

To the Public Utility Commission of Texas

# ERCOT Wholesale Electricity Market Monthly Report

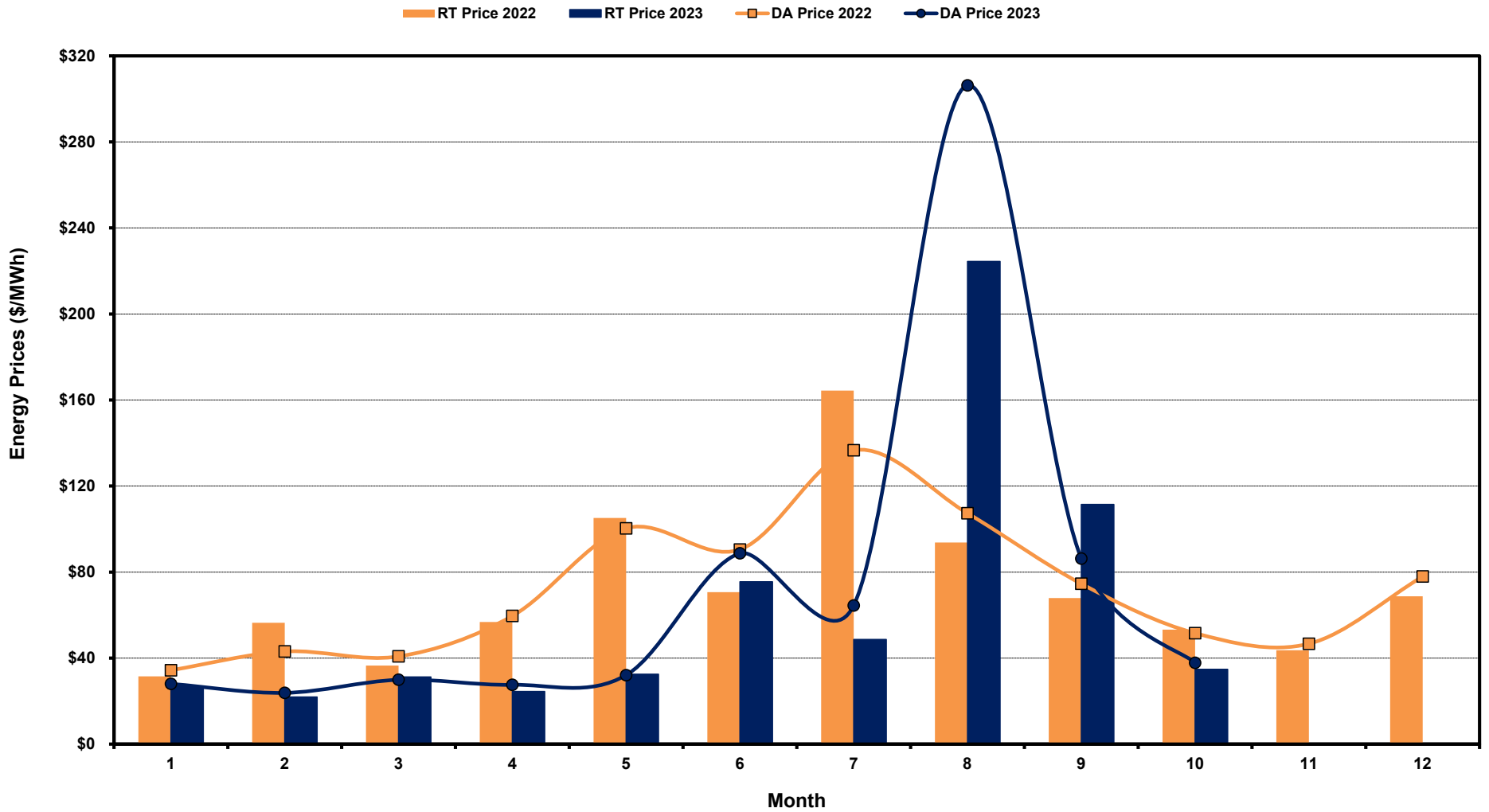
Friday, November 10, 2023

Potomac Economics, Ltd.  
Independent Market Monitor

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# ERCOT-wide Average Energy Prices DA vs RT

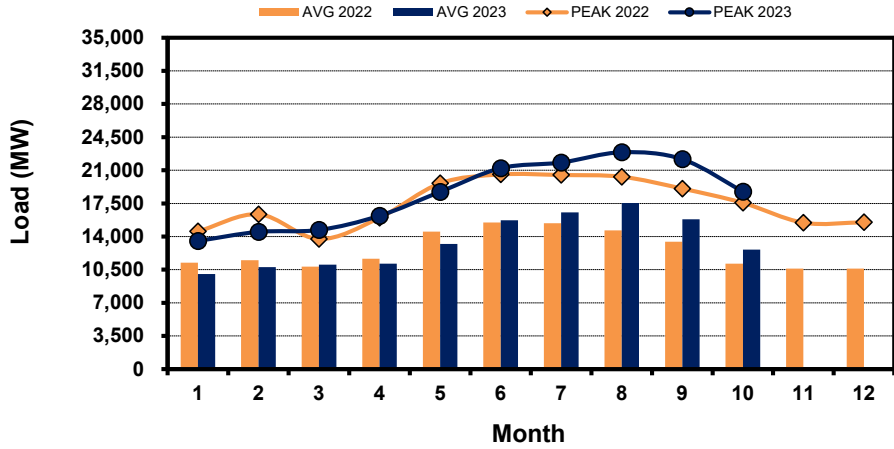
(avg. DA & RT SPPs weighted by Real Time Settlement Loads)



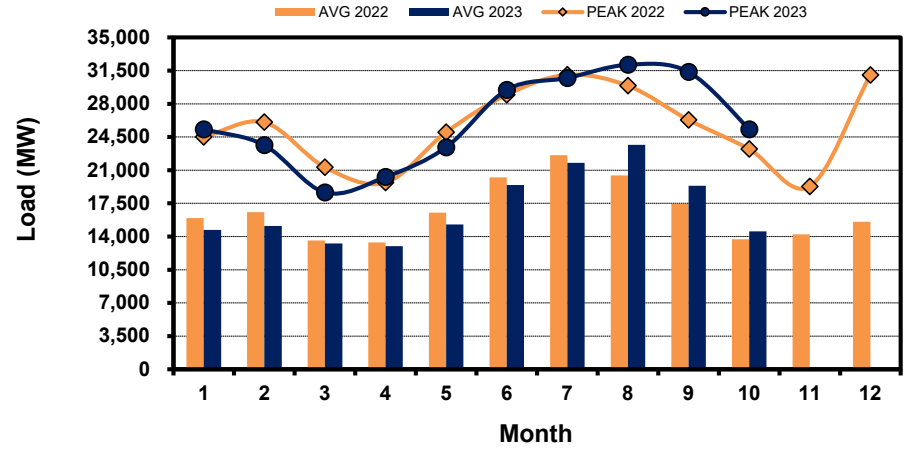
# Load Zone Load Statistics

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

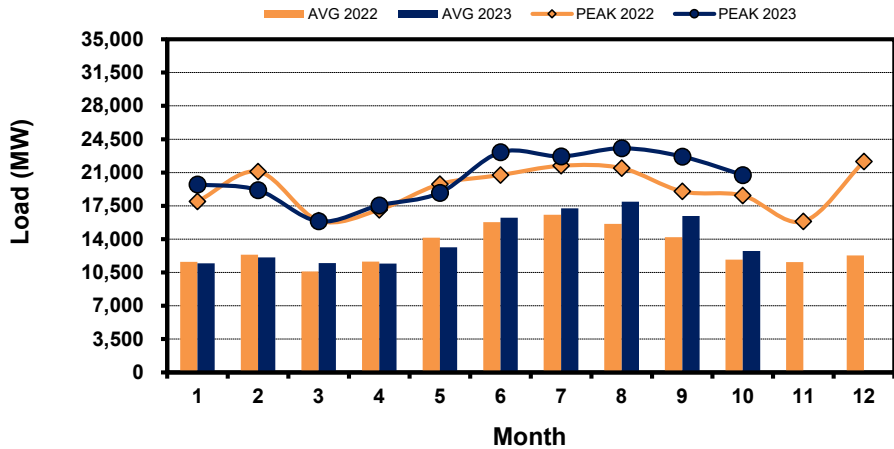
## Houston Zone



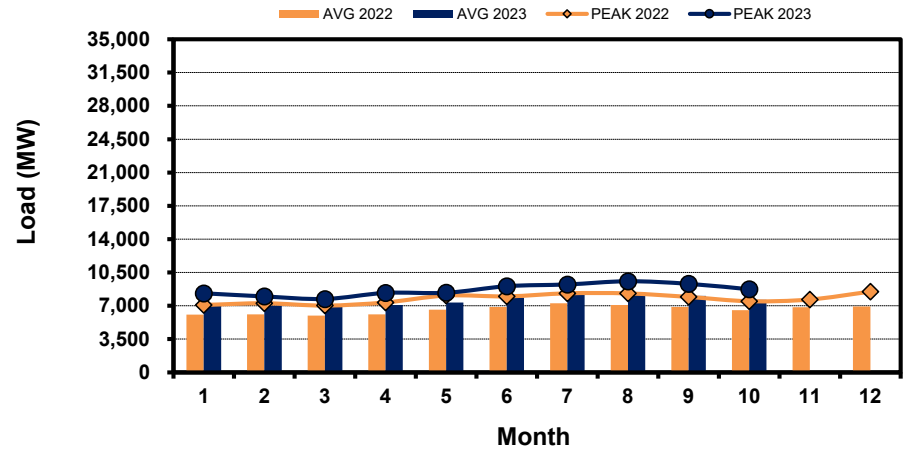
## North Zone



## South Zone



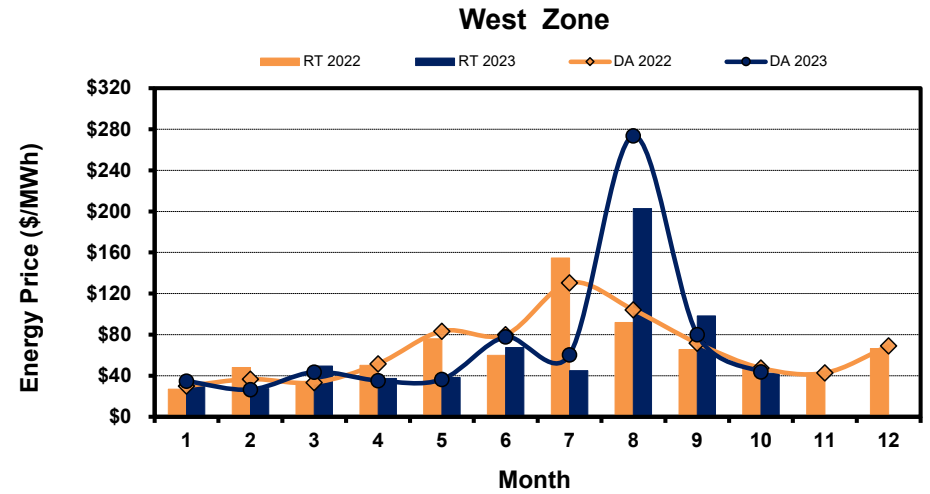
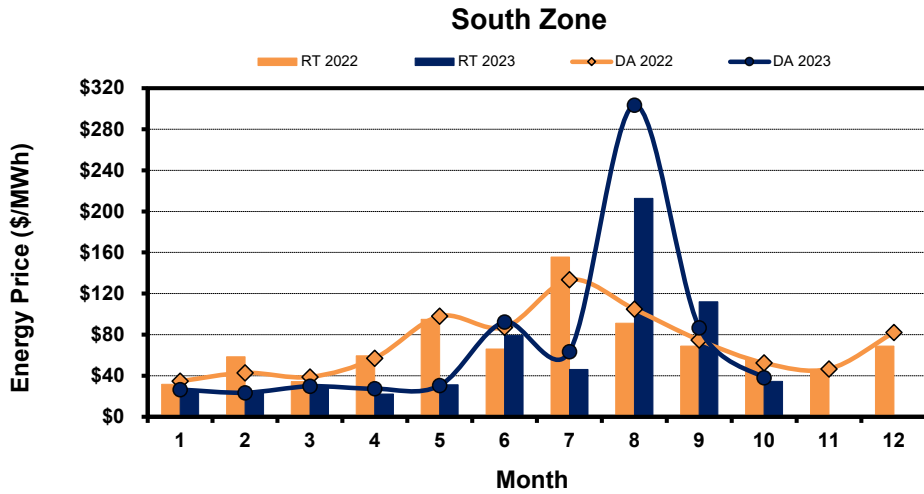
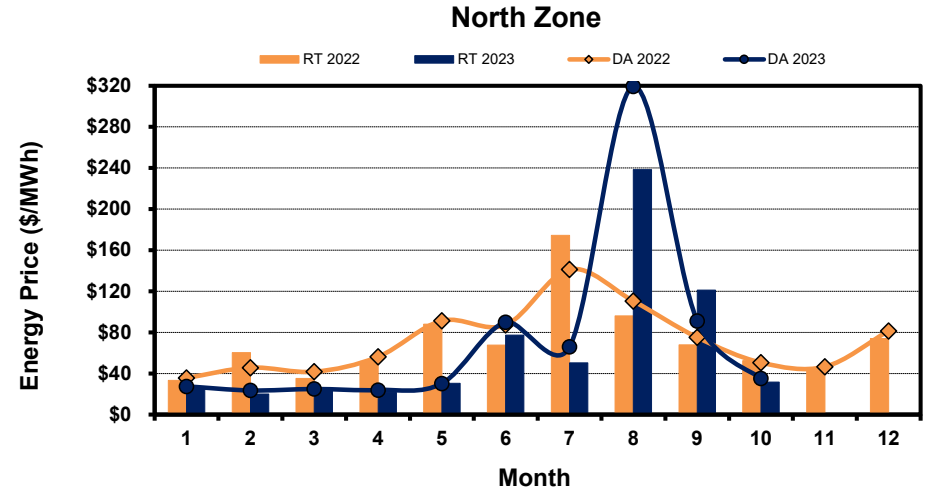
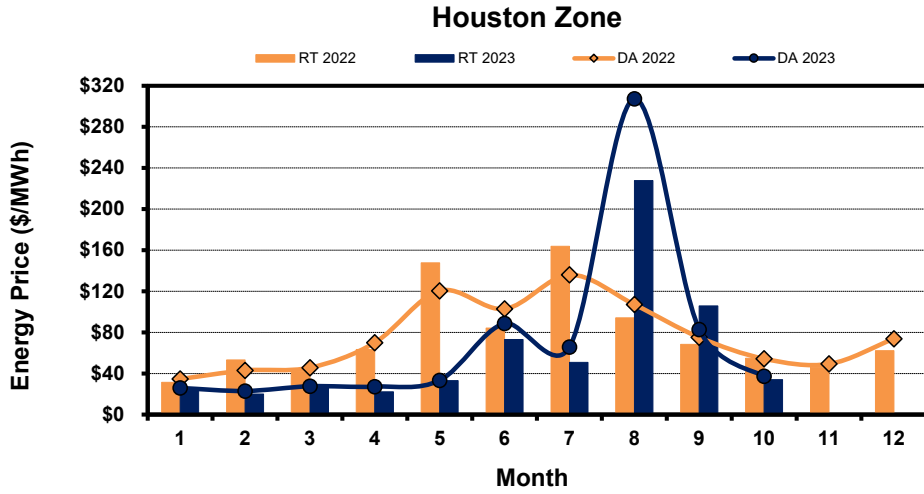
## West Zone



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

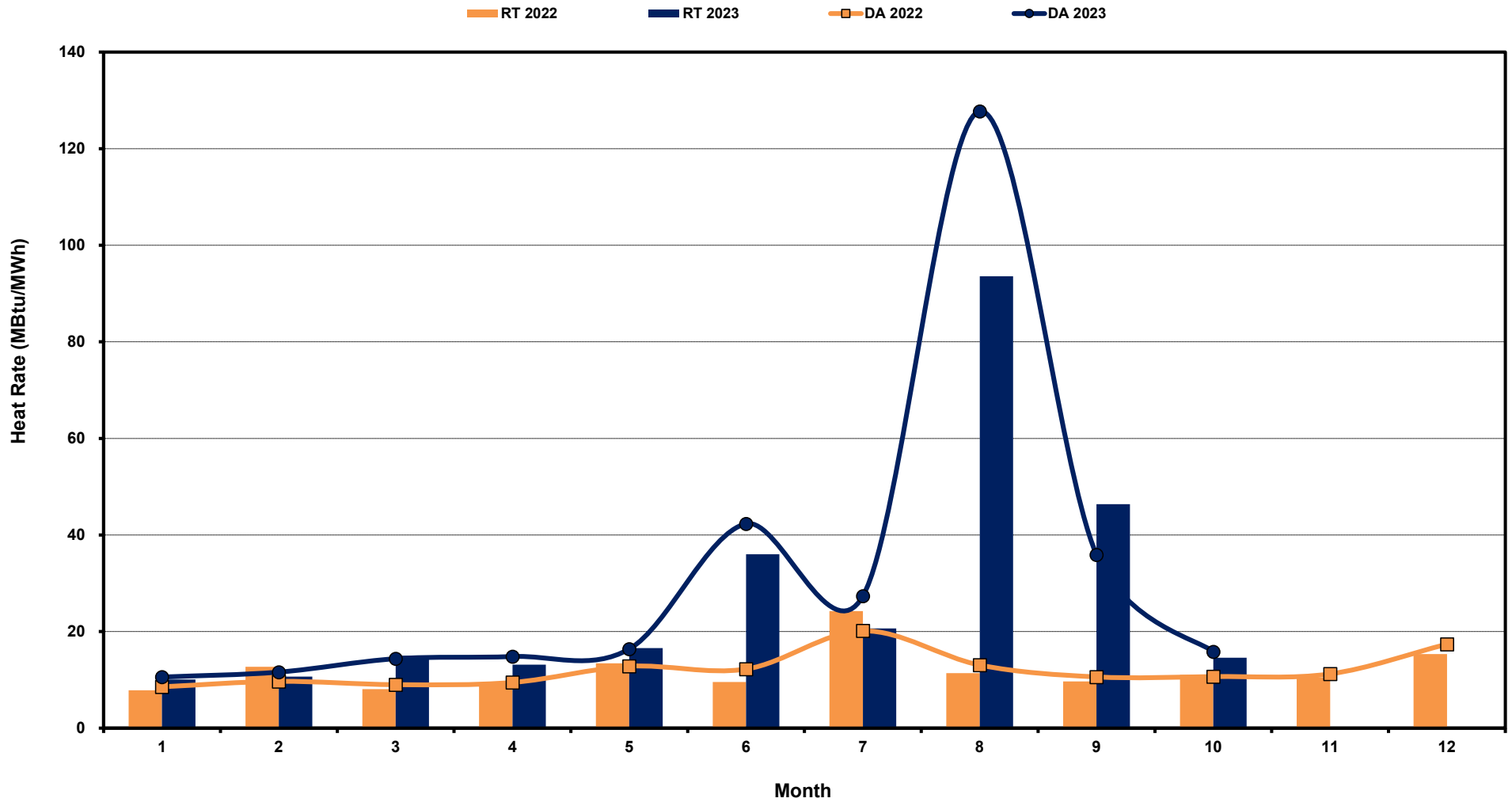
(avg. DA & RT SPPs weighted by Real Time Settlement Loads)  
 (Nodal load zone made comparable to zonal sytem Load Zone definitions\*)



**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)

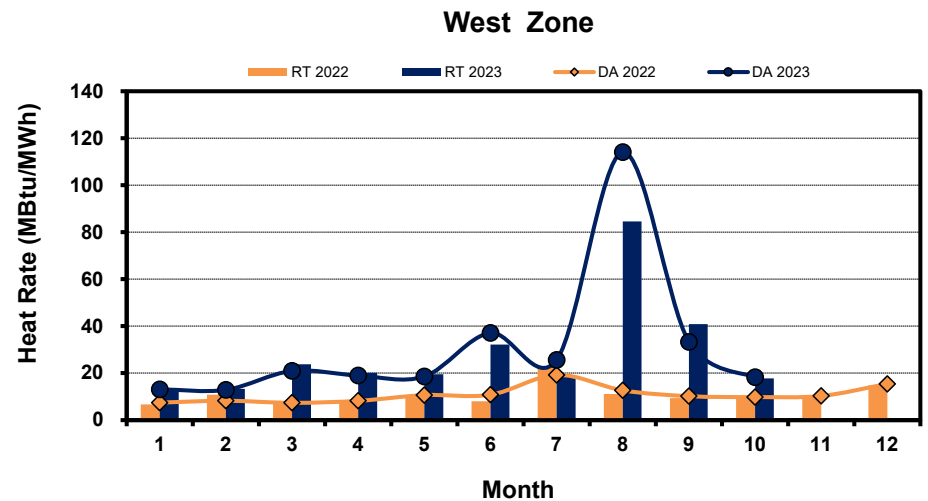
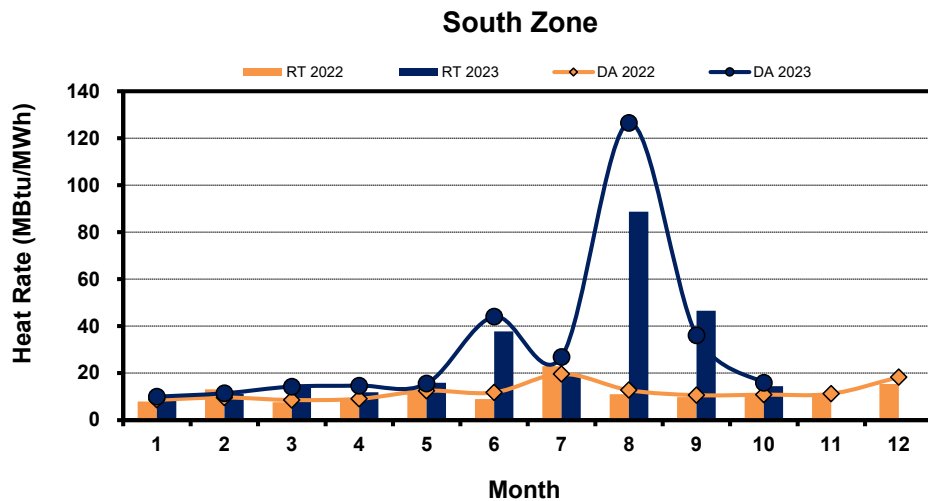
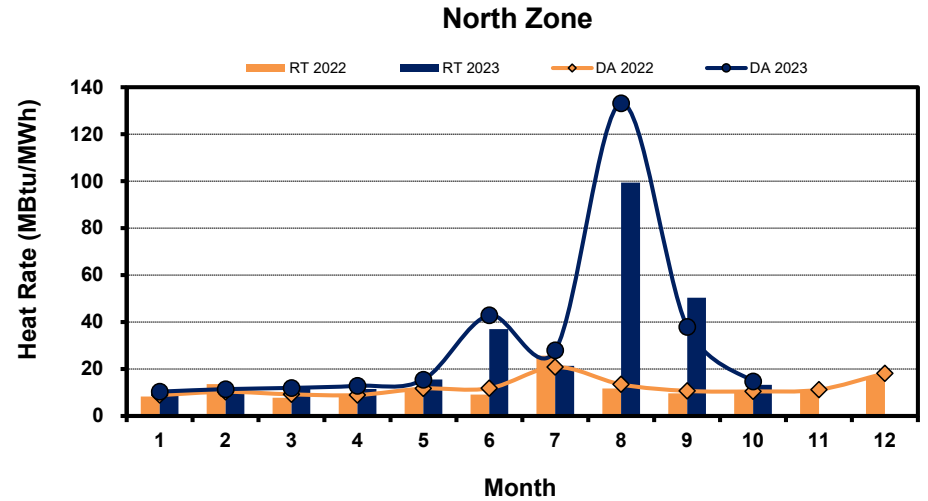
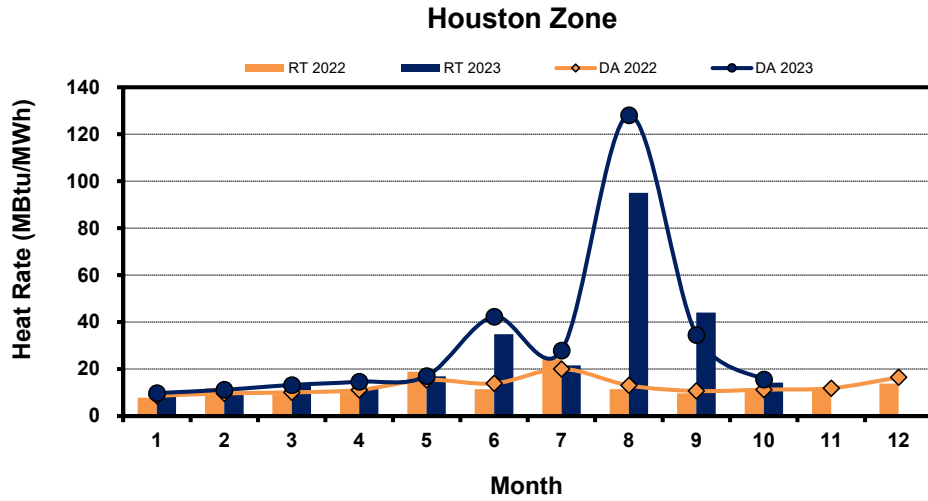
# ERCOT-wide Monthly Implied Heat Rate DA vs RT

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



# Load Zone Monthly Implied Heat Rate DA vs RT

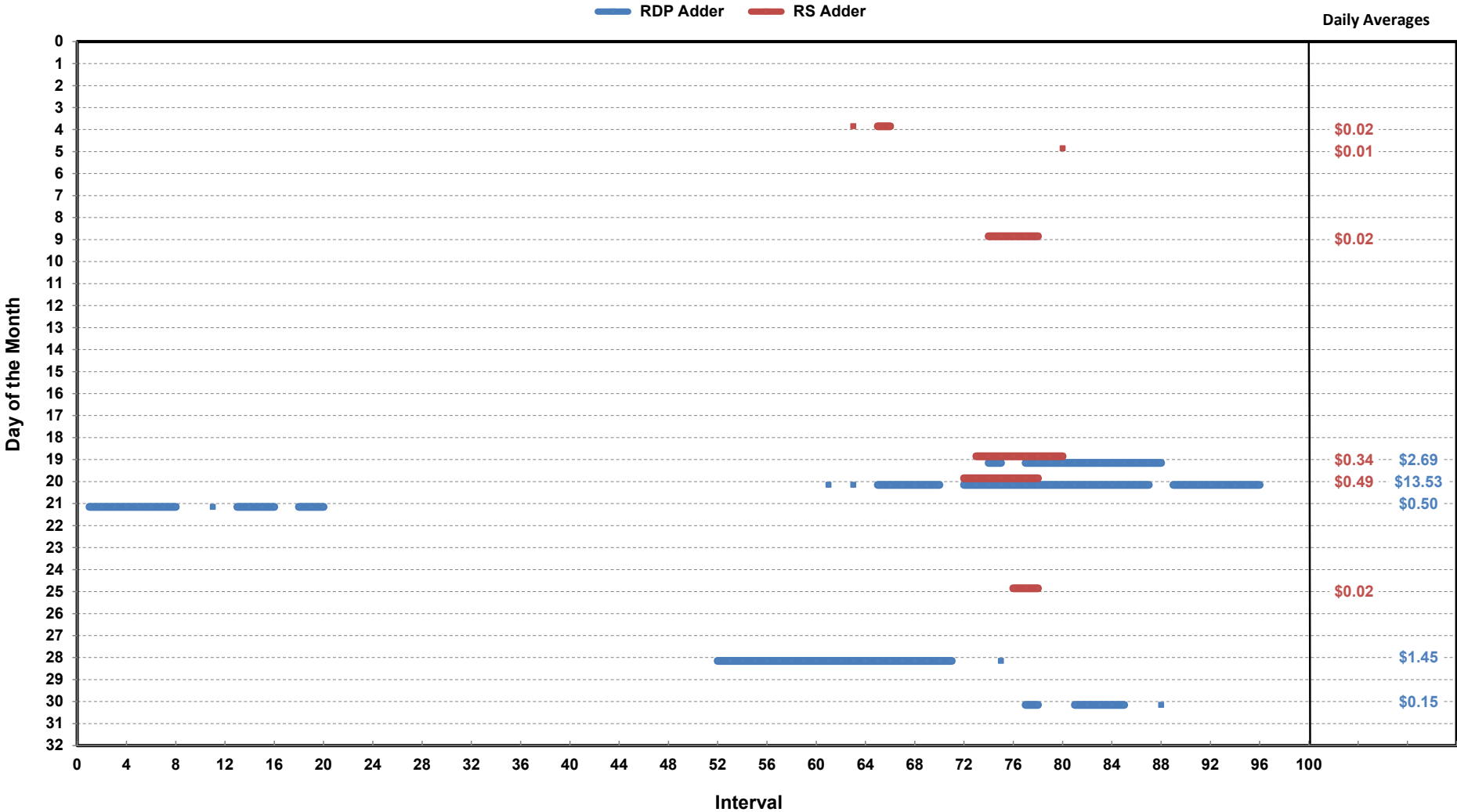
(avg. heat rates weighted by Real Time Settlement Loads)  
 (Nodal load zone made comparable to zonal sytem Load Zone definitions\*)



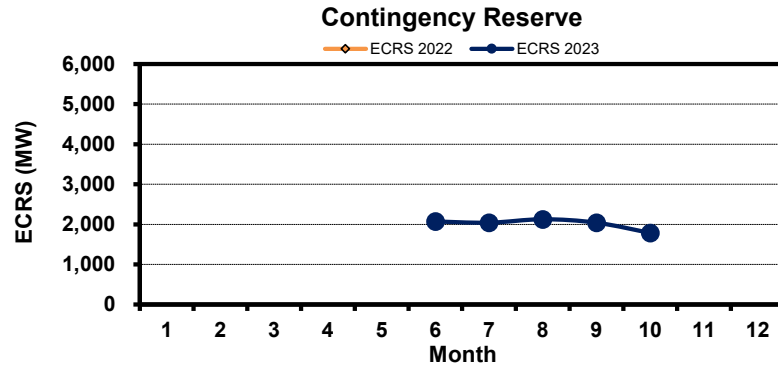
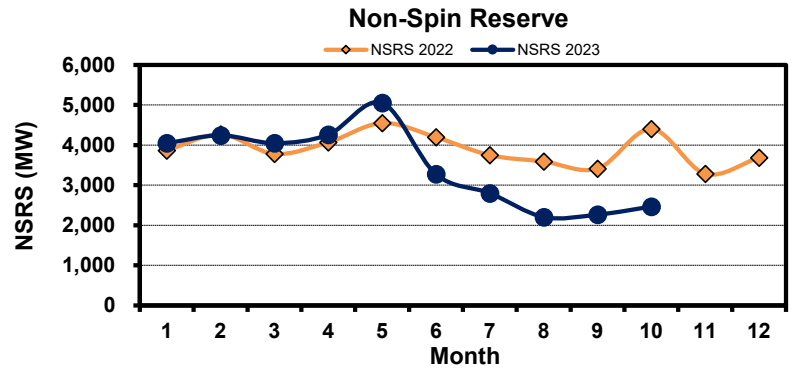
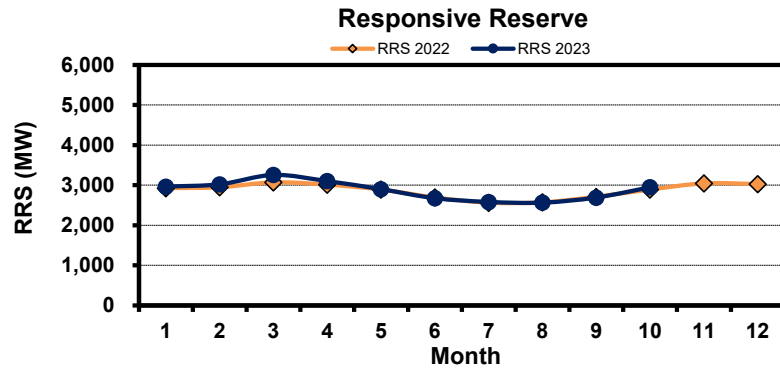
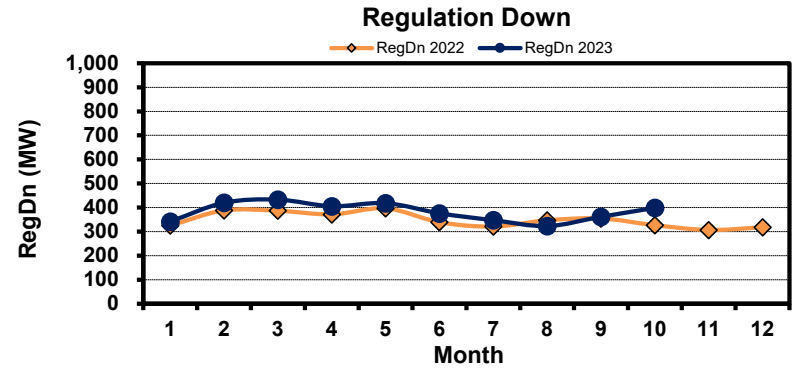
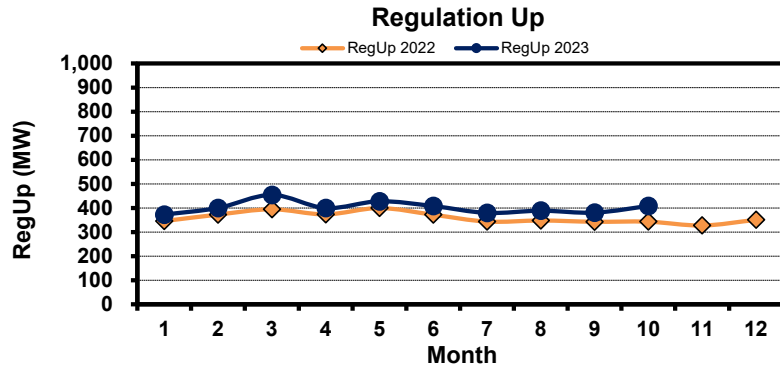
**Note:** \* Zonal load zone definition vs. Nodal comparable load zone definition: LZ\_Houston=LZ\_Houston; LZ\_West=LZ\_West; LZ\_North=(LZ\_North,LZ\_RAYBN); LZ\_South=(LZ\_South,LZ\_CPS,LZ\_AEN,LZ\_LCRA)

# Daily ORDC Adders Average Values and Interval Duration

## Oct-2023

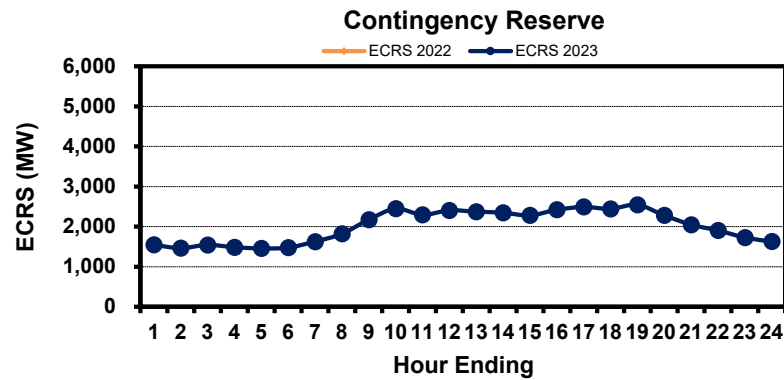
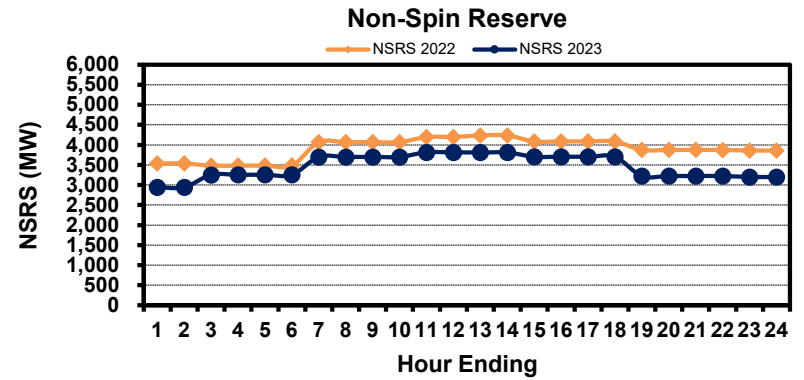
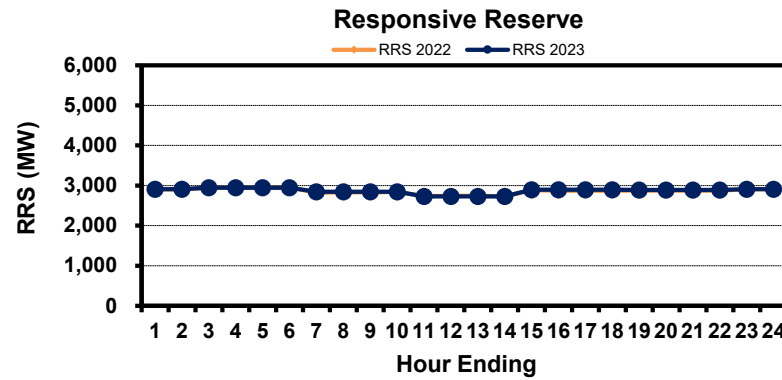
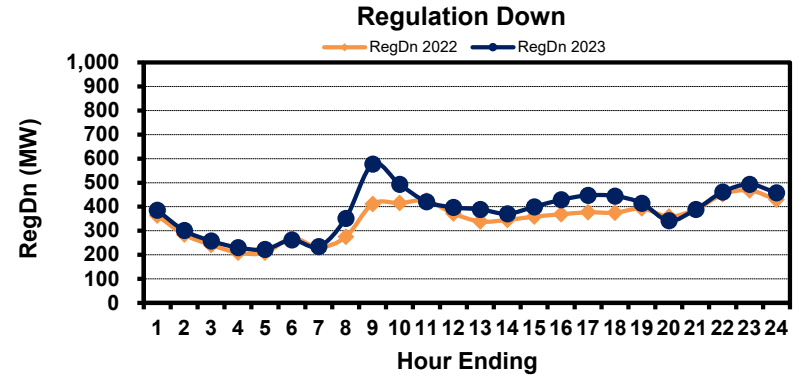
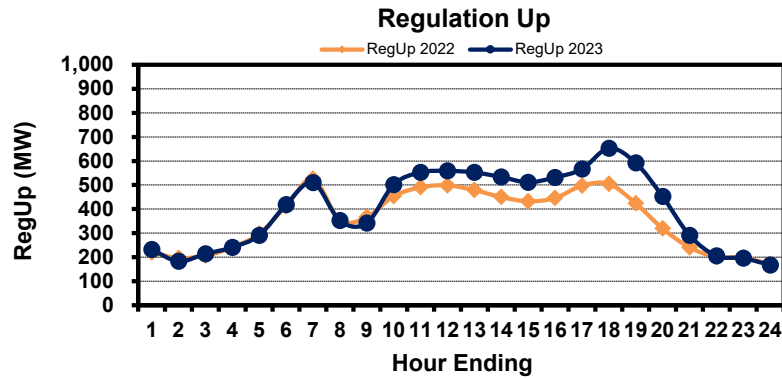


# Monthly Average of Ancillary Services Required MW



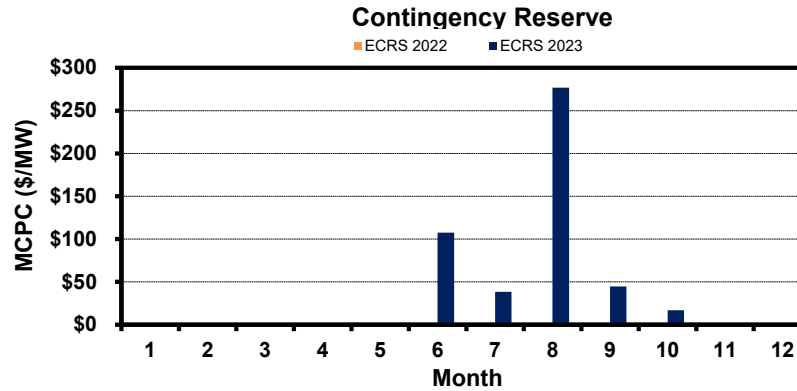
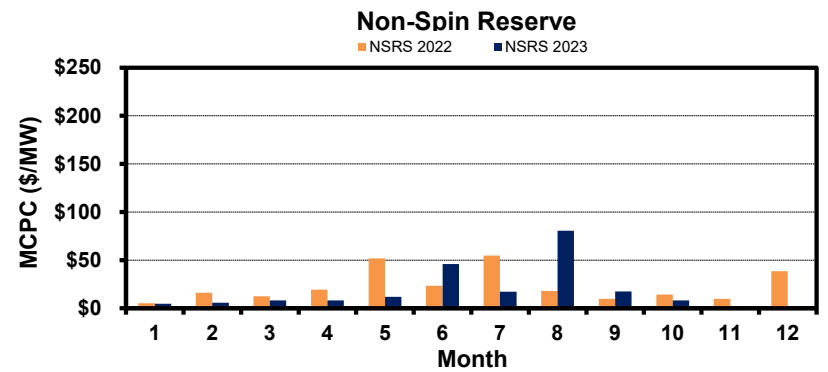
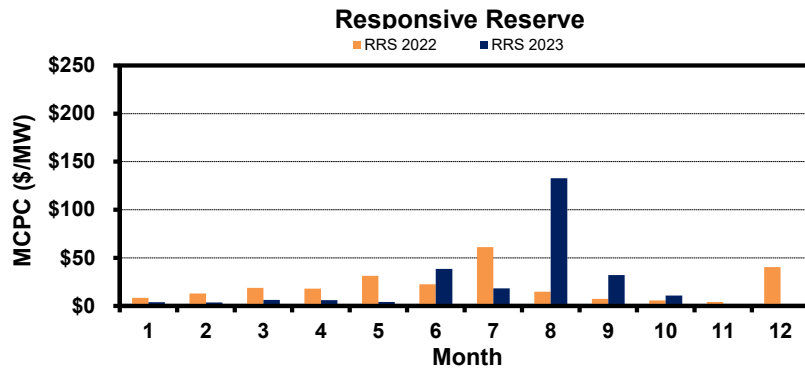
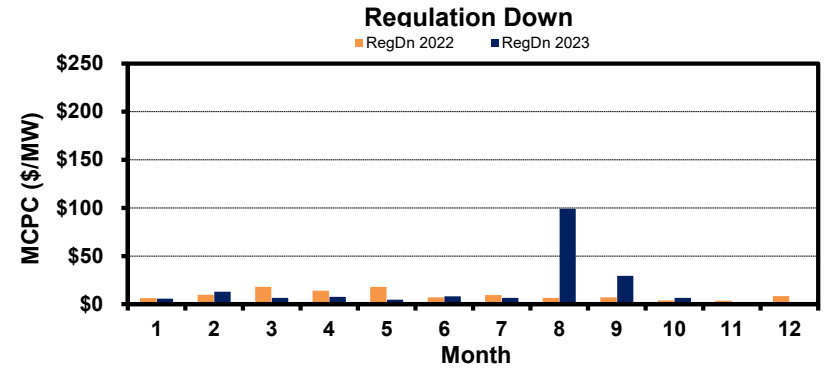
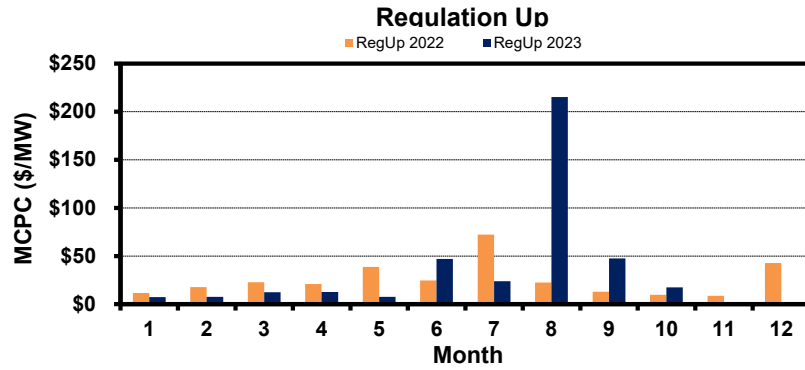


# Hourly Average of Ancillary Services Required MW

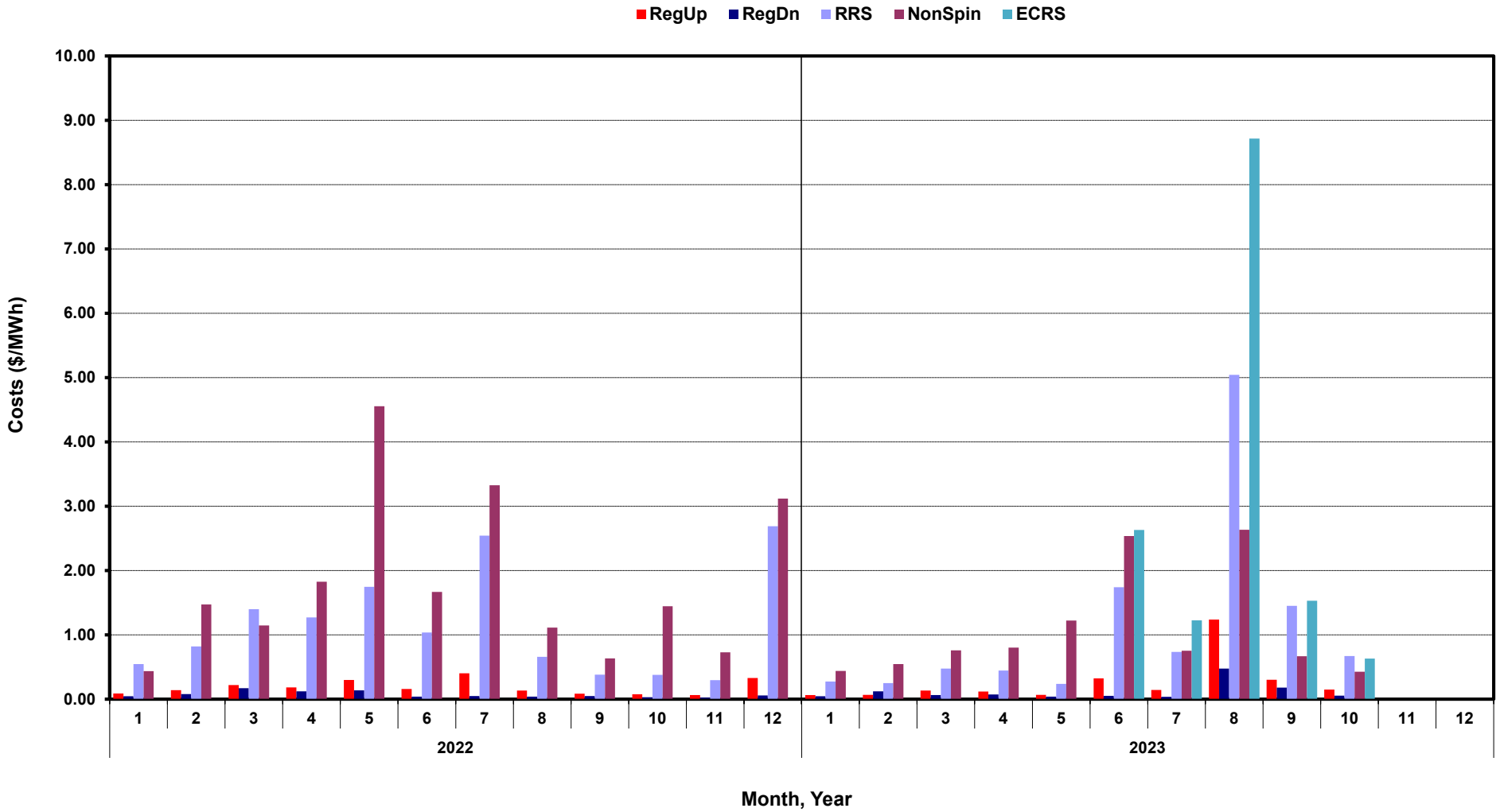


# Monthly Average Ancillary Services Price

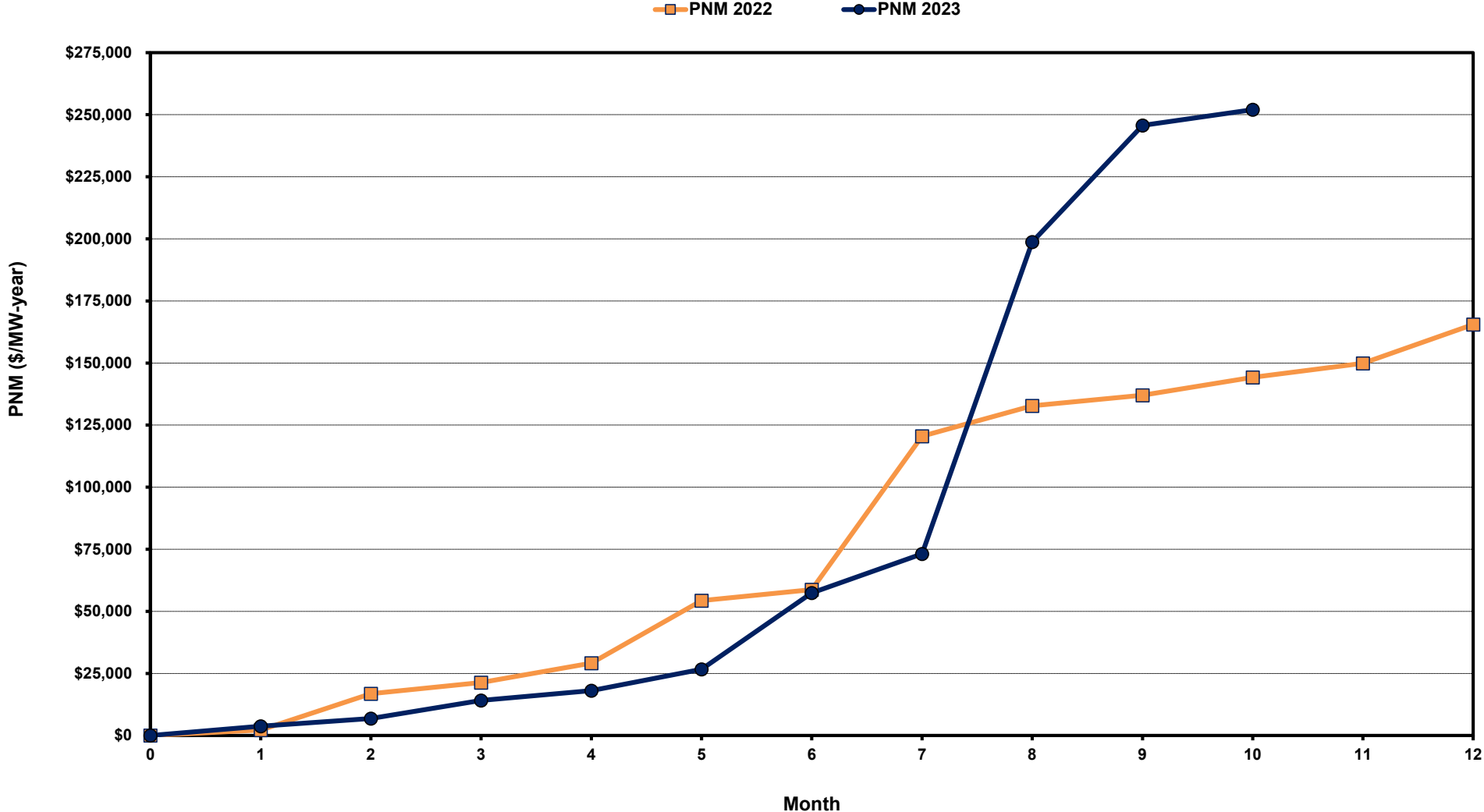
(weighted by A/S Quantities Required)



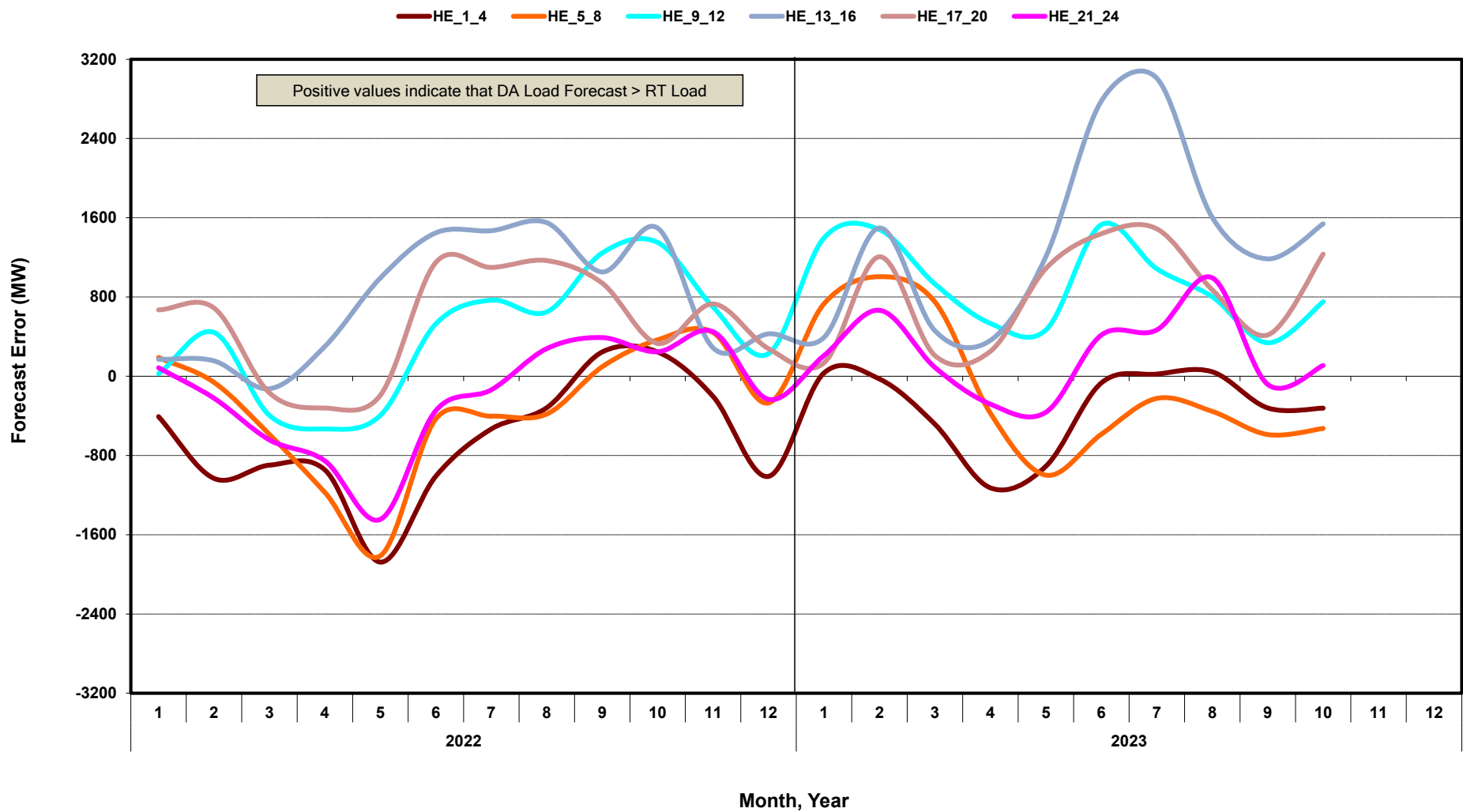
# Monthly Average A/S Cost per MWh Load



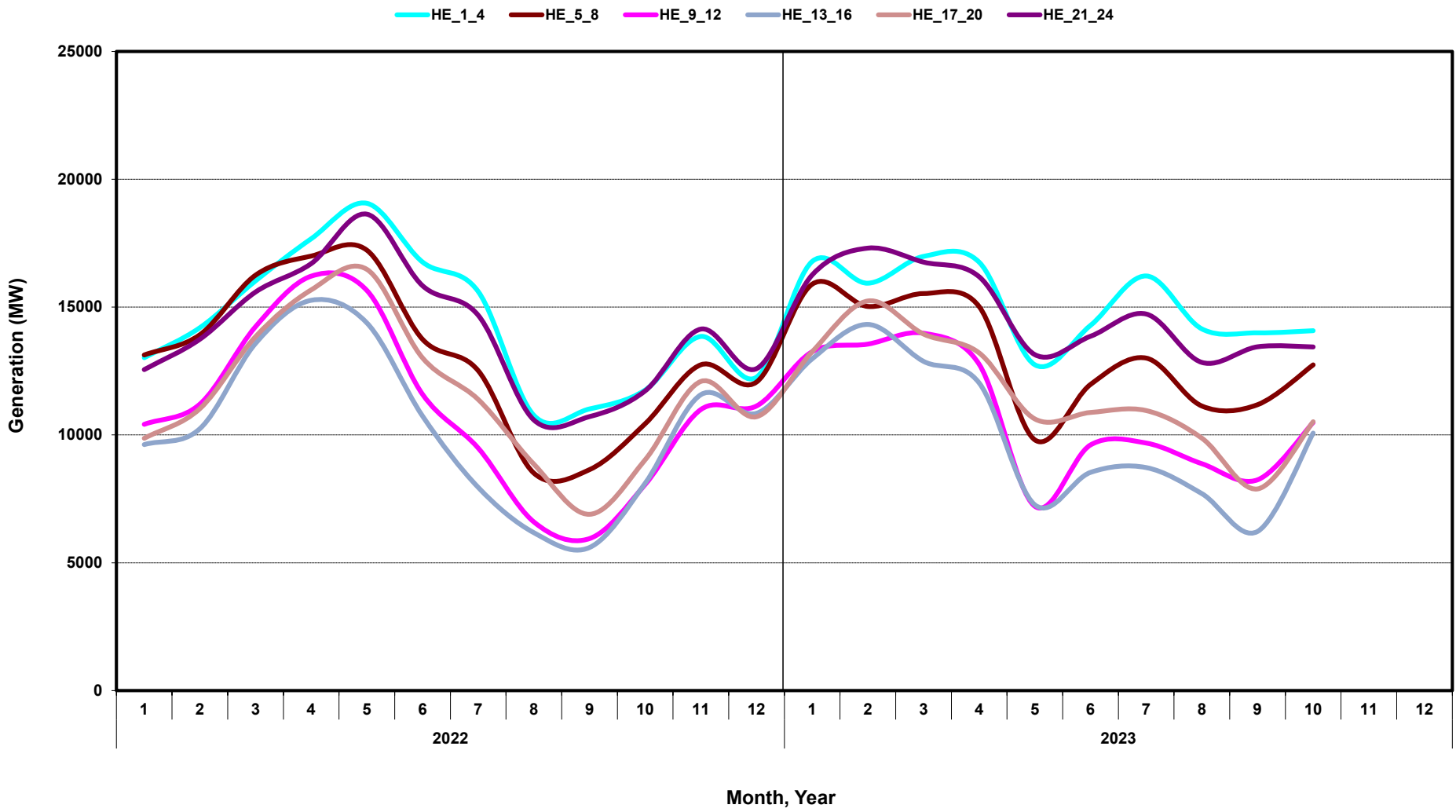
# ERCOT-wide Cumulative Peaker Net Margin



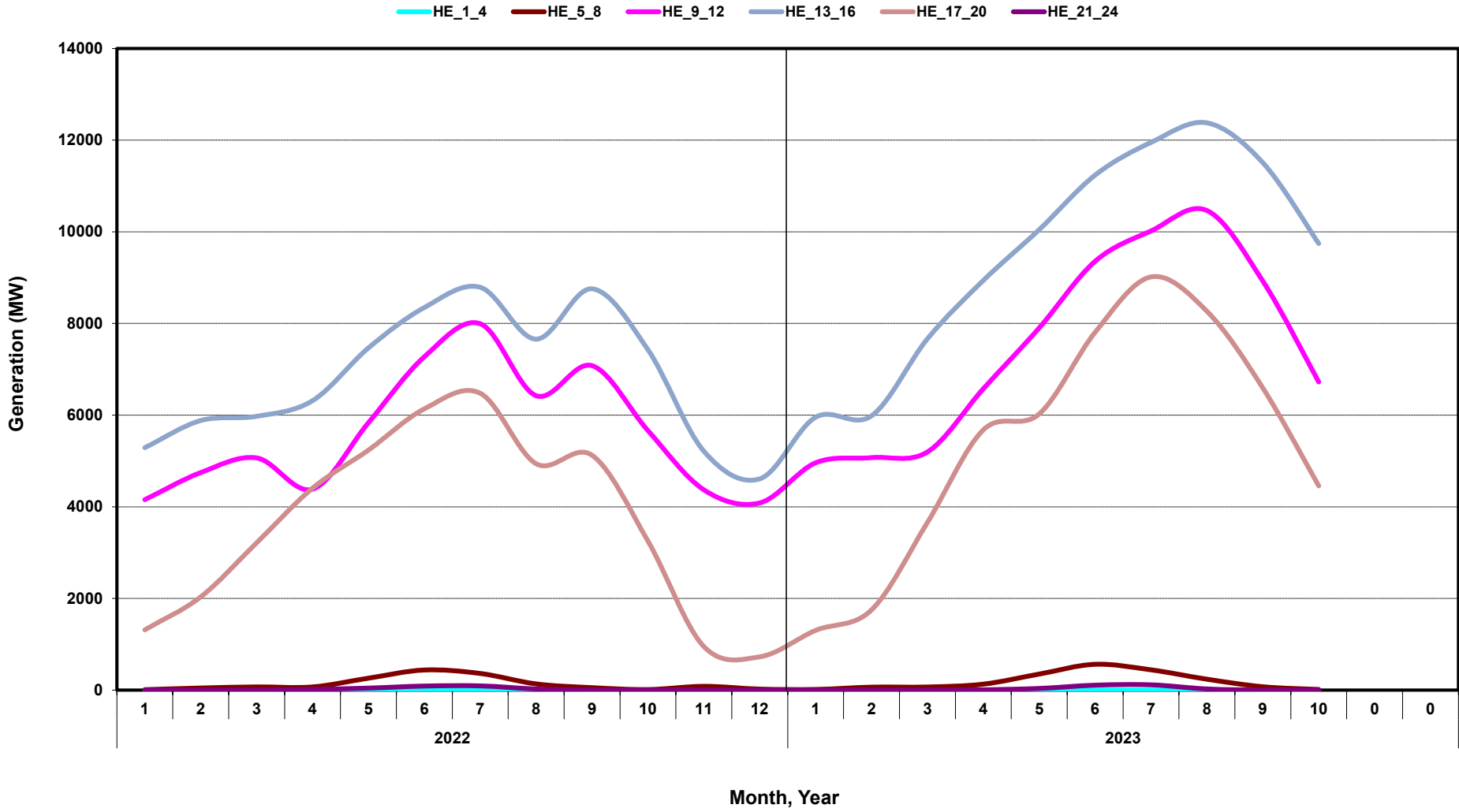
# DA vs. RT Load Forecast Error by Hour Ending



# Monthly Average of Wind Generation by Hour Ending



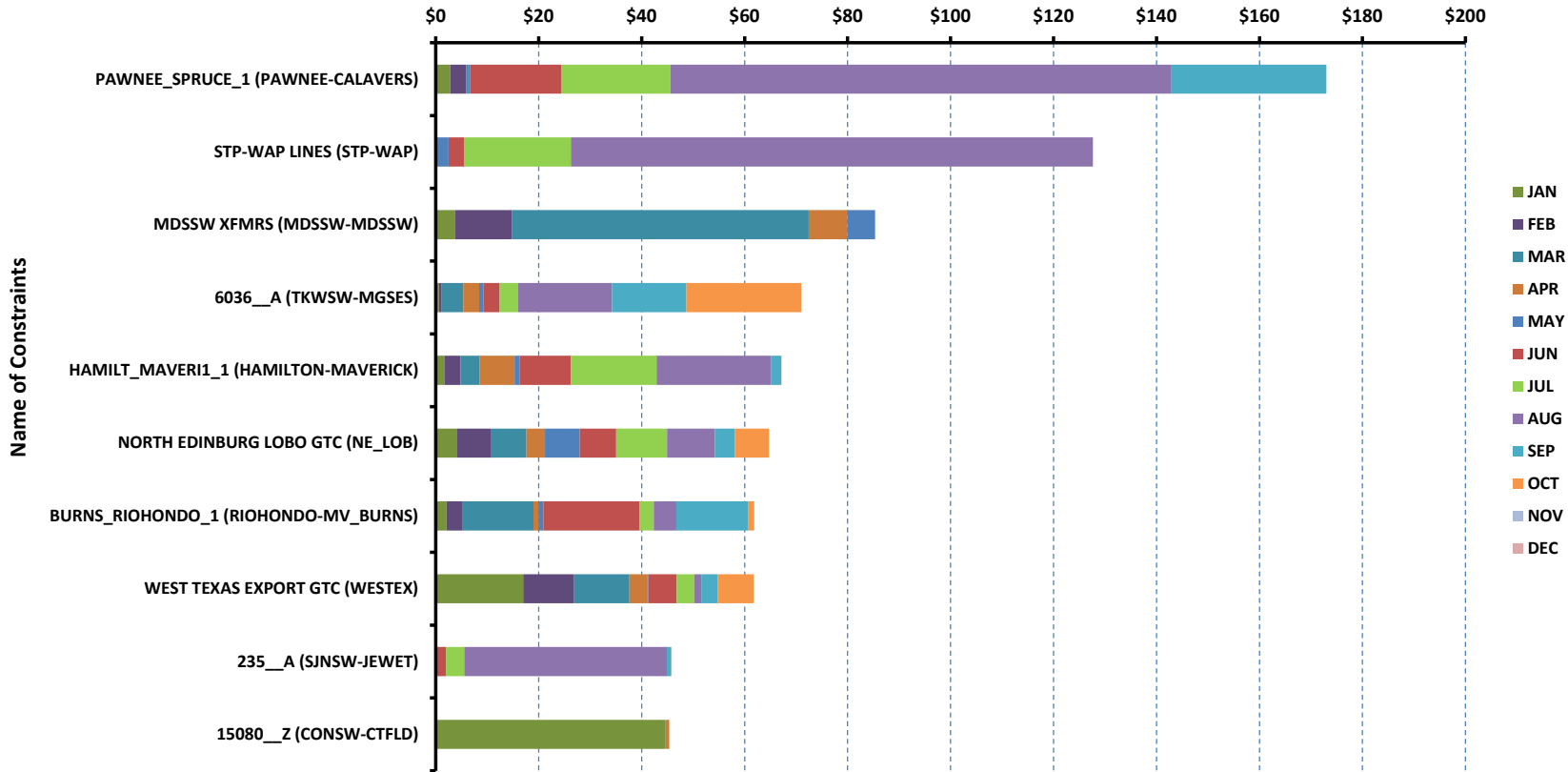
# Monthly Average of Solar Generation by Hour Ending



# RT Congestion Constraint Rankings - 1

## Top 10 Constraints by Total Congestion Value - 2023

Congestion Rent in \$ million

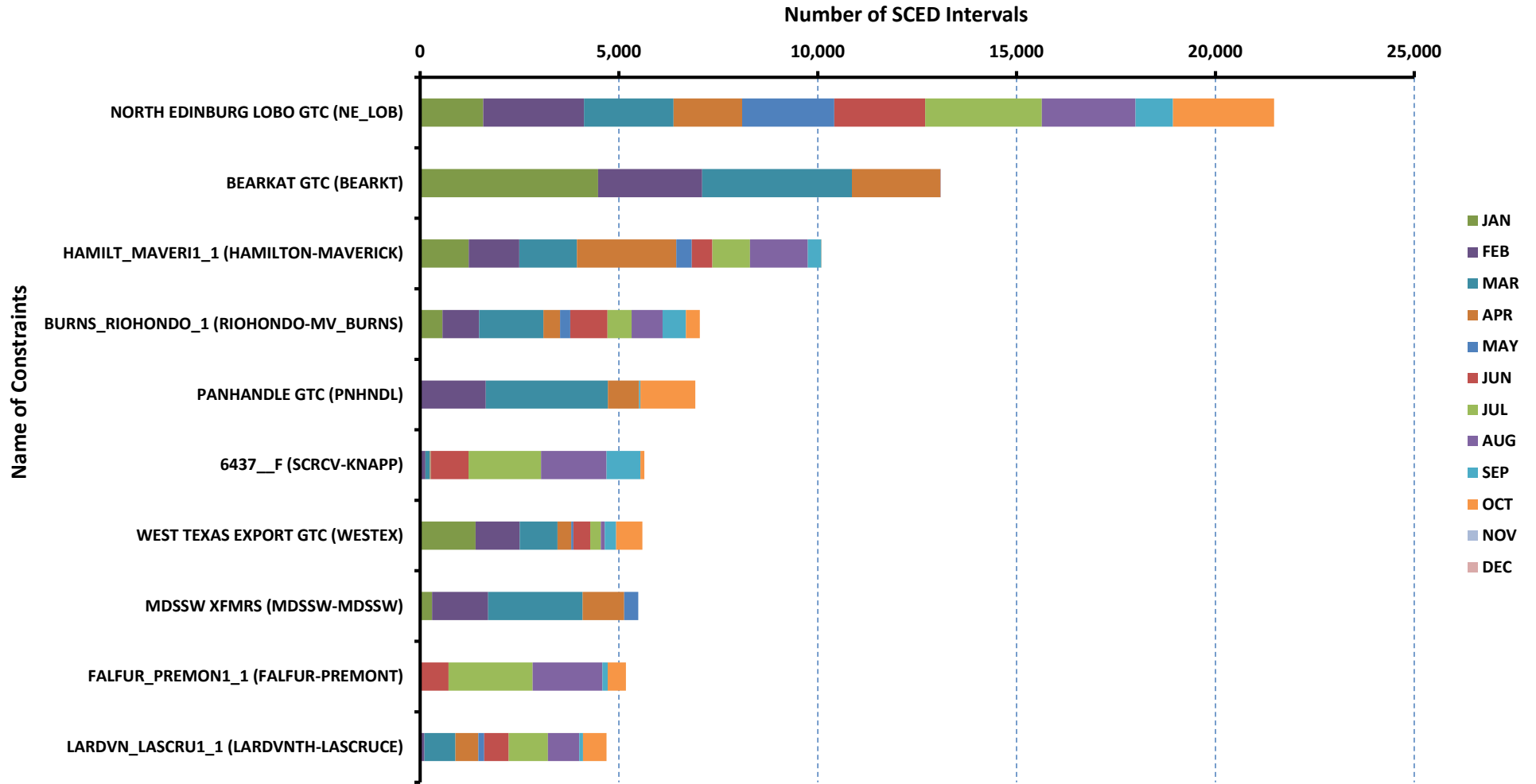


MONTH	RENT TOTAL
1	145.61
2	154.48
3	260.24
4	174.51
5	88.05
6	183.76
7	176.15
8	553.47
9	257.01
10	169.08
11	0.00
12	0.00
SUM-TOTAL	2162.36
(unit: \$ million)	



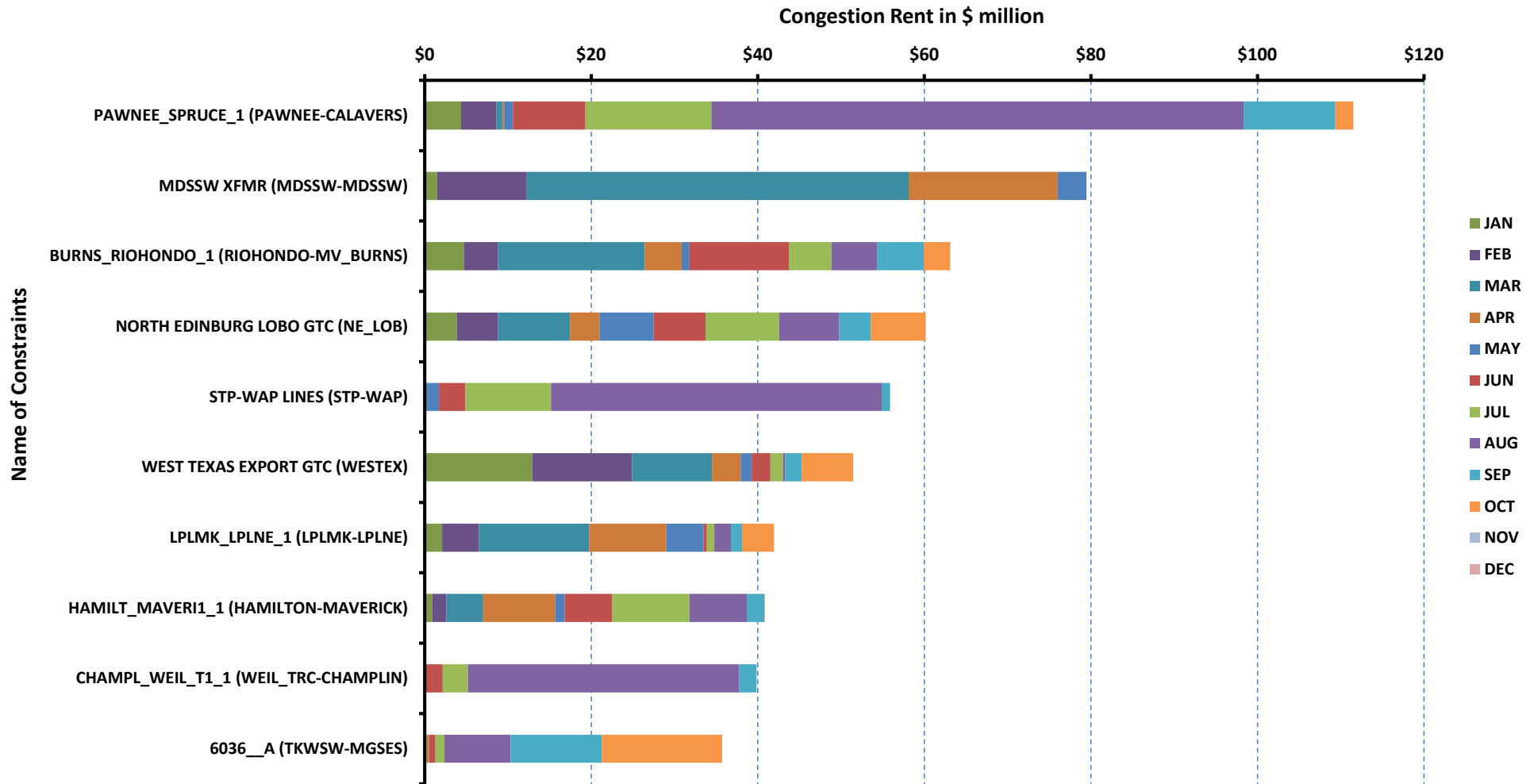
# RT Congestion Constraint Rankings - 2

## Top 10 Constraints by Binding Frequency - 2023



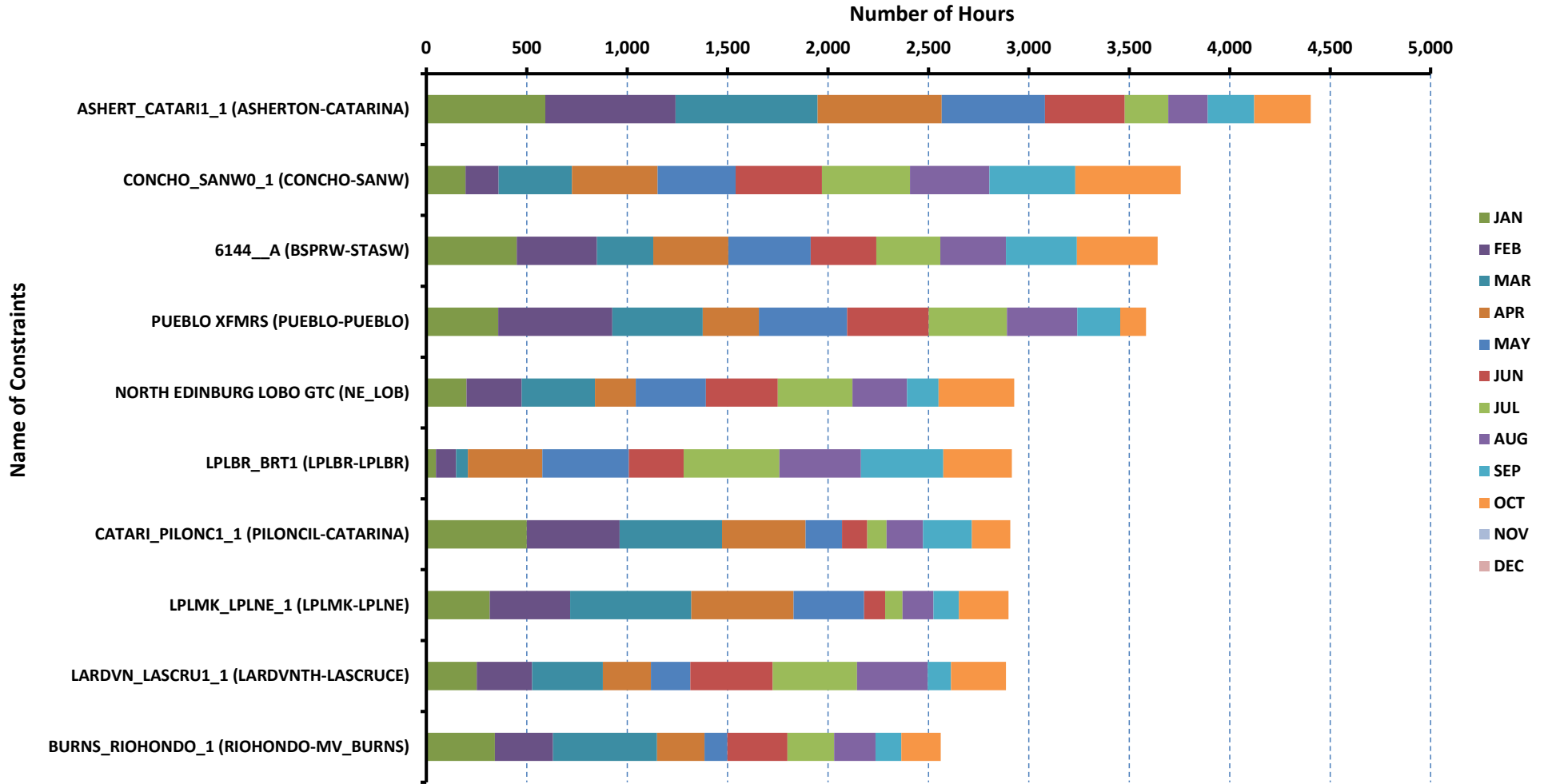
# DA Congestion Constraint Rankings - 1

## Top 10 Constraints by Total Congestion Value - 2023



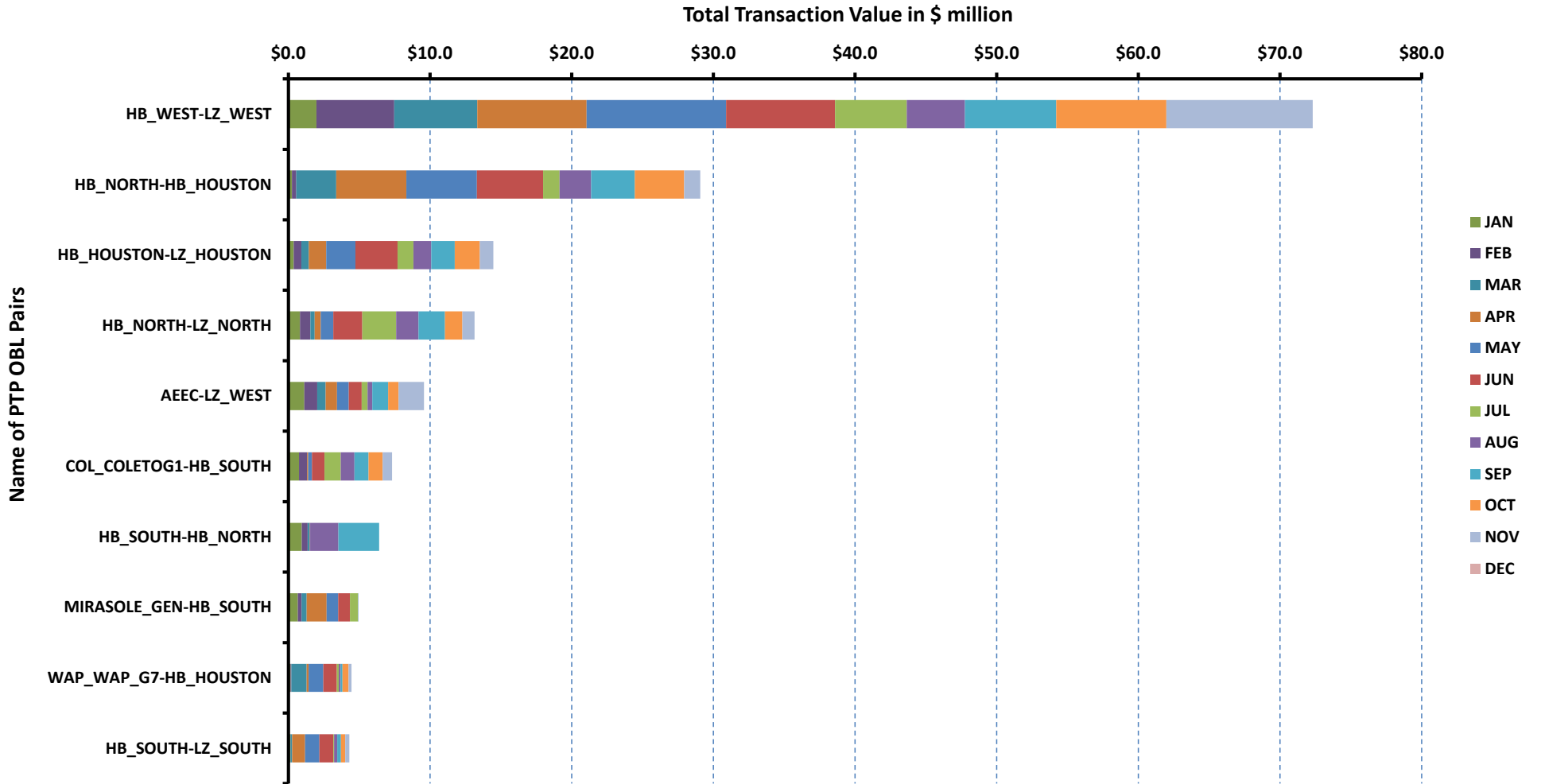
# DA Congestion Constraint Rankings - 2

## Top 10 Constraints by Binding Frequency - 2023



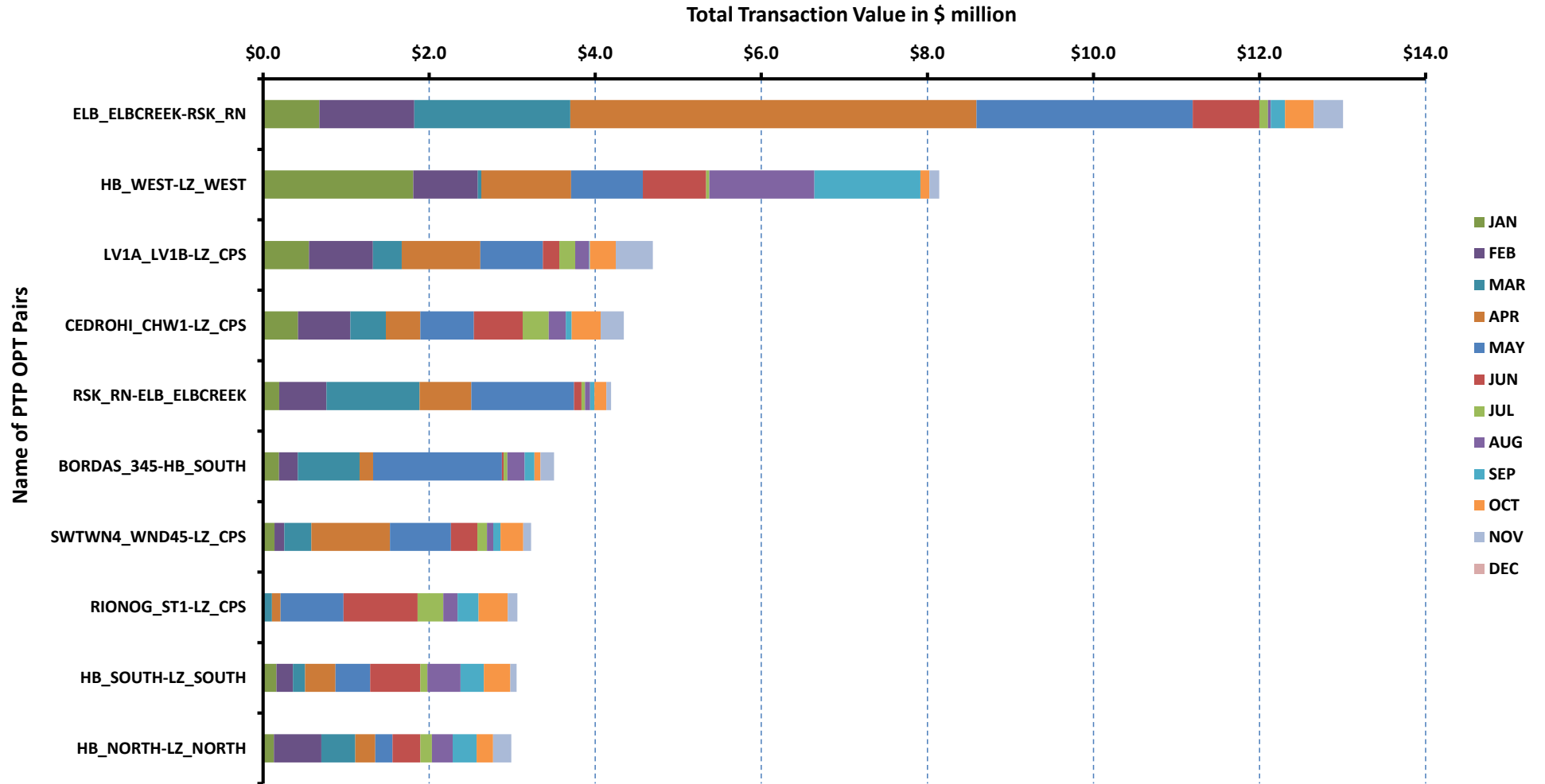
# Top 10 CRR Pairs Ranked by Monthly Auction Values - 1

## Top 10 PTP Obligations by Total Transaction Value - 2023



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

## Top 10 PTP Options by Total Transaction Value - 2023



ERCOT-wide Avg. Energy Price - DA vs. RT			
year	month	dam_spp	rtm_spp
2022	1	\$ 34.35	\$ 31.53
	2	\$ 43.07	\$ 56.44
	3	\$ 40.77	\$ 36.50
	4	\$ 59.57	\$ 56.75
	5	\$ 100.33	\$ 105.11
	6	\$ 90.49	\$ 70.68
	7	\$ 136.65	\$ 164.42
	8	\$ 107.33	\$ 93.70
	9	\$ 74.55	\$ 67.90
	10	\$ 51.60	\$ 53.24
	11	\$ 46.66	\$ 43.59
	12	\$ 77.92	\$ 68.72
2023	1	\$ 28.02	\$ 26.68
	2	\$ 23.83	\$ 21.95
	3	\$ 29.90	\$ 31.20
	4	\$ 27.58	\$ 24.45
	5	\$ 32.08	\$ 32.48
	6	\$ 88.69	\$ 75.44
	7	\$ 64.47	\$ 48.62
	8	\$ 306.32	\$ 224.39
	9	\$ 86.22	\$ 111.41
	10	\$ 37.83	\$ 34.81
	11	\$ -	\$ -
	12	\$ -	\$ -







ERCOT-wide Monthly Implied Heat Rate - DA vs. RT						
year	month	gasprice	rtn_spp	HR_rtn	dam_spp	HR_dam
2022	1	\$ 4.01	\$ 31.53	7.86	\$ 34.35	8.56
	2	\$ 4.45	\$ 56.44	12.70	\$ 43.07	9.69
	3	\$ 4.53	\$ 36.50	8.06	\$ 40.77	9.00
	4	\$ 6.29	\$ 56.75	9.02	\$ 59.57	9.46
	5	\$ 7.83	\$ 105.11	13.43	\$ 100.33	12.81
	6	\$ 7.40	\$ 70.68	9.55	\$ 90.49	12.23
	7	\$ 6.78	\$ 164.42	24.24	\$ 136.65	20.15
	8	\$ 8.22	\$ 93.70	11.40	\$ 107.33	13.06
	9	\$ 7.03	\$ 67.90	9.66	\$ 74.55	10.61
	10	\$ 4.83	\$ 53.24	11.02	\$ 51.60	10.68
	11	\$ 4.16	\$ 43.59	10.49	\$ 46.66	11.23
	12	\$ 4.48	\$ 68.72	15.33	\$ 77.92	17.39
2023	1	\$ 2.65	\$ 26.68	10.07	\$ 28.02	10.58
	2	\$ 2.05	\$ 21.95	10.69	\$ 23.83	11.60
	3	\$ 2.08	\$ 31.20	15.00	\$ 29.90	14.37
	4	\$ 1.86	\$ 24.45	13.15	\$ 27.58	14.83
	5	\$ 1.96	\$ 32.48	16.59	\$ 32.08	16.39
	6	\$ 2.10	\$ 75.44	36.00	\$ 88.69	42.32
	7	\$ 2.36	\$ 48.62	20.63	\$ 64.47	27.35
	8	\$ 2.40	\$ 224.39	93.58	\$ 306.32	127.75
	9	\$ 2.40	\$ 111.41	46.38	\$ 86.22	35.89
	10	\$ 2.39	\$ 34.81	14.56	\$ 37.83	15.83
	11	\$ -	\$ -	-	\$ -	-
	12	\$ -	\$ -	-	\$ -	-



Daily ORDC Adders Average Values and Interval Duration								
YEAR	MONTH	DAY	PRICE_RS	PRICE_RDP	RS_CNT	RDP_CNT	RS_POS	RDP_POS
2023	10	1	\$ -	\$ -	0	0	80	90
2023	10	2	\$ -	\$ -	0	0	80	90
2023	10	3	\$ -	\$ -	0	0	80	90
2023	10	4	\$ 0.02	\$ -	3	0	80	90
2023	10	5	\$ 0.01	\$ -	1	0	80	90
2023	10	6	\$ -	\$ -	0	0	80	90
2023	10	7	\$ -	\$ -	0	0	80	90
2023	10	8	\$ -	\$ -	0	0	80	90
2023	10	9	\$ 0.02	\$ -	5	0	80	90
2023	10	10	\$ -	\$ -	0	0	80	90
2023	10	11	\$ -	\$ -	0	0	80	90
2023	10	12	\$ -	\$ -	0	0	80	90
2023	10	13	\$ -	\$ -	0	0	80	90
2023	10	14	\$ -	\$ -	0	0	80	90
2023	10	15	\$ -	\$ -	0	0	80	90
2023	10	16	\$ -	\$ -	0	0	80	90
2023	10	17	\$ -	\$ -	0	0	80	90
2023	10	18	\$ -	\$ -	0	0	80	90
2023	10	19	\$ 0.34	\$ 2.69	8	14	80	90
2023	10	20	\$ 0.49	\$ 13.53	7	32	80	90
2023	10	21	\$ -	\$ 0.50	0	16	80	90
2023	10	22	\$ -	\$ -	0	0	80	90
2023	10	23	\$ -	\$ -	0	0	80	90
2023	10	24	\$ -	\$ -	0	0	80	90
2023	10	25	\$ 0.02	\$ -	3	0	80	90
2023	10	26	\$ -	\$ -	0	0	80	90
2023	10	27	\$ -	\$ -	0	0	80	90
2023	10	28	\$ -	\$ 1.45	0	21	80	90
2023	10	29	\$ -	\$ -	0	0	80	90
2023	10	30	\$ -	\$ 0.15	0	8	80	90
2023	10	31	\$ -	\$ -	0	0	80	90

**Monthly Average of Ancillary Services Required MW**

year	month	ASMW_REGDN	ASMW_NSPIN	ASMW_RRS	ASMW_REGUP	ASMW_ECRS
2022	1	325	3,867	2,926	346	-
	2	388	4,267	2,950	372	-
	3	387	3,782	3,070	395	-
	4	372	4,069	3,014	373	-
	5	397	4,551	2,893	399	-
	6	339	4,197	2,694	372	-
	7	321	3,750	2,564	343	-
	8	347	3,592	2,572	348	-
	9	355	3,414	2,712	343	-
	10	327	4,404	2,893	343	-
	11	307	3,287	3,045	327	-
	12	318	3,687	3,030	351	-
2023	1	342	4,048	2,965	372	-
	2	420	4,243	3,022	400	-
	3	433	4,049	3,256	454	-
	4	405	4,262	3,102	400	-
	5	418	5,052	2,901	428	-
	6	376	3,275	2,676	408	2,073
	7	347	2,801	2,583	379	2,041
	8	323	2,207	2,566	389	2,127
	9	362	2,265	2,693	381	2,041
	10	399	2,467	2,950	409	1,784
	11	-	-	-	-	-
	12	-	-	-	-	-

Hourly Average of Ancillary Services Required MW

year	DELIVERY_HOUR	ASMW_REGDN	ASMW_NSPIN	ASMW_RRS	ASMW_REGUP	ASMW_ECRS
2022	1	364	3,535	2,910	219	-
	2	284	3,535	2,910	197	-
	3	241	3,483	2,942	206	-
	4	209	3,483	2,943	241	-
	5	208	3,483	2,943	297	-
	6	269	3,483	2,943	412	-
	7	232	4,067	2,832	526	-
	8	274	4,068	2,832	354	-
	9	411	4,068	2,832	367	-
	10	415	4,068	2,832	453	-
	11	425	4,195	2,745	490	-
	12	372	4,198	2,745	499	-
	13	339	4,235	2,745	479	-
	14	345	4,236	2,745	450	-
	15	359	4,086	2,872	432	-
	16	368	4,086	2,872	446	-
	17	377	4,086	2,872	497	-
	18	375	4,086	2,872	505	-
	19	393	3,875	2,876	424	-
	20	359	3,875	2,876	319	-
	21	389	3,875	2,876	241	-
	22	451	3,873	2,876	201	-
	23	468	3,860	2,910	198	-
	24	429	3,860	2,910	170	-
2023	1	385	2,943	2,910	232	1,544
	2	301	2,943	2,910	183	1,464
	3	258	3,253	2,945	214	1,542
	4	230	3,255	2,947	241	1,485
	5	222	3,255	2,947	291	1,455
	6	262	3,255	2,947	419	1,476
	7	235	3,700	2,847	510	1,626
	8	352	3,700	2,847	352	1,820
	9	577	3,700	2,847	341	2,174
	10	493	3,700	2,847	502	2,445
	11	421	3,814	2,730	552	2,296
	12	397	3,814	2,730	559	2,405
	13	389	3,810	2,730	552	2,372
	14	371	3,810	2,730	533	2,346
	15	400	3,705	2,896	511	2,280
	16	429	3,705	2,896	532	2,420
	17	447	3,705	2,896	566	2,490
	18	445	3,705	2,896	653	2,444
	19	415	3,224	2,892	592	2,543
	20	342	3,224	2,892	452	2,280
	21	389	3,224	2,892	291	2,048
	22	462	3,224	2,892	206	1,904
	23	493	3,200	2,910	195	1,728
	24	458	3,200	2,910	167	1,627

**Monthly Average Ancillary Services Price**

year	month	MCPC_REGDN	MCPC_NSPIN	MCPC_RRS	MCPC_REGUP	MCPC_ECRS
2022	1	\$ 6.15	\$ 5.07	\$ 8.39	\$ 11.56	\$ -
	2	\$ 9.60	\$ 16.07	\$ 12.93	\$ 17.69	\$ -
	3	\$ 17.94	\$ 12.43	\$ 18.67	\$ 22.69	\$ -
	4	\$ 13.88	\$ 19.17	\$ 18.04	\$ 20.99	\$ -
	5	\$ 18.03	\$ 51.85	\$ 31.29	\$ 38.71	\$ -
	6	\$ 7.01	\$ 23.22	\$ 22.48	\$ 24.71	\$ -
	7	\$ 9.52	\$ 54.81	\$ 61.26	\$ 72.27	\$ -
	8	\$ 6.45	\$ 17.89	\$ 14.80	\$ 22.36	\$ -
	9	\$ 6.93	\$ 9.67	\$ 7.32	\$ 12.85	\$ -
	10	\$ 3.89	\$ 14.20	\$ 5.65	\$ 9.55	\$ -
	11	\$ 3.63	\$ 9.58	\$ 4.19	\$ 8.53	\$ -
	12	\$ 8.42	\$ 38.40	\$ 40.31	\$ 42.73	\$ -
2023	1	\$ 5.69	\$ 4.69	\$ 4.00	\$ 7.27	\$ -
	2	\$ 12.99	\$ 5.79	\$ 3.72	\$ 7.58	\$ -
	3	\$ 6.42	\$ 8.01	\$ 6.24	\$ 12.47	\$ -
	4	\$ 7.65	\$ 8.03	\$ 6.12	\$ 12.52	\$ -
	5	\$ 4.74	\$ 11.87	\$ 4.03	\$ 7.66	\$ -
	6	\$ 8.20	\$ 45.87	\$ 38.57	\$ 47.00	\$ 107.44
	7	\$ 6.53	\$ 17.12	\$ 18.14	\$ 23.85	\$ 38.30
	8	\$ 99.16	\$ 80.61	\$ 132.73	\$ 215.17	\$ 276.73
	9	\$ 29.48	\$ 17.56	\$ 32.12	\$ 47.44	\$ 44.76
	10	\$ 6.59	\$ 8.23	\$ 10.82	\$ 17.38	\$ 16.78
	11	\$ -	\$ -	\$ -	\$ -	\$ -
	12	\$ -	\$ -	\$ -	\$ -	\$ -

Monthly Average A/S Cost per MWh Load

year	month	AScost_REGDN	AScost_NSPIN	AScost_RRS	AScost_REGUP	AScost_ECRS
2022	1	\$ 0.04	\$ 0.44	\$ 0.55	\$ 0.09	\$ -
	2	\$ 0.08	\$ 1.47	\$ 0.82	\$ 0.14	\$ -
	3	\$ 0.17	\$ 1.15	\$ 1.40	\$ 0.22	\$ -
	4	\$ 0.12	\$ 1.82	\$ 1.27	\$ 0.18	\$ -
	5	\$ 0.14	\$ 4.56	\$ 1.75	\$ 0.30	\$ -
	6	\$ 0.04	\$ 1.67	\$ 1.04	\$ 0.16	\$ -
	7	\$ 0.05	\$ 3.33	\$ 2.54	\$ 0.40	\$ -
	8	\$ 0.04	\$ 1.11	\$ 0.66	\$ 0.13	\$ -
	9	\$ 0.05	\$ 0.64	\$ 0.38	\$ 0.08	\$ -
	10	\$ 0.03	\$ 1.45	\$ 0.38	\$ 0.08	\$ -
	11	\$ 0.03	\$ 0.73	\$ 0.29	\$ 0.06	\$ -
	12	\$ 0.06	\$ 3.12	\$ 2.69	\$ 0.33	\$ -
2023	1	\$ 0.04	\$ 0.44	\$ 0.27	\$ 0.06	\$ -
	2	\$ 0.12	\$ 0.55	\$ 0.25	\$ 0.07	\$ -
	3	\$ 0.06	\$ 0.76	\$ 0.48	\$ 0.13	\$ -
	4	\$ 0.07	\$ 0.80	\$ 0.45	\$ 0.12	\$ -
	5	\$ 0.04	\$ 1.22	\$ 0.24	\$ 0.07	\$ -
	6	\$ 0.05	\$ 2.53	\$ 1.74	\$ 0.32	\$ 2.63
	7	\$ 0.04	\$ 0.75	\$ 0.73	\$ 0.14	\$ 1.23
	8	\$ 0.47	\$ 2.63	\$ 5.04	\$ 1.24	\$ 8.72
	9	\$ 0.18	\$ 0.67	\$ 1.45	\$ 0.30	\$ 1.53
	10	\$ 0.06	\$ 0.43	\$ 0.67	\$ 0.15	\$ 0.63
	11	\$ -	\$ -	\$ -	\$ -	\$ -
	12	\$ -	\$ -	\$ -	\$ -	\$ -

ERCOT-wide Cumulative PNM			
year	month	pnm	pnm_accum
2022	0	\$ -	\$ -
	1	\$ 2,245.58	\$ 2,245.58
	2	\$ 14,589.18	\$ 16,834.76
	3	\$ 4,492.68	\$ 21,327.44
	4	\$ 7,843.68	\$ 29,171.12
	5	\$ 25,120.79	\$ 54,291.91
	6	\$ 4,444.47	\$ 58,736.38
	7	\$ 61,835.52	\$ 120,571.90
	8	\$ 12,243.51	\$ 132,815.41
	9	\$ 4,218.01	\$ 137,033.42
	10	\$ 7,195.67	\$ 144,229.09
	11	\$ 5,637.30	\$ 149,866.39
	12	\$ 15,653.63	\$ 165,520.02
2023	0	\$ -	\$ -
	1	\$ 3,758.67	\$ 3,758.67
	2	\$ 3,066.65	\$ 6,825.32
	3	\$ 7,327.65	\$ 14,152.97
	4	\$ 3,963.19	\$ 18,116.16
	5	\$ 8,532.76	\$ 26,648.92
	6	\$ 30,746.31	\$ 57,395.23
	7	\$ 15,736.44	\$ 73,131.67
	8	\$ 125,626.42	\$ 198,758.09
	9	\$ 46,968.45	\$ 245,726.54
	10	\$ 6,305.54	\$ 252,032.08
	11	\$ -	\$ -
	12	\$ -	\$ -



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
2022	1	(408)	171	670	86	190	25
	2	(1,031)	155	689	(222)	(62)	442
	3	(897)	(126)	(168)	(643)	(588)	(395)
	4	(946)	302	(321)	(854)	(1,173)	(532)
	5	(1,877)	992	(191)	(1,445)	(1,812)	(395)
	6	(1,009)	1,448	1,149	(347)	(431)	530
	7	(532)	1,469	1,099	(137)	(403)	769
	8	(318)	1,551	1,167	279	(381)	650
	9	245	1,053	940	390	96	1,245
	10	245	1,496	331	247	368	1,351
	11	(204)	286	730	449	441	698
	12	(1,011)	428	278	(233)	(269)	229
2023	1	33	392	136	210	732	1,397
	2	(28)	1,497	1,206	666	1,005	1,480
	3	(484)	459	208	89	750	931
	4	(1,127)	362	252	(282)	(373)	534
	5	(909)	1,207	1,088	(363)	(998)	467
	6	(68)	2,778	1,439	415	(586)	1,530
	7	22	3,009	1,488	468	(224)	1,085
	8	45	1,604	872	994	(355)	802
	9	(320)	1,185	417	(82)	(589)	338
	10	(322)	1,539	1,233	109	(527)	752
	11	-	-	-	-	-	-
	12	-	-	-	-	-	-

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
2022	1	13,020	9,623	9,868	12,555	13,127	10,415
	2	14,195	10,245	11,028	13,744	13,920	11,206
	3	16,027	13,581	13,844	15,591	16,250	14,236
	4	17,675	15,266	15,674	16,702	16,996	16,211
	5	19,060	14,380	16,476	18,635	17,225	15,650
	6	16,762	10,737	13,012	15,837	13,740	11,588
	7	15,609	7,947	11,386	14,680	12,513	9,484
	8	10,766	6,175	8,856	10,584	8,506	6,596
	9	11,017	5,597	6,896	10,717	8,643	5,946
	10	11,757	8,113	9,031	11,725	10,439	8,063
	11	13,853	11,574	12,093	14,140	12,744	10,994
	12	12,260	10,846	10,713	12,593	12,069	11,133
2023	1	16,786	12,978	13,256	16,258	15,896	13,255
	2	15,935	14,322	15,239	17,307	15,026	13,552
	3	16,983	12,878	13,946	16,760	15,530	13,978
	4	16,756	12,031	13,207	16,187	15,018	12,761
	5	12,744	7,265	10,625	13,140	9,807	7,209
	6	14,285	8,535	10,879	13,859	11,975	9,609
	7	16,218	8,723	10,953	14,729	13,006	9,683
	8	14,147	7,705	9,874	12,837	11,131	8,875
	9	13,994	6,223	7,888	13,447	11,182	8,244
	10	14,077	10,071	10,516	13,441	12,740	10,486
	11	-	-	-	-	-	-
	12	-	-	-	-	-	-



RT Congestion Constraint Rankings - Top 10 Constraints by Binding Frequency and Top 10 Constraints by Total Congestion Rent																
CATEGORY	YEAR	CONSTRAINT	RANKVAR	RANK	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
FREQ_EXIST	2023	NORTH EDINBURG LOBO GTC (NE LOB)	21475	1	1585	2536	2252	1723	2319	2288	2934	2356	938	2544	0	0
FREQ_EXIST	2023	BEARKAT GTC (BEARKT)	13083	2	4477	2614	3765	2223	3	1	0	0	0	0	0	
FREQ_EXIST	2023	HAMILT MAVERI1 1 (HAMILTON-MAVERICK)	10092	3	1221	1273	1449	2499	391	514	946	1455	343	1	0	
FREQ_EXIST	2023	BURNS RIOHONDO 1 (RIOHONDO-MV_BURNS)	7033	4	561	924	1614	422	255	937	607	778	584	351	0	
FREQ_EXIST	2023	PANHNDL GTC (PNHNDL)	6920	5	0	1653	3070	783	0	0	0	0	36	1378	0	
FREQ_EXIST	2023	6437 F (SCRCV-KNAPP)	5640	6	0	132	116	23	7	937	1825	1647	853	100	0	
FREQ_EXIST	2023	WEST TEXAS EXPORT GTC (WESTEX)	5590	7	1395	1111	948	346	56	420	268	99	288	659	0	
FREQ_EXIST	2023	MDSSW XFMR5 (MDSSW-MDSSW)	5484	8	300	1410	2377	1044	353	0	0	0	0	0	0	
FREQ_EXIST	2023	FALFUR_PREM01_1 (FALFUR-PREMONT)	5177	9	0	0	0	0	24	691	2116	1755	131	460	0	
FREQ_EXIST	2023	LARDVN_LASCRU1_1 (LARDVNTH-LASCRUCE)	4685	10	22	87	780	573	149	617	984	789	95	589	0	
TOP10_RENT	2023	PAWNEE_SPRUCE_1 (PAWNEE-CALAVERS)	\$ 172.99	1	\$ 2.80	\$ 3.15	\$ 0.43	\$ 0.01	\$ 0.33	\$ 17.74	\$ 21.16	\$ 97.17	\$ 30.20	\$ -	\$ -	\$ -
TOP10_RENT	2023	STP-WAP LINES (STP-WAP)	\$ 127.63	2	\$ -	\$ 0.09	\$ -	\$ 0.01	\$ 2.40	\$ 3.09	\$ 20.67	\$ 101.35	\$ 0.03	\$ -	\$ -	\$ -
TOP10_RENT	2023	MDSSW XFMR5 (MDSSW-MDSSW)	\$ 85.35	3	\$ 3.79	\$ 10.99	\$ 57.66	\$ 7.53	\$ 5.38	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2023	6036_A (TKWSW-MGSES)	\$ 70.99	4	\$ 0.63	\$ 0.54	\$ 4.19	\$ 3.08	\$ 0.86	\$ 3.11	\$ 3.60	\$ 18.23	\$ 14.46	\$ 22.29	\$ -	\$ -
TOP10_RENT	2023	HAMILT MAVERI1 1 (HAMILTON-MAVERICK)	\$ 67.12	5	\$ 1.66	\$ 3.13	\$ 3.77	\$ 6.76	\$ 1.00	\$ 9.96	\$ 16.65	\$ 22.25	\$ 1.96	\$ 0.00	\$ -	\$ -
TOP10_RENT	2023	NORTH EDINBURG LOBO GTC (NE LOB)	\$ 64.75	6	\$ 4.19	\$ 6.47	\$ 6.94	\$ 3.60	\$ 6.77	\$ 7.06	\$ 9.91	\$ 9.28	\$ 3.90	\$ 6.63	\$ -	\$ -
TOP10_RENT	2023	BURNS RIOHONDO 1 (RIOHONDO-MV_BURNS)	\$ 61.86	7	\$ 2.12	\$ 2.98	\$ 13.91	\$ 0.90	\$ 0.99	\$ 18.72	\$ 2.72	\$ 4.39	\$ 13.89	\$ 1.24	\$ -	\$ -
TOP10_RENT	2023	WEST TEXAS EXPORT GTC (WESTEX)	\$ 61.79	8	\$ 17.01	\$ 9.87	\$ 10.76	\$ 3.44	\$ 0.21	\$ 5.51	\$ 3.41	\$ 1.37	\$ 3.16	\$ 7.04	\$ -	\$ -
TOP10_RENT	2023	235_A (SJNSW-JEWET)	\$ 45.78	9	\$ -	\$ -	\$ -	\$ -	\$ 0.00	\$ 1.97	\$ 3.56	\$ 39.35	\$ 0.88	\$ 0.01	\$ -	\$ -
TOP10_RENT	2023	15080_Z (CONSW-CTFLD)	\$ 45.36	10	\$ 44.65	\$ -	\$ -	\$ 0.71	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

MONTH	RENT TOTAL
1	145.61
2	154.48
3	260.24
4	174.51
5	88.05
6	183.76
7	176.15
8	553.47
9	257.01
10	169.08
11	0.00
12	0.00
Sum-Total	2162.36

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	2023	ASHERT_CATARI1_1 (ASHERTON-CATARINA)	4,403	1	592	649	707	618	514	397	217	196	232	281	-	-
FREQ_EXIST	2023	CONCHO_SANW0_1 (CONCHO-SANW)	3,756	2	195	165	365	427	388	430	438	395	428	525	-	-
FREQ_EXIST	2023	6144_A (BSPRW-STASW)	3,641	3	450	399	281	374	410	326	319	327	353	402	-	-
FREQ_EXIST	2023	PUEBLO_XFMRS (PUEBLO-PUEBLO)	3,583	4	358	568	450	280	439	406	390	350	214	128	-	-
FREQ_EXIST	2023	NORTH_EDINBURG_LOBO_GTC (NE_LOB)	2,927	5	200	275	365	203	349	358	372	271	157	377	-	-
FREQ_EXIST	2023	LPLBR_BRT1 (LPLBR-LPLBR)	2,915	6	48	100	59	371	430	273	477	406	410	341	-	-
FREQ_EXIST	2023	CATARI_PILONC1_1 (PILONCIL-CATARINA)	2,907	7	500	462	510	416	182	125	96	182	243	191	-	-
FREQ_EXIST	2023	LPLMK_LPLNE_1 (LPLMK-LPLNE)	2,899	8	316	400	603	509	352	104	87	154	126	248	-	-
FREQ_EXIST	2023	LARDVN_LASCRU1_1 (LARDVNTH-LASCRUCE)	2,886	9	251	276	352	239	196	410	420	352	116	274	-	-
FREQ_EXIST	2023	BURNS_RIOHONDO_1 (RIOHONDO-MV_BURNS)	2,561	10	341	290	518	236	114	299	232	206	129	196	-	-
TOP10_RENT	2023	PAWNEE_SPRUCE_1 (PAWNEE-CALAVERS)	\$ 111.53	1	\$ 4.36	\$ 4.27	\$ 0.72	\$ 0.20	\$ 1.06	\$ 8.70	\$ 15.11	\$ 63.93	\$ 11.01	\$ 2.17	\$ -	\$ -
TOP10_RENT	2023	MDSSW_XFMR (MDSSW-MDSSW)	\$ 79.47	2	\$ 1.47	\$ 10.79	\$ 45.85	\$ 17.89	\$ 3.47	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOP10_RENT	2023	BURNS_RIOHONDO_1 (RIOHONDO-MV_BURNS)	\$ 63.09	3	\$ 4.70	\$ 4.11	\$ 17.60	\$ 4.44	\$ 0.95	\$ 11.92	\$ 5.11	\$ 5.47	\$ 5.62	\$ 3.16	\$ -	\$ -
TOP10_RENT	2023	NORTH_EDINBURG_LOBO_GTC (NE_LOB)	\$ 60.17	4	\$ 3.86	\$ 4.95	\$ 8.64	\$ 3.55	\$ 6.50	\$ 6.21	\$ 8.87	\$ 7.21	\$ 3.76	\$ 6.62	\$ -	\$ -
TOP10_RENT	2023	STP-WAP LINES (STP-WAP)	\$ 55.88	5	\$ -	\$ 0.14	\$ 0.23	\$ -	\$ 1.34	\$ 3.18	\$ 10.29	\$ 39.70	\$ 1.01	\$ -	\$ -	\$ -
TOP10_RENT	2023	WEST TEXAS EXPORT_GTC (WESTEX)	\$ 51.46	6	\$ 12.91	\$ 11.98	\$ 9.60	\$ 3.47	\$ 1.29	\$ 2.26	\$ 1.51	\$ 0.27	\$ 1.98	\$ 6.18	\$ -	\$ -
TOP10_RENT	2023	LPLMK_LPLNE_1 (LPLMK-LPLNE)	\$ 41.93	7	\$ 2.09	\$ 4.42	\$ 13.23	\$ 9.27	\$ 4.47	\$ 0.40	\$ 0.90	\$ 1.99	\$ 1.33	\$ 3.83	\$ -	\$ -
TOP10_RENT	2023	HAMILT_MAVERI1_1 (HAMILTON-MAVERICK)	\$ 40.86	8	\$ 0.88	\$ 1.73	\$ 4.41	\$ 8.63	\$ 1.15	\$ 5.67	\$ 9.32	\$ 6.87	\$ 2.15	\$ 0.04	\$ -	\$ -
TOP10_RENT	2023	CHAMPL_WEIL_T1_1 (WEIL_TRC-CHAMPLIN)	\$ 39.84	9	\$ -	\$ -	\$ -	\$ -	\$ 0.00	\$ 2.16	\$ 3.02	\$ 32.59	\$ 2.07	\$ -	\$ -	\$ -
TOP10_RENT	2023	6036_A (TKWSW-MGSES)	\$ 35.71	10	\$ 0.07	\$ -	\$ 0.13	\$ 0.28	\$ 0.02	\$ 0.79	\$ 1.08	\$ 7.92	\$ 10.98	\$ 14.42	\$ -	\$ -

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																
ft_option	year	pair	total_value	rank	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
N	2023	HB WEST-LZ WEST	\$ 72.30	1	\$ 1.97	\$ 5.50	\$ 5.86	\$ 7.71	\$ 9.85	\$ 7.68	\$ 5.06	\$ 4.11	\$ 6.45	\$ 7.77	\$ 10.33	\$ -
N	2023	HB NORTH-HB HOUSTON	\$ 29.07	2	\$ 0.24	\$ 0.31	\$ 2.82	\$ 4.96	\$ 4.97	\$ 4.68	\$ 1.16	\$ 2.23	\$ 3.07	\$ 3.49	\$ 1.13	\$ -
N	2023	HB HOUSTON-LZ HOUSTON	\$ 14.47	3	\$ 0.38	\$ 0.54	\$ 0.52	\$ 1.22	\$ 2.07	\$ 2.97	\$ 1.12	\$ 1.26	\$ 1.66	\$ 1.77	\$ 0.95	\$ -
N	2023	HB NORTH-LZ NORTH	\$ 13.14	4	\$ 0.81	\$ 0.73	\$ 0.31	\$ 0.44	\$ 0.89	\$ 2.05	\$ 2.39	\$ 1.57	\$ 1.88	\$ 1.23	\$ 0.85	\$ -
N	2023	AEEC-LZ WEST	\$ 9.57	5	\$ 1.13	\$ 0.91	\$ 0.59	\$ 0.79	\$ 0.84	\$ 0.91	\$ 0.42	\$ 0.32	\$ 1.12	\$ 0.74	\$ 1.80	\$ -
N	2023	COL_COLETOG1-HB SOUTH	\$ 7.31	6	\$ 0.74	\$ 0.57	\$ -	\$ 0.08	\$ 0.27	\$ 0.88	\$ 1.15	\$ 0.97	\$ 0.98	\$ 1.00	\$ 0.67	\$ -
N	2023	HB SOUTH-HB NORTH	\$ 6.40	7	\$ 0.95	\$ 0.41	\$ 0.16	\$ -	\$ -	\$ 0.02	\$ -	\$ 1.99	\$ 2.88	\$ -	\$ -	\$ -
N	2023	MIRASOLE_GEN-HB SOUTH	\$ 4.95	8	\$ 0.66	\$ 0.26	\$ 0.37	\$ 1.40	\$ 0.82	\$ 0.83	\$ 0.56	\$ 0.02	\$ 0.01	\$ -	\$ 0.02	\$ -
N	2023	WAP_WAP_G7-HB HOUSTON	\$ 4.46	9	\$ 0.16	\$ 0.04	\$ 1.09	\$ 0.14	\$ 1.04	\$ 0.96	\$ 0.14	\$ 0.12	\$ 0.14	\$ 0.44	\$ 0.21	\$ -
N	2023	HB SOUTH-LZ SOUTH	\$ 4.30	10	\$ 0.15	\$ -	\$ 0.11	\$ 0.91	\$ 1.01	\$ 0.98	\$ 0.06	\$ 0.22	\$ 0.26	\$ 0.30	\$ 0.30	\$ -
Y	2023	ELB_ELBCREEK-RSK RN	\$ 13.01	1	\$ 0.68	\$ 1.14	\$ 1.88	\$ 4.89	\$ 2.60	\$ 0.80	\$ 0.10	\$ 0.03	\$ 0.17	\$ 0.34	\$ 0.35	\$ -
Y	2023	HB WEST-LZ WEST	\$ 8.14	2	\$ 1.81	\$ 0.78	\$ 0.04	\$ 1.08	\$ 0.86	\$ 0.76	\$ 0.04	\$ 1.27	\$ 1.28	\$ 0.11	\$ 0.12	\$ -
Y	2023	LV1A_LV1B-LZ CPS	\$ 4.69	3	\$ 0.55	\$ 0.77	\$ 0.35	\$ 0.95	\$ 0.75	\$ 0.20	\$ 0.19	\$ 0.17	\$ 0.01	\$ 0.31	\$ 0.45	\$ -
Y	2023	CEDROHI_CHW1-LZ CPS	\$ 4.34	4	\$ 0.42	\$ 0.63	\$ 0.43	\$ 0.42	\$ 0.64	\$ 0.59	\$ 0.31	\$ 0.21	\$ 0.07	\$ 0.35	\$ 0.28	\$ -
Y	2023	RSK_RN-ELB_ELBCREEK	\$ 4.19	5	\$ 0.20	\$ 0.57	\$ 1.12	\$ 0.62	\$ 1.24	\$ 0.09	\$ 0.04	\$ 0.06	\$ 0.05	\$ 0.14	\$ 0.06	\$ -
Y	2023	BORDAS_345-HB SOUTH	\$ 3.50	6	\$ 0.19	\$ 0.23	\$ 0.74	\$ 0.16	\$ 1.55	\$ 0.02	\$ 0.04	\$ 0.21	\$ 0.12	\$ 0.07	\$ 0.16	\$ -
Y	2023	SWTWN4_WND45-LZ CPS	\$ 3.23	7	\$ 0.14	\$ 0.12	\$ 0.33	\$ 0.95	\$ 0.73	\$ 0.32	\$ 0.11	\$ 0.08	\$ 0.09	\$ 0.27	\$ 0.09	\$ -
Y	2023	RIONOG_ST1-LZ CPS	\$ 3.06	8	\$ -	\$ -	\$ 0.11	\$ 0.10	\$ 0.76	\$ 0.89	\$ 0.31	\$ 0.17	\$ 0.25	\$ 0.35	\$ 0.12	\$ -
Y	2023	HB SOUTH-LZ SOUTH	\$ 3.05	9	\$ 0.16	\$ 0.20	\$ 0.15	\$ 0.37	\$ 0.42	\$ 0.60	\$ 0.09	\$ 0.40	\$ 0.28	\$ 0.32	\$ 0.08	\$ -
Y	2023	HB NORTH-LZ NORTH	\$ 2.99	10	\$ 0.13	\$ 0.57	\$ 0.41	\$ 0.24	\$ 0.21	\$ 0.34	\$ 0.14	\$ 0.25	\$ 0.29	\$ 0.20	\$ 0.22	\$ -