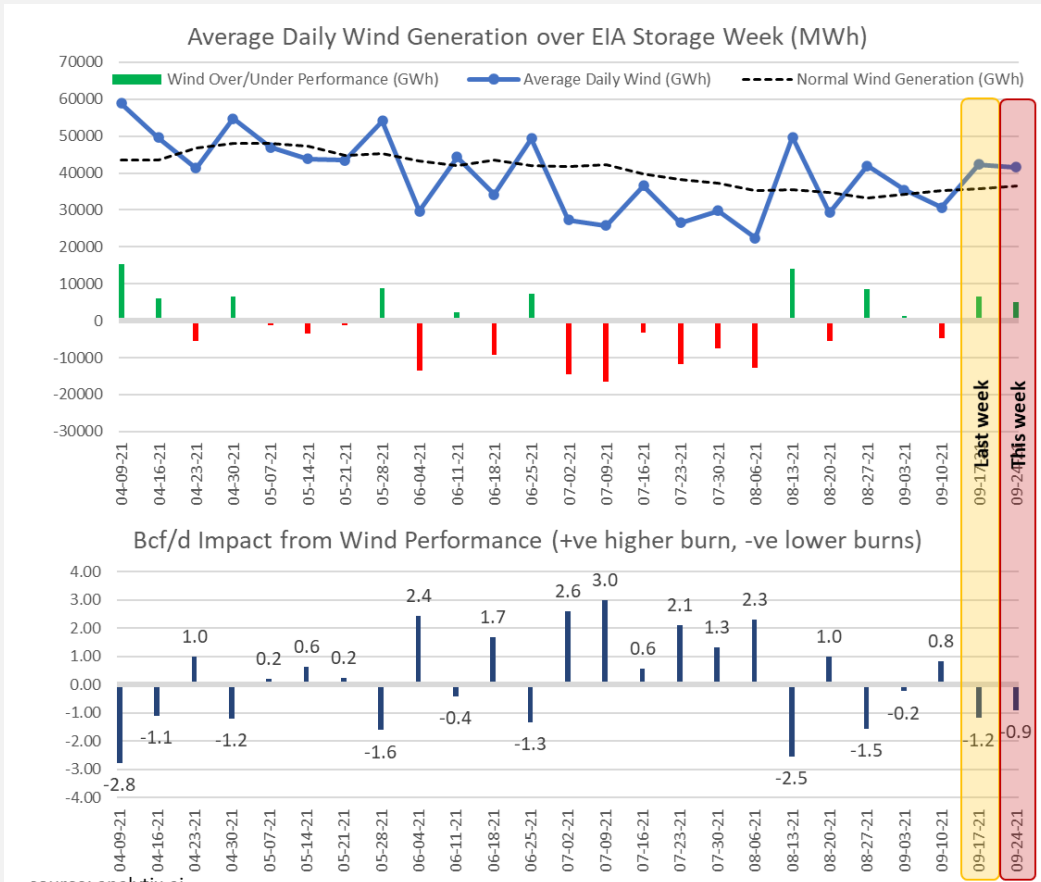


This past week the EIA reported a +76 Bcf storage injection for week ending Sept 17th. The report once again came in a few Bcf higher than expectations, but the market shook it off and price started to move higher for the balance of the day and into Friday. As with last week's report, this report indicated loosening conditions from the last few weeks of August. We estimate this report was 0.4 Bcf/d tight versus the average 3Yr wx-adjusted injection.

Wind and Solar generation picked up significantly during this reporting period. Wind generation averaged 42.3 GWh during the reporting period, which we calculate to be 18% stronger than normal. Solar generation averaged 14.1 GWh during the reporting period, which we calculate to be 7% stronger than normal. The net impact of the strong renewables dropped gas burns by 1.34 Bcf/d leading to ~9 Bcf of more natgas directed to storage over the week.

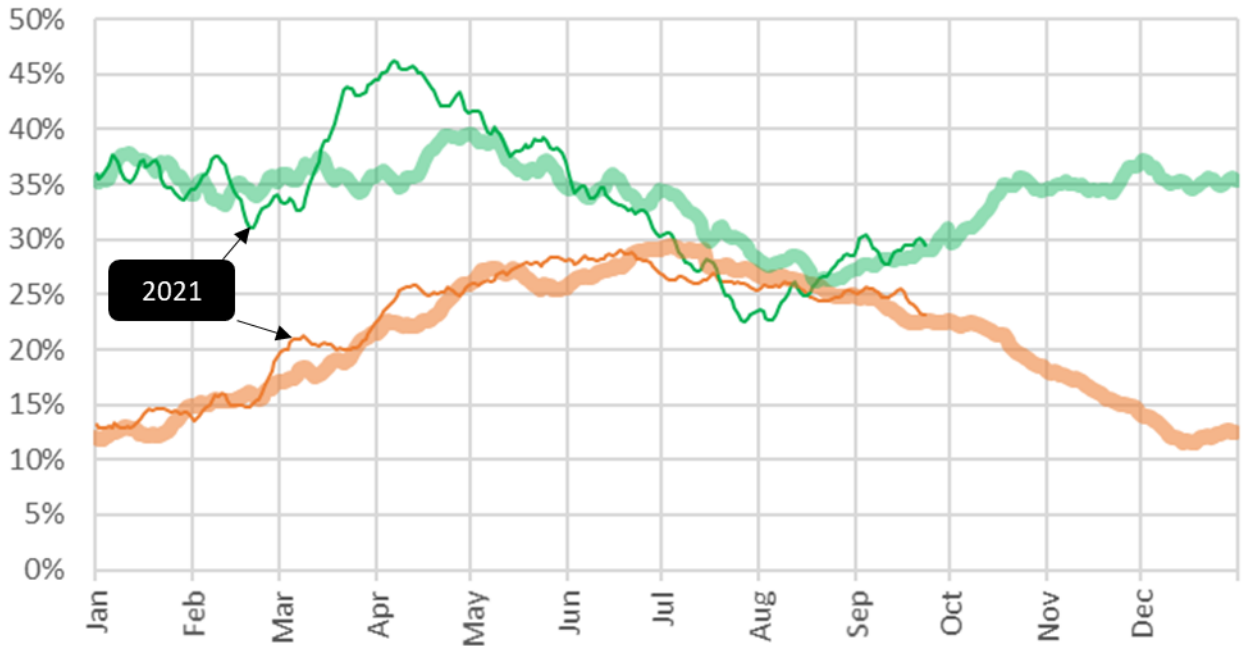
The wind has specifically led to some very volatile storage numbers this summer. Below is our assessment of wind's performance over this summer. We show the weekly average wind generation versus our calculated normal for that given week. As can be seen, we had very strong wind in late Q1 and early Q2, followed by very low wind in Q3. The low wind during Q3 (the peak summer months) led to tight balances and concerns of low end-of-summer storage inventories. In the accompanying chart right below, we show the net impact the over/under wind gen had on gas burns for that given week.



source: analytix.ai

Wind and solar are two new variables that we now need to closely monitor week to week. The projected capacity additions and any variance to the expected capacity factor can greatly influence the forward balances. In the chart below you can see the typical seasonal capacity factor for wind and solar. They do somewhat complement each other.

WIND and **SOLAR** Capacity Factor: 2021 vs Normal



source: analytix.ai

For this coming winter, we ran some scenarios to understand how a 1% variance in wind/solar gen would impact gas burns and more importantly end of winter storage levels. We found that if wind gen performed 1% better than its normal capacity factor, then we would have 37 Bcf less consumed by natural gas generation.

Gas Burn Impact over the Winter (Bcf)		
	Wind	Solar
+2%	-73	-36
+1%	-37	-18
Normal	0	0
-1%	37	18
-2%	73	36

Fundamentals for the week ending Sept 24: For the week ending Sept 24th, our early view is +90 Bcf. The 5Yr average is also a +72 Bcf injection. Our projected injection would take the L48 storage level to 3172 Bcf (-573 vs LY, -211 vs. 5Yr).

Domestic dry gas production was higher by 1.0 Bcf/d to an average of 92.7 Bcf/d during the week. Production continued to return in the GoM as Entergy has almost fully restored power to gas processing facilities in the Southern Parishes of Louisiana. BSEE.gov published their final Hurricane Ida report on September 23rd in which they stated that 0.54 Bcf/d or 24.3% of GoM natural gas production was still shut-in. Entergy has noted that all power will be restored before September 29th.

Here is a good link to keep track of the restoration process:

<https://www.entergy.com/hurricaneida/etr/>

Total consumption was lower this week, primarily driven by lower temps reducing the total power demand. Total national temps were lower by 2.4F week-on-week. Total national power generation was lower by 2.8% from the previous week. As we showed in the chart above, wind generation was lower than the previous week but still well above normal. We estimate the higher-than-normal wind generation removed 0.9 Bcf/d or 6.3 Bcf of gas burns to help loosen the balances.

Generation Weekly Average - MWh (EIA)

	17-Sep	24-Sep	WoW
US Wind	42355	41506	-848
US Solar	14094	12002	-2091
US Petroleum	2470	2639	170
US Other	9247	8964	-283
US Coal	115066	110587	-4479
US Nuke	89425	88524	-901
US Hydro	24139	25302	1163
US Gas	182007	176857	-5150
US Total	479661	466449	-13212

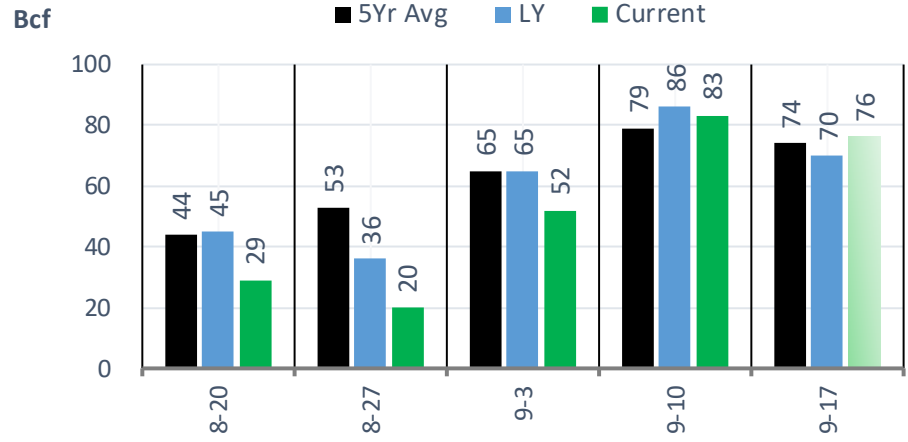
Deliveries to LNG facilities averaged 9.9 Bcf/d, which was -0.2 Bcf/d lower than the previous week. During the week we had Freeport returns after power being knocked out for 3 days due to Hurricane Nicholas. To offset those gains we had Cove Point start its annual 26 day maintenance and Cameron performing a some short-term maintenance that closed off train 1. Cameron is back as of Friday.

The net balance is looser by 2.4 Bcf/d week-on-week.

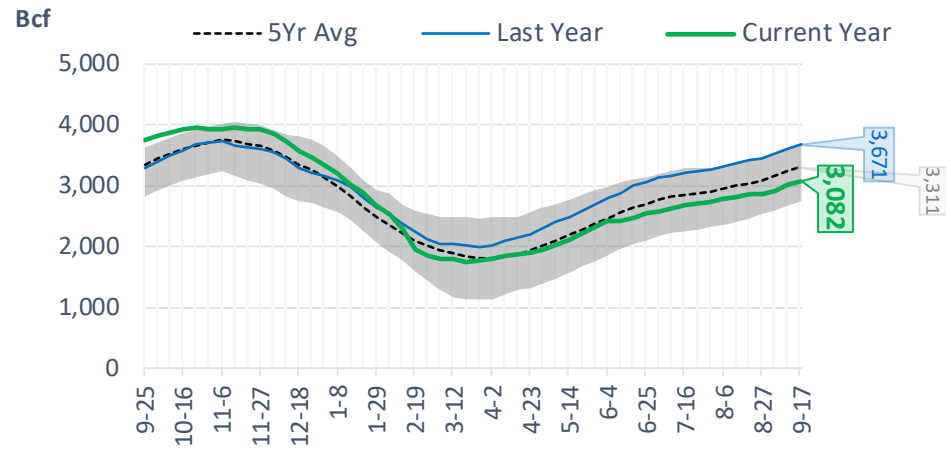
Expiration and rolls: UNG ETF roll starts on Oct 14th and ends on Oct 19th.
Oct futures expire on Sept 28th, and Oct options expire on Sept 27th.

EIA Storage Report

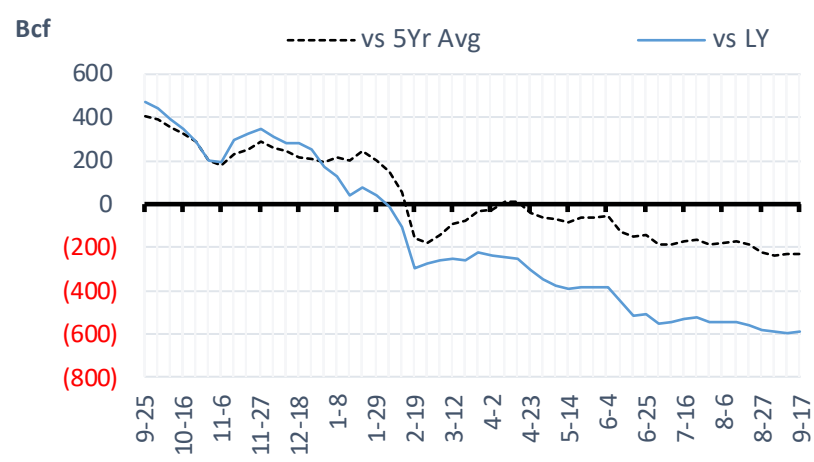
Total Lower 48 YoY Weekly Change



Total Lower 48 Storage Levels



Total Lower 48 LY Surplus/Deficit

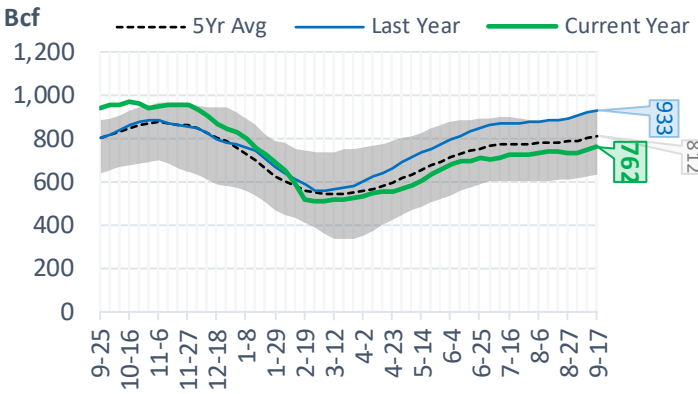


The risk of trading futures and options and other derivatives involves a substantial risk of loss and is not suitable for all persons. Each person must consider whether a particular trade, combination of trades, or strategy is suitable for that person's financial means and objectives. Past results are not necessarily indicative of future results. This communication may contain links to third party websites which are not under the control of and are not maintained by ION Energy Group, and ION Energy Group is not responsible for their content.

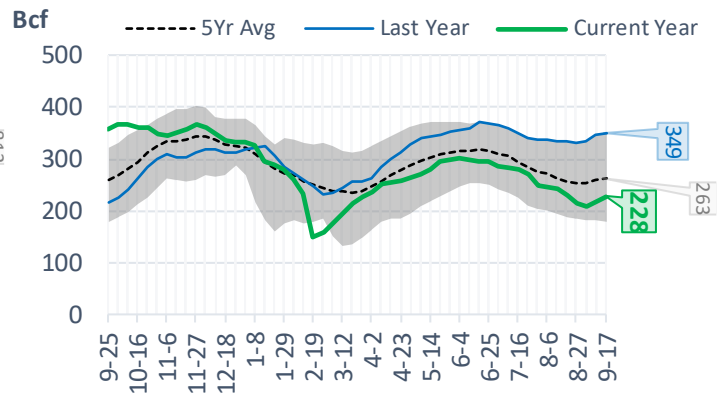
Natural Gas Storage Stats - Last 5 Weeks

Week Ending	Current 17-Sep	Week - 1 10-Sep	Week - 2 3-Sep	Week - 3 27-Aug	Week - 4 20-Aug	Week - 5 13-Aug
Total Lower 48 Storage Level	3082	3006	2923	2871	2851	2822
Weekly Change	+76	+83	+52	+20	+29	+46
vs LY	-589	-595	-592	-579	-563	-547
vs 5Yr Avg	-229	-231	-235	-222	-189	-174
S. Central Salt Storage Level	228	217	208	214	229	244
Weekly Change	+11	+9	-6	-15	-15	-3
vs LY	-121	-130	-126	-117	-105	-91
vs 5Yr Avg	-35	-44	-45	-39	-28	-20
S. Central NonSalt Storage Level	762	748	735	734	742	741
Weekly Change	+14	+13	+1	-8	+1	+9
vs LY	-171	-176	-171	-160	-147	-146
vs 5Yr Avg	-50	-55	-57	-52	-40	-40
Midwest Storage Level	904	876	842	812	790	765
Weekly Change	+28	+34	+30	+22	+25	+24
vs LY	-101	-103	-107	-109	-111	-112
vs 5Yr Avg	-24	-21	-23	-22	-16	-16
East Storage Level	751	732	703	678	661	645
Weekly Change	+19	+29	+25	+17	+16	+16
vs LY	-96	-90	-100	-109	-110	-103
vs 5Yr Avg	-56	-51	-57	-60	-55	-49
Mountain Storage Level	196	193	191	190	188	188
Weekly Change	+3	+2	+1	+2	0	+3
vs LY	-28	-27	-24	-22	-24	-21
vs 5Yr Avg	-10	-9	-7	-5	-4	-2
Pacific Storage Level	240	240	243	243	241	240
Weekly Change	0	-3	0	+2	+1	-1
vs LY	-72	-70	-64	-61	-66	-73
vs 5Yr Avg	-54	-51	-45	-44	-45	-46

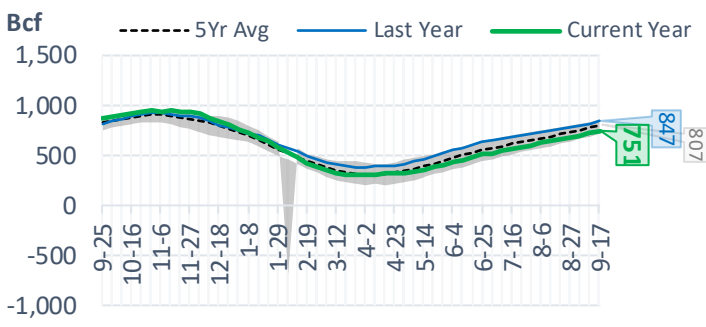
NonSalt Storage Levels



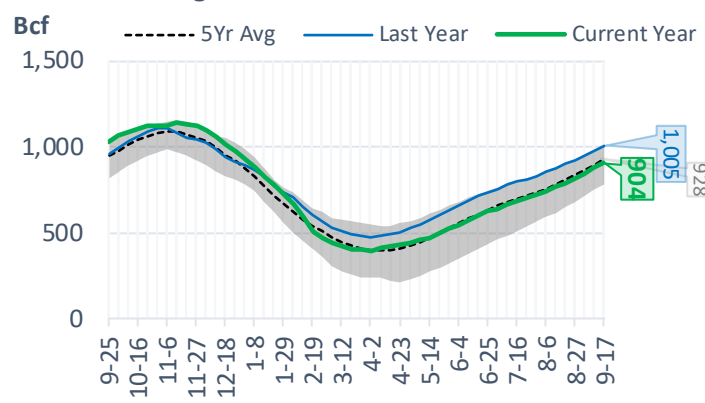
Salt Storage Levels



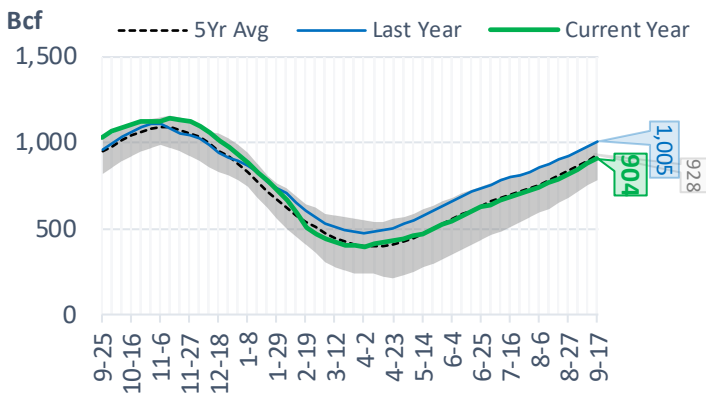
East Storage Levels



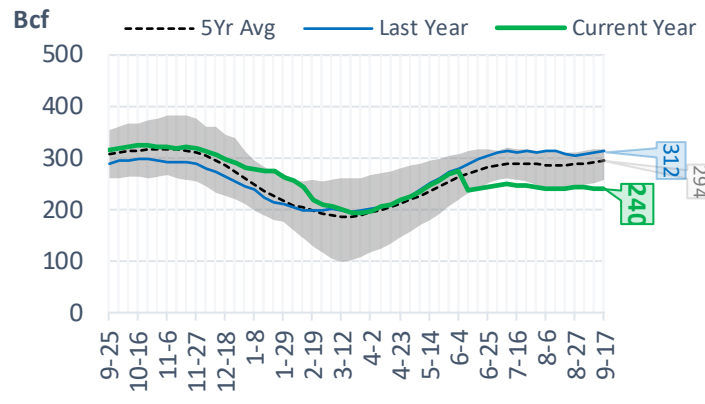
Midwest Storage Levels



Midwest Storage Levels



Pacific Storage Levels



EIA Storage Week Balances

	20-Aug	27-Aug	3-Sep	10-Sep	17-Sep	24-Sep	WoW	vs. 4W
Lower 48 Dry Production	92.4	93.0	90.9	91.2	91.7	92.7	▲ 1.0	▲ 1.0
Canadian Imports	5.0	5.3	5.0	4.8	5.2	5.1	▼ 0.0	▲ 0.1
L48 Power	39.7	41.9	38.1	33.7	35.0	33.2	▼ -1.8	▼ -4.0
L48 Residential & Commercial	7.6	7.8	7.5	7.0	7.3	8.1	▲ 0.9	▲ 0.7
L48 Industrial	20.9	20.9	18.9	19.6	21.0	20.7	▼ -0.4	▲ 0.6
L48 Lease and Plant Fuel	5.1	5.1	5.0	5.0	5.1	5.1	▲ 0.1	▲ 0.0
L48 Pipeline Distribution	2.3	2.4	2.2	2.1	2.2	2.1	▼ 0.0	▼ -0.1
L48 Regional Gas Consumption	75.6	78.2	71.7	67.5	70.5	69.3	▼ -1.2	▼ -2.7
Net LNG Exports	10.9	10.6	10.5	11.0	10.2	9.9	▼ -0.3	▼ -0.6
Total Mexican Exports	6.8	6.8	7.0	6.7	6.6	6.8	▲ 0.2	▲ 0.0
Implied Daily Storage Activity	4.2	2.8	6.7	10.9	9.5	11.9	2.4	
EIA Reported Daily Storage Activity	4.1	2.9	7.4	11.9	10.9			
Daily Model Error	0.1	-0.1	-0.7	-1.0	-1.4			

Monthly Balances

	2Yr Ago Sep-19	LY Sep-20	May-21	Jun-21	Jul-21	Aug-21	MTD Sep-21	MoM	vs. LY
Lower 48 Dry Production	94.4	89.1	93.1	93.4	92.4	92.2	91.8	▼ -0.4	▲ 2.6
Canadian Imports	4.7	3.8	4.5	4.8	5.2	5.1	5.0	▼ -0.1	▲ 1.2
L48 Power	36.3	34.4	26.8	35.9	39.6	40.2	33.8	▼ -6.4	▼ -0.6
L48 Residential & Commercial	8.2	8.8	12.8	8.9	8.6	7.7	7.5	▼ -0.2	▼ -1.2
L48 Industrial	22.5	20.3	20.8	20.6	19.6	20.1	20.4	▲ 0.3	▲ 0.0
L48 Lease and Plant Fuel	5.1	4.9	5.1	5.1	5.1	5.1	5.1	▼ 0.0	▲ 0.1
L48 Pipeline Distribution	2.2	2.2	2.1	2.2	2.3	2.3	2.1	▼ -0.2	▼ -0.1
L48 Regional Gas Consumption	74.5	70.6	67.6	72.7	75.1	75.4	68.8	▼ -6.6	▼ -1.8
Net LNG Exports	6.2	5.9	10.8	10.2	10.8	10.5	10.4	▼ -0.1	▲ 4.4
Total Mexican Exports	5.3	6.1	6.8	7.4	7.1	6.9	6.7	▼ -0.1	▲ 0.6
Implied Daily Storage Activity	13.2	10.2	12.4	8.0	4.6	4.5	10.9		
EIA Reported Daily Storage Activity									
Daily Model Error									

Source: Bloomberg, analytix.ai

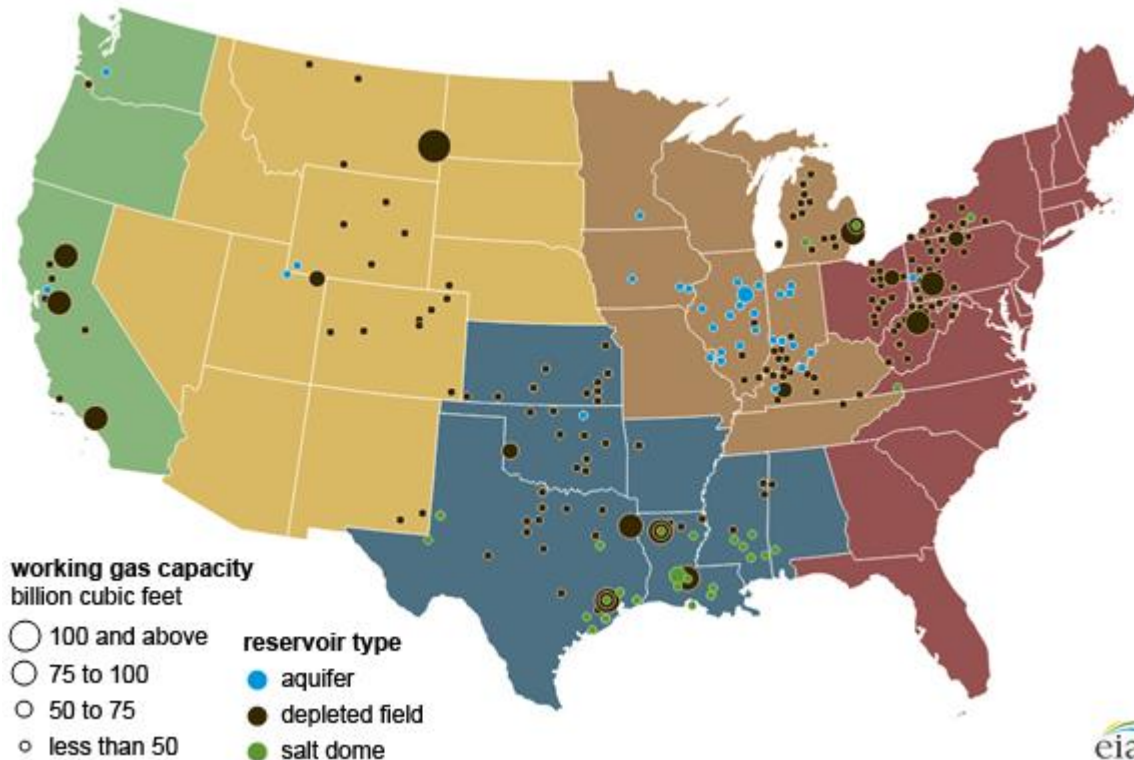
Regional S/D Models Storage Projection

Week Ending 24-Sep

	Daily Raw Storage	Daily Adjustment Factor	Daily Average Storage Activity (Adjusted) *	Weekly Adjusted Storage Activity
L48	11.6	1.3	12.8	90
East	3.0	0.7	3.6	25
Midwest	5.1	-0.7	4.5	31
Mountain	3.8	-3.6	0.3	2
South Central	-1.1	5.3	4.2	30
Pacific	0.7	-0.4	0.3	2

*Adjustment Factor is calculated based on historical regional deltas

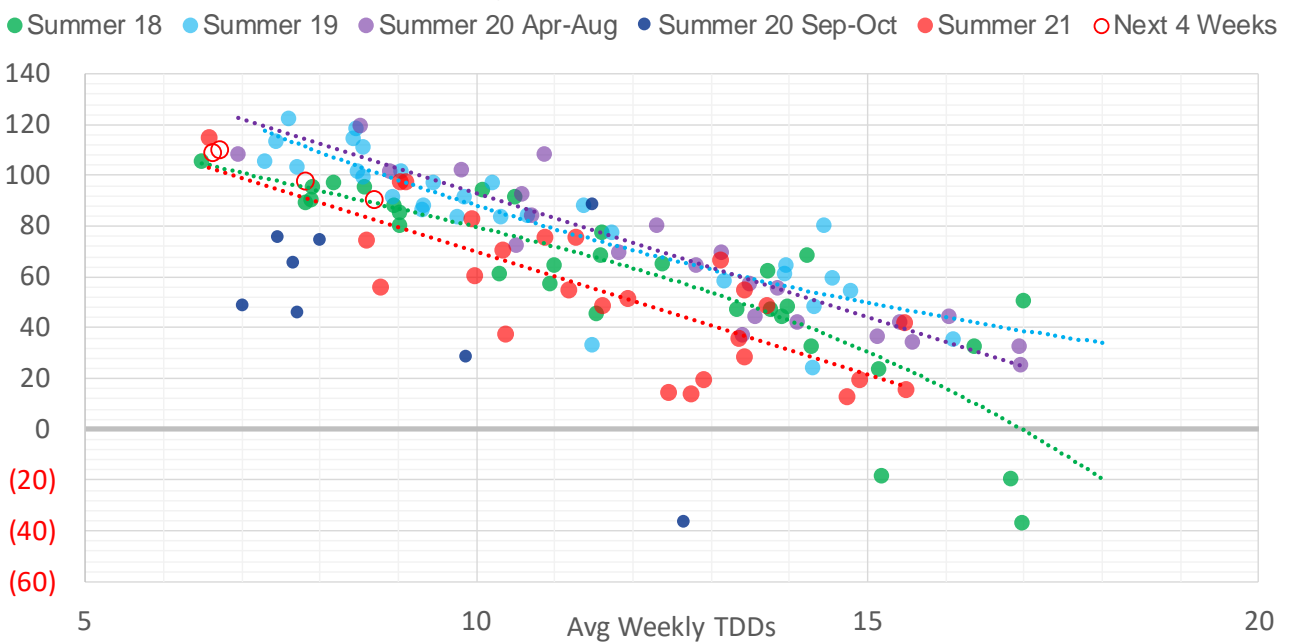
U.S. underground natural gas storage facilities by type (July 2015)



Weather Model Storage Projection

Next report and beyond		
Week Ending	Temp	Week Storage Projection
01-Oct	6.6	109
08-Oct	6.7	110
15-Oct	7.8	97

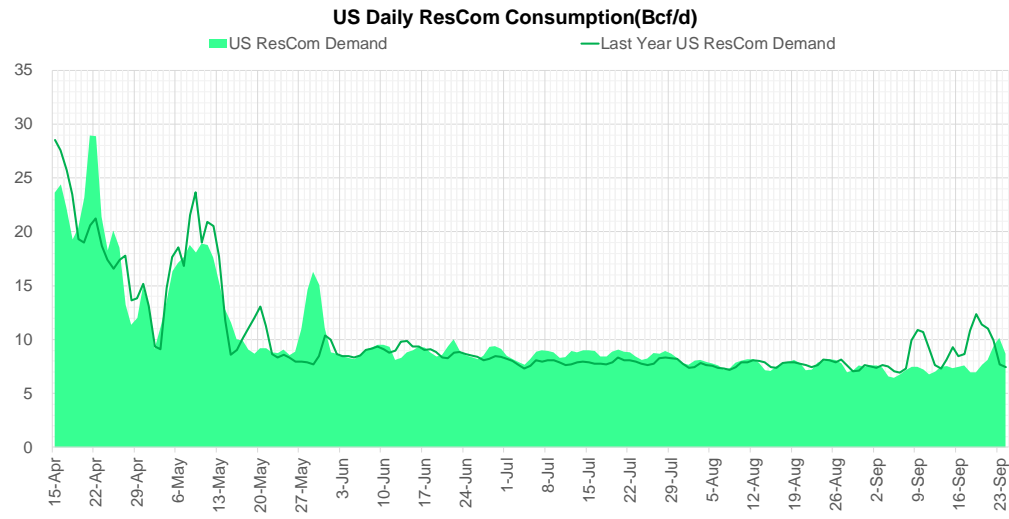
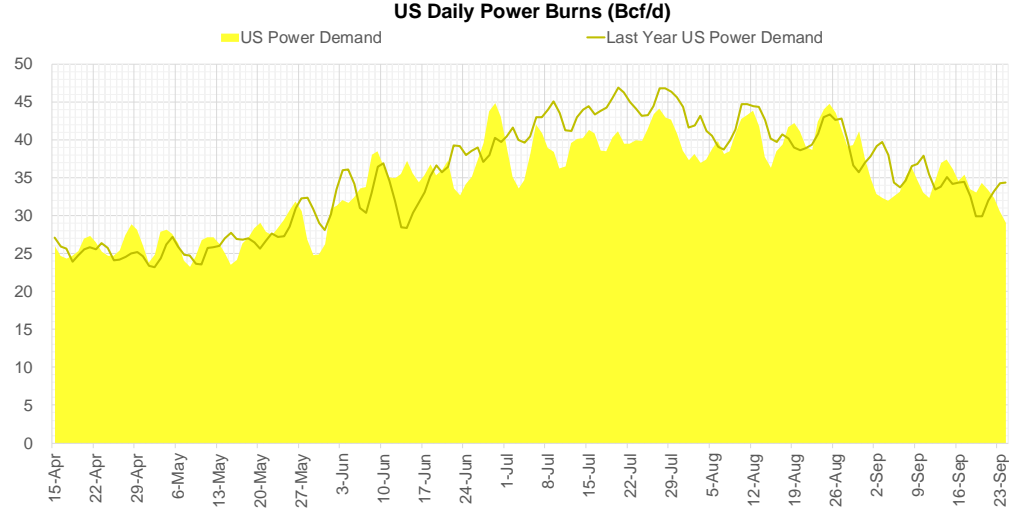
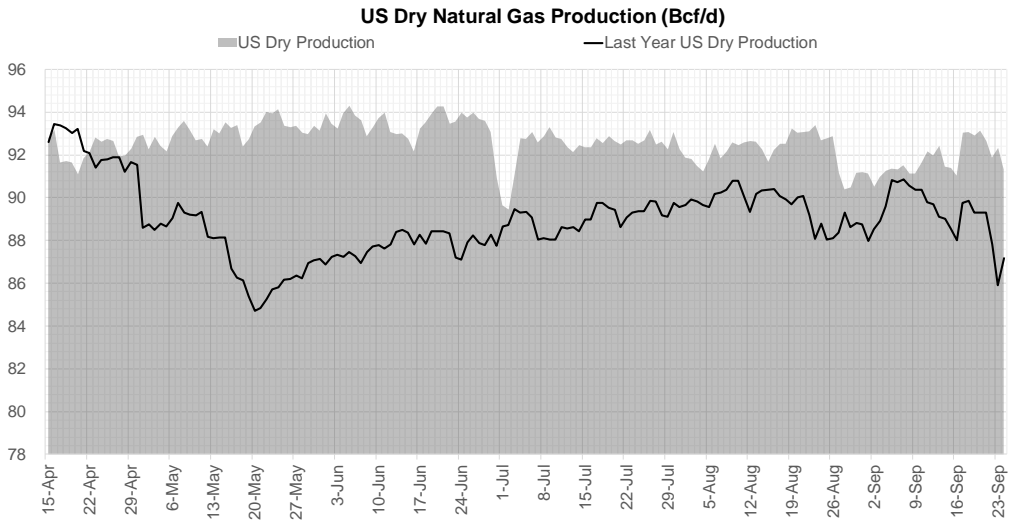
Weather Storage Model - Next 4 Week Forecast



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

The risk of trading futures and options and other derivatives involves a substantial risk of loss and is not suitable for all persons. Each person must consider whether a particular trade, combination of trades, or strategy is suitable for that person's financial means and objectives. Past results are not necessarily indicative of future results. This communication may contain links to third party websites which are not under the control of and are not maintained by ION Energy Group, and ION Energy Group is not responsible for their content.

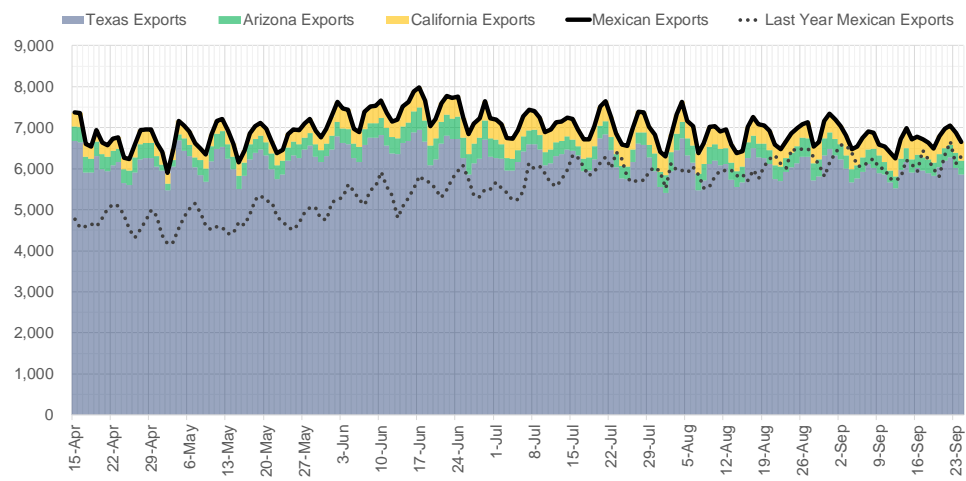
Supply – Demand Trends



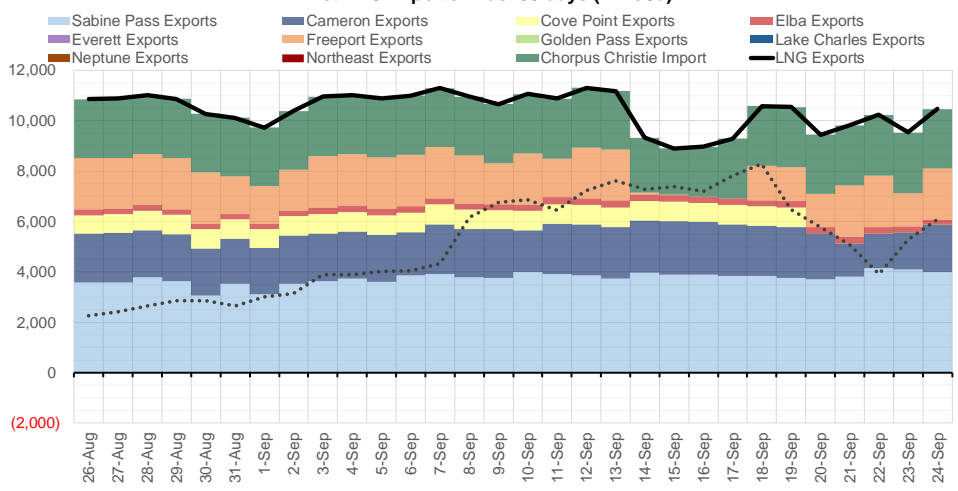
Source: Bloomberg

The risk of trading futures and options and other derivatives involves a substantial risk of loss and is not suitable for all persons. Each person must consider whether a particular trade, combination of trades, or strategy is suitable for that person's financial means and objectives. Past results are not necessarily indicative of future results. This communication may contain links to third party websites which are not under the control of and are not maintained by ION Energy Group, and ION Energy Group is not responsible for their content.

Mexican Exports (MMcf/d)



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



Source: Bloomberg

The risk of trading futures and options and other derivatives involves a substantial risk of loss and is not suitable for all persons. Each person must consider whether a particular trade, combination of trades, or strategy is suitable for that person's financial means and objectives. Past results are not necessarily indicative of future results. This communication may contain links to third party websites which are not under the control of and are not maintained by ION Energy Group, and ION Energy Group is not responsible for their content.

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

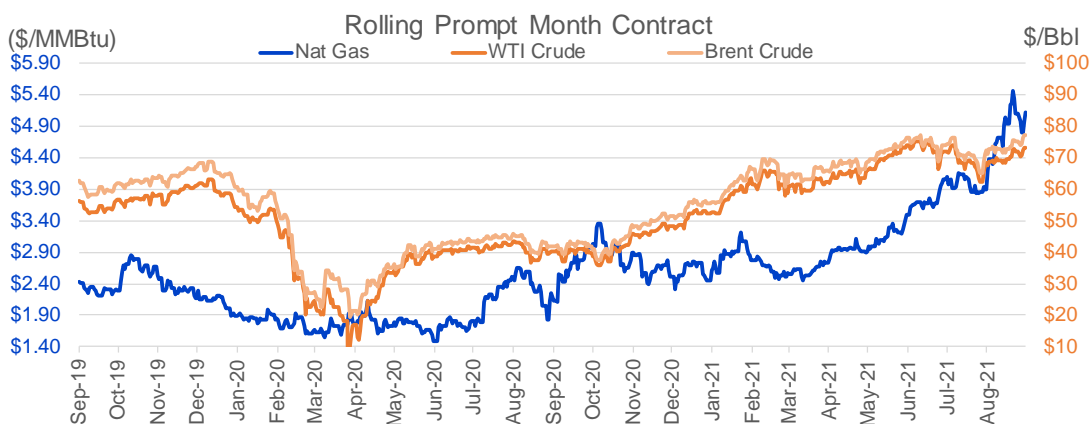
CONTRACT MONTH	CONTRACT YEAR	PUT/CALL	STRIKE	CUMULATIVE VOL	CONTRACT MONTH	CONTRACT YEAR	PUT/CALL	STRIKE	CUMULATIVE OI
10	2021	C	5.25	12460	10	2021	C	5.00	54206
10	2021	C	5.00	9674	10	2021	C	6.00	48831
10	2021	C	5.50	6594	12	2021	P	2.75	42009
10	2021	P	4.75	6096	10	2021	P	3.50	42002
10	2021	P	4.50	5017	10	2021	C	4.00	41741
12	2021	P	3.50	4539	10	2021	C	4.50	39060
3	2022	P	4.25	4240	12	2021	P	2.50	38548
10	2021	C	5.10	4145	10	2021	C	3.50	32999
3	2022	P	3.75	3750	10	2021	C	4.25	32763
11	2021	C	6.00	3214	10	2021	P	3.00	31755
10	2021	C	5.15	3093	11	2021	P	3.00	30655
10	2021	C	5.20	3071	10	2021	P	2.50	29993
11	2021	P	4.50	2850	10	2021	P	2.00	28650
3	2022	P	4.00	2800	10	2021	P	4.00	28479
10	2021	C	6.00	2797	10	2021	C	3.25	28188
12	2021	P	4.25	2650	10	2021	P	2.75	26887
3	2022	C	9.00	2630	3	2022	C	10.00	26843
3	2022	C	8.00	2588	12	2021	P	3.00	26020
12	2021	P	4.00	2553	11	2021	P	4.00	25591
3	2022	C	7.00	2551	10	2021	P	4.25	24893
11	2021	C	5.50	2511	3	2022	C	8.00	24476
2	2022	C	5.00	2394	11	2021	C	4.00	23311
10	2021	P	4.60	2315	11	2021	P	3.50	23055
10	2021	C	5.75	2156	10	2021	P	4.50	23018
3	2022	C	14.00	2000	12	2021	C	4.00	22596
2	2022	C	5.50	1954	12	2021	P	4.00	22188
3	2022	C	5.25	1850	10	2021	P	3.75	22037
10	2021	C	5.40	1820	11	2021	C	7.00	21437
11	2021	P	4.25	1771	11	2021	C	6.00	20806
4	2022	P	2.50	1753	3	2022	C	5.00	19976
10	2021	P	4.25	1708	10	2021	P	2.25	19784
2	2022	C	7.00	1695	4	2022	C	3.00	19760
2	2022	C	8.00	1600	3	2022	P	3.50	19093
3	2022	C	5.00	1597	12	2021	C	6.00	18590
12	2021	C	5.50	1524	10	2021	C	3.00	18486
11	2021	C	7.00	1469	2	2022	P	3.50	18245
11	2021	C	5.75	1467	10	2021	C	5.50	18083
10	2021	P	5.00	1427	1	2022	C	5.00	17986
1	2022	P	4.75	1426	10	2021	P	3.25	17940
1	2022	P	3.50	1398	1	2022	P	3.50	17669
12	2021	C	5.00	1292	2	2022	C	5.00	17028
2	2022	C	7.50	1290	3	2022	P	2.50	16845
11	2021	P	4.00	1279	10	2021	C	3.75	16780
2	2022	C	15.00	1260	3	2022	C	4.00	16485
4	2022	C	4.60	1250	11	2021	C	5.00	16436
8	2022	C	4.60	1250	10	2021	C	5.25	15801
11	2021	C	6.50	1238	2	2022	C	4.00	15800
1	2022	C	8.00	1206	11	2021	C	4.50	15135
12	2021	C	6.00	1137	4	2022	P	2.50	15070
					11	2021	P	3.25	14825.75

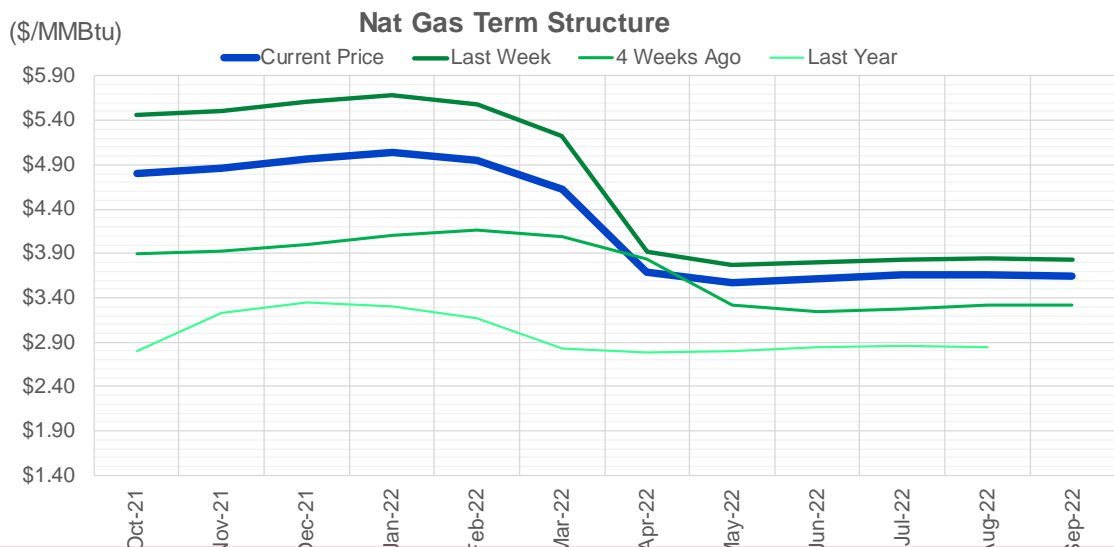
Source: CME, Nasdaq, ICE

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
OCT 21	27672	41097	-13425	OCT 21	91968	89489	2479
NOV 21	280003	275144	4859	NOV 21	82756	81142	1614
DEC 21	94343	91594	2749	DEC 21	75920	76607	-687
JAN 22	162094	157533	4561	JAN 22	95363	95050	313
FEB 22	58397	57577	820	FEB 22	69938	70037	-100
MAR 22	123834	122995	839	MAR 22	74627	74881	-254
APR 22	118970	118816	154	APR 22	72754	72859	-105
MAY 22	118204	117435	769	MAY 22	69881	69997	-117
JUN 22	40682	39055	1627	JUN 22	53824	53953	-129
JUL 22	37803	36300	1503	JUL 22	55915	55961	-46
AUG 22	32006	31994	12	AUG 22	54991	55176	-185
SEP 22	34381	34452	-71	SEP 22	55202	55344	-142
OCT 22	87667	87241	426	OCT 22	61764	62161	-396
NOV 22	32297	32302	-5	NOV 22	48033	47935	98
DEC 22	25911	25714	197	DEC 22	51298	51197	101
JAN 23	23025	22756	269	JAN 23	37294	37461	-167
FEB 23	9480	9250	230	FEB 23	30767	30641	127
MAR 23	12312	11869	443	MAR 23	32382	32271	112
APR 23	12265	12003	262	APR 23	30430	30130	300
MAY 23	6730	6694	36	MAY 23	30126	29973	153
JUN 23	6129	6125	4	JUN 23	27957	27809	148
JUL 23	4199	4206	-7	JUL 23	28125	27965	161
AUG 23	3218	3191	27	AUG 23	27908	27748	160
SEP 23	4599	4483	116	SEP 23	27218	27070	148
OCT 23	5685	5790	-105	OCT 23	29488	29312	176
NOV 23	2124	2158	-34	NOV 23	27981	28063	-82
DEC 23	2142	2142	0	DEC 23	27430	27507	-77
JAN 24	1430	1429	1	JAN 24	14987	14932	54
FEB 24	1089	1089	0	FEB 24	12501	12487	14
MAR 24	3342	3192	150	MAR 24	17197	17421	-225

Source: CME, ICE






	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22
Current Price	\$4.805	\$4.855	\$4.969	\$5.042	\$4.952	\$4.628	\$3.696	\$3.578	\$3.612	\$3.657	\$3.663	\$3.643
Last Week	\$5.460	\$5.507	\$5.604	\$5.676	\$5.585	\$5.221	\$3.914	\$3.768	\$3.797	\$3.831	\$3.839	\$3.825
vs. Last Week	-\$0.655	-\$0.652	-\$0.635	-\$0.634	-\$0.633	-\$0.593	-\$0.218	-\$0.190	-\$0.185	-\$0.174	-\$0.176	-\$0.182
4 Weeks Ago	\$3.897	\$3.925	\$3.995	\$4.105	\$4.166	\$4.089	\$3.836	\$3.320	\$3.251	\$3.281	\$3.315	\$3.323
vs. 4 Weeks Ago	\$0.908	\$0.930	\$0.974	\$0.937	\$0.786	\$0.539	-\$0.140	\$0.258	\$0.361	\$0.376	\$0.348	\$0.320
Last Year	\$2.125	\$2.794	\$3.229	\$3.348	\$3.303	\$3.165	\$2.834	\$2.783	\$2.807	\$2.843	\$2.856	\$2.844
vs. Last Year	\$2.680	\$2.061	\$1.740	\$1.694	\$1.649	\$1.463	\$0.862	\$0.795	\$0.805	\$0.814	\$0.807	\$0.799

	Units	Current Price	vs. Last Week	vs. 4 Weeks Ago	vs. Last Year
NatGas Jul21/Oct21	\$/MMBtu	1.359	▼ -0.359	▲ 0.765	▲ 1.334
NatGas Oct21/Nov21	\$/MMBtu	0.067	▲ 0.020	▲ 0.017	▲ 0.013
NatGas Oct21/Jan22	\$/MMBtu	0.256	▲ 0.027	▲ 0.048	▼ -0.035
NatGas Apr22/Oct22	\$/MMBtu	-0.042	▲ 0.004	▼ -0.043	▼ -0.060
WTI Crude	\$/Bbl	73.30	▲ 0.690	▲ 5.880	▲ 32.990
Brent Crude	\$/Bbl	77.25	▲ 1.580	▲ 6.180	▲ 35.310
Fuel Oil, NY Harbour 1%	\$/Bbl	97.18	▲ 0.000	▲ 0.000	▲ 0.000
Heating Oil	cents/Gallon	224.91	▲ 3.810	▲ 16.590	▲ 113.240
Propane, Mt. Bel	cents/Gallon	1.28	▲ 0.005	▲ 0.167	▲ 0.785
Ethane, Mt. Bel	cents/Gallon	0.38	▼ -0.010	▲ 0.049	▲ 0.183
Coal, PRB	\$/MTon	12.30	▲ 0.000	▲ 0.000	▲ 0.000
Coal, PRB	\$/MMBtu	0.70			

Source: CME, Bloomberg

Baker Hughes Rig Counts

Rotary Rig Count						Baker Hughes 
9/24/2021						
U.S. Breakout Information	This Week	+/-	Last Week	+/-	Year Ago	
Oil	421	10	411	238	183	
Gas	99	-1	100	24	75	
Miscellaneous	1	0	1	-2	3	
Directional	20	3	17	-1	21	
Horizontal	471	5	466	247	224	
Vertical	30	1	29	14	16	
Canada Breakout	This Week	+/-	Last Week	+/-	Year Ago	
Oil	96	1	95	63	33	
Gas	65	6	59	27	38	
Miscellaneous	1	1	0	1	0	
Major Basin Variances	This Week	+/-	Last Week	+/-	Year Ago	
Ardmore Woodford	2	0	2	2	0	
Arkoma Woodford	2	1	1	1	1	
Cana Woodford	20	1	19	14	6	
DJ-Niobrara	12	0	12	8	4	
Eagle Ford	37	1	36	25	12	
Granite Wash	3	-1	4	2	1	
Haynesville	47	0	47	11	36	
Marcellus	26	-1	27	0	26	
Mississippian	1	0	1	1	0	
Permian	260	1	259	135	125	
Utica	12	0	12	6	6	
Williston	23	0	23	13	10	