Fundamentals for the week ending Aug 13: This past week the EIA reported a +49 Bcf storage injection for week ending Aug 6. This report came in 2 Bcf above market consensus and 6 Bcf/d above our estimate. The big dip in weather during the week led to a 7% drop in US power consumption + a minor fluctuation in Cameron LNG feedgas volumes kept storage injections strong. Salt posted another draw of -3 Bcf, which was nowhere near the -19 Bcf posted the previous week. So far in Q3, we have had salt draw every week – totaling -49 Bcf.

As we reported last week, the summer storage numbers have painted a tight S/D picture when compared to the past few years. This report from last week showed balances being 4 Bcf/d tighter (wx adjusted) versus the storage injections from April through August of last year. For our analysis below, we focus on the 3-year average storage picture to ensure we capture a more normal build scenario.

Let's quickly define the start and end of the summer. Week 14 of the year or the first storage report period of April typically marks the start of the summer season, while week 45 marks the end of summer injection season. As just so we know where we currently are in the summer season - week ending Aug 6th is week 32.

In the table below, we track the historical storage injections over the past 3 years and compare them to the current year.

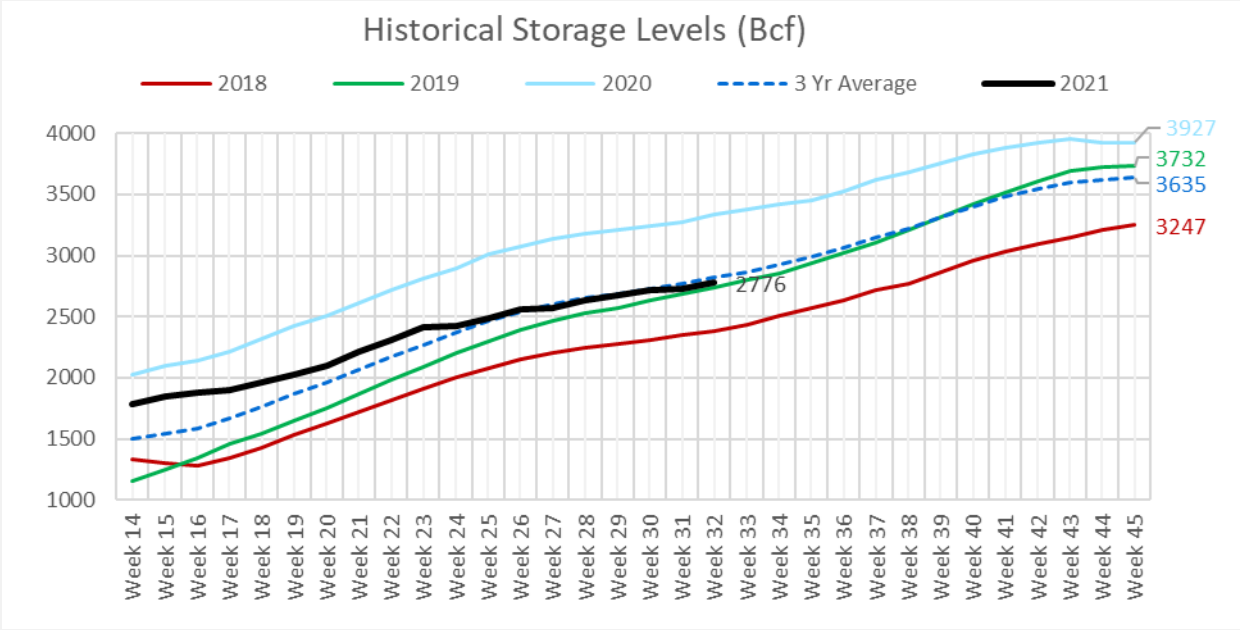
Historical Summer Builds (Bcf)

	To Last Report Week 14 to 32	Rest of Summer Week 33 to 45	Full Summer Week 14 to 45
2018	1032	861	1893
2019	1608	994	2602
2020	1346	595	1941
3 Yr Average	**1329**	**817**	**2145**
2021	1012	??	??

As very clearly seen, this summer's injections have been quite low relative to the 3Yr average but notably how close to 2018. This is somewhat of a coincidence that the storage activity is similar in the two years with the fundamental make-up being quite different. Production is 6-7 Bcf higher this year, but that gets canceled out with LNG higher by 6-7 Bcf/d. Also interestingly enough, total consumption is at a similar level in both summers despite prices averaging 45-50c higher this summer. We would have expected a big unwind in C2G switching this summer, but the retirement of coal generation plants over the past few years and lower coal production (due to halted mine operations during COVID) kept gas burns very strong. One last thing to note between the two years is the vastly different starting level. The 2018 summer injection started 449 Bcf lower than this current summer [At the end of week 14: 2018 = 1335 & 2021 = 1784].

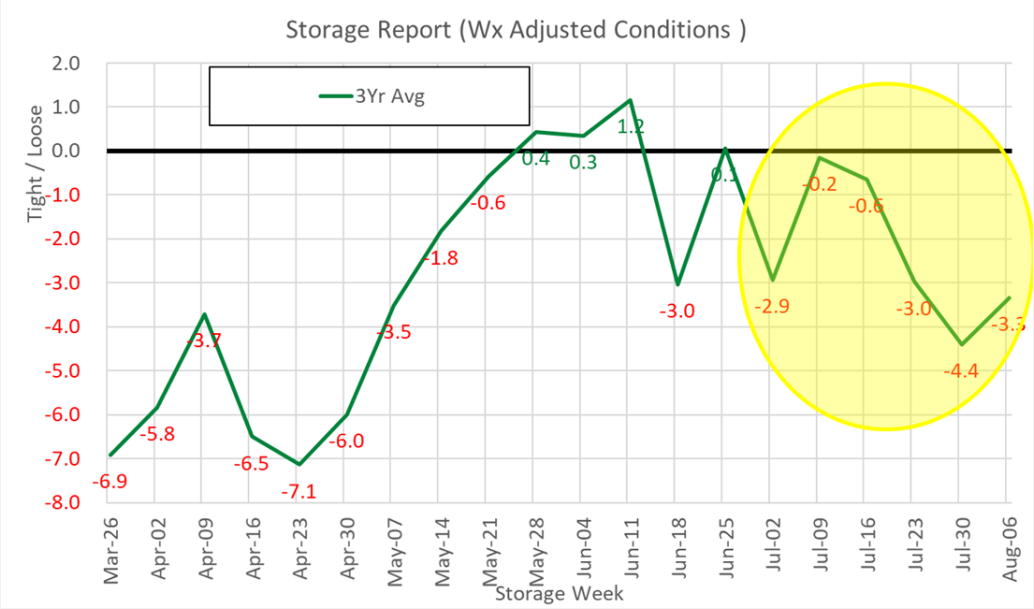
Today we'll lay out several end-of-summer (EOS) storage level estimates based on historical injection rates. Our fundamental model points to an EOS level of ~3450 Bcf, which falls close to the -2.1 Bcf/d tight scenario - explained better below….

To start, here is how the EOS looks the past 3 years. There is a range of 680 Bcf between the 2018 end of summer (EOS) level of 3247 Bcf and the 2020 EOS of 3927 Bcf. The 3 Yr average level is 3635 Bcf. As seen, weekly injections should start to ramp up as the summer peak heat start to wind down.

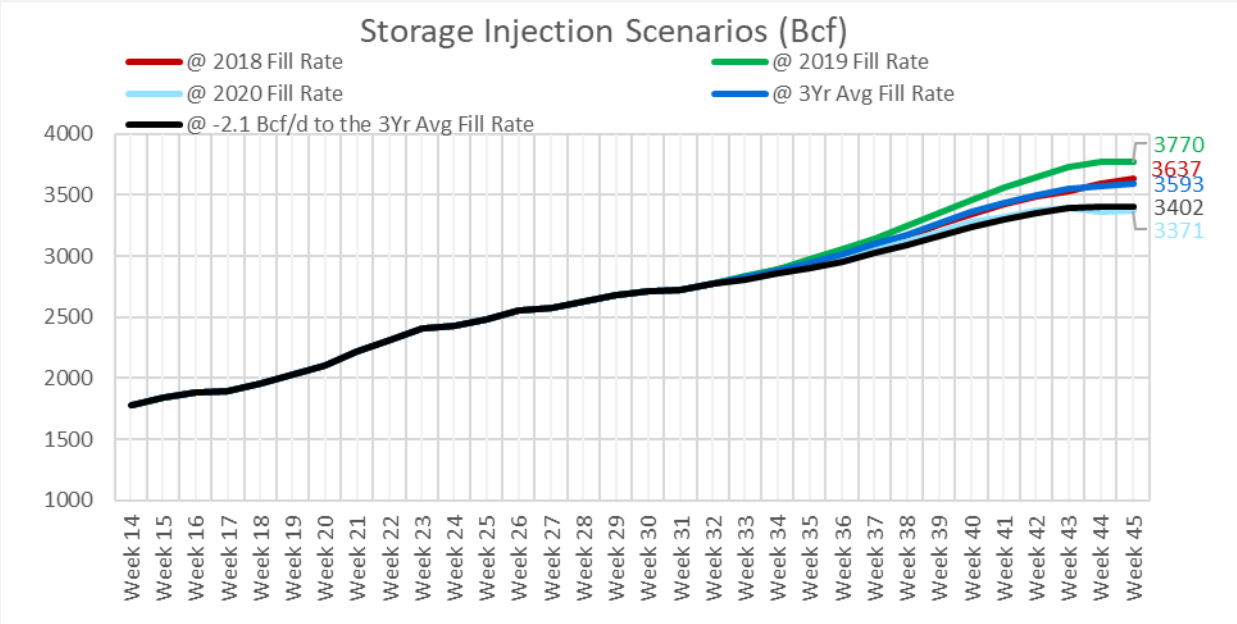


During the current summer, the storage number has been consistently tight versus past years. Although constantly tight, the level has fluctuated wildly due to the variability in wind generation. For example, the past 3 storage reports have been particularly tight on a weather-adjusted basis due to the lack of wind and this upcoming report should show a very different picture with strong wind. To get a good proxy of how recent storage builds compare to past years, we review the last 5 storage reports. This set of reports tells us that injections lag the 3Yr average injection rate by 2.1 Bcf (adjusted for weather variability) – or more simply put as "-2.1 Bcf/d to the 3yr Avg Fill Rate" .

Market Report

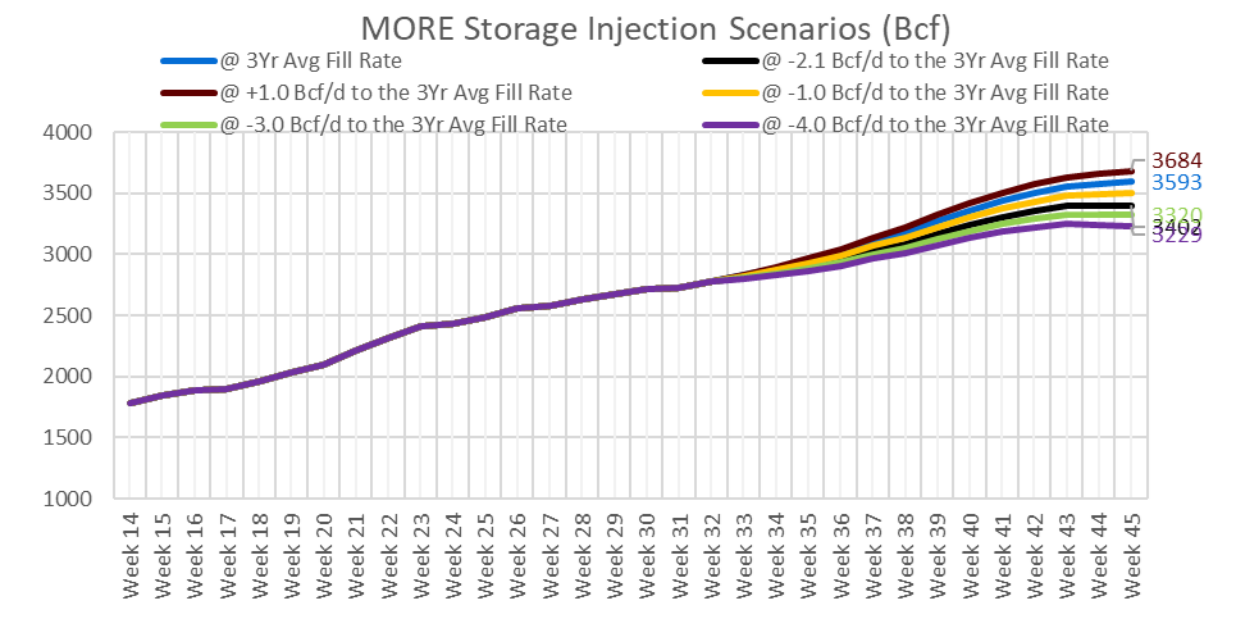


In the chart below, we project storage out for the rest of 2021 with the actual injection rates from the past 3 years, the average of the past 3 years, and finally, the scenario where balances each day are tighter by -2.1 Bcf/d to the 3 year average build. With those 5 scenarios, EOS storage levels end up between 3371 and 3770 Bcf.



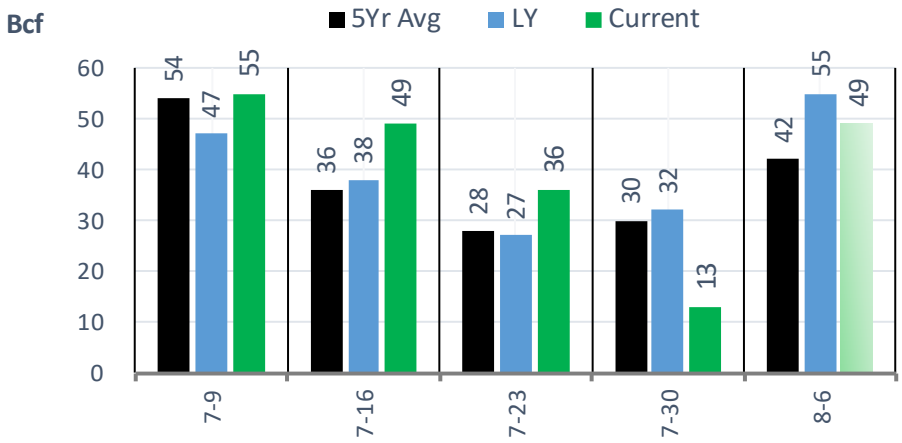
Lastly, we run out the EOS storage estimates with various tight and loose conditions around the 3Yr average injections for the rest of summer.

These scenarios should allow you to better gauge where we end up for EOS based on your belief of how tight the natgas market actually is. With those 6 scenarios, EOS storage levels end up between 3229 and 3684 Bcf.

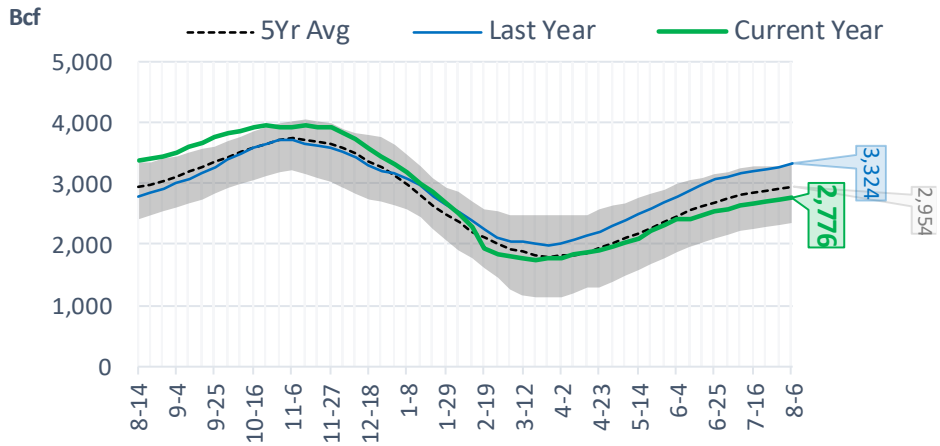


EIA Storage Report

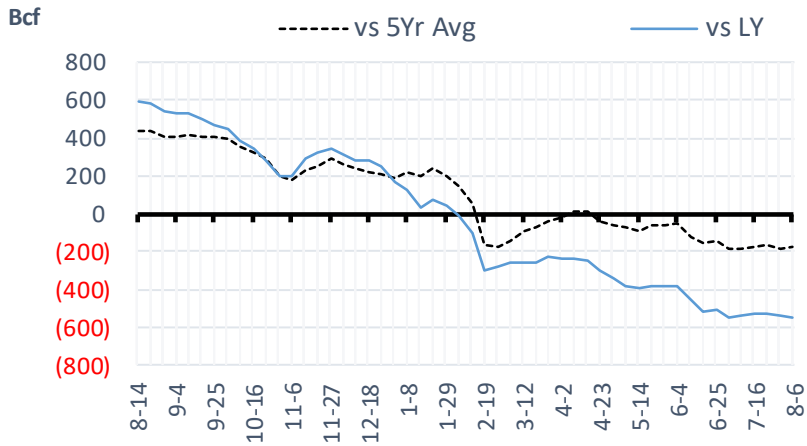
Total Lower 48 YoY Weekly Change



Total Lower 48 Storage Levels



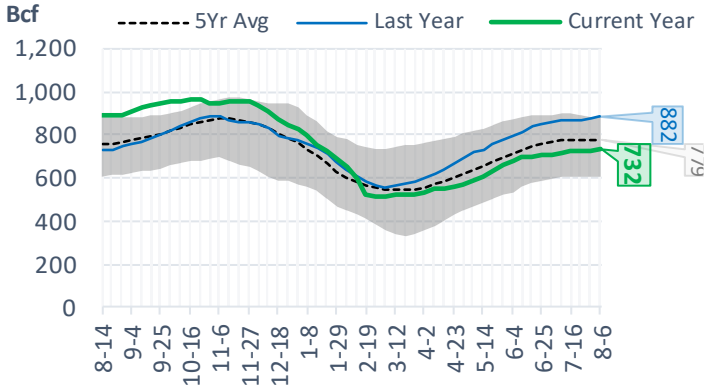
Total Lower 48 LY Surplus/Deficit



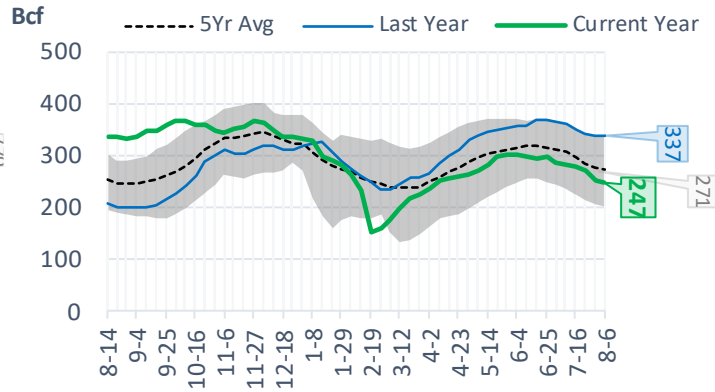
Natural Gas Storage Stats - Last 5 Weeks

Week Ending	Current 6-Aug	Week - 1 30-Jul	Week - 2 23-Jul	Week - 3 16-Jul	Week - 4 9-Jul	Week - 5 2-Jul
Total Lower 48 Storage Level	**2776**	2727	2714	2678	2629	2574
Weekly Change	**+49**	+13	+36	+49	+55	+16
vs LY	**-548**	-542	-523	-532	-543	-551
vs 5Yr Avg	**-178**	-185	-168	-176	-189	-190
S. Central Salt Storage Level	**247**	250	269	279	283	286
Weekly Change	**-3**	-19	-10	-4	-3	-10
vs LY	**-90**	-86	-71	-71	-77	-79
vs 5Yr Avg	**-24**	-26	-14	-16	-22	-24
S. Central NonSalt Storage Level	**732**	726	729	723	712	705
Weekly Change	**+6**	-3	+6	+11	+7	-4
vs LY	**-150**	-151	-143	-149	-156	-156
vs 5Yr Avg	**-47**	-51	-47	-53	-61	-60
Midwest Storage Level	**741**	719	702	683	662	638
Weekly Change	**+22**	+17	+19	+21	+24	+15
vs LY	**-111**	-109	-111	-113	-115	-120
vs 5Yr Avg	**-16**	-15	-13	-14	-16	-18
East Storage Level	**629**	604	583	562	543	521
Weekly Change	**+25**	+21	+21	+19	+22	+8
vs LY	**-106**	-112	-121	-128	-127	-133
vs 5Yr Avg	**-45**	-51	-53	-56	-55	-57
Mountain Storage Level	**185**	184	184	183	180	177
Weekly Change	**+1**	0	+1	+3	+3	+4
vs LY	**-20**	-17	-11	-6	-5	-2
vs 5Yr Avg	**-2**	0	+3	+5	+5	+7
Pacific Storage Level	**241**	244	246	247	250	246
Weekly Change	**-3**	-2	-1	-3	+4	+2
vs LY	**-73**	-67	-67	-64	-62	-63
vs 5Yr Avg	**-45**	-43	-43	-43	-40	-40

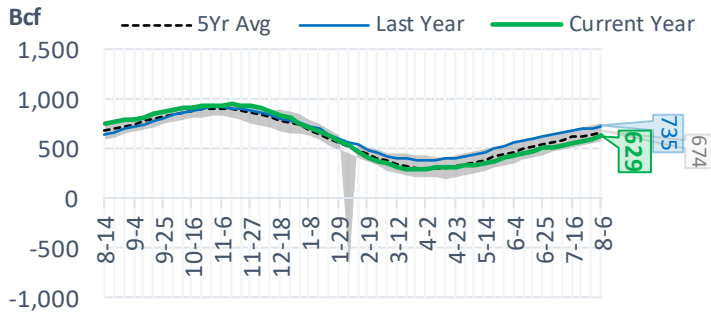
NonSalt Storage Levels



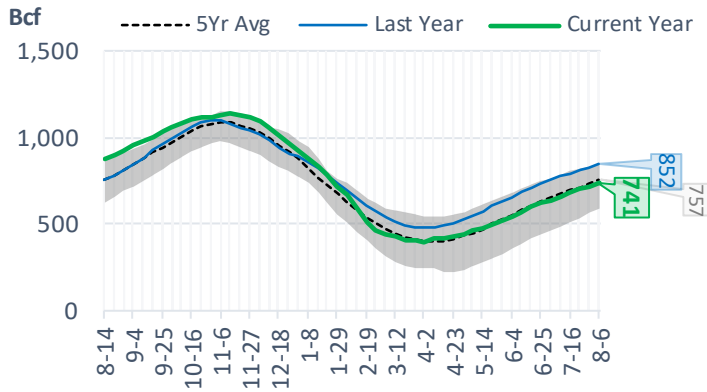
Salt Storage Levels



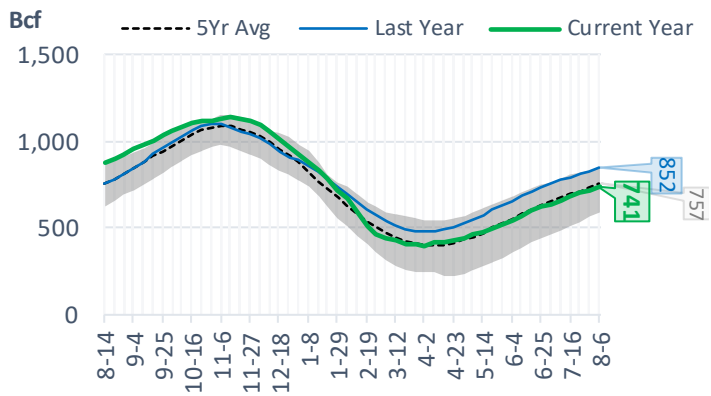
East Storage Levels



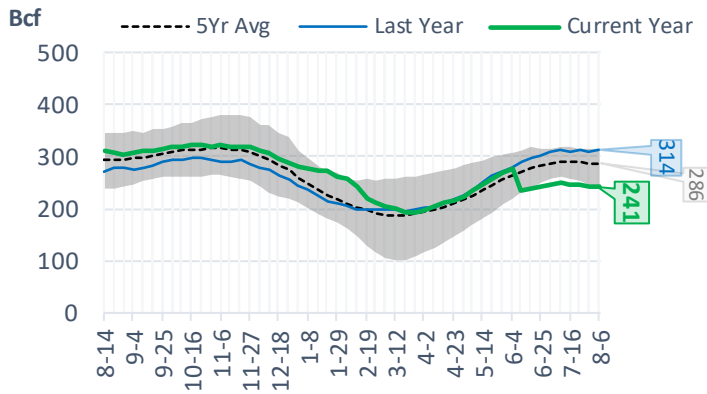
Midwest Storage Levels



Midwest Storage Levels



Pacific Storage Levels



EIA Storage Week Balances

	9-Jul	16-Jul	23-Jul	30-Jul	6-Aug	13-Aug	WoW	vs. 4W
Lower 48 Dry Production	**91.8**	**92.4**	**92.4**	**92.5**	**91.9**	**92.3**	**0.4**	**0.0**
Canadian Imports	**5.1**	**5.2**	**4.9**	**5.5**	**5.1**	**5.2**	**0.1**	**0.0**
L48 Power	37.2	38.7	39.7	42.2	38.4	41.1	2.7	1.3
L48 Residential & Commercial	8.2	8.4	8.4	8.3	7.8	7.7	-0.1	-0.5
L48 Industrial	19.4	19.5	19.5	20.6	20.4	20.4	0.0	0.4
L48 Lease and Plant Fuel	5.1	5.1	5.1	5.1	5.1	5.1	0.0	0.0
L48 Pipeline Distribution	2.1	2.2	2.3	2.4	2.2	2.4	0.1	0.1
L48 Regional Gas Consumption	**71.9**	**74.0**	**75.1**	**78.6**	**74.0**	**76.7**	**2.7**	**1.3**
Net LNG Exports	**11.0**	**10.8**	**10.5**	**10.8**	**10.6**	**9.9**	**-0.6**	**-0.7**
Total Mexican Exports	**7.1**	**7.1**	**7.1**	**7.0**	**6.9**	**6.9**	**0.0**	**-0.1**
Implied Daily Storage Activity	**6.8**	**5.6**	**4.6**	**1.7**	**5.5**	**3.9**	**-1.5**	
EIA Reported Daily Storage Activity	**7.9**	**7.0**	**5.1**	**1.9**	**7.0**			
Daily Model Error	**-1.1**	**-1.4**	**-0.5**	**-0.2**	**-1.5**			

Monthly Balances

	2Yr Ago Aug-18	LY Aug-18	Apr-21	May-21	Jun-21	Jul-21	MTD Aug-21	MoM	vs. LY
Lower 48 Dry Production	**85.0**	**85.0**	**92.3**	**92.7**	**92.8**	**92.2**	**92.0**	**-0.2**	**7.0**
Canadian Imports	**5.0**	**5.0**	**4.6**	**4.5**	**4.8**	**5.2**	**5.1**	**-0.1**	**0.1**
L48 Power	38.1	38.1	24.9	26.7	35.3	39.4	39.8	0.4	1.7
L48 Residential & Commercial	7.8	7.8	19.5	13.2	8.8	8.3	7.8	-0.5	0.0
L48 Industrial	21.6	21.6	21.2	20.3	20.8	19.8	20.4	0.6	-1.2
L48 Lease and Plant Fuel	4.7	4.7	5.1	5.1	5.1	5.1	5.1	0.0	0.4
L48 Pipeline Distribution	2.2	2.2	2.3	2.1	2.2	2.3	2.3	0.1	0.2
L48 Regional Gas Consumption	**74.4**	**74.4**	**73.0**	**67.2**	**72.1**	**74.9**	**75.4**	**0.5**	**1.1**
Net LNG Exports	**3.3**	**3.3**	**11.5**	**10.8**	**10.2**	**10.8**	**10.2**	**-0.6**	**6.9**
Total Mexican Exports	**4.9**	**4.9**	**6.7**	**6.8**	**7.4**	**7.0**	**7.0**	**-0.1**	**2.0**
Implied Daily Storage Activity	**7.4**	**7.4**	**5.7**	**12.4**	**8.0**	**4.6**	**4.5**		
EIA Reported Daily Storage Activity									
Daily Model Error									

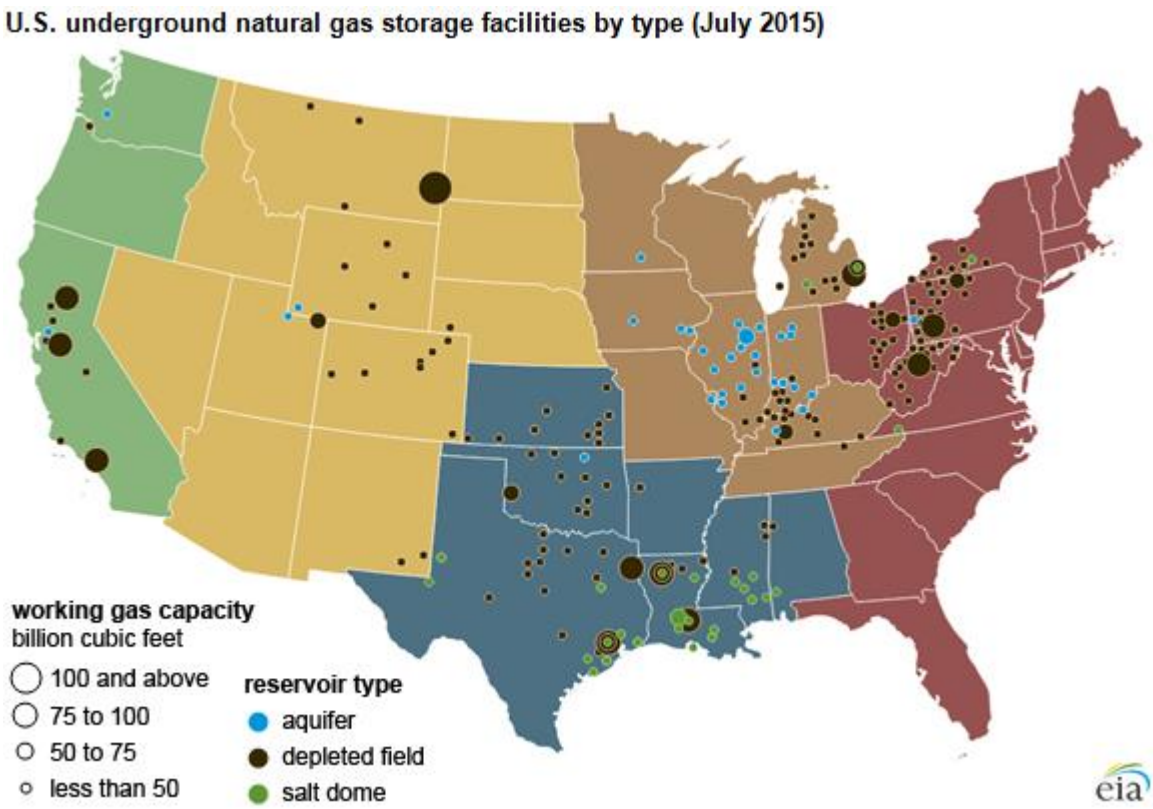
Source: Bloomberg, analytix.ai

Regional S/D Models Storage Projection

Week Ending 13-Aug

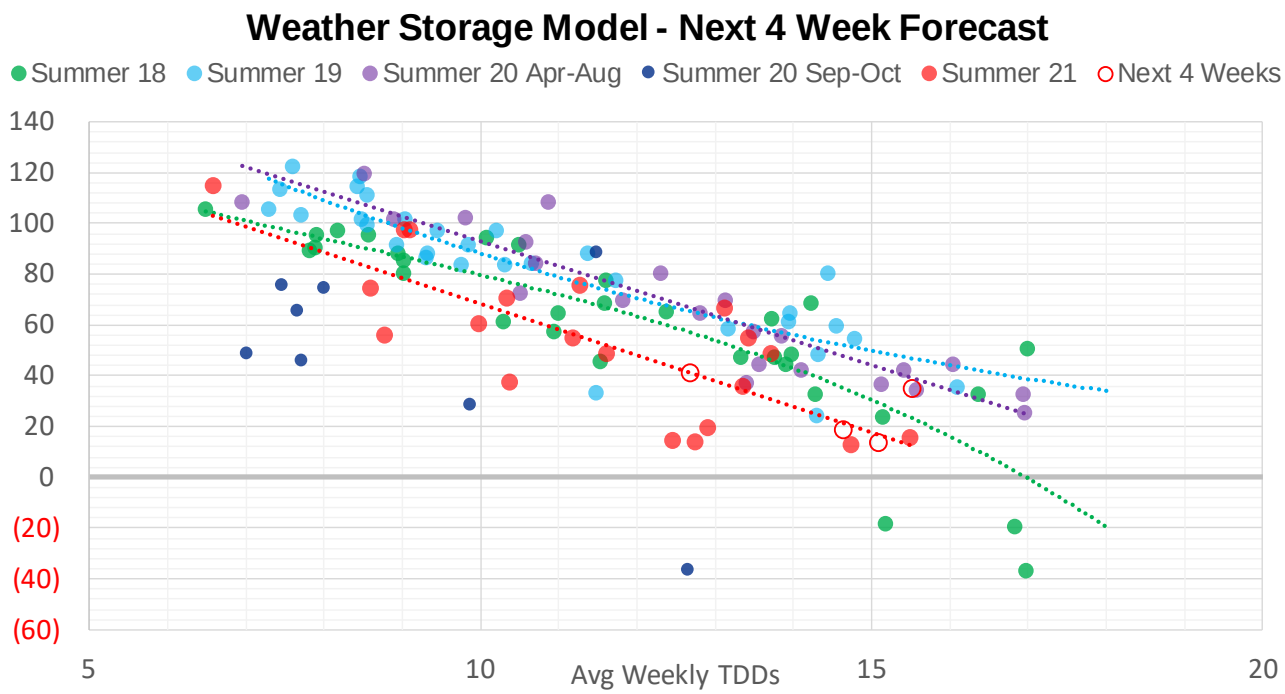
	Daily Raw Storage	Daily Adjustment Factor	Daily Average Storage Activity (Adjusted) *	Weekly Adjusted Storage Activity
L48	3.6	1.3	4.9	34
East	1.2	1.3	2.5	18
Midwest	3.6	-0.3	3.3	23
Mountain	4.2	-4.2	0.0	0
South Central	-5.3	4.6	-0.7	-5
Pacific	0.0	-0.2	-0.2	-1

*Adjustment Factor is calcuated based on historical regional deltas



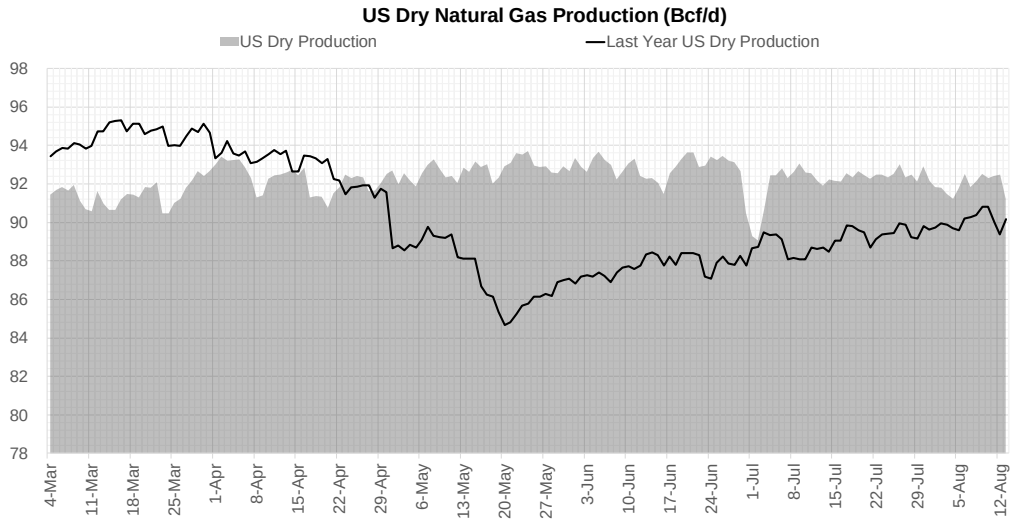
Weather Model Storage Projection

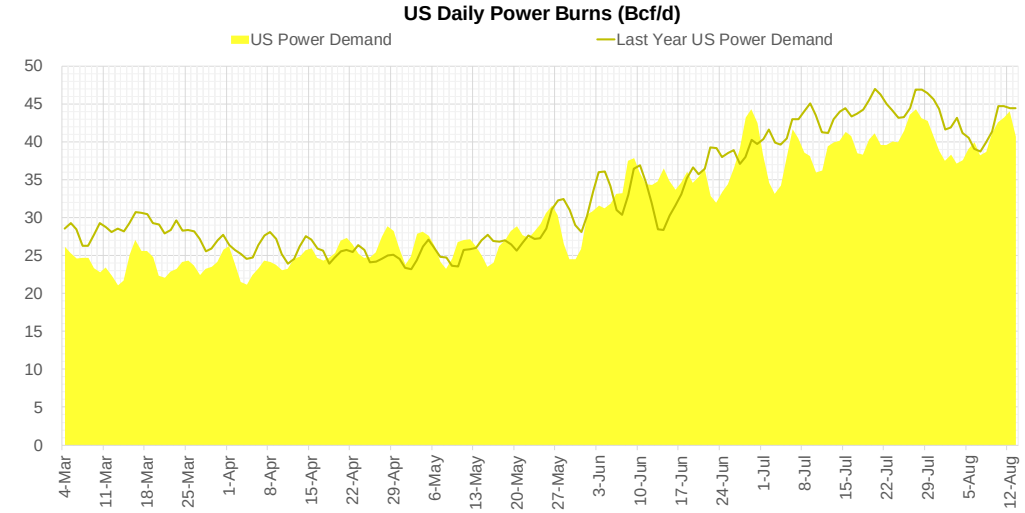
Next report and beyond		
Week Ending	Temp	Week Storage Projection
20-Aug	15.1	13
27-Aug	14.7	19
03-Sep	12.7	41

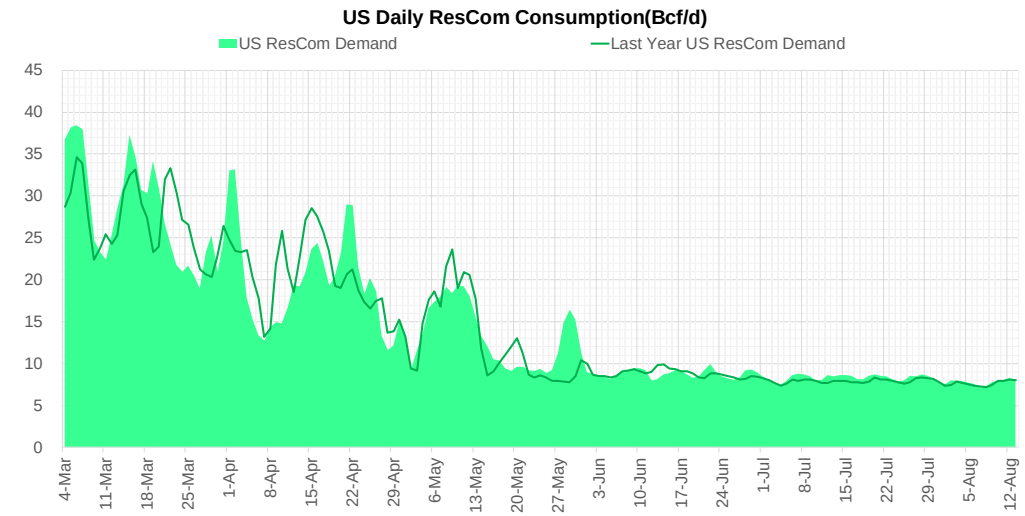


Note: this is not our official end of season forecast. This chart signifies where storage levels end with 10-year normal weather and current market tightness relative to last year

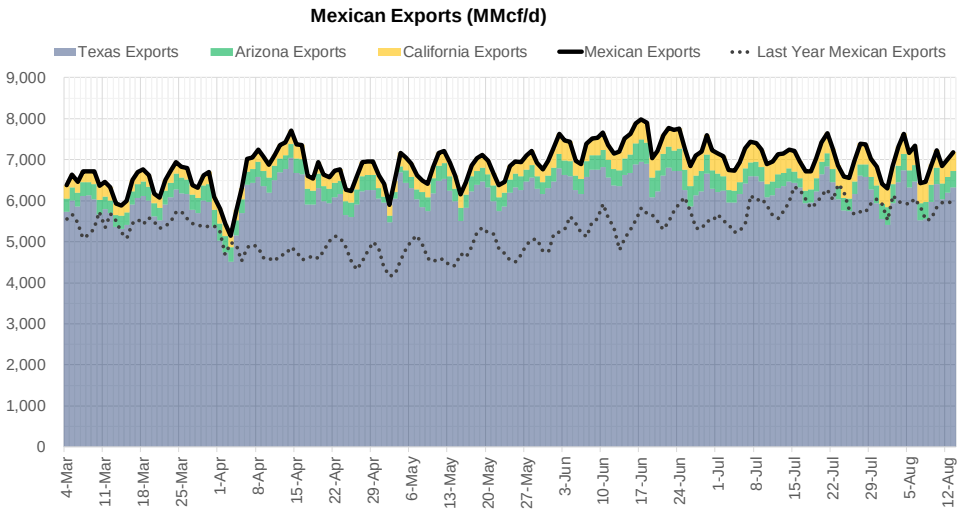
Supply – Demand Trends

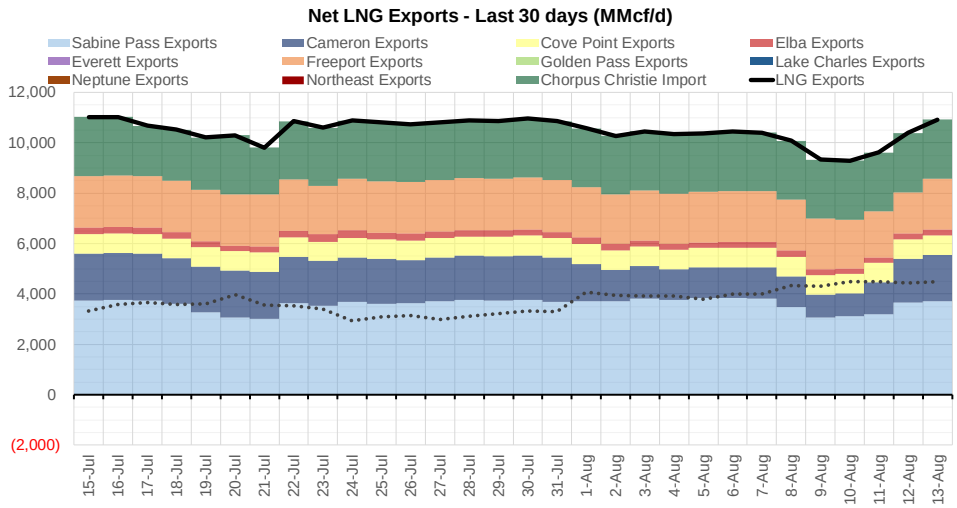






Source: Bloomberg





Source: Bloomberg

Nat Gas Options Volume and Open Interest

CME, ICE and Nasdaq Combined

CONTRACT MONTH	CONTRACT YEAR	PUT/CALL	STRIKE	CUMULATIVE VOL
9	2021	C	4.25	14089
9	2021	P	3.80	9569
10	2021	P	3.50	9551
9	2021	P	3.90	8815
10	2021	C	4.50	8803
9	2021	P	3.70	7101
9	2021	C	4.75	5558
10	2021	C	4.25	5472
9	2021	C	4.00	5049
10	2021	P	3.75	4456
9	2021	P	4.00	3230
11	2021	C	4.25	3094
9	2021	C	4.50	2975
9	2021	P	3.75	2883
10	2021	C	4.00	2655
4	2022	P	2.25	2200
10	2022	P	2.25	2200
9	2021	P	3.60	2033
10	2021	C	5.00	1838
9	2021	P	3.50	1821
9	2021	C	4.10	1724
11	2021	P	3.25	1702
10	2021	C	4.75	1653
11	2021	C	4.50	1647
11	2021	P	3.75	1628
10	2021	P	3.60	1626
11	2021	P	3.50	1453
9	2021	P	3.85	1431
10	2021	P	3.25	1417
9	2021	C	4.40	1353
11	2021	P	4.00	1317
12	2021	P	3.50	1301
9	2021	C	4.05	1269
10	2021	P	4.00	1252
10	2021	C	4.10	1211
11	2021	C	4.75	1193
11	2021	C	5.00	1001
9	2021	C	4.20	992
11	2021	P	3.00	865
9	2021	C	4.30	792
9	2021	C	5.00	784
9	2021	C	3.95	778
12	2021	P	3.75	775
9	2021	C	4.65	764
12	2021	P	3.25	750
11	2021	P	3.70	740
9	2021	C	4.85	710
10	2021	P	2.90	702
9	2021	C	3.90	679

CONTRACT MONTH	CONTRACT YEAR	PUT/CALL	STRIKE	CUMULATIVE OI
10	2021	C	4.50	44846
12	2021	P	2.75	41619
10	2021	C	4.00	40327
10	2021	C	5.00	38063
10	2021	C	3.50	33006
10	2021	P	3.50	32450
10	2021	P	2.50	30039
12	2021	P	2.50	29530
10	2021	P	2.00	28650
10	2021	C	3.25	28230
10	2021	P	3.00	28070
9	2021	C	4.00	26651
9	2021	C	5.00	26599
9	2021	C	4.25	25785
10	2021	P	2.75	25764
12	2021	P	3.00	24895
10	2021	C	6.00	24501
9	2021	P	2.50	23385
11	2021	P	3.00	22898
9	2021	C	3.50	22604
9	2021	P	3.00	22432
11	2021	C	4.00	22136
12	2021	C	4.00	22091
10	2021	C	4.25	21929
9	2021	C	4.75	20629
9	2021	P	2.00	20427
9	2021	P	3.25	20102
10	2021	P	2.25	19900
4	2022	C	3.00	19810
9	2021	P	3.50	19617
9	2021	C	3.25	18994
10	2021	C	3.00	18502
11	2021	C	5.00	18033
10	2021	C	3.75	16815
9	2021	C	4.50	16514
1	2022	C	5.00	16023
9	2021	P	2.75	15816
3	2022	C	5.00	15521
9	2021	P	4.00	15490
2	2022	C	5.00	15076
11	2021	C	3.75	15026
1	2022	C	4.00	14782
3	2022	C	3.00	14448
10	2021	P	3.25	14039
12	2021	P	2.00	13889
3	2022	C	8.00	13874
9	2021	P	2.60	13814
3	2022	C	10.00	13784
9	2021	P	1.90	13773
11	2021	P	2.5	13698

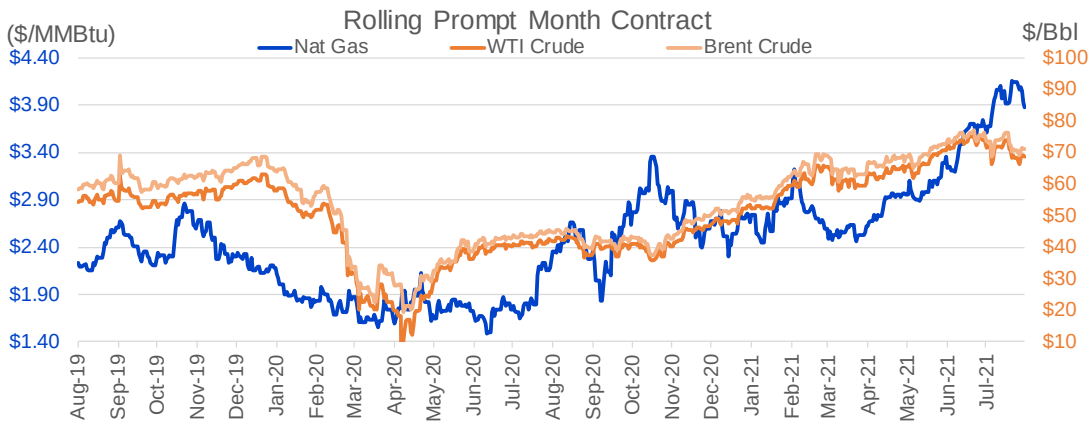
Source: CME, Nasdaq, ICE

Nat Gas Futures Open Interest

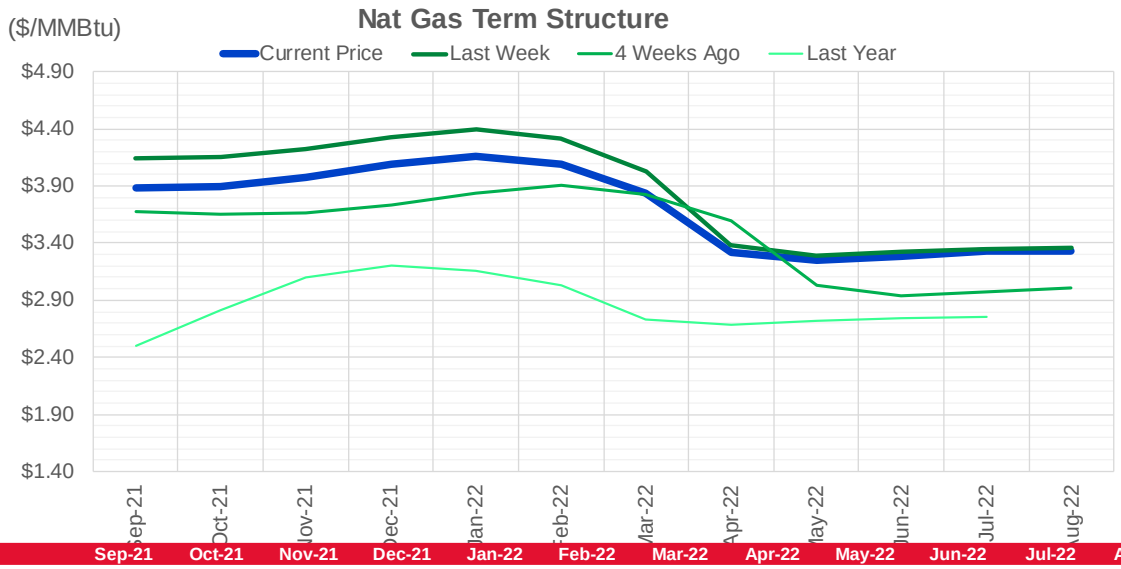
CME, ICE and Nasdaq Combined

CME Henry Hub Futures (10,000 MMBtu)				ICE Henry Hub Futures Contract Equivalent (10,000 MM			
	Current	Prior	Daily Change		Current	Prior	Daily Change
SEP 21	138851	160885	-22034	SEP 21	85568	89531	-3964
OCT 21	203663	195203	8460	OCT 21	106579	107878	-1299
NOV 21	184303	173012	11291	NOV 21	69480	69676	-197
DEC 21	78545	75978	2567	DEC 21	76100	75672	428
JAN 22	135049	133563	1486	JAN 22	78312	78622	-310
FEB 22	54725	55135	-410	FEB 22	71172	71199	-27
MAR 22	101308	103599	-2291	MAR 22	74196	73338	858
APR 22	111073	110161	912	APR 22	70496	70347	149
MAY 22	98134	94727	3407	MAY 22	69150	68771	380
JUN 22	30339	30718	-379	JUN 22	54924	55037	-113
JUL 22	26284	26156	128	JUL 22	54914	54769	146
AUG 22	25114	25099	15	AUG 22	55842	55919	-77
SEP 22	25913	25416	497	SEP 22	55664	55750	-86
OCT 22	64920	65481	-561	OCT 22	62489	62334	155
NOV 22	27235	26983	252	NOV 22	48886	48847	39
DEC 22	24028	23854	174	DEC 22	52331	52368	-37
JAN 23	17502	17330	172	JAN 23	33231	33202	30
FEB 23	6160	6200	-40	FEB 23	27844	27871	-27
MAR 23	7929	7894	35	MAR 23	29645	29682	-37
APR 23	10723	10538	185	APR 23	24389	24303	86
MAY 23	6287	6152	135	MAY 23	25297	25230	67
JUN 23	4651	4701	-50	JUN 23	23515	23444	72
JUL 23	3810	3772	38	JUL 23	23657	23577	80
AUG 23	3429	3222	207	AUG 23	23490	23410	80
SEP 23	3863	3676	187	SEP 23	22999	22921	78
OCT 23	4647	4804	-157	OCT 23	24624	24542	82
NOV 23	1392	1330	62	NOV 23	24558	24598	-39
DEC 23	1850	1850	0	DEC 23	23517	22357	1160
JAN 24	989	989	0	JAN 24	12973	13060	-87
FEB 24	873	873	0	FEB 24	11311	11332	-22

Source: CME, ICE



Market Report



	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22
Current Price	**$3.885**	**$3.901**	**$3.974**	**$4.094**	**$4.164**	**$4.088**	**$3.840**	**$3.315**	**$3.248**	**$3.281**	**$3.325**	**$3.331**
Last Week	$4.140	$4.154	$4.219	$4.330	$4.400	$4.315	$4.023	$3.377	$3.291	$3.319	$3.351	$3.357
vs. Last Week	-$0.255	-$0.253	-$0.245	-$0.236	-$0.236	-$0.227	-$0.183	-$0.062	-$0.043	-$0.038	-$0.026	-$0.026
4 Weeks Ago	$3.674	$3.658	$3.664	$3.732	$3.843	$3.909	$3.830	$3.591	$3.031	$2.941	$2.972	$3.008
vs. 4 Weeks Ago	$0.211	$0.243	$0.310	$0.362	$0.321	$0.179	$0.010	-$0.276	$0.217	$0.340	$0.353	$0.323
Last Year	$2.356	$2.495	$2.811	$3.104	$3.203	$3.156	$3.026	$2.732	$2.689	$2.714	$2.746	$2.752
vs. Last Year	$1.529	$1.406	$1.163	$0.990	$0.961	$0.932	$0.814	$0.583	$0.559	$0.567	$0.579	$0.579

	Units	Current Price	vs. Last Week	vs. 4 Weeks Ago	vs. Last Year
NatGas Jul21/Oct21	$/MMBtu	#N/A	#N/A	#N/A	#N/A
NatGas Oct21/Nov21	$/MMBtu	#N/A	#N/A	#N/A	#N/A
NatGas Oct21/Jan22	$/MMBtu	#N/A	#N/A	#N/A	#N/A
NatGas Apr22/Oct22	$/MMBtu	#N/A	#N/A	#N/A	#N/A
WTI Crude	$/Bbl	#N/A	#N/A	#N/A	#N/A
Brent Crude	$/Bbl	#N/A	#N/A	#N/A	#N/A
Fuel Oil, NY Harbour 1%	$/Bbl	#N/A	#N/A	#N/A	#N/A
Heating Oil	cents/Gallon	#N/A	#N/A	#N/A	#N/A
Propane, Mt. Bel	cents/Gallon	#N/A	#N/A	#N/A	#N/A
Ethane, Mt. Bel	cents/Gallon	#N/A	#N/A	#N/A	#N/A
Coal, PRB	$/MTon	#N/A	#N/A	#N/A	#N/A
Coal, PRB	$/MMBtu	#N/A			

Source: CME, Bloomberg

Market Report

Baker Hughes Rig Counts

Rotary Rig Count

8/13/2021

Baker Hughes

U.S. Breakout Information	This Week	+/-	Last Week	+/-	Year Ago
Oil	397	10	387	225	172
Gas	102	-1	103	32	70
Miscellaneous	1	0	1	-1	2
Directional	27	0	27	3	24
Horizontal	456	7	449	249	207
Vertical	17	2	15	4	13
Canada Breakout	**This Week**	**+/-**	**Last Week**	**+/-**	**Year Ago**
Oil	100	5	95	81	19
Gas	63	3	60	28	35
Miscellaneous	1	0	1	1	0
Major Basin Variances	**This Week**	**+/-**	**Last Week**	**+/-**	**Year Ago**
Ardmore Woodford	3	0	3	3	0
Arkoma Woodford	1	0	1	0	1
Cana Woodford	18	1	17	12	6
DJ-Niobrara	12	0	12	8	4
Eagle Ford	36	4	32	25	11
Granite Wash	4	0	4	3	1
Haynesville	46	-1	47	14	32
Marcellus	29	0	29	4	25
Permian	245	2	243	128	117
Utica	11	0	11	5	6
Williston	23	4	19	12	11