

To the Public Utility Commission of Texas

# ERCOT Wholesale Electricity Market Monthly Report

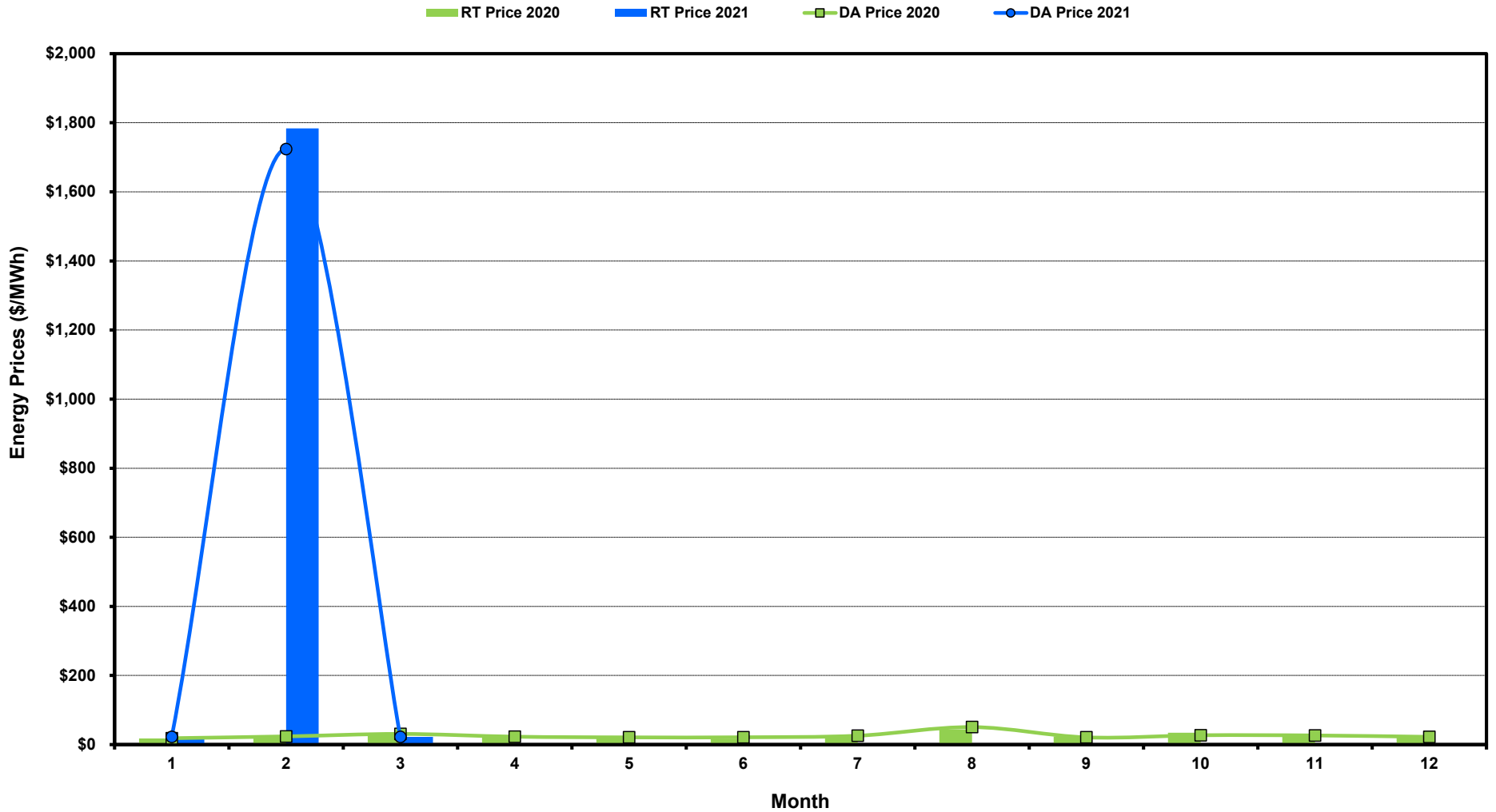
Monday, April 12, 2021

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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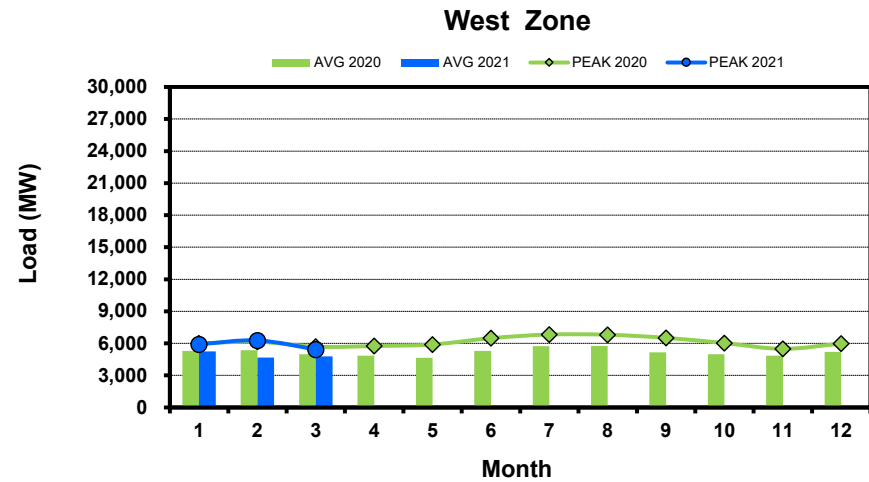
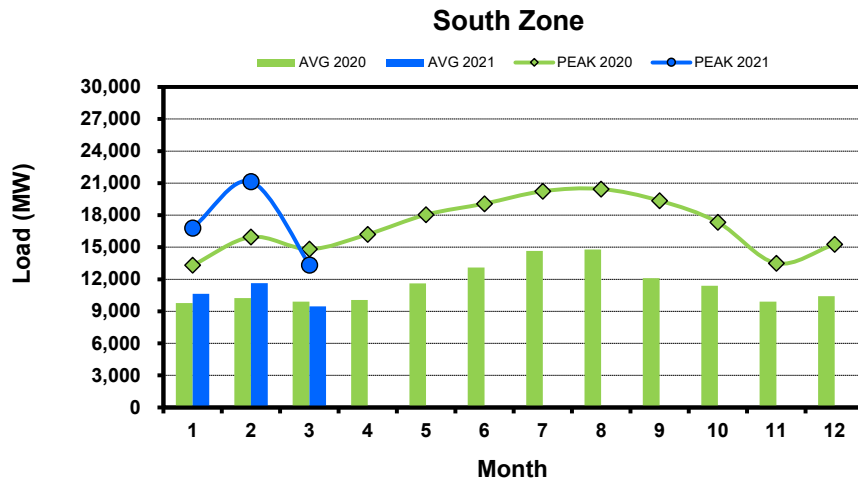
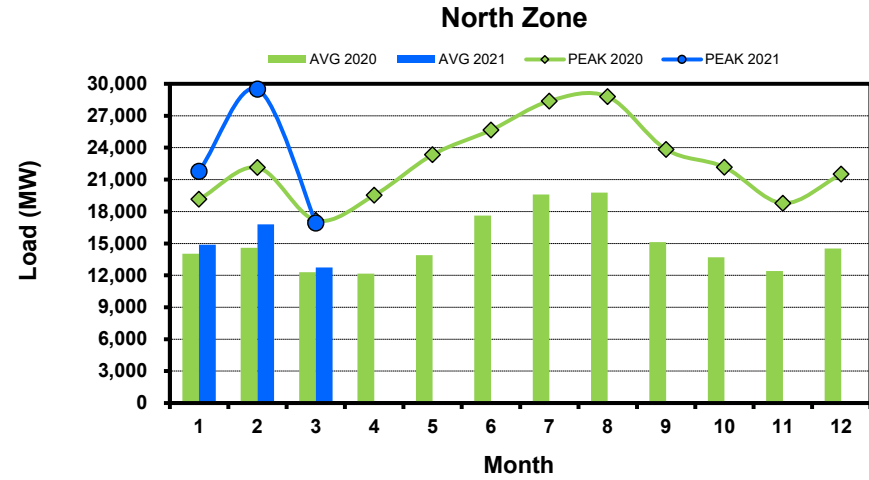
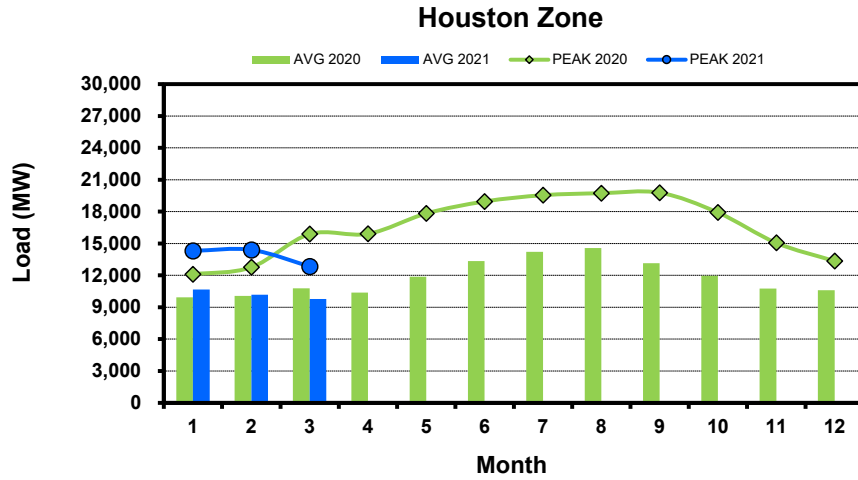
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# Load Zone Load Statistics

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



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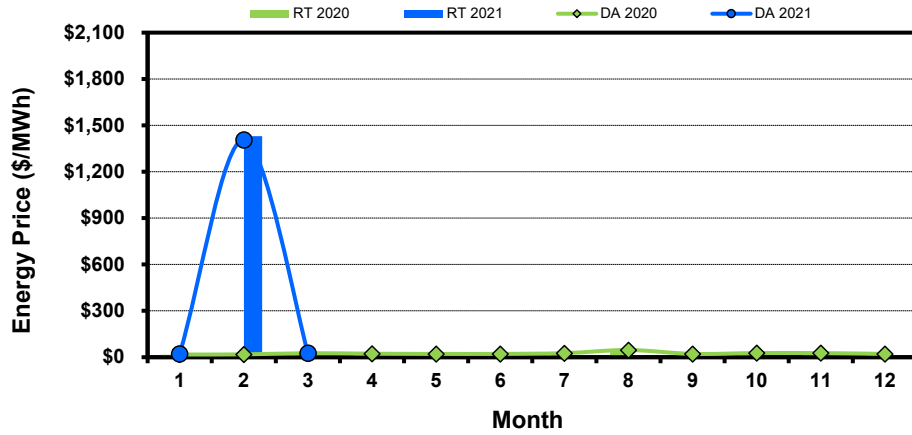
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**Note:** \* Zonal load zone definition vs. Nodal comparable load zone definition: LZ\_Houston=LZ\_Houston; LZ\_West=LZ\_West; LZ\_North=(LZ\_North,LZ\_RAYBN); LZ\_South=(LZ\_South,LZ\_CPS,LZ\_AEN,LZ\_LCRA)

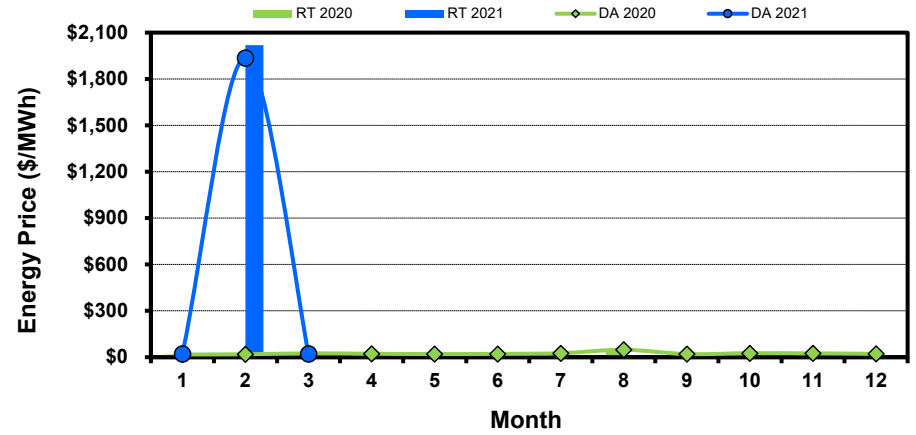
# Load Zone Monthly Average Energy Price DA vs RT

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

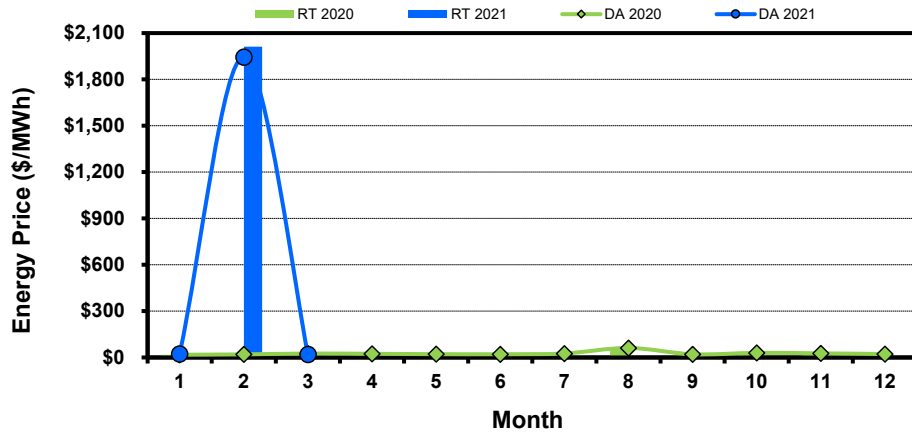
### Houston Zone



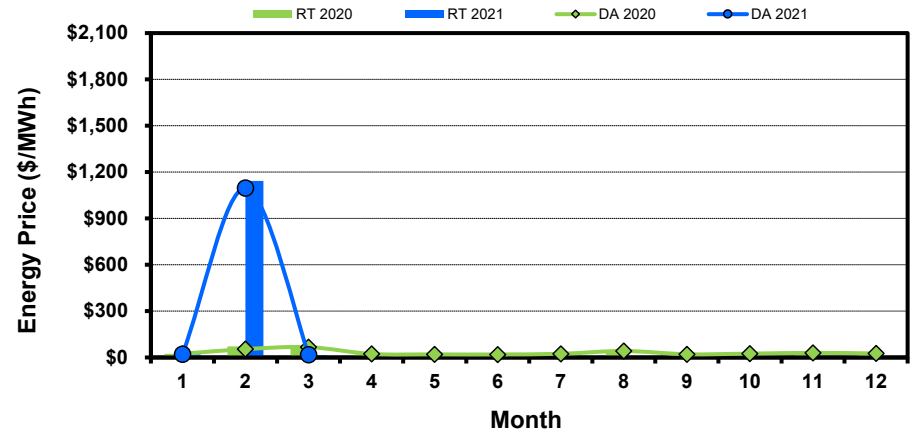
### North Zone



### South Zone



### West Zone



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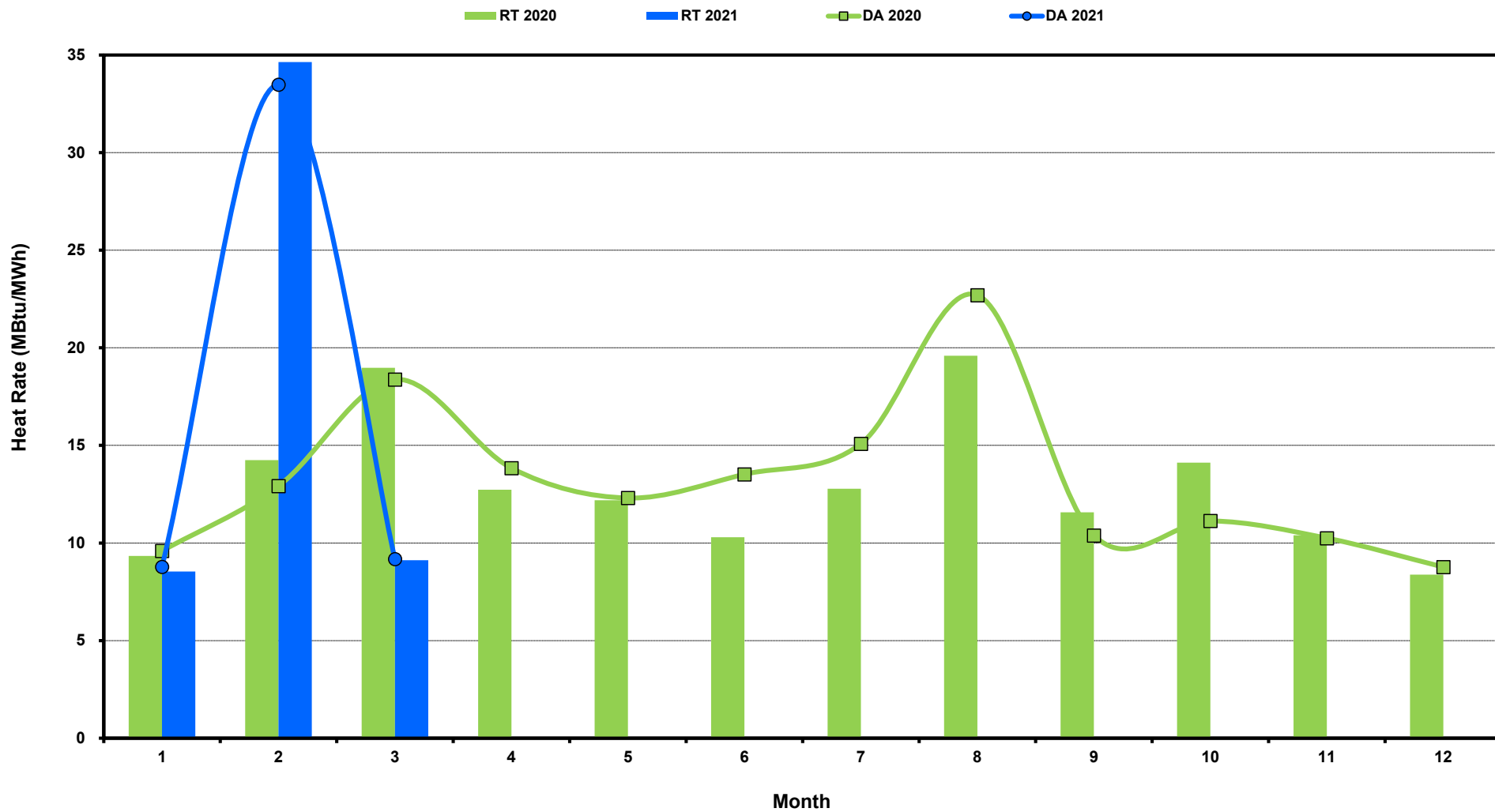
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**Note:** \* Zonal load zone definition vs. Nodal comparable load zone definition: LZ\_Houston=LZ\_Houston; LZ\_West=LZ\_West; LZ\_North=(LZ\_North,LZ\_RAYBN); LZ\_South=(LZ\_South,LZ\_CPS,LZ\_AEN,LZ\_LCRA)

# ERCOT-wide Monthly Implied Heat Rate DA vs RT

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



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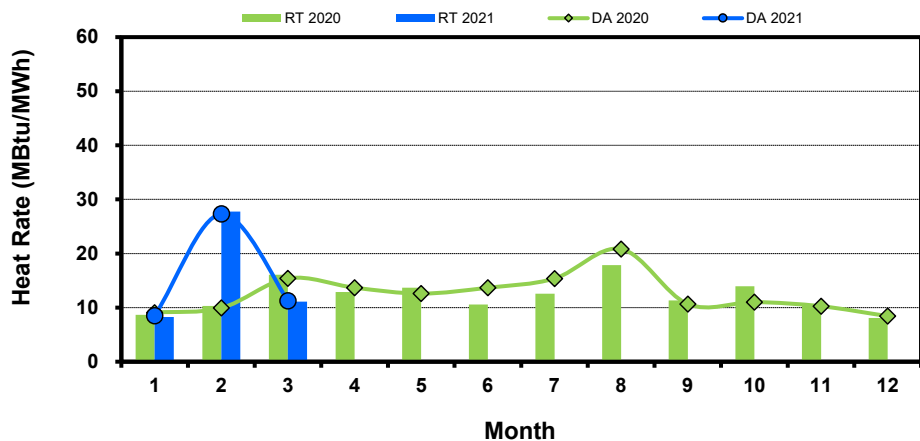
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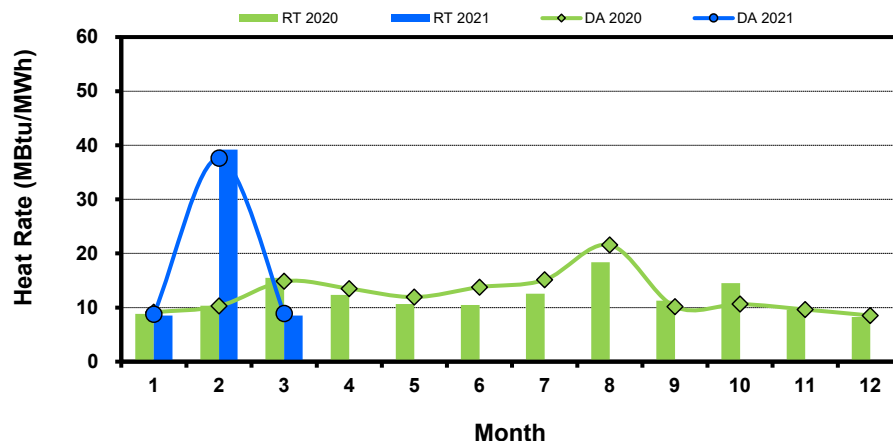
# Load Zone Monthly Implied Heat Rate DA vs RT

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

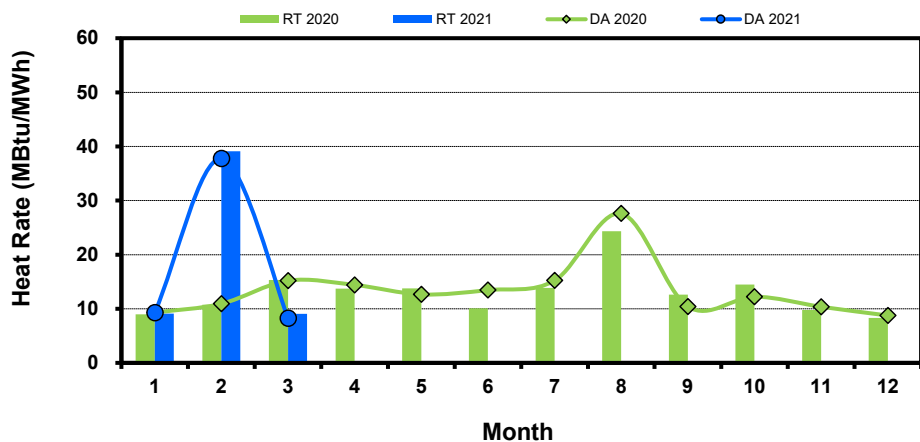
### Houston Zone



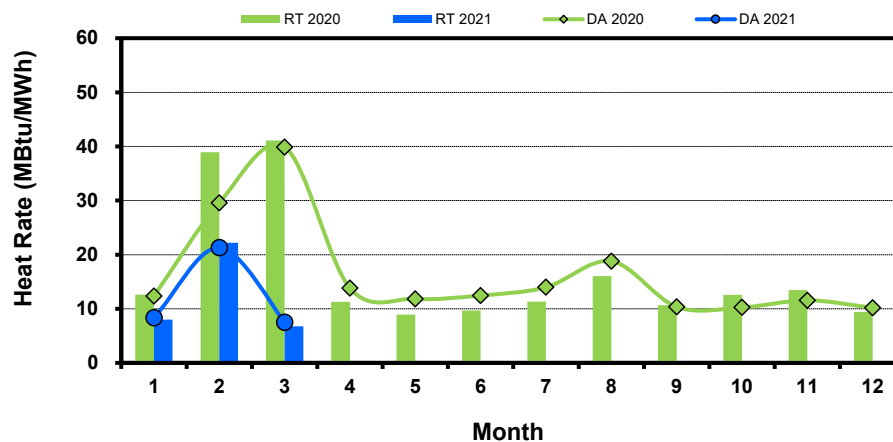
### North Zone



### South Zone



### West Zone



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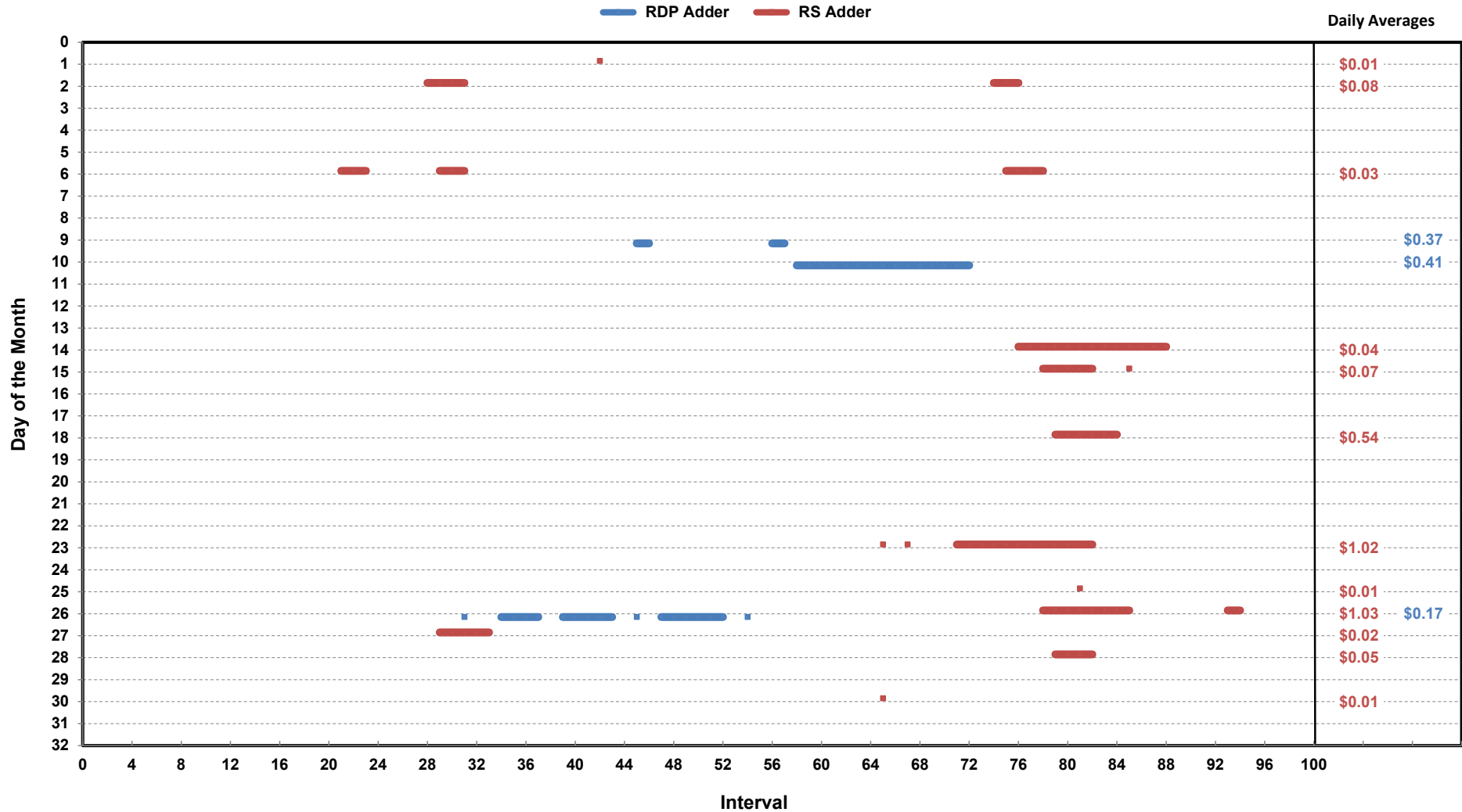
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**Note:** \* Zonal load zone definition vs. Nodal comparable load zone definition: LZ\_Houston=LZ\_Houston; LZ\_West=LZ\_West; LZ\_North=(LZ\_North,LZ\_RAYBN); LZ\_South=(LZ\_South,LZ\_CPS,LZ\_AEN,LZ\_LCRA)

# Daily ORDC Adders Average Values and Interval Duration

## Mar-2021



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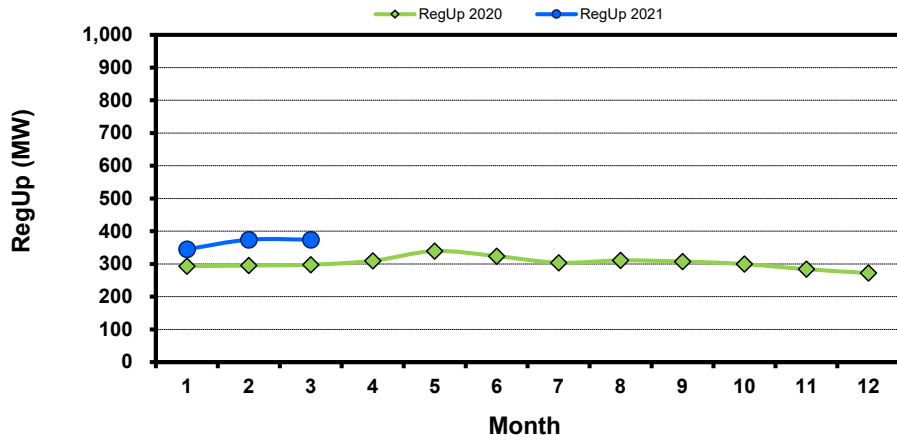
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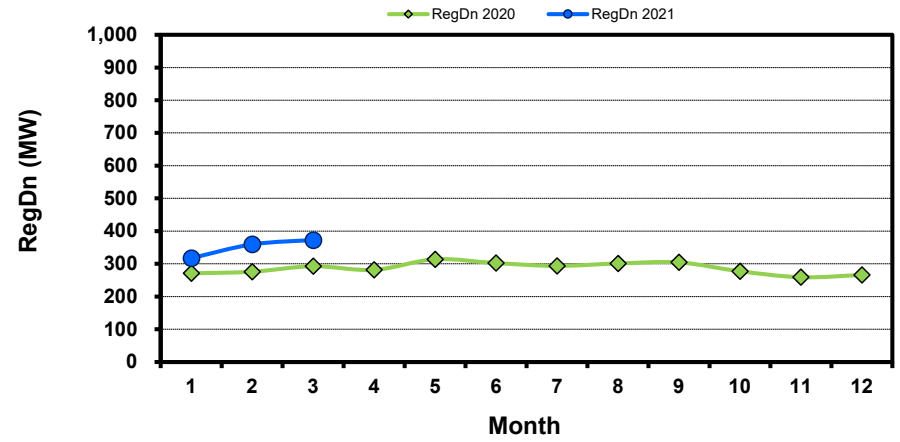
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# Monthly Average of Ancillary Services Required MW

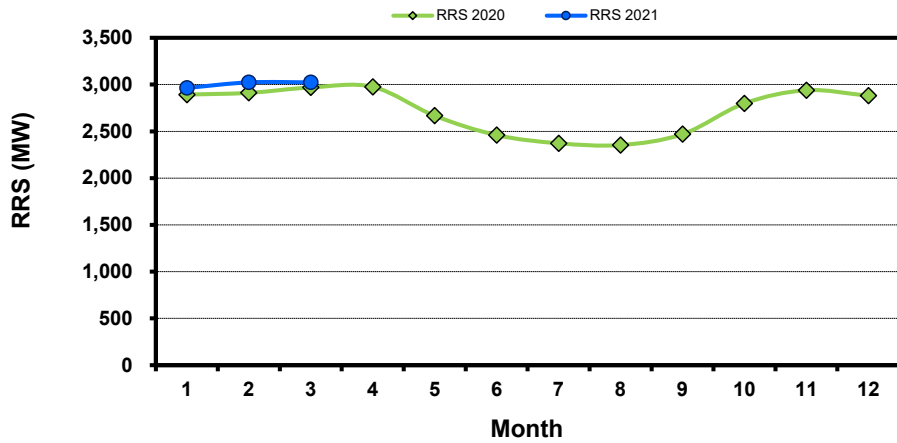
## Regulation Up



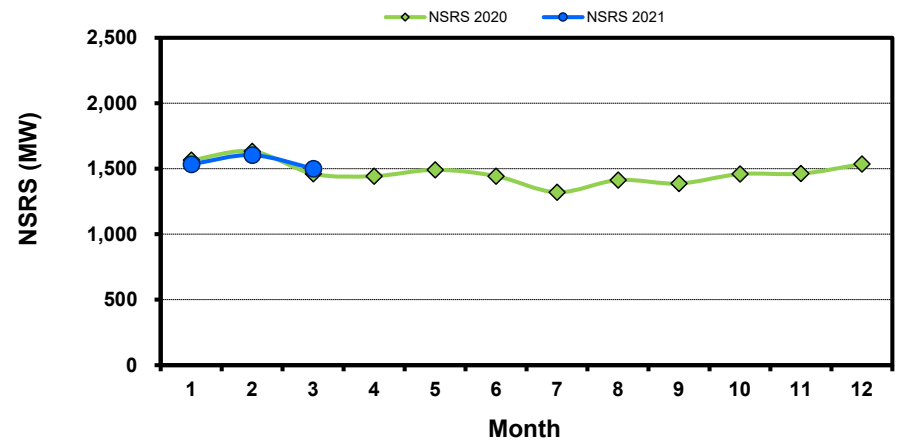
## Regulation Down



## Responsive Reserve



## Non-Spin Reserve



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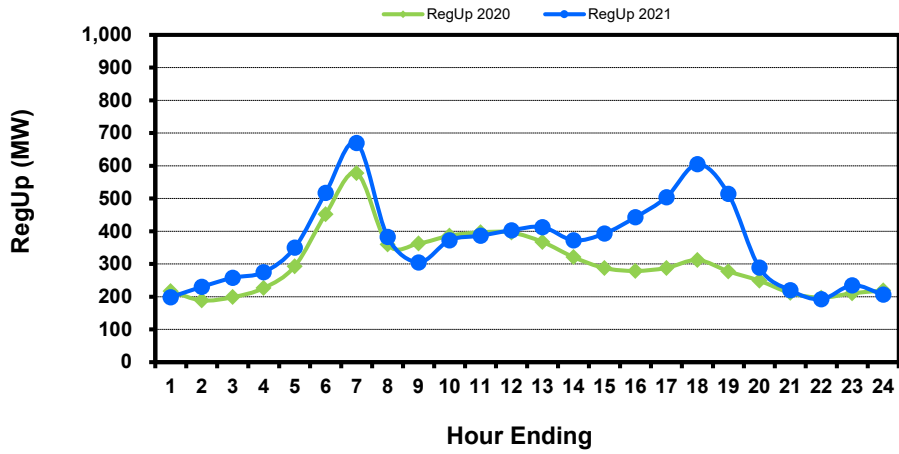
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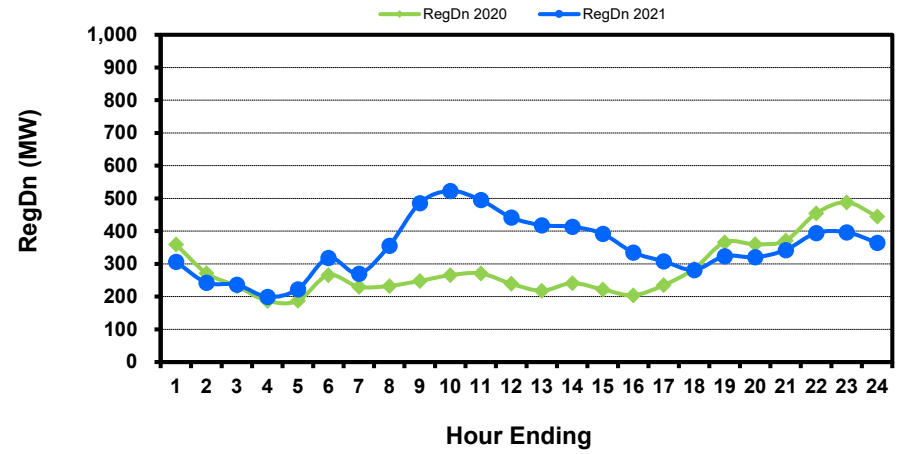


# Hourly Average of Ancillary Services Required MW

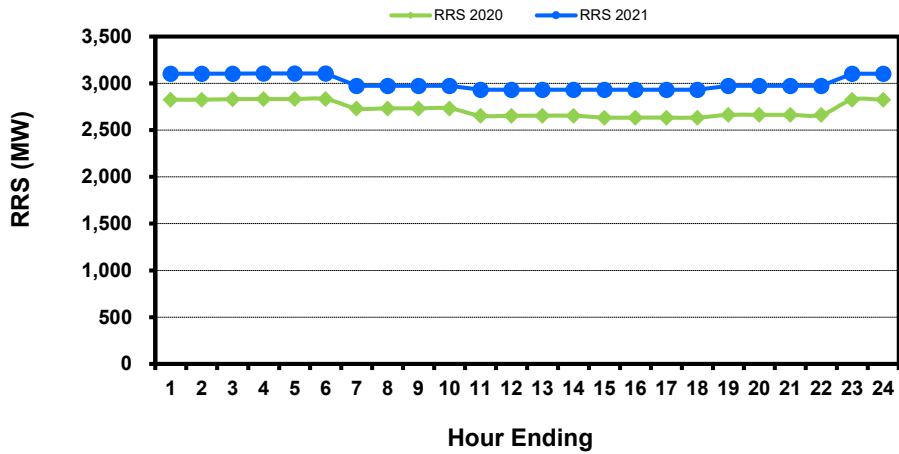
## Regulation Up



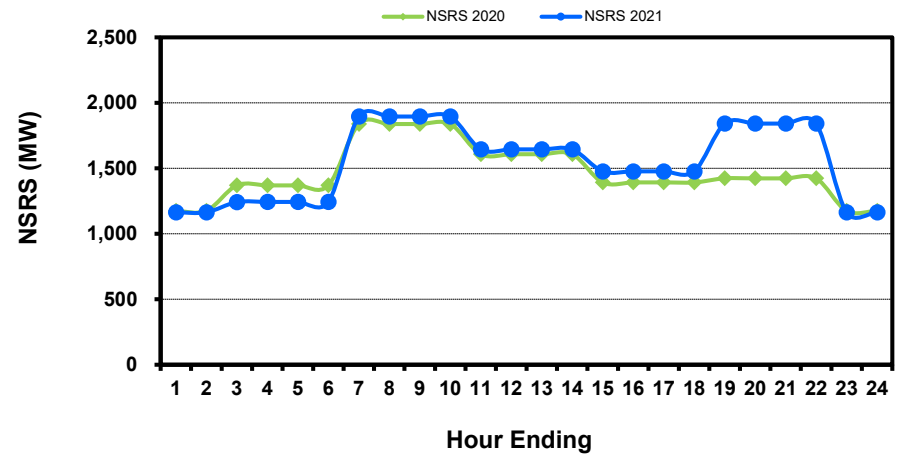
## Regulation Down



## Responsive Reserve



## Non-Spin Reserve



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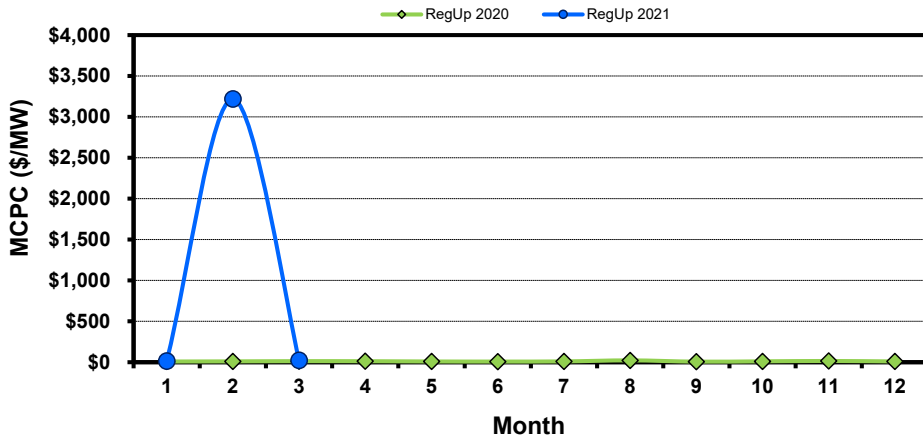
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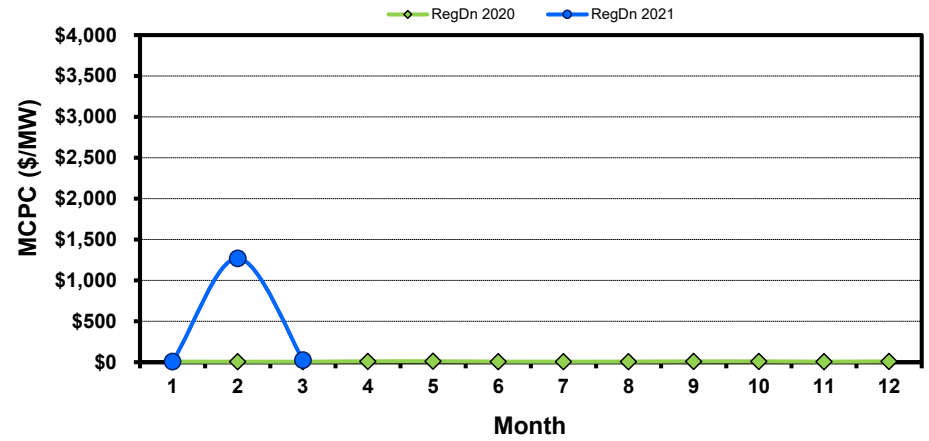
# Monthly Average Ancillary Services Price

(weighted by A/S Quantities Required)

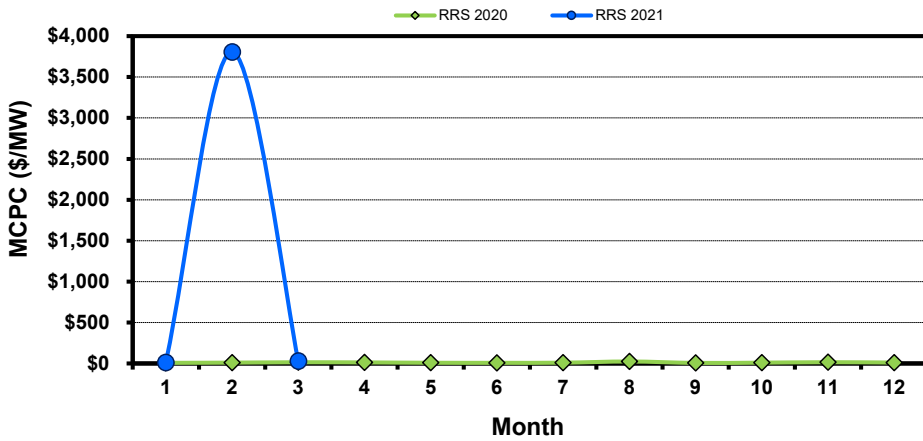
### Regulation Up



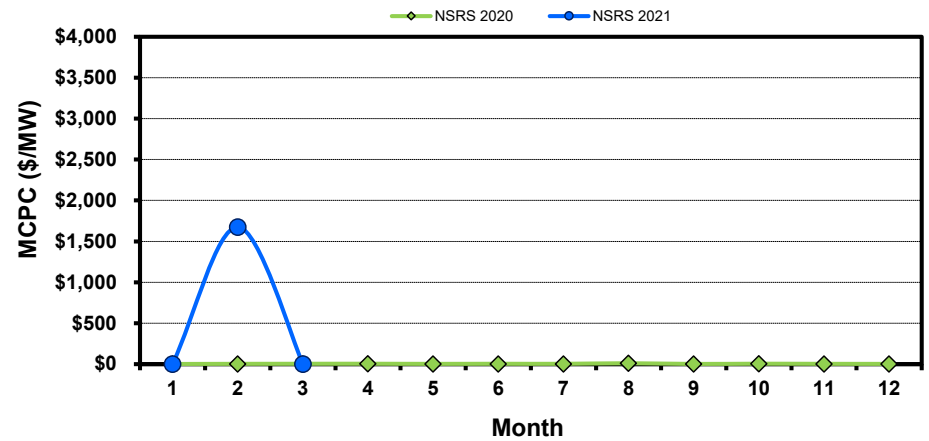
### Regulation Down



### Responsive Reserve



### Non-Spin Reserve



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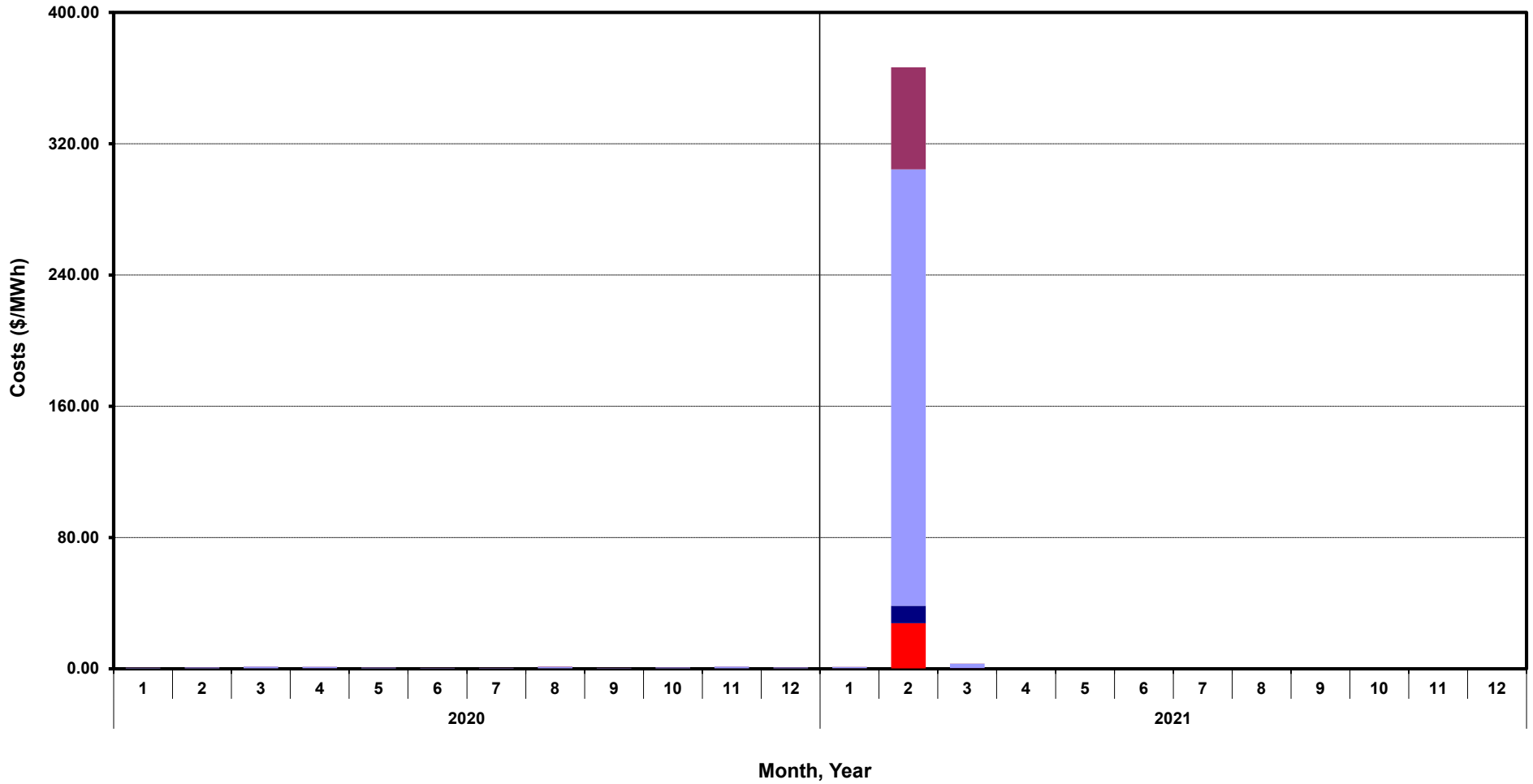
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# Monthly Average A/S Cost per MWh Load

RegUp RegDn RRS NonSpin



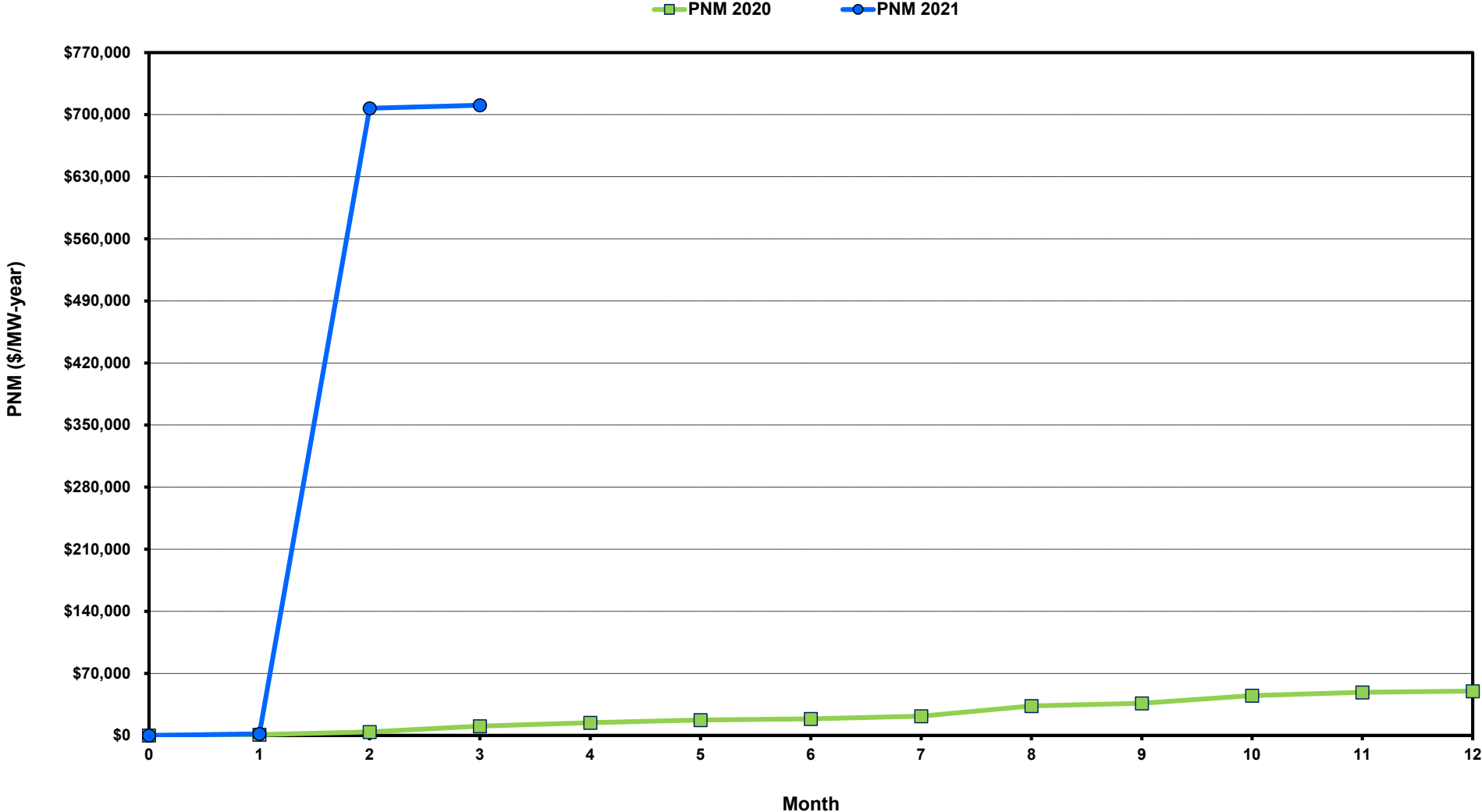
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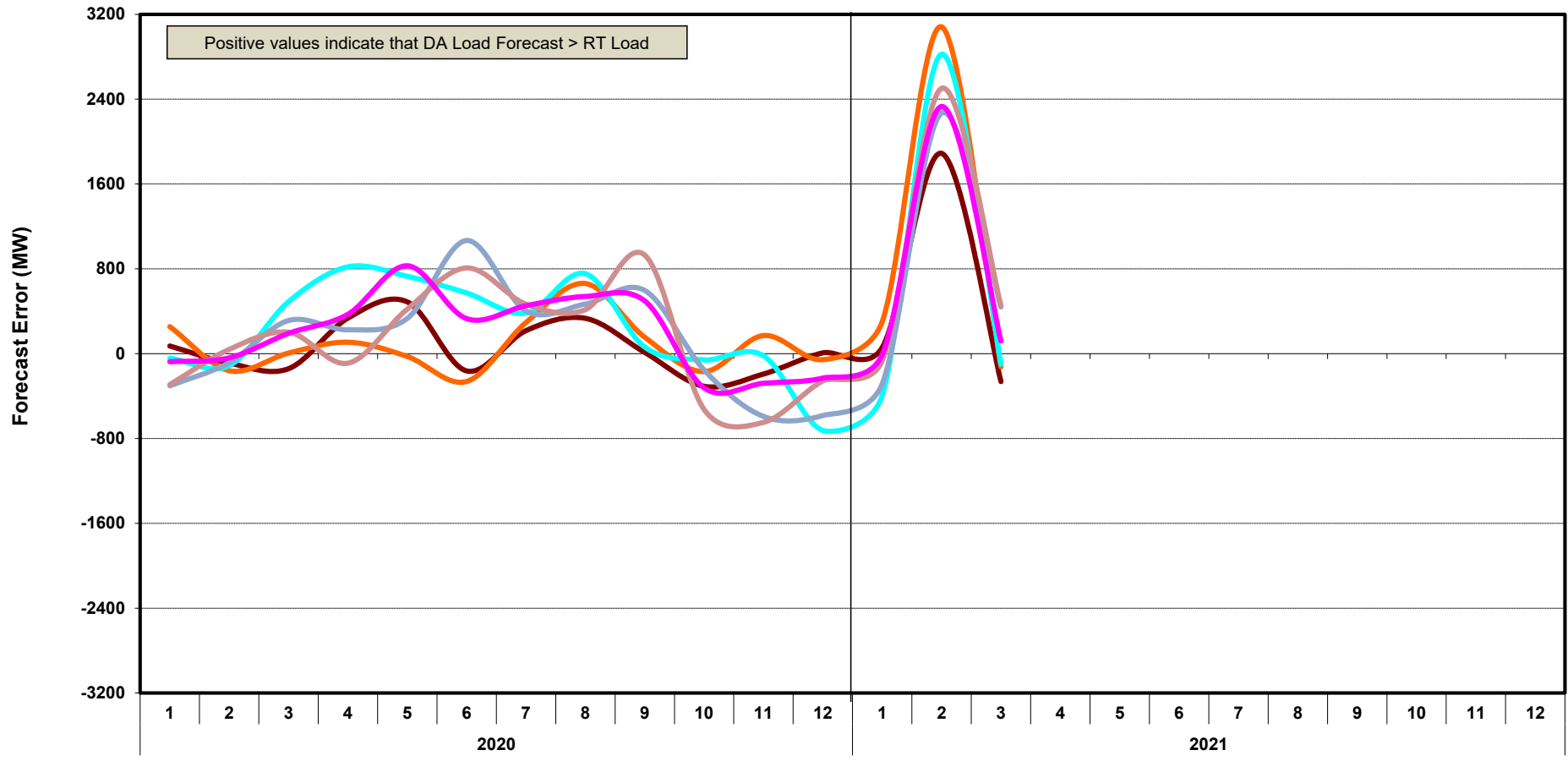
# ERCOT-wide Cumulative Peaker Net Margin



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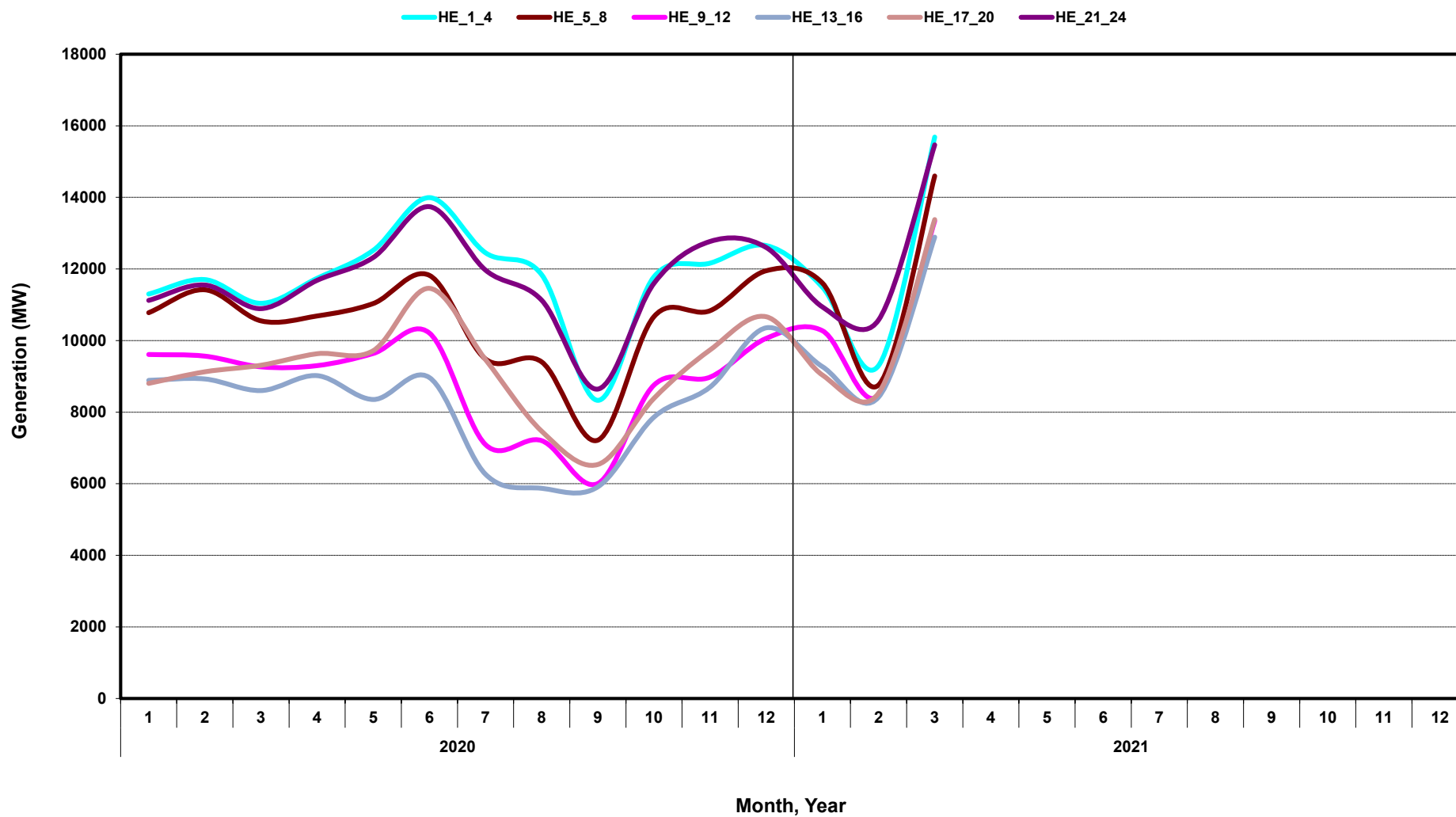
# DA vs. RT Load Forecast Error by Hour Ending

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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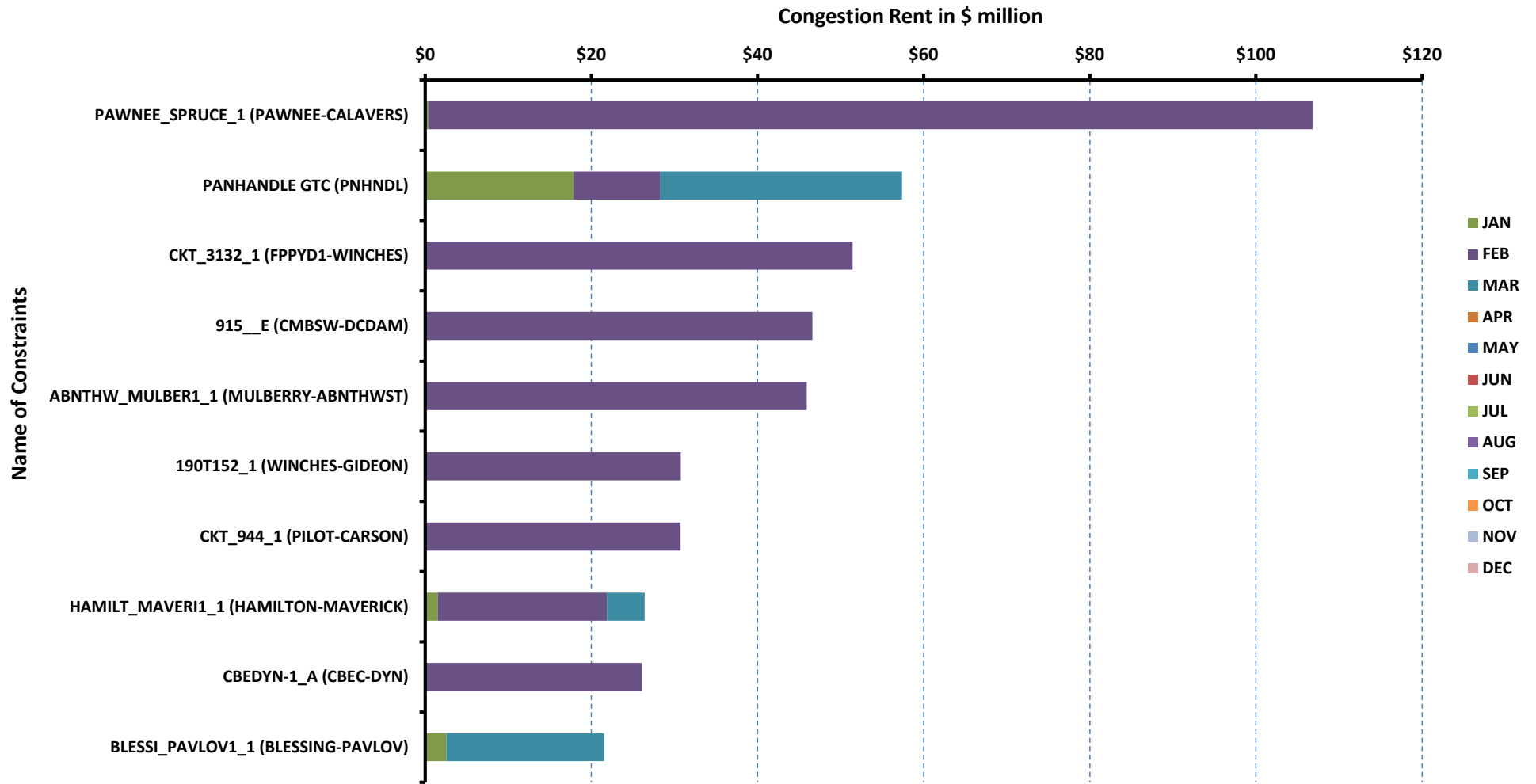
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# RT Congestion Constraint Rankings - 1

## Top 10 Constraints by Total Congestion Value - 2021



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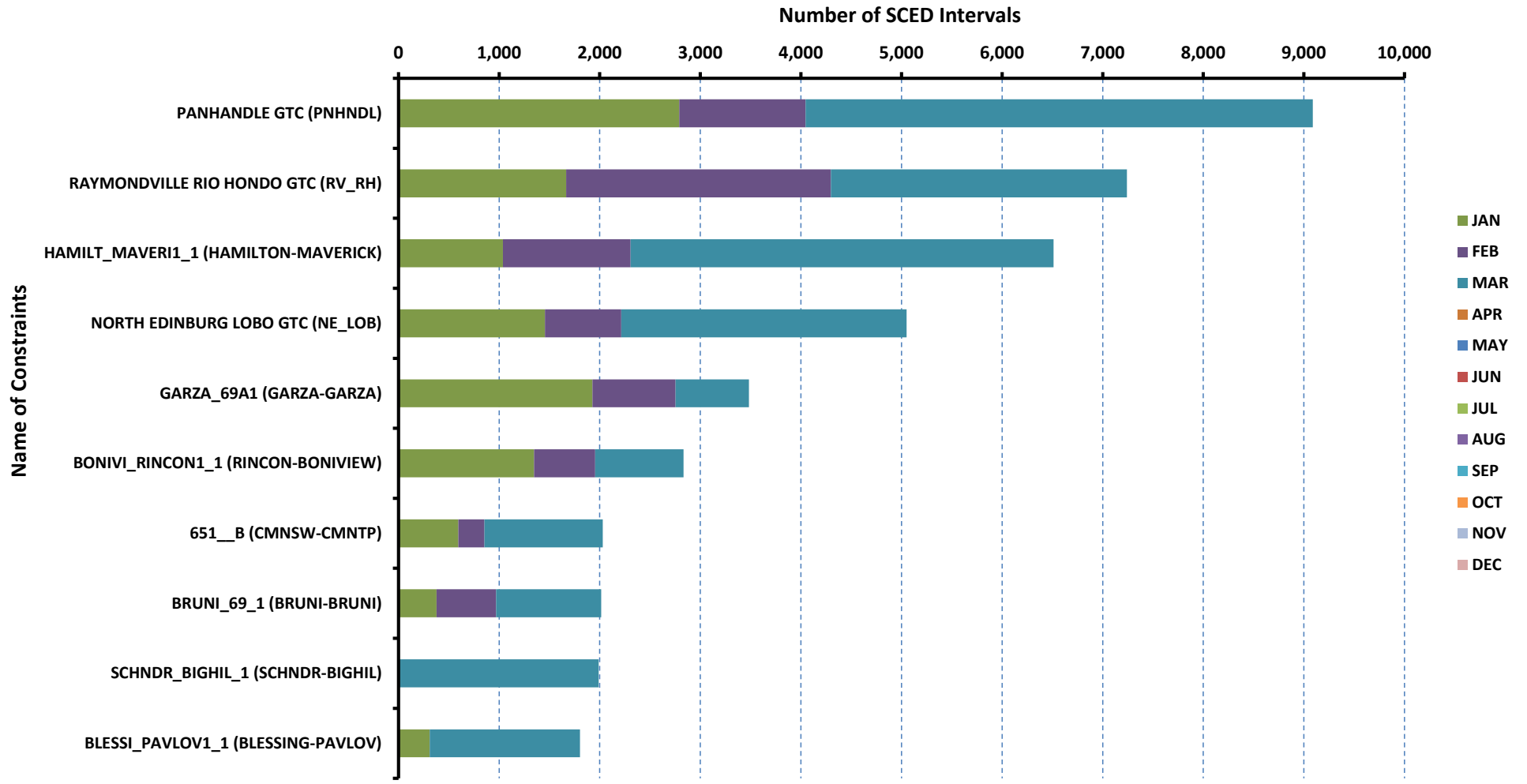
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# RT Congestion Constraint Rankings - 2

## Top 10 Constraints by Binding Frequency - 2021



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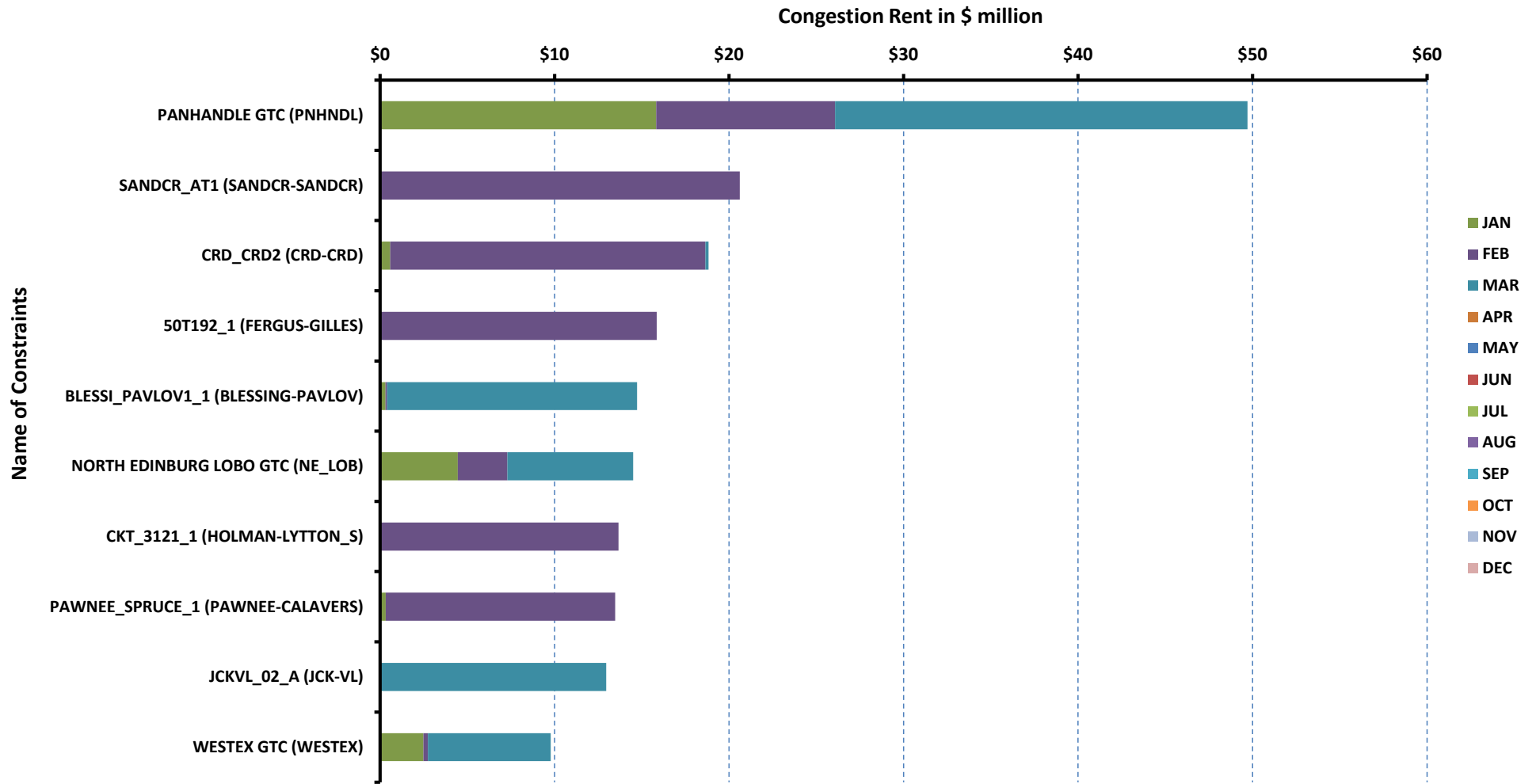
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# DA Congestion Constraint Rankings - 1

## Top 10 Constraints by Total Congestion Value - 2021



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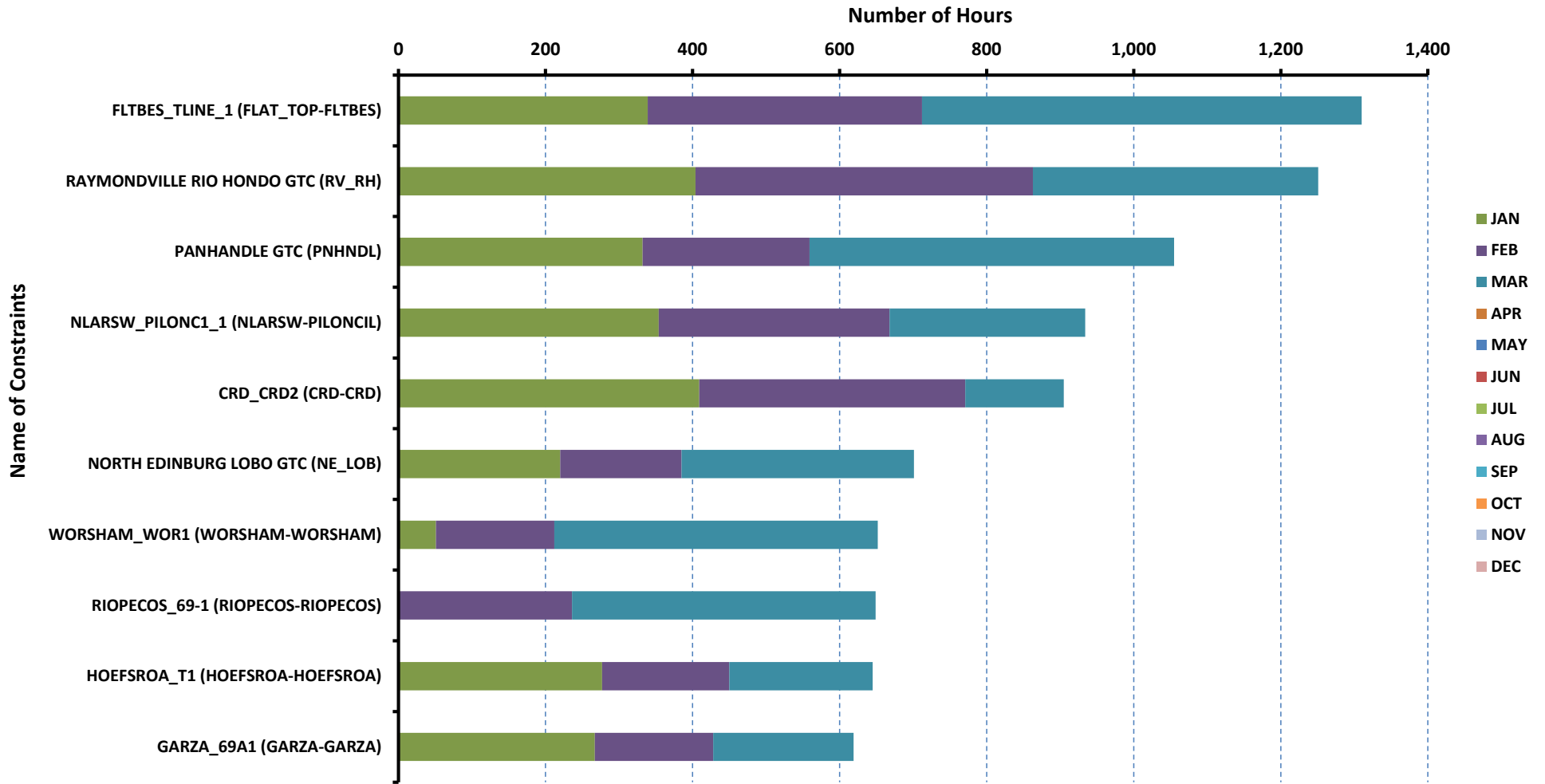
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# DA Congestion Constraint Rankings - 2

## Top 10 Constraints by Binding Frequency - 2021



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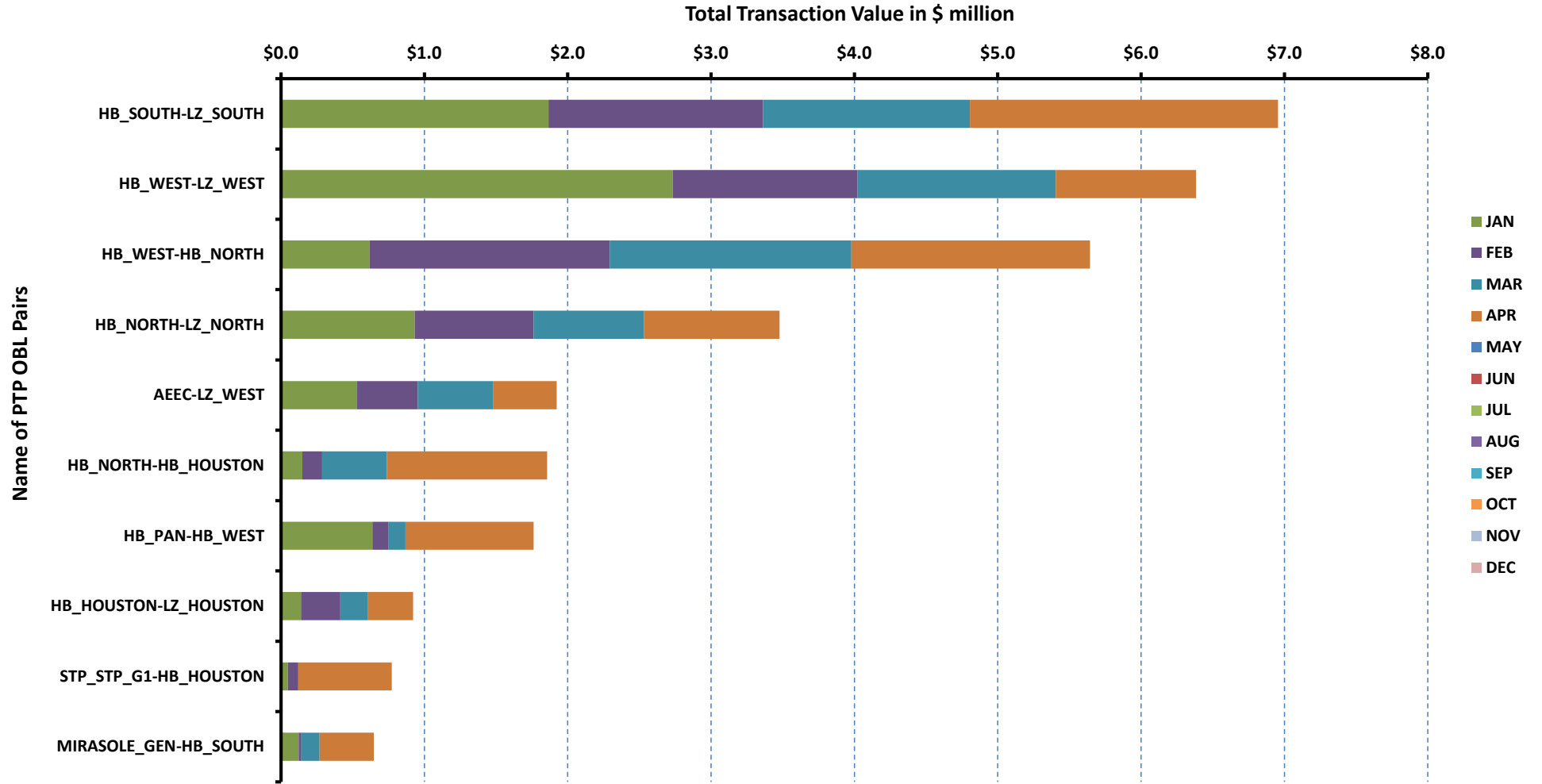
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# Top 10 CRR Pairs Ranked by Monthly Auction Values - 1

## Top 10 PTP Obligations by Total Transaction Value - 2021



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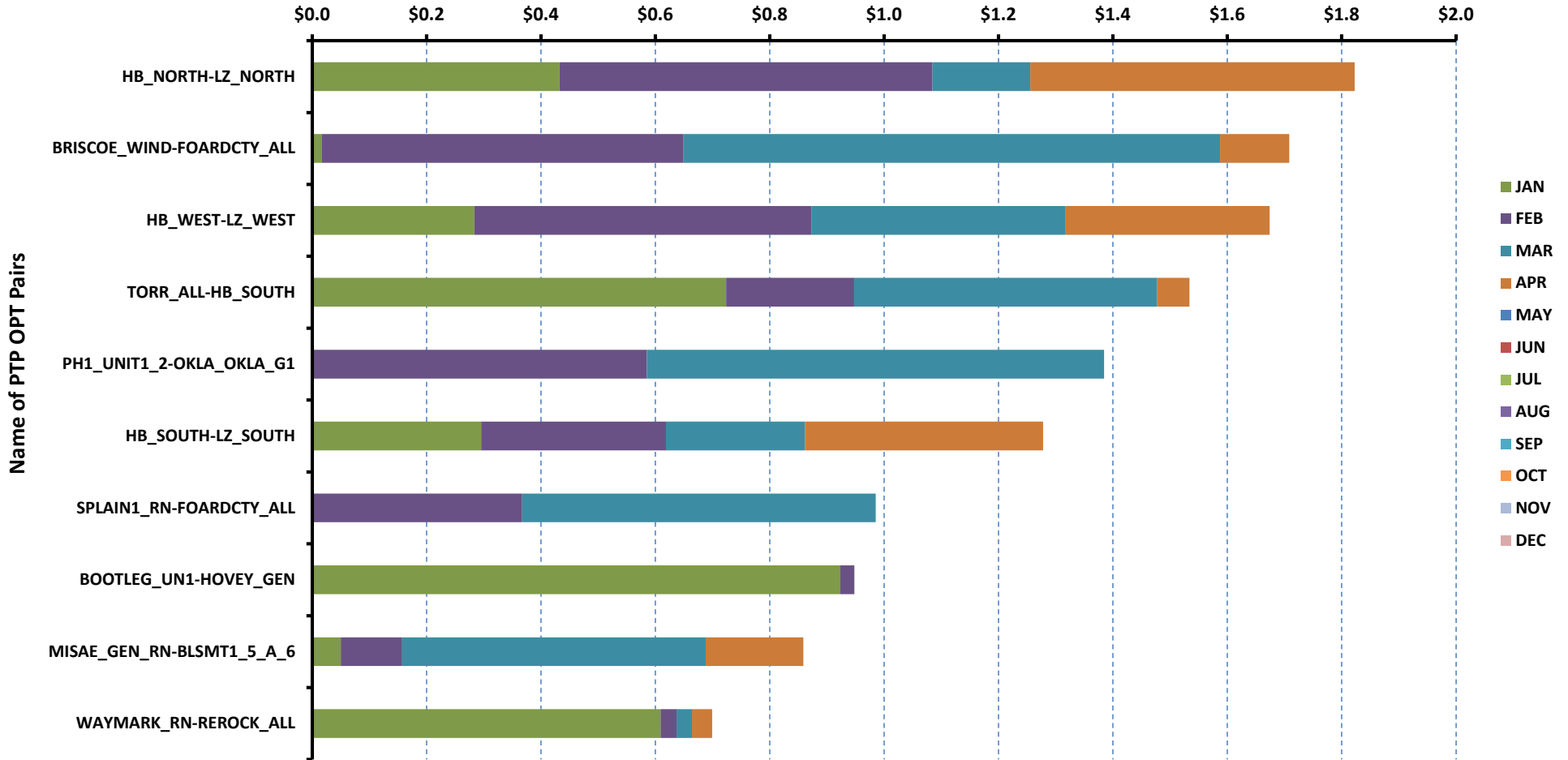
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# Top 10 CRR Pairs Ranked by Monthly Auction Values - 2

## Top 10 PTP Options by Total Transaction Value - 2021

Total Transaction Value in \$ million



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ERCOT-wide Avg. Energy Price - DA vs. RT			
year	month	dam_spp	rtm_spp
2020	1	\$ 18.46	\$ 17.97
	2	\$ 23.69	\$ 26.12
	3	\$ 30.87	\$ 31.87
	4	\$ 22.89	\$ 21.06
	5	\$ 20.92	\$ 20.72
	6	\$ 21.18	\$ 16.13
	7	\$ 25.72	\$ 21.79
	8	\$ 50.64	\$ 43.72
	9	\$ 20.93	\$ 23.32
	10	\$ 27.12	\$ 34.39
	11	\$ 26.47	\$ 26.86
	12	\$ 22.37	\$ 21.38
2021	1	\$ 22.60	\$ 21.96
	2	\$ 1,723.62	\$ 1,783.47
	3	\$ 22.43	\$ 22.27
	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	
2020	1	12,102	19,145	13,311	5,996	9,945	14,023	9,781	5,288	
	2	12,763	22,127	15,953	6,150	10,077	14,586	10,236	5,351	
	3	15,886	17,173	14,820	5,684	10,786	12,298	9,908	4,982	
	4	15,909	19,521	16,210	5,750	10,385	12,167	10,063	4,840	
	5	17,827	23,337	18,047	5,895	11,875	13,891	11,624	4,655	
	6	18,953	25,649	19,077	6,485	13,351	17,610	13,092	5,293	
	7	19,545	28,378	20,240	6,826	14,207	19,609	14,644	5,736	
	8	19,732	28,793	20,448	6,809	14,569	19,780	14,786	5,765	
	9	19,778	23,832	19,355	6,516	13,144	15,129	12,102	5,164	
	10	17,911	22,168	17,330	6,027	11,968	13,693	11,389	4,976	
	11	15,057	18,778	13,503	5,489	10,755	12,406	9,898	4,855	
	12	13,343	21,505	15,278	5,977	10,605	14,512	10,420	5,195	
2021	1	14,310	21,786	16,810	5,919	10,668	14,873	10,630	5,257	
	2	14,403	29,499	21,146	6,279	10,191	16,787	11,635	4,678	
	3	12,830	16,915	13,347	5,425	9,789	12,737	9,455	4,780	
	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
2020	1	\$ 16.65	\$ 17.03	\$ 17.27	\$ 24.25	\$ 17.48	\$ 17.57	\$ 17.87	\$ 23.75
	2	\$ 18.94	\$ 18.97	\$ 19.71	\$ 71.42	\$ 18.21	\$ 18.85	\$ 20.04	\$ 54.21
	3	\$ 27.03	\$ 26.02	\$ 25.72	\$ 69.03	\$ 25.88	\$ 24.94	\$ 25.51	\$ 66.94
	4	\$ 21.29	\$ 20.43	\$ 22.73	\$ 18.66	\$ 22.63	\$ 22.34	\$ 23.83	\$ 22.87
	5	\$ 23.27	\$ 18.12	\$ 23.42	\$ 15.20	\$ 21.41	\$ 20.28	\$ 21.50	\$ 20.11
	6	\$ 16.54	\$ 16.38	\$ 15.76	\$ 15.14	\$ 21.42	\$ 21.57	\$ 21.07	\$ 19.50
	7	\$ 21.44	\$ 21.40	\$ 23.62	\$ 19.29	\$ 26.21	\$ 25.76	\$ 25.93	\$ 23.82
	8	\$ 39.86	\$ 41.02	\$ 54.24	\$ 35.79	\$ 46.46	\$ 48.10	\$ 61.57	\$ 41.90
	9	\$ 22.80	\$ 22.72	\$ 25.43	\$ 21.43	\$ 21.48	\$ 20.45	\$ 20.95	\$ 20.85
	10	\$ 34.02	\$ 35.34	\$ 35.30	\$ 30.58	\$ 26.86	\$ 25.90	\$ 29.79	\$ 24.97
	11	\$ 27.18	\$ 24.78	\$ 25.28	\$ 34.70	\$ 26.49	\$ 24.89	\$ 26.78	\$ 29.86
	12	\$ 20.62	\$ 21.08	\$ 21.24	\$ 24.04	\$ 21.50	\$ 21.74	\$ 22.33	\$ 25.99
2021	1	\$ 21.23	\$ 21.92	\$ 23.45	\$ 20.58	\$ 21.92	\$ 22.57	\$ 23.90	\$ 21.47
	2	\$ 1,429.48	\$ 2,018.22	\$ 2,012.14	\$ 1,143.46	\$ 1,407.11	\$ 1,937.07	\$ 1,944.78	\$ 1,097.12
	3	\$ 27.09	\$ 20.85	\$ 22.13	\$ 16.48	\$ 27.54	\$ 21.74	\$ 20.16	\$ 18.31
	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
2020	1	\$ 1.92	\$ 17.97	9.34	\$ 18.46	9.59
	2	\$ 1.83	\$ 26.12	14.25	\$ 23.69	12.92
	3	\$ 1.68	\$ 31.87	18.98	\$ 30.87	18.38
	4	\$ 1.65	\$ 21.06	12.73	\$ 22.89	13.84
	5	\$ 1.70	\$ 20.72	12.19	\$ 20.92	12.31
	6	\$ 1.57	\$ 16.13	10.30	\$ 21.18	13.52
	7	\$ 1.70	\$ 21.79	12.78	\$ 25.72	15.09
	8	\$ 2.23	\$ 43.72	19.60	\$ 50.64	22.70
	9	\$ 2.01	\$ 23.32	11.58	\$ 20.93	10.39
	10	\$ 2.44	\$ 34.39	14.12	\$ 27.12	11.13
	11	\$ 2.58	\$ 26.86	10.40	\$ 26.47	10.25
	12	\$ 2.55	\$ 21.38	8.38	\$ 22.37	8.77
2021	1	\$ 2.57	\$ 21.96	8.53	\$ 22.60	8.78
	2	\$ 51.48	\$ 1,783.47	34.64	\$ 1,723.62	33.48
	3	\$ 2.44	\$ 22.27	9.12	\$ 22.43	9.18
	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
2020	1	9.08	9.29	9.13	12.34	8.65	8.98	8.85	12.60
	2	9.93	10.93	10.28	29.56	10.33	10.75	10.35	38.95
	3	15.41	15.19	14.85	39.87	16.10	15.32	15.49	41.11
	4	13.68	14.40	13.50	13.83	12.87	13.74	12.35	11.28
	5	12.59	12.65	11.93	11.83	13.69	13.78	10.66	8.94
	6	13.68	13.45	13.78	12.45	10.56	10.06	10.46	9.67
	7	15.38	15.21	15.11	13.98	12.58	13.86	12.56	11.32
	8	20.82	27.60	21.56	18.78	17.86	24.31	18.39	16.04
	9	10.66	10.40	10.16	10.35	11.32	12.62	11.28	10.64
	10	11.03	12.23	10.63	10.25	13.97	14.49	14.51	12.55
	11	10.25	10.37	9.64	11.56	10.52	9.79	9.60	13.44
	12	8.43	8.75	8.52	10.19	8.08	8.32	8.26	9.42
2021	1	8.52	9.29	8.77	8.34	8.25	9.11	8.52	8.00
	2	27.33	37.78	37.63	21.31	27.77	39.09	39.20	22.21
	3	11.27	8.25	8.90	7.50	11.09	9.06	8.54	6.74
	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
2021	3	1	\$ 0.01	\$ -	1	0	80	90
2021	3	2	\$ 0.08	\$ -	7	0	80	90
2021	3	3	\$ -	\$ -	0	0	80	90
2021	3	4	\$ -	\$ -	0	0	80	90
2021	3	5	\$ -	\$ -	0	0	80	90
2021	3	6	\$ 0.03	\$ -	10	0	80	90
2021	3	7	\$ -	\$ -	0	0	80	90
2021	3	8	\$ -	\$ -	0	0	80	90
2021	3	9	\$ -	\$ 0.37	0	4	80	90
2021	3	10	\$ -	\$ 0.41	0	15	80	90
2021	3	11	\$ -	\$ -	0	0	80	90
2021	3	12	\$ -	\$ -	0	0	80	90
2021	3	13	\$ -	\$ -	0	0	80	90
2021	3	14	\$ 0.04	\$ -	13	0	80	90
2021	3	15	\$ 0.07	\$ -	6	0	80	90
2021	3	16	\$ -	\$ -	0	0	80	90
2021	3	17	\$ -	\$ -	0	0	80	90
2021	3	18	\$ 0.54	\$ -	6	0	80	90
2021	3	19	\$ -	\$ -	0	0	80	90
2021	3	20	\$ -	\$ -	0	0	80	90
2021	3	21	\$ -	\$ -	0	0	80	90
2021	3	22	\$ -	\$ -	0	0	80	90
2021	3	23	\$ 1.02	\$ -	14	0	80	90
2021	3	24	\$ -	\$ -	0	0	80	90
2021	3	25	\$ 0.01	\$ -	1	0	80	90
2021	3	26	\$ 1.03	\$ 0.17	10	18	80	90
2021	3	27	\$ 0.02	\$ -	5	0	80	90
2021	3	28	\$ 0.05	\$ -	4	0	80	90
2021	3	29	\$ -	\$ -	0	0	80	90
2021	3	30	\$ 0.01	\$ -	1	0	80	90
2021	3	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
2020	1	271	1,565	2,893	293
	2	276	1,633	2,911	295
	3	293	1,462	2,969	298
	4	282	1,444	2,976	310
	5	314	1,492	2,667	339
	6	302	1,444	2,460	324
	7	294	1,321	2,373	304
	8	301	1,414	2,354	311
	9	304	1,387	2,470	307
	10	277	1,460	2,799	300
	11	259	1,463	2,939	284
	12	266	1,535	2,881	272
2021	1	317	1,535	2,964	345
	2	360	1,604	3,024	374
	3	373	1,500	3,023	374
	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
2020	1	360	1,175	2,825	217
	2	272	1,175	2,825	189
	3	232	1,370	2,831	199
	4	187	1,369	2,832	226
	5	187	1,369	2,832	293
	6	266	1,369	2,832	452
	7	230	1,838	2,733	578
	8	233	1,838	2,733	360
	9	248	1,838	2,733	363
	10	265	1,838	2,733	386
	11	271	1,608	2,654	397
	12	239	1,608	2,654	396
	13	218	1,608	2,654	367
	14	241	1,608	2,654	321
	15	222	1,392	2,634	288
	16	204	1,392	2,634	279
	17	235	1,392	2,634	288
	18	285	1,392	2,634	312
	19	366	1,423	2,663	277
	20	360	1,423	2,663	249
	21	371	1,423	2,663	212
	22	454	1,423	2,663	197
	23	488	1,175	2,825	211
	24	445	1,175	2,825	219
2021	1	307	1,164	3,103	199
	2	243	1,164	3,103	230
	3	236	1,242	3,105	258
	4	200	1,243	3,105	275
	5	223	1,243	3,105	350
	6	318	1,243	3,105	518
	7	270	1,895	2,974	670
	8	356	1,895	2,974	382
	9	486	1,895	2,974	305
	10	523	1,895	2,974	373
	11	495	1,645	2,932	387
	12	442	1,645	2,932	403
	13	418	1,645	2,932	413
	14	414	1,645	2,932	372
	15	392	1,477	2,932	393
	16	335	1,477	2,932	443
	17	308	1,477	2,932	504
	18	282	1,477	2,932	605
	19	324	1,842	2,972	514
	20	320	1,842	2,972	289
	21	342	1,842	2,972	220
	22	394	1,842	2,972	192
	23	397	1,164	3,103	235
	24	365	1,164	3,103	206

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Monthly Average Ancillary Services Price					
year	month	MCPC_REGDN	MCPC_NSPIIN	MCPC_RRS	MCPC_REGUP
2020	1	\$ 7.06	\$ 2.04	\$ 7.24	\$ 8.60
	2	\$ 6.46	\$ 3.78	\$ 10.06	\$ 10.33
	3	\$ 6.39	\$ 4.59	\$ 14.60	\$ 13.00
	4	\$ 10.83	\$ 5.15	\$ 12.78	\$ 12.31
	5	\$ 11.54	\$ 3.36	\$ 8.37	\$ 9.04
	6	\$ 7.57	\$ 4.69	\$ 7.70	\$ 7.89
	7	\$ 6.73	\$ 4.12	\$ 9.56	\$ 9.98
	8	\$ 7.32	\$ 11.02	\$ 23.91	\$ 22.42
	9	\$ 10.12	\$ 2.55	\$ 6.66	\$ 6.91
	10	\$ 10.22	\$ 5.47	\$ 9.81	\$ 10.82
	11	\$ 7.10	\$ 3.84	\$ 15.21	\$ 15.10
	12	\$ 9.71	\$ 3.16	\$ 11.03	\$ 9.49
2021	1	\$ 9.98	\$ 2.16	\$ 11.85	\$ 14.31
	2	\$ 1,272.06	\$ 1,676.26	\$ 3,808.44	\$ 3,218.92
	3	\$ 28.66	\$ 3.93	\$ 30.23	\$ 23.61
	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
2020	1	\$ 0.05	\$ 0.08	\$ 0.54	\$ 0.06
	2	\$ 0.04	\$ 0.15	\$ 0.73	\$ 0.08
	3	\$ 0.05	\$ 0.18	\$ 1.14	\$ 0.10
	4	\$ 0.08	\$ 0.20	\$ 1.02	\$ 0.10
	5	\$ 0.09	\$ 0.12	\$ 0.53	\$ 0.07
	6	\$ 0.05	\$ 0.14	\$ 0.38	\$ 0.05
	7	\$ 0.04	\$ 0.10	\$ 0.42	\$ 0.06
	8	\$ 0.04	\$ 0.28	\$ 1.03	\$ 0.13
	9	\$ 0.07	\$ 0.08	\$ 0.36	\$ 0.05
	10	\$ 0.07	\$ 0.19	\$ 0.65	\$ 0.08
	11	\$ 0.05	\$ 0.15	\$ 1.18	\$ 0.11
	12	\$ 0.06	\$ 0.12	\$ 0.78	\$ 0.06
2021	1	\$ 0.08	\$ 0.08	\$ 0.85	\$ 0.12
	2	\$ 10.56	\$ 62.12	\$ 265.99	\$ 27.82
	3	\$ 0.29	\$ 0.16	\$ 2.49	\$ 0.24
	4	\$ -	\$ -	\$ -	\$ -
	5	\$ -	\$ -	\$ -	\$ -
	6	\$ -	\$ -	\$ -	\$ -
	7	\$ -	\$ -	\$ -	\$ -
	8	\$ -	\$ -	\$ -	\$ -
	9	\$ -	\$ -	\$ -	\$ -
	10	\$ -	\$ -	\$ -	\$ -
	11	\$ -	\$ -	\$ -	\$ -
	12	\$ -	\$ -	\$ -	\$ -

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ERCOT-wide Cumulative PNM			
year	month	pnm	pnm_accum
2020	0	\$ -	\$ -
	1	\$ 948.71	\$ 948.71
	2	\$ 2,962.95	\$ 3,911.66
	3	\$ 6,596.00	\$ 10,507.66
	4	\$ 3,928.31	\$ 14,435.97
	5	\$ 2,971.45	\$ 17,407.42
	6	\$ 1,257.14	\$ 18,664.56
	7	\$ 3,082.86	\$ 21,747.42
	8	\$ 11,591.85	\$ 33,339.27
	9	\$ 3,063.07	\$ 36,402.34
	10	\$ 8,681.74	\$ 45,084.08
	11	\$ 3,520.43	\$ 48,604.51
	12	\$ 1,469.68	\$ 50,074.19
2021	0	\$ -	\$ -
	1	\$ 1,930.83	\$ 1,930.83
	2	\$ 705,359.21	\$ 707,290.04
	3	\$ 3,356.50	\$ 710,646.54
	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
2020	1	73	(303)	(292)	(76)	255	(43)
	2	(89)	(84)	40	(39)	(160)	(113)
	3	(142)	313	202	192	5	490
	4	335	225	(90)	371	108	819
	5	488	332	420	829	(26)	729
	6	(163)	1,067	808	330	(262)	573
	7	218	403	467	452	294	382
	8	333	468	415	540	662	754
	9	12	596	930	497	155	62
	10	(308)	(154)	(527)	(323)	(169)	(58)
	11	(192)	(592)	(648)	(279)	171	(20)
	12	8	(583)	(257)	(230)	(57)	(724)
2021	1	58	(284)	(66)	(9)	302	(394)
	2	1,889	2,270	2,503	2,331	3,083	2,824
	3	(263)	440	452	119	(125)	(99)
	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
2020	1	11,301	8,889	8,804	11,122	10,778	9,611
	2	11,703	8,927	9,127	11,552	11,418	9,565
	3	11,041	8,603	9,310	10,892	10,550	9,266
	4	11,740	9,020	9,632	11,683	10,687	9,300
	5	12,521	8,354	9,718	12,321	11,035	9,639
	6	13,993	8,966	11,459	13,741	11,821	10,210
	7	12,451	6,263	9,467	11,967	9,483	7,091
	8	11,838	5,872	7,466	11,126	9,403	7,204
	9	8,330	5,914	6,538	8,644	7,217	6,007
	10	11,781	7,862	8,387	11,600	10,670	8,756
	11	12,163	8,702	9,740	12,769	10,835	8,979
	12	12,653	10,356	10,665	12,599	11,951	10,062
2021	1	11,491	9,270	9,037	10,939	11,606	10,274
	2	9,300	8,420	8,532	10,575	8,759	8,461
	3	15,685	12,889	13,380	15,467	14,598	13,338
	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	2021	PANHANDLE GTC (PNHNDL)	9,089	1	2,790	1,257	5,042	-	-	-	-	-	-	-	-	-
FREQ_EXIST	2021	RAYMONDVILLE RIO HONDO GTC (RV RH)	7,241	2	1,667	2,630	2,944	-	-	-	-	-	-	-	-	-
FREQ_EXIST	2021	HAMILT MAVERI1_1 (HAMILTON-MAVERICK)	6,512	3	1,038	1,269	4,205	-	-	-	-	-	-	-	-	-
FREQ_EXIST	2021	NORTH EDINBURG LOBO GTC (NE LOB)	5,050	4	1,455	758	2,837	-	-	-	-	-	-	-	-	-
FREQ_EXIST	2021	GARZA 69A1 (GARZA-GARZA)	3,484	5	1,928	825	731	-	-	-	-	-	-	-	-	-
FREQ_EXIST	2021	BONIVI RINCON1_1 (RINCON-BONIVIEW)	2,834	6	1,347	607	880	-	-	-	-	-	-	-	-	-
FREQ_EXIST	2021	651_B (CMNSW-CMNTP)	2,030	7	594	260	1,176	-	-	-	-	-	-	-	-	-
FREQ_EXIST	2021	BRUNI 69_1 (BRUNI-BRUNI)	2,014	8	378	592	1,044	-	-	-	-	-	-	-	-	-
FREQ_EXIST	2021	SCHNDR BIGHIL_1 (SCHNDR-BIGHIL)	1,989	9	-	-	1,989	-	-	-	-	-	-	-	-	-
FREQ_EXIST	2021	BLESSI_PAVLOV1_1 (BLESSING-PAVLOV)	1,803	10	310	-	1,493	-	-	-	-	-	-	-	-	-
TOP10_RENT	2021	PAWNEE_SPRUCE_1 (PAWNEE-CALAVERS)	\$ 106.80	1	\$ 0.39	\$ 106.40	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2021	PANHANDLE GTC (PNHNDL)	\$ 57.39	2	\$ 17.87	\$ 10.46	\$ 29.06	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2021	CKT_3132_1 (FPPYD1-WINCHES)	\$ 51.44	3	\$ -	\$ 51.44	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2021	915_E (CMBSW-DCDAM)	\$ 46.61	4	\$ -	\$ 46.61	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2021	ABNTHW_MULBER1_1 (MULBERRY-ABNTHWST)	\$ 45.93	5	\$ -	\$ 45.93	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2021	190T152_1 (WINCHES-GIDEON)	\$ 30.76	6	\$ 0.12	\$ 30.63	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2021	CKT_944_1 (PILOT-CARSON)	\$ 30.74	7	\$ -	\$ 30.74	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2021	HAMILT MAVERI1_1 (HAMILTON-MAVERICK)	\$ 26.41	8	\$ 1.51	\$ 20.38	\$ 4.52	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2021	CBEDYN-1_A (CBEC-DYN)	\$ 26.09	9	\$ -	\$ 26.09	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2021	BLESSI_PAVLOV1_1 (BLESSING-PAVLOV)	\$ 21.53	10	\$ 2.57	\$ -	\$ 18.96	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

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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	2021	FLTBES TLINE 1 (FLAT_TOP-FLTBES)	1,310	1	339	373	598	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2021	RAYMONDVILLE RIO HONDO GTC (RV_RH)	1,251	2	404	459	388	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2021	PANHANDLE GTC (PNHNDL)	1,055	3	332	227	496	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2021	NLARSW_PILONC1_1 (NLARSW-PILONCIL)	934	4	354	314	266	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2021	CRD_CRD2 (CRD-CRD)	905	5	409	362	134	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2021	NORTH EDINBURG LOBO GTC (NE_LOB)	701	6	220	165	316	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2021	WORSHAM_WOR1 (WORSHAM-WORSHAM)	652	7	51	161	440	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2021	RIOPECOS_69-1 (RIOPECOS-RIOPECOS)	649	8	-	236	413	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2021	HOEFSROA_T1 (HOEFSROA-HOEFSROA)	645	9	277	173	195	-	-	-	-	-	-	-	-	-	
FREQ_EXIST	2021	GARZA_69A1 (GARZA-GARZA)	619	10	267	161	191	-	-	-	-	-	-	-	-	-	
TOP10_RENT	2021	PANHANDLE GTC (PNHNDL)	\$ 49.70	1	\$ 15.82	\$ 10.25	\$ 23.63	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2021	SANDCR_ATT1 (SANDCR-SANDCR)	\$ 20.61	2	\$ -	\$ 20.61	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2021	CRD_CRD2 (CRD-CRD)	\$ 18.82	3	\$ 0.58	\$ 18.06	\$ 0.18	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2021	50T192_1 (FERGUS-GILLES)	\$ 15.86	4	\$ -	\$ 15.86	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2021	BLESSI_PAVLOV1_1 (BLESSING-PAVLOV)	\$ 14.73	5	\$ 0.31	\$ 0.09	\$ 14.32	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2021	NORTH EDINBURG LOBO GTC (NE_LOB)	\$ 14.50	6	\$ 4.45	\$ 2.84	\$ 7.21	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2021	CKT_3121_1 (HOLMAN-LYTTON_S)	\$ 13.66	7	\$ -	\$ 13.66	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2021	PAWNEE_SPRUCE_1 (PAWNEE-CALAVERS)	\$ 13.47	8	\$ 0.32	\$ 13.14	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2021	JCKVL_02_A (JCK-VL)	\$ 12.96	9	\$ -	\$ 0.01	\$ 12.95	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2021	WESTEX GTC (WESTEX)	\$ 9.78	10	\$ 2.49	\$ 0.26	\$ 7.04	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	

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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	2021	HB SOUTH-LZ SOUTH	\$ 6.96	1	\$ 1.87	\$ 1.50	\$ 1.44	\$ 2.15	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2021	HB WEST-LZ WEST	\$ 6.38	2	\$ 2.73	\$ 1.29	\$ 1.38	\$ 0.98	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2021	HB WEST-HB NORTH	\$ 5.64	3	\$ 0.62	\$ 1.68	\$ 1.69	\$ 1.67	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2021	HB NORTH-LZ NORTH	\$ 3.48	4	\$ 0.93	\$ 0.83	\$ 0.77	\$ 0.94	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2021	AEEC-LZ WEST	\$ 1.92	5	\$ 0.53	\$ 0.42	\$ 0.52	\$ 0.44	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2021	HB NORTH-HB HOUSTON	\$ 1.86	6	\$ 0.15	\$ 0.14	\$ 0.45	\$ 1.12	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2021	HB PAN-HB WEST	\$ 1.76	7	\$ 0.64	\$ 0.11	\$ 0.12	\$ 0.89	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2021	HB HOUSTON-LZ HOUSTON	\$ 0.92	8	\$ 0.14	\$ 0.27	\$ 0.19	\$ 0.32	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2021	STP STP G1-HB HOUSTON	\$ 0.77	9	\$ 0.05	\$ 0.07	\$ -	\$ 0.65	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2021	MIRASOLE_GEN-HB SOUTH	\$ 0.65	10	\$ 0.12	\$ 0.02	\$ 0.13	\$ 0.38	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2021	HB NORTH-LZ NORTH	\$ 1.82	1	\$ 0.43	\$ 0.65	\$ 0.17	\$ 0.57	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2021	BRISCOE_WIND-FOARDCTY_ALL	\$ 1.71	2	\$ 0.02	\$ 0.63	\$ 0.94	\$ 0.12	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2021	HB WEST-LZ WEST	\$ 1.67	3	\$ 0.28	\$ 0.59	\$ 0.44	\$ 0.36	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2021	TORR_ALL-HB SOUTH	\$ 1.53	4	\$ 0.72	\$ 0.22	\$ 0.53	\$ 0.06	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2021	PH1_UNIT1_2-OKLA_OKLA_G1	\$ 1.38	5	\$ 0.00	\$ 0.58	\$ 0.80	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2021	HB SOUTH-LZ SOUTH	\$ 1.28	6	\$ 0.30	\$ 0.32	\$ 0.24	\$ 0.42	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2021	SPLAIN1_RN-FOARDCTY_ALL	\$ 0.99	7	\$ -	\$ 0.37	\$ 0.62	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2021	BOOTLEG_UN1-HOVEY_GEN	\$ 0.95	8	\$ 0.92	\$ 0.02	\$ 0.00	\$ 0.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2021	MISAE_GEN_RN-BLSMT1_5_A_6	\$ 0.86	9	\$ 0.05	\$ 0.11	\$ 0.53	\$ 0.17	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2021	WAYMARK_RN-REROCK_ALL	\$ 0.70	10	\$ 0.61	\$ 0.03	\$ 0.03	\$ 0.04	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	

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