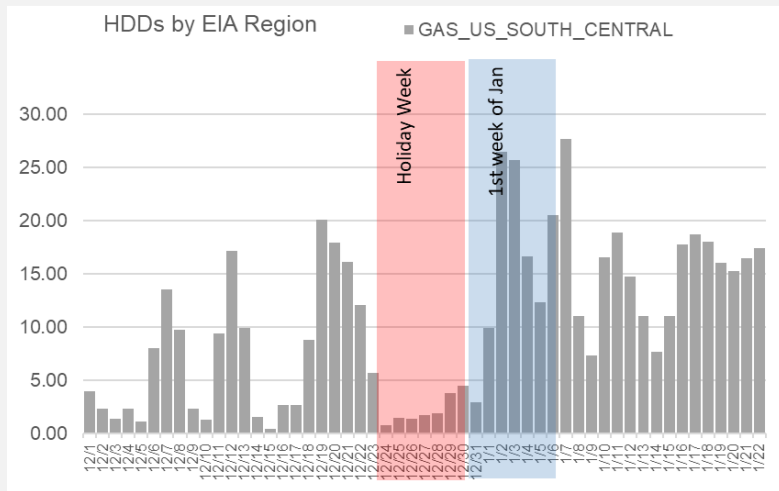
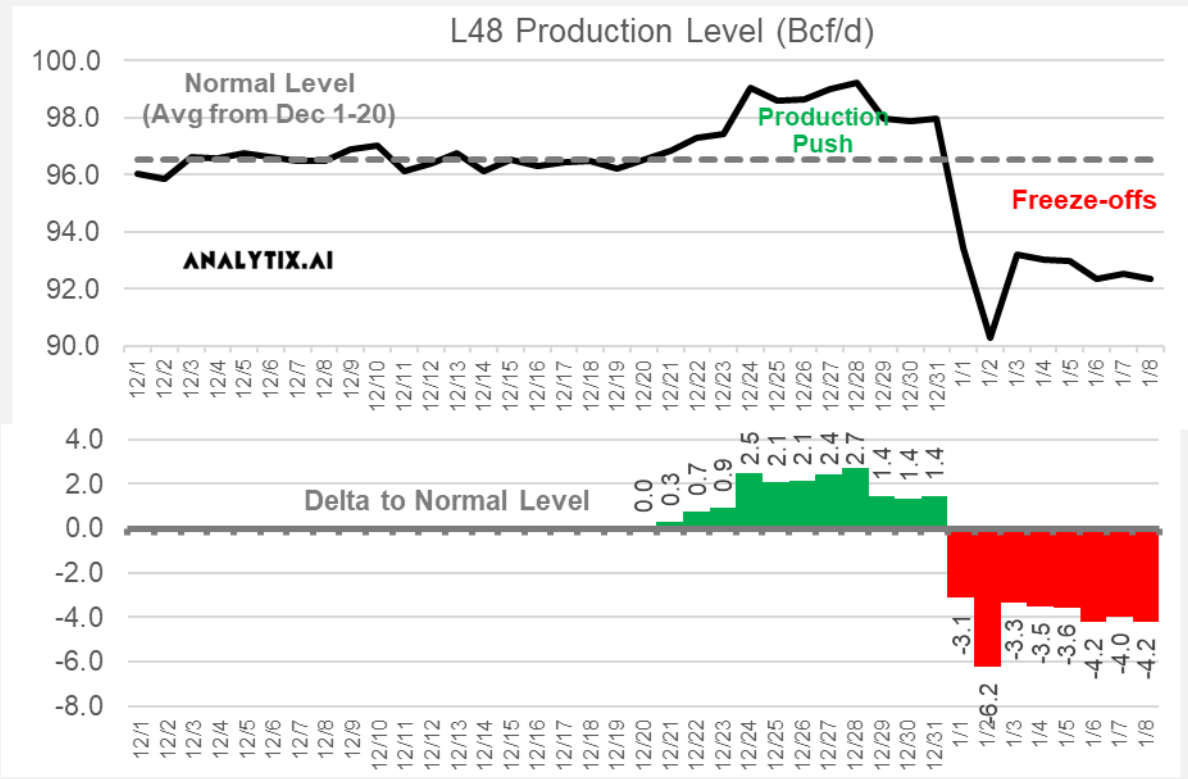


This week we touch on the volatility in production we have observed over the past couple of weeks. To end the year we saw production surge across the nation as producers gave one last push to solidify their productions targets and financial positions. Bloomberg daily production estimates showed daily output rising from ~96.5 Bcf/d to a peak of 99.2 Bcf/d on Dec 28th. The production rally did not last too long with producers stepping off the pedal and winter weather hitting on Jan 1st.



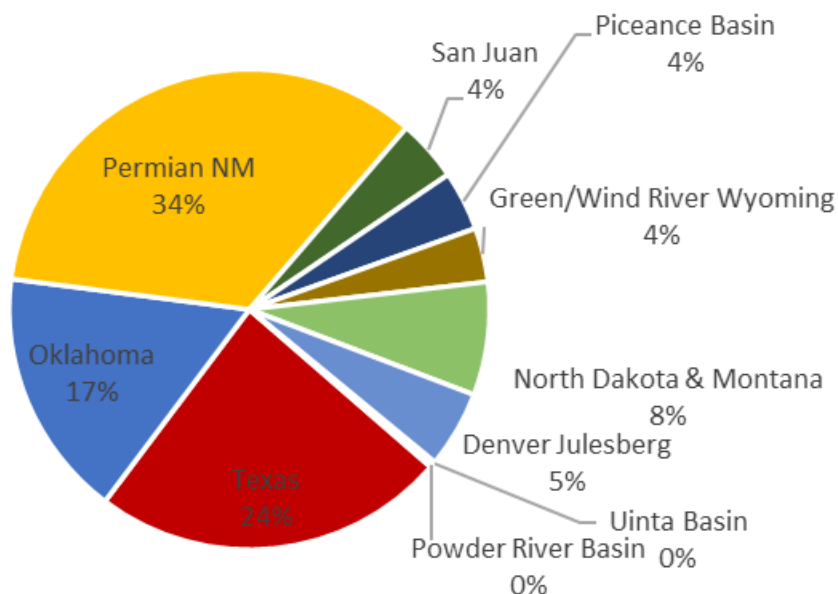
With the sudden turn in weather over the prime shale play, we observed a wild reversal in daily output due to freeze-offs spanning from the Bakken down to the Permian.



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Here is the breakdown of where the freeze-offs occurred on Jan 2nd (the peak freeze-off day) according to Genscape data.

Jan 2nd Freeze-off Play Breakdown (Genscape)

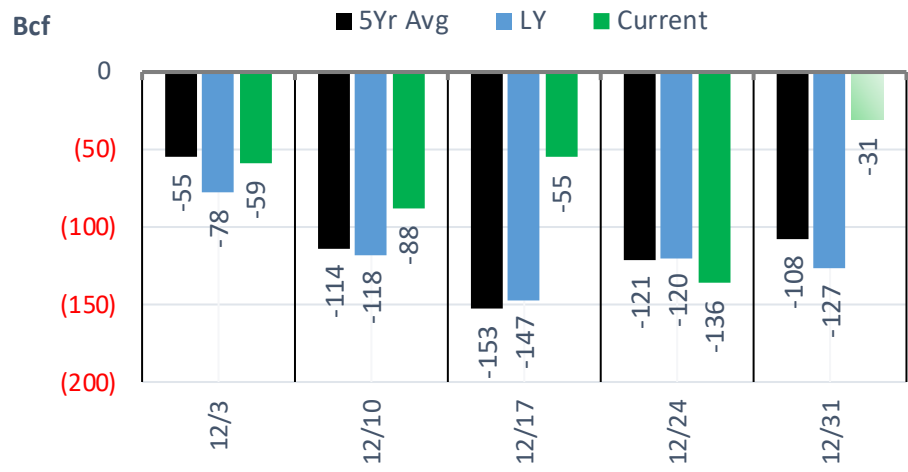


Production freeze-offs occur when temps drop below 32°F (0°C) in producing fields, causing water and other liquids in above-ground gathering lines at the wellhead to freeze and block the flow of natural gas. Northern areas are well prepared for cold weather and have installed glycol units, which help prevent freeze-offs, on most of their vulnerable equipment and lines. That being said, producing fields in these colder climates such as Western Canada's Montney and Duvernay basins still experience freeze-offs.

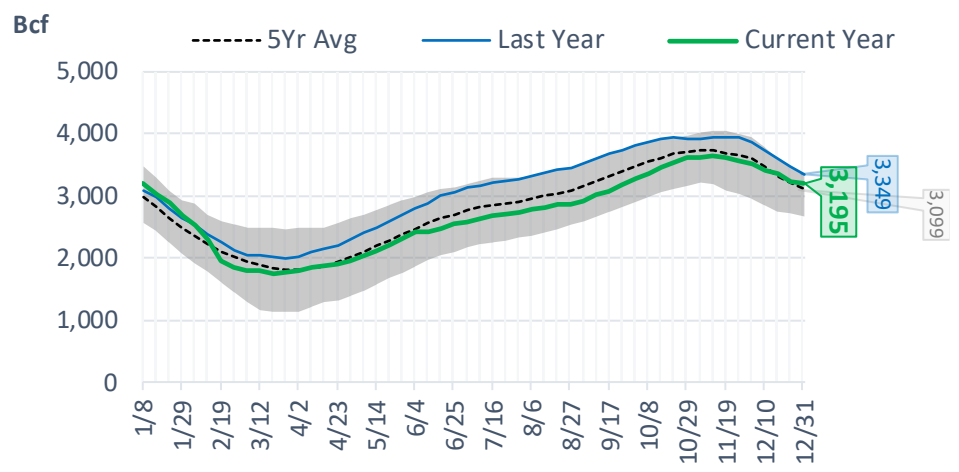
The US States with warmer temperatures on average are more susceptible to freeze-offs when temps dip below freezing because producers in these areas have less of an incentive to prepare for cold events. Also notable is that shale plays with wet gas production have a higher likelihood of freeze-offs than dry-gas production as the condensates in the gas stream freeze.

EIA Storage Report

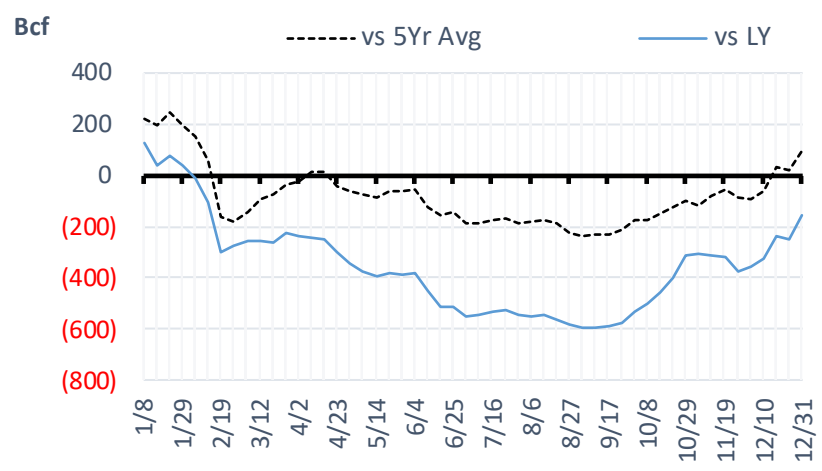
Total Lower 48 YoY Weekly Change



Total Lower 48 Storage Levels



Total Lower 48 LY Surplus/Deficit

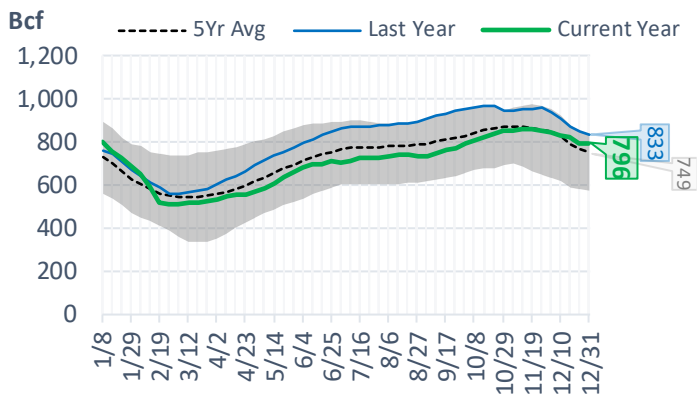


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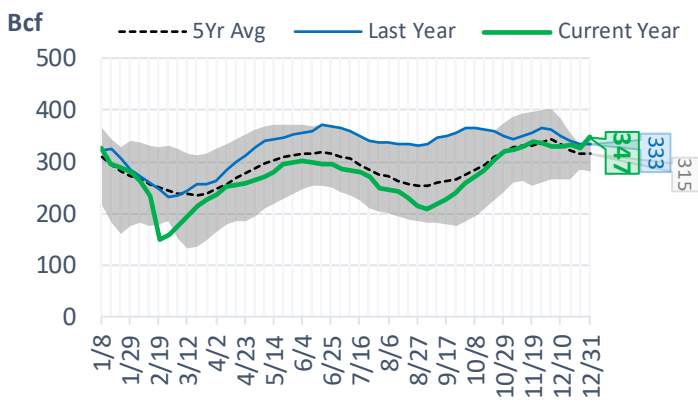
Natural Gas Storage Stats - Last 5 Weeks

Week Ending	Current 31-Dec	Week - 1 24-Dec	Week - 2 17-Dec	Week - 3 10-Dec	Week - 4 3-Dec	Week - 5 26-Nov
Total Lower 48 Storage Level	3195	3226	3362	3417	3505	3564
Weekly Change	-31	-136	-55	-88	-59	-59
vs LY	-154	-250	-234	-326	-356	-375
vs 5Yr Avg	+96	+19	+34	-64	-90	-86
S. Central Salt Storage Level	347	326	334	328	328	335
Weekly Change	+21	-8	+6	0	-7	-3
vs LY	+14	-8	-5	-22	-34	-31
vs 5Yr Avg	+32	+11	+13	-7	-14	-3
S. Central NonSalt Storage Level	796	790	820	829	842	851
Weekly Change	+6	-30	-9	-13	-9	-8
vs LY	-37	-62	-55	-83	-95	-107
vs 5Yr Avg	+47	+21	+27	+3	-8	-9
Midwest Storage Level	893	918	963	982	1019	1043
Weekly Change	-25	-45	-19	-37	-24	-23
vs LY	-37	-61	-58	-82	-80	-81
vs 5Yr Avg	+20	+5	+10	-18	-17	-15
East Storage Level	767	777	809	818	843	867
Weekly Change	-10	-32	-9	-25	-24	-22
vs LY	-4	-38	-40	-68	-75	-67
vs 5Yr Avg	+39	+19	+18	-12	-16	-8
Mountain Storage Level	172	180	188	199	206	206
Weekly Change	-8	-8	-11	-7	0	-4
vs LY	-25	-25	-26	-25	-27	-34
vs 5Yr Avg	-6	-7	-7	-6	-7	-12
Pacific Storage Level	219	235	247	261	266	263
Weekly Change	-16	-12	-14	-5	+3	+1
vs LY	-64	-55	-50	-46	-47	-55
vs 5Yr Avg	-37	-30	-29	-24	-28	-37

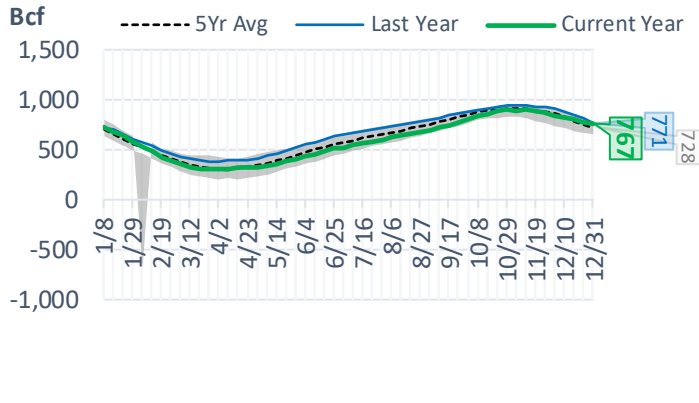
NonSalt Storage Levels



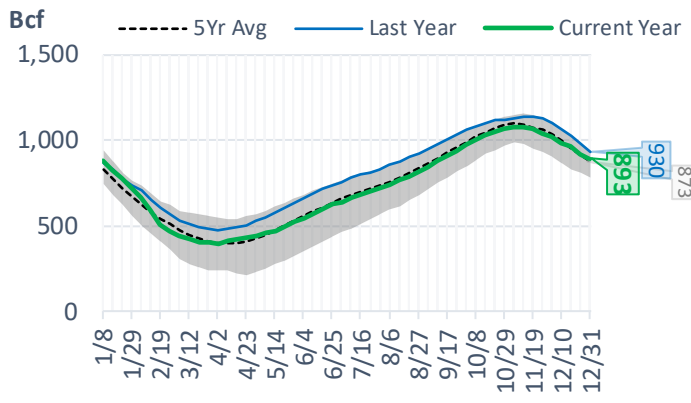
Salt Storage Levels



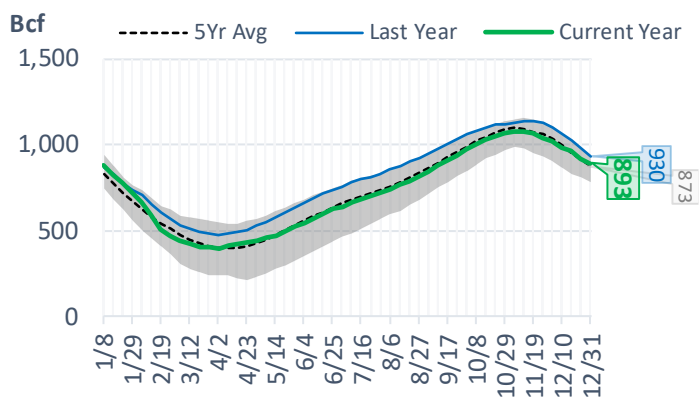
East Storage Levels



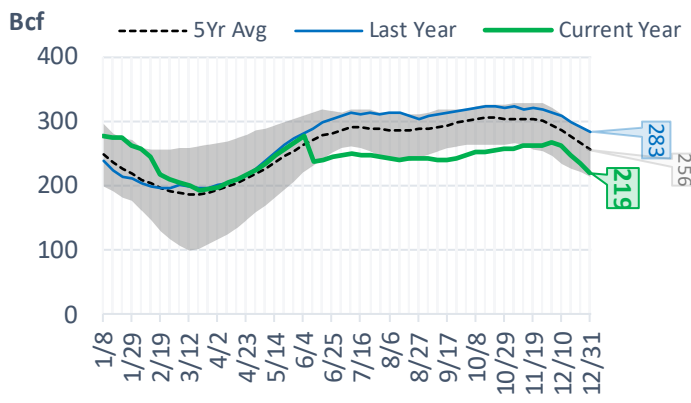
Midwest Storage Levels



Midwest Storage Levels



Pacific Storage Levels



EIA Storage Week Balances

	3-Dec	10-Dec	17-Dec	24-Dec	31-Dec	7-Jan	WoW	vs. 4W
Lower 48 Dry Production	96.8	96.6	96.5	96.8	98.6	93.3	▼-5.3	▼-3.8
Canadian Imports	5.6	5.3	4.6	5.0	4.2	5.7	▲1.5	▲0.9
L48 Power	28.7	29.1	28.4	29.9	26.4	29.8	▲3.4	▲1.3
L48 Residential & Commercial	33.1	35.4	31.4	40.3	33.4	44.2	▲10.8	▲9.1
L48 Industrial	22.5	23.7	23.7	24.0	22.1	24.6	▲2.5	▲1.2
L48 Lease and Plant Fuel	5.3	5.2	5.2	5.2	5.3	5.1	▼-0.3	▼-0.2
L48 Pipeline Distribution	3.2	3.2	3.0	3.5	3.0	3.6	▲0.6	▲0.4
L48 Regional Gas Consumption	92.9	96.7	91.7	103.0	90.2	107.3	▲17.1	▲11.9
Net LNG Exports	11.8	12.0	11.9	12.7	12.3	11.9	▼-0.4	▼-0.3
Total Mexican Exports	6.4	6.4	6.2	6.1	5.8	5.9	▲0.1	▼-0.3
Implied Daily Storage Activity	-8.7	-13.2	-8.7	-20.0	-5.5	-26.1	-20.6	
EIA Reported Daily Storage Activity	-8.4	-12.6	-7.9	-19.4	-4.4			
Daily Model Error	-0.3	-0.6	-0.9	-0.5	-1.0			

Monthly Balances

	2Yr Ago Jan-20	LY Jan-21	Sep-21	Oct-21	Nov-21	Dec-21	MTD Jan-22	MoM	vs. LY
Lower 48 Dry Production	94.6	91.4	93.4	94.3	95.9	97.1	92.6	▼-4.5	▲1.1
Canadian Imports	4.8	6.3	5.1	5.4	5.3	4.8	6.0	▲1.2	▼-0.3
L48 Power	29.9	28.3	33.1	30.5	28.8	28.4	30.5	▲2.2	▲2.2
L48 Residential & Commercial	41.7	44.0	8.8	12.5	29.4	34.5	47.7	▲13.2	▲3.7
L48 Industrial	24.5	23.8	20.2	21.0	22.4	23.3	25.1	▲1.8	▲1.3
L48 Lease and Plant Fuel	5.1	5.0	5.1	5.2	5.2	5.3	5.1	▼-0.2	▲0.1
L48 Pipeline Distribution	3.6	3.5	2.3	2.4	3.1	3.1	3.8	▲0.7	▲0.3
L48 Regional Gas Consumption	104.8	104.6	69.4	71.5	88.9	94.5	112.2	▲17.7	▲7.6
Net LNG Exports	8.4	10.5	10.3	10.6	11.4	12.1	12.0	▼-0.2	▲1.5
Total Mexican Exports	5.1	6.2	6.7	6.6	6.1	6.1	6.0	▼-0.2	▼-0.2
Implied Daily Storage Activity	-18.9	-23.5	12.1	11.0	-5.2	-10.9	-31.5		
EIA Reported Daily Storage Activity									
Daily Model Error									

Source: Bloomberg, analytix.ai

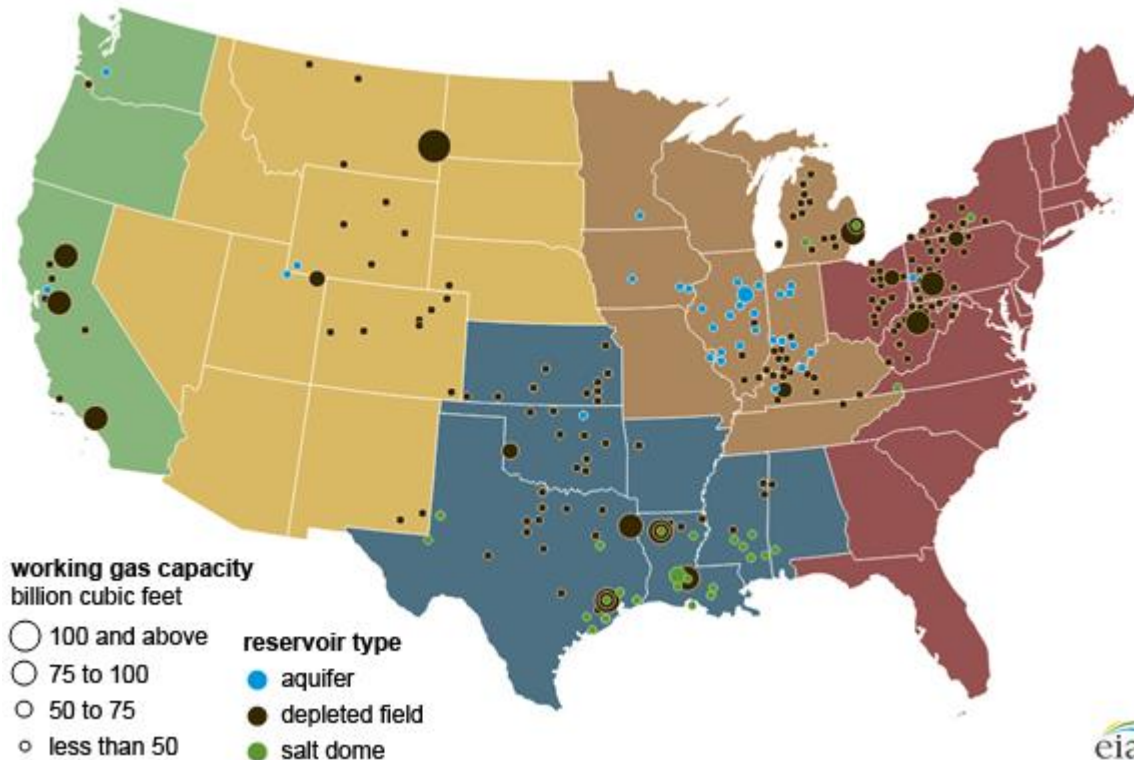
Regional S/D Models Storage Projection

Week Ending 7-Jan

	Daily Raw Storage	Daily Adjustment Factor	Daily Average Storage Activity (Adjusted) *	Weekly Adjusted Storage Activity
L48	-26.4	1.0	-25.3	-177
East	-7.3	2.6	-4.7	-33
Midwest	-7.2	0.8	-6.4	-45
Mountain	0.9	-3.3	-2.4	-17
South Central	-11.3	1.8	-9.5	-66
Pacific	-1.4	-0.9	-2.4	-16

*Adjustment Factor is calculated based on historical regional deltas

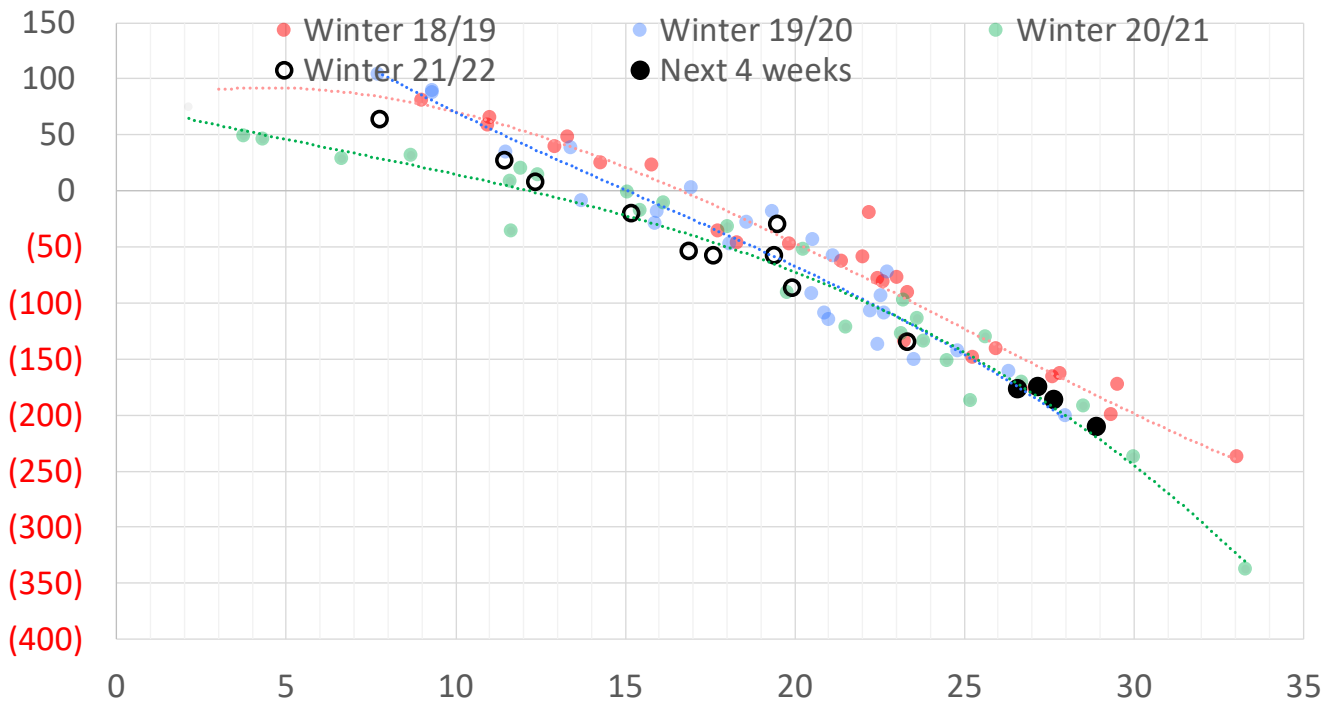
U.S. underground natural gas storage facilities by type (July 2015)



Weather Model Storage Projection

Next report and beyond		
Week Ending	GWDDs	Week Storage Projection
07-Jan	27	-177
14-Jan	29	-210
21-Jan	28	-186
28-Jan	27	-174

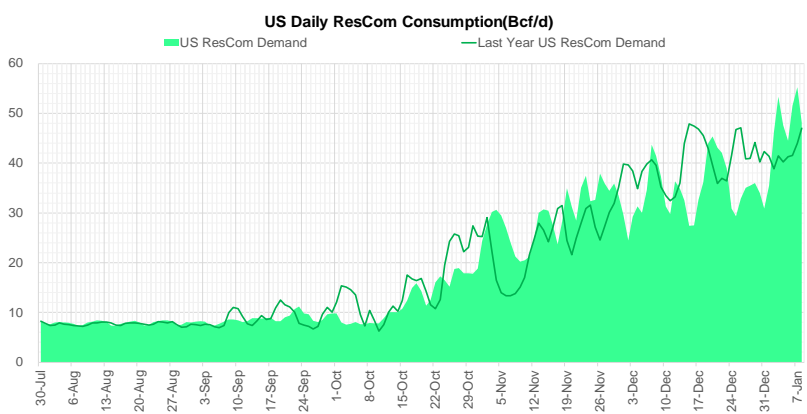
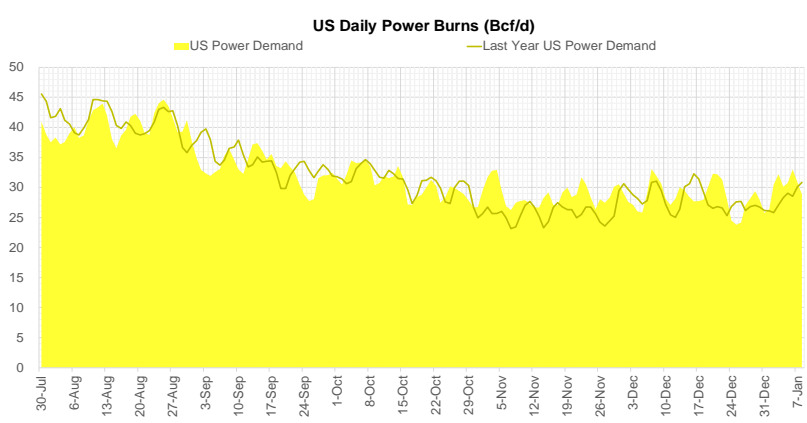
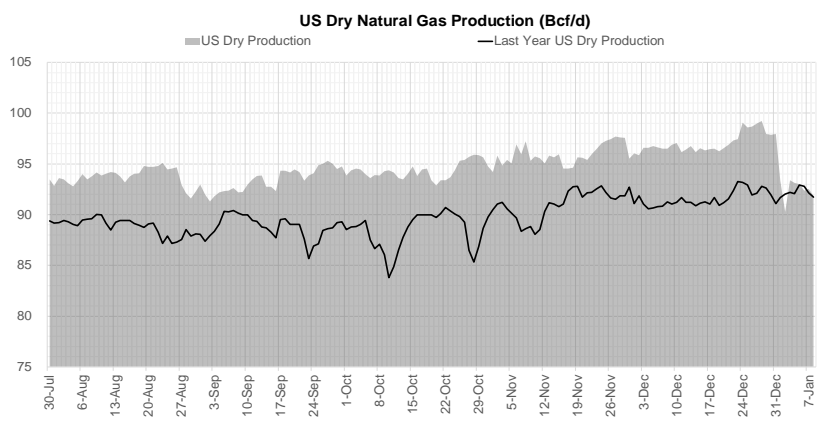
Weather Storage Model - Next 4 Week Forecast



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

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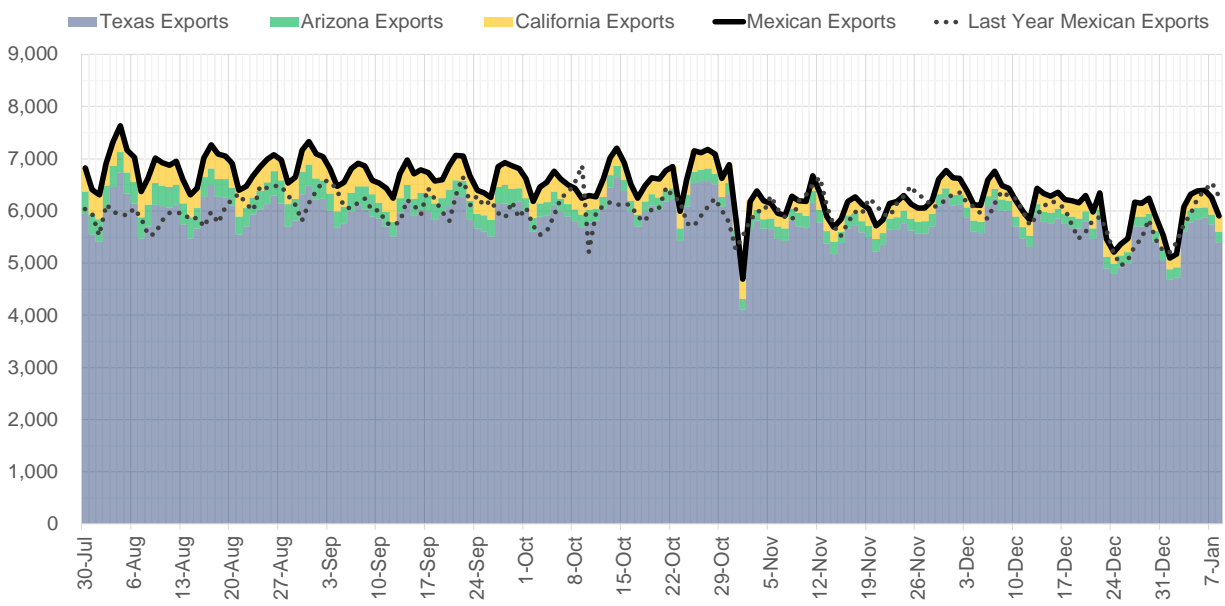
Supply – Demand Trends



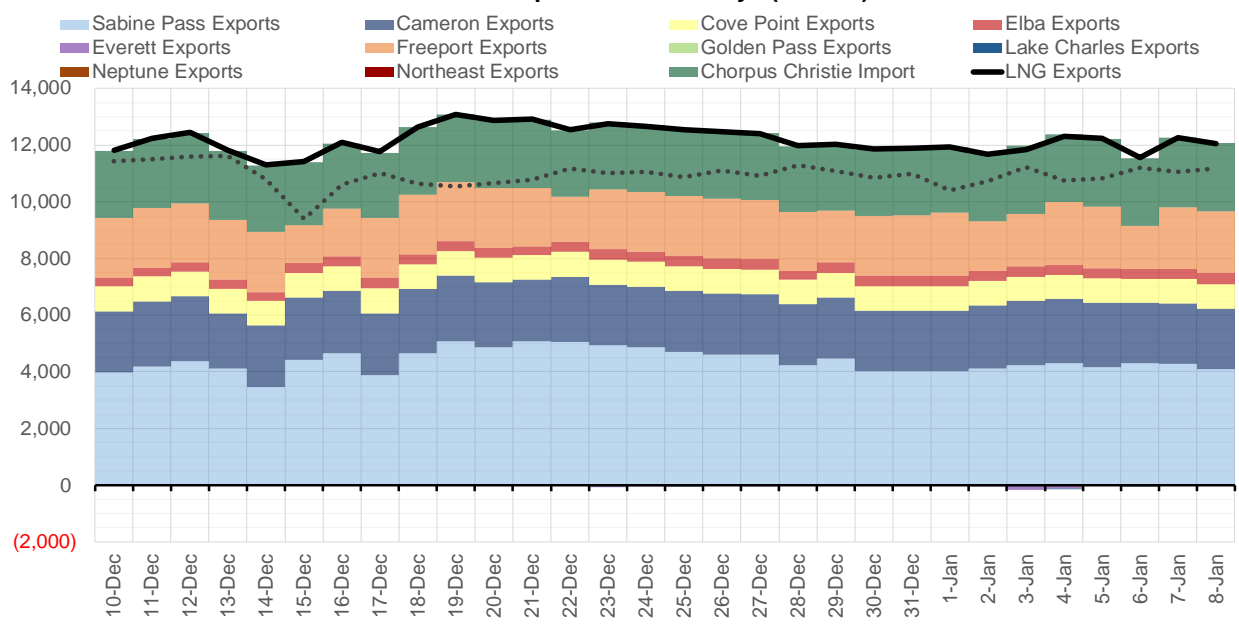
Source: Bloomberg

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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

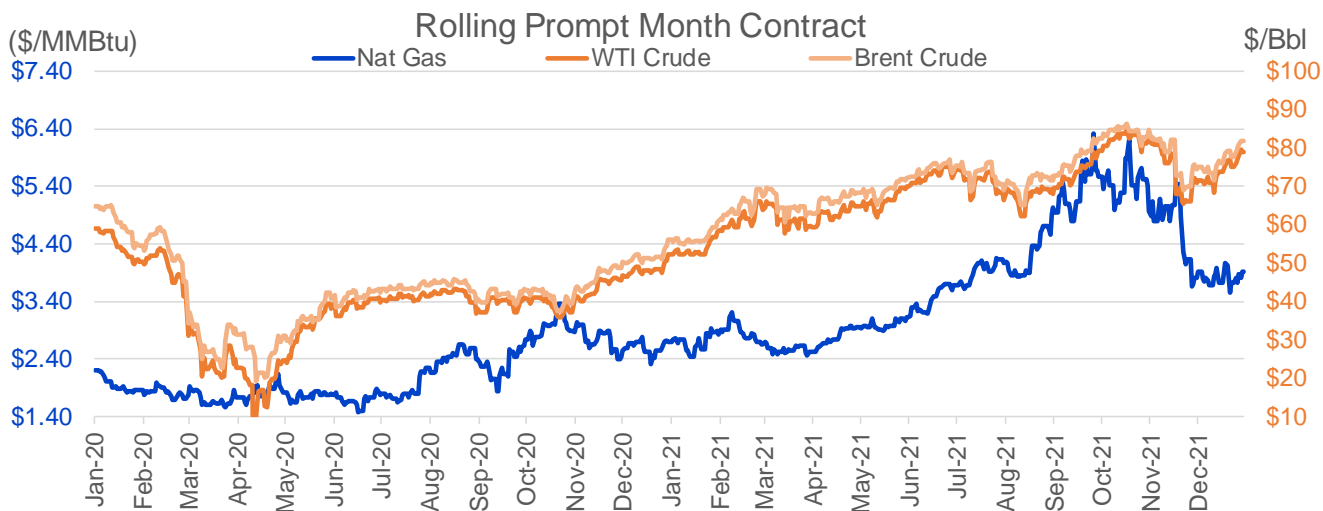
CONTRACT MONTH	CONTRACT YEAR	PUT/CALL	STRIKE	CUMULATIVE VOL	CONTRACT MONTH	CONTRACT YEAR	PUT/CALL	STRIKE	CUMULATIVE OI
2	2022	P	3.50	3606	3	2022	C	10.00	36028
3	2022	C	8.00	2011	3	2022	C	5.00	32737
2	2022	C	4.00	1766	2	2022	C	4.00	29292
3	2022	P	3.25	1589	3	2022	C	8.00	27733
4	2022	C	5.50	1500	3	2022	C	4.00	26374
5	2022	C	5.50	1500	2	2022	C	5.00	25236
2	2022	C	4.25	1478	3	2022	C	6.00	22113
2	2022	P	3.00	1337	3	2022	P	2.50	21546
4	2022	P	3.00	1329	12	2022	C	5.00	21297
3	2022	C	4.50	1282	4	2022	C	3.00	19710
4	2022	P	3.25	1264	4	2022	C	5.00	19478
3	2022	C	4.00	1126	2	2022	C	6.00	18855
4	2022	P	3.50	1124	3	2022	P	3.00	18782
5	2022	P	3.00	1100	2	2022	P	3.50	17344
5	2022	C	3.90	1000	3	2022	C	7.00	16546
10	2022	C	4.00	1000	3	2022	P	4.00	16332
2	2022	C	5.50	993	5	2022	C	5.00	16298
3	2022	C	5.00	953	3	2022	P	3.50	16239
2	2022	C	6.00	851	6	2022	C	5.00	16167
5	2022	P	2.75	825	2	2022	P	4.00	16023
2	2022	C	4.20	819	4	2022	P	2.50	16008
2	2022	C	4.75	795	2	2022	C	4.50	15770
3	2022	P	3.50	704	2	2022	C	5.50	15479
2	2022	C	4.10	702	10	2022	C	5.00	15463
2	2022	C	5.00	670	10	2022	C	6.00	15055
5	2022	P	2.50	600	3	2022	P	2.00	14936
3	2022	P	3.00	592	2	2022	C	4.25	14531
9	2022	C	5.00	577	2	2022	C	10.00	14427
7	2022	C	5.00	563	5	2022	P	3.00	14285
6	2022	C	5.00	550	3	2022	P	2.25	14102
6	2022	P	3.00	550	2	2022	P	3.00	13971
7	2022	P	3.00	550	10	2022	P	2.00	13921
8	2022	C	5.00	550	5	2022	C	3.00	13733
8	2022	P	3.00	550	4	2022	C	4.00	13726
9	2022	P	3.00	550	8	2022	C	5.00	13643
10	2022	C	5.00	550	3	2022	C	4.50	13568
10	2022	P	3.00	550	3	2022	P	5.00	13560
3	2022	C	4.20	531	6	2022	C	3.00	13438
4	2022	P	2.50	506	4	2022	P	3.00	13370
3	2022	P	3.30	503	12	2022	C	4.50	13282
2	2022	C	7.50	495	3	2022	C	3.00	13280
4	2022	C	5.00	484	3	2022	C	3.50	13274
3	2022	C	6.00	443	7	2022	C	3.00	13230
2	2022	P	3.75	412	8	2022	C	3.00	13226
2	2022	C	3.90	380	9	2022	C	3.00	13225
6	2022	C	4.50	350	10	2022	C	3.00	13114
7	2022	C	4.50	350	12	2022	C	5.25	13113
8	2022	C	4.50	350	2	2022	C	8.00	12494
8	2022	C	4.50	350	5	2022	P	2.50	12398
9	2022	C	4.50	350	2	2022	P	2.5	12397

Source: CME, Nasdaq, ICE

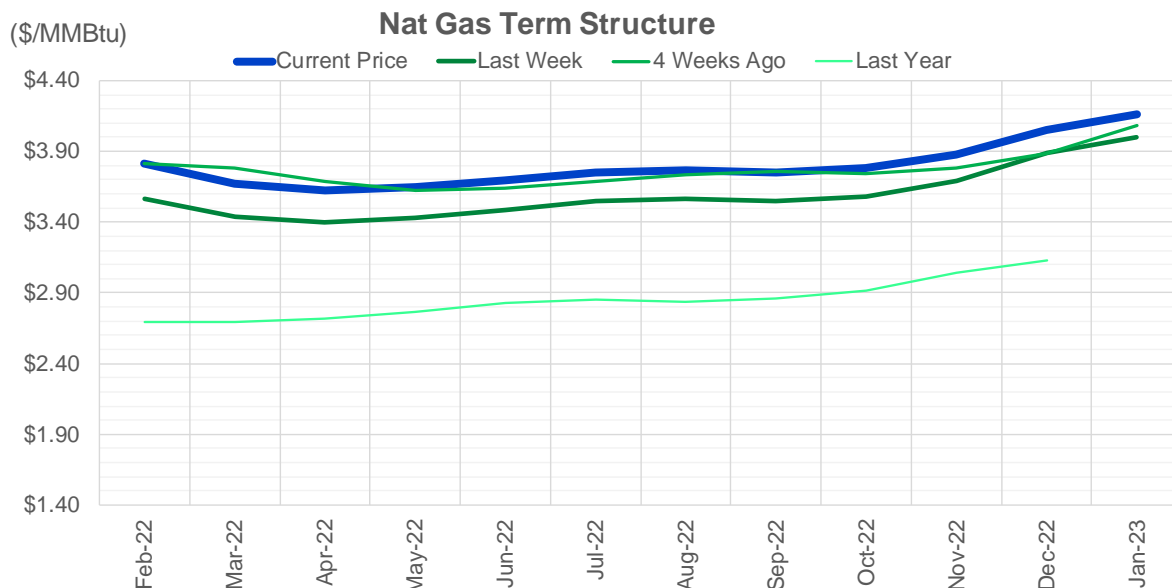
Nat Gas Futures Open Interest CME, ICE and Nasdaq Combined

CME Henry Hub Futures (10,000 MMBtu)				ICE Henry Hub Futures Contract Equivalent (10,000 MM			
	Current	Prior	Daily Change		Current	Prior	Daily Change
FEB 22	108616	114957	-6341	FEB 22	78438	79997	-1559
MAR 22	263061	261106	1955	MAR 22	86276	86840	-564
APR 22	84786	82901	1885	APR 22	75234	76537	-1303
MAY 22	113716	115220	-1504	MAY 22	66680	66849	-168
JUN 22	55253	54571	682	JUN 22	53655	53565	90
JUL 22	47259	47125	134	JUL 22	58965	58952	13
AUG 22	35157	34449	708	AUG 22	55150	55273	-123
SEP 22	48824	48730	94	SEP 22	56301	56401	-101
OCT 22	77051	76690	361	OCT 22	62795	62954	-159
NOV 22	35461	35145	316	NOV 22	51000	51221	-221
DEC 22	36635	36791	-156	DEC 22	60399	60711	-312
JAN 23	42151	42400	-249	JAN 23	48272	48334	-62
FEB 23	12616	12703	-87	FEB 23	36935	36916	19
MAR 23	27492	27696	-204	MAR 23	41426	41354	71
APR 23	21465	21376	89	APR 23	40981	40910	72
MAY 23	13371	13290	81	MAY 23	36378	36336	42
JUN 23	10251	10138	113	JUN 23	33213	33155	58
JUL 23	8256	8116	140	JUL 23	32354	32323	30
AUG 23	5408	5257	151	AUG 23	33217	33191	26
SEP 23	8292	8055	237	SEP 23	31868	31834	34
OCT 23	13344	13199	145	OCT 23	36033	36027	6
NOV 23	7067	7108	-41	NOV 23	35559	35569	-10
DEC 23	9743	9532	211	DEC 23	33403	33407	-4
JAN 24	6696	6693	3	JAN 24	23723	23692	32
FEB 24	1742	1742	0	FEB 24	16865	16786	79
MAR 24	9702	9702	0	MAR 24	22795	22713	82
APR 24	5234	5234	0	APR 24	16095	16034	62
MAY 24	2055	2055	0	MAY 24	16432	16393	39
JUN 24	931	931	0	JUN 24	16549	16546	3
JUL 24	563	563	0	JUL 24	17145	17143	2

Source: CME, ICE



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	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23
Current Price	\$3.812	\$3.670	\$3.627	\$3.645	\$3.696	\$3.753	\$3.769	\$3.753	\$3.783	\$3.875	\$4.055	\$4.163
Last Week	\$3.561	\$3.435	\$3.400	\$3.431	\$3.486	\$3.546	\$3.564	\$3.552	\$3.583	\$3.692	\$3.891	\$4.001
vs. Last Week	\$0.251	\$0.235	\$0.227	\$0.214	\$0.210	\$0.207	\$0.205	\$0.201	\$0.200	\$0.183	\$0.164	\$0.162
4 Weeks Ago	\$3.814	\$3.784	\$3.686	\$3.624	\$3.638	\$3.684	\$3.738	\$3.755	\$3.746	\$3.781	\$3.889	\$4.082
vs. 4 Weeks Ago	-\$0.002	-\$0.114	-\$0.059	\$0.021	\$0.058	\$0.069	\$0.031	-\$0.002	\$0.037	\$0.094	\$0.166	\$0.081
Last Year	\$2.729	\$2.691	\$2.696	\$2.717	\$2.769	\$2.832	\$2.849	\$2.835	\$2.861	\$2.919	\$3.043	\$3.132
vs. Last Year	\$1.083	\$0.979	\$0.931	\$0.928	\$0.927	\$0.921	\$0.920	\$0.918	\$0.922	\$0.956	\$1.012	\$1.031

	Units	Current Price	vs. Last Week	vs. 4 Weeks Ago	vs. Last Year
NatGas Jul21/Oct21	\$/MMBtu	2.224	▲ 0.000	▲ 0.000	▲ 2.193
NatGas Oct21/Nov21	\$/MMBtu	0.361	▲ 0.000	▲ 0.000	▲ 0.304
NatGas Oct21/Jan22	\$/MMBtu	-1.817	▲ 0.000	▲ 0.099	▼ -2.090
NatGas Apr22/Oct22	\$/MMBtu	0.150	▼ -0.019	▼ -0.002	▲ 0.137
WTI Crude	\$/Bbl	78.90	▲ 3.690	▲ 7.230	▲ 26.660
Brent Crude	\$/Bbl	81.75	▲ 3.970	▲ 6.600	▲ 25.760
Fuel Oil, NY Harbour 1%	\$/Bbl	97.18	▲ 0.000	▲ 0.000	▲ 0.000
Heating Oil	cents/Gallon	248.18	▲ 15.170	▲ 23.020	▲ 90.230
Propane, Mt. Bel	cents/Gallon	1.11	▲ 0.073	▲ 0.082	▲ 0.256
Ethane, Mt. Bel	cents/Gallon	0.36	▲ 0.020	▲ 0.017	▲ 0.130
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					
1/7/2022					
Baker Hughes 					
U.S. Breakout Information	This Week	+/-	Last Week	+/-	Year Ago
Oil	481	1	480	206	275
Gas	107	1	106	23	84
Miscellaneous	0	0	0	-1	1
Directional	33	3	30	11	22
Horizontal	532	2	530	212	320
Vertical	23	-3	26	5	18
Canada Breakout Information	This Week	+/-	Last Week	+/-	Year Ago
Oil	78	39	39	25	53
Gas	63	12	51	-1	64
Major Basin Variances	This Week	+/-	Last Week	+/-	Year Ago
Ardmore Woodford	1	0	1	1	0
Arkoma Woodford	2	0	2	2	0
Cana Woodford	26	-2	28	16	10
DJ-Niobrara	12	1	11	7	5
Eagle Ford	44	0	44	18	26
Granite Wash	4	0	4	4	0
Haynesville	49	0	49	6	43
Marcellus	29	0	29	-1	30
Permian	292	-1	293	113	179
Utica	11	0	11	7	4
Williston	27	0	27	16	11