

To the Public Utility Commission of Texas

# ERCOT Wholesale Electricity Market Monthly Report

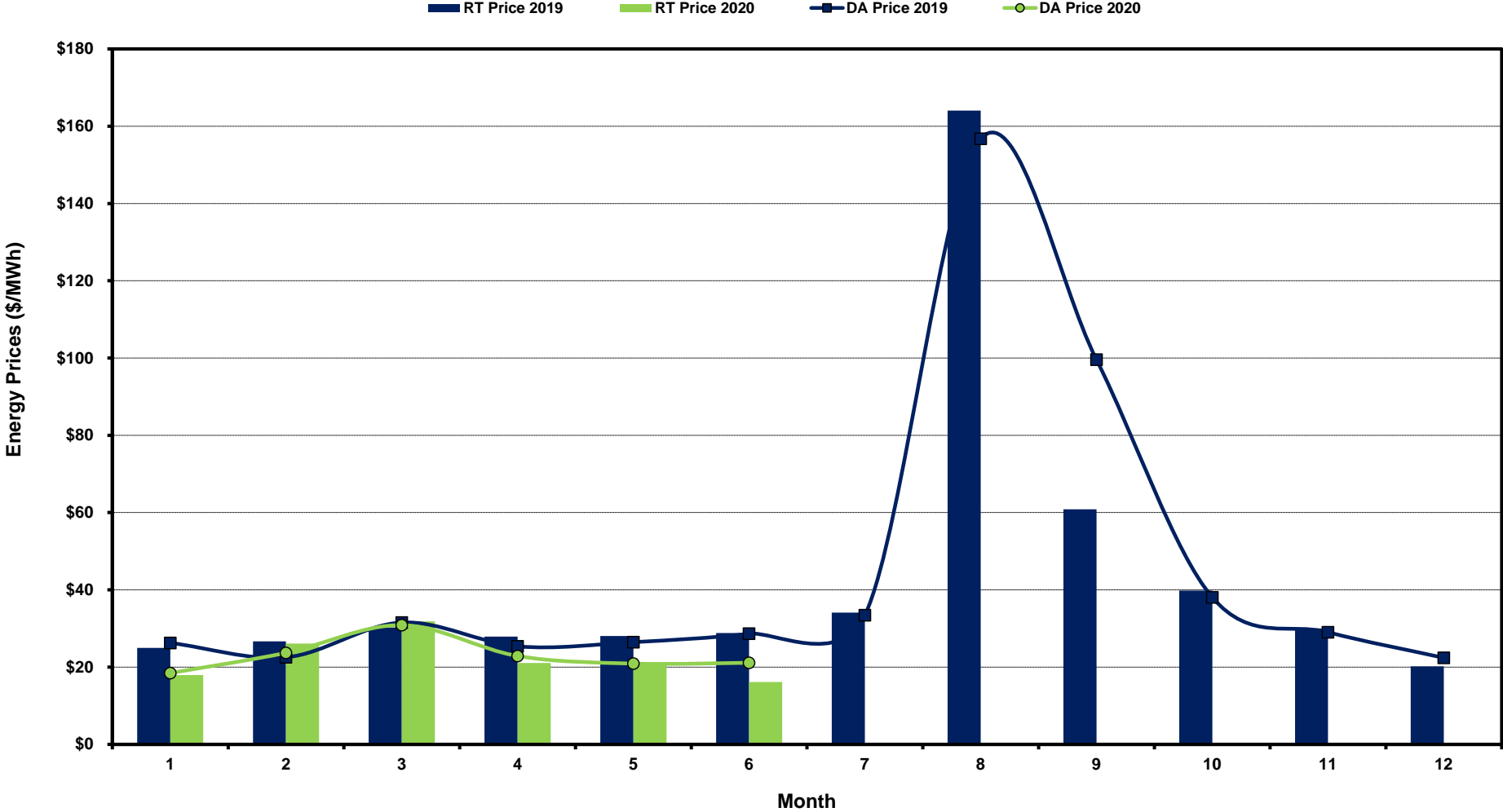
Friday, July 10, 2020

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 <<](#)

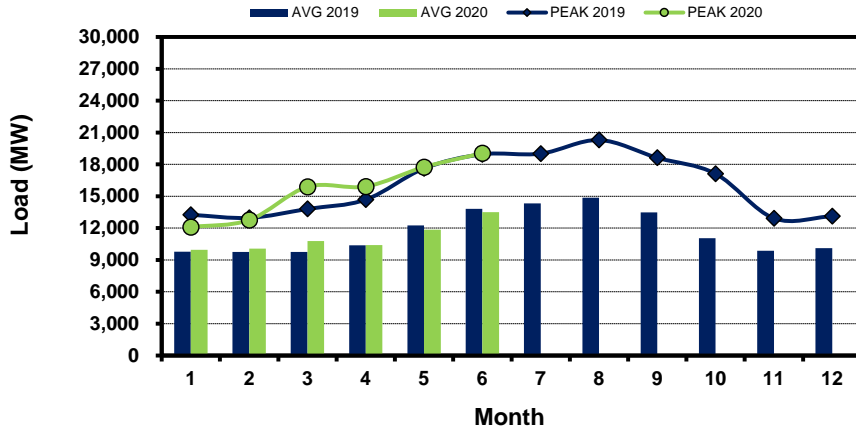
[next >>](#)

[data](#)

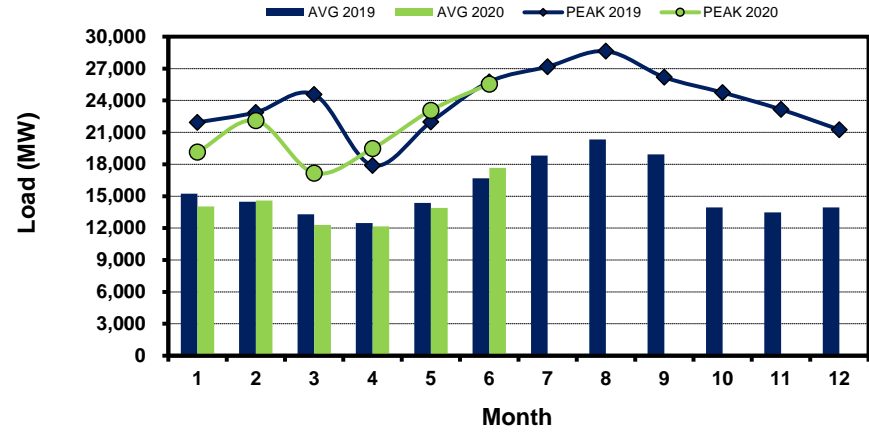
# Load Zone Load Statistics

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

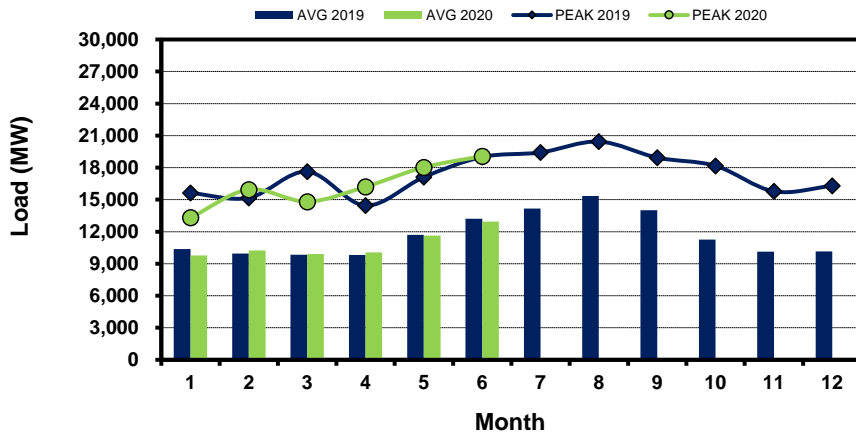
### Houston Zone



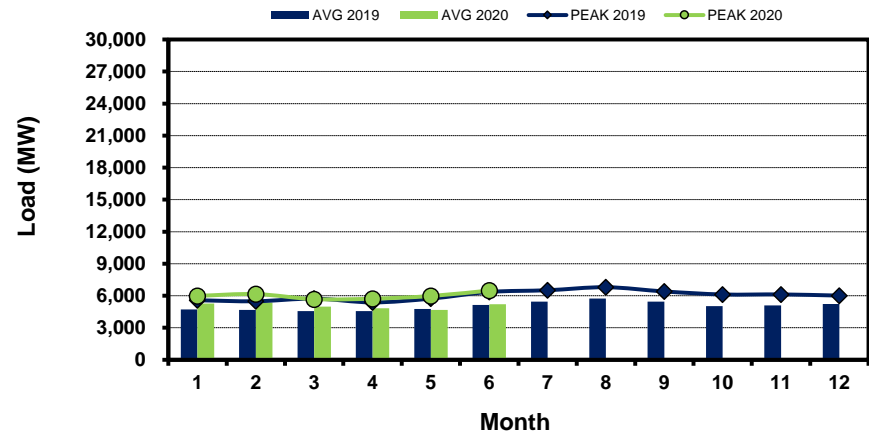
### North Zone



### South Zone



### West Zone



[Home <<](#)

[previous <<](#)

[next >>](#)

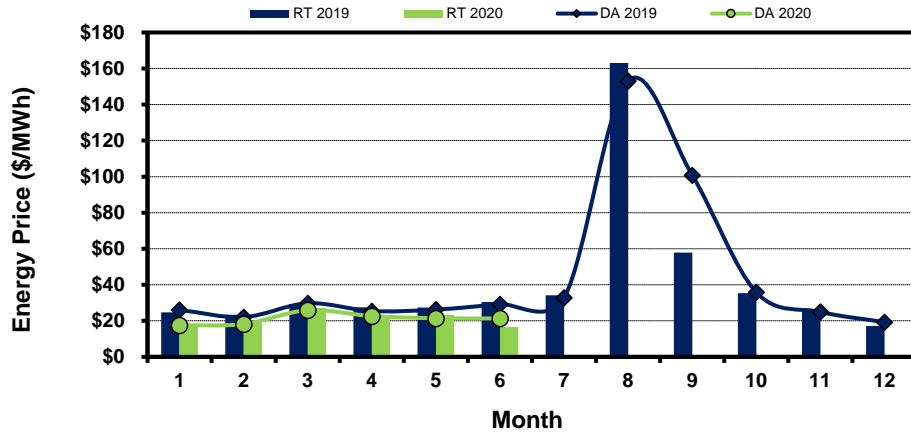
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**Note:** \* Zonal load zone definition vs. Nodal comparable load zone definition: LZ\_Houston=LZ\_Houston; LZ\_West=LZ\_West; LZ\_North=(LZ\_North,LZ\_RAYBN); LZ\_South=(LZ\_South,LZ\_CPS,LZ\_AEN,LZ\_LCRA)

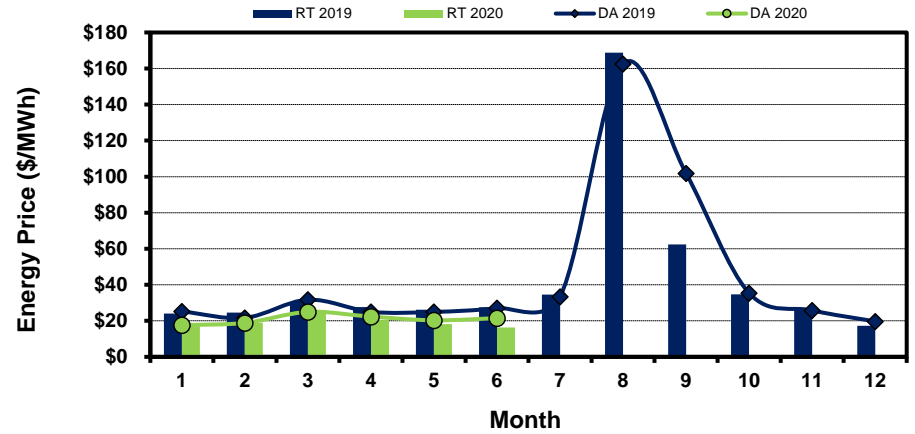
# Load Zone Monthly Average Energy Price DA vs RT

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

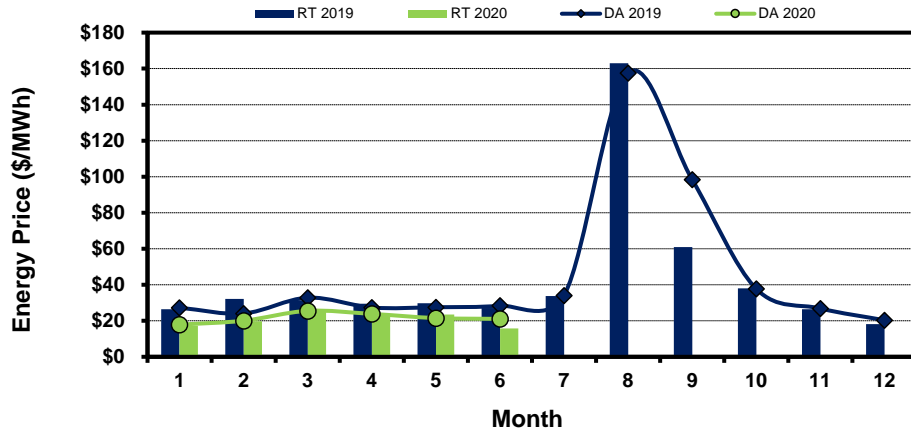
### Houston Zone



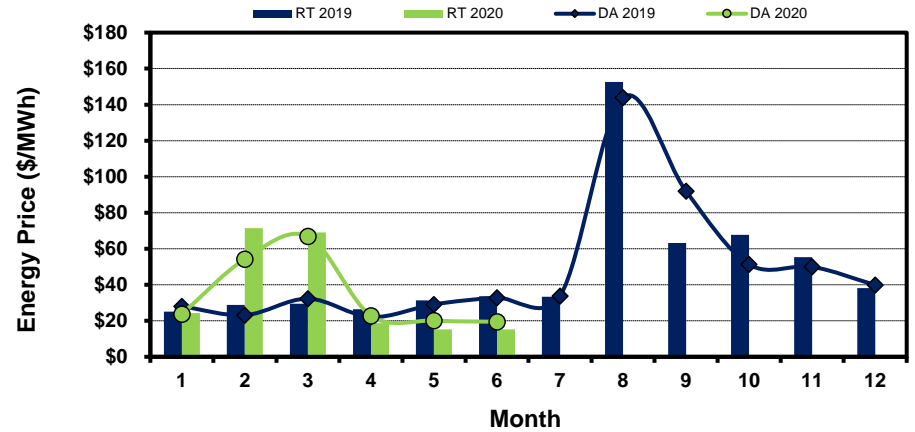
### North Zone



### South Zone



### West Zone



[Home <<](#)

[previous <<](#)

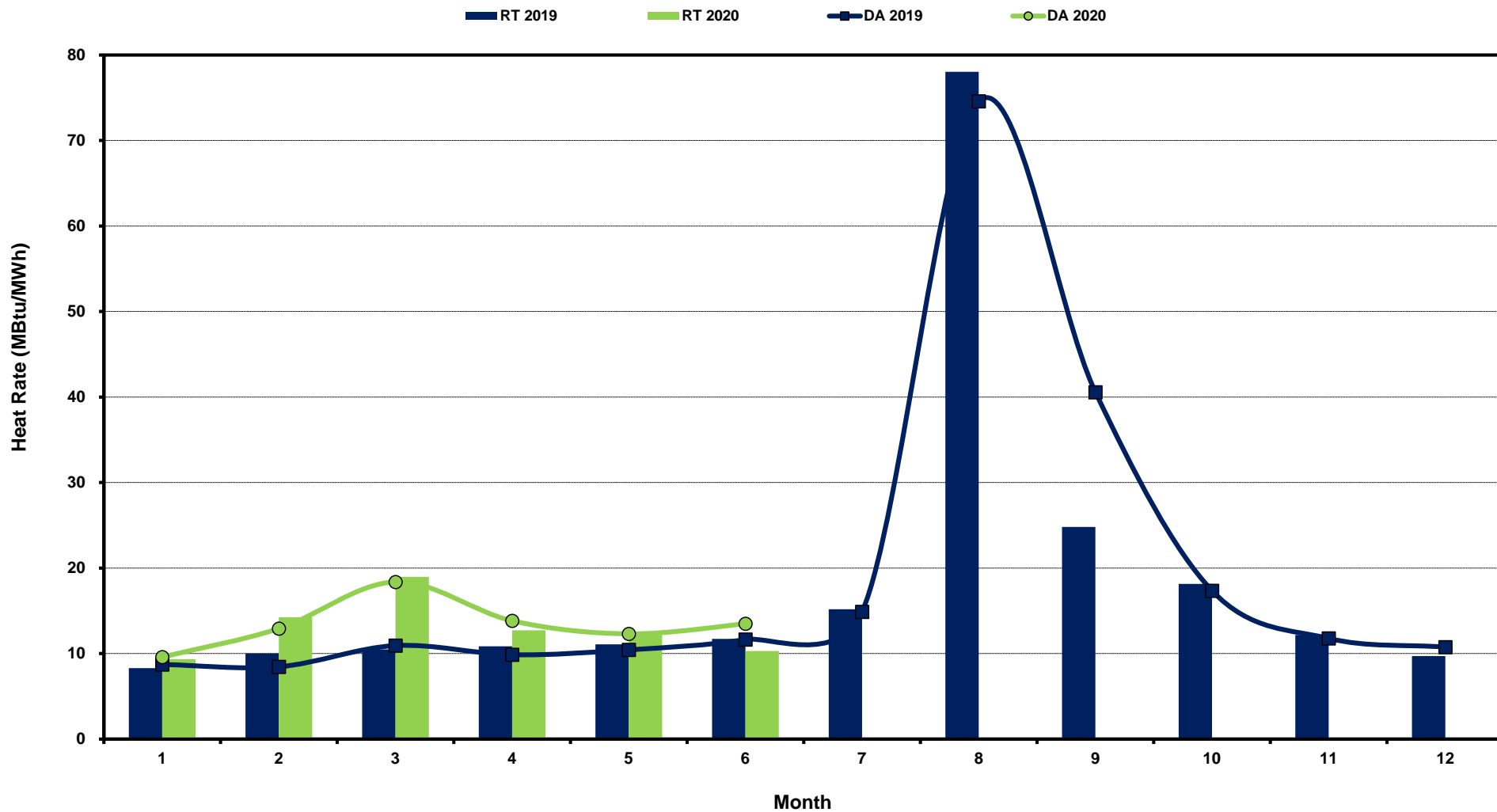
[next >>](#)

[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 <<](#)

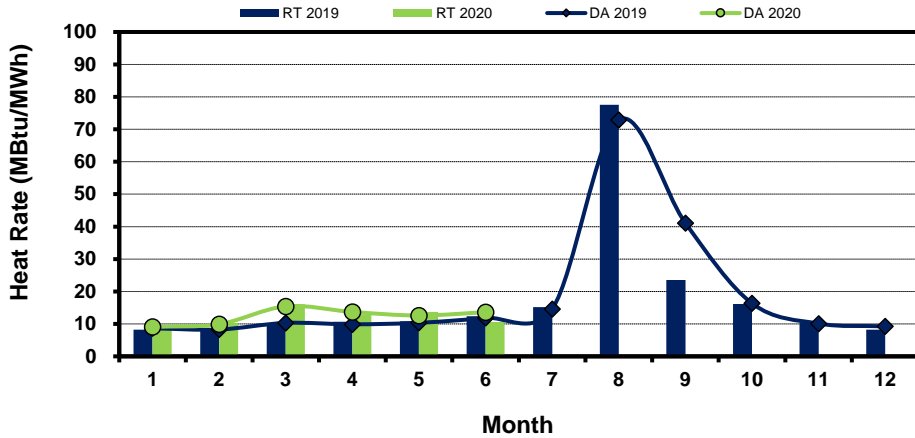
[next >>](#)

[data](#)

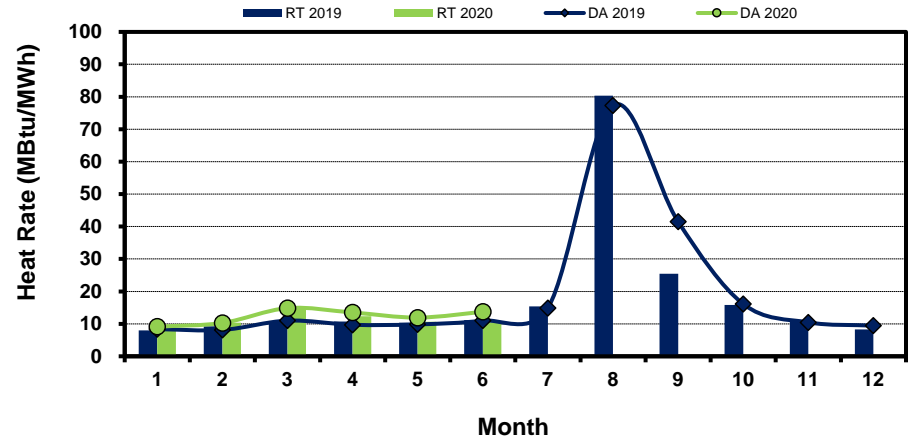
# Load Zone Monthly Implied Heat Rate DA vs RT

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

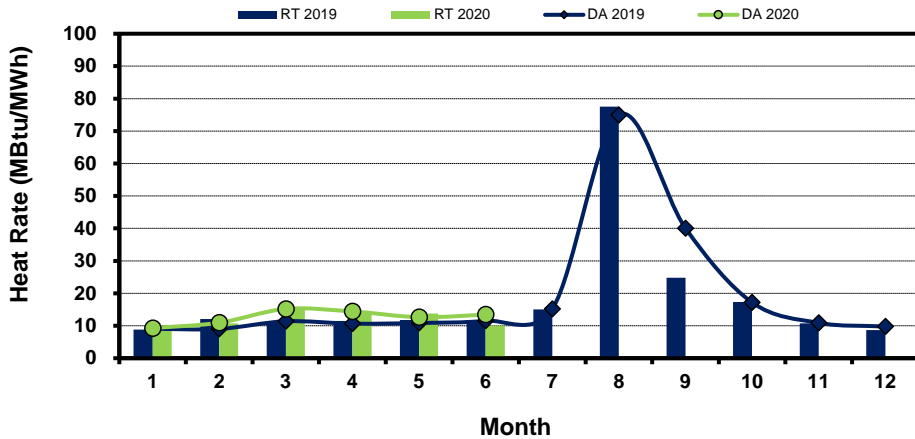
### Houston Zone



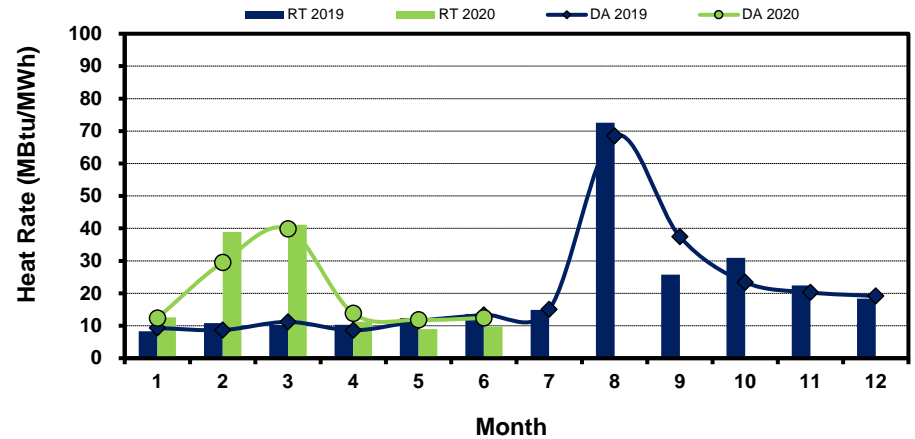
### North Zone



### South Zone



### West Zone



[Home <<](#)

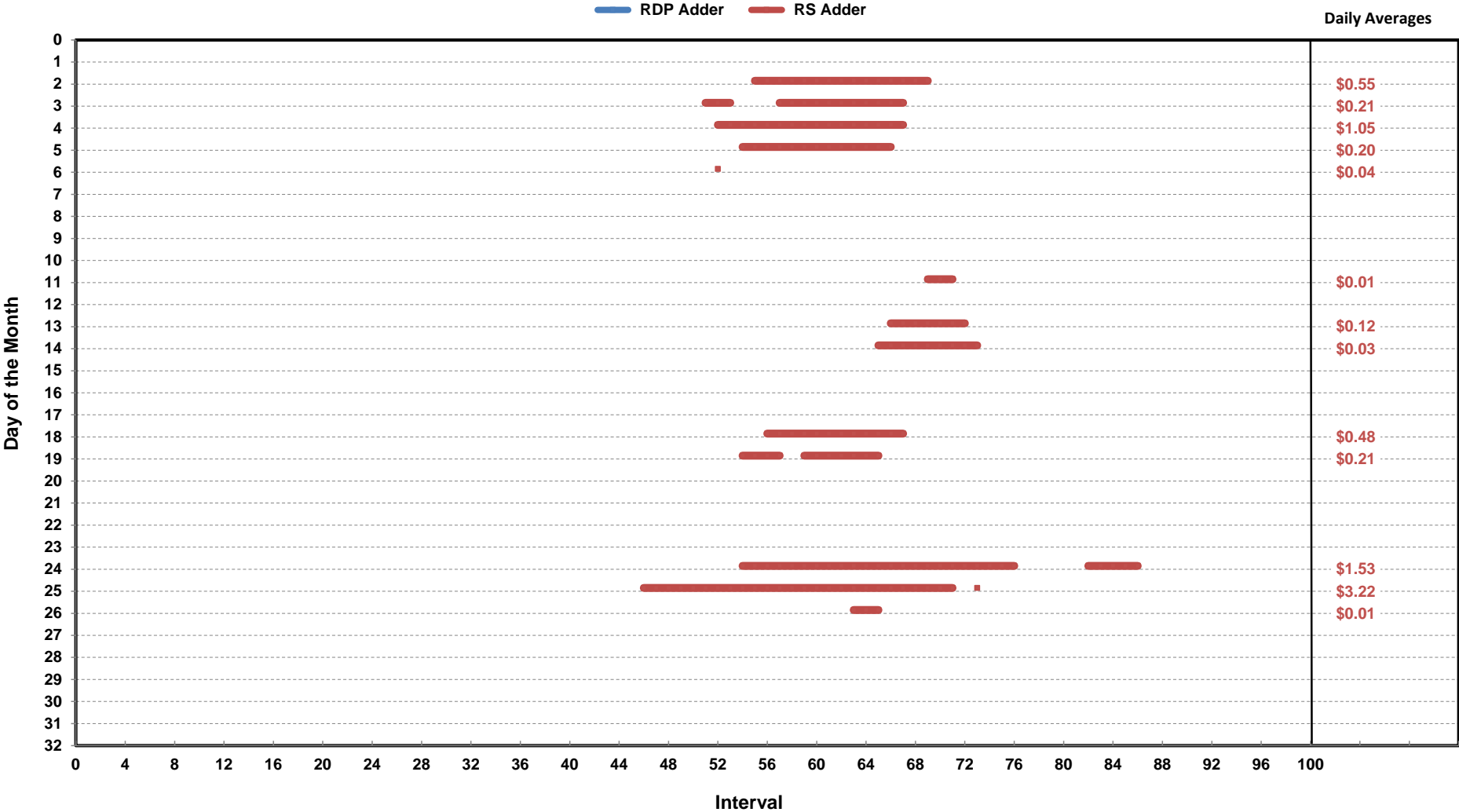
[previous <<](#)

[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)

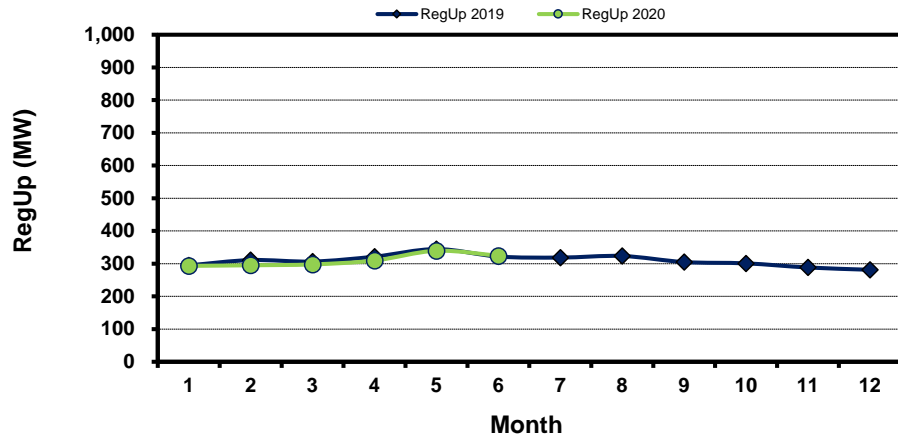
# Daily ORDC Adders Average Values and Interval Duration Jun-2020



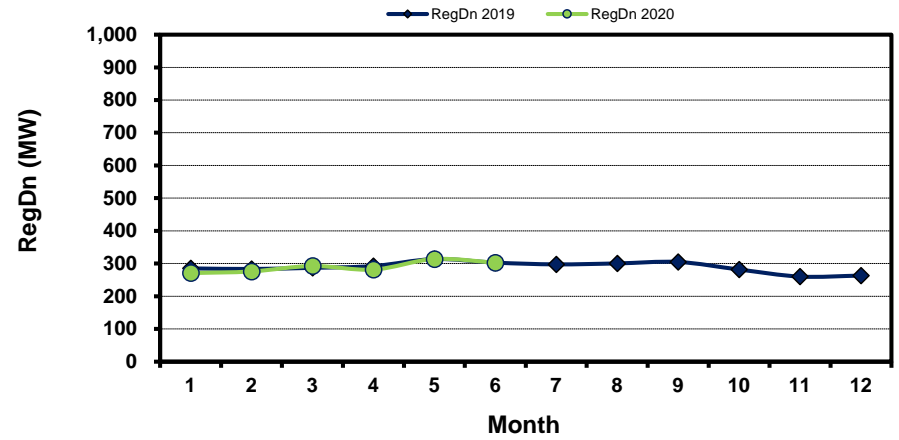
[Home <<](#)     
 [previous <<](#)     
 [next >>](#)  
[data](#)

# Monthly Average of Ancillary Services Required MW

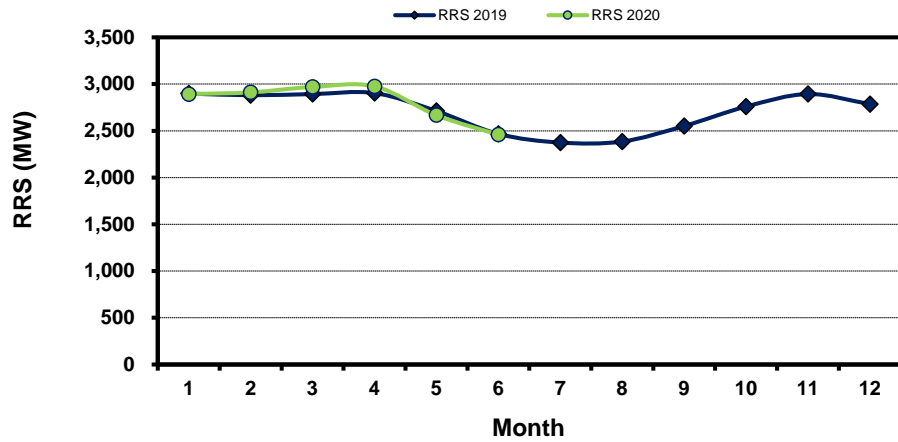
## Regulation Up



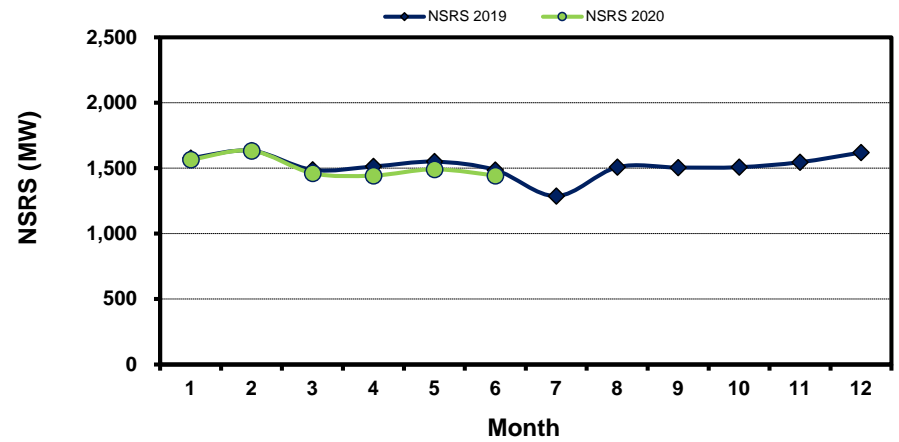
## Regulation Down



## Responsive Reserve



## Non-Spin Reserve



[Home <<](#)

[previous <<](#)

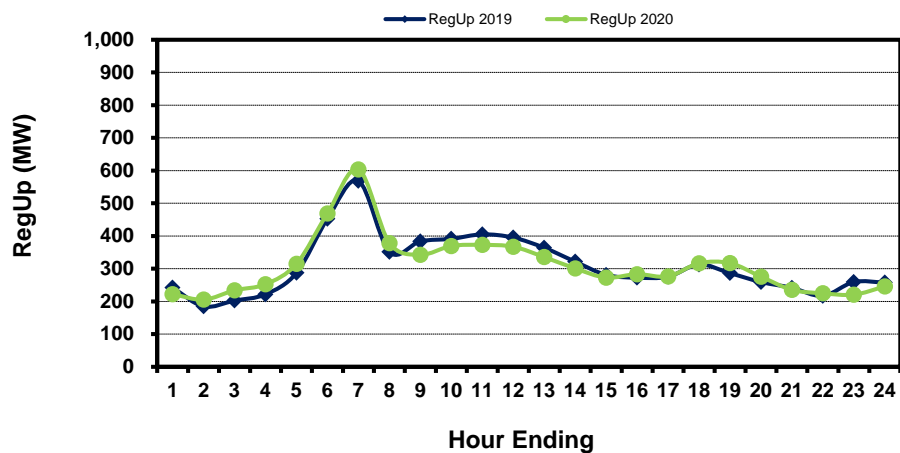
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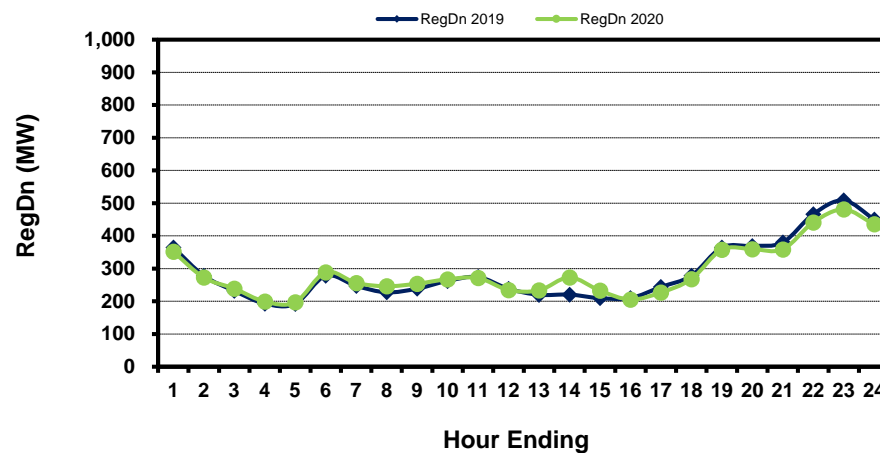


# Hourly Average of Ancillary Services Required MW

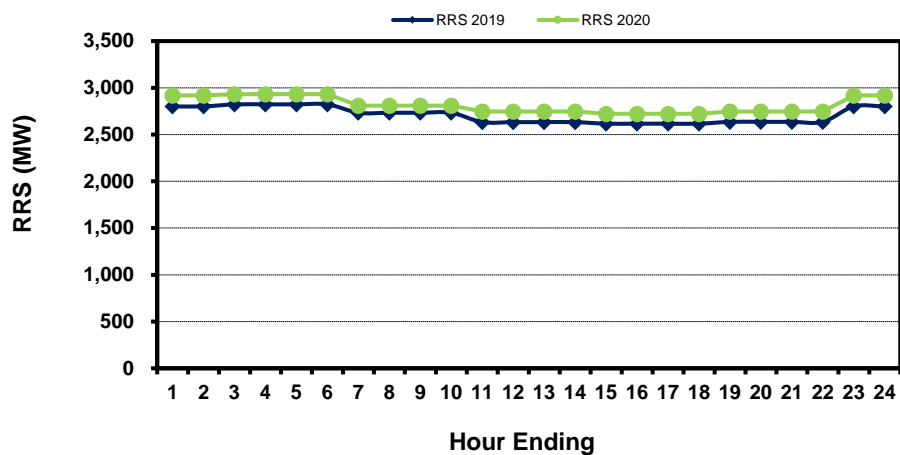
## Regulation Up



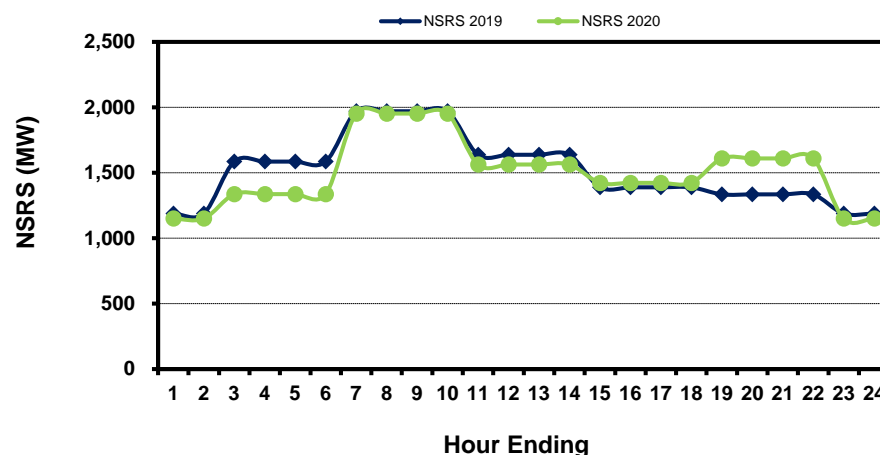
## Regulation Down



## Responsive Reserve



## Non-Spin Reserve



[Home <<](#)

[previous <<](#)

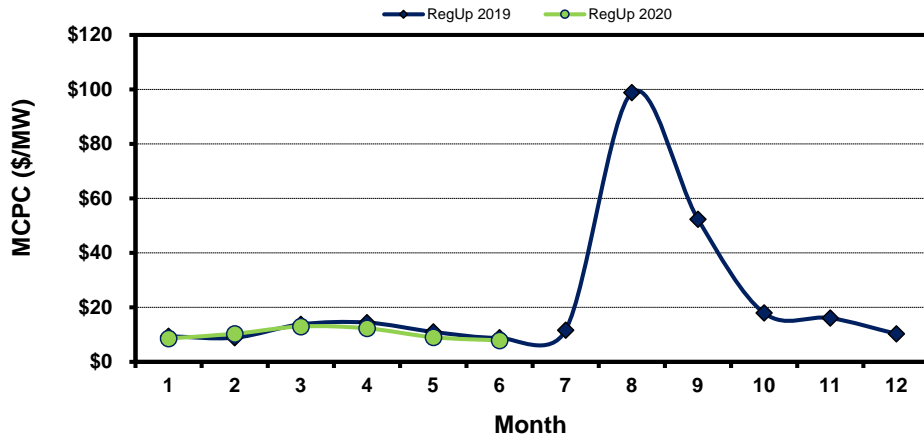
[next >>](#)

[data](#)

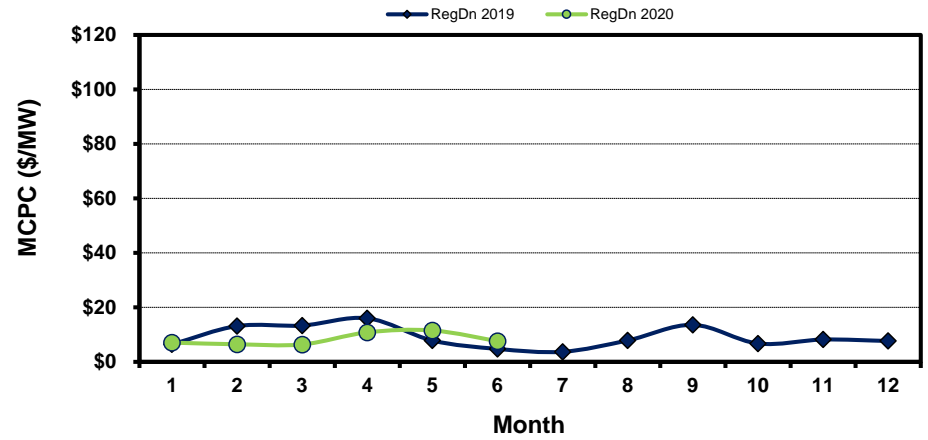
# Monthly Average Ancillary Services Price

(weighted by A/S Quantities Required)

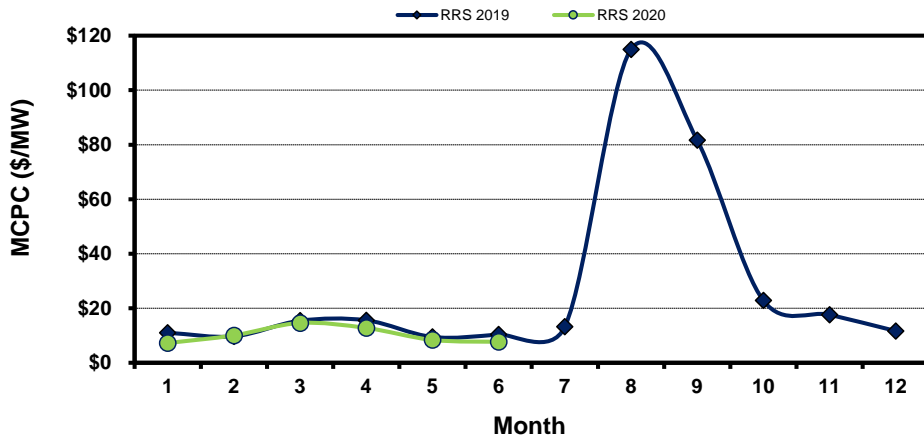
### Regulation Up



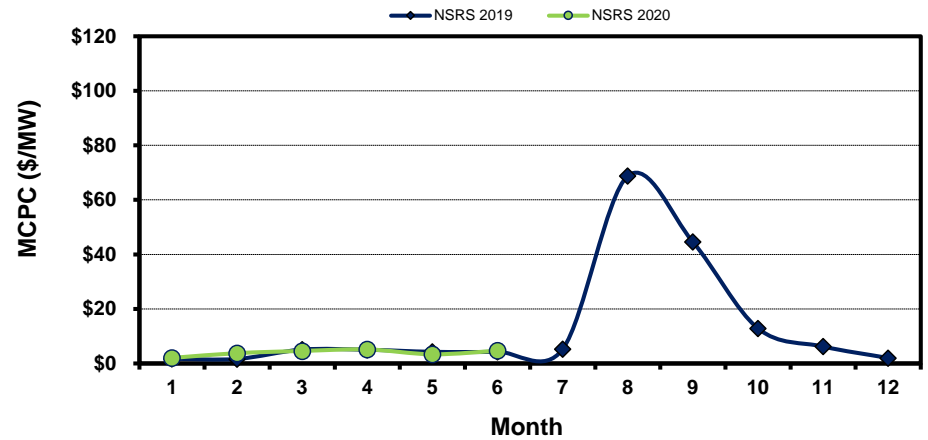
### Regulation Down



### Responsive Reserve



### Non-Spin Reserve



[Home <<](#)

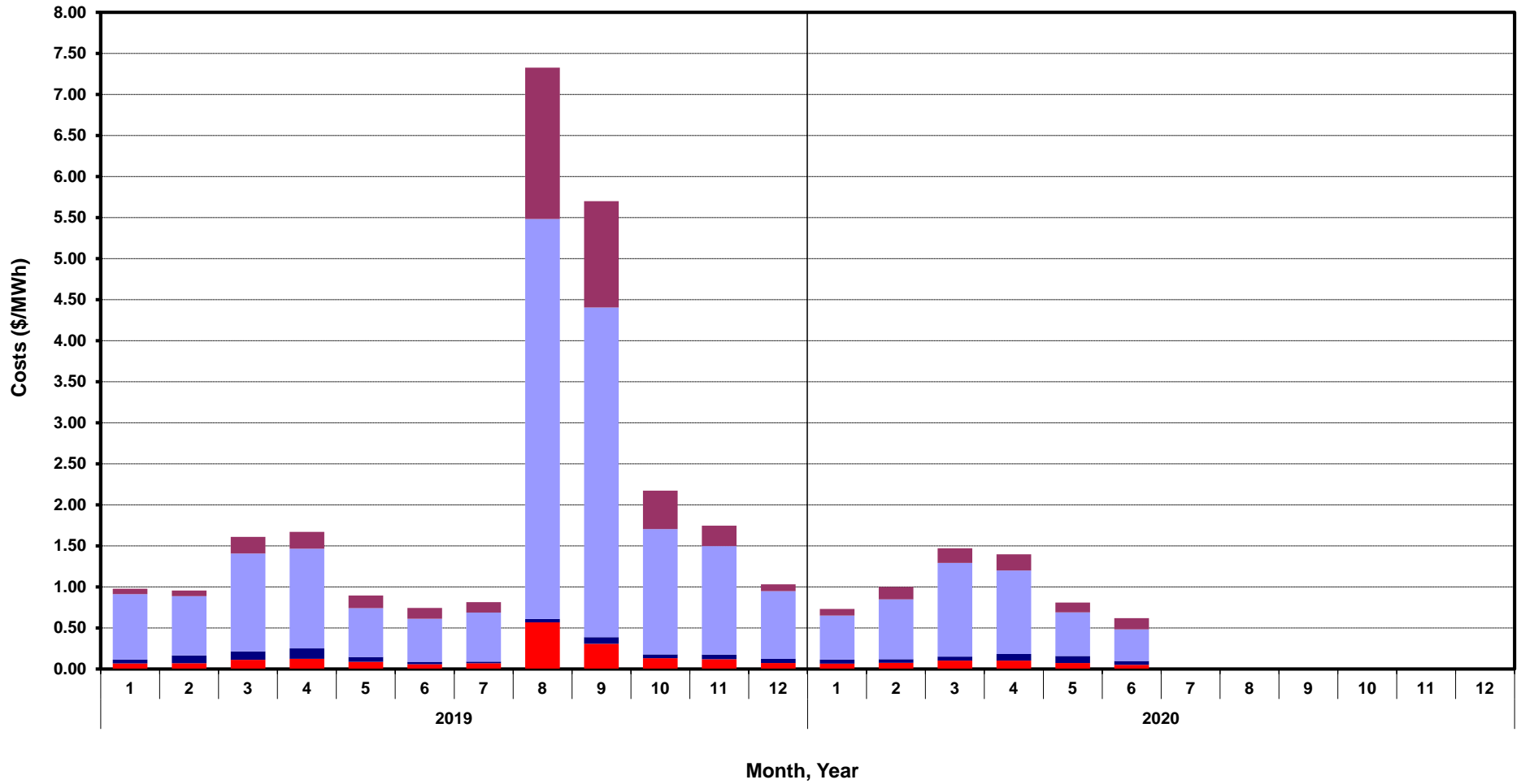
[previous <<](#)

[next >>](#)

[data](#)

# Monthly Average A/S Cost per MWh Load

RegUp RegDn RRS NonSpin



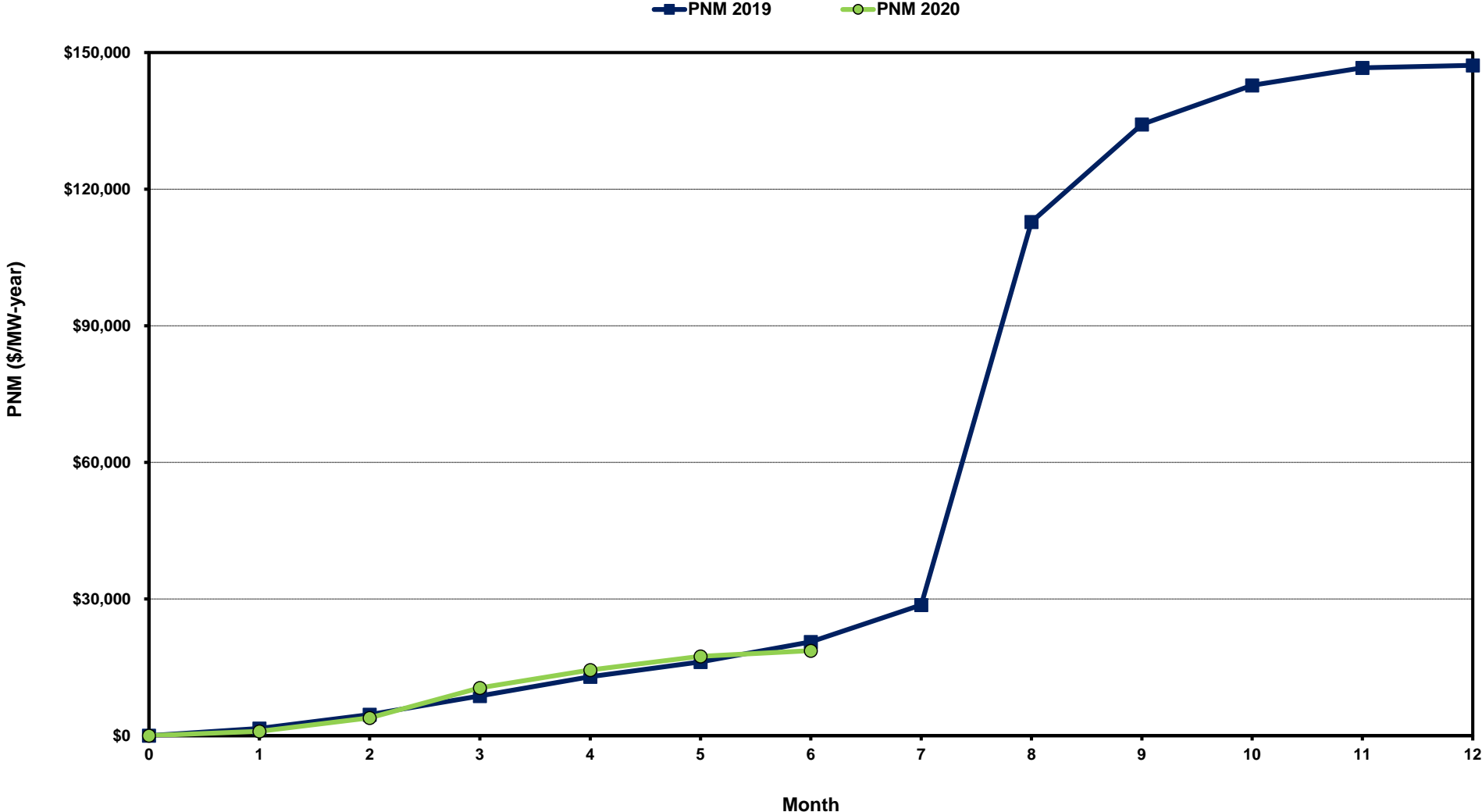
[Home <<](#)

[previous <<](#)

[next >>](#)

[data](#)

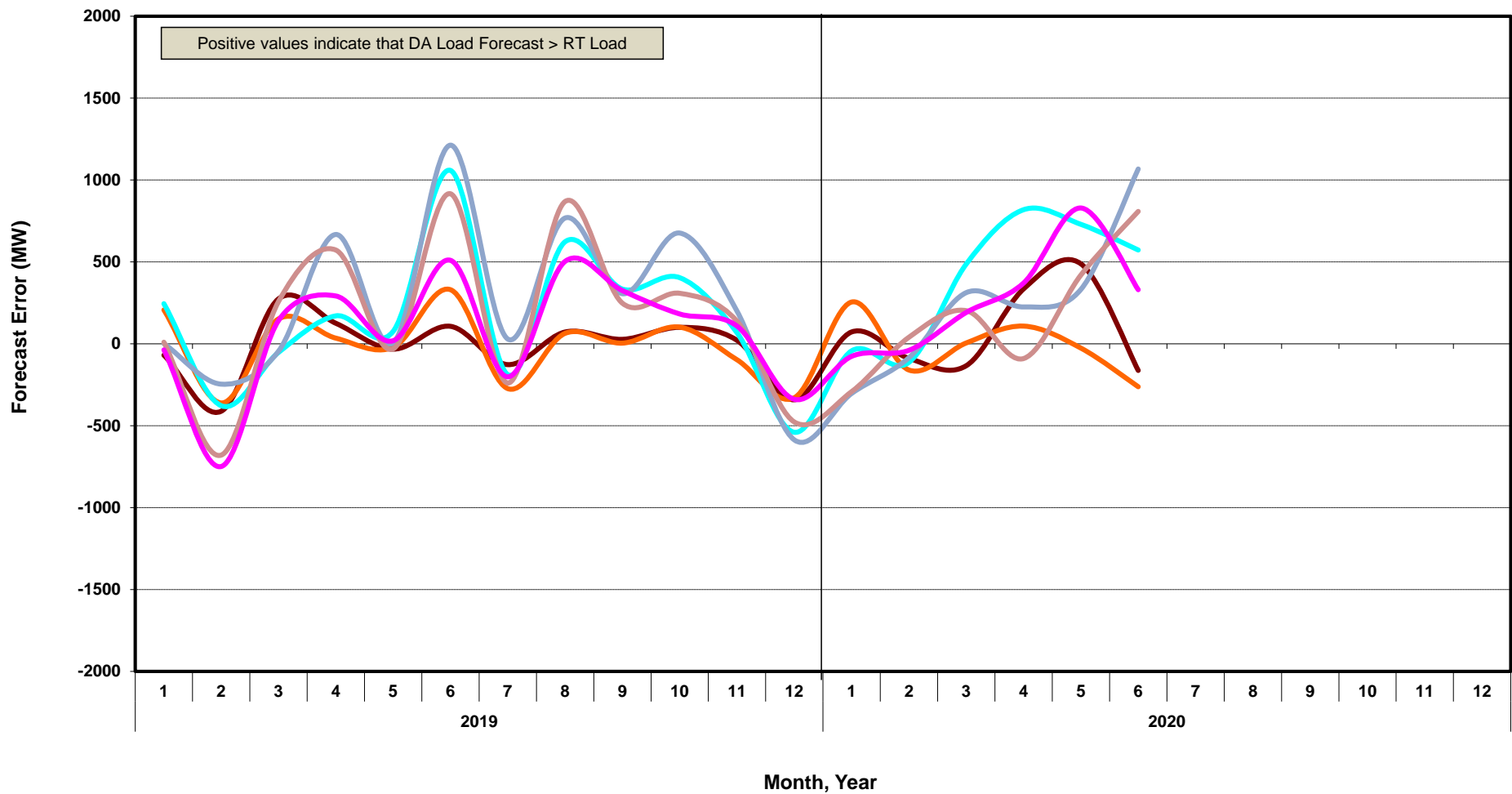
# ERCOT-wide Cumulative Peaker Net Margin



[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



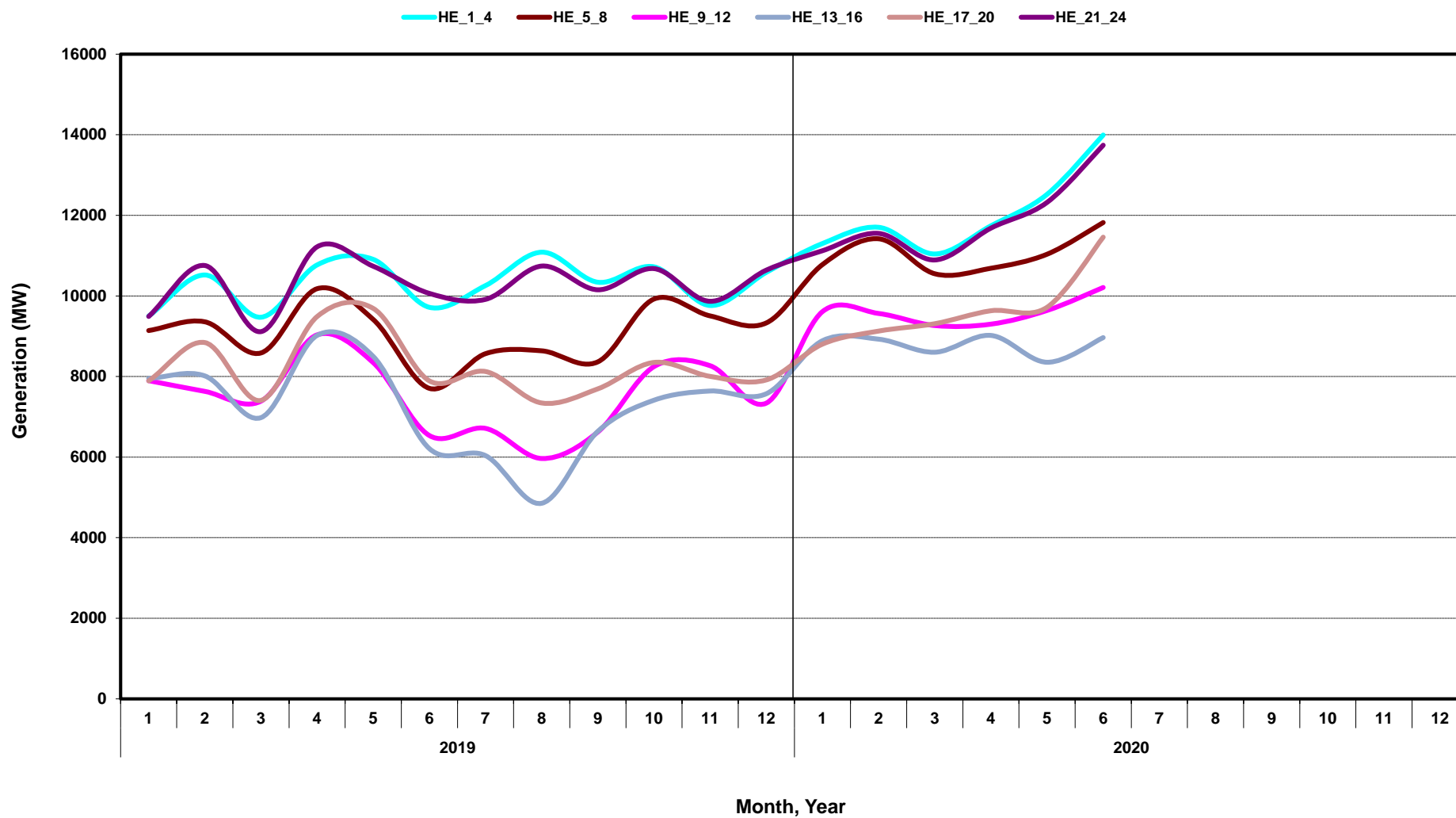
[Home <<](#)

[previous <<](#)

[next >>](#)

[data](#)

# Monthly Average of Wind Generation by Hour Ending



[Home <<](#)

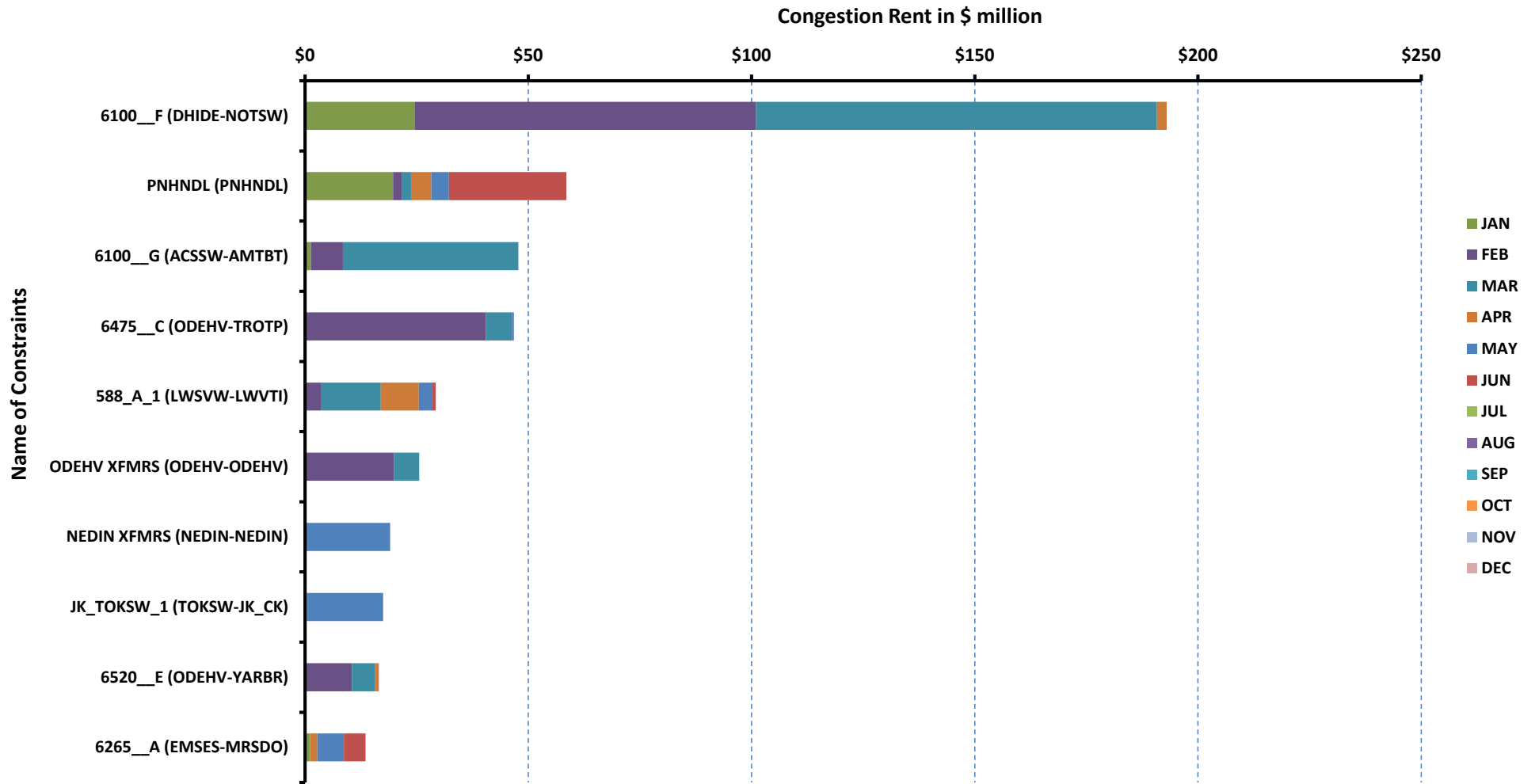
[previous <<](#)

[next >>](#)

[data](#)

# RT Congestion Constraint Rankings - 1

## Top 10 Constraints by Total Congestion Value - 2019



[Home <<](#)

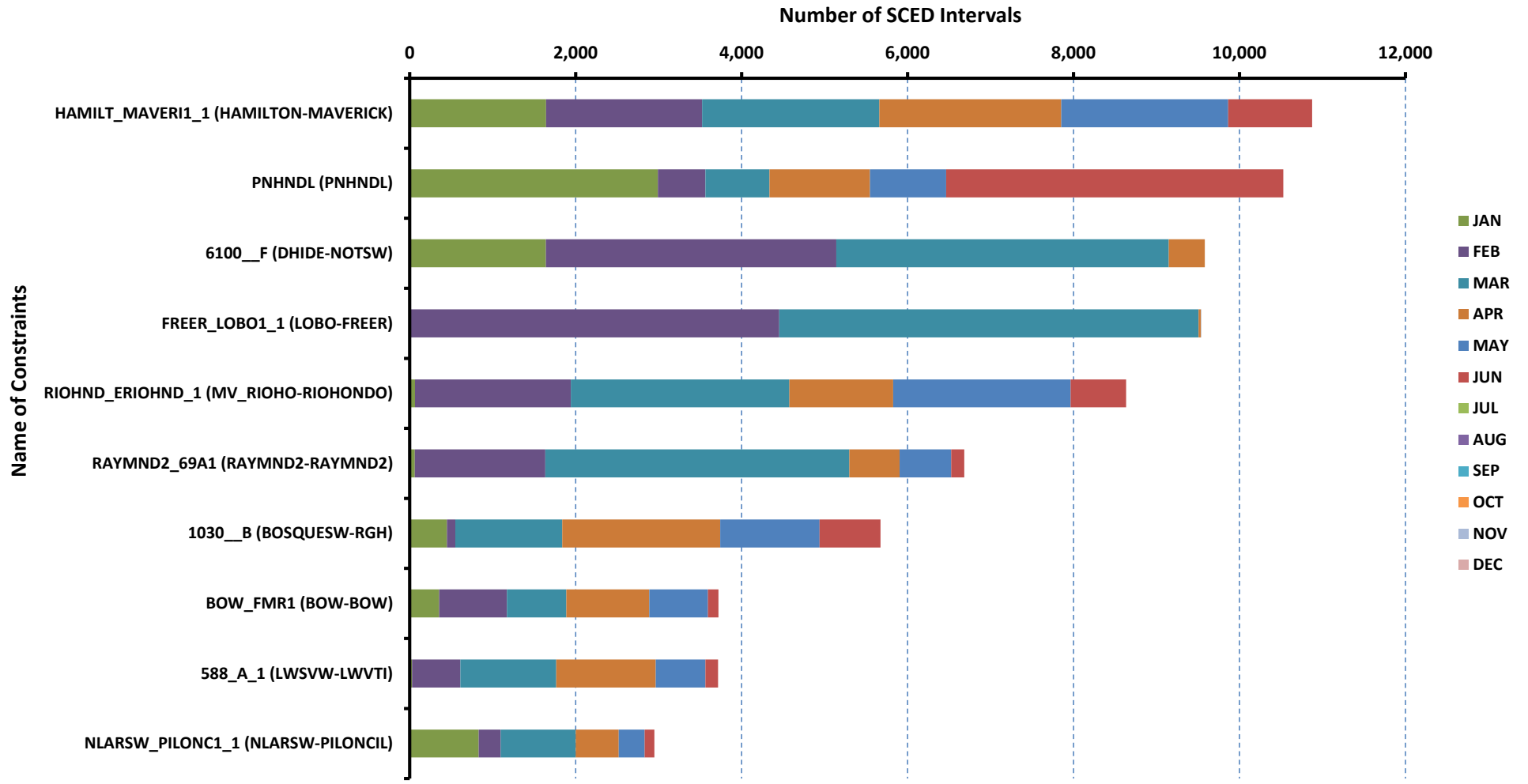
[previous <<](#)

[next >>](#)

[data](#)

# RT Congestion Constraint Rankings - 2

## Top 10 Constraints by Binding Frequency - 2019



[Home <<](#)

[previous <<](#)

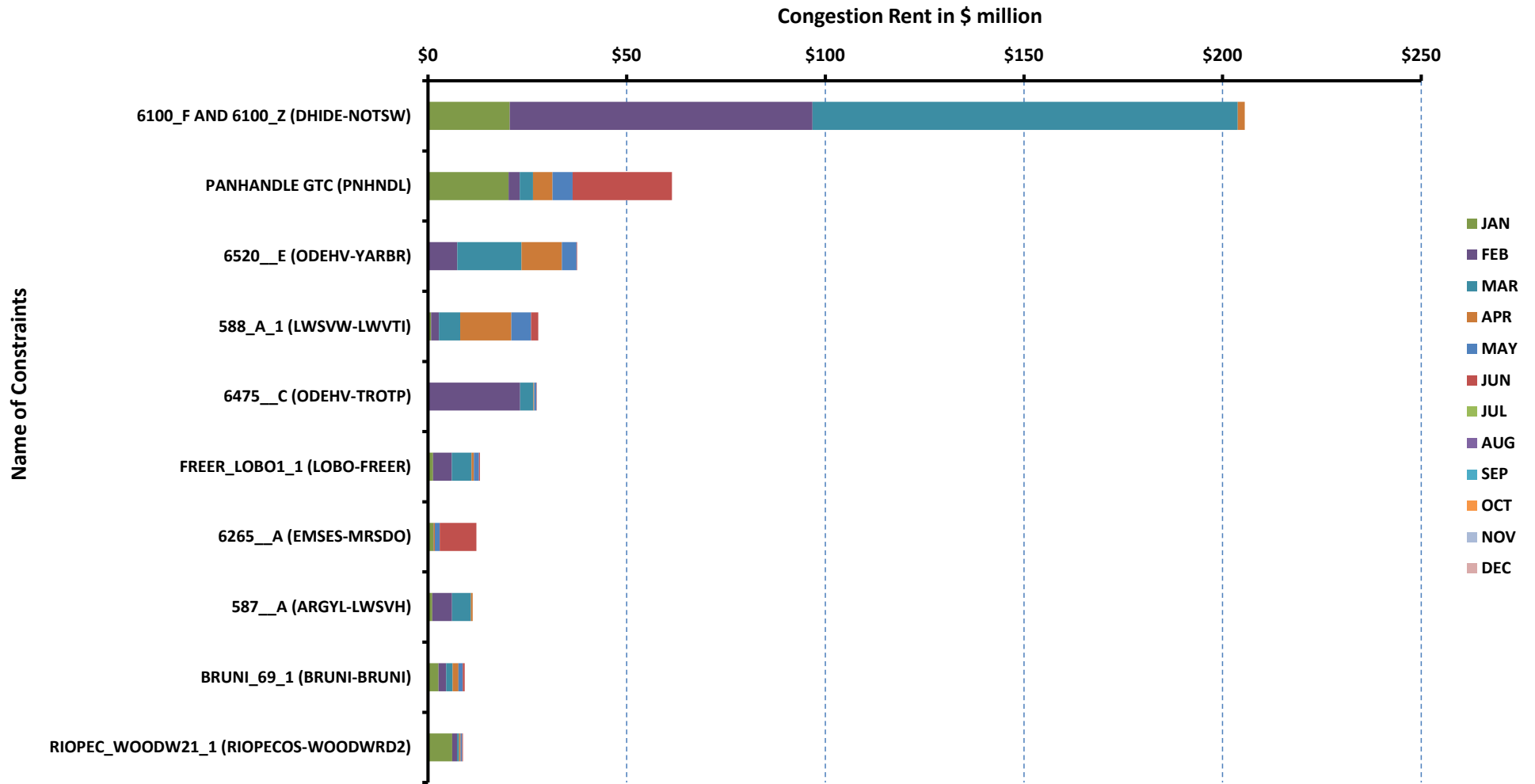
[next >>](#)

[data](#)



# DA Congestion Constraint Rankings - 1

## Top 10 Constraints by Total Congestion Value - 2019



[Home <<](#)

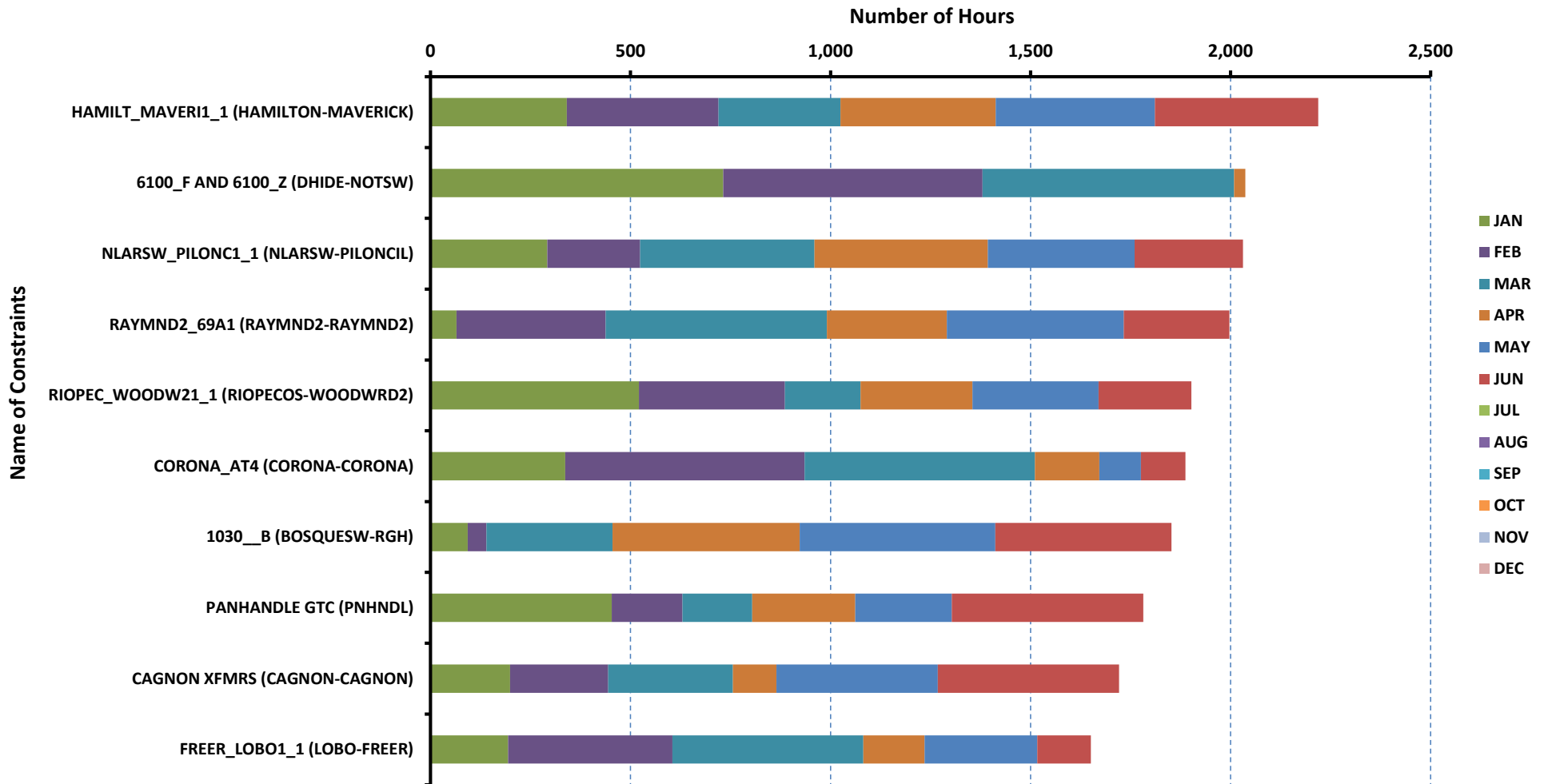
[previous <<](#)

[next >>](#)

[data](#)

# DA Congestion Constraint Rankings - 2

## Top 10 Constraints by Binding Frequency - 2019



[Home <<](#)

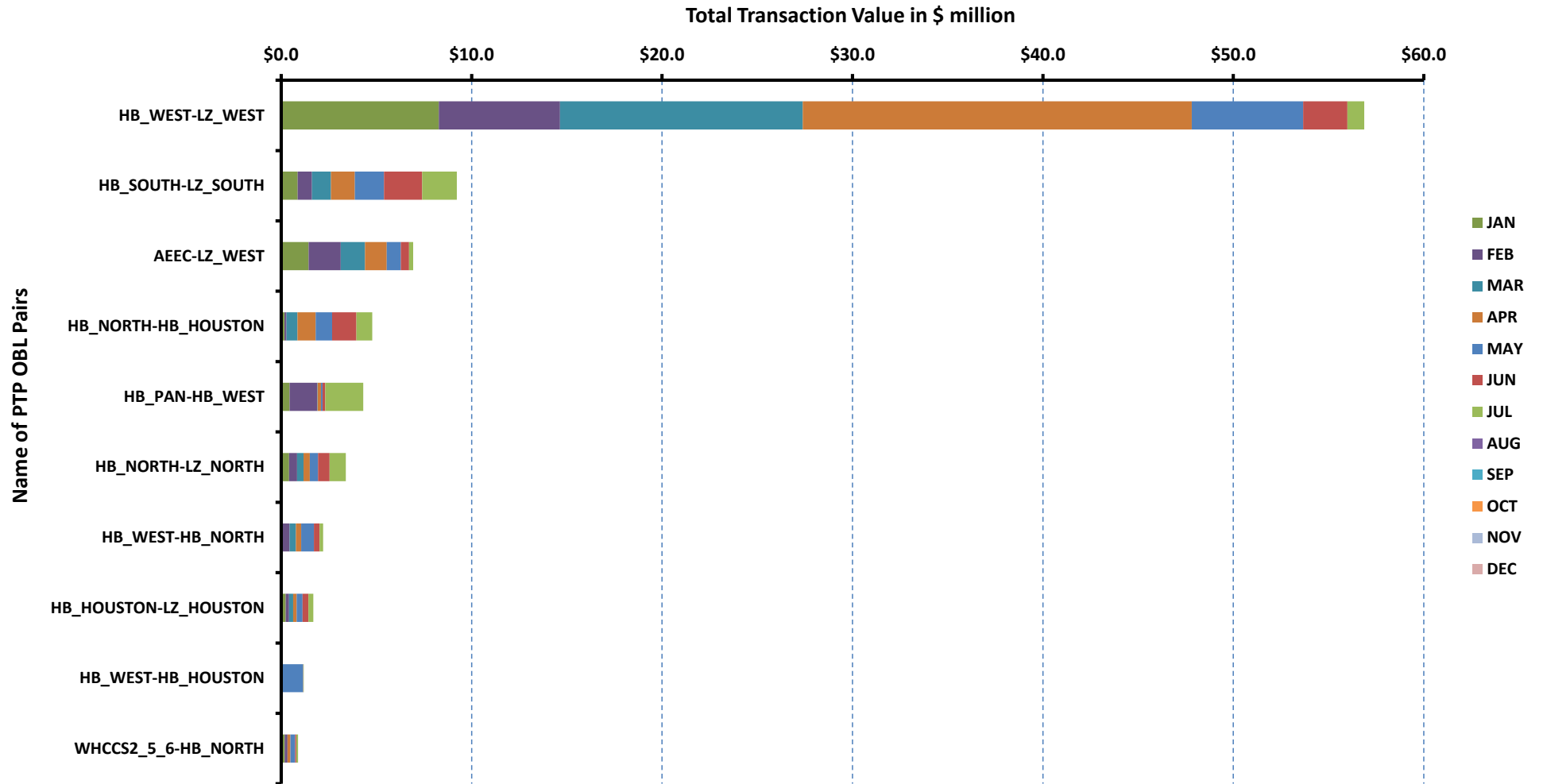
[previous <<](#)

[next >>](#)

[data](#)

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

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



[Home <<](#)

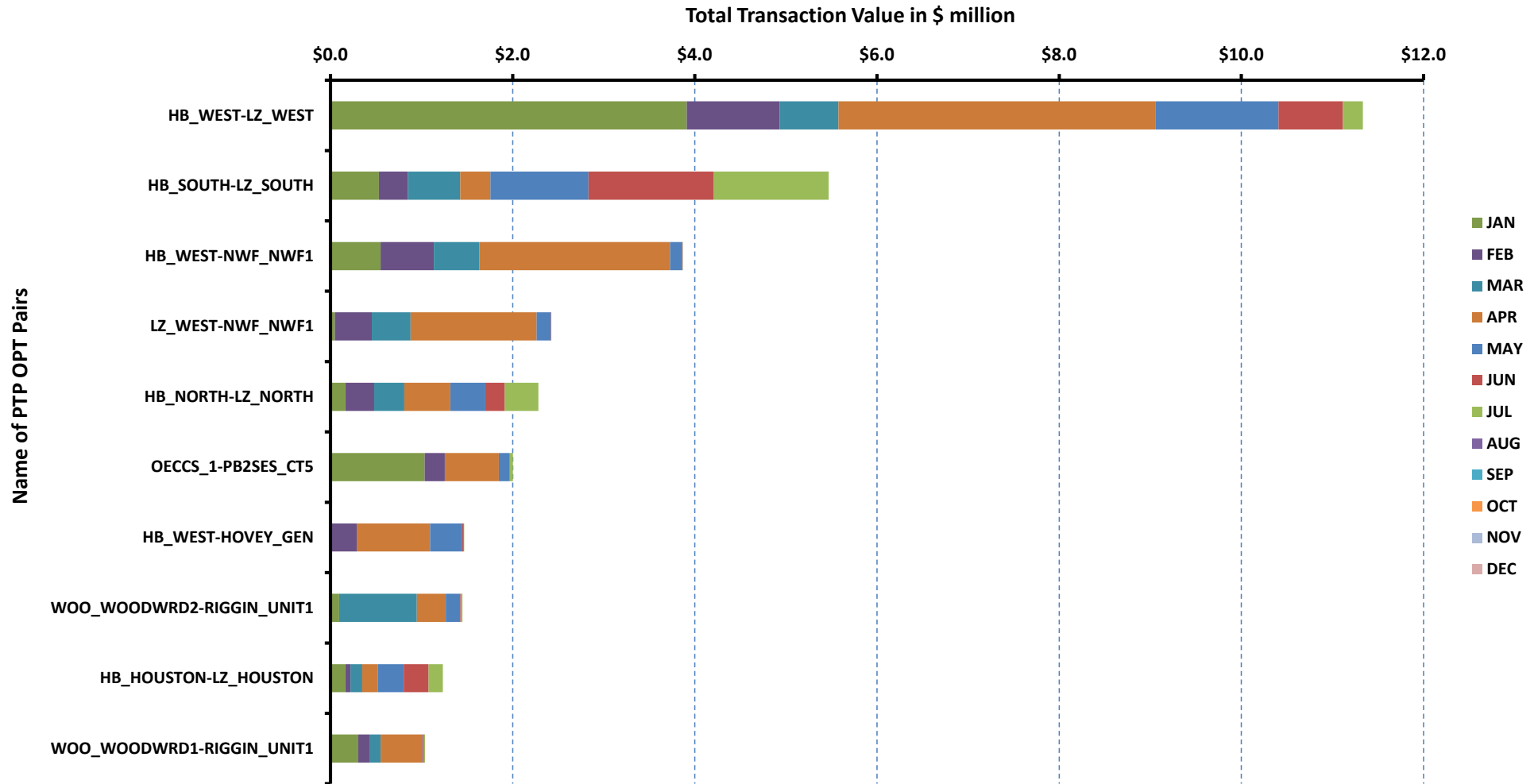
[previous <<](#)

[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	\$ 23.70	\$ 26.13
	3	\$ 30.87	\$ 31.87
	4	\$ 22.88	\$ 21.06
	5	\$ 20.92	\$ 20.72
	6	\$ 21.13	\$ 16.13
	7	\$ -	\$ -
	8	\$ -	\$ -
	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	5,988	9,948	14,027	9,780	5,281		
	2	12,764	22,114	15,943	6,154	10,075	14,584	10,236	5,355		
	3	15,889	17,180	14,814	5,679	10,783	12,306	9,899	4,985		
	4	15,919	19,484	16,207	5,724	10,406	12,159	10,058	4,831		
	5	17,747	23,076	18,030	5,974	11,858	13,891	11,628	4,662		
	6	19,047	25,538	19,060	6,490	13,510	17,658	12,954	5,195		
	7	-	-	-	-	-	-	-	-	-	
	8	-	-	-	-	-	-	-	-	-	
	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	\$ 23.74
	2	\$ 18.94	\$ 18.97	\$ 19.71	\$ 71.42	\$ 18.21	\$ 18.86	\$ 20.04	\$ 54.20
	3	\$ 27.02	\$ 26.01	\$ 25.72	\$ 69.02	\$ 25.88	\$ 24.93	\$ 25.52	\$ 66.94
	4	\$ 21.29	\$ 20.43	\$ 22.73	\$ 18.65	\$ 22.63	\$ 22.33	\$ 23.82	\$ 22.87
	5	\$ 23.28	\$ 18.11	\$ 23.42	\$ 15.20	\$ 21.42	\$ 20.28	\$ 21.50	\$ 20.10
	6	\$ 16.54	\$ 16.37	\$ 15.77	\$ 15.15	\$ 21.36	\$ 21.50	\$ 21.06	\$ 19.45
	7	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	8	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	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	\$ 26.13	14.25	\$ 23.70	12.92
	3	\$ 1.68	\$ 31.87	18.98	\$ 30.87	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	\$ -	\$ -	-	\$ -	-
	8	\$ -	\$ -	-	\$ -	-
	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	15.20	14.85	39.86	16.09	15.32	15.49	41.10
	4	13.68	14.40	13.50	13.83	12.87	13.74	12.35	11.27
	5	12.60	12.65	11.93	11.82	13.70	13.78	10.66	8.94
	6	13.64	13.45	13.73	12.42	10.56	10.07	10.45	9.67
	7	-	-	-	-	-	-	-	-
	8	-	-	-	-	-	-	-	-
	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	6	1	\$ -	\$ -	0	0	80	90
2020	6	2	\$ 0.55	\$ -	15	0	80	90
2020	6	3	\$ 0.21	\$ -	14	0	80	90
2020	6	4	\$ 1.05	\$ -	16	0	80	90
2020	6	5	\$ 0.20	\$ -	13	0	80	90
2020	6	6	\$ 0.04	\$ -	1	0	80	90
2020	6	7	\$ -	\$ -	0	0	80	90
2020	6	8	\$ -	\$ -	0	0	80	90
2020	6	9	\$ -	\$ -	0	0	80	90
2020	6	10	\$ -	\$ -	0	0	80	90
2020	6	11	\$ 0.01	\$ -	3	0	80	90
2020	6	12	\$ -	\$ -	0	0	80	90
2020	6	13	\$ 0.12	\$ -	7	0	80	90
2020	6	14	\$ 0.03	\$ -	9	0	80	90
2020	6	15	\$ -	\$ -	0	0	80	90
2020	6	16	\$ -	\$ -	0	0	80	90
2020	6	17	\$ -	\$ -	0	0	80	90
2020	6	18	\$ 0.48	\$ -	12	0	80	90
2020	6	19	\$ 0.21	\$ -	11	0	80	90
2020	6	20	\$ -	\$ -	0	0	80	90
2020	6	21	\$ -	\$ -	0	0	80	90
2020	6	22	\$ -	\$ -	0	0	80	90
2020	6	23	\$ -	\$ -	0	0	80	90
2020	6	24	\$ 1.53	\$ -	28	0	80	90
2020	6	25	\$ 3.22	\$ -	27	0	80	90
2020	6	26	\$ 0.01	\$ -	3	0	80	90
2020	6	27	\$ -	\$ -	0	0	80	90
2020	6	28	\$ -	\$ -	0	0	80	90
2020	6	29	\$ -	\$ -	0	0	80	90
2020	6	30	\$ -	\$ -	0	0	80	90
0	0	0	\$ -	\$ -	0	0	0	0

[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	-	-	-	-
	8	-	-	-	-
	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	352	1,150	2,920	222
	2	273	1,150	2,920	205
	3	239	1,337	2,932	234
	4	199	1,337	2,933	252
	5	197	1,337	2,933	315
	6	289	1,337	2,933	469
	7	256	1,953	2,809	604
	8	246	1,953	2,809	379
	9	254	1,953	2,809	343
	10	267	1,953	2,809	370
	11	271	1,563	2,746	373
	12	235	1,563	2,746	367
	13	233	1,563	2,746	336
	14	273	1,563	2,746	301
	15	233	1,423	2,722	273
	16	205	1,423	2,722	283
	17	227	1,423	2,722	276
	18	268	1,423	2,722	317
	19	358	1,610	2,746	317
	20	360	1,610	2,746	276
	21	359	1,610	2,746	235
	22	441	1,610	2,746	225
	23	481	1,150	2,920	221
	24	436	1,150	2,920	246

[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	\$ -	\$ -	\$ -	\$ -
	8	\$ -	\$ -	\$ -	\$ -
	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	\$ -	\$ -	\$ -	\$ -
	8	\$ -	\$ -	\$ -	\$ -
	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	\$ -	\$ -
	8	\$ -	\$ -
	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	-	-	-	-	-	-
	8	-	-	-	-	-	-
	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	-	-	-	-	-	-
	8	-	-	-	-	-	-
	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)	10,876	1	1,645	1,879	2,137	2,191	2,011	1,013	-	-	-	-	-	-	
FREQ_EXIST	2020	PNHNDL (PNHNDL)	10,529	2	2,990	573	774	1,210	919	4,063	-	-	-	-	-	-	
FREQ_EXIST	2020	6100_F (DHIDE-NOTSW)	9,582	3	1,642	3,500	4,006	434	-	-	-	-	-	-	-	-	
FREQ_EXIST	2020	FREER_LOBO1_1 (LOBO-FREER)	9,537	4	14	4,439	5,054	28	2	-	-	-	-	-	-	-	
FREQ_EXIST	2020	RIOHND_ERIOHND_1 (MV_RIOHO-RIOHONDO)	8,635	5	63	1,879	2,634	1,251	2,139	669	-	-	-	-	-	-	
FREQ_EXIST	2020	RAYMND2_69A1 (RAYMND2-RAYMND2)	6,683	6	62	1,573	3,663	605	623	157	-	-	-	-	-	-	
FREQ_EXIST	2020	1030_B (BOSQUESW-RGH)	5,675	7	450	100	1,289	1,904	1,196	736	-	-	-	-	-	-	
FREQ_EXIST	2020	BOW_FMR1 (BOW-BOW)	3,722	8	356	817	715	1,001	708	127	-	-	-	-	-	-	
FREQ_EXIST	2020	588_A_1 (LWSVW-LWVTI)	3,716	9	30	582	1,155	1,198	600	151	-	-	-	-	-	-	
FREQ_EXIST	2020	NLARSW_PILONC1_1 (NLARSW-PILONCIL)	2,949	10	832	265	904	518	312	118	-	-	-	-	-	-	
TOP10_RENT	2020	6100_F (DHIDE-NOTSW)	\$ 192.97	1	\$ 24.52	\$ 76.51	\$ 89.80	\$ 2.14	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2020	PNHNDL (PNHNDL)	\$ 58.54	2	\$ 19.72	\$ 1.94	\$ 2.07	\$ 4.53	\$ 3.96	\$ 26.32	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2020	6100_G (ACSSW-AMTBT)	\$ 47.79	3	\$ 1.31	\$ 7.16	\$ 39.32	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2020	6475_C (ODEHV-TROTP)	\$ 46.77	4	\$ -	\$ 40.50	\$ 5.85	\$ 0.00	\$ 0.41	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2020	588_A_1 (LWSVW-LWVTI)	\$ 29.27	5	\$ 0.13	\$ 3.52	\$ 13.33	\$ 8.51	\$ 3.04	\$ 0.74	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2020	ODEHV_XFMRS (ODEHV-ODEHV)	\$ 25.59	6	\$ -	\$ 19.91	\$ 5.68	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2020	NEDIN_XFMRS (NEDIN-NEDIN)	\$ 19.06	7	\$ -	\$ -	\$ -	\$ 0.00	\$ 19.06	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2020	JK_TOKSW_1 (TOKSW-JK_CK)	\$ 17.48	8	\$ -	\$ -	\$ 0.01	\$ 0.40	\$ 17.07	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2020	6520_E (ODEHV-YARBR)	\$ 16.49	9	\$ -	\$ 10.49	\$ 5.12	\$ 0.87	\$ -	\$ 0.02	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2020	6265_A (EMSES-MRSDO)	\$ 13.54	10	\$ 1.14	\$ -	\$ -	\$ 1.61	\$ 5.96	\$ 4.84	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	

[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)	2,219	1	341	379	305	388	398	408	-	-	-	-	-	-	
FREQ_EXIST	2020	6100 F AND 6100_Z (DHIIDE-NOTSW)	2,037	2	732	648	629	28	-	-	-	-	-	-	-	-	
FREQ_EXIST	2020	NLARSW_PILONC1 1 (NLARSW-PILONCIL)	2,031	3	292	232	436	433	367	271	-	-	-	-	-	-	
FREQ_EXIST	2020	RAYMND2_89A1 (RAYMND2-RAYMND2)	1,997	4	65	373	553	300	442	264	-	-	-	-	-	-	
FREQ_EXIST	2020	RIOPEC_WOODW21_1 (RIOPECOS-WOODWRD2)	1,902	5	521	365	189	280	315	232	-	-	-	-	-	-	
FREQ_EXIST	2020	CORONA_AT4 (CORONA-CORONA)	1,887	6	337	598	576	161	104	111	-	-	-	-	-	-	
FREQ_EXIST	2020	1030_B (BOSQUESW-RGH)	1,852	7	93	47	315	468	489	440	-	-	-	-	-	-	
FREQ_EXIST	2020	PANHANDLE_GTC (PNHNDL)	1,782	8	453	177	174	258	241	479	-	-	-	-	-	-	
FREQ_EXIST	2020	CAGNON_XFMRS (CAGNON-CAGNON)	1,721	9	199	245	312	109	403	453	-	-	-	-	-	-	
FREQ_EXIST	2020	FREER_LOBO1_1 (LOBO-FREER)	1,651	10	194	411	477	153	282	134	-	-	-	-	-	-	
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)	\$ 61.39	2	\$ 20.27	\$ 2.80	\$ 3.38	\$ 4.88	\$ 5.06	\$ 25.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2020	6520_E (ODEHV-YARBR)	\$ 37.53	3	\$ -	\$ 7.35	\$ 16.19	\$ 10.17	\$ 3.68	\$ 0.15	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2020	588_A_1 (LWSVW-LWVTI)	\$ 27.78	4	\$ 0.76	\$ 1.98	\$ 5.35	\$ 12.86	\$ 4.99	\$ 1.83	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2020	6475_C (ODEHV-TROTP)	\$ 27.34	5	\$ -	\$ 23.18	\$ 3.34	\$ 0.20	\$ 0.53	\$ 0.09	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2020	FREER_LOBO1_1 (LOBO-FREER)	\$ 13.04	6	\$ 1.26	\$ 4.71	\$ 4.96	\$ 0.63	\$ 1.27	\$ 0.20	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2020	6265_A (EMSSES-MRSDO)	\$ 12.17	7	\$ 1.33	\$ 0.10	\$ 0.00	\$ 0.28	\$ 1.23	\$ 9.23	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2020	587_A (ARGYL-LWSVH)	\$ 11.25	8	\$ 1.07	\$ 4.96	\$ 4.78	\$ 0.46	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2020	BRUNI_69_1 (BRUNI-BRUNI)	\$ 9.25	9	\$ 2.65	\$ 1.91	\$ 1.62	\$ 1.47	\$ 1.08	\$ 0.53	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
TOP10_RENT	2020	RIOPEC_WOODW21_1 (RIOPECOS-WOODWRD2)	\$ 8.79	10	\$ 6.07	\$ 1.24	\$ 0.48	\$ 0.41	\$ 0.41	\$ 0.19	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	

[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																	
fir option	year	pair	total value	rank	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
N	2020	HB WEST-LZ WEST	\$ 56.87	1	\$ 8.27	\$ 6.36	\$ 12.75	\$ 20.43	\$ 5.85	\$ 2.33	\$ 0.88	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2020	HB SOUTH-LZ SOUTH	\$ 9.22	2	\$ 0.87	\$ 0.75	\$ 1.00	\$ 1.25	\$ 1.54	\$ 2.00	\$ 1.83	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2020	AEEC-LZ WEST	\$ 6.93	3	\$ 1.44	\$ 1.69	\$ 1.27	\$ 1.14	\$ 0.74	\$ 0.43	\$ 0.22	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2020	HB NORTH-HB HOUSTON	\$ 4.78	4	\$ 0.18	\$ 0.10	\$ 0.58	\$ 0.95	\$ 0.87	\$ 1.27	\$ 0.84	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2020	HB PAN-HB WEST	\$ 4.31	5	\$ 0.44	\$ 1.45	\$ 0.01	\$ 0.18	\$ 0.08	\$ 0.15	\$ 2.00	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2020	HB NORTH-LZ NORTH	\$ 3.40	6	\$ 0.41	\$ 0.42	\$ 0.34	\$ 0.33	\$ 0.44	\$ 0.60	\$ 0.86	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2020	HB WEST-HB NORTH	\$ 2.20	7	\$ 0.00	\$ 0.44	\$ 0.33	\$ 0.28	\$ 0.66	\$ 0.30	\$ 0.18	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2020	HB HOUSTON-LZ HOUSTON	\$ 1.69	8	\$ 0.24	\$ 0.17	\$ 0.21	\$ 0.19	\$ 0.31	\$ 0.31	\$ 0.26	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2020	HB WEST-HB HOUSTON	\$ 1.18	9	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.01	\$ 1.13	\$ 0.01	\$ 0.02	\$ -	\$ -	\$ -	\$ -	\$ -	
N	2020	WHCCS2.5 6-HB NORTH	\$ 0.88	10	\$ 0.19	\$ 0.14	\$ -	\$ 0.15	\$ 0.24	\$ 0.06	\$ 0.09	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2020	HB WEST-LZ WEST	\$ 11.33	1	\$ 3.91	\$ 1.02	\$ 0.65	\$ 3.48	\$ 1.35	\$ 0.71	\$ 0.22	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2020	HB SOUTH-LZ SOUTH	\$ 5.47	2	\$ 0.53	\$ 0.32	\$ 0.57	\$ 0.33	\$ 1.08	\$ 1.37	\$ 1.27	\$ -	\$ -	\$ -	\$ -	\$ -	
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	LZ WEST-NWF NWF1	\$ 2.42	4	\$ 0.05	\$ 0.41	\$ 0.43	\$ 1.38	\$ 0.16	\$ 0.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2020	HB NORTH-LZ NORTH	\$ 2.28	5	\$ 0.16	\$ 0.32	\$ 0.33	\$ 0.51	\$ 0.38	\$ 0.21	\$ 0.37	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2020	OECCS 1-PB2SES CT5	\$ 2.00	6	\$ 1.03	\$ 0.22	\$ -	\$ 0.59	\$ 0.12	\$ 0.01	\$ 0.03	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2020	HB WEST-HOVEY GEN	\$ 1.47	7	\$ -	\$ 0.29	\$ -	\$ 0.81	\$ 0.35	\$ 0.02	\$ 0.00	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2020	WOO WOODWRD2-RIGGIN UNIT1	\$ 1.45	8	\$ 0.09	\$ -	\$ 0.85	\$ 0.32	\$ 0.16	\$ 0.01	\$ 0.01	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2020	HB HOUSTON-LZ HOUSTON	\$ 1.23	9	\$ 0.16	\$ 0.06	\$ 0.13	\$ 0.17	\$ 0.28	\$ 0.27	\$ 0.16	\$ -	\$ -	\$ -	\$ -	\$ -	
Y	2020	WOO WOODWRD1-RIGGIN UNIT1	\$ 1.04	10	\$ 0.31	\$ 0.13	\$ 0.12	\$ 0.45	\$ 0.01	\$ 0.02	\$ 0.01	\$ -	\$ -	\$ -	\$ -	\$ -	

[Home <<](#)

[previous <<](#)

[chart 1](#)

[chart 2](#)