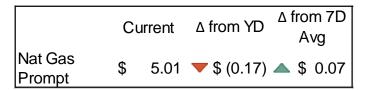


Market Report

17 November 2021



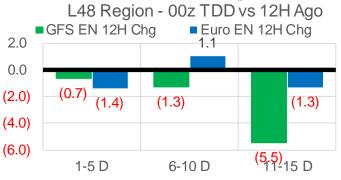
	С	urrent	Δ from YD	_	m 7D vg
WTI Prompt	\$	80.20	\$ (0.56)	~ \$	(0.8)

	_	urrant	Δ from YD	∆ fro	m 7D
	C	urreni		A	vg
Brent Prompt	Ф	Q1 Q1	* \$ (0.52)	2	(0.4)
Prompt	Ψ	01.91	Ψ ψ (0.52)	ΨΨ	(0.4)

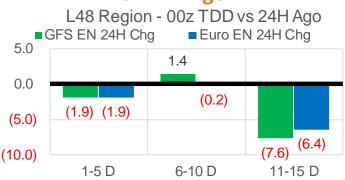
Page Menu

Short-term Weather Model Outlooks
Lower 48 Component Models
Regional S/D Models Storage Projection
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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	95.3	- 0.39	▼ -1.56

	Current	Δ from YD	Δ from 7D Avg
US ResComm	22.0	▼ -5.06	▼ -4.30

	Current		Δ from 7D Avg		
Net LNG Exports	11.2	a 0.14	a 0.16		

	Current	Δ from YD	Δ from 7D Avg		
US Power Burns	27.3	▼ -0.61	a 0.02		

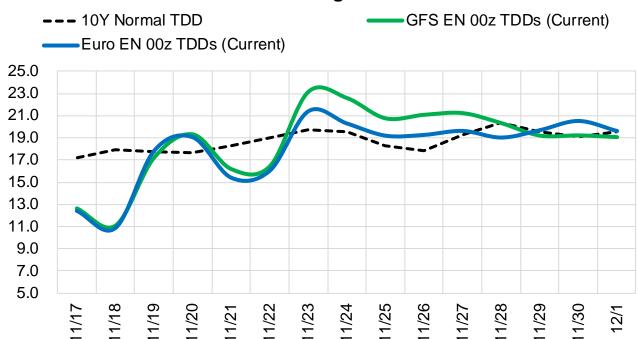
	Current	Δ from YD	Δ from 7D Avg
Canadian Imports	4.2	▼ -0.83	- 0.66

	Current	Δ from YD	Δ from 7D Avg
Mexican Exports	6.2	▲ 0.02	0.06

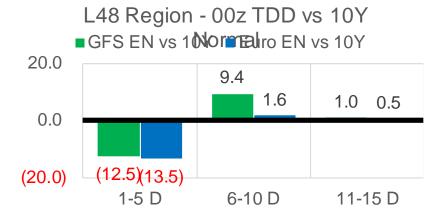


Short-term Weather Model Outlooks (00z)

L48 Region



Vs. 10Y Normal





Market Report

Lower 48 Component Models

Daily Balances

	11-Nov	12-Nov	13-Nov	14-Nov	15-Nov	16-Nov	17-Nov	DoD	vs.7D
Lower 48 Dry Production	97.0	96.5	97.3	97.0	97.3	95.7	95.3	▼-0.4	▼ -1.5
Canadian Imports	4.3	4.4	4.9	5.3	5.4	5.0	4.2	▼-0.8	▼ -0.7
L48 Power	27.8	27.9	26.1	25.8	27.9	27.9	27.3	▼-0.6	0.1
L48 Residential & Commercial	21.2	24.8	30.1	30.6	30.0	27.1	22.0	▼ -5.1	▼ -5.3
L48 Industrial	23.2	24.4	25.3	25.5	25.5	24.6	23.9	▼-0.7	▼ -0.8
L48 Lease and Plant Fuel	5.3	5.3	5.3	5.3	5.3	5.2	5.1	▼-0.1	▼ -0.1
L48 Pipeline Distribution	2.6	2.8	3.0	3.0	3.1	2.9	2.6	▼-0.3	▼ -0.3
L48 Regional Gas Consumption	80.1	85.1	89.8	90.2	91.8	87.8	81.0	▼-6.8	▼ -6.4
Net LNG Delivered	11.35	10.42	11.57	11.38	10.50	11.09	11.23	0.1	0.2
Total Mexican Exports	6.5	6.5	5.9	5.7	5.7	6.1	6.2	▲ 0.0	▲ 0.1
Implied Daily Storage Activity EIA Reported Daily Storage Activity Daily Model Error	3.2	-1.1	-5.1	-5.0	-5.3	-4.4	1.0		

EIA Storage Week Balances

	8-Oct	15-Oct	22-Oct	29-Oct	5-Nov	12-Nov	WoW	vs. 4W
Lower 48 Dry Production	94.9	94.8	94.6	95.7	96.5	97.3	0.9	1.9
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	8.2	9.5	13.9	17.7	24.1	23.5	▼ -0.7	7.2
L48 Industrial	23.8	21.6	20.5	21.0	22.8	22.7	▼ -0.1	1.2
L48 Lease and Plant Fuel	5.2	5.2	5.2	5.2	5.3	5.3	0.0	0.1
L48 Pipeline Distribution	2.2	2.2	2.3	2.5	2.9	2.7	▼ -0.2	0.2
L48 Regional Gas Consumption	72.2	70.2	70.9	75.4	84.6	81.5	▼ -3.1	6.2
Net LNG Exports	9.9	10.7	10.8	10.8	10.9	11.2	0.3	0.4
Total Mexican Exports	6.6	6.6	6.6	6.9	6.1	6.2	▲ 0.1	▼-0.4
Implied Daily Storage Activity	11.6	12.2	12.0	8.2	0.4	3.5	3.1	
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	-0.6			

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	94.4	95.2	96.8	1.6	5.7
Canadian Imports	4.5	4.6	5.2	5.1	5.1	5.4	5.1	▼ -0.3	0.5
L48 Power	27.5	25.7	39.4	40.1	33.1	30.3	28.2	▼-2.1	2.5
L48 Residential & Commercial	32.8	24.4	8.1	7.8	7.7	12.9	26.0	13.1	1.7
L48 Industrial	24.9	22.4	21.2	21.9	22.1	21.7	23.7	2.0	1.3
L48 Lease and Plant Fuel	5.2	5.0	5.1	5.1	5.2	5.2	5.3	0.1	0.3
L48 Pipeline Distribution	3.0	2.7	2.5	2.6	2.2	2.3	2.9	0.6	0.2
L48 Regional Gas Consumption	93.5	80.2	76.3	77.5	70.4	72.4	86.1	▲13.7	6.0
Net LNG Exports	7.2	10.1	10.8	10.5	10.3	10.6	11.0	0.4	0.9
Total Mexican Exports	5.2	6.1	7.1	6.9	6.7	6.6	6.0	▼ -0.6	▼ 0.0
Implied Daily Storage Activity EIA Reported Daily Storage Activity Daily Model Error	-5.1	-0.7	4.6	4.6	12.2	10.9	-1.3		



Daily Average Generation Data

Nuclear Generation Daily Average - GWh (NRC)

	9-Nov	10-Nov	11-Nov	12-Nov	13-Nov	14-Nov	15-Nov	DoD	vs. 7D
NRC Nuclear Daily Output	81.7	81.7	82.1	82.6	82.7	83.7	84.0	0.3	1.5
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	23.2	23.1	22.7	22.2	22.1	21.2	20.9	-0.3	-1.5
NRC % Nuclear Cap Utilization	83.0	83.1	83.5	84.0	84.1	85.1	85.4	0.3	1.5

Wind Generation Daily Average - MWh (EIA)

	9-Nov	10-Nov	11-Nov	12-Nov	13-Nov	14-Nov	15- N ov	DoD	vs. 7D
CALI Wind	2831	1703	603	484	342	272	1244	972	205
TEXAS Wind	10746	16930	6916	11152	12085	8889	10264	1375	-855
US Wind	38002	60852	55365	64722	50577	49269	43525	-5744	-9606

Generation Daily Average - MWh (EIA)

	9-Nov	10-Nov	11-Nov	12-Nov	13- N ov	14-Nov	15-Nov	DoD	vs. 7D
US Wind	38002	60852	55365	64722	50577	49269	43525	-5744	-9606
US Solar	8695	9586	9798	10225	9885	10351	10356	5	599
US Petroleum	2878	2489	2042	1941	2754	2549	3233	683	791
US Other	7725	7815	7757	8013	7477	7581	7887	306	159
US Coal	84701	76438	73780	73139	78168	77987	84340	6352	6970
US Nuke	86125	86527	86829	86997	87358	87638	88332	693	1419
US Hydro	26753	26074	26602	24353	24796	24965	26944	1979	1354
US Gas	150681	135098	143909	140713	138431	140797	162151	21355	20547

See National Wind and Nuclear daily charts



Storage Week Average Generation Data

	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	32116	50996	18880	-3.4
					-17754.6			
					-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	32116	50996	18880	-3.4
US Solar	11294	10530	12209	10138	9979	9817	-161	0.0
US Petroleum	3901	3224	3092	2815	3517	2532	-985	0.2
US Other	10973	12221	12109	10196	9288	8142	-1146	0.2
US Coal	100713	89841	74017	73355	77392	77955	563	-0.1
US Nuke	83696	77046	73748	73713	75510	84337	8827	-1.6
US Hydro	24553	24699	23105	23540	25530	25347	-183	0.0
US Gas	176848	162707	150057	152802	159071	144802	-14269	2.6

See National Wind and Nuclear daily charts



Monthly Average Generation Data

Nuclear Generation Monthl	y Average -	GWh (NI	RC)						
	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	81.1	77.3	91.5	87.2	75.5	79.5	76.1	4.0	-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	23.8	27.6	13.4	17.7	29.4	25.4	28.8	-4.0	1.2
NRC % Nuclear Cap Utilization	82.5	78.6	93.0	88.7	76.8	80.8	77.4	4.1	-1.2

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	647	1225	2442	2020	1765	1411	1562	-354	337
TEXAS Wind	8843	9751	9901	9400	11565	10192	11543	-1373	1792
US Wind	34334	41729	35830	40223	40991	44355	45648	3364	3919

Generation Monthly Average - MWh (EIA)

Ocheration monthly Average	(=:	,							
	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	34334	41729	35830	40223	40991	44355	45648	1292.9	3919
US Solar	6274	7340	13787	13382	11044	9819	10209	390.4	2869
US Petroleum	3162	2572	4484	2452	3238	2949	2948	▼ 0	376
US Other	8224	8986	9928	9008	11099	8422	9245	824	259
US Coal	98252	89090	137655	110037	82735	80614	76958	▼ -3655	▼-12132
US Nuke	87868	80895	94062	90146	76700	83862	79391	▼ -4471	▼ -1504
US Hydro	25992	28068	28533	25665	23895	25978	25030	▼ -948	▼ -3038
US Gas	151428	143850	210824	173538	158237	154416	152600	▼ -6568	8749
US Total	415903	402844	534937	464626	410686	411025	404327	▼-14429	1482



See National Wind and Nuclear daily charts



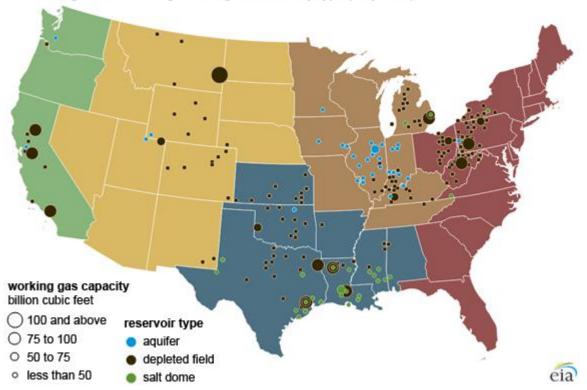
Regional S/D Models Storage Projection

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	0.0	0.4	0.3	2
Midwest	0.3	1.4	1.6	11
Mountain	3.3	-3.3	0.0	0
South Central	-1.0	2.5	1.6	11
Pacific	0.6	-0.1	0.5	4

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

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



26-Nov

03-Dec

-60

-69



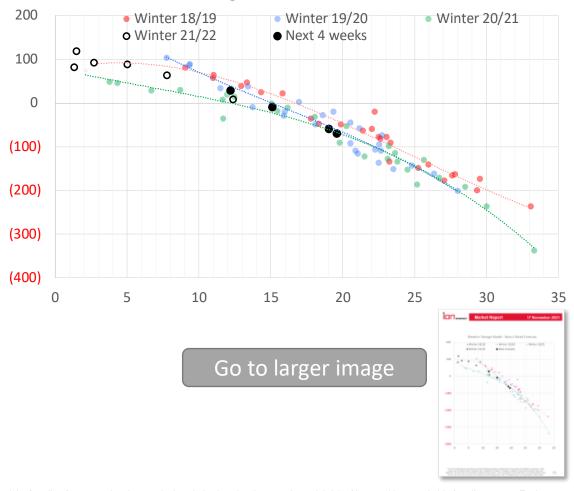
Weather Model Storage Projection

Next report and beyond		
Week Ending	GWDDs	Week Storage Projection
12-Nov	12.2	29
19-Nov	15	-8

Weather Storage Model - Next 4 Week Forecast

19

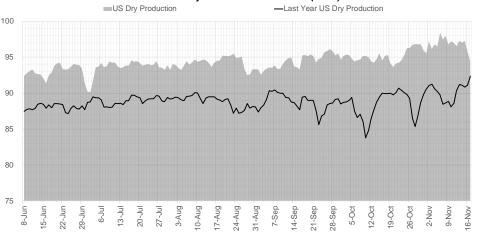
20



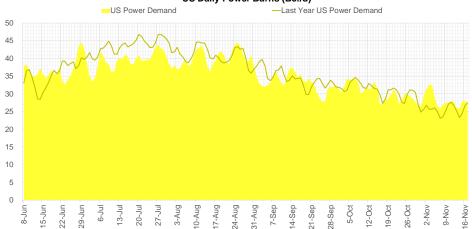


Supply - Demand Trends

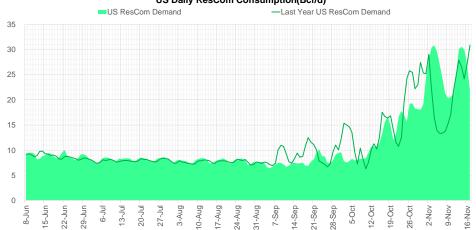
US Dry Natural Gas Production (Bcf/d)



US Daily Power Burns (Bcf/d)



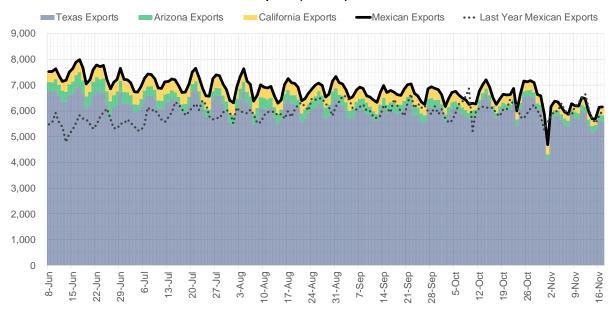
US Daily ResCom Consumption(Bcf/d)



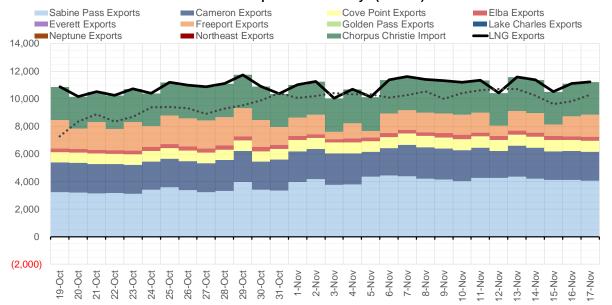
Source: Bloomberg



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

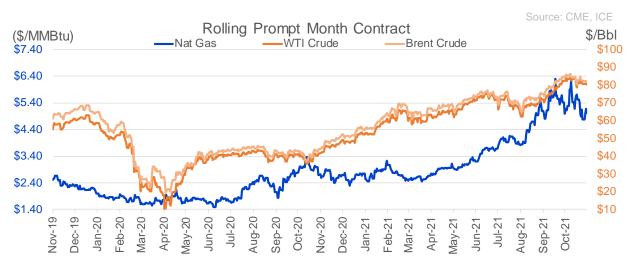
	CONTRACT	PUT/CALL	STRIKE	CUMULATIVE	CONTRACT	CONTRACT	PUT/CALL	STRIKE	CUMULATIVE (
MONTH	YEAR	1 0 1/O/LEE	OTTAIL	VOL	MONTH	YEAR	1 OT/OALL	OTTAIL	COMOLATIVE
12	2021	С	6.00	8701	12	2021	Р	2.75	54612
12	2021	С	6.50	3803	12	2021	Р	4.00	44891
12	2021	С	5.50	3585	12	2021	Р	3.00	40234
12	2021	P	4.00	2814	12	2021	Р	2.50	39420
5	2022	C	5.50	2450	3	2022	С	10.00	34568
12	2021	Č	7.00	2409	12	2021	Р	3.50	33470
3	2022	P	3.50	2402	12	2021	С	6.00	27439
12	2021	Р	5.00	2188	12	2021	Р	4.25	25603
12	2021	Р	4.20	2030	12	2021	Р	5.00	25310
1	2022	C	9.00	1921	3	2022	С	8.00	25213
12	2021	P	4.75	1573	1	2022	C	6.00	23449
12	2021	r P	4.50	1489	1	2022	Р	2.75	23229
		C			12	2021	С	7.00	22809
4	2022	P	5.50	1450	3	2022	Ċ	5.00	22573
3	2022		3.00	1429	12	2021	Ċ	4.00	22526
3	2022	С	6.00	1411	1	2022	P	3.00	22428
12	2021	С	5.75	1369	3	2022	Р	3.00	20949
2	2022	Р	3.50	1309	12	2021	Ċ	8.00	20687
12	2021	С	7.50	1290	4	2022	Č	3.00	19710
1	2022	С	8.00	1191	3	2022	P	2.50	18833
12	2021	С	5.90	1063	3	2022	P	3.50	18450
12	2021	С	5.80	1032	1	2022	C	5.00	18413
4	2022	С	8.00	910	1	2022	C	7.00	17920
1	2022	С	6.00	904	12	2022	P	4.50	
1	2022	С	7.00	904	12	2021	P P	4.50 3.50	17715 17699
1	2022	С	10.00	872	2	2022	C	5.00	17699
12	2021	С	8.00	869			P		
12	2021	Р	5.10	704	3 1	2022 2022	P P	4.00 4.00	17457
1	2023	С	4.50	700	12	2022	P P	2.00	17343 16834
1	2023	С	5.00	700					
12	2021	C	6.25	643	3	2022	С	6.00	16528
2	2022	C	15.00	609	12	2022	С	5.00	16097
5	2022	P	3.00	600	12	2021	С	5.00	16059
5	2022	Р	3.50	600	4	2022	С	5.00	15548
9	2022	C	5.70	600	3	2022	С	4.00	15506
9	2022	P	3.40	600	12	2021	C	6.50	15311
10	2022	C	5.70	600	4	2022	Р	2.50	15264
10	2022	P			2	2022	P	3.50	15121
		P P	3.40	600	12	2021	С	5.50	14916
4	2024	-	2.75	600	1	2022	С	4.00	14369
5	2024	P	2.75	600	1	2022	С	8.00	13951
6	2024	Р	2.75	600	2	2022	С	6.00	13879
7	2024	P -	2.75	600	3	2022	С	7.00	13838
8	2024	Р	2.75	600	3	2022	Р	5.00	13798
9	2024	Р	2.75	600	5	2022	С	3.00	13733
10	2024	Р	2.75	600	12	2021	С	15.00	13491
12	2021	Р	4.90	578	6	2022	С	3.00	13438
12	2021	Р	5.20	573	3	2022	С	9.00	13281
3	2022	Р	4.00	554	12	2022	С	4.50	13267
2	2022	С	8.00	542	12	2022	С	5.25	13263
1	2022	С	5.50	534	7	2022	C	: CME, ICE	13230



Nat Gas Futures Open Interest

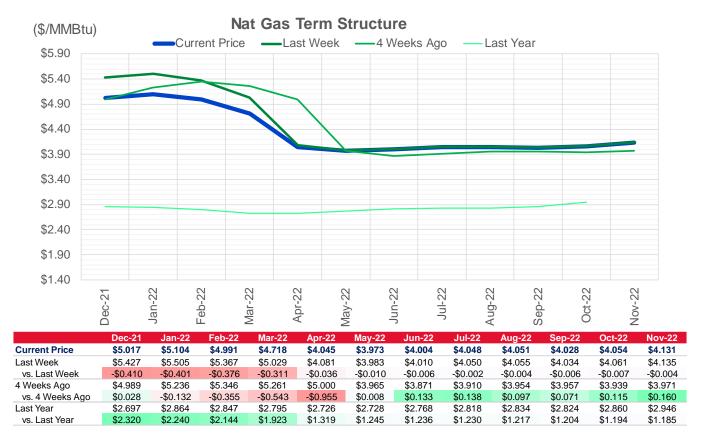
CME, and ICE Combined

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	72857	82297	-9440	DEC 21	92613	92650	-37
JAN 22	255825	251910	3915	JAN 22	87695	87403	292
FEB 22	78771	79170	-399	FEB 22	70293	70270	24
MAR 22	157780	156086	1694	MAR 22	80074	80023	51
APR 22	117273	116210	1063	APR 22	76979	77579	-600
MAY 22	139880	138321	1559	MAY 22	72393	72531	-138
JUN 22	44184	44076	108	JUN 22	54768	54743	25
JUL 22	43131	43296	-165	JUL 22	56834	57320	-486
AUG 22	31738	31509	229	AUG 22	55015	55242	-227
SEP 22	37113	36976	137	SEP 22	56090	56303	-214
OCT 22	87638	87234	404	OCT 22	62184	62371	-187
NOV 22	35586	35439	147	NOV 22	47820	47803	17
DEC 22	27379	27491	-112	DEC 22	50603	50694	-91
JAN 23	31865	32335	-470	JAN 23	40263	40256	7
FEB 23	11141	11229	-88	FEB 23	33430	33442	-12
MAR 23	23868	23796	72	MAR 23	37034	36993	42
APR 23	16572	16088	484	APR 23	37832	37845	-13
MAY 23	10033	10021	12	MAY 23	35443	35229	215
JUN 23	9172	9414	-242	JUN 23	31695	31440	255
JUL 23	6237	6037	200	JUL 23	31558	31319	239
AUG 23	4527	4453	74	AUG 23	32627	32387	239
SEP 23	6165	5792	373	SEP 23	30745	30513	232
OCT 23	10814	10860	-46	OCT 23	34484	34260	224
NOV 23	5135	4993	142	NOV 23	33991	33980	12
DEC 23	8219	8078	141	DEC 23	31507	31494	12
JAN 24	4843	4836	7	JAN 24	19555	19597	-42
FEB 24	1451	1443	8	FEB 24	15043	15039	4
MAR 24	8631	8626	5	MAR 24	19924	19792	132
APR 24	5367	5362	5	APR 24	14306	14283	24
MAY 24	1982	1982	0	MAY 24	14844	14843	1





Market Report



		Cash	Prompt	Cash to	
	Units	Settled	Settle	Prompt	
AGT Citygate	\$/MMBtu	4.91	12.56	7.65	
TETCO M3	\$/MMBtu	4.69	6.40	1.71	
FGT Zone 3	\$/MMBtu	4.65	5.10	0.45	
Zone 6 NY	\$/MMBtu	4.65	6.57	1.93	
Chicago Citygate	\$/MMBtu	4.94	5.29	0.35	
Michcon	\$/MMBtu	4.96	4.73	-0.23	
Columbia TCO Pool	\$/MMBtu	4.62	4.46	-0.16	
Ventura	\$/MMBtu	4.91	5.69	0.78	
Rockies/Opal	\$/MMBtu	5.02	5.04	0.03	
El Paso Permian Basin	\$/MMBtu	4.75	5.06	0.31	
Socal Citygate	\$/MMBtu	6.30	6.38	80.0	
Malin	\$/MMBtu	5.90	5.65	-0.25	
Houston Ship Channel	\$/MMBtu	4.53	5.15	0.62	
Henry Hub Cash	\$/MMBtu	5.05	4.86	-0.19	
AECO Cash	C\$/GJ	4.25 3.96		-0.29	
Station2 Cash	C\$/GJ	3.37	6.01	2.64	
Dawn Cash	C\$/GJ	5.07	4.91	-0.16	

Source: CME, Bloomberg



					\/C	s. 4 Weeks		
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	Units	Current Price	VS.	Last Week		Ago	VS	s. Last Year
NatGas Jul21/Oct21	\$/MMBtu	2.224		0.000		0.000		2.180
NatGas Oct21/Nov21	\$/MMBtu	0.361		0.000		1.114		0.277
NatGas Oct21/Jan22	\$/MMBtu	-0.571		0.200	•	-0.195		-0.895
NatGas Apr22/Oct22	\$/MMBtu	-0.003		-0.015		0.002		-0.058
WTI Crude	\$/Bbl	80.76		-3.390		-2.200		39.330
Brent Crude	\$/Bbl	82.43		-2.350	▼	-2.650		38.680
Fuel Oil, NY Harbour 1%	\$/Bbl	97.18		0.000		0.000		0.000
Heating Oil	cents/Gallon	243.09		-7.720	\blacksquare	-12.980		119.180
Propane, Mt. Bel	cents/Gallon	1.30		-0.119	•	-0.177		0.750
Ethane, Mt. Bel	cents/Gallon	0.41		-0.001	•	-0.019		0.193
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

