

This week, we dig into the strong gas burns. The market looks to be picking up on this theme this past week with the summer natgas strip shooting well past \$6. The strong performance of gas generation has been a phenomenon we have been seeing since last summer, but it might be more of an issue this summer with power loads growing. The lower coal inventory and production trends have finally got to a point where the C2G flexibility no longer exists.

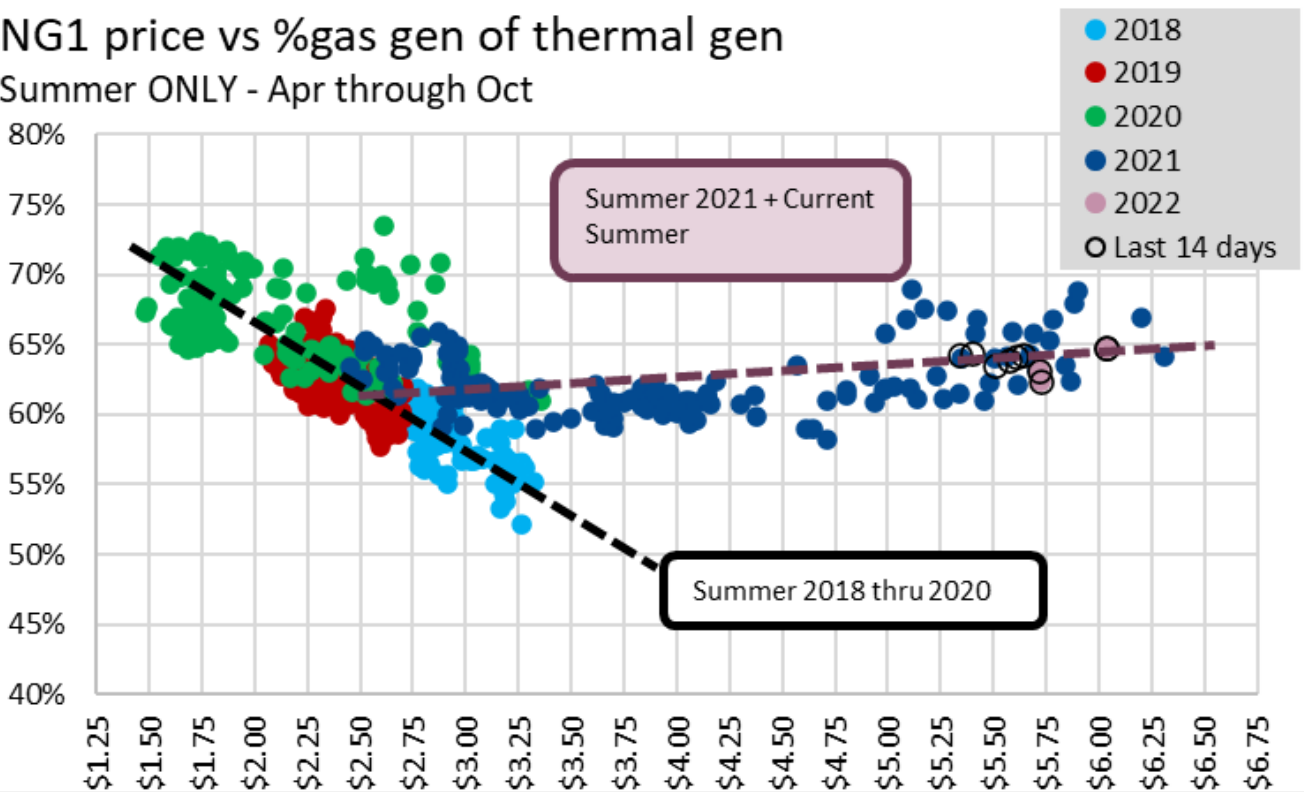
To start today's discussion, the chart below gives a brief history of summer gas generation relative to coal over the last 4 years (daily points) – more simply put it's the coal to gas switching dynamic. The y-axis show gas generation as a % of total thermal generation, and the x-axis shows the prompt month price.

Before 2021, it's very obvious that the gas share falls as gas prices increase. Last year (actually starting in late summer 2020), we see those dynamics change drastically where natgas burns remained steady at 60-70% of the thermal stack despite the big price moves. In fact, the gas share has been increasing even with prices moving above \$6 (a bit worrisome).

The chart also shows the first week of April 2022, and the dynamics look similar.

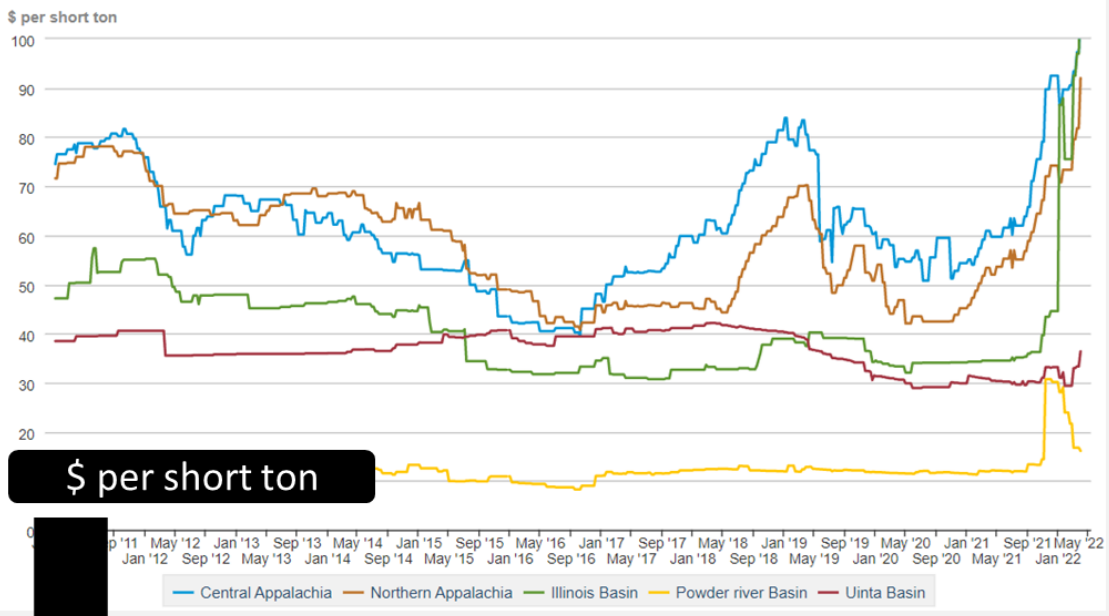
NG1 price vs %gas gen of thermal gen

Summer ONLY - Apr through Oct



One of the reason power burns have remained strong despite the natgas price rally is that spot coal prices have made epic moves as well. The lower coal production, along with already low stocks have sent prices skyrocketing. Here is a view of basin level prices from EIA/SNL:

Historic coal prices by region, 2011 - current data

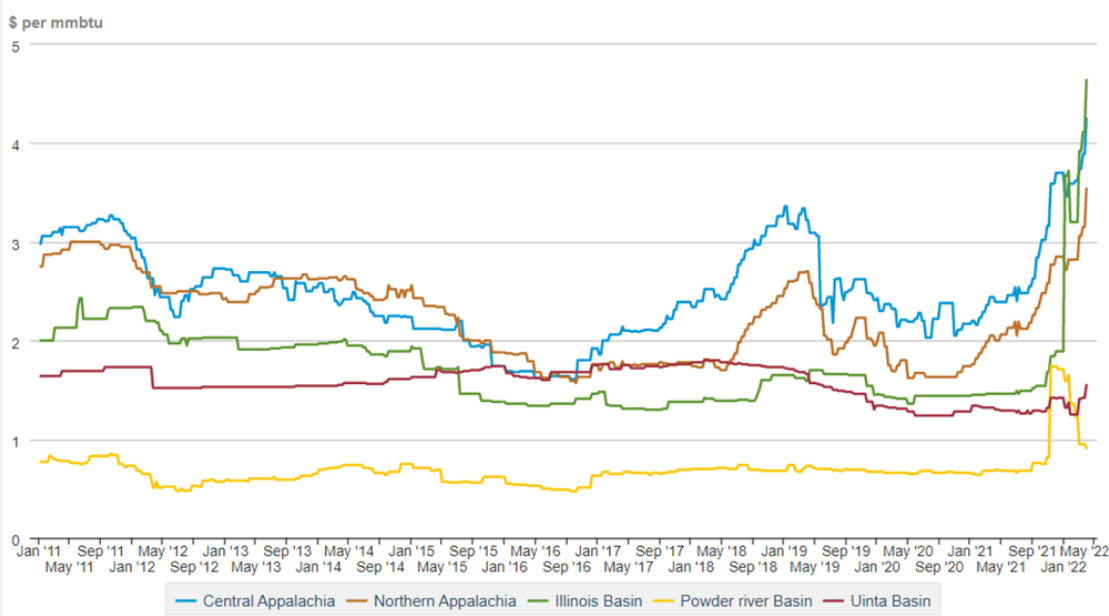


\$ per short ton



\$ per mmbtu

Historic coal prices by region, 2011 - current data



Source: EIA

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As an estimate to understand how coal prices compare to gas prices, we add in the rough rail transport cost. This comes from the preliminary 2020 average basin to state cost reported by the EIA. Here are some example costs:

Central App to Virginia is \$20.24/ton or \$0.81/MMBtu*
 Powder River Basin to Illinois is roughly \$19.17 or \$1.09/MMBtu*

[Send me an email if you are interested in more details on rail costs: het@analytix.ai]

With the rail transport included, delivered coal to downstream markets is roughly \$2.00/MMBtu (PRB) to \$5.00/MMBtu (Central App & Northern App).

*Note that heat content and SO2 levels vary widely between regions

Central Appalachia	12,500 Btu, 1.2 SO2
Northern Appalachia	13,000 Btu, < 3.0 SO2
Illinois Basin	11,800 Btu, 5.0 SO2
Powder River Basin	8,800 Btu, 0.8 SO2
Uinta Basin	11,700 Btu, 0.8 SO2

We should note that coal plants have long-term contracts for coal deliveries. So the spot prices only applies to plants with no existing deliveries and ones looking to ramp up above expected levels a few months out. (that's the beauty of natgas which can be delivered instantaneously through pipelines, while rail logistics are a bit more difficult.)

Final Thought: One last set of data we wanted to show leads us to believe that the extreme power burns could push out into the summer. We believe this is the data series that is waking up the bulls. The following table does a YoY comparison of price, weather, and power dynamics side by side.

Q1 2022 in Review (YoY)

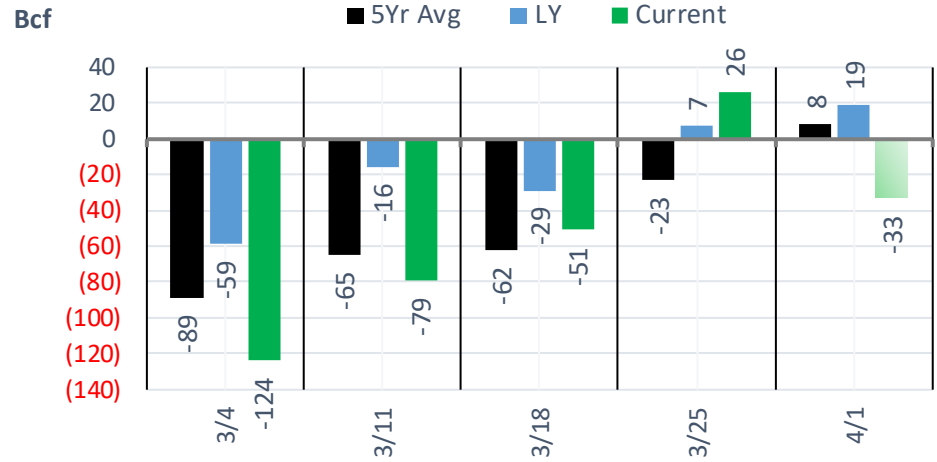
	NYMEX Price	Weather (US Pop Wt. TDDs)	Avg GWh						
			Total Power Load	NatGas	Coal	Wind	Solar	Hydro	Nuke
Jan YoY	\$ 1.56	3.6	35.4	11.3	8.1	9.8	2.7	0.3	-1.6
Feb YoY	\$ 3.51	-3.2	-2.1	-0.3	-23.8	16.5	3.6	-0.2	-1.8
Mar YoY	\$ 1.71	0.7	18.7	7.1	-1.4	4.7	3.1	4.3	-0.9

We will focus specifically on March which shows Price Settles higher by +1.71 (Mar settlement), Weather flat, and Total Power Load higher by an average of 18.7 GWh or 5%. The higher YoY power load is the concern here. In March the higher power load was met by hydro, wind, solar, and nat gas (38%). Coal did not help at all despite the large change in price.

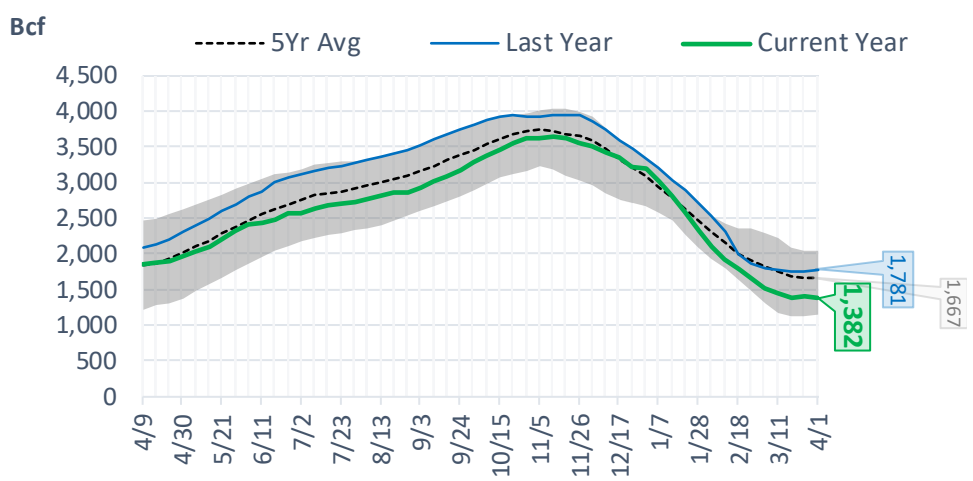
Going into this summer, if the load remains elevated by 5% then we can expect a higher reliance on gas generation. {[this is especially true knowing that hydro is going to be lower than normal, and wind/solar could potentially not show up like last July]}

EIA Storage Report

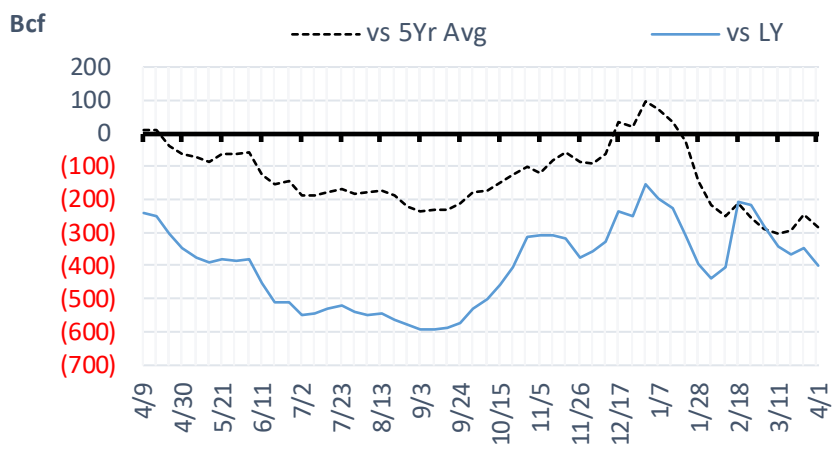
Total Lower 48 YoY Weekly Change



Total Lower 48 Storage Levels



Total Lower 48 LY Surplus/Deficit

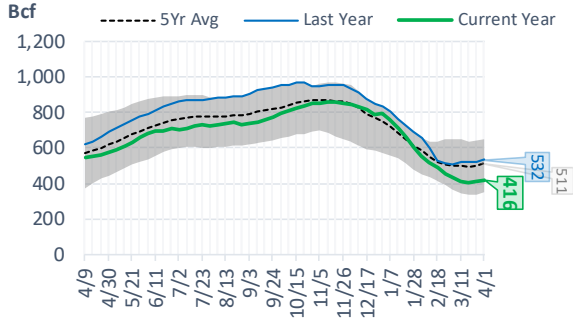


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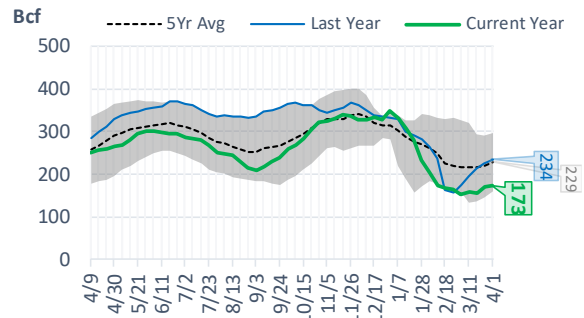
Natural Gas Storage Stats - Last 5 Weeks

Week Ending	Current 1-Apr	Week - 1 25-Mar	Week - 2 18-Mar	Week - 3 11-Mar	Week - 4 4-Mar	Week - 5 25-Feb
Total Lower 48 Storage Level	1382	1415	1389	1440	1519	1643
Weekly Change	-33	+26	-51	-79	-124	-139
vs LY	-399	-347	-366	-344	-281	-216
vs 5Yr Avg	-285	-244	-293	-304	-290	-255
S. Central Salt Storage Level	173	169	156	159	151	163
Weekly Change	+4	+13	-3	+8	-12	-5
vs LY	-61	-55	-56	-35	-23	+5
vs 5Yr Avg	-56	-51	-60	-56	-65	-57
S. Central NonSalt Storage Level	416	412	404	412	431	457
Weekly Change	+4	+8	-8	-19	-26	-30
vs LY	-116	-110	-115	-106	-78	-55
vs 5Yr Avg	-95	-89	-92	-87	-68	-52
Midwest Storage Level	296	317	318	337	364	404
Weekly Change	-21	-1	-19	-27	-40	-46
vs LY	-102	-85	-90	-91	-80	-67
vs 5Yr Avg	-75	-61	-77	-86	-85	-77
East Storage Level	241	268	268	290	317	358
Weekly Change	-27	0	-22	-27	-41	-38
vs LY	-64	-39	-42	-41	-38	-31
vs 5Yr Avg	-37	-17	-35	-43	-48	-39
Mountain Storage Level	91	89	87	87	93	96
Weekly Change	+2	+2	0	-6	-3	-9
vs LY	-24	-23	-25	-27	-21	-22
vs 5Yr Avg	-9	-10	-12	-14	-10	-13
Pacific Storage Level	165	161	157	155	162	164
Weekly Change	+4	+4	+2	-7	-2	-12
vs LY	-32	-33	-37	-45	-44	-47
vs 5Yr Avg	-15	-14	-16	-19	-16	-19

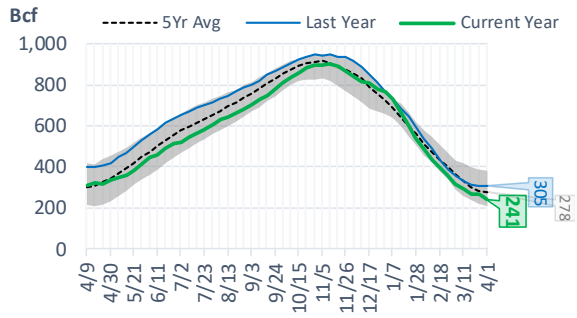
NonSalt Storage Levels



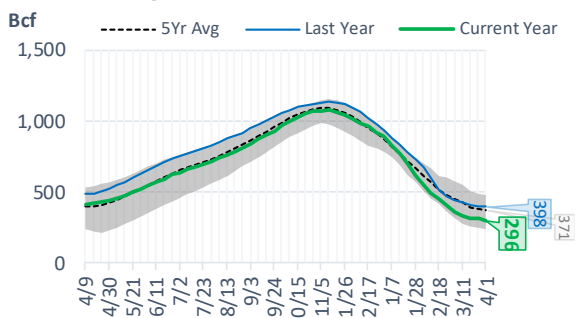
Salt Storage Levels



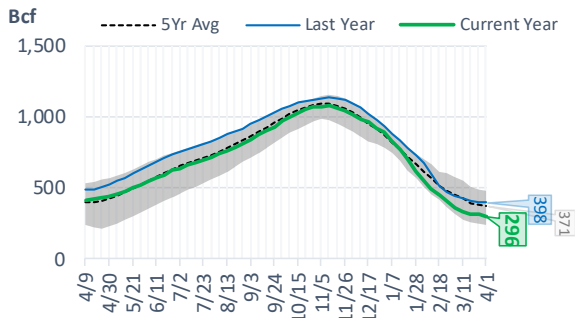
East Storage Levels



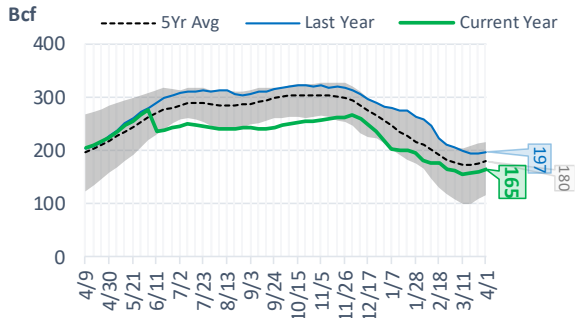
Midwest Storage Levels



Midwest Storage Levels



Pacific Storage Levels



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EIA Storage Week Balances

	4-Mar	11-Mar	18-Mar	25-Mar	1-Apr	8-Apr	WoW	vs. 4W
Lower 48 Dry Production	94.2	94.8	93.9	95.4	96.0	96.1	▲ 0.1	▲ 1.1
Canadian Imports	5.9	5.2	5.2	4.8	5.7	5.8	▲ 0.1	▲ 0.5
L48 Power	29.4	27.6	27.3	25.6	27.0	26.8	▼ -0.2	▼ -0.1
L48 Residential & Commercial	38.1	33.2	31.5	23.5	29.7	24.2	▼ -5.5	▼ -5.2
L48 Industrial	23.1	22.7	20.7	20.7	22.4	20.4	▼ -2.0	▼ -1.2
L48 Lease and Plant Fuel	5.1	5.2	5.1	5.2	5.2	5.2	▲ 0.0	▲ 0.1
L48 Pipeline Distribution	3.3	3.2	3.1	2.6	3.0	2.8	▼ -0.1	▼ -0.1
L48 Regional Gas Consumption	99.1	91.8	87.7	77.5	87.3	79.5	▼ -7.8	▼ -6.6
Net LNG Exports	12.5	12.8	12.9	13.0	13.1	12.4	▼ -0.6	▼ -0.5
Total Mexican Exports	6.4	6.6	6.6	6.5	6.4	6.7	▲ 0.3	▲ 0.2
Implied Daily Storage Activity	-17.9	-11.1	-7.9	3.2	-5.1	3.2	8.3	
EIA Reported Daily Storage Activity	-17.7	-11.3	-7.3	3.7	-4.7			
Daily Model Error	-0.2	0.1	-0.7	-0.5	-0.4			

Monthly Balances

	2Yr Ago Apr-20	LY Apr-21	Dec-21	Jan-22	Feb-22	Mar-22	MTD Apr-22	MoM	vs. LY
Lower 48 Dry Production	92.7	92.5	96.1	93.6	93.6	95.0	96.1	▲ 1.1	▲ 3.7
Canadian Imports	4.0	4.7	4.8	6.7	6.6	5.2	5.8	▲ 0.5	▲ 1.1
L48 Power	25.6	25.0	28.7	31.4	29.0	26.9	26.8	▼ -0.2	▲ 1.8
L48 Residential & Commercial	20.5	19.6	33.9	48.6	42.7	29.6	24.2	▼ -5.3	▲ 4.7
L48 Industrial	20.4	21.4	22.5	25.5	25.3	21.7	21.6	▼ -0.1	▲ 0.2
L48 Lease and Plant Fuel	5.0	5.0	5.3	5.1	5.1	5.2	5.2	▲ 0.1	▲ 0.2
L48 Pipeline Distribution	2.4	2.5	3.2	3.8	3.4	2.9	2.8	▼ -0.1	▲ 0.4
L48 Regional Gas Consumption	74.0	73.5	93.6	114.4	105.5	86.3	80.7	▼ -5.6	▲ 7.2
Net LNG Exports	8.2	11.5	12.1	12.4	12.4	12.9	12.4	▼ -0.4	▲ 1.0
Total Mexican Exports	4.8	6.7	6.2	6.3	6.2	6.5	6.7	▲ 0.2	▲ 0.0
Implied Daily Storage Activity	9.7	5.5	-11.0	-32.8	-23.8	-5.4	2.0		
EIA Reported Daily Storage Activity									
Daily Model Error									

Source: Bloomberg, analytix.ai

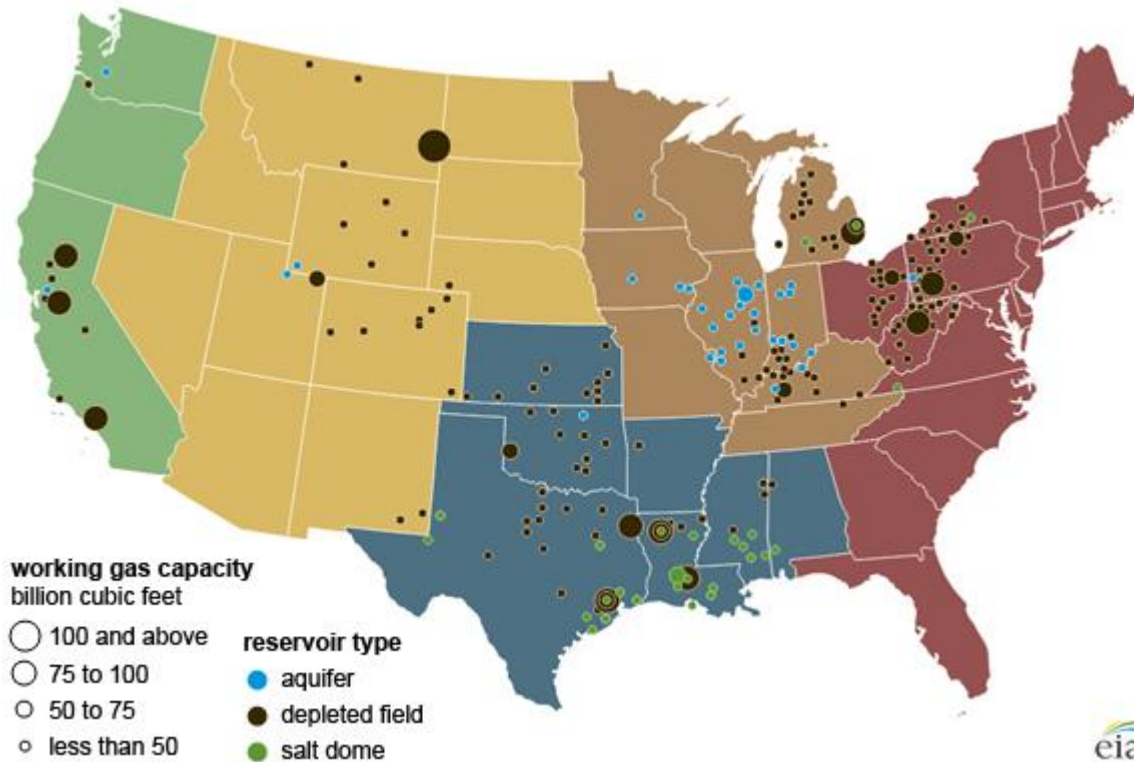
Regional S/D Models Storage Projection

Week Ending 8-Apr

	Daily Raw Storage	Daily Adjustment Factor	Daily Average Storage Activity (Adjusted) *	Weekly Adjusted Storage Activity
L48	3.7	0.0	3.7	26
East	-2.7	2.0	-0.7	-5
Midwest	0.1	-0.7	-0.6	-4
Mountain	3.6	-3.2	0.4	3
South Central	2.1	1.7	3.8	26
Pacific	0.5	0.2	0.8	5

*Adjustment Factor is calculated based on historical regional deltas

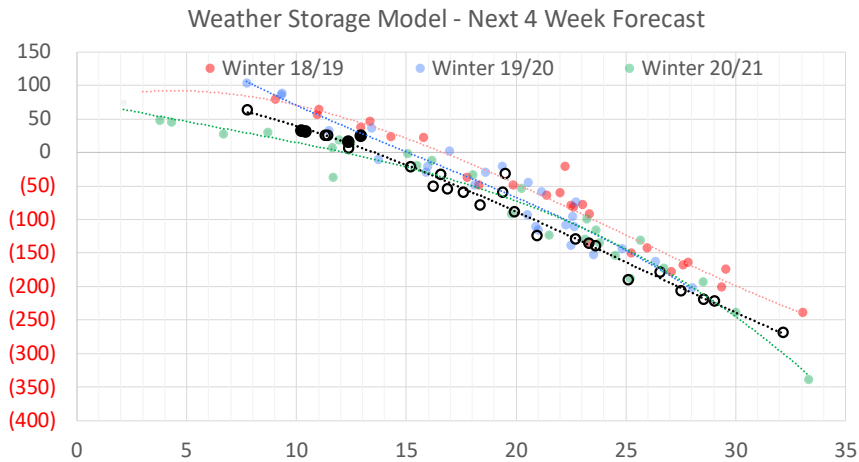
U.S. underground natural gas storage facilities by type (July 2015)



Weather Model Storage Projection

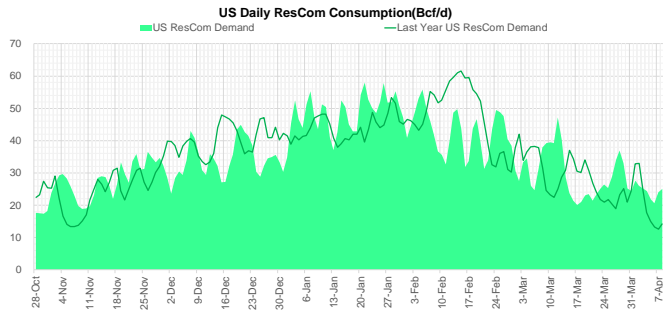
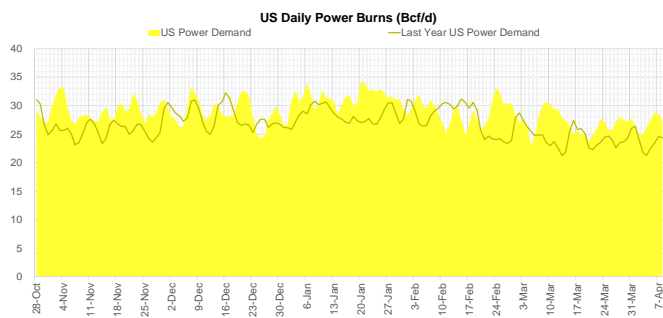
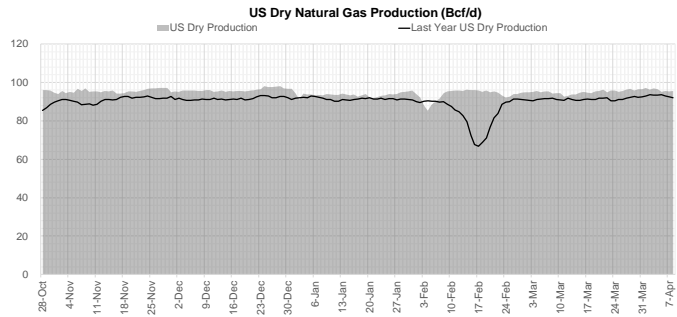
Next report
and beyond

Week Ending	GWDDs	Week Storage Projection
08-Apr	13	26
15-Apr	10	33
22-Apr	12	17



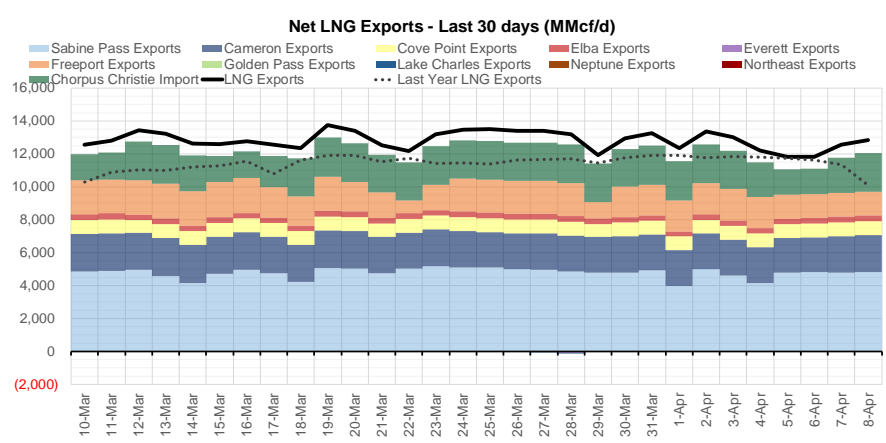
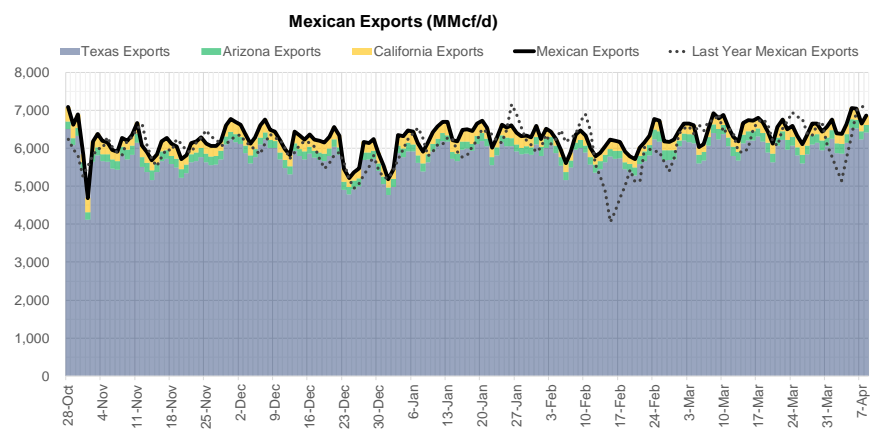
Note: this is not our official end of season forecast. This chart signifies where storage levels end with 10-year normal weather and current market tightness relative to last year

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

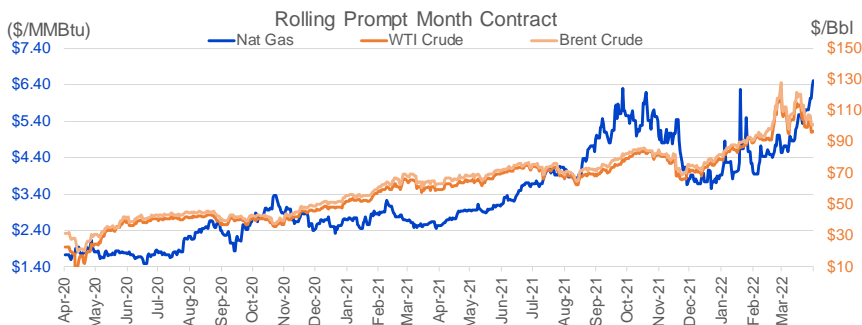
CONTRACT MONTH	CONTRACT YEAR	PUT/CALL	STRIKE	CUMULATIVE VOL	CONTRACT MONTH	CONTRACT YEAR	PUT/CALL	STRIKE	CUMULATIVE OI
5	2022	P	5.00	7867	8	2022	C	10.00	44709
9	2022	C	10.00	7371	8	2022	C	10.50	40500
9	2022	C	9.50	4723	10	2022	C	6.00	29399
5	2022	C	7.00	4342	5	2022	P	4.00	27080
7	2022	C	6.50	3920	10	2022	C	5.00	26880
5	2022	C	6.00	3873	9	2022	C	6.00	23948
6	2022	C	8.00	3829	5	2022	C	6.00	23691
7	2022	C	7.50	3826	6	2022	C	6.00	23542
6	2022	C	10.00	3649	5	2022	P	3.00	22636
5	2022	P	5.50	3357	5	2022	C	5.00	21434
5	2022	C	10.00	2990	5	2022	C	7.00	21279
6	2022	P	5.50	2565	10	2022	P	3.00	20875
5	2022	P	5.25	2560	5	2022	P	4.50	20367
9	2022	C	10.50	2500	8	2022	C	6.00	20299
5	2022	C	9.00	2420	6	2022	C	8.00	20226
6	2022	C	7.00	2322	5	2022	P	2.50	19874
8	2022	C	10.00	2318	6	2022	P	4.00	19600
6	2022	C	9.00	2144	8	2022	C	7.00	18640
6	2022	C	11.00	2102	7	2022	C	7.00	18376
8	2022	C	9.75	2072	5	2022	P	3.50	18270
5	2022	C	6.10	2041	5	2022	P	5.00	18233
5	2022	P	5.35	2012	7	2022	C	6.00	18188
10	2022	P	4.00	1903	7	2022	P	3.25	17855
6	2022	P	6.00	1798	12	2022	C	5.00	17771
5	2022	P	5.75	1761	5	2022	P	2.75	17685
7	2022	C	8.00	1601	6	2022	C	5.00	17375
6	2022	C	12.00	1596	10	2022	P	2.50	17361
8	2022	C	9.00	1565	10	2022	C	7.00	17332
6	2022	P	5.00	1449	1	2023	C	6.00	17294
7	2022	P	6.00	1420	6	2022	P	3.00	17172
6	2022	P	4.00	1409	5	2022	C	8.00	17138
8	2022	C	9.10	1401	6	2022	C	7.00	17047
6	2022	C	8.50	1358	9	2022	C	7.00	16697
10	2022	C	7.00	1280	5	2022	P	3.75	16152
7	2022	C	7.00	1208	10	2022	P	4.00	15762
5	2022	C	6.50	1205	6	2022	P	3.50	15470
1	2023	C	10.00	1200	9	2022	P	2.50	15366
1	2023	P	5.00	1100	1	2023	C	5.00	15127
6	2022	P	3.75	1007	12	2022	C	6.00	15009
5	2022	P	5.65	1003	10	2022	P	3.50	14972
8	2022	C	10.50	1000	9	2022	P	2.75	14933
1	2023	P	4.50	1000	7	2022	C	8.00	14892
5	2022	C	8.00	998	7	2022	P	3.50	14881
10	2022	P	5.50	975	6	2022	P	4.75	14760
3	2023	C	9.00	955	6	2022	C	10.00	14687
7	2022	P	5.00	945	10	2022	P	2.00	14675
3	2023	C	7.50	925	6	2022	P	3.75	14112
6	2022	C	6.50	912	5	2022	C	3.00	13733
3	2023	C	7.00	845	8	2022	P	3.00	13700
					7	2022	P	3	13663

Source: CME, ICE

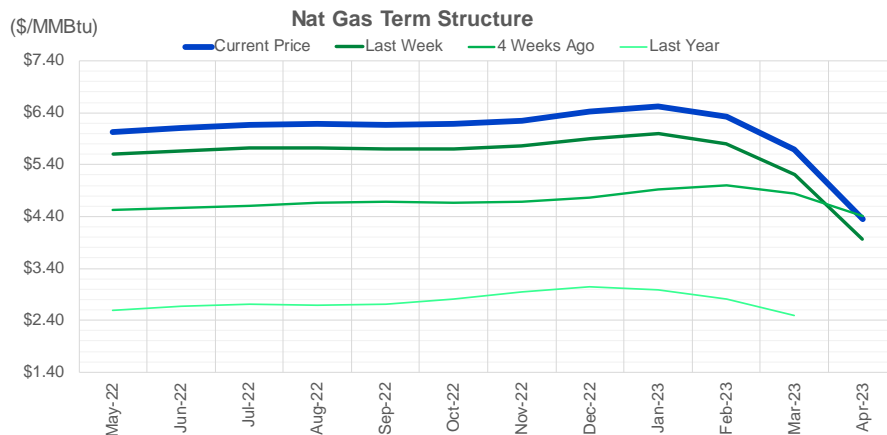
Nat Gas Futures Open Interest CME and ICE data combined

CME Henry Hub Futures (10,000 MMBtu)				ICE Henry Hub Futures Contract Equivalent (10,000 MMBtu)			
	Current	Prior	Daily Change		Current	Prior	Daily Change
MAY 22	196972	218843	-21871	MAY 22	76627	75415	1212
JUN 22	93251	84985	8266	JUN 22	66233	65523	710
JUL 22	108792	101729	7063	JUL 22	73377	72542	835
AUG 22	48016	48341	-325	AUG 22	60896	60802	95
SEP 22	77289	76212	1077	SEP 22	64757	65032	-275
OCT 22	94275	95968	-1693	OCT 22	73985	73276	710
NOV 22	43624	44924	-1300	NOV 22	53508	53568	-60
DEC 22	45674	45150	524	DEC 22	59939	59572	366
JAN 23	65485	63455	2030	JAN 23	67286	67941	-655
FEB 23	21000	20445	555	FEB 23	47032	47012	20
MAR 23	41382	40406	976	MAR 23	53081	52938	144
APR 23	53921	52508	1413	APR 23	51229	51227	2
MAY 23	45635	40977	4658	MAY 23	44950	45213	-263
JUN 23	21558	20278	1280	JUN 23	43102	42761	341
JUL 23	17107	16325	782	JUL 23	42822	42476	346
AUG 23	14184	13856	328	AUG 23	42506	42027	479
SEP 23	17629	16745	884	SEP 23	42198	41910	289
OCT 23	35626	34520	1106	OCT 23	47875	46391	1484
NOV 23	12027	12018	9	NOV 23	41870	41737	134
DEC 23	14492	14679	-187	DEC 23	37879	37786	94
JAN 24	22595	21524	1071	JAN 24	36644	35345	1300
FEB 24	5045	4925	120	FEB 24	24269	23925	344
MAR 24	15992	16058	-66	MAR 24	30774	30277	497
APR 24	10796	10511	285	APR 24	22686	22376	310
MAY 24	3975	3967	8	MAY 24	21429	21168	261
JUN 24	1732	1707	25	JUN 24	21440	21327	113
JUL 24	1708	1681	27	JUL 24	22166	21980	187
AUG 24	3000	2984	16	AUG 24	22334	22138	196
SEP 24	1355	1338	17	SEP 24	20917	20700	217
OCT 24	6908	6853	55	OCT 24	22679	22630	49

Source: CME, ICE



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	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23
Current Price	\$6.029	\$6.107	\$6.172	\$6.176	\$6.157	\$6.177	\$6.254	\$6.413	\$6.512	\$6.325	\$5.687	\$4.340
Last Week	\$5.605	\$5.658	\$5.714	\$5.717	\$5.695	\$5.702	\$5.766	\$5.903	\$5.992	\$5.808	\$5.204	\$3.970
vs. Last Week	\$0.424	\$0.449	\$0.458	\$0.459	\$0.462	\$0.475	\$0.488	\$0.510	\$0.520	\$0.517	\$0.483	\$0.370
4 Weeks Ago	\$4.526	\$4.561	\$4.610	\$4.670	\$4.682	\$4.666	\$4.683	\$4.765	\$4.914	\$5.010	\$4.844	\$4.417
vs. 4 Weeks Ago	\$1.503	\$1.546	\$1.562	\$1.506	\$1.475	\$1.511	\$1.571	\$1.648	\$1.598	\$1.315	\$0.843	-\$0.077
Last Year	\$2.520	\$2.597	\$2.674	\$2.703	\$2.695	\$2.714	\$2.800	\$2.951	\$3.044	\$2.989	\$2.818	\$2.494
vs. Last Year	\$3.509	\$3.510	\$3.498	\$3.473	\$3.462	\$3.463	\$3.454	\$3.462	\$3.468	\$3.336	\$2.869	\$1.846

	Units	Current Price	vs. Last Week	vs. 4 Weeks Ago	vs. Last Year
NatGas Jul21/Oct21	\$/MMBtu	2.224	▲ 0.000	▲ 0.000	▲ 2.178
NatGas Oct21/Nov21	\$/MMBtu	0.361	▲ 0.000	▲ 0.000	▲ 0.276
NatGas Oct21/Jan22	\$/MMBtu	-1.817	▲ 0.000	▲ 0.000	▼ -2.149
NatGas Apr22/Oct22	\$/MMBtu	1.162	▲ 0.758	▲ 1.001	▲ 1.130
WTI Crude	\$/Bbl	96.03	▼ -4.250	▼ -9.990	▲ 36.430
Brent Crude	\$/Bbl	100.58	▼ -7.330	▼ -8.750	▲ 37.380
Fuel Oil, NY Harbour 1%	\$/Bbl	97.18	▲ 0.000	▲ 0.000	▲ 0.000
Heating Oil	cents/Gallon	326.78	▼ -42.340	▼ -2.840	▲ 145.800
Propane, Mt. Bel	cents/Gallon	1.29	▼ -0.152	▼ -0.176	▲ 0.418
Ethane, Mt. Bel	cents/Gallon	0.49	▲ 0.062	▲ 0.071	▲ 0.263
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 
4/8/2022						
U.S. Breakout Information	This Week	+/-	Last Week	+/-	Year Ago	
Oil	546	13	533	209	337	
Gas	141	3	138	48	93	
Miscellaneous	2	0	2	0	2	
Directional	32	-3	35	14	18	
Horizontal	631	18	613	237	394	
Vertical	26	1	25	6	20	
Canada Breakout Information	This Week	+/-	Last Week	+/-	Year Ago	
Oil	53	-11	64	34	19	
Gas	58	-2	60	19	39	
Major Basin Variances	This Week	+/-	Last Week	+/-	Year Ago	
Ardmore Woodford	1	0	1	1	0	
Arkoma Woodford	2	0	2	2	0	
Barnett	3	0	3	2	1	
Cana Woodford	25	0	25	13	12	
DJ-Niobrara	15	1	14	8	7	
Eagle Ford	57	1	56	24	33	
Granite Wash	4	0	4	3	1	
Haynesville	67	1	66	22	45	
Marcellus	37	0	37	7	30	
Mississippian	1	0	1	1	0	
Permian	332	9	323	108	224	
Utica	12	1	11	2	10	
Williston	34	1	33	20	14	