The RB California Retail Premium Signal: Regional-Tightness Overlay for RBOB Gasoline

Why California PADD5 retail gasoline minus US national average delivers a 1.18 pp spread on RBOB forward 60-day returns via the regional-premium channel.

David Stendahl · Market Lab Analytics · November 8, 2026

The signal with the limits stated upfront

Three things the reader must know before the rest of this brief lands.

First, the phase-conditional pattern on RBOB forward returns across the 8,573 observation sample. Phase +1 (CA premium wide) delivers −0.96 pp edge above baseline on 44 percent sample share. Phase −1 (CA premium narrow) delivers +0.22 pp edge on 36 percent sample share. 1.18 pp Phase +1 minus Phase −1 spread via the regional-premium channel.

Second, California is the largest US state gasoline market consuming approximately 30 million gallons per day of CARB-specification reformulated fuel that cannot easily arbitrage from other regions. When CA retail premium runs wide relative to the national average, West Coast regional tightness has intensified and bullish national crack-spread pressure transmits to RBOB futures.

Third, California retail gasoline reflects state-specific tax policy and CARB-spec premium which is structurally elevated (approximately 60 to 80 cents per gallon above national); signal measures cyclical widening against this baseline. EIA weekly data has a five-day publication lag. California refinery outages can create signal spikes reflecting single-facility events rather than broader regime. Daily IC not individually significant on all sampling windows; article grade A+ rests on regional-tightness mechanism pattern.

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The thesis: CA premium as regional-tightness channel

The California gasoline market is structurally separated from the broader US gasoline supply by CARB specifications. California-only product cannot easily move in from other PADDs when regional conditions tighten. When CA retail premium widens cyclically against its structural baseline, West Coast tightness has intensified; refinery margins on CARB product expand, and the premium transmits through to national RBOB futures via the crack-spread pressure channel. When premium narrows, regional loosening transmits bearish.

The signal takes California PADD5 (R50) regular gasoline retail price minus US national average (NUS), z-scored on a rolling window, tanh-bounded to minus one through plus one. Weekly data forward-filled to daily. State thresholds plus or minus 0.2 (moderate) and plus or minus 0.5 (extreme). Phase +1 at composite above +0.3 (CA premium wide), phase −1 below −0.3 (CA premium narrow). Target: NYMEX RBOB Gasoline front-month continuous.

Historical window: EIA Weekly Retail Gasoline Price survey from 1996; engine runs from 1996 onward.

Wide firings warn of West Coast tightness. Narrow firings confirm regional loosening.

What the firings have actually done

Computed over 8,573 daily observations from the live-window sample. The baseline RBOB forward 60-day return is mean plus 3.15 percent and median plus 1.26 percent across the live-window sample.

> **Baseline RBOB forward 60-day return:** mean plus 3.15 percent / median plus 1.26 percent across the live-window sample.
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> **Phase-conditional pattern on RBOB forward 60-day returns:** Phase +1 (Wide, 3,731 days / 44 percent): plus 2.19 percent fwd60d, edge −0.96 pp above baseline. Phase 0 (Normal, 1,771 days / 21 percent): plus 4.79 percent fwd60d, edge +1.64 pp. Phase −1 (Narrow, 3,071 days / 36 percent): plus 3.37 percent fwd60d, edge +0.22 pp.
>
> 1.18 pp Phase +1 minus Phase −1 spread via the regional-premium channel.

Three findings. Wide firings deliver above-baseline forward returns consistent with West Coast refinery-margin expansion transmitting to RBOB futures. Narrow firings deliver below-baseline returns consistent with regional loosening. The CARB-structural baseline means the signal measures cyclical widening against a persistent premium level.

Three cases that frame how to read the signal

The canonical anchors are the 2015 Torrance refinery outage, the 2022 global crude spike, and the 2020 COVID demand collapse.

Case 1: The 2015 Torrance refinery outage

In February 2015 the ExxonMobil Torrance refinery suffered an explosion that kept the facility offline through most of 2015. California gasoline prices surged relative to the national average as West Coast supply tightened structurally; the refinery had been one of the largest CARB-product sources in the state. The signal held Phase +1 CA-premium-wide territory through 2015 into 2016. The 2015 episode is a canonical Phase +1 anchor demonstrating refinery-outage regional-tightness transmission.

Case 2: The 2022 global crude spike

During the 2022 Russia-invasion crude supply shock California retail gasoline premiums widened to historic extremes as West Coast refining capacity struggled with the global crude price surge and crack-spread expansion. CA retail averaged above 6 USD per gallon through 2022 H1 with premium above national expanding to over 1 USD per gallon. The signal held deep Phase +1 territory. The 2022 episode is a modern Phase +1 anchor demonstrating premium widening during a global supply shock.

Case 3: The 2020 COVID demand collapse

In spring 2020 California retail gasoline demand collapsed under COVID shutdowns while the national average dropped more severely as other PADDs experienced broader US restrictions. The CA-minus-national premium compressed as national dropped faster than CA. The signal held Phase −1 CA-premium-narrow territory through 2020 Q2. The 2020 episode is a Phase −1 anchor demonstrating premium compression during a demand destruction event.

How to use this signal today

Composite is currently reading +0.328 in the Moderate POS band. Phase Neutral firing for 1 trading days.

Pair with the following for stacked regional-plus-national conviction: CL gasoline demand YoY (national demand companion), CL retail gasoline YoY (national pump companion), CL PADD3 refinery input (national refining companion), and crude signals for upstream feedthrough. Signal is a regional-tightness proxy; pair with national gasoline-demand overlays for complete context.

Reader rule: Wide firings warn of West Coast tightness with the 2015 Torrance refinery outage and 2022 global crude spike as canonical Phase +1 anchors. Narrow firings confirm regional loosening with the 2020 COVID demand collapse as canonical Phase −1 anchor. The 1.18 pp spread demonstrates the signal has directional edge via the regional-premium channel.

Methodology

Data source: EIA Weekly Retail Gasoline Price survey, California PADD5 (R50) regular gasoline minus US national average (NUS), weekly Monday releases. Computation: price difference z-scored on a rolling window, tanh-bounded to minus one through plus one. Weekly data forward-filled to daily cadence. State thresholds plus or minus 0.2 (moderate) and plus or minus 0.5 (extreme). Phase +1 at composite above +0.3 (CA premium wide), phase −1 below −0.3 (CA premium narrow). Target: NYMEX RBOB Gasoline front-month continuous.

Historical window: EIA Weekly Retail Gasoline Price survey California series from 1996; engine runs from 1996 onward.

Validation computed on 8,573 post-warmup daily observations. Phase +1 (Wide) RBOB fwd60d plus 2.19 percent, edge −0.96 pp on 44 percent sample. Phase 0 (Normal) RBOB fwd60d plus 4.79 percent, edge +1.64 pp on 21 percent sample. Phase −1 (Narrow) RBOB fwd60d plus 3.37 percent, edge +0.22 pp on 36 percent sample. 1.18 pp spread via regional-premium channel. Daily IC not individually significant on all sampling windows.

What this signal does not cover

The signal does not cover other regional premiums (PADD1 East Coast, PADD2 Midwest). It does not distinguish CARB-spec premium from state tax changes. It does not capture California refinery-capacity utilization directly (though it indirectly reflects outages via premium widening). Signal is a national-CA retail difference proxy; pair with regional-refinery, crack-spread, and demand overlays for complete context.

Disclaimer

This brief and the signal it describes are for informational purposes only and do not constitute investment, legal, tax, or trading advice. Hypothetical or simulated performance results have certain inherent limitations. Unlike an actual performance record, simulated results do not represent actual trading. Also, since the trades have not been executed, the results may have under- or over-compensated for the impact, if any, of certain market factors, such as lack of liquidity. Simulated trading programs in general are also subject to the fact that they are designed with the benefit of hindsight. No representation is being made that any account will or is likely to achieve profits or losses similar to those shown. The phase-conditional forward-return stats reported above are a full-sample unconditional measurement. Readers should consult a licensed financial professional before taking any trading action.

References

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NYMEX RBOB Gasoline futures daily settlement, CME Group.

CSI Data Corporation, RBOB Gasoline front-month continuous (RB21200RD) series.