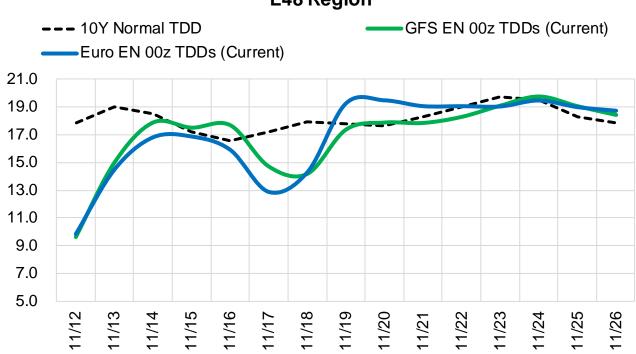


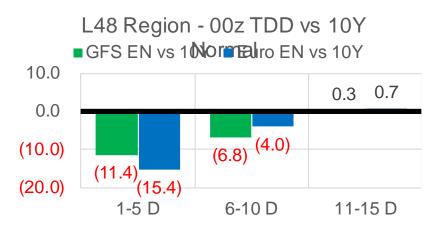


Short-term Weather Model Outlooks (00z)



L48 Region

Vs. 10Y Normal



Source: WSI, Bloomberg

12 November 2021

Daily Balances

	6-Nov	7-Nov	8-Nov	9-Nov	10-Nov	11-Nov	12-Nov	DoD	vs. 7D
Lower 48 Dry Production	97.0	96.0	96.5	95.1	95.6	95.3	95.3	▲ 0.0	-0.6
Canadian Imports	5.5	5.5	5.6	5.0	4.5	4.3	4.1	▼ -0.2	V -0.9
L48 Power	26.5	25.8	27.0	27.4	27.6	27.8	27.9	▲ 0.0	a 0.8
L48 Residential & Commercial	27.0	24.1	21.3	20.3	20.4	21.2	22.5	1 .4	A 0.1
L48 Industrial	22.7	22.0	21.6	21.3	21.4	21.5	22.0	A 0.5	0.2
L48 Lease and Plant Fuel	5.3	5.2	5.3	5.2	5.2	5.2	5.1	▼ 0.0	▼ -0.1
L48 Pipeline Distribution	2.9	2.7	2.6	2.5	2.6	2.6	2.7	A 0.1	A 0.1
L48 Regional Gas Consumption	84.3	79.8	77.8	76.7	77.2	78.3	80.2	🔺 1.9	1.2
Net LNG Delivered	11.38	11.62	11.39	11.31	11.20	11.45	10.93	-0.5	v -0.5
Total Mexican Exports	6.1	5.9	6.2	6.3	6.2	6.5	6.5	▼ 0.0	0.3
Implied Daily Storage Activity EIA Reported Daily Storage Activity	0.6	4.2	6.7	5.7	5.6	3.3	1.8		

Lower 48 Component Models

Daily Model Error

EIA Storage Week Balances

	8-Oct	15-Oct	22-Oct	29-Oct	5-Nov	12-Nov	WoW	vs. 4W
Lower 48 Dry Production	93.3	93.0	92.8	94.0	95.0	95.8	0.8	2.1
Canadian Imports	5.3	5.0	5.6	5.6	5.5	5.1	▼ -0.4	▼ -0.3
L48 Power	32.9	31.7	29.0	29.0	29.5	27.3	▼ -2.1	- 2.5
L48 Residential & Commercial	8.1	9.5	13.9	17.7	24.1	23.4	▼ -0.7	A 7.1
L48 Industrial	22.2	19.9	18.9	19.5	22.9	22.0	- 0.9	1 .7
L48 Lease and Plant Fuel	5.1	5.1	5.1	5.1	5.2	5.2	▲ 0.0	a 0.1
L48 Pipeline Distribution	2.2	2.2	2.3	2.5	2.9	2.7	T -0.2	a 0.2
L48 Regional Gas Consumption	70.6	68.5	69.1	73.8	84.6	80.6	▼ -3.9	6.7
Net LNG Exports	9.9	10.7	10.8	10.8	10.9	11.2	0.4	0.4
Total Mexican Exports	6.6	6.6	6.6	6.9	6.1	6.2	0.1	-0.3
Implied Daily Storage Activity	11.6	12.2	11.9	8.2	-1.0	2.9	3.9	
EIA Reported Daily Storage Activity	11.6	13.1	12.4	9.0	1.0			
Daily Model Error	0.0	-0.9	-0.5	-0.8	-2.0			

Monthly Balances

	2Yr Ago	LY					MTD		
	Nov-19	Nov-20	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	МоМ	vs. LY
Lower 48 Dry Production	96.2	91.1	93.6	94.1	93.0	93.4	95.5	2.0	4.4
Canadian Imports	4.5	4.6	5.2	5.1	5.1	5.4	5.1	▼ -0.2	0.5
L48 Power	27.5	25.7	39.4	40.1	33.1	30.3	28.7	T -1.6	3 .0
L48 Residential & Commercial	32.8	24.4	8.1	7.8	7.7	12.9	25.0	12.1	a 0.6
L48 Industrial	24.9	22.5	21.2	21.7	20.8	20.3	22.6	2 .3	A 0.1
L48 Lease and Plant Fuel	5.2	5.0	5.1	5.1	5.1	5.1	5.2	A 0.1	a 0.2
L48 Pipeline Distribution	3.0	2.7	2.5	2.6	2.2	2.3	2.9	0.6	a 0.2
L48 Regional Gas Consumption	93.5	80.2	76.3	77.3	68.9	70.9	84.4	13.5	4.2
Net LNG Exports	7.2	10.1	10.8	10.5	10.3	10.6	11.0	0.5	0.9
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 Daily Model Error	-5.1	-0.7	4.6	4.5	12.1	10.7	-1.0		

Source: Bloomberg, analytix.ai

Daily Average Generation Data

Nuclear Generation Daily Average - GWh (NRC)

ENERGY

	4-Nov	5-Nov	6-Nov	7-Nov	8-Nov	9-Nov	10-Nov	DoD	vs. 7D
NRC Nuclear Daily Output	74.9	76.0	77.4	78.8	80.6	81.7	81.7	0.1	3.5
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	29.9	28.9	27.5	26.1	24.3	23.2	23.1	-0.1	-3.5
NRC % Nuclear Cap Utilization	76.2	77.3	78.7	80.2	81.9	83.0	83.1	0.1	3.6

Wind Generation Daily Average - MWh (EIA)

	4-Nov	5-Nov	6-Nov	7-Nov	8-Nov	9-Nov	10-Nov	DoD	vs. 7D
CALI Wind	2356	893	2071	3302	1231	2831	1703	-1128	-411
TEXAS Wind	4582	7879	9903	15300	16548	10746	16930	6183	6103
US Wind	27037	41256	46281	60534	54905	38002	60852	22850	16182

Generation Daily Average - MWh (EIA)

	4-Nov	5-Nov	6-Nov	7-Nov	8-Nov	9-Nov	10-Nov	DoD	vs.7D
US Wind	27037	41256	46281	60534	54905	38002	60852	22850	16182
US Solar	8478	9436	9903	9540	11156	8692	9578	886	44
US Petroleum	3793	3573	2434	1810	2499	2878	2489	-388	-342
US Other	10459	9880	8302	7439	8041	7982	8077	94	-607
US Coal	87451	83058	76931	71806	78974	84680	76419	-8261	-4064
US Nuke	79304	80587	81804	83574	84844	86125	86527	402	3821
US Hydro	26709	25857	22598	23096	26322	26748	26069	-679	847
US Gas	180978	168722	148374	124662	138881	150688	135200	-15488	-16851

See National Wind and Nuclear daily charts

Source: Bloomberg, analytix.ai

Storage Week Average Generation Data

Nuclear Generation Weekly Average - GWh (NRC)

	8-Oct	15-Oct	22-Oct	29-Oct	5-Nov	12-Nov	WoW	WoW Bcf/d Impact
NRC Nuclear Daily Output	82.1	76.5	73.6	71.6	72.2	79.7	7.5	-1.4
NRC Nuclear Max Capacity	104.9	104.9	104.9	104.9	104.9	104.9	0.0	
NRC Nuclear Outage	22.7	28.3	31.2	33.3	32.7	25.2	-7.5	
NRC % Nuclear Cap Utilization	0.1	0.1	0.1	0.1	0.1	0.1	0.0	

Wind Generation Weekly Average - MWh (EIA)

	8-Oct	15-Oct	22-Oct	29-Oct	5-Nov	12-Nov	WoW	WoW Bcf/d Impact
CALI Wind	1099	2400	1270	2314	1669	1962	293	-0.1
TEXAS Wind	4890	15396	10729	15462	8472	13462	4990	-0.9
US Wind	20468	49918	43721	49870	32113	51812	19699	-3.5
					-17757.5			
					-36%			

Generation Weekly Average - MWh (EIA)

	8-Oct	15-Oct	22-Oct	29-Oct	5-Nov	12-Nov	WoW	WoW Bcf/d Impact
US Wind	20468	49918	43721	49870	32113	51812	19699	-3.5
US Solar	11294	10530	12209	10138	9929	9698	-231	0.0
US Petroleum	3901	3224	3092	2815	3517	2596	-921	0.2
US Other	10973	12221	12109	10196	9259	8257	-1003	0.2
US Coal	100713	89841	74011	73355	77392	78327	935	-0.2
US Nuke	83696	77046	73748	73713	75510	84284	8774	-1.6
US Hydro	24553	24699	23105	23540	25530	25251	-279	0.1
US Gas	176848	162707	150057	152802	158937	143104	-15833	2.8

See National Wind and Nuclear daily charts

Source: Bloomberg, analytix.ai



Monthly Average Generation Data

Nuclear Generation Monthly Average - GWh (NRC)

	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	80.4	76.4	91.5	87.2	75.5	77.6	74.6	2.1	-1.8
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	24.5	28.5	13.4	17.7	29.4	27.2	30.3	-2.1	1.8
NRC % Nuclear Cap Utilization	81.7	77.7	93.0	88.7	76.8	79.0	75.9	2.2	-1.8

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	897	1196	2442	2020	1765	1830	1778	65	582
TEXAS Wind	9130	10365	9901	9400	11565	11440	12041	-125	1676
US Wind	35773	42018	35830	40223	40991	43786	44635	2795	2616

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
US Wind	35773	42018	35830	40223	40991	43786	44635	4 848.6	2616
US Solar	6610	7574	13787	13380	11044	9482	10535	A 1052.1	2961
US Petroleum	3170	2522	4484	2452	3238	3010	3026	1 5	504
US Other	8318	8863	9928	9008	11099	8760	9972	A 1213	A 1109
US Coal	92443	87037	137655	110037	82734	80595	76375	-4220	T-10662
US Nuke	86914	79946	94062	90146	76700	82068	77141	- 4927	v -2805
US Hydro	25351	27108	28533	25665	23895	26007	24391	🔽 -1616	T -2718
US Gas	151 007	146831	210824	173538	158237	153421	151595	▼ -7636	4764
US Total	409974	402145	534937	464626	410685	407453	400673	▼-16120	▼ -1472



See National Wind and Nuclear daily charts

Source: Bloomberg, analytix.ai

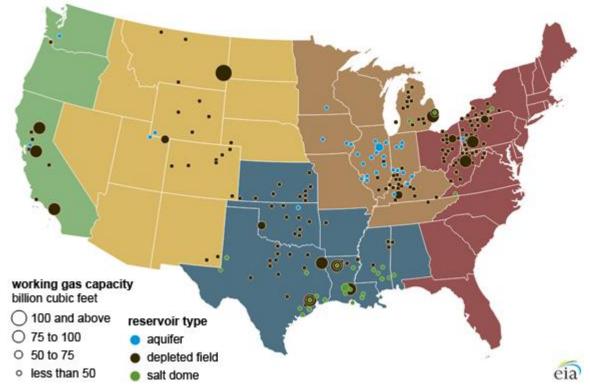


Regional S/D Models Storage Projection

Week Ending	12-Nov			
	Daily Raw Storage	Daily Adjustment Factor	Daily Average Storage Activity (Adjusted) *	Weekly Adjusted Storage Activity
L48	2.6	1.6	4.2	30
East Midwest Mountain South Central Pacific	0.1 0.3 3.1 -1.6 0.7	0.2 1.2 -3.1 3.5 -0.2	0.4 1.5 -0.1 1.8 0.5	3 11 0 13 4

*Adjustment Factor is calcuated based on historical regional deltas

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



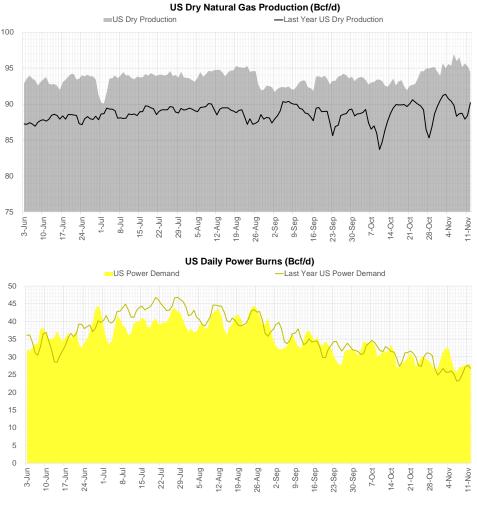
Weather Model Storage Projection

Next report and beyond		
Week Ending	GWDDs	Week Storage Projection
12-Nov	12.0	30
19-Nov	15	-6
26-Nov	19	-55
03-Dec	20	-72

Weather Storage Model - Next 4 Week Forecast

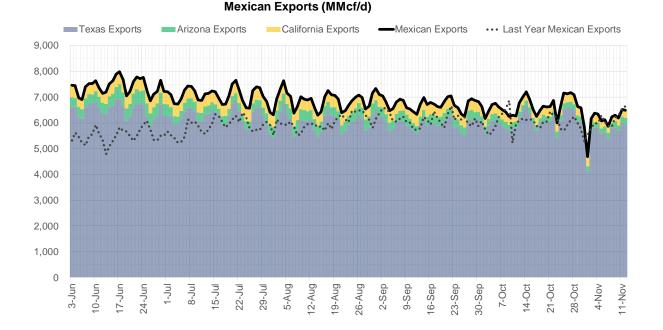


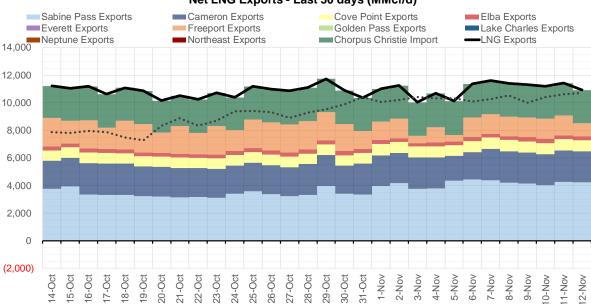




US Daily ResCom Consumption(Bcf/d) US ResCom Demand -Last Year US ResCom Demand 35 30 25 20 15 10 5 0 10-Jun 17-Jun 5-Aug I2-Aug 19-Aug 26-Aug 2-Sep 9-Sep l6-Sep 23-Sep 3-Jun 24-Jun 8-Jul 30-Sep 14-Oct 21-Oct 28-Oct 11-Nov 1-Jul 15-Jul 22-Jul 29-Jul 7-Oct 4-Nov

Source: Bloomberg





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

Source: Bloomberg

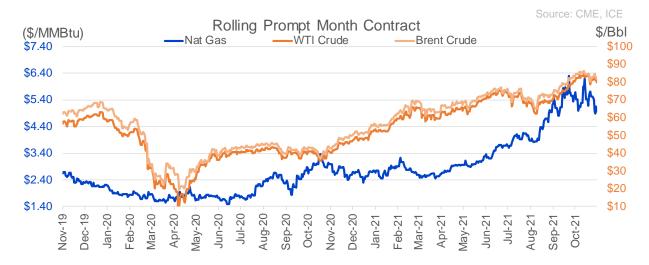


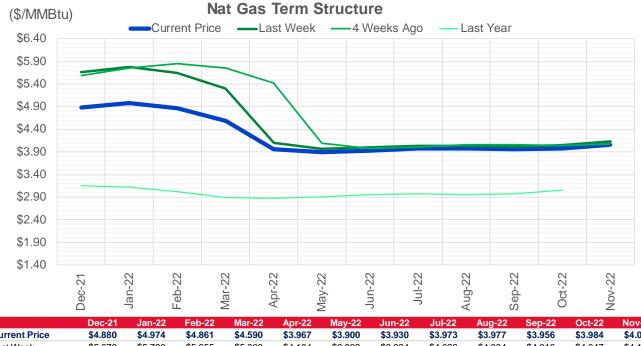
Nat Gas Options Volume and Open Interest CME, ICE and Nasdaq Combined

CONTRACT MONTH	CONTRACT YEAR	PUT/CALL	STRIKE	CUMULATIVE VOL	CONTRACT MONTH	CONTRACT YEAR	PUT/CALL	STRIKE	CUMULATIVE OI
12	2021	Р	4.25	12560	12	2021	Р	2.75	54612
12	2021	Р	4.50	6943	12	2021	Р	4.00	46212
12	2021	C	5.50	5274	12	2021	Р	3.00	40224
12	2021	P	4.00	5185	12	2021	Р	2.50	39420
12	2021	C	6.00	4252	12	2021	Р	3.50	34327
12	2021	C	6.50	3712	3	2022	С	10.00	33885
1	2022	C	7.00	2713	12	2021	Р	4.25	27125
3	2022	C	6.00	2565	12	2021	С	6.00	26976
12	2021	P	4.75	2557	3	2022	С	8.00	25357
1	2022	C	9.00	2450	12	2021	Р	5.00	24781
3	2022	C	10.00	1972	1	2022	Р	3.00	23722
3	2022	C	8.00	1548	1	2022	С	6.00	23335
3	2022	P	4.00	1504	1	2022	Р	2.75	22952
1	2022	C	10.00	1429	3	2022	С	5.00	22539
1	2022	C	6.00	1090	12	2021	С	4.00	22526
12	2021	C	5.00	1027	12	2021	С	7.00	22429
12	2021	C	7.00	1025	3	2022	Р	3.00	21025
1	2022	C	8.00	936	12	2021	С	8.00	20236
12	2021	P	3.75	929	4	2022	С	3.00	19710
12	2021	C	11.00	921	1	2022	Р	4.00	19439
3	2022	C	5.00	860	3	2022	Р	2.50	18788
3	2022	P	3.00	850	3	2022	Р	3.50	18644
4	2022	C	6.00	850	1	2022	С	7.00	18601
3	2022	P	3.50	810	1	2022	Р	3.50	18491
1	2023	P	3.00	780	1	2022	С	5.00	18144
2	2023	P	3.00	780	3	2022	Р	4.00	17719
3	2023	P	3.00	780	12	2021	Р	4.50	17352
12	2021	P	5.00	768	2	2022	С	5.00	17317
12	2021	C	12.00	720	12	2021	Р	2.00	16834
1	2022	P	5.00	700	2	2022	P	3.50	15721
12	2021	C	9.00	681	12	2022	С	5.00	15682
12	2021	C	5.75	664	3	2022	С	4.00	15631
12	2021	C	6.75	613	12	2021	C P	5.00	15587
1	2022	P	4.75	610	4	2022 2022	P C	2.50 5.00	15564
12	2021	C	5.30	609		2022	c		15317
1	2022	P	3.50	602	12 12	2021		6.50 7.50	15075
3	2022	C	4.75	590	2	2021	C P	7.50 4.00	14679 14534
12	2021	Č	8.00	565	2	2022	F C	4.00	14534
4	2022	P	3.00	550	3	2022	c	4.00 6.00	14034
12	2021	P	4.40	543	3	2022	c	7.00	13944
2	2022	C	6.00	530	5	2022	c	3.00	13733
2	2022	P	3.50	501	2	2022	c	6.00	13604
1	2023	P	3.50	500	3	2022	P	5.00	13498
2	2023	P	3.50	500	12	2022	C	15.00	13492
3	2023	P	3.50	500	6	2021	c	3.00	13438
1	2022	P	2.75	492	1	2022	c	8.00	13358
1	2022	C	7.50	479	1	2022	c	10.00	13354
12	2021	c	7.50	475	2	2022	c	4.00	13320
12	2021	P	4.60	471	12	2022	č	45	13267
		-			12	LULL	Source	e: CME, ICE	

Nat Gas Futures Open Interest CME, and ICE Combined

Civile, and ICE Combined									
CME Henry H	lub Futures (1			ICE Henry	Hub Futures Cont				
	Current	Prior	Daily Change		Current	Prior	Daily Change		
DEC 21	98935	107353	-8418	DEC 21	94242	92111	2130		
JAN 22	246361	238728	7633	JAN 22	87616	87605	11		
FEB 22	77910	77499	411	FEB 22	69624	69675	-51		
MAR 22	155960	155635	325	MAR 22	80061	79644	417		
APR 22	116403	115917	486	APR 22	77964	78236	-272		
MAY 22	137050	133988	3062	MAY 22	72496	72161	335		
JUN 22	43798	43798	0	JUN 22	54552	54607	-54		
JUL 22	41747	41090	657	JUL 22	57519	57525	-6		
AUG 22	31531	31151	380	AUG 22	55290	55677	-387		
SEP 22	36713	36521	192	SEP 22	56293	56549	-256		
OCT 22	86813	87419	-606	OCT 22	62137	62404	-267		
NOV 22	35638	35453	185	NOV 22	48020	48374	-354		
DEC 22	27499	27604	-105	DEC 22	50714	50867	-153		
JAN 23	32397	31921	476	JAN 23	40326	40381	-55		
FEB 23	11230	11285	-55	FEB 23	33455	33440	15		
MAR 23	23000	21792	1208	MAR 23	36988	36566	422		
APR 23	16757	16691	66	APR 23	37839	37610	229		
MAY 23	10171	10443	-272	MAY 23	35388	35552	-164		
JUN 23	8680	8593	87	JUN 23	31504	31649	-145		
JUL 23	5993	5702	291	JUL 23	31464	31648	-185		
AUG 23	4319	4274	45	AUG 23	32532	32724	-192		
SEP 23	5782	5781	1	SEP 23	30652	30833	-180		
OCT 23	10867	10740	127	OCT 23	34417	34551	-134		
NOV 23	5092	5058	34	NOV 23	33979	34085	-106		
DEC 23	8098	8096	2	DEC 23	31486	31588	-102		
JAN 24	4782	4732	50	JAN 24	19628	19669	-41		
FEB 24	1443	1443	0	FEB 24	15068	15097	-29		
MAR 24	8619	8603	16	MAR 24	19808	19913	-106		
APR 24	5347	5347	0	APR 24	14272	14279	-7		
MAY 24	1832	1832	0	MAY 24	14863	14918	-55		





Current Price	\$4.880	\$4.974	\$4.861	\$4.590	\$3.967	\$3.900	\$3.930	\$3.973	\$3.977	\$3.956	\$3.984	\$4.061
Last Week	\$5.670	\$5.780	\$5.655	\$5.309	\$4.104	\$3.969	\$3.994	\$4.029	\$4.034	\$4.016	\$4.047	\$4.127
vs. Last Week	-\$0.790	-\$0.806	-\$0.794	-\$0.719	-\$0.137	-\$0.069	-\$0.064	-\$0.056	-\$0.057	-\$0.060	-\$0.063	-\$0.066
4 Weeks Ago	\$5.590	\$5.753	\$5.854	\$5.750	\$5.429	\$4.098	\$3.977	\$4.011	\$4.052	\$4.058	\$4.042	\$4.072
vs. 4 Weeks Ago	-\$0.710	-\$0.779	-\$0.993	-\$1.160	-\$1.462	-\$0.198	-\$0.047	-\$0.038	-\$0.075	-\$0.102	-\$0.058	-\$0.011
Last Year	\$3.031	\$3.151	\$3.116	\$3.026	\$2.892	\$2.872	\$2.910	\$2.957	\$2.966	\$2.949	\$2.980	\$3.047
vs. Last Year	\$1.849	\$1.823	\$1.745	\$1.564	\$1.075	\$1.028	\$1.020	\$1.016	\$1.011	\$1.007	\$1.004	\$1.014

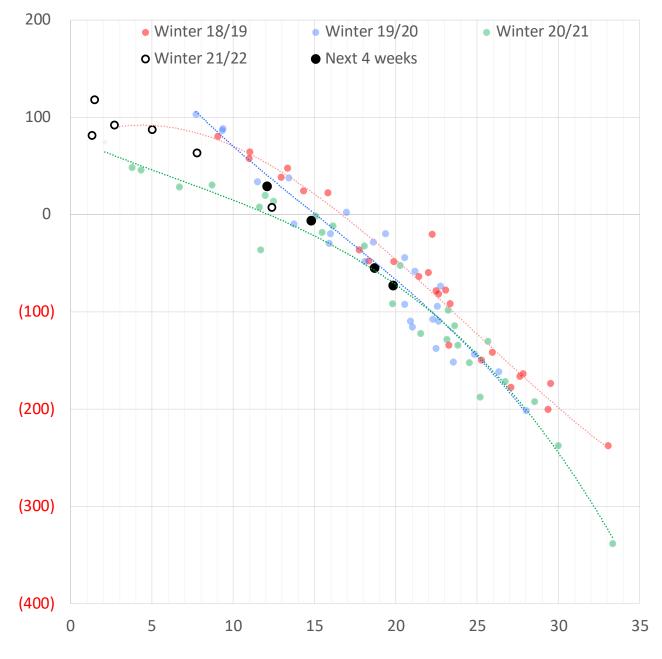
		Cash	Prompt	Cash to
	Units	Settled	Settle	Prompt
AGT Citygate	\$/MMBtu	4.20	14.14	9.94
TETCO M3	\$/MMBtu	4.01	7.47	3.46
FGT Zone 3	\$/MMBtu	4.13	5.80	1.67
Zone 6 NY	\$/MMBtu	4.13	7.66	3.53
Chicago Citygate	\$/MMBtu	4.71	6.00	1.29
Michcon	\$/MMBtu	4.66	5.42	0.76
Columbia TCO Pool	\$/MMBtu	4.18	5.19	1.01
Ventura	\$/MMBtu	4.69	6.40	1.71
Rockies/Opal	\$/MMBtu	4.60	5.70	1.10
El Paso Permian Basin	\$/MMBtu	4.43	5.85	1.42
Socal Citygate	\$/MMBtu	5.75	7.24	1.49
Malin	\$/MMBtu	4.70	6.47	1.77
Houston Ship Channel	\$/MMBtu	4.59	6.03	1.44
Henry Hub Cash	\$/MMBtu	4.81	5.54	0.73
AECO Cash	C\$/GJ	3.59	4.81	1.22
Station2 Cash	C\$/GJ	3.91	7.07	3.16
Dawn Cash	C\$/GJ	4.73	5.59	0.86

Source: CME, Bloomberg



					V	s. 4 Weeks		
	Units	Current Price	vs.	Last Week		Ago	vs	. Last Year
NatGas Jul21/Oct21	\$/MMBtu	2.224		0.000		0.000		2.198
NatGas Oct21/Nov21	\$/MMBtu	0.361		0.000		0.515		0.291
NatGas Oct21/Jan22	\$/MMBtu	-0.596		-0.581	▼	-0.691	▼	-0.903
NatGas Apr22/Oct22	\$/MMBtu	-0.004		0.038		0.027	▼	-0.033
WTI Crude	\$/Bbl	81.59		2.780		0.280		40.470
Brent Crude	\$/Bbl	82.87		2.330	▼	-1.130		39.340
Fuel Oil, NY Harbour 1%	\$/Bbl	97.18		0.000		0.000		0.000
Heating Oil	cents/Gallon	244.71		4.050	▼	-11.430		121.380
Propane, Mt. Bel	cents/Gallon	1.36		-0.009	▼	-0.109		0.796
Ethane, Mt. Bel	cents/Gallon	0.41		-0.024	▼	-0.036		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						

Weather Storage Model - Next 4 Week Forecast



ENERGY

12 November 2021

