

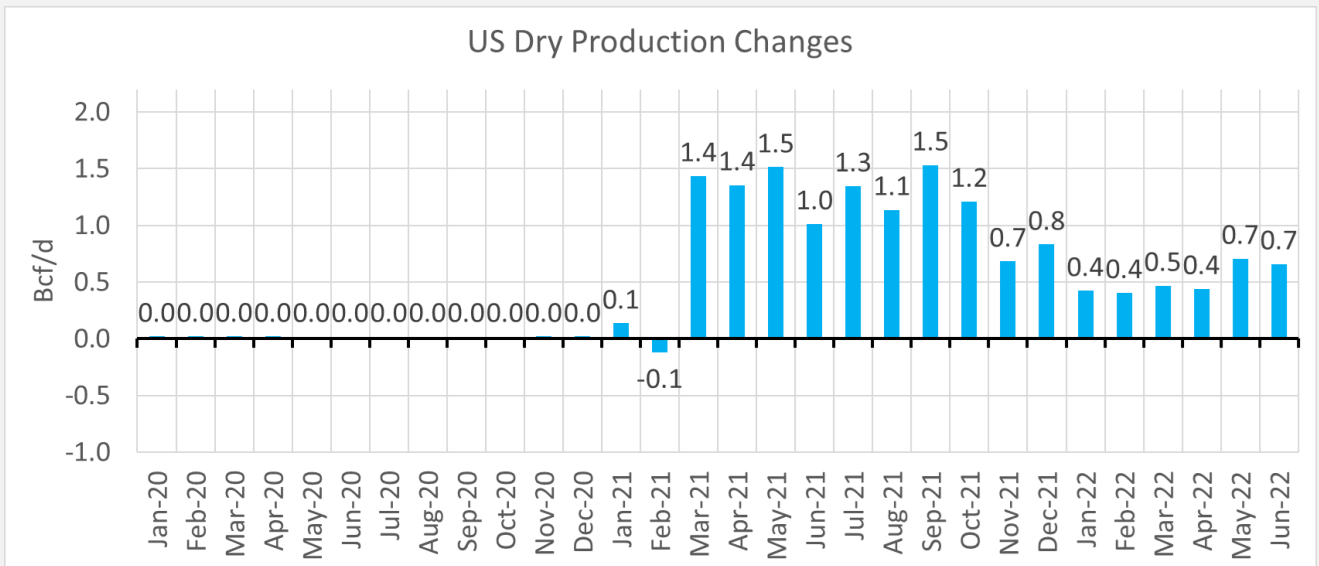
This week we start by reviewing some big changes made to the 2021 EIA Natural Gas S/D data. Along with the release of the July S/D data, the EIA “issued extensive revisions to data for 2020, 2021, and year-to-date 2022 because of benchmarking to annual data published in the Natural Gas Annual 2021 (NGA).”

The nature of these changes are quite important, and we will likely see these flow into daily and forward-looking production and demand estimates that use the EIA data as the benchmark soon.

Here is the full story of the changes in three charts:

Production

Production levels were unchanged for 2020, but there were massive adjustments made to both 2021 (1.0 Bcf/d on average) and the first half of 2022 (0.6 Bcf/d on average). So all this time when we were saying that production levels were relatively stale – we were misguided.



Consumption

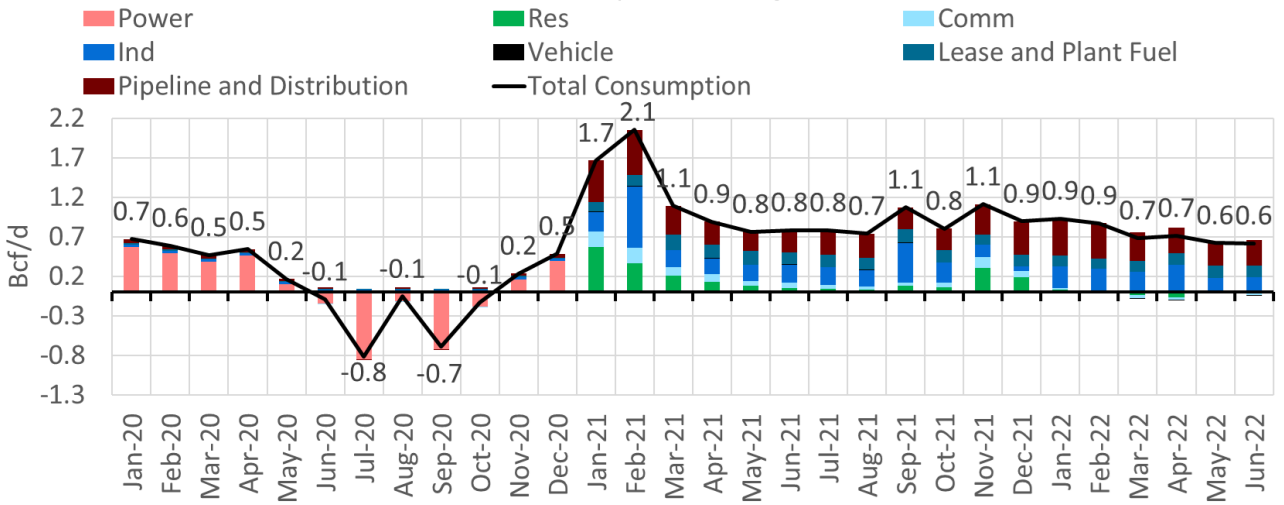
The changes to historical consumption are quite drastic.

A couple of key things to note:

- 1) Changes to the power burns were made for 2020, but not really in 2021 and 2022.
- 2) The changes to consumption in 2021 and 2022 were mainly made to Industrial uses (Industrial + Pipe/Dist + Lease/Plant). This is generally a hard category to track as it is not entirely tied to the weather, and is difficult to follow from the ebb daily pipeline data.
- 3) The 2021 and 2022 somewhat track the increased production estimates.

My guess is that these changes were an attempt to cancel out the changes of the rapidly increasing supply.

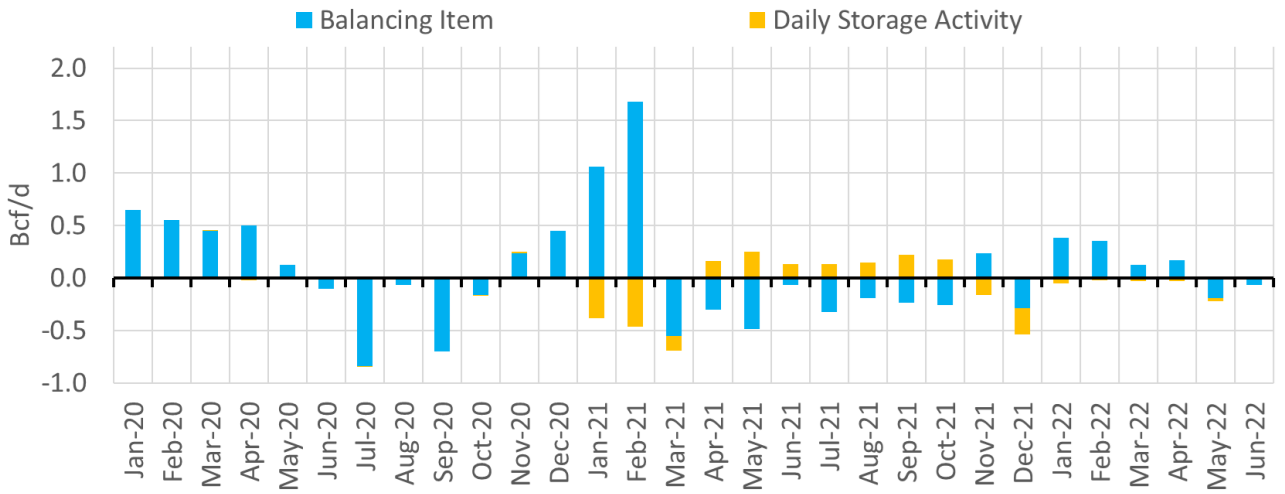
US Consumption Changes



Balancing Item and Daily Storage Activity

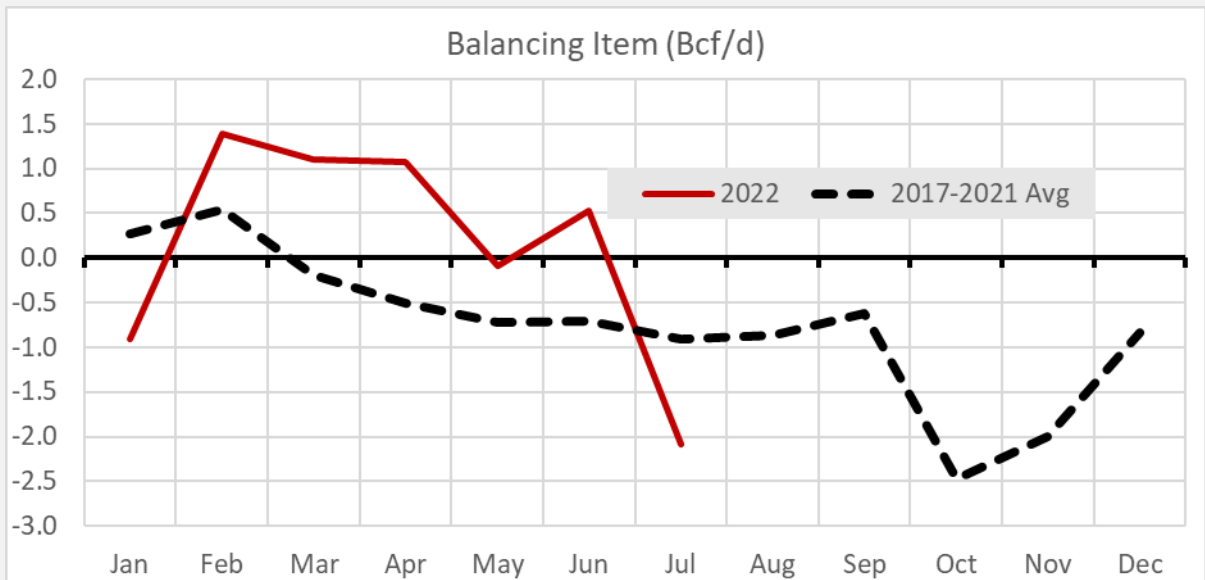
The balancing items is usually the catch-all error line item. It typically follows a seasonal pattern where its highest in the winter and falls through the rest of the year. The belief is that RC consumption is precisely tracked as the utility level metering/billing is done on a one-month lagged basis. The changes to the balancing item and daily storage look to be an attempt to get the balancing item to match historical levels.

US Balancing Item and Daily Storage Activity Changes



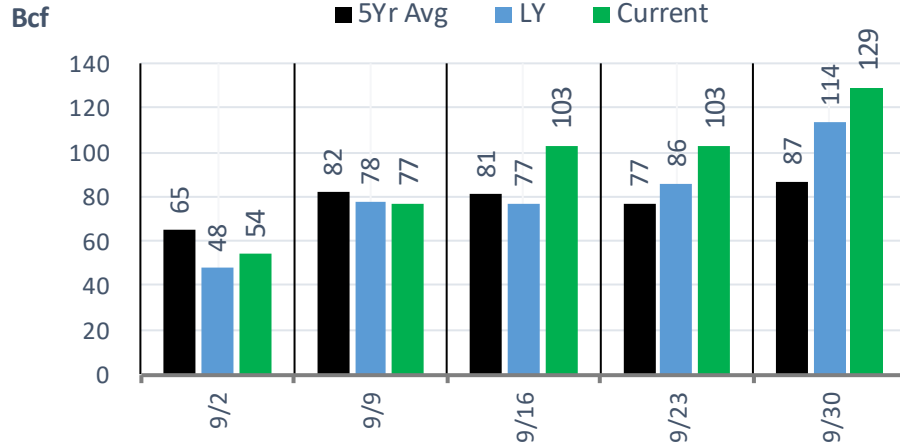
Our overall takeaway from all these changes is that production levels now better track actual levels. The market had been understating levels, and this increase will now make its way through industry production models as vendors recalibrate higher.

This helps verify what we have been saying for some time. We believe that the loose storage numbers we have had all summer have been due to production levels being 1+ Bcf/d. When the EIA restates 2022 numbers again next year, we will likely see monthly production levels pushed higher. Here is some evidence of how out of whack 2022's balancing item currently is. If the EIA restates the 2022 balancing item to get back to historical norms then they will have that amount show up in supply to keep things balanced.

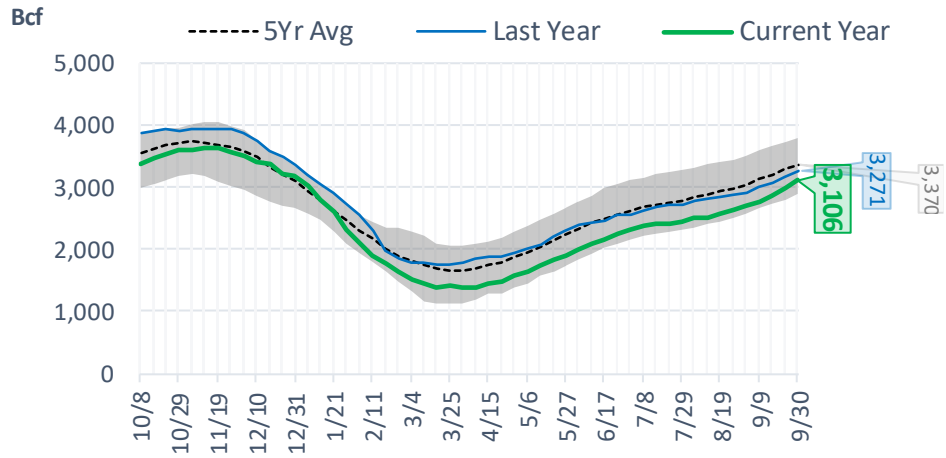


EIA Storage Report

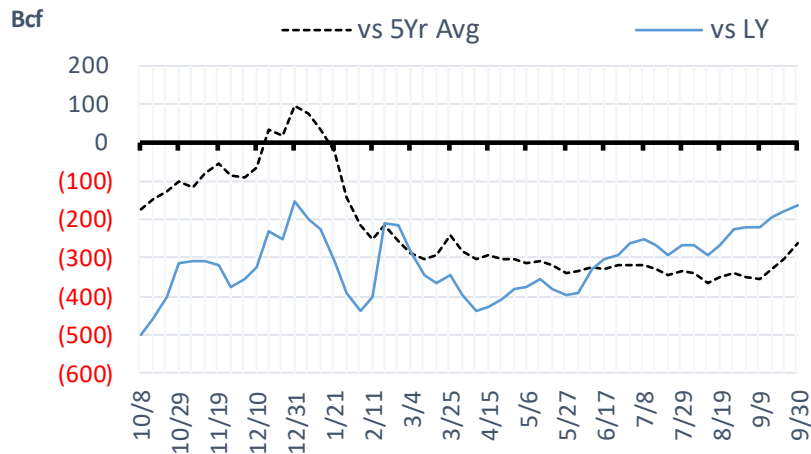
Total Lower 48 YoY Weekly Change



Total Lower 48 Storage Levels



Total Lower 48 LY Surplus/Deficit

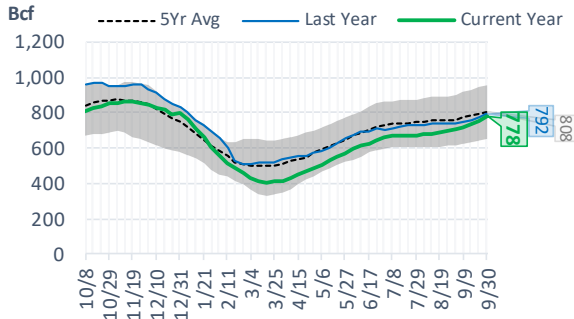


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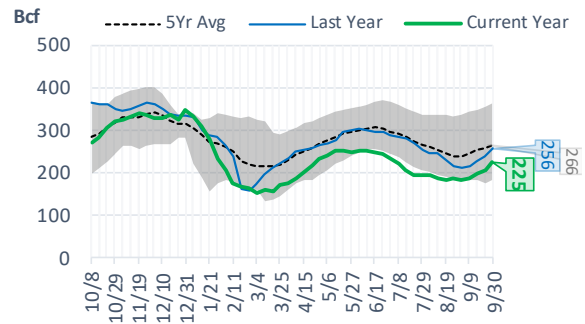
Natural Gas Storage Stats - Last 5 Weeks

Week Ending	Current 30-Sep	Week - 1 23-Sep	Week - 2 16-Sep	Week - 3 9-Sep	Week - 4 2-Sep	Week - 5 26-Aug
Total Lower 48 Storage Level	3106	2977	2874	2771	2694	2640
Weekly Change	+129	+103	+103	+77	+54	+61
vs LY	-165	-180	-197	-223	-222	-228
vs 5Yr Avg	-264	-306	-332	-354	-349	-338
S. Central Salt Storage Level	225	204	199	187	182	185
Weekly Change	+21	+5	+12	+5	-3	+1
vs LY	-31	-33	-27	-29	-27	-31
vs 5Yr Avg	-41	-53	-54	-59	-56	-54
S. Central NonSalt Storage Level	778	754	736	717	705	696
Weekly Change	+24	+18	+19	+12	+9	+9
vs LY	-14	-18	-24	-29	-30	-39
vs 5Yr Avg	-30	-41	-50	-57	-57	-60
Midwest Storage Level	916	879	844	809	776	747
Weekly Change	+37	+35	+35	+33	+29	+33
vs LY	-50	-51	-56	-62	-62	-62
vs 5Yr Avg	-54	-58	-63	-67	-67	-64
East Storage Level	756	721	690	661	635	614
Weekly Change	+35	+31	+29	+26	+21	+16
vs LY	-50	-54	-58	-67	-64	-62
vs 5Yr Avg	-77	-86	-94	-98	-100	-97
Mountain Storage Level	184	176	168	163	159	157
Weekly Change	+8	+8	+5	+4	+2	+4
vs LY	-21	-24	-28	-30	-32	-33
vs 5Yr Avg	-24	-27	-31	-32	-32	-31
Pacific Storage Level	247	243	237	235	238	241
Weekly Change	+4	+6	+2	-3	-3	-2
vs LY	0	0	-3	-5	-5	-2
vs 5Yr Avg	-39	-40	-41	-40	-36	-32

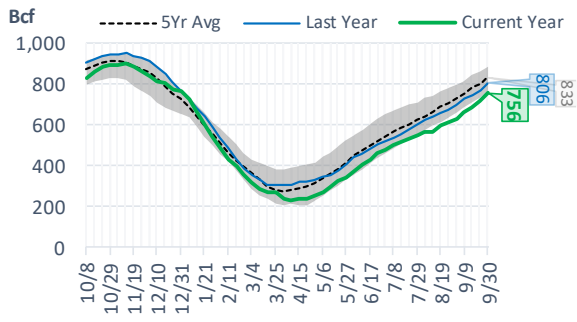
NonSalt Storage Levels



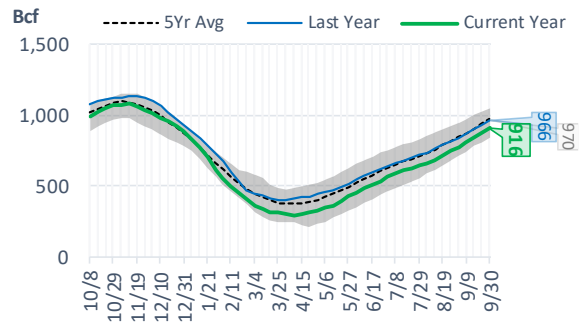
Salt Storage Levels



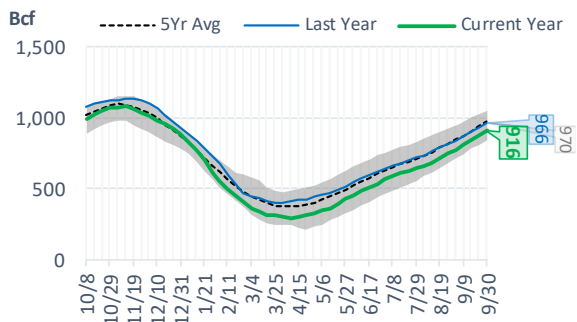
East Storage Levels



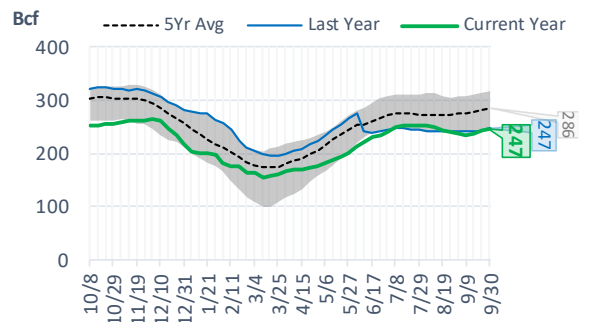
Midwest Storage Levels



Midwest Storage Levels



Pacific Storage Levels



EIA Storage Week Balances

	LY 8-Oct	9-Sep	16-Sep	23-Sep	LW 30-Sep	Current 7-Oct	WoW	vs. LY
Lower 48 Dry Production	95.3	100.9	101.0	100.8	101.6	102.3	▲ 0.7	▲ 7.1
Canadian Imports	5.3	5.9	5.6	6.1	6.2	6.0	▼ -0.2	▲ 0.7
L48 Power	32.9	41.1	37.9	37.0	31.5	30.5	▼ -1.0	-2.4
L48 Residential & Commercial	8.2	7.6	8.0	8.2	11.9	13.2	▲ 1.3	5.0
L48 Industrial	23.6	21.4	20.9	21.3	20.2	21.2	▲ 1.0	-2.4
L48 Lease and Plant Fuel	5.3	5.6	5.6	5.6	5.6	5.7	▲ 0.1	0.4
L48 Pipeline Distribution	2.5	3.0	2.8	2.8	2.7	2.7	▲ 0.0	0.2
L48 Regional Gas Consumption	72.6	78.7	75.1	74.9	71.9	73.3	▲ 1.4	▲ 0.7
Net LNG Exports	9.9	11.3	11.3	11.5	11.8	11.0	▼ -0.8	▲ 1.1
Total Mexican Exports	6.5	6.6	6.7	6.6	6.9	6.6	▼ -0.3	▲ 0.1
Implied Daily Storage Activity	11.5	10.2	13.4	14.0	17.2	17.4	0.3	5.9
EIA Reported Daily Storage Activity	11.6	11.0	14.7	14.7	18.4			
Daily Model Error	0.0	-0.8	-1.3	-0.8	-1.3			

Monthly Balances

	2Yr Ago Oct-20	LY Oct-21	Jun-22	Jul-22	Aug-22	Sep-22	MTD Oct-22	MoM	vs. LY
Lower 48 Dry Production	88.5	95.5	97.3	97.7	99.1	101.1	102.4	▲ 1.3	▲ 6.9
Canadian Imports	4.3	5.4	5.7	5.9	5.4	5.9	5.9	▼ 0.0	▲ 0.5
L48 Power	30.6	30.4	38.3	44.3	43.1	36.8	30.7	▼ -6.1	▲ 0.3
L48 Residential & Commercial	15.5	12.6	8.9	8.3	8.0	9.0	13.3	▲ 4.3	▲ 0.7
L48 Industrial	22.7	21.7	19.1	19.8	21.1	21.0	21.4	▲ 0.4	▼ -0.3
L48 Lease and Plant Fuel	4.8	5.3	5.5	5.5	5.5	5.6	5.7	▲ 0.1	▲ 0.4
L48 Pipeline Distribution	2.5	2.7	2.9	3.1	3.0	2.8	2.7	▼ -0.1	▲ 0.1
L48 Regional Gas Consumption	76.1	72.7	74.6	81.0	80.8	75.2	73.8	▼ -1.4	▲ 1.1
Net LNG Exports	8.0	10.6	11.2	10.9	11.0	11.5	10.8	▼ -0.7	▲ 0.2
Total Mexican Exports	6.0	6.6	7.1	7.0	6.9	6.7	6.6	▼ -0.1	▼ 0.0
Implied Daily Storage Activity	2.7	11.0	10.0	4.7	5.8	13.6	17.0		
EIA Reported Daily Storage Activity									
Daily Model Error					0.0				

Source: Bloomberg, analytix.ai

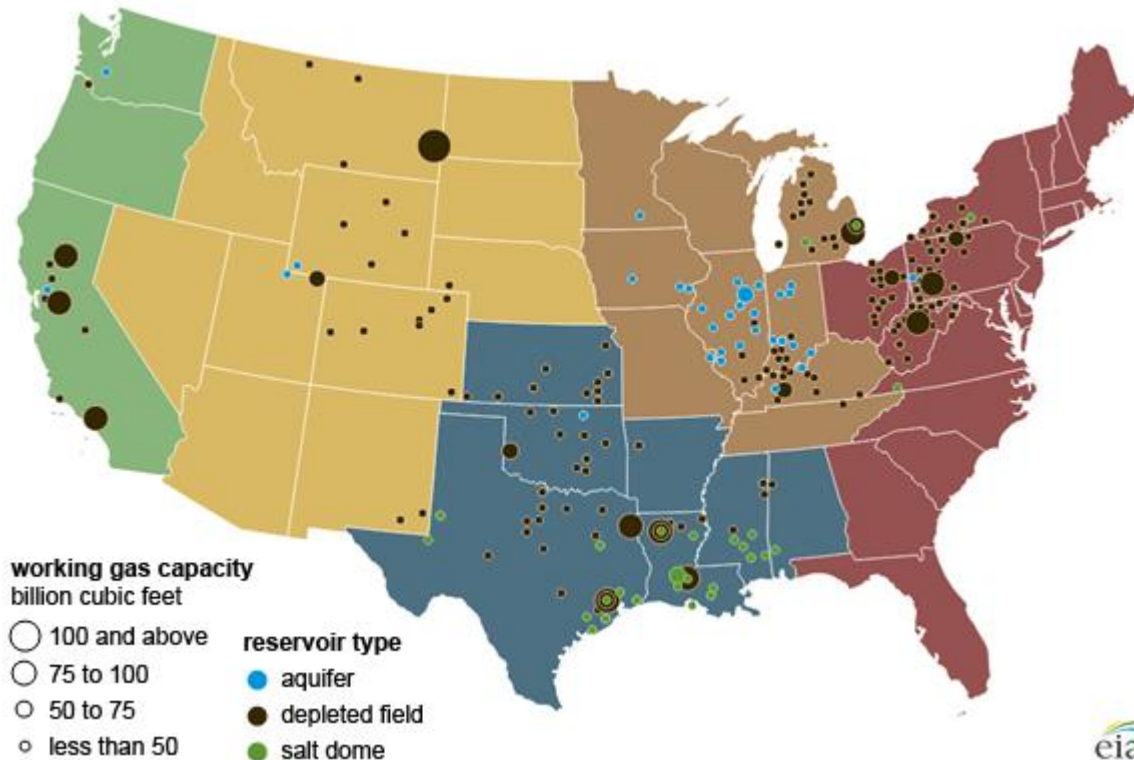
Regional S/D Models Storage Projection

Week Ending 7-Oct

	Daily Raw Storage	Daily Adjustment Factor	Daily Average Storage Activity (Adjusted) *	Weekly Adjusted Storage Activity
L48	18.6	0.0	18.6	130
East	0.7	2.4	3.1	22
Midwest	4.8	0.5	5.3	37
Mountain	5.4	-4.3	1.1	8
South Central	6.9	1.7	8.6	60
Pacific	0.9	-0.3	0.5	4

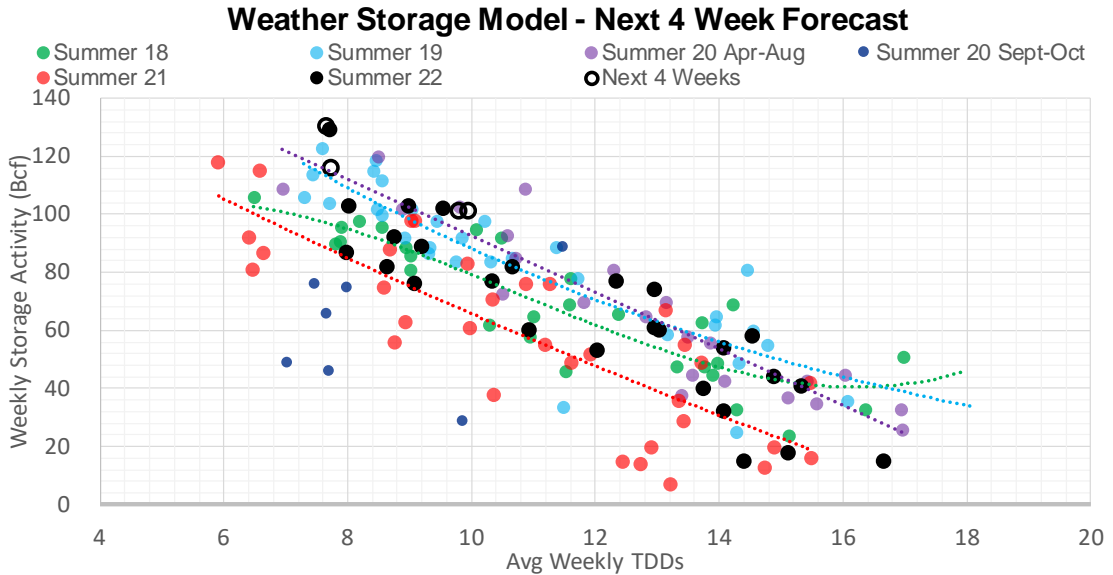
*Adjustment Factor is calculated based on historical regional deltas

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



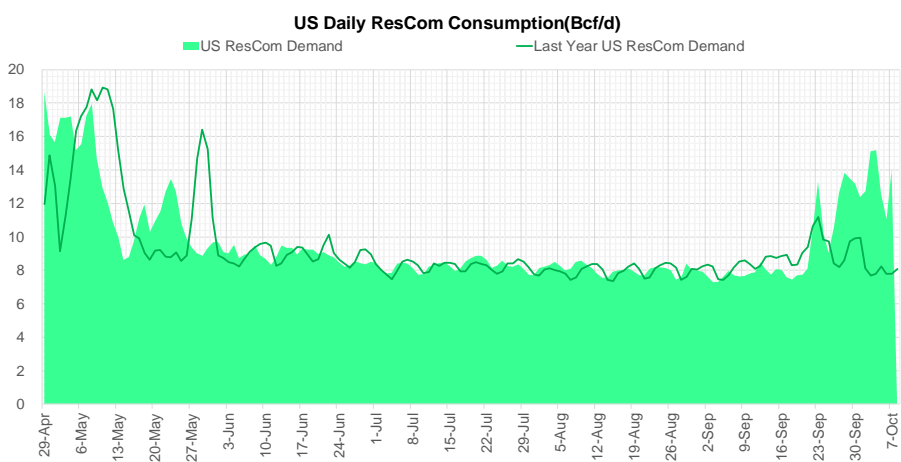
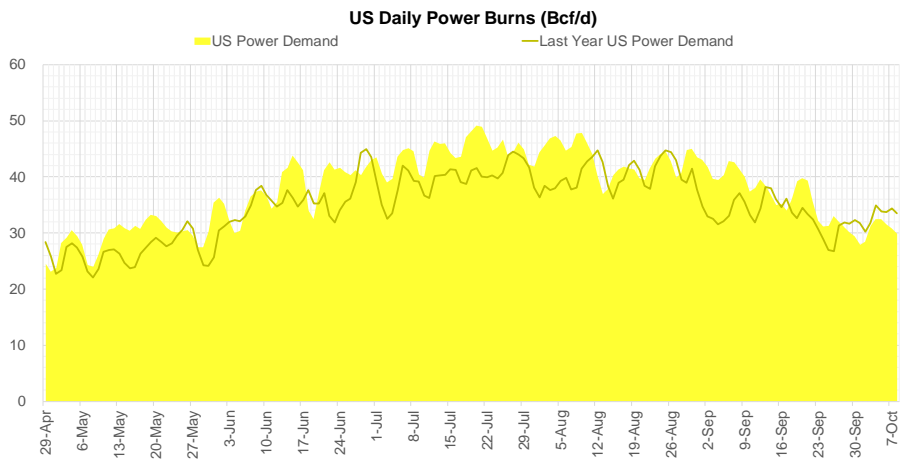
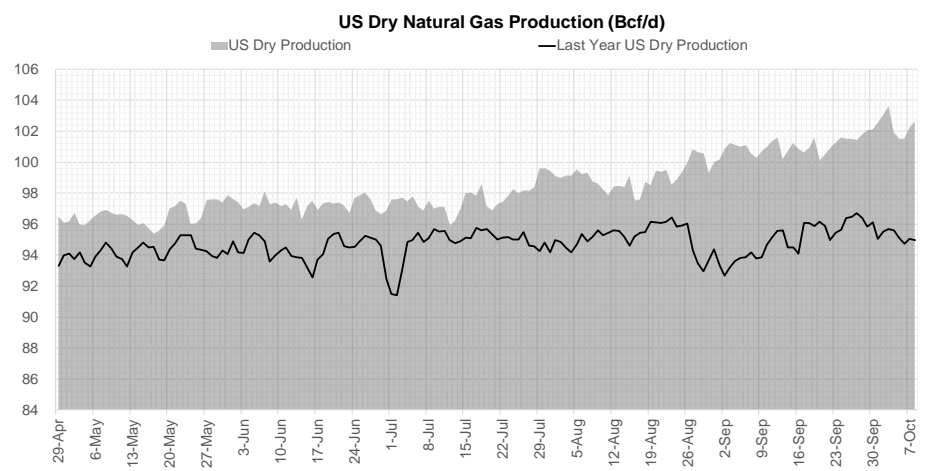
Weather Model Storage Projection

Next report and beyond		
Week Ending	GWDDs	Week Storage Projection
07-Oct	7.7	130
14-Oct	7.8	116
21-Oct	9.8	101
28-Oct	10.0	101



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

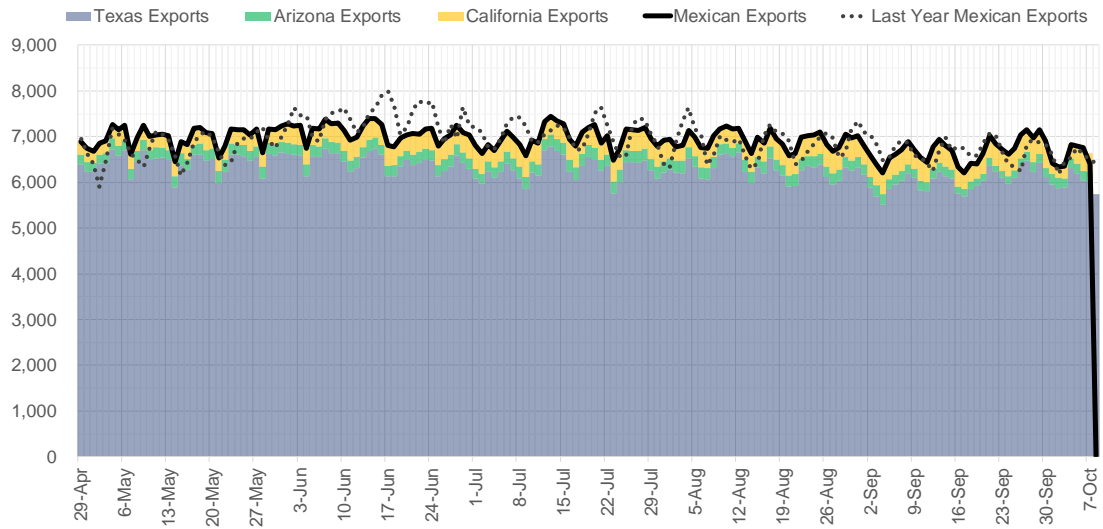
Supply – Demand Trends



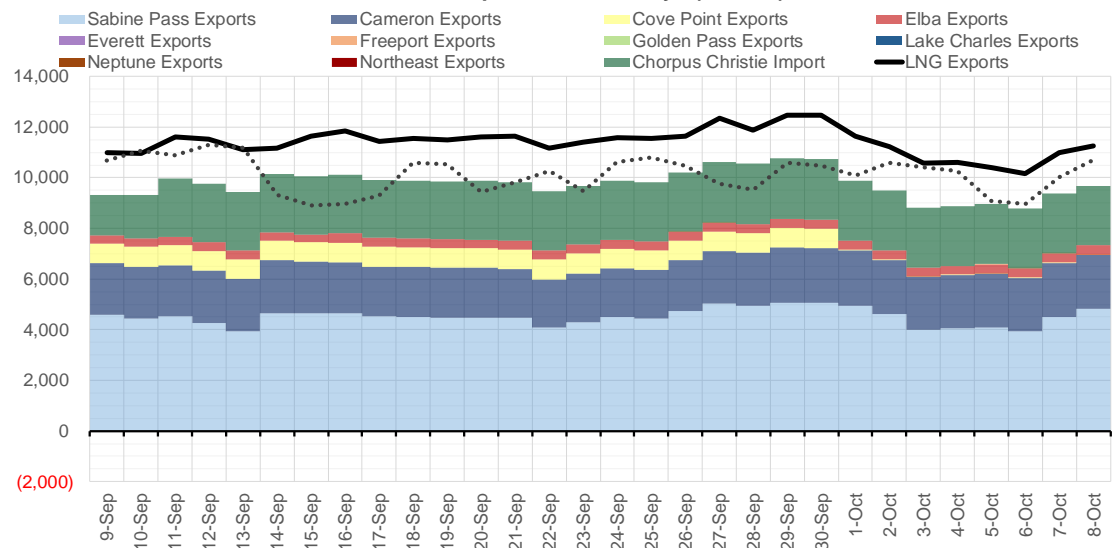
Source: Bloomberg

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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 and ICE data combined

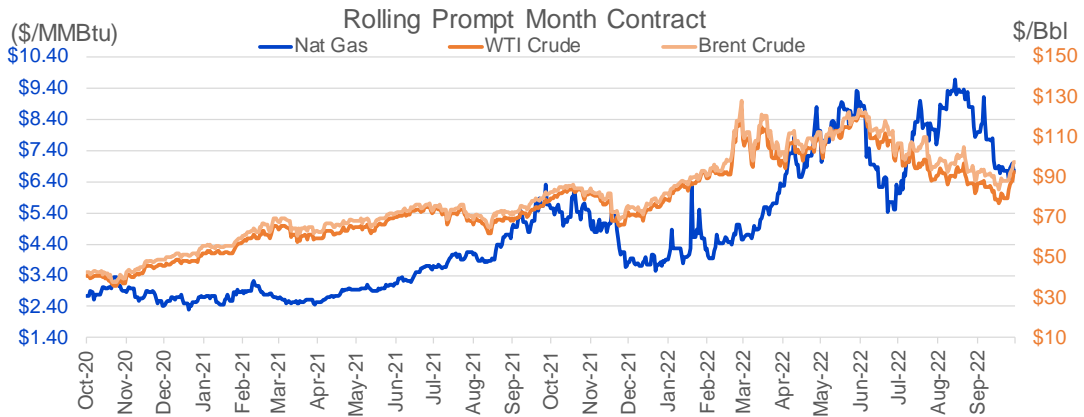
CONTRACT MONTH	CONTRACT YEAR	PUT/CALL	STRIKE	CUMULATIVE VOL	CONTRACT MONTH	CONTRACT YEAR	PUT/CALL	STRIKE	CUMULATIVE OI
11	2022	C	10.00	8877	3	2023	C	10.00	26403
11	2022	P	5.50	6240	12	2022	P	4.00	25914
11	2022	P	5.25	5888	11	2022	P	6.00	25825
10	2023	P	3.00	3695	11	2022	P	4.00	24546
11	2022	C	8.00	3666	12	2022	P	6.00	24191
10	2023	C	6.00	3350	12	2022	P	5.00	23923
10	2023	C	6.50	3350	11	2022	C	10.00	23726
10	2023	P	2.00	3250	5	2023	P	2.00	22397
11	2022	C	7.25	2780	4	2023	P	3.00	20919
11	2022	C	9.00	2738	11	2022	P	5.00	20539
11	2022	P	5.00	2266	3	2023	P	4.00	19605
11	2022	P	6.00	2167	3	2023	C	20.00	19302
11	2022	P	6.25	2012	1	2023	C	10.00	19198
11	2022	C	11.00	1978	10	2023	P	3.00	18919
12	2022	C	8.00	1625	10	2023	P	2.50	18850
12	2022	C	15.00	1557	12	2022	C	5.00	18227
11	2022	P	6.50	1556	4	2023	P	3.50	18116
1	2023	C	15.00	1502	6	2023	P	3.00	17455
12	2022	C	7.50	1372	11	2022	C	8.00	17389
12	2022	C	12.00	1106	10	2023	P	4.00	17291
12	2022	C	10.00	1078	5	2023	P	3.00	17133
11	2022	C	7.50	914	2	2023	C	10.00	17102
3	2023	P	4.00	884	11	2022	C	12.00	17051
11	2022	C	7.00	852	3	2023	P	3.00	17006
11	2022	C	11.50	802	1	2023	P	4.00	16830
11	2022	C	12.00	786	5	2023	P	3.50	16715
4	2023	P	4.00	725	12	2022	C	10.00	16713
5	2023	P	4.00	725	12	2022	P	5.50	16250
6	2023	P	4.00	725	10	2023	P	2.00	16204
7	2023	P	4.00	725	12	2022	C	4.00	16195
8	2023	P	4.00	725	2	2023	C	9.00	15967
9	2023	P	4.00	725	3	2023	P	2.75	15950
10	2023	P	4.00	725	4	2023	P	4.00	15943
11	2022	C	7.85	701	8	2023	P	3.50	15897
1	2023	P	4.00	612	6	2023	P	3.50	15890
1	2023	C	20.00	605	10	2023	P	3.50	15884
1	2023	P	5.00	599	7	2023	P	3.50	15865
11	2022	C	8.50	594	9	2023	P	3.50	15855
4	2023	P	2.75	550	11	2022	C	4.00	15755
5	2023	P	2.75	550	9	2023	P	4.00	15591
6	2023	P	2.75	550	7	2023	P	3.00	15415
7	2023	P	2.75	550	1	2023	P	5.00	15400
8	2023	P	2.75	550	8	2023	P	3.00	15215
9	2023	P	2.75	550	9	2023	P	3.00	15215
10	2023	P	2.75	550	4	2023	P	2.00	15158
5	2023	P	4.25	525	11	2022	P	5.50	15136
11	2022	P	7.00	523	12	2022	P	7.00	15019
12	2022	P	5.50	513	7	2023	P	4.00	14984
12	2022	P	6.00	513	5	2023	P	4.00	14543
					8	2023	P	4	14406

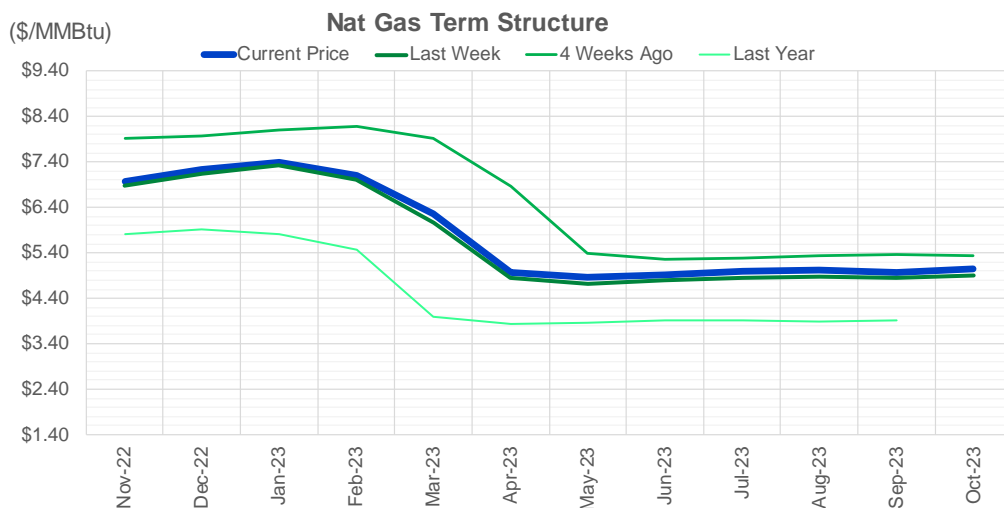
Source: CME, ICE

Nat Gas Futures Open Interest CME and ICE data 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
NOV 22	151654	158037	-6383	NOV 22	69442	70079	-636
DEC 22	70568	72777	-2209	DEC 22	74817	73946	871
JAN 23	96363	94309	2054	JAN 23	70893	70020	873
FEB 23	46094	46448	-354	FEB 23	65823	65687	136
MAR 23	76800	75969	831	MAR 23	56106	57102	-996
APR 23	77330	76553	777	APR 23	54764	55102	-338
MAY 23	82697	82504	193	MAY 23	55329	55318	11
JUN 23	24352	24483	-131	JUN 23	45957	45900	58
JUL 23	26157	25806	351	JUL 23	46255	46150	105
AUG 23	20748	20658	90	AUG 23	44877	44786	91
SEP 23	24477	23560	917	SEP 23	41744	41801	-57
OCT 23	56847	56599	248	OCT 23	54881	54884	-3
NOV 23	20449	20002	447	NOV 23	47703	47637	67
DEC 23	16930	16245	685	DEC 23	40909	40479	430
JAN 24	29562	28643	919	JAN 24	43813	43819	-6
FEB 24	9643	9589	54	FEB 24	30928	30865	63
MAR 24	19564	19383	181	MAR 24	36291	36249	42
APR 24	17272	16736	536	APR 24	30002	29807	195
MAY 24	8407	8417	-10	MAY 24	28430	28398	32
JUN 24	2949	2854	95	JUN 24	25796	25733	62
JUL 24	4004	3895	109	JUL 24	25342	25281	61
AUG 24	3799	3744	55	AUG 24	25079	25018	61
SEP 24	2372	2299	73	SEP 24	24771	24734	38
OCT 24	8842	8825	17	OCT 24	28857	28790	67
NOV 24	4978	4970	8	NOV 24	26083	26030	53
DEC 24	8217	8225	-8	DEC 24	29849	29826	23
JAN 25	17488	17482	6	JAN 25	23834	23807	27
FEB 25	1638	1636	2	FEB 25	15884	15876	8
MAR 25	5157	5277	-120	MAR 25	18059	18054	5
APR 25	5282	5162	120	APR 25	16349	16367	-18

Source: CME, ICE






	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23
Current Price	\$6.972	\$7.242	\$7.383	\$7.103	\$6.261	\$4.977	\$4.854	\$4.929	\$5.002	\$5.010	\$4.972	\$5.046
Last Week	\$6.874	\$7.142	\$7.320	\$7.009	\$6.066	\$4.842	\$4.729	\$4.792	\$4.856	\$4.868	\$4.841	\$4.911
vs. Last Week	\$0.098	\$0.100	\$0.063	\$0.094	\$0.195	\$0.135	\$0.125	\$0.137	\$0.146	\$0.142	\$0.131	\$0.135
4 Weeks Ago	\$7.915	\$7.971	\$8.102	\$8.196	\$7.910	\$6.873	\$5.399	\$5.247	\$5.297	\$5.351	\$5.366	\$5.350
vs. 4 Weeks Ago	-\$0.943	-\$0.729	-\$0.719	-\$1.093	-\$1.649	-\$1.896	-\$0.545	-\$0.318	-\$0.295	-\$0.341	-\$0.394	-\$0.304
Last Year	\$5.677	\$5.817	\$5.910	\$5.806	\$5.457	\$3.986	\$3.832	\$3.869	\$3.911	\$3.915	\$3.894	\$3.925
vs. Last Year	\$1.295	\$1.425	\$1.473	\$1.297	\$0.804	\$0.991	\$1.022	\$1.060	\$1.091	\$1.095	\$1.078	\$1.121

	Units	Current Price	vs. Last Week	vs. 4 Weeks Ago	vs. Last Year
NatGas Jul21/Oct21	\$/MMBtu	2.224	▲ 0.000	▲ 0.000	▲ 0.000
NatGas Oct21/Nov21	\$/MMBtu	0.361	▲ 0.000	▲ 0.000	▲ 0.637
NatGas Oct21/Jan22	\$/MMBtu	-1.817	▲ 0.000	▲ 0.000	▼ -1.782
NatGas Apr22/Oct22	\$/MMBtu	1.532	▲ 0.000	▼ -1.128	▲ 1.580
WTI Crude	\$/Bbl	92.64	▲ 13.150	▲ 5.850	▲ 13.290
Brent Crude	\$/Bbl	97.92	▲ 9.960	▲ 5.080	▲ 15.530
Fuel Oil, NY Harbour 1%	\$/Bbl	97.18	▲ 0.000	▲ 0.000	▲ 0.000
Heating Oil	cents/Gallon	401.87	▲ 64.970	▲ 44.000	▲ 154.500
Propane, Mt. Bel	cents/Gallon	0.91	▼ -0.087	▼ -0.143	▼ -0.557
Ethane, Mt. Bel	cents/Gallon	0.42	▼ -0.048	▼ -0.097	▼ -0.022
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 
9/30/2022						
U.S. Breakout Information	This Week	+/-	Last Week	+/-	Year Ago	
Oil	604	2	602	176	428	
Gas	159	-1	160	60	99	
Miscellaneous	2	0	2	1	1	
Directional	46	0	46	24	22	
Horizontal	696	3	693	222	474	
Vertical	23	-2	25	-9	32	
Canada Breakout	This Week	+/-	Last Week	+/-	Year Ago	
Oil	144	-4	148	47	97	
Gas	69	2	67	1	68	
Major Basin Variances	This Week	+/-	Last Week	+/-	Year Ago	
Ardmore Woodford	4	1	3	2	2	
Arkoma Woodford	5	-3	8	3	2	
Barnett	3	0	3	3	0	
Cana Woodford	26	1	25	6	20	
DJ-Niobrara	17	0	17	5	12	
Eagle Ford	72	0	72	35	37	
Granite Wash	6	0	6	3	3	
Haynesville	71	0	71	24	47	
Marcellus	39	3	36	13	26	
Mississippian	1	-1	2	0	1	
Permian	344	0	344	81	263	
Utica	10	-1	11	-2	12	
Williston	39	0	39	16	23	