

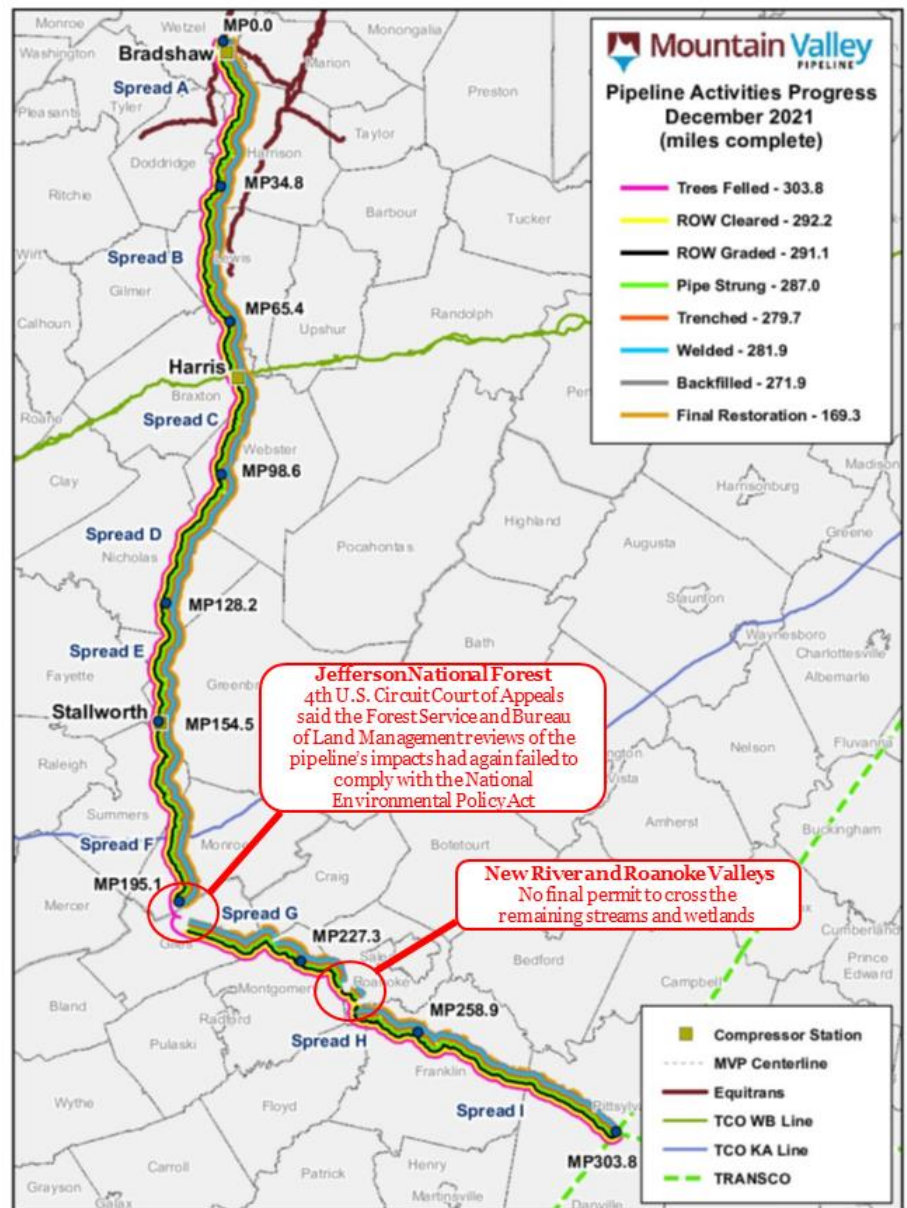
This week review some key updates on two major pipelines that impact global supply.

The first is the Mountain Valley Pipeline (MVP) in the Northeast US. The Mountain Valley Pipeline (MVP) project is a natural gas pipeline system that spans approximately 303 miles from northwestern West Virginia to southern Virginia. With a vast supply of natural gas from Marcellus and Utica shale production, the Mountain Valley Pipeline is expected to provide up to 2 Bcf/d capacity to markets along the Eastern Corridor by connecting to Appalachian production to Transco and Columbia Gas.

MVP once again hit major setback after a federal appeals court tossed out key approvals for the natural gas project. In an unanimous decision, a three-judge panel of the 4th U.S. Circuit Court of Appeals said the Forest Service and Bureau of Land Management reviews of the pipeline's impacts had again failed to comply with the National Environmental Policy Act.

Much of the 303-mile pipeline has been completed expect for a few key areas:

- A 3.5-mile section of the Jefferson National Forest in Giles and Montgomery counties. [from this latest ruling]
- crossing through streams and wetlands in the New River and Roanoke valleys



We should note that the other approvals by the U.S. Fish and Wildlife Service and the FERC are also being challenged in court by opponents of the deeply controversial project.

So after the latest news, it's fair to say that A summer 2022 in-service date is unrealistic. The company had been optimistic to commence the pipeline this year, but this ruling sends the permit back to the Forest Service and BLM for reconsideration. The first time the court did that, in July 2018, it took about two years for the agencies to approve a second permit — which now has also been found lacking by the Fourth Circuit.

Mountain Valley received this Certificate on October 13, 2017 and construction activities began in early 2018. With an estimated 20 linear miles of pipe remaining, MVP's total project work is nearly 94% complete, which includes 55.8% of the right-of-way fully restored.

The next pipeline we discuss is Nordstream 2 which is one of the components raising tensions between the Western and Eastern powers. This past week, Nord Stream 2 launched a German subsidiary Gas for Europe [a to the point name]. The new company will become the owner and operator of the 54-kilometre section of the Nord Stream 2 Pipeline located in the German territorial waters and the landfall facility in Lubmin. The new entity is an independent transmission operator meeting the precondition issued by German regulator BNetzA in November 2021.

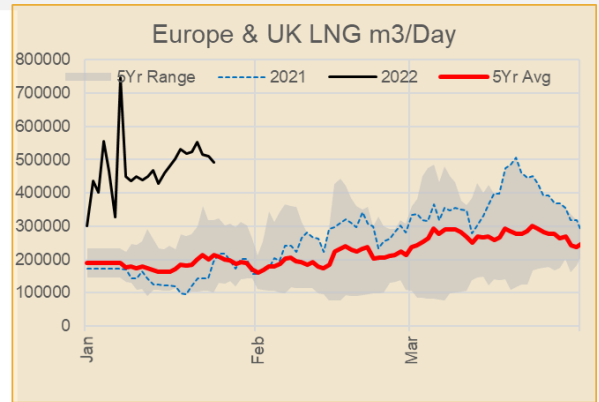
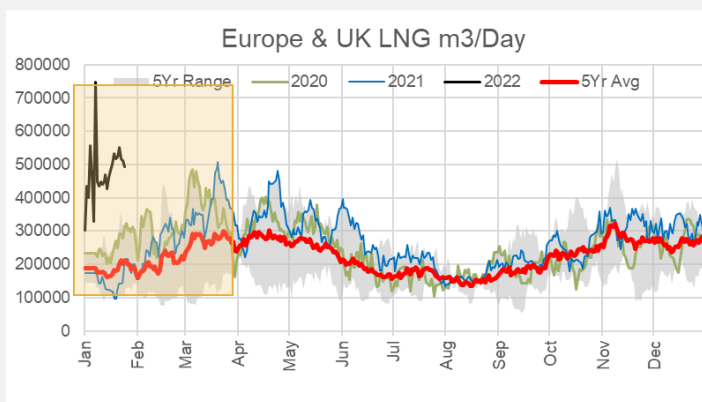


With this latest move, the timeline for the pipeline is still unknown.

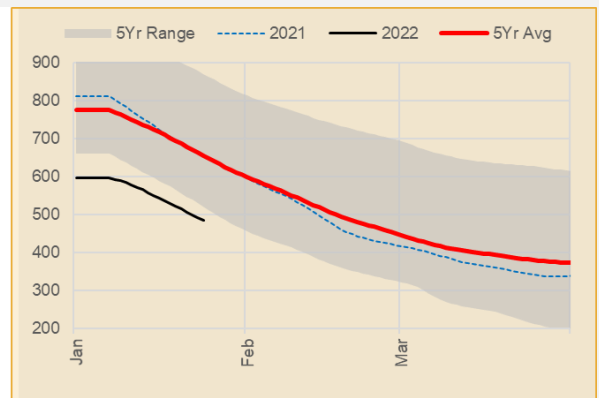
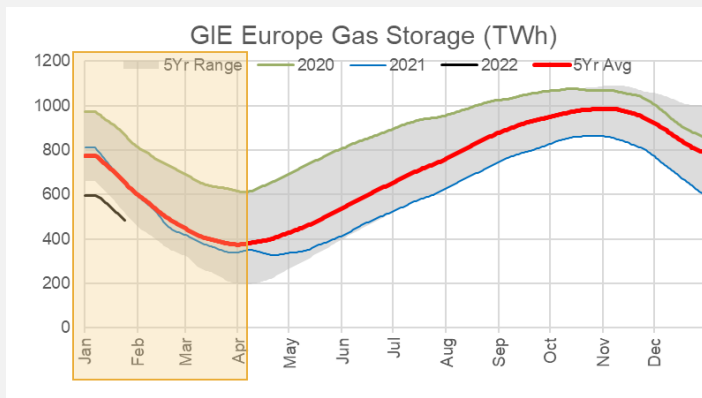
The commencement of this pipeline is adding tensions to the US & Germany relationship. Germany's view is that this is solely a commercial project, but NS2 does have geopolitical consequences. The project allows gas flows to bypasses Ukraine, and potentially cuts them out of the ~\$2B in transit fees that Russia currently pays to send gas through its territory.

The pipeline is also now causing political division within Europe. Ukraine and Poland have opposed the pipeline while other nations are looking for solutions to moderation soaring gas prices. Ukraine's President has asked the US Senate to approve the NS2 sanctions, while Germany has specifically asked that the US Congress not to propose sanctions.

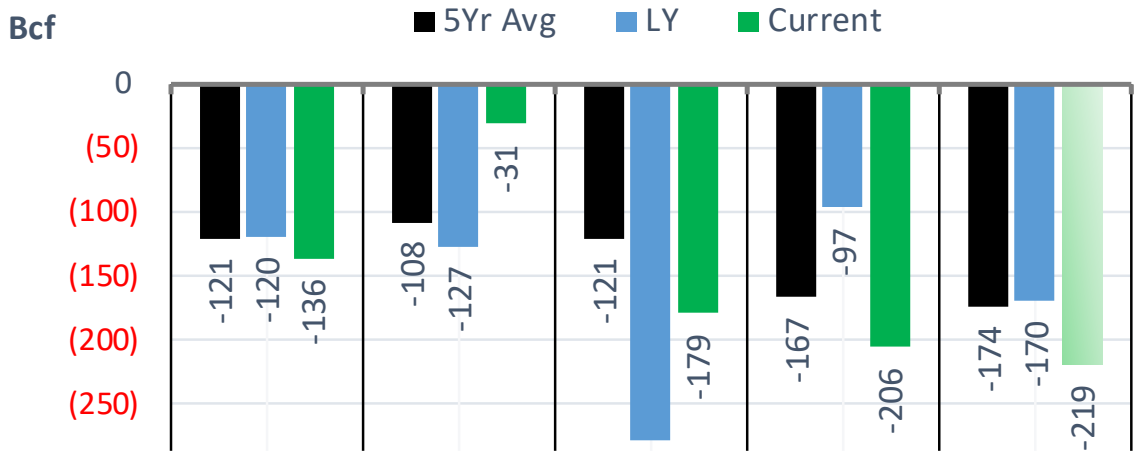
The European markets had been banking on NS2 to provide supply and price relief this winter, but even with the latest move the timeline is unknown. Weather has luckily been on Europe's side this winter with warm temps in the outlook. That along with record level of LNG arriving, it appears Europe will make it through this winter.



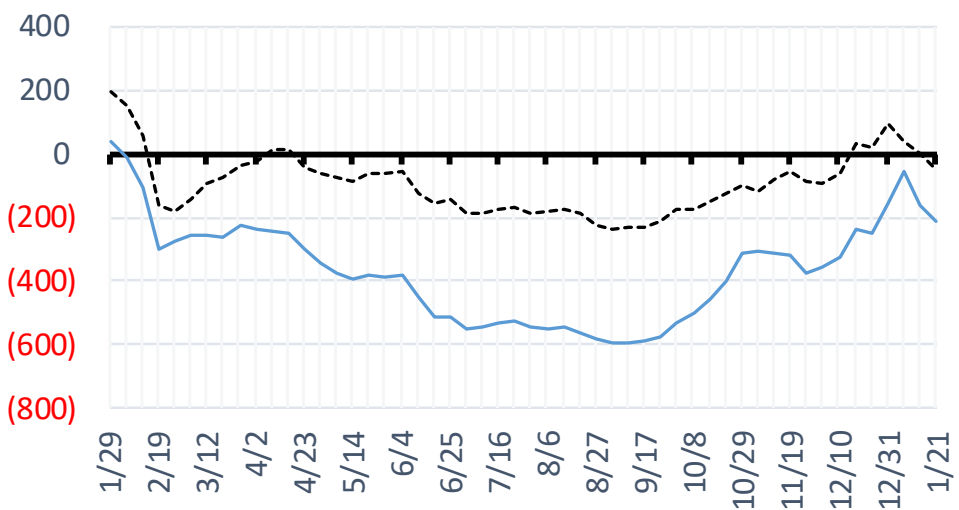
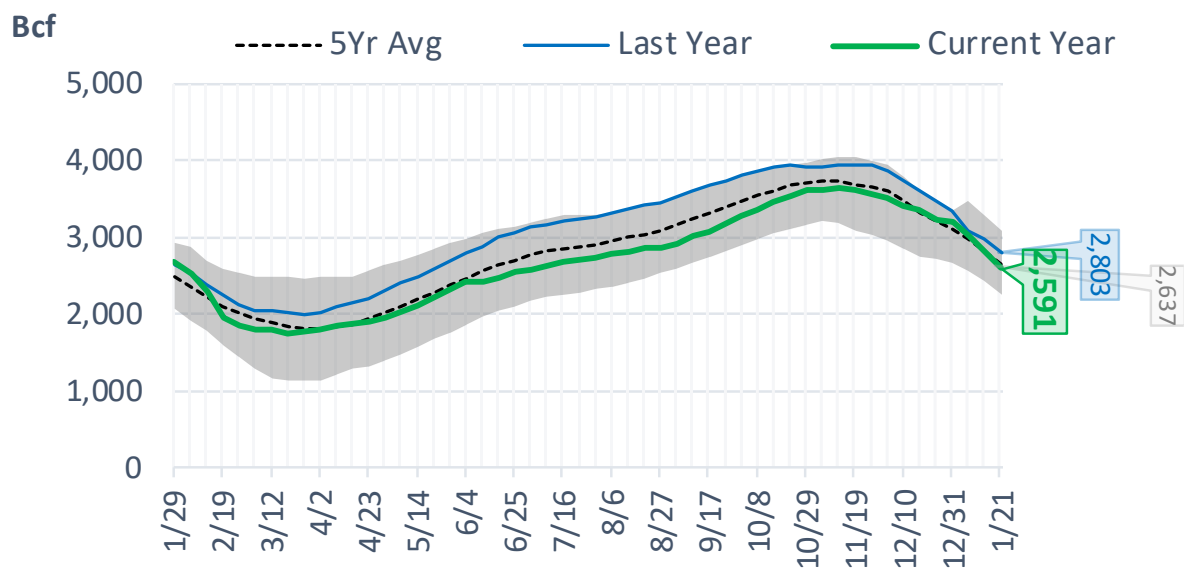
Current European and UK storage levels sit at 42% full, or 15% behind last year.



## Total Lower 48 YoY Weekly Change



## Total Lower 48 Storage Levels



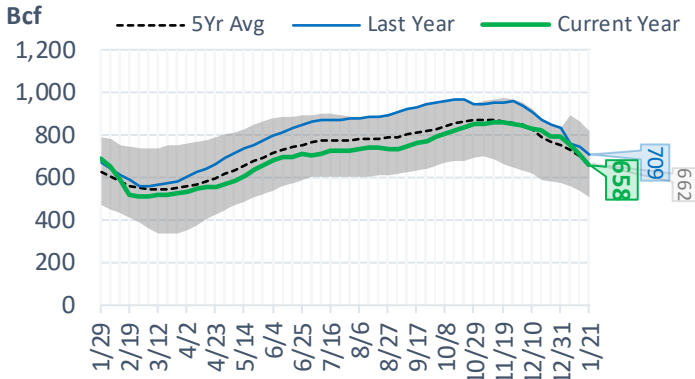
The risk person

## Natural Gas Storage Stats - Last 5 Weeks

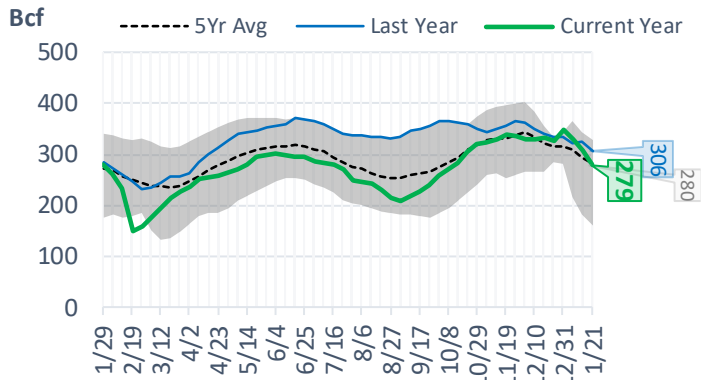
Week Ending	Current 21-Jan	Week - 1 14-Jan	Week - 2 7-Jan	Week - 3 31-Dec	Week - 4 24-Dec	Week - 5 17-Dec
<b>Total Lower 48 Storage Level</b>	<b>2591</b>	2810	3016	3195	3226	3362
<b>Weekly Change</b>	<b>-219</b>	-206	-179	-31	-136	-55
<b>vs LY</b>	<b>-212</b>	-163	-54	-154	-250	-234
<b>vs 5Yr Avg</b>	<b>-46</b>	-1	+38	+96	+19	+34
<b>S. Central Salt Storage Level</b>	<b>279</b>	308	330	347	326	334
<b>Weekly Change</b>	<b>-29</b>	-22	-17	+21	-8	+6
<b>vs LY</b>	<b>-27</b>	-18	+9	+14	-8	-5
<b>vs 5Yr Avg</b>	<b>-1</b>	+15	+22	+32	+11	+13
<b>S. Central NonSalt Storage Level</b>	<b>658</b>	711	759	796	790	820
<b>Weekly Change</b>	<b>-53</b>	-48	-37	+6	-30	-9
<b>vs LY</b>	<b>-51</b>	-31	-2	-37	-62	-55
<b>vs 5Yr Avg</b>	<b>-4</b>	+12	+27	+47	+21	+27
<b>Midwest Storage Level</b>	<b>701</b>	770	835	893	918	963
<b>Weekly Change</b>	<b>-69</b>	-65	-58	-25	-45	-19
<b>vs LY</b>	<b>-75</b>	-55	-26	-37	-61	-58
<b>vs 5Yr Avg</b>	<b>-17</b>	-3	+6	+20	+5	+10
<b>East Storage Level</b>	<b>609</b>	669	730	767	777	809
<b>Weekly Change</b>	<b>-60</b>	-61	-37	-10	-32	-9
<b>vs LY</b>	<b>-46</b>	-33	+3	-4	-38	-40
<b>vs 5Yr Avg</b>	<b>+4</b>	+16	+33	+39	+19	+18
<b>Mountain Storage Level</b>	<b>143</b>	151	159	172	180	188
<b>Weekly Change</b>	<b>-8</b>	-8	-13	-8	-8	-11
<b>vs LY</b>	<b>-2</b>	-3	-3	-25	-25	-26
<b>vs 5Yr Avg</b>	<b>-5</b>	-5	-6	-6	-7	-7
<b>Pacific Storage Level</b>	<b>201</b>	201	204	219	235	247
<b>Weekly Change</b>	<b>0</b>	-3	-15	-16	-12	-14
<b>vs LY</b>	<b>-12</b>	-23	-34	-64	-55	-50
<b>vs 5Yr Avg</b>	<b>-24</b>	-35	-44	-37	-30	-29



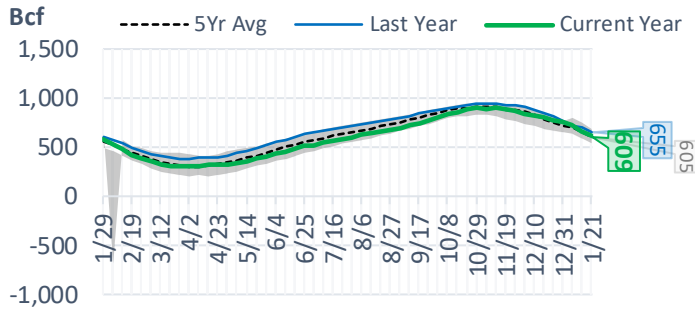
## NonSalt Storage Levels



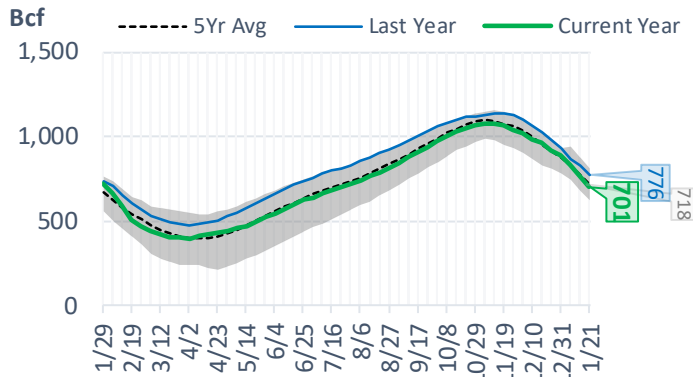
## Salt Storage Levels



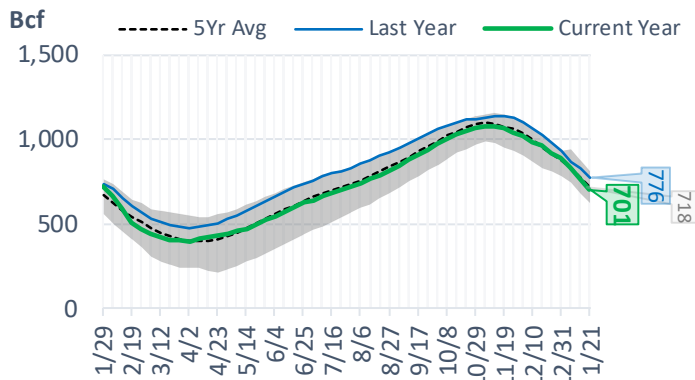
## East Storage Levels



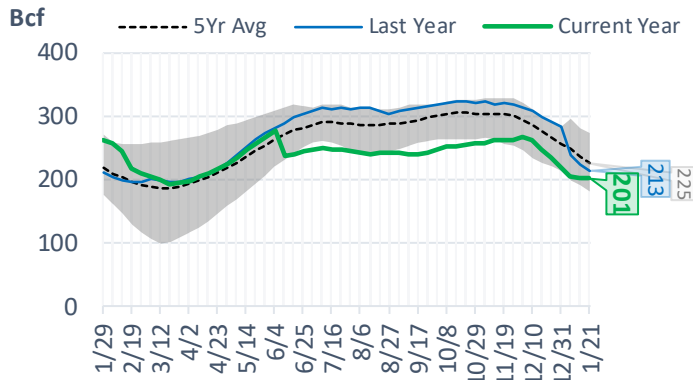
## Midwest Storage Levels



## Midwest Storage Levels



## Pacific Storage Levels



## EIA Storage Week Balances

	24-Dec	31-Dec	7-Jan	14-Jan	21-Jan	28-Jan	WoW	vs. 4W
<b>Lower 48 Dry Production</b>	<b>96.7</b>	<b>98.6</b>	<b>95.3</b>	<b>95.3</b>	<b>95.0</b>	<b>94.7</b>	▼ -0.3	▼ -1.3
<b>Canadian Imports</b>	<b>5.0</b>	<b>4.2</b>	<b>5.7</b>	<b>6.5</b>	<b>7.0</b>	<b>7.1</b>	▲ 0.1	▲ 1.3
L48 Power	29.9	26.4	29.9	30.4	30.3	31.9	▲ 1.6	▲ 2.7
L48 Residential & Commercial	40.3	33.4	44.3	47.5	48.3	53.6	▲ 5.3	▲ 10.2
L48 Industrial	24.0	22.2	26.0	25.7	27.0	27.4	▲ 0.4	▲ 2.1
L48 Lease and Plant Fuel	5.2	5.4	5.2	5.2	5.2	5.2	▼ 0.0	▼ -0.1
L48 Pipeline Distribution	3.5	3.0	3.6	3.8	3.8	4.1	▲ 0.3	▲ 0.6
<b>L48 Regional Gas Consumption</b>	<b>103.0</b>	<b>90.3</b>	<b>109.0</b>	<b>112.6</b>	<b>114.6</b>	<b>122.2</b>	▲ 7.6	▲ 15.6
<b>Net LNG Exports</b>	<b>12.7</b>	<b>12.3</b>	<b>11.9</b>	<b>12.3</b>	<b>12.9</b>	<b>12.5</b>	▼ -0.4	▲ 0.2
<b>Total Mexican Exports</b>	<b>6.1</b>	<b>5.8</b>	<b>5.9</b>	<b>6.3</b>	<b>6.4</b>	<b>6.5</b>	▲ 0.0	▲ 0.3
<b>Implied Daily Storage Activity</b>	<b>-20.0</b>	<b>-5.6</b>	<b>-25.9</b>	<b>-29.5</b>	<b>-31.9</b>	<b>-39.4</b>	-7.4	
<b>EIA Reported Daily Storage Activity</b>	<b>-19.4</b>	<b>-4.4</b>	<b>-25.6</b>	<b>-29.4</b>	<b>-31.3</b>			
<b>Daily Model Error</b>	<b>-0.6</b>	<b>-1.2</b>	<b>-0.4</b>	<b>0.0</b>	<b>-0.6</b>			

## Monthly Balances

	2Yr Ago Jan-20	LY Jan-21	Sep-21	Oct-21	Nov-21	Dec-21	MTD Jan-22	MoM	vs. LY
<b>Lower 48 Dry Production</b>	<b>94.6</b>	<b>91.4</b>	<b>93.4</b>	<b>94.3</b>	<b>95.9</b>	<b>97.0</b>	<b>95.0</b>	▼ -2.0	▲ 3.5
<b>Canadian Imports</b>	<b>4.8</b>	<b>6.3</b>	<b>5.1</b>	<b>5.4</b>	<b>5.3</b>	<b>4.8</b>	<b>6.7</b>	▲ 1.9	▲ 0.4
L48 Power	29.9	28.3	33.1	30.5	28.8	28.4	30.8	▲ 2.4	▲ 2.5
L48 Residential & Commercial	41.7	44.0	8.8	12.5	29.4	34.5	49.1	▲ 14.6	▲ 5.1
L48 Industrial	24.5	23.8	20.2	21.0	22.4	23.3	26.1	▲ 2.8	▲ 2.3
L48 Lease and Plant Fuel	5.1	5.0	5.1	5.2	5.2	5.3	5.2	▼ -0.1	▲ 0.2
L48 Pipeline Distribution	3.6	3.5	2.3	2.4	3.1	3.1	3.9	▲ 0.7	▲ 0.4
<b>L48 Regional Gas Consumption</b>	<b>104.8</b>	<b>104.6</b>	<b>69.4</b>	<b>71.5</b>	<b>88.9</b>	<b>94.5</b>	<b>115.1</b>	▲ 20.5	▲ 10.5
<b>Net LNG Exports</b>	<b>8.4</b>	<b>10.5</b>	<b>10.3</b>	<b>10.6</b>	<b>11.4</b>	<b>12.1</b>	<b>12.4</b>	▲ 0.3	▲ 1.9
<b>Total Mexican Exports</b>	<b>5.1</b>	<b>6.2</b>	<b>6.7</b>	<b>6.6</b>	<b>6.1</b>	<b>6.1</b>	<b>6.3</b>	▲ 0.2	▲ 0.2
<b>Implied Daily Storage Activity</b>	<b>-18.9</b>	<b>-23.5</b>	<b>12.1</b>	<b>11.0</b>	<b>-5.2</b>	<b>-11.0</b>	<b>-32.2</b>		
<b>EIA Reported Daily Storage Activity</b>									
<b>Daily Model Error</b>									

Source: Bloomberg, analytix.ai

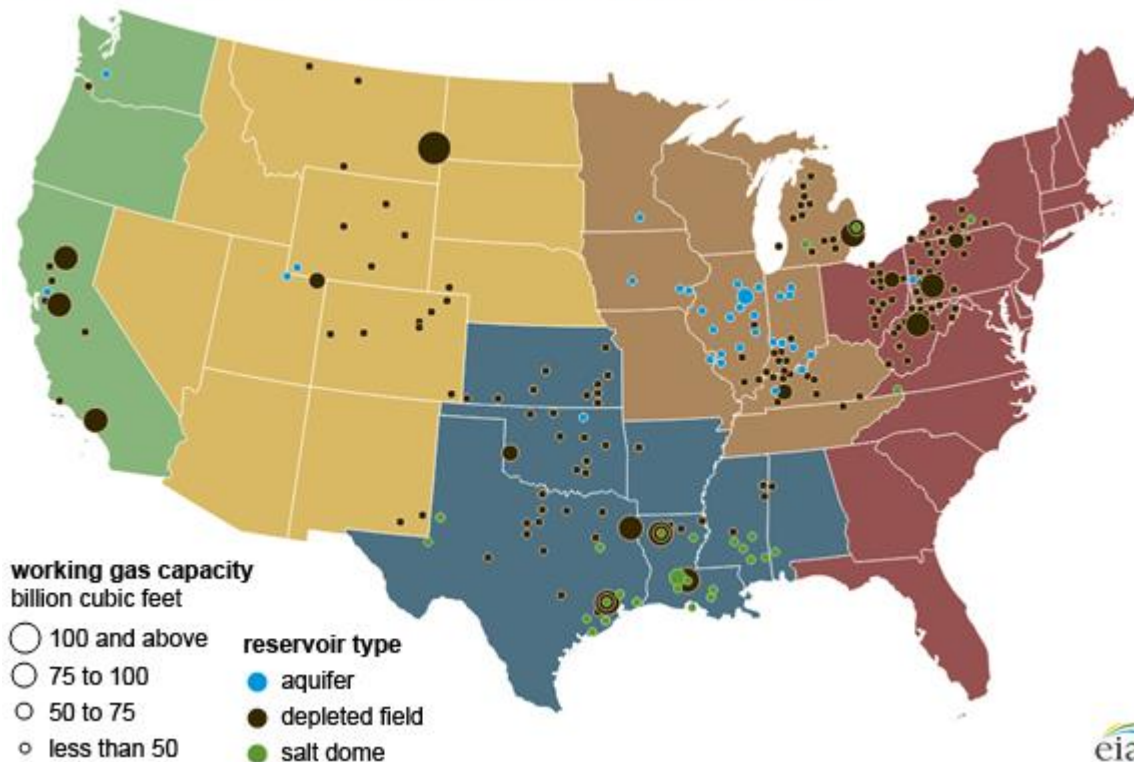
## Regional S/D Models Storage Projection

Week Ending 28-Jan

	Daily Raw Storage	Daily Adjustment Factor	Daily Average Storage Activity (Adjusted) *	Weekly Adjusted Storage Activity
L48	-39.5	0.8	-38.7	-271
East	-12.9	2.5	-10.4	-73
Midwest	-10.7	-0.3	-11.1	-78
Mountain	1.6	-3.0	-1.4	-10
South Central	-17.4	2.1	-15.3	-107
Pacific	-0.2	-0.4	-0.6	-4

\*Adjustment Factor is calculated based on historical regional deltas

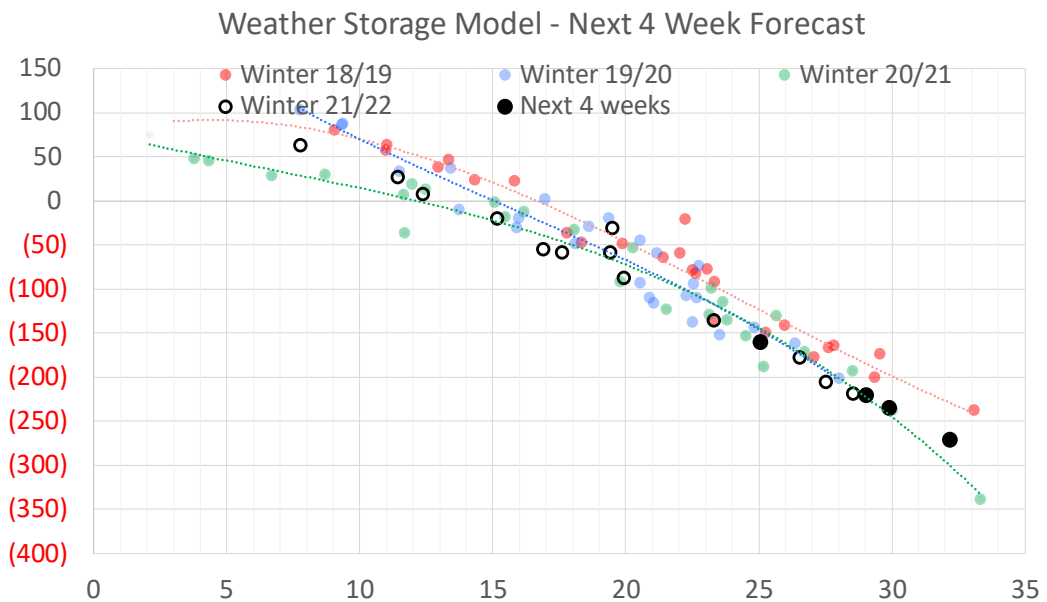
U.S. underground natural gas storage facilities by type (July 2015)





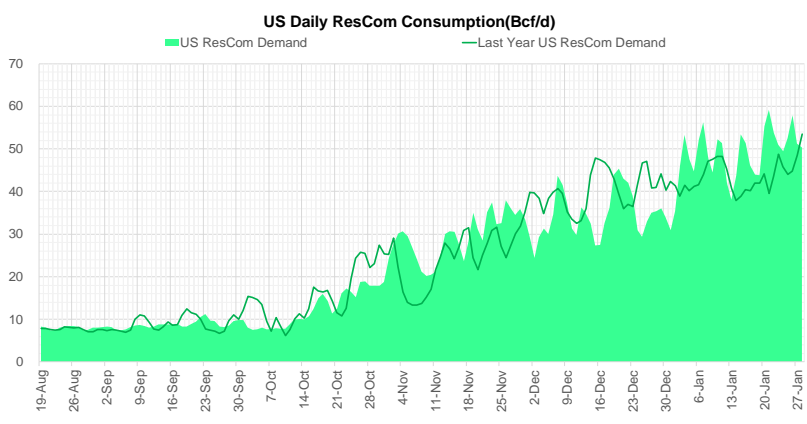
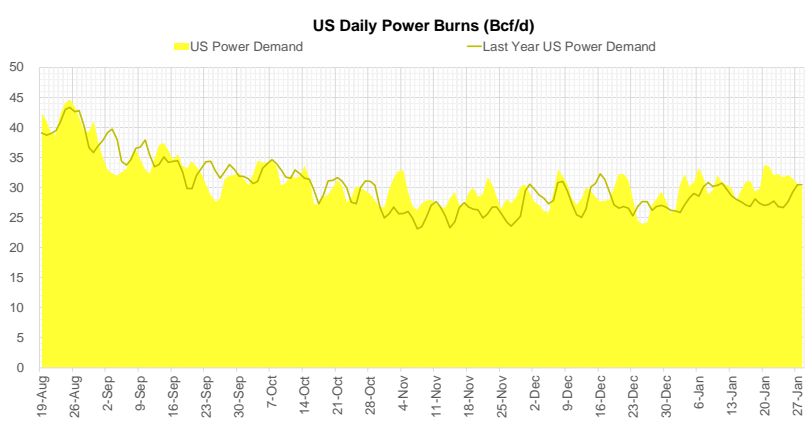
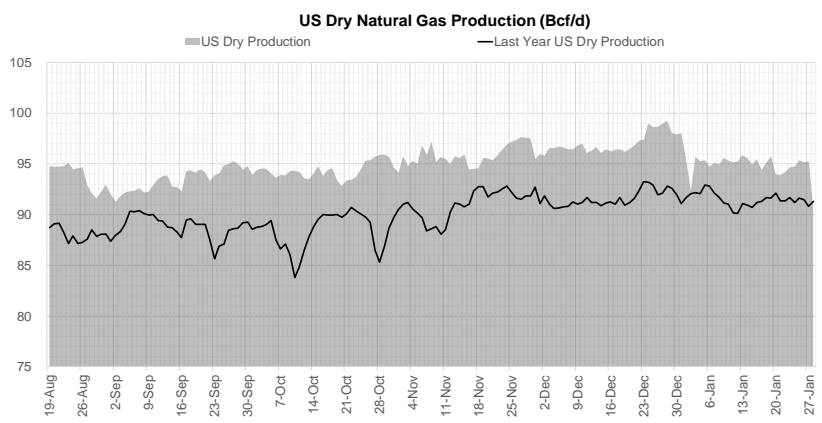
## Weather Model Storage Projection

Next report and beyond		
Week Ending	GWDDs	Week Storage Projection
28-Jan	32	-271
04-Feb	29	-220
11-Feb	30	-234
18-Feb	25	-159



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

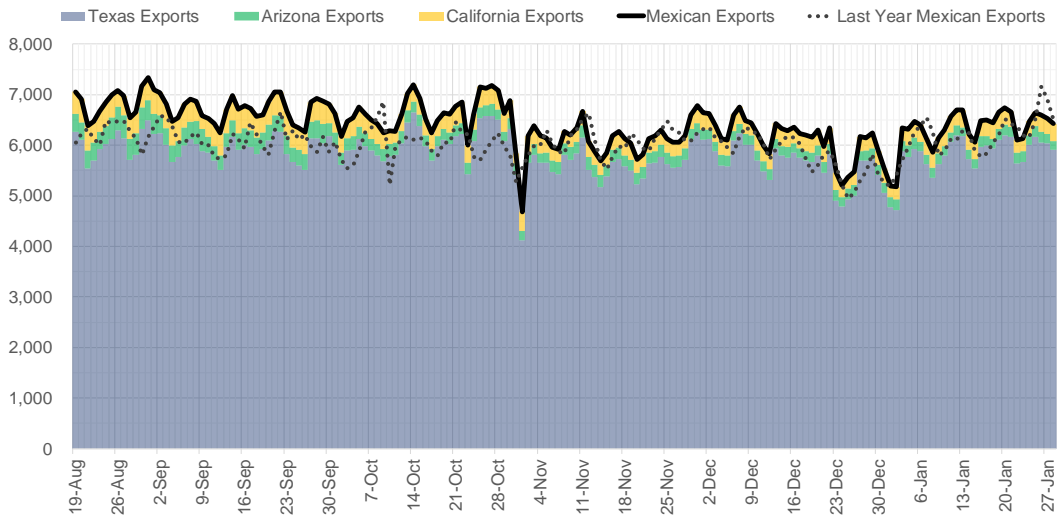
## Supply – Demand Trends



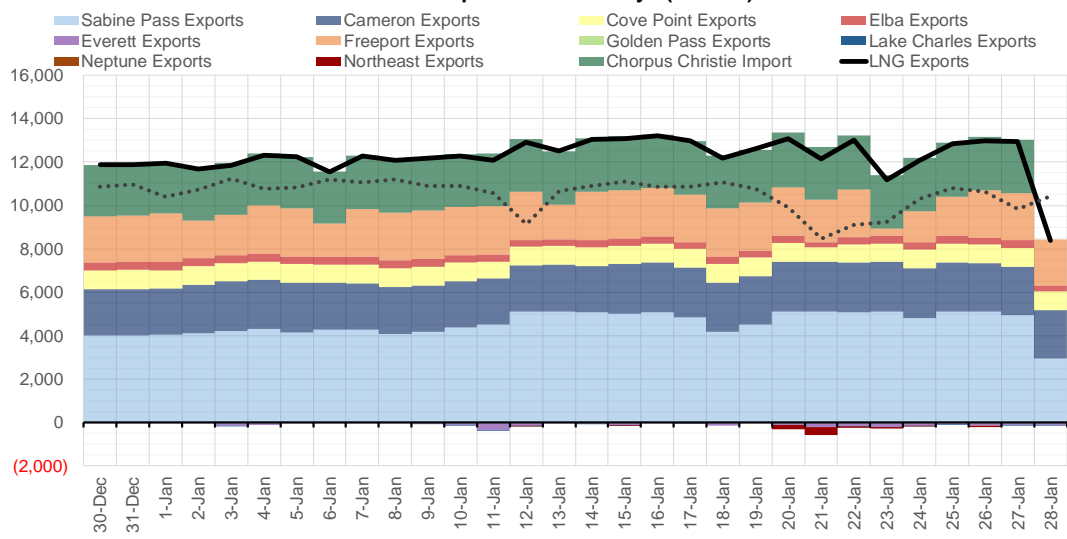
Source: Bloomberg

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

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

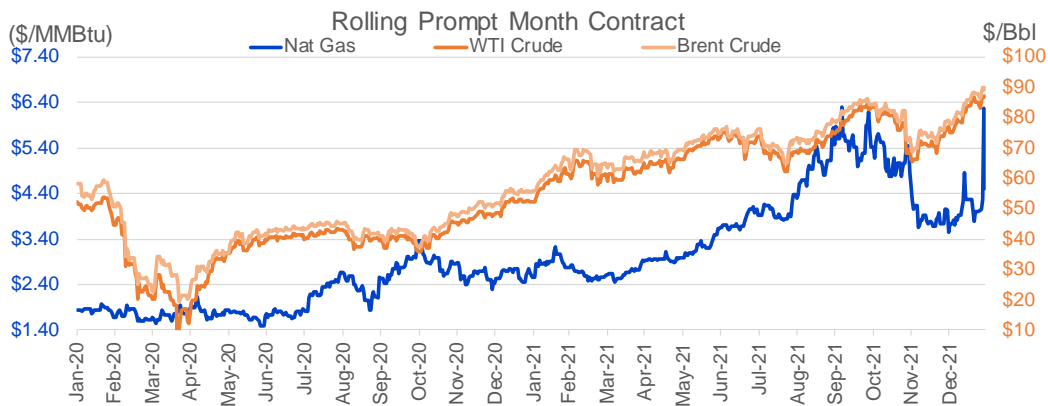
CONTRACT MONTH	CONTRACT YEAR	PUT/CALL	STRIKE	CUMULATIVE VOL	CONTRACT MONTH	CONTRACT YEAR	PUT/CALL	STRIKE	CUMULATIVE OI
3	2022	C	5.00	8205	3	2022	P	3.00	42991
3	2022	C	4.50	6341	3	2022	C	5.00	37348
3	2022	P	3.50	5935	3	2022	C	10.00	35056
3	2022	P	4.00	5752	3	2022	C	8.00	32022
3	2022	P	3.25	4511	3	2022	P	3.50	26552
3	2022	P	3.75	3665	3	2022	P	4.00	24847
3	2022	C	4.75	3544	3	2022	C	4.00	24462
3	2022	C	6.00	2972	3	2022	P	2.50	24078
5	2022	P	3.00	2667	10	2022	C	6.00	23764
5	2022	C	6.00	2600	3	2022	C	6.00	22007
3	2022	P	3.00	2551	12	2022	C	5.00	20447
9	2022	C	6.00	1977	3	2022	P	3.75	20433
10	2022	C	6.00	1925	4	2022	P	3.00	19946
4	2022	C	6.00	1857	4	2022	C	3.00	19710
3	2022	C	8.00	1784	6	2022	C	5.00	19206
4	2022	C	5.50	1741	5	2022	P	3.00	18974
3	2022	P	3.90	1684	3	2022	P	3.25	18843
3	2022	C	4.00	1506	3	2022	C	4.50	17776
3	2022	C	4.25	1393	4	2022	C	5.00	17327
10	2022	C	7.00	1350	4	2022	P	2.50	17277
4	2022	P	3.75	1335	3	2022	C	7.00	16225
6	2022	C	6.00	1200	4	2022	P	3.50	16095
10	2022	P	3.00	1200	5	2022	C	5.00	15318
10	2022	P	3.50	1200	5	2022	P	3.50	15049
5	2022	C	5.50	1193	3	2022	P	2.00	14981
3	2022	C	7.00	1170	4	2022	C	6.00	14636
3	2022	P	4.25	1016	10	2022	C	5.00	14628
8	2022	C	6.00	1015	3	2022	P	2.75	14563
9	2022	C	5.00	1010	4	2022	C	4.00	14273
4	2022	P	4.00	996	10	2022	P	2.00	13921
4	2022	C	5.25	988	3	2022	P	2.25	13916
6	2022	P	3.75	960	12	2022	C	4.50	13737
3	2022	P	3.30	860	5	2022	C	3.00	13733
3	2022	C	9.00	853	3	2022	P	5.00	13589
3	2022	C	5.50	845	3	2022	C	5.50	13507
5	2022	C	5.00	798	10	2022	P	3.00	13466
3	2022	P	3.35	729	6	2022	C	3.00	13438
12	2022	C	4.50	720	3	2022	C	3.50	13353
1	2023	C	4.50	720	6	2022	C	6.00	13282
6	2022	P	3.50	711	3	2022	C	3.00	13281
1	2023	C	5.00	700	7	2022	C	3.00	13230
3	2023	C	4.50	620	8	2022	C	3.00	13226
12	2022	C	5.00	613	9	2022	C	3.00	13225
9	2022	P	2.50	600	10	2022	C	3.00	13114
10	2022	P	2.50	600	9	2022	C	6.00	13106
4	2022	C	4.50	581	5	2022	P	2.50	13008
3	2022	P	4.15	576	7	2022	P	3.00	12848
3	2022	P	3.60	559	5	2022	C	4.00	12497
6	2022	P	3.25	554	10	2022	P	2.50	12152
					6	2022	P	3	12045

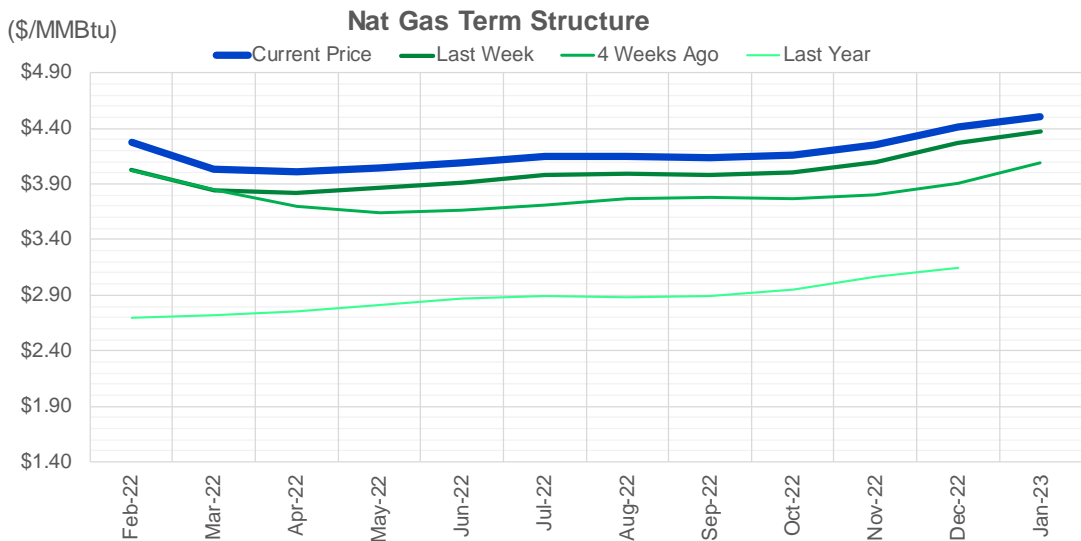
Source: CME, Nasdaq, ICE

## 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
MAR 22	624	5028	-4404	MAR 22	75158	70858	4300
APR 22	277066	272110	4956	APR 22	97092	98798	-1707
MAY 22	86205	83592	2613	MAY 22	75112	74803	309
JUN 22	123494	121119	2375	JUN 22	70675	69694	981
JUL 22	66570	63979	2591	JUL 22	63937	63112	825
AUG 22	66669	64338	2331	AUG 22	61988	62124	-136
SEP 22	41502	40315	1187	SEP 22	58533	57854	679
OCT 22	52727	51017	1710	OCT 22	59752	59362	390
NOV 22	82542	80268	2274	NOV 22	65331	63784	1547
DEC 22	35991	35907	84	DEC 22	53754	53535	219
JAN 23	39987	39247	740	JAN 23	63107	63603	-497
FEB 23	56376	54668	1708	FEB 23	52915	52342	573
MAR 23	17973	17885	88	MAR 23	41745	41061	684
APR 23	33530	32809	721	APR 23	46145	45784	361
MAY 23	34237	33382	855	MAY 23	46324	46025	299
JUN 23	17370	17427	-57	JUN 23	39273	39067	206
JUL 23	11869	11451	418	JUL 23	37270	36828	443
AUG 23	11195	10528	667	AUG 23	36722	36287	435
SEP 23	7131	7139	-8	SEP 23	35813	35638	175
OCT 23	10301	10218	83	OCT 23	36034	35599	435
NOV 23	14882	14117	765	NOV 23	40285	39834	451
DEC 23	9043	8987	56	DEC 23	39603	39443	160
JAN 24	11011	11359	-348	JAN 24	34328	34162	165
FEB 24	8437	8640	-203	FEB 24	24223	24187	36
MAR 24	1927	1755	172	MAR 24	18226	18125	101
APR 24	11504	11503	1	APR 24	24013	23921	92
MAY 24	5305	5464	-159	MAY 24	17275	17248	27
JUN 24	2111	2111	0	JUN 24	17352	17139	214
JUL 24	976	961	15	JUL 24	17294	17249	45
AUG 24	617	602	15	AUG 24	17848	17801	47

Source: CME, ICE






	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23
<b>Current Price</b>	<b>\$4.277</b>	<b>\$4.036</b>	<b>\$4.011</b>	<b>\$4.044</b>	<b>\$4.090</b>	<b>\$4.144</b>	<b>\$4.154</b>	<b>\$4.135</b>	<b>\$4.158</b>	<b>\$4.247</b>	<b>\$4.415</b>	<b>\$4.510</b>
Last Week	\$4.031	\$3.845	\$3.826	\$3.865	\$3.918	\$3.977	\$3.993	\$3.978	\$4.004	\$4.097	\$4.271	\$4.371
vs. Last Week	\$0.246	\$0.191	\$0.185	\$0.179	\$0.172	\$0.167	\$0.161	\$0.157	\$0.154	\$0.150	\$0.144	\$0.139
4 Weeks Ago	\$4.024	\$3.850	\$3.696	\$3.645	\$3.667	\$3.716	\$3.770	\$3.785	\$3.772	\$3.801	\$3.902	\$4.088
vs. 4 Weeks Ago	\$0.253	\$0.186	\$0.315	\$0.399	\$0.423	\$0.428	\$0.384	\$0.350	\$0.386	\$0.446	\$0.513	\$0.422
Last Year	\$2.760	\$2.702	\$2.720	\$2.751	\$2.806	\$2.871	\$2.890	\$2.877	\$2.896	\$2.947	\$3.064	\$3.150
vs. Last Year	\$1.517	\$1.334	\$1.291	\$1.293	\$1.284	\$1.273	\$1.264	\$1.258	\$1.262	\$1.300	\$1.351	\$1.360

	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	▲ 0.306
NatGas Oct21/Jan22	\$/MMBtu	-1.817	▲ 0.000	▲ 0.000	▼ -2.077
NatGas Apr22/Oct22	\$/MMBtu	0.126	▼ -0.060	▼ -0.057	▲ 0.096
WTI Crude	\$/Bbl	86.61	▼ -0.290	▲ 9.620	▲ 34.270
Brent Crude	\$/Bbl	89.34	▲ 0.960	▲ 10.020	▲ 33.810
Fuel Oil, NY Harbour 1%	\$/Bbl	97.18	▲ 0.000	▲ 0.000	▲ 0.000
Heating Oil	cents/Gallon	279.45	▲ 12.270	▲ 39.860	▲ 119.280
Propane, Mt. Bel	cents/Gallon	1.16	▲ 0.005	▲ 0.122	▲ 0.284
Ethane, Mt. Bel	cents/Gallon	0.37	▲ 0.007	▲ 0.037	▲ 0.138
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 
1/28/2022						
U.S. Breakout Information	This Week	+/-	Last Week	+/-	Year Ago	
Oil	495	4	491	200	295	
Gas	115	2	113	27	88	
Miscellaneous	0	0	0	-1	1	
Directional	36	-1	37	18	18	
Horizontal	553	9	544	209	344	
Vertical	21	-2	23	-1	22	
Canada Breakout	This Week	+/-	Last Week	+/-	Year Ago	
Oil	135	1	134	37	98	
Gas	82	4	78	6	76	
Major Basin Variances	This Week	+/-	Last Week	+/-	Year Ago	
Ardmore Woodford	0	-1	1	0	0	
Arkoma Woodford	2	0	2	2	0	
Barnett	2	2	0	1	1	
Cana Woodford	26	0	26	16	10	
DJ-Niobrara	12	0	12	5	7	
Eagle Ford	50	0	50	22	28	
Granite Wash	4	0	4	4	0	
Haynesville	54	1	53	9	45	
Marcellus	34	1	33	4	30	
Mississippian	1	0	1	1	0	
Permian	293	1	292	101	192	
Utica	11	0	11	6	5	
Williston	27	0	27	15	12	