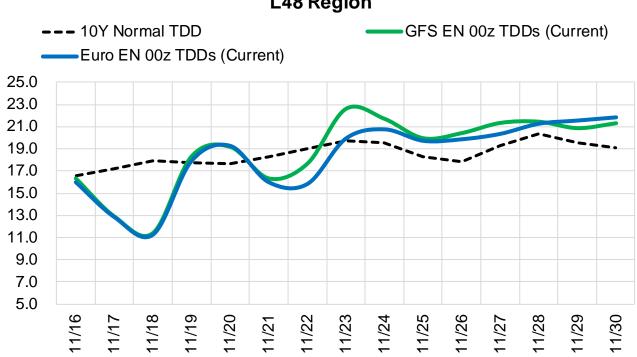


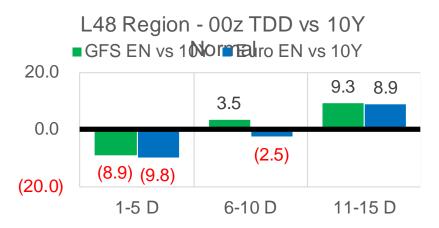


### Short-term Weather Model Outlooks (00z)



### L48 Region

### Vs. 10Y Normal



Source: WSI, Bloomberg

## **Market Report**

### 16 November 2021

#### **Daily Balances**

	10-Nov	11-Nov	12-Nov	13-Nov	14-Nov	15-Nov	16-Nov	DoD	vs.7D
Lower 48 Dry Production	95.7	95.4	94.9	95.6	95.4	95.1	94.9	▼ -0.2	▼ -0.4
Canadian Imports	4.5	4.3	4.4	4.9	5.3	5.3	5.0	<b>▼</b> -0.3	<b>0.2</b>
L48 Power	27.6	27.8	27.9	26.1	25.8	27.9	27.9	▲ 0.0	<b>0.7</b>
L48 Residential & Commercial	20.6	21.3	24.8	30.0	30.3	30.0	26.5	▼ -3.5	<b>0.3</b>
L48 Industrial	21.1	21.6	22.7	23.5	23.8	23.7	23.2	▼ -0.5	<b>0.5</b>
L48 Lease and Plant Fuel	5.2	5.2	5.2	5.2	5.2	5.2	5.2	<b>A</b> 0.0	▼ 0.0
L48 Pipeline Distribution	2.6	2.6	2.8	3.0	3.0	3.1	2.9	▼ -0.2	<b>a</b> 0.1
L48 Regional Gas Consumption	77.1	78.5	83.4	87.8	88.1	89.9	85.7	▼ -4.2	<b>1.6</b>
Net LNG Delivered	11.20	11.45	10.42	11.57	11.38	10.50	10.96	<b>A</b> 0.5	<b>T-0.1</b>
Total Mexican Exports	6.2	6.5	6.5	5.9	5.7	5.7	6.2	<b>A</b> 0.5	<b>0.1</b>
Implied Daily Storage Activity EIA Reported Daily Storage Activity Daily Model Error	5.8	3.1	-1.0	-4.8	-4.5	-5.7	-3.0		

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	94.9	95.8	<b>0.9</b>	<b>2.1</b>
Canadian Imports	5.3	5.0	5.6	5.6	5.5	5.1	<b>-0.4</b>	<b>▼-0.3</b>
L48 Power	32.9	31.7	29.0	29.0	29.5	27.3	▼ -2.1	<b>-</b> 2.5
L48 Residential & Commercial	8.1	9.5	13.9	17.7	24.1	23.5	<b>V</b> -0.6	<b>A</b> 7.2
L48 Industrial	22.3	19.9	18.8	19.4	21.4	21.3	<b>T</b> -0.1	<b>1</b> .4
L48 Lease and Plant Fuel	5.1	5.1	5.1	5.1	5.2	5.2	<b>0.0</b>	<b>a</b> 0.1
L48 Pipeline Distribution	2.2	2.2	2.3	2.5	2.9	2.7	<b>T</b> -0.1	<b>a</b> 0.2
L48 Regional Gas Consumption	70.6	68.5	69.1	73.7	83.0	80.0	▼ -3.0	<b>6.5</b>
Net LNG Exports	9.9	10.7	10.8	10.8	10.9	11.2	<b>0.4</b>	<b>0.4</b>
Total Mexican Exports	6.6	6.6	6.6	6.9	6.1	6.2	<b>0.1</b>	▼-0.4
Implied Daily Storage Activity	11.6	12.2	11.9	8.3	0.5	3.5	3.0	
EIA Reported Daily Storage Activity	11.6	13.1	12.4	9.0	1.0			
Daily Model Error	0.0	-0.9	-0.5	-0.7	-0.5			

#### **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	95.4	<b>1.9</b>	<b>4.3</b>
Canadian Imports	4.5	4.6	5.2	5.1	5.1	5.4	5.1	▼ -0.2	<b>0.5</b>
L48 Power	27.5	25.7	39.4	40.1	33.1	30.3	28.3	▼ -2.0	<b>2.6</b>
L48 Residential & Commercial	32.8	24.4	8.1	7.8	7.7	12.9	26.2	<b>1</b> 3.3	<b>1.8</b>
L48 Industrial	24.9	22.5	21.2	21.7	20.8	20.1	22.2	<b>2</b> .1	<b>V</b> -0.3
L48 Lease and Plant Fuel	5.2	5.0	5.1	5.1	5.1	5.1	5.2	<b>A</b> 0.1	<b>a</b> 0.2
L48 Pipeline Distribution	3.0	2.7	2.5	2.6	2.2	2.3	2.9	<b>0.6</b>	<b>a</b> 0.2
L48 Regional Gas Consumption	93.5	80.2	76.3	77.3	68.9	70.7	84.8	<b>14.0</b>	<b>4.6</b>
Net LNG Exports	7.2	10.1	10.8	10.5	10.3	10.6	11.0	▲ 0.4	<b>0.9</b>
Total Mexican Exports	5.2	6.1	7.1	6.9	6.7	6.6	6.1	▼ -0.6	▼ 0.0
Implied Daily Storage Activity EIA Reported Daily Storage Activity Daily Model Error	-5.1	-0.7	4.6	4.5	12.1	10.9	-1.3		

Source: Bloomberg, analytix.ai

# **Daily** Average Generation Data

### Nuclear Generation Daily Average - GWh (NRC)

ENERGY

	8-Nov	9-Nov	10-Nov	11 <b>-No</b> v	12-Nov	13-Nov	14-Nov	DoD	vs. 7D
NRC Nuclear Daily Output	80.6	81.7	81.7	82.1	82.6	82.7	83.7	0.9	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	24.3	23.2	23.1	22.7	22.2	22.1	21.2	-0.9	-1.8
NRC % Nuclear Cap Utilization	81.9	83.0	83.1	83.5	84.0	84.1	85.1	0.9	1.8

#### Wind Generation Daily Average - MWh (EIA)

	8-Nov	9-Nov	10-Nov	11-Nov	12-Nov	13-Nov	14-Nov	DoD	vs.7D
CALI Wind	1231	2831	1703	603	484	342	272	-70	-927
TEXAS Wind	16548	10746	16930	6916	11152	12085	8889	-3196	-3507
US Wind	54905	38002	60852	55365	64774	50577	49269	-1308	-4810

#### Generation Daily Average - MWh (EIA)

	8-Nov	9-Nov	10-Nov	11-Nov	12-Nov	13 <b>-N</b> ov	14-Nov	DoD	vs.7D
US Wind	54905	38002	60852	55365	64774	50577	49269	-1308	-4810
US Solar	11156	8694	9586	9796	10225	9885	10351	466	461
US Petroleum	2499	2878	2489	2042	1941	2754	2549	-205	116
US Other	8050	7982	8077	7790	8013	7475	7582	107	-316
US Coal	78974	84701	76438	73780	73119	78150	77986	-165	458
US Nuke	84844	86125	86527	86829	86997	87358	87638	280	1192
US Hydro	26384	26752	26074	26602	24346	24791	24964	173	-861
US Gas	138919	150689	135154	143965	140769	138485	140804	2319	-526

## 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	79.8	7.6	-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	25.1	-7.6	
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	1805	136	0.0
TEXAS Wind	4890	15396	10729	15462	8472	12032	3560	-0.6
US Wind	20468	49918	43721	49870	32117	51028	18911	-3.4
					-17753.1			
					-36%			

#### Generation Weekly Average - MWh (EIA)

								VVOVV
	8-Oct	15-Oct	22-Oct	29-Oct	5-Nov	12-Nov	WoW	Bcf/d
								Impact
US Wind	20468	49918	43721	49870	32117	51028	18911	-3.4
US Solar	11294	10530	12209	10138	9979	9734	-245	0.0
US Petroleum	3901	3224	3092	2815	3517	2532	-985	0.2
US Other	10973	12221	12109	10196	9288	8226	-1063	0.2
US Coal	100713	89841	74011	73355	77392	77955	563	-0.1
US Nuke	83696	77046	73748	73713	75510	84337	8827	-1.6
US Hydro	24553	24699	23105	23540	25530	25339	-191	0.0
US Gas	176848	162707	150057	152802	159071	144788	-14283	2.6

## See National Wind and Nuclear daily charts

Source: Bloomberg, analytix.ai

The risk of trading futures and options and other derivatives involves a substantial risk of loss and is not suitable for all persons. Each person must consider whether a particular trade, combination of trades, or strategy is suitable for that person's financial means and objectives. Past results are not necessarily indicative of future results. This communication may contain links to third party websites which are not under the control of and are not maintained by ION Energy Group, and ION Energy Group is not responsible for their content.



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# Monthly Average Generation Data

#### Nuclear Generation Monthly Average - GWh (NRC)

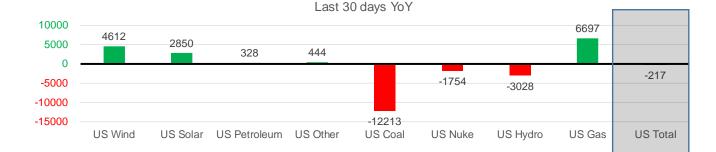
	2Yr Ago	LY				MTD			
	Same 30 days	Same 30 days	Aug-21	Sep-21	Oct-21	Nov-21	Last 30 days	MoM (MTD vs LY)	Last 30 days YoY
NRC Nuclear Daily Output	80.9	77.0	91.5	87.2	75.5	79.2	75.7	3.7	-1.3
NRC Nuclear Max Capacity	104.9	104.9	104.9	104.9	104.9	104.9	104.9	0.0	0.0
NRC Nuclear Outage	24.0	27.9	13.4	17.7	29.4	25.7	29.1	-3.7	1.3
NRC % Nuclear Cap Utilization	82.2	78.3	93.0	88.7	76.8	80.5	77.0	3.8	-1.3

#### 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	730	1254	2442	2020	1765	1300	1576	-465	322
TEXAS Wind	8964	9879	9901	9400	11565	10015	11644	-1550	1765
US Wind	34613	41892	35830	40223	40991	45143	46504	4151	4612

#### **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	34613	41892	35830	40223	40991	45143	46504	<b>A</b> 1361.1	<b>4612</b>
US Solar	6316	7385	13787	13382	11044	9748	10235	<b>486.1</b>	<b>2850</b>
US Petroleum	3166	2558	4484	2452	3238	2846	2887	<b>4</b> 1	<b>328</b>
US Other	8245	8946	9928	9008	11099	8454	9390	<b>4</b> 936	<b>444</b>
US Coal	97062	88342	137655	110037	82734	79584	76129	▼ -3455	▼-12213
US Nuke	87620	80609	94062	90146	76700	83496	78855	<b>v</b> -4641	<b>T</b> -1754
US Hydro	25802	27771	28533	25665	23895	25666	24743	<b>-923</b>	▼ -3028
US Gas	150997	143699	210824	173538	158237	151265	150396	💌 -6196	<b>6697</b>
US Total	414208	401525	534937	464626	410685	406622	401308	▼-13752	▼ -217



### See National Wind and Nuclear daily charts

Source: Bloomberg, analytix.ai

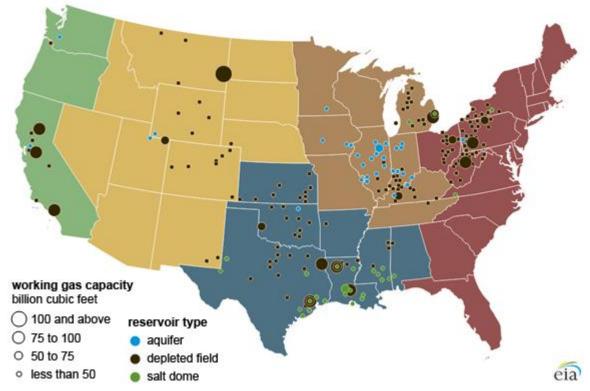


### Regional S/D Models Storage Projection

Week Ending	12-Nov			
	Daily Raw Storage	Daily Adjustment Factor	Daily Average Storage Activity (Adjusted) *	Weekly Adjusted Storage Activity
L48	3.2	0.9	4.1	29
East Midwest Mountain South Central Pacific	0.2 0.5 3.1 -1.4 0.8	0.1 1.0 -3.2 3.2 -0.2	0.3 1.6 -0.1 1.7 0.5	2 11 -1 12 4

\*Adjustment Factor is calcuated based on historical regional deltas

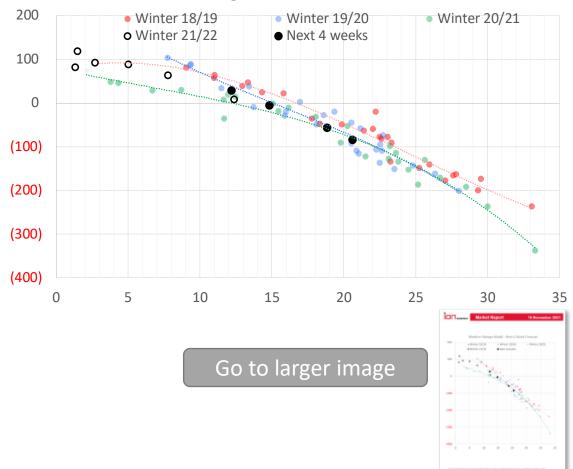
### U.S. underground natural gas storage facilities by type (July 2015)



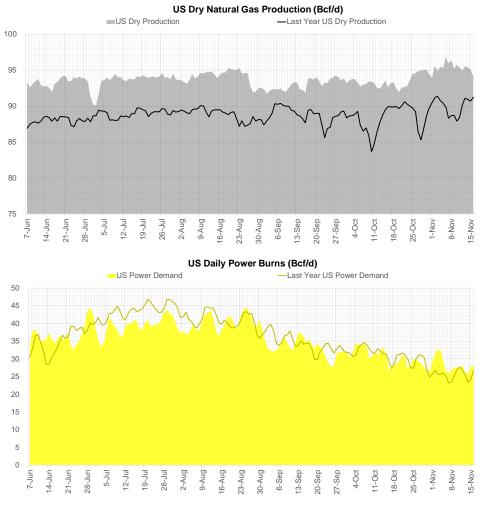
### Weather Model Storage Projection

Next report and beyond		
Week Ending	GWDDs	Week Storage Projection
12-Nov	12.2	29
19-Nov	15	-5
26-Nov	19	-57
03-Dec	21	-84

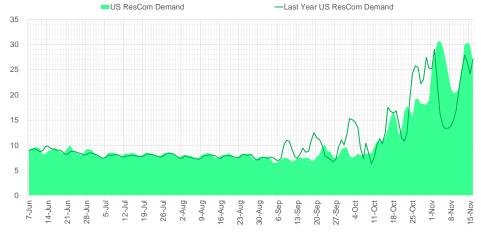
Weather Storage Model - Next 4 Week Forecast



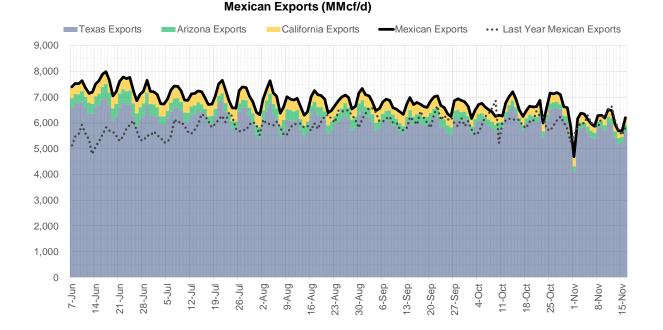


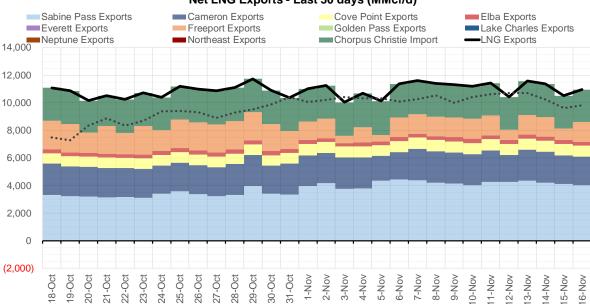


US Daily ResCom Consumption(Bcf/d)



Source: Bloomberg





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

Source: Bloomberg

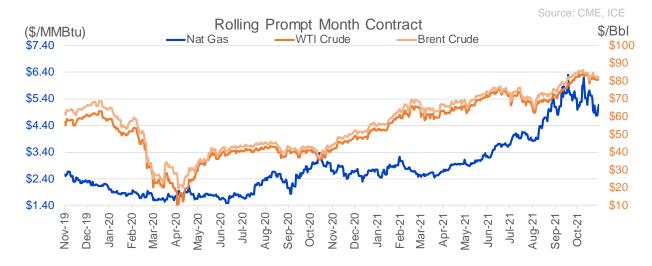


### Nat Gas Options Volume and Open Interest CME, ICE and Nasdaq Combined

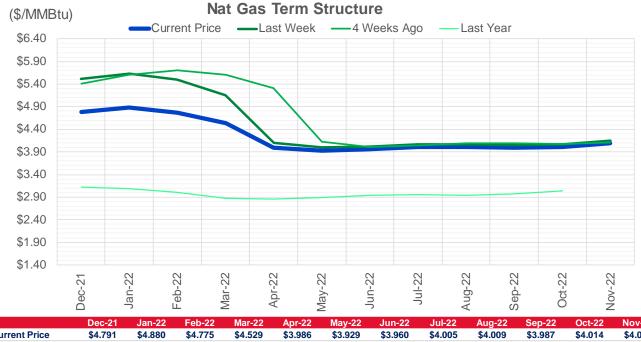
CONTRACT MONTH	CONTRACT YEAR	PUT/CALL	STRIKE	CUMULATIVE VOL	CONTRACT MONTH	CONTRACT YEAR	PUT/CALL	STRIKE	CUMULATIVE OI
12	2021	С	6.00	5404	 12	2021	Р	2.75	54612
12	2021	Р	4.25	4266	12	2021	Р	4.00	45499
12	2021	С	5.50	3907	12	2021	Р	3.00	40224
12	2021	P	5.00	3224	12	2021	Р	2.50	39420
12	2021	С	7.50	3197	3	2022	С	10.00	34727
12	2021	Р	4.50	3153	12	2021	Р	3.50	33469
12	2021	С	8.50	3007	12	2021	С	6.00	28369
12	2021	C	6.50	2931	12	2021	Р	4.25	25660
12	2021	Р	4.00	2860	3	2022	С	8.00	25368
3	2022	С	8.00	2712	12	2021	Р	5.00	24573
12	2021	Р	4.75	2663	1	2022	С	6.00	23679
1	2022	С	12.00	2395	1	2022	Р	2.75	23224
12	2021	C	5.60	2228	3	2022	С	5.00	22575
1	2022	C	10.00	2219	12	2021	С	4.00	22526
12	2021	С	5.70	2070	1	2022	Р	3.00	22415
12	2021	Р	3.85	2002	12	2021	С	7.00	22347
1	2022	Р	3.00	1916	3	2022	Р	3.00	21099
12	2021	С	5.00	1715	12	2021	С	8.00	20099
1	2022	С	6.00	1683	4	2022	С	3.00	19710
1	2022	С	7.00	1515	3	2022	Р	2.50	18833
1	2022	Р	3.25	1500	1	2022	С	5.00	18267
1	2022	С	8.00	1363	3	2022	P	3.50	18153
1	2022	С	7.50	1260	1	2022	P	3.50	17709
2	2022	С	12.00	1243	1	2022	С	7.00	17643
12	2021	C	5.25	1181	2	2022	С	5.00	17612
4	2022	С	4.50	1115	1	2022	P	4.00	17443
5	2022	С	4.00	1100	12	2021	P	4.50	17440
12	2021	С	7.00	1020	3 12	2022 2021	P P	4.00	17417
12	2021	Р	4.40	986	3	2021	P C	2.00 6.00	16834
3	2022	Р	3.50	867	3 12	2022	c	5.00	16220 16097
3	2022	Р	4.00	844	12	2022 2021	c	5.00 6.50	
3	2022	Р	4.50	802	3	2021	c	4.00	15809 15631
1	2022	С	5.50	768	4	2022	c	4.00 5.00	15564
1	2022	Р	4.00	761	4	2022	P	2.50	15564
2	2022	Р	2.75	700	12	2022	C	5.00	15533
3	2022	С	6.00	693	2	2021	P	3.50	15110
12	2021	С	5.40	669	1	2022	C	4.00	14469
12	2021	С	5.10	665	12	2022	c	5.50	14338
1	2022	Р	4.25	654	2	2022	c	6.00	14077
1	2023	Р	3.00	650	3	2022	c	7.00	13836
2	2023	Р	3.00	650	3	2022	P	5.00	13798
3	2023	Р	3.00	650	5	2022	c	3.00	13733
12	2021	С	5.30	640	12	2021	č	15.00	13492
3	2022	C	10.00	574	1	2022	č	10.00	13466
2	2022	C	10.00	550	6	2022	c	3.00	13438
2	2022	P	4.00	548	1	2022	c	8.00	13337
12	2021	P	4.30	535	2	2022	č	4.00	13320
4	2022	C	7.00	530	3	2022	č	9.00	13281
1	2022	Č	6.10	516	12	2022	C	4.5	13267
					-		Source	: CME, ICE	

### Nat Gas Futures Open Interest CME, and ICE Combined

Civile, and ICE Combined									
CME Henry H	lub Futures (1	0,000 MMBt		ICE Henry I	Hub Futures Cont	ract Equiva	alent (10,000 MM		
	Current	Prior	Daily Change		Current	Prior	Daily Change		
DEC 21	82419	90712	-8293	DEC 21	92650	92675	-25		
JAN 22	251920	248869	3051	JAN 22	87403	87796	-393		
FEB 22	79170	78868	302	FEB 22	70270	69969	301		
MAR 22	156087	156502	-415	MAR 22	80023	79476	546		
APR 22	116210	116301	-91	APR 22	77579	77797	-218		
MAY 22	138321	137591	730	MAY 22	72531	72357	174		
JUN 22	44076	43748	328	JUN 22	54743	54482	261		
JUL 22	43296	42190	1106	JUL 22	57320	57451	-131		
AUG 22	31509	31649	-140	AUG 22	55242	55164	78		
SEP 22	36976	36865	111	SEP 22	56303	56215	89		
OCT 22	87234	86409	825	OCT 22	62371	62140	231		
NOV 22	35439	35665	-226	NOV 22	47803	47841	-38		
DEC 22	27491	27536	-45	DEC 22	50694	50631	63		
JAN 23	32335	32544	-209	JAN 23	40256	40193	63		
FEB 23	11229	11189	40	FEB 23	33442	33371	71		
MAR 23	23796	23845	-49	MAR 23	36993	36907	86		
APR 23	16093	16819	-726	APR 23	37845	37860	-15		
MAY 23	10026	10471	-445	MAY 23	35229	35305	-76		
JUN 23	9419	9409	10	JUN 23	31440	31521	-81		
JUL 23	6042	6035	7	JUL 23	31319	31403	-84		
AUG 23	4458	4436	22	AUG 23	32387	32471	-84		
SEP 23	5797	5811	-14	SEP 23	30513	30594	-81		
OCT 23	10865	10840	25	OCT 23	34260	34382	-122		
NOV 23	4993	4919	74	NOV 23	33980	33975	5		
DEC 23	8078	8078	0	DEC 23	31494	31490	5		
JAN 24	4836	4796	40	JAN 24	19597	19600	-3		
FEB 24	1443	1443	0	FEB 24	15039	15041	-2		
MAR 24	8626	8624	2	MAR 24	19792	19816	-23		
APR 24	5362	5357	5	APR 24	14283	14257	26		
MAY 24	1982	1913	69	MAY 24	14843	14816	27		



## **Market Report**



	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	NOV-22
Current Price	\$4.791	\$4.880	\$4.775	\$4.529	\$3.986	\$3.929	\$3.960	\$4.005	\$4.009	\$3.987	\$4.014	\$4.092
Last Week	\$5.516	\$5.626	\$5.494	\$5.161	\$4.102	\$3.996	\$4.021	\$4.060	\$4.065	\$4.045	\$4.072	\$4.146
vs. Last Week	-\$0.725	-\$0.746	-\$0.719	-\$0.632	-\$0.116	-\$0.067	-\$0.061	-\$0.055	-\$0.056	-\$0.058	-\$0.058	-\$0.054
4 Weeks Ago	\$5.410	\$5.600	\$5.708	\$5.613	\$5.317	\$4.121	\$4.008	\$4.046	\$4.087	\$4.091	\$4.073	\$4.104
vs. 4 Weeks Ago	-\$0.619	-\$0.720	-\$0.933	-\$1.084	-\$1.331	-\$0.192	-\$0.048	-\$0.041	-\$0.078	-\$0.104	-\$0.059	-\$0.012
Last Year	\$2.995	\$3.122	\$3.083	\$2.997	\$2.872	\$2.859	\$2.895	\$2.938	\$2.948	\$2.933	\$2.968	\$3.041
vs. Last Year	\$1.796	\$1.758	\$1.692	\$1.532	\$1.114	\$1.070	\$1.065	\$1.067	\$1.061	\$1.054	\$1.046	\$1.051

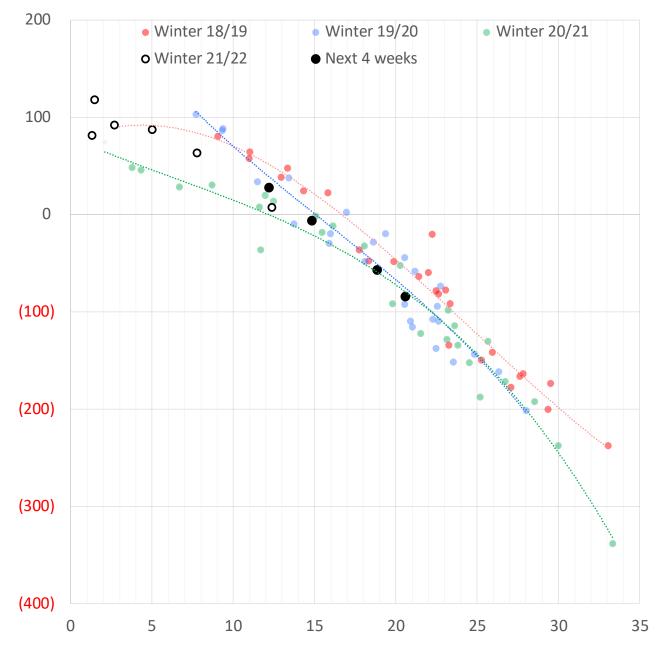
		Cash	Prompt	Cash to
	Units	Settled	Settle	Prompt
AGT Citygate	\$/MMBtu	5.04	13.79	8.75
TETCO M3	\$/MMBtu	4.51	7.47	2.96
FGT Zone 3	\$/MMBtu	4.61	5.54	0.93
Zone 6 NY	\$/MMBtu	4.61	7.40	2.79
Chicago Citygate	\$/MMBtu	4.54	5.74	1.20
Michcon	\$/MMBtu	4.60	5.18	0.58
Columbia TCO Pool	\$/MMBtu	4.37	4.92	0.55
Ventura	\$/MMBtu	4.56	6.14	1.58
Rockies/Opal	\$/MMBtu	4.94	5.46	0.52
El Paso Permian Basin	\$/MMBtu	4.33	5.51	1.18
Socal Citygate	\$/MMBtu	6.00	6.83	0.83
Malin	\$/MMBtu	4.55	6.10	1.55
Houston Ship Channel	\$/MMBtu	4.63	5.60	0.97
Henry Hub Cash	\$/MMBtu	4.75	5.31	0.56
AECO Cash	C\$/GJ	3.83	4.42	0.59
Station2 Cash	C\$/GJ	3.77	6.46	2.69
Dawn Cash	C\$/GJ	4.71	5.36	0.65

Source: CME, Bloomberg



					VS	s. 4 Weeks		
	Units	<b>Current Price</b>	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		1.213		0.275
NatGas Oct21/Jan22	\$/MMBtu	-0.737		-0.401	▼	-0.242	▼	-1.062
NatGas Apr22/Oct22	\$/MMBtu	0.009		0.029		0.003	▼	-0.040
WTI Crude	\$/Bbl	80.88		-1.050		-1.560		39.540
Brent Crude	\$/Bbl	82.05	$\mathbf{T}$	-1.380	▼	-2.280		38.230
Fuel Oil, NY Harbour 1%	\$/Bbl	97.18		0.000		0.000		0.000
Heating Oil	cents/Gallon	239.81	$\bullet$	-6.900	▼	-15.110		116.920
Propane, Mt. Bel	cents/Gallon	1.29		-0.093		-0.184		0.740
Ethane, Mt. Bel	cents/Gallon	0.41		-0.020	▼	-0.025		0.185
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



## **Market Report**

ENERGY

### 16 November 2021

