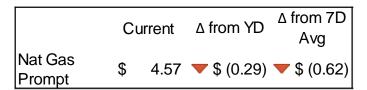


Market Report

30 November 2021



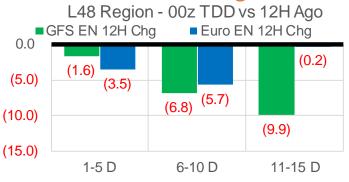
	С	urrent	Δ from YD		m 7D vg
WTI Prompt	\$	67.99	* \$ (1.96)	~ \$	(4.8)

	_	Current	A from VD	Δ from 7D			
	C		ם וווטוו ב	A	vg		
Brent	Ф	71.00	\$ (2.35)	— ¢	/E 9\		
Prompt	φ	71.09	Φ (2.33)	• φ	(5.6)		

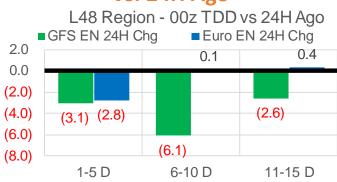
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Short-term Weather Model Outlooks
Lower 48 Component Models
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Supply – Demand Trends
Nat Gas Options Volume and Open Interest
Nat Gas Futures Open Interest
Price Summary

Vs. 12H Ago



Vs. 24H Ago



	Current	Δ from YD	Δ from 7D Avg
US Dry Production	95.5	- 2.41	▼ -2.23

	Current		Δ from 7D Avg		
US Power Burns	28.9	▼ -0.78	a 0.48		

	Current	Δ from YD	Δ from 7D Avg
US ResComm	31.6	▼ -3.50	▼ -3.35

	Current	Δ from YD	Δ from 7D Avg
Canadian Imports	5.6	▼ -0.27	- 0.07

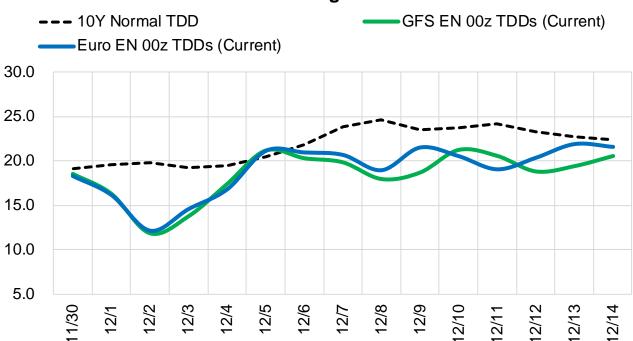
	Current	Δ from YD	Δ from 7D Avg
Net LNG Exports	11.6	▼ -0.15	▼ -0.39

	Current	Δ from YD	Δ from 7D Avg
Mexican Exports	6.3	▼ -0.08	0.17

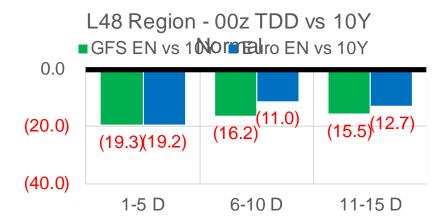


Short-term Weather Model Outlooks (00z)

L48 Region



Vs. 10Y Normal



Source: WSI, Bloomberg



Market Report

Lower 48 Component Models

Daily Balances

	24-Nov	25-Nov	26-Nov	27-Nov	28-Nov	29-Nov	30-Nov	DoD	vs.7D
Lower 48 Dry Production	97.5	97.7	97.9	98.0	98.0	97.9	95.5	▼-2.4	▼ -2.4
Canadian Imports	5.3	5.3	5.7	5.7	5.8	5.9	5.6	▼-0.3	▼ 0.0
L48 Power	28.5	26.5	28.0	27.4	28.3	29.7	28.9	▼-0.8	8.0
L48 Residential & Commercial	32.3	32.5	37.9	35.7	34.0	35.1	31.6	▼ -3.5	▼ -2.9
L48 Industrial	22.3	22.2	22.7	22.2	22.0	22.1	21.7	- 0.4	▼ -0.6
L48 Lease and Plant Fuel	5.3	5.3	5.3	5.3	5.3	5.3	5.2	▼ -0.1	▼ -0.1
L48 Pipeline Distribution	3.2	3.1	3.5	3.4	3.3	3.5	3.2	▼ -0.2	▼ -0.1
L48 Regional Gas Consumption	91.5	89.7	97.5	94.0	92.9	95.7	90.6	▼ -5.0	▼ -2.9
Net LNG Delivered	11.30	12.29	12.47	12.36	12.35	11.73	11.58	▼-0.1	▼ -0.5
Total Mexican Exports	6.3	6.1	6.0	6.2	5.9	6.4	6.3	▼-0.1	▲ 0.2
Implied Daily Storage Activity	-6.3	-5.1	-12.3	-8.9	-7.4	-10.1	-7.5		
EIA Reported Daily Storage Activity Daily Model Error									

EIA Storage Week Balances

	22-Oct	29-Oct	5-Nov	12-Nov	19-Nov	26-Nov	WoW	vs. 4W
Lower 48 Dry Production	93.8	94.9	95.4	96.3	95.6	96.6	1.1	1.1
Canadian Imports	5.6	5.6	5.5	5.1	4.9	5.5	0.7	▲ 0.3
L48 Power	29.0	29.0	29.5	27.5	27.8	29.3	1.5	8.0
L48 Residential & Commercial	13.9	17.7	24.1	23.4	27.8	33.1	5.3	9 .9
L48 Industrial	19.8	20.3	21.9	21.9	23.6	22.7	▼ -1.0	0.7
L48 Lease and Plant Fuel	5.1	5.2	5.2	5.2	5.2	5.3	0.1	0.1
L48 Pipeline Distribution	2.3	2.5	2.9	2.7	3.0	3.3	0.4	0.6
L48 Regional Gas Consumption	70.0	74.6	83.6	80.7	87.4	93.6	6.2	12.0
Net LNG Exports	10.8	10.8	10.9	11.2	11.1	11.7	0.6	0.7
Total Mexican Exports	6.6	6.9	6.1	6.2	6.1	6.0	▼ 0.0	▼-0.3
Implied Daily Storage Activity	12.0	8.2	0.4	3.2	-4.2	-9.2	-5.0	
EIA Reported Daily Storage Activity Daily Model Error	12.4 -0.4	9.0 -0.8	1.0 -0.6	3.7 -0.5	-3.0 -1.2			

Monthly Balances									
	2Yr Ago	LY					MTD		
	Nov-19	Nov-20	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	MoM	vs. LY
Lower 48 Dry Production	96.2	91.1	93.6	94.2	93.8	94.3	96.3	1.9	5.2
Canadian Imports	4.5	4.6	5.2	5.1	5.1	5.4	5.3	▼ -0.1	0.7
L48 Power	27.5	25.7	39.4	40.0	33.2	30.3	28.7	▼ -1.6	2.9
L48 Residential & Commercial	32.8	24.4	8.1	7.8	7.7	12.9	29.3	16.4	4.9
L48 Industrial	24.9	22.4	21.1	21.8	21.5	21.0	22.6	1.7	0.2
L48 Lease and Plant Fuel	5.2	5.0	5.1	5.1	5.1	5.1	5.2	0.1	a 0.3
L48 Pipeline Distribution	3.0	2.7	2.5	2.6	2.2	2.3	3.1	8.0	0.4
L48 Regional Gas Consumption	93.5	80.2	76.3	77.4	69.7	71.6	88.9	▲17.3	8.7
Net LNG Exports	7.2	10.1	10.8	10.5	10.3	10.6	11.4	▲ 0.8	1.3
Total Mexican Exports	5.2	6.1	7.1	6.9	6.7	6.6	6.1	▼ -0.5	▲ 0.0
Implied Daily Storage Activity EIA Reported Daily Storage Activity	-5.1	-0.7	4.6	4.6	12.1	10.9	-4.8		
Daily Model Error									



Daily Average Generation Data

Nuclear Generation Daily Average - GWh (NRC)

	22-Nov	23-Nov	24-Nov	25-Nov	26-Nov	27-Nov	28-Nov	DoD	vs. 7D
NRC Nuclear Daily Output	86.3	87.2	87.9	87.9	88.3	88.3	88.3	0.0	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	18.6	17.7	16.9	16.9	16.6	16.6	16.6	0.0	-0.6
NRC % Nuclear Cap Utilization	87.7	88.7	89.4	89.4	89.7	89.7	89.7	0.0	0.6

Wind Generation Daily Average - MWh (EIA)

	22-Nov	23-Nov	24-Nov	25-Nov	26-Nov	27-Nov	28-Nov	DoD	vs. 7D
CALI Wind	574	2620	2018	1987	510	311	352	41	-985
TEXAS Wind	13940	17438	18308	18272	9894	7715	7082	-633	-7179
US Wind	52117	66417	75184	74591	52069	49433	41807	-7626	-19828

Generation Daily Average - MWh (EIA)

	22-Nov	23-Nov	24-Nov	25-Nov	26-Nov	27-Nov	28-Nov	DoD	vs. 7D
US Wind	52117	66417	75184	74591	52069	49433	41807	-7626	-19828
US Solar	7101	8888	9388	9235	8997	8838	9358	520	617
US Petroleum	2609	3495	2767	2656	3286	2877	3539	662	590
US Other	8636	8734	8627	8682	8106	8294	8257	-36	-256
US Coal	82249	85350	81594	80024	78647	79756	82140	2385	870
US Nuke	91313	92932	93020	93144	93482	93494	93399	-95	502
US Hydro	13037	27901	29461	5151	23519	26449	24074	-2375	3155
US Gas	146568	154670	145379	142181	138495	145420	143903	-1517	-1549

See National Wind and Nuclear daily charts



Storage Week Average Generation Data

Nuclear Generation Weekly Average - GWh (NRC)

	22-Oct	29-Oct	5-Nov	12-Nov	19- N ov	26-Nov	WoW	WoW Bcf/d Impact
NRC Nuclear Daily Output	73.6	71.6	72.2	79.8	83.9	86.1	2.2	-0.4
NRC Nuclear Max Capacity	104.9	104.9	104.9	104.9	104.9	104.9	0.0	
NRC Nuclear Outage	31.2	33.3	32.7	25.1	21.0	18.8	-2.2	
NRC % Nuclear Cap Utilization	0.1	0.1	0.1	0.1	0.1	0.1	0.0	

Wind Generation Weekly Average - MWh (EIA)

	22-Oct	29-Oct	5-Nov	12-Nov	19- N ov	26-Nov	WoW	WoW Bcf/d Impact
CALI Wind	1270	2314	1669	1805	862	1646	784	-0.1
TEXAS Wind	10729	15462	8472	12032	13655	16166	2511	-0.5
US Wind	43721	49870	32116	51002	58367	61378	3011	-0.5
					7364.9			
					14%			

Generation Weekly Average - MWh (EIA)

	22-Oct	29-Oct	5-Nov	12-Nov	19-Nov	26-Nov	WoW	WoW Bcf/d Impact
US Wind	43721	49870	32116	51002	58367	61378	3011	-0.5
US Solar	12209	10138	9979	10015	10016	8768	-1248	0.2
US Petroleum	3092	2815	3517	2532	2555	2996	442	-0.1
US Other	12109	10196	9288	8205	7816	8458	643	-0.1
US Coal	74017	73355	77392	77955	77804	81572	3768	-0.7
US Nuke	73748	73713	75510	84337	88331	91207	2876	-0.5
US Hydro	23105	23540	25530	25395	26226	22320	-3906	0.7
US Gas	150057	152806	159071	145213	145072	147355	2283	-0.4

See National Wind and Nuclear daily charts



Monthly Average Generation Data

Nuclear Generation Monthly Average - GWh (NRC)										
	2Yr Ago	2Yr Ago LY				MTD				
	Same 30 days	Same 30 days	Aug-21	Sep-21	Oct-21	Nov-21	Last 30 days	MoM (MTD vs LY)	Last 30 days YoY	
NRC Nuclear Daily Output	85.0	81.8	91.5	87.2	75.5	82.7	82.7	7.2	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	19.9	23.0	13.4	17.7	29.4	22.1	22.1	-7.2	-0.9	
NRC % Nuclear Cap Utilization	86.4	83.2	93.0	88.7	76.8	84.1	84.1	7.4	0.9	

Wind Generation Monthly Average - MWh (EIA)

	2Yr Ago	LY				MTD			
	Same 30 days	Same 30 days	Aug-21	Sep-21	Oct-21	Nov-21	Last 30 days	MoM (MTD vs LY)	Last 30 days YoY
CALI Wind	675	1237	2442	2020	1765	1286	1286	-479	49
TEXAS Wind	8725	10460	9901	9400	11565	11932	11932	366	1471
US Wind	36146	46294	35830	40223	40991	50803	50803	9812	4508

Generation Monthly Average - MWh (EIA)

- concentration and processing	2Yr Ago	LY				MTD			
	Same 30 days	Same 30 days	Aug-21	Sep-21	Oct-21	Nov-21	Last 30 days	MoM (MTD vs LY)	Last 30 days YoY
US Wind	36146	46294	35830	40223	40991	50803	50803	0.0	4508
US Solar	5364	7170	13787	13382	11044	9473	9473	0.0	2302
US Petroleum	2430	2335	4484	2452	3238	2961	2961	0	626
US Other	8081	8777	9928	9008	11099	8399	8399	a 0	▼ -378
US Coal	100898	84313	137655	110037	82735	80286	80286	0	▼ -4027
US Nuke	92621	85972	94062	90146	76700	87420	87420	0	1448
US Hydro	27365	30041	28533	25665	23895	24968	24968	a 0	▼ -5073
US Gas	146628	135284	210824	173538	158238	149472	149472	0	14188
US Total	419757	400727	534937	464626	410698	415599	415599	0	14872



See National Wind and Nuclear daily charts



Regional S/D Models Storage Projection

Week Ending 26-Nov

	Daily Raw Storage	Daily Adjustment Factor	Daily Average Storage Activity (Adjusted) *	Weekly Adjusted Storage Activity
L48	-9.5	1.3	-8.2	-58
East	-5.2	1.3	-3.9	-27
Midwest	-3.3	8.0	-2.5	-18
Mountain	2.8	-3.5	-0.6	-4
South Central	-4.1	2.7	-1.3	-9
Pacific	0.2	-0.1	0.1	1

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

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



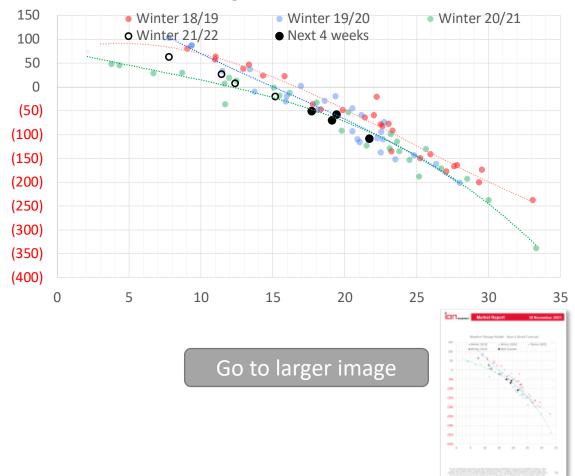


Weather Model Storage Projection

Next report
and beyond

Week Ending	GWDDs	Week Storage Projection
26-Nov	19	-58
03-Dec	18	-50
10-Dec	19	-69
17-Dec	22	-108

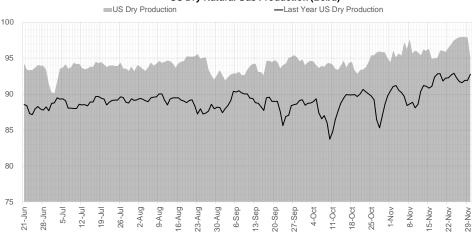
Weather Storage Model - Next 4 Week Forecast



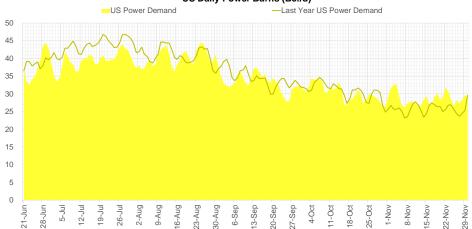


Supply - Demand Trends

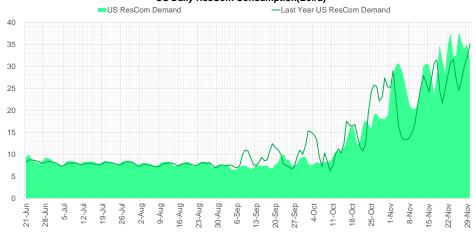
US Dry Natural Gas Production (Bcf/d)



US Daily Power Burns (Bcf/d)



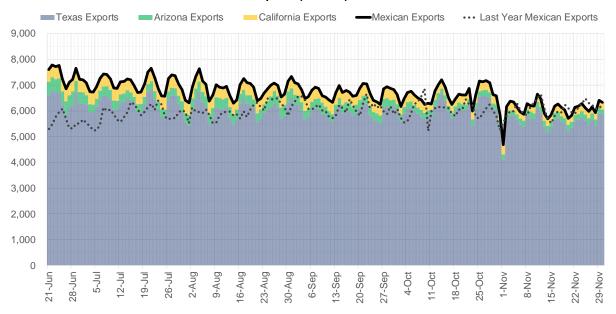
US Daily ResCom Consumption(Bcf/d)



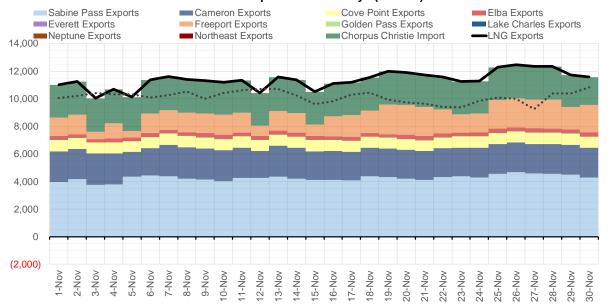
Source: Bloomberg



Mexican Exports (MMcf/d)



Net LNG Exports - Last 30 days (MMcf/d)



Source: Bloomberg



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

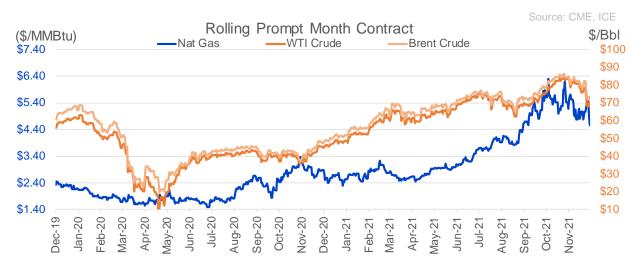
CONTRACT MONTH	CONTRACT YEAR	PUT/CALL	STRIKE	CUMULATIVE VOL		CONTRACT MONTH		DIT/CALL	BIT/CALL STRIKE
1	2022	Р	4.00	5993		3	3 2022	3 2022 C	3 2022 C 10.00
1	2022	C	6.00	4550		3			
1	2022	Ċ	5.50	4508		1	1 2022		
1	2022	Ċ	5.40	4127		3	3 2022	3 2022 C	3 2022 C 5.00
1	2022	Č	5.30	4025		1			
1	2022	P	4.50	3548		1			
1	2022	P	4.30	3449		1			
1	2022	C	5.60	2670		4			
1	2022	P	4.25	2540		1			
						1			
1	2022	С	10.00	2398		1			
1	2022	Р	3.50	2295		3			
1	2022	Р	3.00	2267					
1	2022	С	5.25	2265		3			
3	2022	С	8.00	2152		2			
1	2022	Р	4.75	2068		3			
1	2022	С	8.00	2043		3			
2	2022	C	10.00	1890		12			
1	2022	Ċ	7.00	1865		4	4 2022	4 2022 C	4 2022 C 5.00
3	2022	Č	10.00	1807		3	3 2022	3 2022 P	3 2022 P 3.00
3		P				1	1 2022	1 2022 C	1 2022 C 10.00
	2022		4.00	1674		3	3 2022	3 2022 C	3 2022 C 4.00
1	2022	Р	4.60	1656		2			
1	2022	С	5.00	1540		4			
12	2022	С	5.00	1500		2			
12	2022	С	6.00	1500		1			
3	2022	Р	3.00	1477					
3	2022	С	6.00	1470		1			
3	2022	С	7.00	1322		3			
1	2022	C	7.50	1303		3			
2	2022	Č	6.00	1263		5			
1	2022	P	3.75	1239		2			
						6			
3	2022	С	9.00	1177		12			
4	2022	С	5.00	1102		6	6 2022	6 2022 C	6 2022 C 5.00
2	2022	P	3.50	1100		1	1 2022		
2	2022	P	4.00	1003	12		2022	2022 C	2022 C 5.25
1	2022	С	22.00	1000	2		2022	2022 C	2022 C 10.00
4	2022	Р	2.80	1000	7		2022		
4	2022	Р	3.00	1000	8		2022		
1	2022	С	6.50	992	9		2022		
1	2022	C	6.25	959	2		2022		
2	2022	P	4.50	935			2022		
3	2022	Ċ	5.00	883	3				
					10		2022		
3	2022	С	14.00	878	1		2022		
2	2022	P	3.75	876	5		2022		
3	2022	Р	3.25	826	5		2022	2022 C	2022 C 5.00
5	2022	С	5.00	825	1		2022	2022 C	2022 C 6.10
3	2022	С	12.00	788	1		2022		
3	2022	C	5.75	774	5		2022		
1	2023	Ċ	5.00	750	3		2022		
3	2023	C	4.60	736 716	2		2022		
J	2022	C	4.00	7 10	2		2022	2022 F	2022 P 2.5 Source: CME, ICE



Nat Gas Futures Open Interest

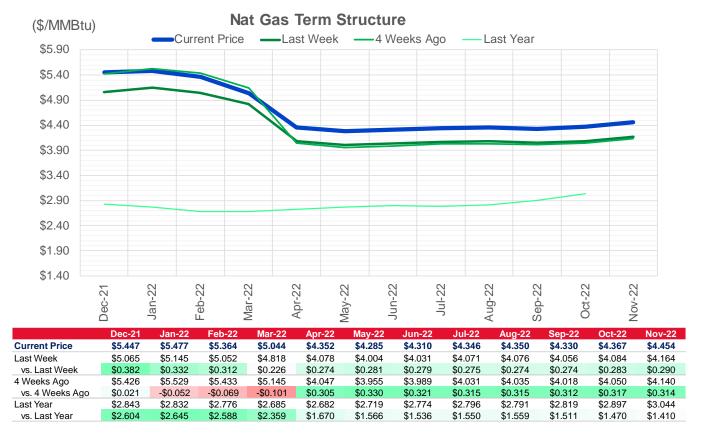
CME, and ICE Combined

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	255513	403	255110	JAN 22	104847	87078	17769			
FEB 22	83273	258314	-175041	FEB 22	70715	103906	-33191			
MAR 22	169709	82896	86813	MAR 22	79363	69809	9555			
APR 22	121121	170352	-49231	APR 22	76713	78683	-1970			
MAY 22	138277	119905	18372	MAY 22	72273	76219	-3947			
JUN 22	46909	140227	-93318	JUN 22	55176	72053	-16877			
JUL 22	43889	46968	-3079	JUL 22	56551	55473	1079			
AUG 22	34415	43810	-9395	AUG 22	55599	57036	-1436			
SEP 22	38844	33745	5099	SEP 22	56538	55613	925			
OCT 22	86962	38762	48200	OCT 22	62773	56655	6119			
NOV 22	34430	88191	-53761	NOV 22	48728	63143	-14416			
DEC 22	26756	35087	-8331	DEC 22	51722	48521	3201			
JAN 23	41920	27362	14558	JAN 23	41377	51827	-10450			
FEB 23	12249	39189	-26940	FEB 23	33652	41173	-7521			
MAR 23	26841	12059	14782	MAR 23	38032	33603	4429			
APR 23	19645	26739	-7094	APR 23	39318	37979	1340			
MAY 23	11884	19170	-7286	MAY 23	35159	39374	-4215			
JUN 23	9570	11605	-2035	JUN 23	31830	35193	-3362			
JUL 23	7130	9507	-2377	JUL 23	31539	31908	-369			
AUG 23	4801	7014	-2213	AUG 23	32627	31601	1026			
SEP 23	6849	4770	2079	SEP 23	30888	32714	-1826			
OCT 23	10899	6762	4137	OCT 23	34736	30974	3763			
NOV 23	5570	10866	-5296	NOV 23	33796	34909	-1113			
DEC 23	8540	5560	2980	DEC 23	31236	33780	-2544			
JAN 24	5075	8526	-3451	JAN 24	20469	31220	-10751			
FEB 24	1461	5081	-3620	FEB 24	15478	20441	-4964			
MAR 24	8705	1460	7245	MAR 24	20560	15450	5110			
APR 24	4871	8704	-3833	APR 24	14506	20590	-6084			
MAY 24	2050	4871	-2821	MAY 24	15220	14536	684			
JUN 24	927	2038	-1111	JUN 24	15995	15200	796			





Market Report



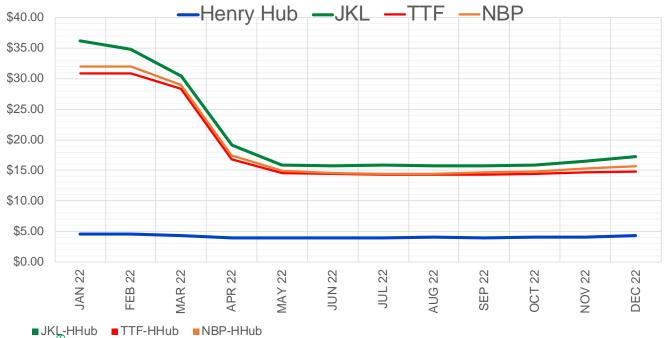
		Cash	Prompt	Cash to
	Units	Settled	Settle	Prompt
AGT Citygate	\$/MMBtu	8.05	11.32	3.27
TETCO M3	\$/MMBtu	5.31	6.10	0.79
FGT Zone 3	\$/MMBtu	5.47	4.88	-0.59
Zone 6 NY	\$/MMBtu	5.47	6.20	0.73
Chicago Citygate	\$/MMBtu	4.69	4.91	0.22
Michcon	\$/MMBtu	4.65	4.55	-0.10
Columbia TCO Pool	\$/MMBtu	4.50	4.26	-0.25
Ventura	\$/MMBtu	4.76	5.07	0.31
Rockies/Opal	\$/MMBtu	4.29	4.83	0.54
El Paso Permian Basin	\$/MMBtu	4.36	4.66	0.30
Socal Citygate	\$/MMBtu	4.85	6.00	1.15
Malin	\$/MMBtu	4.38	5.83	1.45
Houston Ship Channel	\$/MMBtu	4.71	4.87	0.17
Henry Hub Cash	\$/MMBtu	4.85	4.61	-0.24
AECO Cash	C\$/GJ	3.14	3.80	0.66
Station2 Cash	C\$/GJ	2.99	7.00	4.01
Dawn Cash	C\$/GJ	4.78	4.65	-0.13

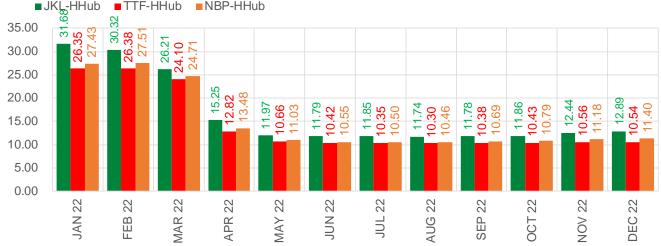
Source: CME, Bloomberg



				vs. 4 Wooks	
	11.50	O	1()0/1-	vs. 4 Weeks	I (V
	Units	Current Price	vs. Last Week	Ago	vs. Last Year
NatGas Jul21/Oct21	\$/MMBtu	2.224	0.000	0.000	2.182
NatGas Oct21/Nov21	\$/MMBtu	0.361	0.000	0.000	a 0.291
NatGas Oct21/Jan22	\$/MMBtu	-0.987	-0.007	- 0.451	▼ -1.303
NatGas Apr22/Oct22	\$/MMBtu	0.059	0.035	0.057	0.012
WTI Crude	\$/Bbl	69.95	-6.800	-14.100	24.610
Brent Crude	\$/Bbl	73.44	- 6.260	▼ -11.270	25.850
Fuel Oil, NY Harbour 1%	\$/Bbl	97.18	0.000	0.000	0.000
Heating Oil	cents/Gallon	215.21	-17.330	▼ -35.100	79.620
Propane, Mt. Bel	cents/Gallon	1.26	0.013	- 0.158	a 0.718
Ethane, Mt. Bel	cents/Gallon	0.40	0.002	- 0.016	0.187
Coal, PRB	\$/MTon	12.30	0.000	0.000	0.000
Coal, PRB	\$/MMBtu	0.70			
Coal, ILB	\$/MTon	31.05	0.000	0.000	0.000
Coal, ILB	\$/MMBtu	1.32			

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	\$4.568	\$4.501	\$4.277	\$3.933	\$3.905	\$3.939	\$3.984	\$3.993	\$3.977	\$4.015	\$4.113	\$4.301
JKL	\$36.250	\$34.825	\$30.490	\$19.185	\$15.870	\$15.730	\$15.835	\$15.730	\$15.760	\$15.870	\$16.555	\$17.195
JKL-HHub	\$31.682	\$30.324	\$26.213	\$15.252	\$11.965	\$11.791	\$11.851	\$11.737	\$11.783	\$11.855	\$12.442	\$12.894
TTF	\$30.921	\$30.880	\$28.377	\$16.754	\$14.567	\$14.361	\$14.334	\$14.293	\$14.353	\$14.449	\$14.676	\$14.843
TTF-HHub	\$26.353	\$26.379	\$24.100	\$12.821	\$10.662	\$10.422	\$10.350	\$10.300	\$10.376	\$10.434	\$10.563	\$10.542
NBP	\$31.997	\$32.013	\$28.989	\$17.411	\$14.936	\$14.486	\$14.482	\$14.453	\$14.668	\$14.802	\$15.291	\$15.696
NBP-HHub	\$27.429	\$27.512	\$24.712	\$13.478	\$11.031	\$10.547	\$10.498	\$10.460	\$10.691	\$10.787	\$11.178	\$11.395



Weather Storage Model - Next 4 Week Forecast

