

To the Public Utility Commission of Texas

ERCOT Wholesale Electricity Market Monthly Report

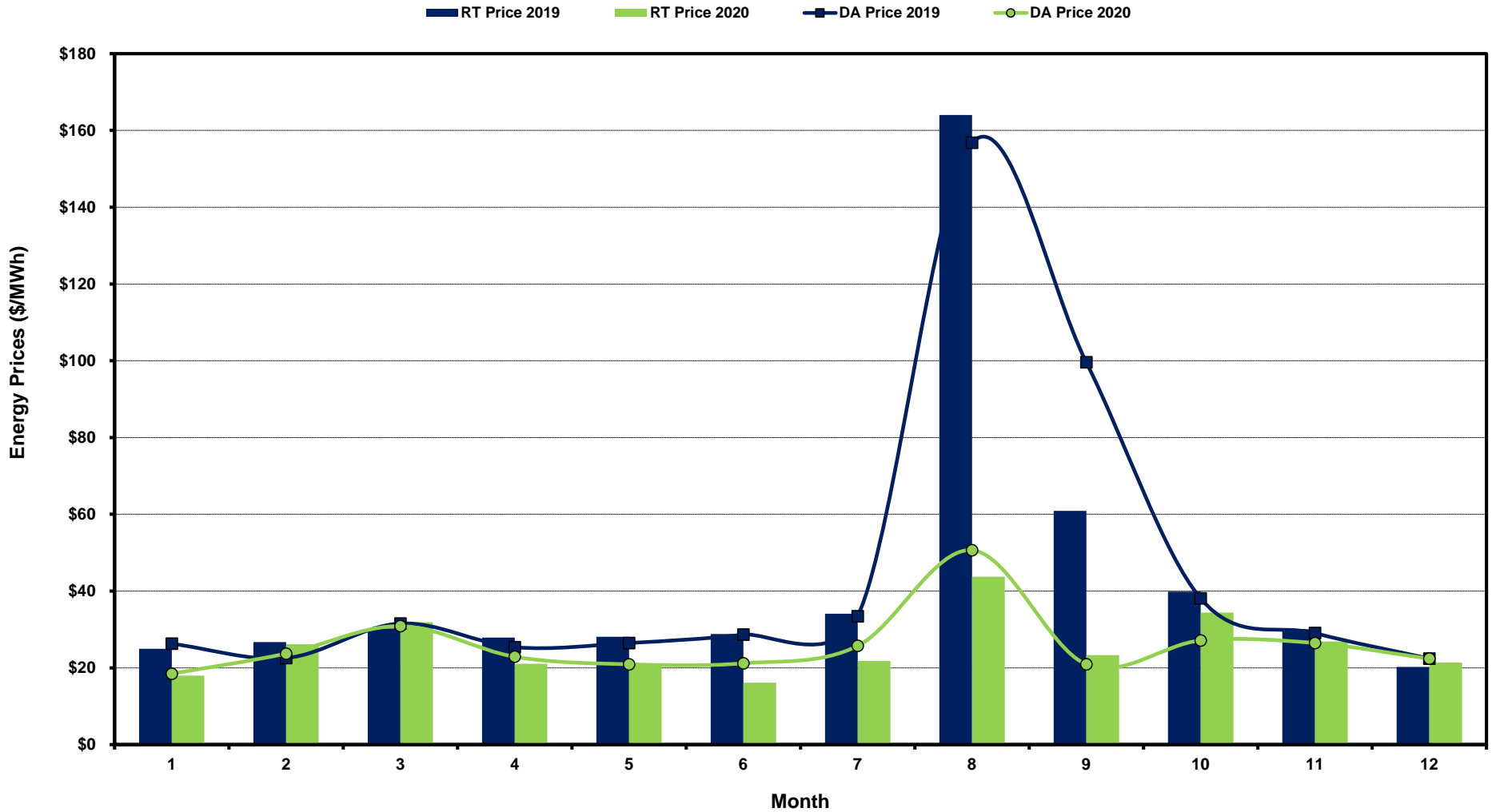
Monday, January 11, 2021

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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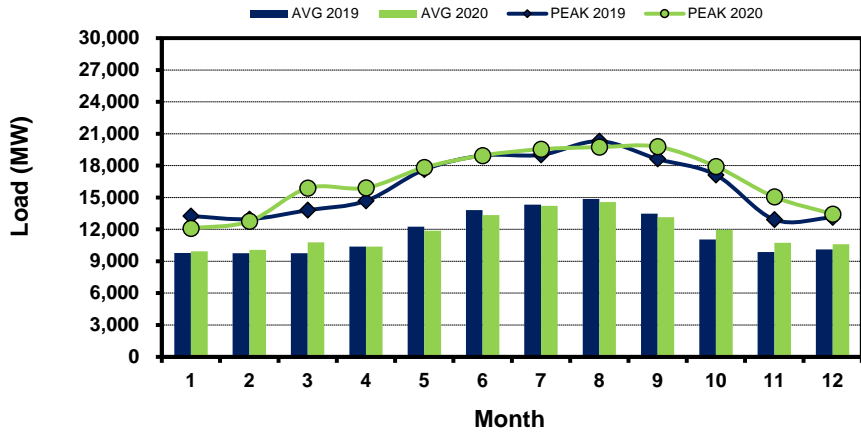
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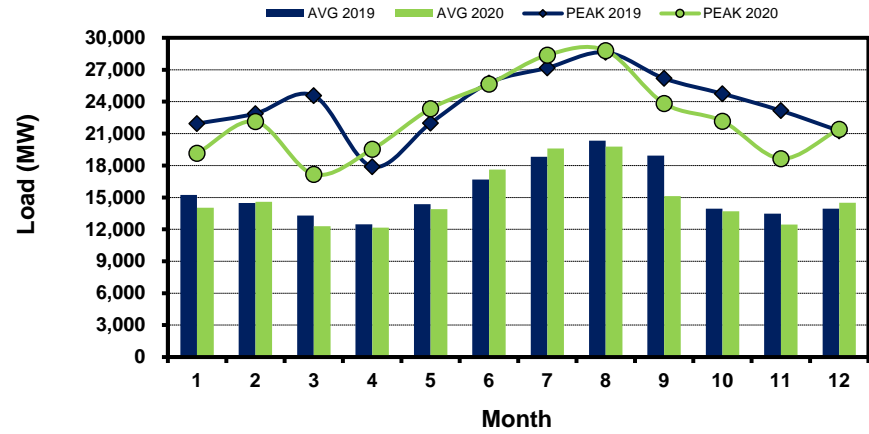
Load Zone Load Statistics

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

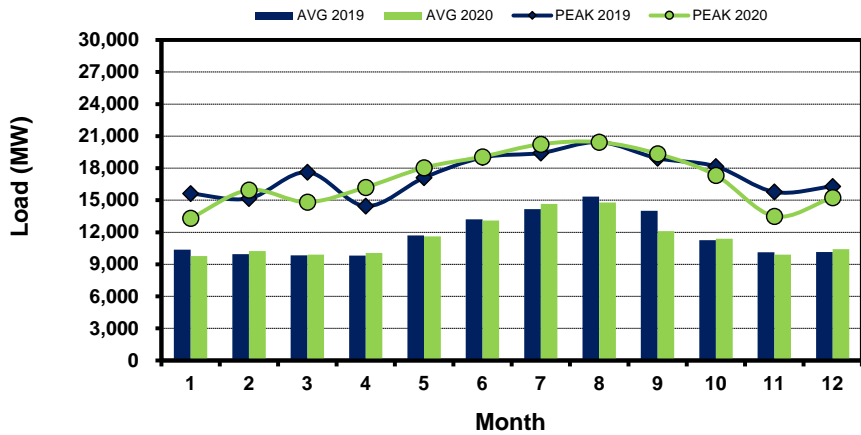
Houston Zone



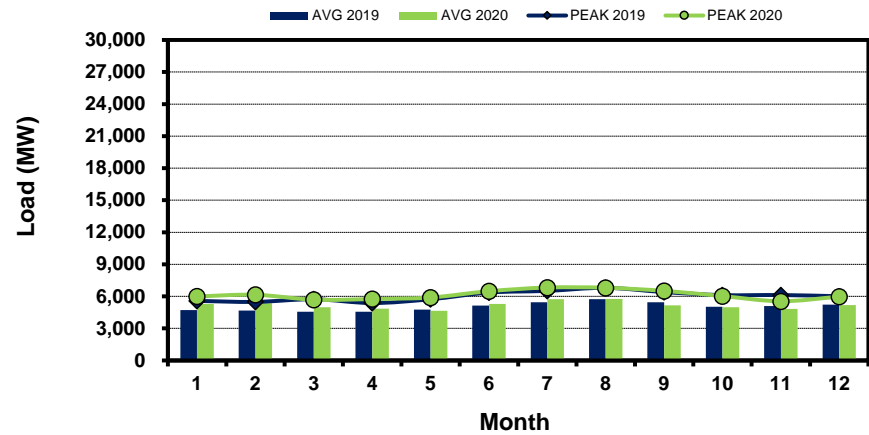
North Zone



South Zone



West Zone



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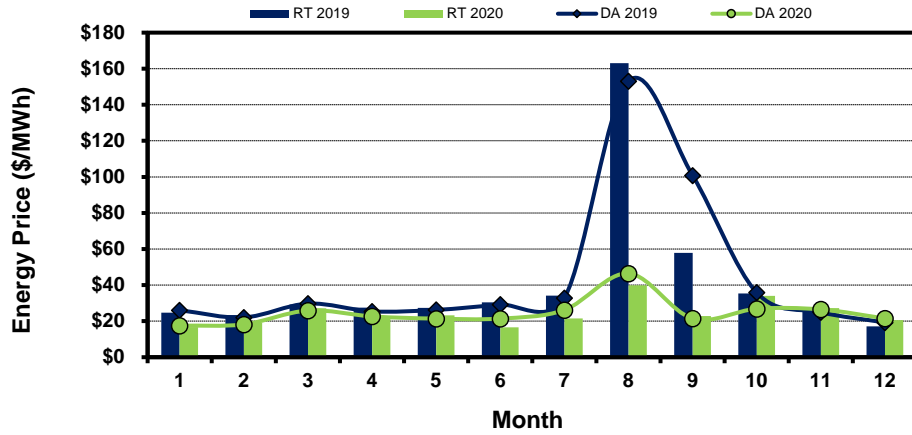
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Note: * Zonal load zone definition vs. Nodal comparable load zone definition: LZ_Houston=LZ_Houston; LZ_West=LZ_West; LZ_North=(LZ_North,LZ_RAYBN); LZ_South=(LZ_South,LZ_CPS,LZ_AEN,LZ_LCRA)

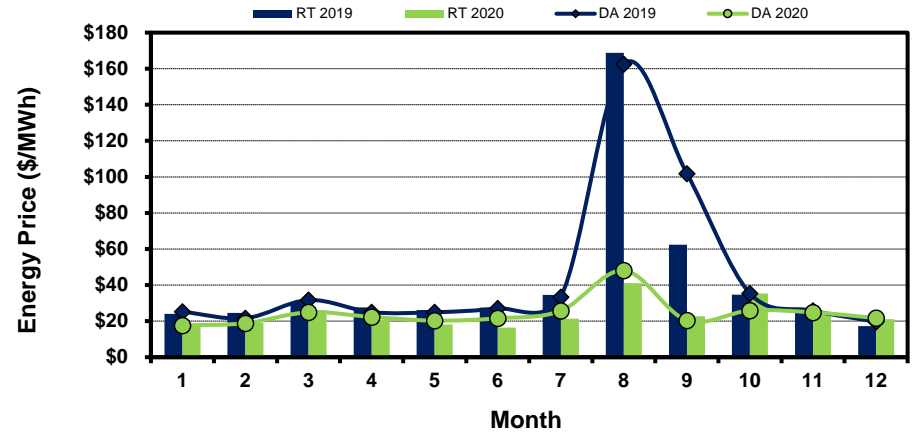
Load Zone Monthly Average Energy Price DA vs RT

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

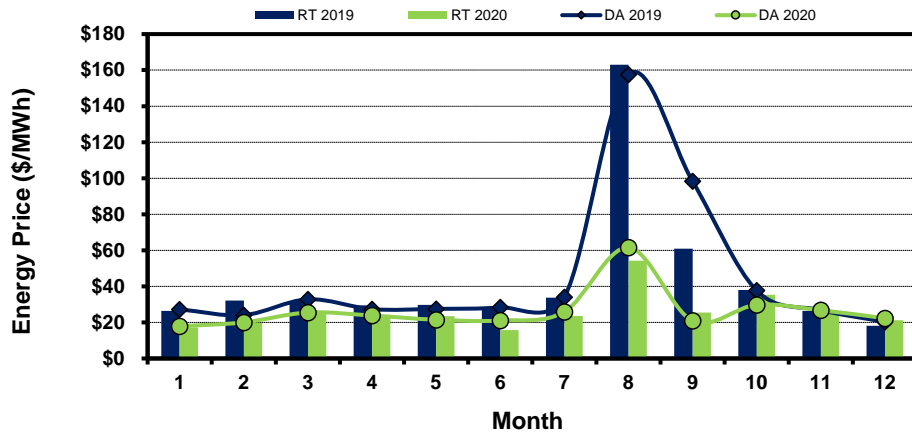
Houston Zone



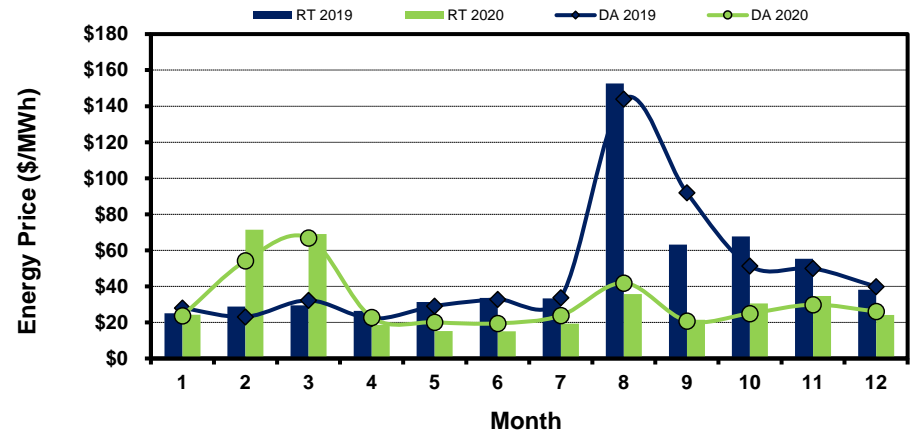
North Zone



South Zone



West Zone



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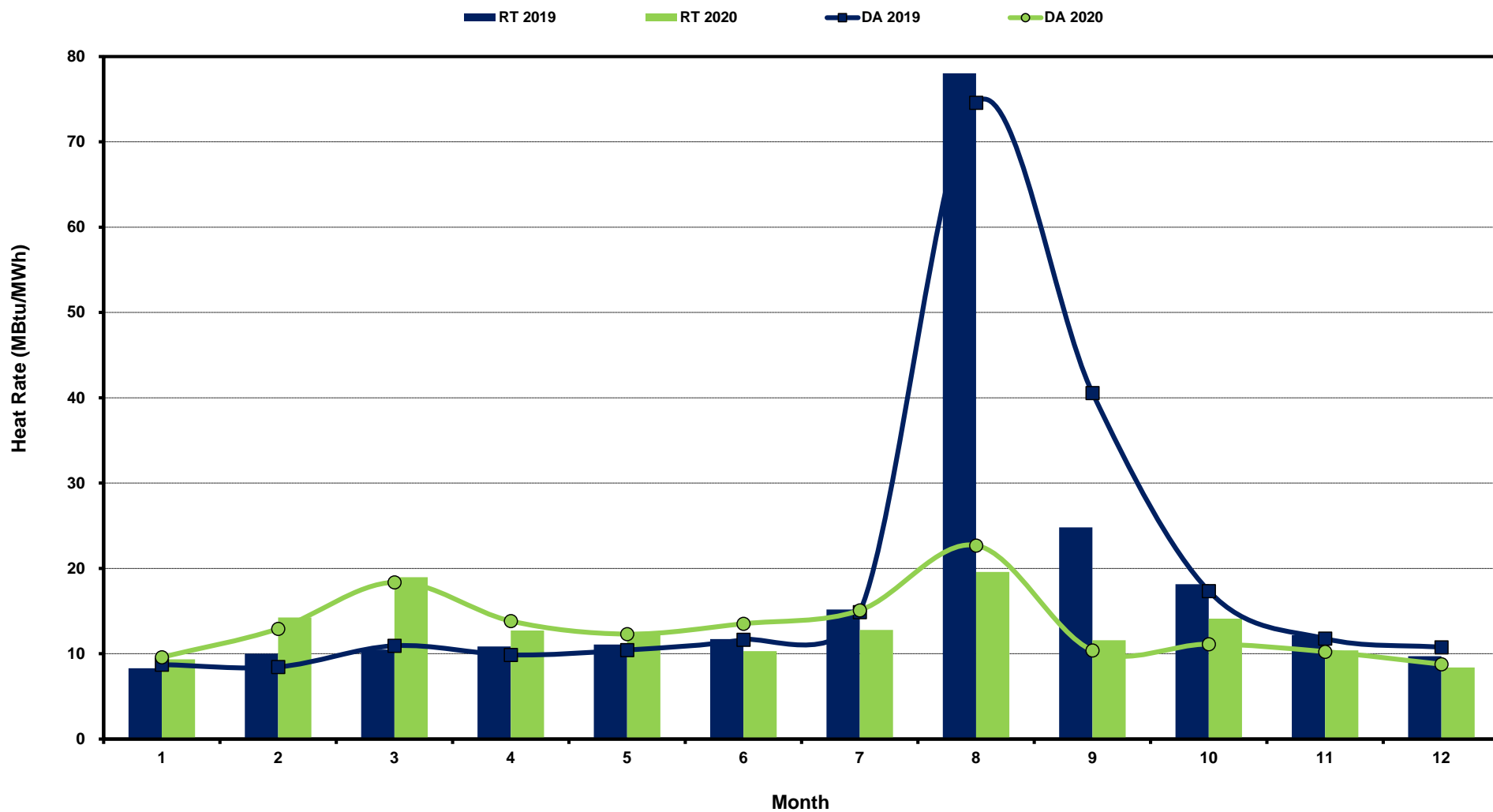
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Note: * Zonal load zone definition vs. Nodal comparable load zone definition: LZ_Houston=LZ_Houston; LZ_West=LZ_West; LZ_North=(LZ_North,LZ_RAYBN); LZ_South=(LZ_South,LZ_CPS,LZ_AEN,LZ_LCRA)

ERCOT-wide Monthly Implied Heat Rate DA vs RT

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



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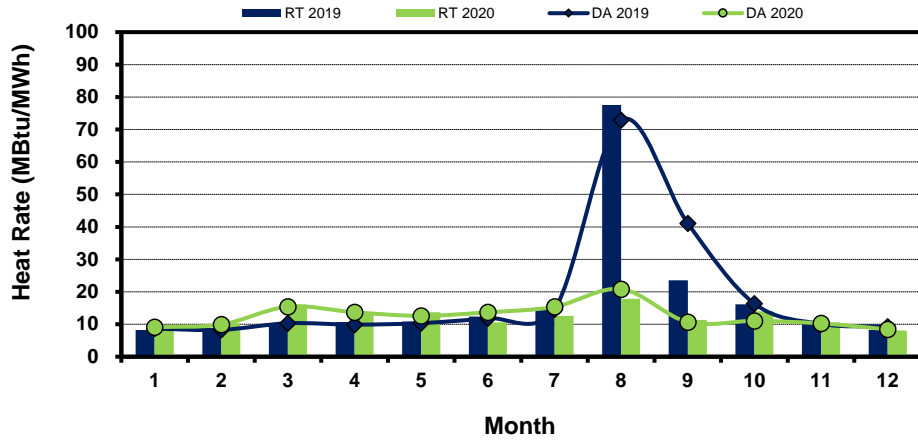
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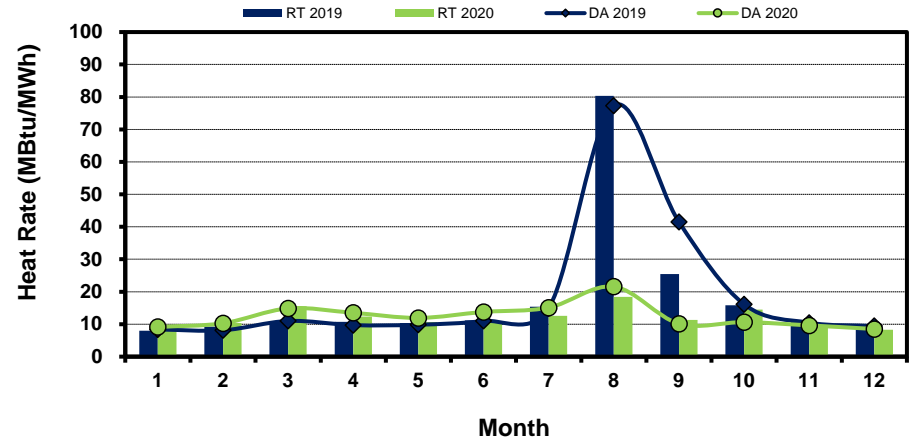
Load Zone Monthly Implied Heat Rate DA vs RT

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

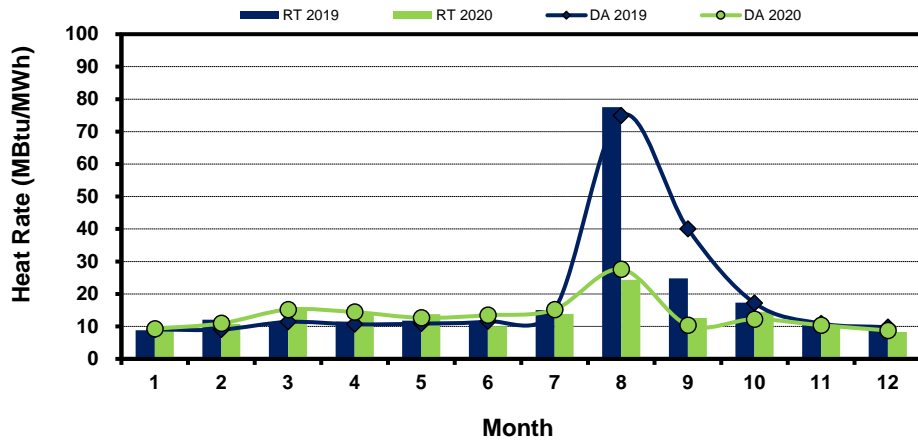
Houston Zone



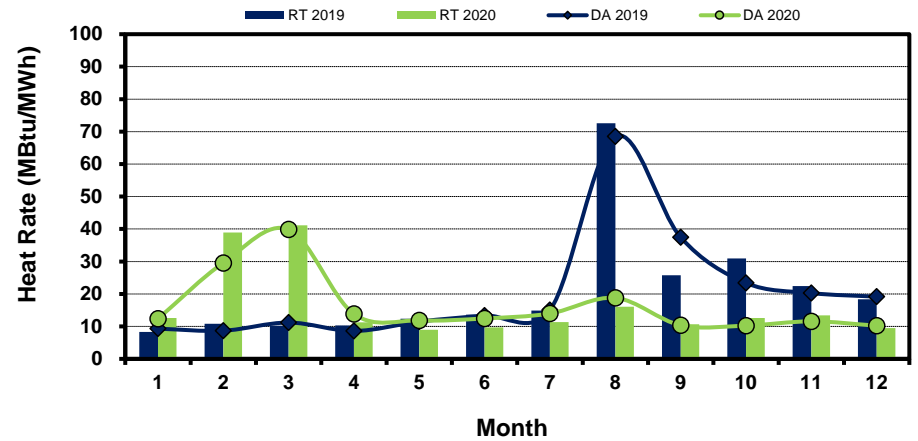
North Zone



South Zone



West Zone



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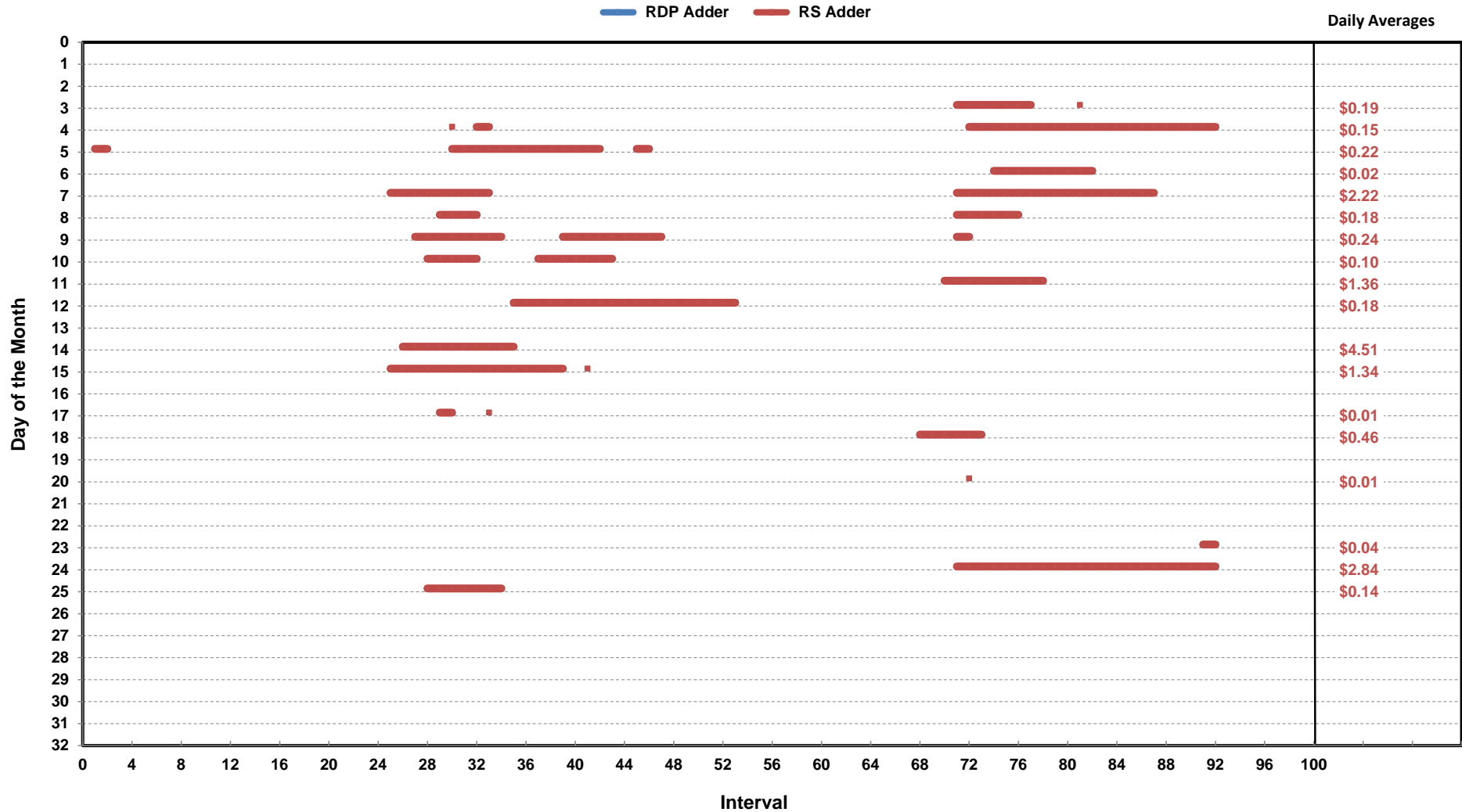
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Note: * Zonal load zone definition vs. Nodal comparable load zone definition: LZ_Houston=LZ_Houston; LZ_West=LZ_West; LZ_North=(LZ_North,LZ_RAYBN); LZ_South=(LZ_South,LZ_CPS,LZ_AEN,LZ_LCRA)

Daily ORDC Adders Average Values and Interval Duration

Dec-2020



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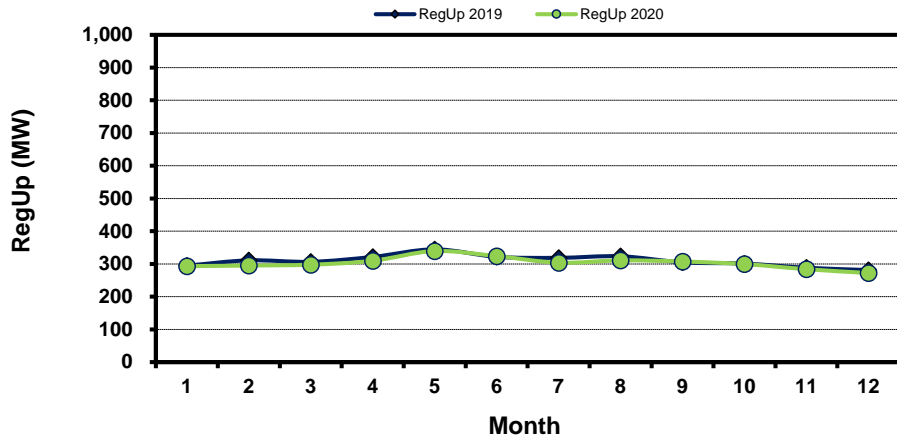
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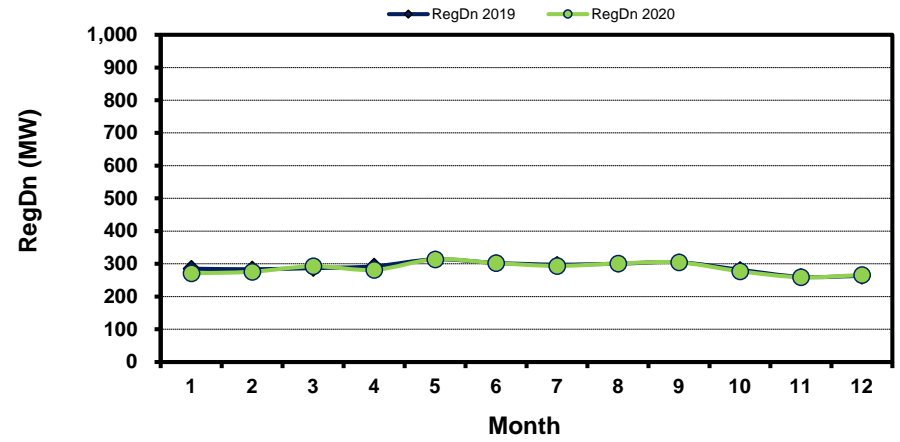
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Monthly Average of Ancillary Services Required MW

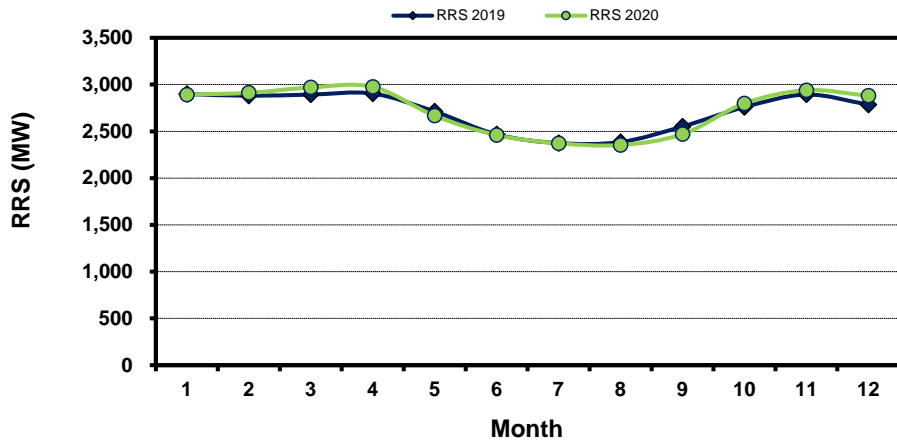
Regulation Up



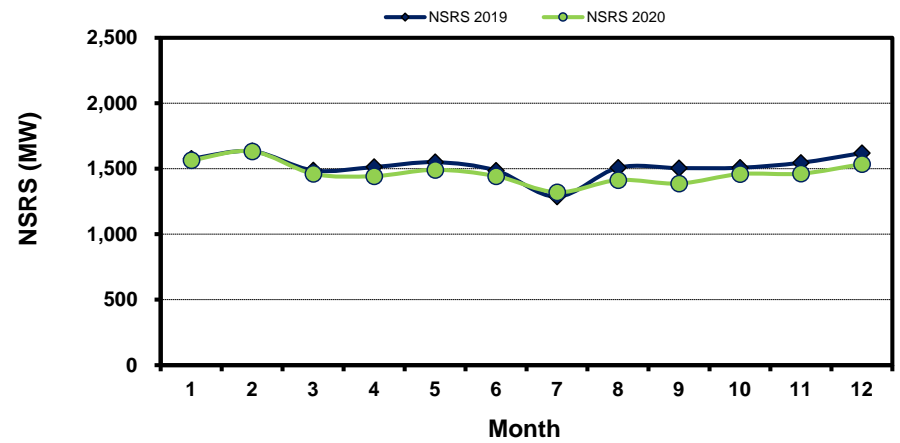
Regulation Down



Responsive Reserve



Non-Spin Reserve



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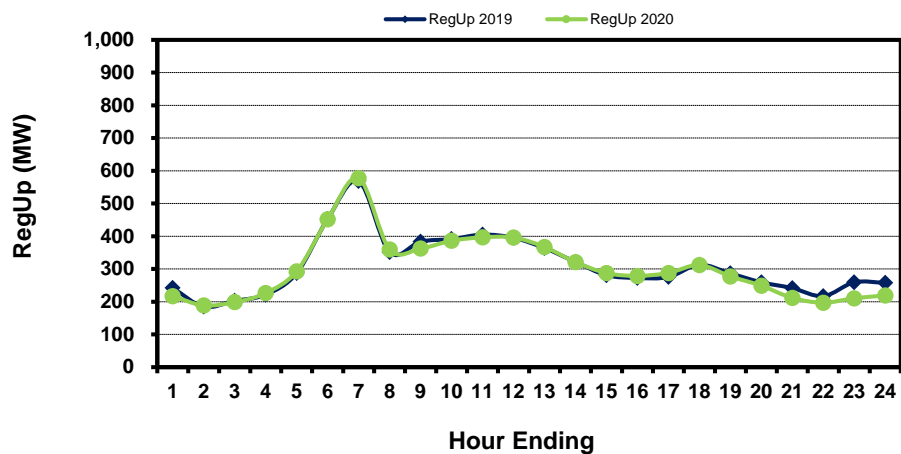
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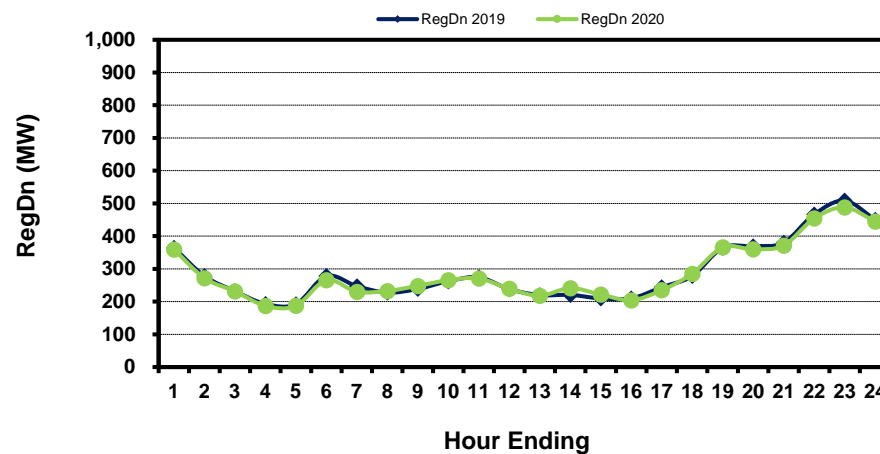
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Hourly Average of Ancillary Services Required MW

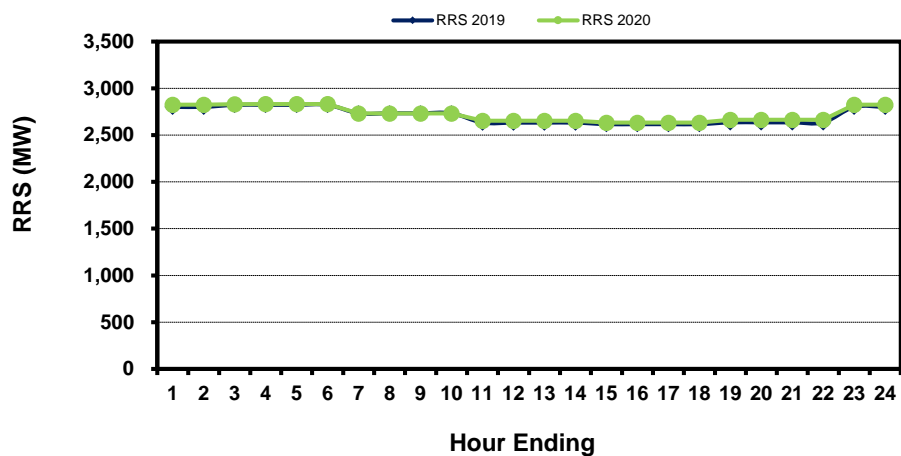
Regulation Up



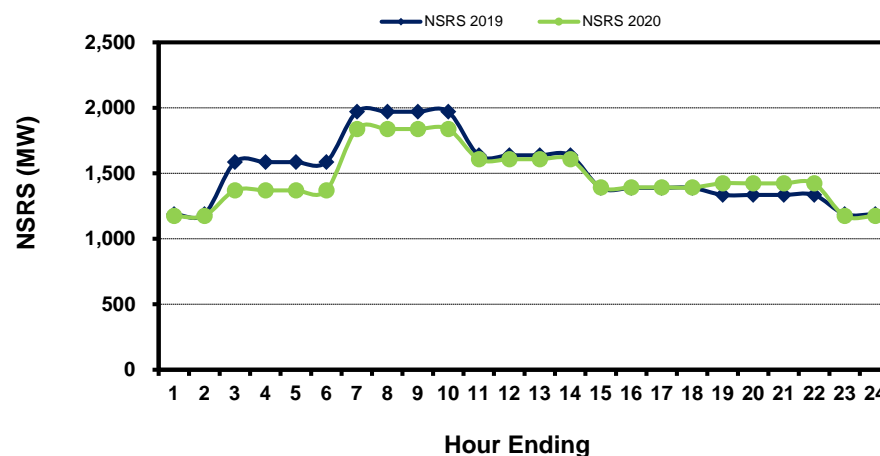
Regulation Down



Responsive Reserve



Non-Spin Reserve



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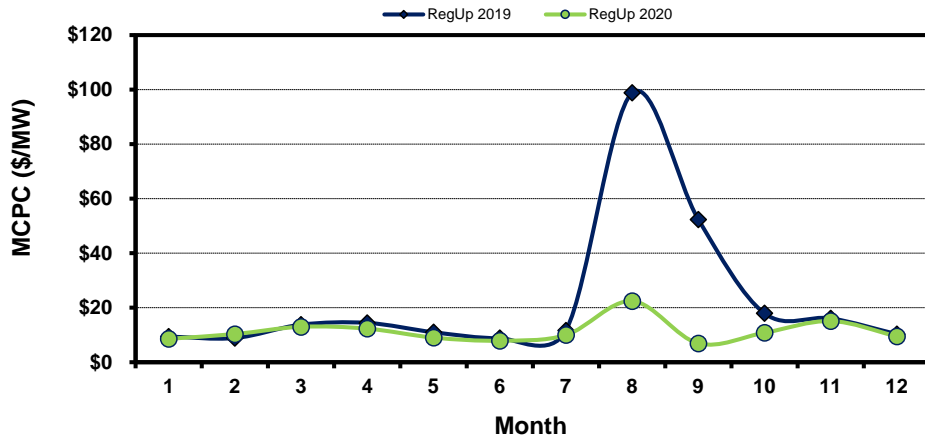
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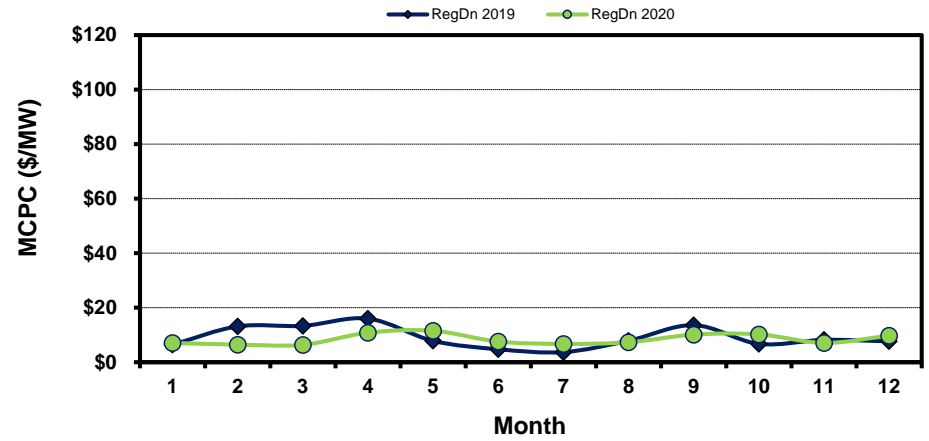
Monthly Average Ancillary Services Price

(weighted by A/S Quantities Required)

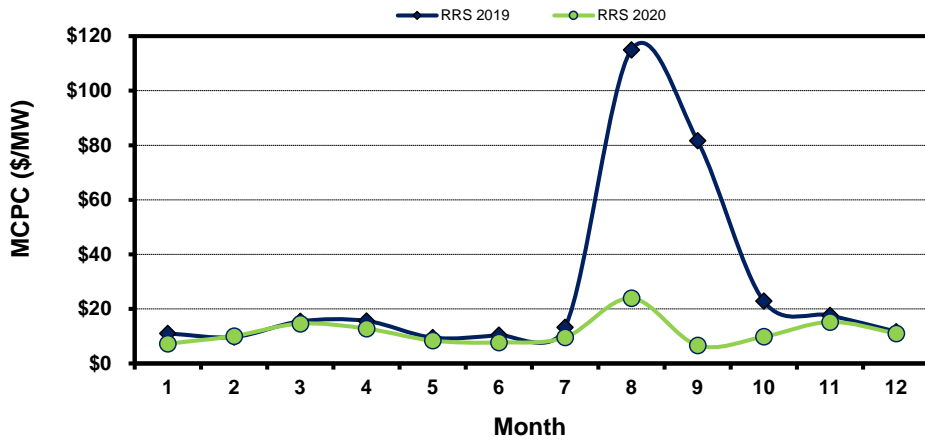
Regulation Up



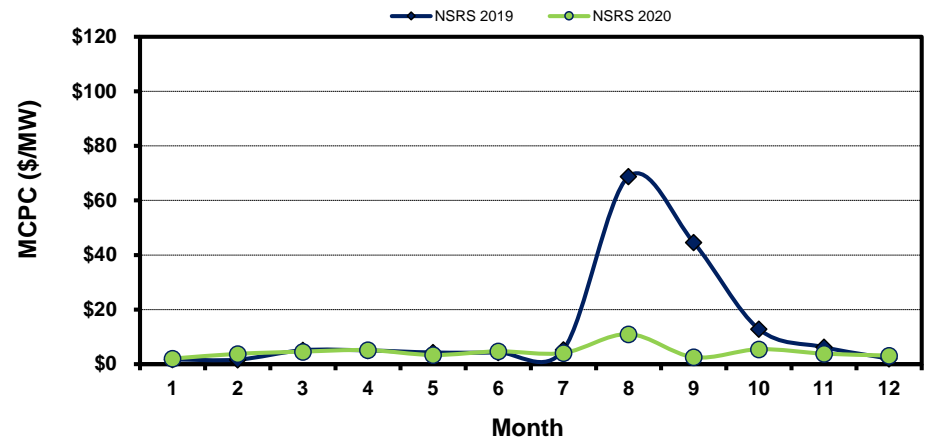
Regulation Down



Responsive Reserve



Non-Spin Reserve



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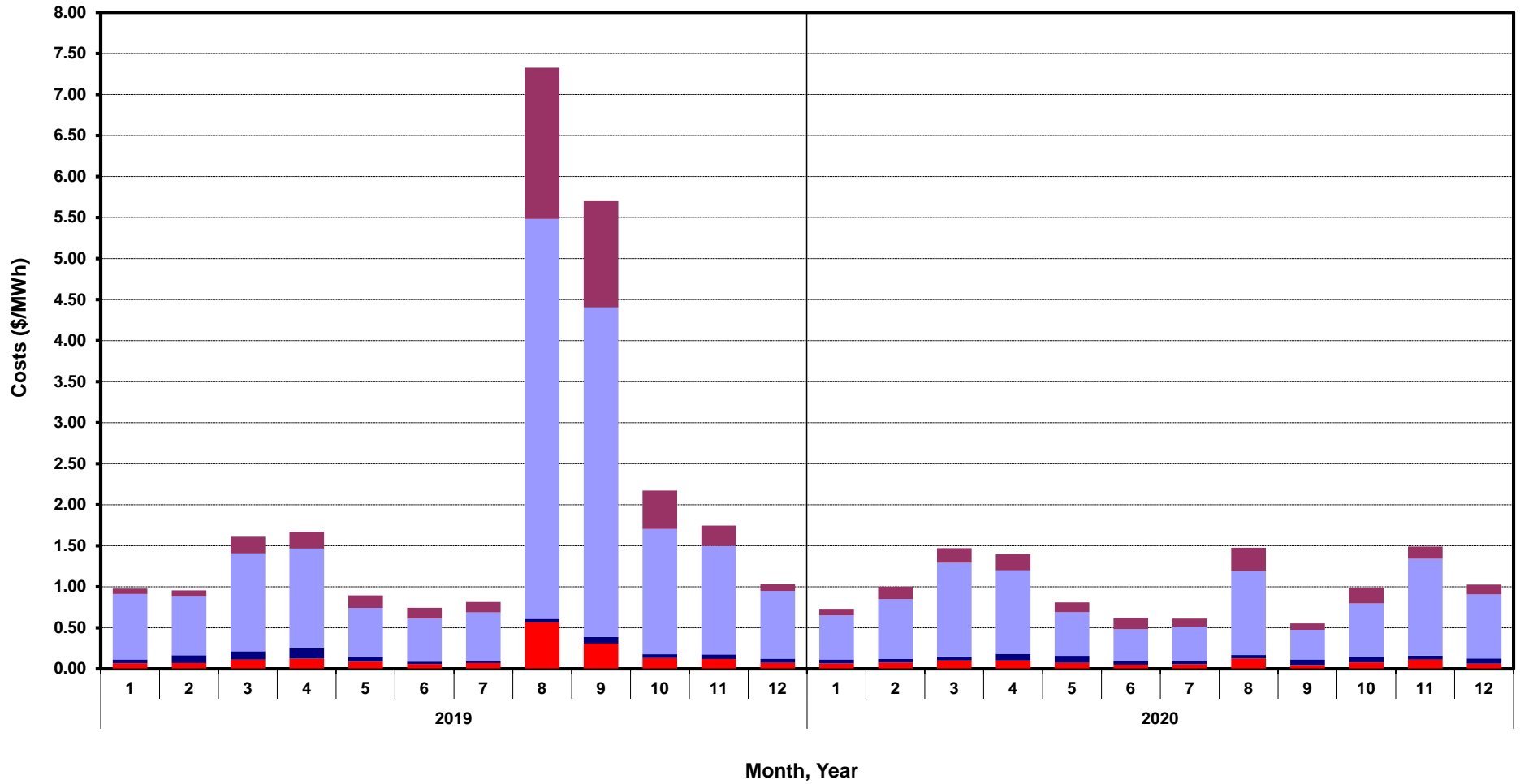
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Monthly Average A/S Cost per MWh Load

RegUp RegDn RRS NonSpin



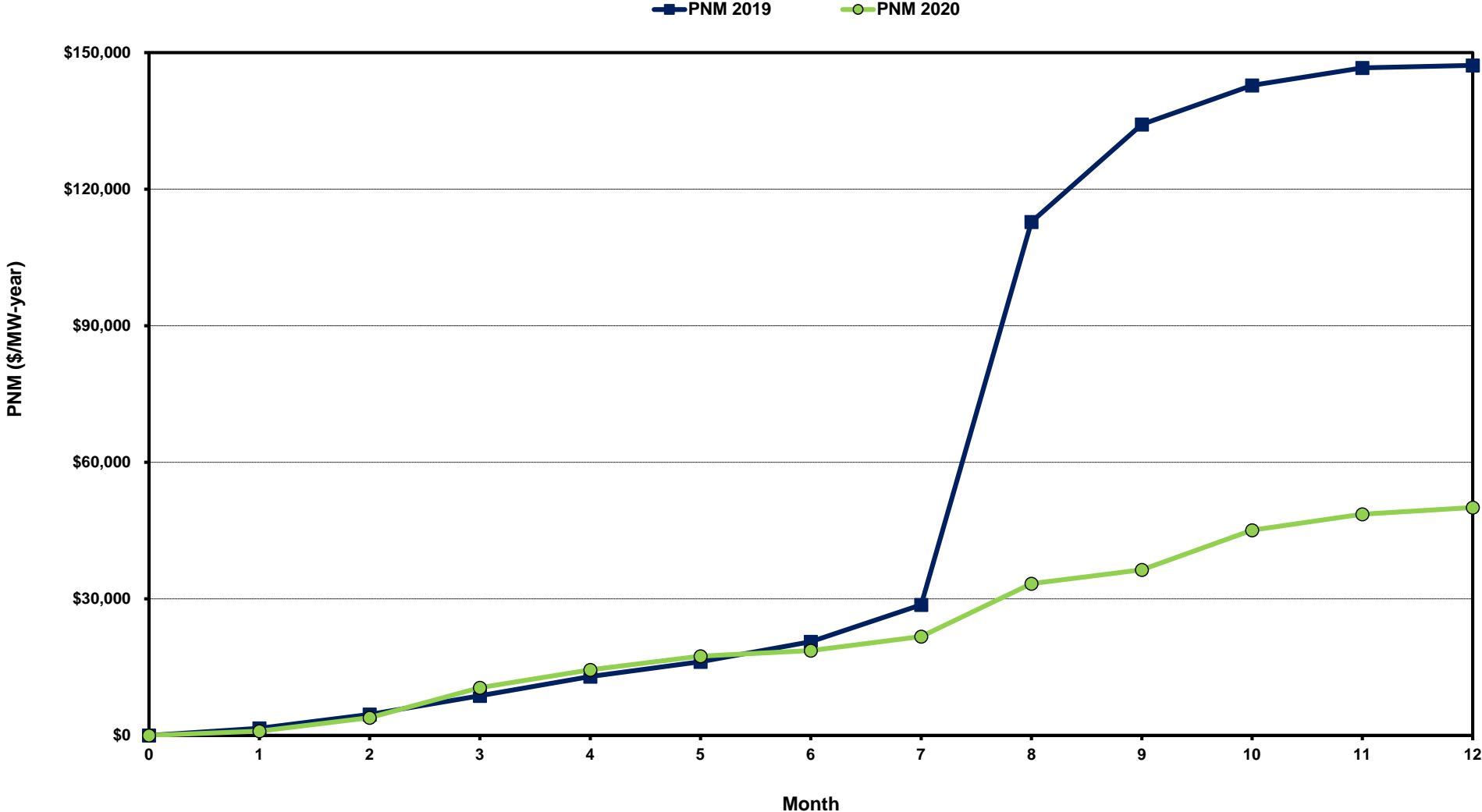
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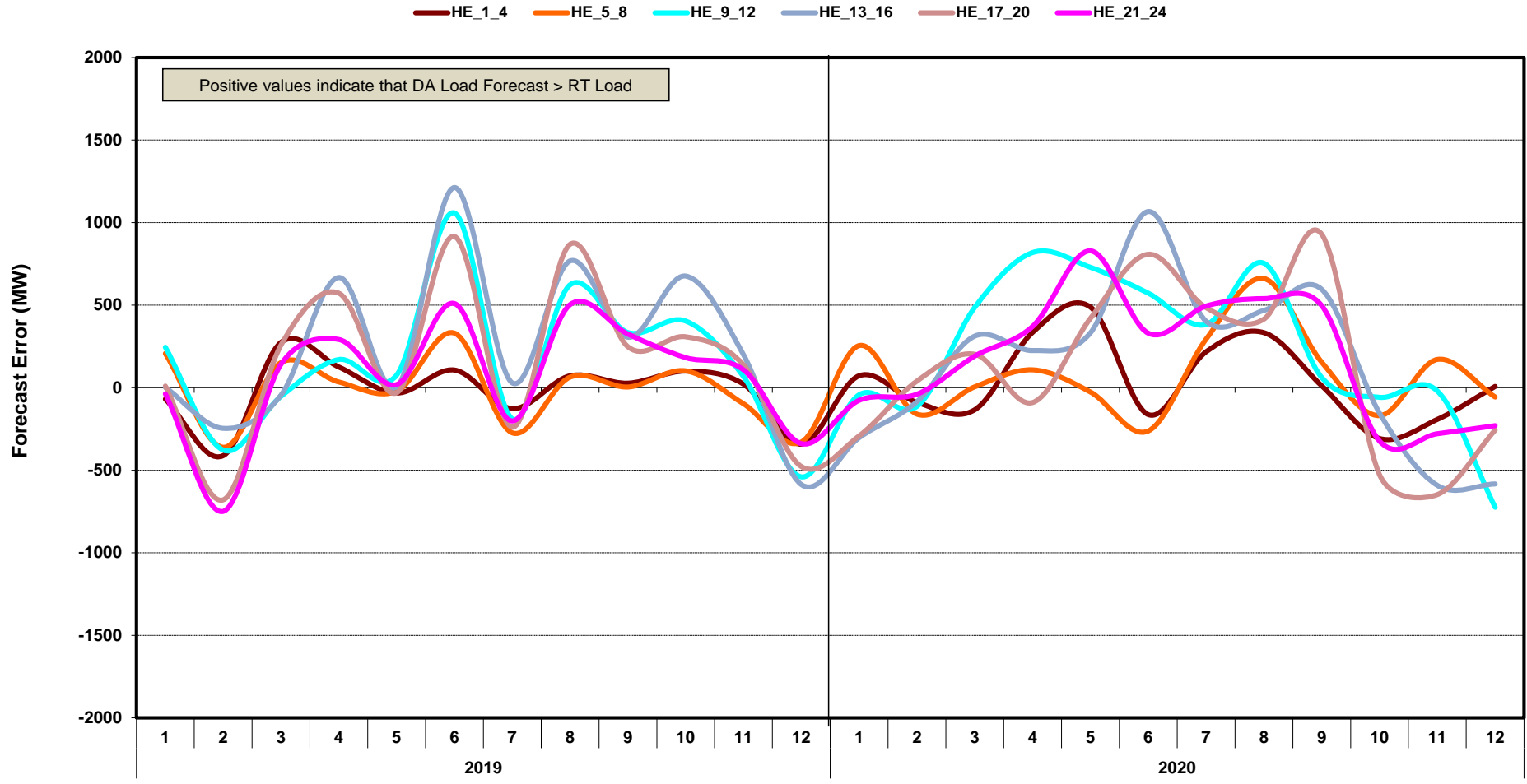
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ERCOT-wide Cumulative Peaker Net Margin



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DA vs. RT Load Forecast Error by Hour Ending



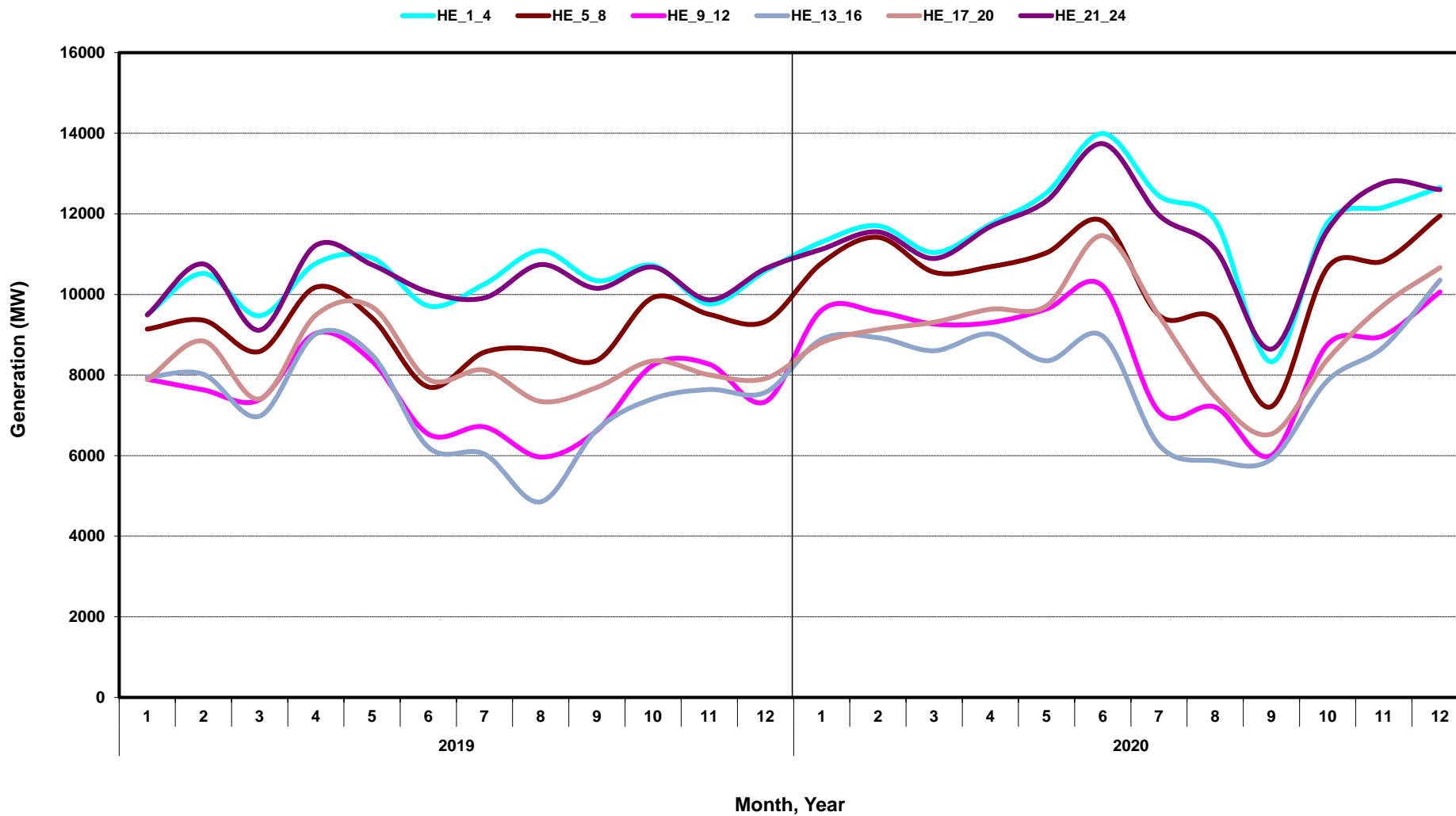
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Monthly Average of Wind Generation by Hour Ending



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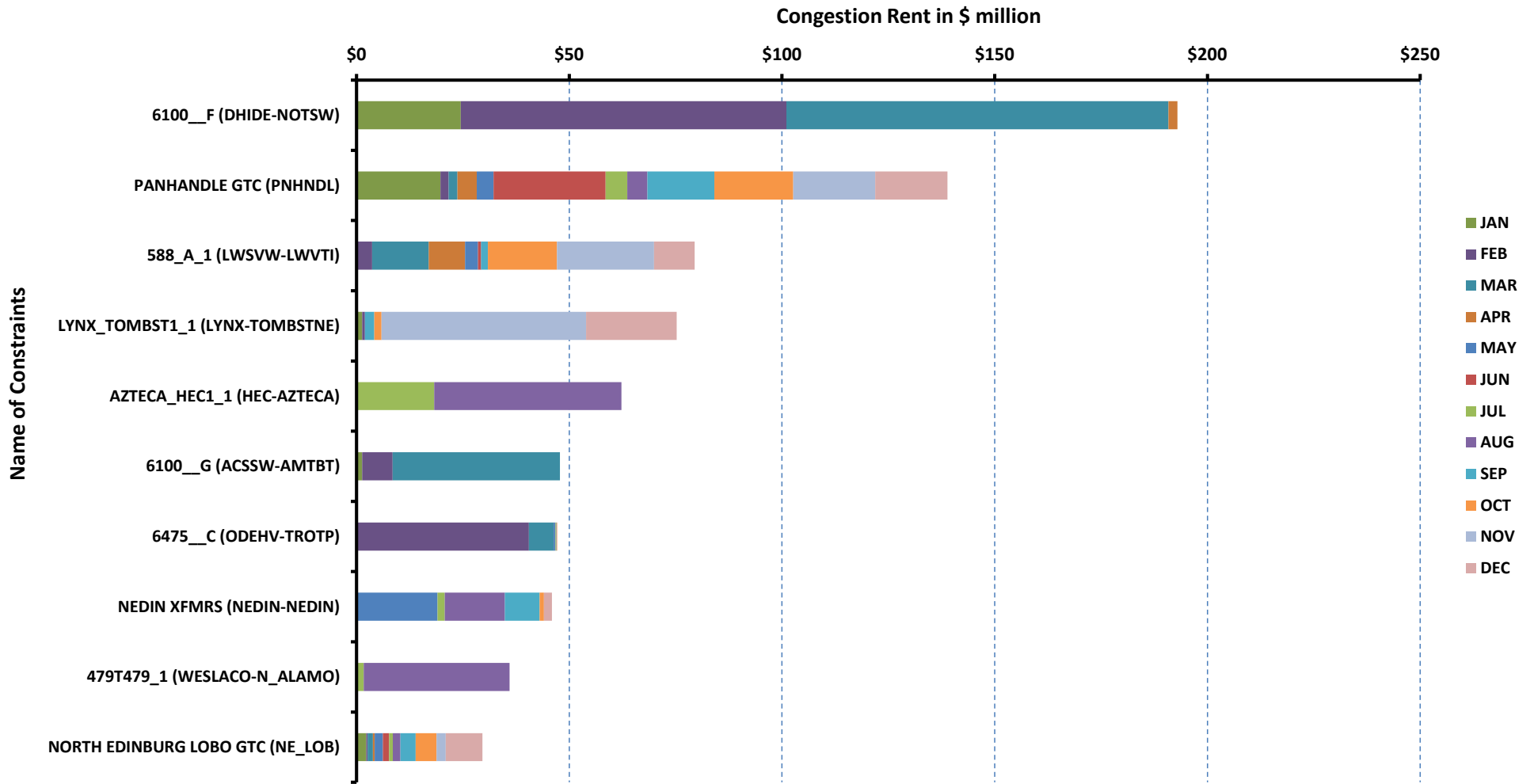
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RT Congestion Constraint Rankings - 1

Top 10 Constraints by Total Congestion Value - 2020



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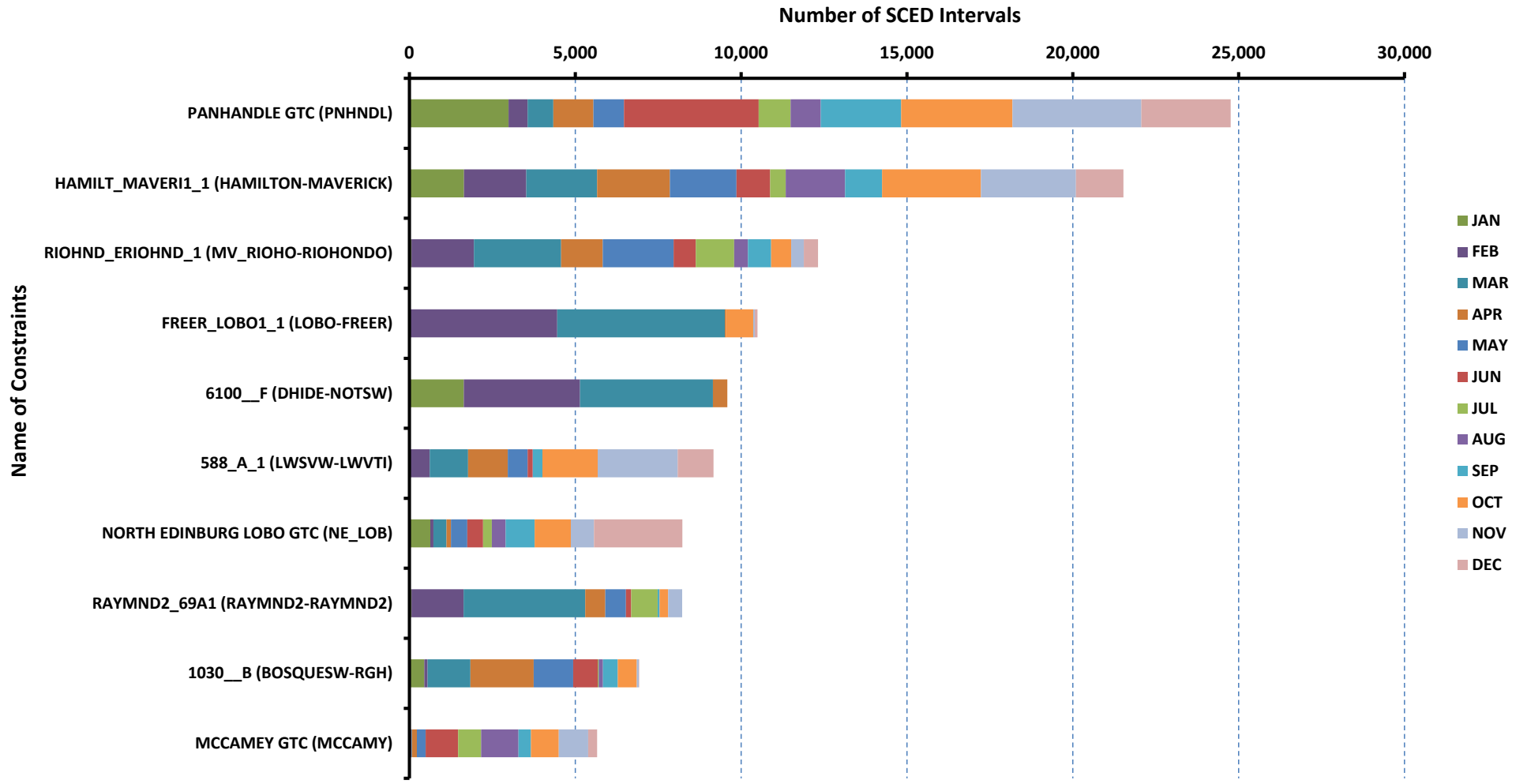
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RT Congestion Constraint Rankings - 2

Top 10 Constraints by Binding Frequency - 2020



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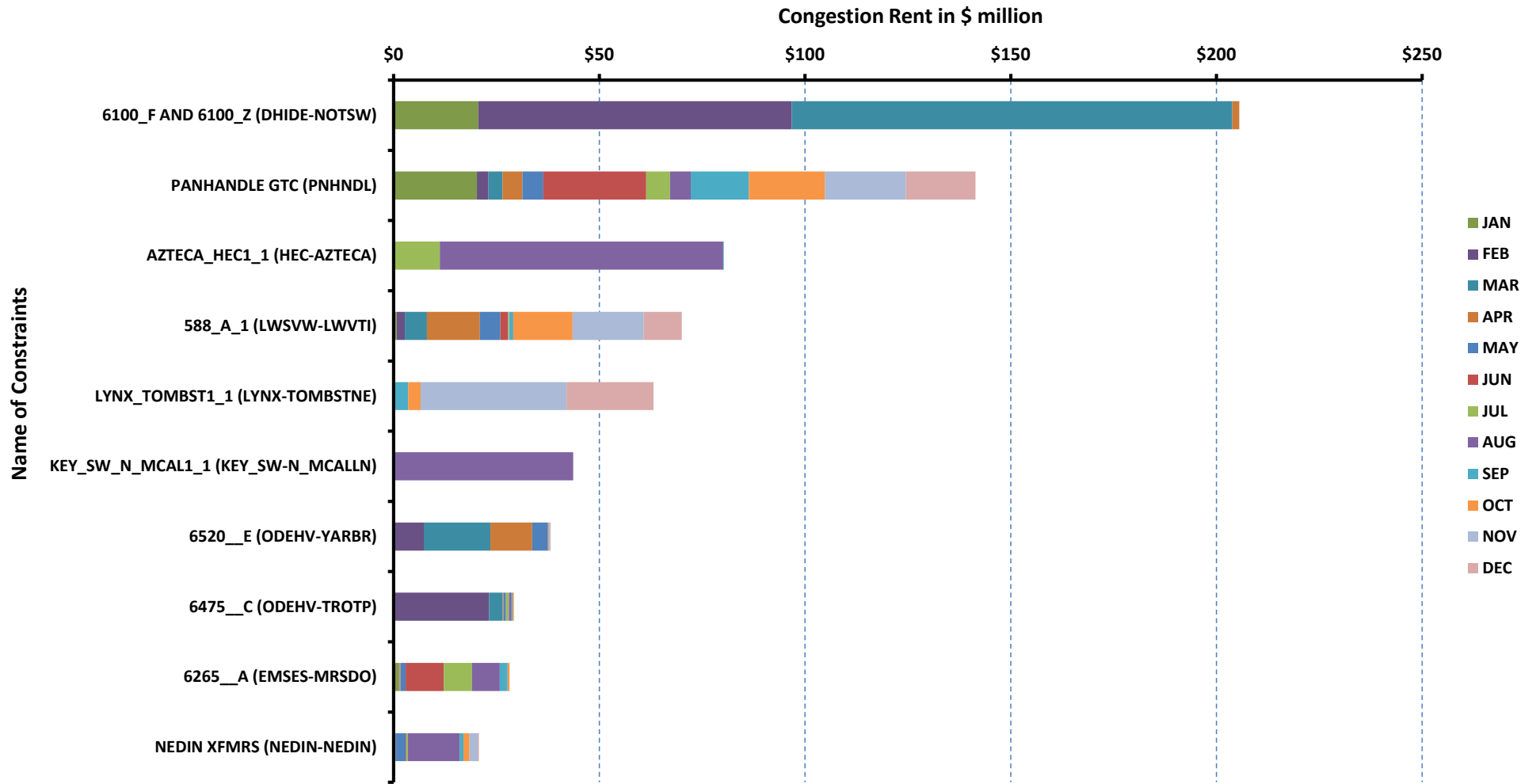
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DA Congestion Constraint Rankings - 1

Top 10 Constraints by Total Congestion Value - 2020



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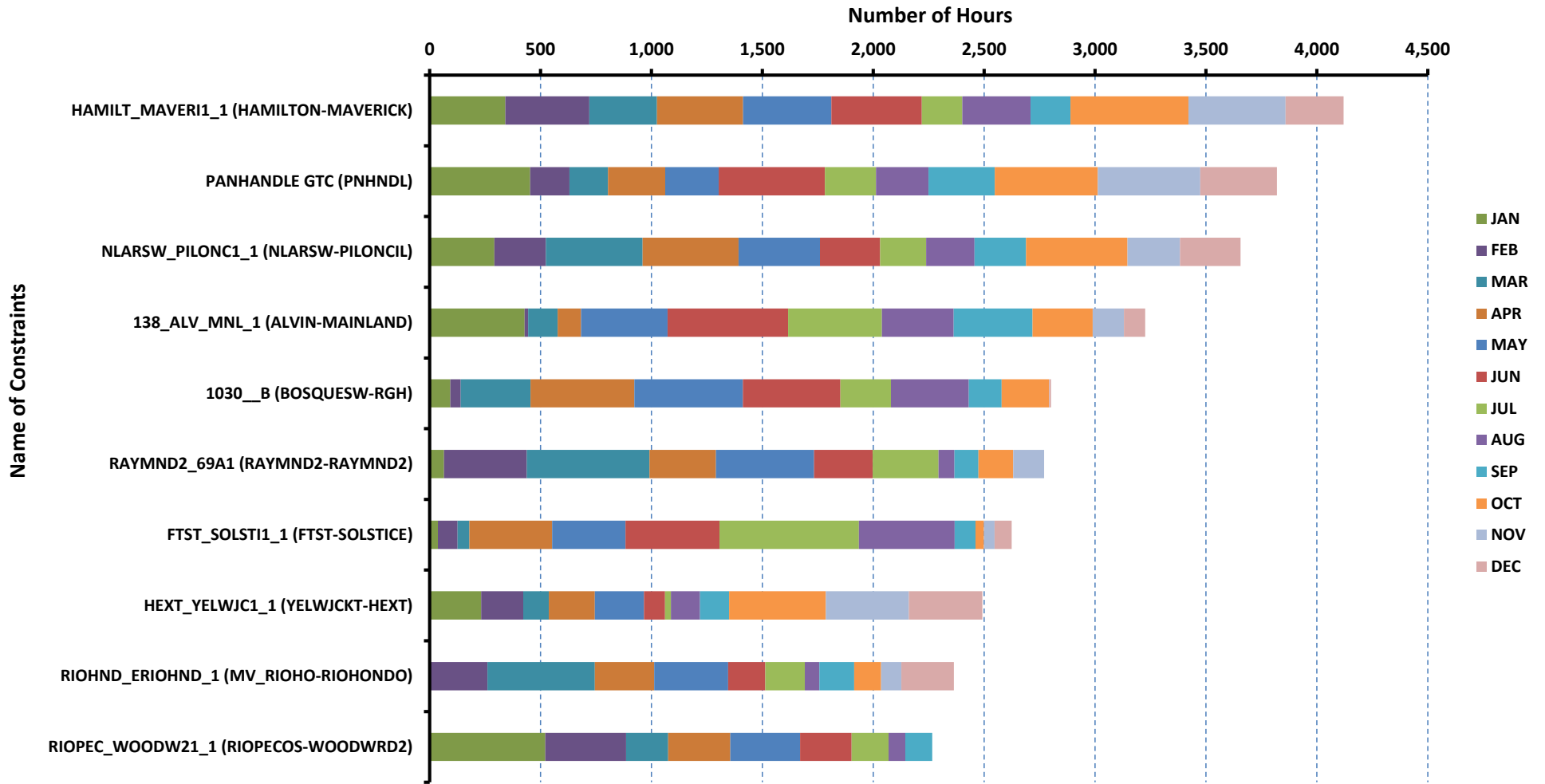
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DA Congestion Constraint Rankings - 2

Top 10 Constraints by Binding Frequency - 2020



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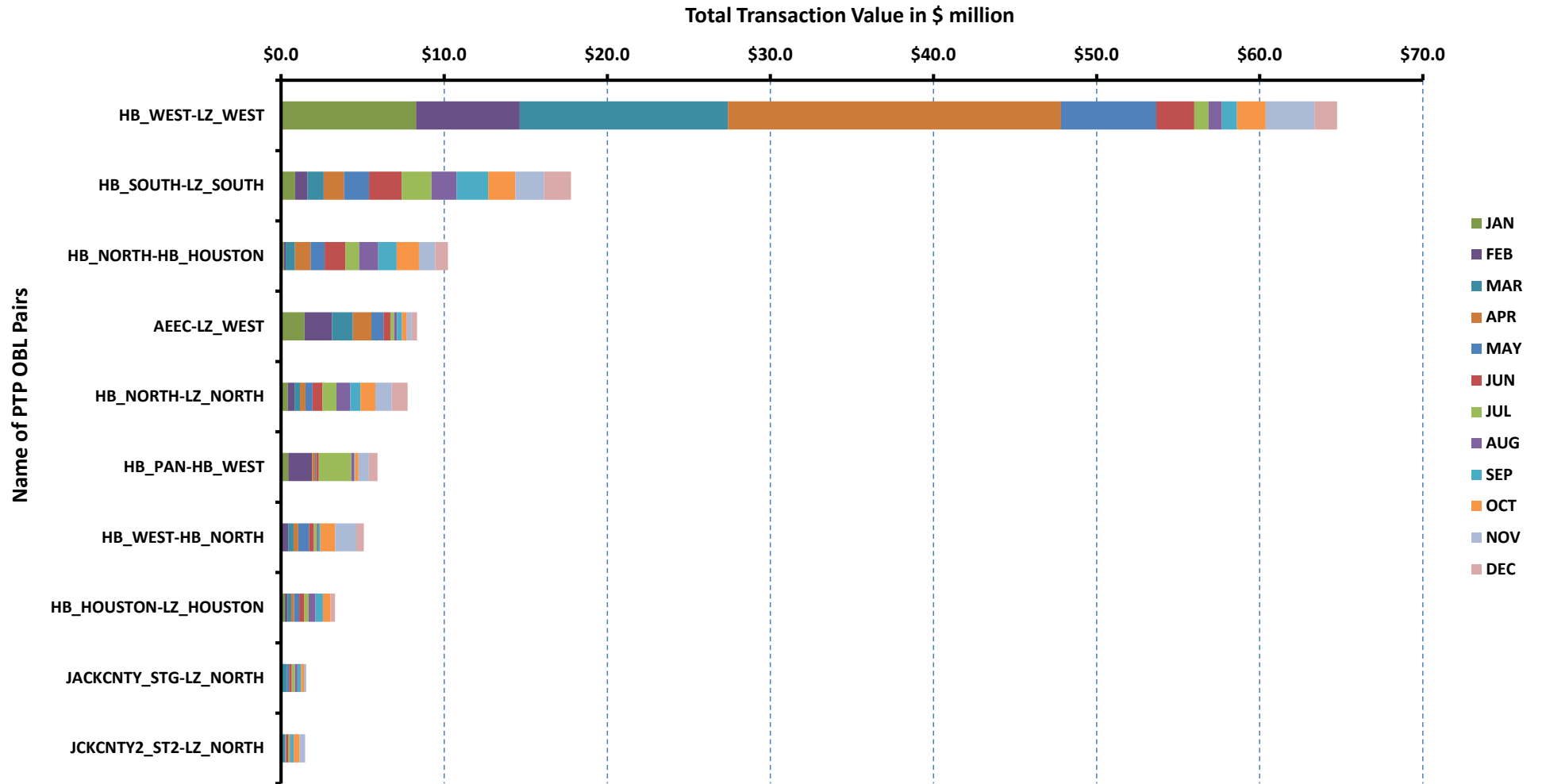
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Top 10 CRR Pairs Ranked by Monthly Auction Values - 1

Top 10 PTP Obligations by Total Transaction Value - 2020



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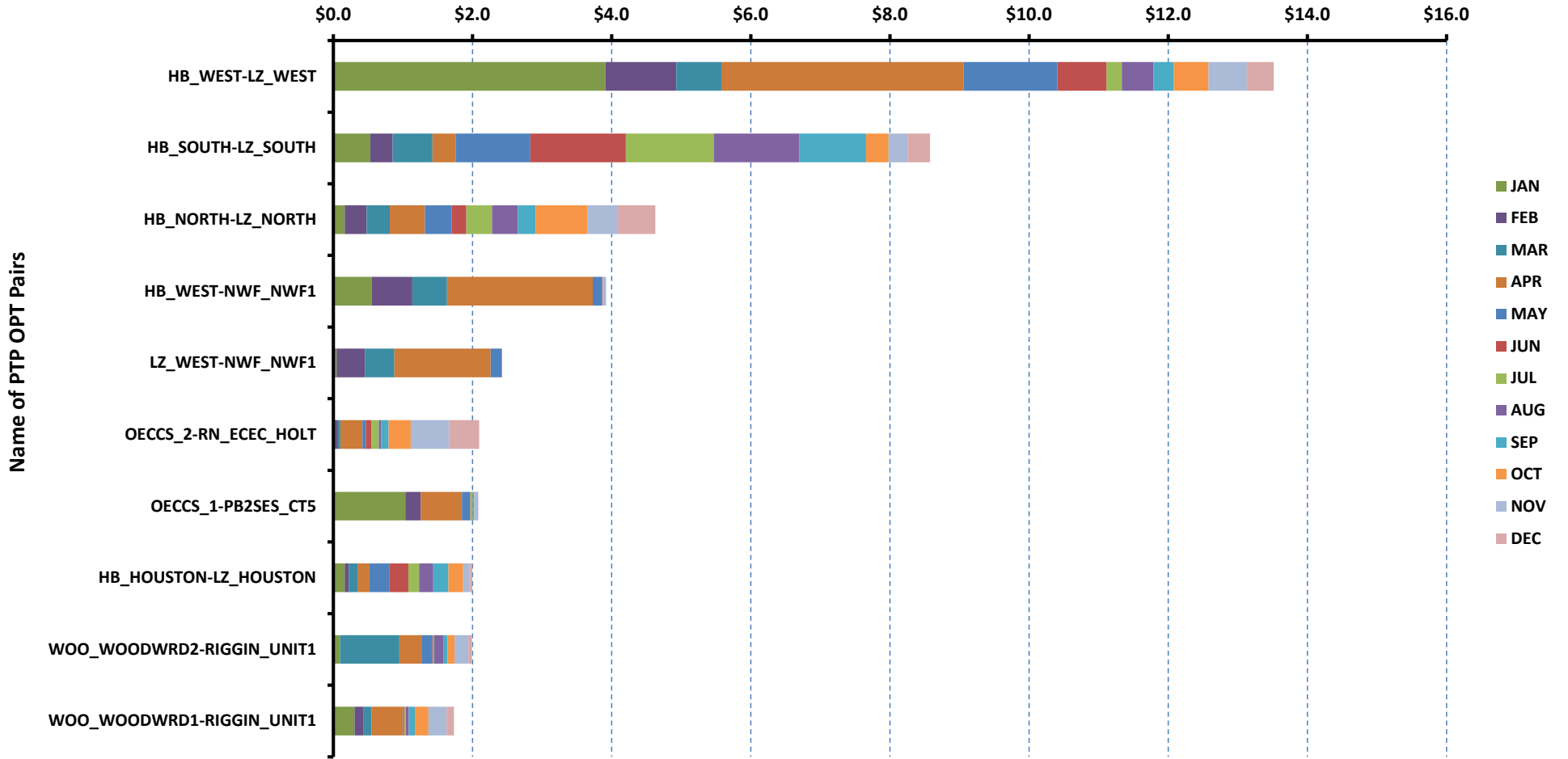
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Top 10 CRR Pairs Ranked by Monthly Auction Values - 2

Top 10 PTP Options by Total Transaction Value - 2020

Total Transaction Value in \$ million



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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	\$ 18.46	\$ 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	\$ 26.85
	12	\$ 22.38	\$ 21.38

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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	20,332	15,348	5,742	
	9	18,622	26,186	18,933	6,400	13,485	18,926	14,002	5,440	
	10	17,118	24,745	18,162	6,119	11,040	13,934	11,252	5,028	
	11	12,925	23,153	15,777	6,124	9,876	13,473	10,132	5,099	
	12	13,117	21,255	16,291	6,013	10,108	13,944	10,141	5,220	
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	14,206	19,609	14,643	5,736	
	8	19,736	28,800	20,440	6,808	14,571	19,781	14,783	5,766	
	9	19,780	23,834	19,348	6,517	13,146	15,129	12,099	5,164	
	10	17,923	22,165	17,325	6,027	11,971	13,691	11,388	4,976	
	11	15,057	18,651	13,503	5,544	10,729	12,443	9,898	4,837	
	12	13,442	21,412	15,243	5,971	10,611	14,507	10,415	5,183	

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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	\$ 168.80	\$ 162.94	\$ 152.57	\$ 153.14	\$ 162.52	\$ 157.51	\$ 143.92
	9	\$ 57.84	\$ 62.35	\$ 60.89	\$ 63.14	\$ 100.80	\$ 101.83	\$ 98.31	\$ 91.91
	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	\$ 17.13	\$ 17.24	\$ 18.13	\$ 38.16	\$ 19.25	\$ 19.67	\$ 20.31	\$ 39.89
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	\$ 23.61	\$ 19.29	\$ 26.21	\$ 25.76	\$ 25.93	\$ 23.82
	8	\$ 39.86	\$ 41.02	\$ 54.24	\$ 35.80	\$ 46.45	\$ 48.11	\$ 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	\$ 24.77	\$ 25.27	\$ 34.68	\$ 26.50	\$ 24.87	\$ 26.78	\$ 29.85
	12	\$ 20.61	\$ 21.06	\$ 21.25	\$ 24.13	\$ 21.51	\$ 21.73	\$ 22.33	\$ 26.09

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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	24.81	\$ 99.57	40.58
	10	\$ 2.19	\$ 39.83	18.16	\$ 38.07	17.36
	11	\$ 2.47	\$ 30.02	12.18	\$ 29.04	11.78
	12	\$ 2.08	\$ 20.21	9.70	\$ 22.40	10.76
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	\$ 26.85	10.40	\$ 26.47	10.25
	12	\$ 2.55	\$ 21.38	8.38	\$ 22.38	8.77

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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	74.94	77.32	68.47	77.57	77.52	80.31	72.58
	9	41.08	40.07	41.50	37.46	23.57	24.82	25.41	25.73
	10	16.33	17.18	16.13	23.39	16.13	17.33	15.84	30.90
	11	10.11	10.89	10.46	20.26	10.27	10.72	10.78	22.44
	12	9.24	9.75	9.44	19.15	8.23	8.70	8.28	18.32
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	13.96	14.49	14.51	12.55
	11	10.26	10.37	9.63	11.56	10.52	9.79	9.59	13.43
	12	8.43	8.75	8.52	10.23	8.08	8.33	8.26	9.46

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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	12	1	\$ -	\$ -	0	0	80	90
2020	12	2	\$ -	\$ -	0	0	80	90
2020	12	3	\$ 0.19	\$ -	8	0	80	90
2020	12	4	\$ 0.15	\$ -	24	0	80	90
2020	12	5	\$ 0.22	\$ -	17	0	80	90
2020	12	6	\$ 0.02	\$ -	9	0	80	90
2020	12	7	\$ 2.22	\$ -	26	0	80	90
2020	12	8	\$ 0.18	\$ -	10	0	80	90
2020	12	9	\$ 0.24	\$ -	19	0	80	90
2020	12	10	\$ 0.10	\$ -	12	0	80	90
2020	12	11	\$ 1.36	\$ -	9	0	80	90
2020	12	12	\$ 0.18	\$ -	19	0	80	90
2020	12	13	\$ -	\$ -	0	0	80	90
2020	12	14	\$ 4.51	\$ -	10	0	80	90
2020	12	15	\$ 1.34	\$ -	16	0	80	90
2020	12	16	\$ -	\$ -	0	0	80	90
2020	12	17	\$ 0.01	\$ -	3	0	80	90
2020	12	18	\$ 0.46	\$ -	6	0	80	90
2020	12	19	\$ -	\$ -	0	0	80	90
2020	12	20	\$ 0.01	\$ -	1	0	80	90
2020	12	21	\$ -	\$ -	0	0	80	90
2020	12	22	\$ -	\$ -	0	0	80	90
2020	12	23	\$ 0.04	\$ -	2	0	80	90
2020	12	24	\$ 2.84	\$ -	22	0	80	90
2020	12	25	\$ 0.14	\$ -	7	0	80	90
2020	12	26	\$ -	\$ -	0	0	80	90
2020	12	27	\$ -	\$ -	0	0	80	90
2020	12	28	\$ -	\$ -	0	0	80	90
2020	12	29	\$ -	\$ -	0	0	80	90
2020	12	30	\$ -	\$ -	0	0	80	90
2020	12	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	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

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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	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

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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	\$ 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

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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	\$ 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

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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	\$ 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

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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	(89)	(84)	40	(39)	(160)	(113)
	3	(133)	313	202	192	5	487
	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	485	495	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)

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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	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

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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)	24,762	1	2,990	573	774	1,210	919	4,063	962	913	2,421	3,358	3,885	2,694
FREQ_EXIST	2020	HAMILT MAVERI1_1 (HAMILTON-MAVERICK)	21,524	2	1,645	1,879	2,137	2,191	2,011	1,013	469	1,788	1,118	2,979	2,863	1,431
FREQ_EXIST	2020	RIOHND_ERIOHND_1 (MV RIOHO-RIOHONDO)	12,321	3	63	1,879	2,634	1,251	2,139	669	1,154	417	699	605	380	431
FREQ_EXIST	2020	FREER LOBO1_1 (LOBO-FREER)	10,492	4	14	4,439	5,054	28	2	-	-	-	-	826	50	79
FREQ_EXIST	2020	6100_F (DHIDE-NOTSW)	9,582	5	1,642	3,500	4,006	434	-	-	-	-	-	-	-	-
FREQ_EXIST	2020	588_A_1 (LWSVW-LWVTI)	9,169	6	30	582	1,155	1,198	600	151	-	9	282	1,671	2,411	1,080
FREQ_EXIST	2020	NORTH EDINBURG LOBO GTC (NE_LOB)	8,230	7	630	92	392	138	495	475	262	419	875	1,088	697	2,667
FREQ_EXIST	2020	RAYMND2_69A1 (RAYMND2-RAYMND2)	8,223	8	62	1,573	3,663	605	623	157	802	-	60	256	422	-
FREQ_EXIST	2020	1030_B (BOSQUESW-RGH)	6,928	9	450	100	1,289	1,904	1,196	736	28	134	446	574	59	12
FREQ_EXIST	2020	MCCAMEY GTC (MCCAMY)	5,660	10	13	55	8	146	265	982	695	1,125	376	840	885	270
TOP10_RENT	2020	6100_F (DHIDE-NOTSW)	\$ 192.97	1	\$ 24.52	\$ 76.51	\$ 89.80	\$ 2.14	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2020	PANHANDLE GTC (PNHNDL)	\$ 138.91	2	\$ 19.72	\$ 1.94	\$ 2.07	\$ 4.53	\$ 3.96	\$ 26.32	\$ 5.08	\$ 4.73	\$ 15.78	\$ 18.51	\$ 19.27	\$ 17.01
TOP10_RENT	2020	588_A_1 (LWSVW-LWVTI)	\$ 79.48	3	\$ 0.13	\$ 3.52	\$ 13.33	\$ 8.51	\$ 3.04	\$ 0.74	\$ -	\$ 0.02	\$ 1.57	\$ 16.26	\$ 22.83	\$ 9.54
TOP10_RENT	2020	LYNX_TOMBST1_1 (LYNX-TOMBSTNE)	\$ 75.24	4	\$ 1.31	\$ 0.64	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2.22	\$ 1.68	\$ 48.12	\$ 21.28
TOP10_RENT	2020	AZTECA_HEC1_1 (HEC-AZTECA)	\$ 62.25	5	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 18.25	\$ 44.00	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2020	6100_G (ACSSW-AMTBT)	\$ 47.79	6	\$ 1.31	\$ 7.16	\$ 39.32	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2020	6475_C (ODEHV-TROTP)	\$ 47.16	7	\$ -	\$ 40.50	\$ 5.85	\$ 0.00	\$ 0.41	\$ -	\$ 0.19	\$ 0.13	\$ -	\$ 0.07	\$ -	\$ -
TOP10_RENT	2020	NEDIN_XFMRS (NEDIN-NEDIN)	\$ 45.92	8	\$ -	\$ -	\$ -	\$ 0.00	\$ 19.06	\$ -	\$ 1.66	\$ 14.13	\$ 8.20	\$ 0.98	\$ -	\$ 1.89
TOP10_RENT	2020	479T479_1 (WESLACO-N ALAMO)	\$ 35.96	9	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1.68	\$ 34.28	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2020	NORTH EDINBURG LOBO GTC (NE_LOB)	\$ 29.61	10	\$ 2.30	\$ 0.31	\$ 1.25	\$ 0.41	\$ 1.94	\$ 1.44	\$ 0.89	\$ 1.79	\$ 3.58	\$ 4.89	\$ 2.16	\$ 8.64

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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	HAMILT MAVER1 1 (HAMILTON-MAVERICK)	4,120	1	341	379	305	388	398	408	182	308	180	532	438	261	
FREQ_EXIST	2020	PANHANDLE GTC (PNHNDL)	3,820	2	453	177	174	258	241	479	230	237	299	464	462	346	
FREQ_EXIST	2020	NLARSW PILONG1 1 (NLARSW-PILONCIL)	3,656	3	292	232	436	433	367	271	207	218	233	457	237	273	
FREQ_EXIST	2020	138 ALV_MNL 1 (ALVIN-MAINLAND)	3,226	4	428	16	133	106	390	543	423	323	356	271	141	96	
FREQ_EXIST	2020	1030 B (BOSQUESW-RGH)	2,801	5	93	47	315	468	489	440	228	351	148	213	1	8	
FREQ_EXIST	2020	RAYMND2 69A1 (RAYMND2-RAYMND2)	2,770	6	65	373	553	300	442	264	297	72	108	157	139	-	
FREQ_EXIST	2020	FTST_SOLSTI1 1 (FTST-SOLSTICE)	2,624	7	37	89	53	373	331	424	628	432	94	38	48	77	
FREQ_EXIST	2020	HEXT_YELWJC1 1 (YELWJCKT-HEXT)	2,492	8	232	190	115	208	221	95	27	131	131	436	374	332	
FREQ_EXIST	2020	RIOHND ERIOHND 1 (MV RIOHO-RIOHONDO)	2,363	9	-	261	484	267	334	167	178	66	157	121	92	236	
FREQ_EXIST	2020	RIOPEC_WOODW21 1 (RIOPECOS-WOODWRD2)	2,266	10	521	365	189	280	315	232	167	75	122	-	-	-	
TOP10_RENT	2020	6100_F AND 6100_Z (DHIIDE-NOTSW)	\$ 205.56	1	\$ 20.58	\$ 76.21	\$ 107.05	\$ 1.73	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2020	PANHANDLE GTC (PNHNDL)	\$ 141.44	2	\$ 20.27	\$ 2.80	\$ 3.38	\$ 4.88	\$ 5.06	\$ 25.00	\$ 5.80	\$ 5.05	\$ 14.14	\$ 18.54	\$ 19.61	\$ 16.92	
TOP10_RENT	2020	AZTECA_HEC1 1 (HEC-AZTECA)	\$ 80.24	3	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 0.00	\$ 11.22	\$ 68.90	\$ 0.11	\$ -	\$ -	\$ -	
TOP10_RENT	2020	588_A 1 (LWSVW-LWVTI)	\$ 70.02	4	\$ 0.76	\$ 1.98	\$ 5.35	\$ 12.86	\$ 4.99	\$ 1.83	\$ 0.29	\$ 0.13	\$ 0.89	\$ 14.44	\$ 17.28	\$ 9.22	
TOP10_RENT	2020	LYNX_TOMBST1 1 (LYNX-TOMBSTNE)	\$ 63.16	5	\$ 0.16	\$ 0.05	\$ 0.01	\$ 0.02	\$ -	\$ -	\$ -	\$ -	\$ 3.29	\$ 3.05	\$ 35.46	\$ 21.12	
TOP10_RENT	2020	KEY_SW_N_MCAL1 1 (KEY_SW-N_MCALLN)	\$ 43.63	6	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 0.11	\$ 43.52	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2020	6520_E (ODEHV-YARBR)	\$ 38.18	7	\$ -	\$ 7.35	\$ 16.19	\$ 10.17	\$ 3.68	\$ 0.15	\$ 0.04	\$ 0.00	\$ 0.08	\$ 0.05	\$ 0.35	\$ 0.12	
TOP10_RENT	2020	6475_C (ODEHV-TROTP)	\$ 29.27	8	\$ -	\$ 23.18	\$ 3.34	\$ 0.20	\$ 0.53	\$ 0.09	\$ 0.71	\$ 0.62	\$ 0.26	\$ 0.27	\$ 0.06	\$ -	
TOP10_RENT	2020	6265_A (EMSES-MRSDO)	\$ 28.17	9	\$ 1.33	\$ 0.10	\$ 0.00	\$ 0.28	\$ 1.23	\$ 9.23	\$ 6.87	\$ 6.77	\$ 1.90	\$ 0.46	\$ -	\$ -	
TOP10_RENT	2020	NEDIN_XFMRS (NEDIN-NEDIN)	\$ 20.72	10	\$ 0.05	\$ 0.18	\$ 0.24	\$ 0.05	\$ 2.42	\$ 0.17	\$ 0.39	\$ 12.53	\$ 0.94	\$ 1.47	\$ 1.96	\$ 0.29	

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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	\$ 64.74	1	\$ 8.27	\$ 6.36	\$ 12.75	\$ 20.43	\$ 5.85	\$ 2.33	\$ 0.88	\$ 0.81	\$ 0.92	\$ 1.77	\$ 2.99	\$ 1.38	
N	2020	HB SOUTH-LZ SOUTH	\$ 17.78	2	\$ 0.87	\$ 0.75	\$ 1.00	\$ 1.25	\$ 1.54	\$ 2.00	\$ 1.83	\$ 1.53	\$ 1.94	\$ 1.66	\$ 1.77	\$ 1.64	
N	2020	HB NORTH-HB HOUSTON	\$ 10.23	3	\$ 0.18	\$ 0.10	\$ 0.58	\$ 0.95	\$ 0.87	\$ 1.27	\$ 0.84	\$ 1.18	\$ 1.13	\$ 1.37	\$ 1.00	\$ 0.77	
N	2020	AEEC-LZ WEST	\$ 8.33	4	\$ 1.44	\$ 1.69	\$ 1.27	\$ 1.14	\$ 0.74	\$ 0.43	\$ 0.22	\$ 0.18	\$ 0.29	\$ 0.31	\$ 0.29	\$ 0.32	
N	2020	HB NORTH-LZ NORTH	\$ 7.76	5	\$ 0.41	\$ 0.42	\$ 0.34	\$ 0.33	\$ 0.44	\$ 0.60	\$ 0.86	\$ 0.85	\$ 0.62	\$ 0.91	\$ 1.01	\$ 0.97	
N	2020	HB PAN-HB WEST	\$ 5.92	6	\$ 0.44	\$ 1.45	\$ 0.01	\$ 0.18	\$ 0.08	\$ 0.15	\$ 2.00	\$ 0.19	\$ 0.04	\$ 0.21	\$ 0.64	\$ 0.53	
N	2020	HB WEST-HB NORTH	\$ 5.07	7	\$ 0.00	\$ 0.44	\$ 0.33	\$ 0.28	\$ 0.66	\$ 0.30	\$ 0.18	\$ 0.07	\$ 0.14	\$ 0.91	\$ 1.29	\$ 0.46	
N	2020	HB HOUSTON-LZ HOUSTON	\$ 3.31	8	\$ 0.24	\$ 0.17	\$ 0.21	\$ 0.19	\$ 0.31	\$ 0.31	\$ 0.26	\$ 0.43	\$ 0.46	\$ 0.47	\$ -	\$ 0.28	
N	2020	JACKCNTY STG-LZ NORTH	\$ 1.55	9	\$ 0.03	\$ 0.00	\$ 0.33	\$ 0.01	\$ 0.11	\$ 0.17	\$ 0.19	\$ 0.15	\$ 0.22	\$ 0.18	\$ 0.14	\$ 0.01	
N	2020	JCKCNTY2_ST2-LZ NORTH	\$ 1.48	10	\$ 0.05	\$ 0.02	\$ 0.17	\$ 0.02	\$ 0.05	\$ 0.13	\$ 0.12	\$ 0.06	\$ 0.16	\$ 0.37	\$ 0.31	\$ 0.03	
Y	2020	HB WEST-LZ WEST	\$ 13.52	1	\$ 3.91	\$ 1.02	\$ 0.65	\$ 3.48	\$ 1.35	\$ 0.71	\$ 0.22	\$ 0.46	\$ 0.29	\$ 0.50	\$ 0.55	\$ 0.39	
Y	2020	HB SOUTH-LZ SOUTH	\$ 8.58	2	\$ 0.53	\$ 0.32	\$ 0.57	\$ 0.33	\$ 1.08	\$ 1.37	\$ 1.27	\$ 1.23	\$ 0.96	\$ 0.32	\$ 0.27	\$ 0.32	
Y	2020	HB NORTH-LZ NORTH	\$ 4.63	3	\$ 0.16	\$ 0.32	\$ 0.33	\$ 0.51	\$ 0.38	\$ 0.21	\$ 0.37	\$ 0.37	\$ 0.26	\$ 0.74	\$ 0.43	\$ 0.55	
Y	2020	HB WEST-NWF NWF1	\$ 3.92	4	\$ 0.55	\$ 0.59	\$ 0.50	\$ 2.10	\$ 0.13	\$ 0.01	\$ 0.00	\$ -	\$ -	\$ -	\$ 0.05	\$ -	
Y	2020	LZ WEST-NWF NWF1	\$ 2.42	5	\$ 0.05	\$ 0.41	\$ 0.43	\$ 1.38	\$ 0.16	\$ 0.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2020	OECCS 2-RN ECEC HOLT	\$ 2.09	6	\$ 0.01	\$ 0.05	\$ 0.03	\$ 0.32	\$ 0.05	\$ 0.08	\$ 0.11	\$ 0.03	\$ 0.10	\$ 0.32	\$ 0.55	\$ 0.43	
Y	2020	OECCS 1-PB2SES CT5	\$ 2.08	7	\$ 1.03	\$ 0.22	\$ -	\$ 0.59	\$ 0.12	\$ 0.01	\$ 0.03	\$ 0.00	\$ 0.02	\$ 0.00	\$ 0.05	\$ 0.00	
Y	2020	HB HOUSTON-LZ HOUSTON	\$ 2.00	8	\$ 0.16	\$ 0.06	\$ 0.13	\$ 0.17	\$ 0.28	\$ 0.27	\$ 0.16	\$ 0.20	\$ 0.22	\$ 0.21	\$ 0.09	\$ 0.04	
Y	2020	WOO WOODWRD2-RIGGIN UNIT1	\$ 1.99	9	\$ 0.09	\$ -	\$ 0.85	\$ 0.32	\$ 0.16	\$ 0.01	\$ 0.01	\$ 0.13	\$ 0.07	\$ 0.10	\$ 0.20	\$ 0.05	
Y	2020	WOO WOODWRD1-RIGGIN UNIT1	\$ 1.73	10	\$ 0.31	\$ 0.13	\$ 0.12	\$ 0.45	\$ 0.01	\$ 0.02	\$ 0.01	\$ 0.04	\$ 0.09	\$ 0.20	\$ 0.26	\$ 0.11	

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