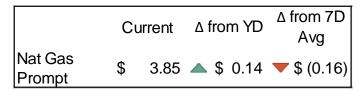


8 December 2021



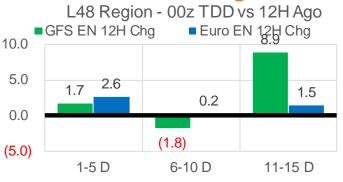
	С	urrent	Δ fro	m YD	Δ fror Αν	n 7D /g
WTI Prompt	\$	72.26	\$	0.21	\$	4.8

	_	urrant	۸ fro	m VD	Δ froi	m 7D
Current	ΔΙΙΟ	טו ווו	Avg			
Brent Prompt	\$	75.79	\$	0.35	\$	4.8

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

Vs. 12H Ago



Vs. 24H Ago

L48 Region - 00z TDD vs 24H Ago GFS EN 24H Chg ■ Euro EN 24H Cha 5.0 2.3 0.7 8.0 0.3 0.0 (5.0)(4.7)(7.7)(10.0)1-5 D 6-10 D 11-15 D

	Current	Δ from YD	Δ from 7D Avg
US Dry Production	95.4	▼ -1.24	▼ -1.14

	Current	Δ from YD	Δ from 7D Avg
US ResComm	39.5	▼ -3.50	7.68

	Current	Δ from YD	Δ from 7D Avg		
Net LNG Exports	11.7	a 0.51	▼ -0.09		

	Current	Δ from YD	Δ from 7D Avg		
US Power Burns	30.9	▼ -1.85	2.70		

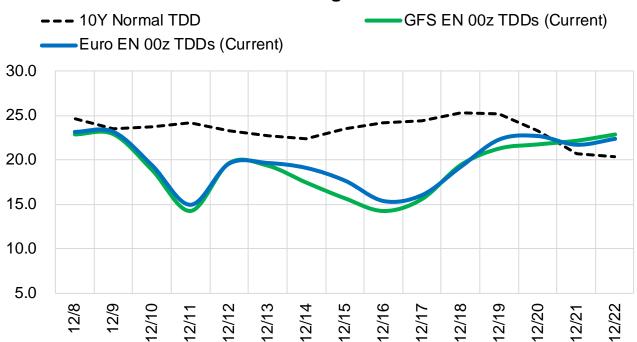
	Current	Δ from YD	Δ from 7D Avg
Canadian Imports	5.6	▲ 0.04	0.48

	Current	Δ from YD	Δ from 7D Avg
Mexican Exports	6.5	▼ -0.23	▲ 0.04

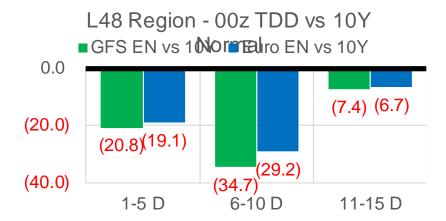


Short-term Weather Model Outlooks (00z)

L48 Region



Vs. 10Y Normal





Lower 48 Component Models

Daily Balances

	2-Dec	3-Dec	4-Dec	5-Dec	6-Dec	7-Dec	8-Dec	DoD	vs. 7D
Lower 48 Dry Production	96.0	96.8	96.7	96.8	96.7	96.7	95.4	▼-1.2	▼-1.2
Canadian Imports	4.9	5.0	5.1	5.0	4.9	5.5	5.6	▲ 0.0	▲ 0.5
L48 Power	27.7	27.1	26.1	25.8	28.8	32.7	30.9	▼ -1.9	2.8
L48 Residential & Commercial	24.6	29.4	31.6	30.1	34.4	43.0	39.5	▼ -3.5	7.3
L48 Industrial	21.3	21.7	21.9	21.9	22.6	23.4	22.9	▼-0.4	8.0
L48 Lease and Plant Fuel	5.2	5.2	5.2	5.3	5.2	5.2	5.2	▼ -0.1	▼ -0.1
L48 Pipeline Distribution	2.6	2.8	2.9	2.8	3.2	3.8	3.5	▼ -0.3	0.5
L48 Regional Gas Consumption	81.5	86.4	87.7	85.9	94.2	108.2	102.0	▼ -6.1	▲11.4
Net LNG Delivered	11.02	12.12	12.41	12.40	12.17	11.19	11.70	0.5	▼ -0.2
Total Mexican Exports	6.6	6.7	6.1	6.1	6.5	6.8	6.5	▼-0.2	▲ 0.1
Implied Daily Storage Activity	1.8	-3.4	-4.4	-2.6	-11.2	-23.9	-19.3		
EIA Reported Daily Storage Activity Daily Model Error									

EIA Storage Week Balances

	29-Oct	5-Nov	12-Nov	19-Nov	26-Nov	3-Dec	WoW	vs. 4W
Lower 48 Dry Production	94.5	95.1	95.9	95.1	96.2	96.9	0.7	1.4
Canadian Imports	5.6	5.5	5.1	4.9	5.5	5.6	▲ 0.0	0.3
L48 Power	29.0	29.6	27.5	27.8	29.2	28.8	▼-0.4	a 0.3
L48 Residential & Commercial	18.0	24.3	23.6	28.0	33.3	33.3	a 0.0	6.0
L48 Industrial	19.6	21.2	21.4	23.1	22.4	22.1	▼ -0.3	0.1
L48 Lease and Plant Fuel	5.1	5.2	5.2	5.2	5.2	5.3	0.0	0.1
L48 Pipeline Distribution	2.5	2.9	2.7	3.0	3.3	3.3	▼ -0.1	a 0.3
L48 Regional Gas Consumption	74.2	83.2	80.4	87.0	93.5	92.7	▼ -0.8	6.7
Net LNG Exports	10.8	10.9	11.2	11.1	11.7	11.8	0.1	0.6
Total Mexican Exports	6.9	6.1	6.2	6.1	6.0	6.4	0.4	0.3
Implied Daily Storage Activity	8.3	0.4	3.2	-4.2	-9.5	-8.4	1.1	
EIA Reported Daily Storage Activity	9.0	1.0	3.7	-3.0	-8.4			
Daily Model Error	-0.7	-0.6	-0.5	-1.2	-1.1			

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	5.1	▼ -0.2	▼-0.7
L48 Power	29.3	28.0	40.1	33.0	30.2	28.8	28.2	▼-0.6	0.2
L48 Residential & Commercial	39.1	40.3	7.9	8.7	13.2	29.6	31.8	2.3	▼-8.4
L48 Industrial	24.6	23.4	21.5	20.3	20.3	22.2	22.1	▼-0.2	▼ -1.3
L48 Lease and Plant Fuel	5.2	5.0	5.1	5.1	5.1	5.2	5.2	0.0	a 0.3
L48 Pipeline Distribution	3.4	3.4	2.6	2.3	2.3	3.1	3.0	▼ -0.1	▼ -0.4
L48 Regional Gas Consumption	101.6	100.0	77.2	69.4	71.3	88.9	90.4	1.5	▼-9.7
Net LNG Exports	7.8	11.0	10.5	10.3	10.6	11.4	11.8	0.4	▲ 0.8
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	-13.8	-19.5	4.6	12.1	10.9	-5.2	-7.0		
EIA Reported Daily Storage Activity Daily Model Error									

Source: Bloomberg, analytix.ai



Daily Average Generation Data

Nuclear Generation Daily Average - GWh (NRC)

	30-Nov	1-Dec	2-Dec	3-Dec	4-Dec	5-Dec	6-Dec	DoD	vs. 7D
NRC Nuclear Daily Output	87.8	86.8	86.5	87.4	87.5	88.1	87.9	-0.2	0.6
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	17.0	18.1	18.4	17.5	17.4	16.8	16.9	0.2	-0.6
NRC % Nuclear Cap Utilization	89.3	88.3	87.9	88.9	89.0	89.6	89.4	-0.2	0.6

Wind Generation Daily Average - MWh (EIA)

	30-Nov	1-Dec	2-Dec	3-Dec	4-Dec	5-Dec	6-Dec	DoD	vs. 7D
CALI Wind	464	369	263	623	704	602	1177	575	673
TEXAS Wind	12257	5946	7886	12447	7675	18043	13906	-4137	3197
US Wind	45422	45656	47349	45523	38850	68903	60673	-8230	12055

Generation Daily Average - MWh (EIA)

	30-Nov	1-Dec	2-Dec	3-Dec	4-Dec	5-Dec	6-Dec	DoD	vs. 7D
US Wind	45422	45656	47349	45523	38850	68903	60673	-8230	12055
US Solar	10205	9193	12016	10287	9198	9883	7176	-2707	-2954
US Petroleum	3960	2306	2963	3276	2798	2104	3216	1112	315
US Other	8961	8615	8581	8158	7987	8228	8258	31	-163
US Coal	87557	82813	78513	78051	78452	71332	80948	9616	1495
US Nuke	92512	91851	91591	92126	92072	93159	92410	-749	191
US Hydro	28458	28222	26996	29962	27512	26843	29318	2476	1320
US Gas	168554	166005	151901	149897	146489	126460	152376	25916	825

See National Wind and Nuclear daily charts

Source: Bloomberg, analytix.ai



Storage Week Average Generation Data

Nuclear	Generation	Weekly	Average -	GWh	(NRC)

	29-Oct	5-Nov	12-Nov	19- N ov	26-Nov	3-Dec	WoW	WoW Bcf/d Impact
NRC Nuclear Daily Output	71.6	72.2	79.8	83.9	86.1	87.8	1.7	-0.3
NRC Nuclear Max Capacity	104.9	104.9	104.9	104.9	104.9	104.9	0.0	
NRC Nuclear Outage	33.3	32.7	25.1	21.0	18.8	17.1	-1.7	
NRC % Nuclear Cap Utilization	0.1	0.1	0.1	0.1	0.1	0.1	0.0	

Wind Generation Weekly Average - MWh (EIA)

	29-Oct	5-Nov	12-Nov	19-Nov	26-Nov	3-Dec	WoW	Bcf/d Impact
CALI Wind	2314	1669	1805	862	1496	363	-1134	0.2
TEXAS Wind	15462	8472	12032	13655	14691	8733	-5958	1.1
US Wind	53896	35306	51002	58367	56260	47211	-9049	1.6
					-2107.9			
					-4%			

Generation Weekly Average - MWh (EIA)

	29-Oct	5-Nov	12-Nov	19-Nov	26-Nov	3-Dec	WoW	WoW Bcf/d Impact
US Wind	53896	35306	51002	58367	56260	47211	-9049	1.6
US Solar	10154	9994	10015	10068	9086	10062	976	-0.2
US Petroleum	2815	3517	2532	2555	3342	3167	-176	0.0
US Other	10211	9302	8205	7849	8442	8549	108	0.0
US Coal	75231	80024	77955	77863	82301	82289	-11	0.0
US Nuke	74294	76091	84337	88331	91252	92817	1564	-0.3
US Hydro	23806	25818	25422	26227	27835	26768	-1067	0.2
US Gas	154007	160442	145216	145263	148206	154765	6559	-1.2

See National Wind and Nuclear daily charts

Source: Bloomberg, analytix.ai

10/010/

20.0

86.3

17.1

89.3

-4.6

4.7

-0.9

1.0



NRC Nuclear Outage

NRC % Nuclear Cap Utilization

Monthly Average Generation Data

Nuclear Generation Monthly Average - GWh (NRC)									
	2Yr Ago	Yr 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	87.8	84.9	87.1	75.5	82.7	87.3	85.8	4.6	0.9
NRC Nuclear Max Capacity	104.9	104.9	104.9	104.9	104.9	104.9	104.9	0.0	0.0

17.8

88.6

29.4

76.8

22.2

84.1

17.5

88.8

19.0

87.3

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	797	1073	1964	1765	1252	761	988	-491	-85
TEXAS Wind	9211	9683	9213	11565	11869	11714	12468	-154	2784
US Wind	38578	42709	39362	43118	49974	53537	54080	3563	11371

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	38578	42709	39362	43118	49974	53537	54080	542.5	11371
US Solar	4676	7076	13345	11056	9670	9013	9496	482.6	2419
US Petroleum	2284	2572	2517	3239	3045	2887	2956	6 9	384
US Other	7963	8562	9021	11109	8452	8293	8225	-68	▼ -337
US Coal	99331	89728	109915	84411	80844	79001	80092	1092	▼ -9636
US Nuke	95454	89363	90072	77089	87404	92254	90696	▼ -1558	1333
US Hydro	27686	30719	25622	24078	26594	28436	27251	▼ -1185	▼ -3468
US Gas	149451	144272	173566	159042	151423	149735	148339	▼ -626	4068
US Total	425422	415478	463578	413298	417847	422436	421208	▼ -1795	5730



See National Wind and Nuclear daily charts

Source: Bloomberg, analytix.ai



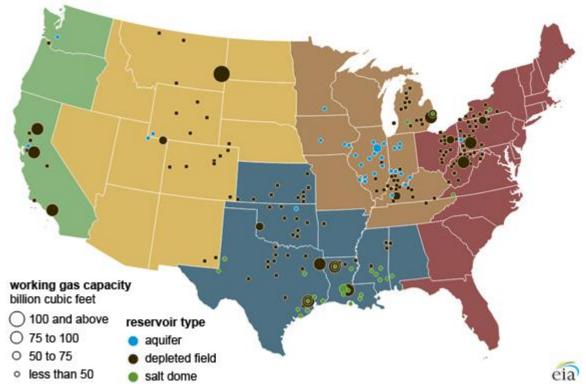
Regional S/D Models Storage Projection

Week Ending 3-Dec

	Daily Raw Storage	Daily Adjustment Factor	Daily Average Storage Activity (Adjusted) *	Weekly Adjusted Storage Activity
L48	-8.7	1.2	-7.5	-53
East	-5.4	1.7	-3.7	-26
Midwest	-3.5	0.3	-3.2	-22
Mountain	3.3	-3.6	-0.2	-2
South Central	-4.1	2.9	-1.2	-8
Pacific	0.9	-0.1	0.8	6

^{*}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
03-Dec	18	-53
10-Dec	19	-71
17-Dec	17	-40
24-Dec	22	-101

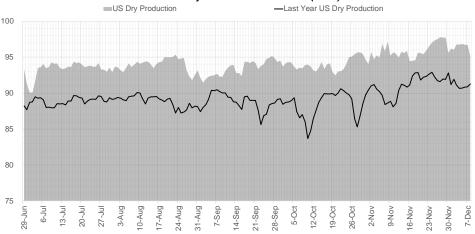
Weather Storage Model - Next 4 Week Forecast



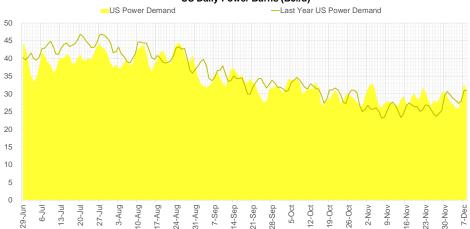


Supply - Demand Trends

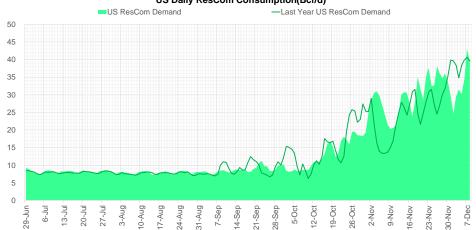
US Dry Natural Gas Production (Bcf/d)



US Daily Power Burns (Bcf/d)



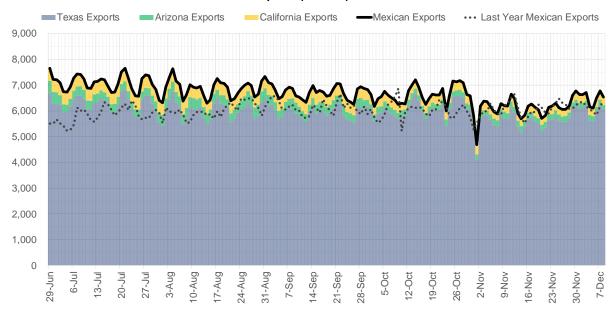
US Daily ResCom Consumption(Bcf/d)



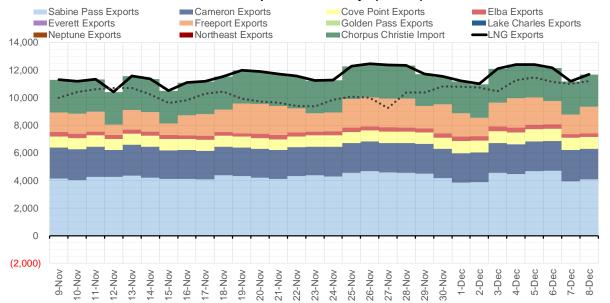
Source: Bloomberg



Mexican Exports (MMcf/d)







Source: Bloomberg



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

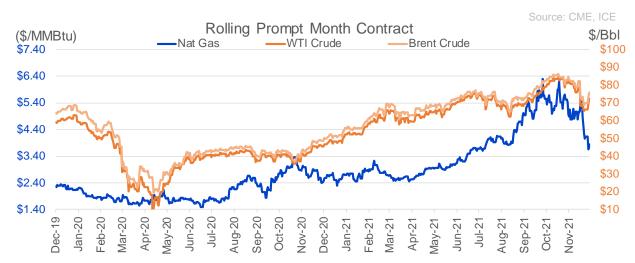
CONTRACT MONTH	CONTRACT YEAR	PUT/CALL	STRIKE	CUMULATIVE VOL		CONTRACT MONTH		DIT/CALL	BIT/CALL STRIKE
1	2022	Р	3.00	7076		3	3 2022	3 2022 C	3 2022 C 10.00
1	2022	С	4.00	5871		1	1 2022	1 2022 P	1 2022 P 4.00
1	2022	С	4.50	5489		3	3 2022	3 2022 C	3 2022 C 8.00
1	2022	P	2.75	5306		3	3 2022	3 2022 C	3 2022 C 5.00
1	2022	P	3.25	5171		1	1 2022	1 2022 C	1 2022 C 6.00
3	2022	C	4.00	3219		1	1 2022		
3	2022	P	3.25	3100		1			
3	2022	P				1			
			3.50	2281		3			
3	2022	C	9.00	2215		2			
1	2022	Р	3.50	2159					
3	2022	Р	2.50	1867		1			
1	2022	С	5.00	1861		12			
1	2022	С	4.25	1724		1			
1	2022	C	3.75	1537		3	3 2022	3 2022 C	3 2022 C 6.00
3	2022	Č	4.25	1533		4	4 2022	4 2022 C	4 2022 C 3.00
3	2022	P	3.00	1492		3	3 2022	3 2022 P	3 2022 P 3.00
						1			
2	2022	С	6.00	1453		4			
3	2022	Р	2.75	1441		1			
1	2022	С	4.20	1253		2			
3	2022	Р	4.00	1235					
3	2022	С	8.00	1211		2			
3	2022	Р	2.25	1200		3			
3	2022	C	3.75	1137		3			
2	2022	C	4.50	1039		3			
						2	2 2022	2 2022 P	2 2022 P 4.00
3	2022	С	4.50	1034		2	2 2022	2 2022 C	2 2022 C 4.00
3	2022	Р	2.90	1002		4	4 2022	4 2022 P	4 2022 P 2.50
9	2022	С	5.50	1000		1			
4	2022	С	4.00	935		6			
2	2022	Р	3.25	887		1			
2	2022	С	5.50	863					
2	2022	P	3.15	858		3			
1	2022	Р	2.25	851		5			
2	2022	C	5.25	846		2			
1		P			5		2022		
	2022		2.90	818	1		2022		
1	2022	P	3.75	816	3		2022	2022 P	2022 P 5.00
2	2022	С	4.75	801	6		2022	2022 C	2022 C 3.00
1	2022	С	5.50	794	12		2022	2022 C	2022 C 5.25
3	2022	С	5.00	786	12		2022		
2	2022	Р	3.00	743	7		2022		
2	2022	С	4.00	722	8		2022		
3	2022	P	3.15	701					
4	2022	C			9		2022		
-			5.00	689	3		2022		
1	2022	C	5.25	678	1		2022		
4	2022	Р	4.00	675	10		2022		
2	2022	С	5.00	671	8		2022	2022 C	2022 C 5.00
10	2022	Р	3.00	625	1		2022		
3	2022	C	3.50	577	5		2022		
5	2022	P	3.00	575	1		2022		
5	2022	P	3.60	569	2		2022		
1									



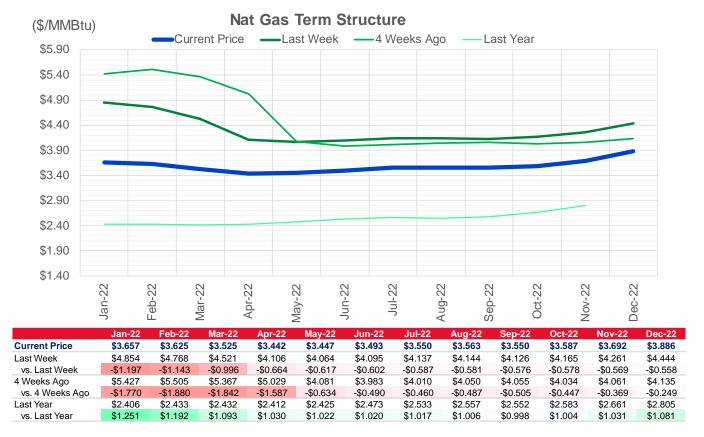
Nat Gas Futures Open Interest

CME, and ICE 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		
JAN 22	217503	243121	-25618	JAN 22	102593	101492	1101		
FEB 22	79985	78244	1741	FEB 22	70929	70542	387		
MAR 22	180526	168677	11849	MAR 22	86695	85432	1263		
APR 22	95511	102993	-7482	APR 22	73615	73763	-148		
MAY 22	119512	121715	-2203	MAY 22	70943	71204	-261		
JUN 22	49265	48394	871	JUN 22	53365	53483	-119		
JUL 22	44679	45542	-863	JUL 22	57121	56838	283		
AUG 22	31755	32196	-441	AUG 22	54865	54676	189		
SEP 22	39761	39071	690	SEP 22	55995	55921	74		
OCT 22	78935	80115	-1180	OCT 22	63237	63184	53		
NOV 22	34863	34679	184	NOV 22	48922	48893	29		
DEC 22	27776	28343	-567	DEC 22	52923	52279	644		
JAN 23	44427	45087	-660	JAN 23	44863	44362	501		
FEB 23	11872	12165	-293	FEB 23	34773	34897	-124		
MAR 23	26520	26916	-396	MAR 23	39259	39269	-10		
APR 23	17626	18407	-781	APR 23	39360	39465	-106		
MAY 23	12995	13025	-30	MAY 23	35541	35584	-44		
JUN 23	9855	9746	109	JUN 23	31800	31876	-76		
JUL 23	7127	7127	0	JUL 23	31545	31648	-103		
AUG 23	4957	5084	-127	AUG 23	32481	32574	-93		
SEP 23	6695	6731	-36	SEP 23	30935	31016	-81		
OCT 23	10511	10556	-45	OCT 23	35209	35323	-114		
NOV 23	6019	6004	15	NOV 23	33863	34141	-278		
DEC 23	8911	8935	-24	DEC 23	31961	32256	-294		
JAN 24	6181	6171	10	JAN 24	21994	21964	31		
FEB 24	1496	1469	27	FEB 24	15913	15926	-13		
MAR 24	9054	9071	-17	MAR 24	21605	21537	68		
APR 24	4715	4714	1	APR 24	15096	15139	-43		
MAY 24	2031	2030	1	MAY 24	15834	15840	-6		
JUN 24	928	927	1	JUN 24	16230	16214	17		







		Cash	Prompt	Cash to
	Units	Settled	Settle	Prompt
AGT Citygate	\$/MMBtu	7.65	19.39	11.74
TETCO M3	\$/MMBtu	5.53	8.60	3.07
FGT Zone 3	\$/MMBtu	5.72	4.74	-0.98
Zone 6 NY	\$/MMBtu	5.72	9.90	4.18
Chicago Citygate	\$/MMBtu	3.55	4.95	1.40
Michcon	\$/MMBtu	3.51	4.33	0.82
Columbia TCO Pool	\$/MMBtu	3.24	4.18	0.94
Ventura	\$/MMBtu	3.69	5.55	1.86
Rockies/Opal	\$/MMBtu	4.45	4.82	0.37
El Paso Permian Basin	\$/MMBtu	3.49	4.63	1.14
Socal Citygate	\$/MMBtu	7.23	5.46	-1.77
Malin	\$/MMBtu	4.62	5.23	0.61
Houston Ship Channel	\$/MMBtu	3.52	4.87	1.35
Henry Hub Cash	\$/MMBtu	3.63	4.49	0.86
AECO Cash	C\$/GJ	2.92	3.16	0.24
Station2 Cash	C\$/GJ	2.93	5.49	2.56
Dawn Cash	C\$/GJ	3.67	4.49	0.82

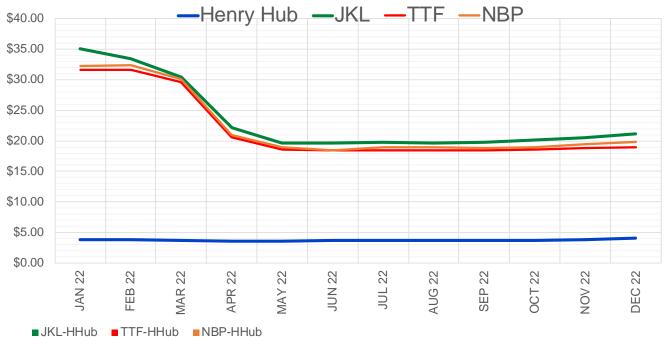
Source: CME, Bloomberg

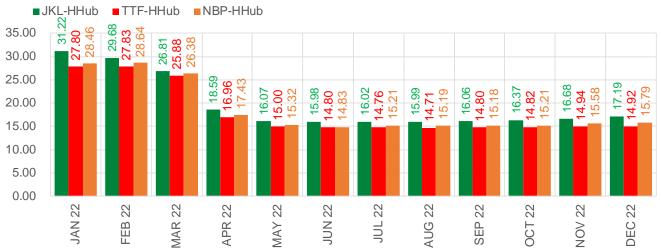


					s. 4 Weeks		
	Units	Current Price	vs. Last	Week	Ago	vs	. Last Year
NatGas Jul21/Oct21	\$/MMBtu	2.224	a 0.00	00	0.000		2.168
NatGas Oct21/Nov21	\$/MMBtu	0.361	a 0.00	00	0.000		0.287
NatGas Oct21/Jan22	\$/MMBtu	-2.133	-0.8	59	-1.362	•	-2.443
NatGas Apr22/Oct22	\$/MMBtu	0.148	a 0.07	70	0.136		0.086
WTI Crude	\$/Bbl	72.05	5.87	70	-12.100		26.450
Brent Crude	\$/Bbl	75.44	4.87	70	-9.340		26.600
Fuel Oil, NY Harbour 1%	\$/Bbl	97.18	a 0.00	00	0.000		0.000
Heating Oil	cents/Gallon	222.46	16.0	80	-28.350		81.790
Propane, Mt. Bel	cents/Gallon	1.01	▼ -0.2	50	-0.411		0.427
Ethane, Mt. Bel	cents/Gallon	0.34	-0.0	52 T	-0.074		0.154
Coal, PRB	\$/MTon	12.30	a 0.00	00	0.000		0.000
Coal, PRB	\$/MMBtu	0.70					
Coal, ILB	\$/MTon	31.05	a 0.00	00	0.000		0.000
Coal, ILB	\$/MMBtu	1.32					

8 December 2021







	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	\$3.850	\$3.807	\$3.697	\$3.583	\$3.590	\$3.638	\$3.690	\$3.703	\$3.692	\$3.723	\$3.821	\$4.009
JKL	\$35.065	\$33.490	\$30.505	\$22.175	\$19.655	\$19.620	\$19.710	\$19.695	\$19.755	\$20.090	\$20.505	\$21.195
JKL-HHub	\$31.215	\$29.683	\$26.808	\$18.592	\$16.065	\$15.982	\$16.020	\$15.992	\$16.063	\$16.367	\$16.684	\$17.186
TTF	\$31.654	\$31.640	\$29.572	\$20.539	\$18.594	\$18.437	\$18.445	\$18.413	\$18.487	\$18.547	\$18.759	\$18.931
TTF-HHub	\$27.804	\$27.833	\$25.875	\$16.956	\$15.004	\$14.799	\$14.755	\$14.710	\$14.795	\$14.824	\$14.938	\$14.922
NBP	\$32.313	\$32.446	\$30.076	\$21.009	\$18.913	\$18.472	\$18.897	\$18.895	\$18.868	\$18.930	\$19.397	\$19.803
NBP-HHub	\$28.463	\$28.639	\$26.379	\$17.426	\$15.323	\$14.834	\$15.207	\$15.192	\$15.176	\$15.207	\$15.576	\$15.794



Weather Storage Model - Next 4 Week Forecast

