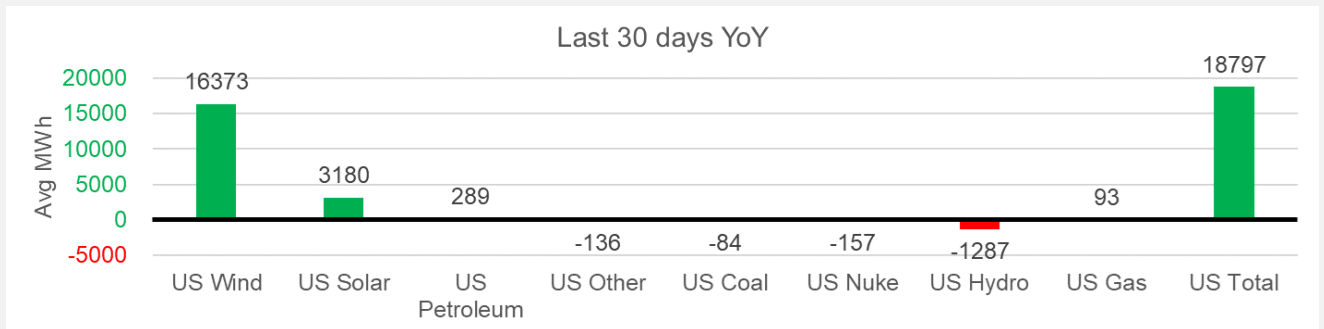
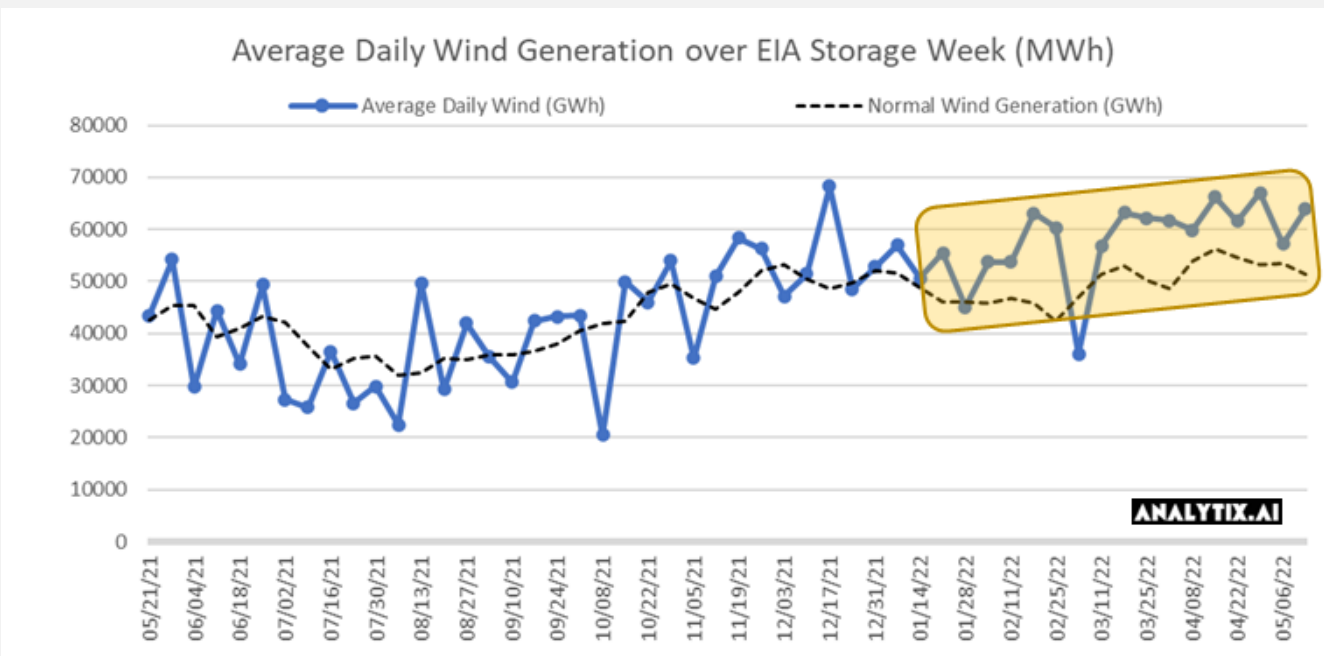


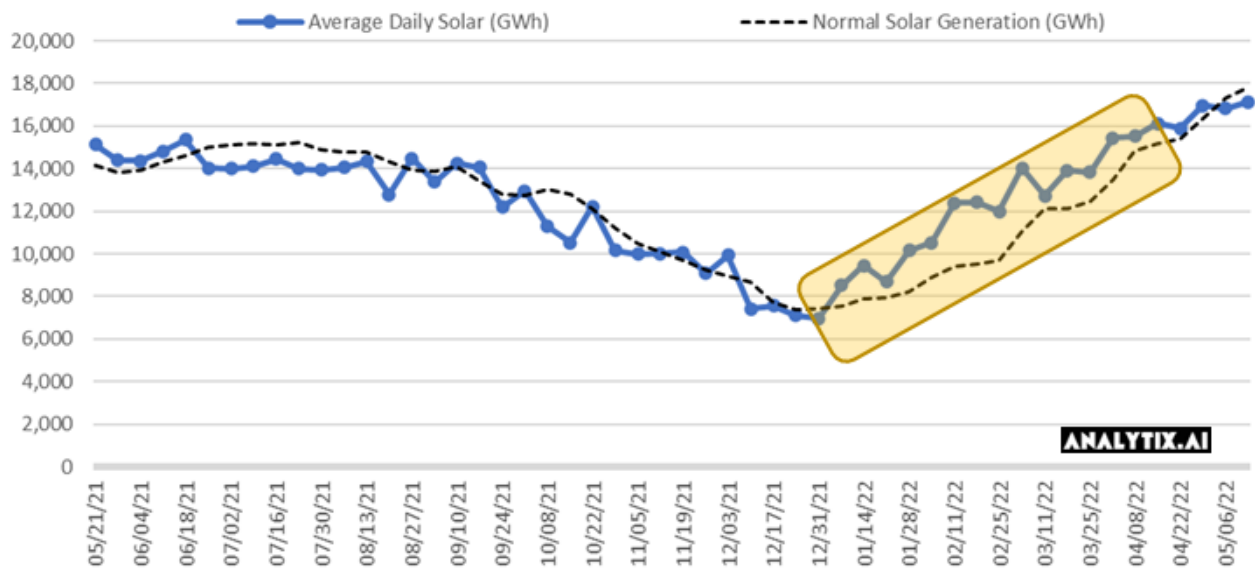
This week we start by focusing on recent power market data to better understand the level of burns this summer. We turn to the EIA 930 data to get more details on how power markets have been functioning this summer so far. Looking at the data, we quickly see that power loads have jumped by ~5% year-on-year. Typically, a gas generator is the marginal producing unit, and therefore a higher load would result in stronger burns. So far this summer this has not been the case. If we look at the generation stats for over the last 30 days relative to last year, the data shows that #wind and #solar growth meet all the excess demand.



Not only has renewable installed capacity jumped year-on-year, but we believe that overall #wind and #solar are performing well ahead of our “expected” levels. The charts below show the average MWh performance each storage week relative to our calculated expected level. We calculate the “expected” level by observing the historical capacity utilization of each asset type and making the necessary adjustments of new capacity based on the EIA-860 data.



Average Daily Solar Generation over EIA Storage Week (MWh)

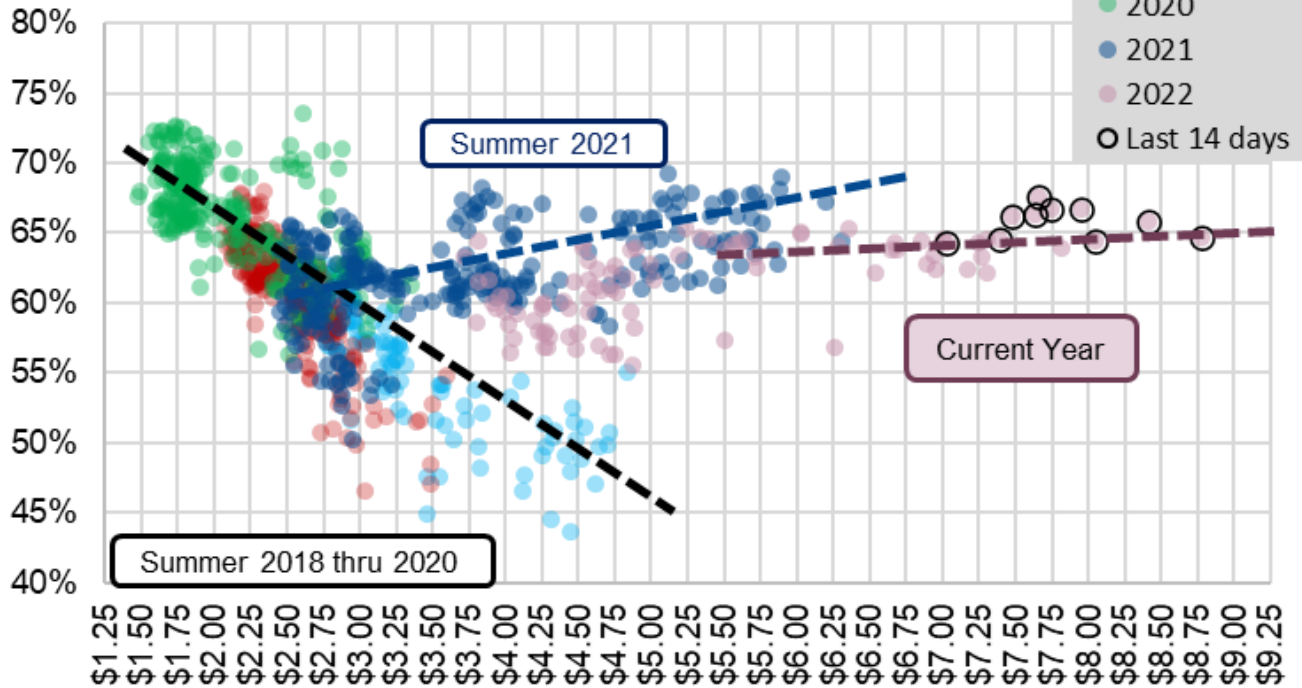


Assuming that both renewable sources displace a 7.5 HR gas plant (which would be higher for peak times), we calculate that just the overperformance of renewables has led to a reduction of 1.7 Bcf/d in gas burns since Jan 1st, and 1.6 Bcf/d since April 1st. So if that increased power load was met by gas gen, then our weekly balances would be much tighter than what we have seen this summer so far.

[Note: Wind Gen is up 27% for the first 6 weeks of summer YoY]

Lastly, we wanted to turn back to a chart we have shown many times in the past. It continues to tell a very interesting story on the coal and natural gas switching dynamics and prices climb to decade highs.

NG1 price vs % gas gen of thermal gen Weekdays ONLY

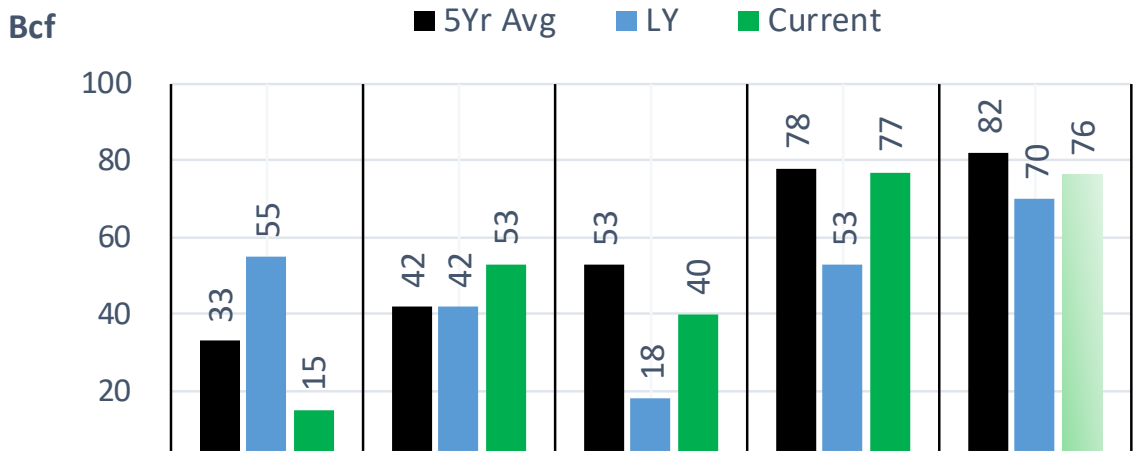


This is not an exact chart of how C2G switching works ISO by ISO, but we get a very clear view that conventionally (before 2020) natgas generation drops as natgas prices increase, i.e. coal becomes the cheaper power source. As of last summer, the dynamic has changed significantly where natgas has consistently held a 60+% market share of thermal generation regardless of how natgas high prices move. In fact, the recent price jumps to almost \$9/MMBtu had no real impact on coal generation.

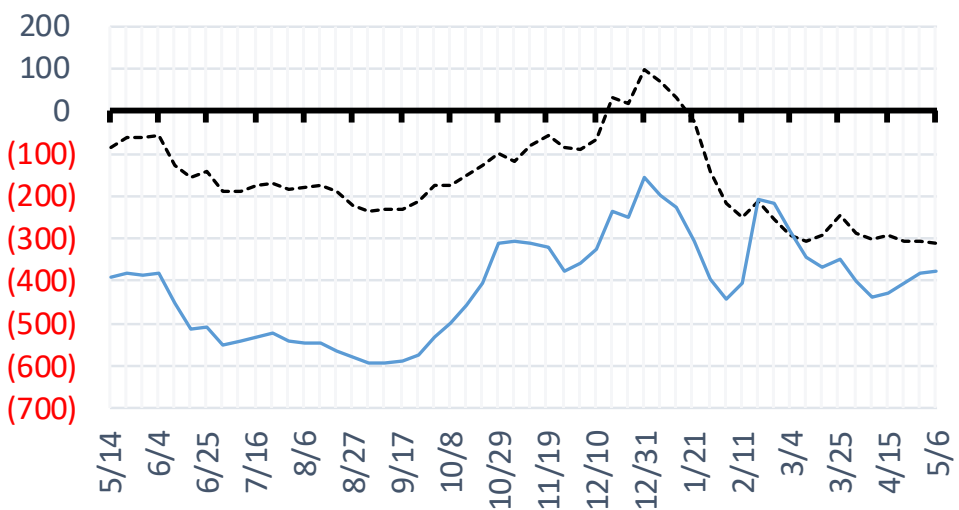
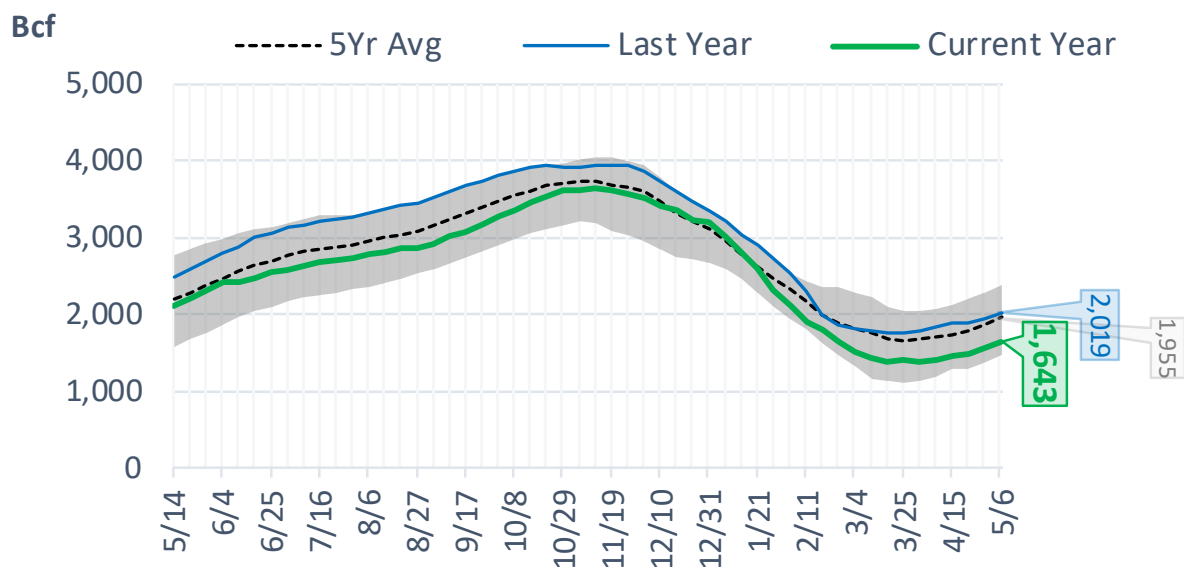
Looking at all this data, we are concerned that we are in for a very volatile summer if the renewables do not show up.

Let me just summarize my thoughts: If the higher power loads cannot be met by the strong renewable performance or coal gen (because C2G flex has essentially disappeared despite the rapid moves in natgas price), then all the pressure falls on gas generation to meet increased load. The question that we ask ourselves is where prices need to move to change consumer or industrial consumption behavior, or do we need to move to levels to disincentivize LNG flows.

Total Lower 48 YoY Weekly Change



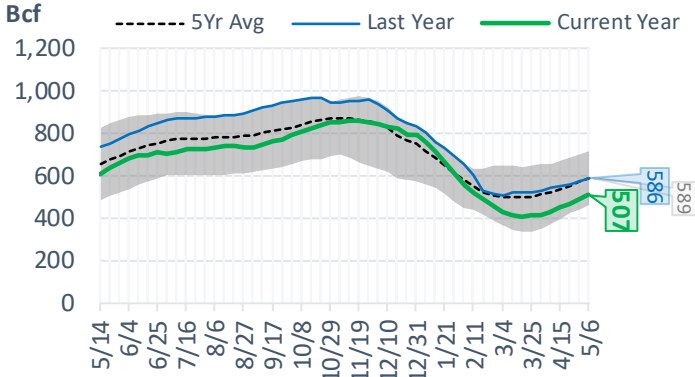
Total Lower 48 Storage Levels



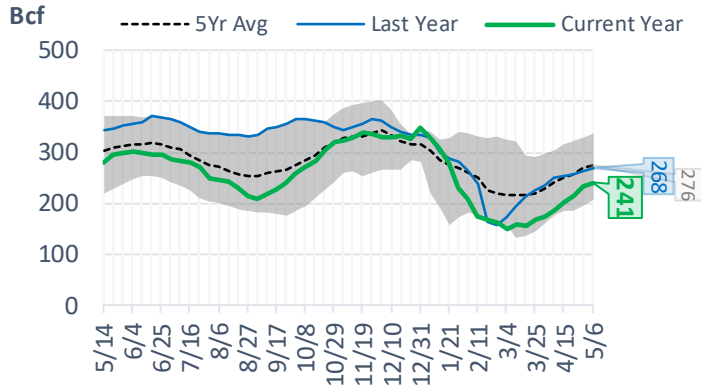
Natural Gas Storage Stats - Last 5 Weeks

Week Ending	Current 6-May	Week - 1 29-Apr	Week - 2 22-Apr	Week - 3 15-Apr	Week - 4 8-Apr	Week - 5 1-Apr
Total Lower 48 Storage Level	1643	1567	1490	1450	1397	1382
Weekly Change	+76	+77	+40	+53	+15	-33
vs LY	-376	-382	-406	-428	-439	-399
vs 5Yr Avg	-312	-306	-305	-292	-303	-285
S. Central Salt Storage Level	241	233	215	201	186	173
Weekly Change	+8	+18	+14	+15	+13	+4
vs LY	-27	-30	-43	-54	-63	-61
vs 5Yr Avg	-35	-35	-42	-48	-54	-56
S. Central NonSalt Storage Level	507	489	467	449	431	416
Weekly Change	+18	+22	+18	+18	+15	+4
vs LY	-79	-81	-90	-104	-114	-116
vs 5Yr Avg	-82	-81	-83	-87	-92	-95
Midwest Storage Level	342	324	309	304	293	296
Weekly Change	+18	+15	+5	+11	-3	-21
vs LY	-114	-116	-117	-116	-119	-102
vs 5Yr Avg	-77	-77	-76	-72	-79	-75
East Storage Level	274	253	238	238	229	241
Weekly Change	+21	+15	0	+9	-12	-27
vs LY	-71	-77	-82	-85	-81	-64
vs 5Yr Avg	-67	-66	-63	-52	-52	-37
Mountain Storage Level	96	92	90	89	90	91
Weekly Change	+4	+2	+1	-1	-1	+2
vs LY	-34	-31	-29	-29	-28	-24
vs 5Yr Avg	-19	-18	-15	-13	-10	-9
Pacific Storage Level	183	176	171	169	169	165
Weekly Change	+7	+5	+2	0	+4	+4
vs LY	-50	-47	-45	-40	-35	-32
vs 5Yr Avg	-32	-29	-26	-21	-16	-15

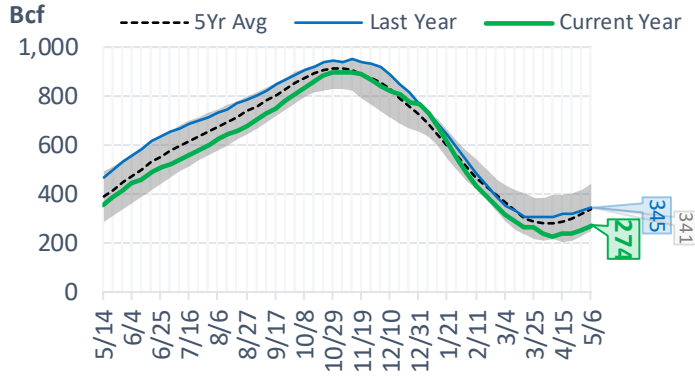
NonSalt Storage Levels



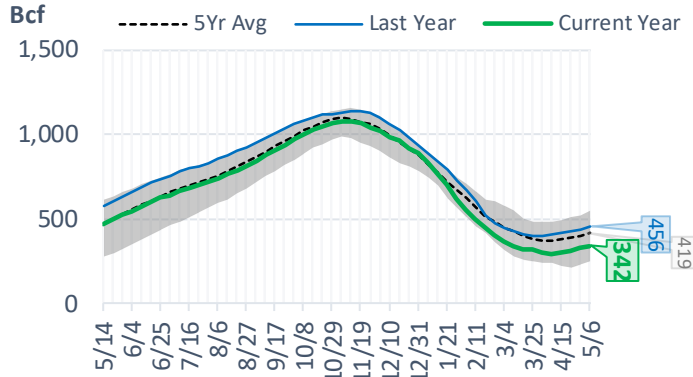
Salt Storage Levels



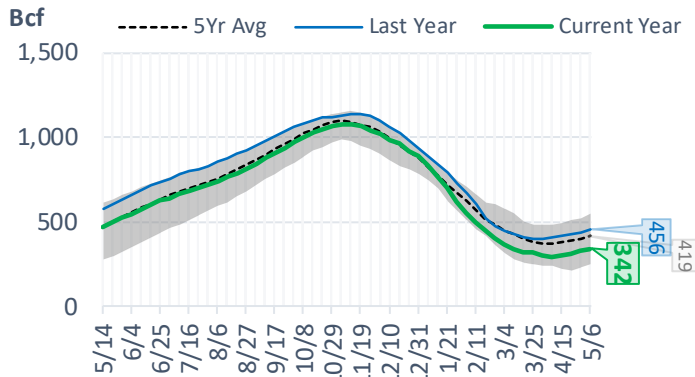
East Storage Levels



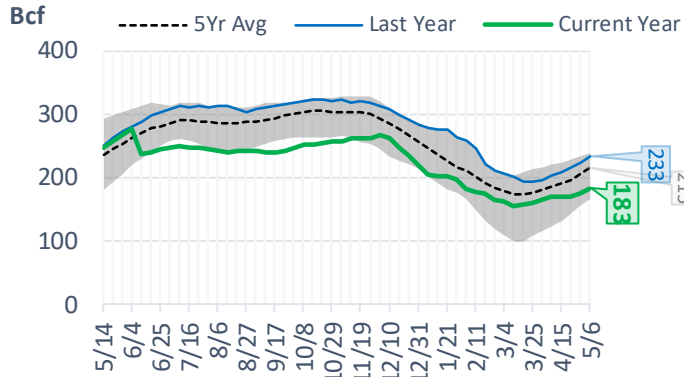
Midwest Storage Levels



Midwest Storage Levels



Pacific Storage Levels



EIA Storage Week Balances

	8-Apr	15-Apr	22-Apr	29-Apr	6-May	13-May	WoW	vs. 4W
Lower 48 Dry Production	95.8	96.4	96.7	95.8	95.8	96.1	▲ 0.2	▼ -0.1
Canadian Imports	5.8	5.6	5.8	6.1	5.9	5.2	▼ -0.8	▼ -0.7
L48 Power	25.0	24.6	25.1	25.0	26.5	26.9	▲ 0.4	▲ 1.6
L48 Residential & Commercial	25.2	22.4	24.1	18.5	16.5	14.2	▼ -2.4	-6.2
L48 Industrial	22.5	21.7	21.8	21.9	21.5	21.1	▼ -0.3	▼ -0.6
L48 Lease and Plant Fuel	5.2	5.3	5.3	5.2	5.2	5.2	▲ 0.0	▼ 0.0
L48 Pipeline Distribution	2.8	2.6	2.7	2.4	2.4	2.3	▼ -0.1	▼ -0.2
L48 Regional Gas Consumption	80.7	76.5	79.0	73.1	72.1	69.7	▼ -2.4	▼ -5.4
Net LNG Exports	12.4	12.5	12.1	12.2	12.2	12.2	▲ 0.0	▼ 0.0
Total Mexican Exports	6.8	6.6	6.7	6.9	6.9	7.0	▲ 0.1	▲ 0.3
Implied Daily Storage Activity	1.7	6.5	4.7	9.8	10.6	12.3	1.7	
EIA Reported Daily Storage Activity	2.1	7.6	5.7	11.0	10.9			
Daily Model Error	-0.4	-1.1	-1.0	-1.2	-0.3			

Monthly Balances

	2Yr Ago May-20	LY May-21	Jan-22	Feb-22	Mar-22	Apr-22	MTD May-22	MoM	vs. LY
Lower 48 Dry Production	87.0	93.0	93.4	92.7	95.0	96.2	95.9	▼ -0.3	▲ 3.0
Canadian Imports	3.9	4.5	6.7	6.6	5.2	5.8	5.5	▼ -0.3	▲ 1.0
L48 Power	26.9	26.5	31.5	28.9	25.6	24.8	27.5	▲ 2.7	▲ 1.0
L48 Residential & Commercial	12.8	12.8	49.1	44.4	30.7	22.2	14.6	▼ -7.6	▲ 1.9
L48 Industrial	19.4	20.9	24.7	22.5	21.8	21.9	21.2	▼ -0.7	▲ 0.3
L48 Lease and Plant Fuel	4.7	5.0	5.1	5.1	5.2	5.2	5.2	▼ -0.1	▲ 0.2
L48 Pipeline Distribution	2.2	2.2	3.8	3.6	2.9	2.6	2.4	▼ -0.2	▲ 0.2
L48 Regional Gas Consumption	65.9	67.5	114.3	104.4	86.2	76.8	70.9	▼ -5.9	▲ 3.4
Net LNG Exports	6.7	10.8	12.4	12.4	12.9	12.3	12.2	▼ -0.1	▲ 1.4
Total Mexican Exports	4.8	6.8	6.3	6.2	6.5	6.7	7.0	▲ 0.3	▲ 0.2
Implied Daily Storage Activity	13.6	12.4	-32.9	-23.7	-5.4	6.2	11.3		
EIA Reported Daily Storage Activity									
Daily Model Error									

Source: Bloomberg, analytix.ai

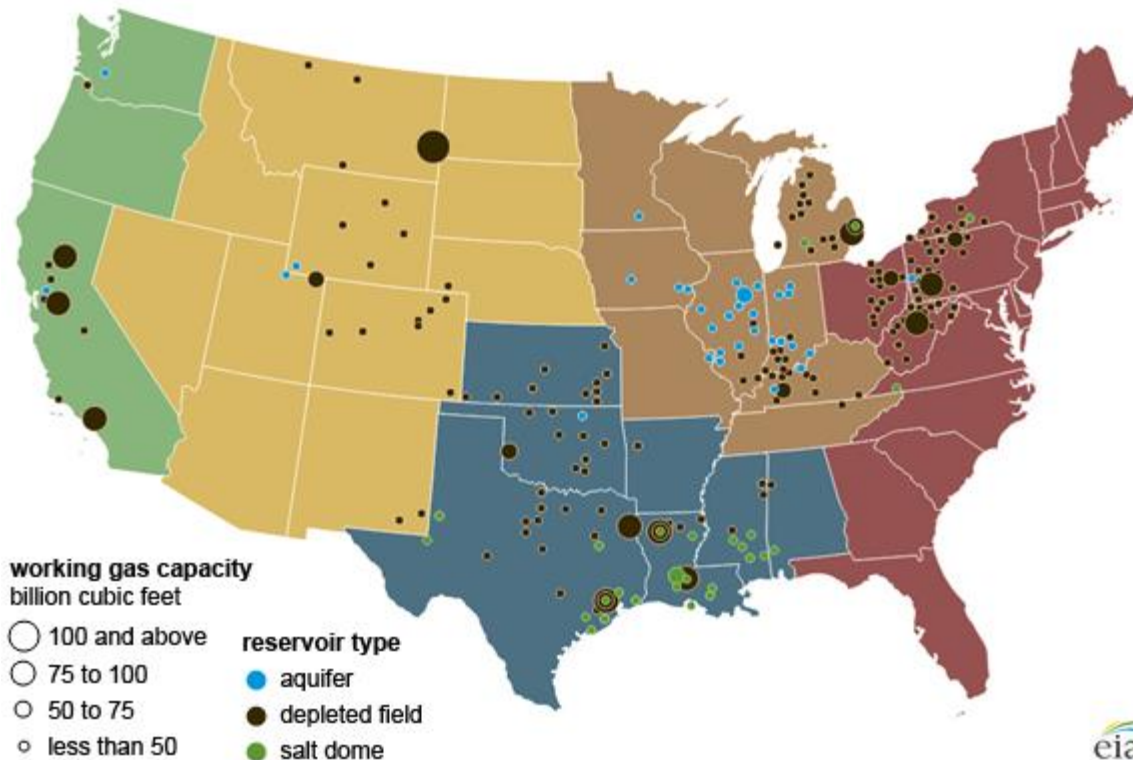
Regional S/D Models Storage Projection

Week Ending 13-May

	Daily Raw Storage	Daily Adjustment Factor	Daily Average Storage Activity (Adjusted) *	Weekly Adjusted Storage Activity
L48	12.9	0.2	13.2	92
East	0.4	2.5	2.9	21
Midwest	4.6	-0.5	4.2	29
Mountain	4.8	-3.4	1.4	10
South Central	2.0	2.3	4.3	30
Pacific	1.1	-0.7	0.4	3

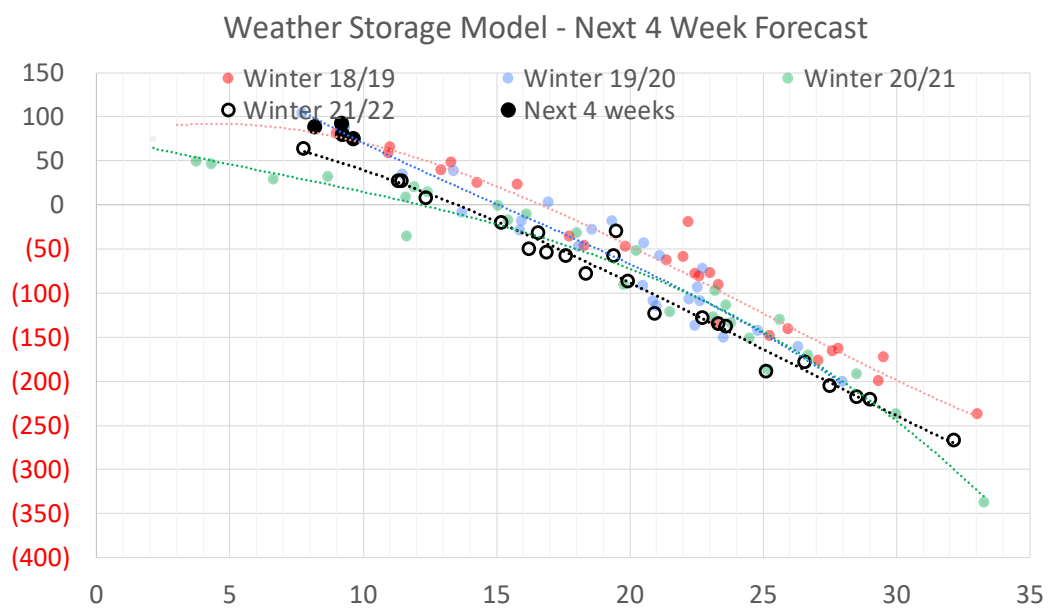
*Adjustment Factor is calculated based on historical regional deltas

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



Weather Model Storage Projection

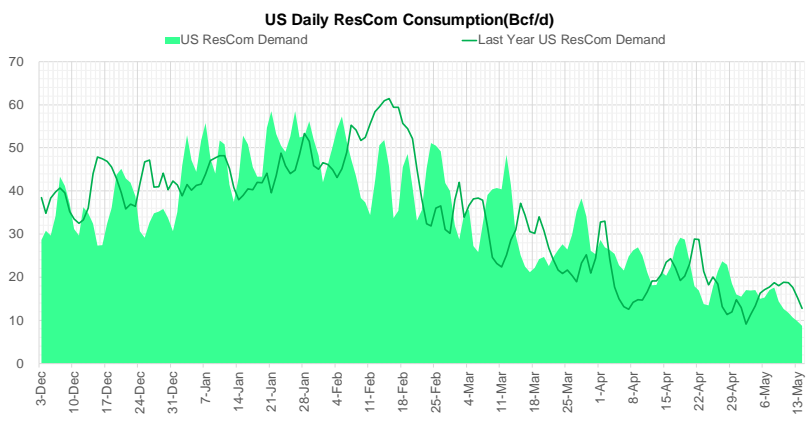
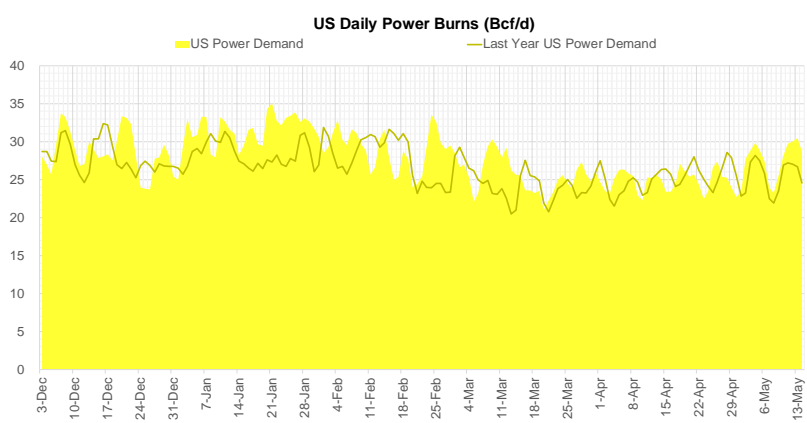
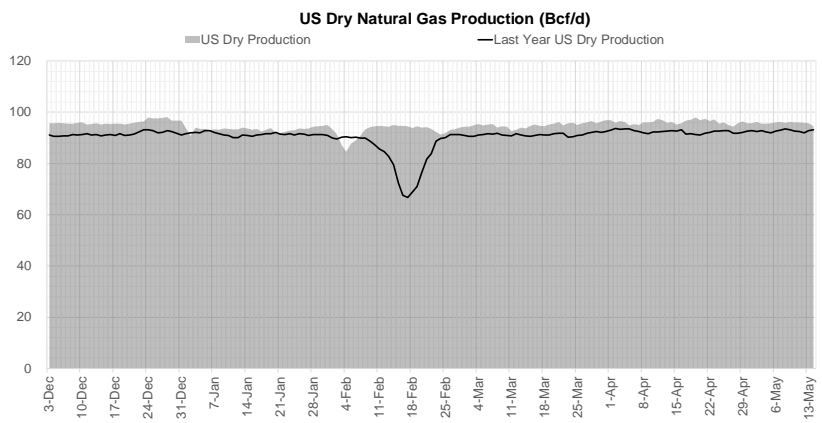
Next report and beyond		
Week Ending	TDDs	Week Storage Projection
13-May	9.2	92
20-May	8.2	88
27-May	9.2	80
03-Jun	9.6	75



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

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.

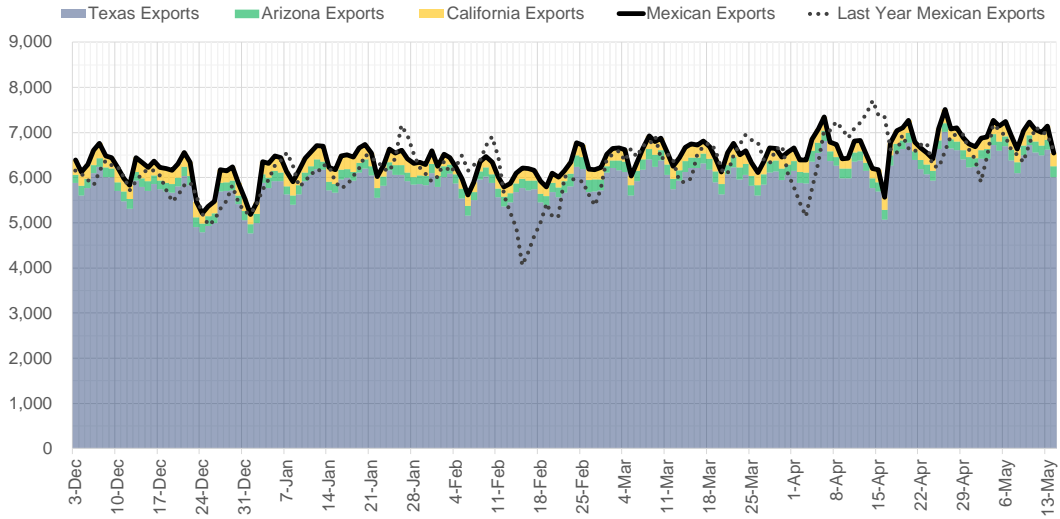
Supply – Demand Trends



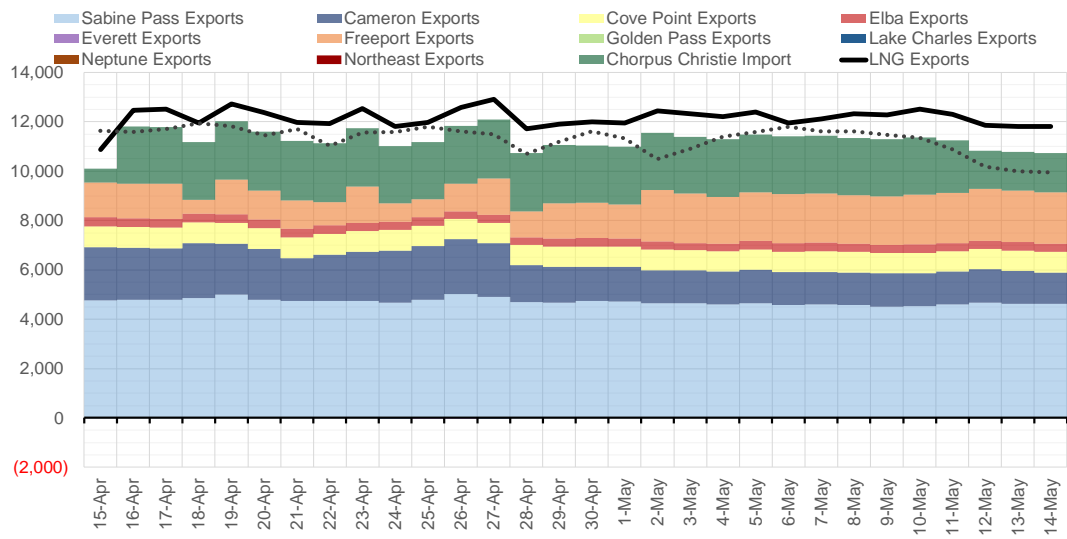
Source: Bloomberg

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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
7	2022	P	7.00	3102	8	2022	C	10.00	53282
7	2022	P	7.25	3031	8	2022	C	10.50	44125
6	2022	P	6.00	2980	10	2022	C	6.00	34947
6	2022	C	9.00	2278	6	2022	C	6.00	25140
6	2022	P	7.00	1827	10	2022	C	5.00	24289
7	2022	C	9.00	1294	9	2022	C	6.00	23730
6	2022	C	12.00	1290	10	2022	P	3.50	20880
6	2022	P	8.00	1010	10	2022	P	3.00	20842
6	2022	C	8.25	952	8	2022	C	6.00	19666
6	2022	C	10.00	950	10	2022	P	2.50	19630
6	2022	C	8.50	838	6	2022	P	4.00	19544
10	2022	P	3.00	750	6	2022	C	7.00	19494
7	2022	P	5.25	702	6	2022	P	6.00	19350
6	2022	C	9.50	692	7	2022	C	8.00	19259
7	2022	P	6.00	659	7	2022	C	6.00	19025
6	2022	P	6.50	656	6	2022	C	10.00	18450
4	2023	P	4.00	600	10	2022	P	6.00	18431
6	2022	C	10.50	552	12	2022	C	5.00	18221
6	2022	P	7.70	504	8	2022	C	7.00	18213
6	2022	P	8.30	501	9	2022	C	7.00	17849
9	2022	P	3.00	500	9	2022	C	10.00	17688
10	2022	P	2.75	500	6	2022	C	5.00	17647
11	2022	P	2.75	500	6	2022	P	5.50	17468
11	2022	P	3.00	500	7	2022	C	7.00	17369
12	2022	P	2.75	500	7	2022	P	3.25	17344
12	2022	P	3.00	500	10	2022	P	2.00	17320
6	2022	C	8.00	404	6	2022	P	3.00	17223
6	2022	P	6.25	403	10	2022	P	4.00	17139
8	2022	P	5.00	350	6	2022	P	4.75	17118
8	2022	P	7.00	314	6	2022	C	12.00	17014
4	2023	C	9.00	300	6	2022	C	9.00	16569
5	2023	C	9.00	300	7	2022	C	10.00	16508
6	2023	C	9.00	300	1	2023	C	10.00	16019
7	2023	C	9.00	300	6	2022	P	3.50	15958
8	2023	C	9.00	300	7	2022	C	9.00	15935
9	2023	C	9.00	300	6	2022	P	7.00	15917
10	2023	C	9.00	300	6	2022	P	5.00	15769
6	2022	P	7.50	280	5	2023	P	2.00	15736
1	2024	C	6.00	275	2	2023	C	10.00	15594
2	2024	C	6.00	275	11	2022	P	4.00	15571
3	2024	C	6.00	275	9	2022	P	2.50	15291
4	2024	C	6.00	275	7	2022	P	3.50	14978
5	2024	C	6.00	275	9	2022	P	2.75	14933
6	2024	C	6.00	275	10	2022	P	3.25	14717
7	2024	C	6.00	275	9	2022	P	3.00	14716
8	2024	C	6.00	275	8	2022	C	9.00	14665
9	2024	C	6.00	275	7	2022	P	3.00	14641
10	2024	C	6.00	275	8	2022	P	3.00	14603
11	2024	C	6.00	275	6	2022	C	8.00	14391
11	2024	C	6.00	275	6	2022	P	3.75	14259.5

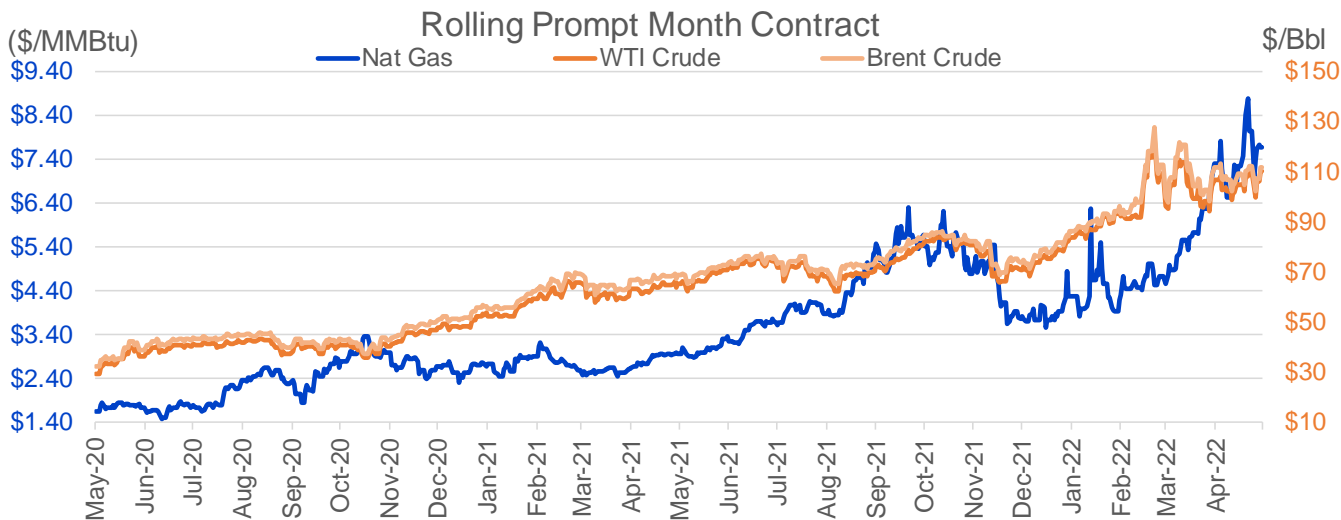
Source: CME, ICE

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	70396	72998	-2602	JUN 22	82954	82622	332
JUL 22	192357	182818	9539	JUL 22	75870	76469	-599
AUG 22	60430	58923	1507	AUG 22	59288	59490	-202
SEP 22	85379	85414	-35	SEP 22	64312	64409	-97
OCT 22	95918	94719	1199	OCT 22	77173	77487	-314
NOV 22	52448	51198	1250	NOV 22	58371	58334	37
DEC 22	48715	48790	-75	DEC 22	62537	62453	85
JAN 23	63158	62759	399	JAN 23	66105	66028	77
FEB 23	27701	27443	258	FEB 23	56419	56036	384
MAR 23	39053	38874	179	MAR 23	55417	55435	-19
APR 23	58331	57849	482	APR 23	53707	53626	81
MAY 23	61119	60841	278	MAY 23	52847	52508	339
JUN 23	26181	25188	993	JUN 23	44772	44742	30
JUL 23	20978	20870	108	JUL 23	44182	44102	81
AUG 23	13430	13349	81	AUG 23	43917	43891	26
SEP 23	17643	18050	-407	SEP 23	43430	43360	71
OCT 23	32653	32139	514	OCT 23	50588	50580	8
NOV 23	12921	12893	28	NOV 23	44314	44212	102
DEC 23	14023	14003	20	DEC 23	40334	40252	82
JAN 24	20374	20267	107	JAN 24	38948	38778	170
FEB 24	5863	5869	-6	FEB 24	26110	26149	-40
MAR 24	14191	14366	-175	MAR 24	30405	30431	-26
APR 24	11661	11685	-24	APR 24	26225	26200	25
MAY 24	6321	6319	2	MAY 24	25578	25597	-19
JUN 24	1803	1734	69	JUN 24	22026	22067	-42
JUL 24	1992	1992	0	JUL 24	22128	22187	-58
AUG 24	2961	2961	0	AUG 24	22233	22291	-58
SEP 24	1366	1366	0	SEP 24	21613	21652	-39
OCT 24	6704	6690	14	OCT 24	24021	24010	11
NOV 24	4677	4676	1	NOV 24	22467	22454	13

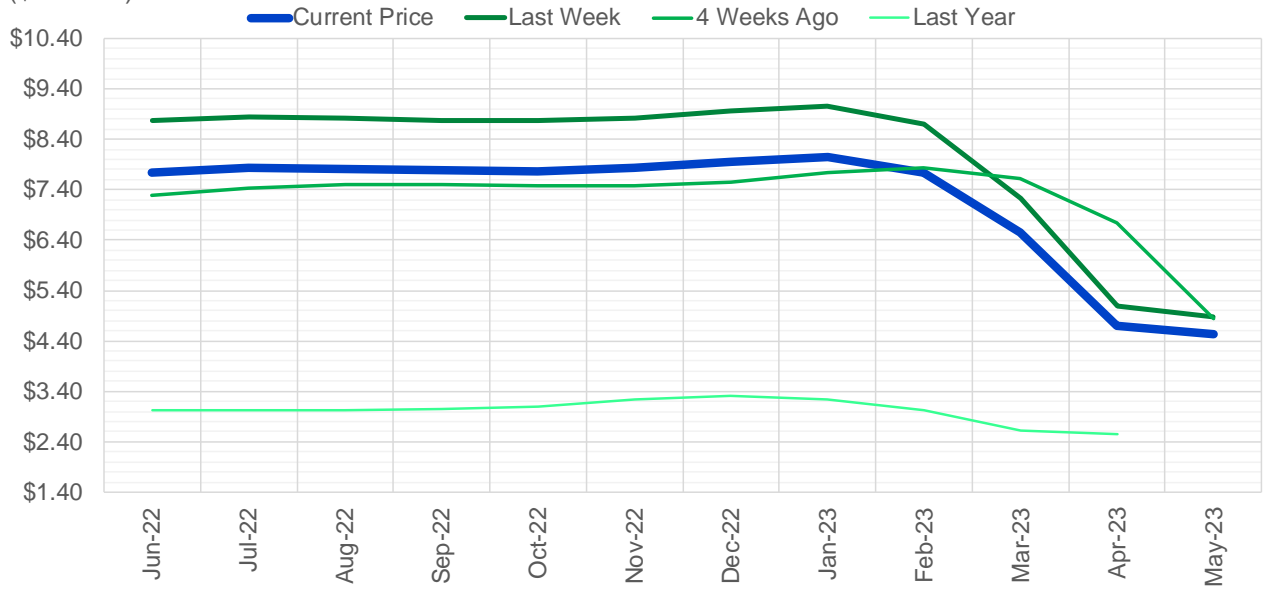
Source: CME, ICE



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(\$/MMBtu)

Nat Gas Term Structure




	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	\$7.739	\$7.835	\$7.822	\$7.778	\$7.768	\$7.836	\$7.956	\$8.054	\$7.732	\$6.544	\$4.709	\$4.542
Last Week	\$8.783	\$8.841	\$8.823	\$8.773	\$8.767	\$8.823	\$8.953	\$9.053	\$8.708	\$7.218	\$5.090	\$4.872
vs. Last Week	-\$1.044	-\$1.006	-\$1.001	-\$0.995	-\$0.999	-\$0.987	-\$0.997	-\$0.999	-\$0.976	-\$0.674	-\$0.381	-\$0.330
4 Weeks Ago	\$7.300	\$7.423	\$7.501	\$7.499	\$7.473	\$7.486	\$7.561	\$7.740	\$7.846	\$7.610	\$6.734	\$4.841
vs. 4 Weeks Ago	\$0.439	\$0.412	\$0.321	\$0.279	\$0.295	\$0.350	\$0.395	\$0.314	-\$0.114	-\$1.066	-\$2.025	-\$0.299
Last Year	\$2.973	\$3.025	\$3.036	\$3.026	\$3.044	\$3.107	\$3.228	\$3.309	\$3.230	\$3.018	\$2.611	\$2.555
vs. Last Year	\$4.766	\$4.810	\$4.786	\$4.752	\$4.724	\$4.729	\$4.728	\$4.745	\$4.502	\$3.526	\$2.098	\$1.987

	Units	Current Price	vs. Last Week	vs. 4 Weeks Ago	vs. Last Year
NatGas Jul21/Oct21	\$/MMBtu	2.224	▲ 0.000	▲ 0.000	▲ 2.204
NatGas Oct21/Nov21	\$/MMBtu	0.361	▲ 0.000	▲ 0.000	▲ 0.295
NatGas Oct21/Jan22	\$/MMBtu	-1.817	▲ 0.000	▲ 0.000	▼ -2.090
NatGas Apr22/Oct22	\$/MMBtu	2.368	▼ -0.365	▲ 0.218	▲ 2.343
WTI Crude	\$/Bbl	110.49	▲ 0.720	▲ 3.540	▲ 45.120
Brent Crude	\$/Bbl	111.55	▼ -0.840	▼ -0.150	▲ 42.840
Fuel Oil, NY Harbour 1%	\$/Bbl	97.18	▲ 0.000	▲ 0.000	▲ 0.000
Heating Oil	cents/Gallon	392.12	▼ -3.310	▲ 6.640	▲ 188.500
Propane, Mt. Bel	cents/Gallon	1.25	▼ -0.027	▼ -0.097	▲ 0.436
Ethane, Mt. Bel	cents/Gallon	0.58	▼ -0.023	▲ 0.071	▲ 0.318
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 
5/13/2022						
U.S. Breakout Information	This Week	+/-	Last Week	+/-	Year Ago	
Oil	563	6	557	211	352	
Gas	149	3	146	49	100	
Miscellaneous	2	0	2	1	1	
Directional	38	4	34	10	28	
Horizontal	651	5	646	241	410	
Vertical	25	0	25	10	15	
Canada Breakout	This Week	+/-	Last Week	+/-	Year Ago	
Oil	37	-5	42	12	25	
Gas	51	2	49	17	34	
Major Basin Variances	This Week	+/-	Last Week	+/-	Year Ago	
Ardmore Woodford	1	-1	2	1	0	
Arkoma Woodford	3	1	2	3	0	
Barnett	4	0	4	3	1	
Cana Woodford	27	2	25	14	13	
DJ-Niobrara	15	0	15	8	7	
Eagle Ford	62	1	61	29	33	
Granite Wash	4	-1	5	1	3	
Haynesville	68	0	68	20	48	
Marcellus	39	0	39	9	30	
Mississippian	1	-1	2	1	0	
Permian	335	0	335	104	231	
Utica	12	0	12	2	10	
Williston	38	1	37	22	16	