

This week we look at all the major spreads followed by nat gas traders, with an interpretation of what they all track.

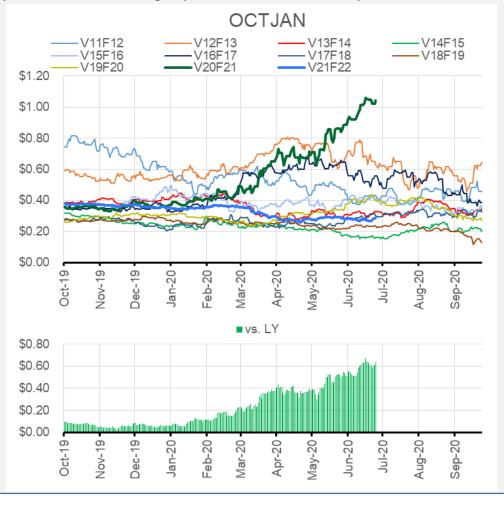
We'll cover the OCTJAN, OCTNOV, MARAPR, and APROCT with various charts to see how they look vs past years.

We'll paste on the charts again at the end in different views.

Let's start by looking at the OCTJAN (VF). This spreads typically tracks the end of summer storage health, particularly measuring the level of natural gas in storage by Oct 31 for the upcoming winter.

The spread moves daily as we progress towards the expiration of the Oct contract (end of Sept). The Oct and Jan contract prices typically move in the same direction as traders track summer fundamentals and injection rates. The Oct contract is usually more volatile as we near expiration, while Jan prices are less volatile due to the lack of a concrete winter weather view.

When end of summer storage expectations are well below normal (the 5Yr average), the spread is narrow as Oct prices remain strong. On the flip side, if storage is projected to end summer above normal, then Oct prices usually weaken. The Oct prices can fall dramatically if storage levels are projected to break storage capacity levels, or exceed storage injection ratchets late in the injection season.

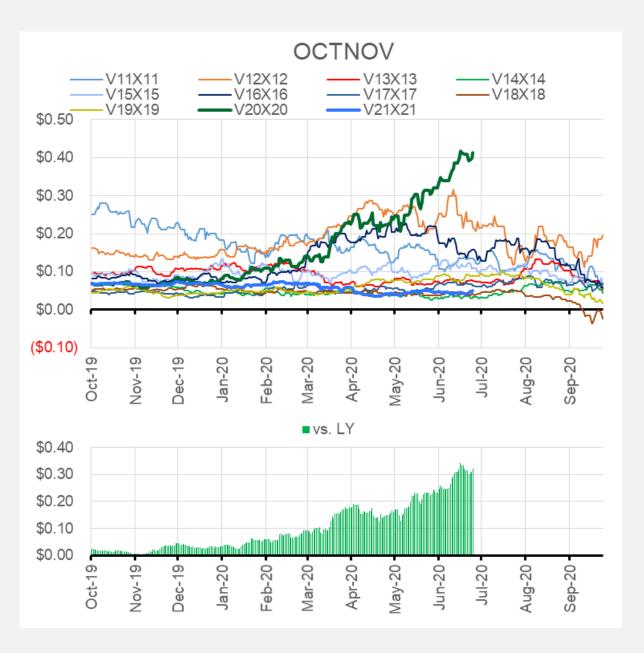




Prices help keep the market in check. A change in the price level change production economics, alter the power generation mix, to increase power burns, and to adjust global LNG shipping economics.

Currently the OctJan is trading at \$1.09, indicating that we are expected to hit severely higher storage levels.

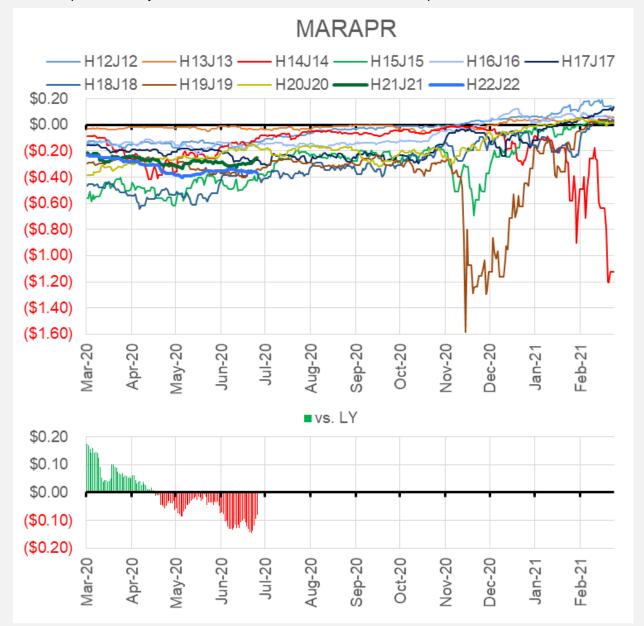
OCTNOV (VX) is similar, but can be a more variable as natural gas injections are normal for the first half of November.





Next we look at the MARAPR (HJ) spread. This spread typically tracks the end of winter storage levels, particularly measuring the level of natural gas expected to be in US storage by Mar 31. This spread is also referred to as the 'Widow maker' as this spread can blow out if fear sets in that the US will be short gas late in winter. To be more precise, the fear revolves around the lack of daily gas deliverability from storage to meet peak winter demand. As storage facilities empty out throughout winter, the storage facilities are not as pressurized leading to physical constraints that reduce the max daily volume that can be delivered

Currently the MarApr is trading at -\$0.24. Current spreads are wider than last year, indicating a tighter market despite projections of going into winter with high storage levels. The current view looks to assume production remains low, and return to a normal winter and LNG exports returning from the low summer levels. The spread usually flattens as we traverse winter and fear dissipates.



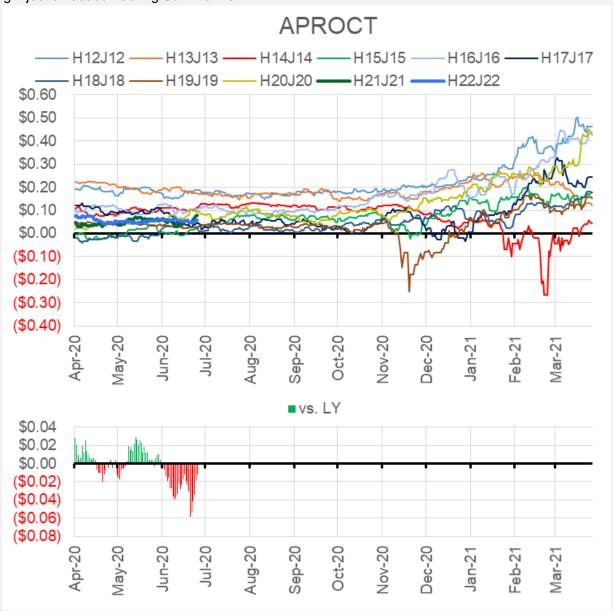


Finally, we cover APROCT (JV). This spread typically tracks the summer injection season, particularly the amount of gas required to fill during the summer to get back to normal levels by Oct 31.

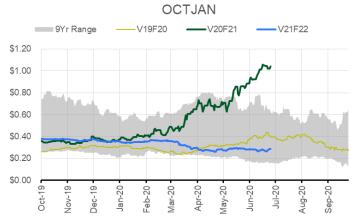
The spread is driven by the outlook on how we exit winter. The spread typically has a high correlation to how much we need to fill during the summer months to get to the 5Yr normal storage levels.

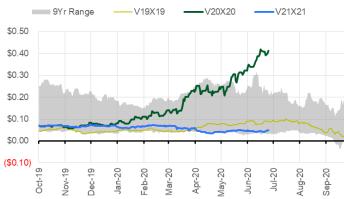
With a low end of winter storage projection, the spread is narrow as Apr prices remain strong to incent production and push coal back in the power stack. On the flip side, if storage is projected to be higher than normal at the end of winter, then Apr prices weaken opening up the spread.

Currently the AprOct is trading at \$0.081, indicating that we will be exiting winter a low levels requiring a strong injection season during Summer 2021.

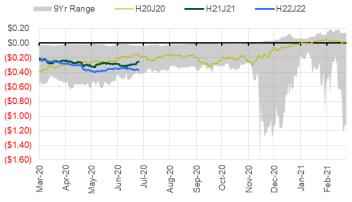




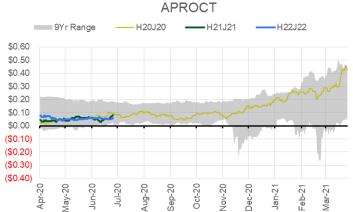




OCTNOV

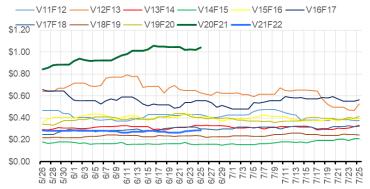


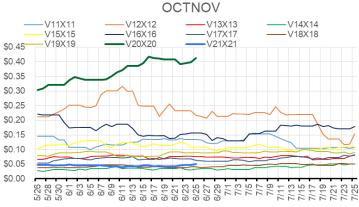
MARAPR



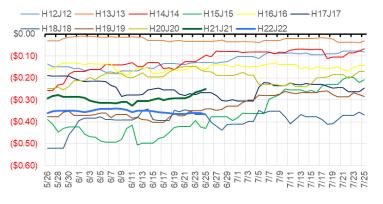


#### OCTJAN

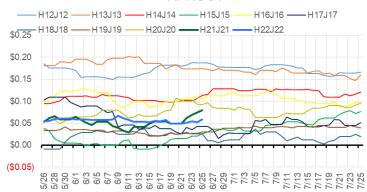




#### **MARAPR**



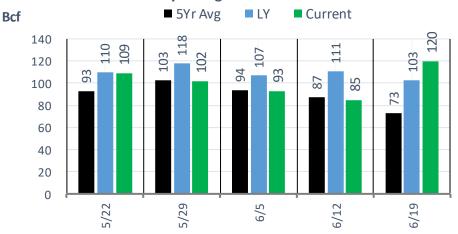
#### **APROCT**



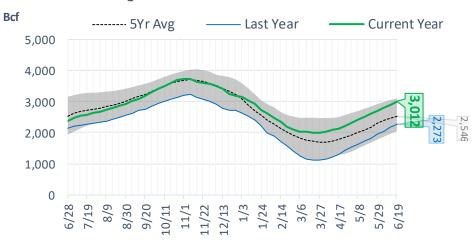


### **EIA Storage Report**

#### **Total Lower 48 YoY Weekly Change**



#### **Total Lower 48 Storage Levels**



#### **Total Lower 48 LY Surplus/Deficit**



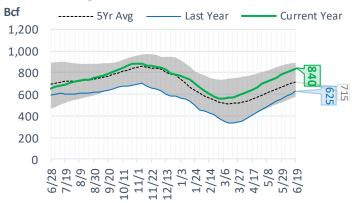


# Natural Gas Storage Stats - Last 5 Weeks

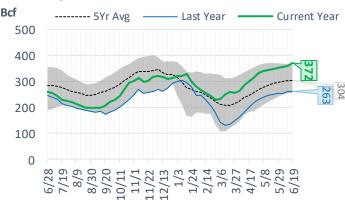
	Current	Week - 1	Week - 2	Week - 3	Week - 4	Week - 5
Week Ending	19-Jun	12-Jun	5-Jun	29-May	22-May	15-May
Total Lower 48 Storage Level	3012	2892	2807	2714	2612	2503
Weekly Change	+120	+85	+93	+102	+109	+81
vs LY	+739	+722	+748	+762	+778	+779
vs 5Yr Avg	+466	+419	+421	+422	+423	+407
S. Central Salt Storage Level	372	358	357	353	348	345
Weekly Change	+14	+1	+4	+5	+3	+5
vs LY	+109	+96	+101	+98	+96	+99
vs 5Yr Avg	+68	+53	+55	+56	+57	+59
S. Central NonSalt Storage Level	840	815	797	778	757	737
Weekly Change	+25	+18	+19	+21	+20	+18
vs LY	+215	+210	+217	+220	+225	+230
vs 5Yr Avg	+125	+113	+111	+110	+109	+110
Midwest Storage Level	716	688	662	634	606	576
Weekly Change	+28	+26	+28	+28	+30	+22
vs LY	+188	+195	+202	+209	+217	+220
vs 5Yr Avg	+145	+143	+144	+145	+147	+144
East Storage Level	619	586	563	536	504	469
Weekly Change	+33	+23	+27	+32	+35	+17
vs LY	+128	+123	+130	+131	+130	+123
vs 5Yr Avg	+104	+96	+102	+103	+101	+93
Mountain Storage Level	165	156	148	140	132	124
Weekly Change	+9	+8	+8	+8	+8	+7
vs LY	+41	+40	+40	+41	+40	+37
vs 5Yr Avg	+8	+4	+2	0	-2	-5
Pacific Storage Level	299	290	281	273	264	253
Weekly Change	+9	+9	+8	+9	+11	+13
vs LY	+57	+58	+58	+64	+69	+70



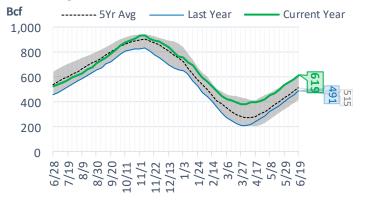
#### NonSalt Storage Levels



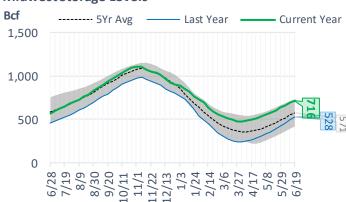
#### Salt Storage Levels



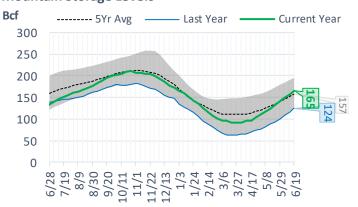
#### **East Storage Levels**



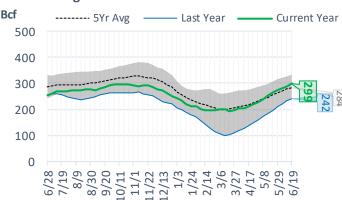
#### Midwest Storage Levels



#### **Mountain Storage Levels**

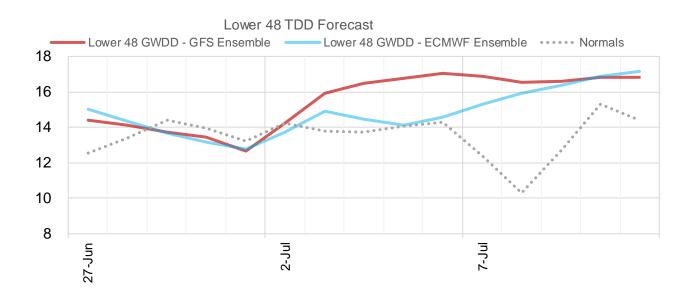


#### **Pacific Storage Levels**





### Current Short-term Weather Model Outlooks (00z)





Source: WSI, Bloomberg



#### **EIA Storage Week Balances**

	22-May	29-May	5-Jun	12-Jun	19-Jun	26-Jun	WoW	vs. 4W
Lower 48 Dry Production	84.0	84.0	84.5	84.3	84.5	84.4	<b>▽ -0.1</b>	<b>△</b> 0.1
Canadian Imports	4.1	4.1	4.2	3.8	3.7	4.2	<b>△</b> 0.5	<b>△</b> 0.2
L48 Power	26.5	29.7	31.7	33.6	30.7	37.3	<b>6.6</b>	<b>5.9</b>
L48 Residential & Commercial	10.8	8.2	8.5	8.1	8.3	7.7	▼ -0.6	▼ -0.5
L48 Industrial	19.0	19.6	19.6	18.6	17.5	17.1	▼ -0.4	▼ -1.8
L48 Lease and Plant Fuel	4.7	4.7	4.7	4.7	4.8	4.8	▼ 0.0	<b>0.0</b>
L48 Pipeline Distribution	1.8	1.9	2.0	2.0	1.9	2.2	<b>0.3</b>	<b>0.2</b>
L48 Regional Gas Consumption	62.9	64.1	66.5	67.0	63.1	69.1	<b>5.9</b>	<b>3.9</b>
Net LNG Exports	6.3	6.1	5.1	3.9	3.8	4.0	<b>△</b> 0.3	<b>▽ -0.7</b>
Total Mexican Exports	5.2	5.0	5.3	5.7	5.6	5.9	<b>△</b> 0.3	<b>△</b> 0.5
Implied Daily Storage Activity EIA Reported Daily Storage Activity Daily Model Error	13.7 15.6 -1.9	12.9 14.6 -1.7	11.8 13.3 -1.5	11.6 12.1 -0.5	15.7 17.1 -1.4	9.6	-6.1	

Monthly Balances									
	2Yr Ago Jun-18	LY Jun-19	Feb-20	Mar-20	Apr-20	May-20	MTD Jun-20	MoM	vs. LY
Lower 48 Dry Production	81.6	89.6	91.8	92.2	91.2	85.3	84.4	<b>▽</b> -0.9	▼ -5.2
Canadian Imports	5.6	4.7	5.2	4.1	4.0	3.9	4.0	<b>△</b> 0.1	▼ -0.8
L48 Power	31.8	33.0	30.0	28.3	25.8	26.8	34.1	<b>7.3</b>	<b>1.1</b>
L48 Residential & Commercial	8.6	9.0	39.9	27.7	21.6	12.8	8.1	▼ -4.7	▼ -0.9
L48 Industrial	21.3	21.3	24.3	21.7	18.9	18.7	17.9	▼ -0.9	▼ -3.4
L48 Lease and Plant Fuel	4.5	5.0	5.2	5.2	5.2	4.8	4.8	▼ 0.0	▼ -0.3
L48 Pipeline Distribution	1.9	2.0	3.0	2.5	2.3	2.0	2.0	<b>△</b> 0.1	<b>a</b> 0.0
L48 Regional Gas Consumption	68.2	70.4	102.3	85.4	73.6	65.0	66.8	<b>1.8</b>	▼ -3.6
Net LNG Exports	3.2	5.5	8.5	8.5	8.2	6.7	4.0	▼ -2.7	▼ -1.5
Total Mexican Exports	4.5	5.3	5.3	5.6	4.9	4.9	5.7	▲ 0.8	<b>△</b> 0.4
Implied Daily Storage Activity EIA Reported Daily Storage Activity Daily Model Error	11.3	13.1	-19.0	-3.1	8.4	12.7	11.9		

Source: Bloomberg, analytix.ai

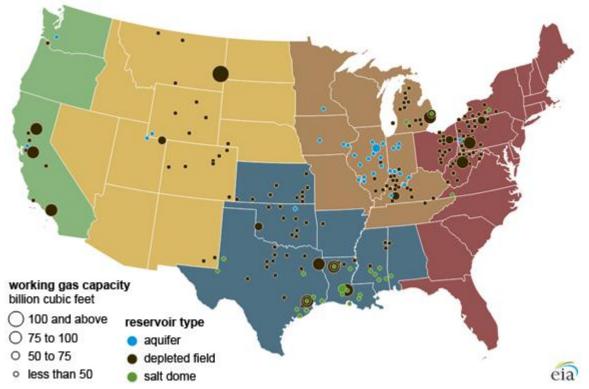
### Regional S/D Models Storage Projection

Week Ending 26-Jun

	Daily Raw Storage	Daily Adjustment Factor	Daily Average Storage Activity (Adjusted) *	Weekly Adjusted Storage Activity
L48	9.4	1.4	10.7	75
East	1.3	1.8	3.1	22
Midwest	3.8	-0.3	3.4	24
Mountain	3.1	-1.9	1.2	8
South Central	-0.2	2.3	2.1	15
Pacific	1.4	-0.5	0.9	7

<sup>\*</sup>Adjustment Factor is calcuated based on historical regional deltas

#### U.S. underground natural gas storage facilities by type (July 2015)





### Weather Model Storage Projection

Next report and beyond						
	Week Storage					
Week Ending	Projection					
3-Jul	58					
10-Jul	34					
17-Jul	53					

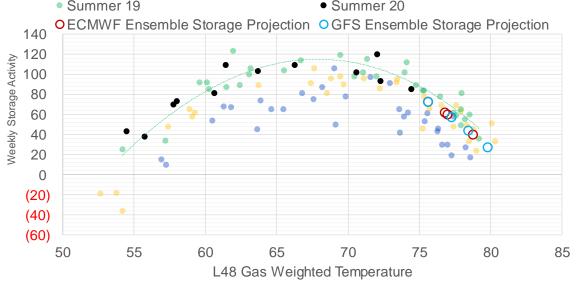
#### Weather Storage Model - Next 4 Week Forecast



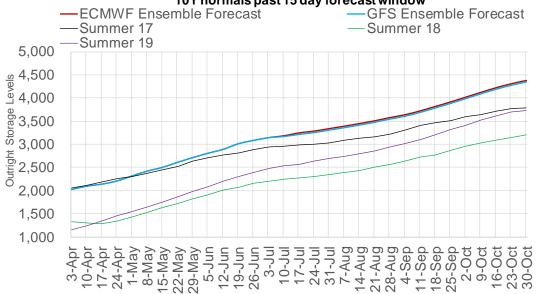
Summer 18

Summer 19

• Summer 20



#### Weather Based End of Winter Projection (Bcf) 10Y normals past 15 day forecast window





### Weather Model Storage Projection to End of Season

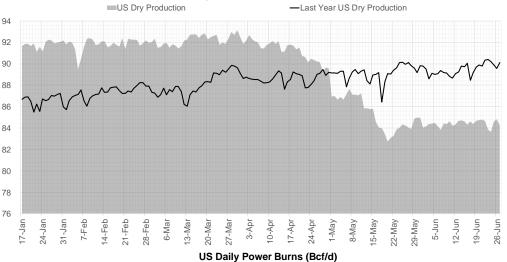
L48 Storage Trajectory from Weather Model					Forecast Storage Levels				
	Report		vs 5Yr	Reported	Estimate	5Yr Avg			
	Storage Level	vs. LY	Avg	Chg	Chg *	LY Chg	vs. LY	Chg	vs. 5Yr
3-Apr-20	2024	876	324	38		25	13	6	32
10-Apr-20	2097	876	370	73		73	0	27	46
17-Apr-20	2140	827	364	43		92	(49)	49	(6)
24-Apr-20	2210	783	360	70		114	(44)	74	(4)
1-May-20	2319	796	395	109		96	13	74	35
8-May-20	2422	799	413	103		100	3	85	18
15-May-20	2503	779	407	81		101	(20)	87	(6)
22-May-20	2612	778	423	109		110	(1)	93	16
29-May-20	2714	762	422	102		118	(16)	103	(1)
5-Jun-20	2807	748	421	93		107	(14)	94	(1)
12-Jun-20	2892	722	419	85		111	(26)	87	(2)
19-Jun-20	3012	739	466	120		103	17	73	47
26-Jun-20					72	92	(20)	65	7
3-Jul-20					58	83	(25)	68	(10)
10-Jul-20					34	67	(33)	63	(29)
17-Jul-20					53	44	9	37	16
24-Jul-20					40	56	(16)	33	7
31-Jul-20					54	58	(4)	33	21
7-Aug-20					53	51	2	44	9
14-Aug-20					56	56	0	44	12
21-Aug-20					60	60	(0)	49	11
28-Aug-20					69	77	(8)	66	3
4-Sep-20					62	80	(18)	68	(6)
11-Sep-20					83	82	1	77	6
18-Sep-20					95	97	(2)	80	15
25-Sep-20					98	109	(11)	78	20
2-Oct-20					103	102	1	86	17
9-Oct-20					103	102	1	87	16
16-Oct-20					99	92	7	75	24
23-Oct-20					86	89	(3)	67	19
30-Oct-20					71	49	22	52	19
			2376	2596	(220)	2024	352		

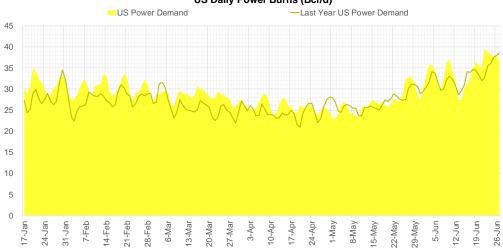
<sup>\*</sup> first 15D change is an average of the GFS Ensemble and ECMWF Ensemble



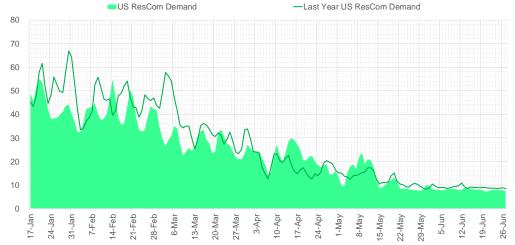
### Supply - Demand Trends







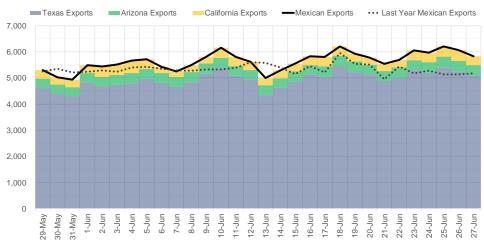
#### US Daily ResCom Consumption(Bcf/d)

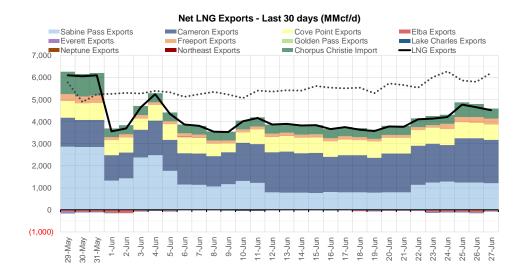


Source: Bloomberg



#### Mexican Exports - Last 30 days (MMcf/d)





Source: Bloomberg



# Nat Gas Options Volume and Open Interest CME, ICE and Nasdaq Combined

CONTRACT MONTH	CONTRACT YEAR	PUT/CALL	STRIKE	CUMULATIVE VOL		CONTRACT MONTH			
8	2020	С	2.00	9568		10	10 2020	10 2020 P	10 2020 P 1.50
3	2020	Č	7.00	4533		10			
10	2020	P	0.75	4212		10			
3	2021	Ċ	6.00	4000		7			
8	2020	P	1.50	3858		7			
8	2020	P	1.60	2910		3			
12	2020	P	2.50	2400		10			
7	2020	C	2.50 1.75	2324		9			
		P				10			
10	2020		1.25	2283	8		2020		
8	2020	P	1.40	2261	10		2020		
7	2020	P	1.55	2239	9		2020		
12	2020	P	2.00	2200	7		2020		
9	2020	С	1.90	2189	7 10		2020		
10	2020	Р	1.00	2186			2020		
10	2020	Р	0.50	2106	10				
9	2020	Р	0.85	2000	8		2020 2020		
8	2020	С	2.25	1990	9				
7	2020	С	1.65	1917	8	2020		С	
8	2020	С	1.70	1885	7	2020		C	
11	2020	С	4.00	1800	9	2020		Р	
9	2020	P	1.50	1647	9	2020		Р	
9	2020	C	1.75	1614	7	2020		Р	
10	2020	Č	2.50	1442	8	2020		Р	
7	2020	C	1.70	1429	7	2020		Р	
7 7	2020	P			10	2020		P	P 1.20
			1.60	1415	7	2020		С	C 2.00
10	2020	P	1.70	1401	7	2020		С	C 3.00
9	2020	С	2.00	1293	9	2020		С	
9	2020	С	2.40	1269	8	2020		P	
9	2020	Р	1.00	1241	10	2020		С	
10	2020	Р	1.75	1134	10	2020		P	
1	2021	Р	2.00	1100	7	2020		Ċ	
4	2021	С	2.50	1089	10	2020		P	
10	2020	С	3.00	1070	10	2020		C	
1	2021	C	2.90	1050	10	2021		C	
10	2020	P	1.80	1024	3	2020		C	
8	2020	C	1.90	1018		2021		P	
10	2020	Č	2.40	1016	8				
4	2021	Č	3.00	1000	8	2020		С	
7	2020	P		967	1	2021		С	
			1.50		10	2020		P	
8	2020	С	1.80	935	7	2020		С	
9	2020	P	1.30	910	9	2020		Р	
10	2020	P	1.40	880	9	2020		С	
8	2020	Р	1.65	858	3	2021		С	
8	2020	С	1.95	731	9	2020		Р	
10	2020	Р	1.65	700	9	2020		Р	
8	2020	Р	1.30	696	10	2020		Р	P 1.10
10	2020	С	2.75	692	8	2020		С	C 3.00
10	2020	С	2.00	675	4	2021		C	
9	2020	P	1.75	657	9	2020		Ċ	

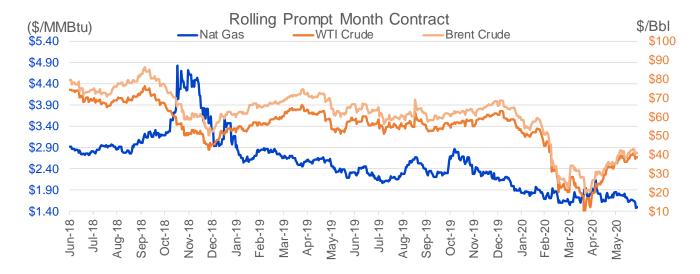
Source: CME, Nasdaq, ICE



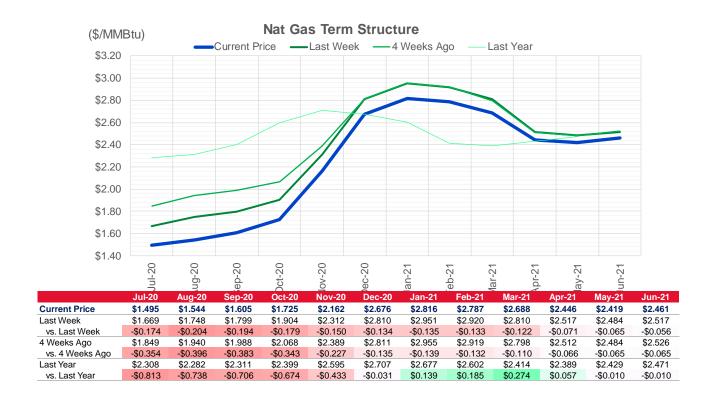
# Nat Gas Futures Open Interest CME, ICE and Nasdaq Combined

CME Henry H	Hub Futures (1	0,000 MMBtu	ı)	ICE Henry	Hub Futures Con	tract Equiva	alent (10,000 MM
	Current	Prior	Daily Change	Í	Current	Prior	Daily Change
JUL 20	18081	23372	-5291	JUL 20	76352	77470	-1118.75
AUG 20	285755	284601	1154	AUG 20	94555	91235	3320.25
SEP 20	191049	192743	-1694	SEP 20	69099	69928	-828.5
OCT 20	126432	124749	1683	OCT 20	80988	80907	81.75
NOV 20	63857	62807	1050	NOV 20	63061	62960	101
DEC 20	73151	72971	180	DEC 20	60174	59829	345.25
JAN 21	118425	118989	-564	JAN 21	75526	74621	904.25
FEB 21	41069	40481	588	FEB 21	46694	46633	61.25
MAR 21	86453	85781	672	MAR 21	62989	62524	465.5
APR 21	72931	71487	1444	APR 21	49128	49204	-76.25
MAY 21	28099	27736	363	MAY 21	45872	45898	-25.75
JUN 21	17669	17860	-191	JUN 21	43667	43592	75.25
JUL 21	16321	15760	561	JUL 21	44635	44453	181.75
AUG 21	12212	12084	128	AUG 21	45203	45018	185.75
SEP 21	14834	14838	-4	SEP 21	42819	42726	93.25
OCT 21	34561	34130	431	OCT 21	57967	56742	1224.5
NOV 21	19865	19623	242	NOV 21	36874	36831	43.25
DEC 21	16152	16036	116	DEC 21	37715	37654	61.25
JAN 22	13050	12702	348	JAN 22	29225	29606	-381.5
FEB 22	8567	8568	-1	FEB 22	26212	26111	100.25
MAR 22	13558	13957	-399	MAR 22	27888	27519	369.5
APR 22	12402	12365	37	APR 22	26787	26355	431.5
MAY 22	4655	4669	-14	MAY 22	22245	22157	87.5
JUN 22	2029	2025	4	JUN 22	22032	22009	23
JUL 22	1795	1795	0	JUL 22	22564	22547	17
AUG 22	1253	1253	0	AUG 22	21669	21645	23.5
SEP 22	1348	1338	10	SEP 22	21321	21698	-377
OCT 22	1891	1891	0	OCT 22	23436	23334	102
NOV 22	1395	1395	0	NOV 22	19686	19439	246.25
DEC 22	1297	1296	1	DEC 22	20383	20131	251.75

Source: CME, ICE







					VS	s. 4 Weeks		
	Units	<b>Current Price</b>	VS.	Last Week		Ago	٧s	s. Last Year
NatGas Jan/Apr	\$/MMBtu	-0.37	_	0.064	_	0.073		0.005
NatGas Mar/Apr	\$/MMBtu	-0.242		0.051	$\overline{}$	-0.528	$\overline{}$	-0.489
NatGas Oct/Nov	\$/MMBtu	0.44	_	0.029	_	0.116		0.373
NatGas Oct/Jan	\$/MMBtu	1.09	_	0.044	_	0.204		0.758
WTI Crude	\$/Bbl	38.49	$\overline{}$	-1.260	_	3.000	$\overline{}$	-19.980
Brent Crude	\$/Bbl	41.02	$\overline{}$	-1.170		5.690	$\overline{}$	-25.530
Fuel Oil, NY Harbour 1%	\$/Bbl	98.03		0.000	_	0.000		0.000
Heating Oil	cents/Gallon	113.63	$\overline{}$	-7.510		17.160	$\overline{}$	-80.830
Propane, Mt. Bel	cents/Gallon	0.50	$\overline{}$	-0.006	<u> </u>	0.086		0.053
Ethane, Mt. Bel	cents/Gallon	0.22	$\overline{}$	-0.007	$\overline{}$	-0.006		0.042
Coal, PRB	\$/MTon	12.30		0.000		0.000	$\overline{}$	-0.050
Coal, ILB	\$/MTon	31.05		0.000		0.000	$\neg$	-8.000

Source: CME, Bloomberg



### **Baker Hughes Rig Counts**

This week we once again see a big change to rig counts. Oil rigs dropped by -1, while nat gas rigs stayed flat. The weekly changes for the major basins are listed below.

	Rotary Rig	Count		Darlson	. U. mb a a
	6/26/20	20		Baker	Hughes 🤰
U.S. Breakout Information	This Week	+/-	Last Week	+/-	Year Ago
Oil	188	-1	189	-605	793
Gas	75	0	75	-98	173
Miscellaneous	2	0	2	1	1
Directional	20	2	18	-48	68
Horizontal	230	-4	234	- <del>40</del>	840
Vertical	15	- <del>4</del> 1	14	-610 -44	59
vertical	15		14	-44	59
Canada Breakout	This Week	+/-	Last Week	+/-	Year Ago
Oil	4	-1	5	-80	84
Gas	9	-3	12	-31	40
Major Basin Variances	This Week	+/-	Last Week	+/-	Year Ago
Ardmore Woodford	1	0	1	-5	6
Arkoma Woodford	0	0	0	-2	2
Barnett	_				
Barnett	2	0	2	1	1
Cana Woodford	2 6	0 1	2 5	1 -43	1 49
		_		•	
Cana Woodford	6	1	5	-43	49
Cana Woodford DJ-Niobrara	6 4	1 -1	5 5	-43 -22	49 26
Cana Woodford DJ-Niobrara Eagle Ford	6 4 11	1 -1 0	5 5 11	-43 -22 -60	49 26 71
Cana Woodford DJ-Niobrara Eagle Ford Granite Wash	6 4 11 0	1 -1 0 0	5 5 11 0	-43 -22 -60 -4	49 26 71 4
Cana Woodford DJ-Niobrara Eagle Ford Granite Wash Haynesville Marcellus	6 4 11 0 32	1 -1 0 0	5 5 11 0 32	-43 -22 -60 -4 -21	49 26 71 4 53
Cana Woodford DJ-Niobrara Eagle Ford Granite Wash Haynesville	6 4 11 0 32 27	1 -1 0 0 0	5 5 11 0 32 27	-43 -22 -60 -4 -21	49 26 71 4 53 58
Cana Woodford DJ-Niobrara Eagle Ford Granite Wash Haynesville Marcellus Mississippian	6 4 11 0 32 27 0	1 -1 0 0 0 0	5 5 11 0 32 27 0	-43 -22 -60 -4 -21 -31	49 26 71 4 53 58 2