

To the Public Utility Commission of Texas

ERCOT Wholesale Electricity Market Monthly Report

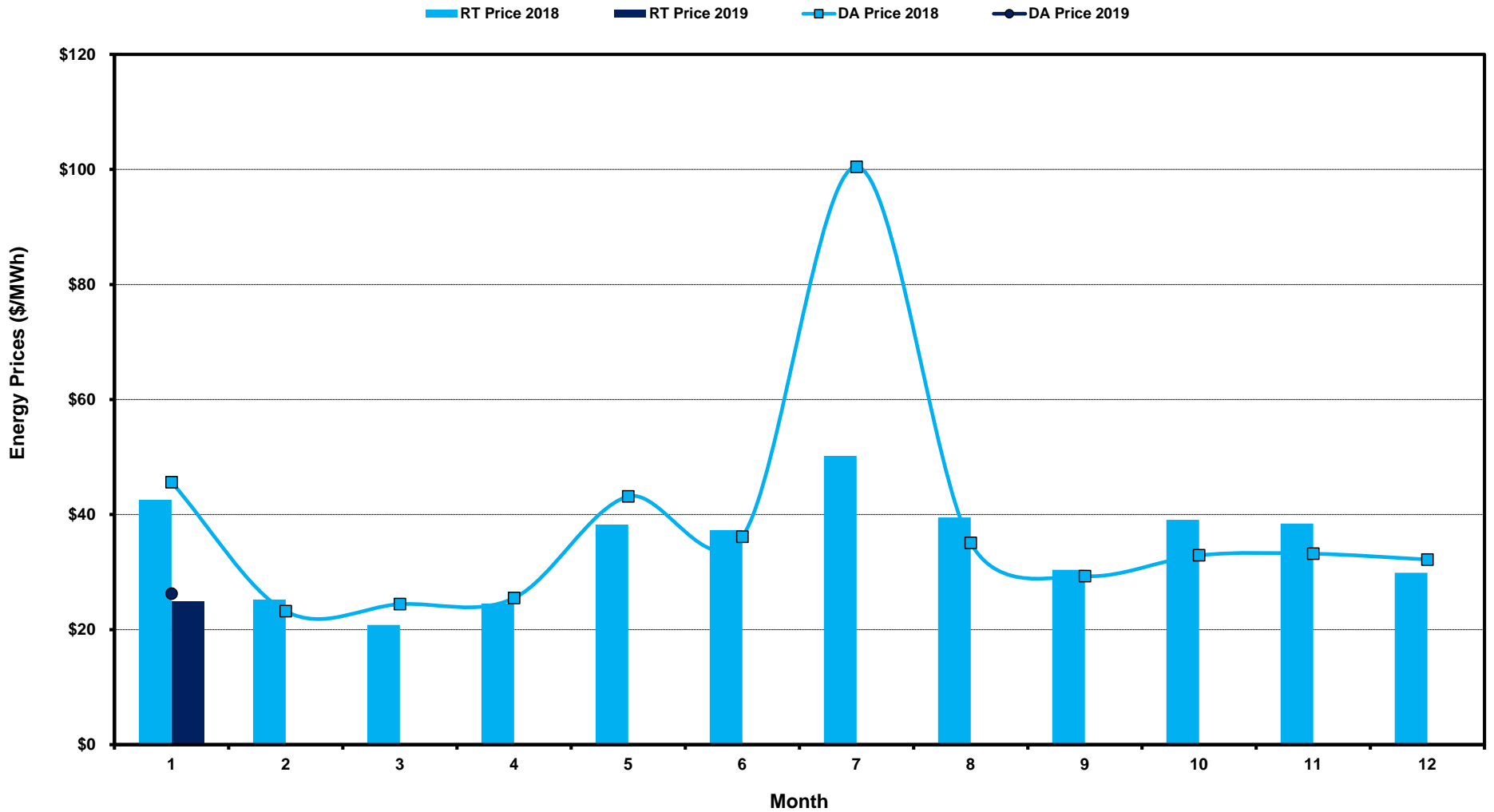
Monday, February 11, 2019

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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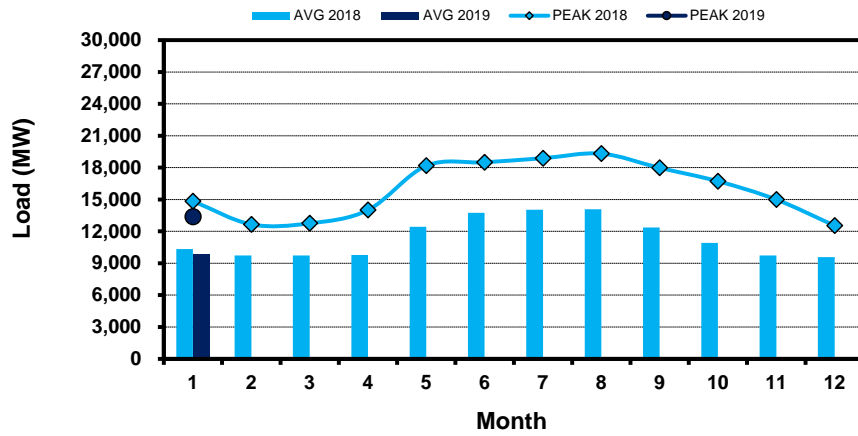
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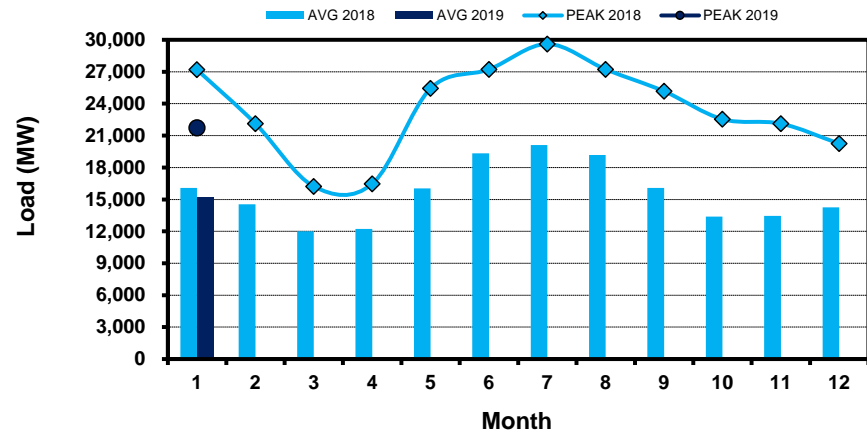
Load Zone Load Statistics

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

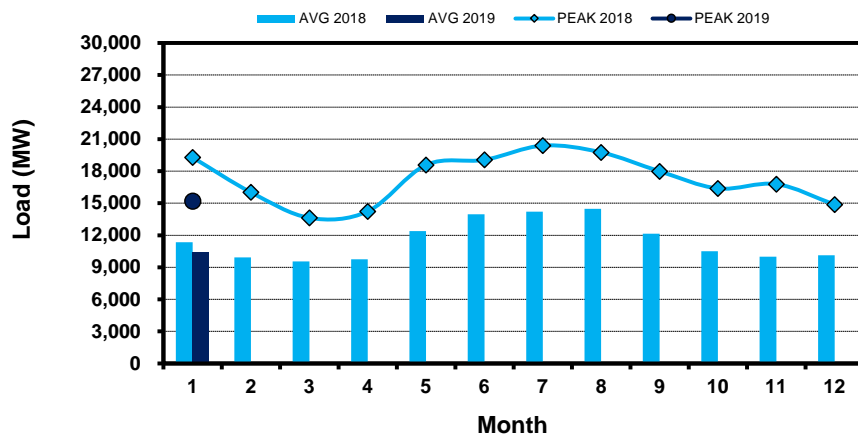
Houston Zone



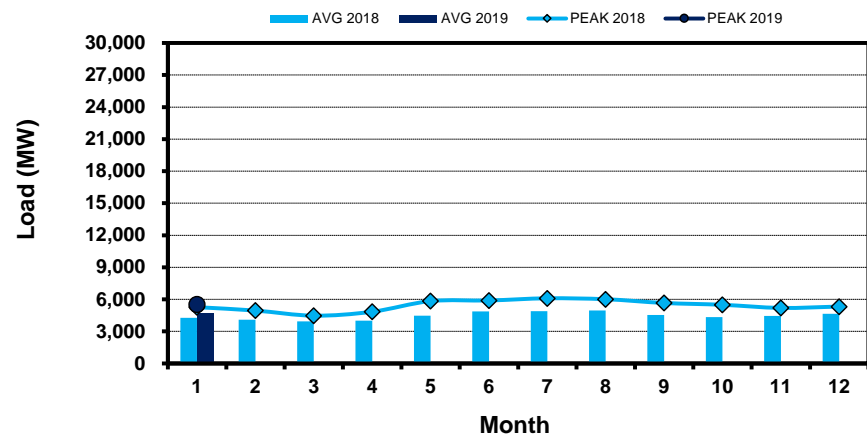
North Zone



South Zone



West Zone



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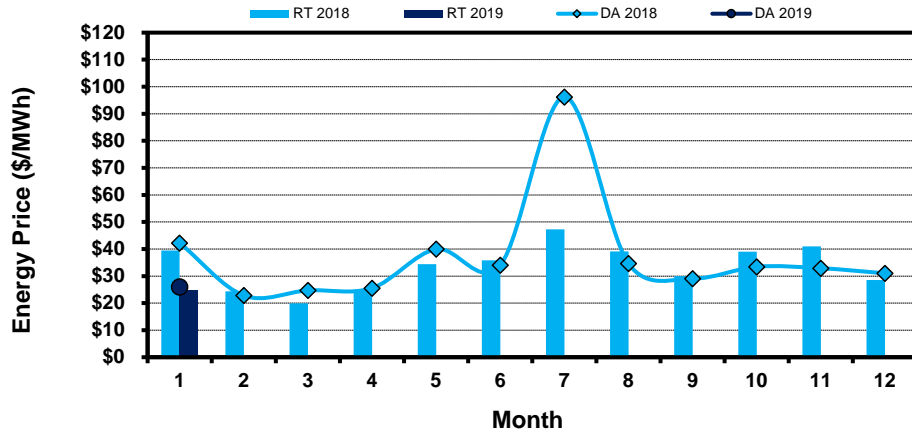
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Note: * Zonal load zone definition vs. Nodal comparable load zone definition: LZ_Houston=LZ_Houston; LZ_West=LZ_West; LZ_North=(LZ_North,LZ_RAYBN); LZ_South=(LZ_South,LZ_CPS,LZ_AEN,LZ_LCRA)

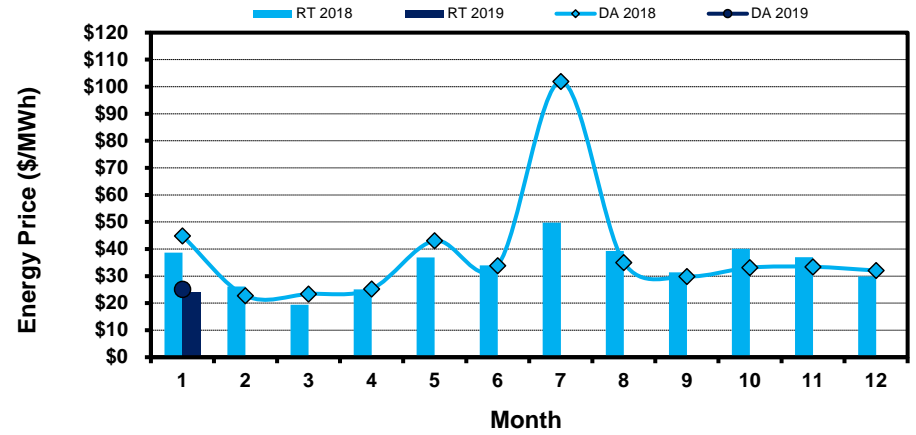
Load Zone Monthly Average Energy Price DA vs RT

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

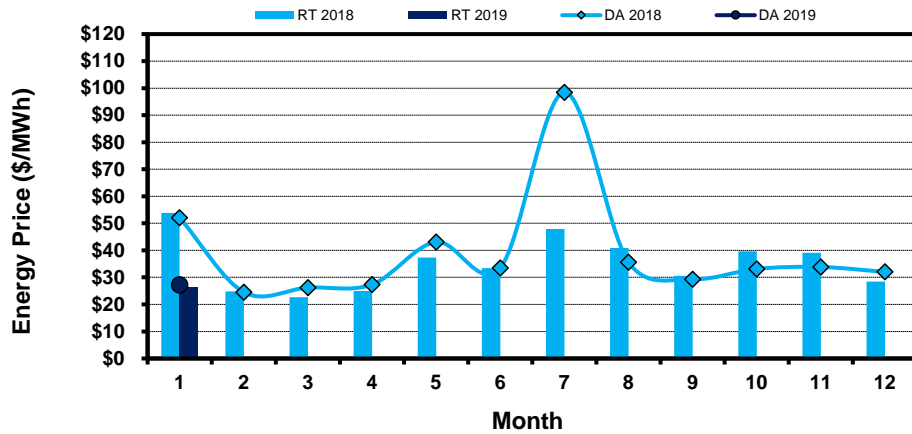
Houston Zone



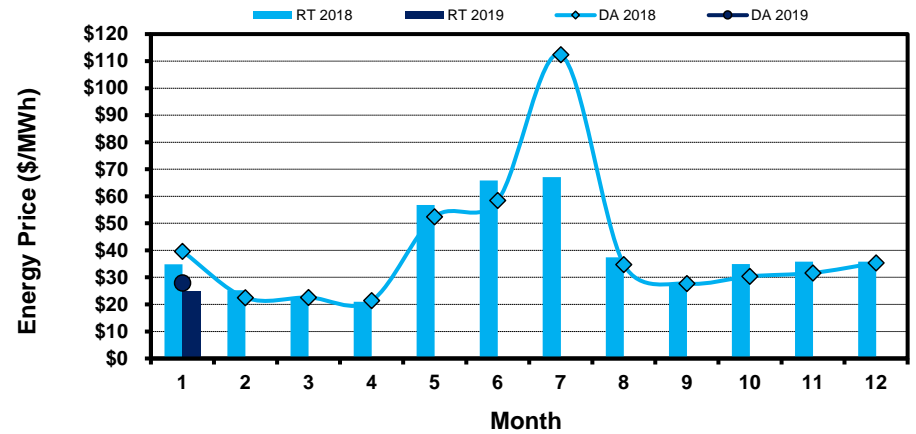
North Zone



South Zone



West Zone



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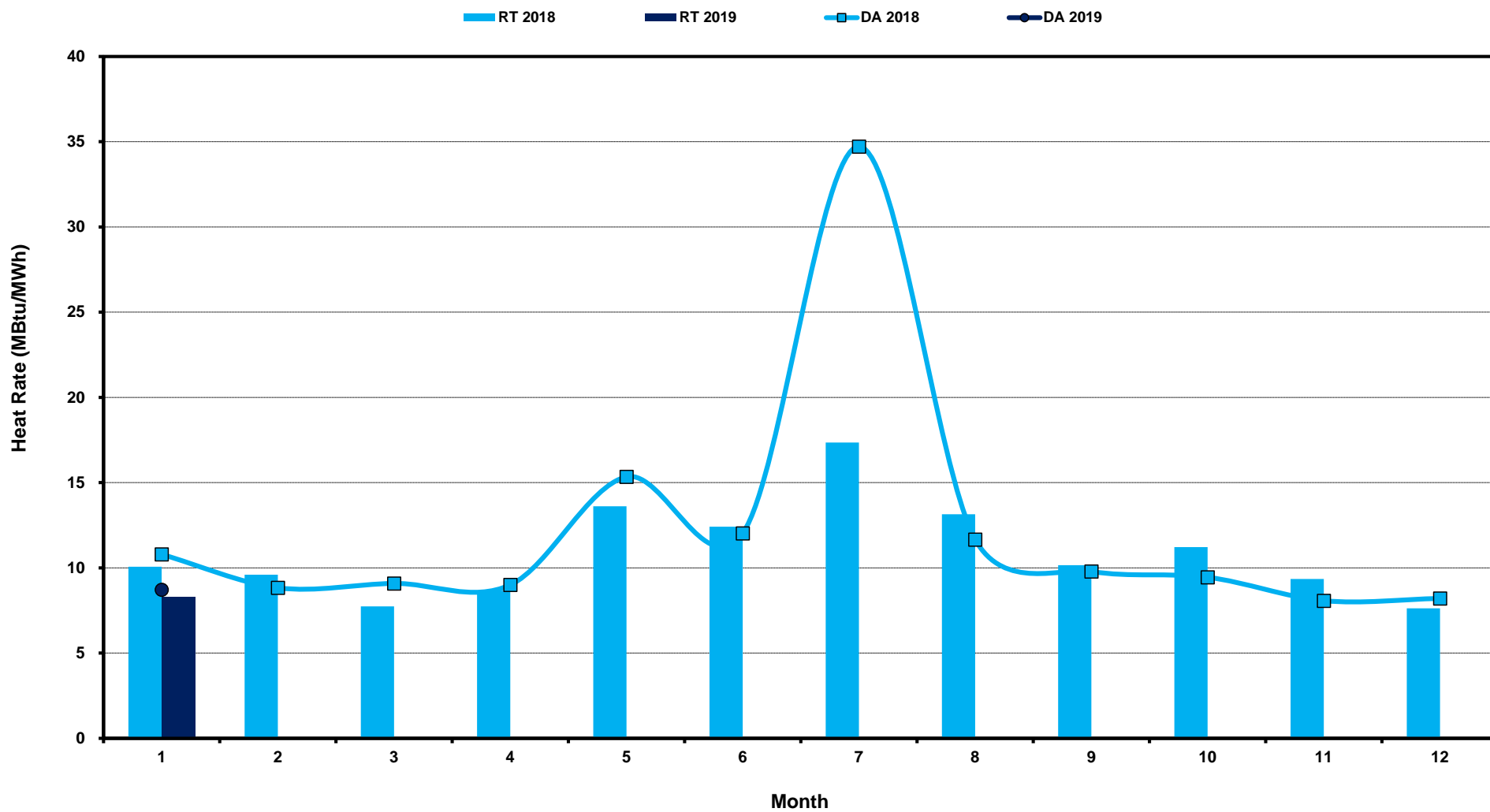
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Note: * Zonal load zone definition vs. Nodal comparable load zone definition: LZ_Houston=LZ_Houston; LZ_West=LZ_West; LZ_North=(LZ_North,LZ_RAYBN); LZ_South=(LZ_South,LZ_CPS,LZ_AEN,LZ_LCRA)

ERCOT-wide Monthly Implied Heat Rate DA vs RT

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



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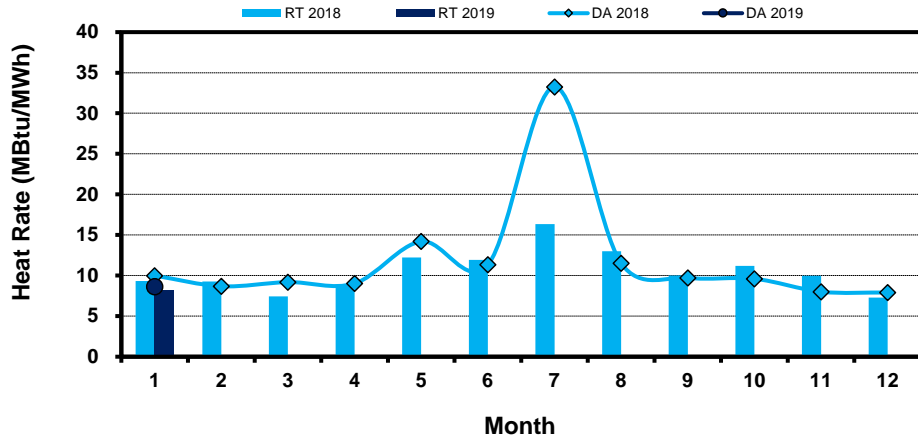
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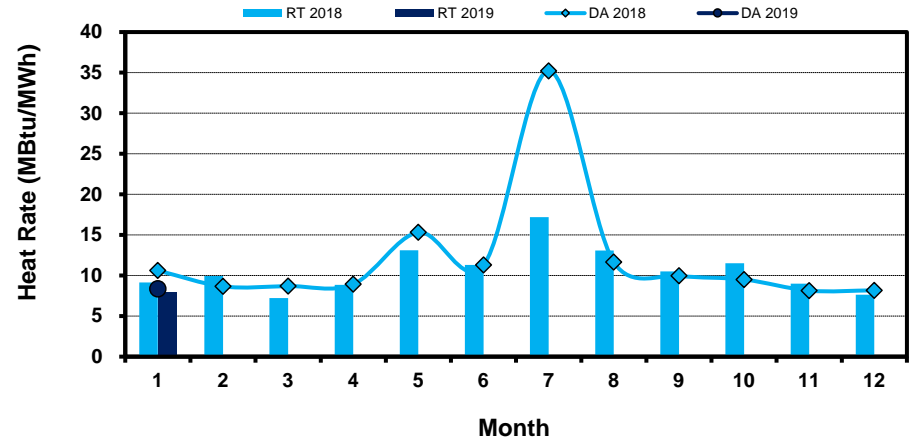
Load Zone Monthly Implied Heat Rate DA vs RT

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

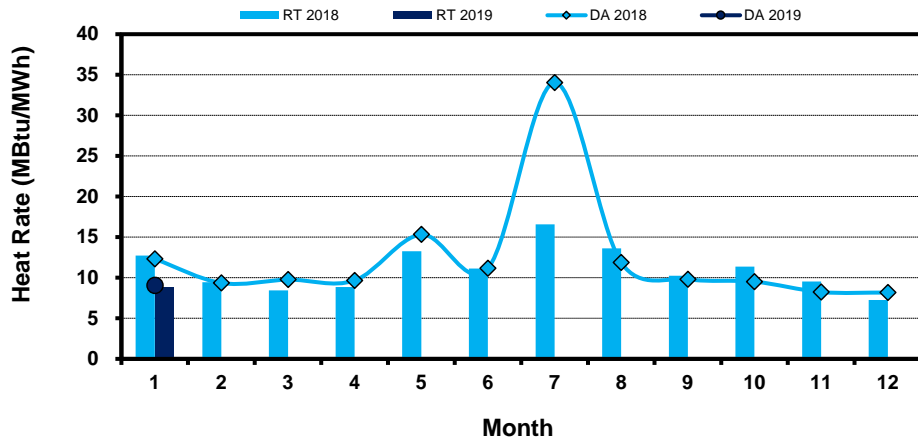
Houston Zone



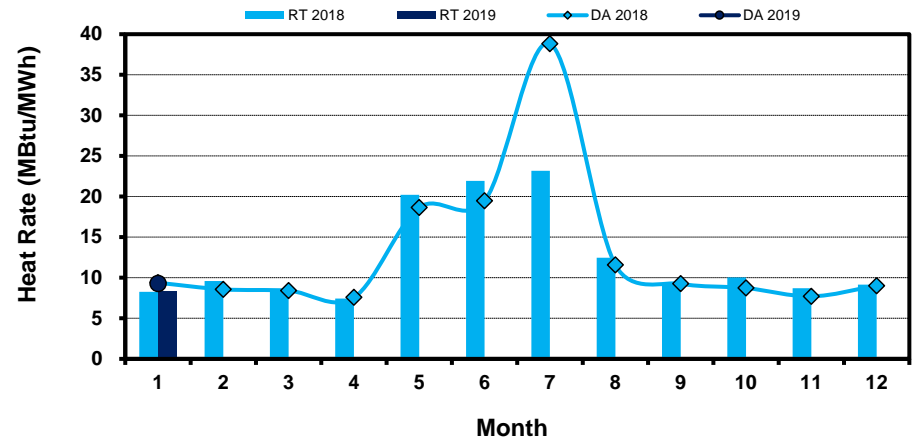
North Zone



South Zone



West Zone



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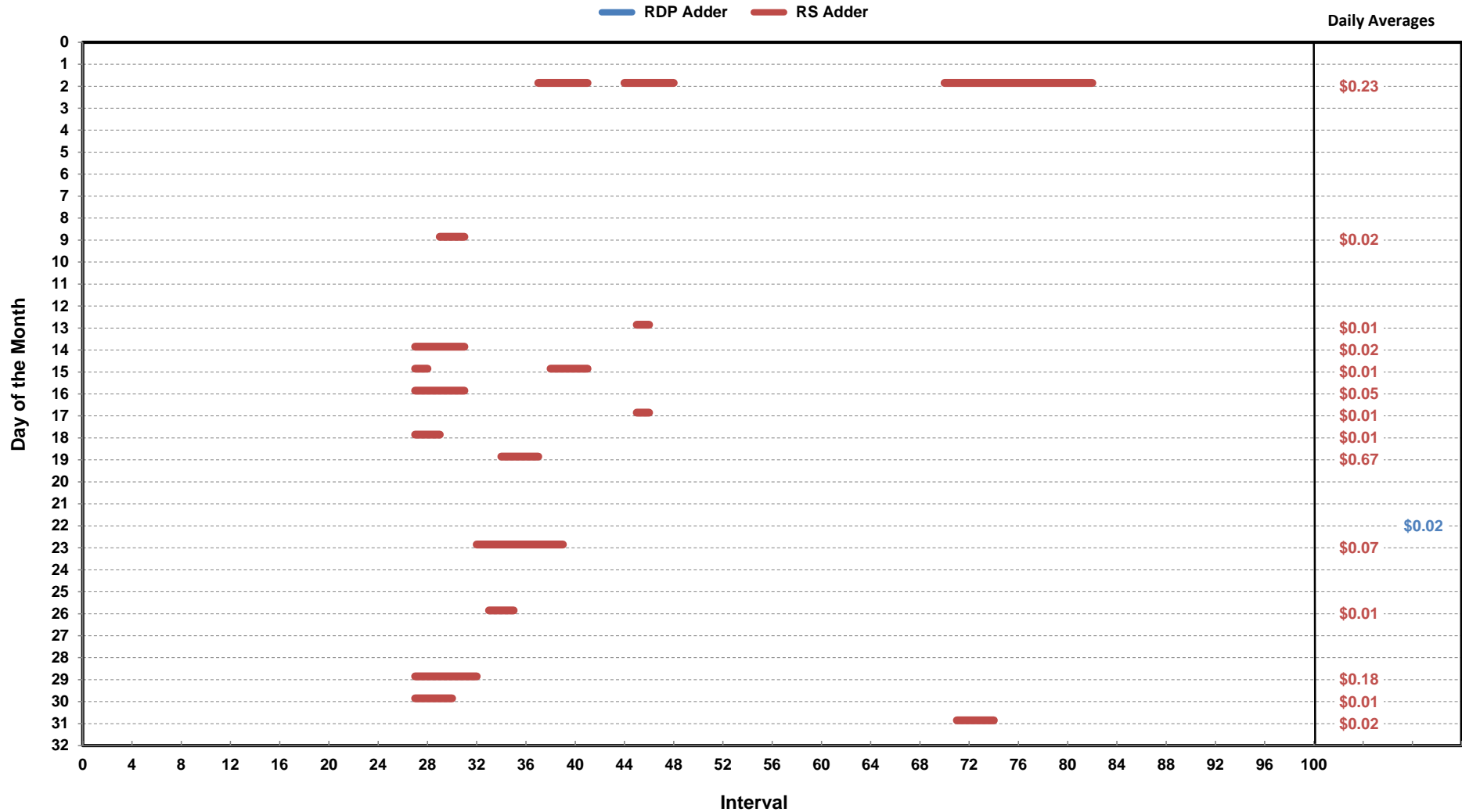
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Note: * Zonal load zone definition vs. Nodal comparable load zone definition: LZ_Houston=LZ_Houston; LZ_West=LZ_West; LZ_North=(LZ_North,LZ_RAYBN); LZ_South=(LZ_South,LZ_CPS,LZ_AEN,LZ_LCRA)

Daily ORDC Adders Average Values and Interval Duration

Jan-2019



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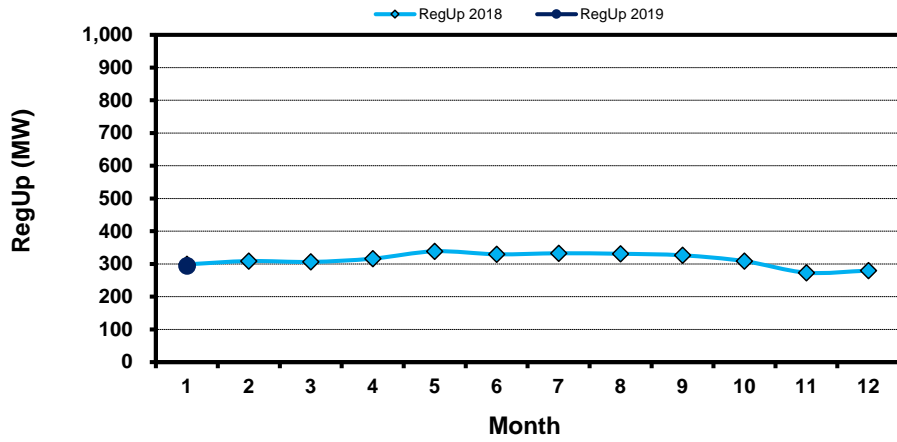
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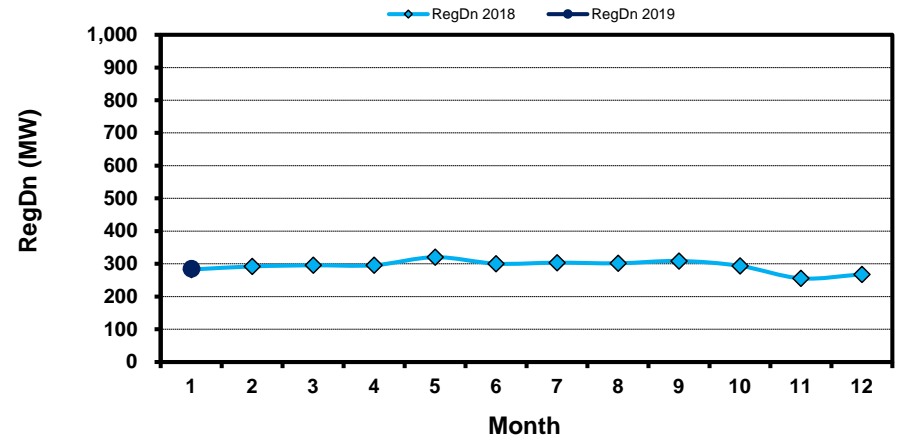
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Monthly Average of Ancillary Services Required MW

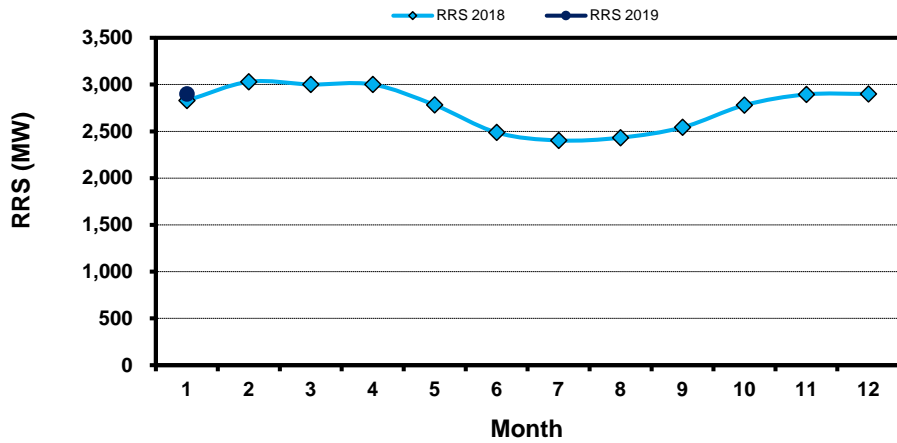
Regulation Up



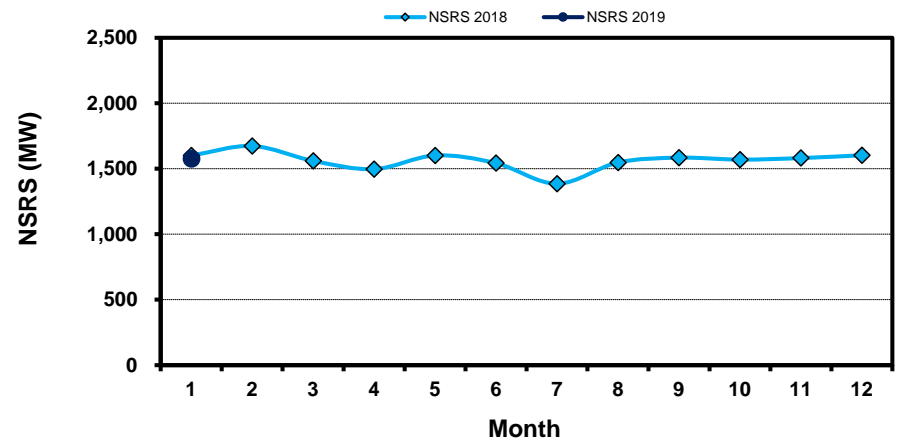
Regulation Down



Responsive Reserve



Non-Spin Reserve



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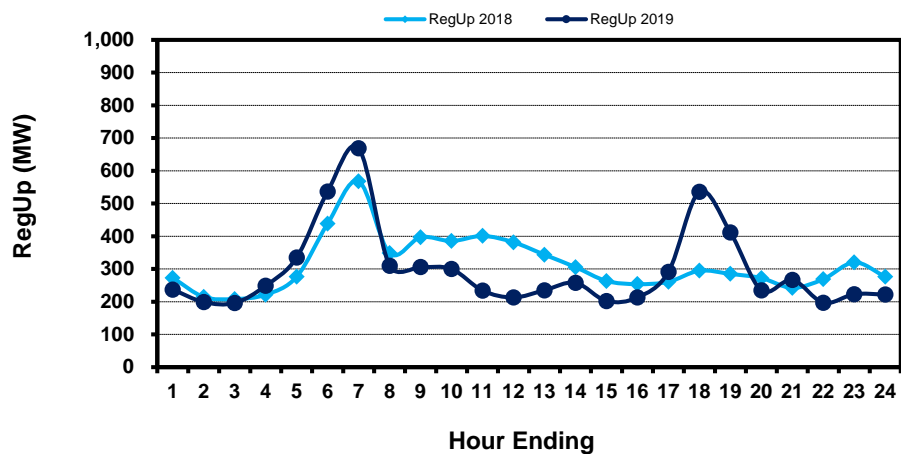
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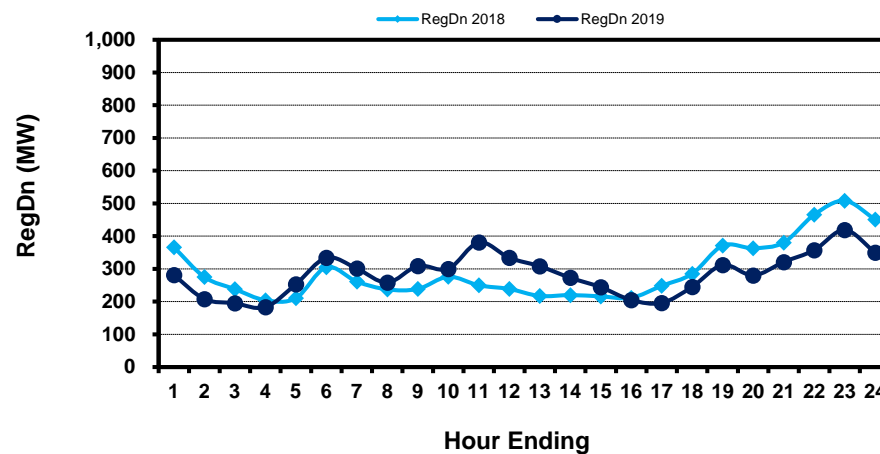
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Hourly Average of Ancillary Services Required MW

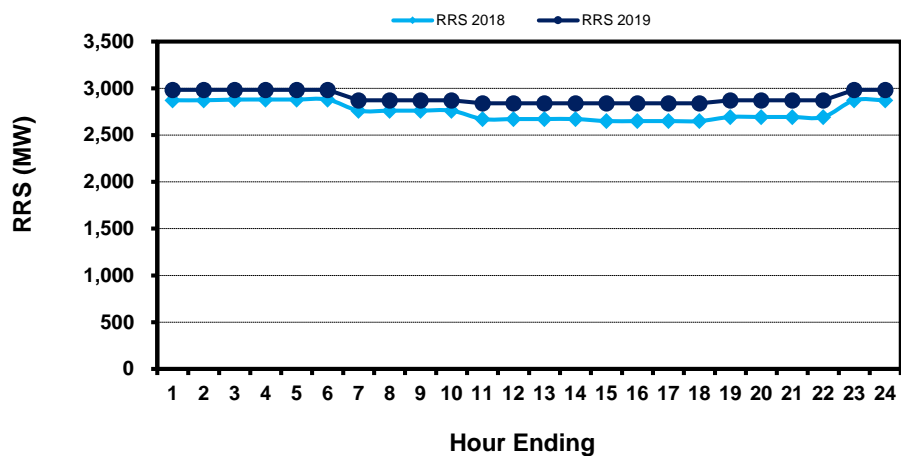
Regulation Up



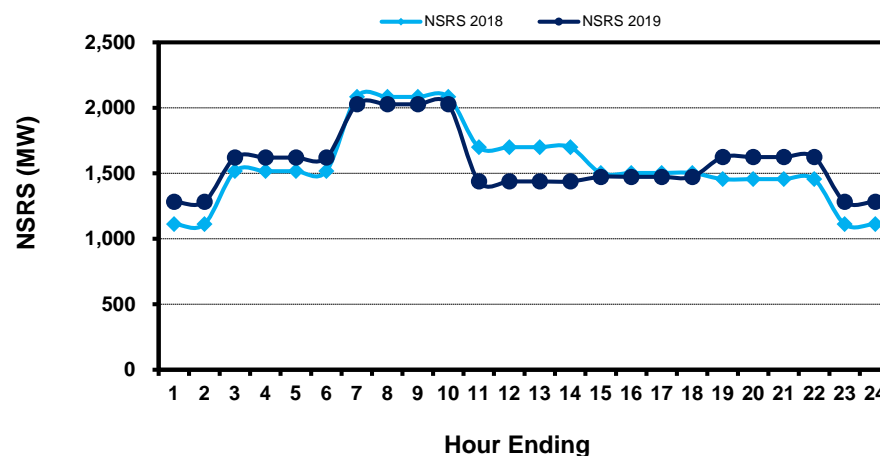
Regulation Down



Responsive Reserve



Non-Spin Reserve



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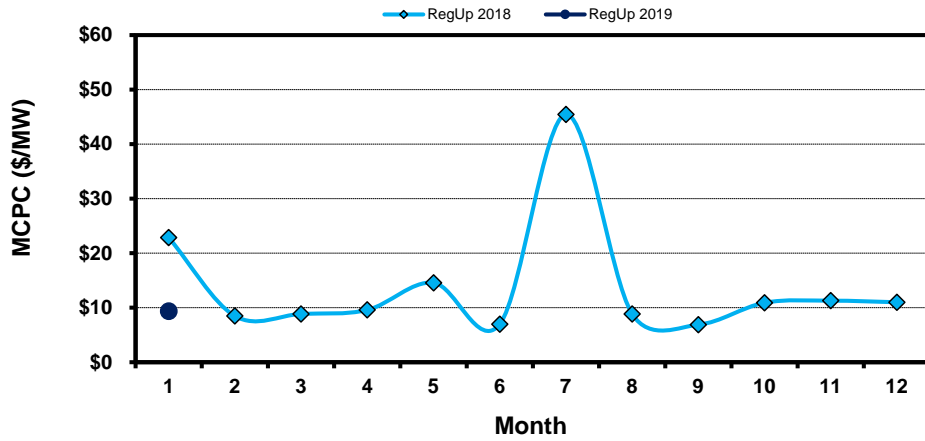
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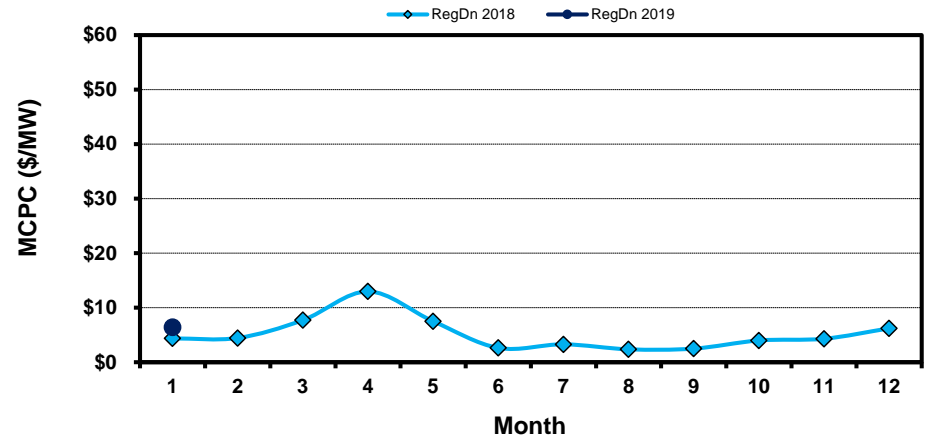
Monthly Average Ancillary Services Price

(weighted by A/S Quantities Required)

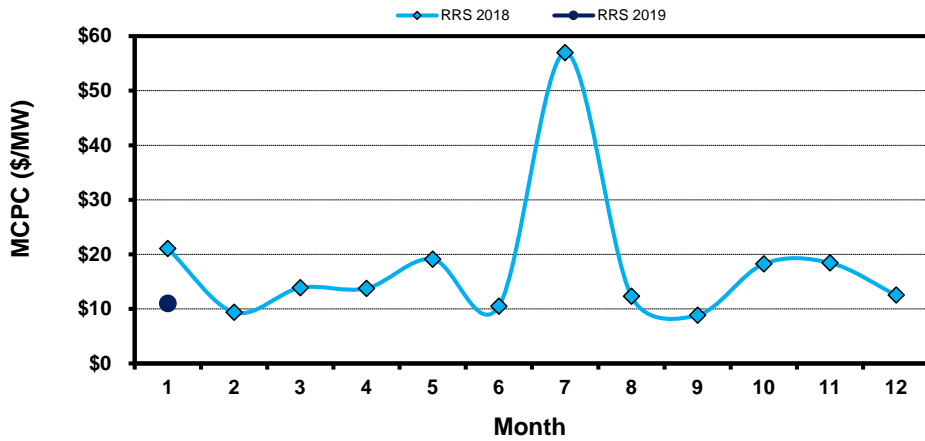
Regulation Up



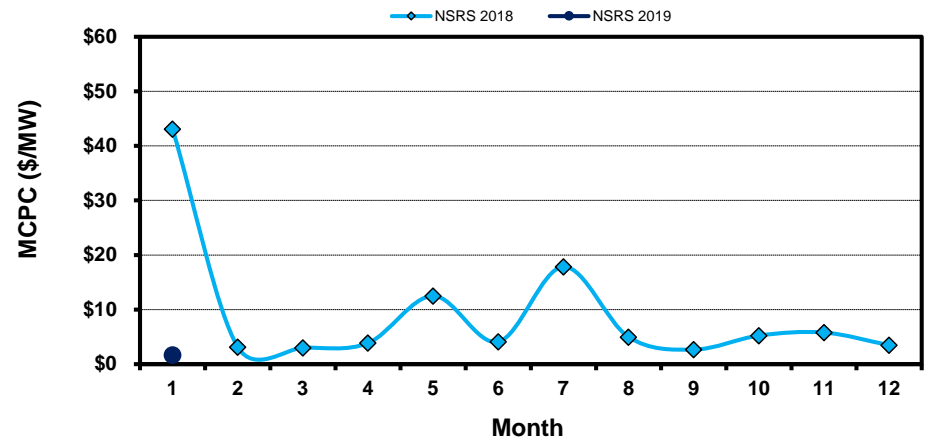
Regulation Down



Responsive Reserve



Non-Spin Reserve



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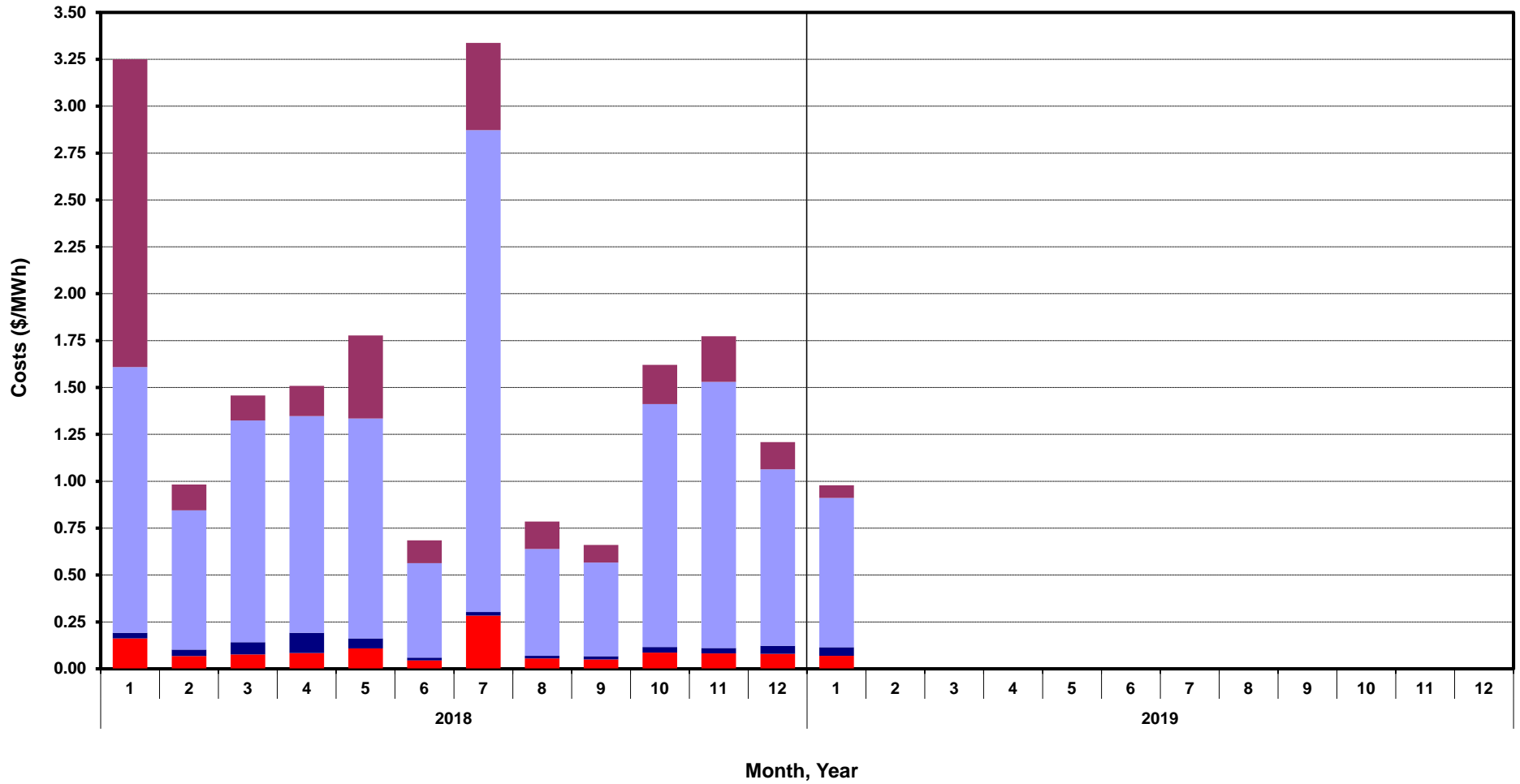
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Monthly Average A/S Cost per MWh Load

RegUp RegDn RRS NonSpin



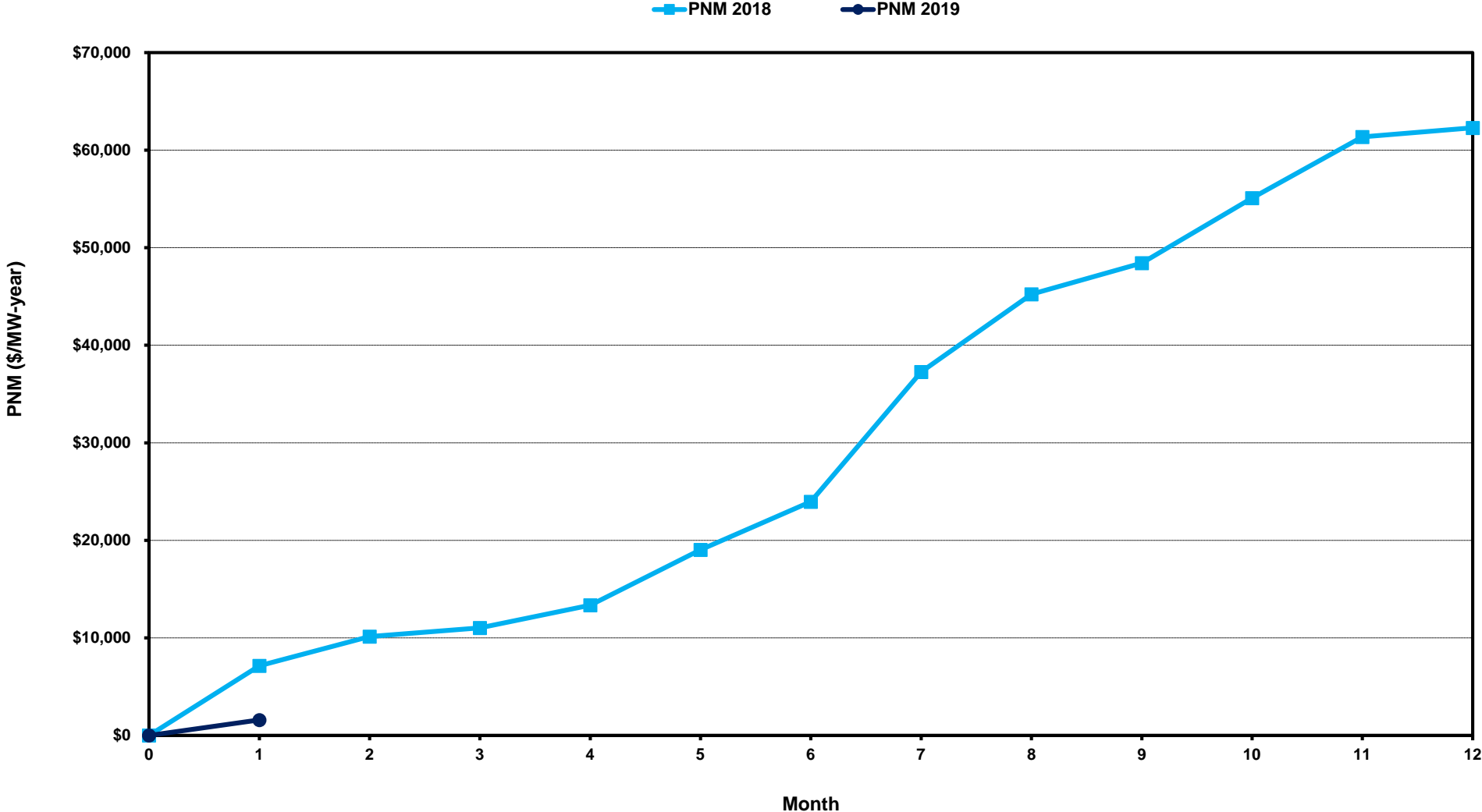
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ERCOT-wide Cumulative Peaker Net Margin



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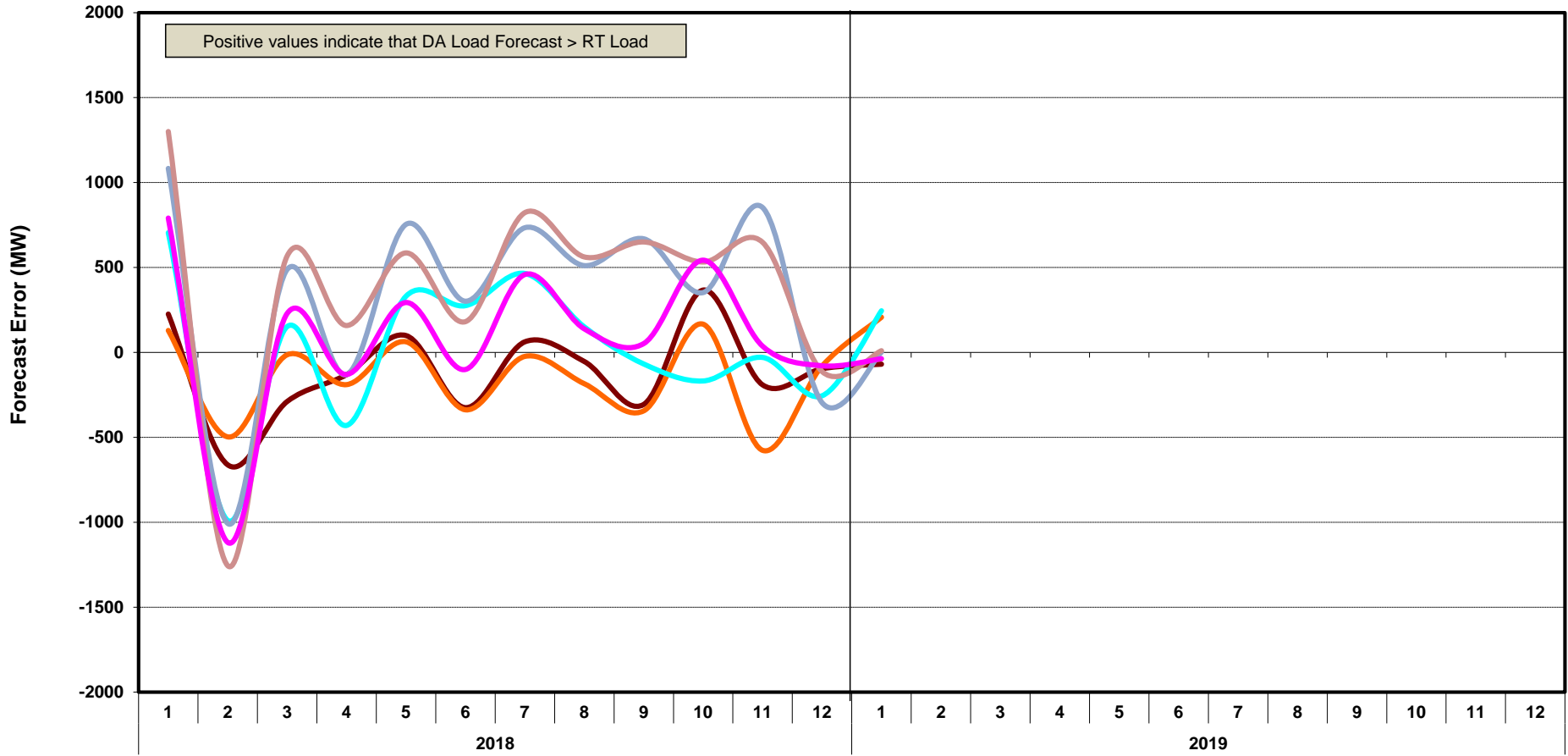
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DA vs. RT Load Forecast Error by Hour Ending

HE_1_4 HE_5_8 HE_9_12 HE_13_16 HE_17_20 HE_21_24



Month, Year

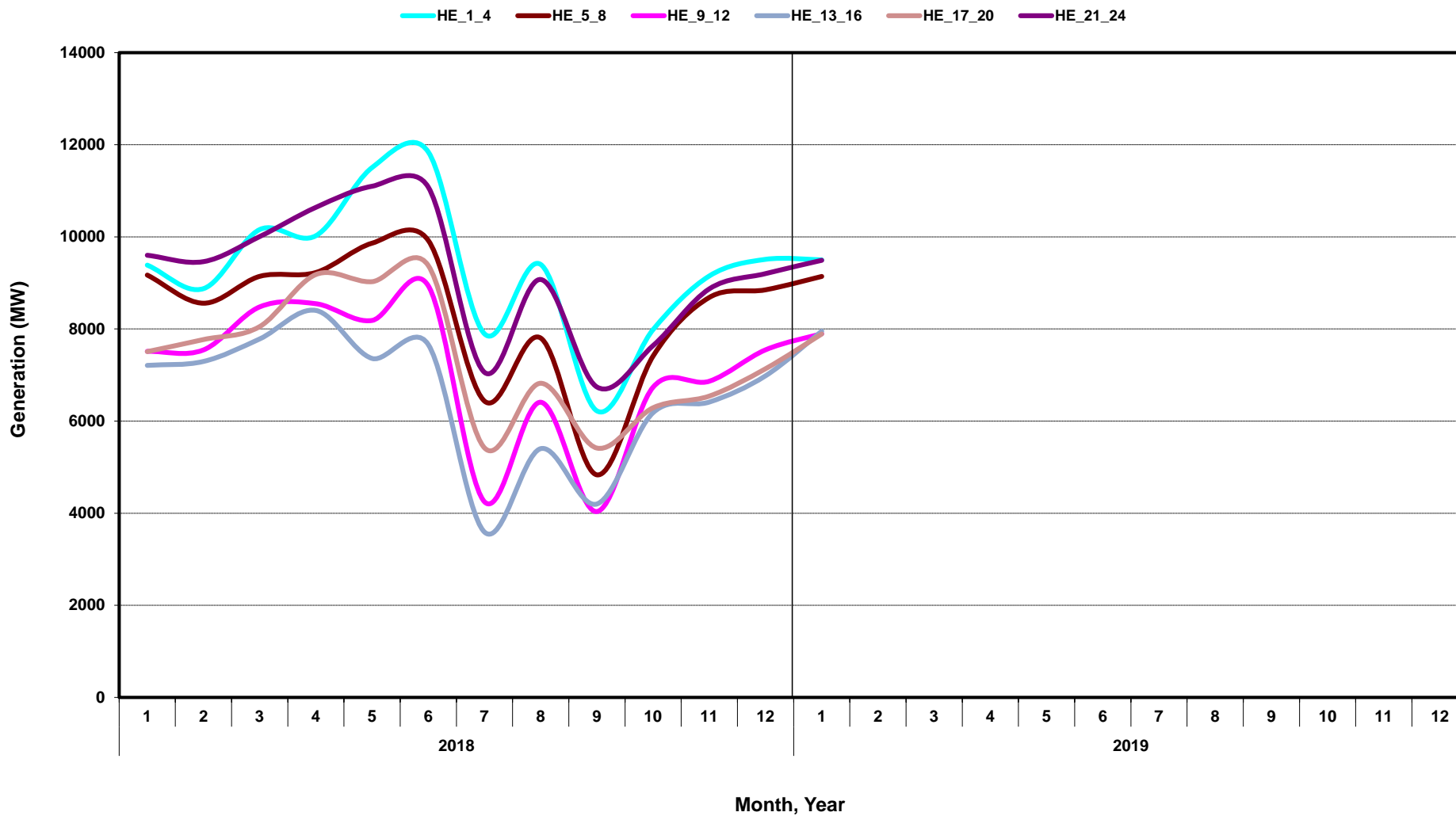
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Monthly Average of Wind Generation by Hour Ending



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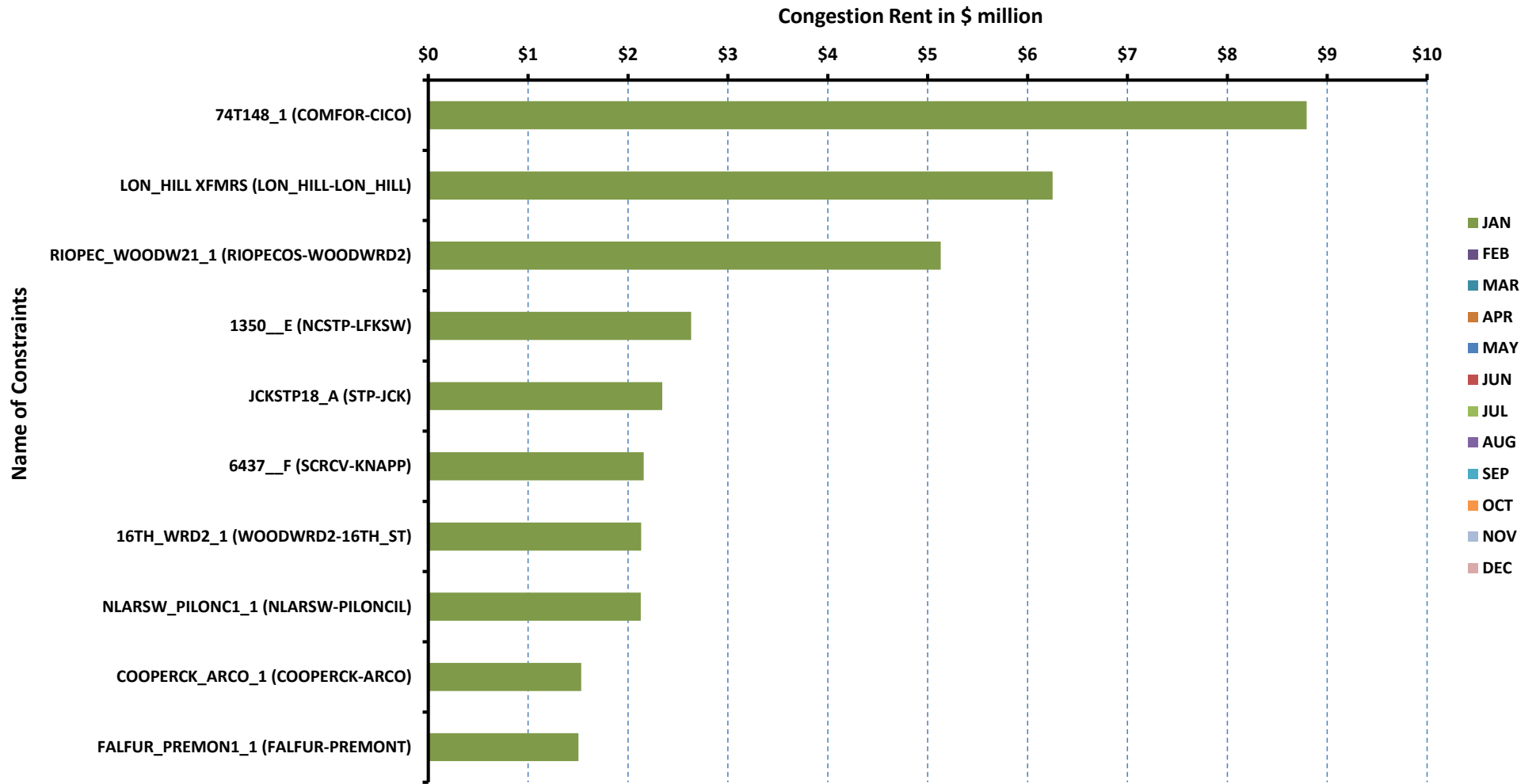
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RT Congestion Constraint Rankings - 1

Top 10 Constraints by Total Congestion Value - 2019



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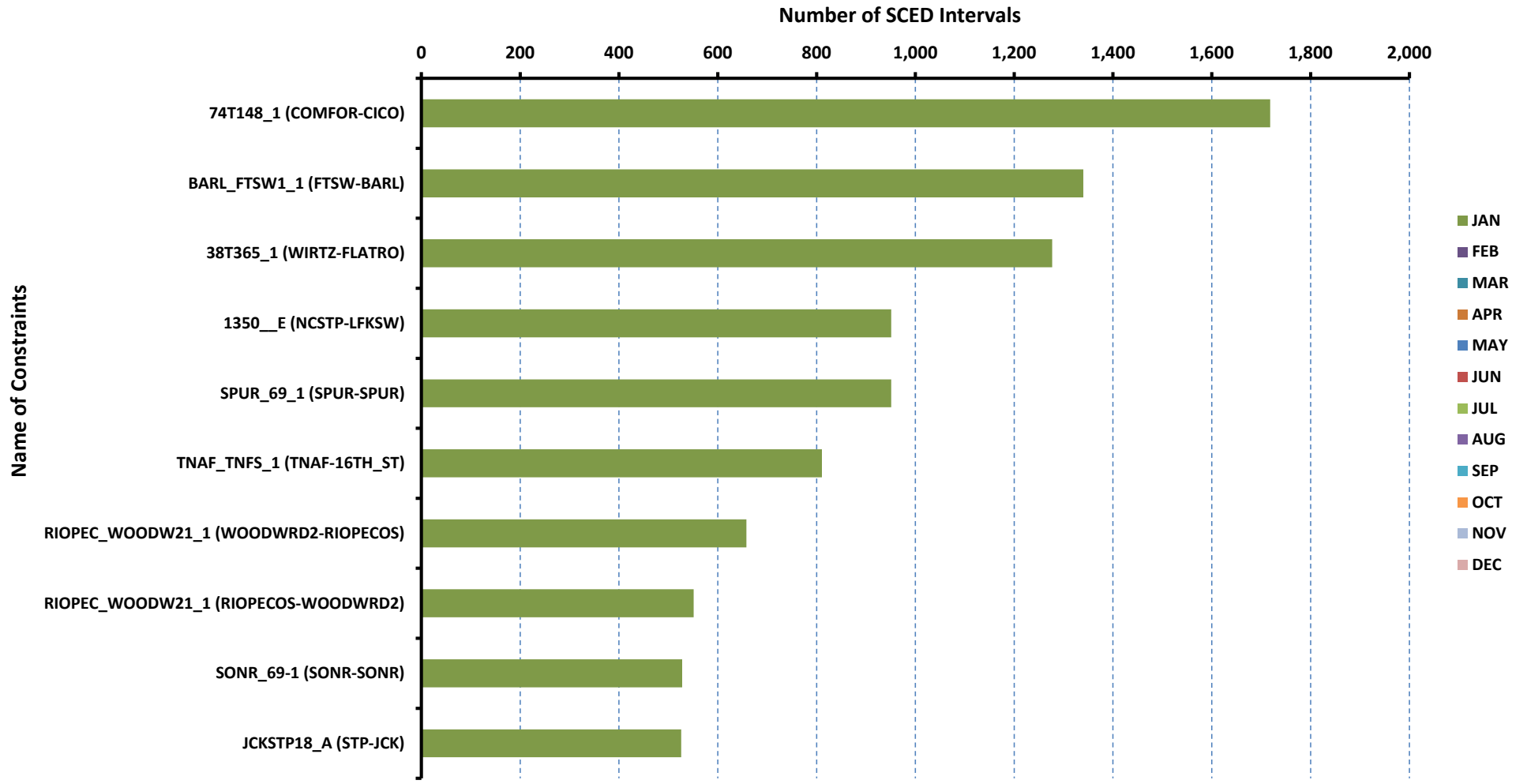
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RT Congestion Constraint Rankings - 2

Top 10 Constraints by Binding Frequency - 2019



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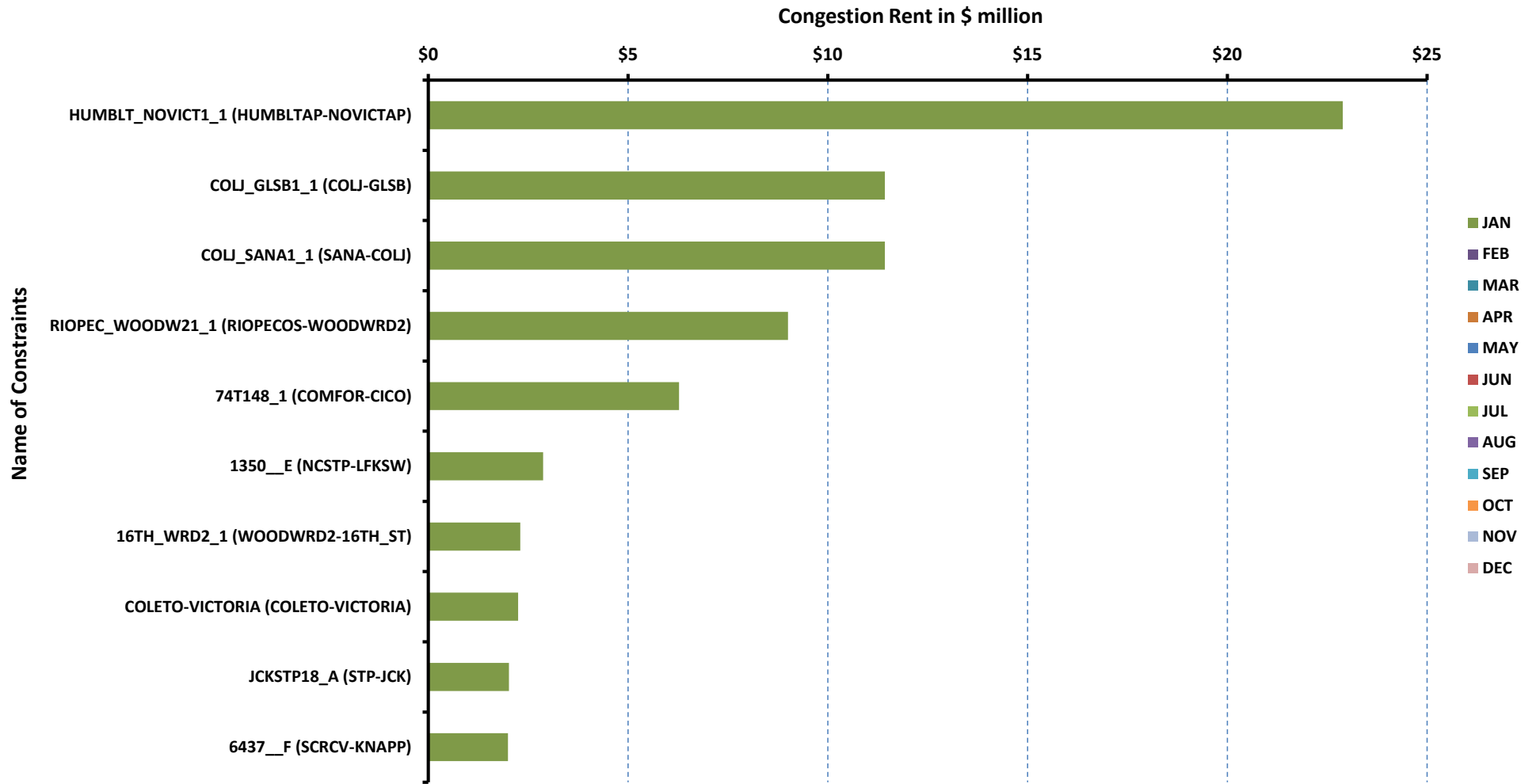
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DA Congestion Constraint Rankings - 1

Top 10 Constraints by Total Congestion Value - 2019



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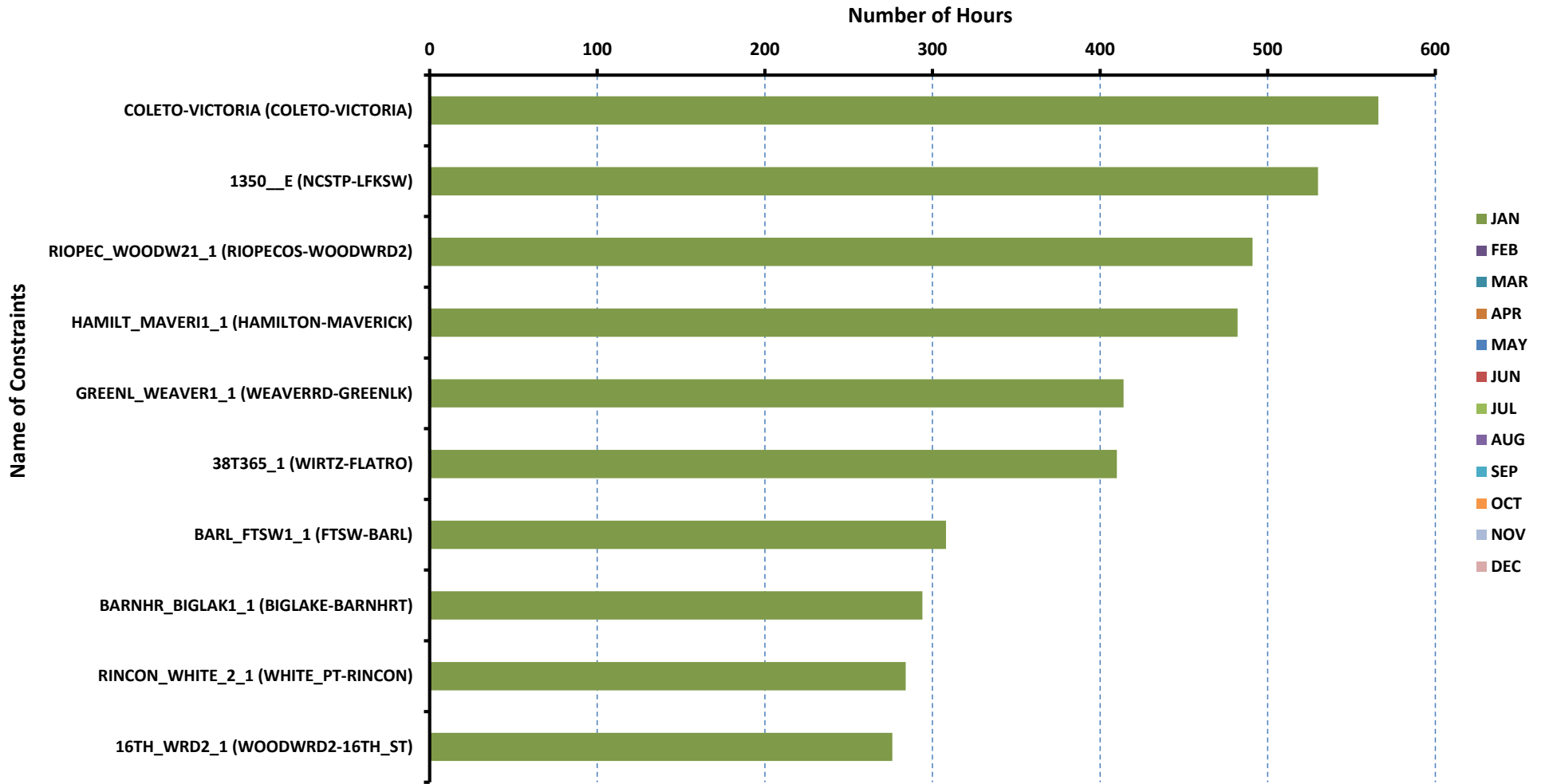
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DA Congestion Constraint Rankings - 2

Top 10 Constraints by Binding Frequency - 2019



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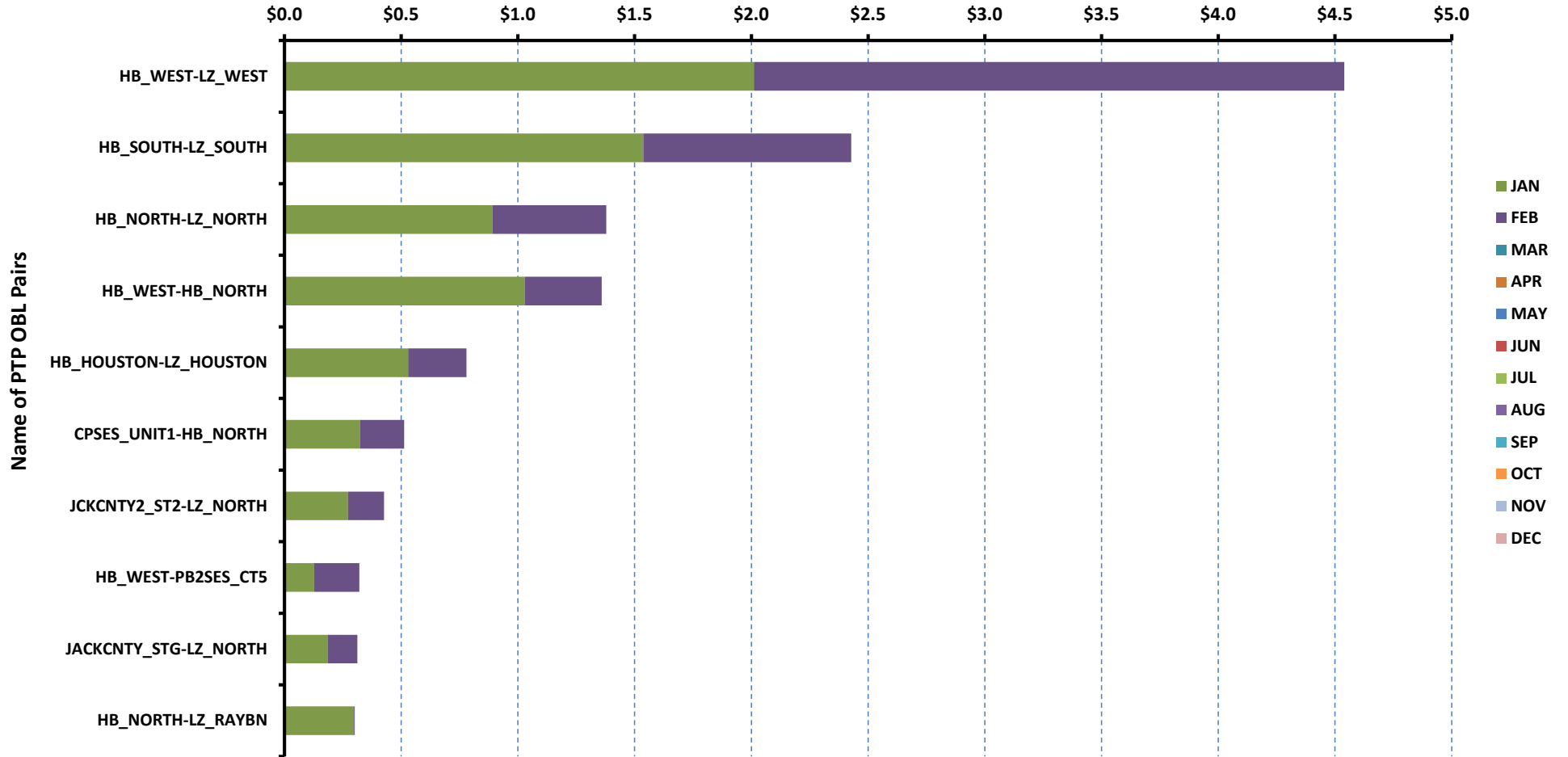
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Top 10 CRR Pairs Ranked by Monthly Auction Values - 1

Top 10 PTP Obligations by Total Transaction Value - 2019

Total Transaction Value in \$ million



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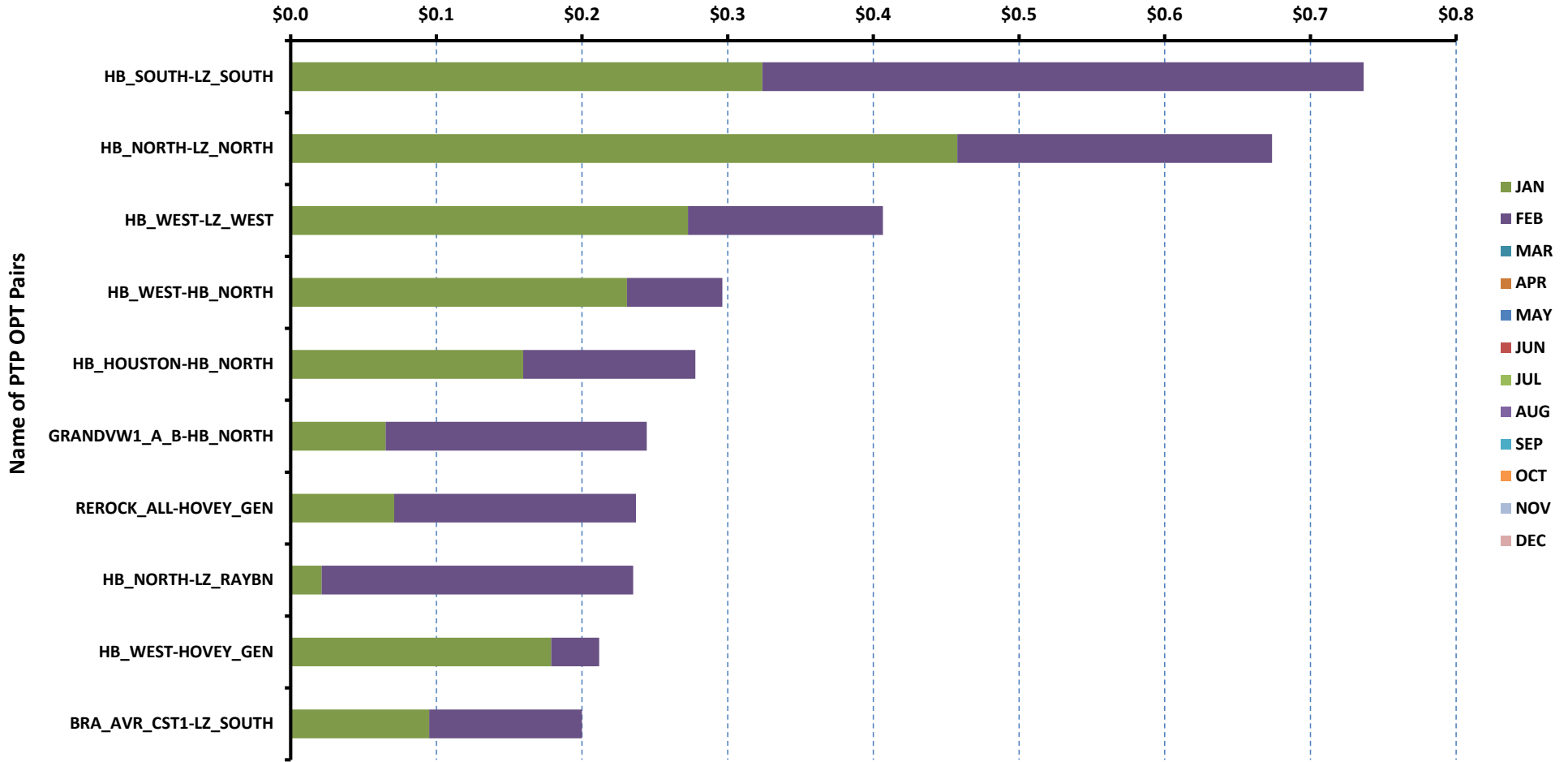
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Top 10 CRR Pairs Ranked by Monthly Auction Values - 2

Top 10 PTP Options by Total Transaction Value - 2019

Total Transaction Value in \$ million



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ERCOT-wide Avg. Energy Price - DA vs. RT			
year	month	dam_spp	rtm_spp
2018	1	\$ 45.63	\$ 42.56
	2	\$ 23.21	\$ 25.24
	3	\$ 24.42	\$ 20.80
	4	\$ 25.49	\$ 24.54
	5	\$ 43.15	\$ 38.28
	6	\$ 36.15	\$ 37.29
	7	\$ 100.46	\$ 50.22
	8	\$ 35.08	\$ 39.51
	9	\$ 29.31	\$ 30.40
	10	\$ 32.92	\$ 39.09
	11	\$ 33.19	\$ 38.44
	12	\$ 32.19	\$ 29.90
2019	1	\$ 26.27	\$ 24.96
	2	\$ -	\$ -
	3	\$ -	\$ -
	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	19,315	27,221	19,763	6,013	14,081	19,185	14,464	4,961	
	9	17,979	25,162	17,990	5,663	12,363	16,073	12,141	4,532	
	10	16,718	22,540	16,381	5,492	10,919	13,392	10,516	4,333	
	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	9,588	14,247	10,118	4,650	
2019	1	13,393	21,735	15,218	5,539	9,808	15,171	10,386	4,712	
	2	-	-	-	-	-	-	-	-	
	3	-	-	-	-	-	-	-	-	
	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	\$ 37.45	\$ 34.63	\$ 35.04	\$ 35.67	\$ 34.79	
	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	\$ 28.57	\$ 29.89	\$ 28.44	\$ 35.84	\$ 31.03	\$ 32.05	\$ 32.05	\$ 35.35	
2019	1	\$ 24.68	\$ 24.08	\$ 26.48	\$ 25.05	\$ 26.05	\$ 25.20	\$ 27.25	\$ 27.99	
	2	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	3	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	4	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	5	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	6	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	7	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
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	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	\$ -	\$ -	-	\$ -	-
	3	\$ -	\$ -	-	\$ -	-
	4	\$ -	\$ -	-	\$ -	-
	5	\$ -	\$ -	-	\$ -	-
	6	\$ -	\$ -	-	\$ -	-
	7	\$ -	\$ -	-	\$ -	-
	8	\$ -	\$ -	-	\$ -	-
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	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	11.65	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	8.17	9.01	7.28	7.25	7.62	9.14
2019	1	8.65	9.05	8.37	9.30	8.20	8.79	8.00	8.32
	2	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-
	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	1	1	\$ -	\$ -	0	0	80	90
2019	1	2	\$ 0.23	\$ -	23	0	80	90
2019	1	3	\$ -	\$ -	0	0	80	90
2019	1	4	\$ -	\$ -	0	0	80	90
2019	1	5	\$ -	\$ -	0	0	80	90
2019	1	6	\$ -	\$ -	0	0	80	90
2019	1	7	\$ -	\$ -	0	0	80	90
2019	1	8	\$ -	\$ -	0	0	80	90
2019	1	9	\$ 0.02	\$ -	3	0	80	90
2019	1	10	\$ -	\$ -	0	0	80	90
2019	1	11	\$ -	\$ -	0	0	80	90
2019	1	12	\$ -	\$ -	0	0	80	90
2019	1	13	\$ 0.01	\$ -	2	0	80	90
2019	1	14	\$ 0.02	\$ -	6	0	80	90
2019	1	15	\$ 0.01	\$ -	7	0	80	90
2019	1	16	\$ 0.05	\$ -	8	0	80	90
2019	1	17	\$ 0.01	\$ -	2	0	80	90
2019	1	18	\$ 0.01	\$ -	3	0	80	90
2019	1	19	\$ 0.67	\$ -	4	0	80	90
2019	1	20	\$ -	\$ -	0	0	80	90
2019	1	21	\$ -	\$ -	0	0	80	90
2019	1	22	\$ -	\$ 0.02	0	1	80	90
2019	1	23	\$ 0.07	\$ -	9	0	80	90
2019	1	24	\$ -	\$ -	0	0	80	90
2019	1	25	\$ -	\$ -	0	0	80	90
2019	1	26	\$ 0.01	\$ -	4	0	80	90
2019	1	27	\$ -	\$ -	0	0	80	90
2019	1	28	\$ -	\$ -	0	0	80	90
2019	1	29	\$ 0.18	\$ -	6	0	80	90
2019	1	30	\$ 0.01	\$ -	4	0	80	90
2019	1	31	\$ 0.02	\$ -	4	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	-	-	-	-
	3	-	-	-	-
	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	281	1,283	2,984	237
	2	208	1,283	2,984	199
	3	195	1,620	2,984	196
	4	183	1,620	2,984	249
	5	253	1,620	2,984	335
	6	334	1,620	2,984	537
	7	301	2,027	2,871	669
	8	258	2,027	2,871	310
	9	309	2,027	2,871	306
	10	300	2,027	2,871	300
	11	381	1,438	2,840	234
	12	334	1,438	2,840	213
	13	308	1,438	2,840	235
	14	273	1,438	2,840	258
	15	244	1,473	2,840	202
	16	205	1,473	2,840	213
	17	196	1,473	2,840	291
	18	245	1,473	2,840	536
	19	312	1,624	2,871	412
	20	280	1,624	2,871	235
	21	321	1,624	2,871	267
	22	357	1,624	2,871	197
	23	419	1,283	2,984	223
	24	350	1,283	2,984	222

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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	\$ -	\$ -	\$ -	\$ -
	3	\$ -	\$ -	\$ -	\$ -
	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	\$ -	\$ -	\$ -	\$ -
	3	\$ -	\$ -	\$ -	\$ -
	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	\$ -	\$ -
	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	-	-	-	-	-	-
	3	-	-	-	-	-	-
	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	11,099	9,863	8,186
	6	11,843	7,661	9,377	11,080	9,922	8,937
	7	7,895	3,590	5,418	7,058	6,434	4,248
	8	9,401	5,402	6,821	9,075	7,803	6,410
	9	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	-	-	-	-	-	-
	3	-	-	-	-	-	-
	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	74T148_1 (COMFOR-CICO)	1,718	1	1,718	-	-	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2019	BARL_FTSW1_1 (FTSW-BARL)	1,340	2	1,340	-	-	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2019	38T365_1 (WIRTZ-FLATRO)	1,277	3	1,277	-	-	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2019	1350_E (NCSTP-LFKSW)	951	4	951	-	-	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2019	SPUR_69_1 (SPUR-SPUR)	951	5	951	-	-	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2019	TNAF_TNFS_1 (TNAF-16TH_ST)	811	6	811	-	-	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2019	RIOPEC_WOODW21_1 (WOODWRD2-RIOPECOS)	658	7	658	-	-	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2019	RIOPEC_WOODW21_1 (RIOPECOS-WOODWRD2)	551	8	551	-	-	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2019	SONR_69-1 (SONR-SONR)	528	9	528	-	-	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2019	JCKSTP18_A (STP-JCK)	526	10	526	-	-	-	-	-	-	-	-	-	-	-	
TOP10_RENT	2019	74T148_1 (COMFOR-CICO)	\$ 8.79	1	\$ 8.79	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2019	LON_HILL_XFMRS (LON_HILL-LON_HILL)	\$ 6.25	2	\$ 6.25	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2019	RIOPEC_WOODW21_1 (RIOPECOS-WOODWRD2)	\$ 5.13	3	\$ 5.13	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2019	1350_E (NCSTP-LFKSW)	\$ 2.63	4	\$ 2.63	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2019	JCKSTP18_A (STP-JCK)	\$ 2.34	5	\$ 2.34	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2019	6437_F (SCRCV-KNAPP)	\$ 2.16	6	\$ 2.16	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2019	16TH_WRD2_1 (WOODWRD2-16TH_ST)	\$ 2.13	7	\$ 2.13	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2019	NLARSW_PILONC1_1 (NLARSW-PILONCIL)	\$ 2.13	8	\$ 2.13	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2019	COOPERCK_ARCO_1 (COOPERCK-ARCO)	\$ 1.53	9	\$ 1.53	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2019	FALFUR_PREMON1_1 (FALFUR-PREMONT)	\$ 1.50	10	\$ 1.50	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	

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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	COLETO-VICTORIA (COLETO-VICTORIA)	566	1	566	-	-	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2019	1350_E (NCSTP-LFKSW)	530	2	530	-	-	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2019	RIOPEC_WOODW21_1 (RIOPECOS-WOODWRD2)	491	3	491	-	-	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2019	HAMILT_MAVR1_1 (HAMILTON-MAVERICK)	482	4	482	-	-	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2019	GREENL_WEAVER1_1 (WEAVERRD-GREENLK)	414	5	414	-	-	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2019	38T365_1 (WIRTZ-FLATRO)	410	6	410	-	-	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2019	BARL_FTSW1_1 (FTSW-BARL)	308	7	308	-	-	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2019	BARNHR_BIGLAK1_1 (BIGLAKE-BARNHRT)	294	8	294	-	-	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2019	RINCON_WHITE_2_1 (WHITE_PT-RINCON)	284	9	284	-	-	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2019	16TH_WRD2_1 (WOODWRD2-16TH_ST)	276	10	276	-	-	-	-	-	-	-	-	-	-	-	
TOP10_RENT	2019	HUMBLT_NOVICT1_1 (HUMBLTAP-NOVICTAP)	\$ 22.89	1	\$ 22.89	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2019	COLJ_GLSB1_1 (COLJ-GLSB)	\$ 11.43	2	\$ 11.43	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2019	COLJ_SANA1_1 (SANA-COLJ)	\$ 11.43	3	\$ 11.43	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2019	RIOPEC_WOODW21_1 (RIOPECOS-WOODWRD2)	\$ 9.00	4	\$ 9.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2019	74T148_1 (COMFOR-CICO)	\$ 6.28	5	\$ 6.28	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2019	1350_E (NCSTP-LFKSW)	\$ 2.87	6	\$ 2.87	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2019	16TH_WRD2_1 (WOODWRD2-16TH_ST)	\$ 2.30	7	\$ 2.30	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2019	COLETO-VICTORIA (COLETO-VICTORIA)	\$ 2.25	8	\$ 2.25	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2019	JCKSTP18_A (STP-JCK)	\$ 2.02	9	\$ 2.02	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2019	6437_F (SCRCV-KNAPP)	\$ 1.99	10	\$ 1.99	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	

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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	\$ 4.54	1	\$ 2.01	\$ 2.53	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2019	HB SOUTH-LZ SOUTH	\$ 2.43	2	\$ 1.54	\$ 0.89	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2019	HB NORTH-LZ NORTH	\$ 1.38	3	\$ 0.89	\$ 0.49	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2019	HB WEST-HB NORTH	\$ 1.36	4	\$ 1.03	\$ 0.33	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2019	HB HOUSTON-LZ HOUSTON	\$ 0.78	5	\$ 0.53	\$ 0.25	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2019	CPSSES_UNIT1-HB NORTH	\$ 0.51	6	\$ 0.32	\$ 0.19	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2019	JCKCNTY2_ST2-LZ NORTH	\$ 0.43	7	\$ 0.27	\$ 0.15	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2019	HB WEST-PB2SES_CT5	\$ 0.32	8	\$ 0.13	\$ 0.19	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2019	JACKCNTY_STG-LZ NORTH	\$ 0.31	9	\$ 0.19	\$ 0.13	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2019	HB NORTH-LZ RAYBN	\$ 0.30	10	\$ 0.30	\$ 0.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2019	HB SOUTH-LZ SOUTH	\$ 0.74	1	\$ 0.32	\$ 0.41	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2019	HB NORTH-LZ NORTH	\$ 0.67	2	\$ 0.46	\$ 0.22	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2019	HB WEST-LZ WEST	\$ 0.41	3	\$ 0.27	\$ 0.13	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2019	HB WEST-HB NORTH	\$ 0.30	4	\$ 0.23	\$ 0.07	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2019	HB HOUSTON-HB NORTH	\$ 0.28	5	\$ 0.16	\$ 0.12	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2019	GRANDVW1_A_B-HB NORTH	\$ 0.24	6	\$ 0.07	\$ 0.18	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2019	REROCK_ALL-HOVEY GEN	\$ 0.24	7	\$ 0.07	\$ 0.17	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2019	HB NORTH-LZ RAYBN	\$ 0.24	8	\$ 0.02	\$ 0.21	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2019	HB WEST-HOVEY GEN	\$ 0.21	9	\$ 0.18	\$ 0.03	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2019	BRA_AVR_CST1-LZ SOUTH	\$ 0.20	10	\$ 0.10	\$ 0.10	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	

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