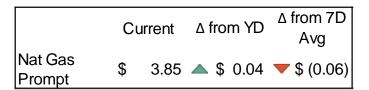


10 December 2021



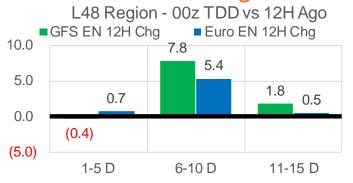
	С	urrent	Δ fro	m YD	Δ fron Αν	
WTI Prompt	\$	71.76	\$	0.82	\$	2.7

	_	urrant	Λf	ron	~ VD	∆ froi	m 7D
	Current	urreni	Δι	1011	טו וו	Avg	
Brent Prompt	\$	75.23		\$	0.81	\$	2.6

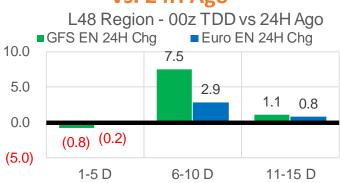
Page Menu

Short-term Weather Model Outlooks
Lower 48 Component Models
Regional S/D Models Storage Projection
Weather Model Storage Projection
Supply – Demand Trends
Nat Gas Options Volume and Open Interest
Nat Gas Futures Open Interest
Price Summary

Vs. 12H Ago



Vs. 24H Ago



	Current	Δ from YD	Δ from 7D Avg
US Dry Production	95.3	- 1.50	▼ -1.40

	Current	Δ from YD	Δ from 7D Avg
US Pow Burns	er 27.9	▼ -2.54	▼ -1.05

	Current	Δ from YD	Δ from 7D Avg
US ResComm	31.9	▼ -4.87	▼ -3.56

	Current	Δ from YD	Δ from 7D Avg
Canadian Imports	4.6	▼ -0.86	▼ -0.72

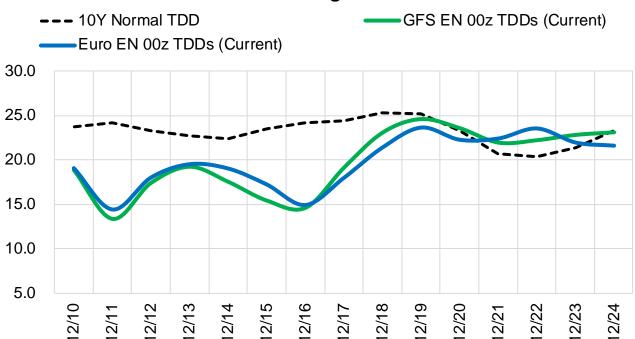
	Current	Δ from YD	Δ from 7D Avg
Net LNG Exports	11.7	- 0.04	▼ -0.40

	Current	Δ from YD	Δ from 7D Avg
Mexican Exports	6.3	▼ -0.27	▼ -0.17

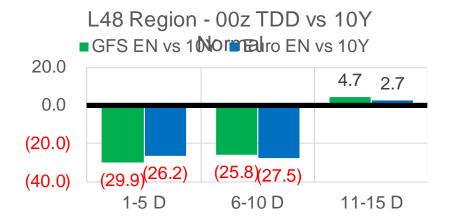


Short-term Weather Model Outlooks (00z)

L48 Region



Vs. 10Y Normal



Source: WSI, Bloomberg



Lower 48 Component Models

Daily Balances

	4-Dec	5-Dec	6-Dec	7-Dec	8-Dec	9-Dec	10-Dec	DoD	vs.7D
Lower 48 Dry Production	96.7	96.9	96.7	96.5	96.5	96.8	95.3	▼-1.5	▼-1.4
Canadian Imports	5.1	5.0	4.9	5.6	5.9	5.4	4.6	▼-0.9	▼ -0.8
L48 Power	26.1	25.9	29.0	32.7	31.4	30.4	27.9	▼ -2.5	▼ -1.3
L48 Residential & Commercial	31.6	30.4	34.9	43.7	41.1	36.7	31.9	-4.9	▼ -4.5
L48 Industrial	23.2	23.3	24.2	25.1	24.5	23.8	23.1	▼ -0.7	▼ -0.9
L48 Lease and Plant Fuel	5.2	5.3	5.2	5.2	5.2	5.3	5.2	▼ -0.1	▼ -0.1
L48 Pipeline Distribution	2.9	2.8	3.2	3.8	3.6	3.4	3.0	▼ -0.4	▼ -0.3
L48 Regional Gas Consumption	89.0	87.7	96.5	110.5	105.8	99.6	91.0	▼-8.6	▼ -7.2
Net LNG Delivered	12.41	12.40	12.17	11.20	12.35	11.69	11.65	▼ 0.0	▼ -0.4
Total Mexican Exports	6.1	6.1	6.5	6.8	6.6	6.6	6.3	▼-0.3	▼ -0.1
Implied Daily Storage Activity	-5.7	-4.3	-13.6	-26.4	-22.4	-15.6	-9.1		
EIA Reported Daily Storage Activity Daily Model Error									

EIA Storage Week Balances

	5-Nov	12-Nov	19-Nov	26-Nov	3-Dec	10-Dec	WoW	vs. 4W
Lower 48 Dry Production	95.1	95.9	95.1	96.2	96.9	96.7	▼-0.2	0.7
Canadian Imports	5.5	5.1	4.9	5.5	5.6	5.3	▼-0.3	▲ 0.0
L48 Power	29.6	27.5	27.8	29.2	28.8	28.9	0.1	0.6
L48 Residential & Commercial	24.3	23.6	28.0	33.3	33.3	35.4	2.1	5.9
L48 Industrial	21.2	21.4	23.1	22.4	22.4	23.8	1.4	1.5
L48 Lease and Plant Fuel	5.2	5.2	5.2	5.2	5.3	5.2	▼ 0.0	0.0
L48 Pipeline Distribution	2.9	2.7	3.0	3.3	3.3	3.2	▼ 0.0	0.1
L48 Regional Gas Consumption	83.2	80.3	87.0	93.5	93.1	96.6	3.6	8.2
Net LNG Exports	10.9	11.2	11.1	11.7	11.8	12.0	0.2	0.6
Total Mexican Exports	6.1	6.2	6.1	6.0	6.4	6.5	0.1	0.3
Implied Daily Storage Activity	0.4	3.2	-4.2	-9.6	-8.8	-13.2	-4.4	
EIA Reported Daily Storage Activity Daily Model Error	1.0 -0.6	3.7 -0.5	-3.0 -1.2	-8.4 -1.1	-8.4 -0.4			

Monthly Balances									
•	2Yr Ago	LY					MTD		
	Dec-19	Dec-20	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	MoM	vs. LY
Lower 48 Dry Production	95.9	91.6	94.0	93.4	94.0	95.9	96.6	0.7	5.0
Canadian Imports	4.5	5.8	5.1	5.1	5.4	5.3	5.2	▼ -0.1	▼-0.6
L48 Power	29.3	28.0	40.1	33.0	30.2	28.8	28.8	0.1	8.0
L48 Residential & Commercial	39.1	40.3	7.9	8.7	13.2	29.6	33.6	4.0	▼ -6.7
L48 Industrial	24.6	23.4	21.5	20.3	20.3	22.3	23.4	1.2	0.0
L48 Lease and Plant Fuel	5.2	5.0	5.1	5.1	5.1	5.2	5.2	0.0	0.3
L48 Pipeline Distribution	3.4	3.4	2.6	2.3	2.3	3.1	3.1	0.0	▼-0.3
L48 Regional Gas Consumption	101.6	100.0	77.2	69.4	71.3	88.9	94.2	5.3	▼ -5.8
Net LNG Exports	7.8	11.0	10.5	10.3	10.6	11.4	11.8	0.5	▲ 0.9
Total Mexican Exports	4.9	5.8	6.9	6.7	6.6	6.1	6.5	0.4	0.7
Implied Daily Storage Activity EIA Reported Daily Storage Activity	-13.8	-19.5	4.6	12.1	10.9	-5.3	-10.8		
	-13.8	-19.5	4.6	12.1	10.9	-5.3	-10.8		



Daily Average Generation Data

Nuclear Generation Daily Average - GWh (NRC)

	2-Dec	3-Dec	4-Dec	5-Dec	6-Dec	7-Dec	8-Dec	DoD	vs. 7D
NRC Nuclear Daily Output	86.5	87.4	87.5	88.1	87.9	87.2	88.5	1.3	1.1
NRC Nuclear Max Capacity	104.9	104.9	104.9	104.9	104.9	104.9	104.9	0.0	0.0
NRC Nuclear Outage	18.4	17.5	17.4	16.8	16.9	17.7	16.4	-1.3	-1.1
NRC % Nuclear Cap Utilization	87.9	88.9	89.0	89.6	89.4	88.7	90.0	1.3	1.1

Wind Generation Daily Average - MWh (EIA)

	2-Dec	3-Dec	4-Dec	5-Dec	6-Dec	7-Dec	8-Dec	DoD	vs. 7D
CALI Wind	263	623	704	602	1177	995	1471	476	744
TEXAS Wind	7886	12447	7675	18043	13906	8370	8254	-115	-3133
US Wind	47349	45523	38850	68914	60665	38188	41254	3066	-8661

Generation Daily Average - MWh (EIA)

	2-Dec	3-Dec	4-Dec	5-Dec	6-Dec	7-Dec	8-Dec	DoD	vs. 7D
US Wind	47349	45523	38850	68914	60665	38188	41254	3066	-8661
US Solar	12016	10287	9198	9884	7170	5867	6985	1118	-2085
US Petroleum	2963	3276	2798	2104	3216	4893	4571	-323	1362
US Other	8336	7889	7727	7981	8230	8413	8571	157	474
US Coal	78549	78051	78452	71350	80899	91596	90189	-1407	10373
US Nuke	91591	92126	92072	93159	92410	92882	93999	1117	1625
US Hydro	26996	29962	27512	26979	29335	30500	30672	173	2125
US Gas	152135	149897	146489	126485	152327	184643	181737	-2906	29741

See National Wind and Nuclear daily charts



Storage Week Average Generation Data

Nuclear	Generation	Weekly	Average -	GWh ((NRC)

	5-Nov	12-Nov	19- N ov	26-Nov	3-Dec	10-Dec	WoW	WoW Bcf/d Impact
NRC Nuclear Daily Output	72.2	79.8	83.9	86.1	87.8	88.0	0.2	0.0
NRC Nuclear Max Capacity	104.9	104.9	104.9	104.9	104.9	104.9	0.0	
NRC Nuclear Outage	32.7	25.1	21.0	18.8	17.1	16.9	-0.2	
NRC % Nuclear Cap Utilization	0.1	0.1	0.1	0.1	0.1	0.1	0.0	

Wind Generation Weekly Average - MWh (EIA)

	5-Nov	12-Nov	19- N ov	26-Nov	3-Dec	10-Dec	WoW	WoW Bcf/d Impact
CALI Wind	1669	1805	862	1496	363	1006	643	-0.1
TEXAS Wind	8472	12032	13655	14691	8733	10993	2260	-0.4
US Wind	35306	51002	58367	56260	47211	47807	596	-0.1
					-9048.6 -16%			

Generation Weekly Average - MWh (EIA)

	5-Nov	12-Nov	19 -N ov	26-Nov	3-Dec	10-Dec	WoW	WoW Bcf/d Impact
US Wind	35306	51002	58367	56260	47211	47807	596	-0.1
US Solar	9994	10015	10068	9086	10191	8054	-2138	0.4
US Petroleum	3517	2532	2555	3342	3167	3633	466	-0.1
US Other	9302	8205	7849	8442	8446	8197	-249	0.0
US Coal	80024	77955	77863	82301	82273	82961	687	-0.1
US Nuke	76091	84337	88331	91252	92817	92950	133	0.0
US Hydro	25818	25422	26206	27837	26774	29376	2602	-0.5
US Gas	160442	145215	145263	148208	155121	160474	5353	-1.0

See National Wind and Nuclear daily charts



Monthly Average Generation Data

Nuclear Generation Monthly Average - GWh (NRC)									
	2Yr Ago LY				MTD				
	Same 30 days	Same 30 days	Sep-21	Oct-21	Nov-21	Dec-21	Last 30 days	MoM (MTD vs LY)	Last 30 days YoY
NRC Nuclear Daily Output	88.4	85.5	87.1	75.5	82.7	87.8	86.4	5.1	0.9
NRC Nuclear Max Capacity	104.9	104.9	104.9	104.9	104.9	104.9	104.9	0.0	0.0
NRC Nuclear Outage	16.5	19.4	17.8	29.4	22.2	17.1	18.5	-5.1	-0.9
NRC % Nuclear Cap Utilization	89.9	86.9	88.6	76.8	84.1	89.3	87.8	5.2	0.9

Wind Generation Monthly Average - MWh (EIA)

	2Yr Ago	LY				MTD			
	Same 30 days	Same 30 days	Sep-21	Oct-21	Nov-21	Dec-21	Last 30 days	MoM (MTD vs LY)	Last 30 days YoY
CALI Wind	816	1106	1964	1765	1252	914	939	-338	-167
TEXAS Wind	8908	9724	9213	11565	11869	9904	11722	-1965	1999
US Wind	38311	42010	39362	43142	49974	46891	52138	-3083	10128

Generation Monthly Average - MWh (EIA)

, , ,	2Yr Ago	LY				MTD			
	Same 30 days	Same 30 days	Sep-21	Oct-21	Nov-21	Dec-21	Last 30 days	MoM (MTD vs LY)	Last 30 days YoY
US Wind	38311	42010	39362	43142	49974	46891	52138	5246.9	10128
US Solar	4512	7072	13345	11059	9687	8496	9298	802.1	2226
US Petroleum	2383	2537	2517	3239	3045	3527	3183	▼ -344	646
US Other	7976	8449	9021	11109	8435	8294	8232	▼ -61	▼ -217
US Coal	99349	91167	109915	84433	80848	83200	81392	▼ -1809	▼ -9775
US Nuke	95897	90068	90072	77089	87404	92809	91276	▼ -1533	1208
US Hydro	27922	30688	25622	24078	26590	29155	27621	▼ -1534	▼ -3068
US Gas	152523	145367	173566	159045	151462	162428	153002	~ 768	~ 7635
US Total	428911	417825	463578	413350	417920	434503	426331	▼ -3711	8507



See National Wind and Nuclear daily charts



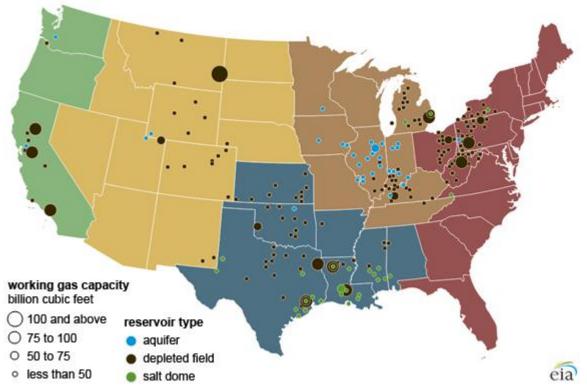
Regional S/D Models Storage Projection

Week Ending 10-Dec

	Daily Raw Storage	Daily Adjustment Factor	Daily Average Storage Activity (Adjusted) *	Weekly Adjusted Storage Activity
L48	-13.5	1.0	-12.5	-87
East	-6.1	1.8	-4.3	-30
Midwest	-5.3	0.2	-5.1	-36
Mountain	2.3	-3.5	-1.2	-8
South Central	-4.4	2.7	-1.6	-11
Pacific	0.1	-0.3	-0.2	-2

^{*}Adjustment Factor is calcuated based on historical regional deltas

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



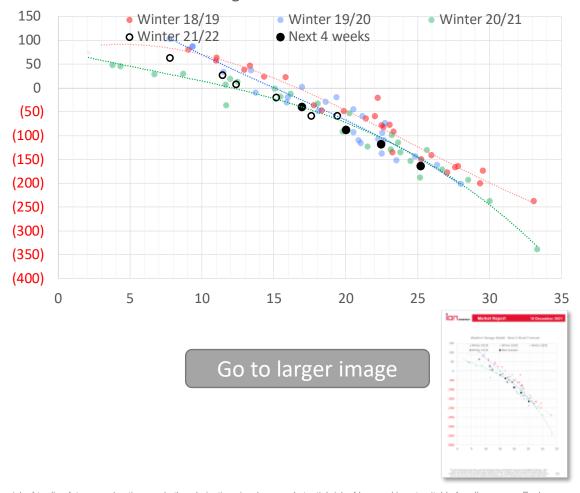


Weather Model Storage Projection

Next report
and beyond

Week Ending	GWDDs	Week Storage Projection
10-Dec	20	-87
17-Dec	17	-39
24-Dec	22	-118
31-Dec	25	-164

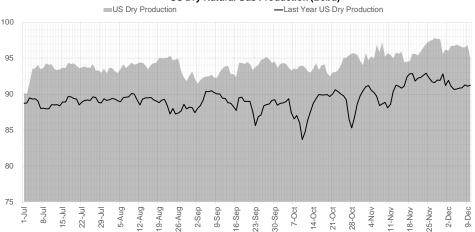
Weather Storage Model - Next 4 Week Forecast



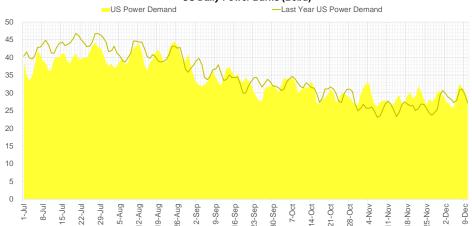


Supply - Demand Trends

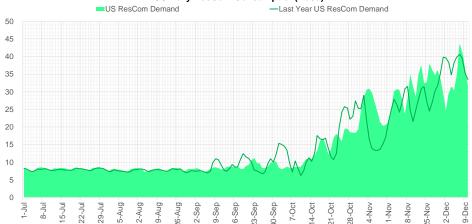
US Dry Natural Gas Production (Bcf/d)



US Daily Power Burns (Bcf/d)



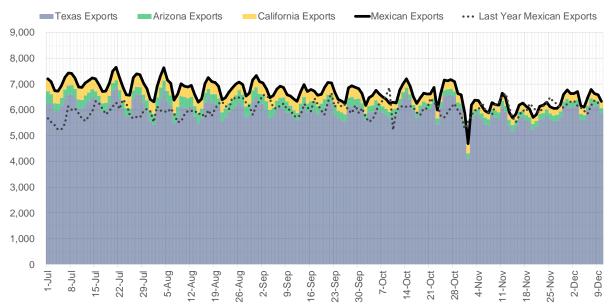
US Daily ResCom Consumption(Bcf/d)



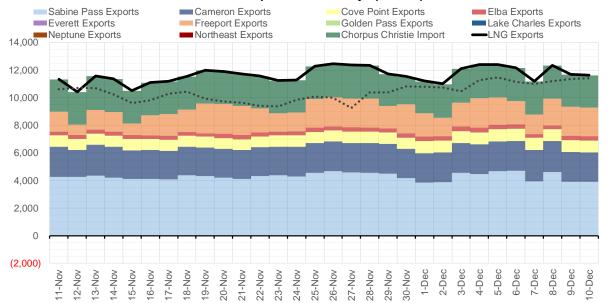
Source: Bloomberg



Mexican Exports (MMcf/d)







Source: Bloomberg



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

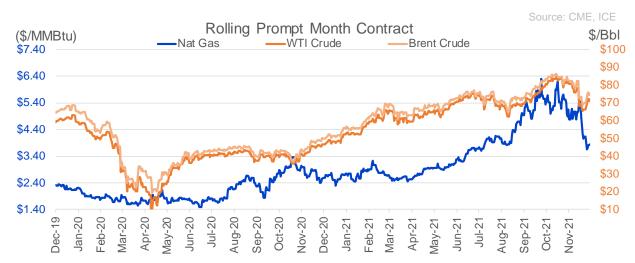
CONTRACT MONTH	CONTRACT YEAR	PUT/CALL	STRIKE	CUMULATIVE VOL		CONTRACT MONTH		BIT/CALL	DIT/CALL STDIZE
1	2022	Р	3.00	6720		3	3 2022	3 2022 C	3 2022 C 10.00
1	2022	C	4.00	3587		1			
3	2022	P	2.25	3502		1	1 2022	1 2022 P	
3	2022	C	4.00	3169		3	3 2022	3 2022 C	3 2022 C 8.00
4	2022	Č	4.00	3025		3			
1	2022	Č	5.00	3011		1			
4	2022	P	2.25	3000		1			
						1			
2	2022	С	5.00	2833		1			
1	2022	С	4.50	2718		2			
1	2022	Р	3.50	2454					
3	2022	Р	3.50	2281		3			
4	2022	Р	2.50	2250		1			
1	2022	С	4.25	2218		4			
3	2022	Р	3.00	2052		12			
3	2022	Р	2.50	2007		3			
5	2022	Р	2.25	2000		4	4 2022	4 2022 C	4 2022 C 3.00
6	2022	Р	2.25	2000		3	3 2022	3 2022 P	3 2022 P 3.00
7	2022	P	2.25	2000	1		2022	2022 C	2022 C 10.00
		P			1		2022	2022 C	2022 C 7.00
8	2022		2.25	2000	3		2022		
9	2022	P	2.25	2000	1		2022		
10	2022	Р	2.25	2000	2		2022		
5	2022	С	5.00	1840	3		2022		
1	2022	Р	3.25	1760	1		2022		
4	2022	С	5.00	1683					
3	2022	C	6.00	1614	3		2022		
2	2022	Ċ	5.50	1594	2		2022		
4	2022	P	3.50	1400	2		2022		
2	2022	P	3.00	1394	2		2022		
					5		2022		
1	2022	С	4.75	1291	6		2022		
2	2022	P	3.50	1178	4		2022	2022 P	2022 P 2.50
3	2022	С	6.75	1150	3		2022		
4	2022	Р	2.00	1100	2		2022		
10	2022	Р	2.00	1100	5		2022		
2	2022	Р	3.25	1043	1		2022		
3	2022	С	10.00	943	3		2022		
1	2022	С	5.50	932	6		2022		
2	2022	C	4.25	927	1		2022		
4	2022	Ċ	5.25	900					
1	2022	P	3.75	840	12		2022		
1	2022	P	3.40		7		022		
				817	8	20:			
3	2022	Р	3.70	800	9	2022			
4	2022	Р	3.70	800	3	2022			
1	2022	Р	3.85	677	5	2022		Р	P 3.00
4	2022	Р	2.35	650	10	2022		С	C 3.00
5	2022	С	6.00	650	12	2022		Č	
5	2022	Р	2.35	650	8	2022		Č	
6	2022	P	2.35	650	2	2022		P	
7	2022	Р	2.35	650	3	2022		Ċ	
8	2022	P	2.35	650	2	2022			C 5.5 Source: CME, ICE
0	2022	Г	2.33	000	2	2022		C	U 5.5



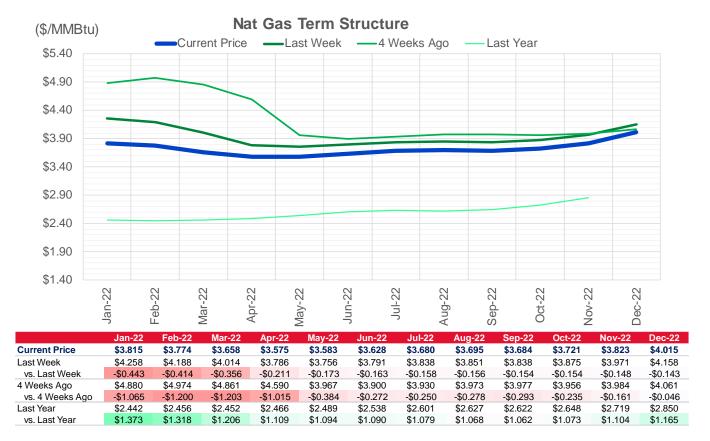
Nat Gas Futures Open Interest

CME, and ICE Combined

CME Henry	Hub Futures (10	0,000 MMBt	J)	ICE Henry Hub Futures Contract Equivalent (10,000 MM						
	Current	Prior	Daily Change		Current	Prior	Daily Change			
JAN 22	157919	188897	-30978	JAN 22	101457	104280	-2823			
FEB 22	84669	79489	5180	FEB 22	73380	71997	1382			
MAR 22	200687	189533	11154	MAR 22	89611	89031	580			
APR 22	91966	94716	-2750	APR 22	73002	72763	240			
MAY 22	115714	117594	-1880	MAY 22	70846	70685	161			
JUN 22	48826	49002	-176	JUN 22	53277	53114	163			
JUL 22	40384	42585	-2201	JUL 22	56955	56708	247			
AUG 22	31967	32019	-52	AUG 22	54840	54566	274			
SEP 22	44584	42619	1965	SEP 22	55917	55852	65			
OCT 22	79138	78545	593	OCT 22	63086	62942	144			
NOV 22	34780	34661	119	NOV 22	49575	49149	427			
DEC 22	32601	32381	220	DEC 22	58144	57659	486			
JAN 23	43165	43376	-211	JAN 23	45019	45074	-55			
FEB 23	11794	11884	-90	FEB 23	35257	35114	144			
MAR 23	25894	26081	-187	MAR 23	39862	39638	225			
APR 23	18323	17991	332	APR 23	39961	39872	89			
MAY 23	12977	12957	20	MAY 23	35454	35372	82			
JUN 23	9924	9842	82	JUN 23	32026	31852	174			
JUL 23	7226	7203	23	JUL 23	31552	31393	159			
AUG 23	5014	4978	36	AUG 23	32549	32329	221			
SEP 23	6754	6706	48	SEP 23	31004	30810	194			
OCT 23	10898	10637	261	OCT 23	35339	35102	237			
NOV 23	5997	5980	17	NOV 23	33764	33812	-48			
DEC 23	8543	8496	47	DEC 23	32374	32354	21			
JAN 24	6462	6277	185	JAN 24	22899	22889	10			
FEB 24	1470	1469	1	FEB 24	16050	16042	9			
MAR 24	9068	9066	2	MAR 24	21822	21589	233			
APR 24	4732	4727	5	APR 24	15371	15262	109			
MAY 24	2047	2036	11	MAY 24	15846	15842	4			
JUN 24	928	928	0	JUN 24	16234	16238	-4			







		Cash	Prompt	Cash to
	Units	Settled	Settle	Prompt
AGT Citygate	\$/MMBtu	3.72	18.59	14.87
TETCO M3	\$/MMBtu	3.14	7.70	4.56
FGT Zone 3	\$/MMBtu	3.19	4.24	1.05
Zone 6 NY	\$/MMBtu	3.19	9.37	6.18
Chicago Citygate	\$/MMBtu	3.44	4.49	1.05
Michcon	\$/MMBtu	3.47	3.84	0.37
Columbia TCO Pool	\$/MMBtu	2.94	3.70	0.76
Ventura	\$/MMBtu	3.55	5.02	1.47
Rockies/Opal	\$/MMBtu	4.80	4.25	-0.55
El Paso Permian Basin	\$/MMBtu	3.30	4.13	0.83
Socal Citygate	\$/MMBtu	7.37	4.96	-2.41
Malin	\$/MMBtu	4.94	4.52	-0.42
Houston Ship Channel	\$/MMBtu	3.68	4.37	0.69
Henry Hub Cash	\$/MMBtu	3.66	3.97	0.31
AECO Cash	C\$/GJ	3.02	2.76	-0.26
Station2 Cash	C\$/GJ	2.93	4.82	1.89
Dawn Cash	C\$/GJ	3.64	4.05	0.41

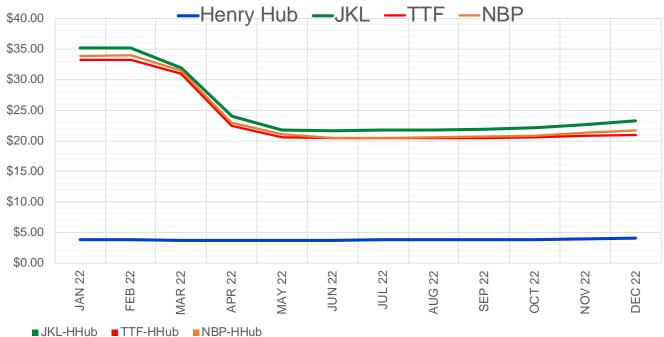
Source: CME, Bloomberg

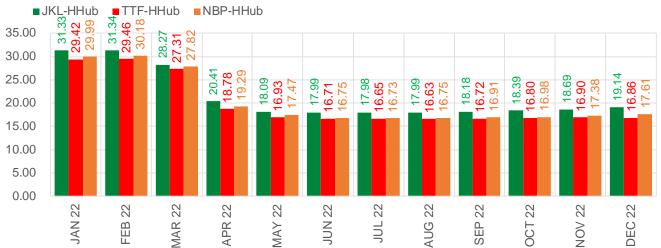


					VS	. 4 Weeks		
	Units	Current Price	vs. La	st Week	VS	Ago	vs	. Last Year
NatGas Jul21/Oct21	\$/MMBtu	2.224	a 0.	.000		0.000		2.191
NatGas Oct21/Nov21	\$/MMBtu	0.361	a 0.	.000		0.000		0.302
NatGas Oct21/Jan22	\$/MMBtu	-2.027	- 0	.242	~	-1.431	\blacksquare	-2.300
NatGas Apr22/Oct22	\$/MMBtu	0.157	a 0.	.057		0.161		0.110
WTI Crude	\$/Bbl	70.94	4 .	.440	•	-10.650		24.160
Brent Crude	\$/Bbl	74.42	4 .	.750	~	-8.450		24.170
Fuel Oil, NY Harbour 1%	\$/Bbl	97.18	a 0.	.000		0.000		0.000
Heating Oil	cents/Gallon	225.03	1 4	1.690	~	-19.680		81.460
Propane, Mt. Bel	cents/Gallon	1.01	a 0.	.046		-0.345		0.421
Ethane, Mt. Bel	cents/Gallon	0.34	- 0	.012	~	-0.072		0.140
Coal, PRB	\$/MTon	12.30	a 0.	.000		0.000		0.000
Coal, PRB	\$/MMBtu	0.70						
Coal, ILB	\$/MTon	31.05	a 0.	.000		0.000		0.000
Coal, ILB	\$/MMBtu	1.32						

10 December 2021

Nat Gas Term Structure (\$MMBTU)





	JAN 22	FEB 22	MAR 22	APR 22	MAY 22	JUN 22	JUL 22	AUG 22	SEP 22	OCT 22	NOV 22	DEC 22
Henry Hub	\$3.852	\$3.819	\$3.721	\$3.649	\$3.663	\$3.711	\$3.766	\$3.779	\$3.769	\$3.803	\$3.921	\$4.108
JKL	\$35.185	\$35.160	\$31.990	\$24.060	\$21.750	\$21.705	\$21.750	\$21.770	\$21.945	\$22.195	\$22.615	\$23.245
JKL-HHub	\$31.333	\$31.341	\$28.269	\$20.411	\$18.087	\$17.994	\$17.984	\$17.991	\$18.176	\$18.392	\$18.694	\$19.137
TTF	\$33.270	\$33.282	\$31.026	\$22.426	\$20.592	\$20.424	\$20.415	\$20.410	\$20.488	\$20.603	\$20.825	\$20.971
TTF-HHub	\$29.418	\$29.463	\$27.305	\$18.777	\$16.929	\$16.713	\$16.649	\$16.631	\$16.719	\$16.800	\$16.904	\$16.863
NBP	\$33.843	\$33.995	\$31.545	\$22.937	\$21.133	\$20.459	\$20.497	\$20.533	\$20.677	\$20.780	\$21.303	\$21.720
NBP-HHub	\$29.991	\$30.176	\$27.824	\$19.288	\$17.470	\$16.748	\$16.731	\$16.754	\$16.908	\$16.977	\$17.382	\$17.612



Weather Storage Model - Next 4 Week Forecast

