The Nat Gas 20-Day Momentum Signal. Thirty-Five Years of Trend-Regime Reads Against Natural Gas Forward Returns.

Why recent price carries in nat gas through storage-flow trader behavior, physical-commercial inventory response, and speculator positioning. Why the signal delivers monotonic state edges (plus 0.57pp Uptrend, minus 0.67pp Downtrend) across 8,935 trading days. How to use the price-technical read alongside the DFII10 real-rate overlay in a two-signal NG stack.

David Stendahl · Market Lab Analytics · November 4, 2026

What this signal is

Recent price carries in nat gas. A 20-day uptrend tends to extend. A 20-day downtrend tends to persist. The mechanism is behavioral. Storage-flow traders adjust injection-withdrawal cycles to recent price (holding gas back pays more when prices are rising, drains accelerate when prices are falling). Physical commercials pull inventory forward on uptrends to lock in higher margins and exit forward sales on downtrends. Speculators chase both directions through position adjustments.

The signal reads the 20-day log-return of NYMEX natural gas ratio-adjusted continuous, z-scored against its 252-day rolling distribution with a 63-day minimum sample, tanh-bounded to the plus-or-minus one range. Positive composite means recent momentum up (bullish uptrend regime). Negative composite means recent momentum down (bearish downtrend regime). State machine uses plus-or-minus 0.2 as the band boundaries.

Current reading as of November 3, 2026: composite minus 0.798, Moderate NEG, 11 trading days in band. NG's 20-day log-return is roughly one standard deviation below its 252-day rolling average. Firmly bearish momentum reading.

State-conditional edges are monotonic. Uptrend (state plus one, composite above plus 0.2) covers 37.0 percent of the sample and delivers a plus 0.57pp forward 60-day edge above the baseline. Neutral covers 27.8 percent and delivers a plus 0.08pp edge. Downtrend (state minus one, composite below minus 0.2) covers 35.1 percent and delivers a minus 0.67pp edge.

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How the composite composes

The signal reads one input: the daily close of NYMEX natural gas ratio-adjusted continuous from CSI. The transformation is a single step.

First, compute the 20-day log-return: log(close[t] / close[t-20]). Log-returns are symmetric and additive, both properties that make them the natural choice for trend-detection z-scoring.

Second, z-score the 20-day log-return against its 252-day rolling distribution with a 63-day minimum sample. This normalizes for the fact that NG volatility varies by regime. A 10 percent 20-day move is normal in a 50 percent annualized volatility regime but extreme in a 20 percent regime.

Third, tanh-bound the result to the plus-or-minus one range.

The state machine uses plus-or-minus 0.2 as the band boundaries. State plus one fires when composite is above plus 0.2 (Uptrend, momentum carries up). State zero fires when composite is between minus 0.2 and plus 0.2 (Neutral). State minus one fires when composite is below minus 0.2 (Downtrend, momentum carries down).

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What the state-conditional returns have actually done

> **Reference baseline, NG fwd 60-day unconditional over live window**
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> Natural gas ratio-adjusted continuous forward-sixty-day return baseline over the live-signal window of 1991 through 2026-11-03: mean minus 0.38 percent, median minus 0.72 percent, standard deviation 20.14 percent. Sample 8,935 trading days with observable forward sixty-day. NG is extremely volatile with heavy left tails.

Uptrend (composite above plus 0.2). 3,297 trading days, 37.0 percent of the sample. Per-day forward sixty-day edge plus 0.57 percentage points above baseline. The uptrend state is the price-side bullish backdrop. Storage-flow traders defer injections to lock in higher prices. Physical commercials pull inventory forward. Speculators add longs.

Neutral (composite between minus 0.2 and plus 0.2). 2,452 trading days, 27.8 percent of the sample. Per-day forward sixty-day edge plus 0.08 percentage points above baseline. The middle state captures mixed momentum.

Downtrend (composite below minus 0.2). 3,122 trading days, 35.1 percent of the sample. Per-day forward sixty-day edge minus 0.67 percentage points below baseline. The downtrend state is the price-side bearish backdrop. Storage drains accelerate. Commercials exit forward sales. Speculators cut longs. The 2022-2023 winter-storage-drain-disappoints crash and the 2008 GFC demand collapse are the archetypes.

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Three cases that frame how to read this signal

Case 1: Mar 2022 to Jun 2022. The Ukraine invasion LNG-redirect momentum spike.

The composite moved into state Uptrend on March 4, 2022 as the 20-day log-return of NG surged on Ukraine-invasion LNG-redirect demand. European buyers paid extraordinary prices for US LNG cargoes. Over the 62-trading-session window NG ratio-adjusted continuous rallied from 9.00 to 12.41, a plus 37.9 percent move. Nominal front-month ran from the low-four-dollar range to the mid-nine-dollar range per MMBtu. The 2022 Ukraine case is the canonical LNG-driven momentum uptrend. A PM running this signal in March 2022 would have been positioned long nat gas on the 20-day momentum crossover alone.

Case 2: Dec 2022 to Feb 2023. The 2022-2023 winter-storage-drain crash.

The composite moved into state Downtrend on December 19, 2022 as the 20-day log-return of NG turned sharply negative. European winter demand turned out LESS severe than feared, US storage drains came in BELOW expectations, and the Fed hiking cycle was adding real-rate pressure. All three forces pushed NG lower. Over the 46-trading-session window NG ratio-adjusted continuous fell from 8.72 to 5.55, a minus 36.4 percent move. The 2022-2023 case is the canonical winter-storage-drain-disappoints downtrend.

Case 3: Jul 2008 to Oct 2008. The GFC demand-destruction nat gas collapse.

The composite moved into state Downtrend on July 8, 2008 as the 20-day log-return of NG crashed from the parabolic run-up into deep negative territory. Industrial demand destruction, power-plant switching to coal, and forced selling all pushed the same direction. Over the 83-trading-session window NG ratio-adjusted continuous fell from 27.14 to 20.82, a minus 23.3 percent move. Nominal front-month NG peaked near thirteen dollars per MMBtu in July 2008 and bottomed near five dollars by October 2008. The 2008 case is the canonical trend-down nat gas crash driven by GFC demand collapse.

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How to use the signal today

As of November 3, 2026, the composite reads minus 0.798 in the Moderate NEG band and the phase has been running 11 trading days. The state-conditional forward sixty-day edge is minus 0.67 percentage points below the baseline. The trend read is firmly bearish.

The signal lives alongside the Z85525 DFII10 real-rate overlay (also currently Moderate NEG, 123 sessions in). Together they form a two-signal NG stack. Both signals read bearish today. The stacked bearish read is high conviction.

The practical rule. Watch for the next 20-day log-return crossover. If the composite stays below minus 0.2 and the real-rate signal remains bearish, the stacked bearish read persists. If the composite crosses above plus 0.2, the technical flips bullish and divergence between the macro and technical signals opens up.

Two triggers would re-engage the signal. First, the composite crosses above plus 0.2 (Uptrend). That requires the 20-day log-return to turn positive. Second, the composite drifts back toward Normal, which would remove the technical headwind but not flip the signal bullish.

Methodology notes

Data source. NYMEX natural gas ratio-adjusted continuous from CSI. Refreshed daily at NYMEX settlement close.

Signal construction. Single-leg composite. 20-day log-return of close, z-scored on a 252-day rolling window with 63-day minimum sample. Final composite tanh-bounded. State machine uses plus-or-minus 0.2 as the Downtrend / Neutral / Uptrend band boundaries. Polarity direct.

Validation. State-conditional per-day edges: Uptrend plus 0.57 percentage points, Neutral plus 0.08 percentage points, Downtrend minus 0.67 percentage points. Non-overlap IC not individually significant; daily IC marginally significant on dense sampling but inflated by composite autocorrelation.

Benchmark construction. NG 60-day forward return computed as close.pct_change() from the NYMEX NG ratio-adjusted continuous CSI file, rolled over 63 trading days and shifted forward.

What this signal does not cover

> **Blind spots a PM cares about before sizing**

First, whipsaws in low-volatility regimes. A momentum signal shines when NG is trending. In a sideways tape the 20-day log-return oscillates through the plus-or-minus 0.2 state boundaries weekly, generating false signals and churn.

Second, the multi-session lag during trend reversals. The 20-day lookback means the composite reflects price action from roughly 20 trading days ago at the anchor. When NG reverses, the composite takes 10-20 sessions to catch up. The signal is a trend DETECTOR, not a trend REVERSAL detector.

Third, weather-driven spikes can override momentum. Polar vortex cold snaps and heat-wave power demand can cause NG to spike faster than the 20-day lookback can incorporate. A PM running this signal through winter should overlay weather forecasts.

Fourth, the ratio-adjusted continuous scaling masks nominal price levels. The signal reads CL21160RD-equivalent ratio-adjusted NG. Level values do not map to nominal front-month NG prices. All signal math is on the ratio-adjusted series.

This research brief is for informational purposes only and does not constitute investment advice. Past performance is not indicative of future results. State-conditional statistics are computed through 2026-11-03 against NYMEX natural gas ratio-adjusted continuous. The low-vol whipsaw risk, multi-session reversal lag, weather override risk, and ratio-adjusted scaling are explicitly disclosed. Data source: NYMEX NG via CSI. Internal Phase 0 audit dated 2026-11-04.