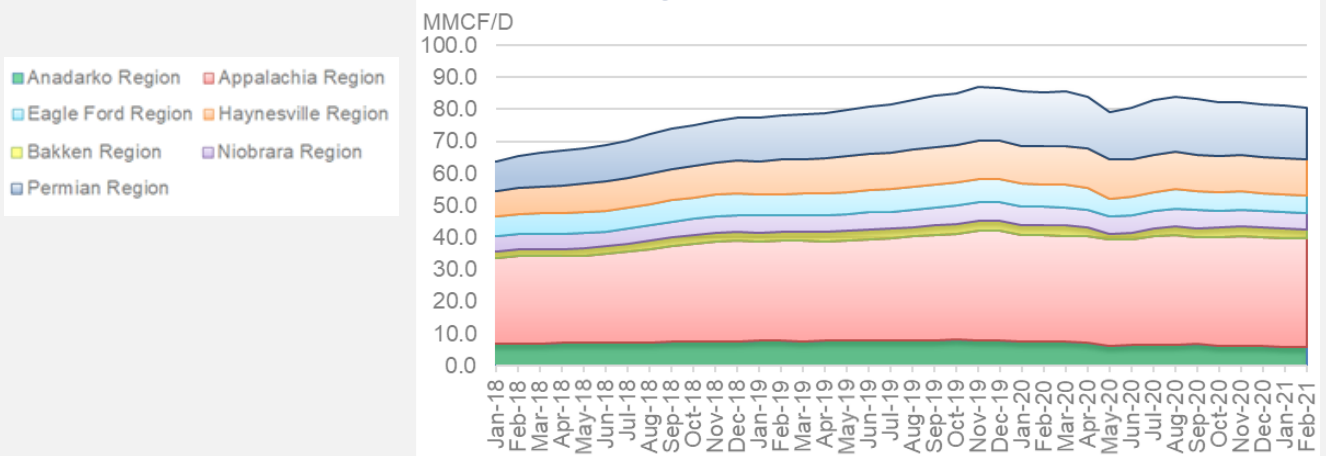


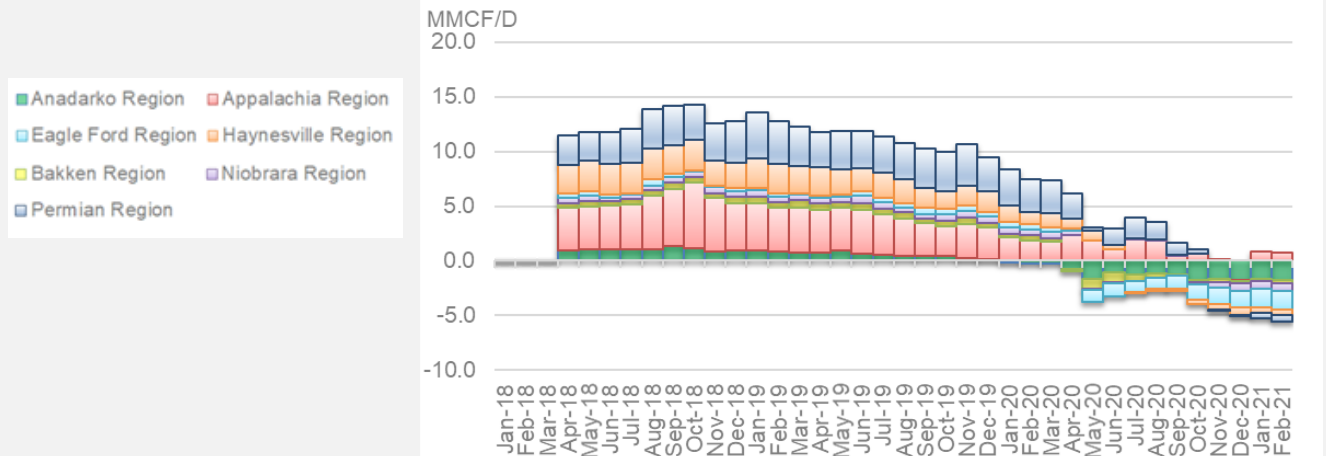
The latest edition of the EIA's Drilling Productivity Report, published on Tuesday, shows cumulative natural gas production from seven key U.S. onshore regions falling by 0.47 Bcf/d from January to February. This extends a downtrend that goes back to last January.

U.S. Shale Monthly Natural Gas Production



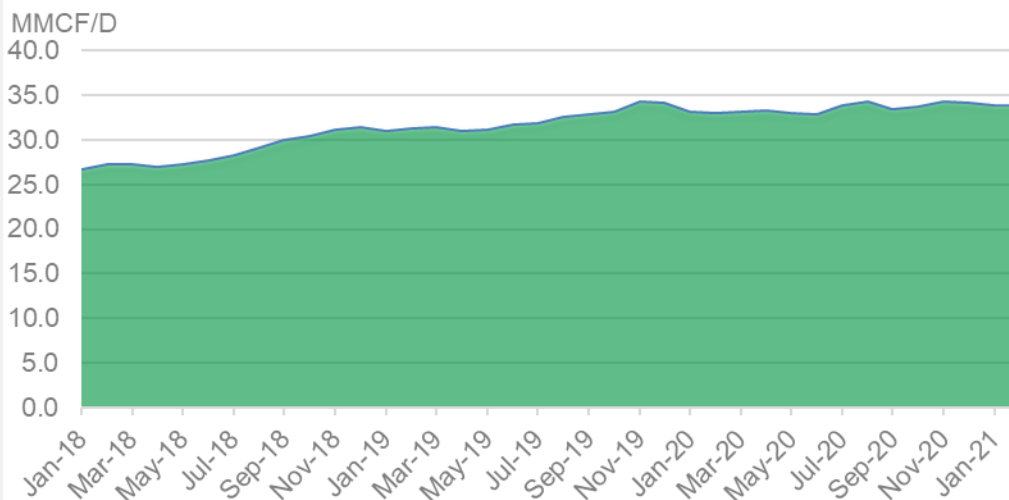
The year-on-year change is -4.81 Bcf/d, with two regions accounting for 71% of the total drop: Anadarko and the Eagle Ford. The natural gas production out of these two regions is heavily tied to oil prices, as the majority of production comes from oily plays. With oil prices recovering to over \$50/bbl there is hope that rigs get deployed to these regions and natural gas production follows

U.S. Shale Year-On-Year Natural Gas Production

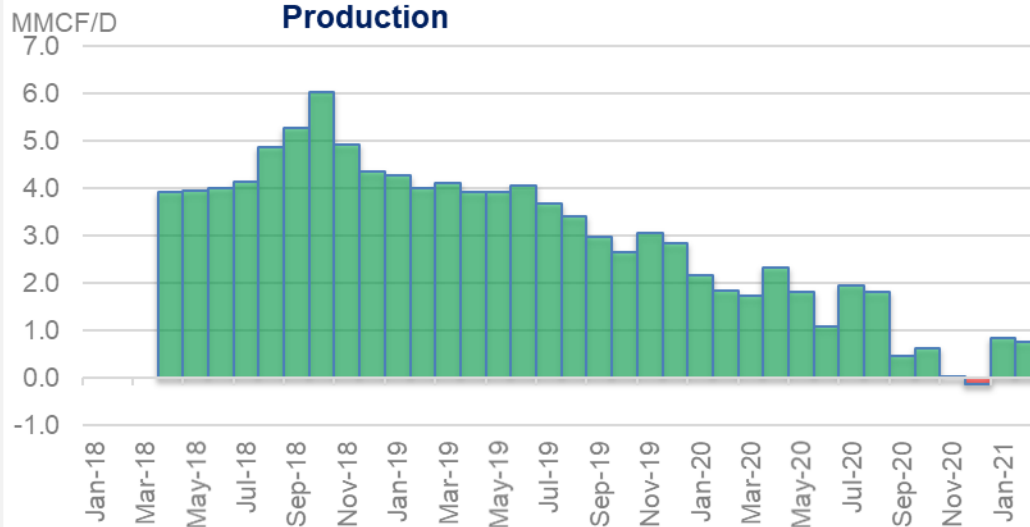


The Appalachian region continues to show strong production with YoY gains. The rationale behind growth despite only 28 rigs operating in the Marcellus (vs. 35 LY) is the strong well performance and reduction in DUC inventory. The Appalachian DUCs dropped by 12 (596 to 584) from Nov to Dec, and the new-well gas production per rig increased by 273 Mcf/d (27.37 MMcf/d to 27.65 MMcf/d). All other regions saw natural gas new well production per rig stay flat or drop.

Appalachia Region Monthly Natural Gas Production

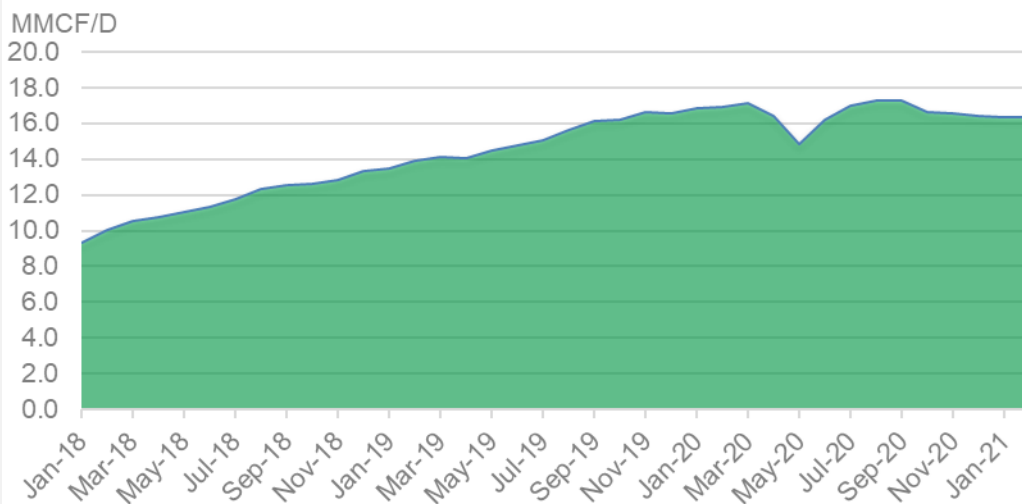


Appalachia Region Year-On-Year Natural Gas Production

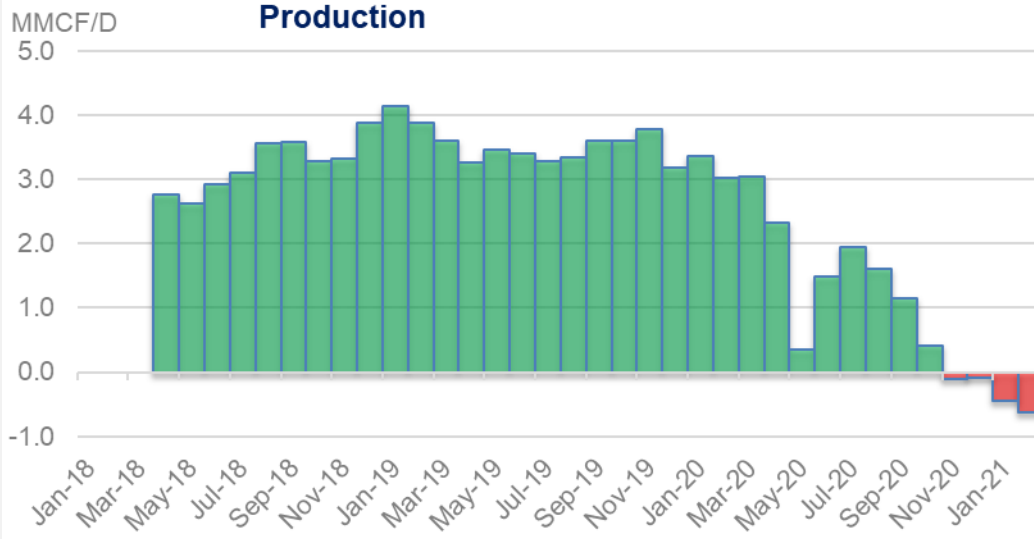


The Permian region oil and gas production has been relatively flat over the past few months, and the EIA does not expect this to change too much in February. Permian Basin rigs in West Texas and New Mexico continue their upward trend after hitting a low in August. For the week ended January 22, WTI Midland prices averaged near \$54/bbl which is above the average break-even of \$43-45/bbl. According to Platts, “The recent surge in oil prices is positive for activity but unlikely to have a significant impact as operators are expected to continue to keep some capital discipline”. So the positive price movement might not spur more production out of the Permian, but for 2020 we can expect producers to at least maintaining current levels.

Permian Region Monthly Natural Gas Production



Permian Region Year-On-Year Natural Gas Production



See the attached PDF that goes through the rig and oil/gas production trends for each region

Lastly, we take a look at the latest Primary Vision Frac Spread Count.

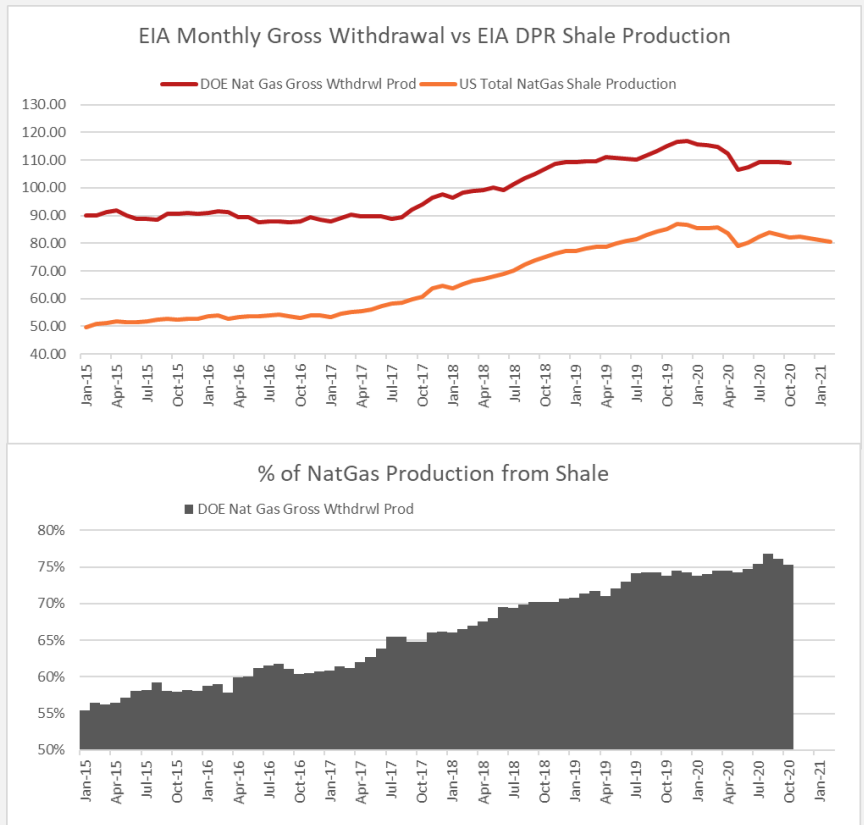
“A frac spread (or sometimes referred to as a frac fleet) is a set number of equipment that a pressure pumper (oil field service company) uses for hydraulic fracturing.

This includes a combination of fracturing pumps (also referred to as frac pumps and/or pumping units), data trucks, storage tanks, chemical additive and hydration units, blenders and other equipment needed to perform a frac stimulation.”



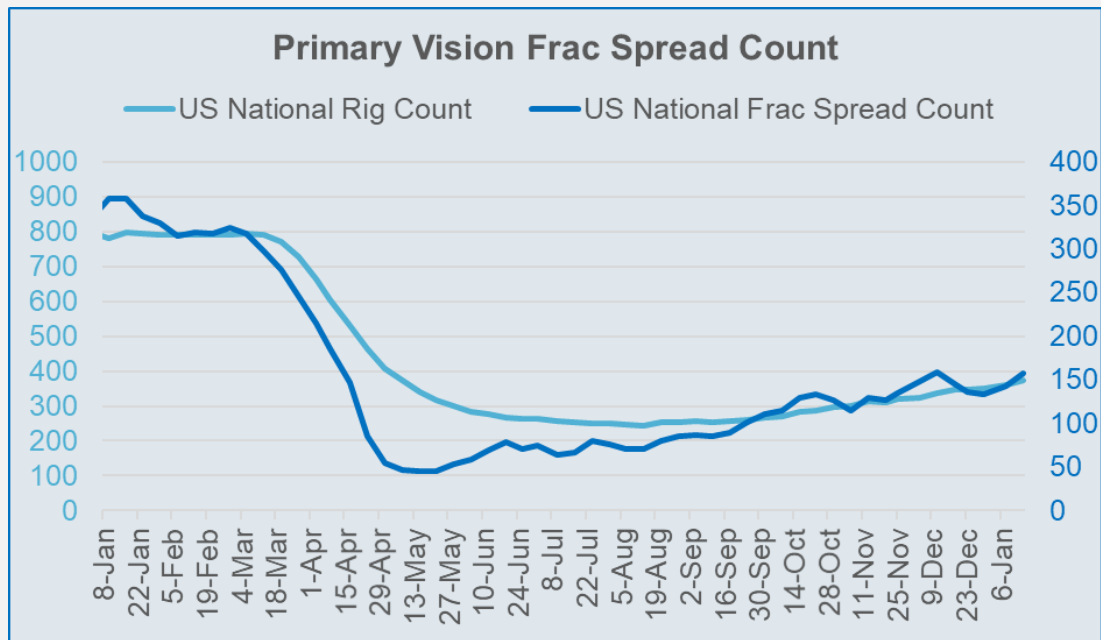
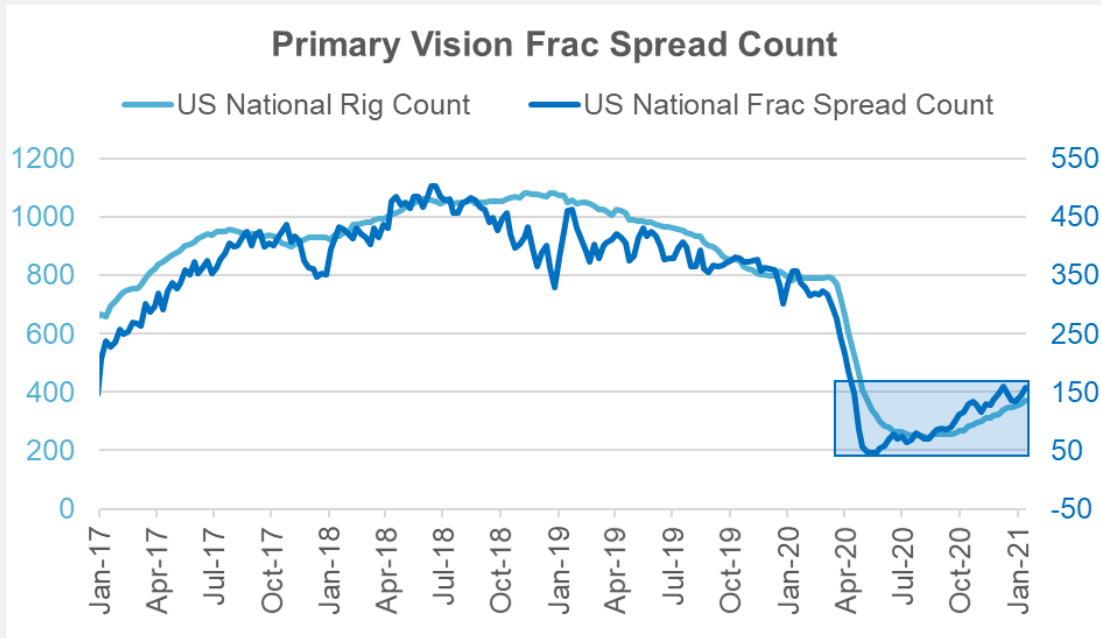
Source: Primary Vision

The count has been on a steady incline since hitting at low in mid-July when the current was 64. The Frac Spread Count is more of a real-time indicator for oil and natural coming online from shale plays vs. rig counts. Since Shale production now makes up 75% of total natural gas production, we keep a close look at the frac count.



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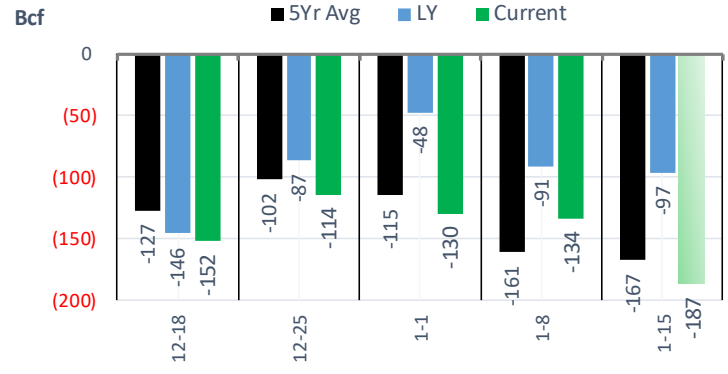
The current count as of Jan 15th is now 250% of that low point – at 158.



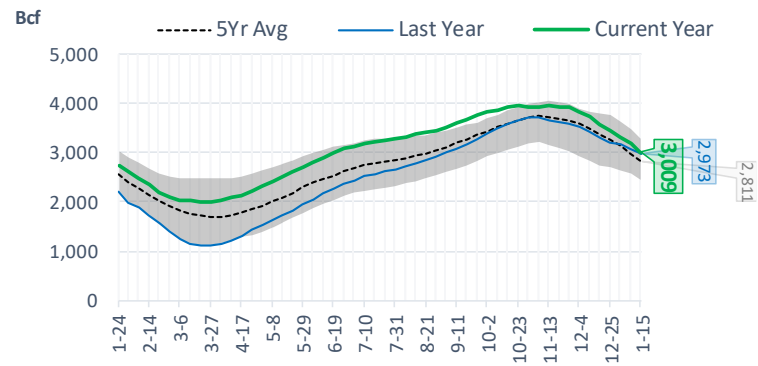
This has not proven to be a great leading indicator of oil and natural gas production in 2020. We believe this is in part to the highly volatile well results last year coming from massive increases in well productivity as producers only tapped the best acreage, and shut-in well and resumption of these wells. That being said, we do keep a close eye on rig and frac spread counts to give us an indicator of which way producers are trending.

EIA Storage Report

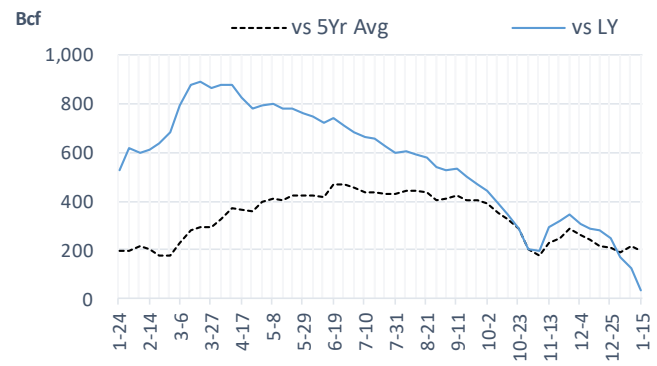
Total Lower 48 YoY Weekly Change



Total Lower 48 Storage Levels



Total Lower 48 LY Surplus/Deficit

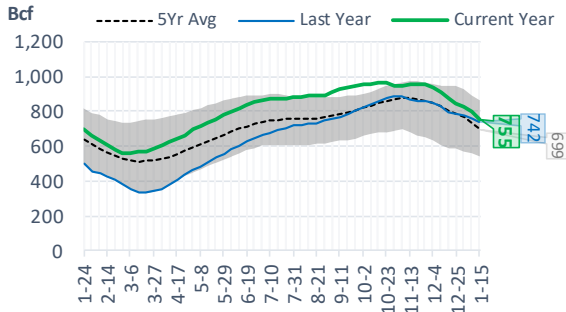


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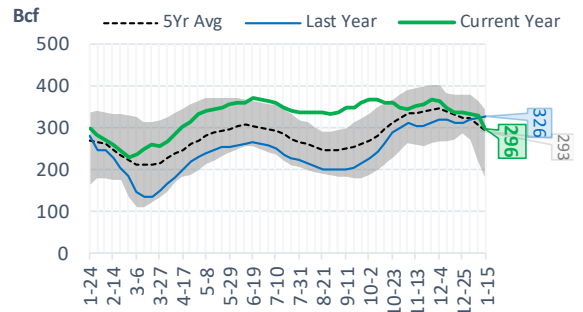
Natural Gas Storage Stats - Last 5 Weeks

Week Ending	Current 15-Jan	Week - 1 8-Jan	Week - 2 1-Jan	Week - 3 25-Dec	Week - 4 18-Dec	Week - 5 11-Dec
Total Lower 48 Storage Level	3009	3196	3330	3460	3574	3726
Weekly Change	-187	-134	-130	-114	-152	-122
vs LY	+36	+126	+169	+251	+278	+284
vs 5Yr Avg	+198	+218	+191	+206	+218	+243
S. Central Salt Storage Level	296	327	333	334	337	348
Weekly Change	-31	-6	-1	-3	-11	-13
vs LY	-30	+6	+13	+22	+25	+28
vs 5Yr Avg	+3	+19	+11	+10	+9	+10
S. Central NonSalt Storage Level	755	799	830	849	870	908
Weekly Change	-44	-31	-19	-21	-38	-25
vs LY	+13	+38	+54	+67	+73	+78
vs 5Yr Avg	+56	+67	+67	+63	+66	+79
Midwest Storage Level	828	879	923	973	1015	1059
Weekly Change	-51	-44	-50	-42	-44	-36
vs LY	+3	+18	+32	+63	+78	+75
vs 5Yr Avg	+55	+50	+45	+54	+61	+64
East Storage Level	679	726	765	810	844	881
Weekly Change	-47	-39	-45	-34	-37	-34
vs LY	-23	-1	+5	+32	+36	+35
vs 5Yr Avg	+26	+29	+24	+43	+48	+54
Mountain Storage Level	176	188	196	204	212	223
Weekly Change	-12	-8	-8	-8	-11	-9
vs LY	+22	+26	+28	+30	+32	+35
vs 5Yr Avg	+20	+23	+22	+20	+21	+24
Pacific Storage Level	275	278	282	289	296	306
Weekly Change	-3	-4	-7	-7	-10	-6
vs LY	+51	+40	+36	+35	+32	+32
vs 5Yr Avg	+39	+30	+22	+15	+12	+11

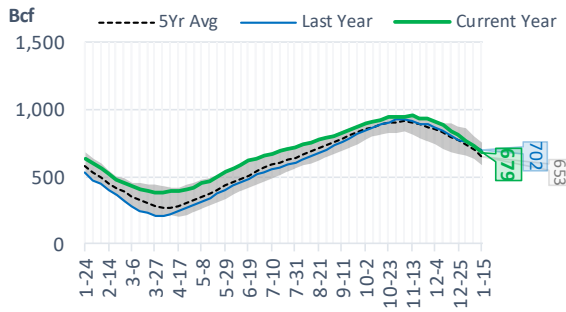
NonSalt Storage Levels



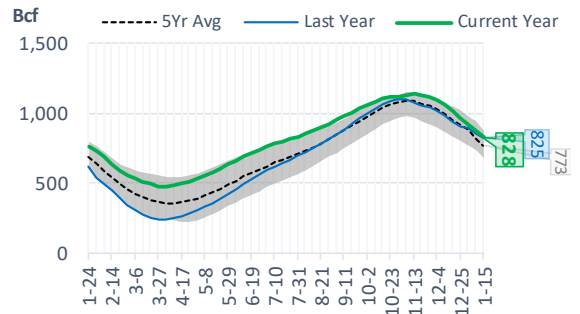
Salt Storage Levels



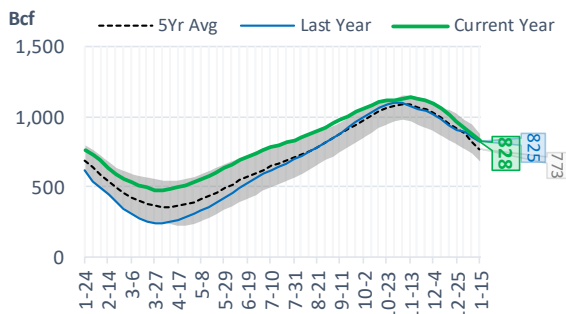
East Storage Levels



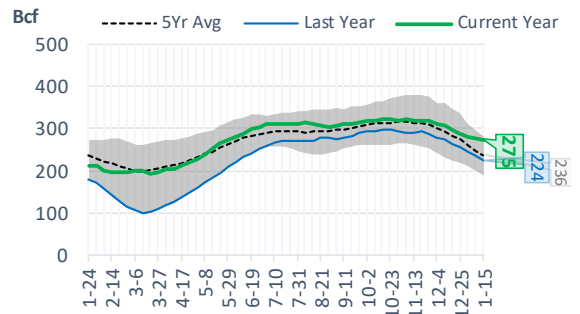
Midwest Storage Levels



Midwest Storage Levels

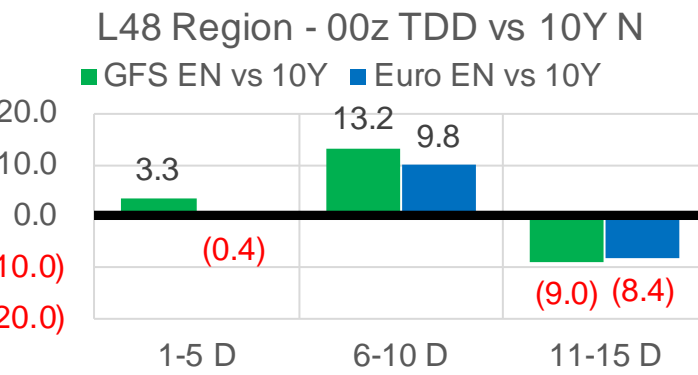
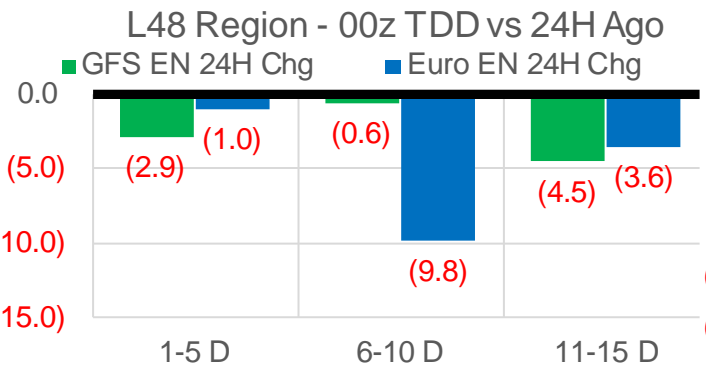
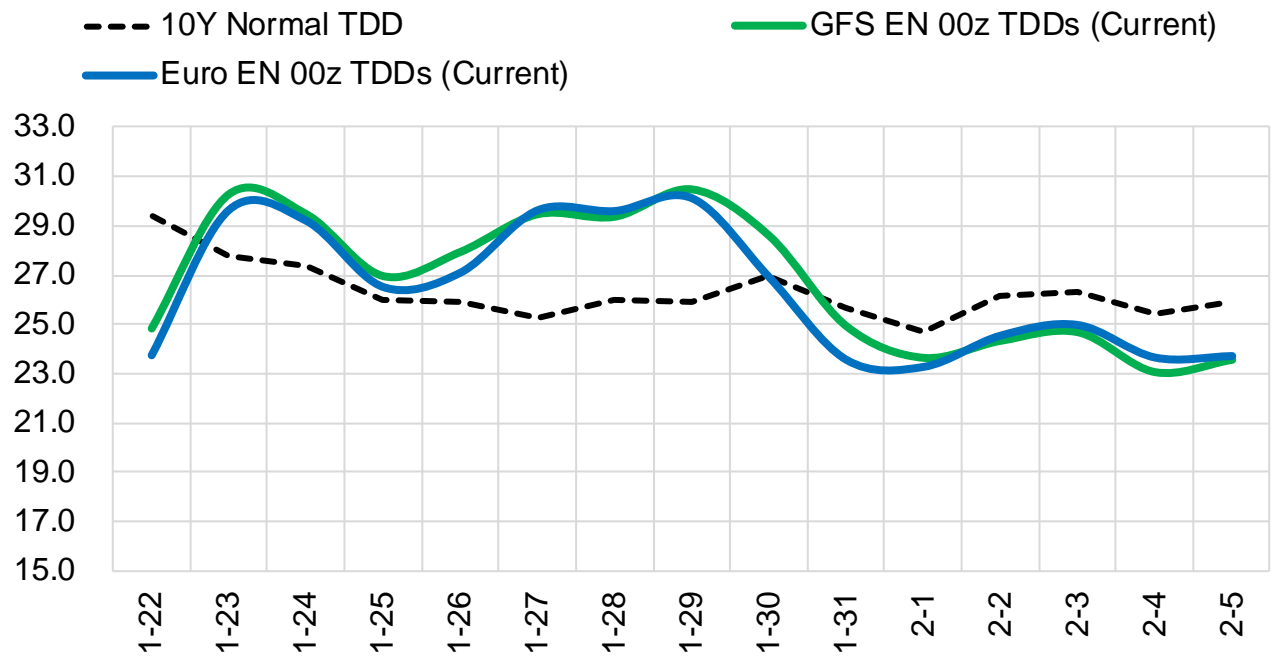


Pacific Storage Levels



Current Short-term Weather Model Outlooks (00z)

L48 Region



Source: WSI, Bloomberg

EIA Storage Week Balances

	18-Dec	25-Dec	1-Jan	8-Jan	15-Jan	22-Jan	WoW	vs. 4W
Lower 48 Dry Production	90.9	91.5	91.7	91.6	90.4	90.8	▲ 0.3	▼ -0.6
Canadian Imports	5.8	5.8	5.8	6.1	6.2	5.9	▼ -0.3	▼ -0.1
L48 Power	28.7	27.1	27.3	28.2	30.1	27.7	▼ -2.5	▼ -0.5
L48 Residential & Commercial	40.0	38.8	41.9	39.9	43.7	40.1	▼ -3.6	▼ -1.0
L48 Industrial	25.1	24.1	23.0	24.0	26.0	24.1	▼ -1.9	▼ -0.1
L48 Lease and Plant Fuel	5.0	5.1	5.1	5.1	5.0	5.0	▲ 0.0	▼ 0.0
L48 Pipeline Distribution	3.1	3.0	3.2	3.1	3.3	3.1	▼ -0.3	▼ -0.1
L48 Regional Gas Consumption	102.0	98.2	100.4	100.3	108.2	100.0	▼ -8.2	▼ -1.8
Net LNG Exports	10.9	10.8	11.0	10.9	10.6	10.4	▼ -0.2	▼ -0.4
Total Mexican Exports	6.2	5.8	5.5	6.0	6.2	6.3	▲ 0.1	▲ 0.4
Implied Daily Storage Activity	-22.4	-17.5	-19.3	-19.4	-28.4	-20.1	8.3	
EIA Reported Daily Storage Activity	-21.7	-16.3	-18.6	-19.1	-26.7			
Daily Model Error	-0.7	-1.2	-0.8	-0.2	-1.6			

Monthly Balances

	2Yr Ago Jan-19	LY Jan-20	Sep-20	Oct-20	Nov-20	Dec-20	MTD Jan-21	MoM	vs. LY
Lower 48 Dry Production	87.2	94.0	88.1	87.5	90.4	91.2	90.9	▼ -0.3	▼ -3.1
Canadian Imports	5.9	4.8	3.8	4.3	4.6	5.8	6.1	▲ 0.3	▲ 1.3
L48 Power	27.2	29.9	34.2	30.7	25.5	28.0	28.6	▲ 0.6	▼ -1.3
L48 Residential & Commercial	48.0	41.1	8.8	14.4	22.8	39.2	41.3	▲ 2.1	▲ 0.1
L48 Industrial	24.1	24.6	19.2	22.5	23.8	24.2	24.7	▲ 0.5	▲ 0.0
L48 Lease and Plant Fuel	4.9	5.2	4.9	4.9	5.0	5.1	5.0	▼ 0.0	▼ -0.2
L48 Pipeline Distribution	3.4	3.2	2.2	2.3	2.3	3.1	3.2	▲ 0.1	▼ -0.1
L48 Regional Gas Consumption	107.6	104.1	69.4	74.9	79.3	99.6	102.8	▲ 3.2	▼ -1.3
Net LNG Exports	4.1	8.4	6.0	8.0	10.1	11.0	10.6	▼ -0.4	▲ 2.2
Total Mexican Exports	5.0	5.2	6.4	6.2	6.2	6.0	6.2	▲ 0.2	▲ 0.9
Implied Daily Storage Activity	-23.6	-18.9	10.1	2.6	-0.6	-19.5	-22.5		
EIA Reported Daily Storage Activity									
Daily Model Error									

Source: Bloomberg, analytix.ai

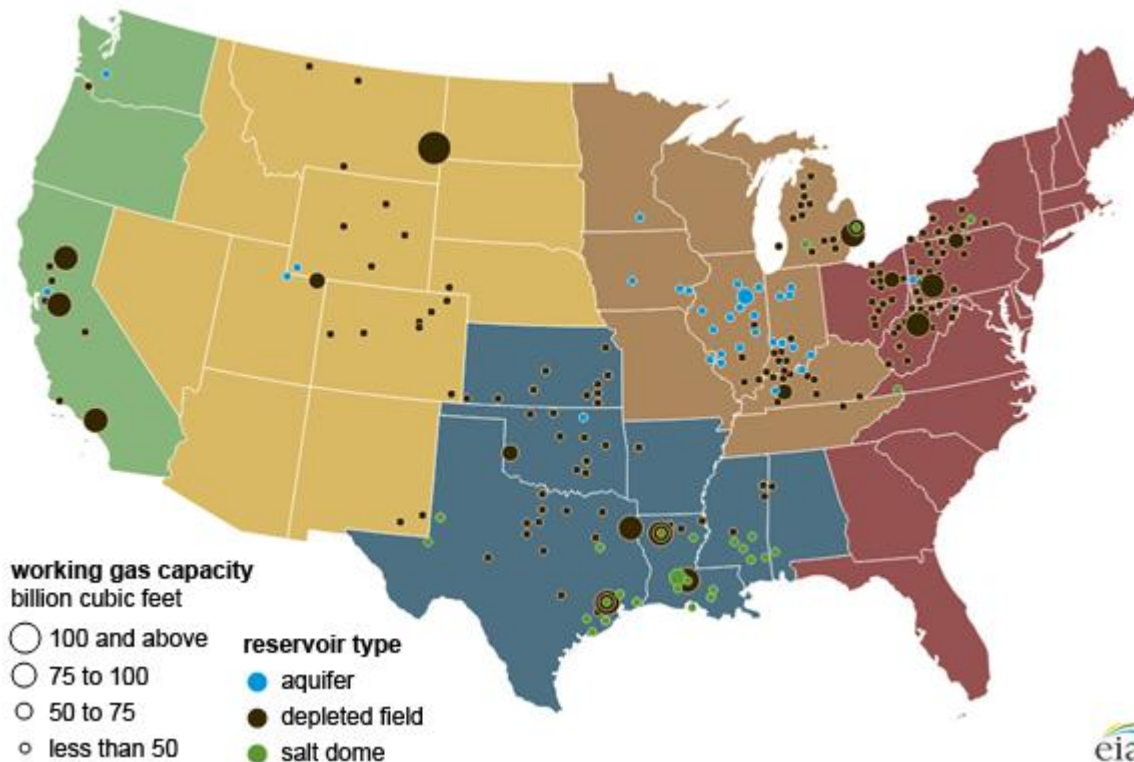
Regional S/D Models Storage Projection

Week Ending 22-Jan

	Daily Raw Storage	Daily Adjustment Factor	Daily Average Storage Activity (Adjusted) *	Weekly Adjusted Storage Activity
L48	-20.3	1.4	-19.0	-133
East	-7.1	1.7	-5.4	-38
Midwest	-6.9	0.2	-6.7	-47
Mountain	2.3	-3.5	-1.2	-8
South Central	-8.9	2.8	-6.1	-43
Pacific	0.3	0.2	0.5	3

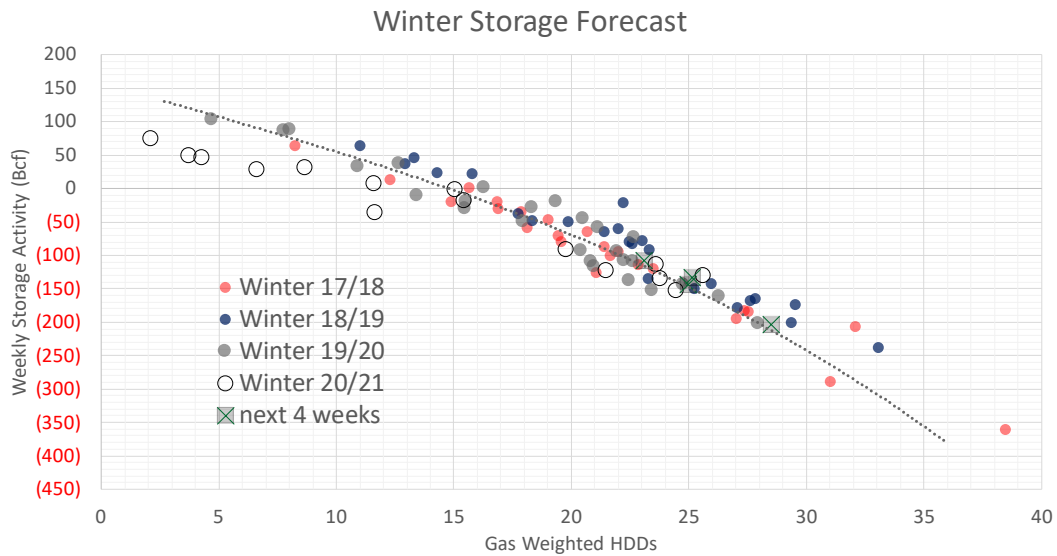
*Adjustment Factor is calculated based on historical regional deltas

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



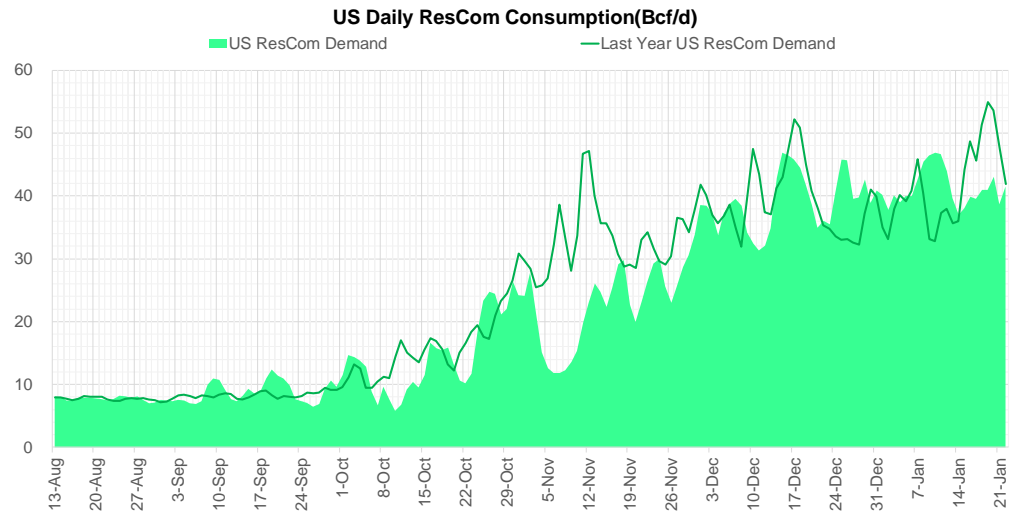
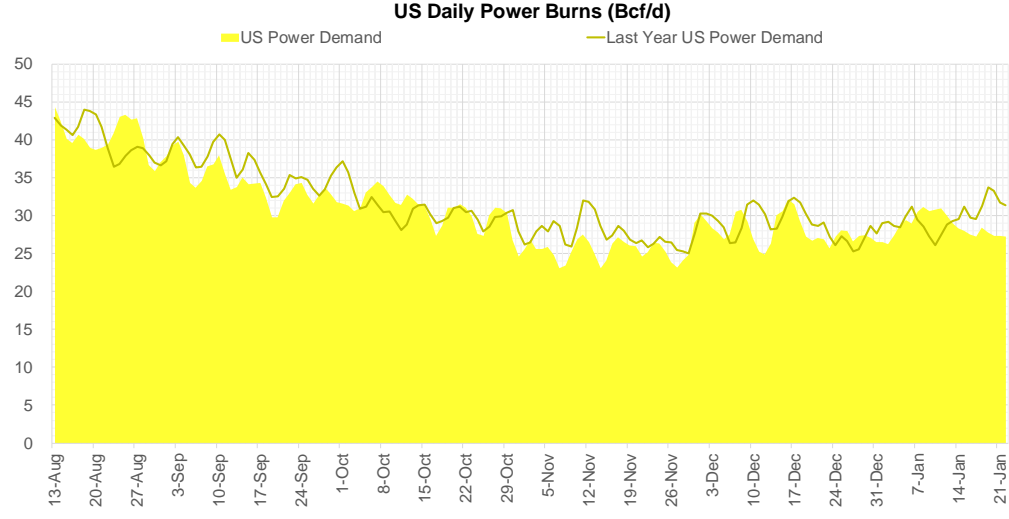
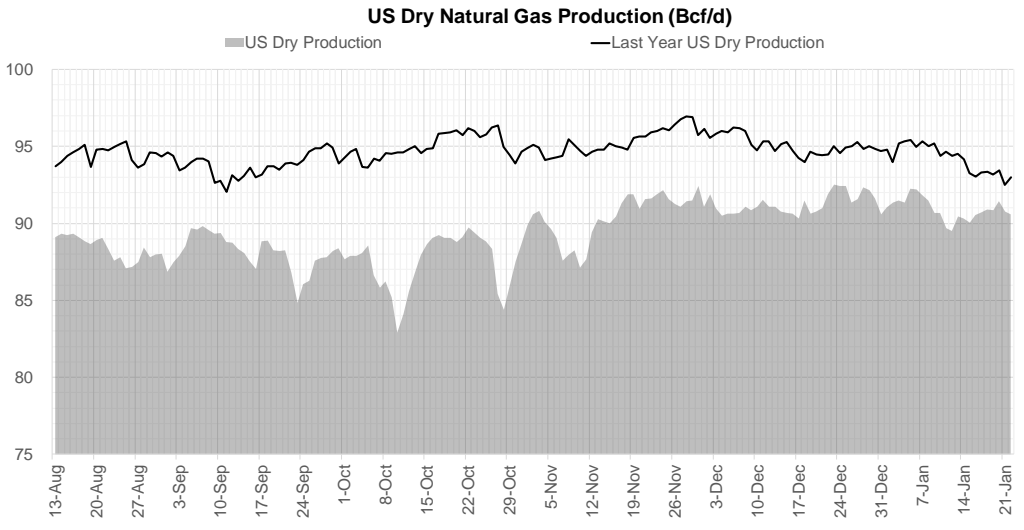
Weather Model Storage Projection

Next report and beyond		
Week Ending	Temp	Week Storage Projection
22-Jan	23.1	-107
29-Jan	28.5	-203
05-Feb	25.0	-143



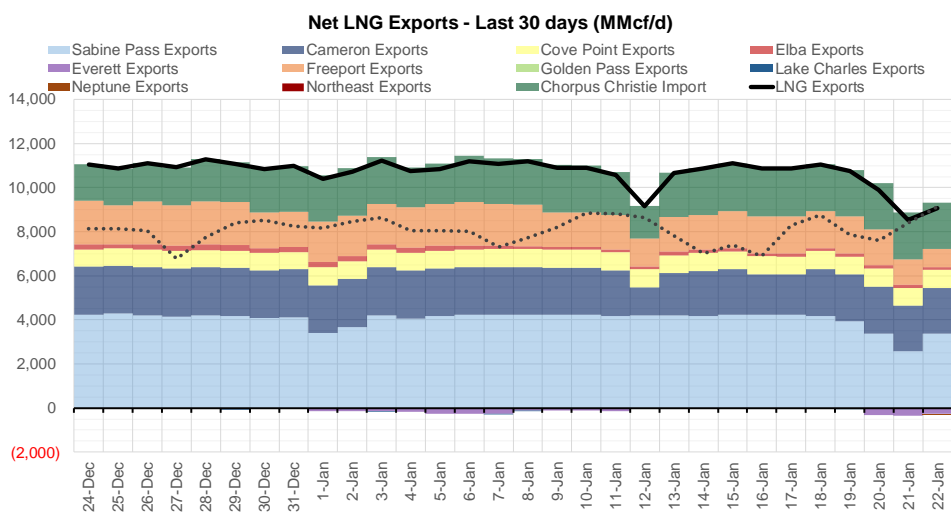
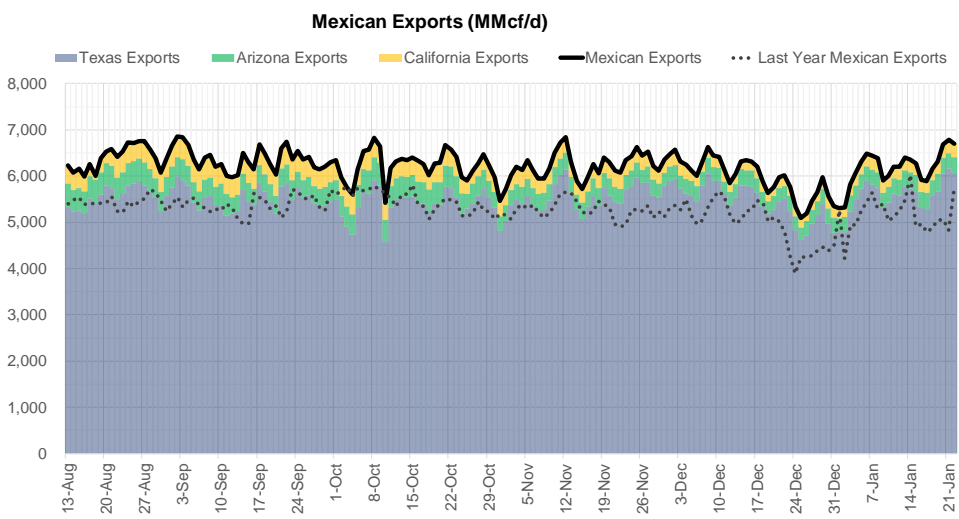
Note: this is not our official end of season forecast. This chart signifies where storage levels end with 10-year normal weather and current market tightness relative to last year

Supply – Demand Trends



Source: Bloomberg

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Source: Bloomberg

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

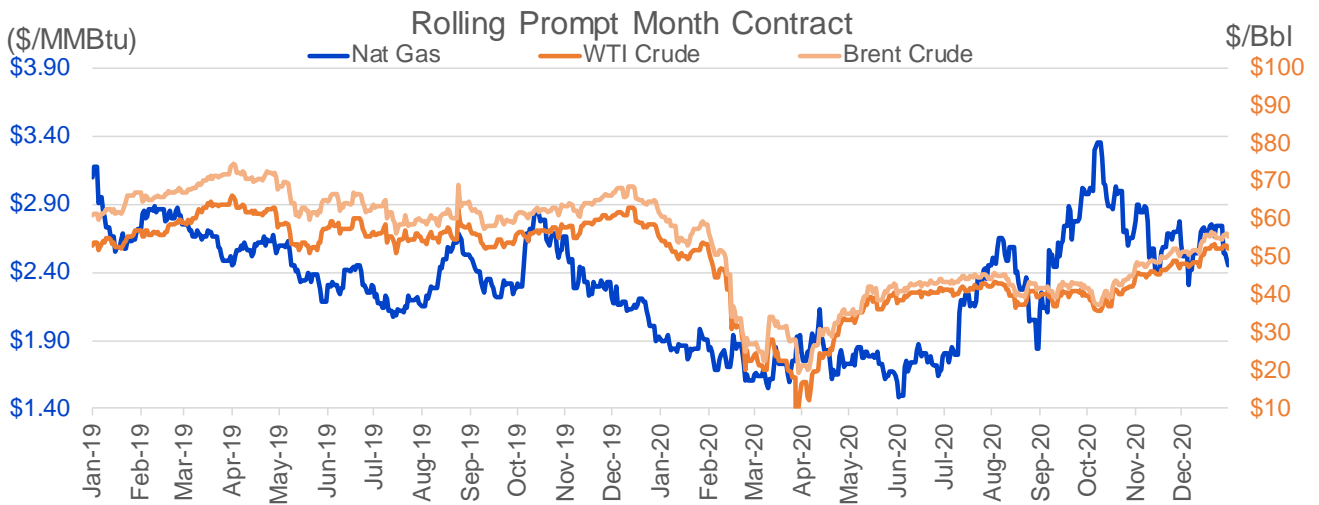
CONTRACT MONTH	CONTRACT YEAR	PUT/CALL	STRIKE	CUMULATIVE VOL	CONTRACT MONTH	CONTRACT YEAR	PUT/CALL	STRIKE	CUMULATIVE OI
4	2021	C	3.00	10981	3	2021	C	3.50	55765
2	2021	P	2.25	9407	4	2021	C	3.00	46836
4	2021	P	2.00	7850	3	2021	P	2.00	42223
3	2021	P	2.25	7646	3	2021	C	4.00	40241
3	2021	C	3.00	4719	3	2021	C	3.25	40133
3	2021	P	2.00	4534	4	2021	C	4.00	37211
4	2021	C	3.25	3969	3	2021	C	5.00	32196
2	2021	P	2.35	3600	2	2021	C	4.00	31928
4	2021	C	2.75	3273	3	2021	C	3.00	31265
2	2021	P	2.30	3175	2	2021	C	3.00	30062
3	2021	P	2.50	2681	10	2021	C	4.00	29591
2	2021	C	2.65	2531	3	2021	P	2.50	27137
4	2021	C	2.50	2260	3	2021	C	4.50	27094
4	2021	P	2.40	2069	4	2021	P	2.00	26853
3	2021	C	3.25	2032	2	2021	P	2.25	25985
5	2021	C	3.00	1992	2	2021	P	2.50	25978
8	2021	C	3.00	1825	10	2021	C	3.25	25088
5	2021	P	2.40	1804	3	2021	C	6.00	24838
6	2021	P	2.40	1780	8	2021	C	4.00	22135
7	2021	P	2.40	1779	4	2021	C	3.50	22033
8	2021	P	2.40	1779	3	2021	C	7.00	21565
9	2021	P	2.40	1779	2	2021	C	3.50	20985
10	2021	P	2.40	1779	2	2021	P	2.00	20378
4	2021	P	2.10	1778	10	2021	C	5.00	19710
5	2021	P	2.10	1750	5	2021	C	3.00	19192
6	2021	P	2.10	1750	4	2021	C	2.75	19175
7	2021	P	2.10	1750	4	2021	P	2.25	19162
8	2021	P	2.10	1750	4	2021	C	3.25	19121
9	2021	P	2.10	1750	8	2021	P	2.25	18983
10	2021	P	2.10	1750	4	2021	C	5.00	18789
4	2021	P	2.25	1669	6	2021	C	4.00	18213
2	2021	C	2.75	1627	5	2021	C	3.50	18132
9	2021	C	3.00	1575	10	2021	P	2.00	17942
7	2021	C	3.00	1501	2	2021	C	3.25	17419
2	2021	C	2.70	1483	2	2021	C	5.00	17294
2	2021	P	2.40	1482	7	2021	C	4.00	17155
6	2021	C	3.00	1475	5	2021	P	2.00	16908
10	2021	C	3.00	1475	5	2021	C	3.25	16235
3	2021	P	1.75	1400	3	2021	P	2.25	15971
2	2021	P	2.45	1238	4	2021	P	2.50	15788
3	2021	C	2.75	1108	2	2021	C	4.50	15199
4	2021	C	4.00	1040	4	2021	C	2.50	15079
11	2021	P	2.00	1000	8	2021	P	2.00	14975
11	2021	P	2.50	1000	12	2021	C	4.00	14733
5	2021	C	3.25	950	5	2021	P	2.50	14669
7	2021	C	3.25	912	10	2021	C	3.00	14656
9	2021	C	3.50	900	4	2022	C	3.00	14508
8	2021	C	3.25	870	10	2021	P	2.50	14417
2	2021	P	2.50	857	5	2021	C	4.00	14361
					10	2021	C	3.5	13668

Source: CME, Nasdaq, ICE

Nat Gas Futures Open Interest CME, ICE and Nasdaq Combined

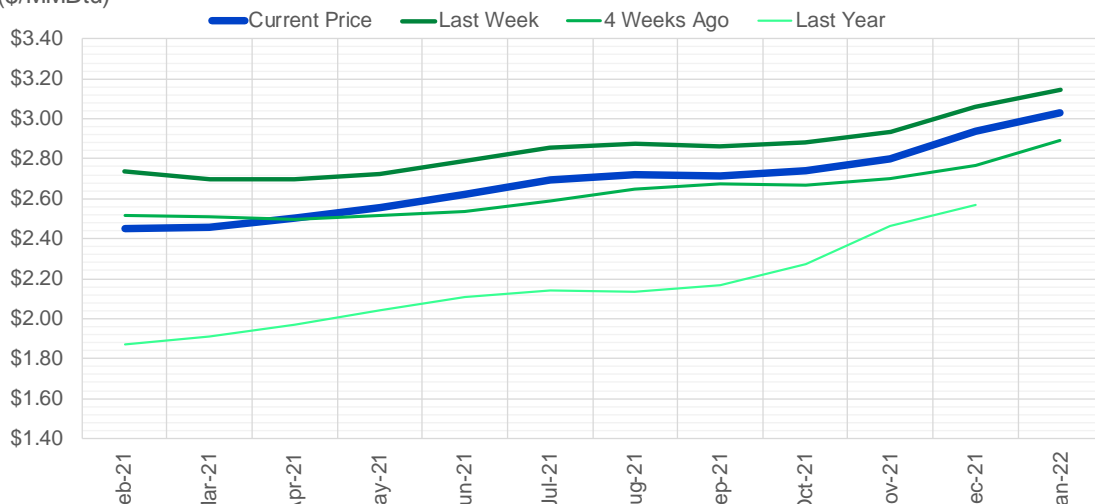
CME Henry Hub Futures (10,000 MMBtu)				ICE Henry Hub Futures Contract Equivalent (10,000 MM			
	Current	Prior	Daily Change	FOR JUNE 26	Current	Prior	Daily Change
FEB 21	32127	45418	-13291	FEB 21	74806	75627	-821
MAR 21	333138	329776	3362	MAR 21	98385	95270	3115
APR 21	106890	107205	-315	APR 21	85439	85558	-119
MAY 21	78459	76634	1825	MAY 21	79193	79339	-146
JUN 21	44053	44017	36	JUN 21	65255	65325	-70
JUL 21	47789	45657	2132	JUL 21	65971	66054	-82
AUG 21	30281	30366	-85	AUG 21	66681	67234	-553
SEP 21	49393	48835	558	SEP 21	63561	63602	-42
OCT 21	113015	111549	1466	OCT 21	83422	83623	-201
NOV 21	40401	41160	-759	NOV 21	51696	51599	98
DEC 21	41416	41484	-68	DEC 21	53663	53749	-85
JAN 22	49526	49490	36	JAN 22	53981	53782	199
FEB 22	25781	25616	165	FEB 22	38692	38758	-66
MAR 22	28205	27849	356	MAR 22	41225	41190	35
APR 22	29122	29723	-601	APR 22	39514	39537	-23
MAY 22	13025	12972	53	MAY 22	34768	34796	-28
JUN 22	8318	8195	123	JUN 22	33046	33082	-36
JUL 22	6469	6812	-343	JUL 22	33610	33482	129
AUG 22	5529	5530	-1	AUG 22	32431	32306	125
SEP 22	5881	5913	-32	SEP 22	33076	33114	-38
OCT 22	11640	11306	334	OCT 22	36514	36490	24
NOV 22	6315	6342	-27	NOV 22	30488	30428	60
DEC 22	7143	7340	-197	DEC 22	32763	32763	0
JAN 23	5118	4972	146	JAN 23	17118	16980	138
FEB 23	1486	1486	0	FEB 23	15908	15793	115
MAR 23	2598	2496	102	MAR 23	15853	15725	128
APR 23	3818	3848	-30	APR 23	14212	14392	-180
MAY 23	2287	2181	106	MAY 23	13830	13560	269
JUN 23	745	745	0	JUN 23	13418	13387	31
JUL 23	818	818	0	JUL 23	13110	13078	32

Source: CME, ICE



(\$/MMBtu)

Nat Gas Term Structure




	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22
Current Price	\$2.448	\$2.455	\$2.503	\$2.556	\$2.622	\$2.695	\$2.721	\$2.712	\$2.737	\$2.802	\$2.937	\$3.032
Last Week	\$2.737	\$2.696	\$2.695	\$2.724	\$2.787	\$2.856	\$2.874	\$2.860	\$2.879	\$2.933	\$3.058	\$3.147
vs. Last Week	-\$0.289	-\$0.241	-\$0.192	-\$0.168	-\$0.165	-\$0.161	-\$0.153	-\$0.148	-\$0.142	-\$0.131	-\$0.121	-\$0.115
4 Weeks Ago	\$2.518	\$2.512	\$2.498	\$2.518	\$2.535	\$2.587	\$2.651	\$2.677	\$2.671	\$2.701	\$2.768	\$2.893
vs. 4 Weeks Ago	-\$0.070	-\$0.057	\$0.005	\$0.038	\$0.087	\$0.108	\$0.070	\$0.035	\$0.066	\$0.101	\$0.169	\$0.139
Last Year	\$1.893	\$1.870	\$1.908	\$1.968	\$2.039	\$2.111	\$2.138	\$2.132	\$2.166	\$2.272	\$2.464	\$2.571
vs. Last Year	\$0.555	\$0.585	\$0.595	\$0.588	\$0.583	\$0.584	\$0.583	\$0.580	\$0.571	\$0.530	\$0.473	\$0.461

	Units	Current Price	vs. Last Week	vs. 4 Weeks Ago	vs. Last Year
NatGas Jan21/Apr21	\$/MMBtu	0.036	▼ -0.192	▲ 0.036	▲ 0.379
NatGas Mar21/Apr21	\$/MMBtu	0.048	▲ 0.049	▲ 0.068	▼ -0.168
NatGas Oct21/Nov21	\$/MMBtu	0.065	▲ 0.011	▼ -0.002	▼ -0.001
NatGas Apr21/Oct21	\$/MMBtu	0.234	▲ 0.646	▲ 0.417	▼ -0.038
WTI Crude	\$/Bbl	52.20	▼ -0.160	▲ 3.970	▼ -1.990
Brent Crude	\$/Bbl	55.34	▲ 0.240	▲ 4.050	▼ -5.350
Fuel Oil, NY Harbour 1%	\$/Bbl	97.18	▲ 0.000	▲ 0.000	▲ 0.000
Heating Oil	cents/Gallon	157.65	▼ -1.640	▲ 8.650	▼ -15.750
Propane, Mt. Bel	cents/Gallon	0.86	▼ -0.043	▲ 0.222	▲ 0.435
Ethane, Mt. Bel	cents/Gallon	0.23	▼ -0.011	▲ 0.031	▲ 0.081
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						Baker Hughes 
1/22/2021						
U.S. Breakout Information	This Week	+/-	Last Week	+/-	Year Ago	
Oil	289	2	287	-387	676	
Gas	88	3	85	-27	115	
Miscellaneous	1	0	1	-2	3	
Directional	22	0	22	-25	47	
Horizontal	338	6	332	-372	710	
Vertical	18	-1	19	-19	37	
Canada Breakout	This Week	+/-	Last Week	+/-	Year Ago	
Oil	96	6	90	-58	154	
Gas	76	5	71	-14	90	
Major Basin Variances	This Week	+/-	Last Week	+/-	Year Ago	
Ardmore Woodford	0	0	0	-3	3	
Arkoma Woodford	0	0	0	-2	2	
Barnett	1	1	0	0	1	
Cana Woodford	10	0	10	-11	21	
DJ-Niobrara	7	0	7	-12	19	
Eagle Ford	28	0	28	-41	69	
Haynesville	45	1	44	2	43	
Marcellus	30	0	30	-10	40	
Mississippian	0	0	0	-2	2	
Permian	188	-1	189	-217	405	
Utica	5	1	4	-6	11	
Williston	11	1	10	-42	53	