

FUTURE OF FUELS

RFA Outlook for Crude Oil, Refined Products, Biofuels, and EVs



- Significant new refinery capacity coming online in 2023 and 2024 relieves the global capacity “squeeze” and puts mild pressure on refining margins through 2025.
- The demand for petroleum and liquid fuels is expected to surpass government targets and forecasts due to the complex challenges of replacing oil while preserving economic growth.
- Energy transition will impact gasoline demand much more than middle distillates or petchem feedstocks as alternatives, especially EVs, are more readily substitutable in gasoline applications.
- Near term discounts for sour and heavy crudes, significant profit sources for complex U.S. refiners, will stay limited through 2025 but grow longer term due to various shifts in both supply and demand factors.
- As domestic demand decreases, the U.S. refining industry will grapple to relocate its production, with USGC refiners regionally advantaged due to their established export market access.
- Falling U.S. demand will also trigger altered domestic trade flows and post-2030 refinery closures outside of the USGC. This will keep regional supply/demand in balance and even short at times for middle distillates, with surviving refiners enjoying relatively attractive margins.
- Upcoming projects in the next three years will cause U.S. RD and SAF production to surpass domestic demand, turning the nation into a major net exporter, particularly of SAF.

Refining Industry Faces Significant Uncertainties

The U.S. refinery industry is continuously influenced by numerous fluctuating economic and other factors, both domestically and internationally. These influences can have both positive or negative impacts, such as variations in crude oil supply and price, and changing demand for refined products. Developments like refinery closures and expansions, along with the transition to lower-carbon energy sources, also play significant roles. The gasoline, middle distillate, and resid sectors, not to mention the renewable fuels market, face a complex landscape with numerous determinants. While it may be impossible for industry operators to fully predict the twists and turns that lie ahead in the refined-product arena, staying abreast of current developments and gaining a thorough understanding of the elements influencing the crude oil and fuel markets, as well as their interconnections, is of paramount importance.

Refinery Capacity To Expand Before Contraction

While refining margins remain attractive, the great times of the past 18 months are coming to an end. The significant new refinery capacity starting up in 2023 and 2024 relieves the global product supply “squeeze” and puts mild pressure on refining margins through 2025. Longer term, the refinery project environment changes, as very few credible capacity expansion projects are scheduled to start up in the 2025-27 timeframe and the prospects for the development of major projects that could come online in the post-2027 era also appears bleak.

Complex Refiners in For Near Term Pinch

Discounts for sour and heavy crudes, an important source of profitability for complex U.S. refiners, will remain narrow through 2025 for a variety of supply- and demand-related factors. The completion of Trans Mountain Pipeline in 2024 will also serve to prop up the price of WCS for two to three years at the USGC as more of those barrels are diverted to Pacific Coast markets. After 2025, the heavy-crude discount will widen as some of the same supply/demand factors currently tightening the spread, reverse. The timing and magnitude of these reversals is uncertain and volatility will persist, although we expect a generally upward trend throughout the forecast period.

Refiners Look Internationally With U.S. Demand Dwindling

As domestic demand declines, the U.S. refining industry will face challenges finding new homes for its production. The ability to meet these challenges will differ regionally, with USGC refiners advantaged due to their proven ability to successfully access attractive export markets. The demand declines will result in changing trade flows and refinery closures in other regions, with most of these happening after 2030. Surviving refiners will maintain attractive margins as regional supply/demand remains balanced or in some cases short middle distillates.

RD and SAF Production Will Outpace Domestic Demand

U.S. RD and SAF production is predicted to triple by 2026 due to new capacity, but growth will be restrained by EPA-set RVOs and alternatives like biomethane and electricity. Though the SAF Blender’s Tax Credit will initially incentivize SAF imports through 2024, the U.S. will become a major exporter from 2025 onwards, stimulated by the Clean Fuels Production Tax Credit and untaxed European demand. Risks to U.S. biofuels exports include possible import tariffs and foreign capacity additions. Hard-hit biodiesel production economics will however limit the downside for RD and SAF margins.

The Future of Crude Oil and Refined Products

To provide clarity on this ever-evolving market, RBN's Refined Fuels Analytics division (RFA) has released its second Future of Fuels study. This insightful publication is dedicated to offering an exhaustive understanding of the diverse factors influencing crude oil and fuel markets, and their interconnectedness. Exuding clarity amidst future uncertainties, this latest study from RFA delves into the outlook for both crude oil and the refined products industry. Future of Fuels dispenses comprehensive analysis and projections surrounding critical elements shaping the dynamics of the petroleum market- ranging from price and its interrelationships, supply and demand of petroleum, the role of alternative fuels, to refining capacity and utilization.

The second edition of Future of Fuels is now available and has an optional add-on private virtual presentation of our findings by RFA senior analysts scheduled on a first-come, first-served basis. Subsequent issues of this product, which will include fresh updates of all the market analysis and forecasts within Future of Fuels, will be issued on a bi-annual basis in February and July each year. For more information, contact your RBN representative or fill out the form below. For more information, visit www.rbnenergy.com/products/Future-of-Fuels or contact TJ Braziel at tjbraziel@rbnenergy.com.

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⁽¹⁾Regions include Canada, Mexico, Other Latin America, Europe, Africa, CIS, Middle East, China, Japan, India, and Other Asia/Pacific

Learn more at: www.rbnenergy.com/products/Future-of-Fuels
About RFA: www.rbnenergy.com/refined-fuels-analytics

FUTURE OF FUELS REPORT

8 Spreadsheets 80+ Data Tables



DETAILS OF THE 8 APPENDIX SPREADSHEETS WITH 88 DATA TABLES

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Global Liquids Demand Forecast
U.S. Renewable Diesel and SAF
Global Biofuels and EVs
Refinery Supply/Demand Balance
Crude Production Forecast
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20+ Year Price Forecast

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Expected Refinery Projects/Shutdowns
Conversion Unit Capacity Changes
By PADD, Country, or Region
Highlights of Recent Developments and Updates

2. Global Liquids Demand Forecast to 2045: 20 Tables

By U.S. PADD, Country, and Region
GDP and Population Assumptions
Petroleum/Liquids (incl. NGLs and Biofuels)

Includes Ten Product Categories

Gasoline/Naphtha/Total
Light Distillates
Diesel/Jet Fuel/Total Middle
Distillates
Resid/Ethane and LPGs
Other Products
Total Liquid Products

Includes 18 Regions

U.S. and 5 PADDs
Canada/Mexico/C&S America
Europe/CIS/Africa
Middle East/China
India/Japan/Other
Asia Pacific/Global

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Location
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U.S. Refinery Crude and Feedstock Demand, Product Supply Balance
Annual Forecast by U.S. Total and PADD, including Imports/Exports

Operable Capacity

Refinery Production

Refinery Inputs

Crude Oil
NC4/IC4/Nat. Gasoline
Naphthas/Kero/Lt. Gas
Oil
Heavy Gas
Oil/Residuum/Other
Unfinished Oils

LPGs
Gasolines (Excl. Oxygenates)
Naphthas
Jet/Kero Distillate
Fuel Oil Lubes &
Waxes Residual
Fuel Oil
Asphalt and Road Oil
Other Liquids
Total Liquid Products
LV Yield (%)

Total Inputs

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U.S. Crude Production By Basin
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Western Canada Supply (Incl. Diluent)
Western Hemisphere Heavy Crude Production

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Includes

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Pipelines from Cushing and Patoka
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U.S. Product Pipeline Expansions/Reversals
Highlights of Recent Developments and Updates

8. 20 Year Price Forecast: 14 Tables / 383 Rows of \$

Includes: Category: # Rows of Prices

Crude Oil: 132
U.S. Gulf Coast Products: 43
U.S. Atlantic Coast (New York Harbor): 12
U.S. Group 3: 4
U.S. Midcontinent (Chicago): 14
U.S. West Coast (Los Angeles): 7
Latin America and West Africa: 9
Northwest Europe: 18
Western Mediterranean: 7
Arab Gulf: 4
Singapore: 16
Freight Rates: 93
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