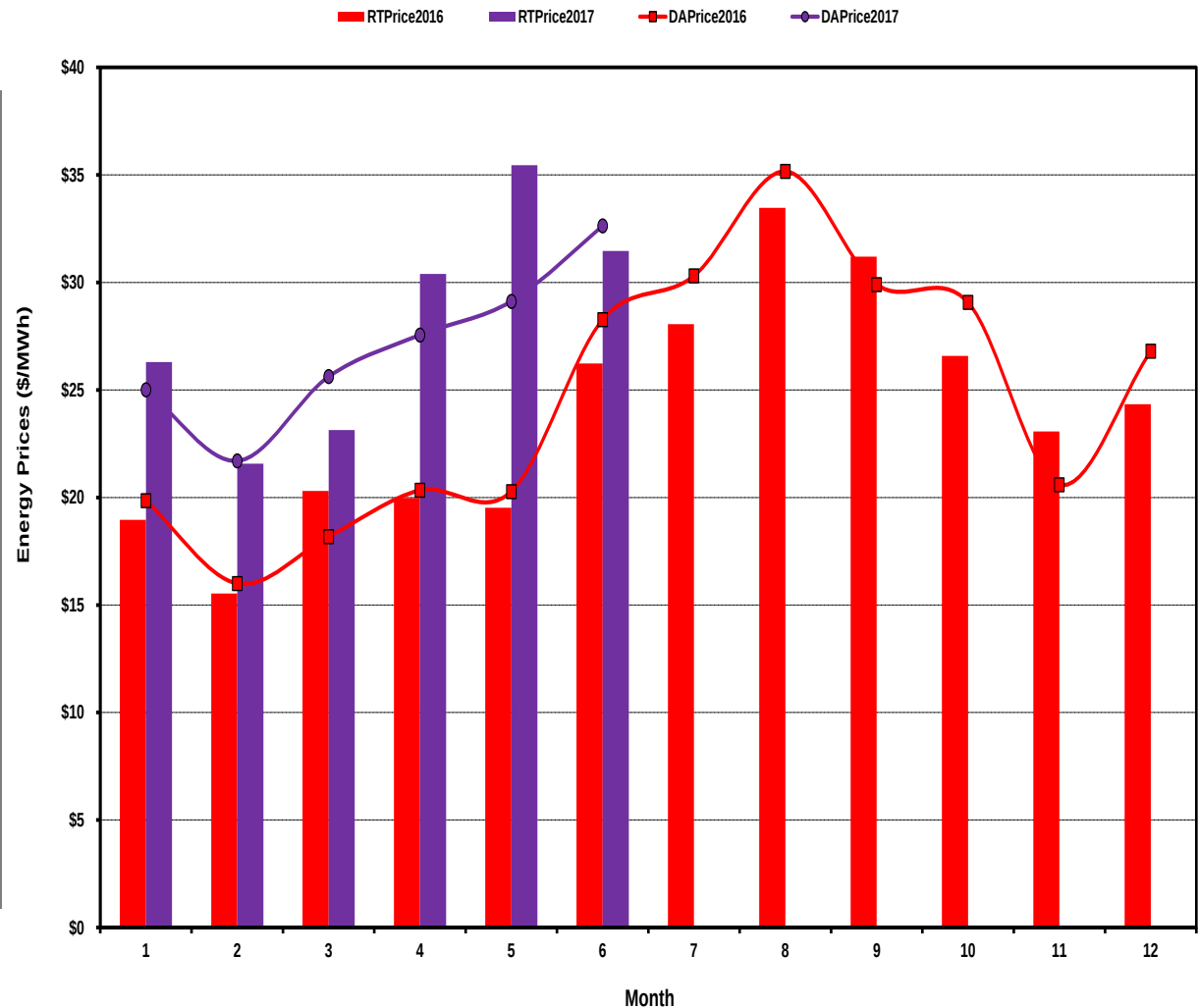
Natural Gas Prices

1H16: ~\$2/MBtu

2016: \$2.45/MBtu

1H17: ~\$3/MBtu

~ 50% increase



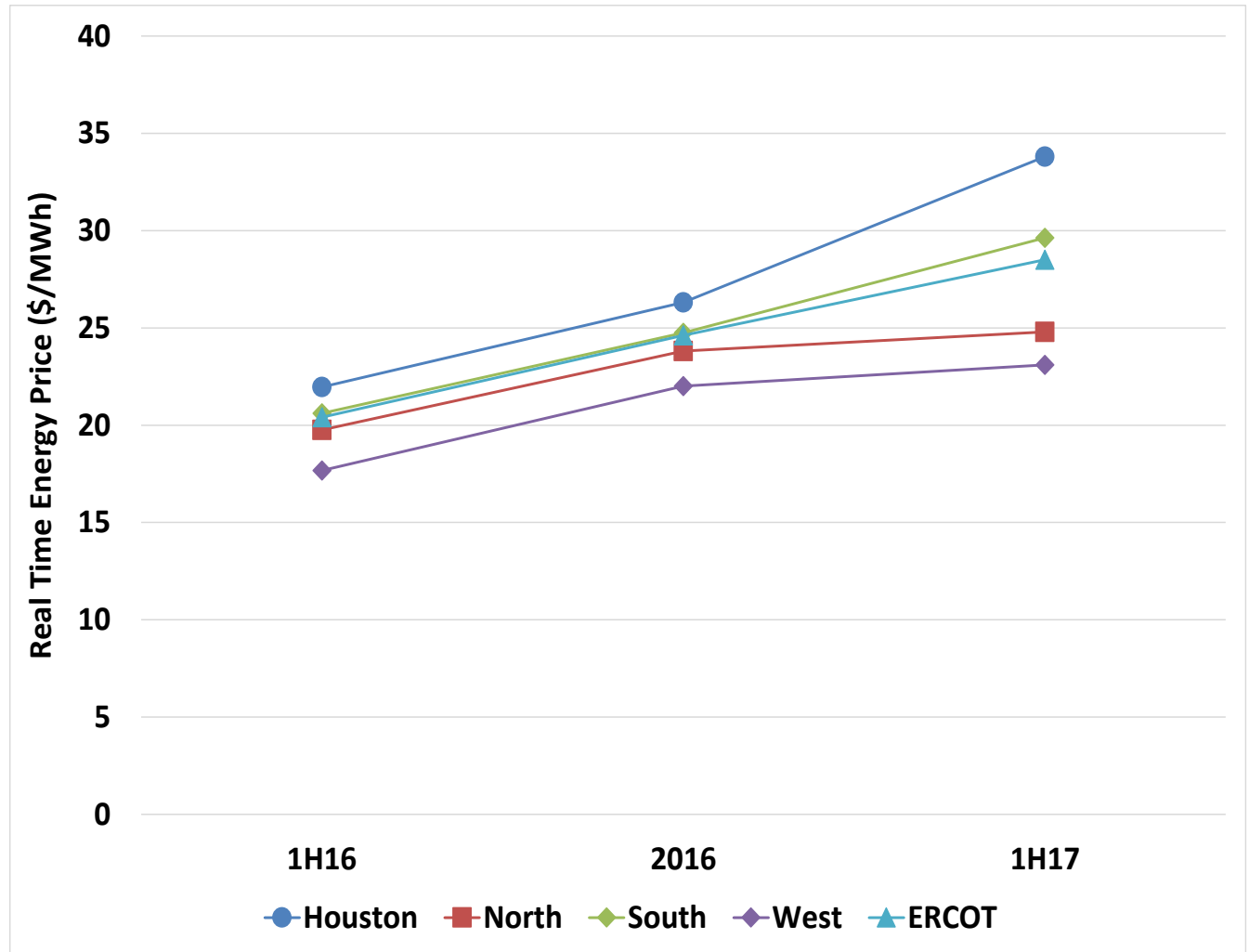
Increased spread between zonal prices

1H16
\$18-22/MWh

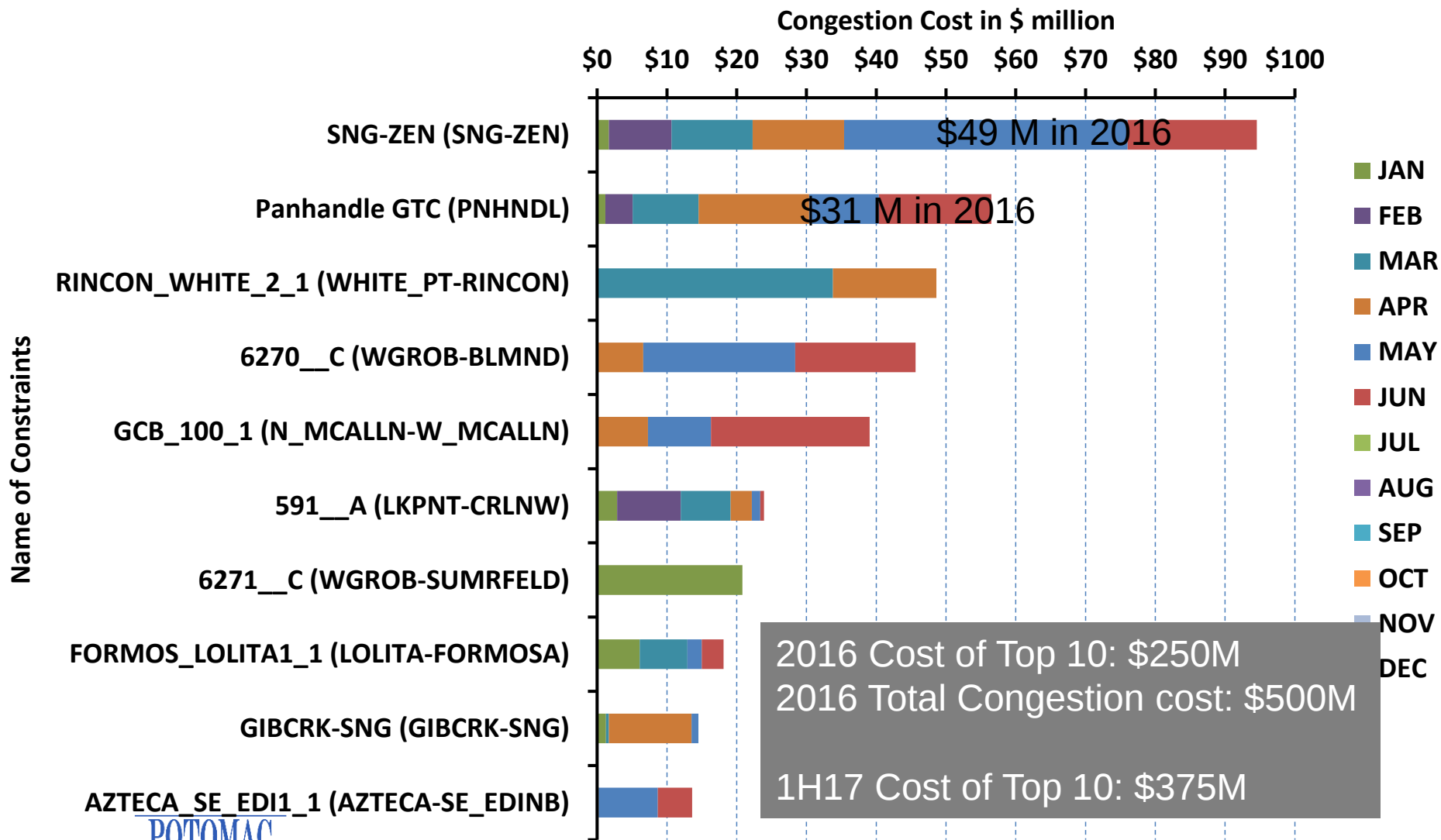
2016
\$22-26/MWh

1H17
\$23-34/MWh

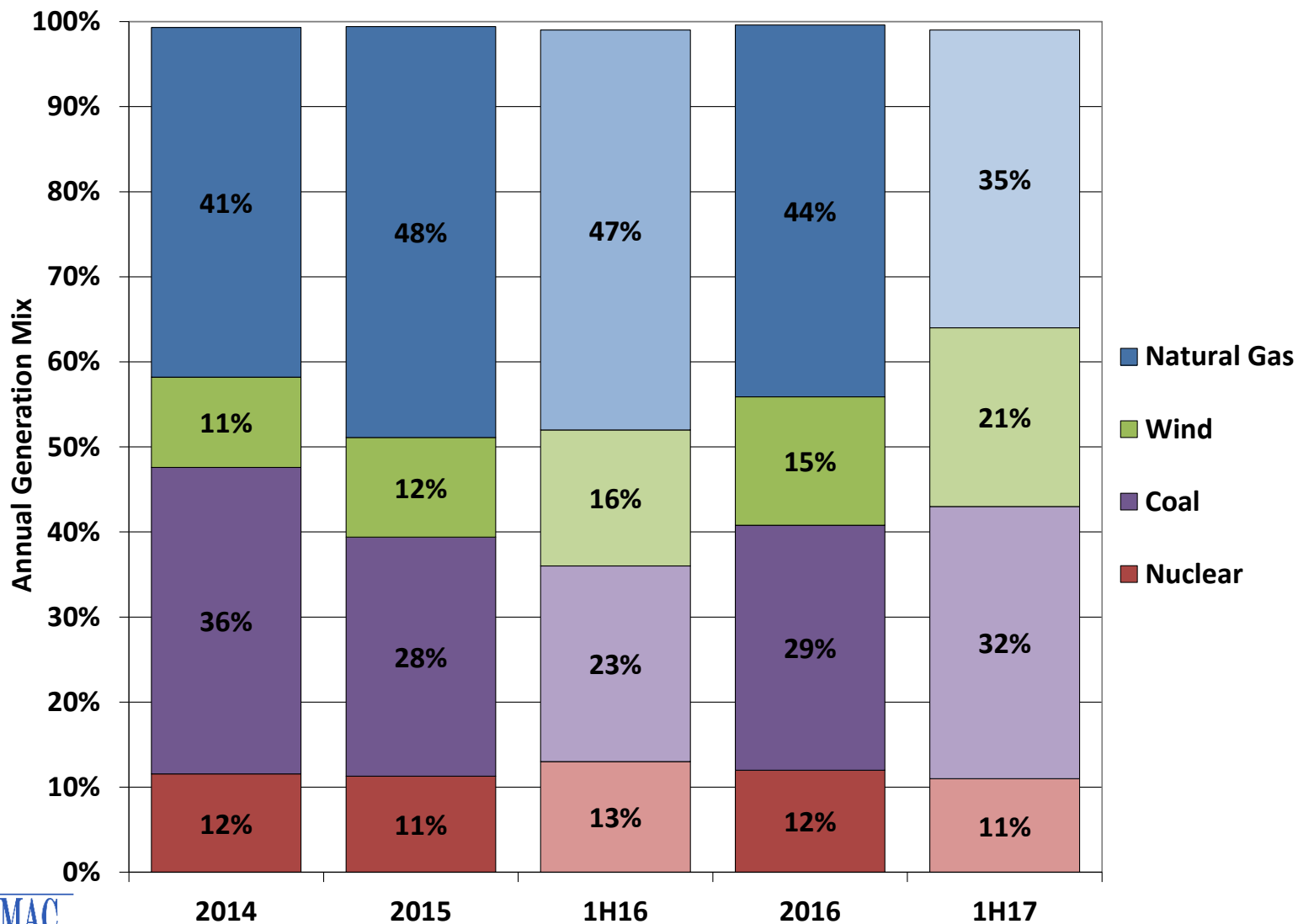
North	+26%
West	+31%
South	+44%
Houston	+54%



Congestion costs trending higher than 2016



Generation by fuel type



Lower A/S costs

A/S Costs

1H16: \$1.07/MWh

2016: \$1.03/MWh

1H17: \$0.98/MWh

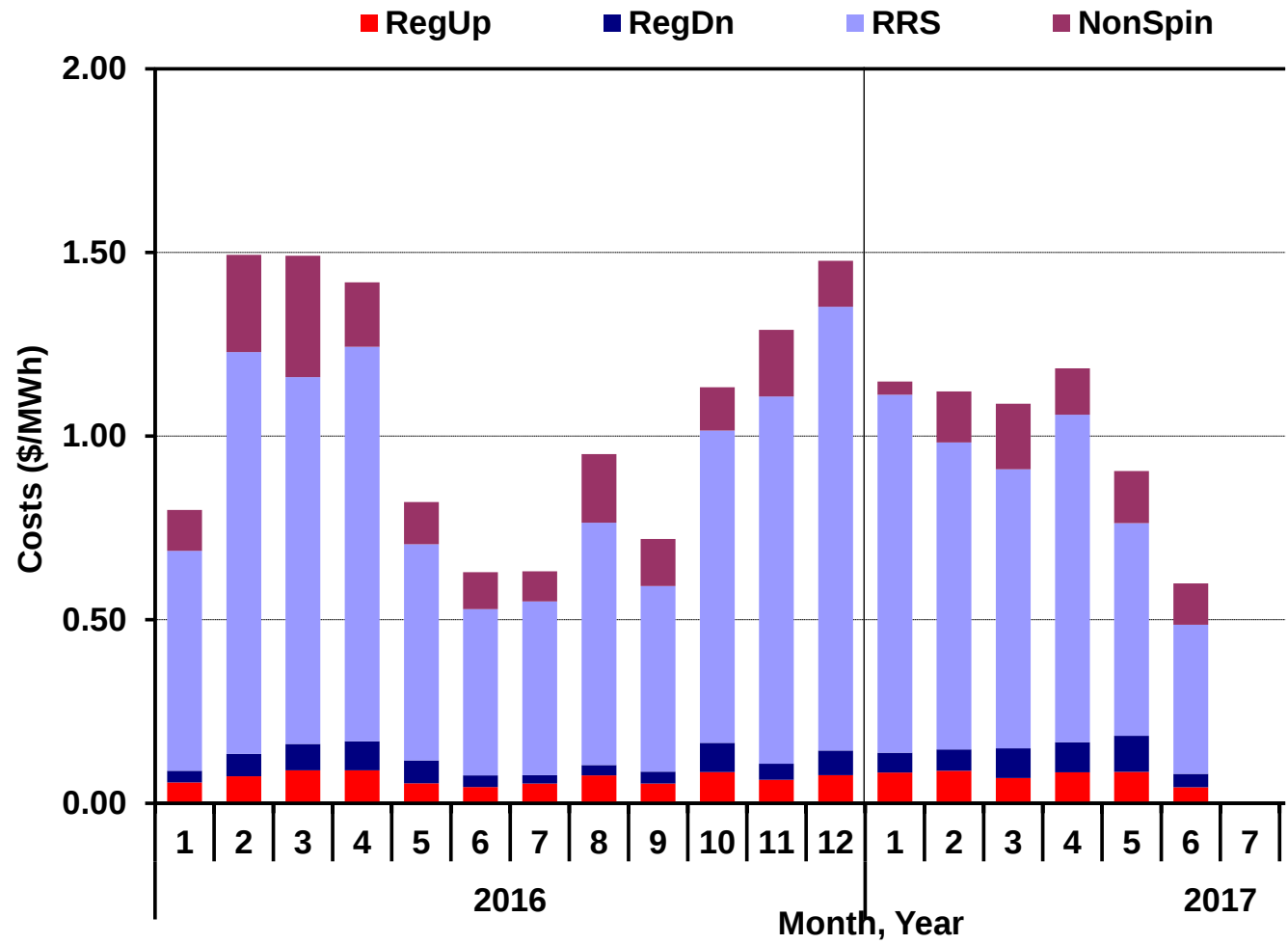
~ 8% decrease

Approximate A/S Quantities

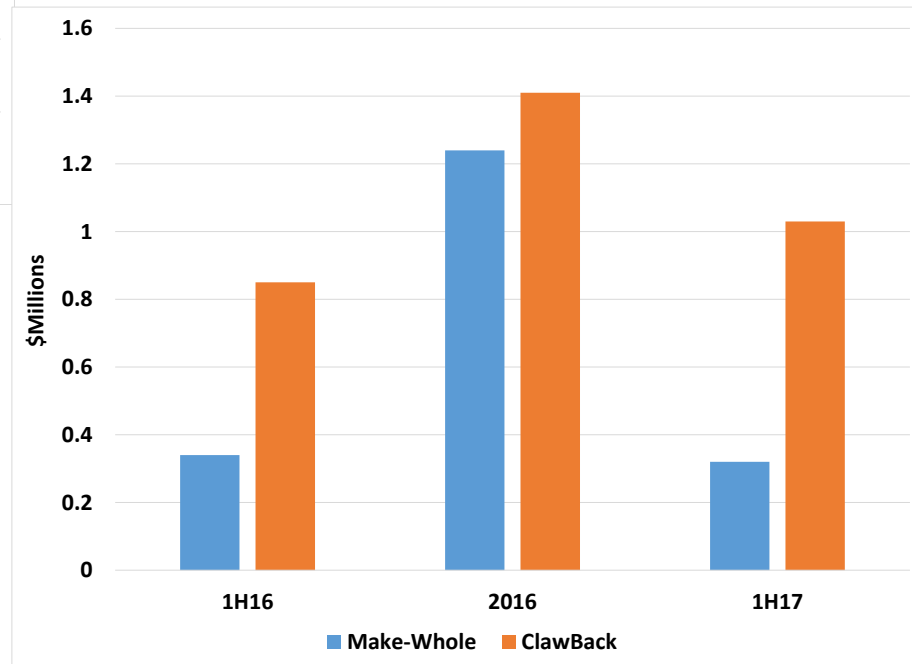
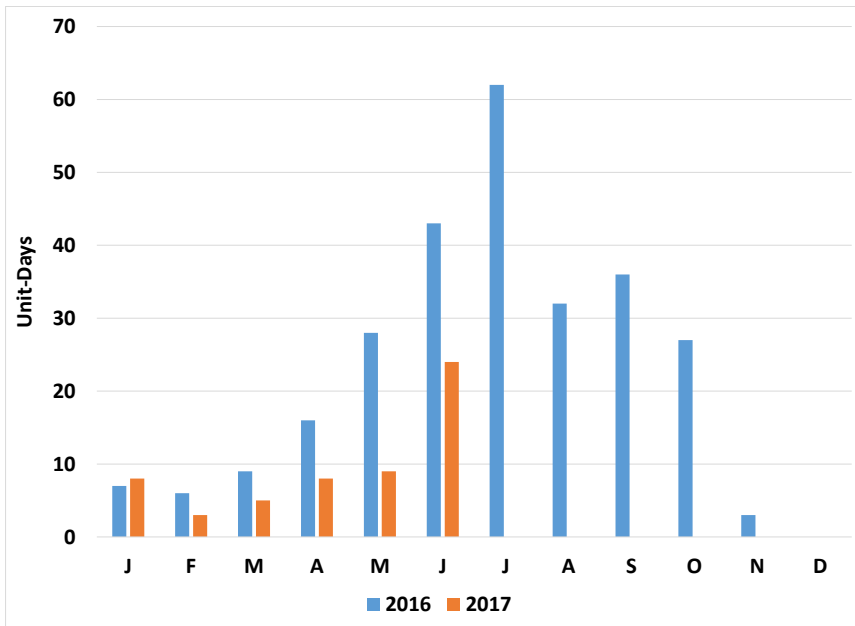
1H16: 5.0 GW

2016: 4.9 GW

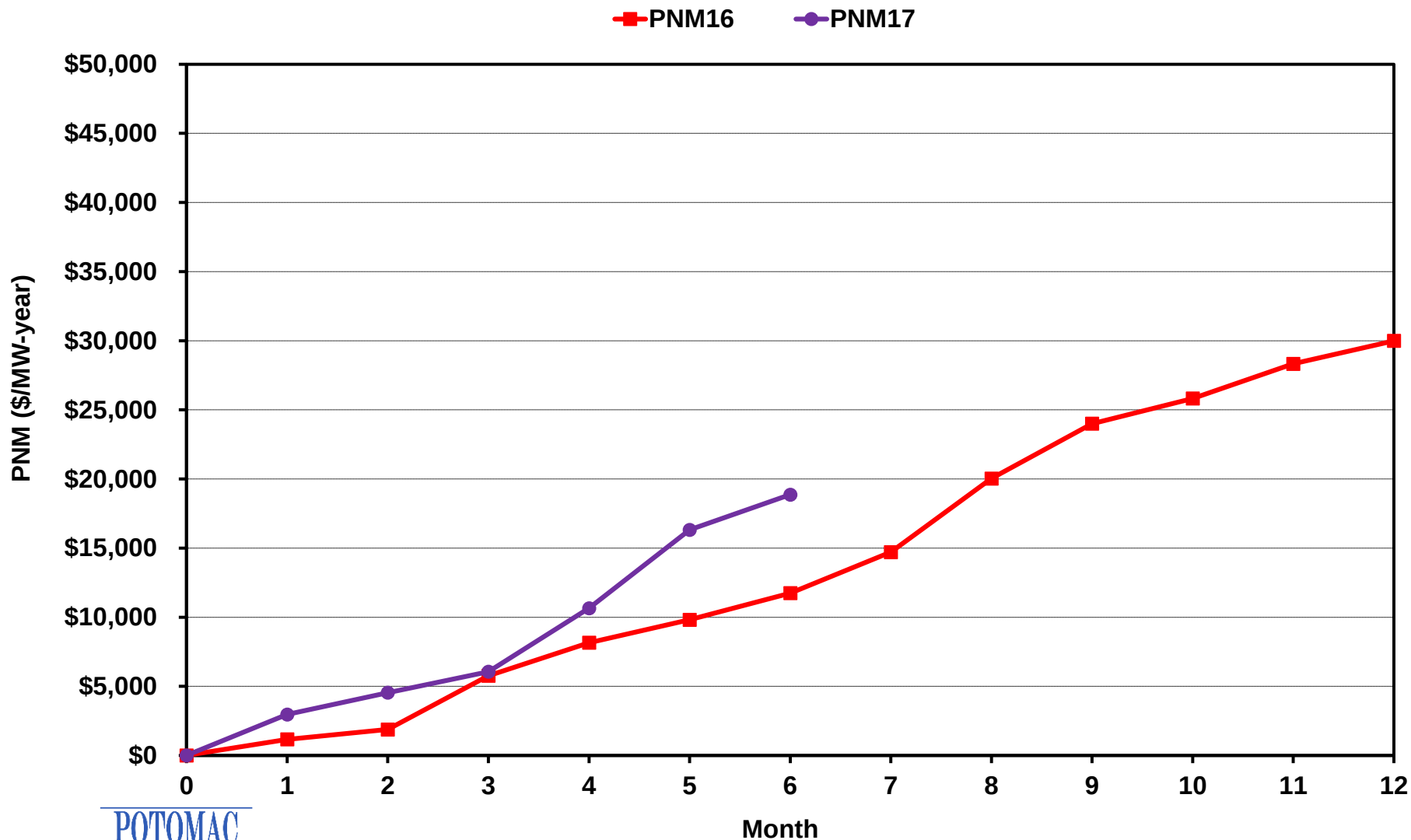
1H17: 4.8 GW



Less RUC activity, similar costs



Peaker net margin trending higher



To the Public Utility Commission of Texas

ERCOT Wholesale Electricity Market Monthly Report

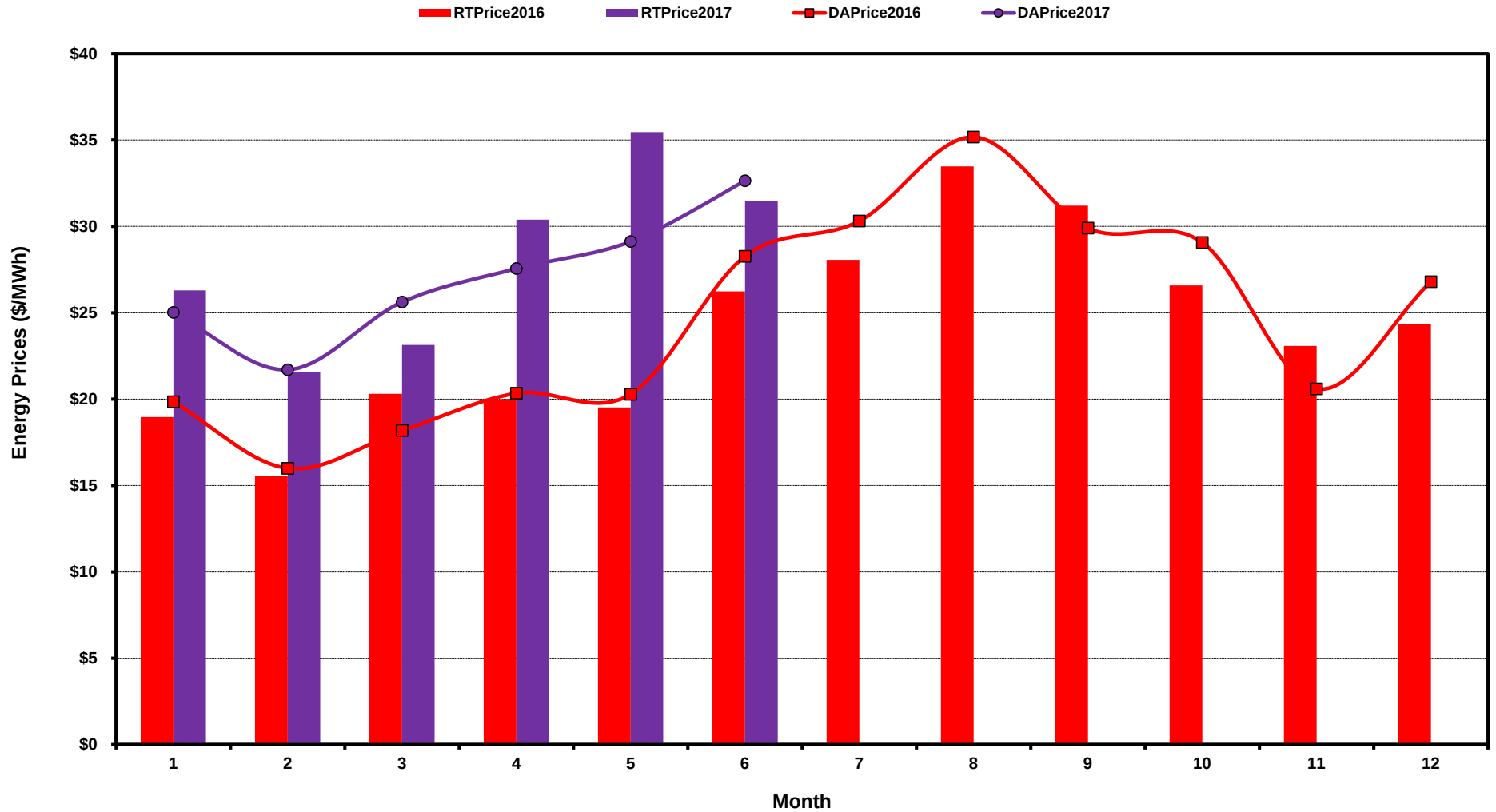
Wednesday, July 12, 2017

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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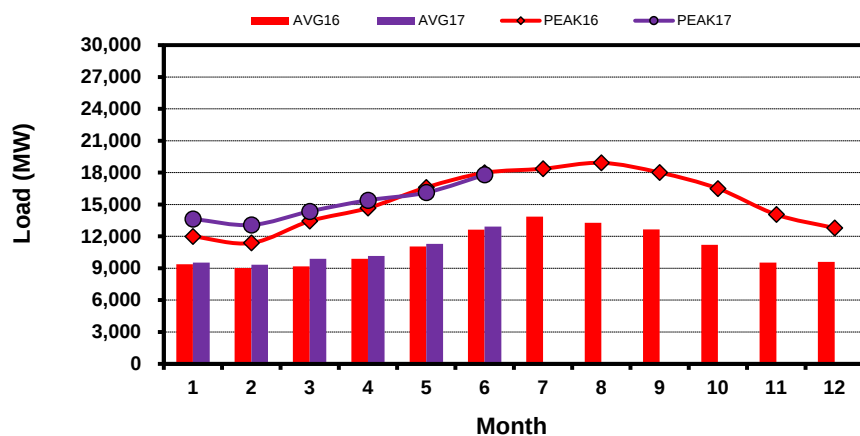
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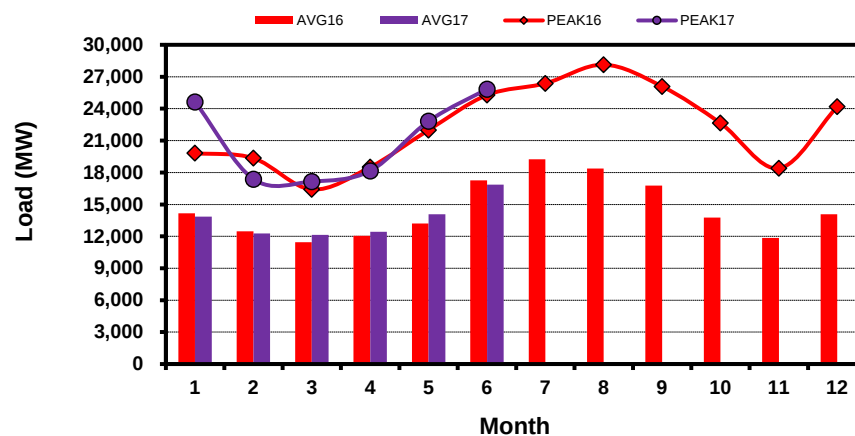
Load Zone Load Statistics

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

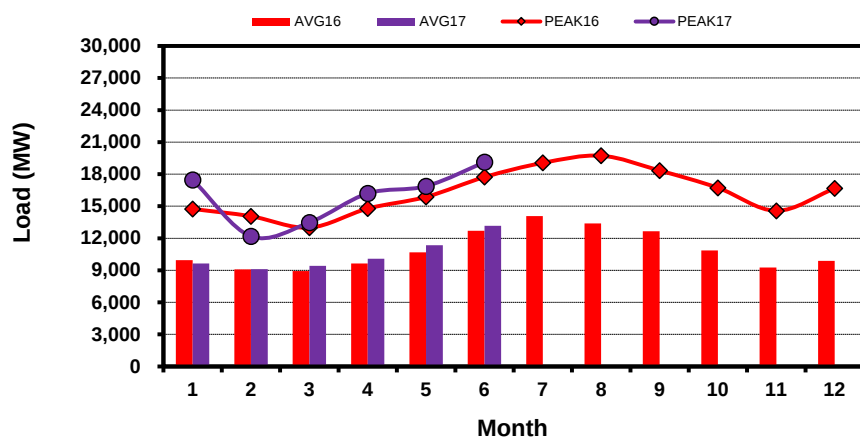
Houston Zone



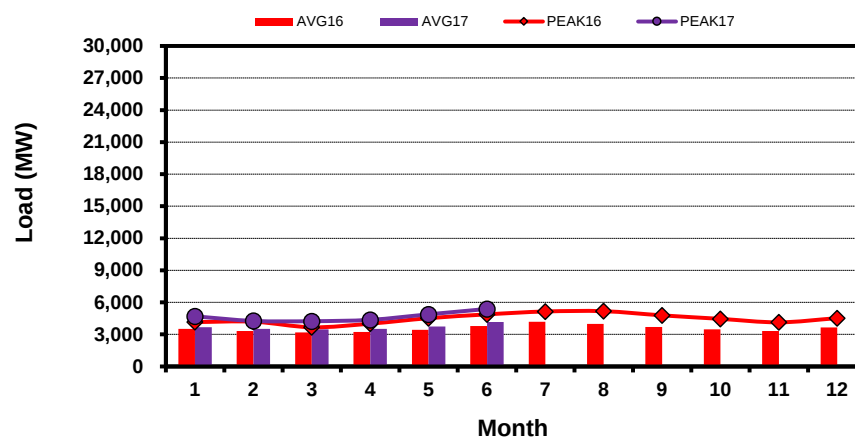
North Zone



South Zone



West Zone



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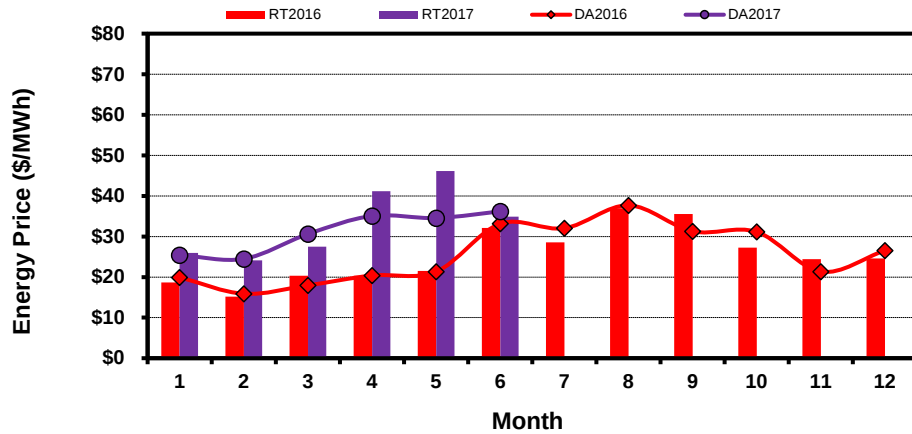
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Note: * Zonal load zone definition vs. Nodal comparable load zone definition: LZ_Houston=LZ_Houston; LZ_West=LZ_West; LZ_North=(LZ_North,LZ_RAYBN); LZ_South=(LZ_South,LZ_CPS,LZ_AEN,LZ_LCRA)

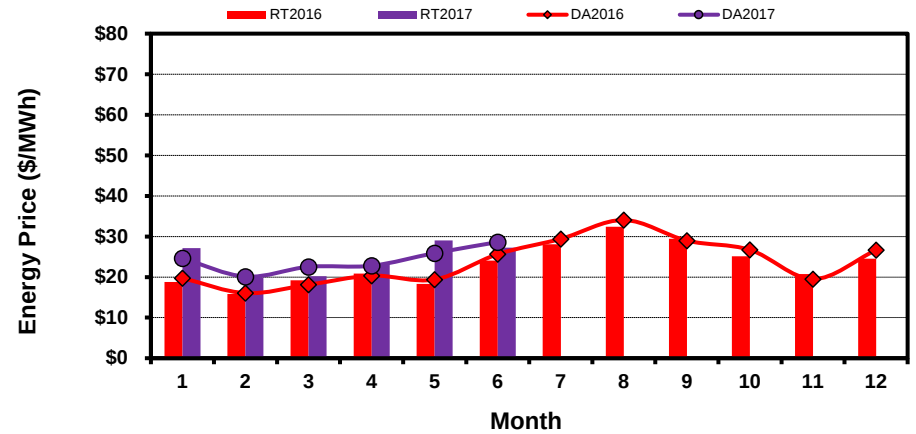
Load Zone Monthly Average Energy Price DA vs RT

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

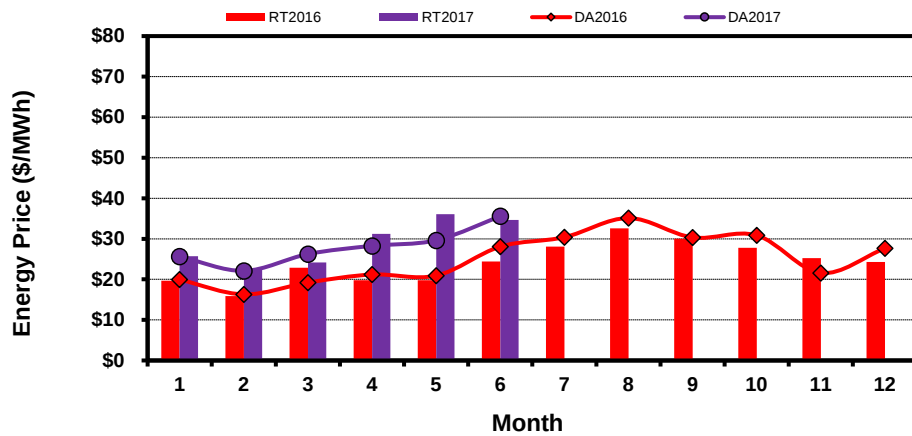
Houston Zone



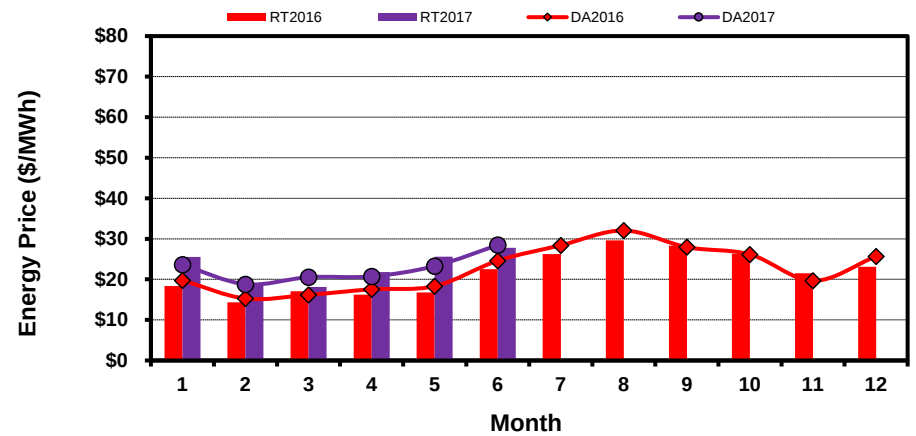
North Zone



South Zone



West Zone



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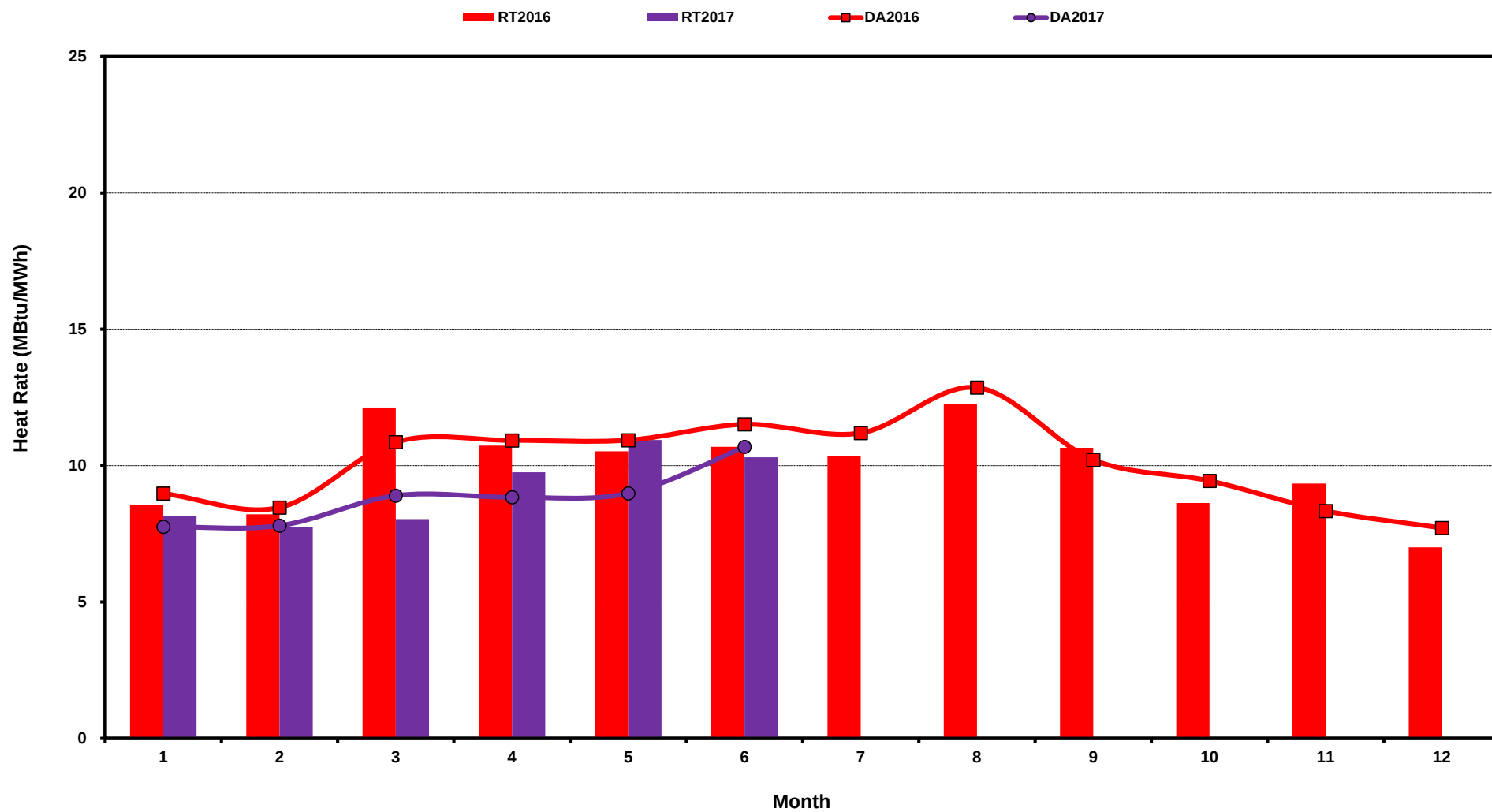
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Note: * Zonal load zone definition vs. Nodal comparable load zone definition: LZ_Houston=LZ_Houston; LZ_West=LZ_West; LZ_North=(LZ_North,LZ_RAYBN); LZ_South=(LZ_South,LZ_CPS,LZ_AEN,LZ_LCRA)

ERCOT-wide Monthly Implied Heat Rate DA vs RT

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



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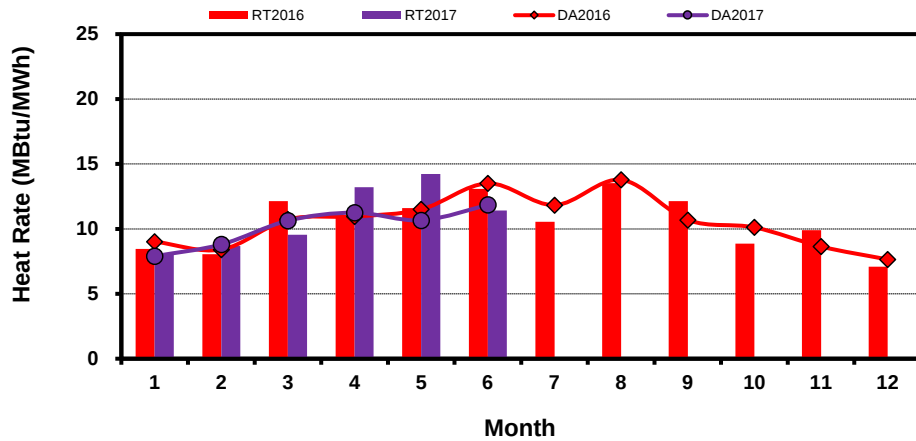
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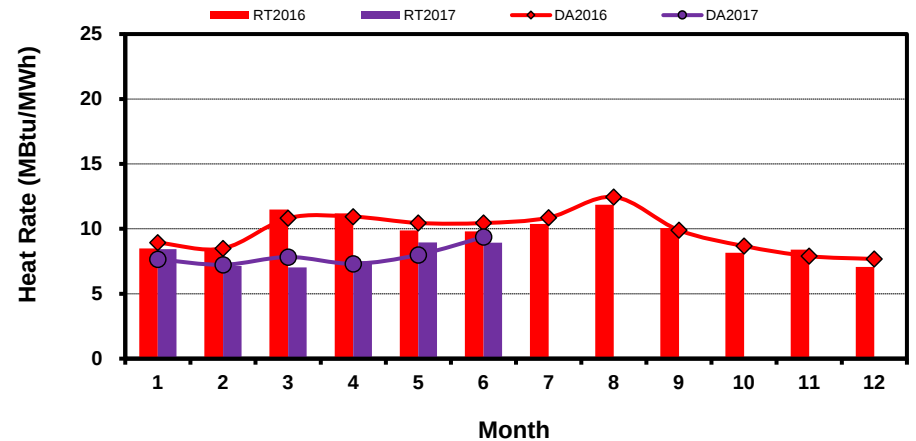
Load Zone Monthly Implied Heat Rate DA vs RT

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

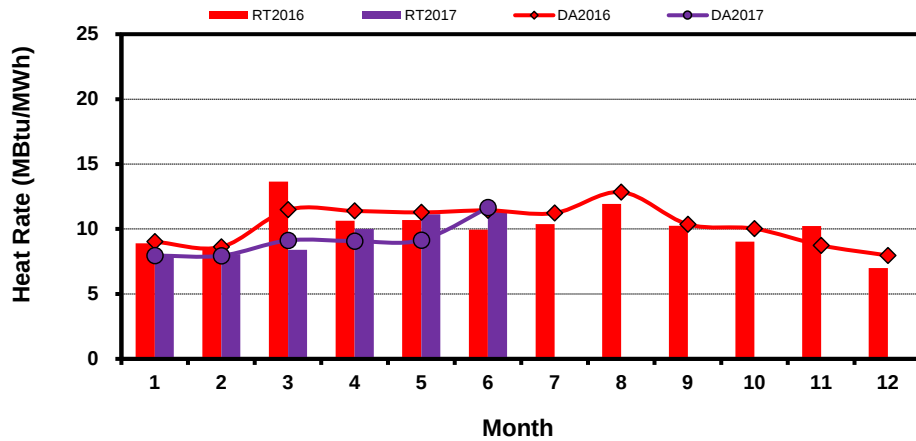
Houston Zone



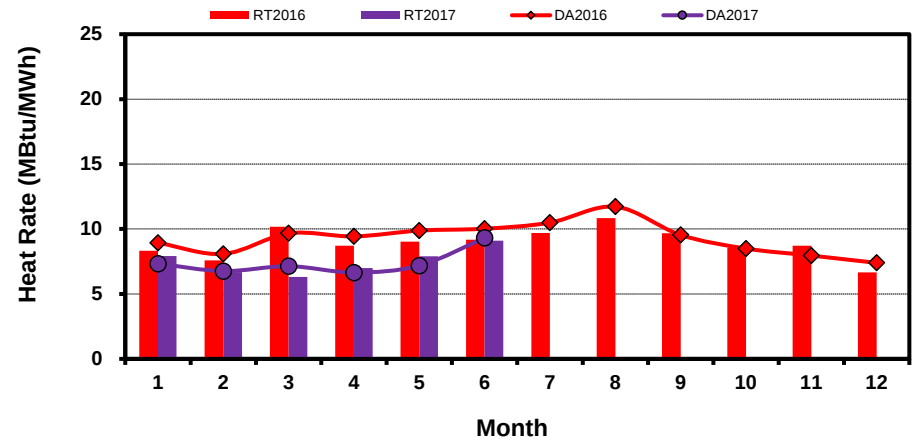
North Zone



South Zone



West Zone



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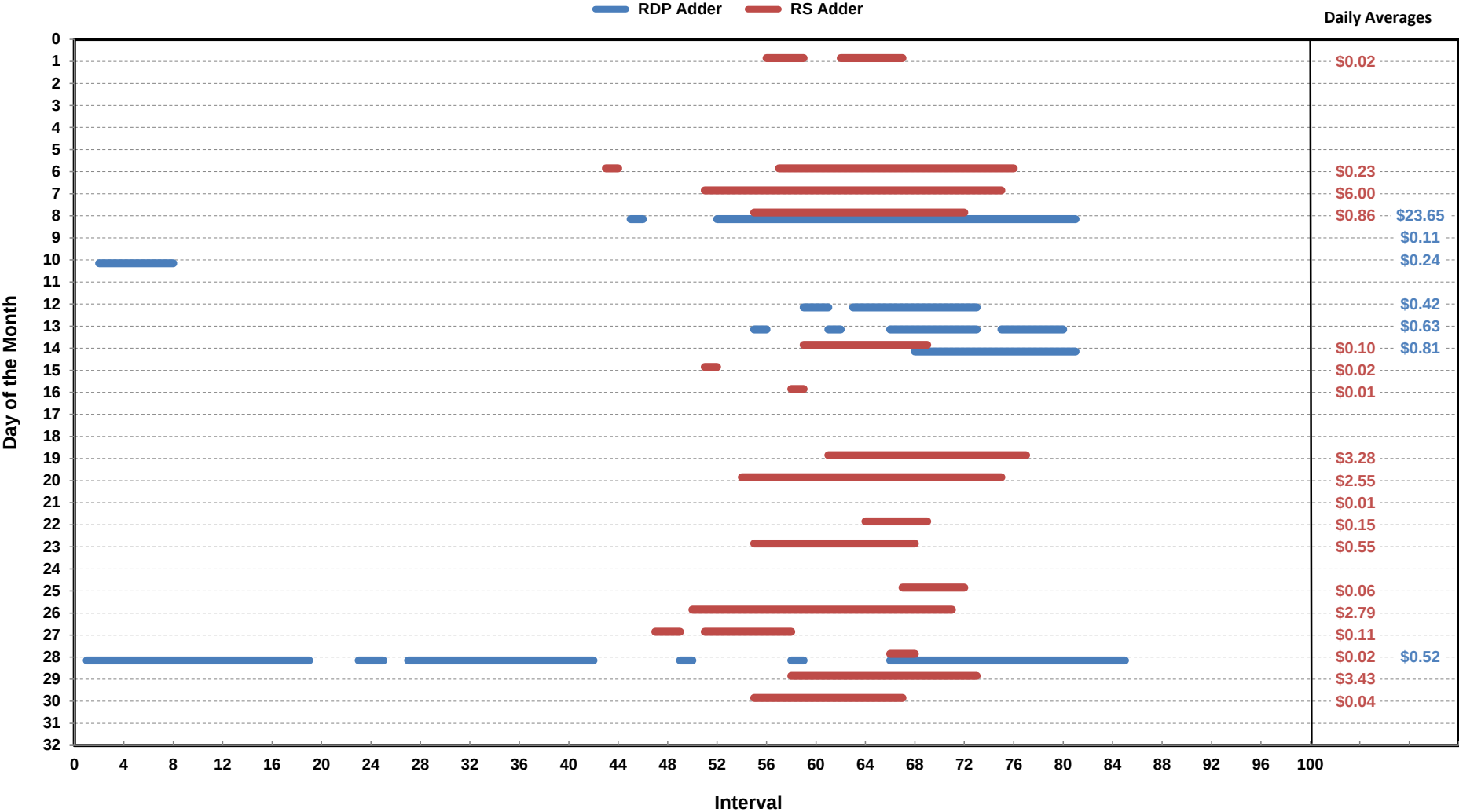
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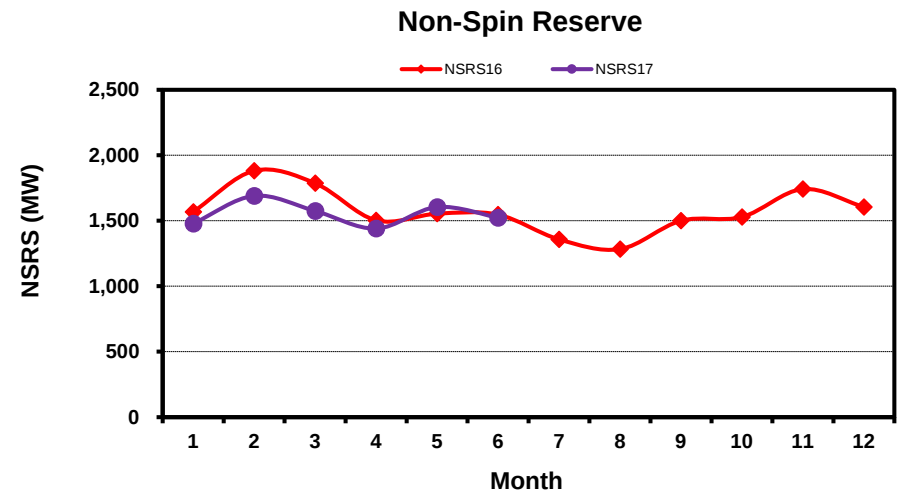
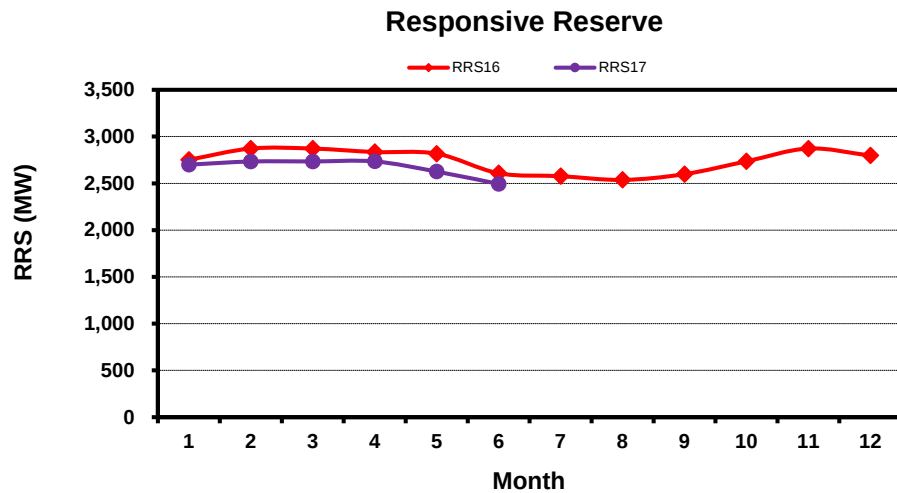
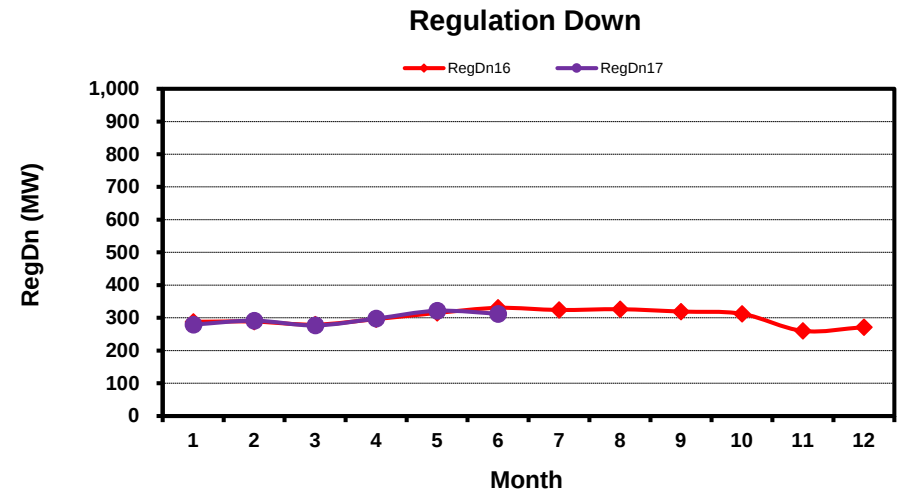
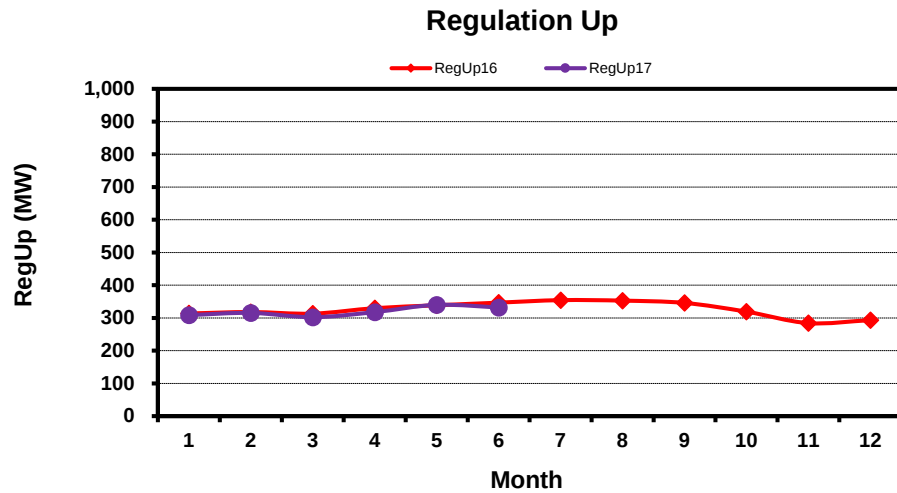
Note: * Zonal load zone definition vs. Nodal comparable load zone definition: LZ_Houston=LZ_Houston; LZ_West=LZ_West; LZ_North=(LZ_North,LZ_RAYBN); LZ_South=(LZ_South,LZ_CPS,LZ_AEN,LZ_LCRA)

Daily ORDC Adders Average Values and Interval Duration
Jun-2017



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Monthly Average of Ancillary Services Required MW



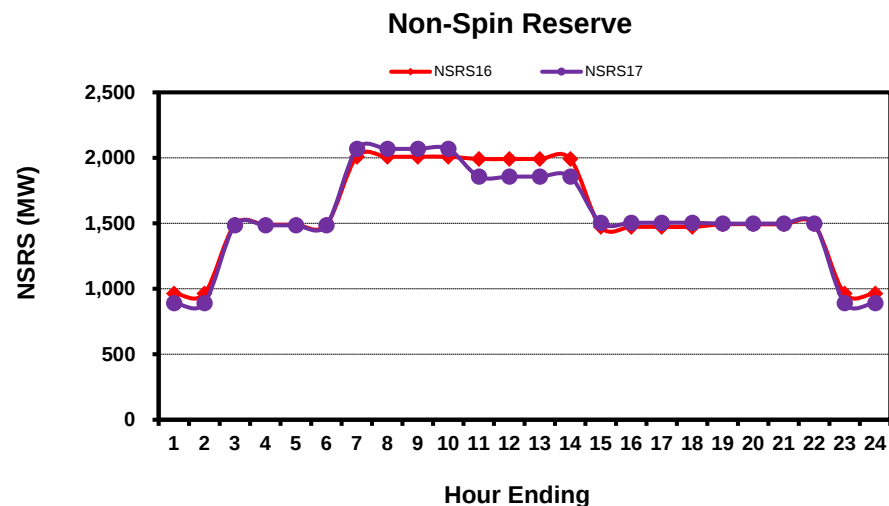
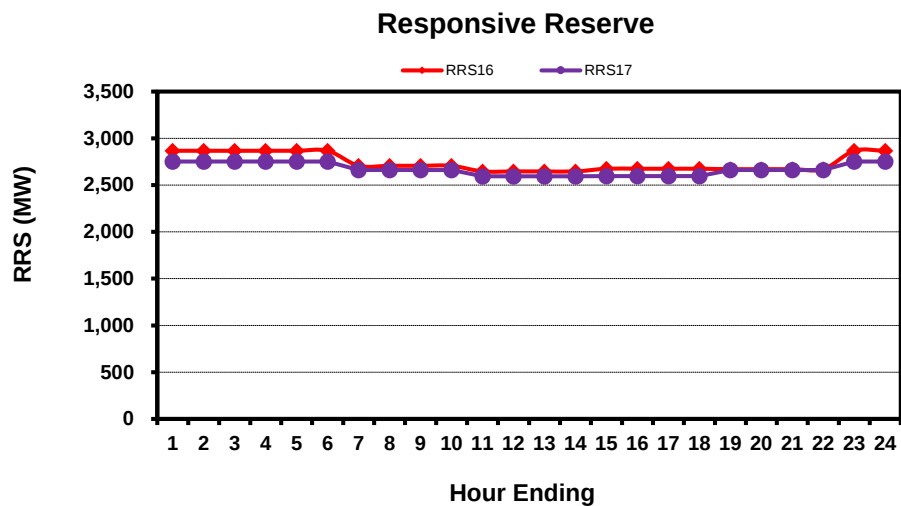
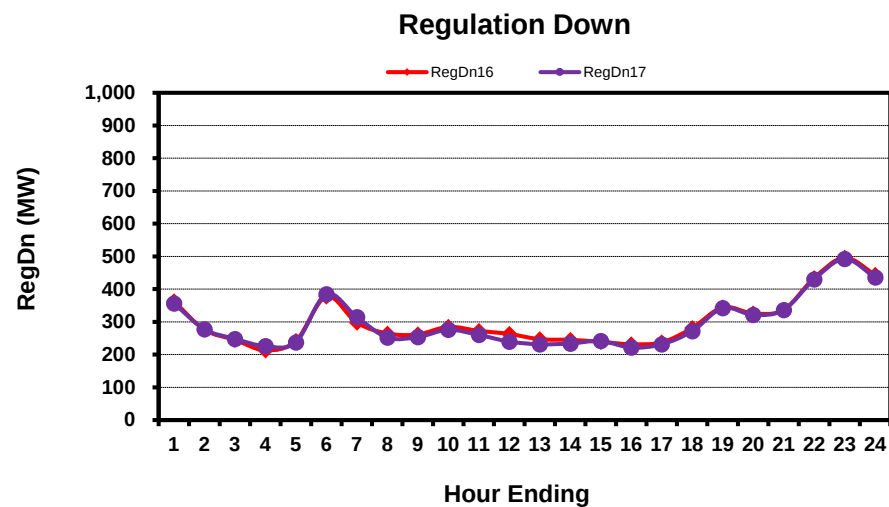
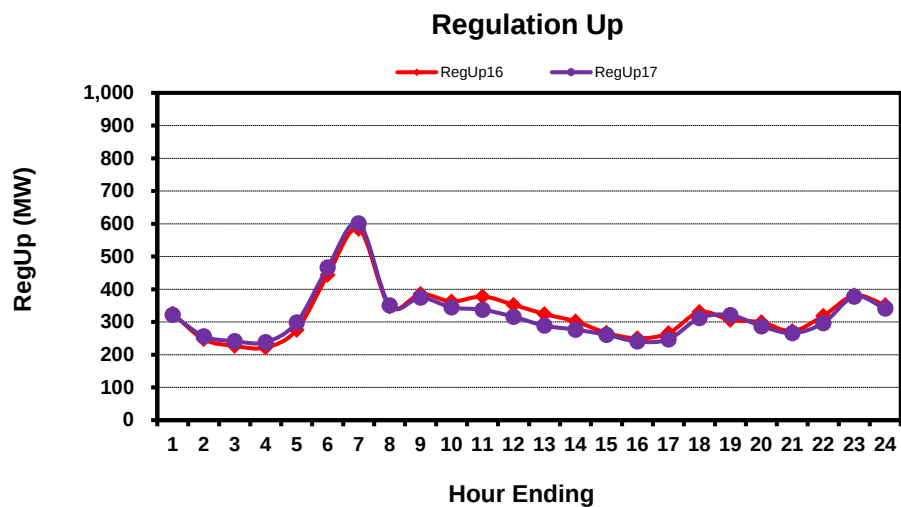
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Hourly Average of Ancillary Services Required MW



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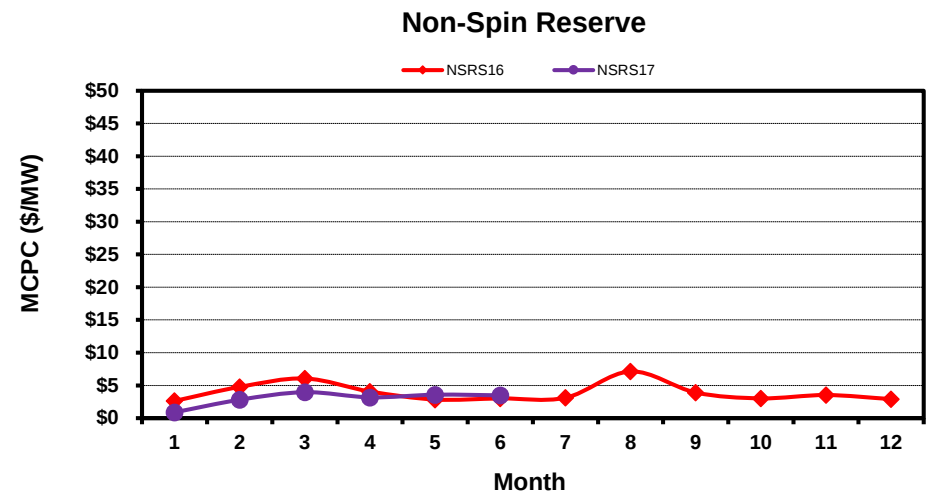
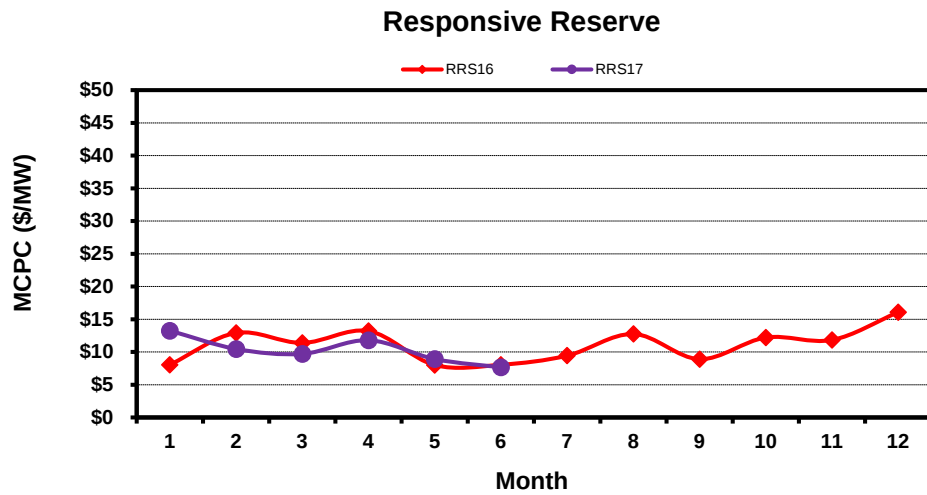
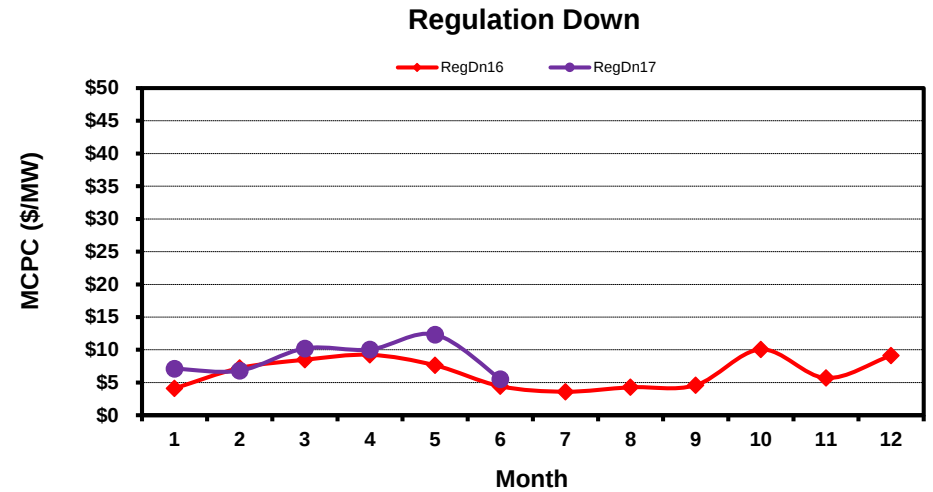
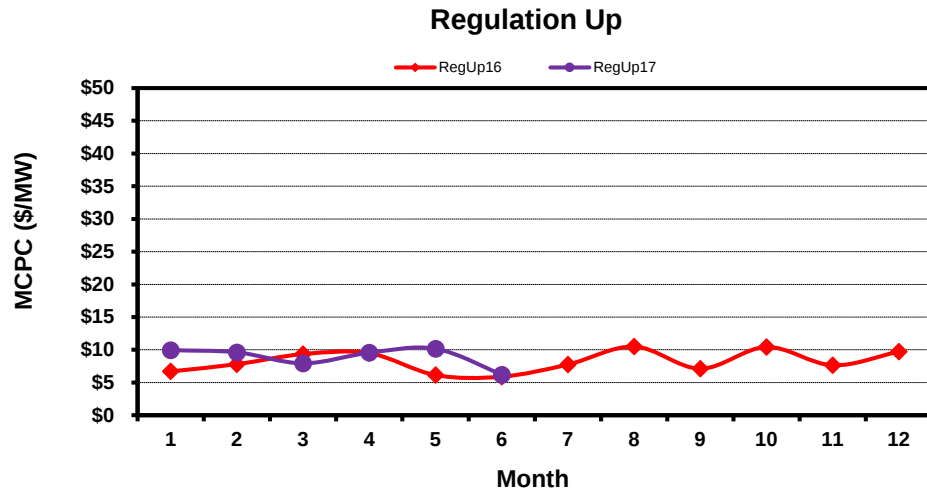
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Monthly Average Ancillary Services Price

(weighted by A/S Quantities Required)



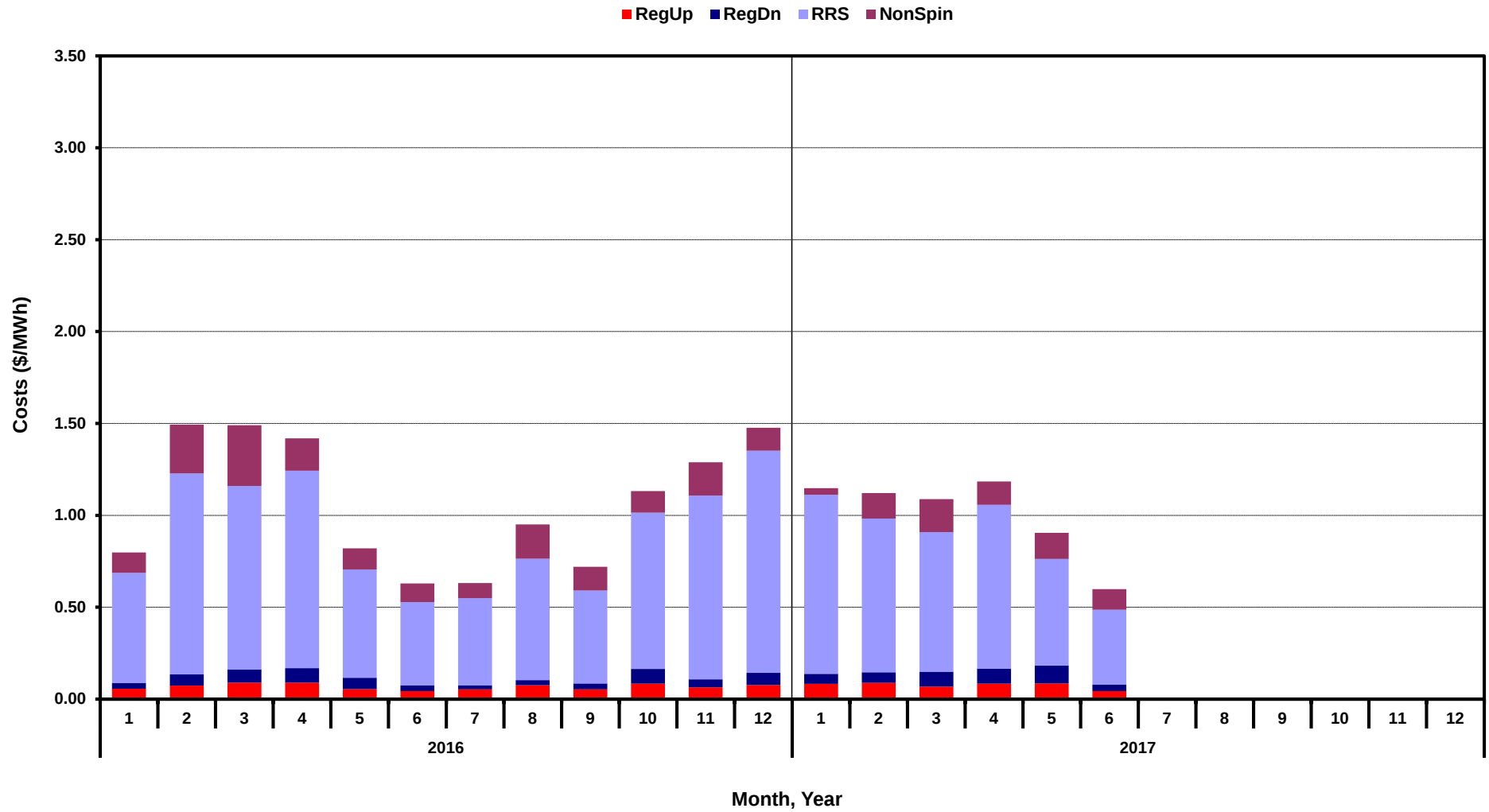
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Monthly Average A/S Cost per MWh Load



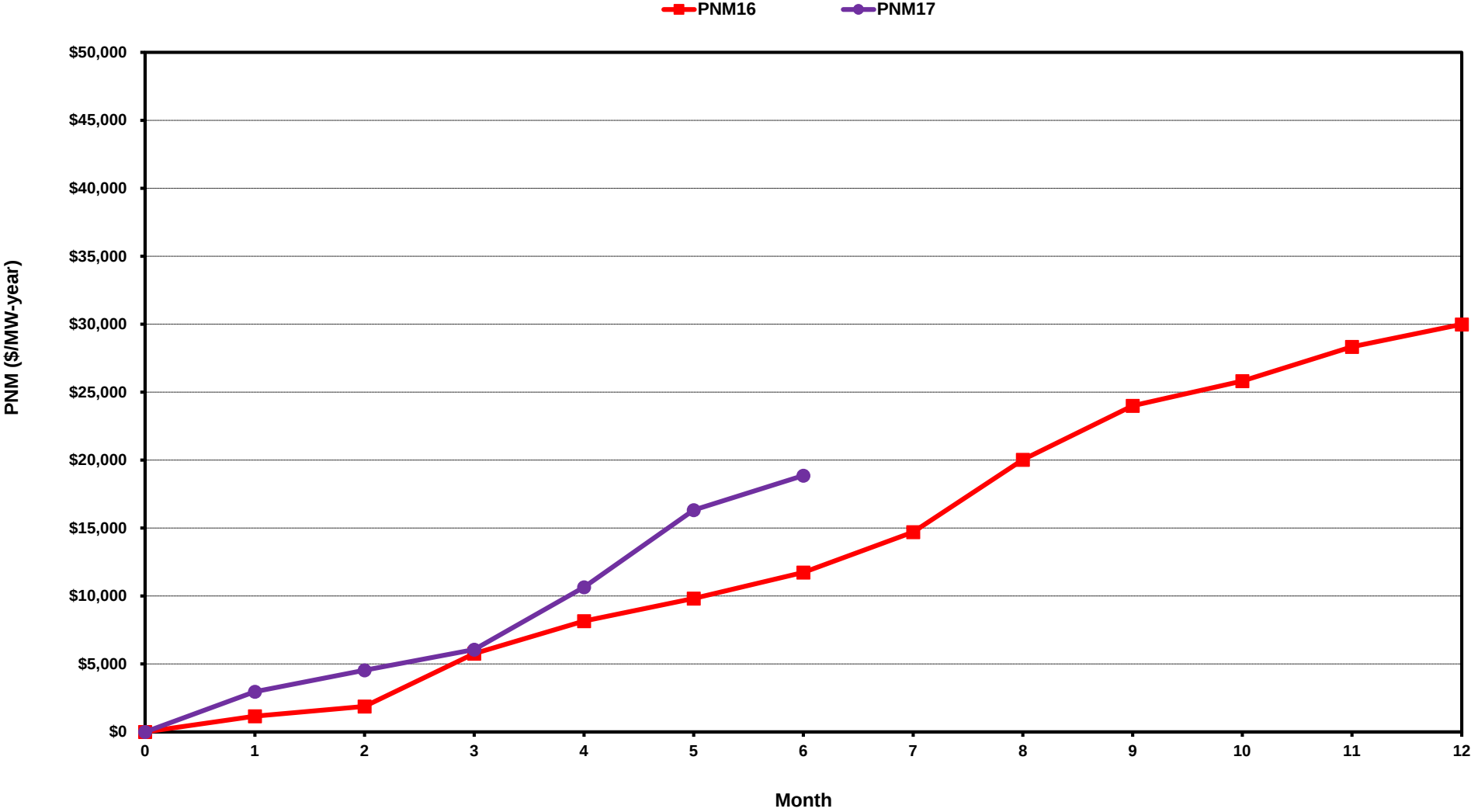
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ERCOT-wide Cumulative Peaker Net Margin



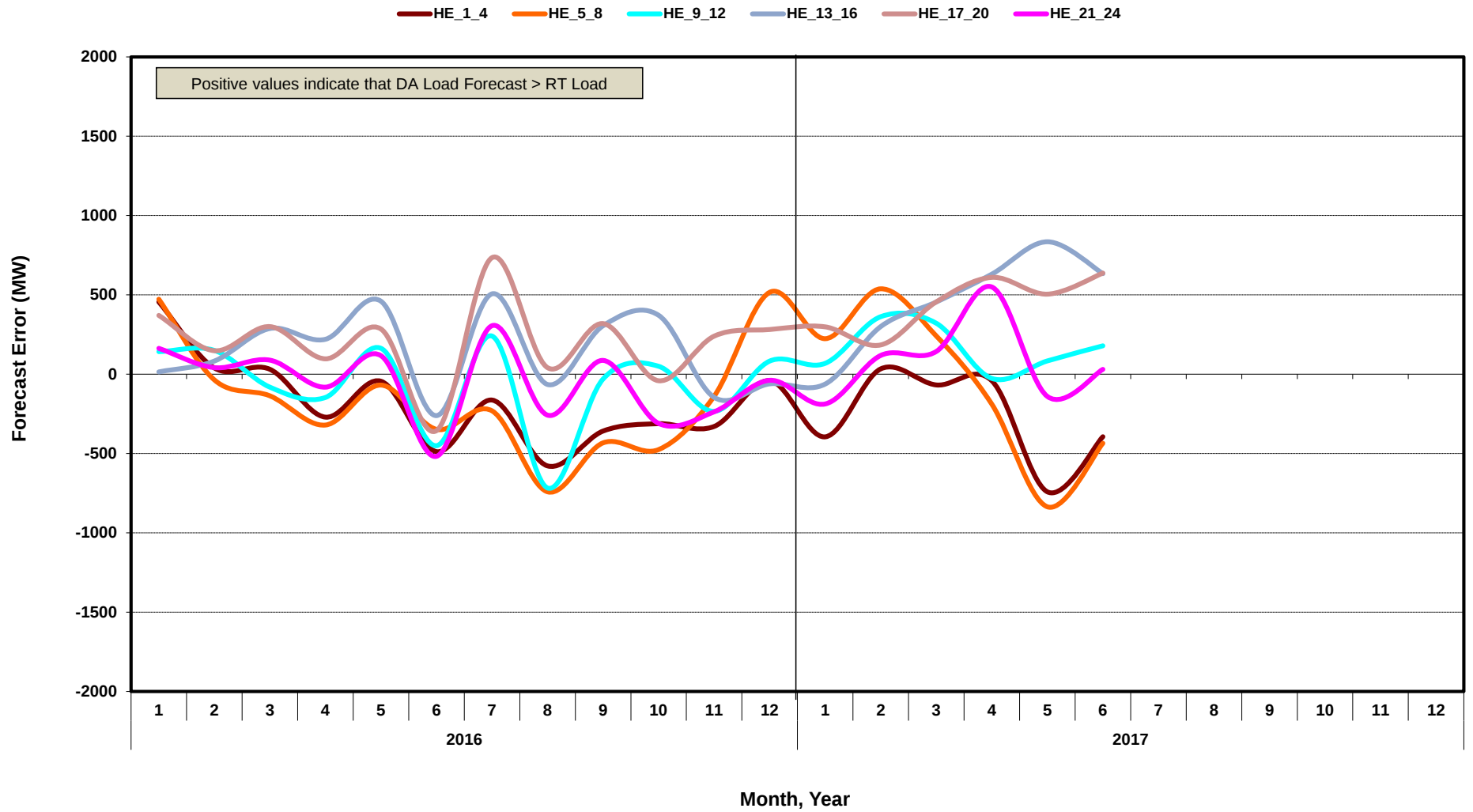
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DA vs. RT Load Forecast Error by Hour Ending



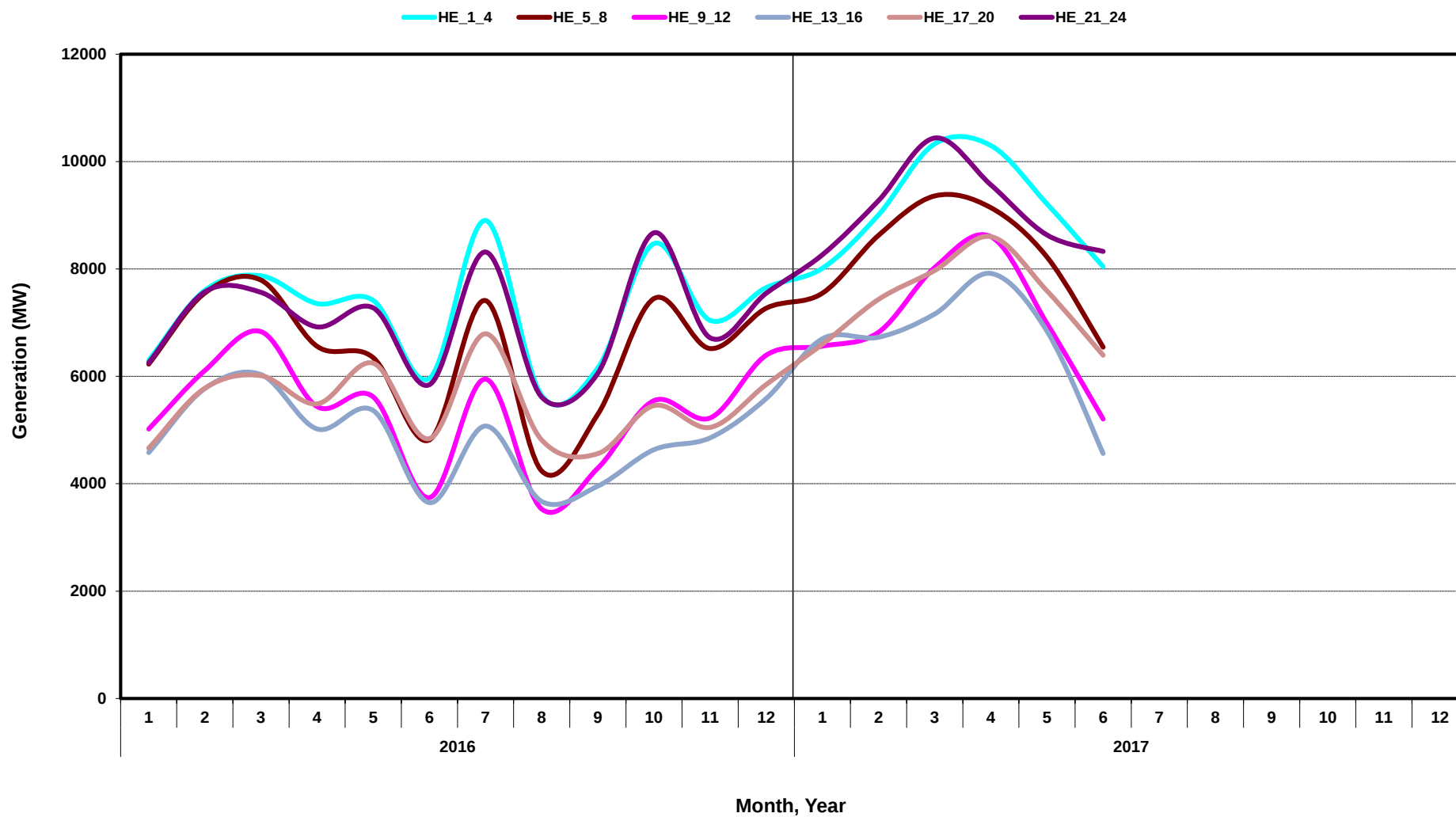
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Monthly Average of Wind Generation by Hour Ending



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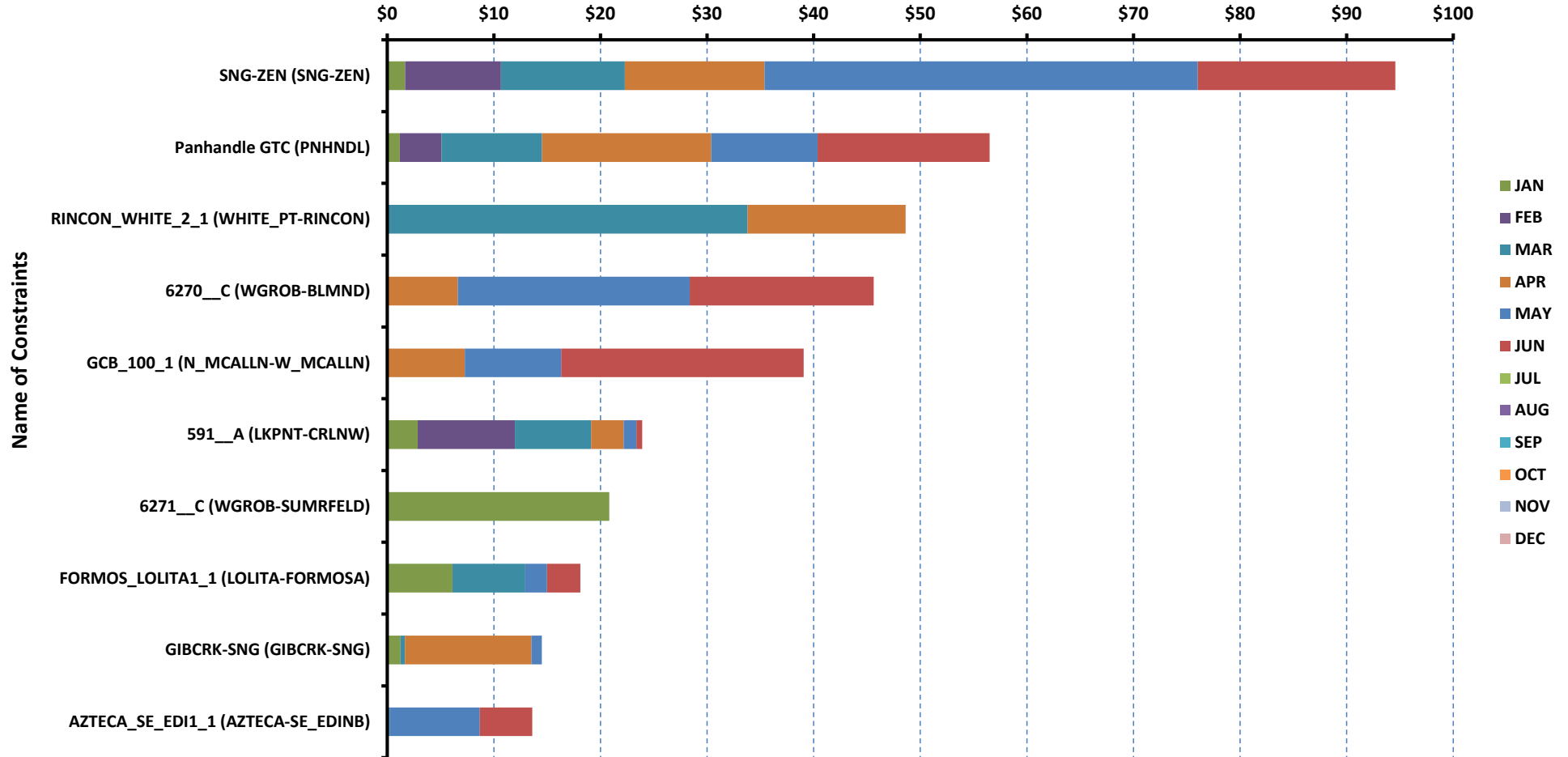
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RT Congestion Constraint Rankings - 1

Top 10 Constraints by Total Congestion Value

Congestion Rent in \$ million



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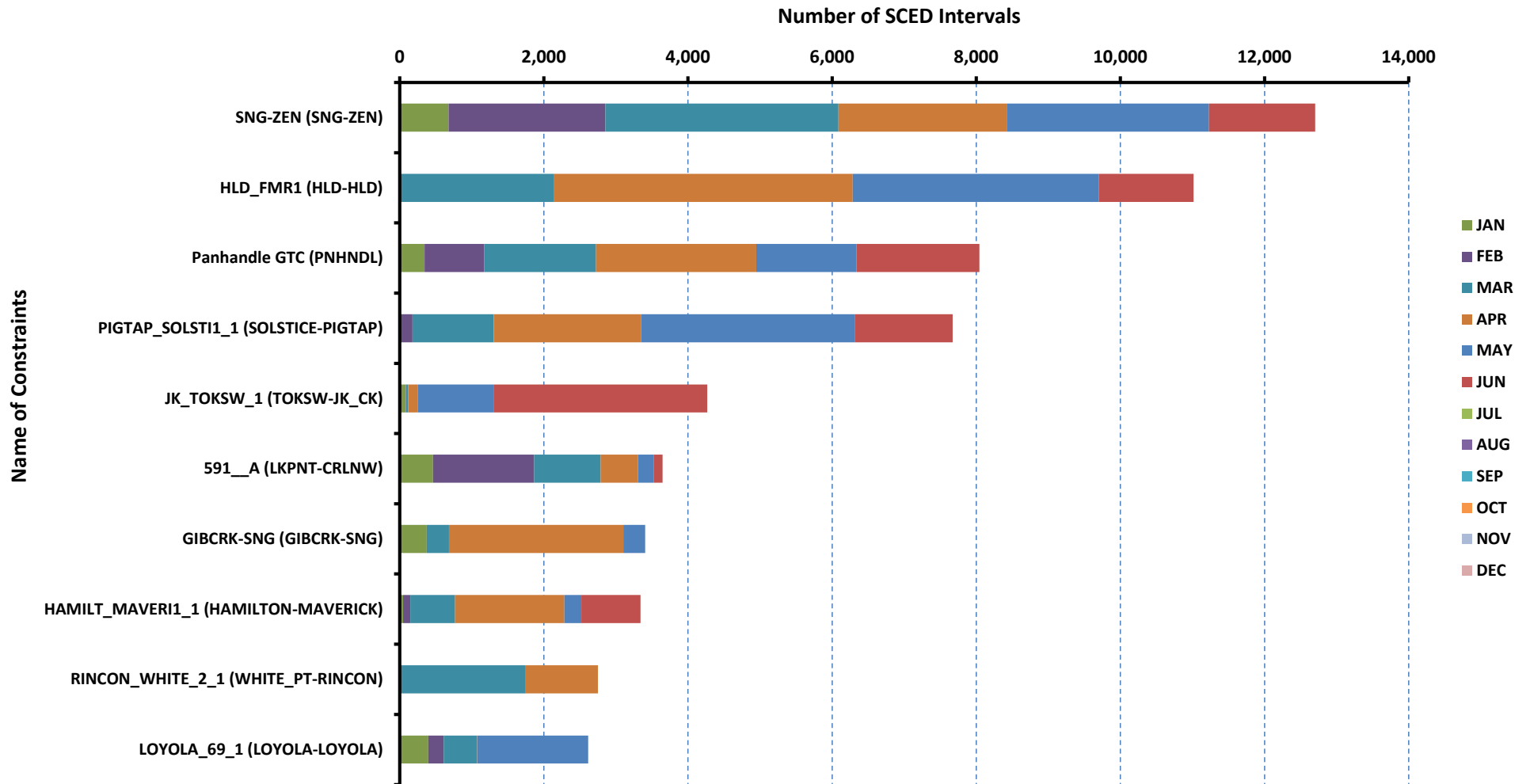
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RT Congestion Constraint Rankings - 2

Top 10 Constraints by Binding Frequency



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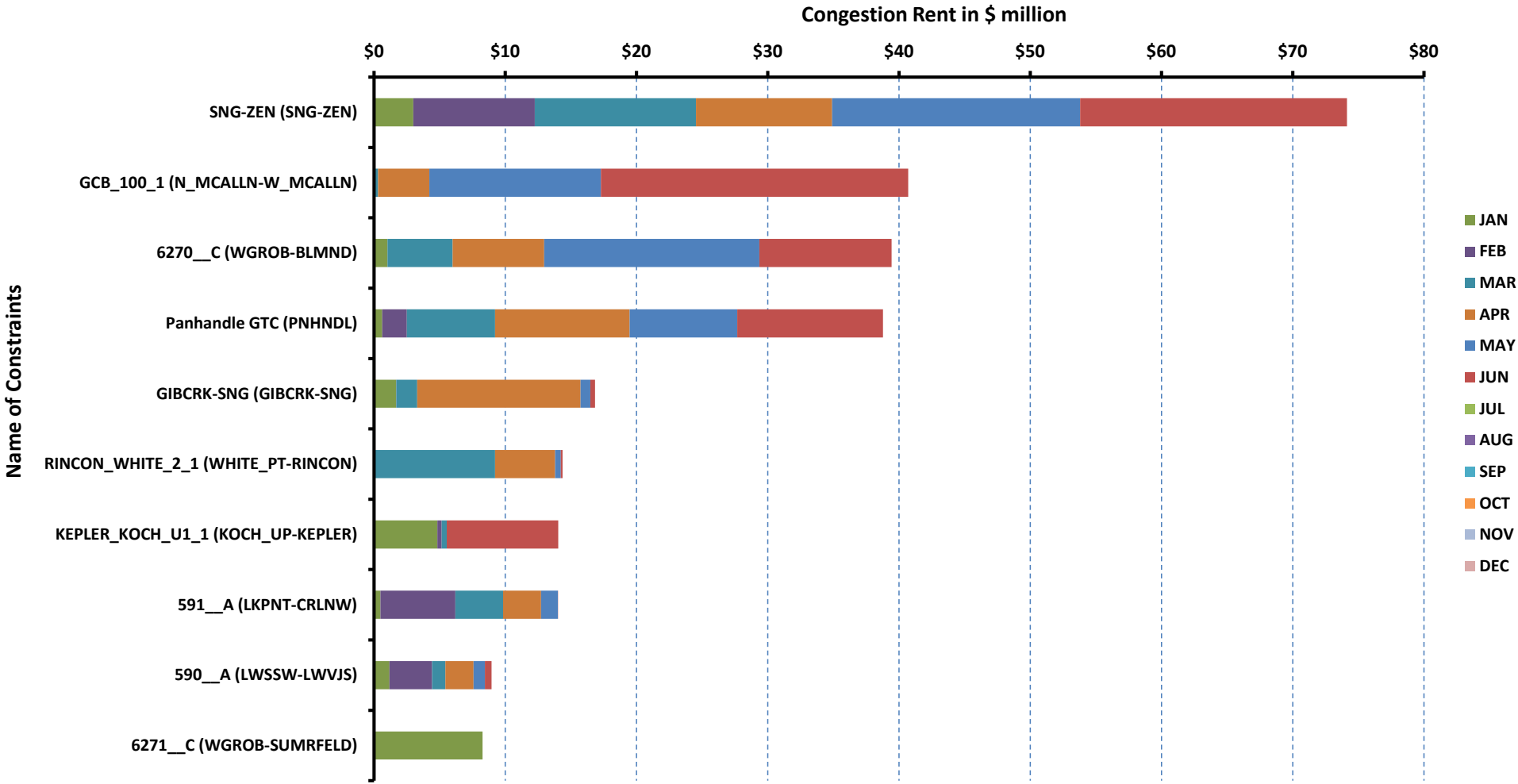
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DA Congestion Constraint Rankings - 1

Top 10 Constraints by Total Congestion Value



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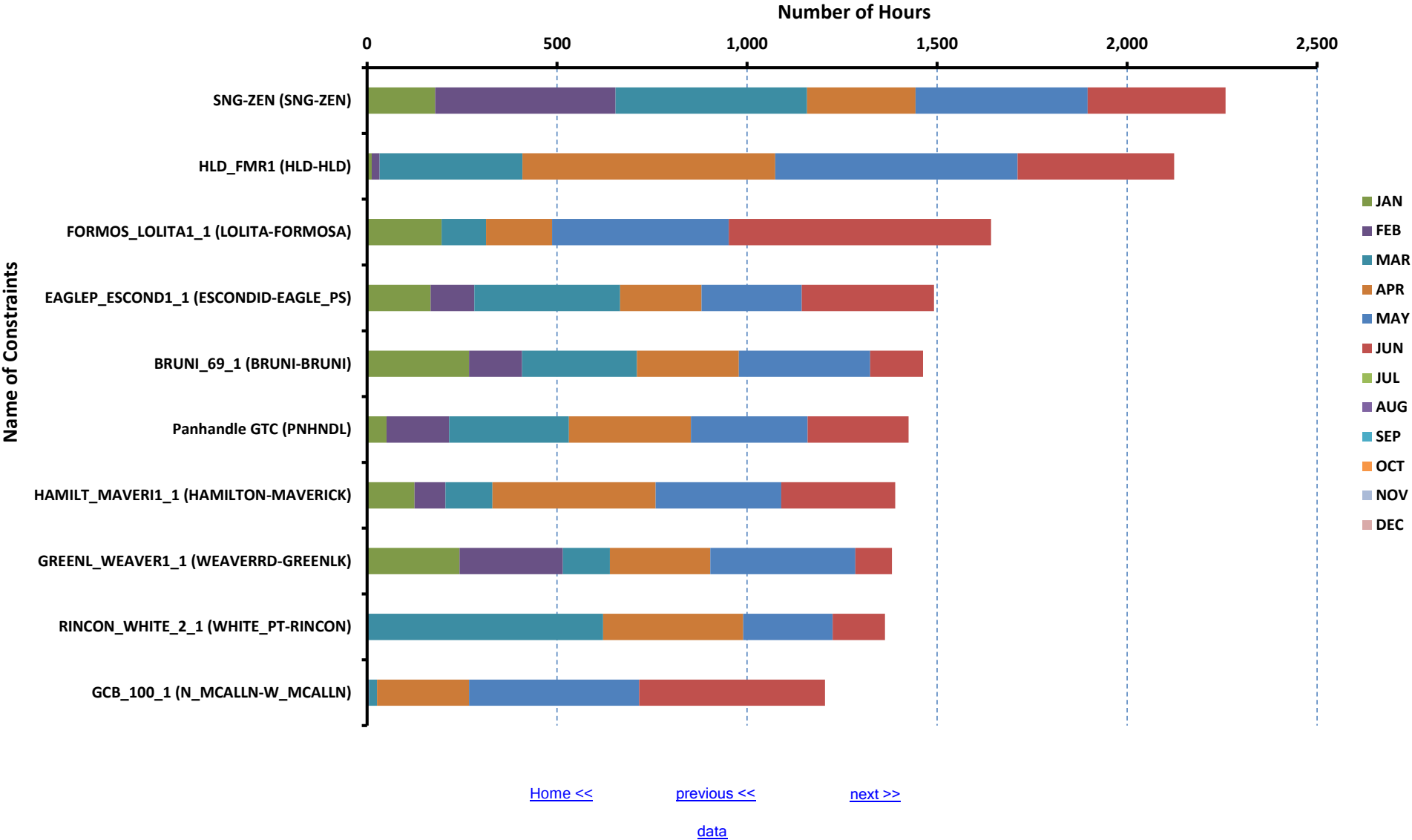
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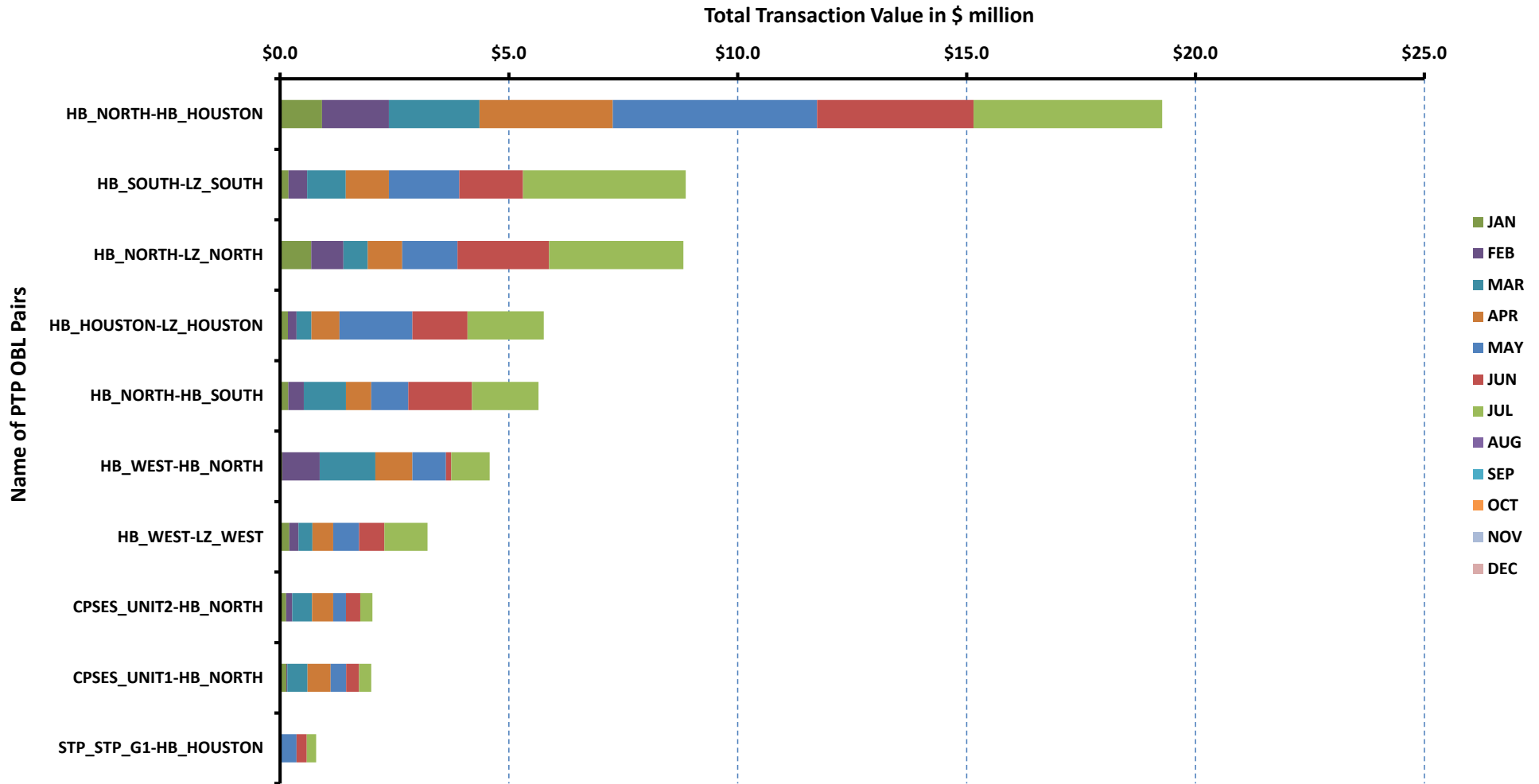
DA Congestion Constraint Rankings - 2

Top 10 Constraints by Binding Frequency



Top 10 CRR Pairs Ranked by Monthly Auction Values - 1

Top 10 PTP Obligations by Total Transaction Value



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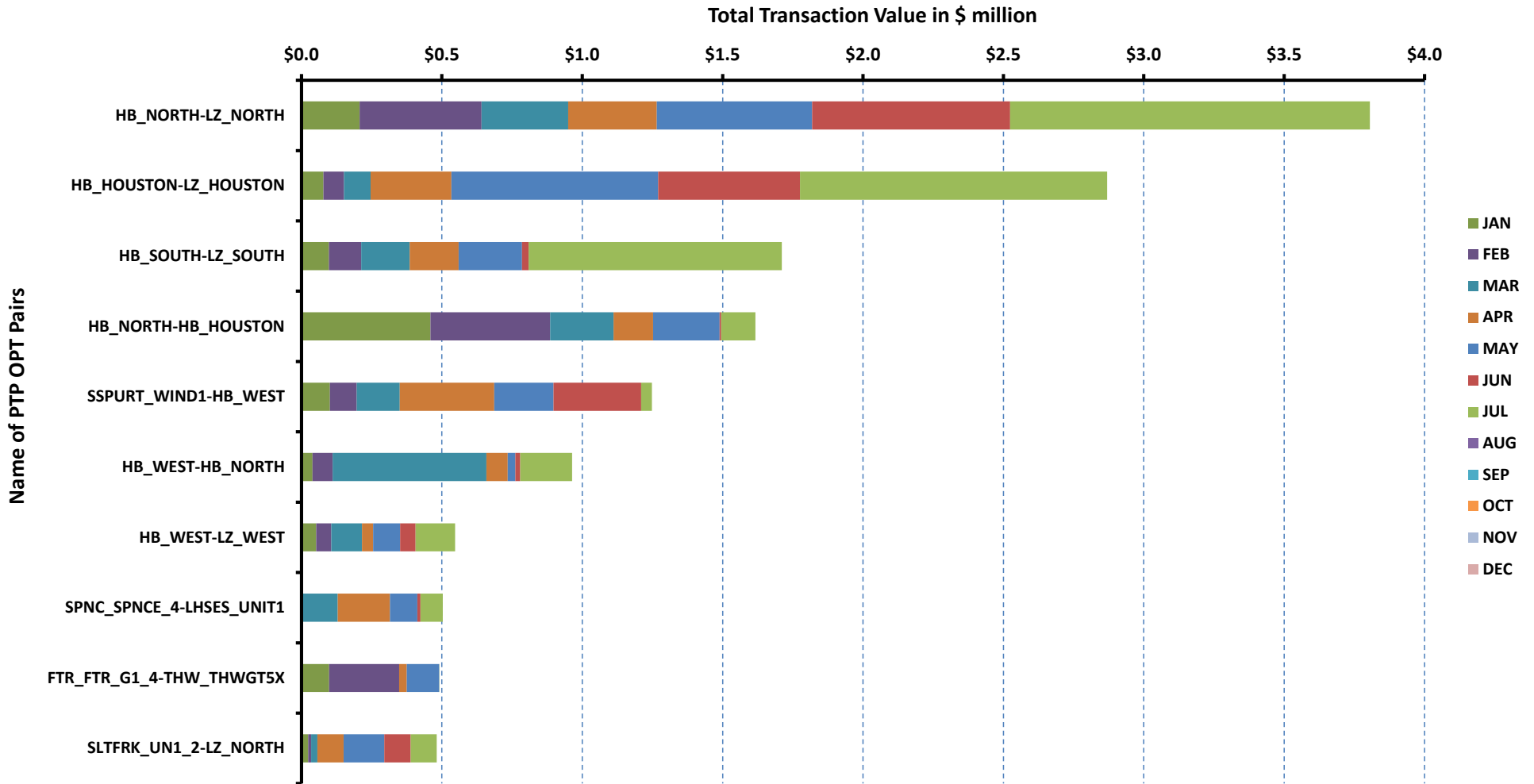
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Top 10 CRR Pairs Ranked by Monthly Auction Values - 2

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	\$ 23.08
	12	\$ 26.80	\$ 24.33
2017	1	\$ 25.01	\$ 26.30
	2	\$ 21.70	\$ 21.57
	3	\$ 25.62	\$ 23.14
	4	\$ 27.56	\$ 30.40
	5	\$ 29.12	\$ 35.46
	6	\$ 32.64	\$ 31.46
	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	9,533	11,857	9,264	3,330
	12	12,783	24,181	16,662	4,523	9,606	14,071	9,886	3,654
2017	1	13,640	24,641	17,476	4,693	9,534	13,864	9,649	3,681
	2	13,075	17,382	12,185	4,263	9,321	12,283	9,102	3,514
	3	14,353	17,152	13,478	4,237	9,894	12,147	9,428	3,485
	4	15,401	18,155	16,198	4,365	10,161	12,431	10,079	3,523
	5	16,122	22,825	16,877	4,880	11,285	14,075	11,351	3,740
	6	17,802	25,826	19,128	5,383	12,926	16,852	13,159	4,172
	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	\$ 21.33	\$ 19.50	\$ 21.58	\$ 19.65
	12	\$ 24.59	\$ 24.51	\$ 24.28	\$ 23.11	\$ 26.55	\$ 26.66	\$ 27.66	\$ 25.67
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	\$ 18.15	\$ 30.61	\$ 22.53	\$ 26.24	\$ 20.54
	4	\$ 41.17	\$ 23.37	\$ 31.21	\$ 21.81	\$ 35.06	\$ 22.79	\$ 28.27	\$ 20.73
	5	\$ 46.11	\$ 29.04	\$ 36.07	\$ 25.58	\$ 34.55	\$ 25.90	\$ 29.64	\$ 23.27
	6	\$ 34.88	\$ 27.26	\$ 34.65	\$ 27.77	\$ 36.20	\$ 28.62	\$ 35.60	\$ 28.49
	7	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	8	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	9	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	10	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	11	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	12	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

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ERCOT-wide Monthly Implied Heat Rate - DA vs. RT						
year	month	gasprice	rtm_spp	HR_rtm	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	\$ 23.08	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	\$ 23.14	8.04	\$ 25.62	8.90
	4	\$ 3.12	\$ 30.40	9.75	\$ 27.56	8.84
	5	\$ 3.24	\$ 35.46	10.94	\$ 29.12	8.99
	6	\$ 3.05	\$ 31.46	10.30	\$ 32.64	10.69
	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	10.63	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	9.15	7.99	7.18	14.23	11.13	8.96	7.89
	6	11.85	11.66	9.37	9.33	11.42	11.35	8.93	9.09
	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	6	1	\$ 0.02	\$ -	10	0	80	90
2017	6	2	\$ -	\$ -	0	0	80	90
2017	6	3	\$ -	\$ -	0	0	80	90
2017	6	4	\$ -	\$ -	0	0	80	90
2017	6	5	\$ -	\$ -	0	0	80	90
2017	6	6	\$ 0.23	\$ -	23	0	80	90
2017	6	7	\$ 6.00	\$ -	26	0	80	90
2017	6	8	\$ 0.86	\$ 23.65	18	32	80	90
2017	6	9	\$ -	\$ 0.11	0	1	80	90
2017	6	10	\$ -	\$ 0.24	0	7	80	90
2017	6	11	\$ -	\$ -	0	0	80	90
2017	6	12	\$ -	\$ 0.42	0	16	80	90
2017	6	13	\$ -	\$ 0.63	0	19	80	90
2017	6	14	\$ 0.10	\$ 0.81	11	14	80	90
2017	6	15	\$ 0.02	\$ -	2	0	80	90
2017	6	16	\$ 0.01	\$ -	2	0	80	90
2017	6	17	\$ -	\$ -	0	0	80	90
2017	6	18	\$ -	\$ -	0	0	80	90
2017	6	19	\$ 3.28	\$ -	17	0	80	90
2017	6	20	\$ 2.55	\$ -	23	0	80	90
2017	6	21	\$ 0.01	\$ -	1	0	80	90
2017	6	22	\$ 0.15	\$ -	6	0	80	90
2017	6	23	\$ 0.55	\$ -	14	0	80	90
2017	6	24	\$ -	\$ -	0	0	80	90
2017	6	25	\$ 0.06	\$ -	6	0	80	90
2017	6	26	\$ 2.79	\$ -	22	0	80	90
2017	6	27	\$ 0.11	\$ -	13	0	80	90
2017	6	28	\$ 0.02	\$ 0.52	3	62	80	90
2017	6	29	\$ 3.43	\$ -	16	0	80	90
2017	6	30	\$ 0.04	\$ -	13	0	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	322	1,605	2,626	340
	6	312	1,522	2,494	332
	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	357	890	2,752	322
	2	278	890	2,752	257
	3	248	1,485	2,752	241
	4	226	1,485	2,752	238
	5	238	1,485	2,752	299
	6	385	1,485	2,752	466
	7	315	2,068	2,662	601
	8	252	2,068	2,662	351
	9	253	2,068	2,662	375
	10	276	2,068	2,662	345
	11	260	1,857	2,594	338
	12	240	1,857	2,594	316
	13	231	1,857	2,594	289
	14	234	1,857	2,594	277
	15	242	1,504	2,596	261
	16	222	1,504	2,596	240
	17	232	1,504	2,596	247
	18	271	1,504	2,596	312
	19	342	1,498	2,662	321
	20	321	1,498	2,662	287
	21	337	1,498	2,662	266
	22	430	1,498	2,662	297
	23	493	890	2,752	378
	24	436	890	2,752	341

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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	\$ 12.33	\$ 3.58	\$ 8.92	\$ 10.16
	6	\$ 5.50	\$ 3.48	\$ 7.67	\$ 6.18
	7	\$ -	\$ -	\$ -	\$ -
	8	\$ -	\$ -	\$ -	\$ -
	9	\$ -	\$ -	\$ -	\$ -
	10	\$ -	\$ -	\$ -	\$ -
	11	\$ -	\$ -	\$ -	\$ -
	12	\$ -	\$ -	\$ -	\$ -

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Monthly Average A/S Cost per MWh Load					
year	month	AScost_REGDN	AScost_NSPIN	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	\$ 0.10	\$ 0.14	\$ 0.58	\$ 0.09
	6	\$ 0.04	\$ 0.11	\$ 0.41	\$ 0.04
	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	\$ 5,673.67	\$ 16,323.41
	6	\$ 2,542.93	\$ 18,866.34
	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)	(518)	(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	(741)	835	505	(140)	(836)	84
	6	(394)	634	637	30	(435)	179
	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	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	-	-	-	-	-	-
	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)	12,702	1	679	2,173	3,235	2,335	2,807	1,473	-	-	-	-	-	-
FREQ_EXIST	2017	HLD_FMR1 (HLD-HLD)	11,016	2	-	-	2,143	4,143	3,413	1,317	-	-	-	-	-	-
FREQ_EXIST	2017	Panhandle GTC (PNHNDL)	8,043	3	344	826	1,553	2,223	1,393	1,704	-	-	-	-	-	-
FREQ_EXIST	2017	PIGTAP_SOLST11_1 (SOLSTICE-PIGTAP)	7,671	4	-	176	1,127	2,048	2,960	1,360	-	-	-	-	-	-
FREQ_EXIST	2017	JK_TOKSW_1 (TOKSW-JK_CK)	4,266	5	85	3	29	136	1,055	2,958	-	-	-	-	-	-
FREQ_EXIST	2017	591_A (LKPNT-CRLNW)	3,648	6	462	1,403	922	519	222	120	-	-	-	-	-	-
FREQ_EXIST	2017	GIBCRK-SNG (GIBCRK-SNG)	3,405	7	375	-	308	2,419	303	-	-	-	-	-	-	-
FREQ_EXIST	2017	HAMILT_MAVR11_1 (HAMILTON-MAVERICK)	3,341	8	47	99	621	1,516	236	822	-	-	-	-	-	-
FREQ_EXIST	2017	RINCON_WHITE_2_1 (WHITE_PT-RINCON)	2,749	9	-	-	1,747	1,002	-	-	-	-	-	-	-	-
FREQ_EXIST	2017	LOYOLA_69_1 (LOYOLA-LOYOLA)	2,614	10	396	215	461	5	1,537	-	-	-	-	-	-	-
TOP10_RENT	2017	SNG-ZEN (SNG-ZEN)	\$ 94.56	1	\$ 1.68	\$ 8.98	\$ 11.62	\$ 13.11	\$ 40.63	\$ 18.53	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2017	Panhandle GTC (PNHNDL)	\$ 56.50	2	\$ 1.17	\$ 3.92	\$ 9.44	\$ 15.86	\$ 9.98	\$ 16.13	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2017	RINCON_WHITE_2_1 (WHITE_PT-RINCON)	\$ 48.63	3	\$ -	\$ -	\$ 33.80	\$ 14.82	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2017	6270_C (WGROB-BLMND)	\$ 45.64	4	\$ -	\$ -	\$ 0.09	\$ 6.52	\$ 21.76	\$ 17.26	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2017	GCB_100_1 (N_MCALLN-W_MCALLN)	\$ 39.06	5	\$ -	\$ -	\$ -	\$ 7.27	\$ 9.05	\$ 22.74	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2017	591_A (LKPNT-CRLNW)	\$ 23.92	6	\$ 2.86	\$ 9.12	\$ 7.14	\$ 3.06	\$ 1.20	\$ 0.54	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2017	6271_C (WGROB-SUMRFELD)	\$ 20.83	7	\$ 20.83	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2017	FORMOS_LOLITA1_1 (LOLITA-FORMOSA)	\$ 18.11	8	\$ 6.11	\$ -	\$ 6.83	\$ -	\$ 2.04	\$ 3.12	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2017	GIBCRK-SNG (GIBCRK-SNG)	\$ 14.51	9	\$ 1.25	\$ -	\$ 0.42	\$ 11.85	\$ 0.99	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2017	AZTECA_SE_ED11_1 (AZTECA-SE_EDINB)	\$ 13.61	10	\$ -	\$ 0.09	\$ 0.13	\$ 0.00	\$ 8.47	\$ 4.92	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

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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)	2,259	1	179	475	504	285	453	363	-	-	-	-	-	-	
FREQ_EXIST	2017	HLD_FMR1 (HLD-HLD)	2,124	2	12	21	376	665	638	412	-	-	-	-	-	-	
FREQ_EXIST	2017	FORMOS_LOLITA1_1 (LOLITA-FORMOSA)	1,642	3	196	-	117	174	465	690	-	-	-	-	-	-	
FREQ_EXIST	2017	EAGLEP_ESCOND1_1 (ESCONDID-EAGLE_PS)	1,492	4	167	115	384	214	264	348	-	-	-	-	-	-	
FREQ_EXIST	2017	BRUNI_69_1 (BRUNI-BRUNI)	1,463	5	268	140	302	268	346	139	-	-	-	-	-	-	
FREQ_EXIST	2017	Panhandle GTC (PNHNDL)	1,425	6	51	165	315	321	307	266	-	-	-	-	-	-	
FREQ_EXIST	2017	HAMILT_MAUVERI1_1 (HAMILTON-MAVERICK)	1,390	7	125	81	124	429	331	300	-	-	-	-	-	-	
FREQ_EXIST	2017	GREENL_WEAVER1_1 (WEAVERRD-GREENLK)	1,381	8	243	272	124	264	382	96	-	-	-	-	-	-	
FREQ_EXIST	2017	RINCON_WHITE_2_1 (WHITE_PT-RINCON)	1,363	9	-	1	620	369	235	138	-	-	-	-	-	-	
FREQ_EXIST	2017	GCB_100_1 (N_MCALLN-W_MCALLN)	1,205	10	-	5	21	242	448	489	-	-	-	-	-	-	
TOP10_RENT	2017	SNG-ZEN (SNG-ZEN)	\$ 74.14	1	\$ 3.00	\$ 9.25	\$ 12.28	\$ 10.37	\$ 18.90	\$ 20.34	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2017	GCB_100_1 (N_MCALLN-W_MCALLN)	\$ 40.69	2	\$ -	\$ 0.00	\$ 0.30	\$ 3.91	\$ 13.07	\$ 23.41	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2017	6270_C (WGROB-BLMND)	\$ 39.44	3	\$ 1.03	\$ -	\$ 4.96	\$ 6.97	\$ 16.41	\$ 10.07	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2017	Panhandle GTC (PNHNDL)	\$ 38.78	4	\$ 0.61	\$ 1.89	\$ 6.71	\$ 10.27	\$ 8.19	\$ 11.11	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2017	GIBCRK-SNG (GIBCRK-SNG)	\$ 16.84	5	\$ 1.68	\$ 0.01	\$ 1.60	\$ 12.45	\$ 0.74	\$ 0.36	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2017	RINCON_WHITE_2_1 (WHITE_PT-RINCON)	\$ 14.36	6	\$ -	\$ 0.00	\$ 9.22	\$ 4.57	\$ 0.43	\$ 0.13	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2017	KEPLER_KOCH_U1_1 (KOCH_UP-KEPLER)	\$ 14.04	7	\$ 4.82	\$ 0.32	\$ 0.39	\$ -	\$ -	\$ 8.51	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2017	591_A (LKPNPT-CRLNW)	\$ 14.03	8	\$ 0.49	\$ 5.71	\$ 3.64	\$ 2.88	\$ 1.28	\$ 0.02	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2017	590_A (LWSSW-LWVJS)	\$ 8.95	9	\$ 1.18	\$ 3.24	\$ 1.02	\$ 2.14	\$ 0.87	\$ 0.49	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2017	6271_C (WGROB-SUMRFELD)	\$ 8.27	10	\$ 8.27	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	

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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																	
ftt_option	year	pair	total_value	rank	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
N	2017	HB NORTH-HB HOUSTON	\$ 19.27	1	\$ 0.92	\$ 1.46	\$ 1.98	\$ 2.92	\$ 4.46	\$ 3.42	\$ 4.12	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2017	HB SOUTH-LZ SOUTH	\$ 8.86	2	\$ 0.18	\$ 0.41	\$ 0.85	\$ 0.94	\$ 1.54	\$ 1.39	\$ 3.56	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2017	HB NORTH-LZ NORTH	\$ 8.81	3	\$ 0.68	\$ 0.70	\$ 0.53	\$ 0.75	\$ 1.21	\$ 2.00	\$ 2.94	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2017	HB HOUSTON-LZ HOUSTON	\$ 5.76	4	\$ 0.17	\$ 0.19	\$ 0.33	\$ 0.61	\$ 1.59	\$ 1.21	\$ 1.67	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2017	HB NORTH-HB SOUTH	\$ 5.65	5	\$ 0.18	\$ 0.34	\$ 0.92	\$ 0.55	\$ 0.81	\$ 1.39	\$ 1.45	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2017	HB WEST-HB NORTH	\$ 4.58	6	\$ 0.05	\$ 0.82	\$ 1.22	\$ 0.81	\$ 0.73	\$ 0.12	\$ 0.84	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2017	HB WEST-LZ WEST	\$ 3.22	7	\$ 0.20	\$ 0.20	\$ 0.30	\$ 0.46	\$ 0.56	\$ 0.55	\$ 0.94	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2017	CPSES UNIT2-HB NORTH	\$ 2.02	8	\$ 0.13	\$ 0.13	\$ 0.44	\$ 0.46	\$ 0.28	\$ 0.31	\$ 0.27	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2017	CPSES UNIT1-HB NORTH	\$ 1.99	9	\$ 0.14	\$ 0.02	\$ 0.44	\$ 0.50	\$ 0.34	\$ 0.28	\$ 0.27	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2017	STP_STP_G1-HB HOUSTON	\$ 0.79	10	\$ -	\$ 0.00	\$ -	\$ -	\$ 0.36	\$ 0.22	\$ 0.21	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2017	HB NORTH-LZ NORTH	\$ 3.81	1	\$ 0.21	\$ 0.43	\$ 0.31	\$ 0.32	\$ 0.55	\$ 0.71	\$ 1.28	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2017	HB HOUSTON-LZ HOUSTON	\$ 2.87	2	\$ 0.08	\$ 0.07	\$ 0.09	\$ 0.29	\$ 0.74	\$ 0.50	\$ 1.09	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2017	HB SOUTH-LZ SOUTH	\$ 1.71	3	\$ 0.10	\$ 0.12	\$ 0.17	\$ 0.17	\$ 0.23	\$ 0.02	\$ 0.90	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2017	HB NORTH-HB HOUSTON	\$ 1.62	4	\$ 0.46	\$ 0.43	\$ 0.23	\$ 0.14	\$ 0.24	\$ 0.01	\$ 0.12	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2017	SSPURT_WIND1-HB WEST	\$ 1.25	5	\$ 0.10	\$ 0.09	\$ 0.15	\$ 0.34	\$ 0.21	\$ 0.31	\$ 0.04	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2017	HB WEST-HB NORTH	\$ 0.96	6	\$ 0.04	\$ 0.07	\$ 0.55	\$ 0.08	\$ 0.03	\$ 0.02	\$ 0.18	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2017	HB WEST-LZ WEST	\$ 0.55	7	\$ 0.05	\$ 0.05	\$ 0.11	\$ 0.04	\$ 0.10	\$ 0.06	\$ 0.14	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2017	SPNC SPNCE_4-LHSES UNIT1	\$ 0.50	8	\$ 0.00	\$ 0.00	\$ 0.12	\$ 0.19	\$ 0.10	\$ 0.01	\$ 0.08	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2017	FTR_FTR_G1_4-THW_THWGT5X	\$ 0.49	9	\$ 0.10	\$ 0.25	\$ -	\$ 0.03	\$ 0.12	\$ -	\$ 0.00	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2017	SLTFRK_UN1_2-LZ NORTH	\$ 0.48	10	\$ 0.02	\$ 0.01	\$ 0.02	\$ 0.09	\$ 0.14	\$ 0.09	\$ 0.09	\$ -	\$ -	\$ -	\$ -	\$ -	

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