

## 4 November 2021



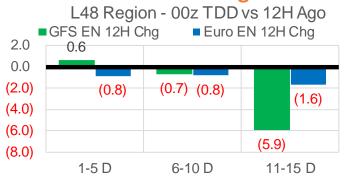
	С	urrent	Δf	ro	m YD		m 7D vg
WTI Prompt	\$	82.59		\$	1.73	<b>~</b> \$	(0.6)

	_	urront	Λ fro	m VD	Δ from 7D			
	Current	urreni	Δ 110	טו ווו	Avg			
Brent Prompt	Ф	83.75	Φ Φ	1 76	<b>—</b> ¢	(0.4)		
Prompt	φ	03.75	<b>—</b> Ф	1.70	• φ	(0.4)		

#### 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

L48 Region - 00z TDD vs 24H Ago GFS EN 24H Chg ■ Euro EN 24H Chg 2.0 1.0 1.0 0.0 (0.3) (1.0)(0.4)(0.4)(2.0)(2.0)(3.0)1-5 D 6-10 D 11-15 D

Currer		Δ from YD	Δ from 7D Avg		
US Dry Production	95.0	▲ 0.24	<b>a</b> 0.11		

urrent	Δ from YD	Δ from 7D Avg		Current	Δ from YD	Δ from 7D Avg	
95.0	<b>a</b> 0.24	<b>a</b> 0.11	US Power Burns	31.3	-0.71	<b>2.53</b>	

	Current	Δ from YD	Δ from 7D Avg
US ResComm	29.3	<b>▼</b> -0.51	<b>7.15</b>

	Current	Δ from YD	Δ from 7D Avg
Canadian Imports	5.2	<b>▼</b> -0.40	<b>▼</b> -0.22

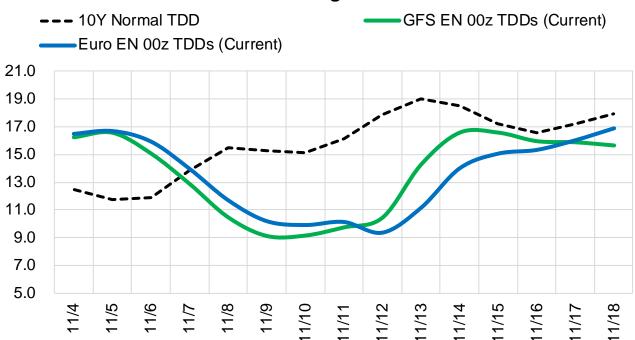
	Current	Δ from YD	Δ from 7D Avg
Net LNG Exports	10.6	<b>0.53</b>	<b>-</b> 0.36

	Current	Δ from YD	Δ from 7D Avg
Mexican Exports	6.3	▼ -0.02	<b>a</b> 0.04

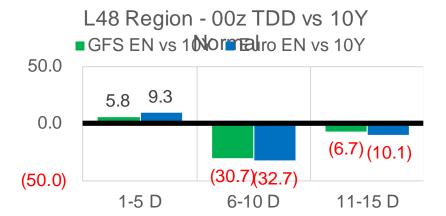


## Short-term Weather Model Outlooks (00z)

## L48 Region



# Vs. 10Y Normal



Source: WSI, Bloomberg



## Lower 48 Component Models

#### **Daily Balances**

	29-Oct	30-Oct	31-Oct	1-Nov	2-Nov	3-Nov	4-Nov	DoD	vs.7D
Lower 48 Dry Production	95.1	95.2	94.5	93.8	95.6	94.7	95.0	<b>0.2</b>	▲ 0.1
Canadian Imports	5.5	5.6	5.6	5.2	5.5	5.6	5.2	▼-0.4	▼ -0.3
L48 Power	27.7	26.5	26.5	29.1	31.1	32.0	31.3	▼-0.7	<b>2.5</b>
L48 Residential & Commercial	18.1	18.1	18.9	24.5	27.5	29.8	29.3	▼-0.5	<b>6.5</b>
L48 Industrial	19.9	19.8	19.9	20.7	21.3	21.9	22.2	<b>0.3</b>	<b>1.6</b>
L48 Lease and Plant Fuel	5.2	5.2	5.1	5.1	5.2	5.2	5.1	▼ 0.0	▼ 0.0
L48 Pipeline Distribution	2.4	2.4	2.4	2.9	3.1	3.3	3.2	▼-0.1	<b>a</b> 0.5
L48 Regional Gas Consumption	73.4	72.0	72.9	82.2	88.2	92.2	91.2	▼-1.0	<b>▲11.0</b>
Net LNG Delivered	11.74	10.90	10.37	11.03	11.25	10.03	10.56	<b>0.5</b>	▼ -0.3
Total Mexican Exports	6.6	6.6	6.3	4.9	6.1	6.4	6.3	▼ 0.0	<b>▲</b> 0.2
Implied Daily Storage Activity EIA Reported Daily Storage Activity Daily Model Error	8.9	11.3	10.4	0.9	-4.4	-8.3	-7.9		

#### **EIA Storage Week Balances**

	24-Sep	1-Oct	8-Oct	15-Oct	22-Oct	29-Oct	WoW	vs. 4W
Lower 48 Dry Production	93.5	93.8	93.3	93.0	92.8	94.0	<b>1.2</b>	▲ 0.8
Canadian Imports	5.2	5.7	5.3	5.0	5.6	5.6	▲ 0.0	<b>0.2</b>
L48 Power	33.3	30.3	32.9	31.7	29.0	29.0	▲ 0.0	<b>▼-2.0</b>
L48 Residential & Commercial	8.1	8.4	8.2	9.5	13.9	17.7	<b>3.8</b>	<b>7.7</b>
L48 Industrial	21.0	20.6	22.3	19.9	18.8	19.8	<b>1.0</b>	▼ -0.6
L48 Lease and Plant Fuel	5.1	5.1	5.1	5.1	5.1	5.1	<b>0.1</b>	<b>0.0</b>
L48 Pipeline Distribution	2.3	2.1	2.2	2.2	2.3	2.5	<b>0.2</b>	<b>0.3</b>
L48 Regional Gas Consumption	69.8	66.5	70.6	68.4	69.1	74.2	<b>▲ 5.1</b>	<b>5.5</b>
Net LNG Exports	9.9	10.3	9.9	10.7	10.8	10.8	▼ 0.0	<b>0.4</b>
Total Mexican Exports	6.8	6.7	6.6	6.6	6.6	6.9	<b>0.3</b>	<b>0.3</b>
Implied Daily Storage Activity	12.2	16.0	11.6	12.2	11.9	7.8	-4.1	
EIA Reported Daily Storage Activity	12.6	16.9	11.6	13.1	12.4			
Daily Model Error	-0.4	-0.8	0.0	-0.9	-0.5			

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	94.1	93.0	93.4	94.6	<b>1.1</b>	<b>3.5</b>
Canadian Imports	4.5	4.6	5.2	5.1	5.1	5.4	5.4	▲ 0.0	▲ 0.8
L48 Power	27.5	25.7	39.4	40.1	33.1	30.3	30.9	<b>0.6</b>	<b>5.2</b>
L48 Residential & Commercial	32.8	24.4	8.1	7.8	7.7	12.9	27.8	<b>14.9</b>	<b>3.4</b>
L48 Industrial	24.9	22.5	21.2	21.7	20.8	20.2	21.5	<b>1.3</b>	<b>▼</b> -1.0
L48 Lease and Plant Fuel	5.2	5.0	5.1	5.1	5.1	5.1	5.1	<b>0.1</b>	<b>0.2</b>
L48 Pipeline Distribution	3.0	2.7	2.5	2.6	2.2	2.3	3.1	<b>8.0</b>	<b>0.5</b>
L48 Regional Gas Consumption	93.5	80.2	76.3	77.3	68.9	70.8	88.5	<b>▲17.7</b>	<b>8.3</b>
Net LNG Exports	7.2	10.1	10.8	10.5	10.3	10.6	10.7	<b>0.1</b>	▲ 0.6
Total Mexican Exports	5.2	6.1	7.1	6.9	6.7	6.6	5.9	▼ -0.7	▼-0.1
Implied Daily Storage Activity	-5.1	-0.7	4.6	4.5	12.1	10.8	-5.1		
EIA Reported Daily Storage Activity Daily Model Error									



# **Daily** Average Generation Data

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

	27-Oct	28-Oct	29-Oct	30-Oct	31-Oct	1-Nov	2-Nov	DoD	vs. 7D
NRC Nuclear Daily Output	70.7	71.5	71.1	71.0	71.1	71.6	72.1	0.5	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	34.1	33.4	33.7	33.9	33.8	33.3	32.8	-0.5	-0.9
NRC % Nuclear Cap Utilization	71.9	72.7	72.3	72.2	72.3	72.8	73.3	0.5	0.9

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

	27-Oct	28-Oct	29-Oct	30-Oct	31-Oct	1-Nov	2-Nov	DoD	vs. 7D
CALI Wind	739	739	485	1946	2725	2224	1586	-638	109
TEXAS Wind	20185	18446	13630	7276	12278	6448	7823	1375	-5221
US Wind	64064	63086	54599	28405	39804	32678	24544	-8134	-22562

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

	27-Oct	28-Oct	29-Oct	30-Oct	31-Oct	1-Nov	2-Nov	DoD	vs. 7D
US Wind	64064	63086	54599	28405	39804	32678	24544	-8134	-22562
US Solar	10413	9171	10654	11213	10479	8937	8770	-167	-1374
US Petroleum	3356	3204	3306	3114	2737	3517	3943	426	737
US Other	8765	9161	8869	8151	7926	8675	9444	769	853
US Coal	74196	72900	73786	64309	61219	80466	85331	4865	14185
US Nuke	74646	74714	74753	72671	72842	75126	75925	799	1799
US Hydro	23450	24683	23786	22551	23103	27425	27731	306	3565
US Gas	149006	145901	146491	137660	122452	162141	174675	12534	30733

See National Wind and Nuclear daily charts



# **Storage Week** Average Generation Data

	<b>Nuclear</b>	Generation	Weekly	Average - GWh	(NRC)
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	24-Sep	1-Oct	8-Oct	15-Oct	22-Oct	29-Oct	WoW	WoW Bcf/d Impact
NRC Nuclear Daily Output	85.9	85.1	82.1	76.5	73.6	71.6	-2.1	0.4
NRC Nuclear Max Capacity	104.9	104.9	104.9	104.9	104.9	104.9	0.0	
NRC Nuclear Outage	19.0	19.8	22.7	28.3	31.2	33.3	2.1	
NRC % Nuclear Cap Utilization	0.1	0.1	0.1	0.1	0.1	0.1	0.0	

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

	24-Sep	1-Oct	8-Oct	15-Oct	22-Oct	29-Oct	WoW	WoW Bcf/d Impact
CALI Wind	1936	2467	1099	2400	1270	2314	1044	-0.2
TEXAS Wind	9780	10364	4890	15396	10729	15462	4733	-0.9
US Wind	43250	43478	20468	49922	43721	49862	6141	-1.1
					-6200.4			
					-12%			

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

	24-Sep	1-Oct	8-Oct	15-Oct	22-Oct	29-Oct	WoW	WoW Bcf/d
	24-06β	. 501	0 001	10 001	22 001	23 001	11311	Impact
US Wind	43250	43478	20468	49922	43721	49862	6141	-1.1
US Solar	12185	12957	11295	10530	12209	10029	-2180	0.4
US Petroleum	2594	2712	3901	3224	3092	2815	-278	0.0
US Other	9121	8709	10972	12221	12109	10124	-1985	0.4
US Coal	109062	94792	100713	89841	74011	73356	-655	0.1
US Nuke	88789	88402	83696	77046	73748	73713	-35	0.0
US Hydro	25340	25370	24552	24701	23105	23542	436	-0.1
US Gas	175354	153813	176848	162707	150057	152557	2500	-0.4

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	Aug-21	Sep-21	Oct-21	Nov-21	Last 30 days	MoM (MTD vs LY)	Last 30 days YoY		
NRC Nuclear Daily Output	79.5	75.8	91.5	87.2	75.5	72.6	73.9	-2.9	-1.9		
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	25.3	29.0	13.4	17.7	29.4	32.2	30.9	2.9	1.9		
NRC % Nuclear Cap Utilization	80.9	77.1	93.0	88.7	76.8	73.9	75.2	-2.9	-1.9		

#### 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	1182	1325	2442	2020	1765	1745	1937	-20	612
TEXAS Wind	9395	10014	9901	9400	11565	7479	12446	-4086	2432
US Wind	37185	41034	35830	40222	40988	26577	43308	-14410	2274

#### **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	37185	41034	35830	40222	40988	26577	43308	<b>16730.3</b>	<b>2274</b>
US Solar	7269	8134	13787	13379	10993	8812	10572	<b>1760.0</b>	<b>2438</b>
US Petroleum	3425	2521	4484	2452	3238	3836	3182	<b>▼</b> -654	<b>661</b>
US Other	8342	8470	9928	9008	11062	9252	10926	<b>1674</b>	<b>2456</b>
US Coal	85165	84203	137655	110037	82734	84115	79787	<b>▼</b> -4327	<b>▼</b> -4416
US Nuke	85780	79259	94062	90146	76700	75725	75256	<b>-469</b>	<b>▼</b> -4004
US Hydro	23905	25709	28532	25661	23895	27655	24367	<b>▼</b> -3287	<b>▼</b> -1342
US Gas	150635	156298	210824	173536	158122	171542	156803	<b>11426</b>	<b>505</b>
US Total	402177	405737	534937	464627	410458	407672	407040	<b>6122</b>	<b>1302</b>



See National Wind and Nuclear daily charts



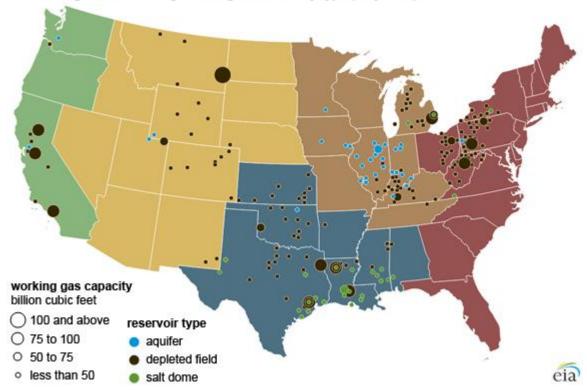
# Regional S/D Models Storage Projection

Week Ending 29-Oct

	Daily Raw Storage	Daily Adjustment Factor	Daily Average Storage Activity (Adjusted) *	Weekly Adjusted Storage Activity
L48	7.5	0.8	8.3	58
East	1.9	0.0	1.9	13
Midwest	1.2	-0.1	1.2	8
Mountain	3.4	-3.1	0.3	2
South Central	0.5	4.3	4.8	34
Pacific	0.4	-0.3	0.1	1

<sup>\*</sup>Adjustment Factor is calcuated based on historical regional deltas

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



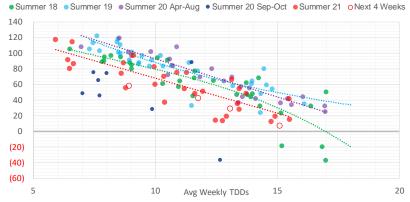


## Weather Model Storage Projection

# Next report and beyond

Week Ending	GWDDs	Week Storage Projection
29-Oct	8.9	58
05-Nov	13.1	29
12-Nov	11.8	42
19-Nov	15.1	7

#### Weather Storage Model - Next 4 Week Forecast



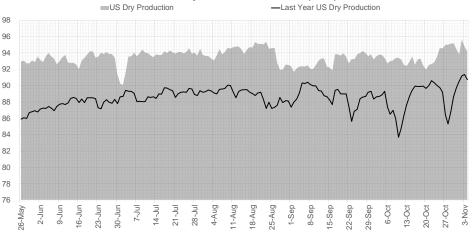
Go to larger image



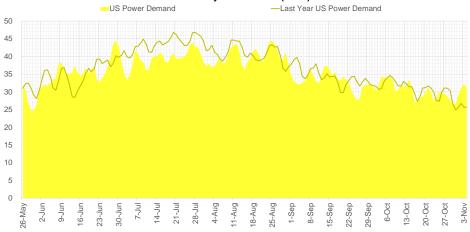


## Supply - Demand Trends

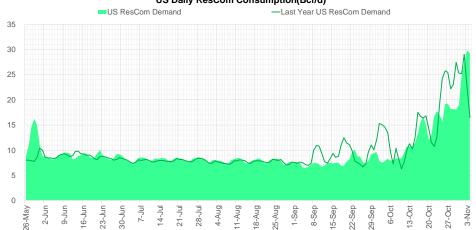
#### US Dry Natural Gas Production (Bcf/d)



#### US Daily Power Burns (Bcf/d)



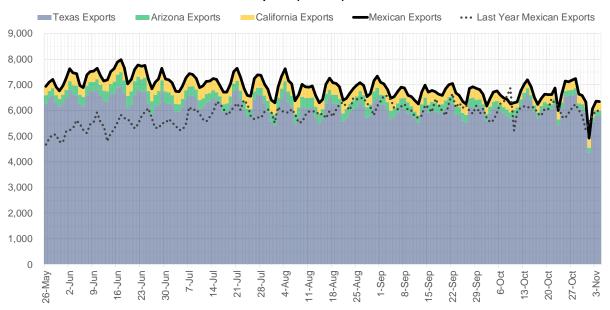
#### US Daily ResCom Consumption(Bcf/d)



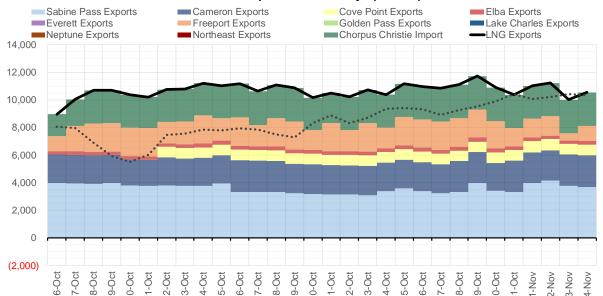
Source: Bloomberg



#### 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

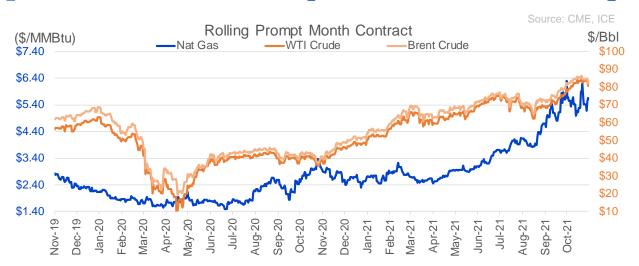
	CONTRACT	PUT/CALL	STRIKE	CUMULATIVE		TRACT		PUT/CALL	STRIKE	CUMULATIVE OI
MONTH	YEAR			VOL	IVIC	HTMC	YEAR			
12	2021	Р	4.25	5251		12	2021	Р	2.75	54603
12	2021	Р	5.00	4496		12	2021	Р	4.00	50383
3	2022	Р	3.00	4211		12	2021	Р	3.00	40231
12	2021	Р	4.75	3530		12	2021	Р	2.50	39420
12	2021	С	7.00	3421		12	2021	Р	3.50	34504
12	2021	Р	4.00	3192		3	2022	С	10.00	31385
3	2022	Р	3.50	2802		3	2022	С	8.00	24525
12	2021	Р	4.50	2626		12	2021	Р	4.25	23481
12	2021	С	6.00	2544		1	2022	Р	3.00	23089
12	2021	С	8.00	2475		3	2022	С	5.00	23041
12	2021	С	6.50	1538		1	2022	Р	2.75	22911
3	2022	С	9.00	1503		12	2021	Р	5.00	22855
1	2022	Р	4.00	1385		12	2021	С	4.00	22526
12	2021	С	6.25	1358		1	2022	С	6.00	21274
1	2022	С	9.00	1222		12	2021	С	6.00	21047
3	2022	P	4.25	1151		4	2022	С	3.00	19710
2	2022	C	9.00	1140		12	2021	С	8.00	19216
12	2021	Č	15.00	1121		1	2022	Р	3.50	18840
1	2022	Č	8.00	1080		3	2022	Р	3.50	18810
12	2021	P	5.25	1061		3	2022	Р	2.50	18561
3	2022	Ċ	6.00	1026		12	2021	С	7.00	18186
2	2022	Č	6.50	817		1	2022	Р	4.00	18089
2	2022	Č	5.50	802		1	2022	С	5.00	18059
12	2022	C	10.00	760		3	2022	Р	3.00	17676
12	2021	C	5.75	715		3	2022	Р	4.00	17648
3	2022	C	10.00	710		2	2022	С	5.00	16863
2		P				12	2021	Р	2.00	16834
7	2022	P P	3.50	675		3	2022	С	4.00	15631
	2022		3.00	650		2	2022	Р	3.50	15625
3	2022	P	4.50	611		12	2021	Р	4.50	15602
1	2023	P	3.00	600		4	2022	Р	2.50	15514
2	2023	P	3.00	600		12	2022	С	5.00	15232
3	2023	P	3.00	600		4	2022	С	5.00	15140
12	2021	P	5.70	595		1	2022	С	4.00	14408
3	2022	С	7.50	585		2	2022	Р	4.00	14233
1	2022	C	7.50	580		1	2022	С	7.00	14030
3	2022	P	3.75	560		5	2022	С	3.00	13733
2	2022	С	7.50	550		3	2022	С	7.00	13540
12	2021	С	5.70	540		2	2022	С	6.00	13513
1	2022	С	17.00	539		3	2022	Р	5.00	13463
2	2022	С	6.00	516		1	2022	С	10.00	13444
3	2022	Р	4.00	516		6	2022	С	3.00	13438
3	2022	С	5.50	501		12	2022	С	4.50	13367
6	2022	Р	3.00	500		1	2022	Р	3.25	13292
12	2021	Р	5.50	464		12	2022	С	5.25	13263
3	2022	С	8.00	453		7	2022	С	3.00	13230
1	2022	Р	4.20	452		8	2022	C	3.00	13226
2	2022	С	8.00	410		9	2022	C	3.00	13225
2	2022	Р	4.00	407		3	2022	С	3.00	13177
1	2022	С	8.50	397		10	2022	<b>C</b> Source		13114
								Source	: CME, ICE	



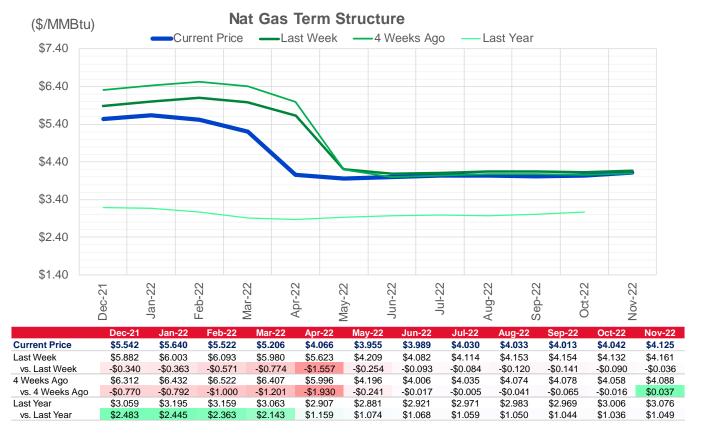
# Nat Gas Futures Open Interest

CME, and ICE Combined

CME, and IOE 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	
DEC 21	142247	146163	-3916	DEC 21	91300	90860	439	
JAN 22	213109	209348	3761	JAN 22	85343	88505	-3162	
FEB 22	75934	76099	-165	FEB 22	69253	69553	-300	
MAR 22	162831	160340	2491	MAR 22	79214	77968	1246	
APR 22	114684	113307	1377	APR 22	78567	79208	-642	
MAY 22	125261	124475	786	MAY 22	71719	71252	467	
JUN 22	43255	41153	2102	JUN 22	55742	55631	111	
JUL 22	37551	37530	21	JUL 22	57771	57548	223	
AUG 22	31424	30484	940	AUG 22	56855	56585	270	
SEP 22	34554	33429	1125	SEP 22	57438	57244	194	
OCT 22	86978	85598	1380	OCT 22	62903	62553	350	
NOV 22	34712	34258	454	NOV 22	49267	49214	53	
DEC 22	27868	27492	376	DEC 22	52305	52065	241	
JAN 23	31452	31117	335	JAN 23	40232	40355	-124	
FEB 23	11158	11105	53	FEB 23	33419	33166	253	
MAR 23	18978	18583	395	MAR 23	35905	35640	265	
APR 23	15816	15832	-16	APR 23	36501	36217	284	
MAY 23	9478	9116	362	MAY 23	35490	35339	150	
JUN 23	7605	7590	15	JUN 23	31565	31449	116	
JUL 23	5393	5037	356	JUL 23	31744	31648	96	
AUG 23	4196	4155	41	AUG 23	32714	32619	96	
SEP 23	5590	5412	178	SEP 23	30702	30628	74	
OCT 23	10212	6669	3543	OCT 23	34706	34556	150	
NOV 23	4301	4120	181	NOV 23	33167	33083	84	
DEC 23	7647	4401	3246	DEC 23	30765	30679	86	
JAN 24	4761	1882	2879	JAN 24	18733	18464	269	
FEB 24	1442	1141	301	FEB 24	14520	14184	337	
MAR 24	8909	4407	4502	MAR 24	19219	18936	283	
APR 24	5602	3449	2153	APR 24	13512	13182	331	
MAY 24	1831	1828	3	MAY 24	14165	13829	336	







		Cash	Prompt	Cash to
	Units	Settled	Settle	Prompt
AGT Citygate	\$/MMBtu	6.10	7.93	1.83
TETCO M3	\$/MMBtu	5.48 5.83		0.35
FGT Zone 3	\$/MMBtu	5.57	5.57 6.25	
Zone 6 NY	\$/MMBtu	5.57	5.86	0.29
Chicago Citygate	\$/MMBtu	5.51	6.22	0.71
Michcon	\$/MMBtu	5.46	5.97	0.51
Columbia TCO Pool	\$/MMBtu	5.17	5.50	0.33
Ventura	\$/MMBtu	5.18	6.28	1.10
Rockies/Opal	\$/MMBtu	5.25	5.92	0.67
El Paso Permian Basin	\$/MMBtu	4.75	5.88	1.13
Socal Citygate	\$/MMBtu	5.85	5.85 6.72	
Malin	\$/MMBtu	5.42	6.67	1.25
Houston Ship Channel	\$/MMBtu	5.28	6.08	0.80
Henry Hub Cash	\$/MMBtu	5.55	5.55 6.01	
AECO Cash	C\$/GJ	4.40	4.75	0.35
Station2 Cash	C\$/GJ	4.33	6.77	2.44
Dawn Cash	C\$/GJ	5.53 5.99		0.46

Source: CME, Bloomberg



					VC	4 Wooks		
	11.00	0 (0)			٧٤	. 4 Weeks		
	Units	Current Price	VS.	Last Week		Ago	VS	s. Last Year
NatGas Jul21/Oct21	\$/MMBtu	2.224		0.000		0.000		2.190
NatGas Oct21/Nov21	\$/MMBtu	0.361		0.000		0.527		0.284
NatGas Oct21/Jan22	\$/MMBtu	-0.061		-0.497	•	-0.108		-0.387
NatGas Apr22/Oct22	\$/MMBtu	-0.057		0.004		0.009		-0.074
WTI Crude	\$/Bbl	80.86		-1.800		3.430		41.710
Brent Crude	\$/Bbl	81.99		-2.590		0.910		40.760
Fuel Oil, NY Harbour 1%	\$/Bbl	97.18		0.000		0.000		0.000
Heating Oil	cents/Gallon	243.45		-8.030		-0.750		126.100
Propane, Mt. Bel	cents/Gallon	1.39		-0.057		-0.111		0.827
Ethane, Mt. Bel	cents/Gallon	0.43		-0.005		-0.008		0.206
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





