

To the Public Utility Commission of Texas

ERCOT Wholesale Electricity Market Monthly Report

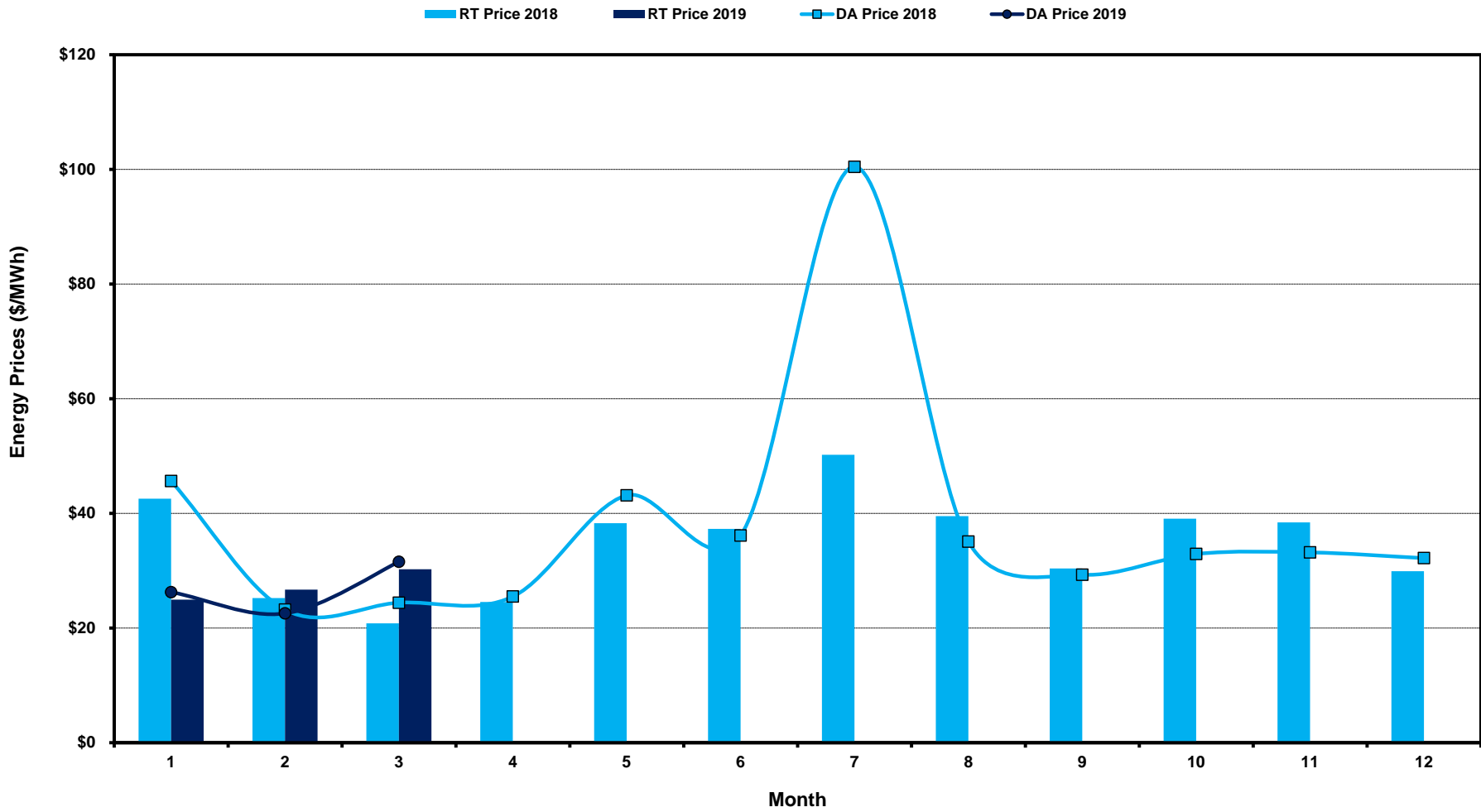
Wednesday, April 10, 2019

Potomac Economics, Ltd.
Independent Market Monitor

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ERCOT-wide Average Energy Prices DA vs RT

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



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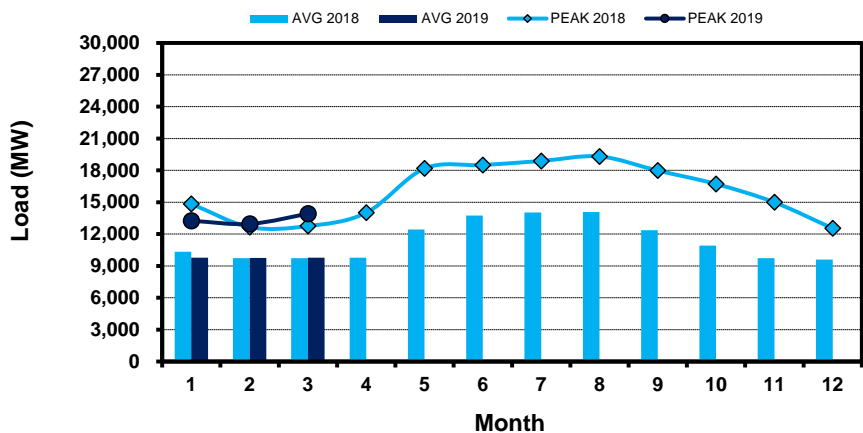
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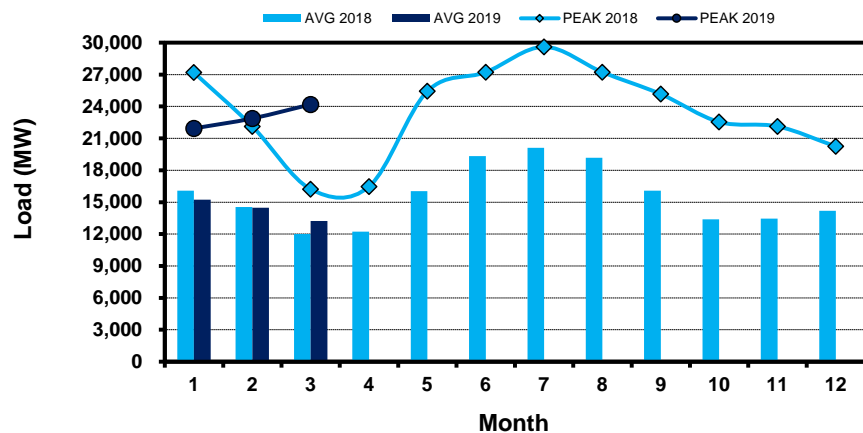
Load Zone Load Statistics

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

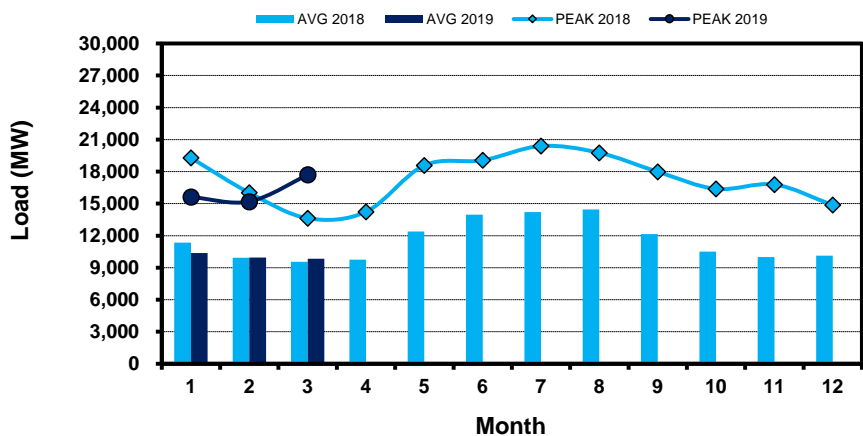
Houston Zone



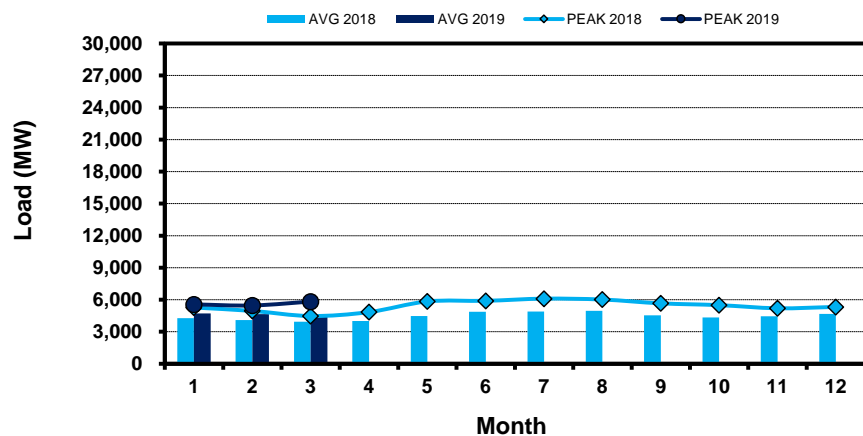
North Zone



South Zone



West Zone



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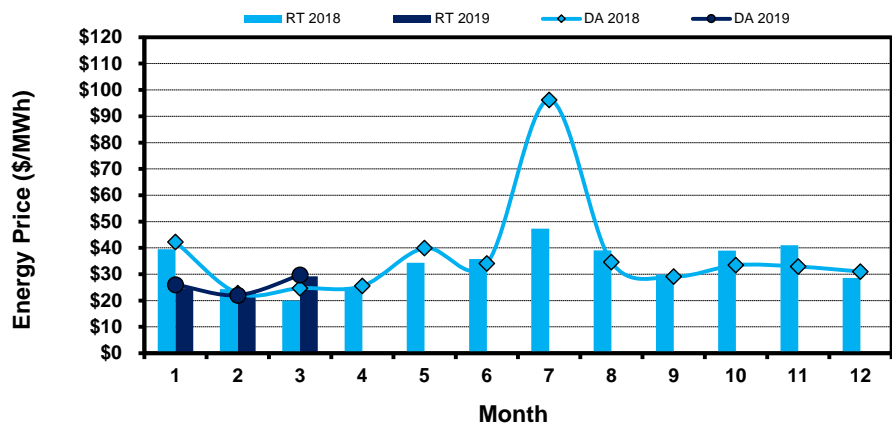
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Note: * Zonal load zone definition vs. Nodal comparable load zone definition: LZ_Houston=LZ_Houston; LZ_West=LZ_West; LZ_North=(LZ_North,LZ_RAYBN); LZ_South=(LZ_South,LZ_CPS,LZ_AEN,LZ_LCRA)

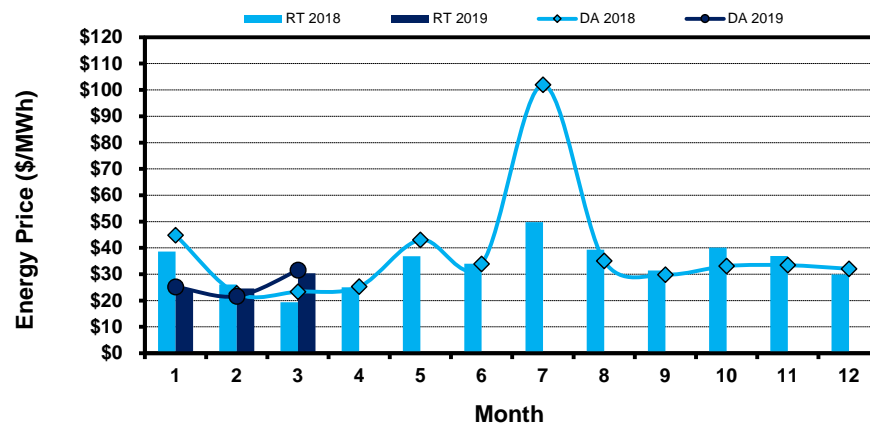
Load Zone Monthly Average Energy Price DA vs RT

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

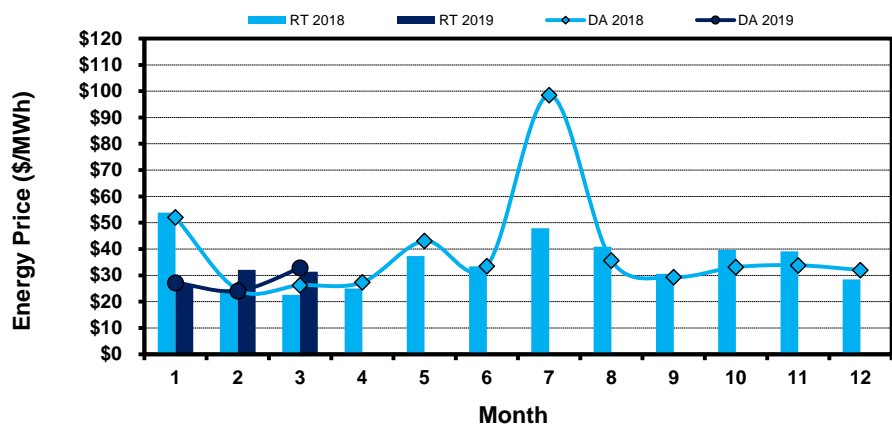
Houston Zone



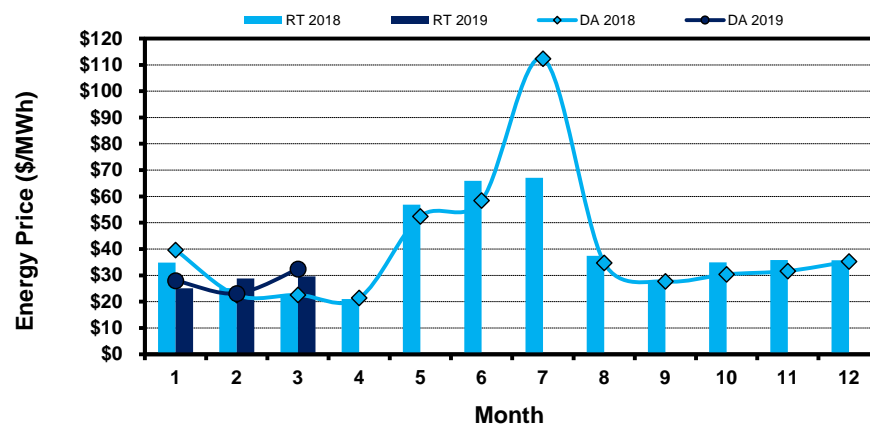
North Zone



South Zone



West Zone



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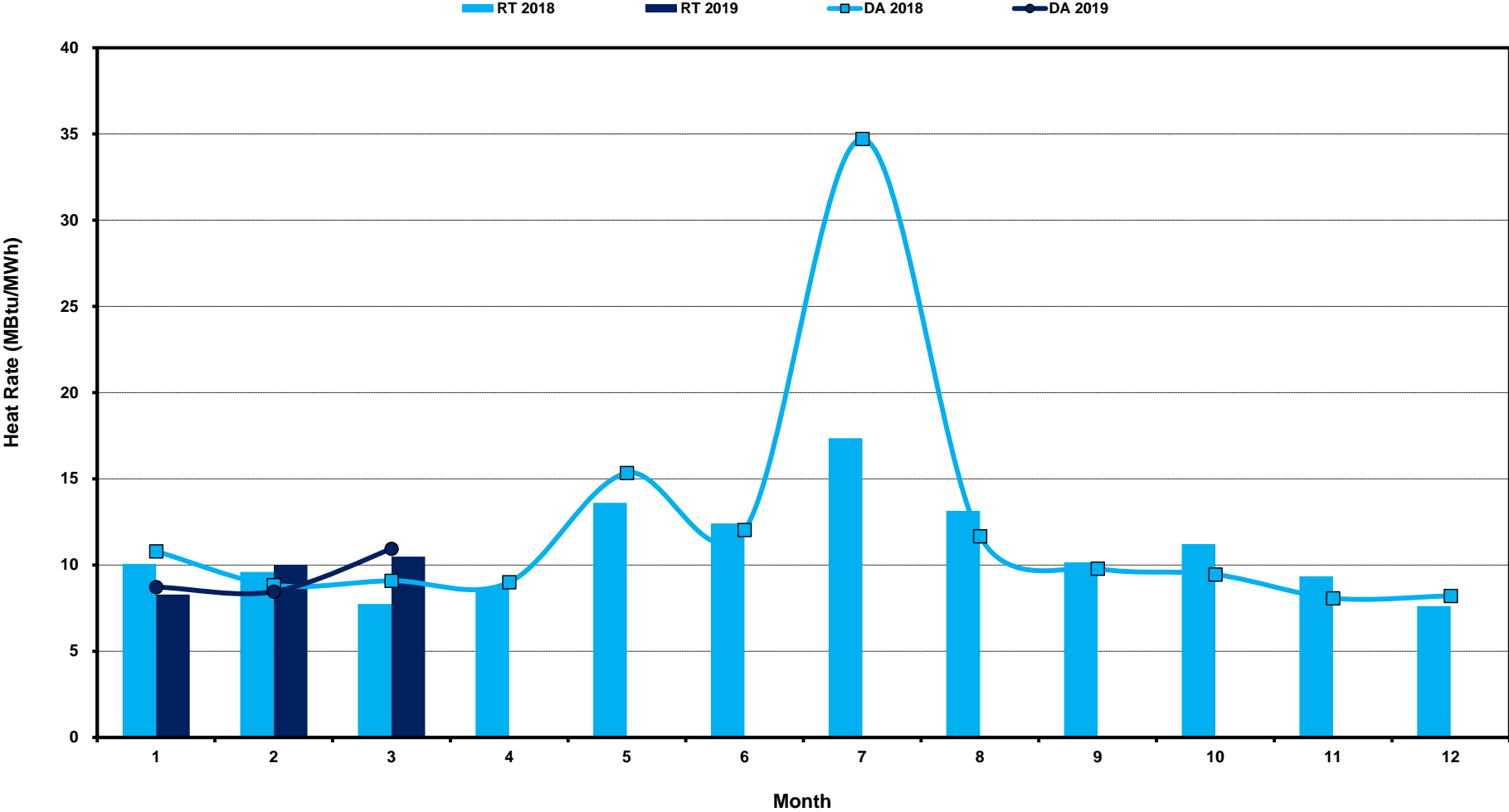
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Note: * Zonal load zone definition vs. Nodal comparable load zone definition: LZ_Houston=LZ_Houston; LZ_West=LZ_West; LZ_North=(LZ_North,LZ_RAYBN); LZ_South=(LZ_South,LZ_CPS,LZ_AEN,LZ_LCRA)

ERCOT-wide Monthly Implied Heat Rate DA vs RT

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



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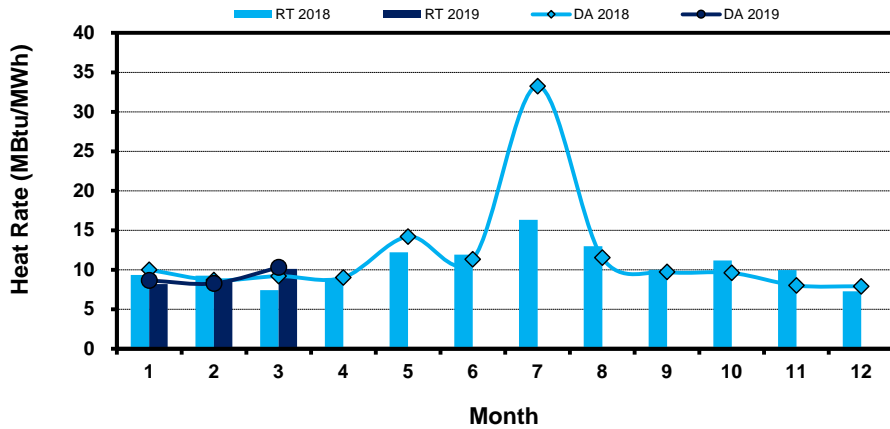
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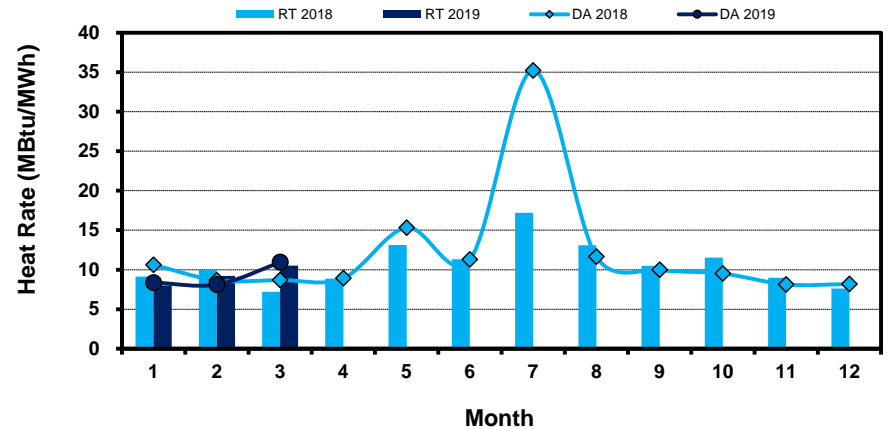
Load Zone Monthly Implied Heat Rate DA vs RT

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

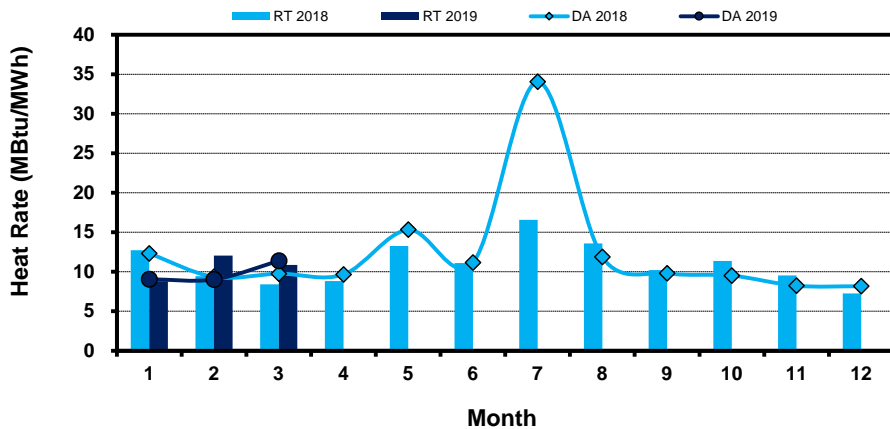
Houston Zone



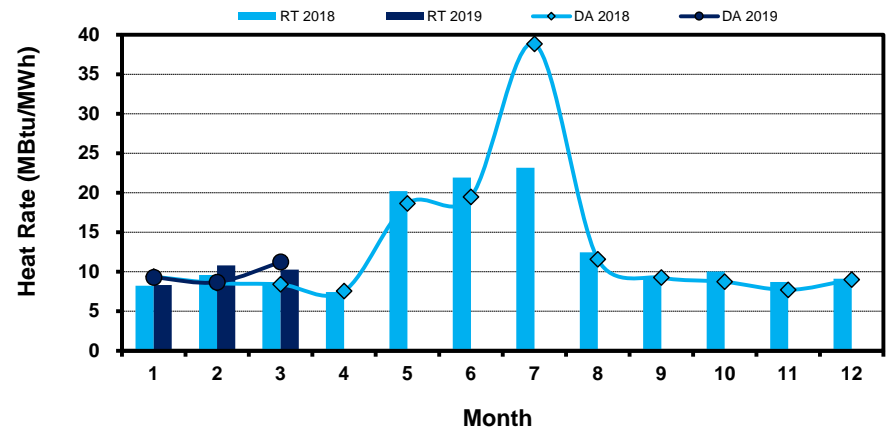
North Zone



South Zone



West Zone



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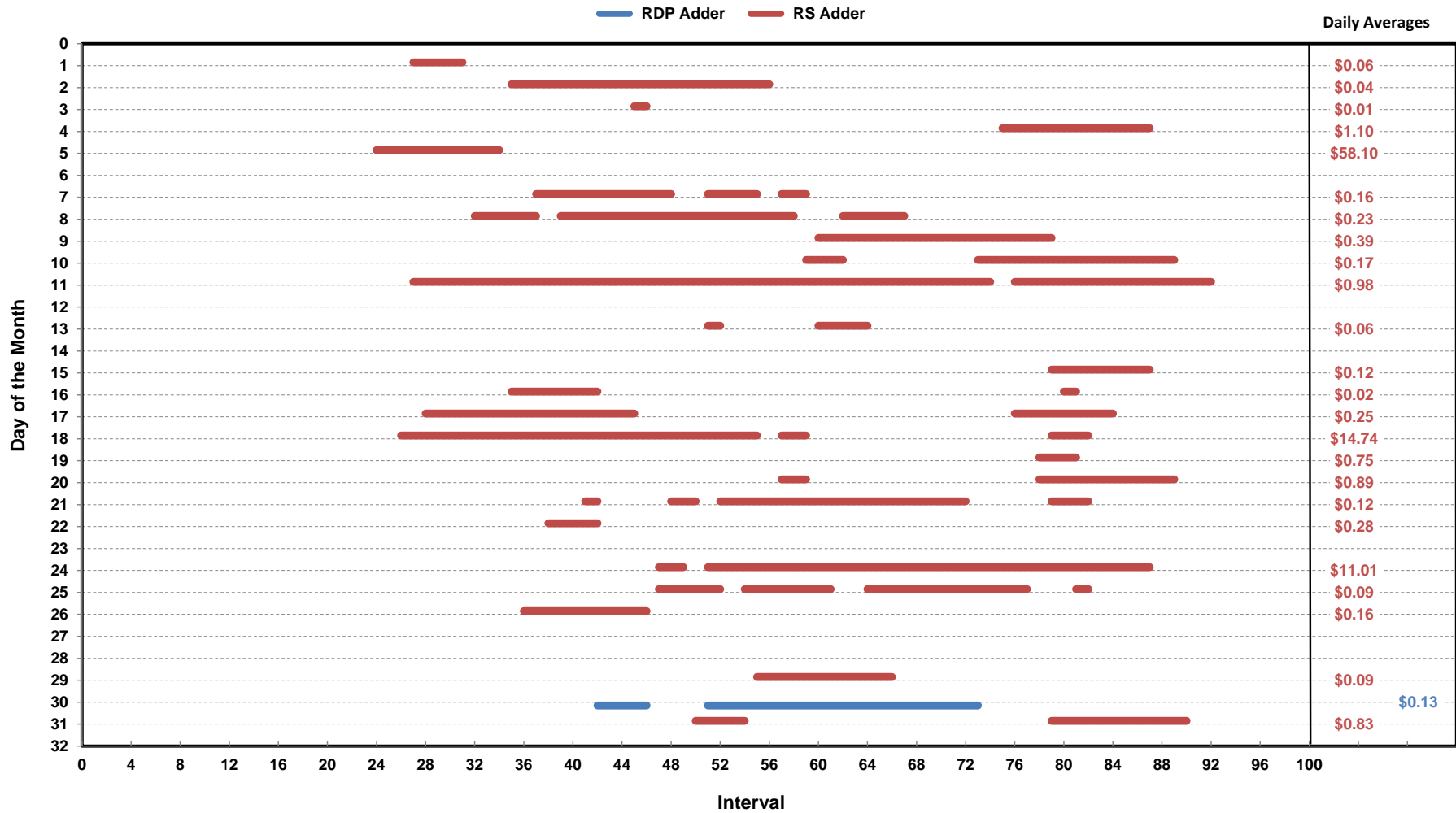
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Note: * Zonal load zone definition vs. Nodal comparable load zone definition: LZ_Houston=LZ_Houston; LZ_West=LZ_West; LZ_North=(LZ_North,LZ_RAYBN); LZ_South=(LZ_South,LZ_CPS,LZ_AEN,LZ_LCRA)

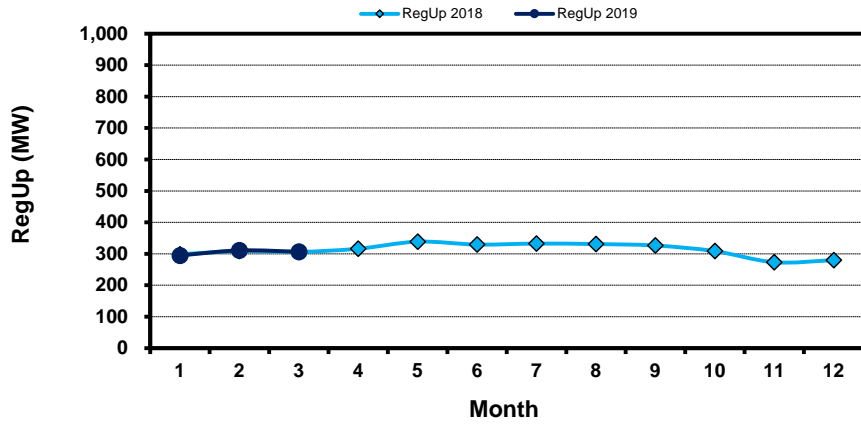
Daily ORDC Adders Average Values and Interval Duration Mar-2019



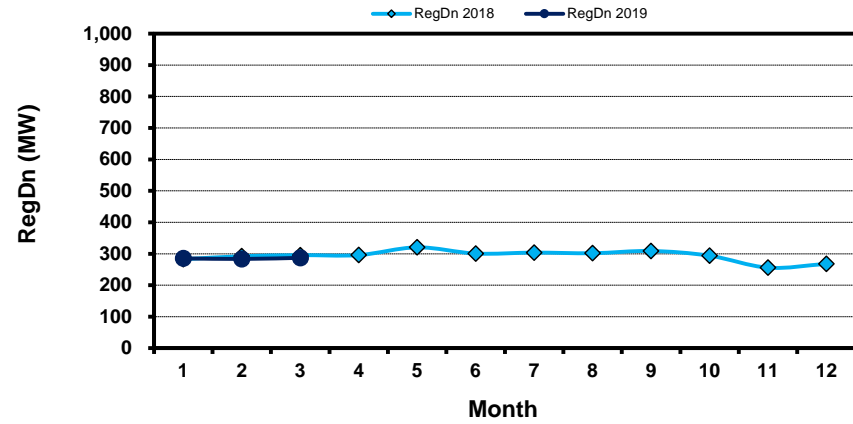
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Monthly Average of Ancillary Services Required MW

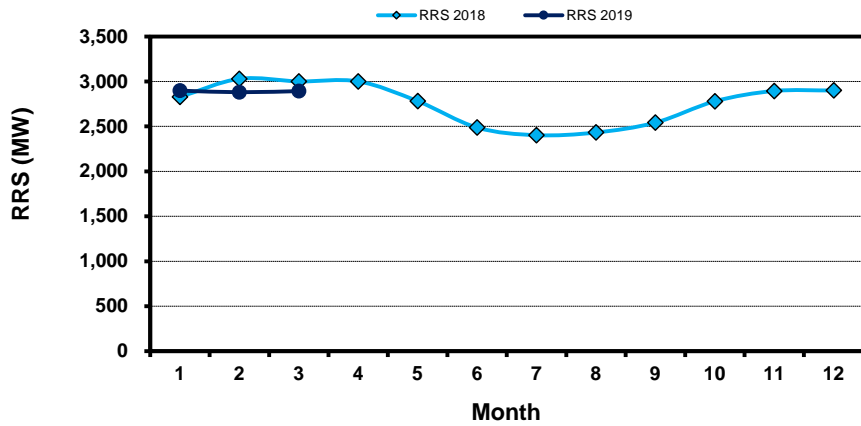
Regulation Up



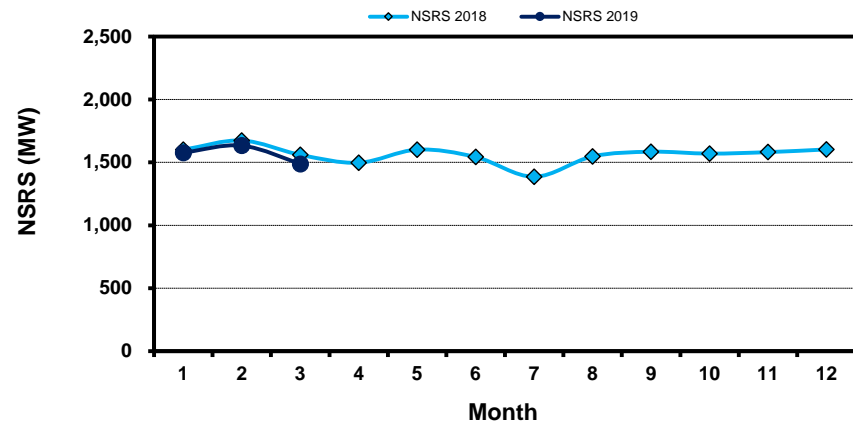
Regulation Down



Responsive Reserve



Non-Spin Reserve



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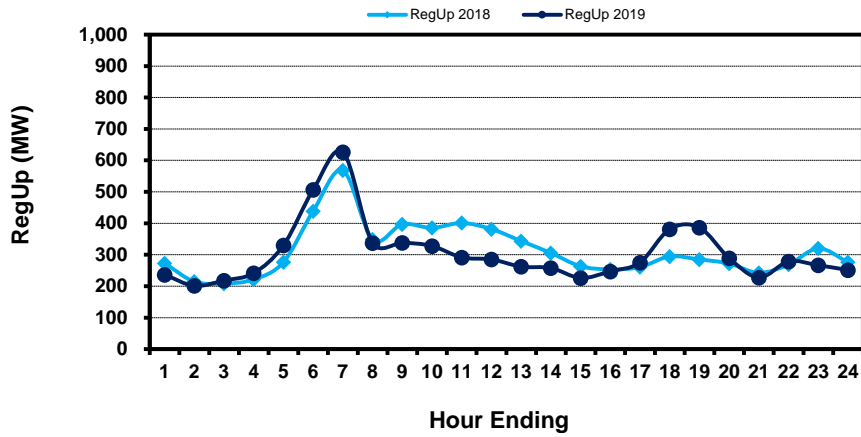
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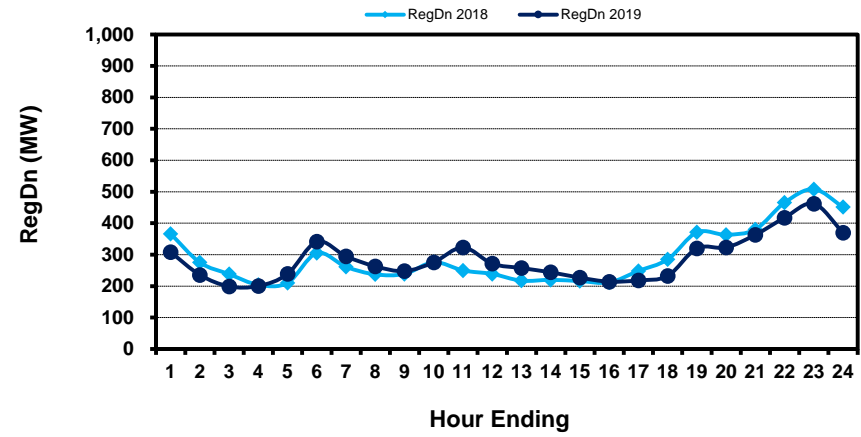
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Hourly Average of Ancillary Services Required MW

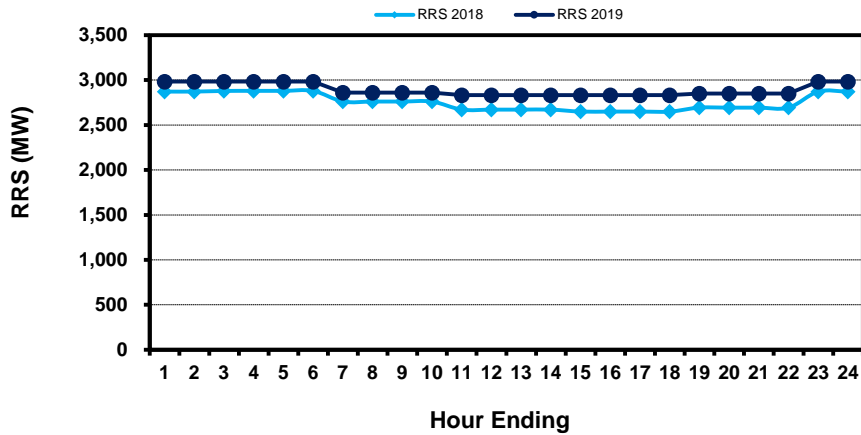
Regulation Up



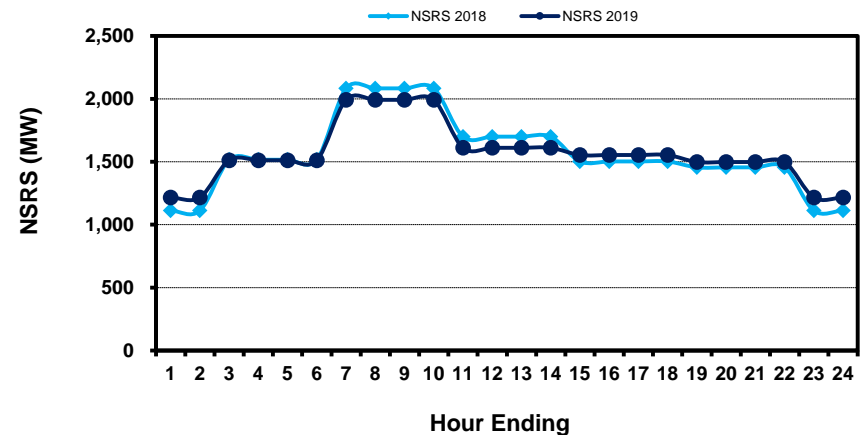
Regulation Down



Responsive Reserve



Non-Spin Reserve



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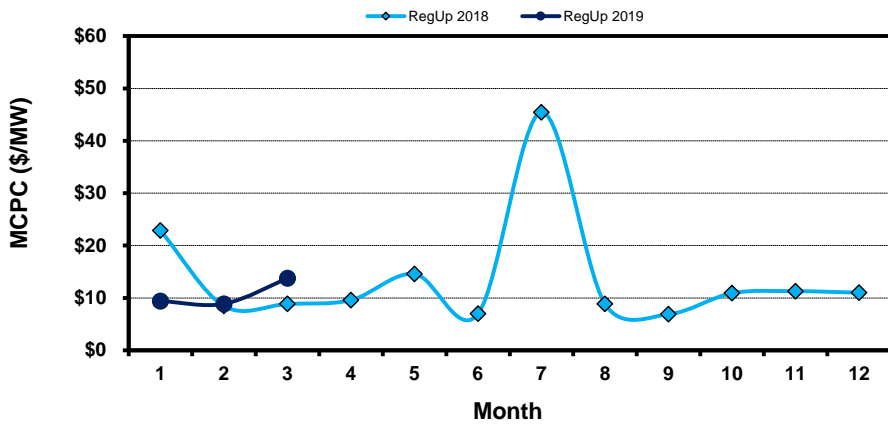
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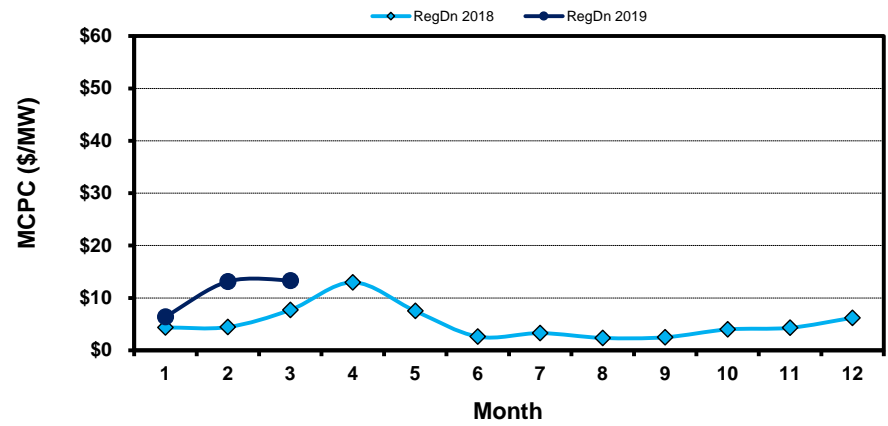
Monthly Average Ancillary Services Price

(weighted by A/S Quantities Required)

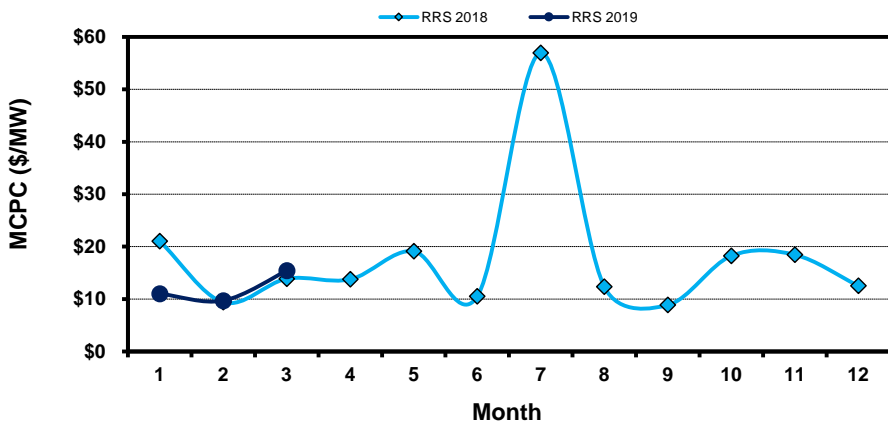
Regulation Up



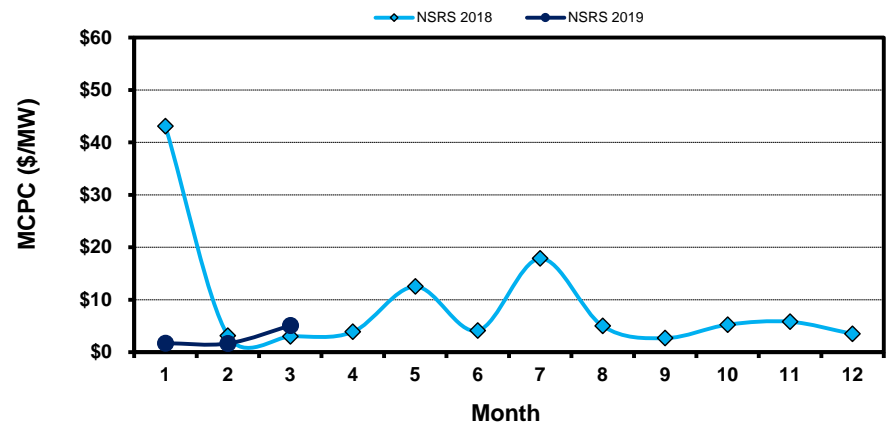
Regulation Down



Responsive Reserve



Non-Spin Reserve



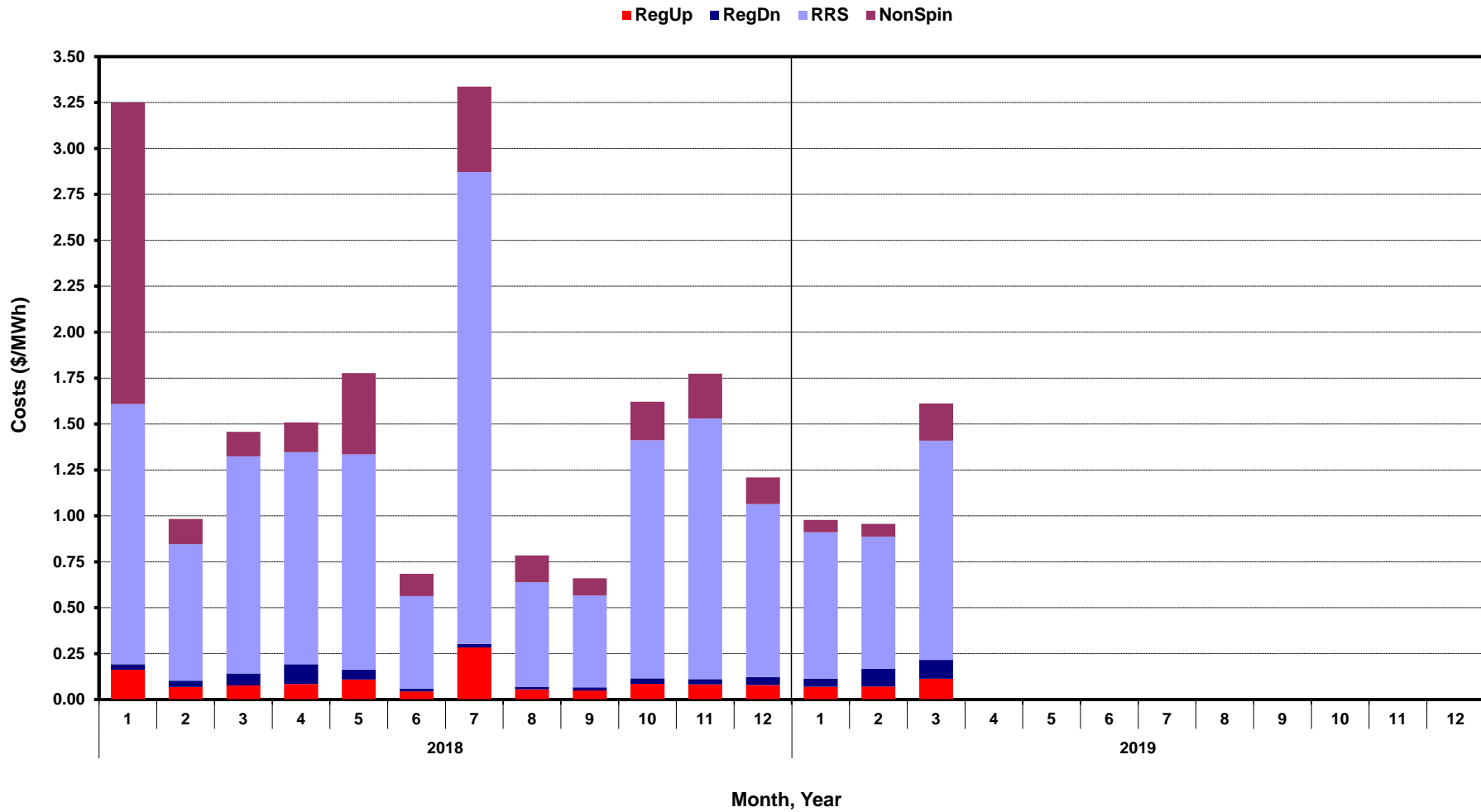
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Monthly Average A/S Cost per MWh Load



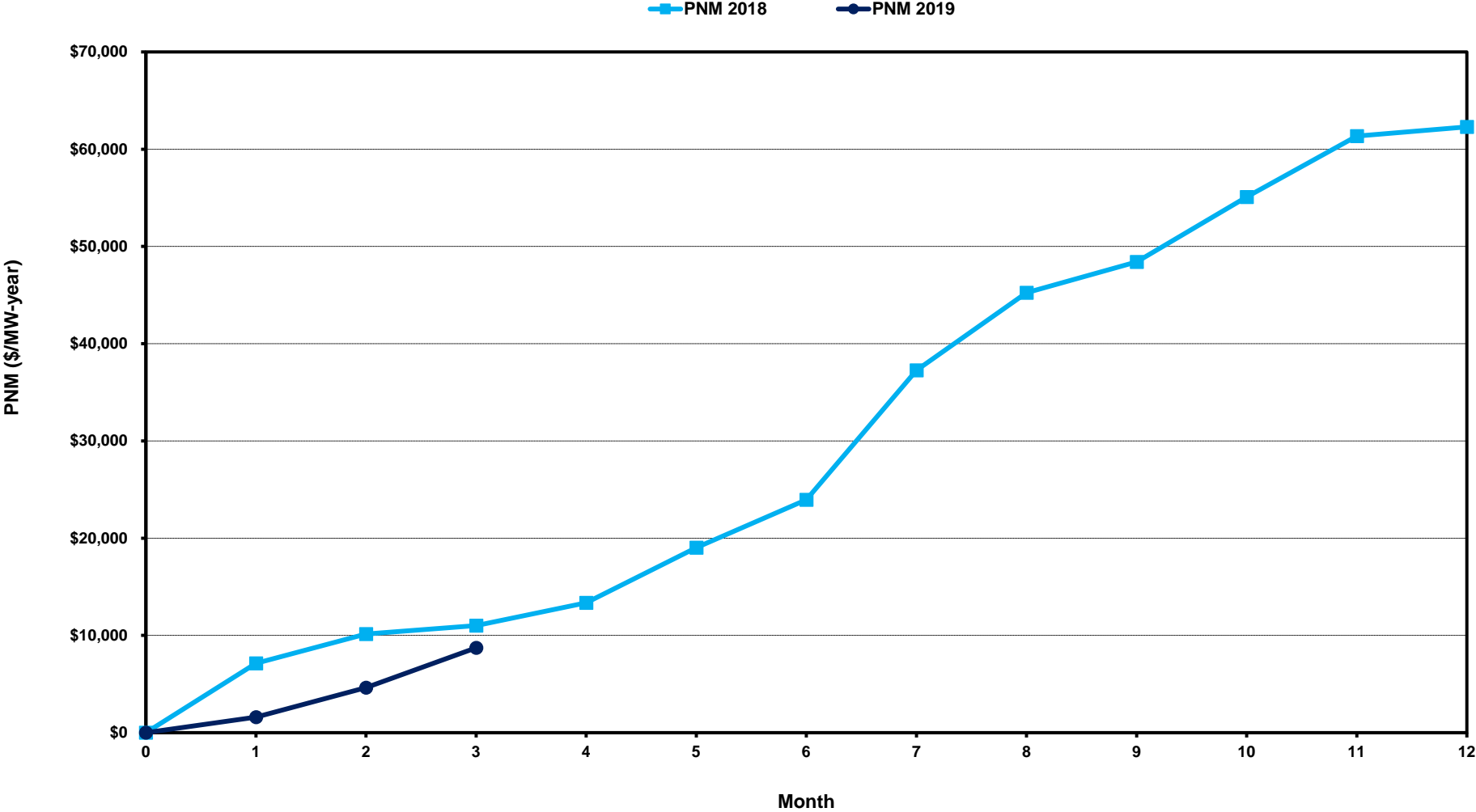
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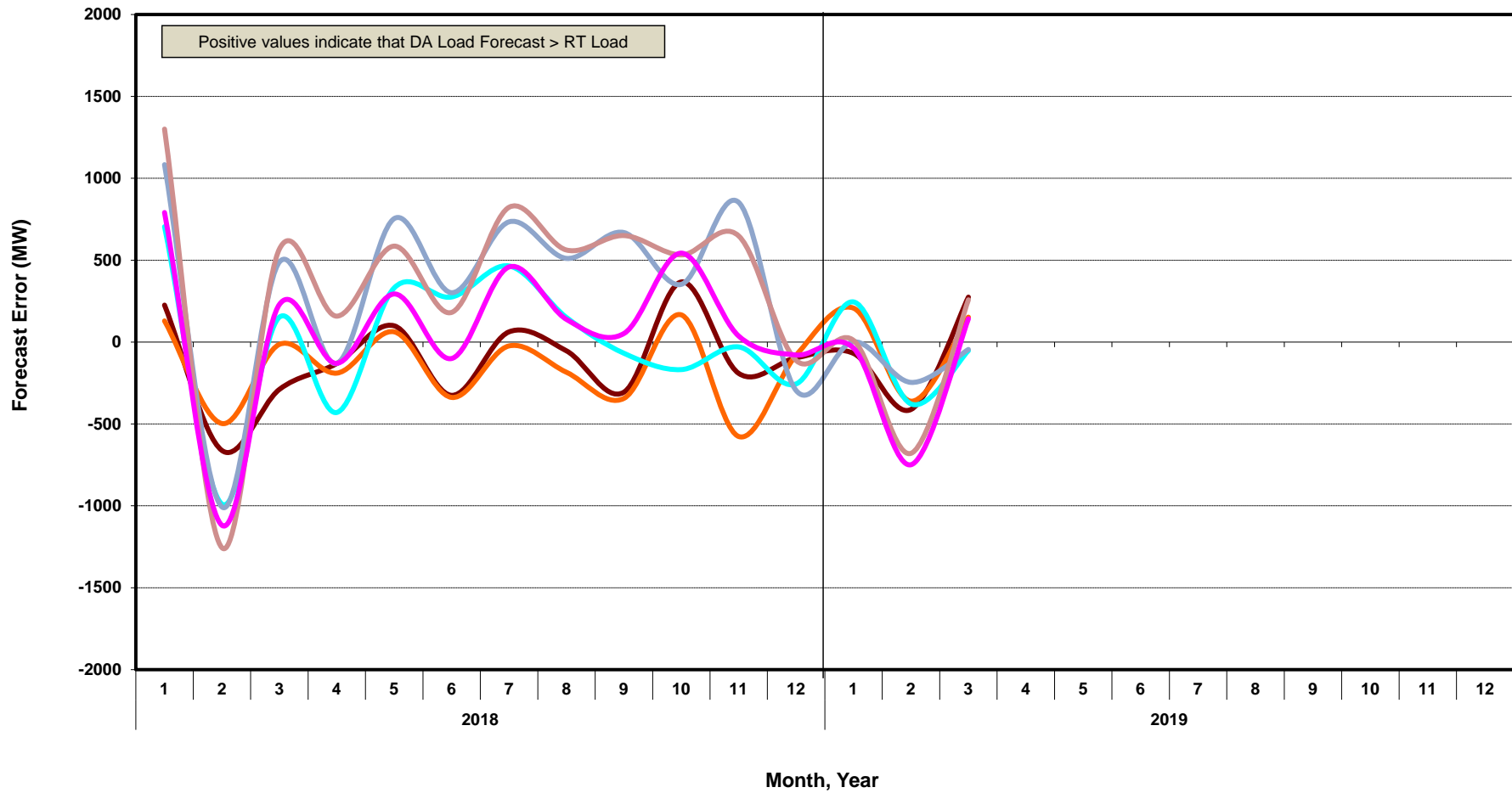
ERCOT-wide Cumulative Peaker Net Margin



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DA vs. RT Load Forecast Error by Hour Ending

HE_1_4 HE_5_8 HE_9_12 HE_13_16 HE_17_20 HE_21_24



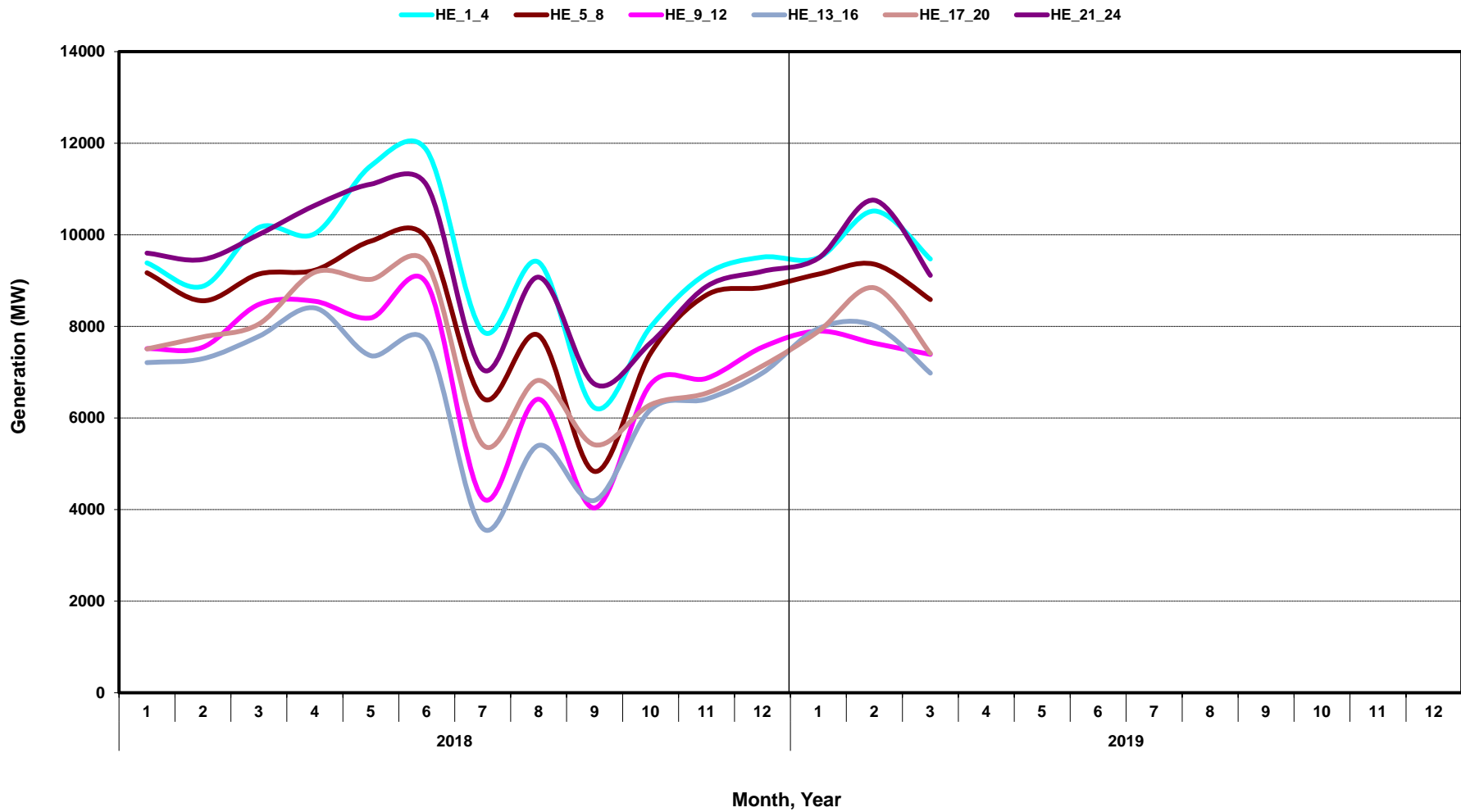
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Monthly Average of Wind Generation by Hour Ending



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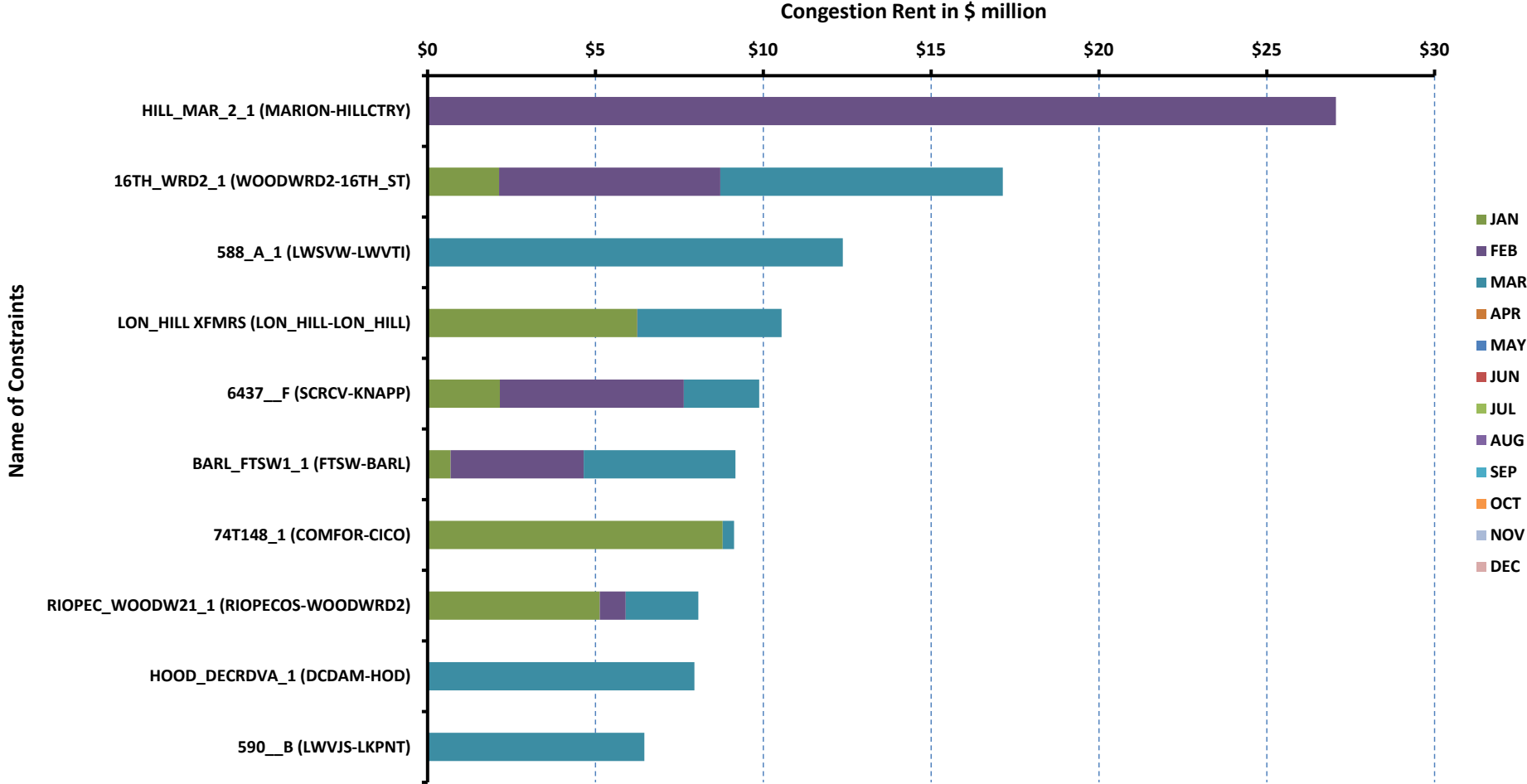
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RT Congestion Constraint Rankings - 1

Top 10 Constraints by Total Congestion Value - 2019

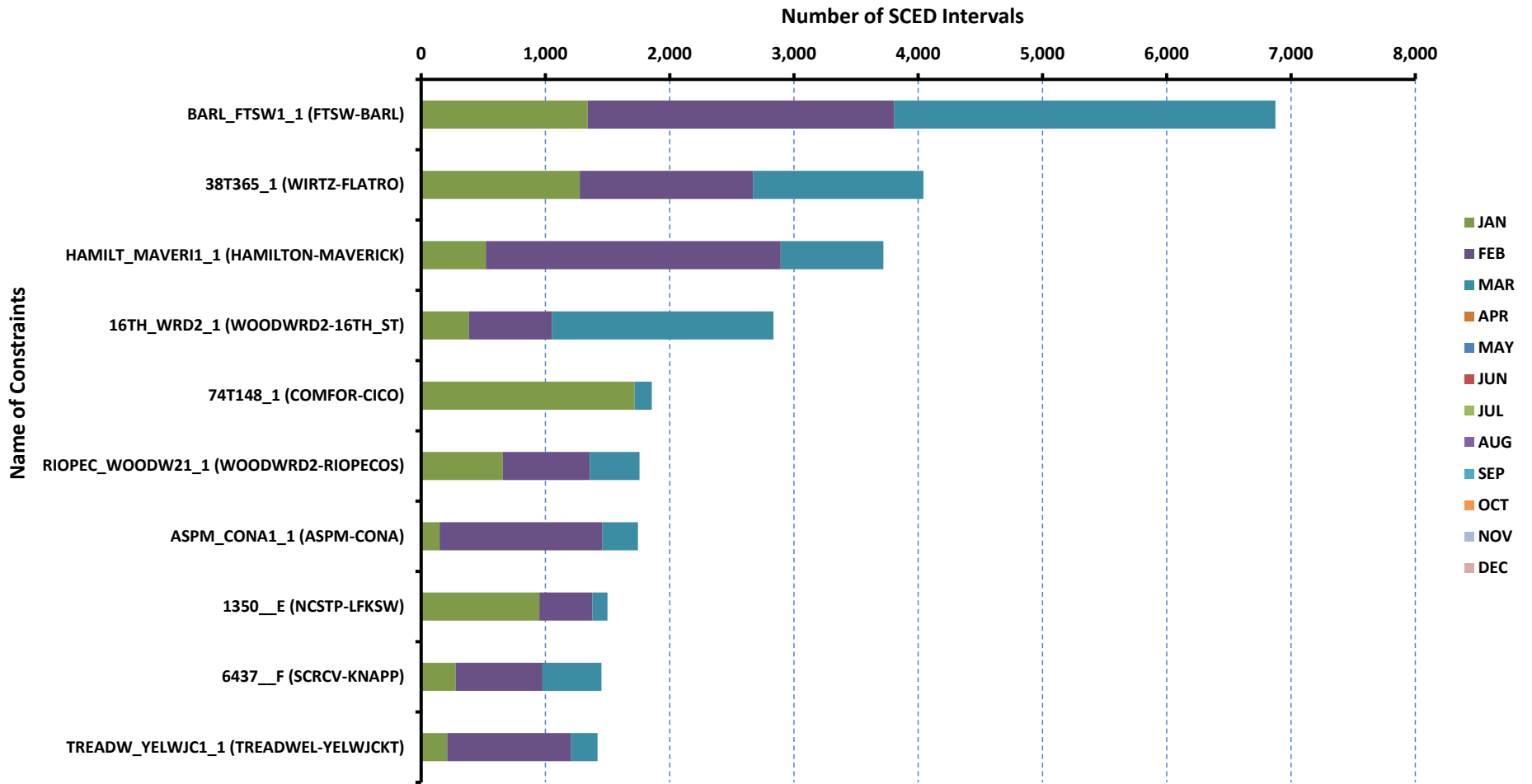


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RT Congestion Constraint Rankings - 2

Top 10 Constraints by Binding Frequency - 2019



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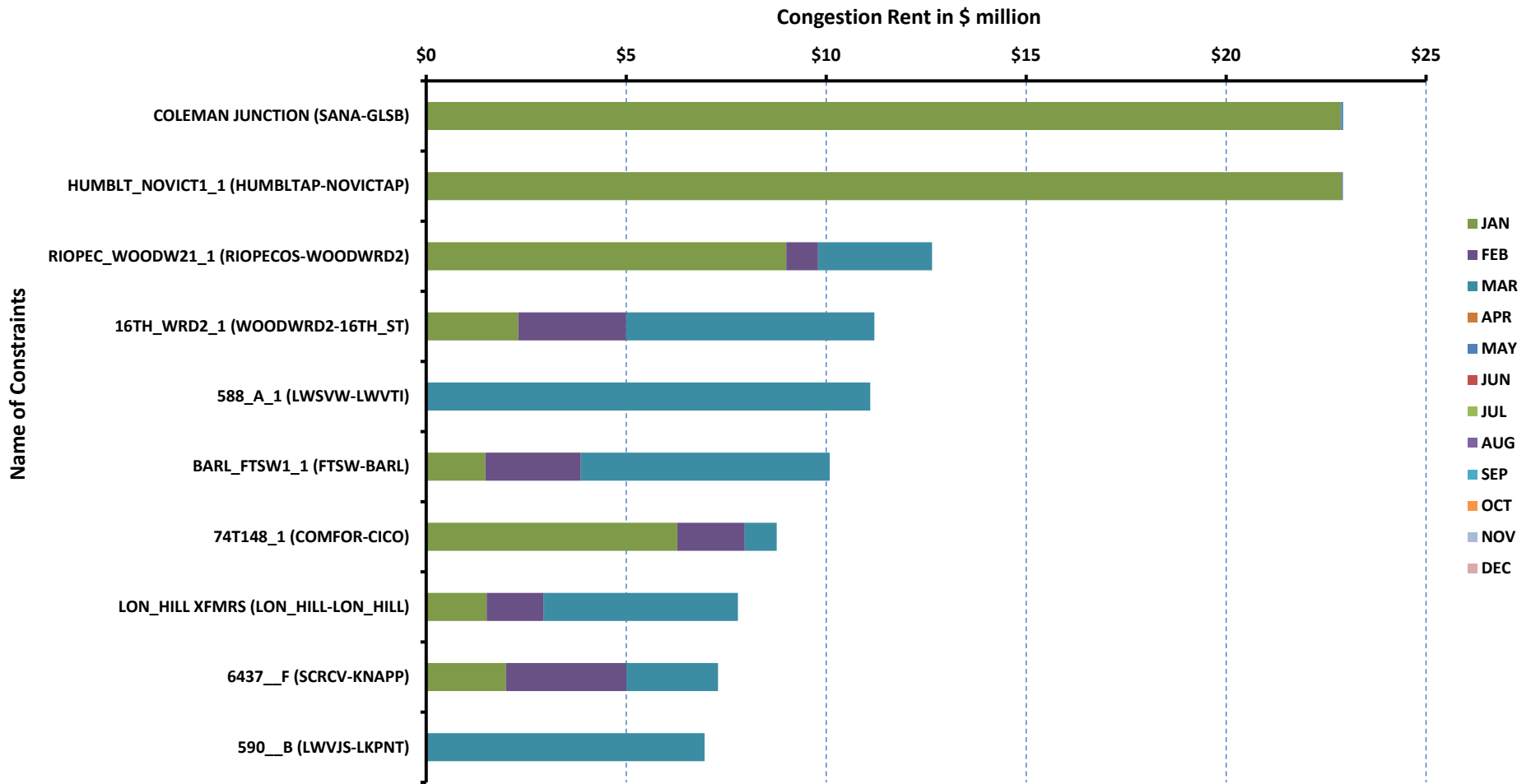
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DA Congestion Constraint Rankings - 1

Top 10 Constraints by Total Congestion Value - 2019



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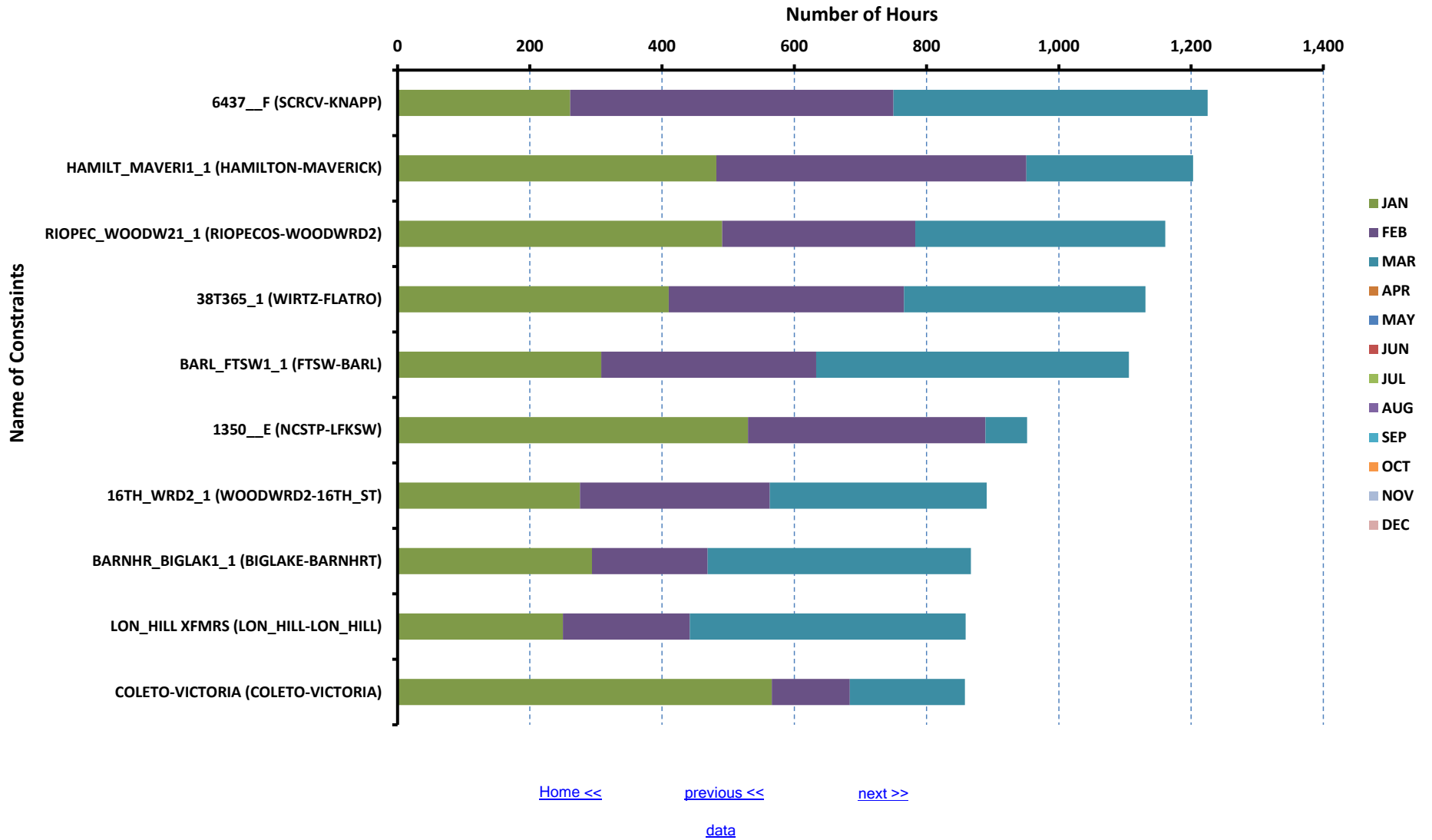
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DA Congestion Constraint Rankings - 2

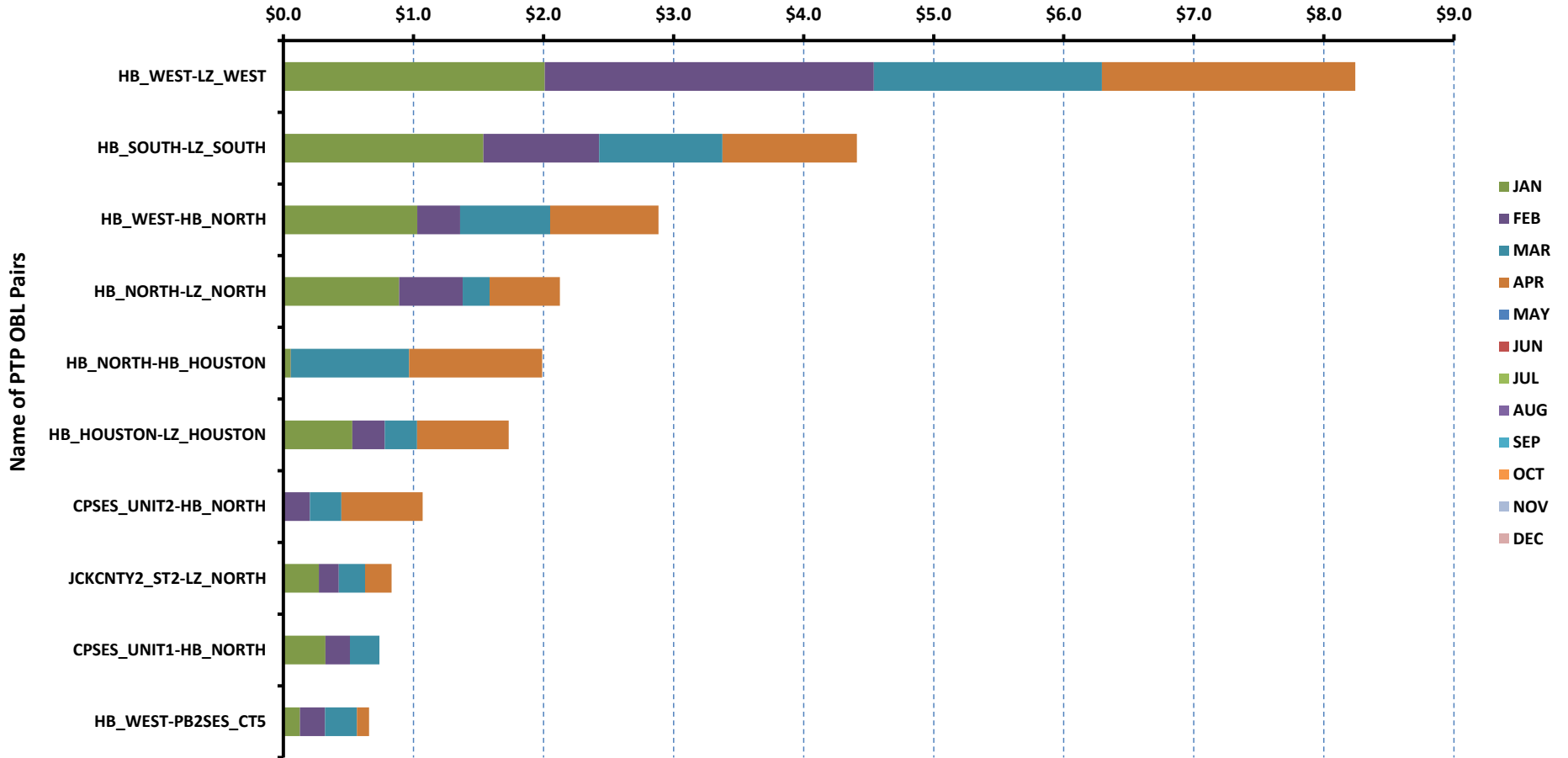
Top 10 Constraints by Binding Frequency - 2019



Top 10 CRR Pairs Ranked by Monthly Auction Values - 1

Top 10 PTP Obligations by Total Transaction Value - 2019

Total Transaction Value in \$ million



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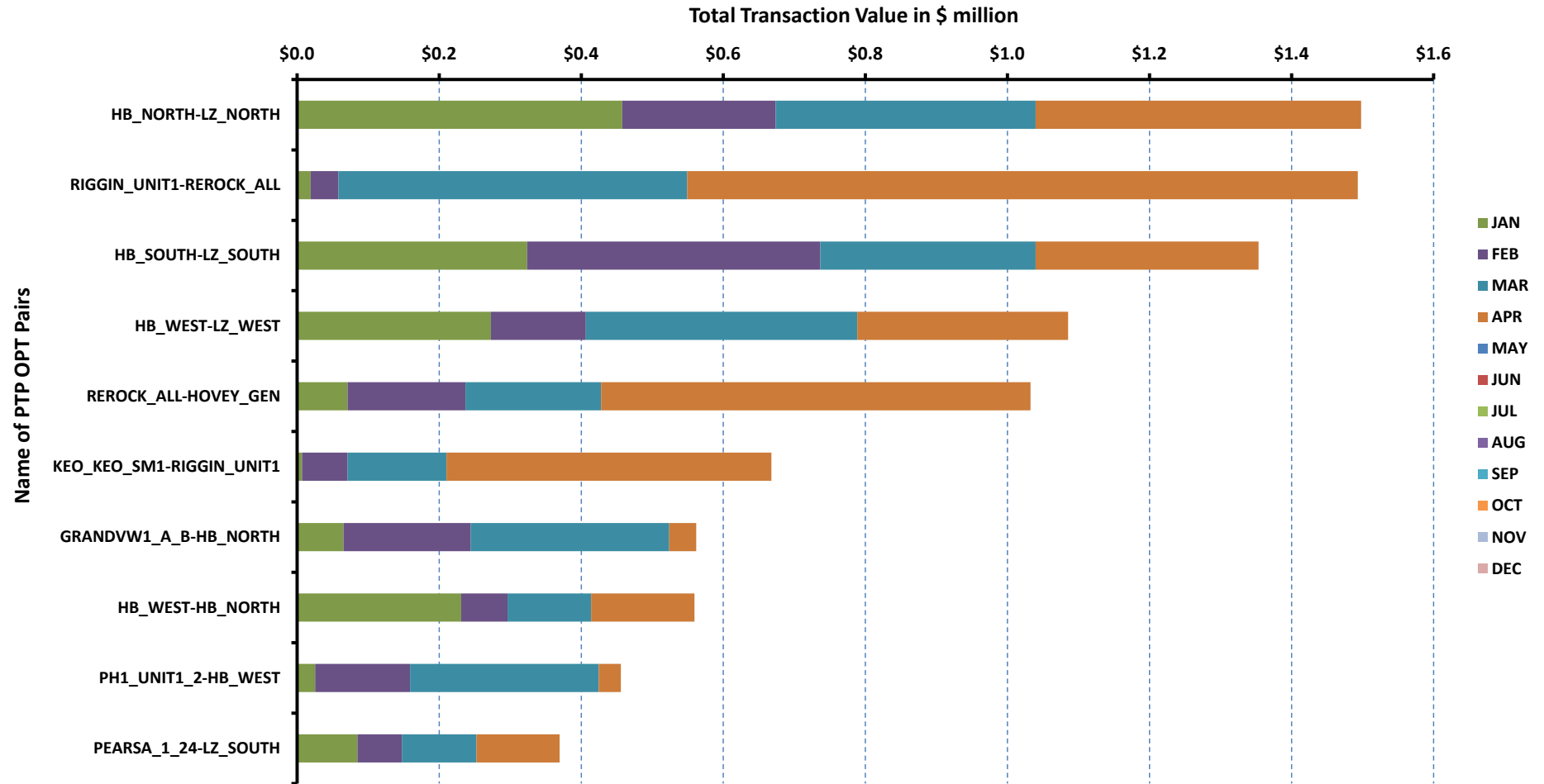
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Top 10 CRR Pairs Ranked by Monthly Auction Values - 2

Top 10 PTP Options by Total Transaction Value - 2019



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ERCOT-wide Avg. Energy Price - DA vs. RT			
year	month	dam_spp	rtm_spp
2018	1	\$ 45.63	\$ 42.56
	2	\$ 23.21	\$ 25.24
	3	\$ 24.42	\$ 20.80
	4	\$ 25.49	\$ 24.54
	5	\$ 43.15	\$ 38.28
	6	\$ 36.15	\$ 37.29
	7	\$ 100.46	\$ 50.22
	8	\$ 35.08	\$ 39.51
	9	\$ 29.31	\$ 30.40
	10	\$ 32.92	\$ 39.09
	11	\$ 33.19	\$ 38.44
	12	\$ 32.19	\$ 29.90
2019	1	\$ 26.27	\$ 24.96
	2	\$ 22.55	\$ 26.68
	3	\$ 31.56	\$ 30.24
	4	\$ -	\$ -
	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	
2018	1	14,841	27,183	19,284	5,270	10,346	16,082	11,354	4,263	
	2	12,660	22,124	16,019	4,952	9,740	14,553	9,933	4,101	
	3	12,755	16,224	13,632	4,474	9,738	12,000	9,549	3,934	
	4	14,008	16,467	14,236	4,842	9,773	12,219	9,759	4,009	
	5	18,179	25,425	18,585	5,840	12,436	16,042	12,382	4,477	
	6	18,501	27,219	19,059	5,898	13,746	19,328	13,975	4,872	
	7	18,885	29,606	20,395	6,101	14,046	20,118	14,207	4,890	
	8	19,311	27,221	19,761	6,017	14,084	19,181	14,463	4,964	
	9	17,980	25,161	17,984	5,661	12,364	16,072	12,140	4,532	
	10	16,718	22,540	16,381	5,492	10,918	13,392	10,515	4,334	
	11	14,993	22,122	16,789	5,200	9,738	13,449	9,988	4,448	
	12	12,540	20,244	14,871	5,325	9,601	14,196	10,136	4,677	
2019	1	13,256	21,937	15,623	5,564	9,784	15,231	10,366	4,713	
	2	12,957	22,873	15,196	5,462	9,747	14,474	9,959	4,644	
	3	13,930	24,193	17,715	5,832	9,778	13,225	9,831	4,553	
	4	-	-	-	-	-	-	-	-	-
	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	
2018	1	\$ 39.47	\$ 38.65	\$ 53.81	\$ 34.86	\$ 42.24	\$ 44.85	\$ 52.06	\$ 39.65	
	2	\$ 24.34	\$ 26.14	\$ 24.82	\$ 25.22	\$ 22.81	\$ 22.74	\$ 24.57	\$ 22.50	
	3	\$ 19.97	\$ 19.38	\$ 22.64	\$ 22.79	\$ 24.70	\$ 23.37	\$ 26.22	\$ 22.58	
	4	\$ 24.84	\$ 25.06	\$ 25.02	\$ 21.02	\$ 25.55	\$ 25.28	\$ 27.35	\$ 21.42	
	5	\$ 34.38	\$ 36.88	\$ 37.31	\$ 56.83	\$ 39.95	\$ 43.08	\$ 43.09	\$ 52.45	
	6	\$ 35.79	\$ 33.97	\$ 33.39	\$ 65.89	\$ 34.05	\$ 33.91	\$ 33.53	\$ 58.47	
	7	\$ 47.28	\$ 49.79	\$ 47.92	\$ 67.06	\$ 96.21	\$ 101.92	\$ 98.48	\$ 112.38	
	8	\$ 39.07	\$ 39.32	\$ 40.89	\$ 37.46	\$ 34.63	\$ 35.04	\$ 35.67	\$ 34.80	
	9	\$ 29.92	\$ 31.42	\$ 30.61	\$ 27.56	\$ 29.11	\$ 29.87	\$ 29.36	\$ 27.71	
	10	\$ 38.98	\$ 40.11	\$ 39.60	\$ 34.97	\$ 33.45	\$ 33.12	\$ 33.15	\$ 30.40	
	11	\$ 40.98	\$ 36.94	\$ 39.14	\$ 35.79	\$ 32.90	\$ 33.42	\$ 33.83	\$ 31.66	
	12	\$ 28.56	\$ 29.93	\$ 28.42	\$ 35.75	\$ 31.02	\$ 32.07	\$ 32.04	\$ 35.31	
2019	1	\$ 24.67	\$ 24.09	\$ 26.47	\$ 25.06	\$ 26.05	\$ 25.21	\$ 27.25	\$ 28.00	
	2	\$ 23.30	\$ 24.56	\$ 32.09	\$ 28.78	\$ 22.06	\$ 21.64	\$ 24.07	\$ 23.14	
	3	\$ 29.21	\$ 30.37	\$ 31.38	\$ 29.61	\$ 29.77	\$ 31.60	\$ 32.87	\$ 32.45	
	4	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	5	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	6	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
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	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
2018	1	\$ 4.23	\$ 42.56	10.07	\$ 45.63	10.79
	2	\$ 2.63	\$ 25.24	9.61	\$ 23.21	8.83
	3	\$ 2.69	\$ 20.80	7.74	\$ 24.42	9.09
	4	\$ 2.83	\$ 24.54	8.67	\$ 25.49	9.00
	5	\$ 2.81	\$ 38.28	13.61	\$ 43.15	15.34
	6	\$ 3.00	\$ 37.29	12.42	\$ 36.15	12.03
	7	\$ 2.89	\$ 50.22	17.35	\$ 100.46	34.71
	8	\$ 3.01	\$ 39.51	13.14	\$ 35.08	11.67
	9	\$ 2.99	\$ 30.40	10.16	\$ 29.31	9.79
	10	\$ 3.48	\$ 39.09	11.22	\$ 32.92	9.45
	11	\$ 4.11	\$ 38.44	9.35	\$ 33.19	8.07
	12	\$ 3.92	\$ 29.90	7.62	\$ 32.19	8.21
2019	1	\$ 3.01	\$ 24.96	8.29	\$ 26.27	8.73
	2	\$ 2.67	\$ 26.68	10.01	\$ 22.55	8.46
	3	\$ 2.88	\$ 30.24	10.48	\$ 31.56	10.94
	4	\$ -	\$ -	-	\$ -	-
	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
2018	1	9.99	12.31	10.61	9.38	9.34	12.73	9.14	8.25
	2	8.68	9.35	8.65	8.56	9.26	9.44	9.95	9.60
	3	9.19	9.76	8.70	8.40	7.43	8.42	7.21	8.48
	4	9.02	9.66	8.93	7.57	8.77	8.84	8.85	7.42
	5	14.20	15.32	15.32	18.65	12.22	13.27	13.11	20.20
	6	11.34	11.16	11.29	19.47	11.92	11.12	11.31	21.94
	7	33.25	34.03	35.22	38.83	16.34	16.56	17.20	23.17
	8	11.52	11.86	11.66	11.57	13.00	13.60	13.08	12.46
	9	9.73	9.81	9.98	9.26	10.00	10.23	10.50	9.21
	10	9.60	9.52	9.51	8.73	11.19	11.37	11.52	10.04
	11	8.01	8.23	8.13	7.70	9.97	9.52	8.99	8.71
	12	7.91	8.17	8.18	9.00	7.28	7.25	7.63	9.12
2019	1	8.65	9.05	8.37	9.30	8.19	8.79	8.00	8.32
	2	8.28	9.03	8.12	8.68	8.74	12.04	9.22	10.80
	3	10.32	11.39	10.95	11.25	10.13	10.88	10.53	10.27
	4	-	-	-	-	-	-	-	-
	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
2019	3	1	\$ 0.06	\$ -	5	0	80	90
2019	3	2	\$ 0.04	\$ -	22	0	80	90
2019	3	3	\$ 0.01	\$ -	2	0	80	90
2019	3	4	\$ 1.10	\$ -	13	0	80	90
2019	3	5	\$ 58.10	\$ -	11	0	80	90
2019	3	6	\$ -	\$ -	0	0	80	90
2019	3	7	\$ 0.16	\$ -	21	0	80	90
2019	3	8	\$ 0.23	\$ -	33	0	80	90
2019	3	9	\$ 0.39	\$ -	21	0	80	90
2019	3	10	\$ 0.17	\$ -	21	0	80	90
2019	3	11	\$ 0.98	\$ -	65	0	80	90
2019	3	12	\$ -	\$ -	0	0	80	90
2019	3	13	\$ 0.06	\$ -	8	0	80	90
2019	3	14	\$ -	\$ -	0	0	80	90
2019	3	15	\$ 0.12	\$ -	9	0	80	90
2019	3	16	\$ 0.02	\$ -	10	0	80	90
2019	3	17	\$ 0.25	\$ -	29	0	80	90
2019	3	18	\$ 14.74	\$ -	37	0	80	90
2019	3	19	\$ 0.75	\$ -	5	0	80	90
2019	3	20	\$ 0.89	\$ -	15	0	80	90
2019	3	21	\$ 0.12	\$ -	30	0	80	90
2019	3	22	\$ 0.28	\$ -	5	0	80	90
2019	3	23	\$ -	\$ -	0	0	80	90
2019	3	24	\$ 11.01	\$ -	40	0	80	90
2019	3	25	\$ 0.09	\$ -	30	0	80	90
2019	3	26	\$ 0.16	\$ -	11	0	80	90
2019	3	27	\$ -	\$ -	0	0	80	90
2019	3	28	\$ -	\$ -	0	0	80	90
2019	3	29	\$ 0.09	\$ -	12	0	80	90
2019	3	30	\$ -	\$ 0.13	0	29	80	90
2019	3	31	\$ 0.83	\$ -	18	0	80	90

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Monthly Average of Ancillary Services Required MW					
year	month	ASMW_REGDN	ASMW_NSPIN	ASMW_RRS	ASMW_REGUP
2018	1	283	1,601	2,829	299
	2	292	1,674	3,030	309
	3	296	1,560	3,001	306
	4	296	1,497	3,001	316
	5	320	1,601	2,782	339
	6	301	1,543	2,488	330
	7	304	1,386	2,403	333
	8	302	1,548	2,433	331
	9	309	1,585	2,543	326
	10	294	1,570	2,780	309
	11	256	1,582	2,895	273
	12	268	1,603	2,900	280
2019	1	285	1,578	2,898	295
	2	283	1,634	2,881	311
	3	287	1,487	2,893	306
	4	-	-	-	-
	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
2018	1	366	1,112	2,872	273
	2	275	1,112	2,872	215
	3	238	1,516	2,880	208
	4	204	1,516	2,880	221
	5	210	1,516	2,880	276
	6	305	1,516	2,880	439
	7	261	2,083	2,761	568
	8	237	2,083	2,761	348
	9	239	2,083	2,761	397
	10	276	2,083	2,761	385
	11	250	1,700	2,672	401
	12	239	1,700	2,672	382
	13	217	1,700	2,672	344
	14	220	1,700	2,672	306
	15	216	1,503	2,650	263
	16	212	1,503	2,650	254
	17	248	1,503	2,650	261
	18	285	1,503	2,650	295
	19	371	1,456	2,694	285
	20	363	1,456	2,694	272
	21	380	1,456	2,694	242
	22	465	1,456	2,694	269
	23	508	1,112	2,872	320
	24	451	1,112	2,872	276
2019	1	308	1,216	2,984	237
	2	236	1,216	2,984	201
	3	199	1,512	2,984	218
	4	200	1,512	2,984	242
	5	239	1,512	2,984	330
	6	341	1,512	2,984	507
	7	295	1,992	2,861	626
	8	263	1,992	2,861	338
	9	248	1,992	2,861	338
	10	276	1,992	2,861	328
	11	323	1,611	2,833	291
	12	271	1,611	2,833	285
	13	257	1,611	2,833	262
	14	244	1,611	2,833	258
	15	227	1,554	2,833	226
	16	214	1,554	2,833	247
	17	218	1,554	2,833	275
	18	232	1,554	2,833	382
	19	320	1,498	2,851	386
	20	323	1,498	2,851	289
	21	363	1,498	2,851	227
	22	417	1,498	2,851	279
	23	462	1,216	2,984	267
	24	370	1,216	2,984	251

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Monthly Average Ancillary Services Price					
year	month	MCPC_REGDN	MCPC_NSPIN	MCPC_RRS	MCPC_REGUP
2018	1	\$ 4.36	\$ 43.10	\$ 21.06	\$ 22.87
	2	\$ 4.45	\$ 3.14	\$ 9.40	\$ 8.48
	3	\$ 7.71	\$ 3.01	\$ 13.87	\$ 8.86
	4	\$ 12.98	\$ 3.86	\$ 13.76	\$ 9.59
	5	\$ 7.51	\$ 12.51	\$ 19.12	\$ 14.58
	6	\$ 2.62	\$ 4.10	\$ 10.51	\$ 6.98
	7	\$ 3.28	\$ 17.86	\$ 56.96	\$ 45.45
	8	\$ 2.37	\$ 4.98	\$ 12.34	\$ 8.85
	9	\$ 2.49	\$ 2.67	\$ 8.86	\$ 6.90
	10	\$ 3.99	\$ 5.24	\$ 18.25	\$ 10.91
	11	\$ 4.30	\$ 5.80	\$ 18.44	\$ 11.28
	12	\$ 6.21	\$ 3.48	\$ 12.53	\$ 11.00
2019	1	\$ 6.43	\$ 1.71	\$ 11.01	\$ 9.40
	2	\$ 13.14	\$ 1.66	\$ 9.70	\$ 8.88
	3	\$ 13.34	\$ 5.10	\$ 15.43	\$ 13.77
	4	\$ -	\$ -	\$ -	\$ -
	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
2018	1	\$ 0.03	\$ 1.64	\$ 1.42	\$ 0.16
	2	\$ 0.03	\$ 0.14	\$ 0.74	\$ 0.07
	3	\$ 0.06	\$ 0.13	\$ 1.18	\$ 0.08
	4	\$ 0.11	\$ 0.16	\$ 1.16	\$ 0.08
	5	\$ 0.05	\$ 0.44	\$ 1.17	\$ 0.11
	6	\$ 0.02	\$ 0.12	\$ 0.50	\$ 0.04
	7	\$ 0.02	\$ 0.46	\$ 2.57	\$ 0.28
	8	\$ 0.01	\$ 0.15	\$ 0.57	\$ 0.06
	9	\$ 0.02	\$ 0.09	\$ 0.50	\$ 0.05
	10	\$ 0.03	\$ 0.21	\$ 1.30	\$ 0.09
	11	\$ 0.03	\$ 0.24	\$ 1.42	\$ 0.08
	12	\$ 0.04	\$ 0.14	\$ 0.94	\$ 0.08
2019	1	\$ 0.05	\$ 0.07	\$ 0.80	\$ 0.07
	2	\$ 0.10	\$ 0.07	\$ 0.72	\$ 0.07
	3	\$ 0.10	\$ 0.20	\$ 1.19	\$ 0.11
	4	\$ -	\$ -	\$ -	\$ -
	5	\$ -	\$ -	\$ -	\$ -
	6	\$ -	\$ -	\$ -	\$ -
	7	\$ -	\$ -	\$ -	\$ -
	8	\$ -	\$ -	\$ -	\$ -
	9	\$ -	\$ -	\$ -	\$ -
	10	\$ -	\$ -	\$ -	\$ -
	11	\$ -	\$ -	\$ -	\$ -
	12	\$ -	\$ -	\$ -	\$ -

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ERCOT-wide Cumulative PNM			
year	month	pnm	pnm_accum
2018	0	\$ -	\$ -
	1	\$ 7,139.99	\$ 7,139.99
	2	\$ 3,011.86	\$ 10,151.85
	3	\$ 870.03	\$ 11,021.88
	4	\$ 2,333.76	\$ 13,355.64
	5	\$ 5,671.10	\$ 19,026.74
	6	\$ 4,930.69	\$ 23,957.43
	7	\$ 13,313.16	\$ 37,270.59
	8	\$ 7,965.15	\$ 45,235.74
	9	\$ 3,181.93	\$ 48,417.67
	10	\$ 6,676.58	\$ 55,094.25
	11	\$ 6,257.98	\$ 61,352.23
	12	\$ 941.00	\$ 62,293.23
2019	0	\$ -	\$ -
	1	\$ 1,594.61	\$ 1,594.61
	2	\$ 3,042.70	\$ 4,637.31
	3	\$ 4,087.75	\$ 8,725.06
	4	\$ -	\$ -
	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
2018	1	226	1,083	1,300	791	129	705
	2	(662)	(1,007)	(1,256)	(1,119)	(497)	(990)
	3	(289)	489	568	229	(14)	152
	4	(131)	(131)	158	(130)	(190)	(430)
	5	99	754	586	294	63	331
	6	(325)	302	181	(100)	(338)	275
	7	62	734	823	459	(23)	465
	8	(54)	511	562	138	(184)	150
	9	(306)	669	650	52	(344)	(68)
	10	367	352	532	543	166	(168)
	11	(191)	853	648	37	(577)	(30)
	12	(96)	(296)	(112)	(79)	(80)	(255)
2019	1	(69)	2	10	(37)	207	245
	2	(412)	(246)	(679)	(749)	(361)	(378)
	3	275	(45)	258	142	152	(52)
	4	-	-	-	-	-	-
	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
2018	1	9,387	7,209	7,508	9,601	9,171	7,514
	2	8,876	7,295	7,771	9,462	8,559	7,545
	3	10,159	7,784	8,052	10,006	9,143	8,480
	4	10,025	8,403	9,183	10,641	9,227	8,549
	5	11,505	7,360	9,027	11,105	9,862	8,186
	6	11,843	7,661	9,377	11,080	9,922	8,937
	7	7,895	3,590	5,418	7,058	6,434	4,248
	8	9,401	5,402	6,821	9,075	7,803	6,410
	9	6,222	4,201	5,415	6,741	4,833	4,036
	10	7,988	6,184	6,290	7,640	7,413	6,738
	11	9,151	6,413	6,543	8,872	8,685	6,866
	12	9,512	6,983	7,137	9,202	8,850	7,547
2019	1	9,500	7,954	7,892	9,491	9,141	7,897
	2	10,520	8,015	8,843	10,755	9,358	7,631
	3	9,471	6,980	7,408	9,114	8,585	7,389
	4	-	-	-	-	-	-
	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	2019	BARL_FTSW1_1 (FTSW-BARL)	6,874	1	1,340	2,467	3,067	-	-	-	-	-	-	-	-	-
FREQ_EXIST	2019	38T365_1 (WIRTZ-FLATRO)	4,041	2	1,277	1,393	1,371	-	-	-	-	-	-	-	-	-
FREQ_EXIST	2019	HAMILT_MAVERI1_1 (HAMILTON-MAVERICK)	3,720	3	520	2,373	827	-	-	-	-	-	-	-	-	-
FREQ_EXIST	2019	16TH_WRD2_1 (WOODWRD2-16TH_ST)	2,835	4	386	666	1,783	-	-	-	-	-	-	-	-	-
FREQ_EXIST	2019	74T148_1 (COMFOR-CICO)	1,856	5	1,718	-	138	-	-	-	-	-	-	-	-	-
FREQ_EXIST	2019	RIOPEC_WOODW21_1 (WOODWRD2-RIOPECOS)	1,757	6	658	698	401	-	-	-	-	-	-	-	-	-
FREQ_EXIST	2019	ASPM_CONA1_1 (ASPM-CONA)	1,744	7	148	1,311	285	-	-	-	-	-	-	-	-	-
FREQ_EXIST	2019	1350_E (NCSTP-LKSW)	1,500	8	951	428	121	-	-	-	-	-	-	-	-	-
FREQ_EXIST	2019	6437_F (SCRCV-KNAPP)	1,451	9	277	699	475	-	-	-	-	-	-	-	-	-
FREQ_EXIST	2019	TREADW_YELWJC1_1 (TREADWEL-YELWJCKT)	1,420	10	210	998	212	-	-	-	-	-	-	-	-	-
TOP10_RENT	2019	HILL_MAR_2_1 (MARION-HILLCTRY)	\$ 27.06	1	\$ -	\$ 27.06	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2019	16TH_WRD2_1 (WOODWRD2-16TH_ST)	\$ 17.14	2	\$ 2.13	\$ 6.59	\$ 8.41	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2019	588_A_1 (LWSVW-LWVTI)	\$ 12.37	3	\$ -	\$ -	\$ 12.37	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2019	LON_HILL_XFMRS (LON_HILL-LON_HILL)	\$ 10.54	4	\$ 6.25	\$ 0.00	\$ 4.29	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2019	6437_F (SCRCV-KNAPP)	\$ 9.88	5	\$ 2.16	\$ 5.48	\$ 2.25	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2019	BARL_FTSW1_1 (FTSW-BARL)	\$ 9.17	6	\$ 0.68	\$ 3.97	\$ 4.52	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2019	74T148_1 (COMFOR-CICO)	\$ 9.13	7	\$ 8.79	\$ -	\$ 0.34	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2019	RIOPEC_WOODW21_1 (RIOPECOS-WOODWRD2)	\$ 8.07	8	\$ 5.13	\$ 0.77	\$ 2.16	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2019	HOOD_DECRDVA_1 (DCDAM-HOD)	\$ 7.95	9	\$ -	\$ -	\$ 7.95	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2019	590_B (LWVJS-LKPNT)	\$ 6.46	10	\$ -	\$ -	\$ 6.46	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

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DA Congestion Constraint Rankings - Top 10 Constraints by Binding Frequency and Top 10 Constraints by Total Congestion Rent																	
category	year	item	rankvar	rank	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
FREQ_EXIST	2019	6437_F(SCRCV-KNAPP)	1,225	1	261	489	475	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2019	HAMILT_MAVERR1_1(HAMILTON-MAVERICK)	1,203	2	482	469	252	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2019	RIOPEC_WOODW21_1(RIOPECOS-WOODWRD2)	1,161	3	491	292	378	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2019	38T365_1(WIRTZ-FLATRO)	1,131	4	410	356	365	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2019	BARL_FTSW1_1(FTSW-BARL)	1,106	5	308	325	473	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2019	1350_E(NCSTP-LFKSW)	952	6	530	359	63	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2019	16TH_WRD2_1(WOODWRD2-16TH_ST)	891	7	276	287	328	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2019	BARNHR_BIGLAK1_1(BIGLAKE-BARNHRT)	867	8	294	175	398	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2019	LON_HILL_XFMRS(LON_HILL-LON_HILL)	859	9	250	192	417	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2019	COLETO-VICTORIA(COLETO-VICTORIA)	858	10	566	118	174	-	-	-	-	-	-	-	-	-	
TOP10_RENT	2019	COLEMAN JUNCTION(SANA-GLSB)	\$ 22.93	1	\$ 22.86	\$ 0.02	\$ 0.05	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2019	HUMBLT_NOVICT1_1(HUMBLTAP-NOVICTAP)	\$ 22.92	2	\$ 22.89	\$ 0.01	\$ 0.02	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2019	RIOPEC_WOODW21_1(RIOPECOS-WOODWRD2)	\$ 12.65	3	\$ 9.00	\$ 0.80	\$ 2.85	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2019	16TH_WRD2_1(WOODWRD2-16TH_ST)	\$ 11.21	4	\$ 2.30	\$ 2.70	\$ 6.20	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2019	588_A_1(LWSVW-LWVTI)	\$ 11.10	5	\$ -	\$ -	\$ 11.10	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2019	BARL_FTSW1_1(FTSW-BARL)	\$ 10.09	6	\$ 1.48	\$ 2.39	\$ 6.22	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2019	74T148_1(COMFOR-CICO)	\$ 8.77	7	\$ 6.28	\$ 1.69	\$ 0.80	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2019	LON_HILL_XFMRS(LON_HILL-LON_HILL)	\$ 7.79	8	\$ 1.51	\$ 1.42	\$ 4.86	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2019	6437_F(SCRCV-KNAPP)	\$ 7.29	9	\$ 1.99	\$ 3.01	\$ 2.29	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2019	590_B(LWVJS-LKPNT)	\$ 6.96	10	\$ -	\$ -	\$ 6.96	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	

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Top 10 CRR Pairs Ranked by Monthly Auction Values - Top 10 PTP Obligations by Total Transaction Values and Top 10 PTP Options by Total Transaction Values																	
fr	option	year	pair	total value	rank	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
N	2019		HB WEST-LZ WEST	\$ 8.24	1	\$ 2.01	\$ 2.53	\$ 1.75	\$ 1.95	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
N	2019		HB SOUTH-LZ SOUTH	\$ 4.41	2	\$ 1.54	\$ 0.89	\$ 0.95	\$ 1.03	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
N	2019		HB WEST-HB NORTH	\$ 2.88	3	\$ 1.03	\$ 0.33	\$ 0.69	\$ 0.83	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
N	2019		HB NORTH-LZ NORTH	\$ 2.13	4	\$ 0.89	\$ 0.49	\$ 0.21	\$ 0.54	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
N	2019		HB NORTH-HB HOUSTON	\$ 1.99	5	\$ 0.06	\$ 0.00	\$ 0.91	\$ 1.02	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
N	2019		HB HOUSTON-LZ HOUSTON	\$ 1.73	6	\$ 0.53	\$ 0.25	\$ 0.25	\$ 0.70	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
N	2019		CPSES UNIT2-HB NORTH	\$ 1.07	7	\$ -	\$ 0.20	\$ 0.24	\$ 0.62	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
N	2019		JCKCNTY2_ST2-LZ NORTH	\$ 0.83	8	\$ 0.27	\$ 0.15	\$ 0.20	\$ 0.20	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
N	2019		CPSES_UNIT1-HB NORTH	\$ 0.74	9	\$ 0.32	\$ 0.19	\$ 0.23	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
N	2019		HB WEST-PB2SES_CT5	\$ 0.66	10	\$ 0.13	\$ 0.19	\$ 0.25	\$ 0.09	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Y	2019		HB NORTH-LZ NORTH	\$ 1.50	1	\$ 0.46	\$ 0.22	\$ 0.37	\$ 0.46	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Y	2019		RIGGIN_UNIT1-REROCK_ALL	\$ 1.49	2	\$ 0.02	\$ 0.04	\$ 0.49	\$ 0.94	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Y	2019		HB SOUTH-LZ SOUTH	\$ 1.35	3	\$ 0.32	\$ 0.41	\$ 0.30	\$ 0.31	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Y	2019		HB WEST-LZ WEST	\$ 1.09	4	\$ 0.27	\$ 0.13	\$ 0.38	\$ 0.30	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Y	2019		REROCK_ALL-HOVEY_GEN	\$ 1.03	5	\$ 0.07	\$ 0.17	\$ 0.19	\$ 0.60	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Y	2019		KEO_KEO_SM1-RIGGIN_UNIT1	\$ 0.67	6	\$ 0.01	\$ 0.06	\$ 0.14	\$ 0.46	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Y	2019		GRANDVW1_A_B-HB NORTH	\$ 0.56	7	\$ 0.07	\$ 0.18	\$ 0.28	\$ 0.04	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Y	2019		HB WEST-HB NORTH	\$ 0.56	8	\$ 0.23	\$ 0.07	\$ 0.12	\$ 0.15	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Y	2019		PH1_UNIT1_2-HB WEST	\$ 0.46	9	\$ 0.03	\$ 0.13	\$ 0.27	\$ 0.03	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Y	2019		PEARSA_1_24-LZ SOUTH	\$ 0.37	10	\$ 0.08	\$ 0.06	\$ 0.10	\$ 0.12	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

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