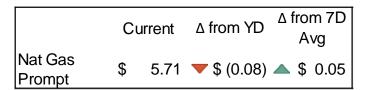


29 October 2021



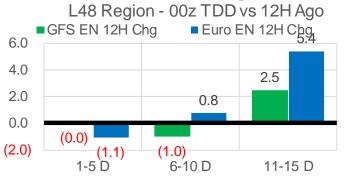
	Cur	rent	Δfı	ror	n YD		om 7D Ava
WTI Prompt	\$ 8	32.99		\$	0.18	•	6 (0.6)

	_	urront	Λ fro	m VD	∆ fro	m 7D	
	Current	urreni	Δπο	טו וווע	Avg		
Brent Prompt	\$	84.65	\$	0.33	- \$	(0.8)	
Prompt	Ψ	0-1.00	— Ψ	0.00	• ψ	(0.0)	

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Short-term Weather Model Outlooks
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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 4.0 3.1 2.0 1.1 1.1 1.0 0.3 0.0 (0.6)(2.0)1-5 D 6-10 D 11-15 D

Current		Δ from YD	Δ from 7D Avg		
US Dry Production	94.4	a 0.07	a 0.87		

	Current	Δ from YD	Δ from 7D Avg
US ResComm	17.4	▼ -0.62	▼ -0.21

	Current	Δ from YD	Δ from 7D Avg		
Net LNG Exports	11.8	a 0.74	1.06		

	Current	Δ from YD	Δ from 7D Avg
US Power Burns	27.1	▼ -1.55	▼ -1.88

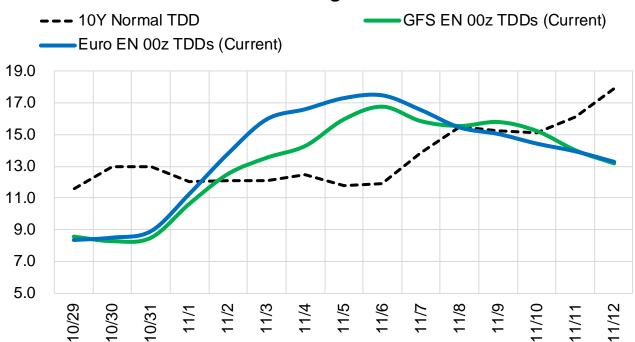
	Current	Δ from YD	Δ from 7D Avg
Canadian Imports	5.2	0.13	- 0.38

	Current	Δ from YD	Δ from 7D Avg
Mexican Exports	6.9	- 0.40	▼ -0.02

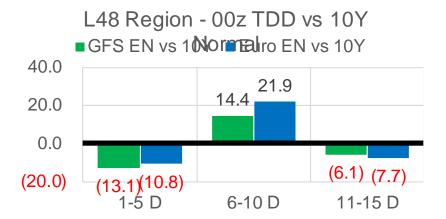


Short-term Weather Model Outlooks (00z)

L48 Region



Vs. 10Y Normal



Source: WSI, Bloomberg



Lower 48 Component Models

Daily Balances

	23-Oct	24-Oct	25-Oct	26-Oct	27-Oct	28-Oct	29-Oct	DoD	vs.7D
Lower 48 Dry Production	92.4	93.2	94.2	93.9	94.2	94.3	94.4	0.1	▲ 0.6
Canadian Imports	5.7	5.7	5.7	5.6	5.6	5.1	5.2	0.1	▼ -0.4
L48 Power	27.3	28.1	29.8	29.6	29.2	28.6	27.1	▼ -1.5	▼-1.7
L48 Residential & Commercial	17.8	17.0	15.8	19.1	19.1	18.0	17.4	▼-0.6	- 0.4
L48 Industrial	19.0	19.2	19.3	19.6	19.6	19.5	19.4	▼ -0.1	0.0
L48 Lease and Plant Fuel	5.0	5.1	5.1	5.1	5.1	5.1	5.1	▼ 0.0	▼ 0.0
L48 Pipeline Distribution	2.4	2.4	2.4	2.6	2.6	2.5	2.4	▼ -0.1	▼ -0.1
L48 Regional Gas Consumption	71.5	71.8	72.4	76.0	75.6	73.7	71.3	▼ -2.4	▼ -2.2
Net LNG Delivered	10.73	10.39	11.18	10.97	10.86	11.11	11.84	0.7	1.0
Total Mexican Exports	6.1	6.5	7.1	7.2	7.2	7.3	6.9	▼-0.4	▼ 0.0
Implied Daily Storage Activity	9.8	10.2	9.2	5.3	6.2	7.2	9.6		
EIA Reported Daily Storage Activity Daily Model Error									

EIA Storage Week Balances

	24-Sep	1-Oct	8-Oct	15-Oct	22-Oct	29-Oct	WoW	vs. 4W
Lower 48 Dry Production	93.0	93.3	92.9	92.6	92.4	93.5	1.1	0.7
Canadian Imports	5.2	5.7	5.3	4.9	5.6	5.6	▲ 0.0	0.2
L48 Power	33.3	30.3	32.9	31.7	29.0	28.9	▼-0.1	▼ -2.0
L48 Residential & Commercial	8.1	8.4	8.2	9.5	13.9	17.6	3.7	~ 7.6
L48 Industrial	20.6	20.1	21.9	19.5	18.7	19.2	0.6	▼ -0.8
L48 Lease and Plant Fuel	5.1	5.1	5.1	5.0	5.0	5.1	0.1	0.0
L48 Pipeline Distribution	2.3	2.1	2.2	2.2	2.3	2.5	0.2	0.3
L48 Regional Gas Consumption	69.2	66.0	70.2	68.0	68.9	73.3	4.4	5.0
Net LNG Exports	9.9	10.3	9.9	10.7	10.8	10.8	▼ 0.0	0.4
Total Mexican Exports	6.8	6.7	6.5	6.6	6.6	6.9	0.3	0.3
Implied Daily Storage Activity	12.2	16.0	11.6	12.2	11.7	8.0	-3.7	
EIA Reported Daily Storage Activity	12.6	16.9	11.6	13.1	12.4			
Daily Model Error	-0.4	-0.9	0.0	-0.9	-0.7			

Monthly Balances									
•	2Yr Ago	LY					MTD		
-	Oct-19	Oct-20	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	MoM	vs. LY
Lower 48 Dry Production	95.1	88.3	93.3	93.3	92.5	92.3	92.9	0.6	4.6
Canadian Imports	4.6	4.3	4.9	5.2	5.1	5.1	5.3	0.2	1.1
L48 Power	30.3	30.8	35.9	39.4	40.2	33.1	30.5	▼-2.6	▼-0.3
L48 Residential & Commercial	15.3	15.3	8.8	8.1	7.7	7.6	12.5	4.8	▼ -2.8
L48 Industrial	23.5	22.6	20.5	20.9	20.4	20.2	19.8	▼ -0.4	▼ -2.8
L48 Lease and Plant Fuel	5.1	4.8	5.0	5.1	5.0	5.0	5.1	0.0	0.2
L48 Pipeline Distribution	2.4	2.5	2.4	2.5	2.5	2.2	2.3	0.1	▼-0.2
L48 Regional Gas Consumption	76.6	75.9	72.7	76.0	75.8	68.2	70.2	1.9	▼ -5.7
Net LNG Exports	6.7	8.0	10.2	10.8	10.5	10.3	10.6	0.2	2.6
Total Mexican Exports	5.4	6.0	7.4	7.1	6.9	6.7	6.7	▼ -0.1	0.7
Implied Daily Storage Activity EIA Reported Daily Storage Activity Daily Model Error	11.1	2.7	7.8	4.6	4.5	12.2	10.8		



Daily Average Generation Data

Nuclear Generation Daily Average - GWh (NRC)

	21-Oct	22-Oct	23-Oct	24-Oct	25-Oct	26-Oct	27-Oct	DoD	vs. 7D
NRC Nuclear Daily Output	72.8	72.3	71.9	72.2	71.8	70.6	70.7	0.1	-1.2
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	32.1	32.6	33.0	32.7	33.1	34.2	34.1	-0.1	1.2
NRC % Nuclear Cap Utilization	74.0	73.5	73.1	73.4	73.0	71.8	71.9	0.1	-1.2

Wind Generation Daily Average - MWh (EIA)

	21-Oct	22-Oct	23-Oct	24-Oct	25-Oct	26-Oct	27-Oct	DoD	vs. 7D
CALI Wind	463	2340	3802	2898	3363	2314	739	-1576	-1791
TEXAS Wind	5406	10682	17522	11586	8865	20948	20948	0	8447
US Wind	33441	29824	35489	40235	46564	69808	63462	-6345	20903

Generation Daily Average - MWh (EIA)

	21-Oct	22-Oct	23-Oct	24-Oct	25-Oct	26-Oct	27-Oct	DoD	vs. 7D
US Wind	33441	29824	35489	40235	46564	69808	63462	-6345	20903
US Solar	10532	10089	11061	8834	8262	9987	10300	314	506
US Petroleum	3517	3671	2446	2376	2387	2264	3356	1093	579
US Other	12469	12494	10802	9771	9549	9137	8754	-383	-1950
US Coal	76239	80711	67154	63140	76508	71159	72246	1088	-239
US Nuke	73401	72921	72308	72432	74786	74184	74646	462	1307
US Hydro	25793	24492	21672	21013	25513	23936	23061	-875	-676
US Gas	171143	169194	135292	137121	171088	153039	148489	-4550	-7657

See National Wind and Nuclear daily charts



Storage Week Average Generation Data

Nuclear	Generation	Weekly	Average -	GWh	(NRC)

	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	2313	1044	-0.2
TEXAS Wind	9780	10364	4890	15396	10729	15928	5199	-0.9
US Wind	43250	43478	20468	49917	43722	49835	6113	-1.1
					-6195.2			
					-12%			

Generation Weekly Average - MWh (EIA)

	24-Sep	1-Oct	8-Oct	15-Oct	22-Oct	29-Oct	WoW	WoW Bcf/d
								Impact
US Wind	43250	43478	20468	49917	43722	49835	6113	-1.1
US Solar	12185	12957	11295	10530	12155	9833	-2321	0.4
US Petroleum	2594	2712	3901	3224	3092	2837	-256	0.0
US Other	9121	8709	10972	12221	12074	9894	-2180	0.4
US Coal	109062	94792	100713	89001	72077	71880	-197	0.0
US Nuke	88789	88402	83696	77046	73748	73703	-45	0.0
US Hydro	25340	25370	24518	24701	23111	23250	139	0.0
US Gas	175354	153813	176848	162483	149263	151816	2553	-0.5

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	Jul-21	Aug-21	Sep-21	Oct-21	Last 30 days	MoM (MTD vs LY)	Last 30 days YoY	
NRC Nuclear Daily Output	80.0	77.0	90.1	91.5	87.2	75.8	76.1	-11.4	-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	24.8	27.8	14.8	13.4	17.7	29.1	28.8	11.4	0.9	
NRC % Nuclear Cap Utilization	81.4	78.3	91.6	93.0	88.7	77.1	77.4	-11.6	-0.9	

Wind Generation Monthly Average - MWh (EIA)

	2Yr Ago	LY							
	Same 30 S days	Same 30 days	Jul-21	Aug-21	Sep-21	Oct-21	Last 30 days	MoM (MTD vs LY)	Last 30 days YoY
CALI Wind	1396	1377	2338	2442	2020	1735	1708	-285	330
TEXAS Wind	9284	9928	7217	9901	9400	12054	12022	2654	2095
US Wind	37501	39100	29217	35830	40222	41761	41441	1539	2341

Generation Monthly Average - MWh (EIA)

Generation Monthly Average	Generation Monthly Average - MWN (EIA)								
	2Yr Ago	LY				MTD			
	Same 30 days	Same 30 days	Jul-21	Aug-21	Sep-21	Oct-21	Last 30 days	MoM (MTD vs LY)	Last 30 days YoY
US Wind	37501	39100	29217	35830	40222	41761	41441	▼ -319.8	2341
US Solar	7913	8471	14140	13787	13379	10931	10982	50.8	2511
US Petroleum	3745	2593	4233	4484	2452	3267	3295	28	~ 702
US Other	8514	8191	9326	9928	9008	11203	11146	▼ -57	2955
US Coal	87383	79319	137228	137655	110037	83033	83707	675	4388
US Nuke	86284	80374	92911	94062	90146	76965	77327	362	▼ -3046
US Hydro	22985	25294	29941	28532	25661	23866	23880	1 4	▼ -1414
US Gas	157141	162378	207823	210824	173536	159702	160079	752	▼ -2299
US Total	411681	405517	524834	534937	464627	414159	415128	1824	9611



See National Wind and Nuclear daily charts



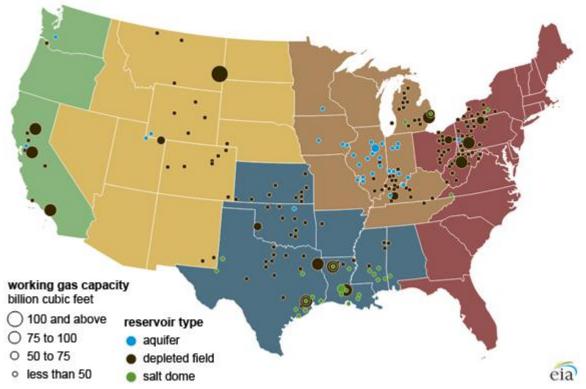
Regional S/D Models Storage Projection

Week Ending 29-Oct

	Daily Raw Storage	Daily Adjustment Factor	Daily Average Storage Activity (Adjusted) *	Weekly Adjusted Storage Activity
L48	7.8	0.9	8.7	61
East	1.5	0.2	1.8	12
Midwest	1.3	0.0	1.3	9
Mountain	3.6	-3.1	0.5	3
South Central	0.7	4.4	5.1	35
Pacific	0.6	-0.5	0.1	1

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

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



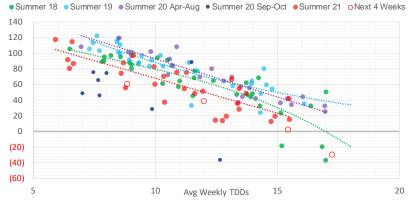


Weather Model Storage Projection

Next report and beyond

Week Ending	GWDDs	Week Storage Projection
29-Oct	8.9	61
05-Nov	12.0	39
12-Nov	15.4	2
19-Nov	17.3	-30

Weather Storage Model - Next 4 Week Forecast



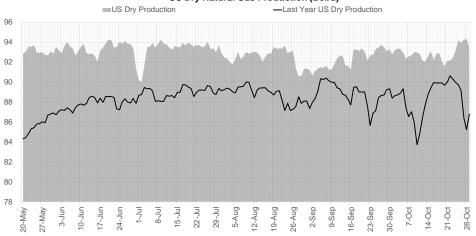
Go to larger image



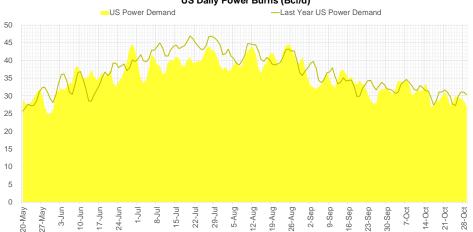


Supply - Demand Trends

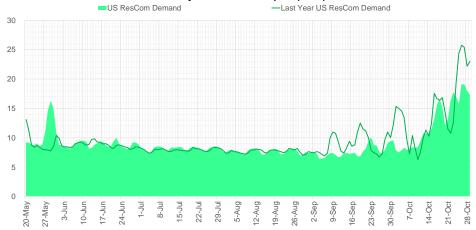
US Dry Natural Gas Production (Bcf/d)



US Daily Power Burns (Bcf/d)



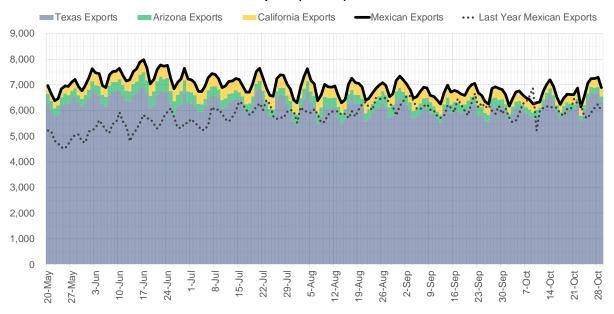
US Daily ResCom Consumption(Bcf/d)



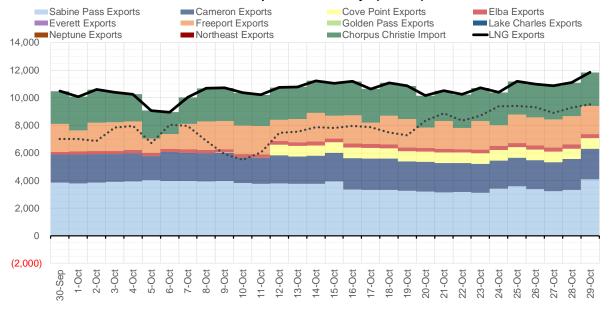
Source: Bloomberg



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

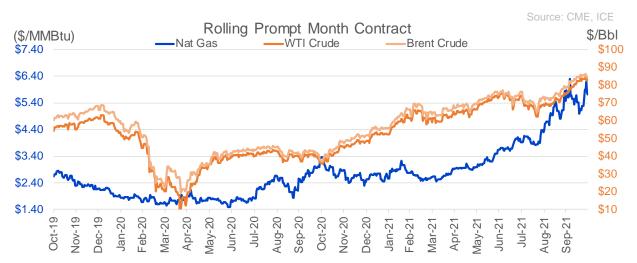
	CONTRACT	PUT/CALL	STRIKE	CUMULATIVE	ONTRACT	CONTRACT	PUT/CALL	STRIKE	CUMULATIVE OI
MONTH	YEAR			VOL	MONTH	YEAR			
12	2021	Р	5.00	7970	12	2021	Р	2.75	54603
12	2021	Р	4.00	4127	12	2021	Р	3.00	42228
12	2021	Р	5.50	4037	12	2021	Р	4.00	41987
12	2021	Р	4.90	4019	12	2021	Р	2.50	39421
12	2021	С	6.00	3535	12	2021	Р	3.50	35665
12	2021	Р	5.40	3293	3	2022	С	10.00	30121
12	2021	С	6.50	2941	3	2022	С	8.00	24767
1	2022	С	7.00	2466	1	2022	Р	3.00	23595
1	2022	Р	4.00	2351	1	2022	Р	2.75	22906
12	2021	С	7.00	2307	12	2021	С	4.00	22527
1	2022	Р	3.50	2088	12	2021	Р	5.00	22263
12	2021	Р	4.25	2075	3	2022	С	5.00	22074
1	2022	С	10.00	1964	1	2022	С	6.00	20595
12	2021	С	10.00	1862	12	2021	С	6.00	20590
3	2022	С	9.00	1845	4	2022	С	3.00	19710
1	2022	С	12.00	1843	1	2022	Р	3.50	19063
12	2021	Р	5.25	1727	3	2022	Р	2.50	18386
1	2022	С	8.00	1716	1	2022	С	5.00	18059
1	2022	Č	6.00	1606	3	2022	Р	3.50	17974
3	2022	Č	8.00	1603	1	2022	Р	4.00	17722
1	2022	Č	9.00	1586	12	2021	С	8.00	17571
3	2022	Č	12.00	1551	3	2022	Р	4.00	17407
12	2021	P	4.75	1308	2	2022	С	5.00	16834
2	2022	Ċ	8.00	1271	12	2021	Р	2.00	16834
12	2021	P	4.50	1200	12	2021	Р	4.50	16768
1	2022	P	4.25	1126	12	2021	С	7.00	16358
2	2022	P	5.00	1050	3	2022	Р	3.00	15633
2	2022	C	6.00	1030	3	2022	С	4.00	15631
1	2022	P	4.50	1011	4	2022	Р	2.50	15489
4	2022	C	4.25	1000	2	2022	Р	3.50	15376
5	2022	Č	4.00	1000	12	2022	С	5.00	15232
5	2022	P	2.50	1000	1	2022	С	4.00	14393
3	2022	C	6.00	980	2	2022	Р	4.00	14362
3	2022	P	4.50	960 845	4	2022	С	5.00	14299
2	2022	P	4.30	800	3	2022	С	7.00	13775
3	2022	P	3.50	708	5	2022	С	3.00	13733
3 12		C			1	2022	C	7.00	13727
12	2021	P	12.00	660	3	2022	С	9.00	13641
	2021		5.20	615	2	2022	С	6.00	13508
12	2021	C P	15.00	600	6	2022	С	3.00	13438
4	2022		2.75	600	3	2022	Р	5.00	13368
12	2021	С	6.25	587	12	2022	C	4.50	13367
1	2022	С	15.00	548	12	2022	С	5.25	13263
1	2022	С	6.10	532	1	2022	С	10.00	13237
4	2022	P	3.50	530	7	2022	С	3.00	13230
3	2022	С	5.00	529	8	2022	С	3.00	13226
12	2021	C	8.50	505	9	2022	C	3.00	13225
3	2022	P	4.00	500	3	2022	С	3.00	13177
6	2022	P	2.50	500	10	2022	С	3.00	13114
3	2022	С	15.00	472	2	2022	C Source	: CME, ICE	13019

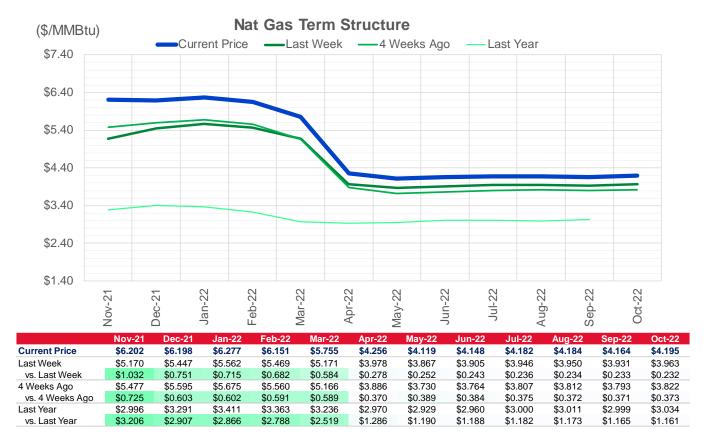


Nat Gas Futures Open Interest

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
DEC 21	165305	540	164765	DEC 21	92407	82477	9931
JAN 22	213926	167178	46748	JAN 22	91630	91769	-139
FEB 22	75946	218011	-142065	FEB 22	69514	95288	-25775
MAR 22	154948	75323	79625	MAR 22	77641	69596	8045
APR 22	112967	155534	-42567	APR 22	78827	76974	1853
MAY 22	125478	113413	12065	MAY 22	71206	78743	-7537
JUN 22	42090	125377	-83287	JUN 22	55354	71344	-15990
JUL 22	38054	41966	-3912	JUL 22	57605	55545	2060
AUG 22	29402	38622	-9220	AUG 22	56212	57428	-1216
SEP 22	34138	29751	4387	SEP 22	57029	56283	746
OCT 22	85355	34261	51094	OCT 22	62154	57210	4944
NOV 22	34778	84987	-50209	NOV 22	49093	62503	-13410
DEC 22	25755	34745	-8990	DEC 22	52042	48979	3063
JAN 23	30124	25687	4437	JAN 23	39611	52165	-12554
FEB 23	10720	30069	-19349	FEB 23	32550	39743	-7193
MAR 23	18085	10580	7505	MAR 23	34995	32632	2363
APR 23	15608	17969	-2361	APR 23	35405	35096	310
MAY 23	9092	15567	-6475	MAY 23	34529	35382	-853
JUN 23	7114	9006	-1892	JUN 23	30753	34711	-3958
JUL 23	4864	7118	-2254	JUL 23	30966	30923	43
AUG 23	4025	4861	-836	AUG 23	31923	31140	783
SEP 23	5031	4056	975	SEP 23	29924	32097	-2174
OCT 23	6469	5063	1406	OCT 23	33814	30094	3720
NOV 23	3729	6497	-2768	NOV 23	32626	33996	-1370
DEC 23	4319	3598	721	DEC 23	27901	32759	-4859
JAN 24	1880	4318	-2438	JAN 24	18170	28036	-9866
FEB 24	1141	1890	-749	FEB 24	13928	18106	-4179
MAR 24	4667	1169	3498	MAR 24	18697	13868	4829
APR 24	3521	4663	-1142	APR 24	13128	18650	-5523
MAY 24	1824	3531	-1707	MAY 24	13690	13148	542





		Cash	Prompt	Cash to
	Units	Settled	Settle	Prompt
AGT Citygate	\$/MMBtu	5.97	7.50	1.53
TETCO M3	\$/MMBtu	4.61	4.77	0.16
FGT Zone 3	\$/MMBtu	5.50	5.36	-0.14
Zone 6 NY	\$/MMBtu	5.50	4.95	-0.55
Chicago Citygate	\$/MMBtu	5.38	5.13	-0.25
Michcon	\$/MMBtu	5.40	4.96	-0.44
Columbia TCO Pool	\$/MMBtu	4.85	4.62	-0.23
Ventura	\$/MMBtu	5.80	5.27	-0.53
Rockies/Opal	\$/MMBtu	5.90	4.88	-1.02
El Paso Permian Basin	\$/MMBtu	5.21	4.91	-0.30
Socal Citygate	\$/MMBtu	6.39	5.70	-0.69
Malin	\$/MMBtu	5.61	5.51	-0.10
Houston Ship Channel	\$/MMBtu	5.44	5.10	-0.34
Henry Hub Cash	\$/MMBtu	5.61	5.00	-0.61
AECO Cash	C\$/GJ	5.08	4.31	-0.77
Station2 Cash	C\$/GJ	1.93	5.87	3.94
Dawn Cash	C\$/GJ	5.41	5.02	-0.39

Source: CME, Bloomberg



					\ / C	4 Wooks		
					VS	s. 4 Weeks		
	Units	Current Price	VS.	Last Week		Ago	VS	s. Last Year
NatGas Jul21/Oct21	\$/MMBtu	2.224		0.000		0.000		2.195
NatGas Oct21/Nov21	\$/MMBtu	0.361		1.087		0.335		0.301
NatGas Oct21/Jan22	\$/MMBtu	0.030		0.410	•	-0.202		-0.270
NatGas Apr22/Oct22	\$/MMBtu	-0.025		-0.019		0.058		-0.051
WTI Crude	\$/Bbl	82.81		0.310		7.780		46.640
Brent Crude	\$/Bbl	84.32		-0.290		5.800		46.670
Fuel Oil, NY Harbour 1%	\$/Bbl	97.18		0.000		0.000		0.000
Heating Oil	cents/Gallon	251.65		-3.260		17.480		142.810
Propane, Mt. Bel	cents/Gallon	1.45		-0.013		0.154		0.924
Ethane, Mt. Bel	cents/Gallon	0.43		0.006		0.045		0.220
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						



