

To the Public Utility Commission of Texas

# ERCOT Wholesale Electricity Market Monthly Report

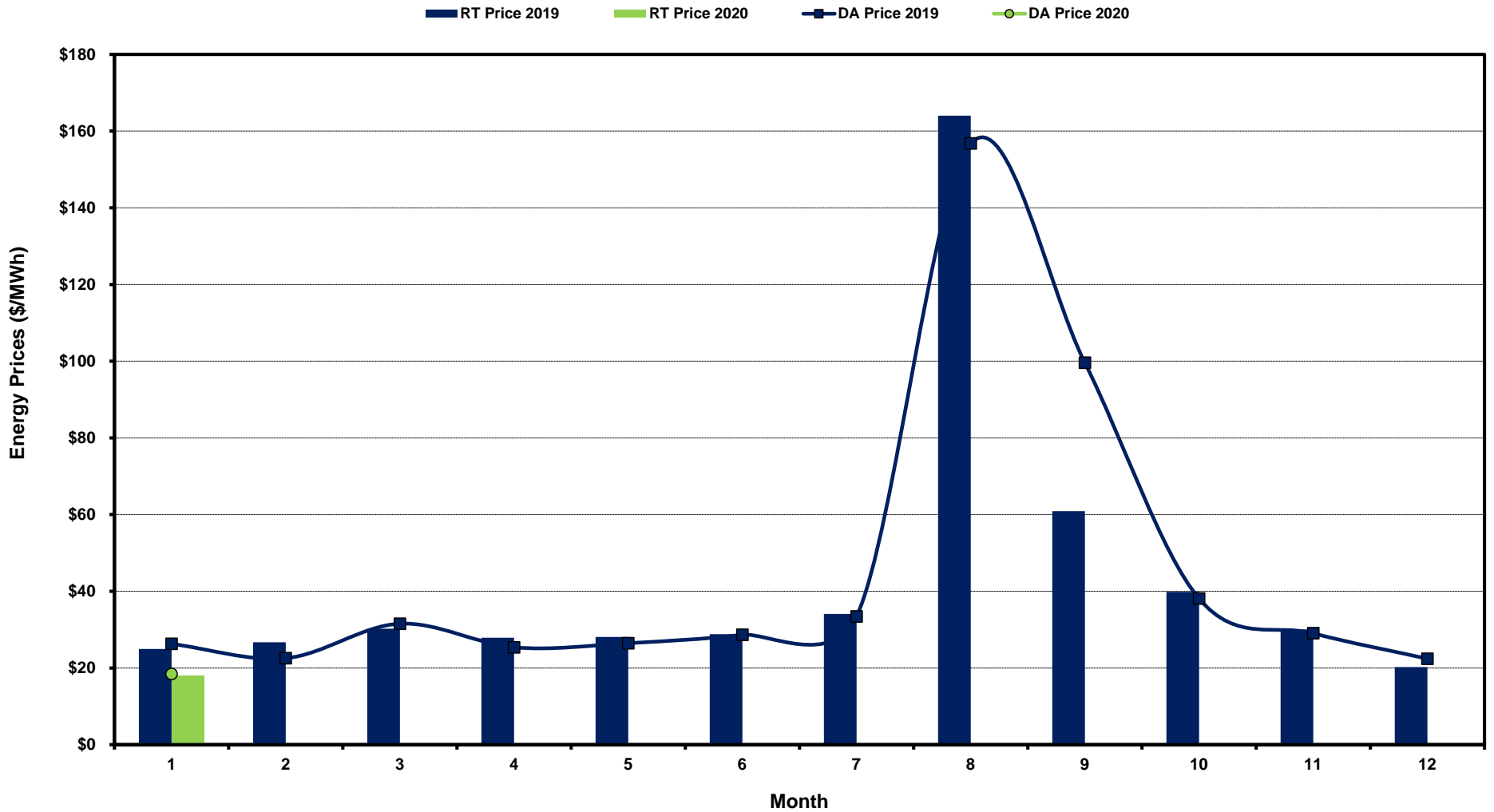
Monday, February 10, 2020

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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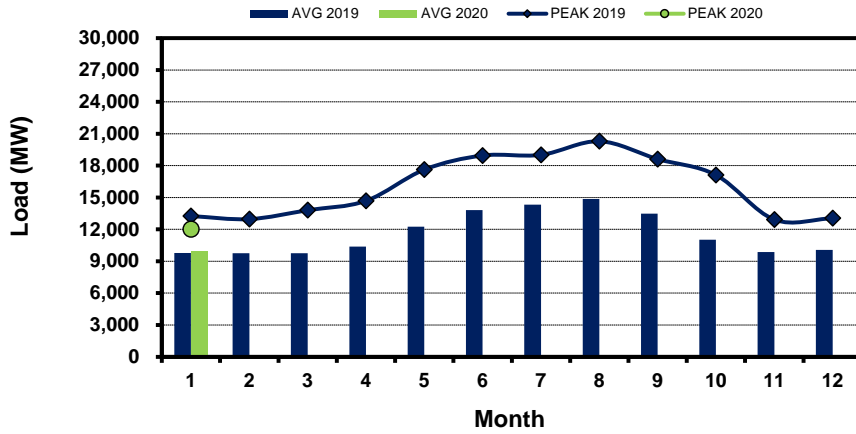
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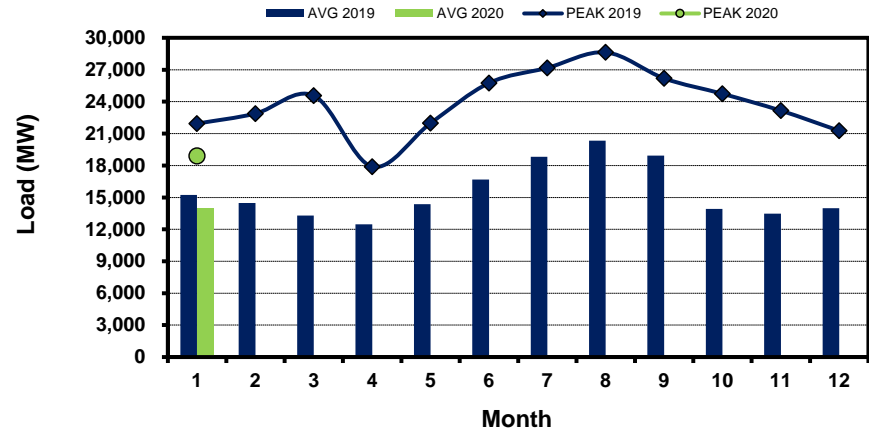
# Load Zone Load Statistics

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

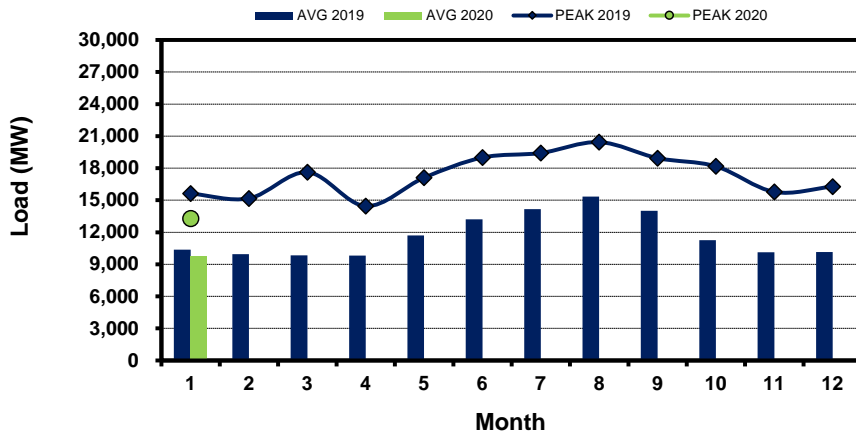
### Houston Zone



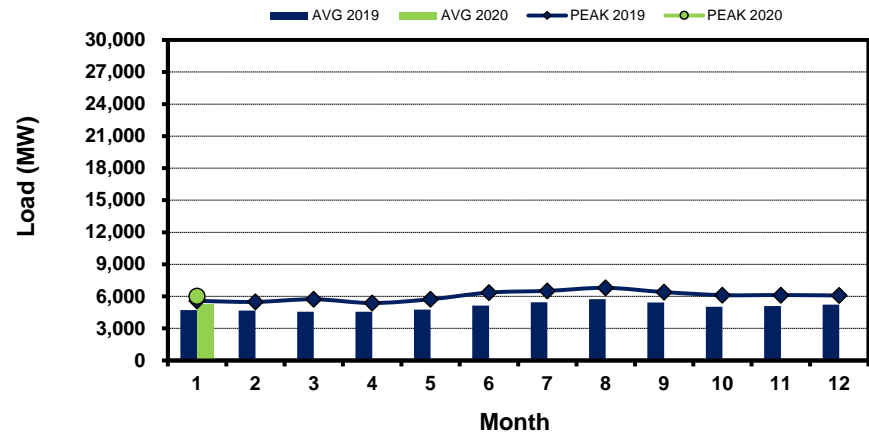
### North Zone



### South Zone



### West Zone



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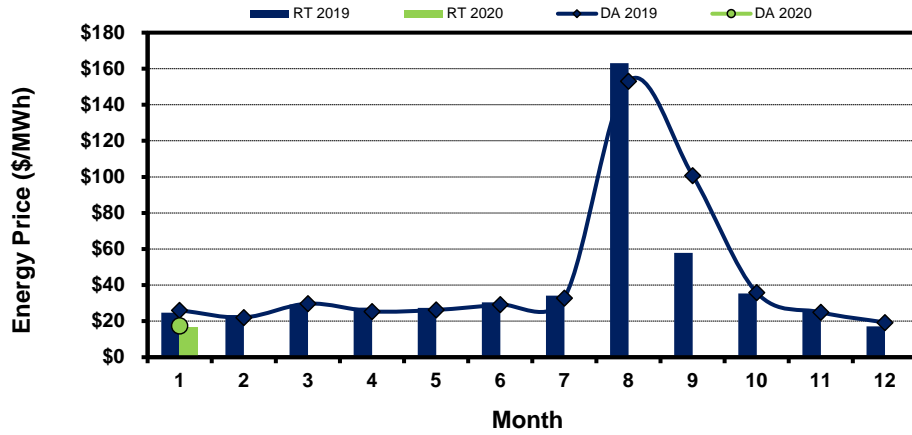
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**Note:** \* Zonal load zone definition vs. Nodal comparable load zone definition: LZ\_Houston=LZ\_Houston; LZ\_West=LZ\_West; LZ\_North=(LZ\_North,LZ\_RAYBN); LZ\_South=(LZ\_South,LZ\_CPS,LZ\_AEN,LZ\_LCRA)

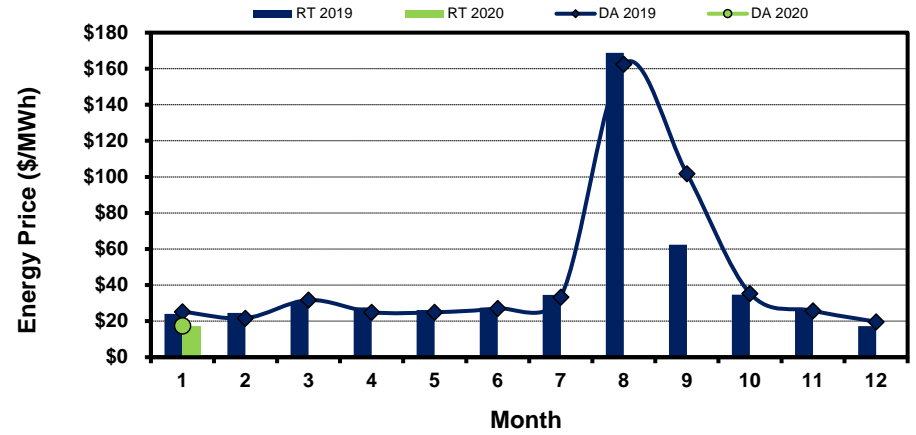
# Load Zone Monthly Average Energy Price DA vs RT

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

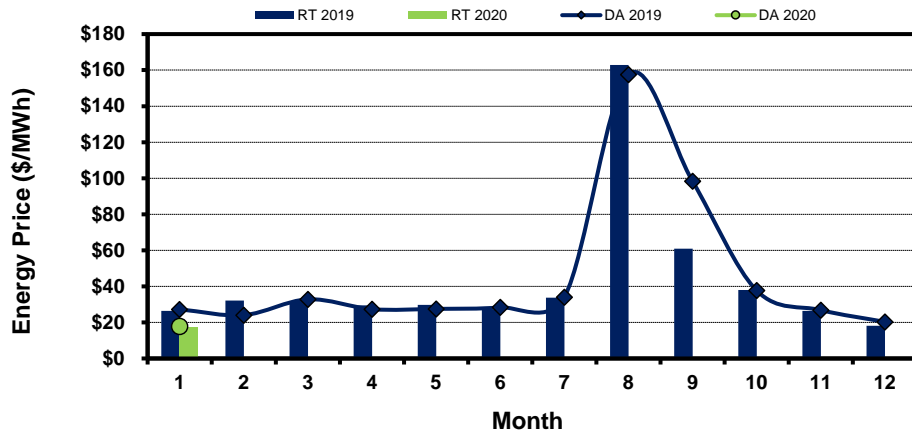
### Houston Zone



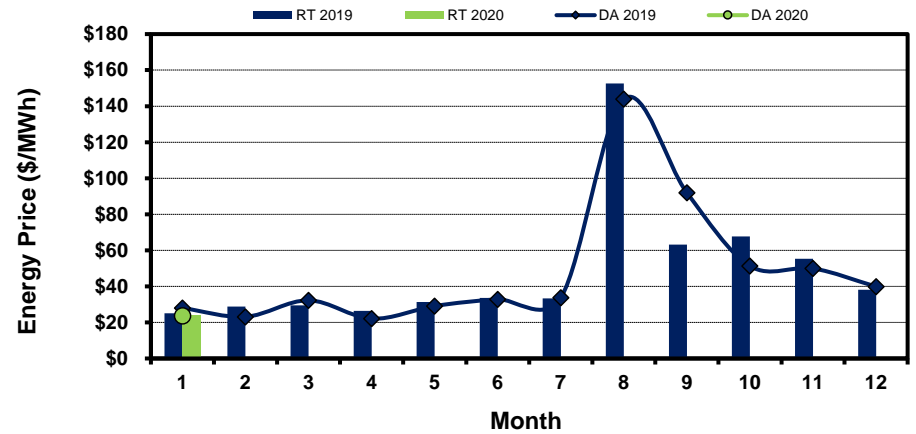
### North Zone



### South Zone



### West Zone



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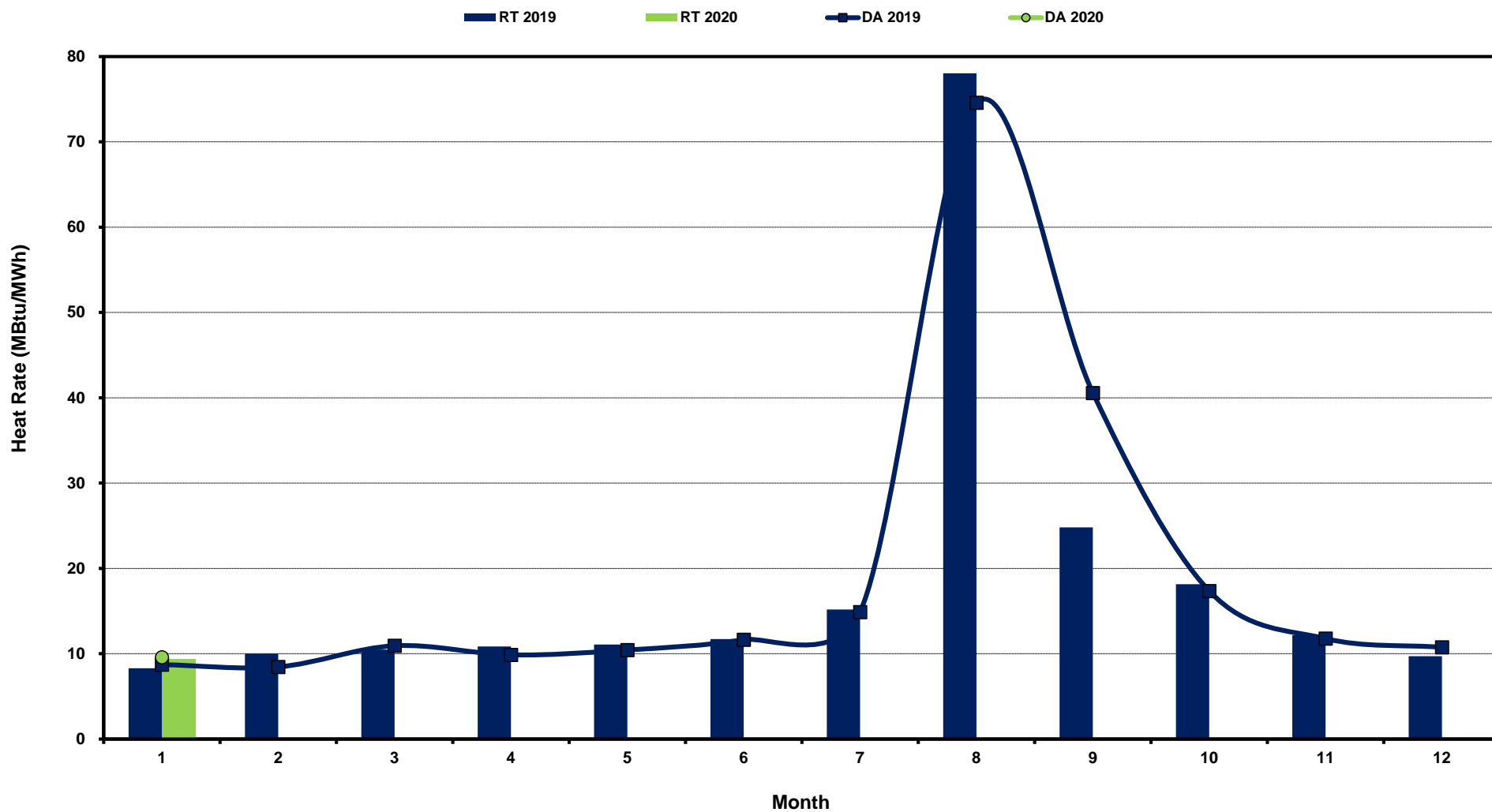
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**Note:** \* Zonal load zone definition vs. Nodal comparable load zone definition: LZ\_Houston=LZ\_Houston; LZ\_West=LZ\_West; LZ\_North=(LZ\_North,LZ\_RAYBN); LZ\_South=(LZ\_South,LZ\_CPS,LZ\_AEN,LZ\_LCRA)

# ERCOT-wide Monthly Implied Heat Rate DA vs RT

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



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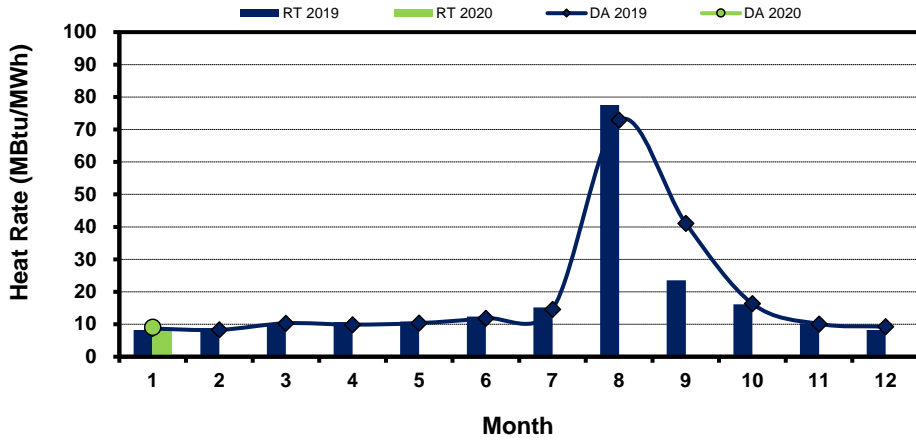
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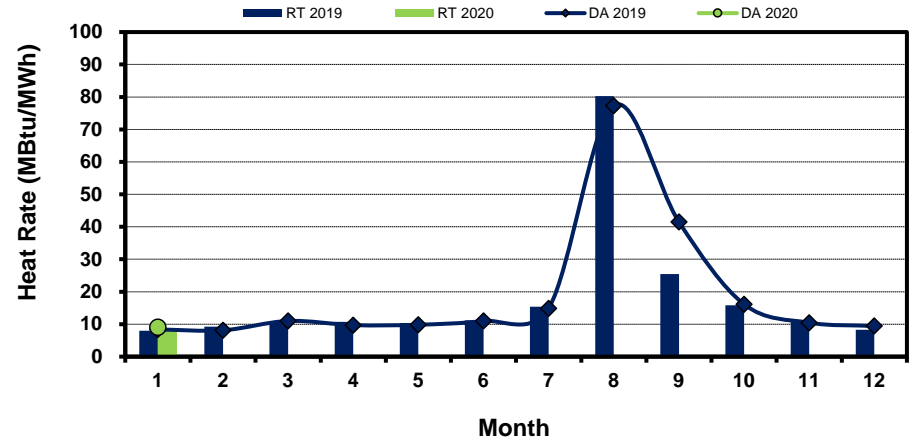
# Load Zone Monthly Implied Heat Rate DA vs RT

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

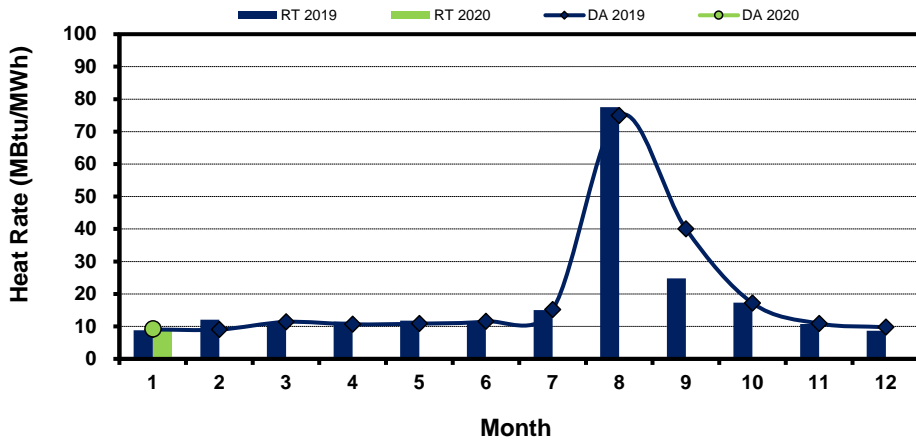
### Houston Zone



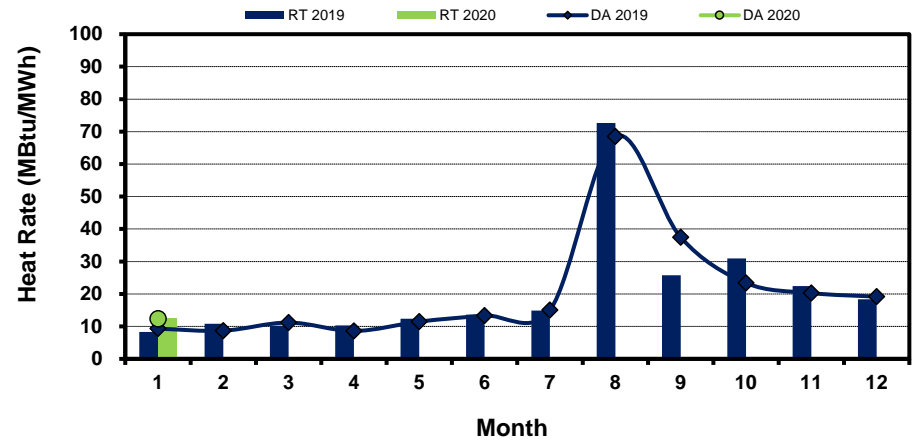
### North Zone



### South Zone



### West Zone



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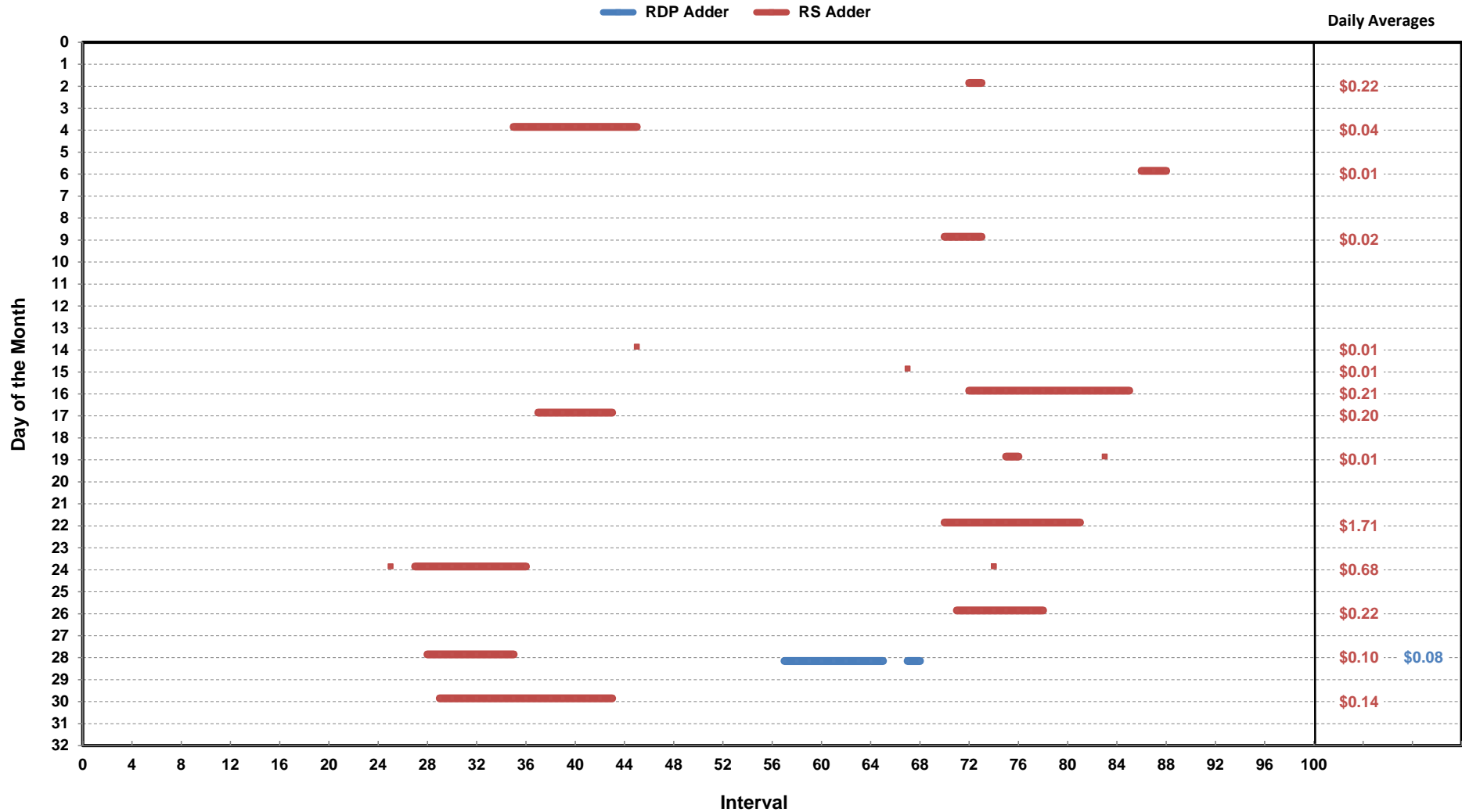
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**Note:** \* Zonal load zone definition vs. Nodal comparable load zone definition: LZ\_Houston=LZ\_Houston; LZ\_West=LZ\_West; LZ\_North=(LZ\_North,LZ\_RAYBN); LZ\_South=(LZ\_South,LZ\_CPS,LZ\_AEN,LZ\_LCRA)

# Daily ORDC Adders Average Values and Interval Duration Jan-2020



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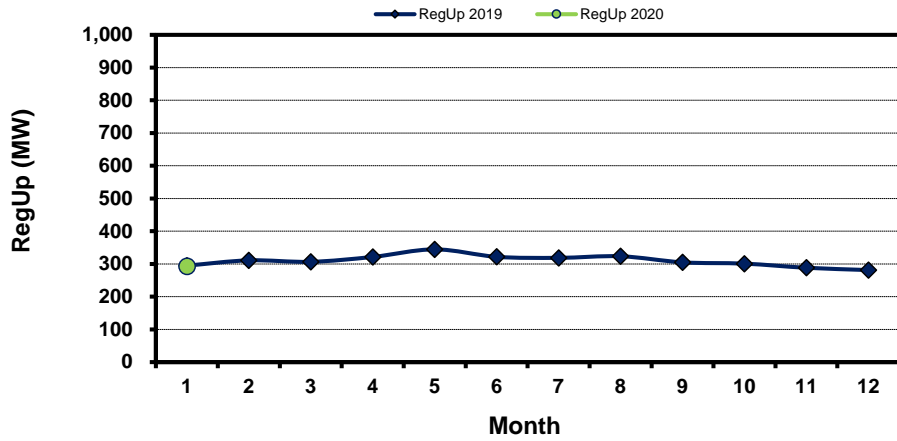
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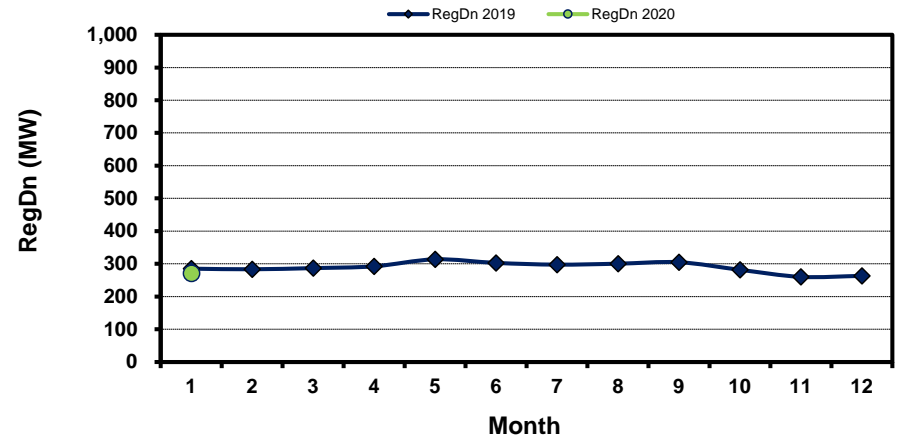
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# Monthly Average of Ancillary Services Required MW

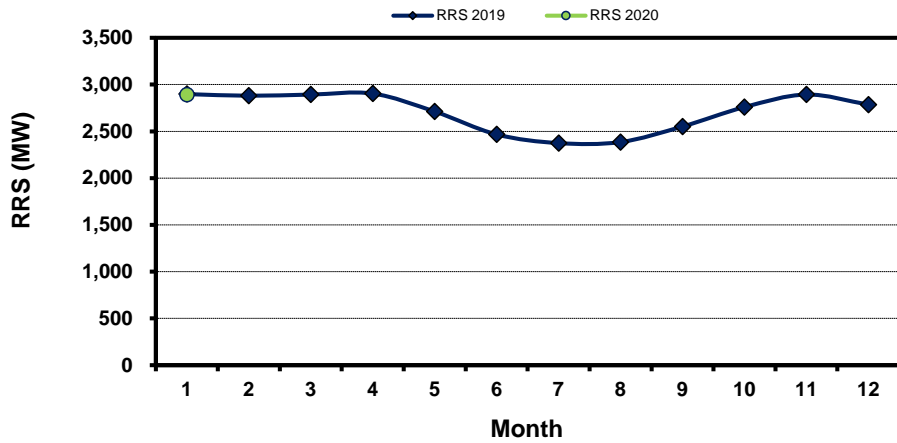
## Regulation Up



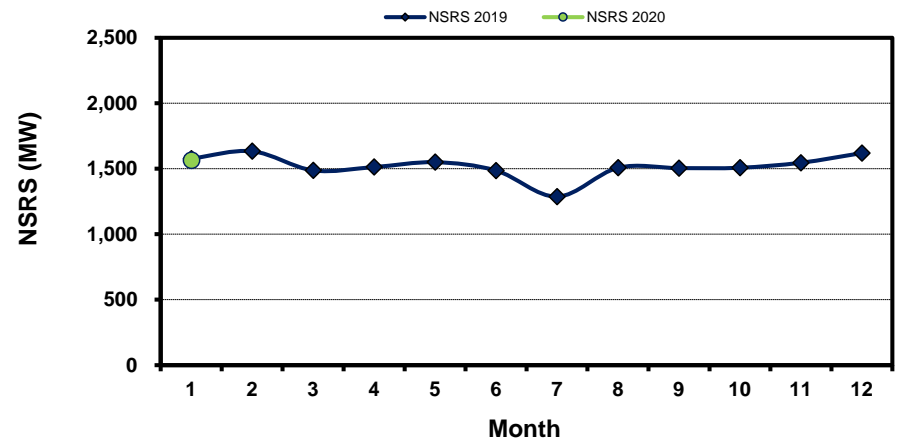
## Regulation Down



## Responsive Reserve



## Non-Spin Reserve



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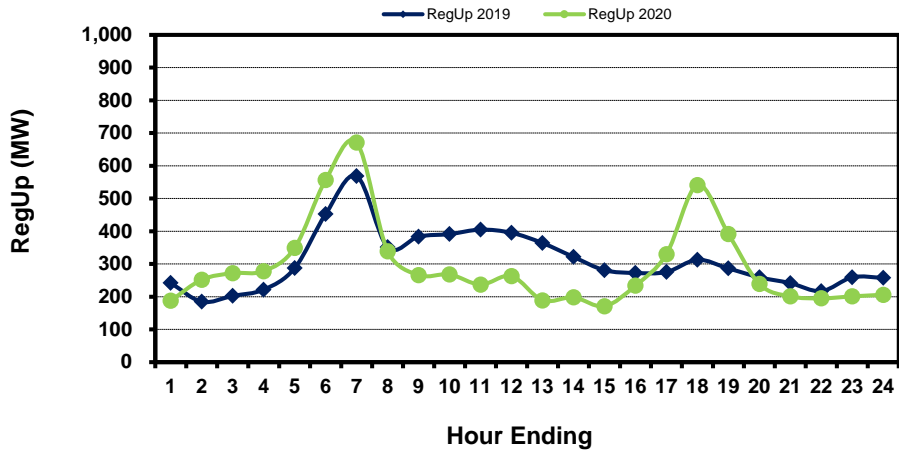
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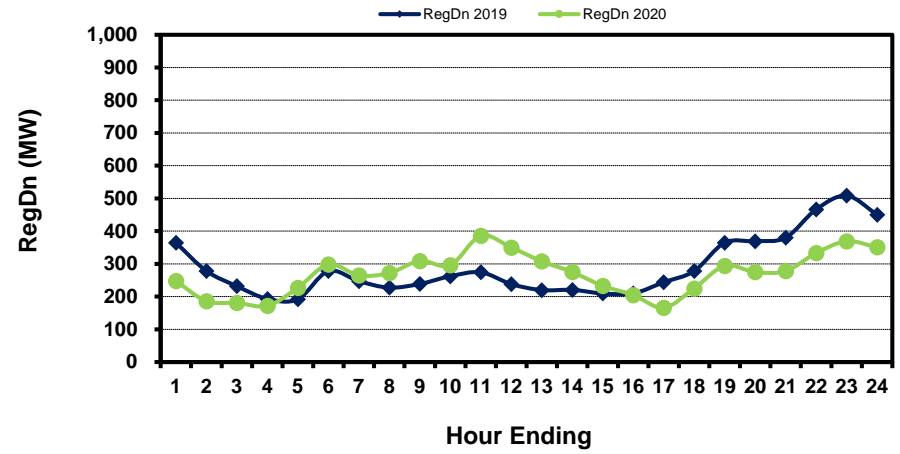


# Hourly Average of Ancillary Services Required MW

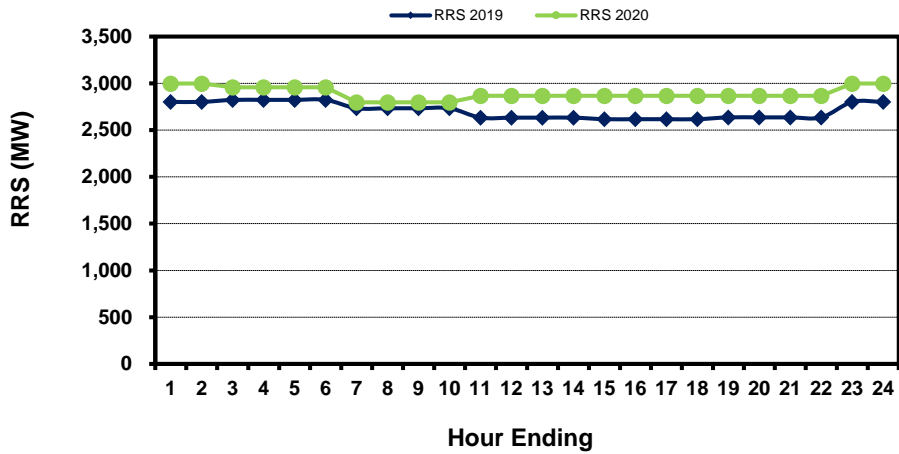
## Regulation Up



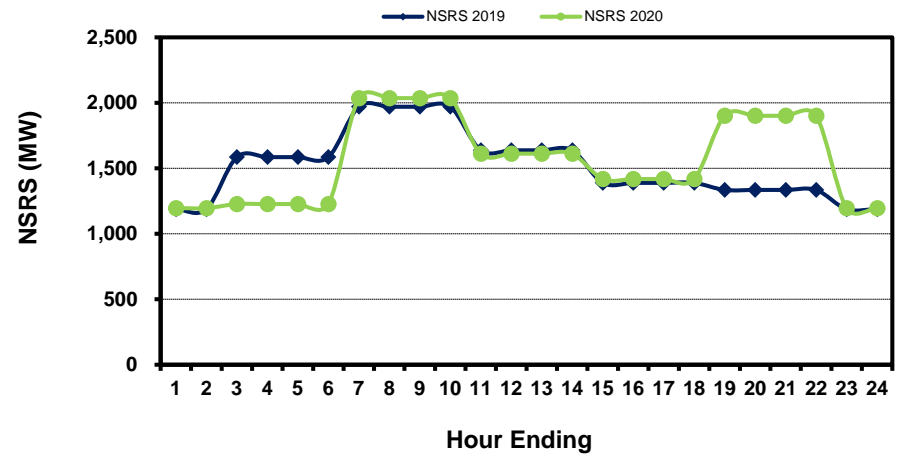
## Regulation Down



## Responsive Reserve



## Non-Spin Reserve



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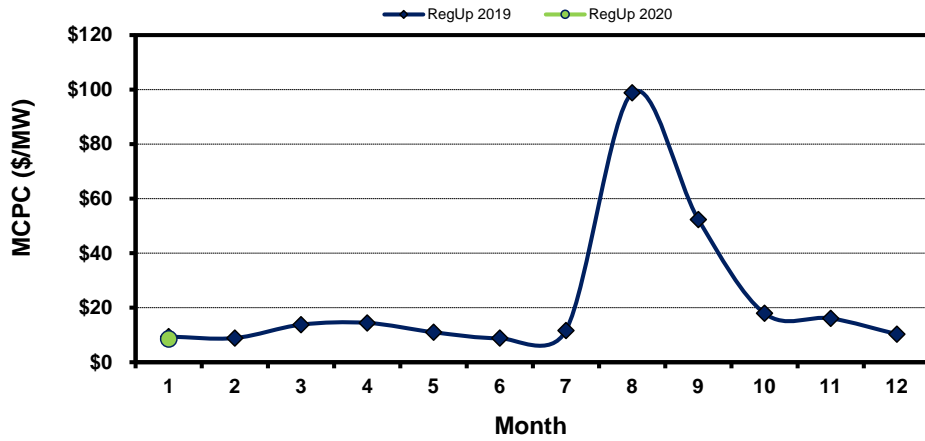
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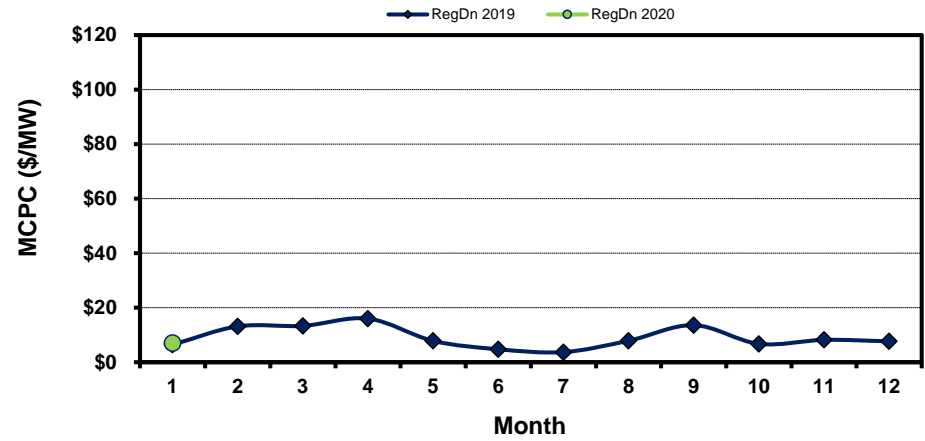
# Monthly Average Ancillary Services Price

(weighted by A/S Quantities Required)

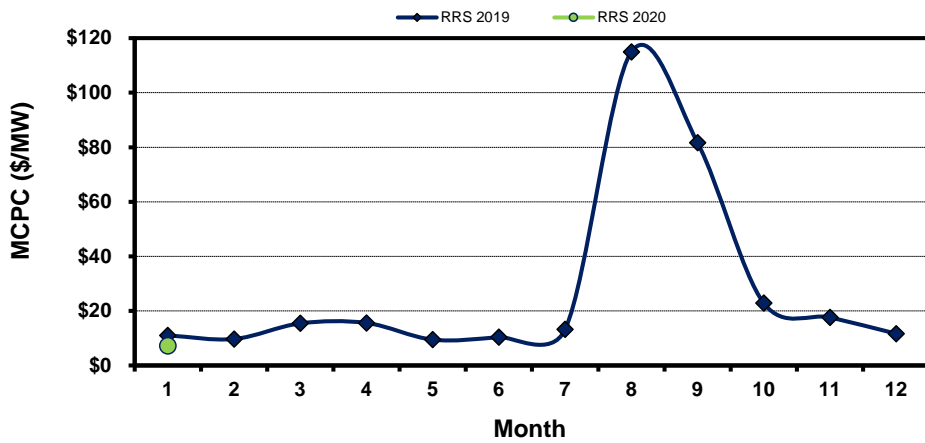
### Regulation Up



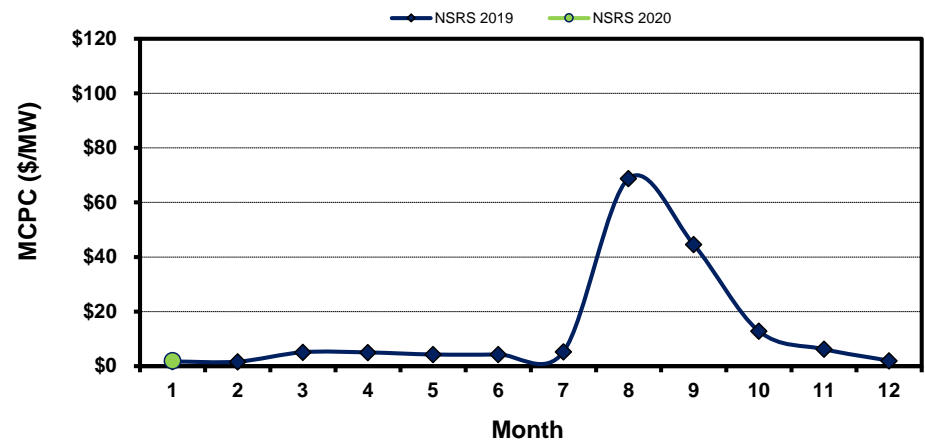
### Regulation Down



### Responsive Reserve



### Non-Spin Reserve



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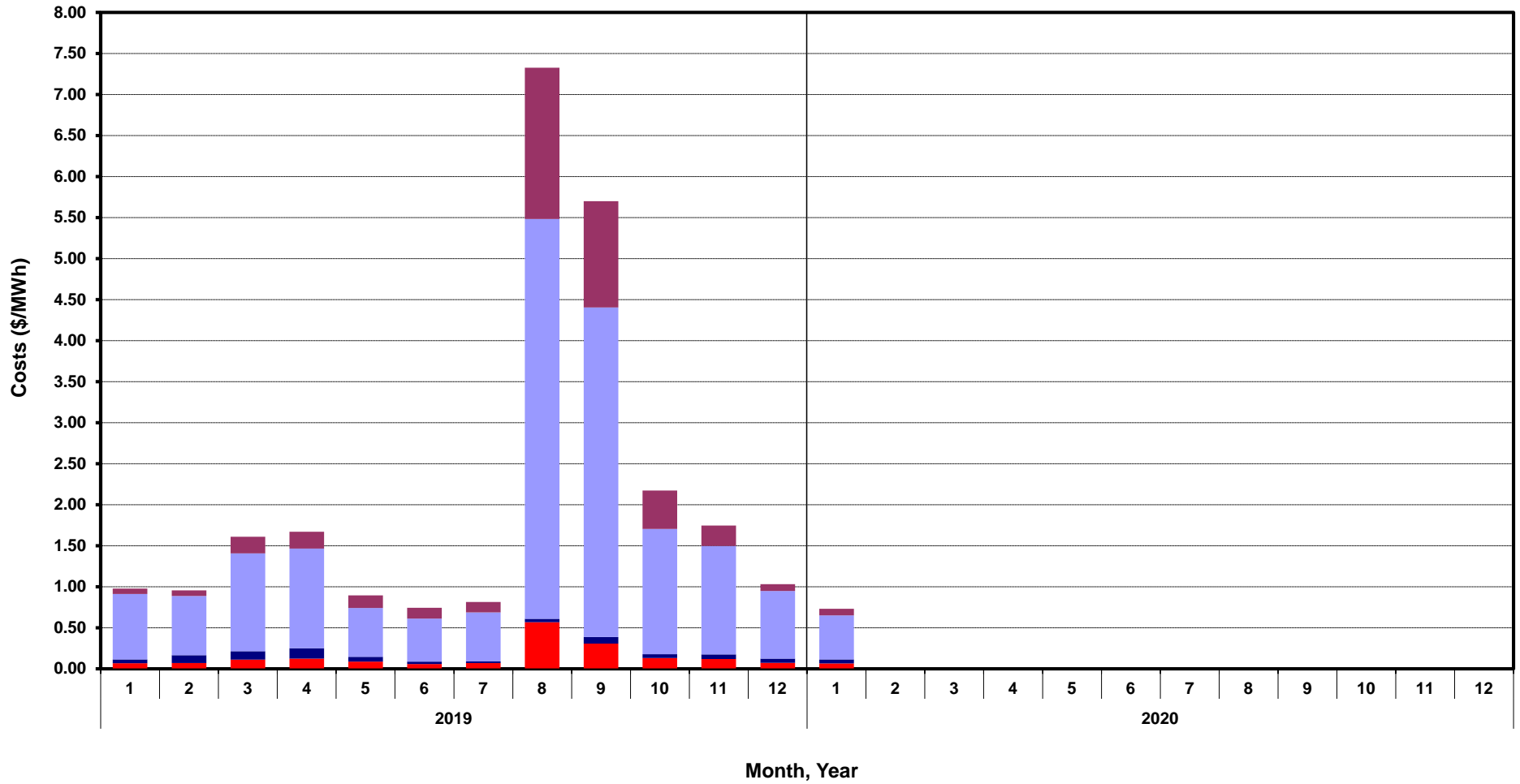
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# Monthly Average A/S Cost per MWh Load

RegUp RegDn RRS NonSpin



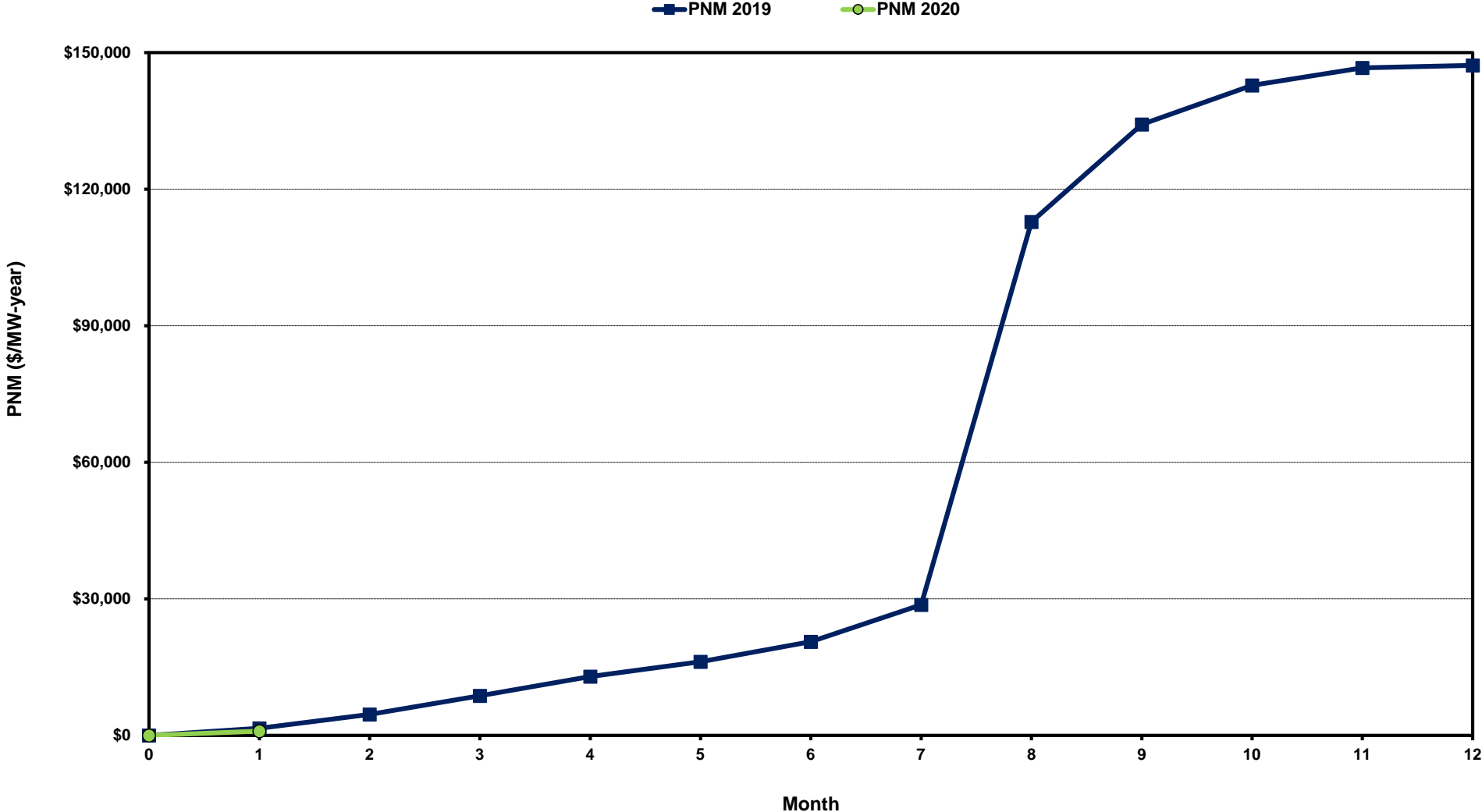
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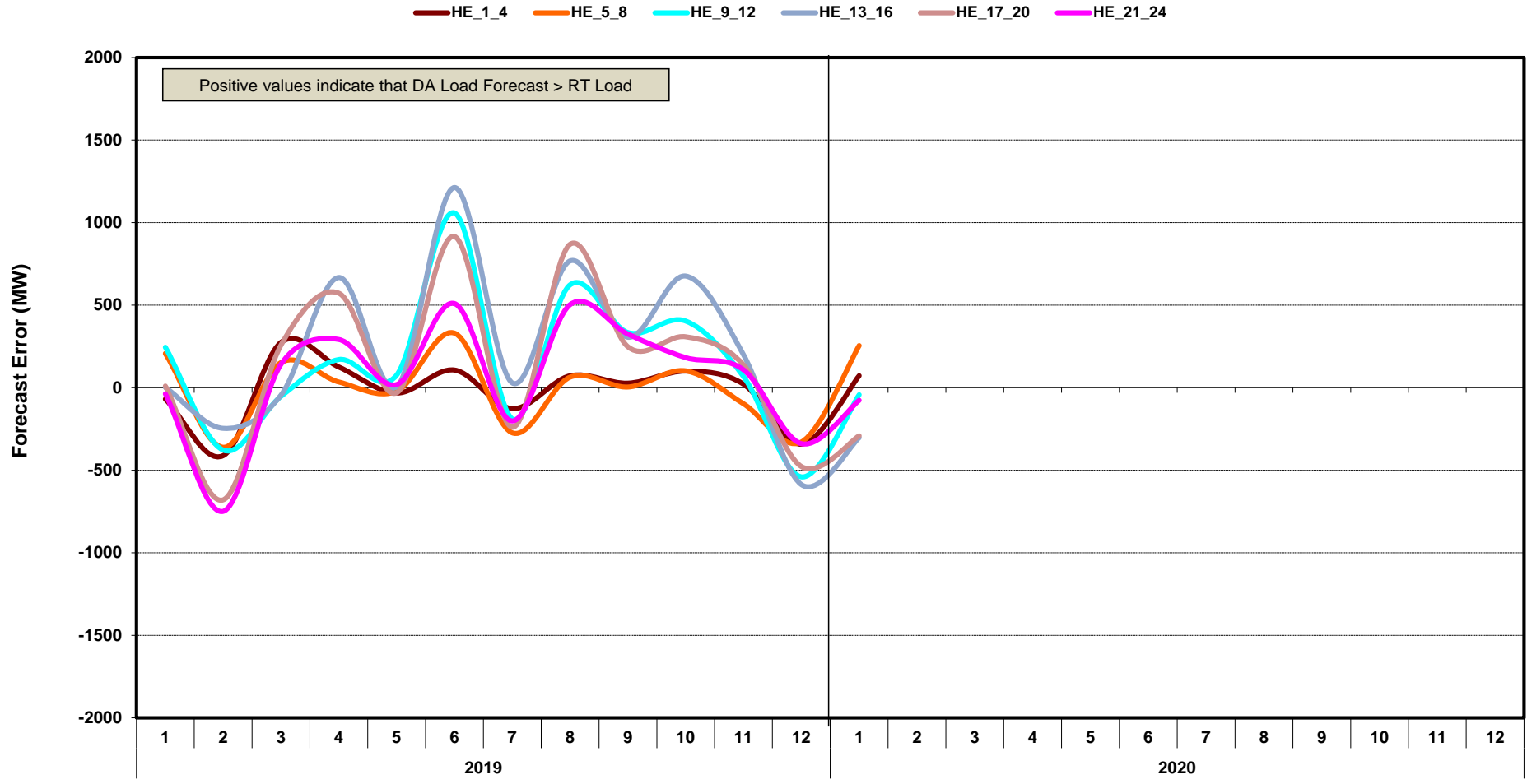
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# ERCOT-wide Cumulative Peaker Net Margin



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# DA vs. RT Load Forecast Error by Hour Ending



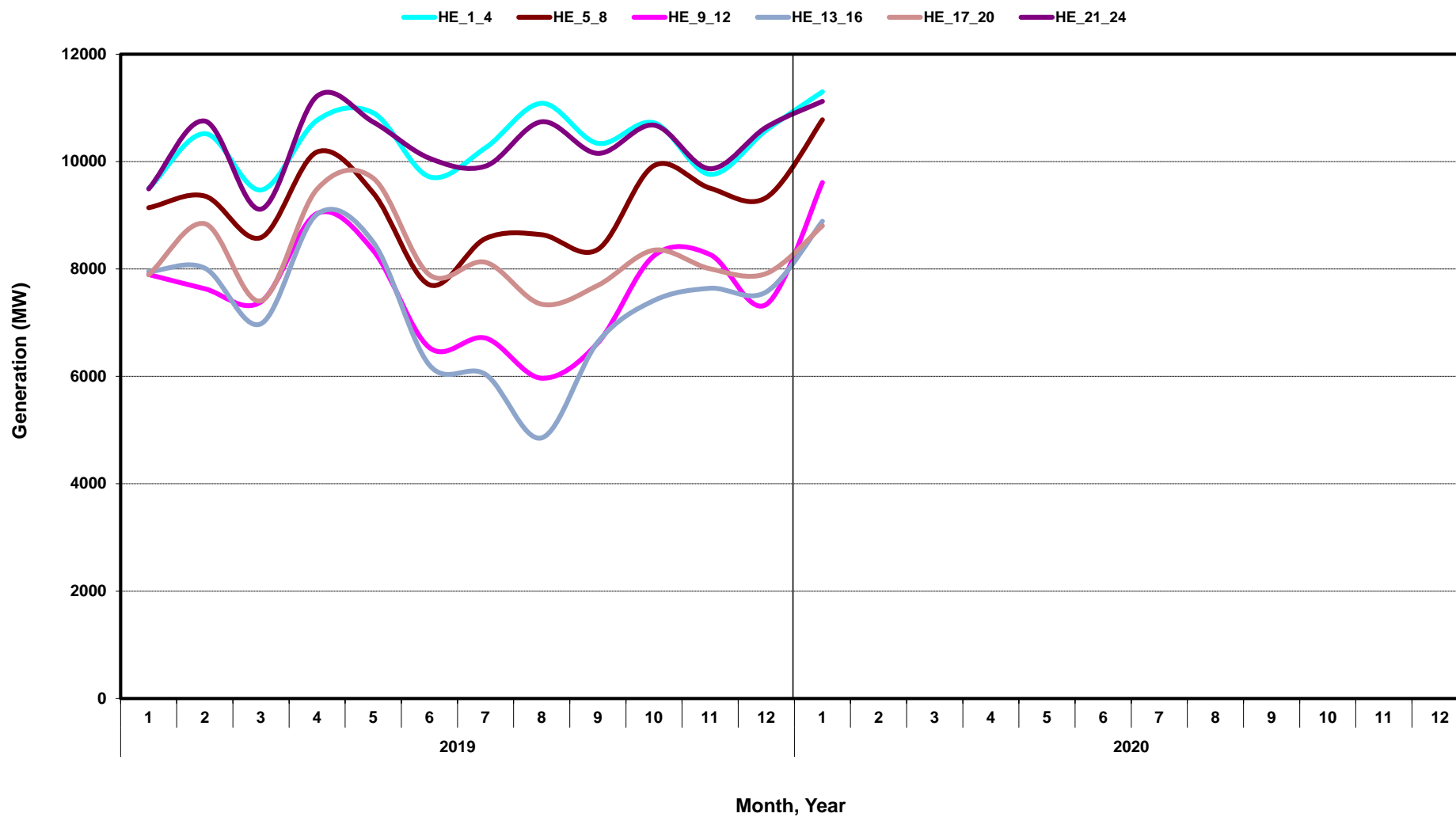
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# Monthly Average of Wind Generation by Hour Ending



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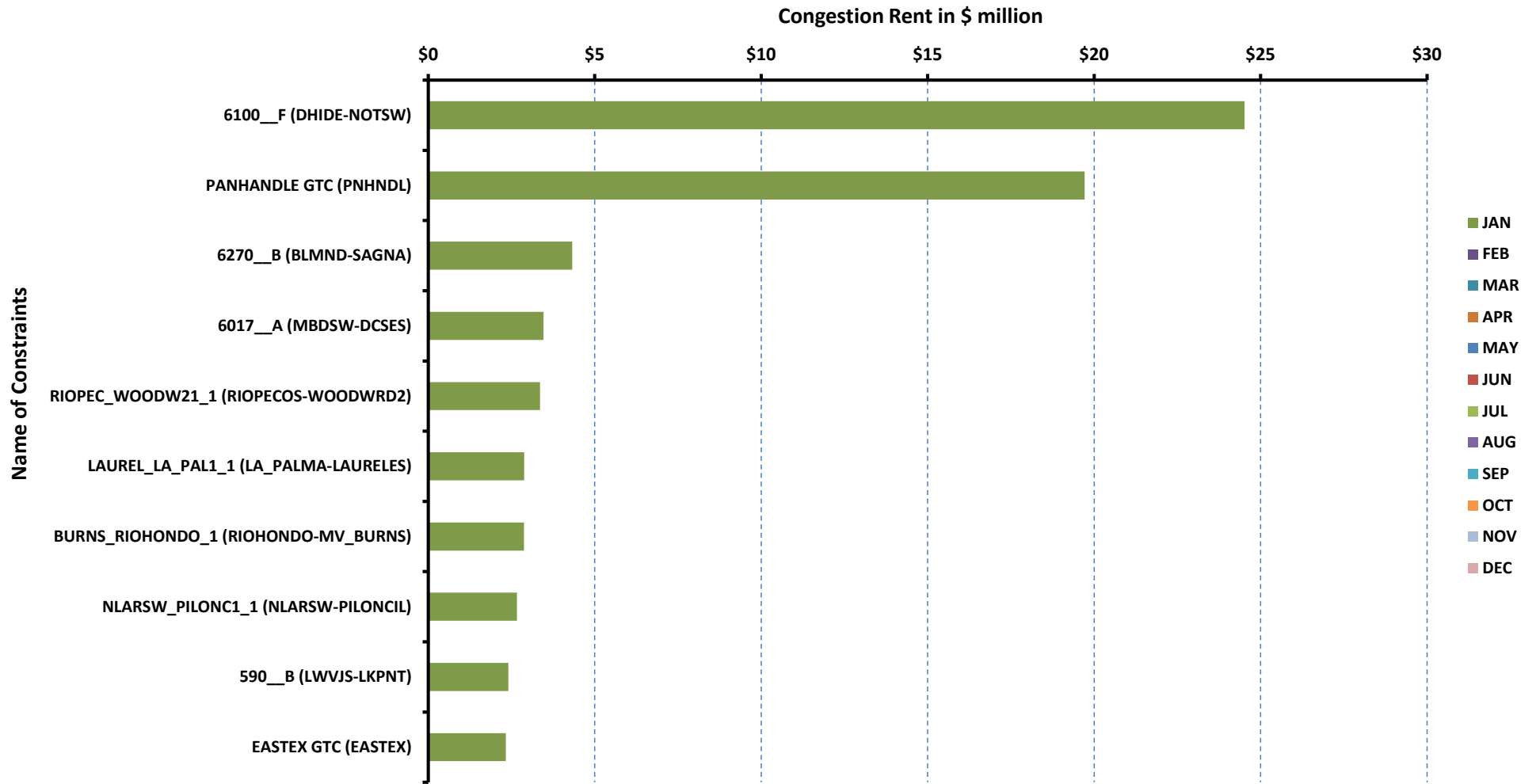
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# RT Congestion Constraint Rankings - 1

## Top 10 Constraints by Total Congestion Value - 2019



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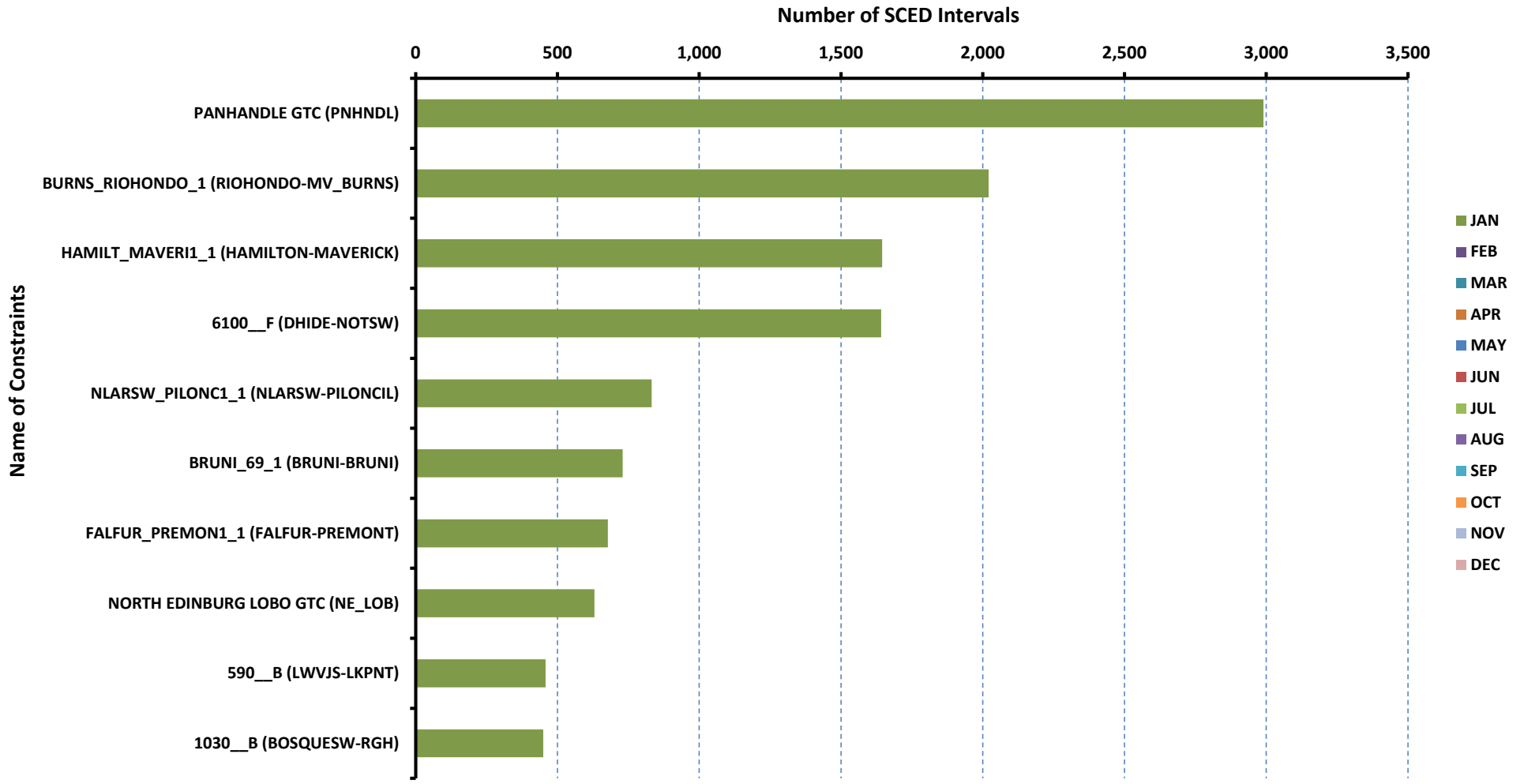
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# RT Congestion Constraint Rankings - 2

## Top 10 Constraints by Binding Frequency - 2019



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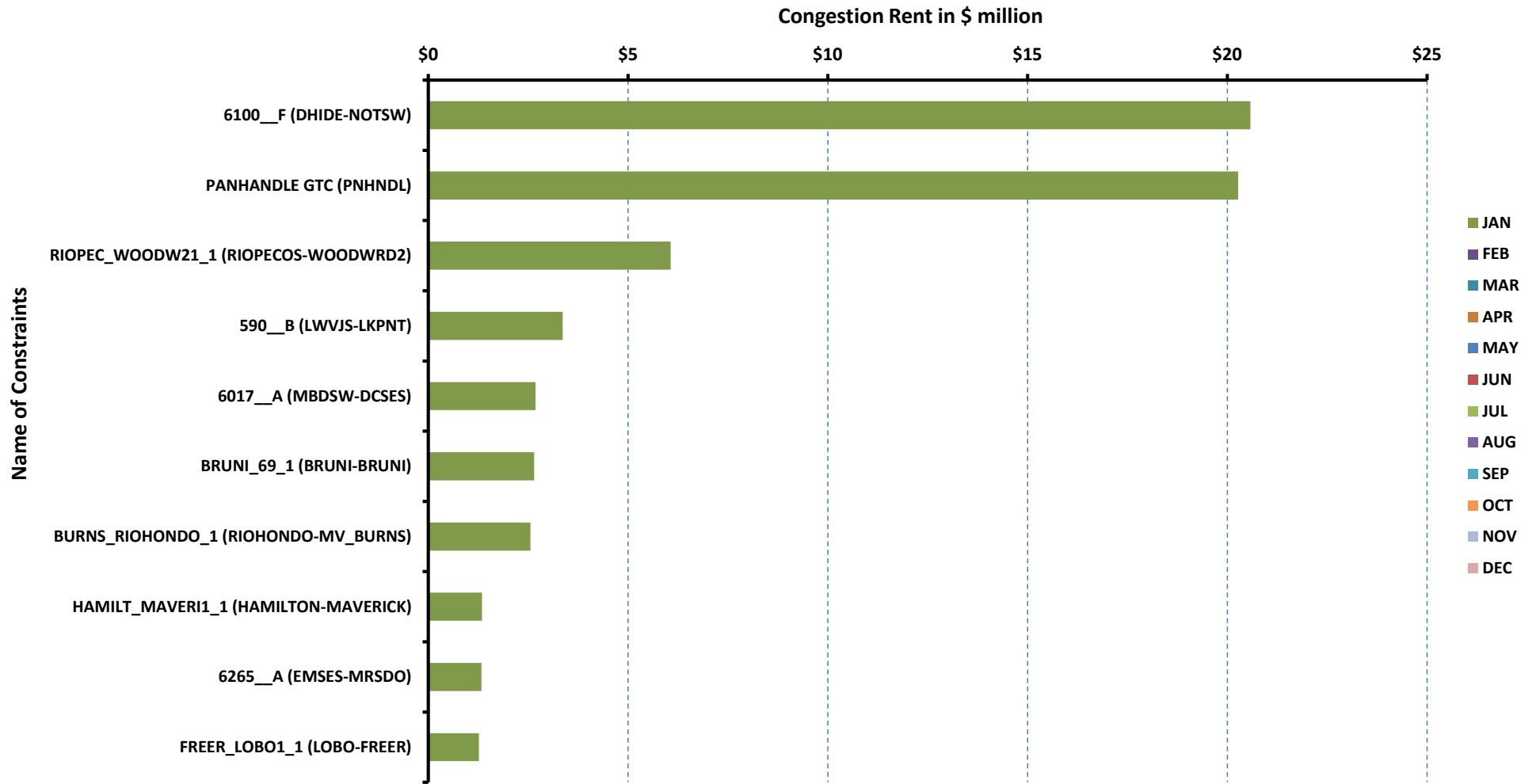
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# DA Congestion Constraint Rankings - 1

## Top 10 Constraints by Total Congestion Value - 2019



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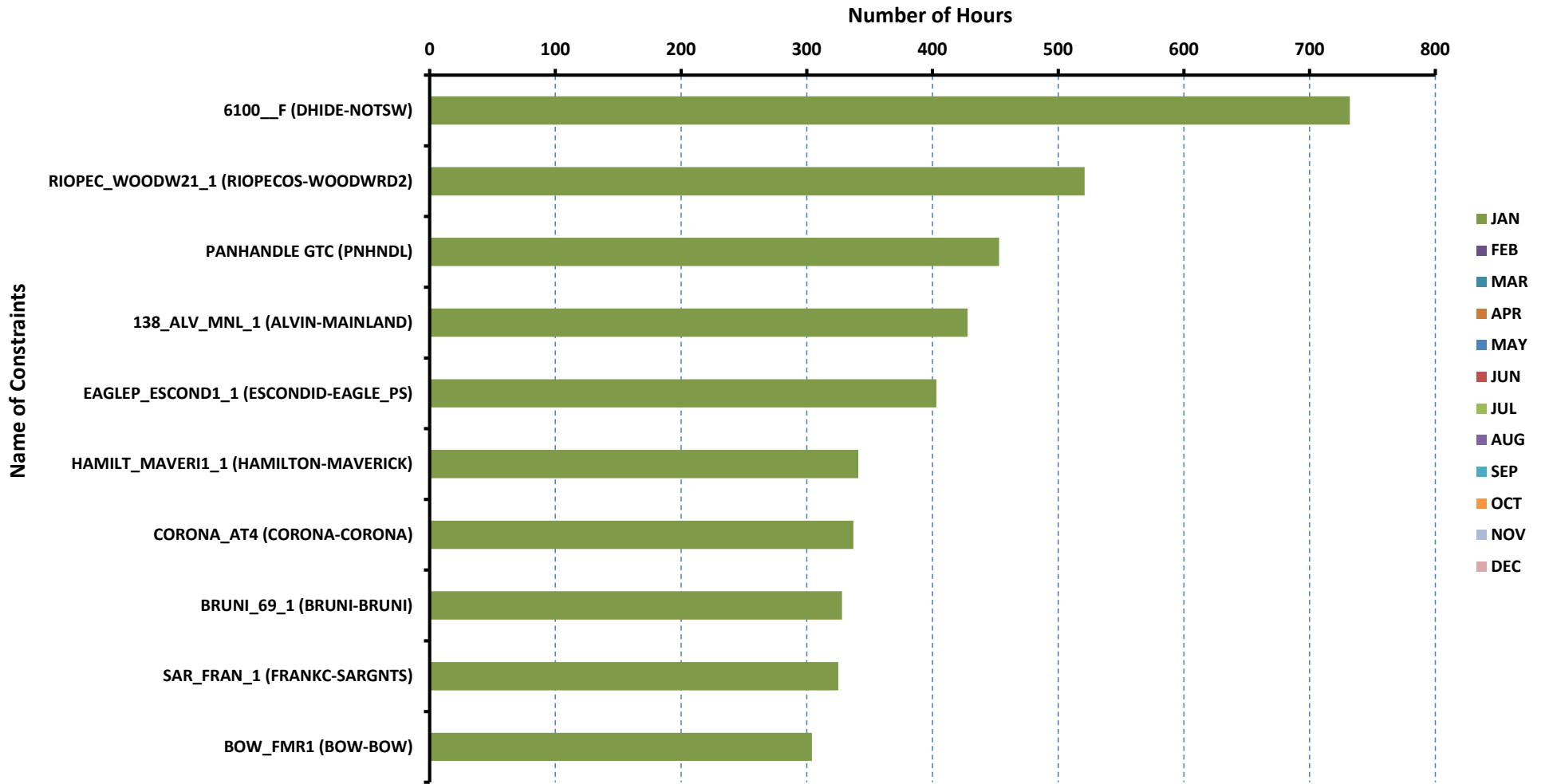
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# DA Congestion Constraint Rankings - 2

## Top 10 Constraints by Binding Frequency - 2019



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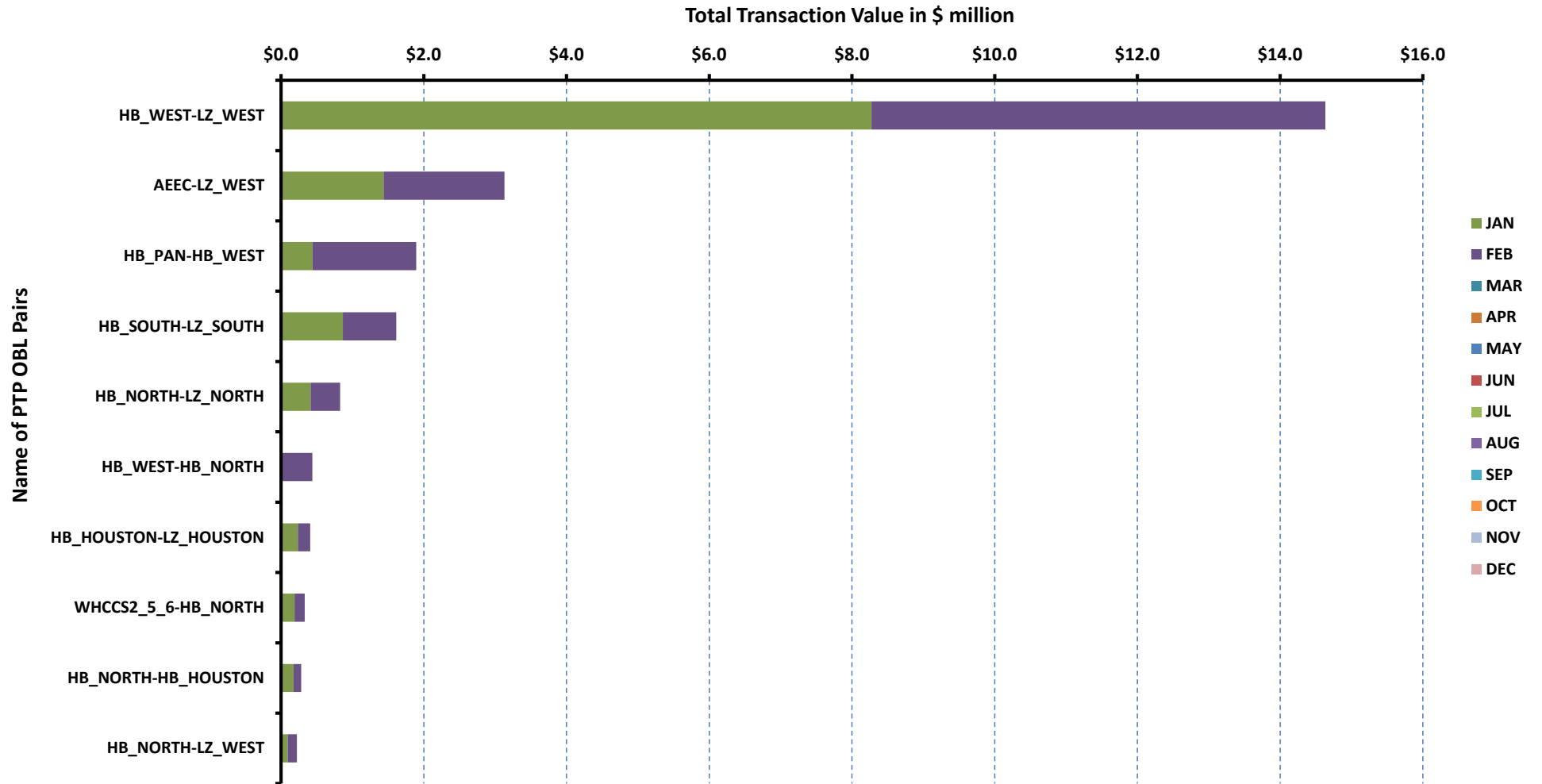
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# Top 10 CRR Pairs Ranked by Monthly Auction Values - 1

## Top 10 PTP Obligations by Total Transaction Value - 2019



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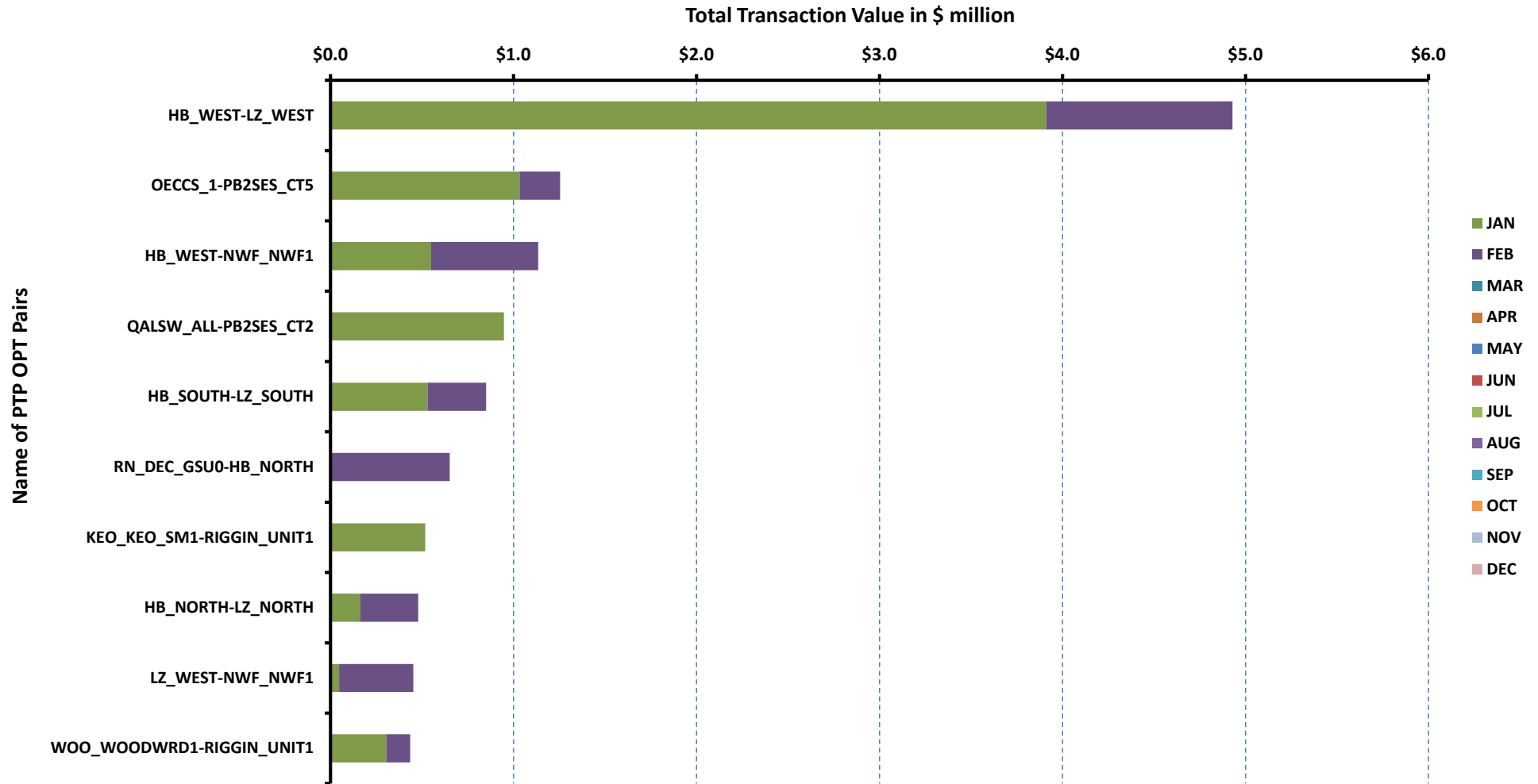
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# Top 10 CRR Pairs Ranked by Monthly Auction Values - 2

## 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
2019	1	\$ 26.27	\$ 24.96
	2	\$ 22.55	\$ 26.69
	3	\$ 31.55	\$ 30.25
	4	\$ 25.38	\$ 27.90
	5	\$ 26.47	\$ 28.08
	6	\$ 28.65	\$ 28.83
	7	\$ 33.43	\$ 34.10
	8	\$ 156.78	\$ 164.03
	9	\$ 99.57	\$ 60.87
	10	\$ 38.07	\$ 39.83
	11	\$ 29.04	\$ 30.02
	12	\$ 22.40	\$ 20.21
2020	1	\$ 18.45	\$ 17.97
	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	
2019	1	13,254	21,938	15,626	5,577	9,787	15,227	10,361	4,720	
	2	12,967	22,880	15,171	5,483	9,754	14,467	9,950	4,662	
	3	13,805	24,563	17,622	5,730	9,761	13,291	9,834	4,557	
	4	14,684	17,895	14,450	5,377	10,377	12,468	9,820	4,558	
	5	17,622	21,976	17,107	5,732	12,243	14,355	11,704	4,763	
	6	18,952	25,751	18,994	6,356	13,805	16,680	13,212	5,146	
	7	19,012	27,177	19,420	6,515	14,322	18,820	14,159	5,446	
	8	20,293	28,632	20,438	6,798	14,852	20,334	15,350	5,739	
	9	18,617	26,190	18,941	6,398	13,482	18,929	14,006	5,435	
	10	17,117	24,741	18,171	6,117	11,037	13,928	11,257	5,031	
	11	12,922	23,156	15,778	6,125	9,875	13,473	10,137	5,095	
	12	13,045	21,264	16,274	6,086	10,061	13,982	10,148	5,216	
2020	1	12,034	18,911	13,308	6,033	9,936	14,019	9,801	5,267	
	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	
2019	1	\$ 24.67	\$ 24.09	\$ 26.47	\$ 25.06	\$ 26.05	\$ 25.20	\$ 27.25	\$ 28.00	
	2	\$ 23.30	\$ 24.58	\$ 32.09	\$ 28.80	\$ 22.05	\$ 21.64	\$ 24.07	\$ 23.14	
	3	\$ 29.20	\$ 30.43	\$ 31.39	\$ 29.52	\$ 29.73	\$ 31.70	\$ 32.83	\$ 32.27	
	4	\$ 27.42	\$ 27.57	\$ 29.52	\$ 26.42	\$ 25.42	\$ 24.98	\$ 27.36	\$ 22.09	
	5	\$ 27.41	\$ 26.16	\$ 29.80	\$ 31.34	\$ 26.23	\$ 24.93	\$ 27.53	\$ 29.11	
	6	\$ 30.40	\$ 27.47	\$ 27.07	\$ 33.54	\$ 29.22	\$ 27.10	\$ 28.39	\$ 32.83	
	7	\$ 34.10	\$ 34.59	\$ 33.73	\$ 33.38	\$ 32.78	\$ 33.41	\$ 34.02	\$ 33.68	
	8	\$ 163.06	\$ 168.79	\$ 162.92	\$ 152.63	\$ 153.14	\$ 162.52	\$ 157.51	\$ 143.92	
	9	\$ 57.84	\$ 62.35	\$ 60.89	\$ 63.15	\$ 100.80	\$ 101.82	\$ 98.30	\$ 91.95	
	10	\$ 35.39	\$ 34.74	\$ 38.01	\$ 67.77	\$ 35.83	\$ 35.38	\$ 37.70	\$ 51.30	
	11	\$ 25.32	\$ 26.59	\$ 26.44	\$ 55.32	\$ 24.92	\$ 25.79	\$ 26.85	\$ 49.96	
	12	\$ 17.14	\$ 17.23	\$ 18.12	\$ 38.18	\$ 19.27	\$ 19.66	\$ 20.31	\$ 39.90	
2020	1	\$ 16.65	\$ 17.02	\$ 17.27	\$ 24.28	\$ 17.48	\$ 17.56	\$ 17.87	\$ 23.76	
	2	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	3	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	4	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	5	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	6	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	7	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	8	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	9	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	10	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	11	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	12	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	

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ERCOT-wide Monthly Implied Heat Rate - DA vs. RT						
year	month	gasprice	rtn_spp	HR_rtn	dam_spp	HR_dam
2019	1	\$ 3.01	\$ 24.96	8.29	\$ 26.27	8.73
	2	\$ 2.67	\$ 26.69	10.01	\$ 22.55	8.46
	3	\$ 2.88	\$ 30.25	10.49	\$ 31.55	10.94
	4	\$ 2.57	\$ 27.90	10.85	\$ 25.38	9.87
	5	\$ 2.54	\$ 28.08	11.07	\$ 26.47	10.44
	6	\$ 2.46	\$ 28.83	11.72	\$ 28.65	11.65
	7	\$ 2.25	\$ 34.10	15.18	\$ 33.43	14.89
	8	\$ 2.10	\$ 164.03	78.04	\$ 156.78	74.59
	9	\$ 2.45	\$ 60.87	24.80	\$ 99.57	40.58
	10	\$ 2.19	\$ 39.83	18.16	\$ 38.07	17.36
	11	\$ 2.47	\$ 30.02	12.17	\$ 29.04	11.78
	12	\$ 2.08	\$ 20.21	9.70	\$ 22.40	10.76
2020	1	\$ 1.92	\$ 17.97	9.34	\$ 18.45	9.59
	2	\$ -	\$ -	-	\$ -	-
	3	\$ -	\$ -	-	\$ -	-
	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
2019	1	8.65	9.05	8.37	9.30	8.19	8.79	8.00	8.32
	2	8.27	9.03	8.12	8.68	8.74	12.04	9.22	10.80
	3	10.31	11.38	10.99	11.19	10.12	10.88	10.55	10.23
	4	9.88	10.64	9.71	8.59	10.66	11.48	10.72	10.27
	5	10.35	10.86	9.83	11.48	10.81	11.75	10.32	12.36
	6	11.88	11.55	11.02	13.35	12.36	11.01	11.17	13.64
	7	14.60	15.15	14.88	14.99	15.18	15.02	15.40	14.86
	8	72.86	74.93	77.32	68.47	77.58	77.51	80.30	72.61
	9	41.08	40.06	41.49	37.47	23.57	24.81	25.41	25.73
	10	16.33	17.18	16.13	23.39	16.13	17.33	15.84	30.89
	11	10.11	10.89	10.46	20.26	10.27	10.73	10.78	22.44
	12	9.25	9.75	9.44	19.16	8.23	8.70	8.27	18.33
2020	1	9.09	9.29	9.13	12.35	8.65	8.98	8.85	12.62
	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
2020	1	1	\$ -	\$ -	0	0	80	90
2020	1	2	\$ 0.22	\$ -	2	0	80	90
2020	1	3	\$ -	\$ -	0	0	80	90
2020	1	4	\$ 0.04	\$ -	11	0	80	90
2020	1	5	\$ -	\$ -	0	0	80	90
2020	1	6	\$ 0.01	\$ -	3	0	80	90
2020	1	7	\$ -	\$ -	0	0	80	90
2020	1	8	\$ -	\$ -	0	0	80	90
2020	1	9	\$ 0.02	\$ -	4	0	80	90
2020	1	10	\$ -	\$ -	0	0	80	90
2020	1	11	\$ -	\$ -	0	0	80	90
2020	1	12	\$ -	\$ -	0	0	80	90
2020	1	13	\$ -	\$ -	0	0	80	90
2020	1	14	\$ 0.01	\$ -	1	0	80	90
2020	1	15	\$ 0.01	\$ -	1	0	80	90
2020	1	16	\$ 0.21	\$ -	14	0	80	90
2020	1	17	\$ 0.20	\$ -	7	0	80	90
2020	1	18	\$ -	\$ -	0	0	80	90
2020	1	19	\$ 0.01	\$ -	3	0	80	90
2020	1	20	\$ -	\$ -	0	0	80	90
2020	1	21	\$ -	\$ -	0	0	80	90
2020	1	22	\$ 1.71	\$ -	12	0	80	90
2020	1	23	\$ -	\$ -	0	0	80	90
2020	1	24	\$ 0.68	\$ -	12	0	80	90
2020	1	25	\$ -	\$ -	0	0	80	90
2020	1	26	\$ 0.22	\$ -	8	0	80	90
2020	1	27	\$ -	\$ -	0	0	80	90
2020	1	28	\$ 0.10	\$ 0.08	8	11	80	90
2020	1	29	\$ -	\$ -	0	0	80	90
2020	1	30	\$ 0.14	\$ -	15	0	80	90
2020	1	31	\$ -	\$ -	0	0	80	90

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Monthly Average of Ancillary Services Required MW					
year	month	ASMW_REGDN	ASMW_NSPIN	ASMW_RRS	ASMW_REGUP
2019	1	285	1,578	2,898	295
	2	283	1,634	2,881	311
	3	287	1,487	2,893	306
	4	292	1,513	2,904	321
	5	314	1,550	2,712	345
	6	303	1,486	2,467	322
	7	298	1,287	2,374	319
	8	300	1,507	2,386	323
	9	305	1,505	2,552	305
	10	282	1,508	2,759	301
	11	260	1,546	2,893	288
	12	263	1,620	2,786	281
2020	1	271	1,565	2,893	293
	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
2019	1	365	1,188	2,802	242
	2	278	1,188	2,802	185
	3	232	1,586	2,823	202
	4	193	1,585	2,823	222
	5	192	1,585	2,823	287
	6	278	1,585	2,823	453
	7	247	1,970	2,733	569
	8	227	1,970	2,733	351
	9	239	1,970	2,733	384
	10	262	1,970	2,733	391
	11	274	1,638	2,633	405
	12	238	1,638	2,633	395
	13	220	1,638	2,633	364
	14	221	1,638	2,633	322
	15	210	1,389	2,617	281
	16	210	1,389	2,617	273
	17	244	1,389	2,617	275
	18	278	1,389	2,617	313
	19	365	1,335	2,636	286
	20	369	1,335	2,636	259
	21	380	1,335	2,636	242
	22	466	1,335	2,636	217
	23	508	1,188	2,802	259
	24	450	1,188	2,802	258
2020	1	248	1,196	2,998	188
	2	186	1,196	2,998	252
	3	181	1,227	2,959	272
	4	172	1,227	2,959	278
	5	227	1,227	2,959	349
	6	298	1,227	2,959	557
	7	265	2,036	2,797	671
	8	272	2,036	2,797	339
	9	309	2,036	2,797	266
	10	296	2,036	2,797	268
	11	386	1,612	2,868	237
	12	350	1,612	2,868	263
	13	308	1,612	2,868	189
	14	275	1,612	2,868	198
	15	233	1,418	2,868	171
	16	205	1,418	2,868	234
	17	166	1,418	2,868	330
	18	225	1,418	2,868	541
	19	294	1,901	2,868	392
	20	275	1,901	2,868	239
	21	278	1,901	2,868	201
	22	333	1,901	2,868	195
	23	369	1,196	2,998	201
	24	351	1,196	2,998	206

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Monthly Average Ancillary Services Price					
year	month	MCPC_REGDN	MCPC_NSPIN	MCPC_RRS	MCPC_REGUP
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	\$ 16.00	\$ 5.03	\$ 15.59	\$ 14.42
	5	\$ 7.83	\$ 4.27	\$ 9.47	\$ 11.00
	6	\$ 4.76	\$ 4.30	\$ 10.39	\$ 8.82
	7	\$ 3.71	\$ 5.25	\$ 13.23	\$ 11.65
	8	\$ 7.87	\$ 68.75	\$ 114.97	\$ 98.80
	9	\$ 13.60	\$ 44.57	\$ 81.63	\$ 52.36
	10	\$ 6.74	\$ 12.87	\$ 22.83	\$ 17.93
	11	\$ 8.19	\$ 6.23	\$ 17.63	\$ 16.10
	12	\$ 7.66	\$ 2.01	\$ 11.65	\$ 10.28
2020	1	\$ 7.06	\$ 2.04	\$ 7.24	\$ 8.60
	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
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	\$ 0.13	\$ 0.20	\$ 1.22	\$ 0.12
	5	\$ 0.06	\$ 0.15	\$ 0.60	\$ 0.09
	6	\$ 0.03	\$ 0.13	\$ 0.52	\$ 0.06
	7	\$ 0.02	\$ 0.13	\$ 0.60	\$ 0.07
	8	\$ 0.04	\$ 1.84	\$ 4.87	\$ 0.57
	9	\$ 0.08	\$ 1.29	\$ 4.02	\$ 0.31
	10	\$ 0.05	\$ 0.47	\$ 1.53	\$ 0.13
	11	\$ 0.06	\$ 0.25	\$ 1.32	\$ 0.12
	12	\$ 0.05	\$ 0.08	\$ 0.82	\$ 0.07
2020	1	\$ 0.05	\$ 0.08	\$ 0.54	\$ 0.06
	2	\$ -	\$ -	\$ -	\$ -
	3	\$ -	\$ -	\$ -	\$ -
	4	\$ -	\$ -	\$ -	\$ -
	5	\$ -	\$ -	\$ -	\$ -
	6	\$ -	\$ -	\$ -	\$ -
	7	\$ -	\$ -	\$ -	\$ -
	8	\$ -	\$ -	\$ -	\$ -
	9	\$ -	\$ -	\$ -	\$ -
	10	\$ -	\$ -	\$ -	\$ -
	11	\$ -	\$ -	\$ -	\$ -
	12	\$ -	\$ -	\$ -	\$ -

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ERCOT-wide Cumulative PNM			
year	month	pnm	pnm_accum
2019	0	\$ -	\$ -
	1	\$ 1,594.61	\$ 1,594.61
	2	\$ 3,042.70	\$ 4,637.31
	3	\$ 4,087.75	\$ 8,725.06
	4	\$ 4,232.61	\$ 12,957.67
	5	\$ 3,234.19	\$ 16,191.86
	6	\$ 4,409.46	\$ 20,601.32
	7	\$ 8,110.34	\$ 28,711.66
	8	\$ 84,095.03	\$ 112,806.69
	9	\$ 21,413.10	\$ 134,219.79
	10	\$ 8,603.88	\$ 142,823.67
	11	\$ 3,834.05	\$ 146,657.72
	12	\$ 534.58	\$ 147,192.30
2020	0	\$ -	\$ -
	1	\$ 948.71	\$ 948.71
	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
2019	1	(69)	2	10	(37)	207	245
	2	(412)	(246)	(679)	(749)	(361)	(378)
	3	275	(45)	258	142	152	(52)
	4	125	668	573	292	35	171
	5	(32)	5	(31)	19	(21)	76
	6	107	1,213	916	510	330	1,059
	7	(127)	29	(239)	(201)	(273)	(188)
	8	72	768	869	503	64	623
	9	27	306	248	325	4	334
	10	101	676	309	182	102	404
	11	21	199	138	108	(97)	67
	12	(342)	(587)	(477)	(339)	(329)	(540)
2020	1	73	(303)	(292)	(76)	255	(43)
	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
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	10,770	9,020	9,488	11,220	10,180	9,034
	5	10,907	8,497	9,689	10,736	9,414	8,343
	6	9,717	6,210	7,891	10,062	7,706	6,535
	7	10,258	6,036	8,124	9,915	8,568	6,712
	8	11,086	4,854	7,343	10,742	8,638	5,965
	9	10,340	6,640	7,694	10,152	8,364	6,624
	10	10,722	7,413	8,350	10,678	9,924	8,246
	11	9,762	7,641	8,003	9,866	9,504	8,268
	12	10,585	7,573	7,916	10,641	9,330	7,340
2020	1	11,301	8,889	8,804	11,122	10,778	9,611
	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	2020	PANHANDLE GTC (PNHNDL)	2,990	1	2,990	-	-	-	-	-	-	-	-	-	-	-
FREQ_EXIST	2020	BURNS RIOHONDO 1 (RIOHONDO-MV BURNS)	2,021	2	2,021	-	-	-	-	-	-	-	-	-	-	-
FREQ_EXIST	2020	HAMILT MAVERI1 1 (HAMILTON-MAVERICK)	1,645	3	1,645	-	-	-	-	-	-	-	-	-	-	-
FREQ_EXIST	2020	6100 F (DHIDE-NOTSW)	1,642	4	1,642	-	-	-	-	-	-	-	-	-	-	-
FREQ_EXIST	2020	NLARSW PILONC1 1 (NLARSW-PILONCIL)	832	5	832	-	-	-	-	-	-	-	-	-	-	-
FREQ_EXIST	2020	BRUNI 69 1 (BRUNI-BRUNI)	730	6	730	-	-	-	-	-	-	-	-	-	-	-
FREQ_EXIST	2020	FALFUR PREMON1 1 (FALFUR-PREMONT)	678	7	678	-	-	-	-	-	-	-	-	-	-	-
FREQ_EXIST	2020	NORTH EDINBURG LOBO GTC (NE_LOB)	630	8	630	-	-	-	-	-	-	-	-	-	-	-
FREQ_EXIST	2020	590 B (LWVJS-LKPNT)	458	9	458	-	-	-	-	-	-	-	-	-	-	-
FREQ_EXIST	2020	1030 B (BOSQUESW-RGH)	450	10	450	-	-	-	-	-	-	-	-	-	-	-
TOP10_RENT	2020	6100 F (DHIDE-NOTSW)	\$ 24.52	1	\$ 24.52	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2020	PANHANDLE GTC (PNHNDL)	\$ 19.72	2	\$ 19.72	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2020	6270 B (BLMND-SAGNA)	\$ 4.33	3	\$ 4.33	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2020	6017 A (MBDSW-DCSES)	\$ 3.46	4	\$ 3.46	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2020	RIOPEC WOODW21 1 (RIOPECOS-WOODWRD2)	\$ 3.36	5	\$ 3.36	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2020	LAUREL LA PAL1 1 (LA PALMA-LAURELES)	\$ 2.88	6	\$ 2.88	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2020	BURNS RIOHONDO 1 (RIOHONDO-MV BURNS)	\$ 2.87	7	\$ 2.87	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2020	NLARSW PILONC1 1 (NLARSW-PILONCIL)	\$ 2.66	8	\$ 2.66	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2020	590 B (LWVJS-LKPNT)	\$ 2.41	9	\$ 2.41	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2020	EASTEX GTC (EASTEX)	\$ 2.33	10	\$ 2.33	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

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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	2020	6100_F (DHIDE-NOTSW)	732	1	732	-	-	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2020	RIOPEC_WOODW21_1 (RIOPECOS-WOODWRD2)	521	2	521	-	-	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2020	PANHANDLE_GTC (PNHNDL)	453	3	453	-	-	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2020	138_ALV_MNL_1 (ALVIN-MAINLAND)	428	4	428	-	-	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2020	EAGLEP_ESCOND1_1 (ESCONDID-EAGLE_PS)	403	5	403	-	-	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2020	HAMILT_MAVR1_1 (HAMILTON-MAVERICK)	341	6	341	-	-	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2020	CORONA_AT4 (CORONA-CORONA)	337	7	337	-	-	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2020	BRUNI_69_1 (BRUNI-BRUNI)	328	8	328	-	-	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2020	SAR_FRAN_1 (FRANKC-SARGNTS)	325	9	325	-	-	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2020	BOW_FMR1 (BOW-BOW)	304	10	304	-	-	-	-	-	-	-	-	-	-	-	
TOP10_RENT	2020	6100_F (DHIDE-NOTSW)	\$ 20.58	1	\$ 20.58	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2020	PANHANDLE_GTC (PNHNDL)	\$ 20.27	2	\$ 20.27	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2020	RIOPEC_WOODW21_1 (RIOPECOS-WOODWRD2)	\$ 6.07	3	\$ 6.07	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2020	590_B (LWVJS-LKPNT)	\$ 3.36	4	\$ 3.36	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2020	6017_A (MBDSW-DCSES)	\$ 2.68	5	\$ 2.68	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2020	BRUNI_69_1 (BRUNI-BRUNI)	\$ 2.65	6	\$ 2.65	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2020	BURNS_RIOHONDO_1 (RIOHONDO-MV_BURNS)	\$ 2.56	7	\$ 2.56	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2020	HAMILT_MAVR1_1 (HAMILTON-MAVERICK)	\$ 1.34	8	\$ 1.34	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2020	6265_A (EMSES-MRSDO)	\$ 1.33	9	\$ 1.33	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2020	FREER_LOBO1_1 (LOBO-FREER)	\$ 1.26	10	\$ 1.26	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	

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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	2020	HB WEST-LZ WEST	\$ 14.64	1	\$ 8.27	\$ 6.36	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2020	AEEC-LZ WEST	\$ 3.13	2	\$ 1.44	\$ 1.69	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2020	HB PAN-HB WEST	\$ 1.90	3	\$ 0.44	\$ 1.45	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2020	HB SOUTH-LZ SOUTH	\$ 1.61	4	\$ 0.87	\$ 0.75	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2020	HB NORTH-LZ NORTH	\$ 0.83	5	\$ 0.41	\$ 0.42	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2020	HB WEST-HB NORTH	\$ 0.44	6	\$ 0.00	\$ 0.44	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2020	HB HOUSTON-LZ HOUSTON	\$ 0.41	7	\$ 0.24	\$ 0.17	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2020	WHCCS2 5 6-HB NORTH	\$ 0.33	8	\$ 0.19	\$ 0.14	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2020	HB NORTH-HB HOUSTON	\$ 0.28	9	\$ 0.18	\$ 0.10	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2020	HB NORTH-LZ WEST	\$ 0.22	10	\$ 0.09	\$ 0.13	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2020	HB WEST-LZ WEST	\$ 4.93	1	\$ 3.91	\$ 1.02	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2020	OECCS 1-PB2SES CT5	\$ 1.25	2	\$ 1.03	\$ 0.22	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2020	HB WEST-NWF NWF1	\$ 1.14	3	\$ 0.55	\$ 0.59	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2020	QALSW ALL-PB2SES CT2	\$ 0.95	4	\$ 0.95	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2020	HB SOUTH-LZ SOUTH	\$ 0.85	5	\$ 0.53	\$ 0.32	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2020	RN DEC GSU0-HB NORTH	\$ 0.65	6	\$ 0.00	\$ 0.65	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2020	KEO KEO SM1-RIGGIN UNIT1	\$ 0.52	7	\$ 0.52	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2020	HB NORTH-LZ NORTH	\$ 0.48	8	\$ 0.16	\$ 0.32	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2020	LZ WEST-NWF NWF1	\$ 0.45	9	\$ 0.05	\$ 0.41	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2020	WOO WOODWRD1-RIGGIN UNIT1	\$ 0.43	10	\$ 0.31	\$ 0.13	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	

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[chart 2](#)