

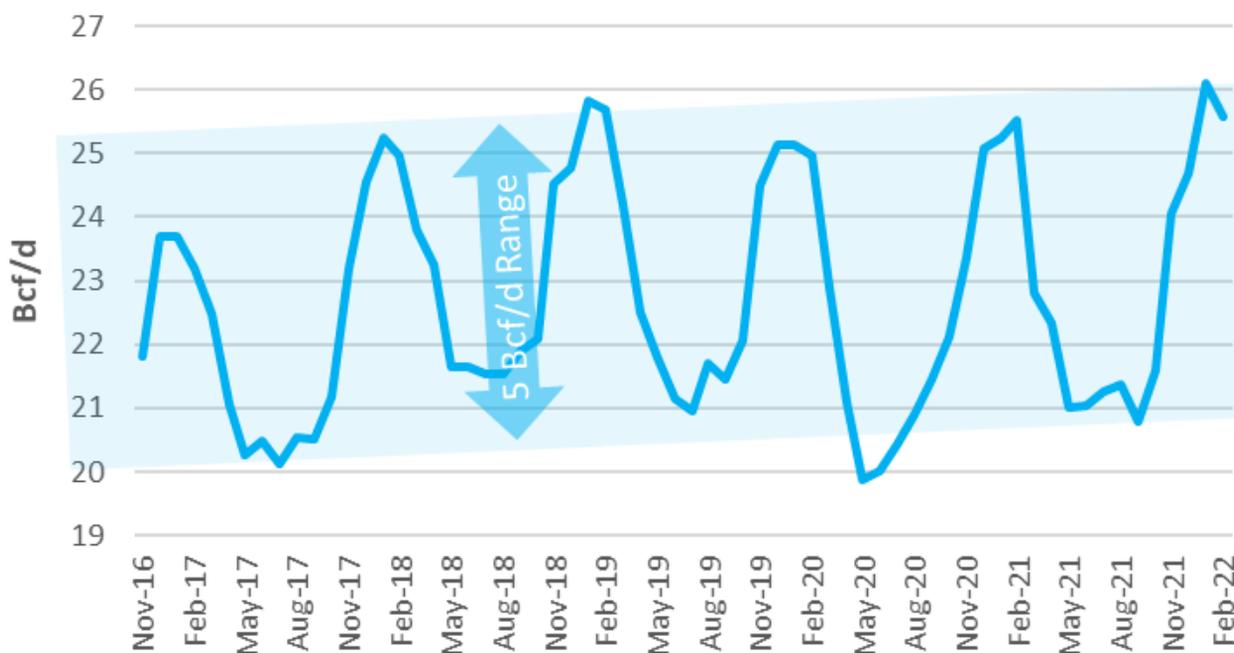
This week we start by looking at industrial natural gas consumption for the current year and see how it compares to past years. Industrial usage accounts for roughly 27% of America's natural gas consumption.

Average Daily Consumption by Sector (Bcf/d)			
	2019	2020	2021
Power	30.9	31.7	30.9
Res	13.8	12.8	12.9
Com	9.7	8.7	9.0
Ind	23.1	22.3	22.5
Other	7.9	7.8	7.9
Total	85.4	83.3	83.1
Ind %	27.0%	26.7%	27.0%

Natural gas has a multitude of industrial uses, including providing feedstock or fuel for products such as plastic, fertilizer, anti-freeze, and fabrics.

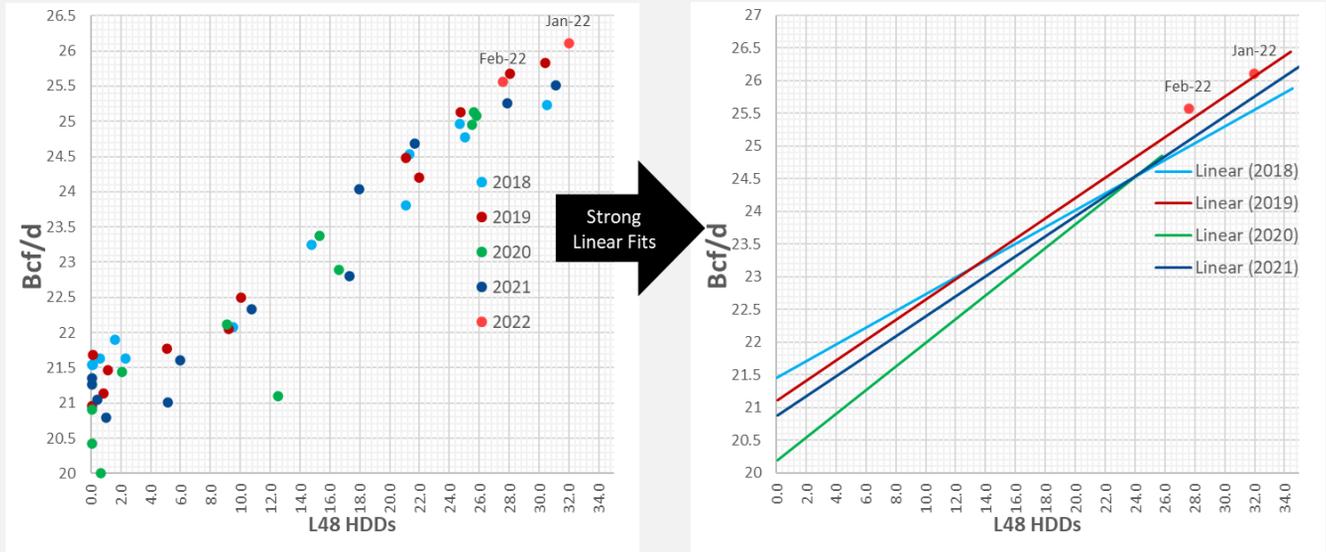
Industrial usage is typically quite steady and predictable. In any given year industrial consumption ranges from ~20 Bcf/d to 26 Bcf/d depending on ambient temperature levels.

L48 Industrial Consumption



Industrial consumption noticeably grows when a large new industrial facility comes online. With

COVID shutdowns over the past few years, we have seen no growth increase from the data. The latest EIA monthly S/D data from the EIA confirms that industrial consumption has finally returned to pre-COVID levels. The chart below shows the first two months of this year lining up with 2019 data points.



This level is roughly 0.5 Bcf/d higher YoY (wx adjusted).

The data shown above is from before the Russia/Ukraine conflict began. Natural gas is a key feedstock for making nitrogen fertilizers such as ammonia, urea, and nitrates. US ammonia/fertilizer production place 3rd globally after China and Russia. Russia supplies 20% of the global seaborne ammonia market, but with the start of the war, their supply has been disrupted pushing fertilizer prices much higher. About 2/3 of Russia’s ammonia production gets to the global market via the Togliatti-Azot pipeline to the Black Sea port of Yuzhny.

According to ICIS, “Russian nitrogen fertilizer major Togliatti confirmed the suspension of the transit of ammonia to the Black Sea port via pipeline to ensure the safety of people living in the vicinity of the lengthy conduit.

The Samara Oblast-based giant also confirmed the shut down of four of its seven ammonia units, with the other three plants operating at reduced rates.”

Oil, gas and ammonia pipelines through Russia into Europe

Selected pipelines through Russia into Europe



SOURCE: Global Fossil Infrastructure Tracker, Global Energy Monitor, Ameropa, ICIS

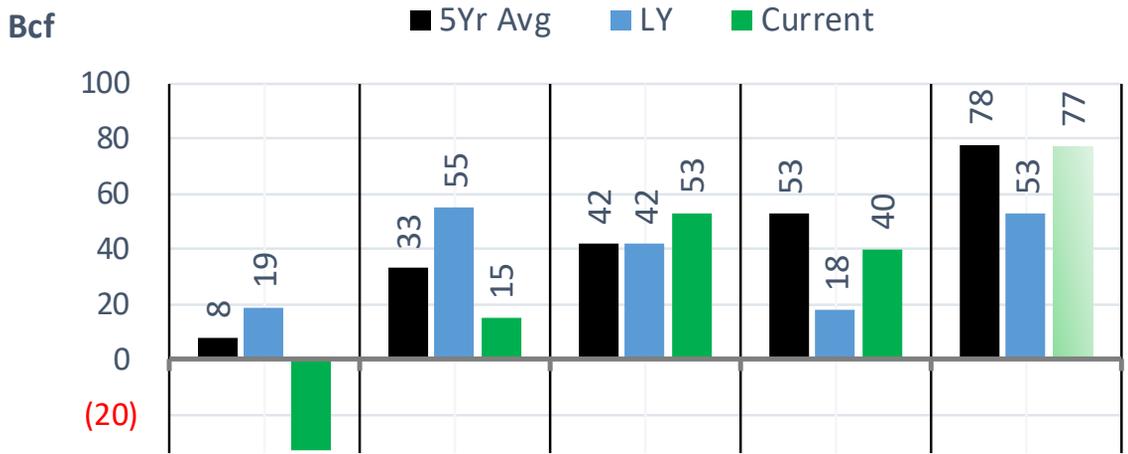
The question raised is whether US ammonia/fertilizer industrial facilities could be ramped up to take advantage of the wide US natgas to global ammonia/fertilizer margins resulting from the lost Russian capacity and global shutdowns of fertilizer plants due to soaring global natural gas prices?

We do not believe so.

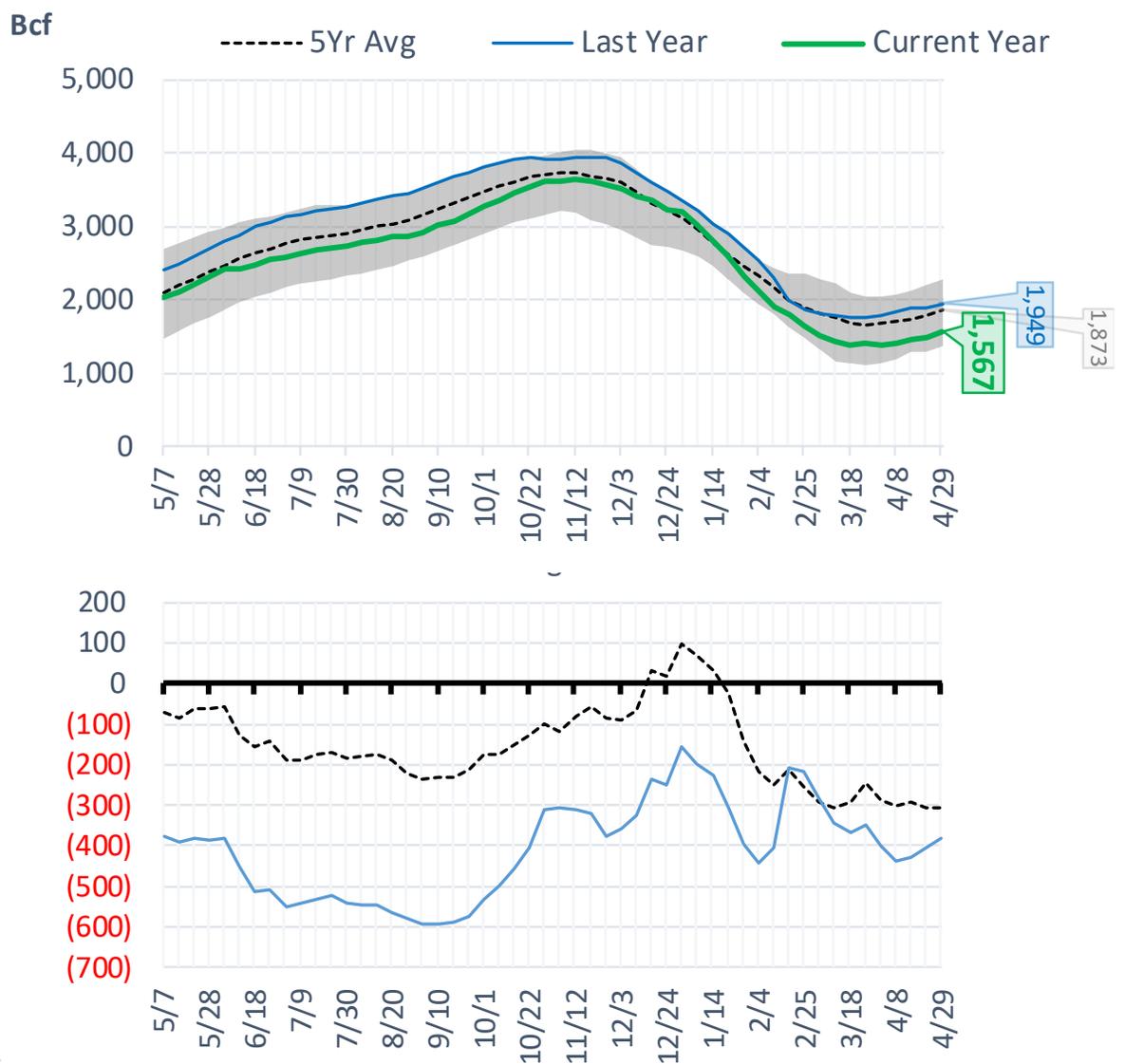
The EIA estimates approximately only 1.5 Bcf/d of natural gas or 6.5% of all US natural gas consumption is used to produce ammonia. So even if there was spare capacity to produce more say 10% more, this would not have a substantial impact on overall industrial gas usage.

For the rest of summer, we have modeled industrial consumption to be in line with 2019 levels using the 10Y normal weather. This gets us to an average of 21.8 Bcf/d vs 21.3 Bcf/d LY.

Total Lower 48 YoY Weekly Change



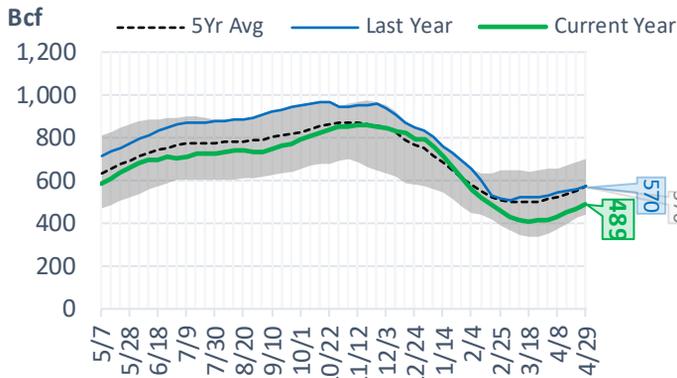
Total Lower 48 Storage Levels



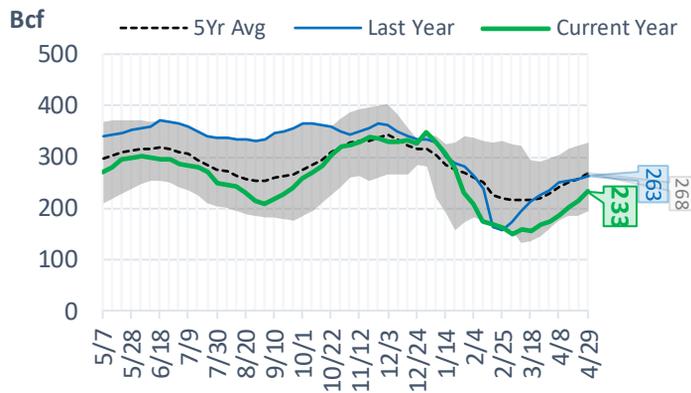
Natural Gas Storage Stats - Last 5 Weeks

Week Ending	Current 29-Apr	Week - 1 22-Apr	Week - 2 15-Apr	Week - 3 8-Apr	Week - 4 1-Apr	Week - 5 25-Mar
Total Lower 48 Storage Level	1567	1490	1450	1397	1382	1415
Weekly Change	+77	+40	+53	+15	-33	+26
vs LY	-382	-406	-428	-439	-399	-347
vs 5Yr Avg	-306	-305	-292	-303	-285	-244
S. Central Salt Storage Level	233	215	201	186	173	169
Weekly Change	+18	+14	+15	+13	+4	+13
vs LY	-30	-43	-54	-63	-61	-55
vs 5Yr Avg	-35	-42	-48	-54	-56	-51
S. Central NonSalt Storage Level	489	467	449	431	416	412
Weekly Change	+22	+18	+18	+15	+4	+8
vs LY	-81	-90	-104	-114	-116	-110
vs 5Yr Avg	-81	-83	-87	-92	-95	-89
Midwest Storage Level	324	309	304	293	296	317
Weekly Change	+15	+5	+11	-3	-21	-1
vs LY	-116	-117	-116	-119	-102	-85
vs 5Yr Avg	-77	-76	-72	-79	-75	-61
East Storage Level	253	238	238	229	241	268
Weekly Change	+15	0	+9	-12	-27	0
vs LY	-77	-82	-85	-81	-64	-39
vs 5Yr Avg	-66	-63	-52	-52	-37	-17
Mountain Storage Level	92	90	89	90	91	89
Weekly Change	+2	+1	-1	-1	+2	+2
vs LY	-31	-29	-29	-28	-24	-23
vs 5Yr Avg	-18	-15	-13	-10	-9	-10
Pacific Storage Level	176	171	169	169	165	161
Weekly Change	+5	+2	0	+4	+4	+4
vs LY	-47	-45	-40	-35	-32	-33
vs 5Yr Avg	-29	-26	-21	-16	-15	-14

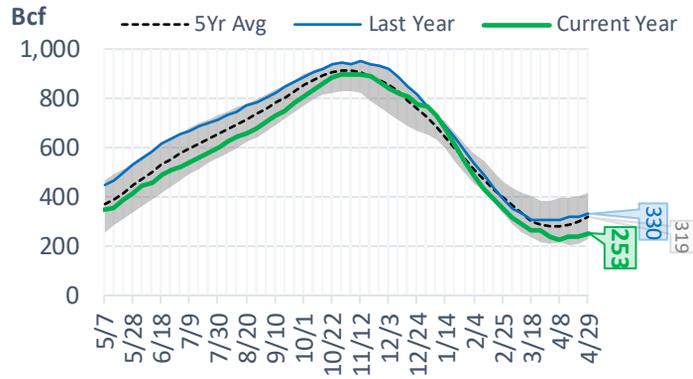
NonSalt Storage Levels



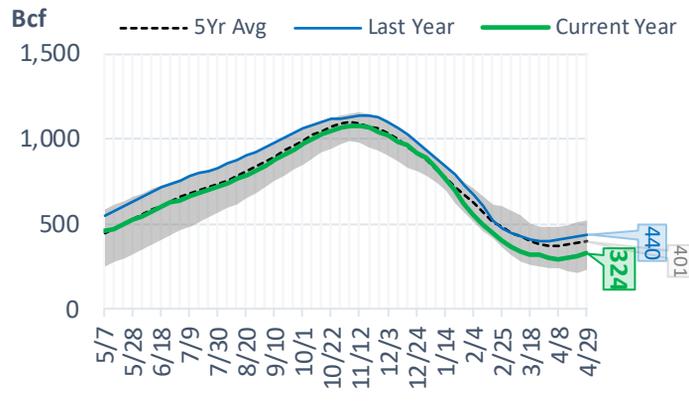
Salt Storage Levels



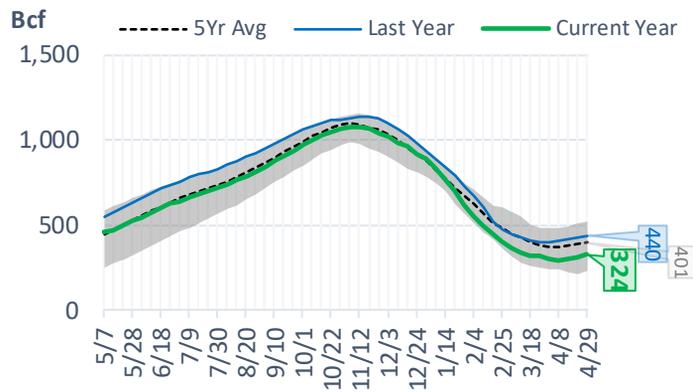
East Storage Levels



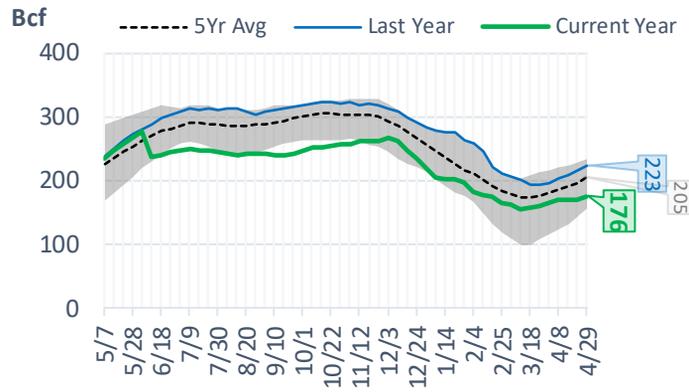
Midwest Storage Levels



Midwest Storage Levels



Pacific Storage Levels



EIA Storage Week Balances

	1-Apr	8-Apr	15-Apr	22-Apr	29-Apr	6-May	WoW	vs. 4W
Lower 48 Dry Production	96.0	95.8	96.4	96.7	95.8	95.9	▲ 0.0	▼ -0.3
Canadian Imports	5.7	5.8	5.6	5.8	6.1	6.0	▼ -0.2	▲ 0.1
L48 Power	25.5	25.0	24.6	25.1	25.0	26.5	▲ 1.5	▲ 1.6
L48 Residential & Commercial	30.8	25.2	22.4	24.1	18.5	16.6	▼ -1.9	▼ -6.0
L48 Industrial	22.9	22.5	21.7	21.9	21.9	21.5	▼ -0.4	▼ -0.5
L48 Lease and Plant Fuel	5.2	5.2	5.3	5.3	5.2	5.2	▼ 0.0	▼ 0.0
L48 Pipeline Distribution	2.9	2.8	2.6	2.7	2.4	2.4	▲ 0.0	▼ -0.2
L48 Regional Gas Consumption	87.3	80.7	76.5	79.1	73.1	72.2	▼ -0.9	▼ -5.1
Net LNG Exports	13.1	12.4	12.5	12.1	12.2	12.2	▼ -0.1	▼ -0.2
Total Mexican Exports	6.4	6.8	6.6	6.7	6.9	6.9	▼ 0.0	▲ 0.2
Implied Daily Storage Activity	-5.1	1.7	6.5	4.7	9.8	10.6	0.8	
EIA Reported Daily Storage Activity	-4.7	2.1	7.6	5.7	11.0			
Daily Model Error	-0.4	-0.4	-1.1	-1.0	-1.2			

Monthly Balances

	2Yr Ago	LY					MTD		
	May-20	May-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	MoM	vs. LY
Lower 48 Dry Production	87.0	93.0	93.4	92.7	95.0	96.2	95.7	▼ -0.5	▲ 2.8
Canadian Imports	3.9	4.5	6.7	6.6	5.2	5.8	6.0	▲ 0.2	▲ 1.5
L48 Power	26.9	26.5	31.5	28.9	25.6	24.8	27.7	▲ 2.9	▲ 1.2
L48 Residential & Commercial	12.8	12.8	49.1	44.4	30.7	22.2	16.3	▼ -5.9	▲ 3.5
L48 Industrial	19.4	20.9	24.7	22.5	21.8	22.0	21.5	▼ -0.4	▲ 0.6
L48 Lease and Plant Fuel	4.7	5.0	5.1	5.1	5.2	5.3	5.2	▼ -0.1	▲ 0.1
L48 Pipeline Distribution	2.2	2.2	3.8	3.6	2.9	2.6	2.5	▼ -0.1	▲ 0.3
L48 Regional Gas Consumption	65.9	67.5	114.3	104.4	86.2	76.8	73.2	▼ -3.6	▲ 5.8
Net LNG Exports	6.7	10.8	12.4	12.4	12.9	12.3	12.2	▼ 0.0	▲ 1.4
Total Mexican Exports	4.8	6.8	6.3	6.2	6.5	6.7	6.9	▲ 0.2	▲ 0.1
Implied Daily Storage Activity	13.6	12.4	-32.9	-23.7	-5.4	6.2	9.3		
EIA Reported Daily Storage Activity									
Daily Model Error									

Source: Bloomberg, analytix.ai

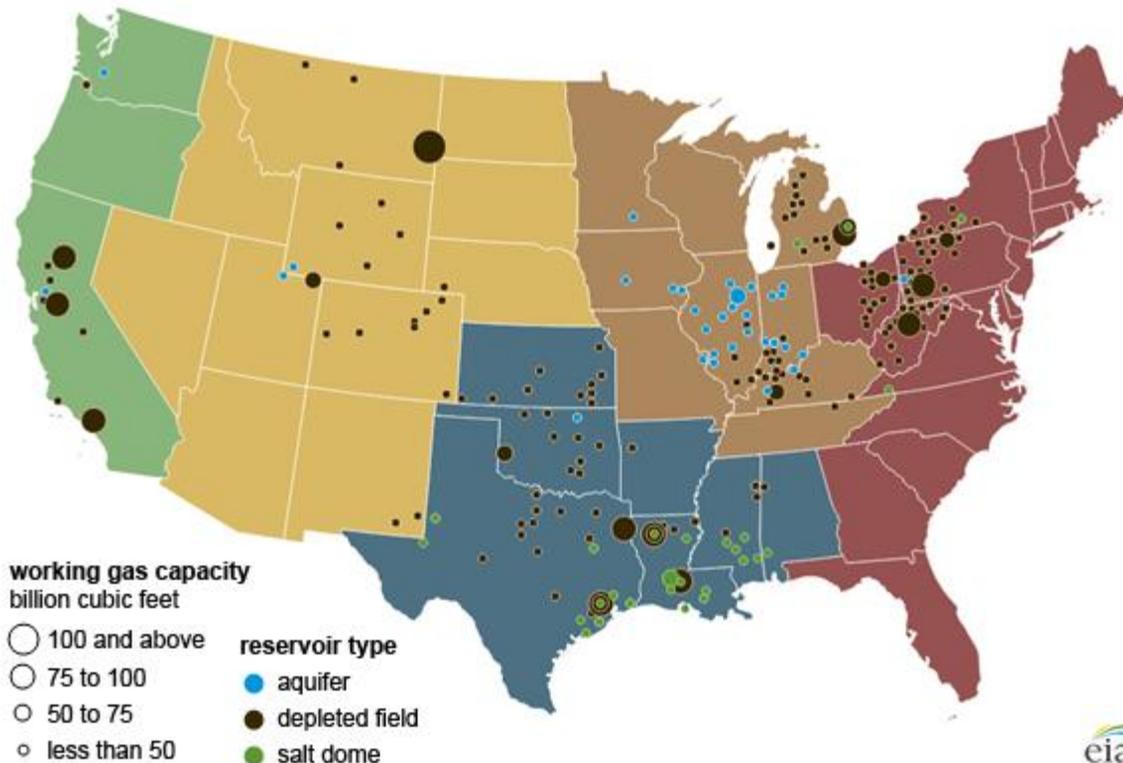
Regional S/D Models Storage Projection

Week Ending 6-May

	Daily Raw Storage	Daily Adjustment Factor	Daily Average Storage Activity (Adjusted) *	Weekly Adjusted Storage Activity
L48	11.2	0.5	11.8	82
East	0.2	2.3	2.4	17
Midwest	3.3	-0.3	3.0	21
Mountain	3.9	-3.5	0.4	3
South Central	2.1	2.7	4.9	34
Pacific	1.7	-0.7	1.0	7

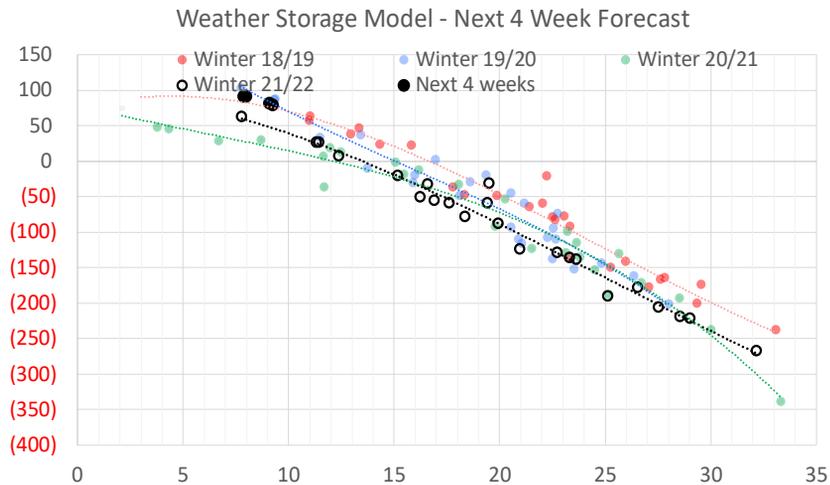
*Adjustment Factor is calculated based on historical regional deltas

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



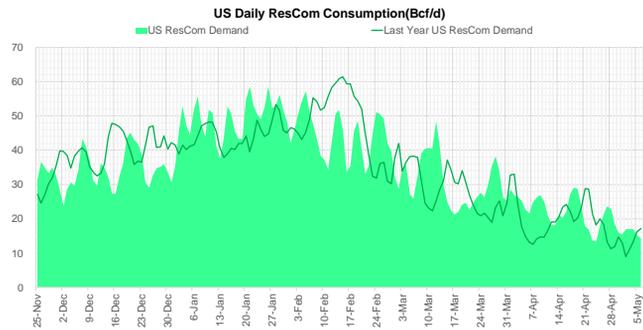
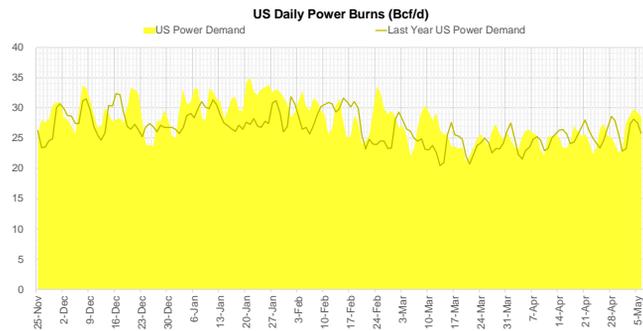
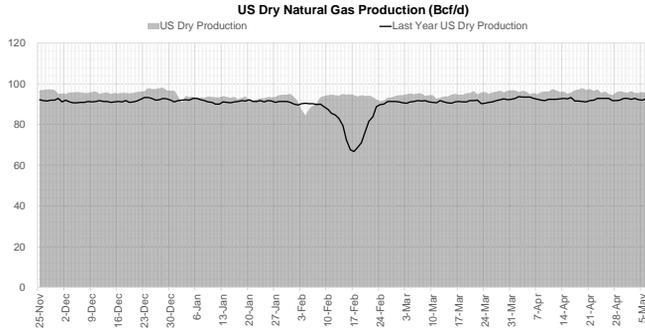
Weather Model Storage Projection

Next report and beyond		
Week Ending	TDDs	Week Storage Projection
06-May	9.1	82
13-May	9.2	80
20-May	7.8	93
27-May	7.9	93



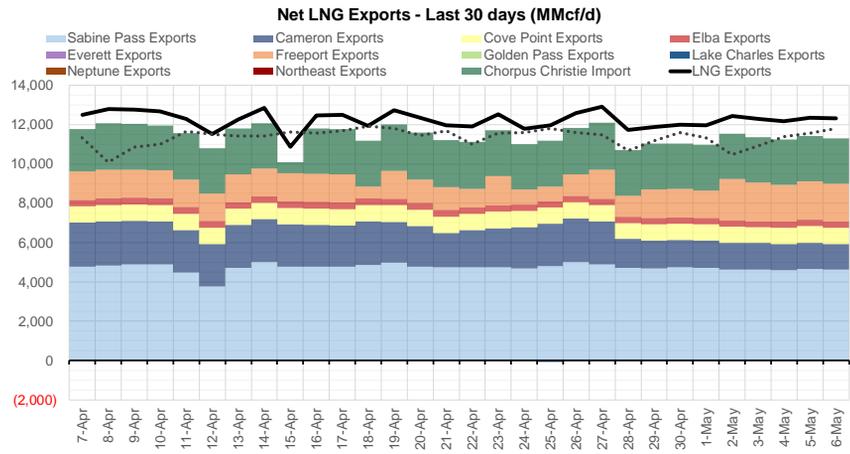
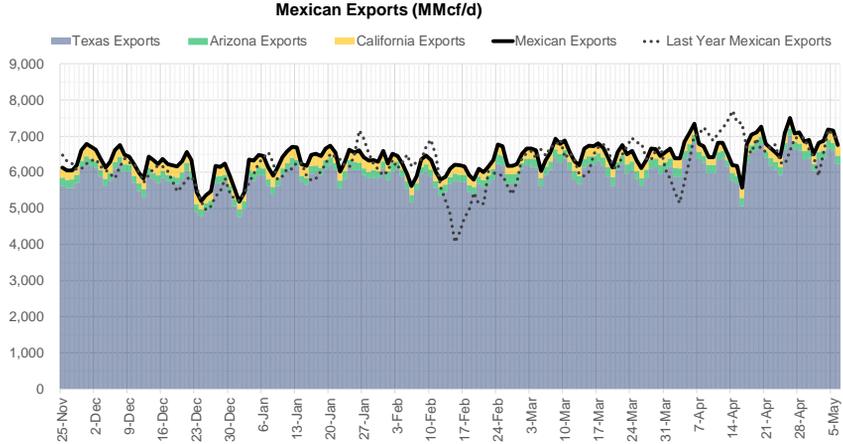
Note: this is not our official end of season forecast. This chart signifies where storage levels end with 10-year normal weather and current market tightness relative to last year

Supply – Demand Trends



Source: Bloomberg

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Source: Bloomberg

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Nat Gas Options Volume and Open Interest CME and ICE data combined

CONTRACT MONTH	CONTRACT YEAR	PUT/CALL	STRIKE	CUMULATIVE VOL	CONTRACT MONTH	CONTRACT YEAR	PUT/CALL	STRIKE	CUMULATIVE OI
6	2022	C	10.00	3418	8	2022	C	10.00	54157
7	2022	P	6.00	3389	8	2022	C	10.50	45125
7	2022	P	7.00	3328	10	2022	C	6.00	34882
6	2022	P	6.00	2797	10	2022	C	5.00	25524
6	2022	C	12.00	2780	6	2022	C	6.00	25146
8	2022	C	10.00	2627	9	2022	C	6.00	23730
7	2022	C	9.00	2597	10	2022	P	3.00	20975
10	2022	C	12.00	2350	6	2022	C	10.00	20793
7	2022	C	10.00	2274	6	2022	P	4.00	20397
2	2023	C	9.00	2189	7	2022	C	8.00	20215
7	2022	P	6.50	2027	10	2022	P	3.50	20204
6	2022	C	9.00	1863	8	2022	C	6.00	19669
10	2022	C	10.00	1821	10	2022	P	2.50	19254
10	2022	P	5.00	1716	6	2022	C	7.00	19238
7	2022	P	7.25	1703	7	2022	C	6.00	19029
9	2022	P	6.00	1678	6	2022	P	6.00	18815
7	2022	C	8.00	1552	12	2022	C	5.00	18221
8	2022	P	5.50	1518	8	2022	C	7.00	18139
7	2022	P	7.50	1444	6	2022	P	4.75	17971
11	2022	P	5.00	1325	6	2022	C	5.00	17862
8	2022	C	10.50	1250	9	2022	C	7.00	17849
7	2022	C	7.50	1245	7	2022	C	7.00	17773
6	2022	P	6.50	1236	7	2022	P	3.25	17645
7	2022	P	5.00	1191	6	2022	P	5.50	17572
8	2022	P	6.50	1093	9	2022	C	10.00	17464
6	2022	C	11.75	1068	10	2022	P	6.00	17302
8	2022	P	6.00	1051	10	2022	P	2.00	17263
8	2022	C	9.50	944	6	2022	P	3.00	17223
7	2022	C	11.00	940	7	2022	C	10.00	17048
11	2022	P	6.00	915	6	2022	P	7.00	16925
10	2022	P	6.00	900	10	2022	P	4.00	16309
2	2023	C	11.00	900	1	2023	C	10.00	16063
6	2022	C	11.00	881	6	2022	P	3.50	15957
6	2022	P	8.00	875	6	2022	C	9.00	15837
6	2022	P	7.00	803	2	2023	C	10.00	15694
11	2022	C	20.00	800	11	2022	P	4.00	15371
6	2022	P	7.50	793	9	2022	P	2.50	15291
7	2022	C	15.00	730	5	2023	P	2.00	15236
8	2022	C	9.00	724	6	2022	P	5.00	15152
8	2022	C	12.00	710	9	2022	P	2.75	14933
7	2022	C	12.50	702	7	2022	P	3.50	14931
2	2023	C	10.00	685	7	2022	P	3.00	14550
10	2022	C	8.50	672	8	2022	P	3.00	14503
6	2022	C	15.00	652	9	2022	P	3.00	14391
8	2022	P	5.00	652	7	2022	C	9.00	14322
1	2023	P	7.50	650	6	2022	P	3.75	14266
2	2023	P	7.50	650	10	2022	P	3.25	14249
3	2023	P	7.50	650	3	2023	C	10.00	14041
6	2022	P	5.50	645	8	2022	C	9.00	14033
					7	2022	P	5	13951

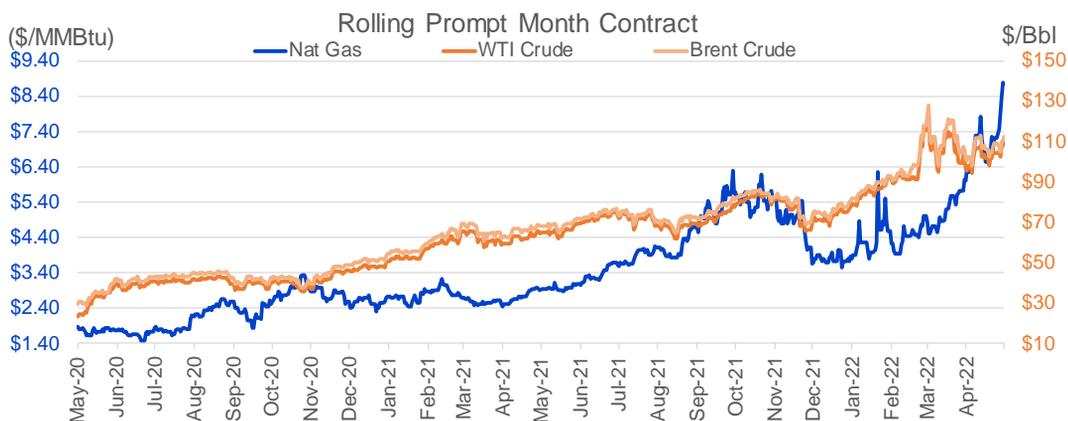
Source: CME, ICE

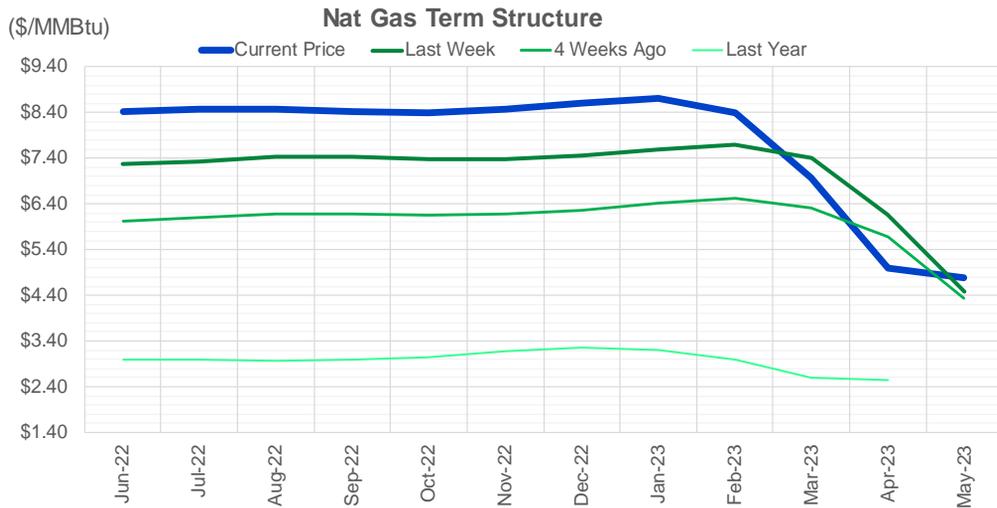
Nat Gas Futures Open Interest

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
JUN 22	121420	122561	-1141	JUN 22	82988	83746	-758
JUL 22	175102	172843	2259	JUL 22	74023	74435	-412
AUG 22	59623	58656	967	AUG 22	59449	61695	-2246
SEP 22	86862	88486	-1624	SEP 22	66033	66549	-516
OCT 22	99312	97584	1728	OCT 22	76893	76746	146
NOV 22	46584	46165	419	NOV 22	58878	59170	-292
DEC 22	47806	47422	384	DEC 22	62772	63202	-431
JAN 23	65327	65727	-400	JAN 23	65814	65991	-177
FEB 23	27055	26600	455	FEB 23	56459	55798	661
MAR 23	40224	38879	1345	MAR 23	55312	54797	515
APR 23	58152	59056	-904	APR 23	53552	53036	516
MAY 23	62036	60266	1770	MAY 23	51794	49354	2440
JUN 23	23796	22704	1092	JUN 23	44546	44302	244
JUL 23	20503	19366	1137	JUL 23	43927	43644	282
AUG 23	13735	13617	118	AUG 23	43686	43465	221
SEP 23	18511	17943	568	SEP 23	43121	42842	279
OCT 23	33247	33965	-718	OCT 23	49748	50109	-362
NOV 23	12828	12326	502	NOV 23	43536	43299	237
DEC 23	13462	13473	-11	DEC 23	39784	39560	223
JAN 24	20235	20682	-447	JAN 24	38019	37891	128
FEB 24	5897	5914	-17	FEB 24	26011	25498	513
MAR 24	14762	14817	-55	MAR 24	30440	30358	82
APR 24	11178	11135	43	APR 24	26028	25901	127
MAY 24	6364	6362	2	MAY 24	25540	25455	85
JUN 24	1867	1862	5	JUN 24	22026	21943	83
JUL 24	1936	1948	-12	JUL 24	22106	22043	63
AUG 24	3117	3144	-27	AUG 24	22218	22156	63
SEP 24	1403	1397	6	SEP 24	21604	21544	61
OCT 24	6671	6661	10	OCT 24	23936	23921	15
NOV 24	4828	4844	-16	NOV 24	22361	22306	55

Source: CME, ICE





	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23
Current Price	\$8.415	\$8.472	\$8.461	\$8.412	\$8.407	\$8.463	\$8.600	\$8.703	\$8.392	\$6.968	\$4.988	\$4.796
Last Week	\$7.267	\$7.339	\$7.436	\$7.435	\$7.385	\$7.387	\$7.456	\$7.589	\$7.692	\$7.405	\$6.165	\$4.470
vs. Last Week	\$1.148	\$1.133	\$1.025	\$0.977	\$1.022	\$1.076	\$1.144	\$1.114	\$0.700	-\$0.437	-\$1.177	\$0.326
4 Weeks Ago	\$6.029	\$6.107	\$6.172	\$6.176	\$6.157	\$6.177	\$6.254	\$6.413	\$6.512	\$6.325	\$5.687	\$4.340
vs. 4 Weeks Ago	\$2.386	\$2.365	\$2.289	\$2.236	\$2.250	\$2.286	\$2.346	\$2.290	\$1.880	\$0.643	-\$0.699	\$0.456
Last Year	\$2.938	\$2.982	\$2.992	\$2.978	\$2.995	\$3.056	\$3.184	\$3.264	\$3.193	\$2.991	\$2.602	\$2.546
vs. Last Year	\$5.477	\$5.490	\$5.469	\$5.434	\$5.412	\$5.407	\$5.416	\$5.439	\$5.199	\$3.977	\$2.386	\$2.250

	Units	Current Price	vs. Last Week	vs. 4 Weeks Ago	vs. Last Year
NatGas Jul21/Oct21	\$/MMBtu	2.224	▲ 0.000	▲ 0.000	▲ 2.208
NatGas Oct21/Nov21	\$/MMBtu	0.361	▲ 0.000	▲ 0.000	▲ 0.299
NatGas Oct21/Jan22	\$/MMBtu	-1.817	▲ 0.000	▲ 0.000	▼ -2.090
NatGas Apr22/Oct22	\$/MMBtu	3.431	▲ 1.808	▲ 2.269	▲ 3.409
WTI Crude	\$/Bbl	108.26	▲ 2.900	▲ 12.230	▲ 43.550
Brent Crude	\$/Bbl	110.90	▲ 3.310	▲ 10.320	▲ 42.810
Fuel Oil, NY Harbour 1%	\$/Bbl	97.18	▲ 0.000	▲ 0.000	▲ 0.000
Heating Oil	cents/Gallon	404.13	▼ -109.410	▲ 77.350	▲ 205.180
Propane, Mt. Bel	cents/Gallon	1.28	▼ -0.033	▼ -0.011	▲ 0.471
Ethane, Mt. Bel	cents/Gallon	0.63	▲ 0.119	▲ 0.138	▲ 0.369
Coal, PRB	\$/MTon	12.30	▲ 0.000	▲ 0.000	▲ 0.000
Coal, PRB	\$/MMBtu	0.70			

Source: CME, 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.

Baker Hughes Rig Counts

Rotary Rig Count						Baker Hughes 
5/6/2022						
U.S. Breakout Information	This Week	+/-	Last Week	+/-	Year Ago	
Oil	557	5	552	213	344	
Gas	146	2	144	43	103	
Miscellaneous	2	0	2	1	1	
Directional	34	4	30	11	23	
Horizontal	646	3	643	238	408	
Vertical	25	0	25	8	17	
Canada Breakout	This Week	+/-	Last Week	+/-	Year Ago	
Oil	42	-3	45	20	22	
Gas	49	-1	50	16	33	
Major Basin Variances	This Week	+/-	Last Week	+/-	Year Ago	
Ardmore Woodford	2	0	2	2	0	
Arkoma Woodford	2	0	2	2	0	
Barnett	4	0	4	3	1	
Cana Woodford	25	-1	26	13	12	
DJ-Niobrara	15	0	15	8	7	
Eagle Ford	61	0	61	28	33	
Granite Wash	5	1	4	2	3	
Haynesville	68	1	67	19	49	
Marcellus	39	2	37	9	30	
Mississippian	2	1	1	2	0	
Permian	335	0	335	106	229	
Utica	12	0	12	2	10	
Williston	37	0	37	22	15	