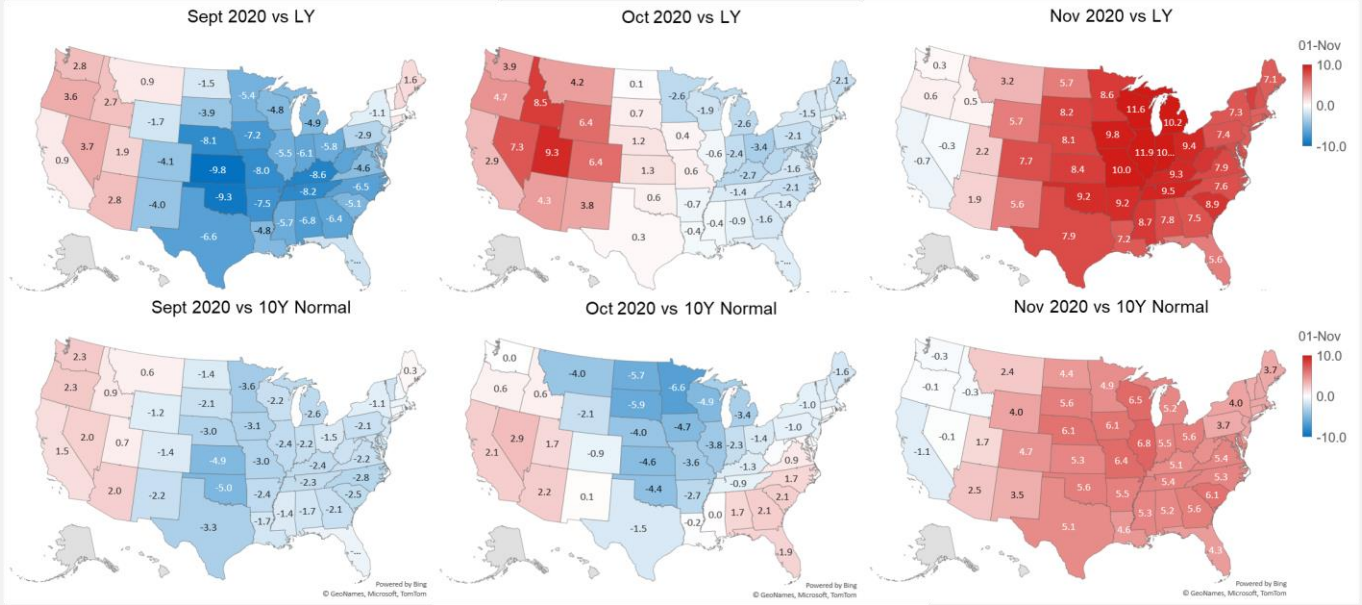


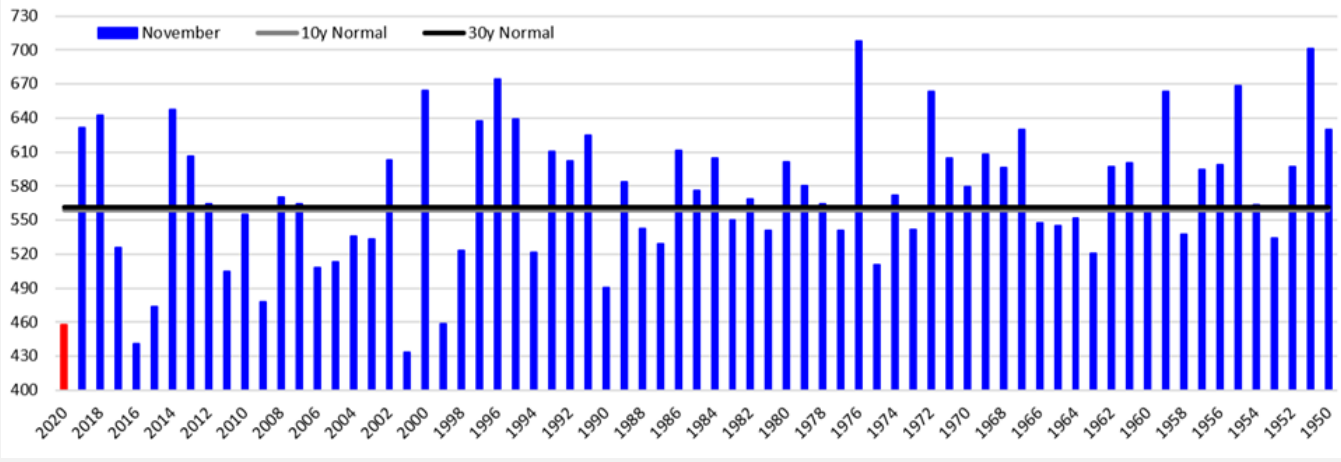
This week we focus in on weather. The changes in the short-term weather forecast has taken natural gas prices through a wild journey in November so far. Since Oct 30th, the market has traded in a 76c range, with Friday's close of \$2.65 being 71c below the Oct 30th close of \$3.35.

November has been one warm revision and another. November is now forecast to total 458 GWHDDs. This comes after September and October came in cooler than expectations.



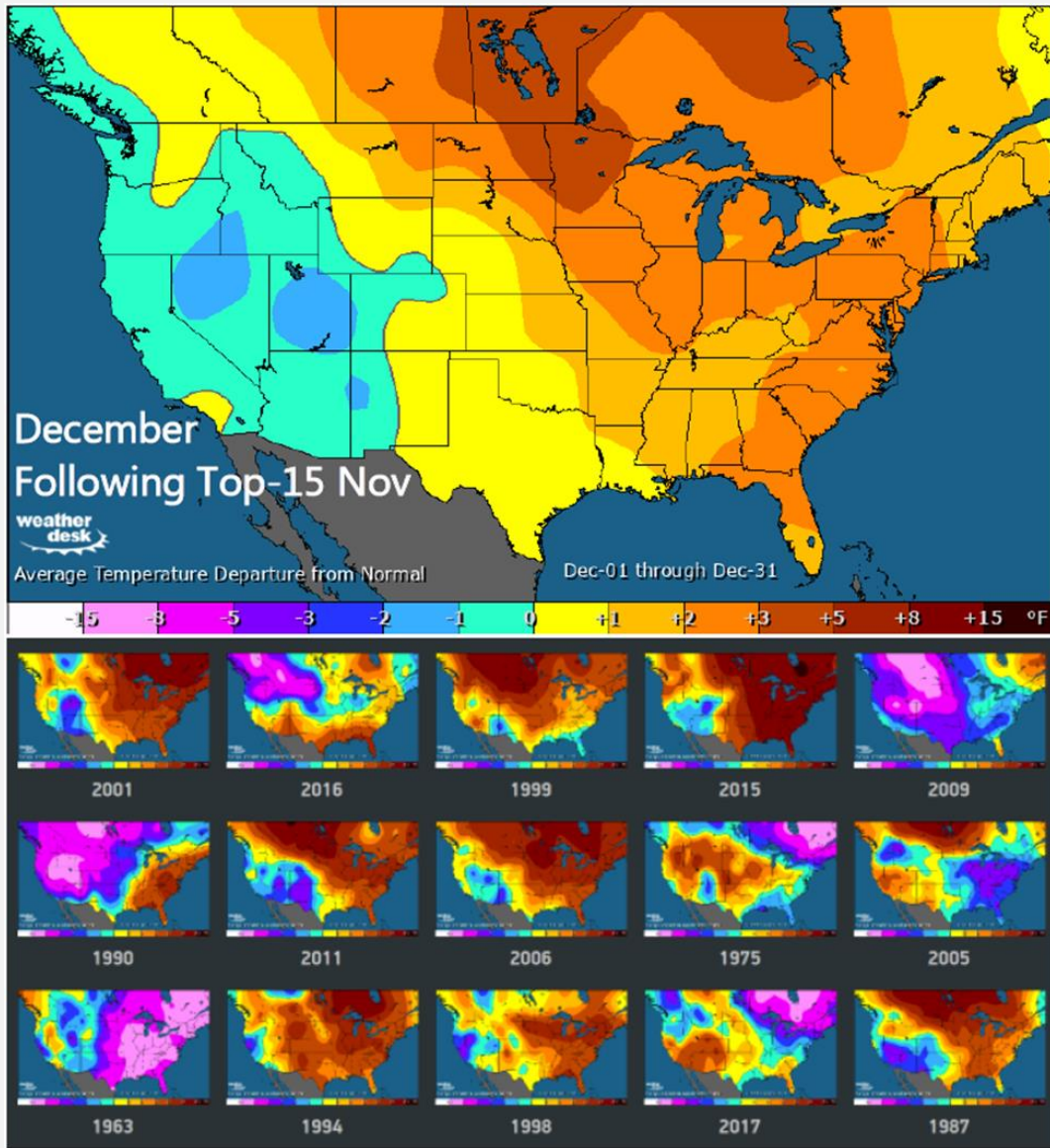
It would rank as the 3rd warmest on record, among national data dating back to 1950. Top-10 record warmth for November per GWHDD measures are in the following regions: Mountain (#4), South Central (#1), Midwest (#3) and East (#5).

November GWHDDs - Historical & Forecast



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A neat tool we looked at this week comes from Maxar Weather (Earthsat MDA) called Dynacast. The tool allows you to do a historical analysis like the following.



The larger map below is a composite of the 15 smaller maps representing Decembers following a top-15 warm November.

There appears to be a warm signal, particularly in the Eastern Half. Among the 15 years shown, 11 Decembers show the East being warmer than normal including three in the top-5 for warmest back to 1950.

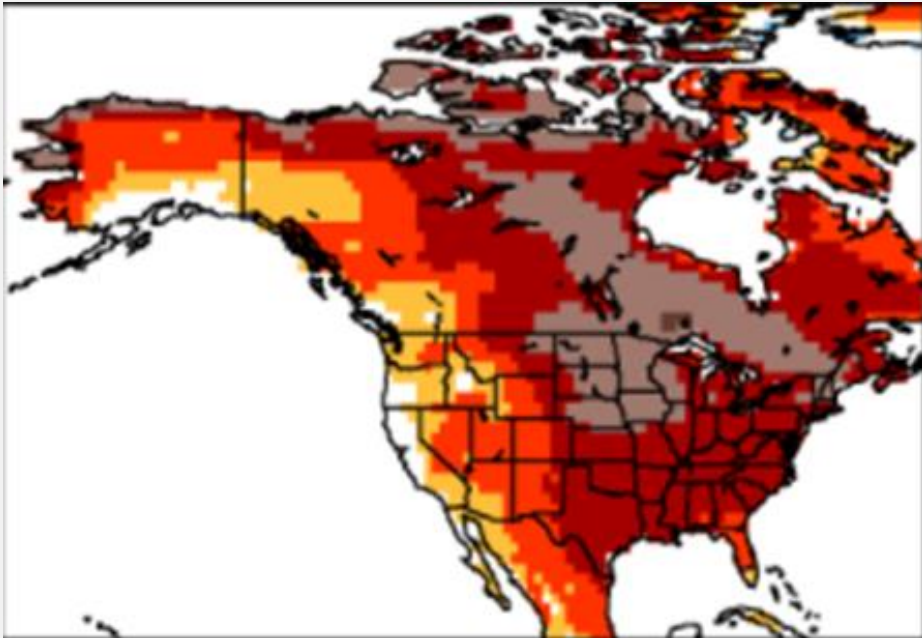
All 15 analogs average 835 GWHDDs, which falls between the warmer 10-year normal (807) and colder 30-year normal (874).

Among the colder than normal Decembers are 2017 (884 GWHDDs), which was in the previous La Niña season, 2005 (920 GWHDDs), 2009's start of an Arctic blocking influenced winter (934 GWHDDs) and the #2 ranked cold December from 1963 (1087 GWHDDs).

The statistical connection is not significant between November and December GWHDDs, with an anomaly correlation of just +0.18.

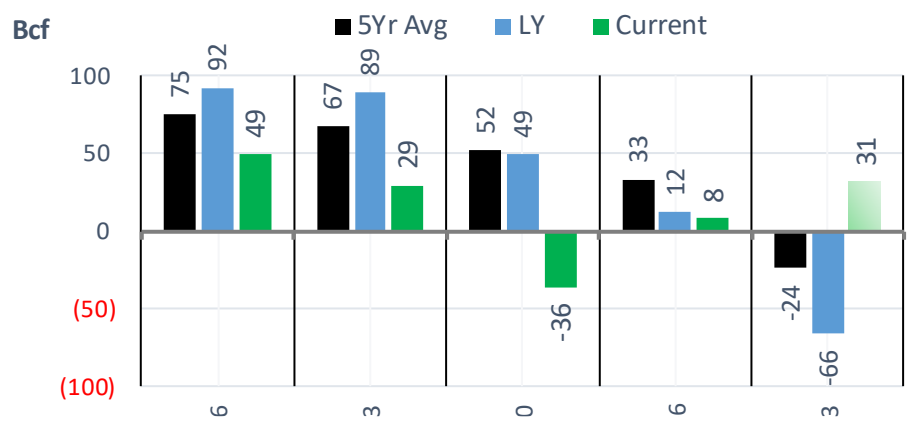
That said, the connection between GWHDDs in November and that for all of winter (i.e. December to February) is more significant, with an anomaly correlation of +0.30. Among the top-15 warm Novembers are 12 that went on to feature a warmer than normal winter per GWHDD measures. The 2020-2021 winter is expected to add to the list of warmer seasons.

The CFS continues to be on fire as well, showing no changes in what it has been show

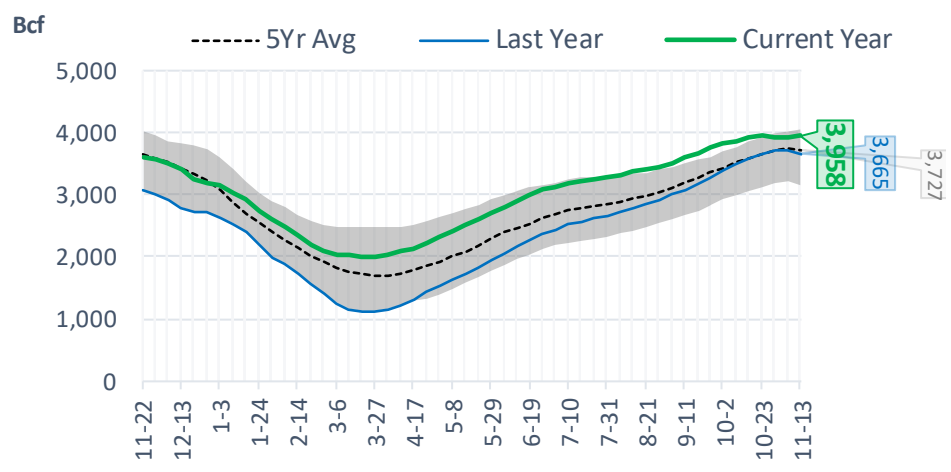


EIA Storage Report

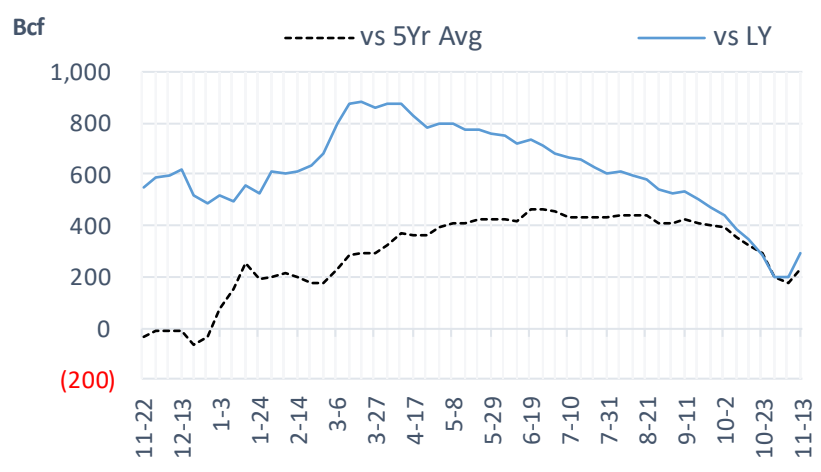
Total Lower 48 YoY Weekly Change



Total Lower 48 Storage Levels



Total Lower 48 LY Surplus/Deficit

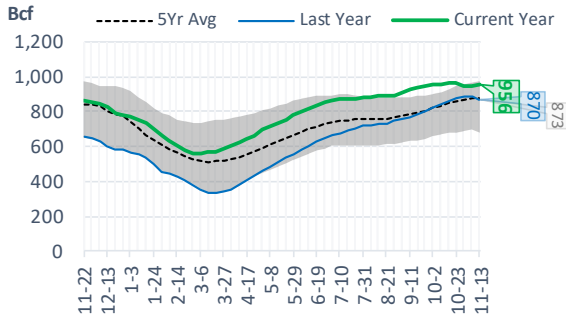


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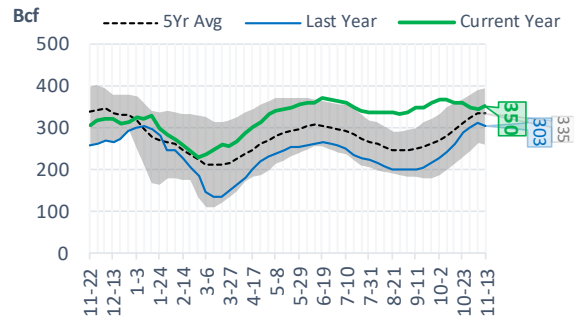
Natural Gas Storage Stats - Last 5 Weeks

Week Ending	Current 13-Nov	Week - 1 6-Nov	Week - 2 30-Oct	Week - 3 23-Oct	Week - 4 16-Oct	Week - 5 9-Oct
Total Lower 48 Storage Level	3958	3927	3919	3955	3926	3877
Weekly Change	+31	+8	-36	+29	+49	+46
vs LY	+293	+196	+200	+285	+345	+388
vs 5Yr Avg	+231	+176	+201	+289	+327	+353
S. Central Salt Storage Level	350	345	348	360	360	366
Weekly Change	+5	-3	-12	0	-6	0
vs LY	+47	+35	+48	+74	+98	+125
vs 5Yr Avg	+15	+10	+24	+49	+65	+85
S. Central NonSalt Storage Level	956	948	945	968	969	960
Weekly Change	+8	+3	-23	-1	+9	+5
vs LY	+86	+63	+59	+88	+108	+119
vs 5Yr Avg	+83	+71	+74	+107	+120	+125
Midwest Storage Level	1139	1127	1119	1118	1105	1081
Weekly Change	+12	+8	+1	+13	+24	+19
vs LY	+59	+20	+14	+30	+43	+47
vs 5Yr Avg	+53	+33	+36	+54	+66	+70
East Storage Level	953	942	947	941	923	908
Weekly Change	+11	-5	+6	+18	+15	+15
vs LY	+37	+10	+20	+32	+30	+35
vs 5Yr Avg	+51	+30	+39	+41	+34	+35
Mountain Storage Level	241	243	240	245	245	241
Weekly Change	-2	+3	-5	0	+4	+5
vs LY	+35	+36	+32	+35	+38	+37
vs 5Yr Avg	+26	+27	+24	+30	+32	+30
Pacific Storage Level	319	322	320	323	323	320
Weekly Change	-3	+2	-3	0	+3	+2
vs LY	+28	+31	+26	+25	+26	+24
vs 5Yr Avg	+4	+6	+4	+8	+10	+7

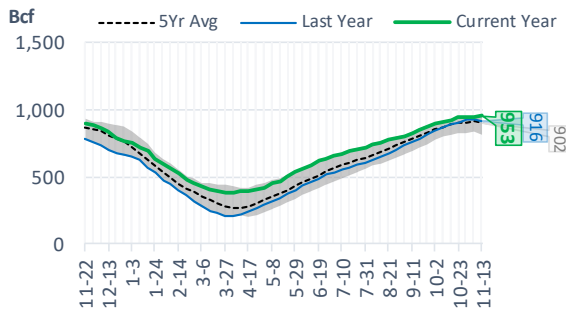
NonSalt Storage Levels



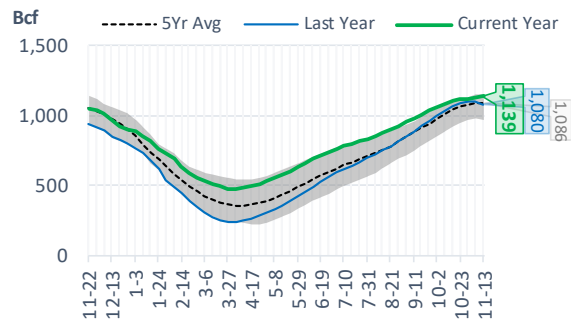
Salt Storage Levels



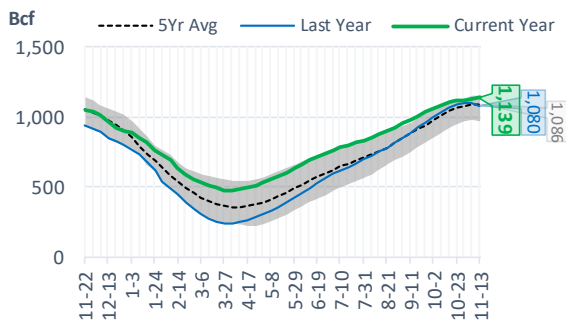
East Storage Levels



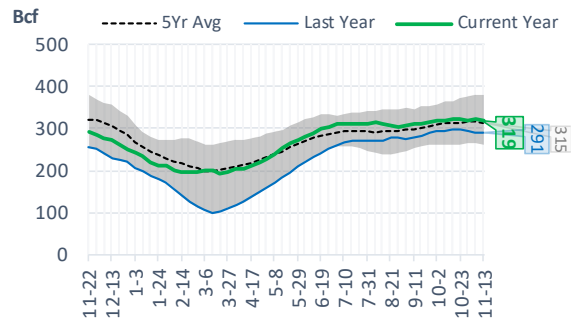
Midwest Storage Levels



Midwest Storage Levels

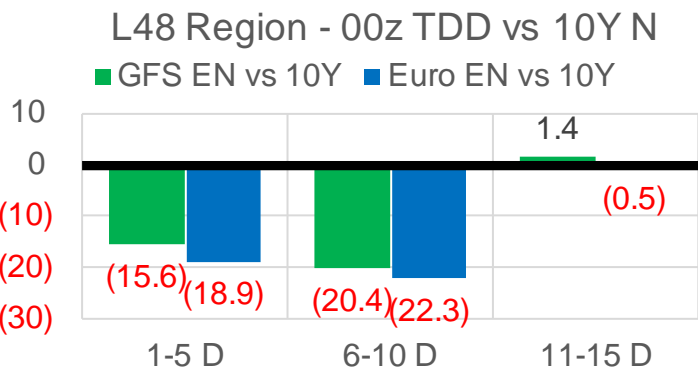
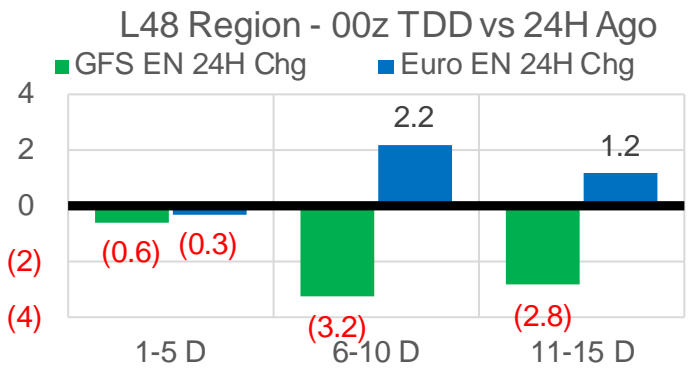
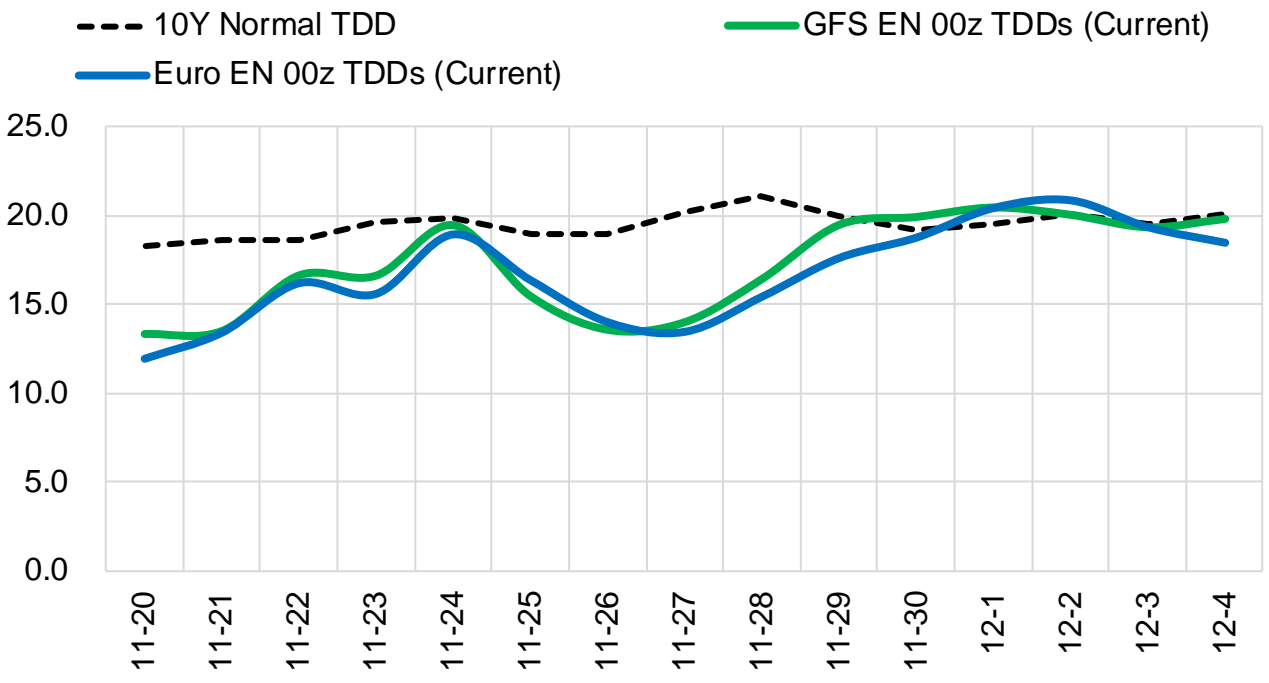


Pacific Storage Levels



Current Short-term Weather Model Outlooks (00z)

L48 Region



Source: WSI , Bloomberg

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EIA Storage Week Balances

	16-Oct	23-Oct	30-Oct	6-Nov	13-Nov	20-Nov	WoW	vs. 4W
Lower 48 Dry Production	86.7	90.0	88.1	90.4	89.0	91.7	▲ 2.7	▲ 2.3
Canadian Imports	4.0	3.6	4.8	4.9	3.9	5.1	▲ 1.2	▲ 0.8
L48 Power	30.5	28.5	28.1	24.8	24.5	24.6	▲ 0.1	-1.9
L48 Residential & Commercial	11.4	16.8	23.3	23.6	17.2	27.6	▲ 10.4	▲ 7.4
L48 Industrial	21.9	22.5	24.1	23.2	24.3	24.9	▲ 0.6	▲ 1.4
L48 Lease and Plant Fuel	4.8	4.9	4.8	5.0	4.9	5.1	▲ 0.1	▲ 0.1
L48 Pipeline Distribution	2.1	2.2	2.5	2.3	1.9	2.4	▲ 0.5	▲ 0.2
L48 Regional Gas Consumption	70.6	75.0	82.9	78.8	72.9	84.6	▲ 11.7	▲ 7.2
Net LNG Exports	6.9	8.0	9.2	10.2	10.4	10.2	▼ -0.2	▲ 0.7
Total Mexican Exports	6.2	6.3	6.2	6.0	6.3	6.2	▼ -0.2	▼ 0.0
Implied Daily Storage Activity	7.0	4.2	-5.3	0.3	3.3	-4.1	-7.4	
EIA Reported Daily Storage Activity	7.0	4.1	-5.1	1.1	4.4			
Daily Model Error	0.0	0.1	-0.2	-0.9	-1.1			

Monthly Balances

	2Yr Ago Nov-18	LY Nov-19	Jul-20	Aug-20	Sep-20	Oct-20	MTD Nov-20	MoM	vs. LY
Lower 48 Dry Production	88.1	95.3	88.3	88.6	88.6	88.3	90.6	▲ 2.3	▼ -4.7
Canadian Imports	4.1	4.5	4.4	4.9	3.8	4.3	4.6	▲ 0.3	▲ 0.0
L48 Power	25.5	27.6	43.8	40.6	33.3	29.2	24.7	▼ -4.6	▼ -2.9
L48 Residential & Commercial	32.9	32.8	7.9	7.7	8.5	16.8	22.2	▲ 5.4	▼ -10.6
L48 Industrial	24.4	24.0	19.3	20.8	21.1	22.5	24.2	▲ 1.6	▲ 0.1
L48 Lease and Plant Fuel	5.0	5.3	4.9	5.0	4.9	4.9	5.0	▲ 0.1	▼ -0.3
L48 Pipeline Distribution	2.6	2.8	2.4	2.4	2.1	2.3	2.2	▼ -0.1	▼ -0.6
L48 Regional Gas Consumption	90.3	92.5	78.3	76.4	69.8	75.7	78.2	▲ 2.5	-14.2
Net LNG Exports	4.3	7.2	3.3	4.0	5.9	8.0	10.2	▲ 2.2	▲ 3.0
Total Mexican Exports	4.8	5.3	6.1	6.3	6.4	6.2	6.2	▼ 0.0	▲ 0.9
Implied Daily Storage Activity	-7.2	-5.1	4.9	6.8	10.2	2.6	0.4		
EIA Reported Daily Storage Activity									
Daily Model Error									

Source: Bloomberg, analytix.ai

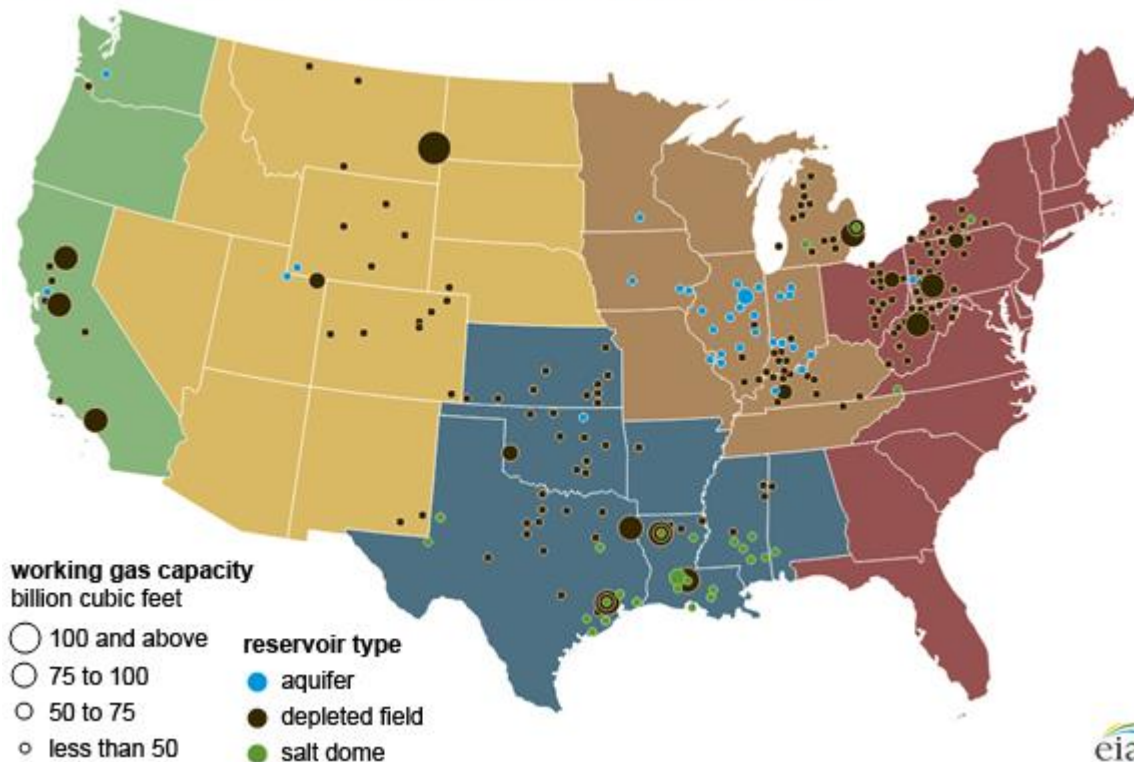
Regional S/D Models Storage Projection

Week Ending 20-Nov

	Daily Raw Storage	Daily Adjustment Factor	Daily Average Storage Activity (Adjusted) *	Weekly Adjusted Storage Activity
L48	-4.4	1.1	-3.3	-22
East	-4.7	1.7	-3.0	-21
Midwest	-1.5	0.7	-0.8	-5
Mountain	3.3	-3.5	-0.2	-1
South Central	-1.8	2.0	0.3	3
Pacific	0.2	0.2	0.4	3

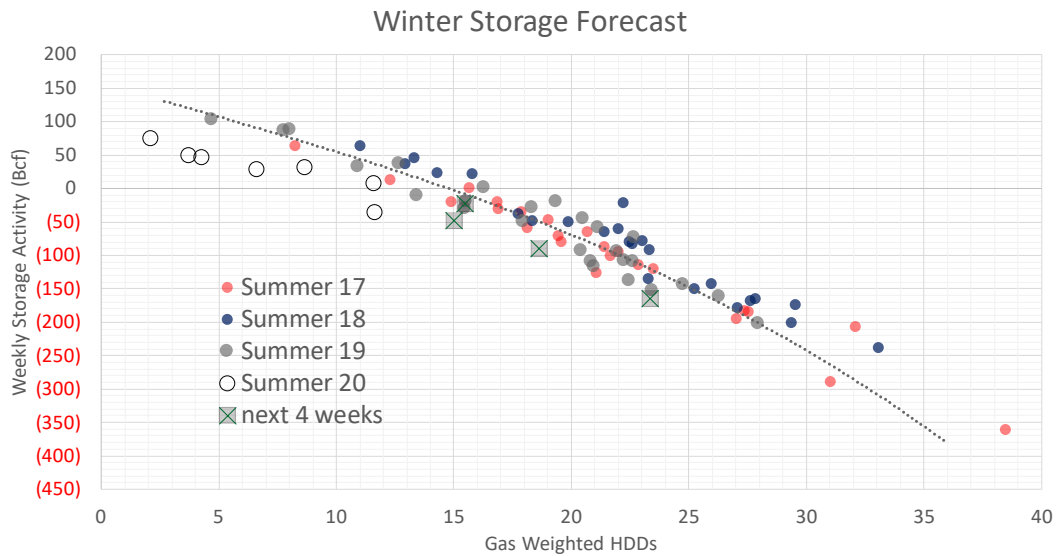
*Adjustment Factor is calculated based on historical regional deltas

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



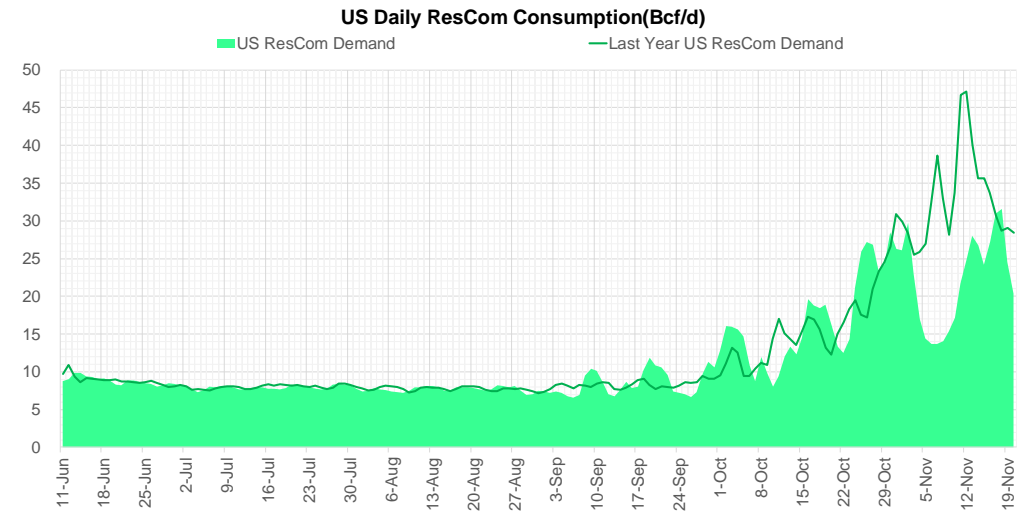
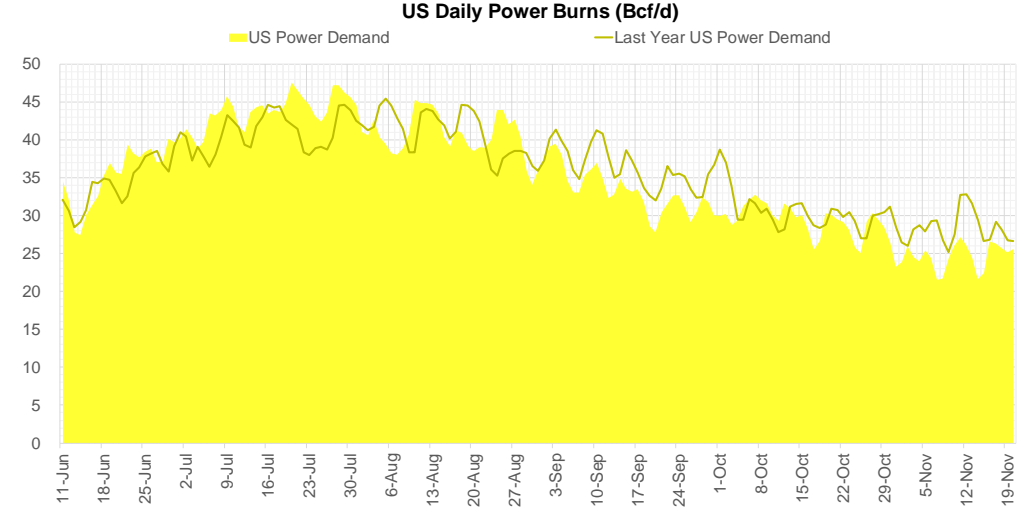
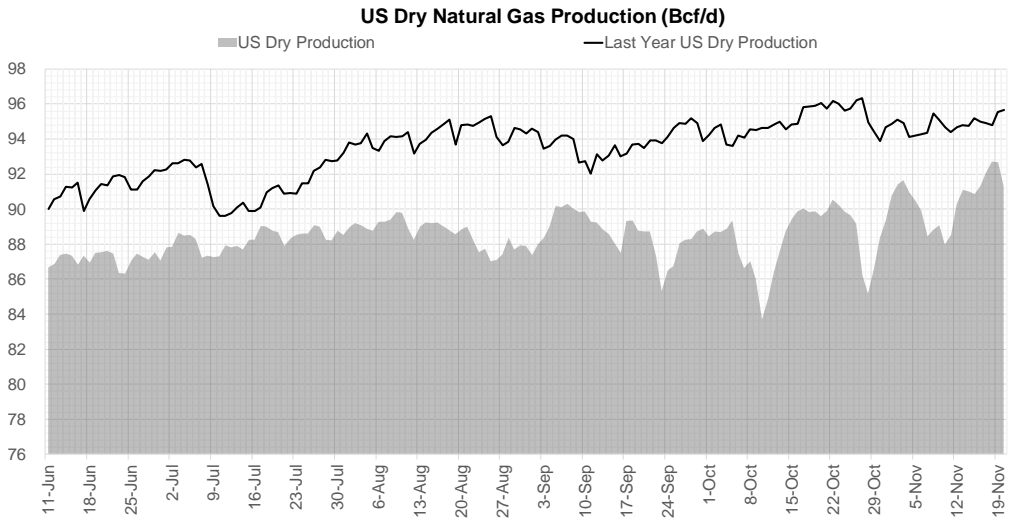
Weather Model Storage Projection

Next report and beyond		
Week Ending	Temp	Week Storage Projection
27-Nov	15.0	-48
04-Dec	18.6	-90
11-Dec	23.4	-165



Note: this is not our official end of season forecast. This chart signifies where storage levels end with 10-year normal weather and current market tightness relative to last year

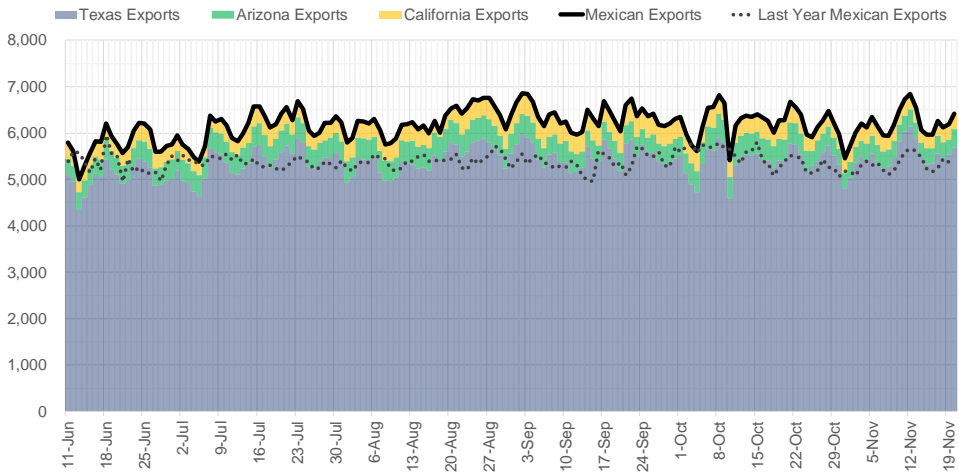
Supply – Demand Trends



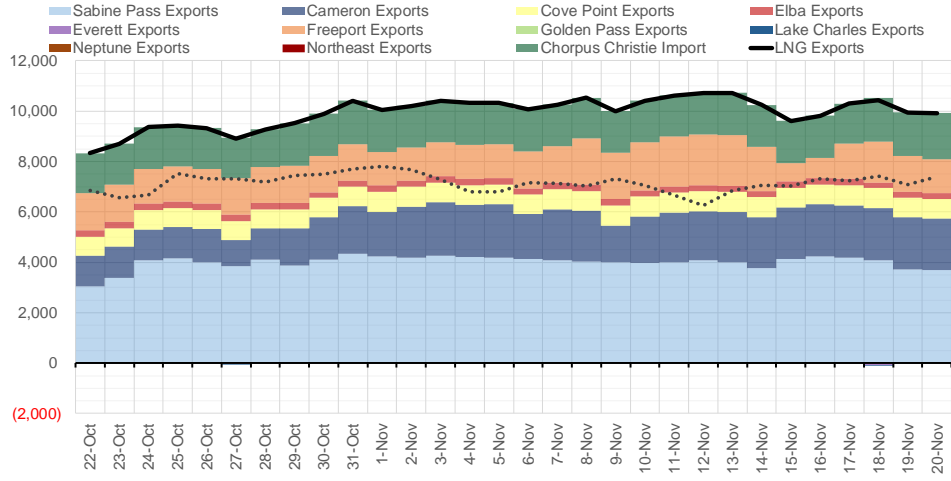
Source: Bloomberg

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Mexican Exports (MMcf/d)



Net LNG Exports - Last 30 days (MMcf/d)



Source: Bloomberg

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

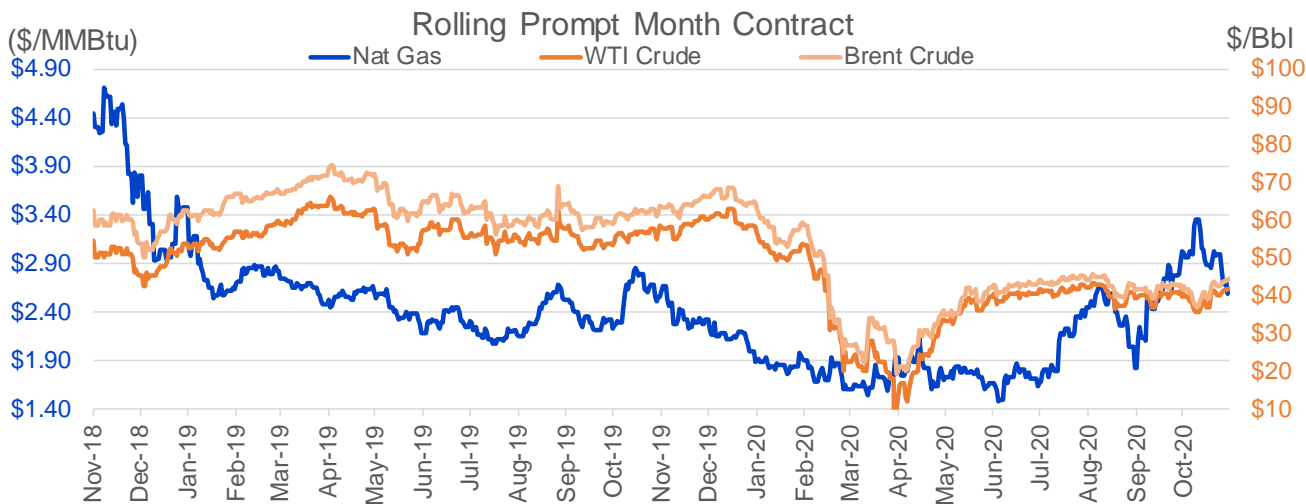
CONTRACT MONTH	CONTRACT YEAR	PUT/CALL	STRIKE	CUMULATIVE VOL	CONTRACT MONTH	CONTRACT YEAR	PUT/CALL	STRIKE	CUMULATIVE OI
12	2020	P	2.50	16834	3	2021	P	2.00	41204
1	2021	C	3.25	9508	3	2021	C	4.00	38860
4	2021	C	5.00	8500	4	2021	C	4.00	38638
1	2021	P	2.50	7117	12	2020	P	2.00	31991
3	2021	C	5.00	6245	1	2021	C	3.50	31544
12	2020	C	2.80	5632	1	2021	C	4.50	30349
12	2020	C	2.75	5506	3	2021	C	3.25	28833
3	2021	C	4.00	5155	10	2021	C	4.00	28665
12	2020	P	2.45	5137	1	2021	P	2.50	28096
1	2021	C	3.00	4928	12	2020	C	3.75	27068
1	2021	C	4.00	4688	10	2021	C	3.25	26971
2	2021	P	2.25	4622	12	2020	C	3.50	25817
12	2020	C	2.70	4611	12	2020	C	4.00	25109
12	2020	P	2.35	4458	2	2021	P	2.25	24637
1	2021	P	2.00	4372	3	2021	C	6.00	24411
3	2021	P	2.25	4351	1	2021	C	5.00	23812
1	2021	C	3.50	4240	3	2021	C	7.00	23778
2	2021	C	3.50	4145	3	2021	C	3.00	23495
1	2021	P	2.25	3981	3	2021	C	5.00	22751
2	2021	P	2.50	3953	3	2021	C	4.50	22605
3	2021	C	6.00	3869	12	2020	C	4.50	22295
12	2020	P	2.60	3662	1	2021	C	3.75	22229
1	2021	C	3.20	3307	3	2021	C	3.50	22168
12	2020	P	2.25	3281	1	2021	C	4.00	21806
12	2020	C	2.60	3237	12	2020	P	2.75	21367
3	2021	P	2.50	3079	1	2021	C	6.00	21112
2	2021	C	4.00	2857	1	2021	C	3.00	20826
12	2020	C	2.65	2771	2	2021	C	3.50	20422
12	2020	P	2.30	2758	3	2021	P	2.50	20365
1	2021	C	3.10	2742	12	2020	C	3.00	20187
12	2020	P	2.65	2674	12	2020	C	3.25	20118
3	2021	C	4.25	2628	8	2021	P	2.25	19712
3	2021	P	2.00	2586	8	2021	C	4.00	19539
12	2020	P	2.40	2543	12	2020	P	2.50	19422
3	2021	C	4.75	2500	4	2021	C	5.00	19328
12	2020	C	2.90	2406	2	2021	P	2.50	19268
10	2021	C	4.00	2300	4	2021	C	3.25	19104
2	2021	C	3.25	2236	2	2021	C	4.00	19027
12	2020	C	2.85	2130	12	2020	P	3.00	18524
4	2021	C	4.00	2130	1	2021	P	2.00	18101
1	2021	C	3.80	2121	10	2021	C	5.00	17953
12	2020	C	3.05	2112	1	2021	P	2.25	17413
3	2021	C	3.00	2097	2	2021	C	5.00	17411
7	2021	C	3.50	2050	4	2021	C	3.00	16217
1	2021	C	5.00	2035	2	2021	C	4.50	16175
2	2021	C	2.75	2004	12	2020	C	5.00	15828
8	2021	C	4.00	1870	4	2021	P	2.00	15649
5	2021	C	4.00	1860	5	2021	C	3.00	15611
2	2021	P	2.00	1851	10	2021	C	3.00	15189
					12	2020	P	1.5	14450

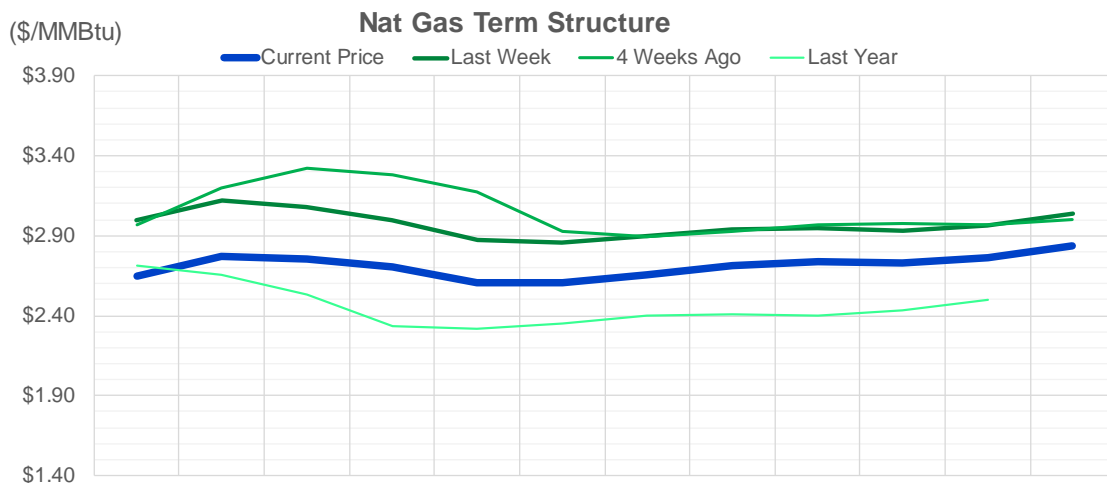
Source: CME, Nasdaq, ICE

Nat Gas Futures Open Interest CME, ICE and Nasdaq Combined

CME Henry Hub Futures (10,000 MMBtu)				ICE Henry Hub Futures Contract Equivalent (10,000 MM			
	Current	Prior	Daily Change	FOR JUNE 26	Current	Prior	Daily Change
DEC 20	35673	48901	-13228	DEC 20	67519	68673	-1153.5
JAN 21	300681	295412	5269	JAN 21	99455	96165	3290
FEB 21	94806	99131	-4325	FEB 21	68494	68161	333
MAR 21	183944	174957	8987	MAR 21	86147	85531	616
APR 21	84245	86693	-2448	APR 21	70412	70832	-420.5
MAY 21	60949	58224	2725	MAY 21	71870	72632	-761.5
JUN 21	36375	36492	-117	JUN 21	59267	59187	79.75
JUL 21	31609	33205	-1596	JUL 21	61358	61717	-359.25
AUG 21	30361	30649	-288	AUG 21	64113	65081	-967.5
SEP 21	43932	40728	3204	SEP 21	57884	58246	-361.5
OCT 21	101199	103198	-1999	OCT 21	69966	69747	219.5
NOV 21	41175	40834	341	NOV 21	52256	52564	-308
DEC 21	33058	31483	1575	DEC 21	49316	48972	344
JAN 22	30313	30546	-233	JAN 22	48378	47294	1084.5
FEB 22	23628	23902	-274	FEB 22	38707	38294	412.75
MAR 22	25290	25344	-54	MAR 22	41387	41178	209.25
APR 22	23144	24336	-1192	APR 22	40308	40445	-136.75
MAY 22	11777	12166	-389	MAY 22	31493	31338	155.25
JUN 22	6245	6634	-389	JUN 22	30350	30318	32
JUL 22	5714	5706	8	JUL 22	32352	32052	300
AUG 22	4703	4653	50	AUG 22	30975	30737	237.75
SEP 22	4129	4601	-472	SEP 22	30388	29931	457
OCT 22	7345	7192	153	OCT 22	34825	34923	-98.5
NOV 22	5444	5529	-85	NOV 22	31507	30726	780.75
DEC 22	5454	5308	146	DEC 22	33859	33013	846.5
JAN 23	4564	4533	31	JAN 23	15072	15087	-14.75
FEB 23	1115	1115	0	FEB 23	14029	14034	-5.5
MAR 23	3086	3086	0	MAR 23	13877	13868	8.25
APR 23	1868	1968	-100	APR 23	13171	13163	7.75
MAY 23	451	451	0	MAY 23	12077	11984	93

Source: CME, ICE






	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21
Current Price	\$2.646	\$2.767	\$2.751	\$2.706	\$2.608	\$2.610	\$2.653	\$2.710	\$2.734	\$2.729	\$2.761	\$2.839
Last Week	\$2.995	\$3.122	\$3.083	\$2.997	\$2.872	\$2.859	\$2.895	\$2.938	\$2.948	\$2.933	\$2.968	\$3.041
vs. Last Week	-\$0.349	-\$0.355	-\$0.332	-\$0.291	-\$0.264	-\$0.249	-\$0.242	-\$0.228	-\$0.214	-\$0.204	-\$0.207	-\$0.202
4 Weeks Ago	\$2.971	\$3.195	\$3.322	\$3.285	\$3.175	\$2.927	\$2.892	\$2.924	\$2.966	\$2.979	\$2.968	\$3.004
vs. 4 Weeks Ago	-\$0.325	-\$0.428	-\$0.571	-\$0.579	-\$0.567	-\$0.317	-\$0.239	-\$0.214	-\$0.232	-\$0.250	-\$0.207	-\$0.165
Last Year	\$2.665	\$2.710	\$2.655	\$2.529	\$2.332	\$2.314	\$2.354	\$2.398	\$2.412	\$2.401	\$2.430	\$2.500
vs. Last Year	-\$0.019	\$0.057	\$0.096	\$0.177	\$0.276	\$0.296	\$0.299	\$0.312	\$0.322	\$0.328	\$0.331	\$0.339

	Units	Current Price	vs. Last Week	vs. 4 Weeks Ago	vs. Last Year
NatGas Jan21/Apr21	\$/MMBtu	-0.159	▲ 0.091	▲ 0.236	▲ 0.295
NatGas Mar21/Apr21	\$/MMBtu	-0.098	▲ 0.027	▼ -0.346	▼ -0.373
NatGas Oct21/Nov21	\$/MMBtu	0.078	▲ 0.005	▲ 0.015	▲ 0.012
NatGas Apr21/Oct21	\$/MMBtu	0.153	▼ -0.001	▼ -0.165	▼ -0.248
WTI Crude	\$/Bbl	41.92	▲ 1.790	▲ 2.070	▼ -15.850
Brent Crude	\$/Bbl	44.61	▲ 1.830	▲ 2.840	▼ -18.780
Fuel Oil, NY Harbour 1%	\$/Bbl	98.03	▲ 0.000	▲ 0.000	▲ 0.000
Heating Oil	cents/Gallon	128.07	▲ 7.650	▲ 12.940	▼ -64.870
Propane, Mt. Bel	cents/Gallon	0.54	▼ -0.018	▲ 0.013	▲ 0.006
Ethane, Mt. Bel	cents/Gallon	0.22	▼ -0.008	▲ 0.001	▲ 0.017
Coal, PRB	\$/MTon	12.30	▲ 0.000	▲ 0.000	▲ 0.050
Coal, PRB	\$/MMBtu	0.70			

Source: CME, Bloomberg

Baker Hughes Rig Counts

Rotary Rig Count						
11/20/2020						
Baker Hughes 						
U.S. Breakout Information	This Week	+/-	Last Week	+/-	Year Ago	
Oil	231	-5	236	-440	671	
Gas	76	3	73	-53	129	
Miscellaneous	3	0	3	0	3	
Directional	20	-3	23	-34	54	
Horizontal	272	5	267	-427	699	
Vertical	18	-4	22	-32	50	
Canada Breakout	This Week	+/-	Last Week	+/-	Year Ago	
Oil	42	3	39	-44	86	
Gas	59	9	50	8	51	
Major Basin Variances	This Week	+/-	Last Week	+/-	Year Ago	
Arkoma Woodford	0	0	0	-3	3	
Barnett	0	0	0	-4	4	
Cana Woodford	9	-2	11	-18	27	
DJ-Niobrara	3	0	3	-19	22	
Eagle Ford	20	0	20	-40	60	
Haynesville	40	3	37	-13	53	
Marcellus	27	0	27	-9	36	
Mississippian	0	0	0	-3	3	
Permian	156	2	154	-249	405	
Utica	4	0	4	-9	13	
Williston	11	-1	12	-40	51	