



Energy Market Watch

January 30, 2023

Market Commentary Storage & Inventory Natural Gas Electricity Renewables Trend Analysis

Market Commentary

Week of January 27, 2023

Natural gas edges lower amid a widening storage surplus.

Electric and Natural Gas Market Drivers

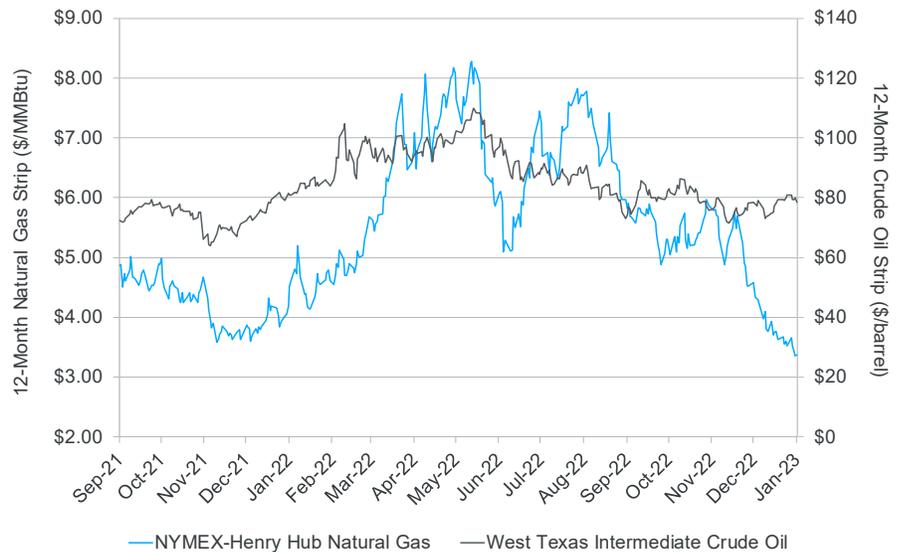
Bullish – Market influences driving prices higher:

- ▲ Geopolitics
- ▲ Economics

Bearish – Market influences driving prices lower:

- ▼ Weather Forecast
- ▼ U.S. Dollar
- ▼ Natural Gas Storage Report
- ▼ Natural Gas Production
- ▼ Crude Oil

Natural Gas & Crude Oil 12-Month Strip Prices



Monday 1/23

The Feb-2023 NYMEX natural gas contract pushed 27.3 cents higher to \$3.447 per MMBtu on stronger demand expectations as weather forecasts called for a chilly pattern to set up in the Midwest during the first week of February. The Mar-2023 WTI crude oil contract edged 2 cents lower to \$81.62 per barrel even as Chinese Lunar New Year celebrations increased demand and after Russian oil shipments slowed. Equity markets landed in the green as investors prepared for a heavy week of quarterly corporate earnings results.

Tuesday 1/24

Natural gas struggled to sustain upside momentum as frigid air forecast for the Midwest for the first week of February would likely avoid much of the East. The cost of gas closed 18.9 cents

lower at \$3.258. Crude fell \$1.49 to \$80.13 on a weaker demand outlook after data revealed the manufacturing and service sectors contracted for the seventh straight month. Equities fluctuated between positive and negative territory as investors digested a mixed bag of fourth quarter corporate earnings from the manufacturing sector.

Wednesday 1/25

Natural gas lost 19.1 cents to settle at \$3.067 ahead of the next day's storage report, which was expected to show a draw around 80 Bcf that would move current levels to a surplus compared to last year. Oil prices gained 2 cents to close at \$80.15 after the EIA reported a 0.5 million barrel increase in oil inventories. Stocks were mixed on the day after a major tech company reported slowing growth in their Q4 corporate earnings.

Thursday 1/26

Natural gas fell to its lowest level since mid-2021 after the EIA reported a lower-than-normal 91 Bcf draw from storage, which widened the surplus to the 5-year average to 128 Bcf. The front-month contract settled 12.3 cents lower at \$2.944. Equities pressed higher after the Commerce Department estimated the economy grew 2.9% during the fourth quarter. Crude climbed 86 cents higher to \$81.01 on demand optimism following U.S. economic growth data and China's continued reopening of its economy.

Friday 1/27

The Feb-2023 NYMEX natural gas contract managed to claw back 16.5 cents before closing and expiring at \$3.109 despite a loosening supply and demand balance. Oil shed \$1.33 to land at \$79.68 on reports Russian oil exports from its Baltic ports were set to rise 50% over December in order to meet strong Asian demand. Equities gained ground after the Federal Reserve's preferred gauged on inflation slowed to its slowest pace since October 2021.

Looking Ahead

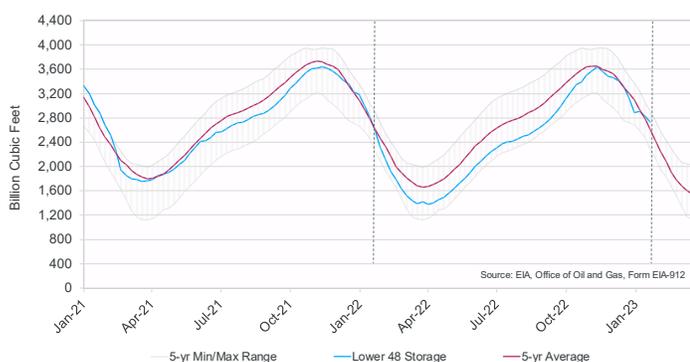
Natural gas prices will likely struggle to gain upside momentum until weather forecasts point to sustained cold in the major consuming regions.

Storage and Inventory

	Last Week Comparison			Historical Comparison			
	1/20/2023	1/13/2023	Change (incr/decr)	Same Period Last Year (1/20/2022)	Stocks over/under Last Year	Same Period 5-Year Ave. (2018-2022)	Stocks over/under 5-Yr Avg.
Natural Gas in Storage (Bcf)	2,729	2,820	-91.0 ▼ -3.2%	2,622	107.0	2,601	128.0
Crude Oil Inventories (mbpd)	448.5	448.0	0.5 ▲ 0.1%	416.2	32.4	n/a	n/a

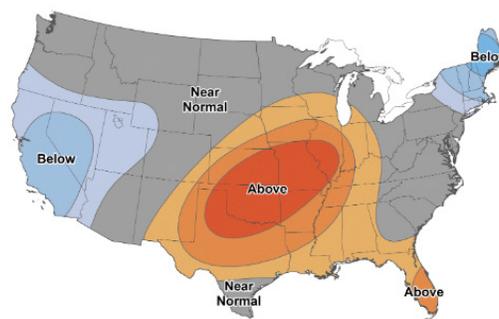
Working Gas in Underground Storage January 20, 2023

Note: The shaded area represents the range between the maximum and minimum values over the past 5 years. The blue line is the historic current level for the date on the x axis and the purple line is the 5-year average.



6-10 Day Weather Forecast January 29, 2023

The short-term weather forecast is calling for above-normal temperatures to cover much of the Central Plains and South, with below-normal temperatures in parts of the Northeast and West.



Natural Gas

UNITED STATES	Current	Historical Comparison (US\$/MMBtu)		
	1/27/2023	Last Week 1/20/2023	Last Month 12/27/2022	Last Year 1/27/2022
NYMEX Contract:				
Henry Hub Spot	\$2.830	▼ -10.16%	▼ -42.01%	▼ -36.12%
Prompt Month: Feb 2023	\$3.109	▼ -2.05%	▼ -41.14%	▼ -50.38%
12 Mth Strip (Feb23-Jan24)	\$3.374	▼ -4.28%	▼ -26.22%	▼ -25.30%
Winter Strip (Feb23-Mar23)	\$2.979	▼ -4.06%	▼ -37.94%	▼ -43.52%
Summer Strip (Apr23-Oct23)	\$3.176	▼ -4.10%	▼ -26.48%	▼ -25.94%
Next Winter Strip (Nov23-Mar24)	\$4.077	▼ -4.65%	▼ -17.58%	▼ -8.60%
Cal '24 (Jan24-Dec24)	\$3.843	▼ -3.74%	▼ -11.75%	▲ 18.29%

CANADA *Pricing in Canadian Dollars	Current	Historical Comparison *(CAD\$/GJ)		
	1/27/2023	Last Week 1/20/2023	Last Month 12/27/2022	Last Year 1/27/2022
AECO:				
Spot Price	\$4.911	▼ -1.03%	▼ -19.10%	▲ 18.33%
Prompt Month: Feb 2023	\$3.214	▲ 6.86%	▼ -31.79%	▼ -41.10%
12 Mth Strip (Feb23-Jan24)	\$2.504	▼ -2.03%	▼ -19.22%	▼ -26.80%

Electricity

UNITED STATES	Current	Historical Comparison (US\$/MWh)			
Wholesale Electricity Prices:	1/27/2023	Last Week 1/20/2023	Last Month 12/27/2022	Last Year 1/27/2022	
ERCOT (Hub Avg.) - ATC					
Monthly Real-Time Avg: January 2023	\$18.86	▲ 4.30%	▼ -66.25%	▼ -32.06%	
Prompt Month: Feb 2023	\$35.71	▼ -13.87%	▼ -46.08%	▼ -35.49%	
12 Mth Strip (Feb23-Jan24)	\$41.79	▼ -5.89%	▼ -24.08%	▼ -8.99%	
NY ISO (Zone J) - ATC					
Monthly Real-Time Avg: January 2023	\$41.26	▼ -4.99%	▼ -69.42%	▼ -69.88%	
Prompt Month: Feb 2023	\$83.41	▼ -17.26%	▼ -51.91%	▼ -28.84%	
12 Mth Strip (Feb23-Jan24)	\$56.82	▼ -11.43%	▼ -36.12%	▼ -10.44%	
PJM (Western Hub) - ATC					
Monthly Real-Time Avg: January 2023	\$37.10	▼ -4.92%	▼ -72.81%	▼ -42.49%	
Prompt Month: Feb 2023	\$48.93	▼ -18.25%	▼ -50.61%	▼ -19.83%	
12 Mth Strip (Feb23-Jan24)	\$46.63	▼ -5.53%	▼ -28.63%	▼ -5.25%	
ISO-NE (SE MASS) - ATC					
Monthly Real-Time Avg: January 2023	\$52.88	▼ -7.22%	▼ -58.34%	▼ -62.42%	
Prompt Month: Feb 2023	\$96.93	▼ -13.46%	▼ -49.97%	▼ -28.63%	
12 Mth Strip (Feb23-Jan24)	\$64.70	▼ -8.50%	▼ -35.78%	▼ -12.08%	
MISO (Indiana Hub) - ATC					
Monthly Real-Time Avg: January 2023	\$38.88	▼ -3.46%	▼ -62.23%	▼ -24.67%	
Prompt Month: Feb 2023	\$45.73	▼ -13.54%	▼ -45.17%	▼ -17.65%	
12 Mth Strip (Feb23-Jan24)	\$46.69	▼ -5.23%	▼ -26.30%	▼ -4.90%	
PG&E (NP15 West) - ATC					
Monthly Real-Time Avg: January 2023	\$136.41	▼ -3.98%	▼ -49.63%	▲ 211.54%	
Prompt Month: Feb 2023	\$104.61	▼ -26.38%	▼ -77.95%	▲ 114.19%	
12 Mth Strip (Feb23-Jan24)	\$76.92	▼ -7.39%	▼ -45.95%	▲ 31.06%	
CANADA *Pricing in Canadian Dollars.					
Wholesale Electricity Prices:	Current	Historical Comparison *(CAD\$/MWh)			
Wholesale Electricity Prices:	1/27/2023	Last Week 1/20/2023	Last Month 12/27/2022	Last Year 1/27/2022	
AESO (Ave.) - ATC					
Rolling 30-Day Average	\$131.35	▼ -24.29%	▼ -60.27%	▲ 27.32%	
IESO (Ave.) - ATC					
Rolling 30-Day Average HOEP	\$32.39	▼ -20.97%	▼ -42.83%	▼ -21.27%	

Renewables

Industry Highlights

National REC prices gradually increased from their October lows amid stronger competition to complete buying prior to the end of the year before leveling off recently. In the longer term, prices will likely be propped up by looming supply and demand imbalances. Although construction costs have been declining in recent years, disruptions in the supply chain and interconnection backlogs are delaying project completions. Additionally, demand for renewable sources continues to grow from increased corporate commitments and rising obligatory state Renewable Portfolio Standard requirements. On the regulatory front, PJM received approval from FERC to move forward with their plan to clear out the current interconnection backlog. The grid operator will move to a “first-ready, first-served” model and won’t review new interconnection requests that aren’t already in the queue until early 2026.

**Renewable GE National Wind REC Index
January 27, 2023**



**Renewable GE National Solar REC Index
January 27, 2023**



Note: Renewable Energy Credits (RECs) are a market-based instrument that represents the property rights to the environmental, social, and other non-power attributes of renewable electricity generation. One REC is equal to one MWh of renewable energy generated and delivered to the grid. The various shades in the above charts refer to the vintage year the REC was produced.

Environmental Price Summary

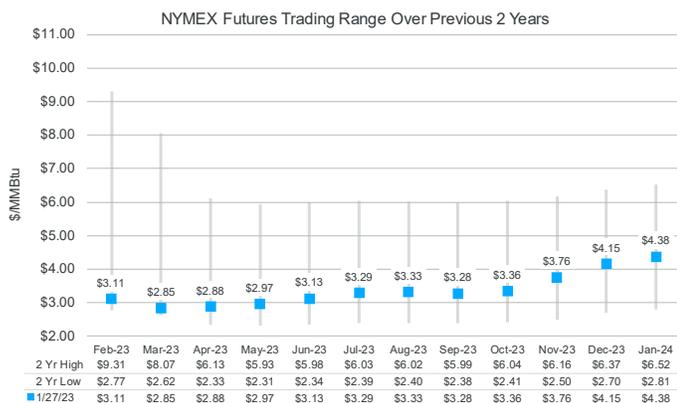
UNITED STATES	Current	Historical Comparison (US\$/Credit)			
Renewable Energy Credits	1/27/2023	Last Week 1/20/2023	Last Month 12/27/2022	Last Year 1/28/2022	
Connecticut Class I REC Index 2023	\$37.69	▲ 0.33%	▲ 0.33%	▲ 2.38%	
Maine Class I REC Index 2023	\$33.13	▲ 0.00%	▲ 0.76%	▲ 9.05%	
Maryland Tier I REC Index 2023	\$29.67	▲ 1.34%	▲ 3.41%	▲ 30.62%	
Massachusetts Class I REC Index 2023	\$37.81	▲ 0.33%	▲ 0.33%	▲ 4.13%	
New Jersey Class I REC Index 2023	\$31.15	▲ 6.04%	▲ 8.63%	▲ 37.22%	
Pennsylvania Tier I REC Index 2023	\$30.69	▲ 4.97%	▲ 8.39%	▲ 39.59%	
Texas Solar REC Index 2023	\$4.075	▼ -1.21%	▼ -8.94%	▼ -22.13%	
Texas Wind REC Index 2023	\$3.150	▼ -6.67%	▼ -16.00%	▼ -34.55%	

UNITED STATES	Current	Historical Comparison (US\$/tonne or ton)			
Carbon and RGGI Allowances	1/27/2023	Last Week 1/20/2023	Last Month 12/27/2022	Last Year 1/28/2022	
California Carbon Dec 2023 Vintage	\$29.73	▼ -2.04%	▼ -1.49%	▲ 1.99%	
RGGI CO2 Allowances Dec 2023 Vintage	\$13.28	▼ -1.26%	▼ -6.81%	▼ -6.08%	

Trend Analysis

NYMEX Futures Trading Range

This graph represents the futures trading range of each NYMEX natural gas contract over the past two years. The high and the low for each month have been provided below, along with the current forward prices as of the market close on January 27, 2023.



Electric ATC 12 Month Rolling Strips

This graph shows the historic trading range of the electric around-the-clock (ATC) 12-month rolling strip by Independent System Operator (ISO) region as of the market close on January 27, 2023.



12-Month Rolling Strip

This chart presents the correlation between NYMEX natural gas and electricity's 12-month rolling forward pricing over the past two years.

12-Month Rolling Strip	ERCOT HZ	NY ISO J	PJM	ISO-NE	MISO	PG&E NP15
NYMEX Correlation	97.5%	96.6%	97.3%	93.8%	97.1%	74.8%

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