

To the Public Utility Commission of Texas

# ERCOT Wholesale Electricity Market Monthly Report

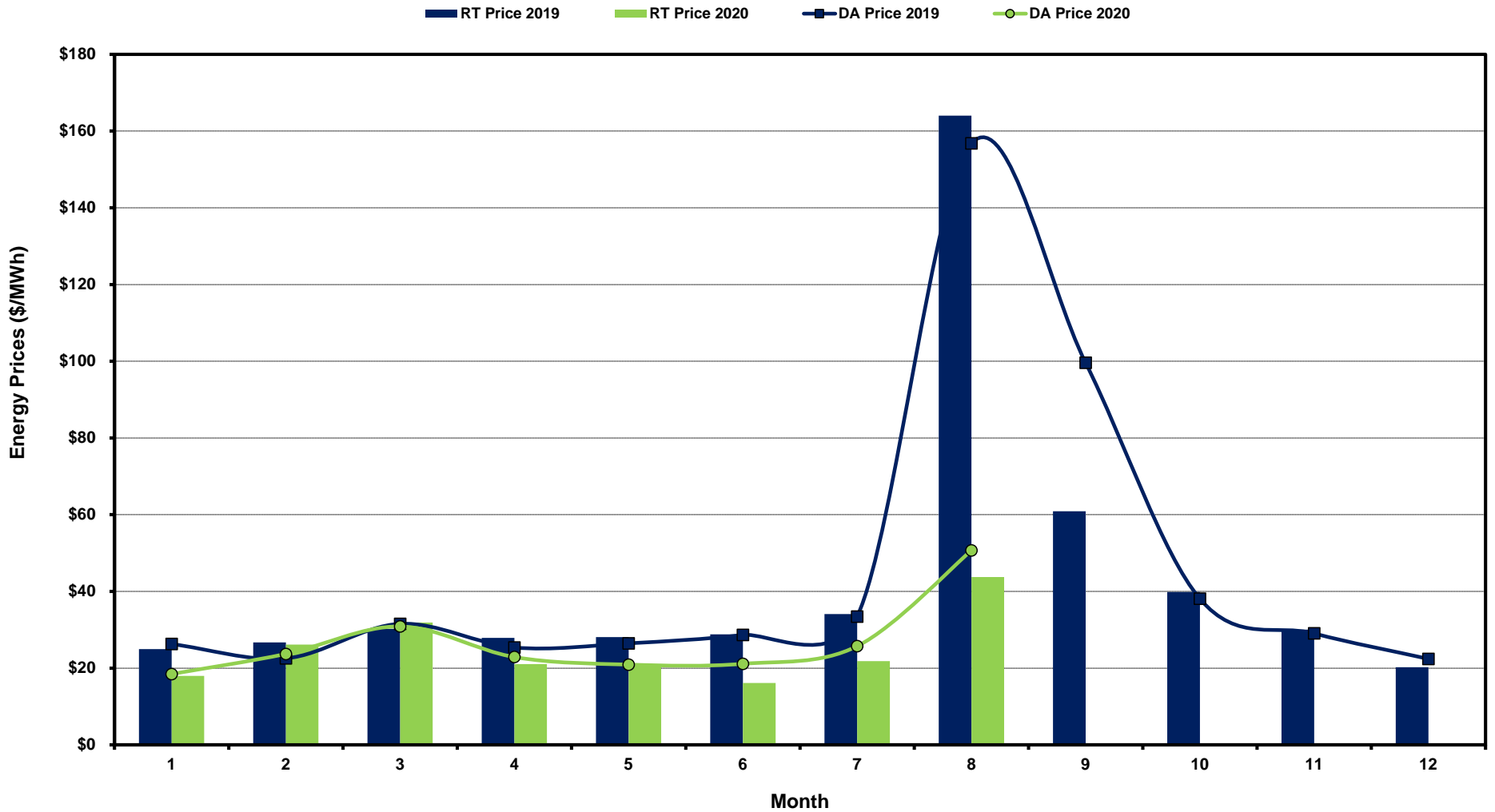
Thursday, September 10, 2020

Potomac Economics, Ltd.  
Independent Market Monitor

1	ERCOT-wide Average Energy Prices DA vs. RT	<a href="#">chart</a>	<a href="#">table</a>
2	Load Zone Load Statistics	<a href="#">chart</a>	<a href="#">table</a>
3	Load Zone Monthly Average Energy Prices DA vs RT	<a href="#">chart</a>	<a href="#">table</a>
4	ERCOT-wide Monthly Implied Heat Rates DA vs RT	<a href="#">chart</a>	<a href="#">table</a>
5	Load Zone Monthly Implied Heat Rates DA vs RT	<a href="#">chart</a>	<a href="#">table</a>
6	Daily ORDC Reserve Adder Avg. Value and Duration	<a href="#">chart</a>	<a href="#">table</a>
7	Monthly Ancillary Services Required MW	<a href="#">chart</a>	<a href="#">table</a>
8	Hourly Average of Ancillary Services Required MW	<a href="#">chart</a>	<a href="#">table</a>
9	Monthly Average Ancillary Services Price	<a href="#">chart</a>	<a href="#">table</a>
10	Monthly Average A/S Cost per MWh Load	<a href="#">chart</a>	<a href="#">table</a>
11	Ercot-wide Cumulative Peaker Net Margin	<a href="#">chart</a>	<a href="#">table</a>
12	DA vs. RT Load Forecast Error by Hour Ending	<a href="#">chart</a>	<a href="#">table</a>
13	Monthly Average of Wind Generation by Hour Ending	<a href="#">chart</a>	<a href="#">table</a>
14	RT Constraint Rankings		<a href="#">table</a>
	- Top 10 Constraints by Total Congestion Value	<a href="#">chart</a>	
	- Top 10 Constraints by Binding Frequency	<a href="#">chart</a>	
15	DA Constraint Rankings		<a href="#">table</a>
	- Top 10 Constraints by Total Congestion Value	<a href="#">chart</a>	
	- Top 10 Constraints by Binding Frequency	<a href="#">chart</a>	
16	CRR Pairs by Monthly Auction Value Rankings		<a href="#">table</a>
	- Top 10 PTP Obligations by Total Transaction Value	<a href="#">chart</a>	
	- Top 10 PTP Options by Total Transaction Value	<a href="#">chart</a>	

# ERCOT-wide Average Energy Prices DA vs RT

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



[Home <<](#)

[previous <<](#)

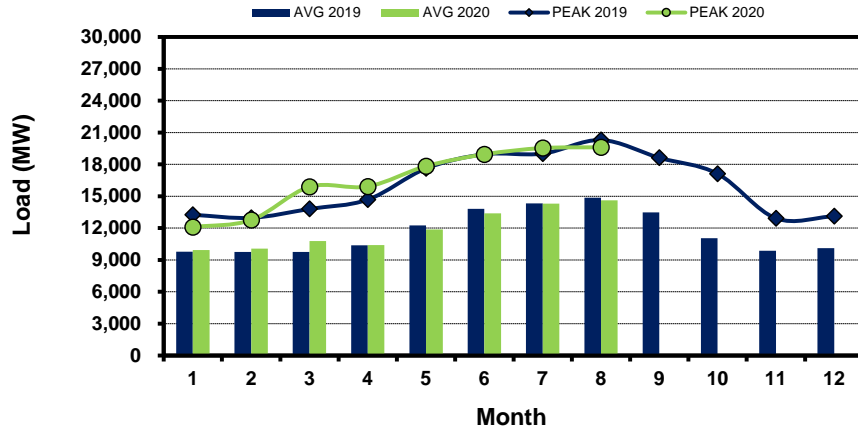
[next >>](#)

[data](#)

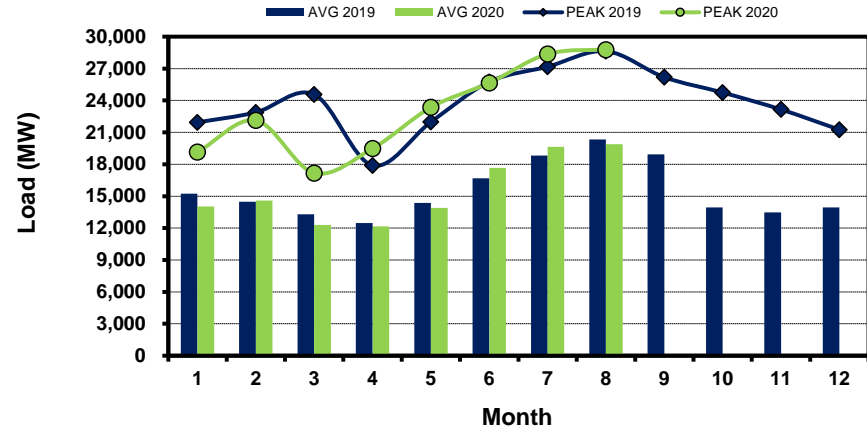
# Load Zone Load Statistics

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

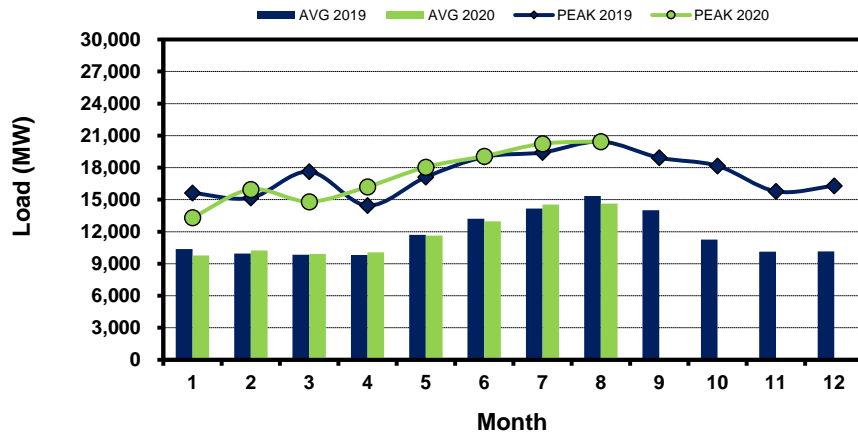
### Houston Zone



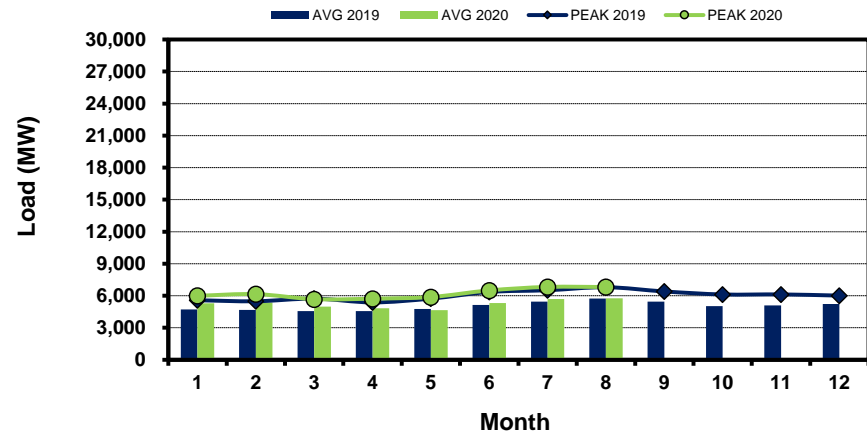
### North Zone



### South Zone



### West Zone



[Home <<](#)

[previous <<](#)

[next >>](#)

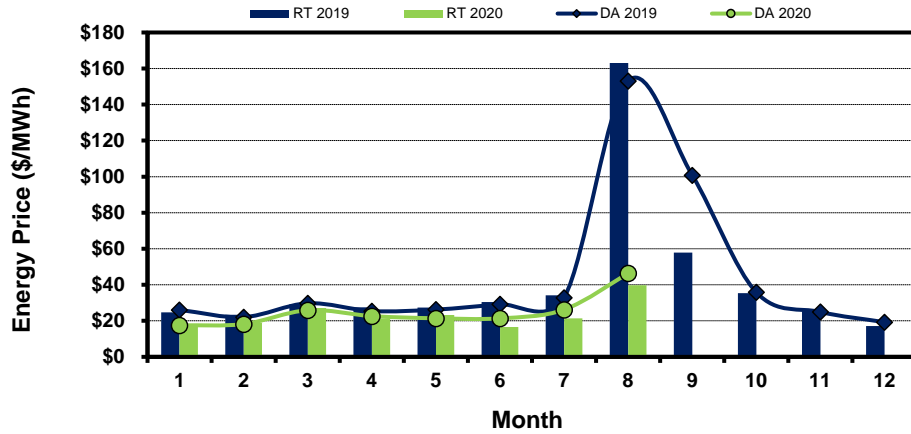
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**Note:** \* Zonal load zone definition vs. Nodal comparable load zone definition: LZ\_Houston=LZ\_Houston; LZ\_West=LZ\_West; LZ\_North=(LZ\_North,LZ\_RAYBN); LZ\_South=(LZ\_South,LZ\_CPS,LZ\_AEN,LZ\_LCRA)

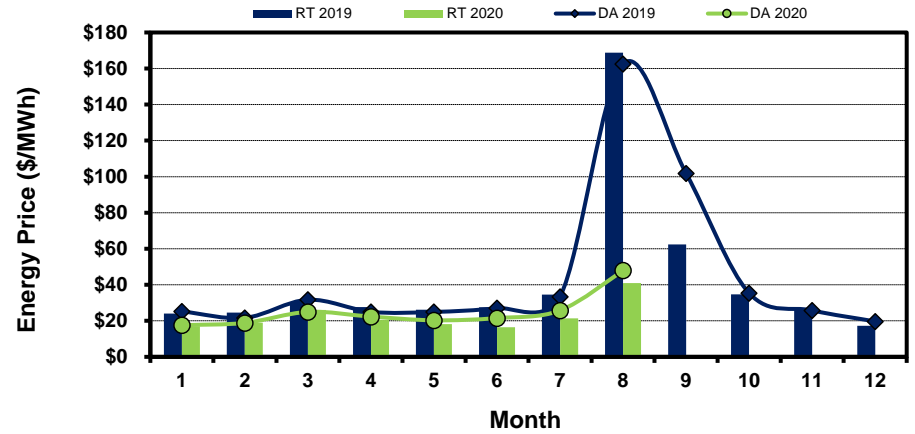
# Load Zone Monthly Average Energy Price DA vs RT

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

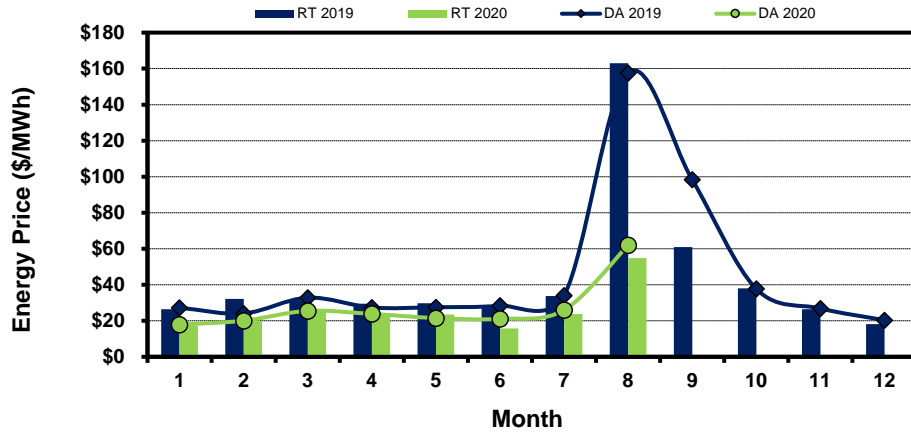
### Houston Zone



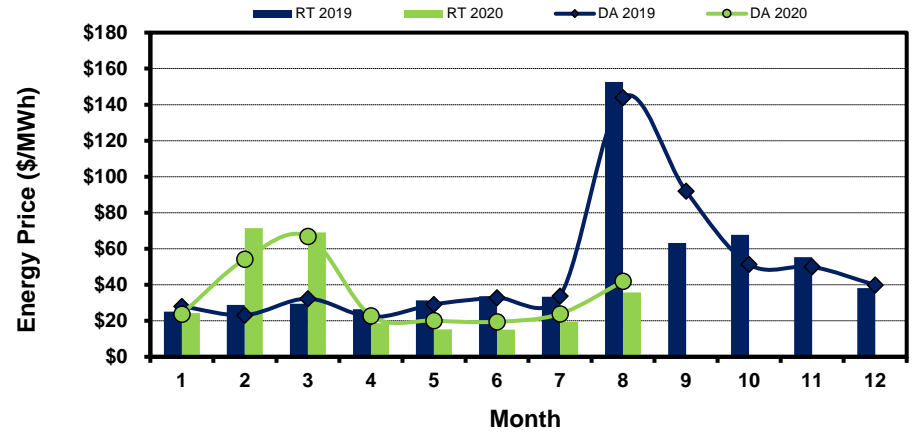
### North Zone



### South Zone



### West Zone



[Home <<](#)

[previous <<](#)

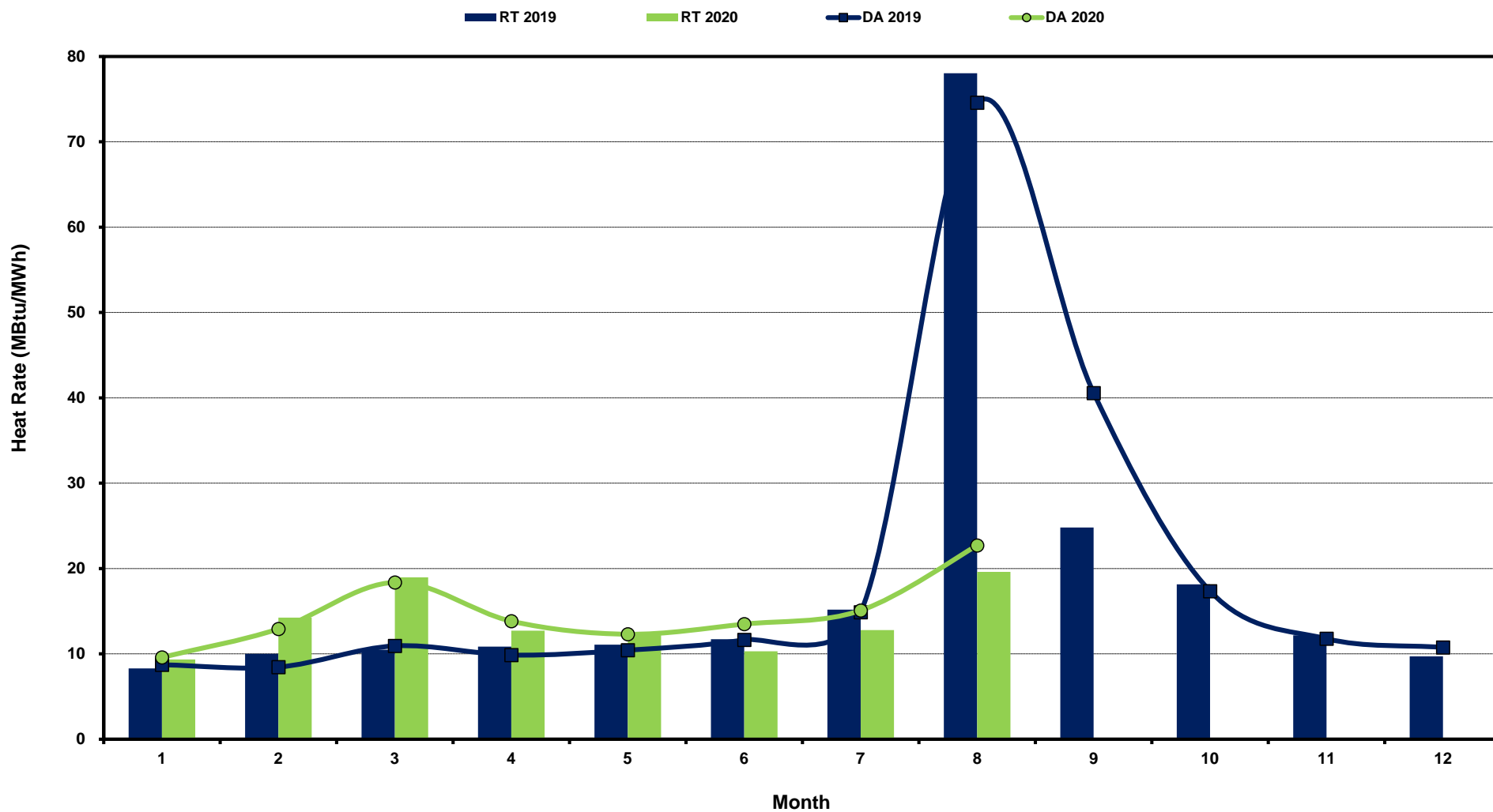
[next >>](#)

[data](#)

**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)



[Home <<](#)

[previous <<](#)

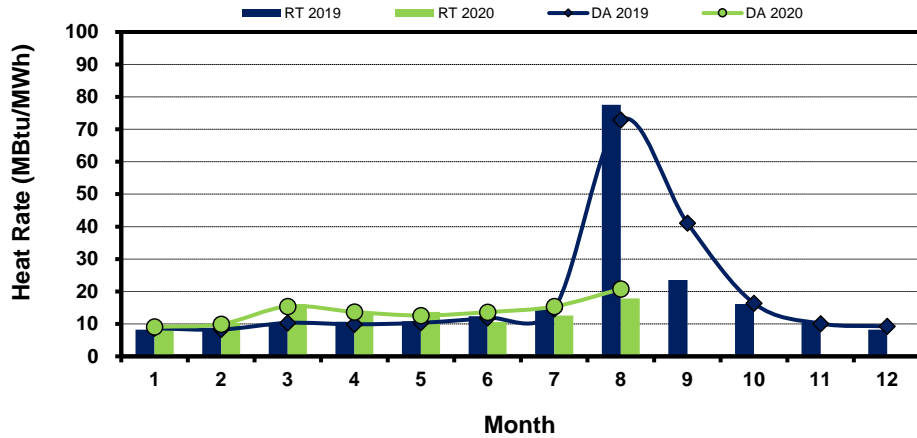
[next >>](#)

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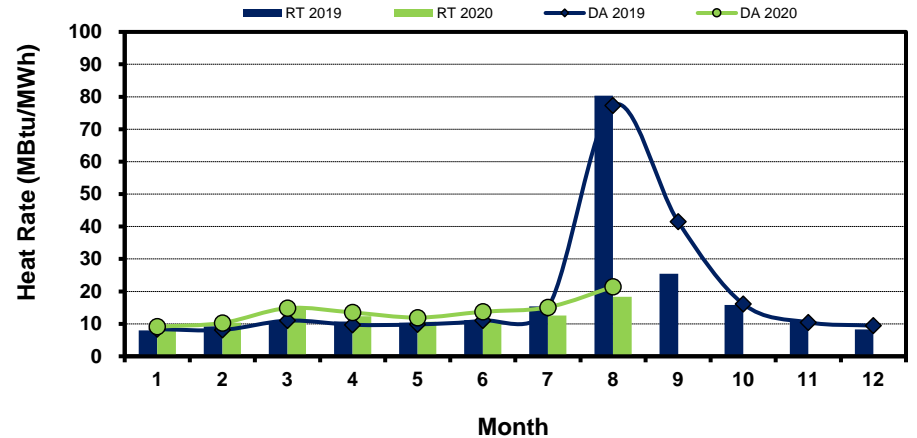
# Load Zone Monthly Implied Heat Rate DA vs RT

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

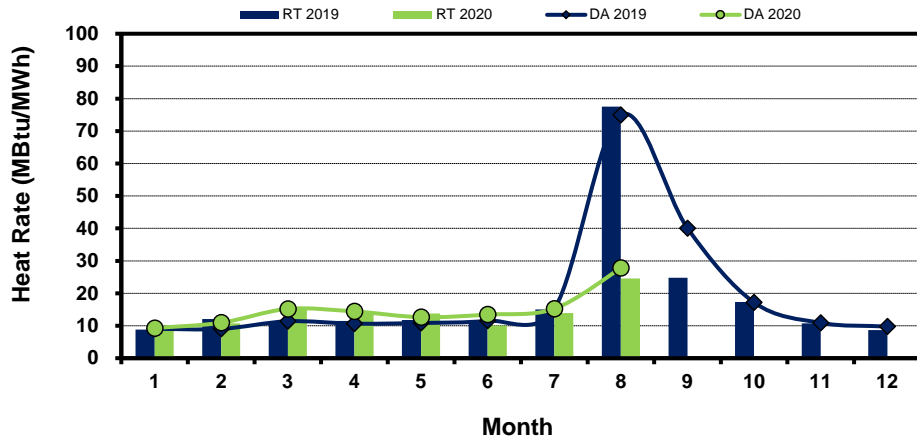
### Houston Zone



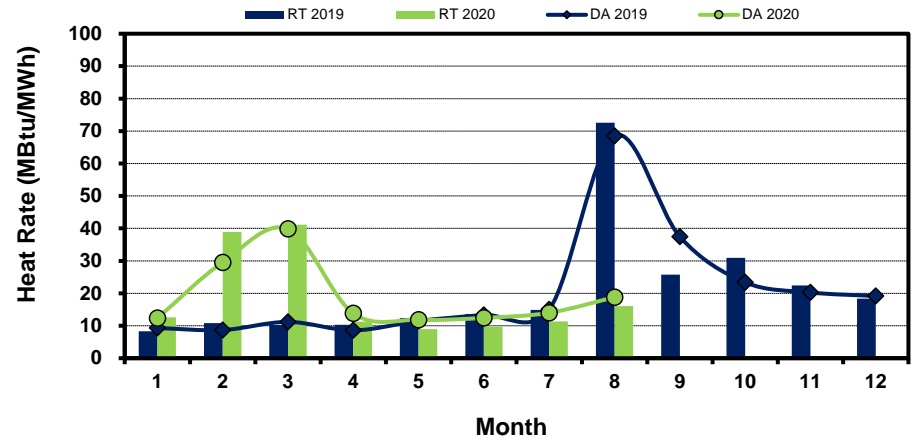
### North Zone



### South Zone



### West Zone



[Home <<](#)

[previous <<](#)

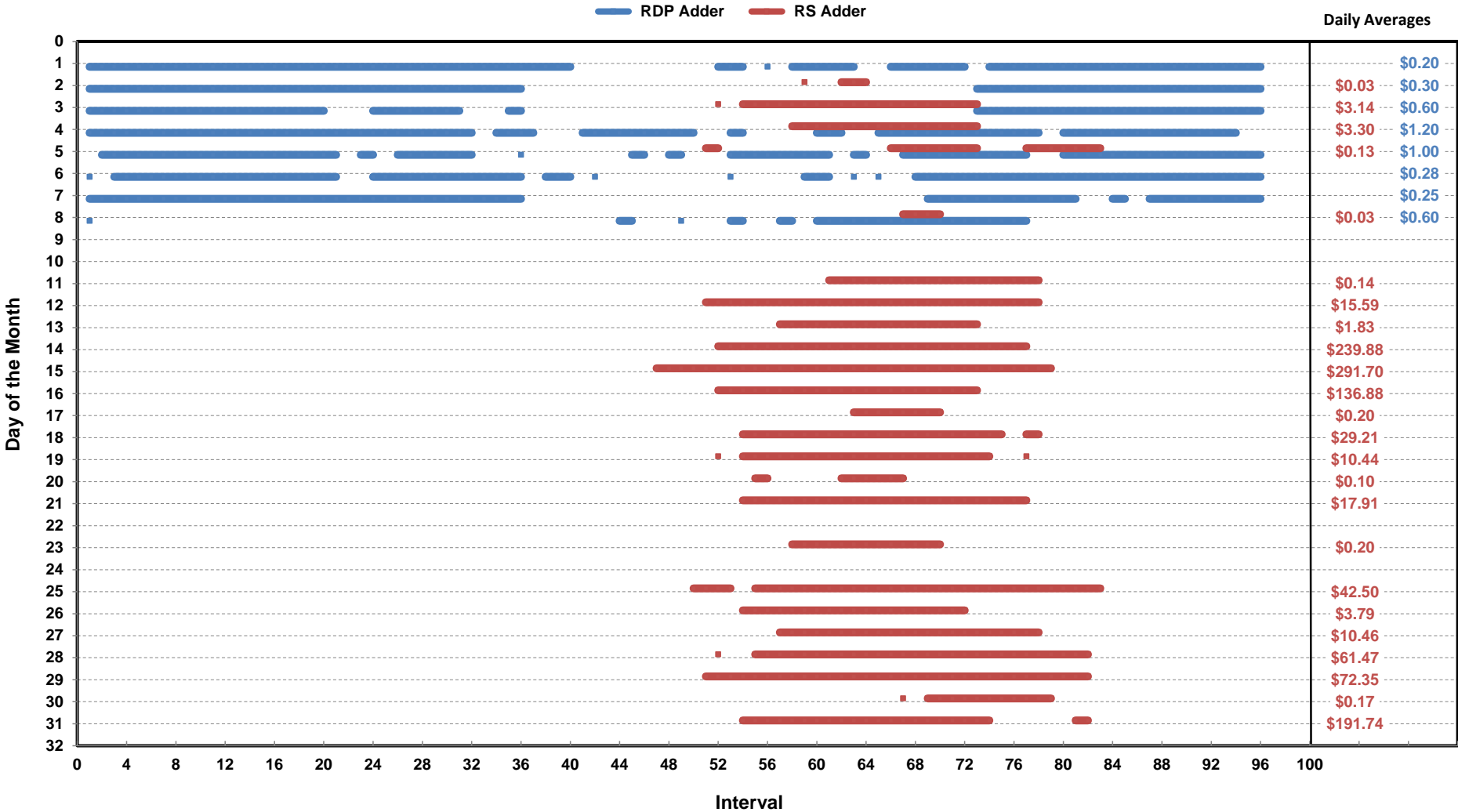
[next >>](#)

[data](#)

**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

## Aug-2020



[Home <<](#)

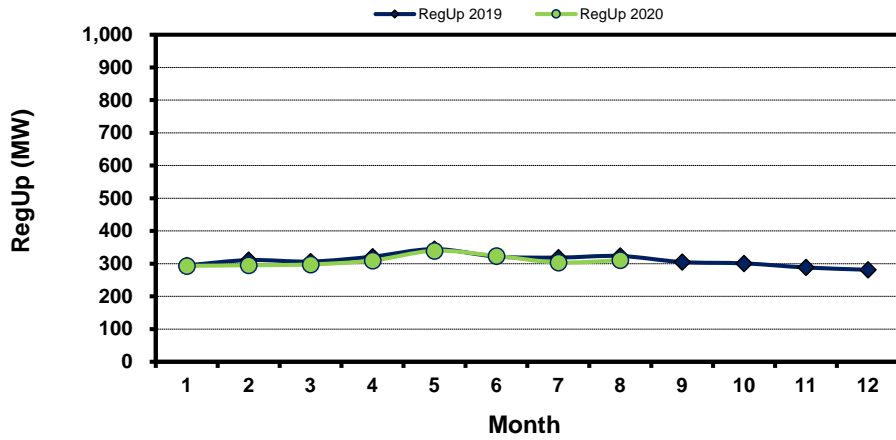
[previous <<](#)

[next >>](#)

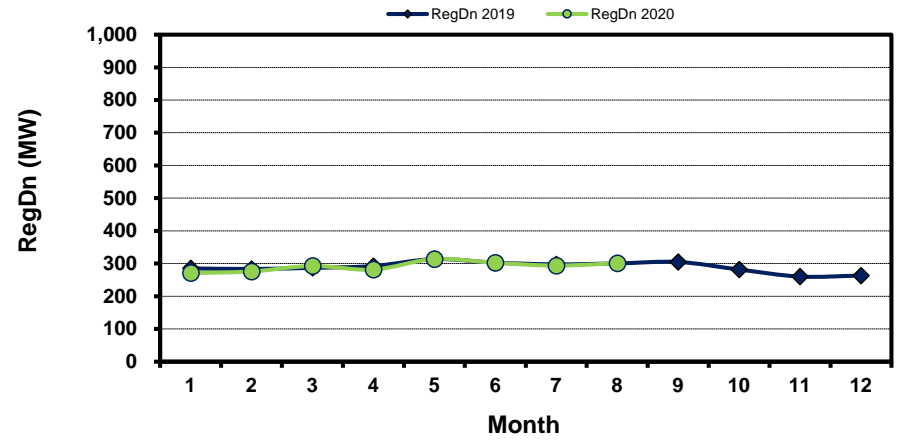
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# Monthly Average of Ancillary Services Required MW

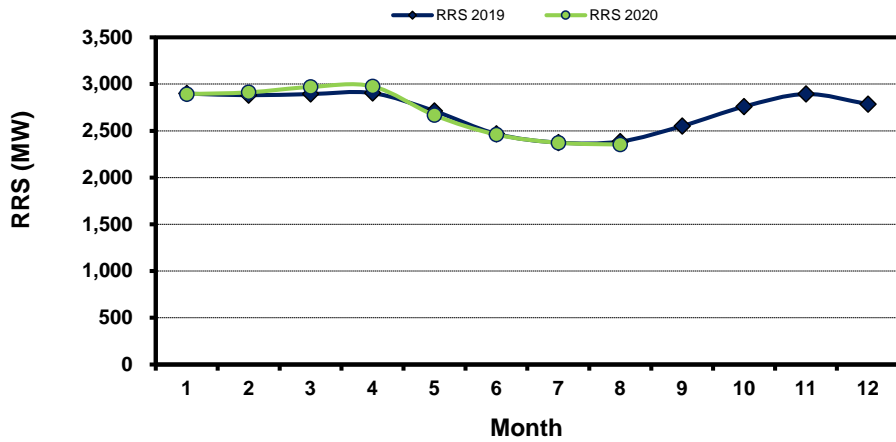
## Regulation Up



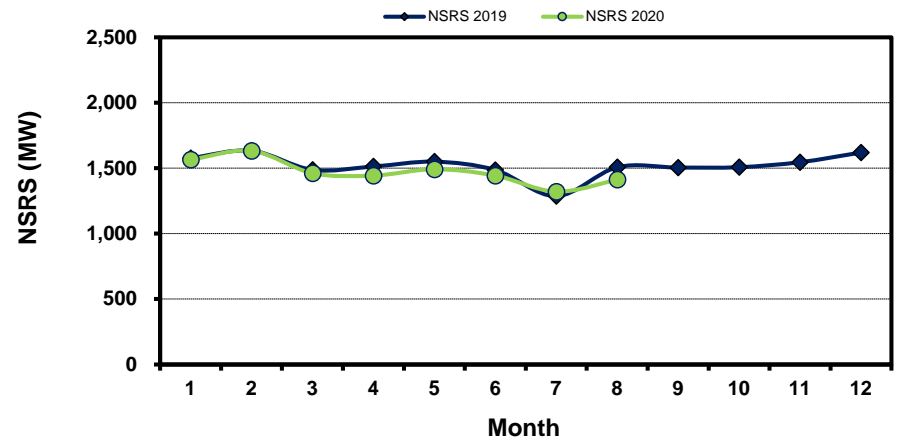
## Regulation Down



## Responsive Reserve



## Non-Spin Reserve



[Home <<](#)

[previous <<](#)

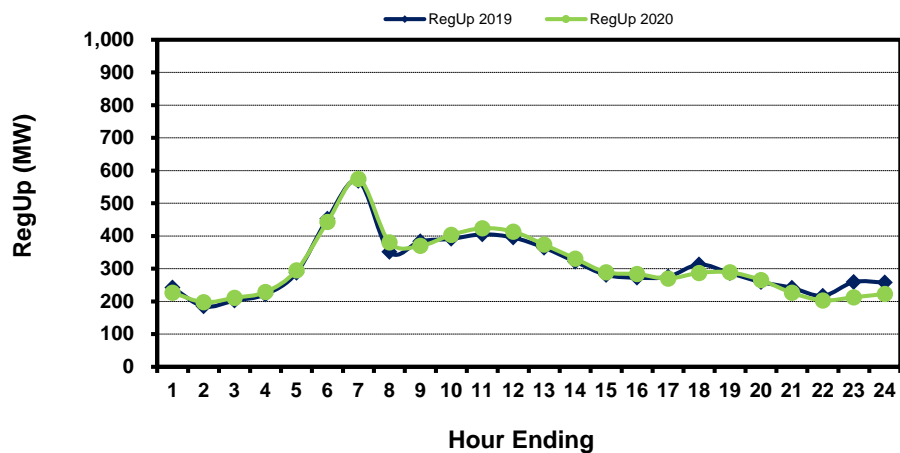
[next >>](#)

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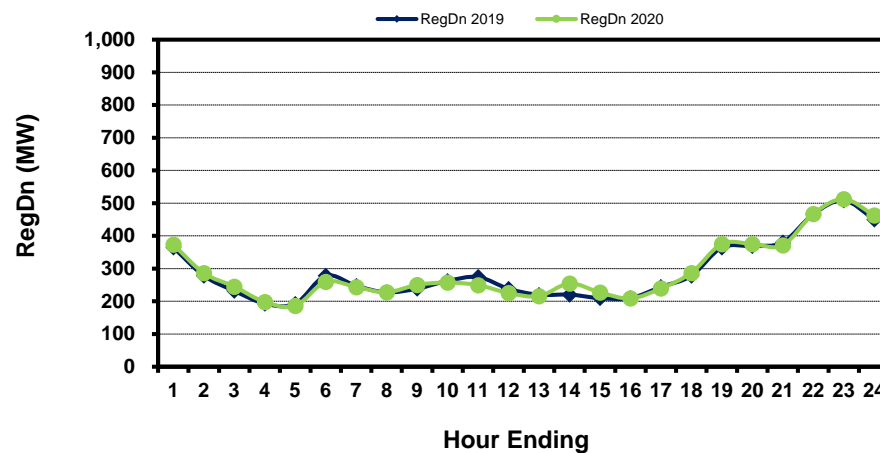


# Hourly Average of Ancillary Services Required MW

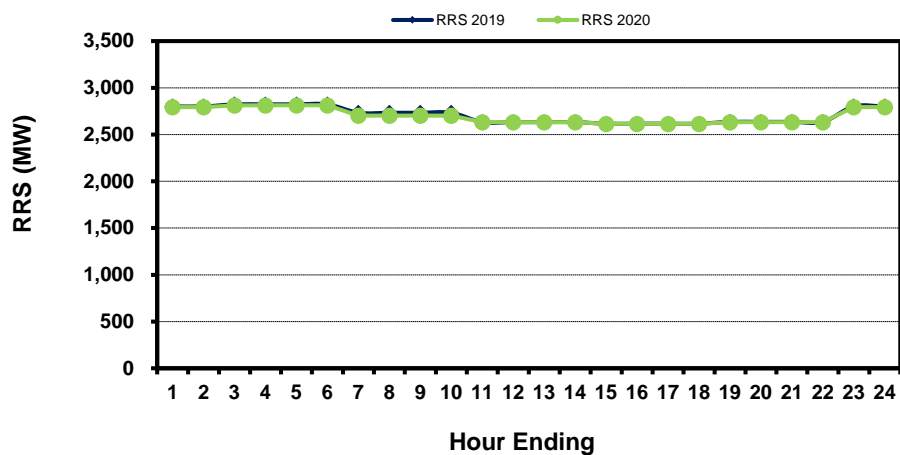
## Regulation Up



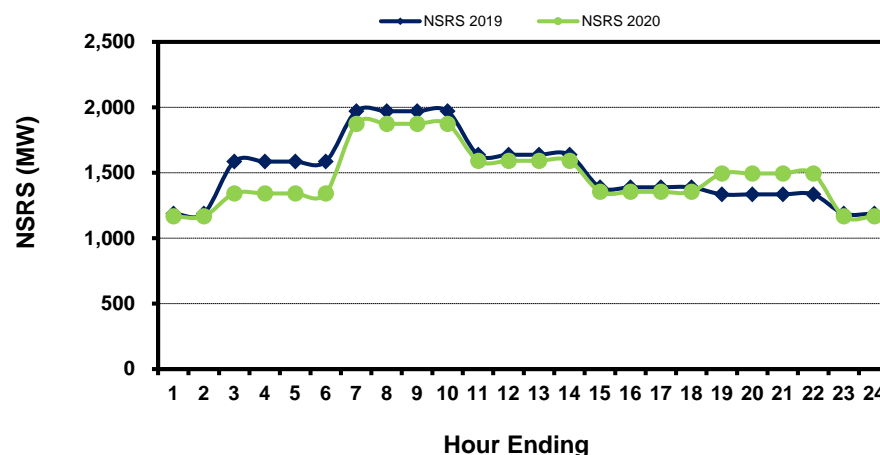
## Regulation Down



## Responsive Reserve



## Non-Spin Reserve



[Home <<](#)

[previous <<](#)

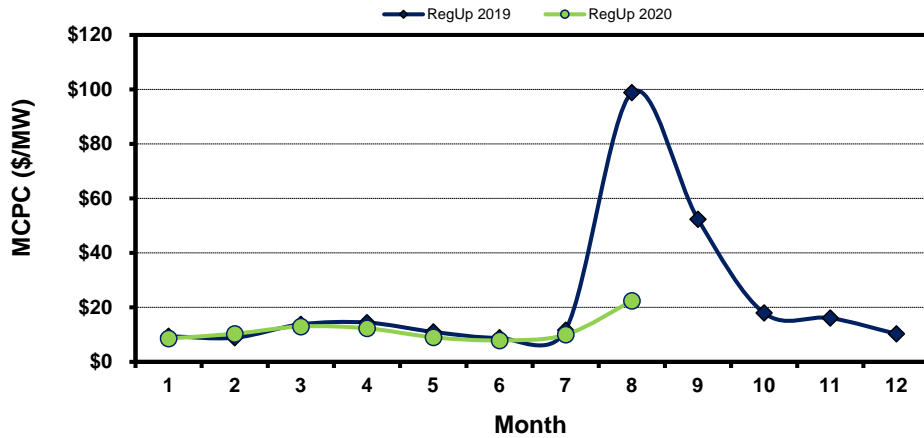
[next >>](#)

[data](#)

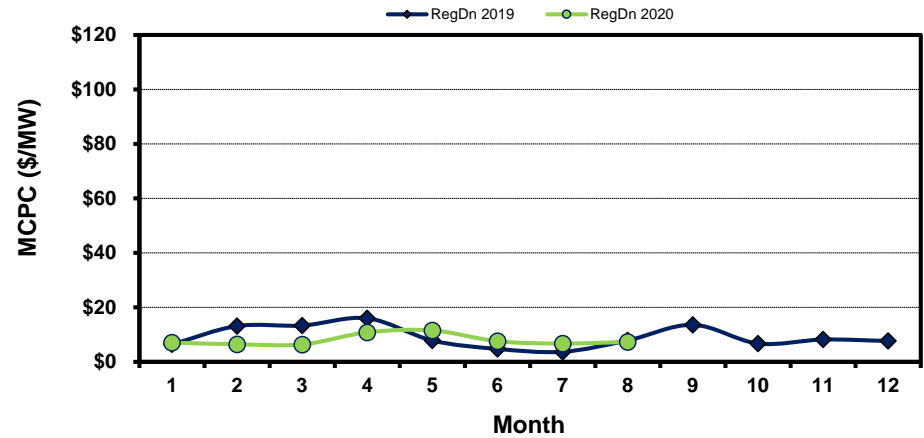
# Monthly Average Ancillary Services Price

(weighted by A/S Quantities Required)

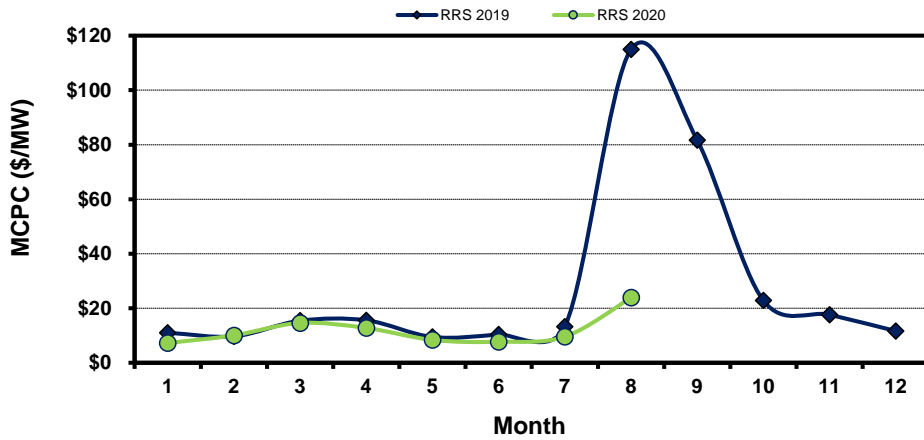
### Regulation Up



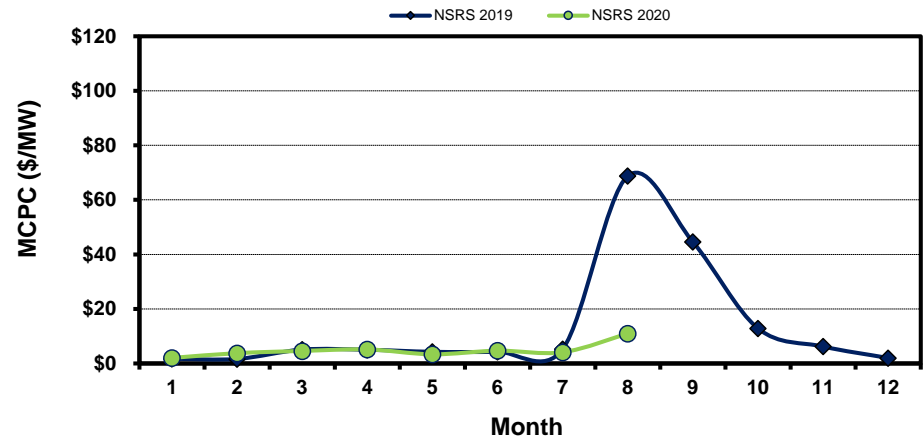
### Regulation Down



### Responsive Reserve



### Non-Spin Reserve



[Home <<](#)

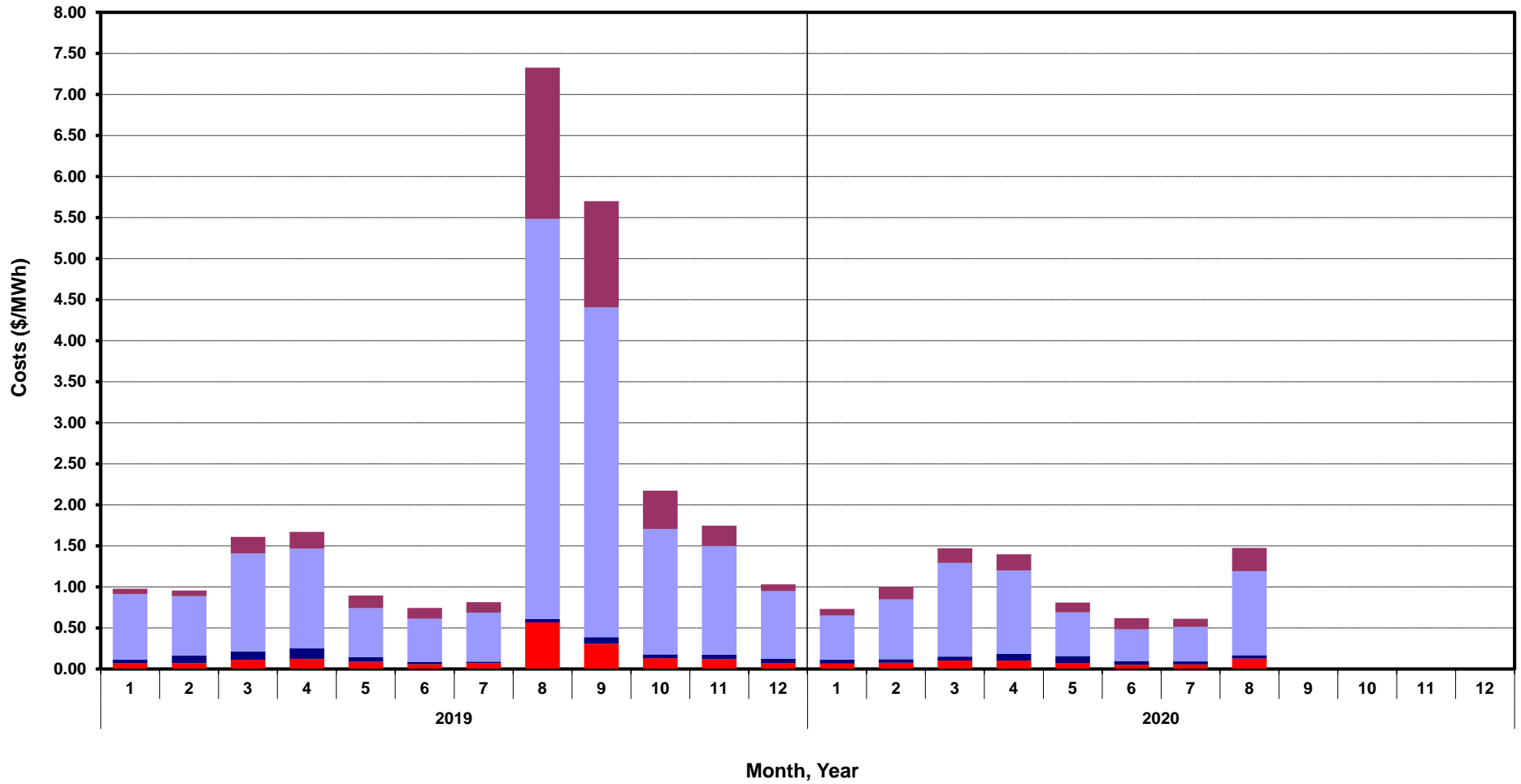
[previous <<](#)

[next >>](#)

[data](#)

# Monthly Average A/S Cost per MWh Load

RegUp RegDn RRS NonSpin



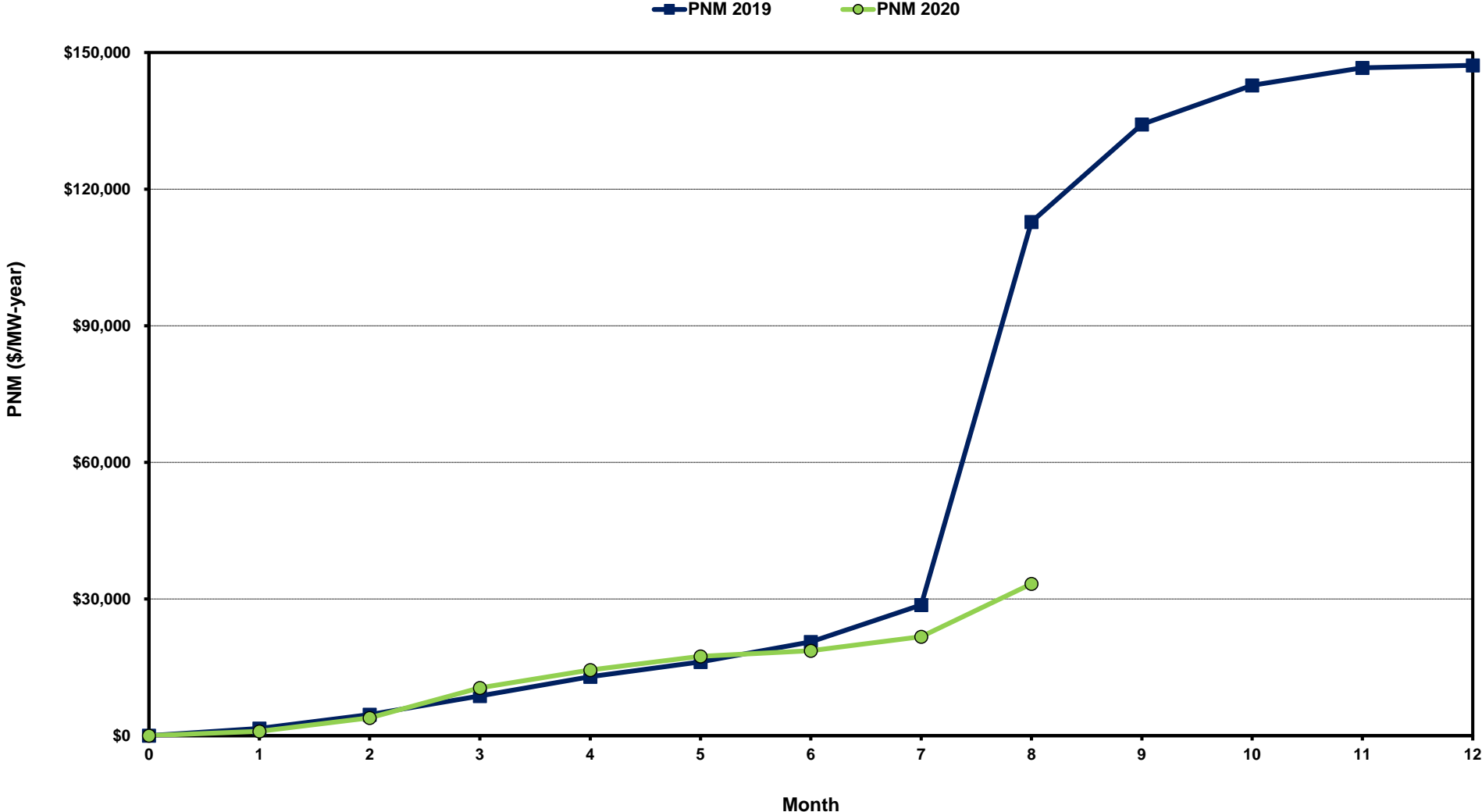
[Home <<](#)

[previous <<](#)

[next >>](#)

[data](#)

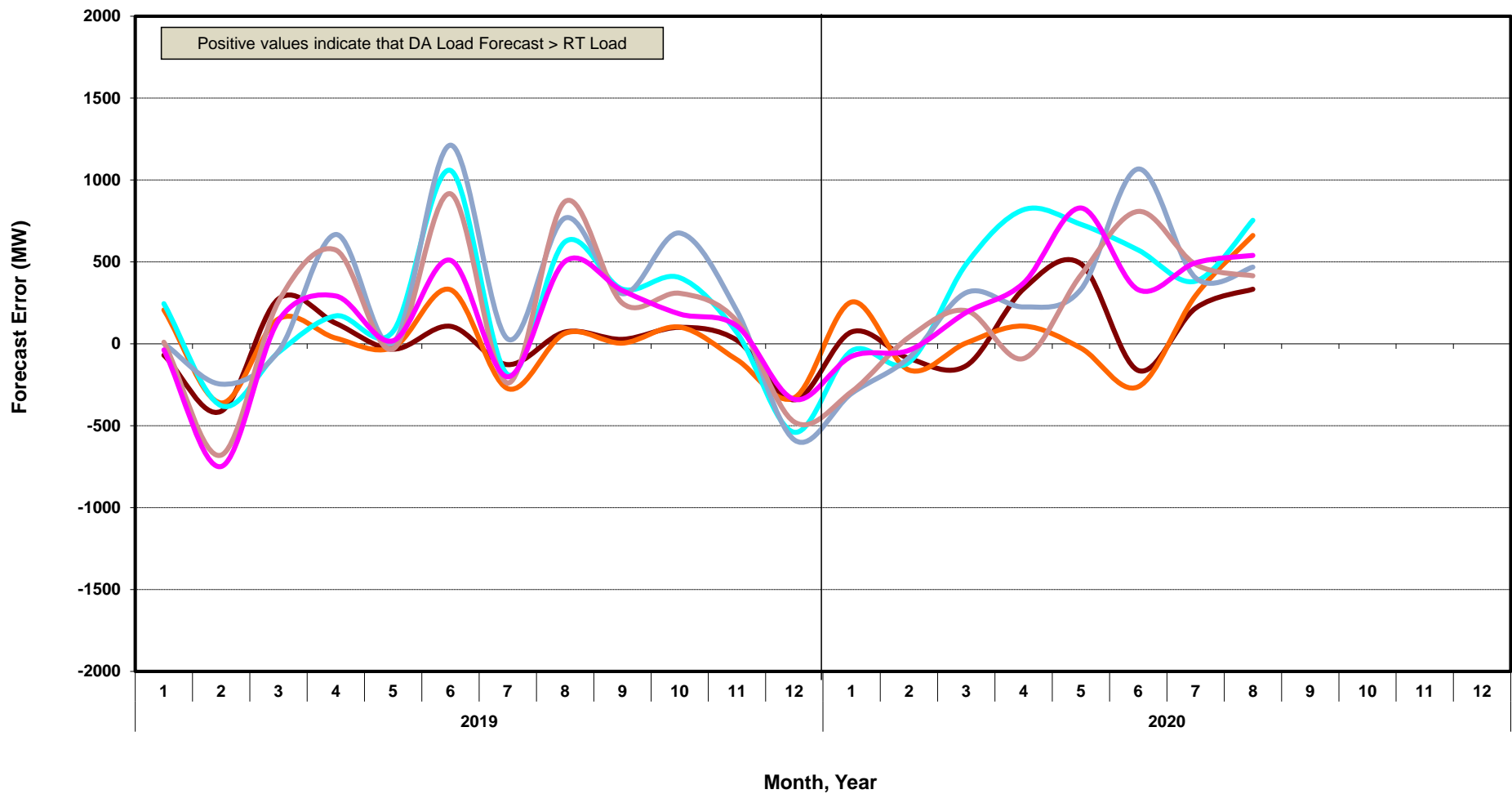
# ERCOT-wide Cumulative Peaker Net Margin



[Home <<](#)      [previous <<](#)      [next >>](#)  
[data](#)

# 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



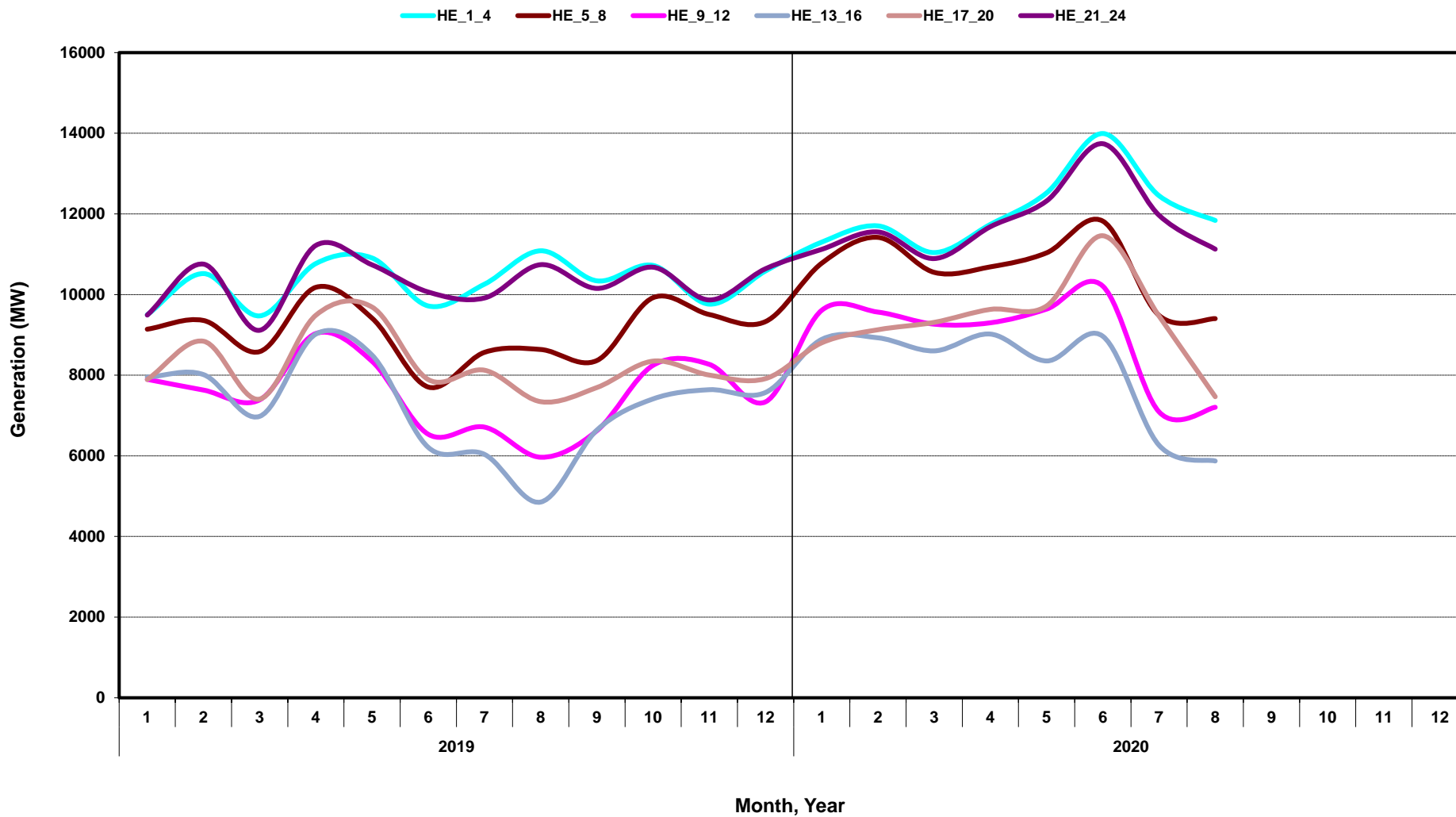
[Home <<](#)

[previous <<](#)

[next >>](#)

[data](#)

# Monthly Average of Wind Generation by Hour Ending



[Home <<](#)

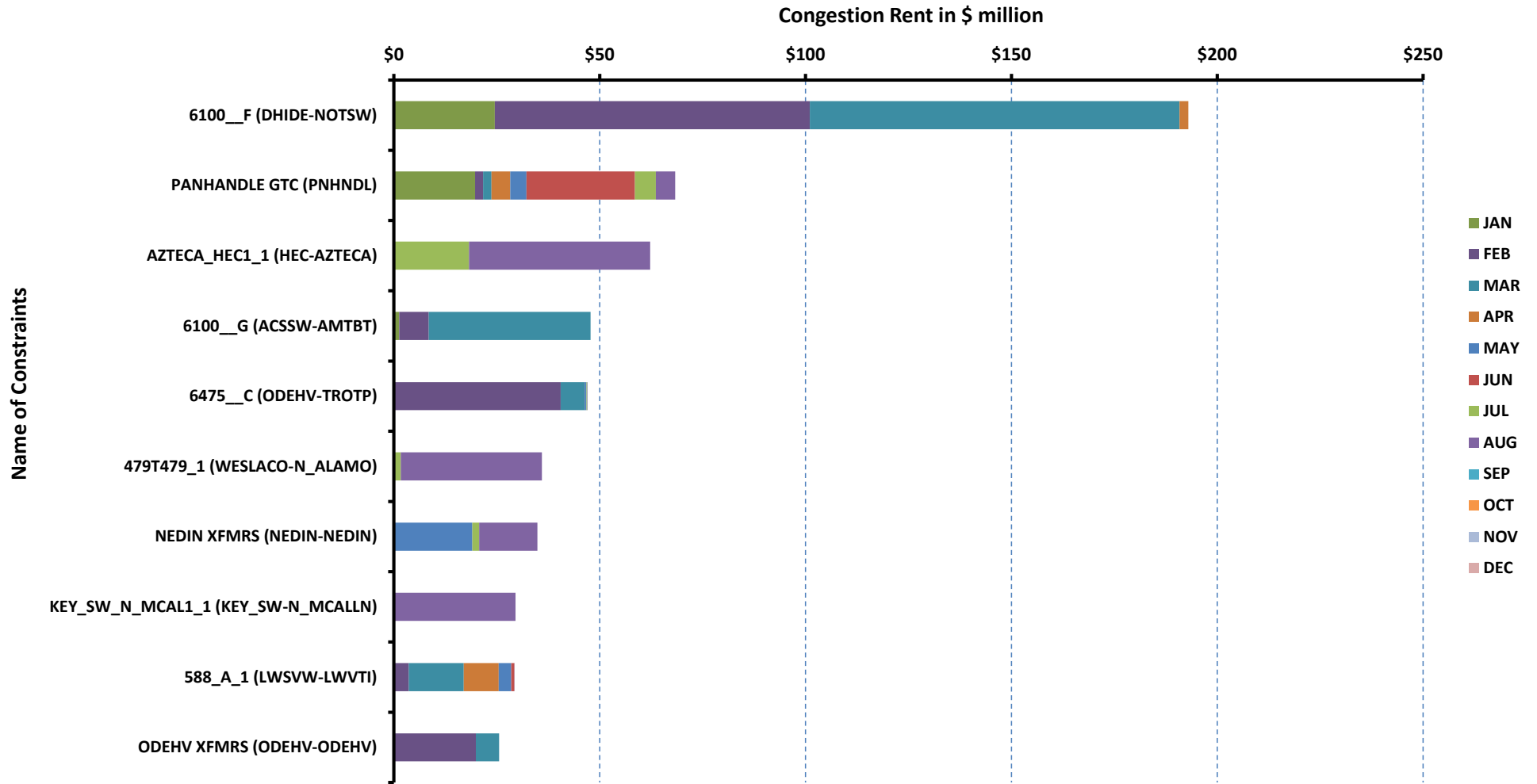
[previous <<](#)

[next >>](#)

[data](#)

# RT Congestion Constraint Rankings - 1

## Top 10 Constraints by Total Congestion Value - 2019



[Home <<](#)

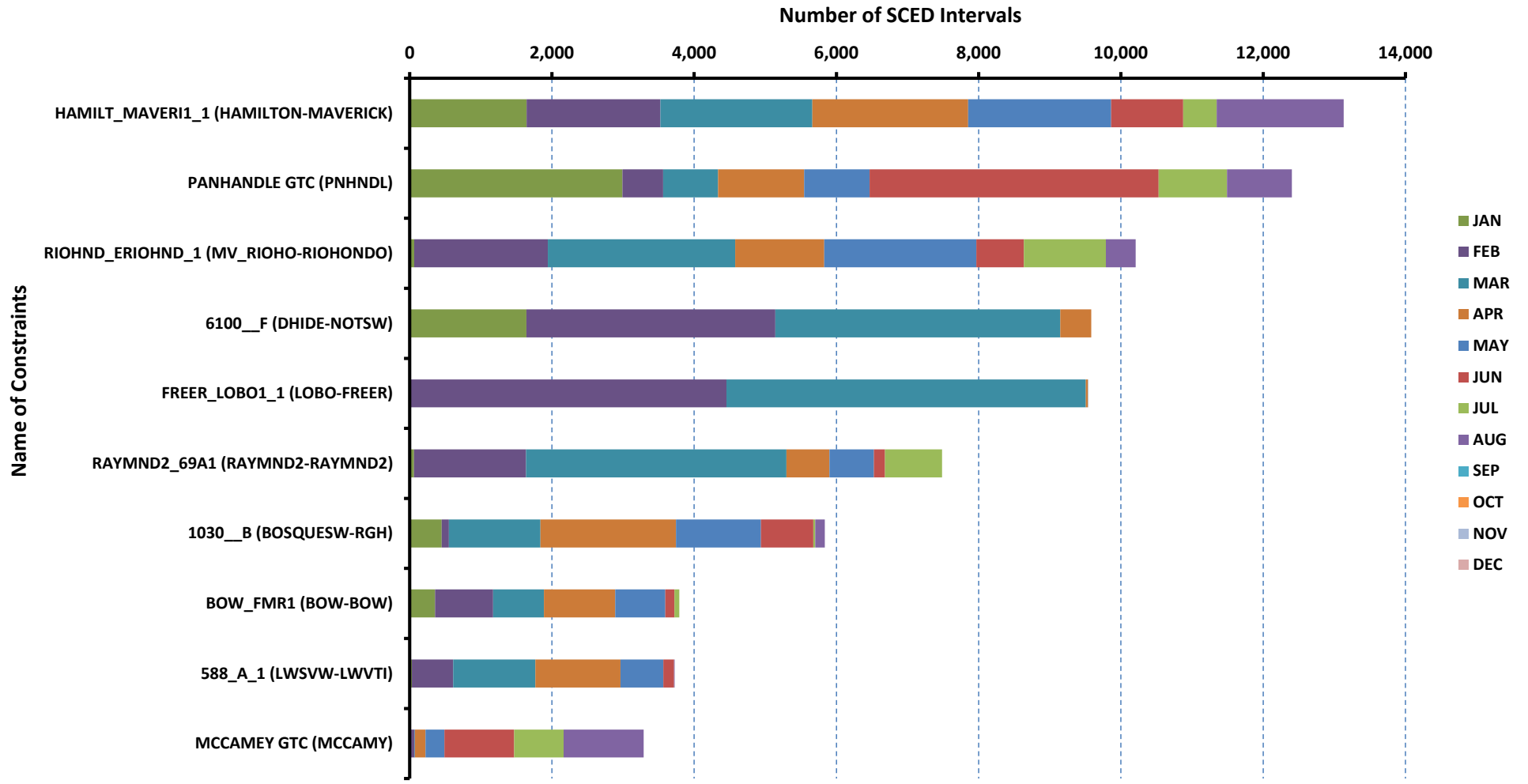
[previous <<](#)

[next >>](#)

[data](#)

# RT Congestion Constraint Rankings - 2

## Top 10 Constraints by Binding Frequency - 2019



[Home <<](#)

[previous <<](#)

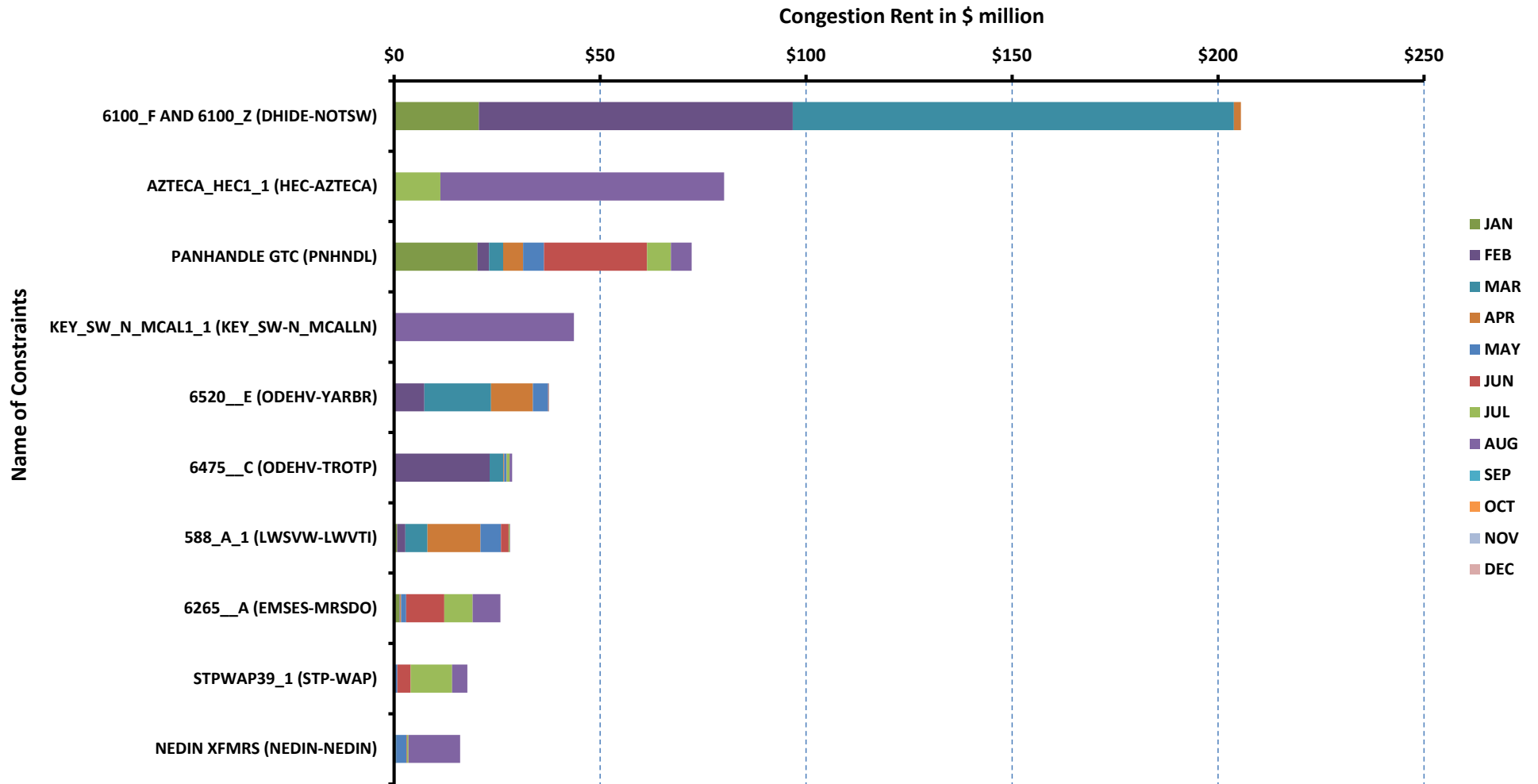
[next >>](#)

[data](#)



# DA Congestion Constraint Rankings - 1

## Top 10 Constraints by Total Congestion Value - 2019



[Home <<](#)

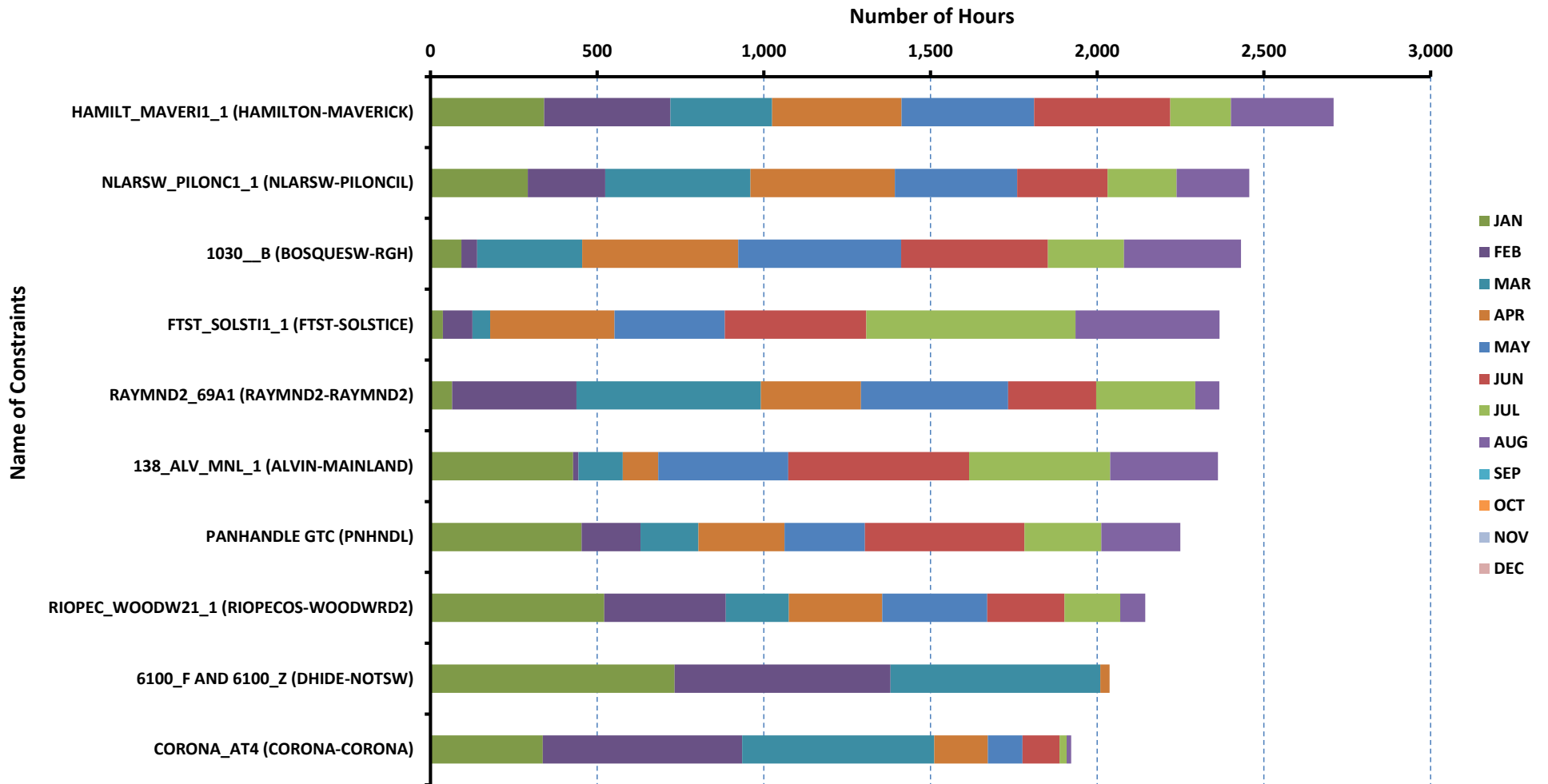
[previous <<](#)

[next >>](#)

[data](#)

# DA Congestion Constraint Rankings - 2

## Top 10 Constraints by Binding Frequency - 2019



[Home <<](#)

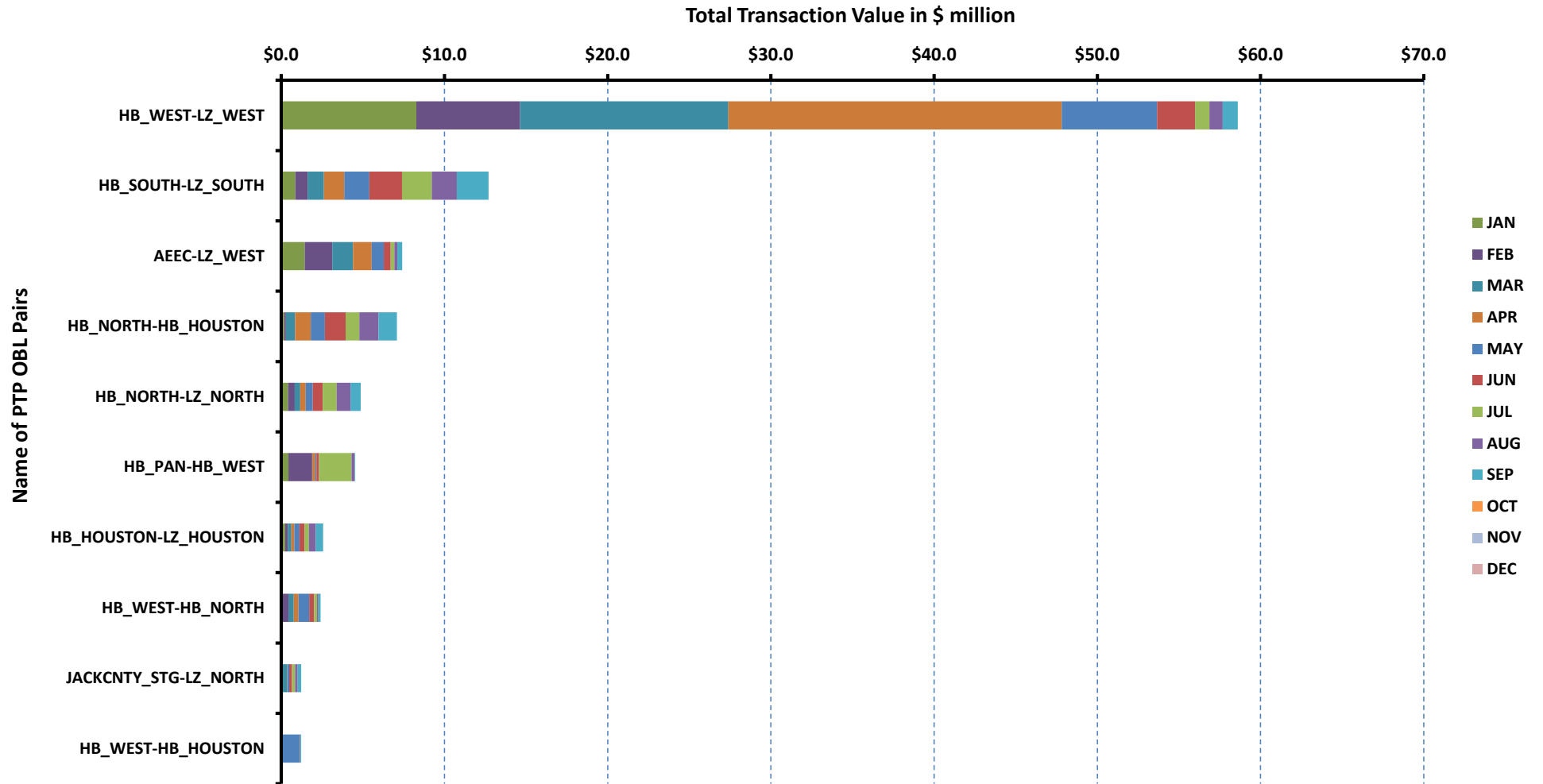
[previous <<](#)

[next >>](#)

[data](#)

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

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



[Home <<](#)

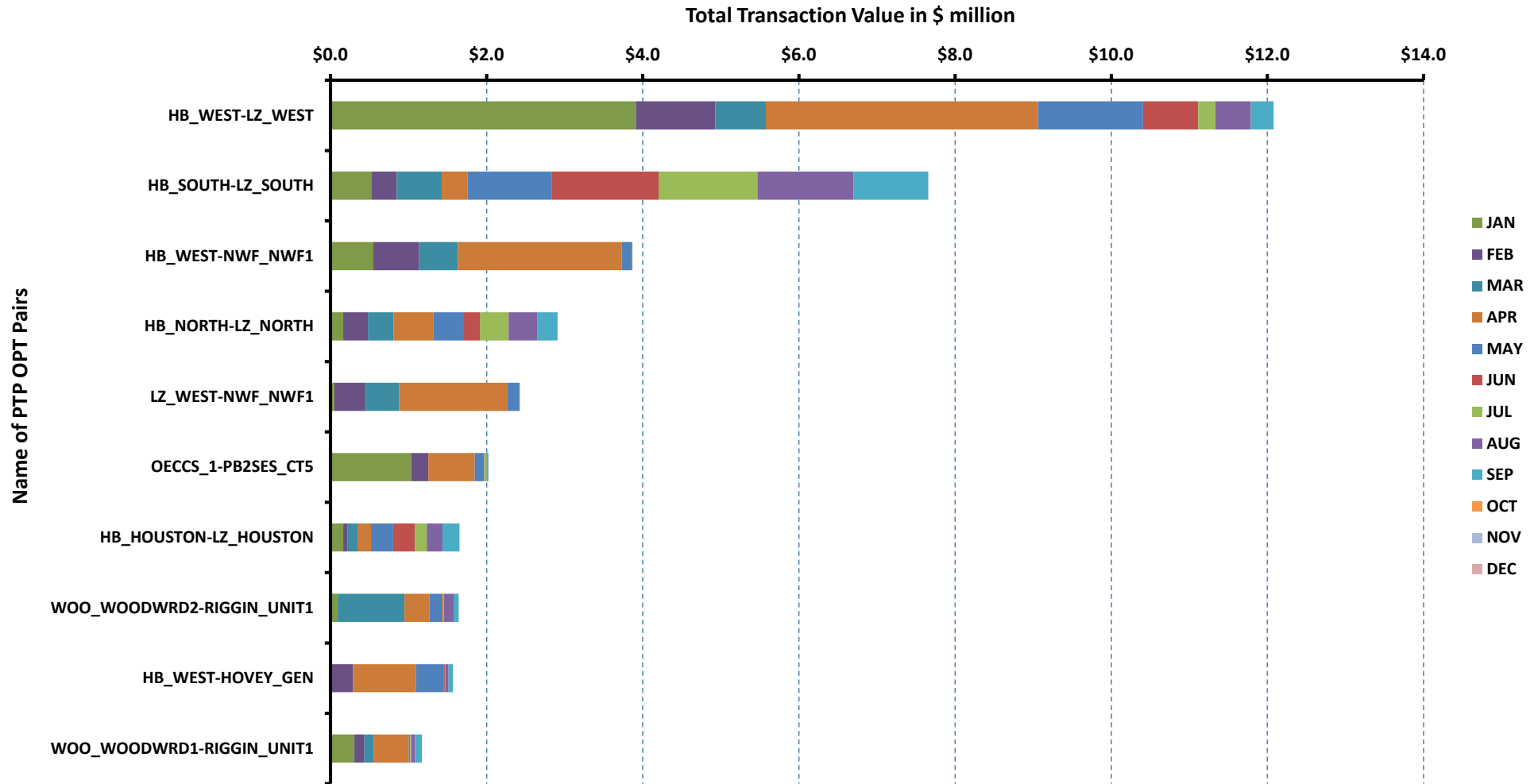
[previous <<](#)

[next >>](#)

[data](#)

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

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



[Home <<](#)

[previous <<](#)

[next >>](#)

[data](#)

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	\$ 30.86	\$ 31.86
	4	\$ 22.88	\$ 21.06
	5	\$ 20.92	\$ 20.72
	6	\$ 21.13	\$ 16.13
	7	\$ 25.72	\$ 21.81
	8	\$ 50.67	\$ 43.75
	9	\$ -	\$ -
	10	\$ -	\$ -
	11	\$ -	\$ -
	12	\$ -	\$ -

[Home <<](#)

[previous <<](#)

[next >>](#)

[chart](#)

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	15,889	17,180	14,814	5,679	10,784	12,302	9,905	4,982		
	4	15,919	19,484	16,207	5,724	10,406	12,159	10,058	4,831		
	5	17,834	23,352	18,052	5,880	11,868	13,906	11,631	4,642		
	6	18,946	25,645	19,077	6,499	13,395	17,669	12,974	5,308		
	7	19,539	28,373	20,240	6,826	14,296	19,640	14,547	5,699		
	8	19,606	28,774	20,448	6,814	14,613	19,897	14,623	5,751		
	9	-	-	-	-	-	-	-	-	-	
	10	-	-	-	-	-	-	-	-	-	
	11	-	-	-	-	-	-	-	-	-	
	12	-	-	-	-	-	-	-	-	-	

[Home <<](#)

[previous <<](#)

[next >>](#)

[chart](#)

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	\$ 26.01	\$ 25.72	\$ 69.02	\$ 25.88	\$ 24.93	\$ 25.51	\$ 66.94	
	4	\$ 21.29	\$ 20.43	\$ 22.73	\$ 18.65	\$ 22.63	\$ 22.33	\$ 23.82	\$ 22.87	
	5	\$ 23.27	\$ 18.12	\$ 23.42	\$ 15.20	\$ 21.41	\$ 20.28	\$ 21.50	\$ 20.10	
	6	\$ 16.54	\$ 16.37	\$ 15.77	\$ 15.14	\$ 21.36	\$ 21.51	\$ 21.06	\$ 19.45	
	7	\$ 21.41	\$ 21.40	\$ 23.74	\$ 19.30	\$ 26.19	\$ 25.74	\$ 25.97	\$ 23.84	
	8	\$ 39.78	\$ 40.88	\$ 54.75	\$ 35.80	\$ 46.42	\$ 47.93	\$ 62.04	\$ 42.00	
	9	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	10	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	11	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	12	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	

[Home <<](#)

[previous <<](#)

[next >>](#)

[chart](#)

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	\$ 31.86	18.98	\$ 30.86	18.38
	4	\$ 1.65	\$ 21.06	12.73	\$ 22.88	13.83
	5	\$ 1.70	\$ 20.72	12.19	\$ 20.92	12.31
	6	\$ 1.57	\$ 16.13	10.30	\$ 21.13	13.49
	7	\$ 1.70	\$ 21.81	12.80	\$ 25.72	15.09
	8	\$ 2.23	\$ 43.75	19.61	\$ 50.67	22.71
	9	\$ -	\$ -	-	\$ -	-
	10	\$ -	\$ -	-	\$ -	-
	11	\$ -	\$ -	-	\$ -	-
	12	\$ -	\$ -	-	\$ -	-

[Home <<](#)

[previous <<](#)

[next >>](#)

[chart](#)



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	39.86	16.10	15.31	15.49	41.10
	4	13.68	14.40	13.50	13.83	12.87	13.74	12.35	11.27
	5	12.59	12.65	11.93	11.83	13.69	13.78	10.66	8.94
	6	13.64	13.44	13.73	12.42	10.56	10.07	10.45	9.67
	7	15.36	15.23	15.11	13.99	12.56	13.93	12.56	11.32
	8	20.81	27.81	21.48	18.82	17.83	24.54	18.32	16.05
	9	-	-	-	-	-	-	-	-
	10	-	-	-	-	-	-	-	-
	11	-	-	-	-	-	-	-	-
	12	-	-	-	-	-	-	-	-

[Home <<](#)

[previous <<](#)

[next >>](#)

[chart](#)

Daily ORDC Adders Average Values and Interval Duration								
YEAR	MONTH	DAY	PRICE_RS	PRICE_RDP	RS_CNT	RDP_CNT	RS_POS	RDP_POS
2020	8	1	\$ -	\$ 0.20	0	80	80	90
2020	8	2	\$ 0.03	\$ 0.30	4	60	80	90
2020	8	3	\$ 3.14	\$ 0.60	21	54	80	90
2020	8	4	\$ 3.30	\$ 1.20	16	80	80	90
2020	8	5	\$ 0.13	\$ 1.00	17	73	80	90
2020	8	6	\$ -	\$ 0.28	0	72	80	90
2020	8	7	\$ -	\$ 0.25	0	61	80	90
2020	8	8	\$ 0.03	\$ 0.60	4	26	80	90
2020	8	9	\$ -	\$ -	0	0	80	90
2020	8	10	\$ -	\$ -	0	0	80	90
2020	8	11	\$ 0.14	\$ -	18	0	80	90
2020	8	12	\$ 15.59	\$ -	28	0	80	90
2020	8	13	\$ 1.83	\$ -	17	0	80	90
2020	8	14	\$ 239.88	\$ -	26	0	80	90
2020	8	15	\$ 291.70	\$ -	33	0	80	90
2020	8	16	\$ 136.88	\$ -	22	0	80	90
2020	8	17	\$ 0.20	\$ -	8	0	80	90
2020	8	18	\$ 29.21	\$ -	24	0	80	90
2020	8	19	\$ 10.44	\$ -	23	0	80	90
2020	8	20	\$ 0.10	\$ -	8	0	80	90
2020	8	21	\$ 17.91	\$ -	24	0	80	90
2020	8	22	\$ -	\$ -	0	0	80	90
2020	8	23	\$ 0.20	\$ -	13	0	80	90
2020	8	24	\$ -	\$ -	0	0	80	90
2020	8	25	\$ 42.50	\$ -	33	0	80	90
2020	8	26	\$ 3.79	\$ -	19	0	80	90
2020	8	27	\$ 10.46	\$ -	22	0	80	90
2020	8	28	\$ 61.47	\$ -	29	0	80	90
2020	8	29	\$ 72.35	\$ -	32	0	80	90
2020	8	30	\$ 0.17	\$ -	12	0	80	90
2020	8	31	\$ 191.74	\$ -	23	0	80	90

[Home <<](#)

[previous <<](#)

[next >>](#)

[chart](#)

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	-	-	-	-
	10	-	-	-	-
	11	-	-	-	-
	12	-	-	-	-

[Home <<](#)

[previous <<](#)

[next >>](#)

[chart](#)

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	373	1,167	2,794	227
	2	286	1,167	2,794	198
	3	245	1,342	2,812	211
	4	198	1,342	2,813	229
	5	186	1,342	2,813	295
	6	260	1,342	2,813	443
	7	244	1,874	2,702	574
	8	228	1,874	2,702	381
	9	250	1,874	2,702	370
	10	257	1,874	2,702	403
	11	250	1,592	2,633	424
	12	225	1,592	2,633	413
	13	216	1,592	2,633	374
	14	255	1,592	2,633	331
	15	227	1,354	2,615	289
	16	209	1,354	2,615	284
	17	239	1,354	2,615	270
	18	287	1,354	2,615	287
	19	375	1,495	2,633	289
	20	375	1,495	2,633	265
	21	371	1,495	2,633	226
	22	467	1,495	2,633	203
	23	513	1,167	2,794	213
	24	463	1,167	2,794	223

[Home <<](#)

[previous <<](#)

[next >>](#)

[chart](#)

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	\$ -	\$ -	\$ -	\$ -
	11	\$ -	\$ -	\$ -	\$ -
	12	\$ -	\$ -	\$ -	\$ -

[Home <<](#)

[previous <<](#)

[next >>](#)

[chart](#)

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	\$ -	\$ -	\$ -	\$ -
	10	\$ -	\$ -	\$ -	\$ -
	11	\$ -	\$ -	\$ -	\$ -
	12	\$ -	\$ -	\$ -	\$ -

[Home <<](#)

[previous <<](#)

[next >>](#)

[chart](#)

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	\$ 3,082.60	\$ 21,747.16
	8	\$ 11,591.85	\$ 33,339.01
	9	\$ -	\$ -
	10	\$ -	\$ -
	11	\$ -	\$ -
12	\$ -	\$ -	

[Home <<](#)

[previous <<](#)

[next >>](#)

[chart](#)

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	-	-	-	-	-	-
	10	-	-	-	-	-	-
	11	-	-	-	-	-	-
	12	-	-	-	-	-	-

[Home <<](#)

[previous <<](#)

[next >>](#)

[chart](#)



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	-	-	-	-	-	-
	10	-	-	-	-	-	-
	11	-	-	-	-	-	-
	12	-	-	-	-	-	-

[Home <<](#)

[previous <<](#)

[next >>](#)

[chart](#)

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	HAMILT_MAVR11_1 (HAMILTON-MAVERICK)	13,133	1	1,645	1,879	2,137	2,191	2,011	1,013	469	1,788	-	-	-	-
FREQ_EXIST	2020	PANHNDL_GTC (PNHNDL)	12,404	2	2,990	573	774	1,210	919	4,063	962	913	-	-	-	-
FREQ_EXIST	2020	RIOHND_ERIOHND_1 (MV RIOHO-RIOHONDO)	10,206	3	63	1,879	2,634	1,251	2,139	669	1,154	417	-	-	-	-
FREQ_EXIST	2020	6100_F (DHIDE-NOTSW)	9,582	4	1,642	3,500	4,006	434	-	-	-	-	-	-	-	-
FREQ_EXIST	2020	FREER_LOBO1_1 (LOBO-FREER)	9,537	5	14	4,439	5,054	28	2	-	-	-	-	-	-	-
FREQ_EXIST	2020	RAYMND2_69A1 (RAYMND2-RAYMND2)	7,485	6	62	1,573	3,663	605	623	157	802	-	-	-	-	-
FREQ_EXIST	2020	1030_B (BOSQUESW-RGH)	5,837	7	450	100	1,289	1,904	1,196	736	28	134	-	-	-	-
FREQ_EXIST	2020	BOW_FMR1 (BOW-BOW)	3,791	8	356	817	715	1,001	706	127	69	-	-	-	-	-
FREQ_EXIST	2020	588_A_1 (LWSVW-LWVTI)	3,725	9	30	582	1,155	1,198	600	151	-	9	-	-	-	-
FREQ_EXIST	2020	MCCAMEY_GTC (MCCAMY)	3,289	10	13	55	8	146	265	982	695	1,125	-	-	-	-
TOP10_RENT	2020	6100_F (DHIDE-NOTSW)	\$ 192.97	1	\$ 24.52	\$ 76.51	\$ 89.80	\$ 2.14	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2020	PANHNDL_GTC (PNHNDL)	\$ 68.35	2	\$ 19.72	\$ 1.94	\$ 2.07	\$ 4.53	\$ 3.96	\$ 26.32	\$ 5.08	\$ 4.73	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2020	AZTECA_HEC1_1 (HEC-AZTECA)	\$ 62.25	3	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 18.25	\$ 44.00	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2020	6100_G (ACSSW-AMTBT)	\$ 47.79	4	\$ 1.31	\$ 7.16	\$ 39.32	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2020	6475_C (ODEHV-TROTP)	\$ 47.09	5	\$ -	\$ 40.50	\$ 5.85	\$ 0.00	\$ 0.41	\$ -	\$ 0.19	\$ 0.13	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2020	479T479_1 (WESLACO-N_ALAMO)	\$ 35.96	6	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1.68	\$ 34.28	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2020	NEDIN_XFMRS (NEDIN-NEDIN)	\$ 34.85	7	\$ -	\$ -	\$ -	\$ 0.00	\$ 19.06	\$ -	\$ 1.66	\$ 14.13	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2020	KEY_SW_N_MCAL1_1 (KEY_SW-N_MCALLN)	\$ 29.57	8	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 29.57	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2020	588_A_1 (LWSVW-LWVTI)	\$ 29.29	9	\$ 0.13	\$ 3.52	\$ 13.33	\$ 8.51	\$ 3.04	\$ 0.74	\$ -	\$ 0.02	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2020	ODEHV_XFMRS (ODEHV-ODEHV)	\$ 25.59	10	\$ -	\$ 19.91	\$ 5.68	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

[Home <<](#)

[previous <<](#)

[next >>](#)

[chart 1](#)

[chart 2](#)

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)	2,709	1	341	379	305	388	398	408	182	308	-	-	-	-	
FREQ_EXIST	2020	NLARSW_PILONC1_1 (NLARSW-PILONCIL)	2,456	2	292	232	436	433	367	271	207	218	-	-	-	-	
FREQ_EXIST	2020	1030_B (BOSQUESW-RGH)	2,431	3	93	47	315	468	489	440	228	351	-	-	-	-	
FREQ_EXIST	2020	FTST_SOLST1_1 (FTST-SOLSTICE)	2,367	4	37	89	53	373	331	424	628	432	-	-	-	-	
FREQ_EXIST	2020	RAYMND2_69A1 (RAYMND2-RAYMND2)	2,366	5	65	373	553	300	442	264	297	72	-	-	-	-	
FREQ_EXIST	2020	138_ALV_MNL_1 (ALVIN-MAINLAND)	2,362	6	428	16	133	106	390	543	423	323	-	-	-	-	
FREQ_EXIST	2020	PANHANDLE_GTC (PNHNDL)	2,249	7	453	177	174	258	241	479	230	237	-	-	-	-	
FREQ_EXIST	2020	RIOPEC_WOODW21_1 (RIOPECOS-WOODWRD2)	2,144	8	521	365	189	280	315	232	167	75	-	-	-	-	
FREQ_EXIST	2020	6100_F AND 6100_Z (DHI-DE-NOTSW)	2,037	9	732	648	629	28	-	-	-	-	-	-	-	-	
FREQ_EXIST	2020	CORONA_AT4 (CORONA-CORONA)	1,922	10	337	598	576	161	104	111	21	14	-	-	-	-	
TOP10_RENT	2020	6100_F AND 6100_Z (DHI-DE-NOTSW)	\$ 205.56	1	\$ 20.58	\$ 76.21	\$ 107.05	\$ 1.73	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2020	AZTECA_HEC1_1 (HEC-AZTECA)	\$ 80.12	2	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 0.00	\$ 11.22	\$ 68.90	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2020	PANHANDLE_GTC (PNHNDL)	\$ 72.23	3	\$ 20.27	\$ 2.80	\$ 3.38	\$ 4.88	\$ 5.06	\$ 25.00	\$ 5.80	\$ 5.05	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2020	KEY_SW_N_MCAL1_1 (KEY_SW-N_MCALLN)	\$ 43.63	4	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 0.11	\$ 43.52	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2020	6520_E (ODEHV-YARBR)	\$ 37.58	5	\$ -	\$ 7.35	\$ 16.19	\$ 10.17	\$ 3.68	\$ 0.15	\$ 0.04	\$ 0.00	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2020	6475_C (ODEHV-TROTP)	\$ 28.67	6	\$ -	\$ 23.18	\$ 3.34	\$ 0.20	\$ 0.53	\$ 0.09	\$ 0.71	\$ 0.62	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2020	588_A_1 (LWSVW-LWVTT)	\$ 28.19	7	\$ 0.76	\$ 1.98	\$ 5.35	\$ 12.86	\$ 4.99	\$ 1.83	\$ 0.29	\$ 0.13	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2020	6265_A (EMSES-MRSDO)	\$ 25.82	8	\$ 1.33	\$ 0.10	\$ 0.00	\$ 0.28	\$ 1.23	\$ 9.23	\$ 6.87	\$ 6.77	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2020	STPWAP39_1 (STP-WAP)	\$ 17.77	9	\$ 0.00	\$ 0.07	\$ 0.00	\$ 0.08	\$ 0.62	\$ 3.21	\$ 10.08	\$ 3.69	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2020	NEDIN_XFMRS (NEDIN-NEDIN)	\$ 16.05	10	\$ 0.05	\$ 0.18	\$ 0.24	\$ 0.05	\$ 2.42	\$ 0.17	\$ 0.39	\$ 12.53	\$ -	\$ -	\$ -	\$ -	

[Home <<](#)

[previous <<](#)

[next >>](#)

[chart 1](#)

[chart 2](#)

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	\$ 58.60	1	\$ 8.27	\$ 6.36	\$ 12.75	\$ 20.43	\$ 5.85	\$ 2.33	\$ 0.88	\$ 0.81	\$ 0.92	\$ -	\$ -	\$ -	
N	2020	HB SOUTH-LZ SOUTH	\$ 12.70	2	\$ 0.87	\$ 0.75	\$ 1.00	\$ 1.25	\$ 1.54	\$ 2.00	\$ 1.83	\$ 1.53	\$ 1.94	\$ -	\$ -	\$ -	
N	2020	AEEC-LZ WEST	\$ 7.41	3	\$ 1.44	\$ 1.69	\$ 1.27	\$ 1.14	\$ 0.74	\$ 0.43	\$ 0.22	\$ 0.18	\$ 0.29	\$ -	\$ -	\$ -	
N	2020	HB NORTH-HB HOUSTON	\$ 7.09	4	\$ 0.18	\$ 0.10	\$ 0.58	\$ 0.95	\$ 0.87	\$ 1.27	\$ 0.84	\$ 1.18	\$ 1.13	\$ -	\$ -	\$ -	
N	2020	HB NORTH-LZ NORTH	\$ 4.87	5	\$ 0.41	\$ 0.42	\$ 0.34	\$ 0.33	\$ 0.44	\$ 0.60	\$ 0.86	\$ 0.85	\$ 0.62	\$ -	\$ -	\$ -	
N	2020	HB PAN-HB WEST	\$ 4.54	6	\$ 0.44	\$ 1.45	\$ 0.01	\$ 0.18	\$ 0.08	\$ 0.15	\$ 2.00	\$ 0.19	\$ 0.04	\$ -	\$ -	\$ -	
N	2020	HB HOUSTON-LZ HOUSTON	\$ 2.57	7	\$ 0.24	\$ 0.17	\$ 0.21	\$ 0.19	\$ 0.31	\$ 0.31	\$ 0.26	\$ 0.43	\$ 0.46	\$ -	\$ -	\$ -	
N	2020	HB WEST-HB NORTH	\$ 2.41	8	\$ 0.00	\$ 0.44	\$ 0.33	\$ 0.28	\$ 0.66	\$ 0.30	\$ 0.18	\$ 0.07	\$ 0.14	\$ -	\$ -	\$ -	
N	2020	JACKCNTY STG-LZ NORTH	\$ 1.22	9	\$ 0.03	\$ 0.00	\$ 0.33	\$ 0.01	\$ 0.11	\$ 0.17	\$ 0.19	\$ 0.15	\$ 0.22	\$ -	\$ -	\$ -	
N	2020	HB WEST-HB HOUSTON	\$ 1.22	10	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.01	\$ 1.13	\$ 0.01	\$ 0.02	\$ 0.00	\$ 0.04	\$ -	\$ -	\$ -	
Y	2020	HB WEST-LZ WEST	\$ 12.08	1	\$ 3.91	\$ 1.02	\$ 0.85	\$ 3.48	\$ 1.35	\$ 0.71	\$ 0.22	\$ 0.46	\$ 0.29	\$ -	\$ -	\$ -	
Y	2020	HB SOUTH-LZ SOUTH	\$ 7.66	2	\$ 0.53	\$ 0.32	\$ 0.57	\$ 0.33	\$ 1.08	\$ 1.37	\$ 1.27	\$ 1.23	\$ 0.96	\$ -	\$ -	\$ -	
Y	2020	HB WEST-NWF NWF1	\$ 3.87	3	\$ 0.55	\$ 0.59	\$ 0.50	\$ 2.10	\$ 0.13	\$ 0.01	\$ 0.00	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2020	HB NORTH-LZ NORTH	\$ 2.91	4	\$ 0.16	\$ 0.32	\$ 0.33	\$ 0.51	\$ 0.38	\$ 0.21	\$ 0.37	\$ 0.37	\$ 0.26	\$ -	\$ -	\$ -	
Y	2020	LZ WEST-NWF NWF1	\$ 2.42	5	\$ 0.05	\$ 0.41	\$ 0.43	\$ 1.38	\$ 0.16	\$ 0.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2020	OECCS 1-PB2SES CT5	\$ 2.02	6	\$ 1.03	\$ 0.22	\$ -	\$ 0.59	\$ 0.12	\$ 0.01	\$ 0.03	\$ 0.00	\$ 0.02	\$ -	\$ -	\$ -	
Y	2020	HB HOUSTON-LZ HOUSTON	\$ 1.85	7	\$ 0.16	\$ 0.06	\$ 0.13	\$ 0.17	\$ 0.28	\$ 0.27	\$ 0.16	\$ 0.20	\$ 0.22	\$ -	\$ -	\$ -	
Y	2020	WOO WOODWRD2-RIGGIN UNIT1	\$ 1.64	8	\$ 0.09	\$ -	\$ 0.85	\$ 0.32	\$ 0.16	\$ 0.01	\$ 0.01	\$ 0.13	\$ 0.07	\$ -	\$ -	\$ -	
Y	2020	HB WEST-HOVEY GEN	\$ 1.57	9	\$ -	\$ 0.29	\$ -	\$ 0.81	\$ 0.35	\$ 0.02	\$ 0.00	\$ 0.04	\$ 0.06	\$ -	\$ -	\$ -	
Y	2020	WOO WOODWRD1-RIGGIN UNIT1	\$ 1.17	10	\$ 0.31	\$ 0.13	\$ 0.12	\$ 0.45	\$ 0.01	\$ 0.02	\$ 0.01	\$ 0.04	\$ 0.09	\$ -	\$ -	\$ -	

[Home <<](#)

[previous <<](#)

[chart 1](#)

[chart 2](#)