S&P Global
Commodity Insights

Sustained margins and gasoline strength: a temporary halt to refinery closures?

European Fundamentals Refining and Marketing: Fourth Quarter Update

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Note: This forecast incorporates S&P Global Commodity Insights analysis for 2025-2027 as presented in the **November Short-Term Outlook** updates for crude oil and refined products markets.

The long-term outlook has been aligned with the **2025 Annual Strategic Workbook**, as released in May 2025, with some minor updates incorporated in Q4

Executive summary

Executive summary for the fourth quarter 2025 long-term outlook

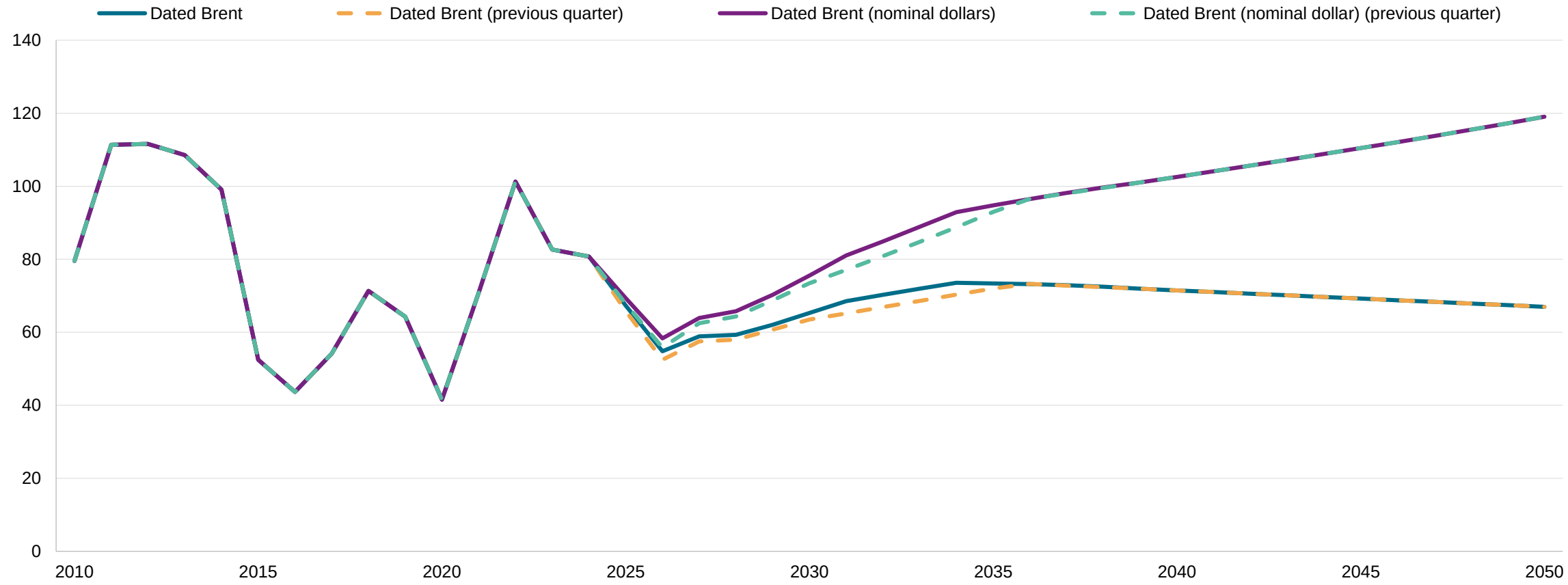
- **Peak demand is still expected toward the end of the decade, but the peak continues to rise.** Refined product demand has been revised upward marginally to 2035. The global economy has proven resilient amidst the Trump-era tariffs and gasoil expectations have increased accordingly. The medium-term gasoline outlook continues to improve in Europe and US trade and environmental policies continue to weigh on EV growth rates.
- **The Brent price outlook:** In 2050, our base Dated Brent price is $67 based on the marginal layer of supply, which is largely below $70. By 2050, the price-setting marginal barrel is anticipated to be from Deepwater Brazil, the US Gulf of Mexico, and higher-cost US tight oil. Relative to last quarter, crude prices have increased an average of $2.2 between 2025 and 2035 as OPEC+ signals greater restraint. Our assumption is that OPEC+ will pause production as crude inventory increases in 2026, and there could be modest cutbacks coming in 2027.
- **Gasoline balances indicate a softer landing for refining through 2030.** With deregulation and tariffs on vehicles in the US, we continue to forecast more robust medium-term gasoline demand. New projects, including Dangote, Olmeca, Panipat, and Barmer refineries, will still outpace gasoline and middle distillate demand growth by the end of the decade. We anticipate that lower complexity exporting European margins will be the main economic closures through 2030.
- **Despite higher gasoline demand, the gasoline to diesel dichotomy remains, with more structural pressures on the gasoline complex.** Efficiency gains, biofuels, and alternative powertrain penetration remain large contributors. More rapid gasoline demand destruction outpaces the diesel demand trajectory, resulting in slightly more acute gasoline-to-distillate ratios at the tail end of our long-term forecast. Therefore, the evolution of the key transport fuel demand still results in the distillate-gasoline price differential widening threefold (to about $9/b real) over historical averages (about $3/b) by 2050.
- **Naphtha crack spreads are lower in the medium term, but switch to a premium to crude by early 2030s, driven by robust petrochemical demand and marginal price setting drivers to convert existing refinery assets from fuels to maximum naphtha mode.** Strong EV penetration rates in mainland China result in a reduction of gasoline supply required, which, in turn, creates more availability for naphtha and petrochemical feedstocks from existing refinery operations. Over 3 million b/d of direct crude oil to chemicals capacity is now expected by the end of the forecast. Despite the increase in supply availability from the refining system, petrochemical demand is still expected to exceed refinery production capabilities.
- **With consideration of carbon costs, the global refining industry will most likely evolve on two fronts:** 1) Market emergence of a high-carbon-intensity (CI) versus low-CI refined product and associated trade reshuffling. 2) Export refining hubs will become even more competitive to the last growing markets such as Latin America and Africa, with less competition from the likes of Singapore and Europe with their own carbon barriers (though a CBAM export mechanism may support the 1st quartile benchmark refineries i.e., low carbon intensity producers in Europe)
- **This quarter, our carbon cost projections have been revised downward from 2035 onward**. The EUA price in 2050 is now $178.6 per metric ton of CO_2 equivalent, compared to $234.3 per metric ton of CO_2 equivalent in last quarter's forecast.

ASW 2025 4Q update: Margins rise through the end of the decade with policies fueling gasoline demand

- **GDP outlook** remains volatile due to potential tariff impacts and trade uncertainties, but the near-term outlook has been slightly raised versus the previous quarter. The global average for 2035 is expected to hold at 2.67%, a slight increase of 0.05%. Global economic conditions have remained resilient to trade-related uncertainties, but concerns about a potential AI bubble add to an already long list of worries.
- **Brent prices lifted $2/b on average between 2027-2035:** We forecast that OPEC+ will pause production growth in 2026 and potentially implement modest reductions in response to elevated global inventory. Compared to our previous outlook, this provides modest price support, raising average Dated Brent by $2/b (2027-2035) compared to Q3 2025. The price lift is expected to incentivize a US shale uptick during 2030-2033.
- **Refined product demand revised marginally through 2035:** Broadly still in line with ASW 2025's April release, US demand was revised upward while expectations for China (mainland) are further moderated. Most demand impacts are arising in the short term and are expected to continue through the forecast. Atlantic Basin gasoline demand has been a bright spot for the year, with a positive revision of over 300,00 b/d since the April ASW.
- **Gasoline crack-spread increased as Atlantic basin demand is revised up:** This quarter, the low in the European gasoline crack-spread from 2026-2028 has increased by $2 to align with the decrease in required rationalization to balance gasoline demand through the end of the decade. Despite a stronger mid-term outlook, long-term gasoline demand (excluding biofuels) decline remains around 7.6 million b/d from 2024 to 2050, on efficiency and powertrain switching.
- **Diesel crack-spread weaker vs previous quarter as new supply reaches market:** The European diesel crack is about $0.7 weaker this quarter from 2030-2035. Diesel prices in the USGC have been adjusted this quarter to reflect the impact of emissions costs on European net-back pricing, as per the Carbon Border Adjustment Mechanism (CBAM). Overall, we continue to anticipate that further rationalization, driven by declining gasoline demand, will lead to a balanced global diesel market and a stable diesel crack spread.
- **Fuel oil crack-spread remains supported:** The heavy sour fuel oil crack will be funded through the early 2030s as growing Permian production keeps the global crude slate relatively light and sweet. OPEC supply has been revised down by 400,000 b/d on average from 2027 to 2035, contributing further to an overall tight supply and demand balance for resid as new complex refineries come online.
- **Naphtha crack-spread trends lower:** Long-term economics continue to be set by demand from the Asian petrochemicals sector, which requires additional on-purpose naphtha from refinery hydrocracker operations. There is no change to our naphtha demand and price this quarter.
- **Margins.** Atlantic Basin gasoline hits the sweet spot as resilient demand and underperforming supply growth result in less overall rationalization required through the end of the decade. Over the course of this year, the outlook for global gasoline demand growth in 2025–26 has progressively improved. In 2025, the capacity closures in Europe fell just under 500,000 b/d, with no announcements yet for 2026-2027, although further closures are anticipated. We estimate that rationalization needs before the end of the decade will range between 500,000 and 700,000 b/d. Refineries most at risk are those heavily reliant on exports.

Dated Brent lowered through 2035 amid OPEC unleashed, while long-term price expected to average around $67/b

Crude oil Dated Brent pricing, $/b



Data compiled November 2025
Source: S&P Global Commodity Insights

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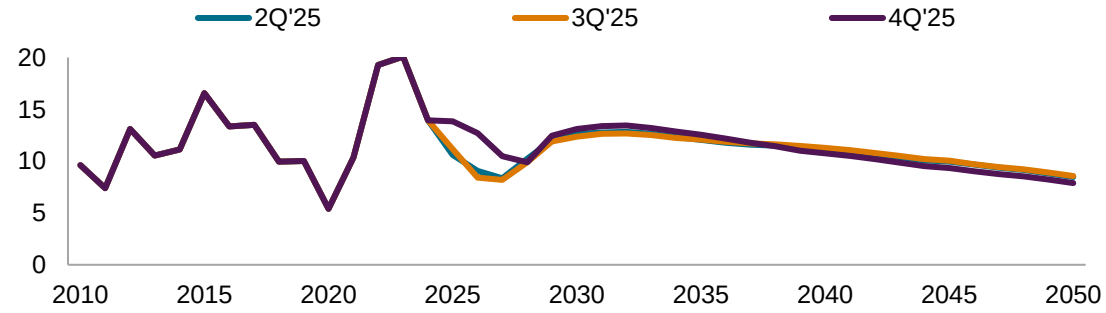
Key revisions versus last quarter's long-term outlook

Short-Term: margins firm up, and gasoline resilience persists amid surging demand. Mid-term: diesel cracks continue to soften from reduced demand. Long-term: the gloomy margin outlook remains largely unchanged, driven by accelerating demand erosion and GHG costs.

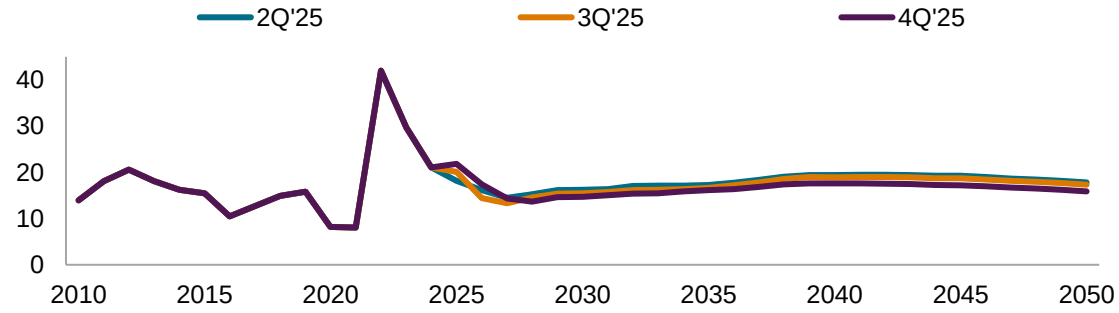
Northwest Europe gasoline price forecast versus Dated Brent

Constant 2024 $/b



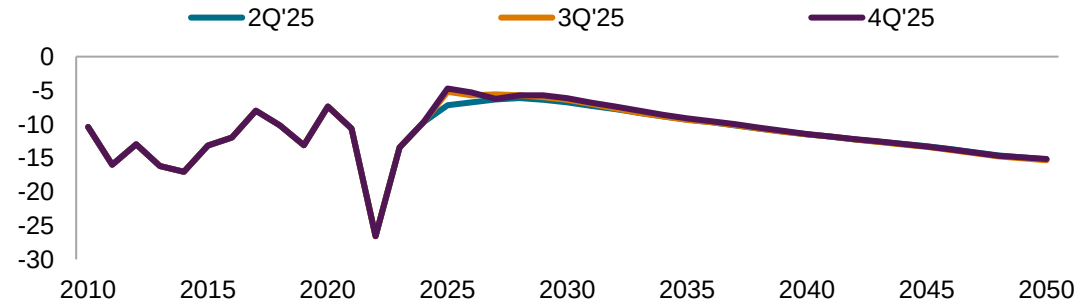
Northwest Europe diesel price forecast versus Dated Brent

Constant 2024 $/b



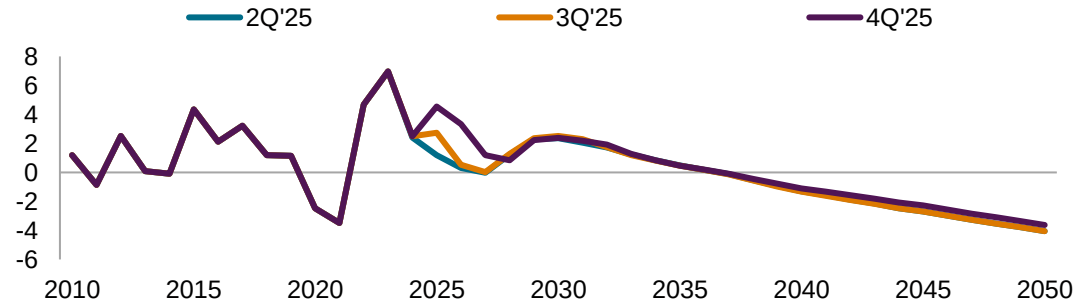
Northwest Europe HSFO price forecast versus Dated Brent

Constant 2024 $/b



Northwest Europe Forties FCC net cash margin forecast

Constant 2024 $/b

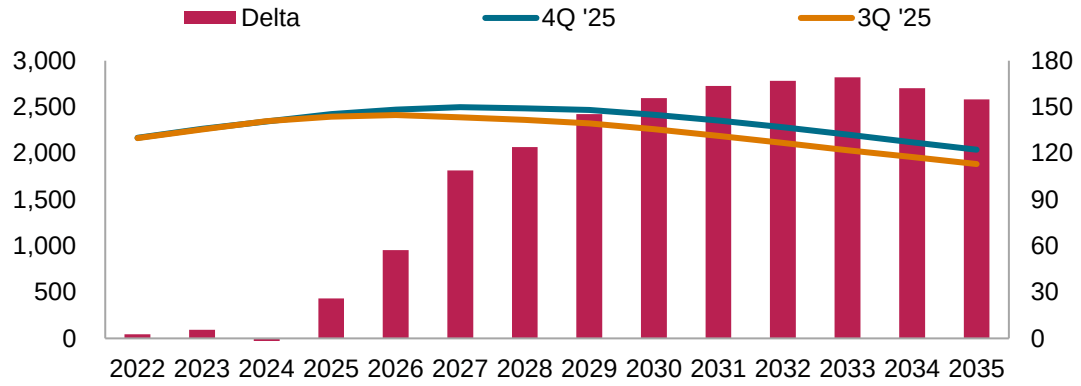


Data compiled November 2025.
GHG = greenhouse gas
Source: S&P Global Commodity Insights

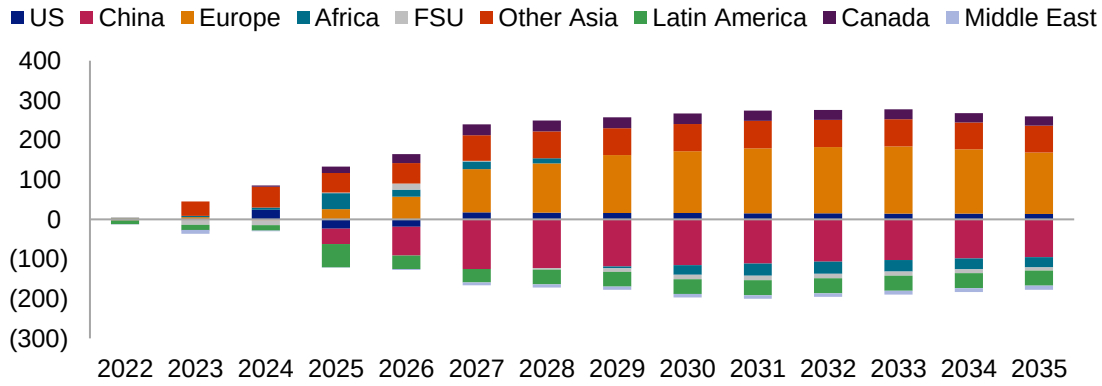
Gasoline demand outlook revised up in the short to medium term

Demand revisions and adjustments relative to 3Q 2025

European gasoline demand outlook — 4Q vs 3Q outlook



Gasoline demand outlook — 4Q vs 3Q outlook



Gasoline demand: Similarly to last quarter, overall gasoline demand outlook is raised in the mid-term, due to stronger outlook in North America, Africa, Europe. These gains more than offset downward revisions in China (mainland) and Eurasia.

- In the US, we anticipate slower EV adoption rates with the loss of the EV federal purchase rebate leasing loophole, and consumer hesitation for vehicle delays and range.
- European EV sales growth has been revised downward for the late 2020s due to regulatory flexibility introduced after industry lobbying, which delayed near-term enforcement of new GHG reduction targets. While long-term zero-emission goals remain in place for now, the pace of adoption is expected to slow in the near term.
- Mainland China's EV penetration outlook has been modestly upgraded on higher Plug-in Hybrid Electric Vehicle Penetration (PHEV) year to date.

Gasoline crack-spread: Stronger than expected European and US gasoline demand based on higher VMT and lower new vehicle sales (keeping less efficient models in the fleet for longer) are combining with tighter supplies after refinery closures on both sides of the Atlantic to raise gasoline crack-spreads. This quarter, the gasoline crack-spread has lifted to align with the decrease rationalization required to remain balanced through the end of the decade. We now forecast that economic rationalization will be limited to 500,000-700,000 b/d of capacity, which we expect will be export-based low-complexity European refiners

Data compiled November 2025.
Refined product demand is inclusive of biofuels and FT-fuels.
Source: S&P Global Commodity Insights.

Global refining and marketing key insights

1) **Risks, rationalization, and resilient demand: The transition period has proved tighter than expected, thanks to geopolitical factors, policies that fuel Atlantic Basin demand, and start-up delays. (2025-2026)**

– With a delay to Dangote's start-up, closures are expected to outpace capacity gains in 2025. Increases in crude runs and product supply will be offset by over a million b/d of announced closures.

– Geopolitical risk continues to play a role in product markets. The impact of the latest wave of sanctions on Russian oil flows by the EU and the US ultimately depends on the level of enforcement and the adaptability of sanctioned entities, which, in recent years, have mitigated against supply and price shocks. However, the logistical scramble that will ensue will likely sustain upward pressure on diesel cracks.

2) **European shake-out: tight medium sour crude market, peaking motor fuel demand, and plentiful diesel from the East of Suez refineries spark rationalization of marginal European refineries (2027-2029)**

- The rationalization requirement by the end of the decade is estimated at around 500-700 thousand b/d, mainly in Europe. Demand erosion, increased competition from new refineries, and the rise of greenhouse gas costs weigh on European refiners. Still, closures of higher-performing assets outside of Europe are likely to continue, driven by corporate strategy, capital investment decisions, and challenging operating environments.
- Refinery start-ups in the East of Suez create a glut of diesel supply beginning in this period. In Asia, the imminent new capacity includes 200,000 b/d Panipat (India; second quarter 2026), 180,000 b/d Barmer (India; second quarter 2026), 180,000 b/d Cauvery Basin (India; 2029), and 250,000 b/d Khalifa Coastal Refinery (Pakistan; 2029).
- Narrow low-sulfur to high-sulfur crude spreads and weak naphtha prices continue to provide minimal incremental margins for coking refineries around the globe.

Global refining and marketing key insights (continued)

3) Reward for Resilience: Accelerated closures in Europe cause one last margin boom (2030–33)

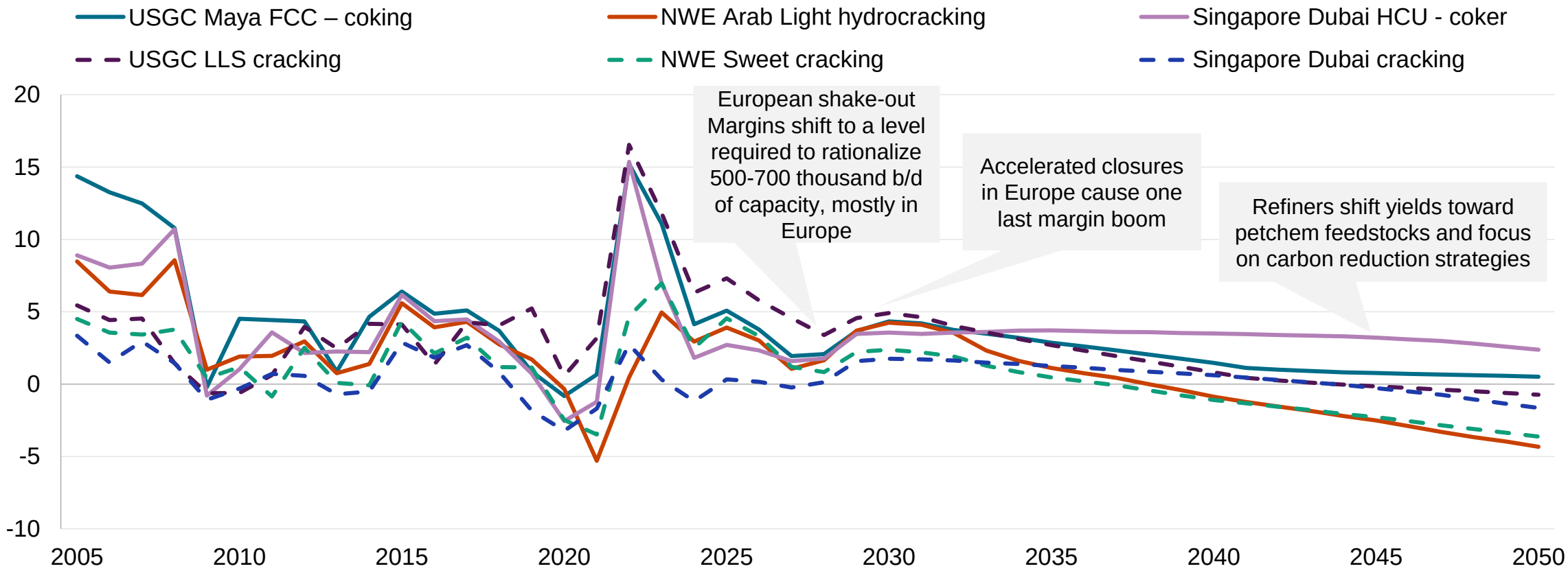
- We expect the next round of closures to overshoot what is strictly necessary as refineries above the margins continue to shut down. Consequently, we expect balances to tighten following this wave of rationalization, supporting refining margins once again
- At the same time, our view is that the EU European Trading System (ETS) and Carbon Border Adjustment Mechanism (CBAM) will be extended to the refining sector.
- Our base case view is that a CBAM extension to refining will be agreed upon and its legislation published in 2028. It would start to take effect from 2031 with 9 years phase-in to 2040, during which, free allowance are phased out at the same pace as CBAM ramps up. As a result, this helps drive the next and final cycle of the refining industry for the European market, as its GHG costs incurred by refiners gives a dire warning: decarbonize or revamp.

4) Reinvention: Fuels Refining After 2035

- This upward cycle will only be fleeting as the structural erosion of traditional transportation fuels (gasoline, diesel, bunker fuel, and even fossil aviation fuel in certain regions) demand sets in through alternative powertrains and clean fuels, further efficiency improvements, and emerging markets moving toward maturity, reducing their oil intensity.
- Refined product demand—except naphtha and total jet fuel—falls, and in turn, crude oil demand begins to “bend over” as early as 2030.
- Refineries must make strategic investments to shift away from producing traditional petroleum fuels to remain relevant and profitable. Further, carbon abatement investments will be propelled by the EU ETS program and other national carbon policies in Singapore, India, Korea, and Japan for their respective domestic refining sector.
- Fuels-only margins—even the most complex ones—trend toward levels observed during the global financial crisis.

Global refining and marketing key insights (continued)

Long-term benchmark margin outlook — USGC margins include RIN costs (constant 2024 $/b)

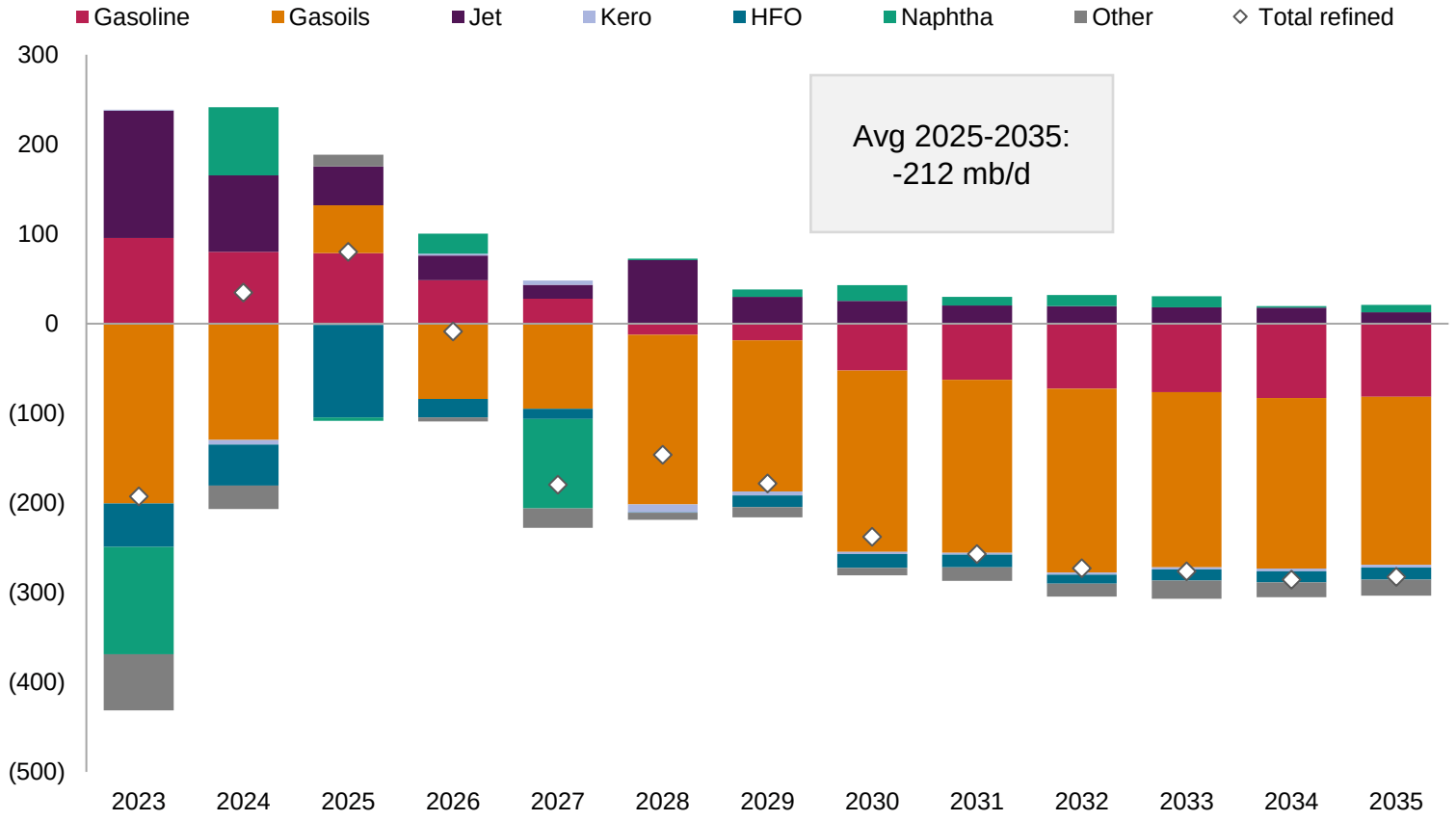


Data compiled November 2025.
RIN = renewable identification number; FCC = fluid catalytic cracker; LLS = Light Louisiana Sweet; NWE = Northwest Europe; HCU = hydrocracking unit.
Note: NWE Margins include GHG (greenhouse gas) costs
Source: S&P Global Commodity Insights.

Europe, Eurasia, and Africa fuels and refining

European refined products outlook: Gasoline remains resilient in the medium term, but gasoils weigh down overall demand outlook on passenger fleet shift

Refined product demand outlook in Europe — year on year change 2023-2035



Data compiled November 2025.
Refined products includes biofuels and sustainable aviation fuels (SAF)
Source: S&P Global Commodity Insights

Transport sector drives both positive and negative impacts on overall demand outlook

Slower-than-anticipated EV sales have favored hybrid adoption, and in turn buoyed gasoline demand.

But Europe's large diesel passenger car fleet continues to decline: diesel trending at just over 9% of new car registrations year-to-date, a record low

Weak manufacturing is exacerbating situation, particularly in Germany, where energy-intensive industries are being hit hard

Naphtha cracker closures are impacting near-term outlook; more rationalization expected as operators re-evaluate European operations in an oversupplied global market

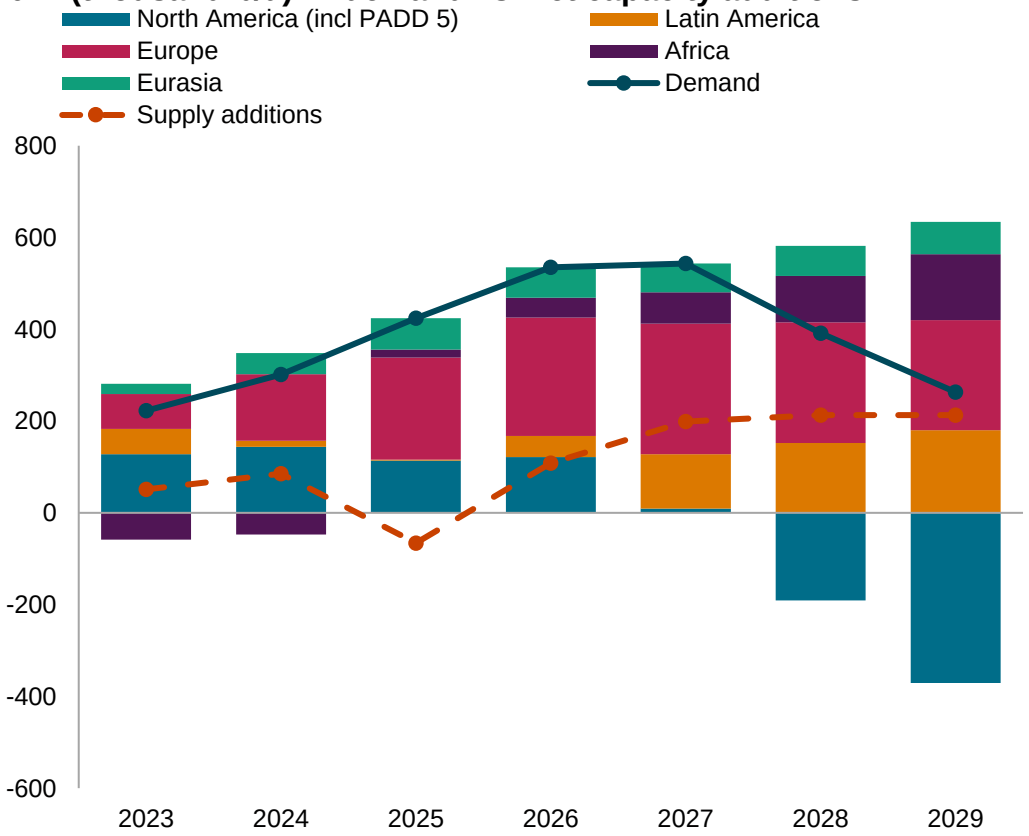
Jet fuel recovery is underway, but growth moderated ahead of peak in late 2030s.

Growth in SAF is unlikely to meet EU's ambitious mandates in the longer term.

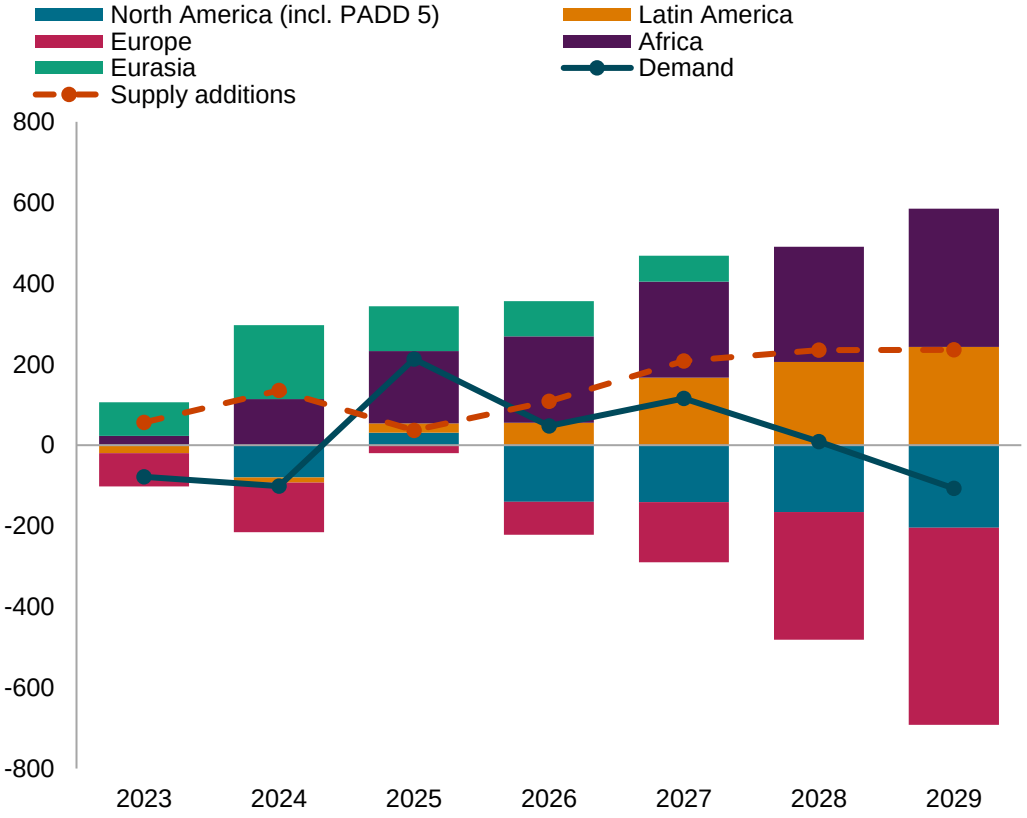
Overall outlook is for a decline of over 200,000 b/d on average to 2035

West: With increased demand and refinery closures, the Atlantic Basin modestly loosens by end of decade, supporting more limited rationalization

Cumulative growth in gasoline demand in the Atlantic Basin since 2022 (thousand b/d) — demand vs. net capacity additions



Cumulative growth in middle distillate demand in the Atlantic Basin since 2022 (thousand b/d) — demand vs. net capacity additions



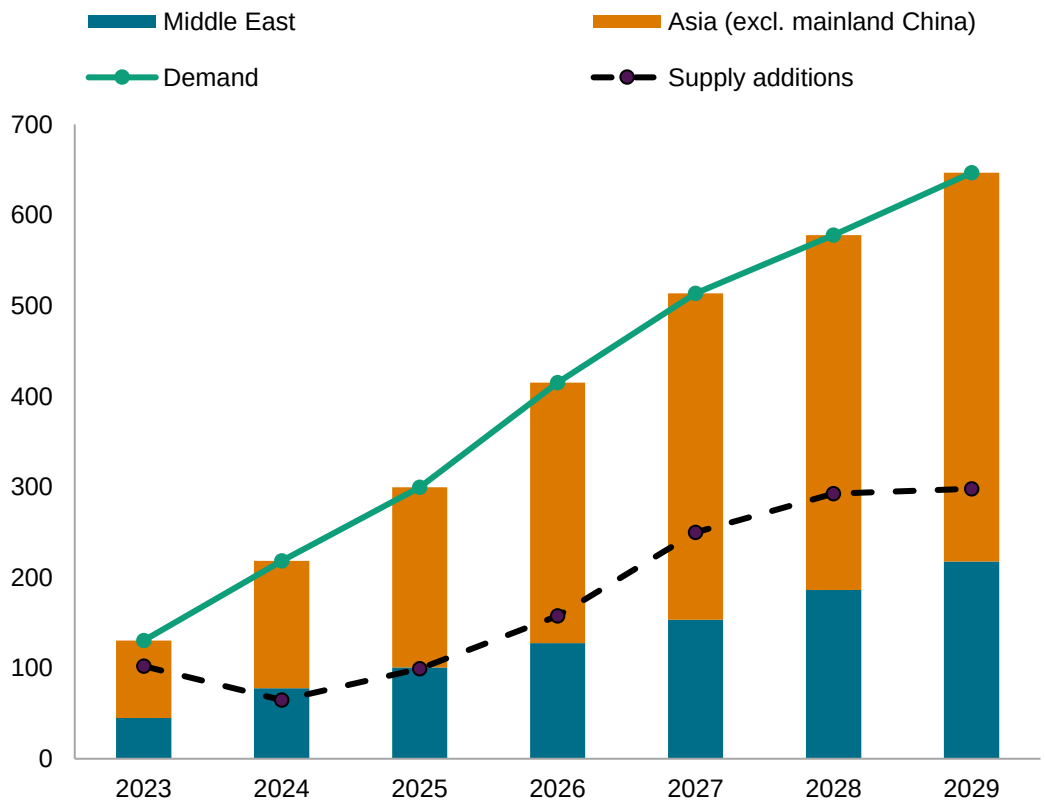
Data compiled November 2025

Atlantic Basin includes Africa, Europe, Latin America and North America. Supply and demand exclude biofuels. Supply additions are based on new additions and expansions but do not include announced closures or changes in utilization among existing assets.

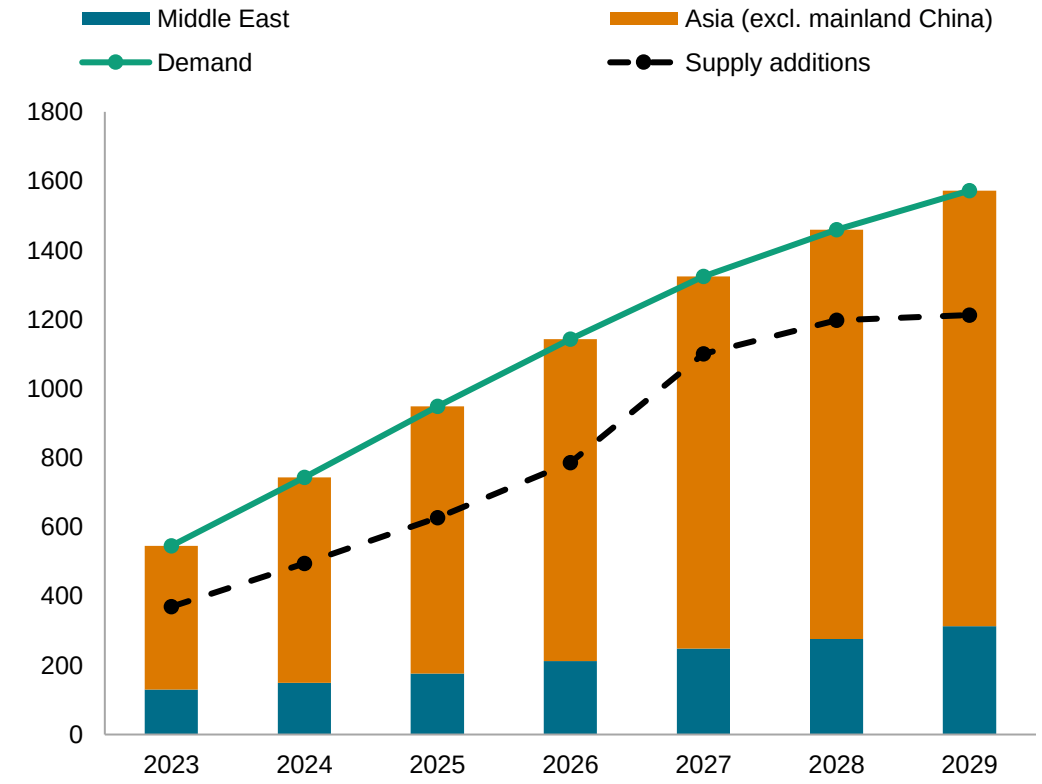
Source: S&P Global Commodity Insights.

East: Gasoline demand grows slightly faster than additions while East of Suez projects target diesel and petrochemical demand

Cumulative growth gasoline demand in East of Suez (excl. mainland China) since 2022 (thousand b/d) — demand vs. net capacity



Cumulative growth in middle distillate demand East of Suez (excl. mainland China) since 2022 (thousand b/d) — demand vs. net capacity additions



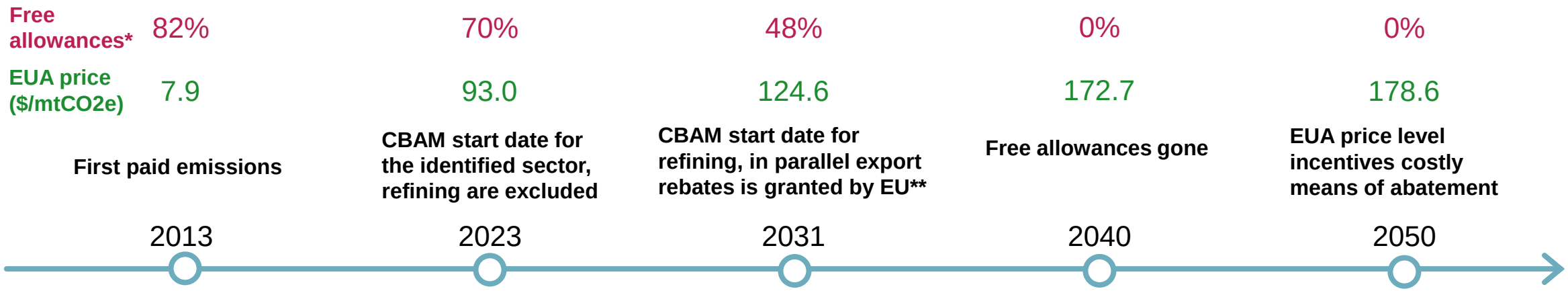
Data compiled November 2025
East of Suez includes Middle East and Asia (excluding mainland China). Supply and demand exclude biofuels. Supply additions are based on new additions and expansions but do not include announced closures or changes in utilization among existing assets.
Source: S&P Global Commodity Insights.

What do carbon costs mean to the refining industry?

- **Considering carbon costs in our base view will bring a bifurcated market.** Some carbon policy equalization and nominalization is warranted among nations and trade partners, but for now, we assume the EU, Singapore, California, and other parts of Northeast Asia will have established carbon policies. Rest of the world does not adopt a nationwide carbon reduction policy.
- **"Welcome to the climate club"—The push for broader decarbonization, albeit at different paces and pledges, will help drive carbon reduction investments, even if there are no "carrots" or "sticks" in certain markets.** As an example, the Middle Eastern states will most likely not pursue ambitious domestic carbon taxation policies, but many individual operating companies based in the Middle East have announced net zero GHG pledges via energy efficiencies, renewables, and carbon capture technologies.
- **Europe is determined to ensure the ETS and CBAM does not weaken its global competitiveness**. With such intention, we assume that some form of an export compensation mechanism by 2031 would come into practice, synchronized with CBAM gradual implementation, allowing for European barrels to continue competing in the international market.
- **Some refiners will outright avoid trading into the EU market.** Some exporters will most likely make the conscious decision to avoid trading into Europe all together. This may result in some trade reshuffling of high-carbon intensity (CI) products away from Europe to other import markets such as Latin America, Africa, and parts of Southeast Asia. The remaining exports barrels (i.e. low-CI barrels) will still arrive within the European barrels and capture the "carbon cost uplift".
- **The global refining industry will most likely evolve on two fronts:**
  1. Market emergence of a high-carbon-intensity (CI) versus low-CI refined product market, and associated trade reshuffling
  2. Export refining hubs will become even more competitive to the last growing markets such as Latin America and Africa, with less competition from the likes of Singapore and Europe with their own carbon barriers (CBAM export mechanism assumed to compensate for the emissions of a top-tier benchmark performer, not a full rebate)
- **Although Singapore, Korea and Japan GHG programs are relatively forgiving relative to the EU ETS in terms of carbon cost, we don't assume those countries will have an import carbon adjustment or export compensation rebate in our base view…for now.** In other words, exporters such as the Middle East and India will be able to take advantage of the higher netback return i.e. carbon leakage will most likely occur
- **These carbon considerations are another long-term headwind for refiners.** Investment in carbon abatement is not enough for most fuels-only refineries to remain viable. It needs to be a combination of such investments plus diversification into petrochemicals or low-carbon fuels (e.g. biofuels).

CBAM = carbon border adjustment mechanism, ETS = Emissions Trading Scheme, GHG = Greenhouse Gas

Emission trading system timeline



*Free allowances decline rate is an assumption based on history, from 2031 acceleration as free allowances must be phased out in parallel with CBAM is ramped up.
**CBAM for refining introduction date and export rebates are S&P Global assumptions

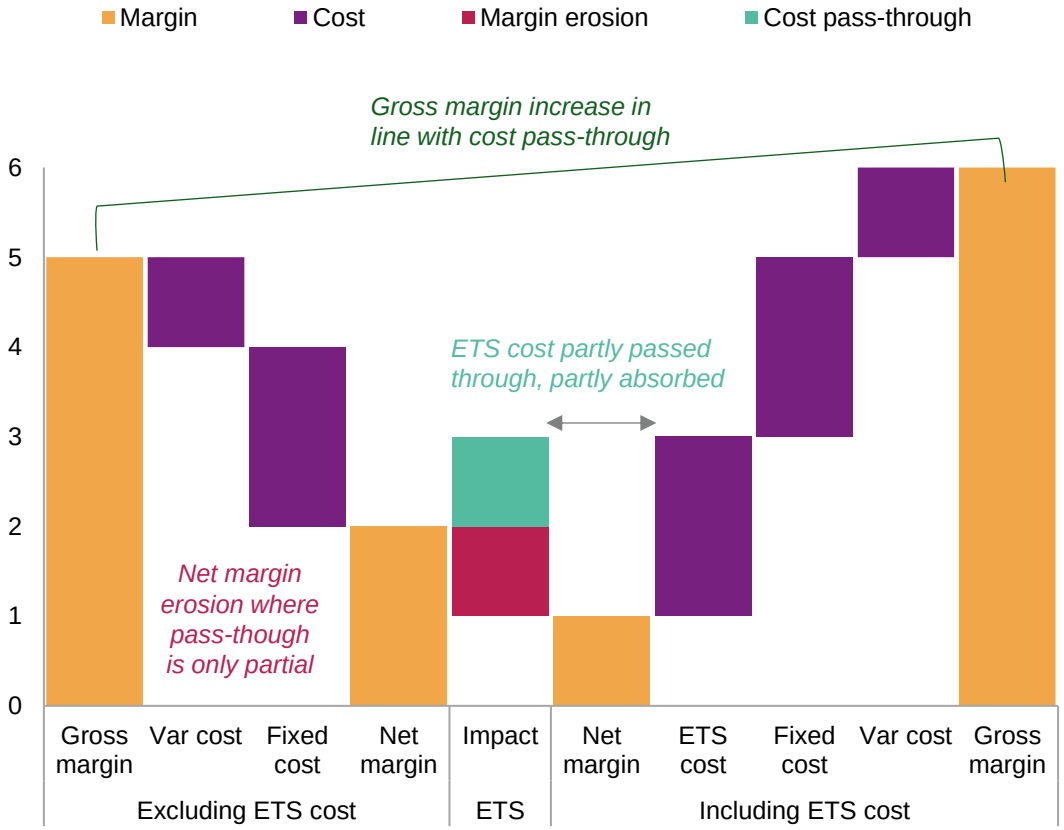
- 2013: Introduction of the first paid emissions, refiners are able to pass through most of the carbon costs, beyond the free allowances, to product buyers. The free allowances are set to decrease.
- 2023: Start of the CBAM for the identified sectors (such as power, steel, cement, fertilizer, hydrogen, …). From 2023 to 2026, there is only an obligation to report carbon emissions, after which CBAM costs increase progressively. Refining sector is not yet included into CBAM.
- 2026: CBAM review by the European Commission
- 2028: We *assume* that a political agreement would be reached on the CBAM extension to refining
- 2031: *Assumed* start of CBAM in the refining sector, with a gradual implementation over 9 years until 2040, as free allowances are phased out at the same pace as CBAM is ramped up. Beyond peak demand, refiners struggle to pass through the incremental carbon cost to buyers, leading to margin erosion.
  CBAM will impact trade flows by changing arbitrage relationships and acting as a barrier to certain imports into Europe. To support domestic refineries and their export competitiveness, the EU is assumed to introduce an export rebate at the same time.
- 2040: Free allowances *assumed* to be fully phased out.
- 2050: EUA prices continue to rise to levels incentivizing more costly means of abatement.

EUA = EU allowances, CBAM = carbon border adjustment mechanism, ETS = Emissions Trading Scheme

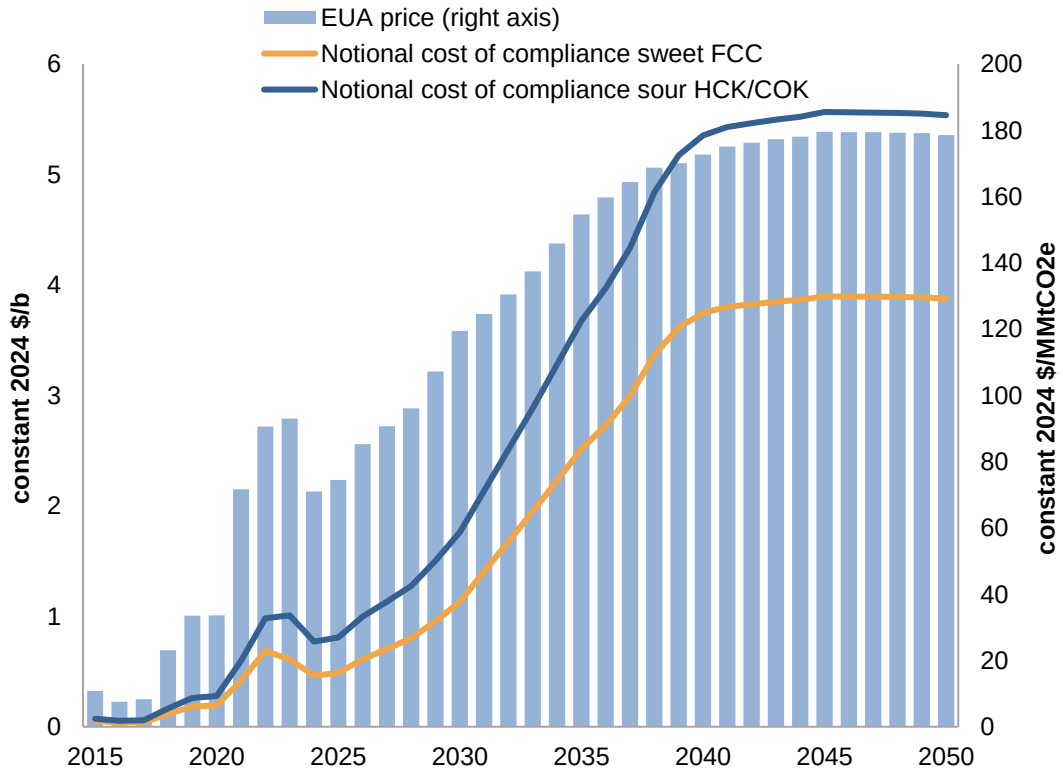
Mechanics and assumptions for European market ETS

The EUA price has been revised downward starting in 2035, with a decrease of about $50/MMtCO2e by 2050

Cost and margin impact of carbon pricing—Illustrative example ($/b)



Notional cost of compliance for sweet FCC and sour HCK/COK yardstick refineries under the EU Emissions Trading System



Note: Cost per barrel calculated using assumptions about yardstick emissions, free allowances track and carbon price track as assumed in S&P Global planning case. All assumptions can be overwritten with any bespoke forecast in Connect model

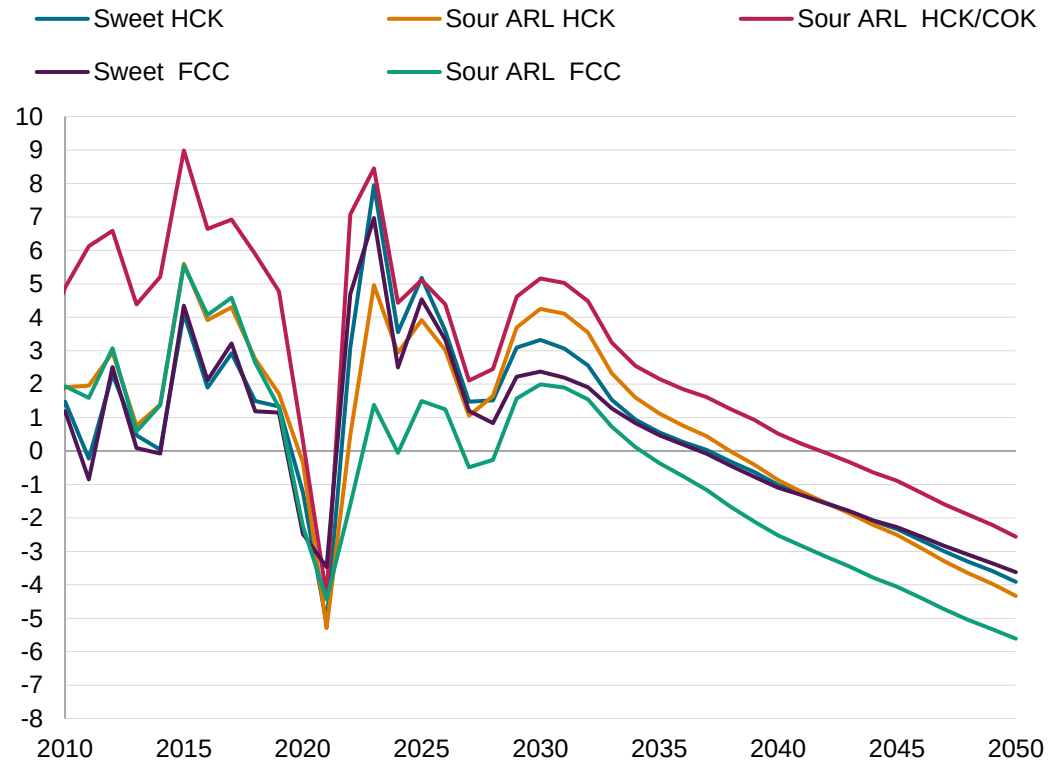
Data compiled November 2025.
Source: S&P Global Commodity Insights.

Our EU long-term price set implies a dire warning: decarbonize and revamp

Carbon capture and storage investment yields a 5-10 years payback period in Europe

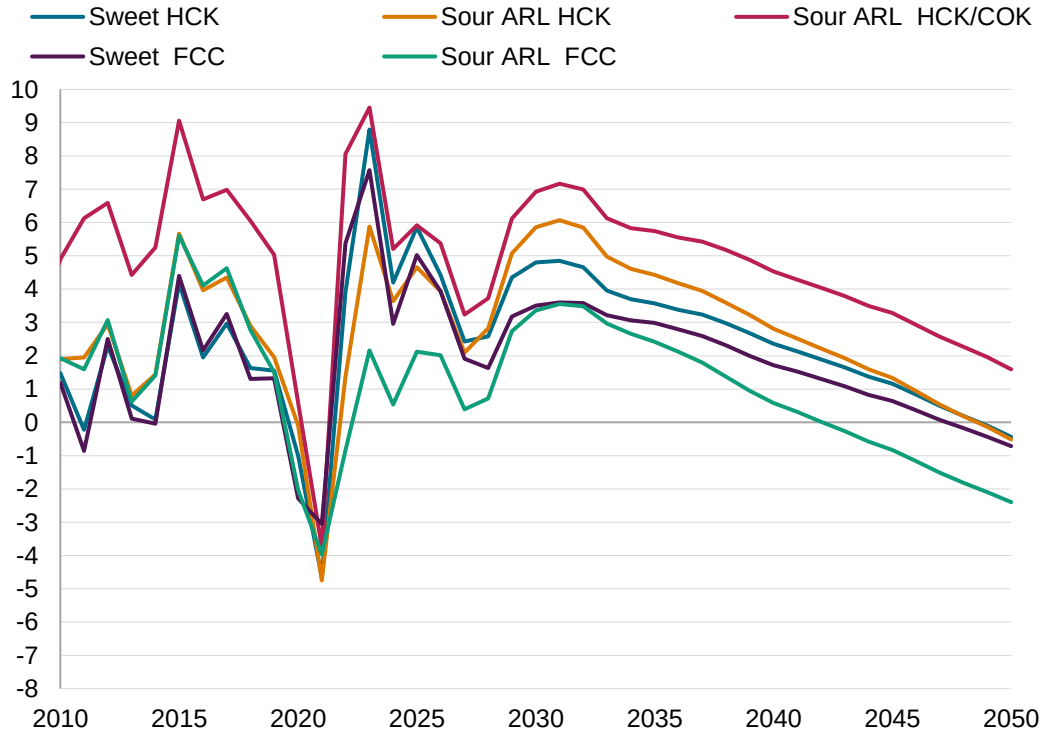
Without any carbon abatement investment

NWE Net Cash Margin Forecast, (constant 2024 $/b)



With carbon abatement investment

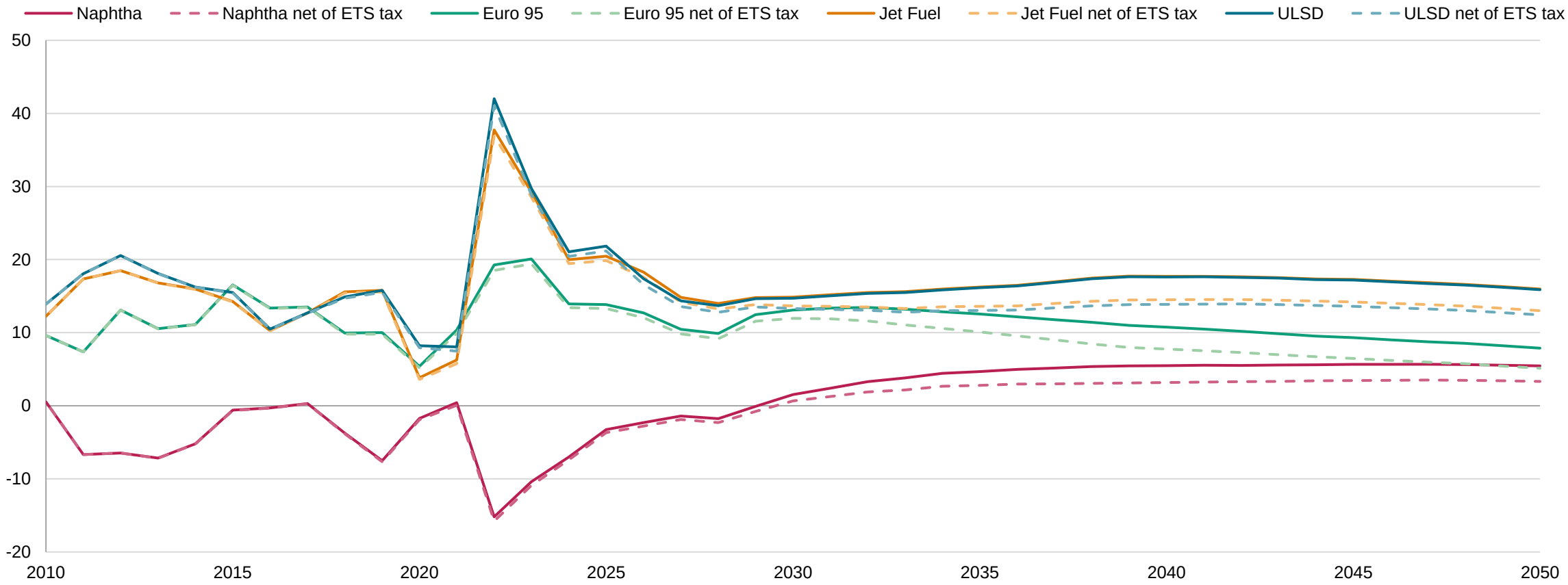
NWE Net Cash Margin with 75% carbon emission reduction, (constant 2024 $/b)



Data compiled November 2025.
FCC = fluidized catalytic cracker; HCK = hydrocracker, HCK/COK = hydrocracking – coking refinery, CIF = cost, insurance, and freight, ARL = Arab Light; NWE = Northwest Europe.
Note: the chart on the right illustrates the level of margins in the case where a refiner invests in a decarbonization solution to abate 75% of its carbon emissions
Source: S&P Global Commodity Insights.

ETS costs are expected to lead to higher crack spreads for light products, averaging $2-3.5 per barrel by 2050

NWE product crack spreads (Dated Brent basis), 24$ per barrel



Data compiled November 2025.
Source: S&P Global Commodity Insights.

S&P Global
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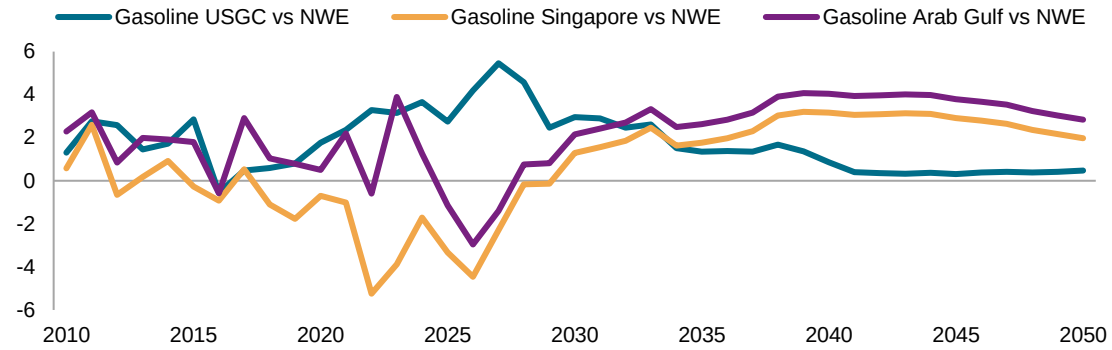
US gasoline demand erosion and new capacity intensity battle for export markets

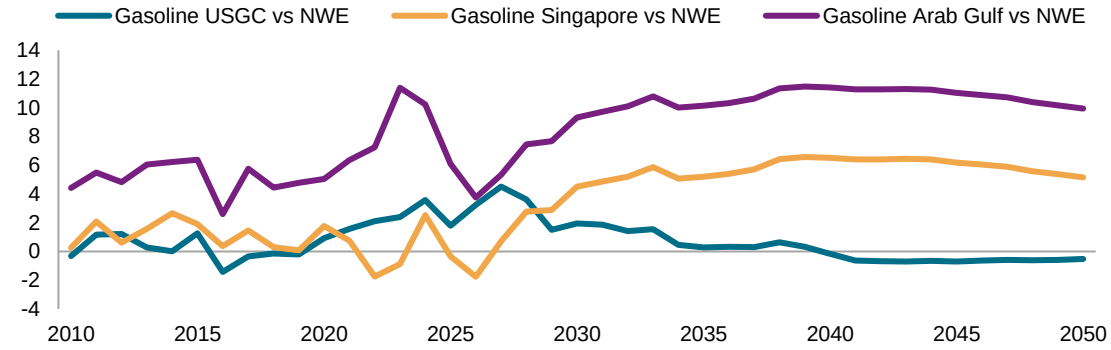
During the next decade, the United States will become an even larger gasoline exporter, supplying an increasing share of the remaining gasoline import markets, at the expense of Europe, shifting to export compensation rebate long-term to remain competitive

- Although U.S. policy will favor gasoline, efficiency gains will not be significantly rolled back. Despite slower EV adoption rates, the country will continue to show a substantial decline in demand. Therefore, in the 2030s and beyond, the United States will become a larger gasoline exporter.
- Gasoline flows from Europe, the United States and the Middle East will continue to rise towards Africa and Latin America as all refining enclaves compete for these remaining net import markets.
- Due to its geographic proximity, North and Northwest Africa will likely be supplied primarily by imports from Europe and Russia, while East Africa would receive the lion's share of its imports from the Middle East and India.
- Consistent with our product trade forecast, United States gasoline price must be low enough to compete in Western and Southern Africa.
- South African export parity serves as the price-setting mechanism for USGC gasoline. Nonetheless, the Middle East and even Europe will seek to compete in this market.
- The United States is also expected to remains Latin America's main gasoline supplier, where its dominant position will be gradually less contested by Europe.

Gasoline landed cost in South Africa relative to NWE (constant 2024 $/b)



Gasoline landed cost in Brazil relative to NWE (constant 2024 $/b)



Data compiled November 2025.
When negative, arbitrage is disadvantageous for Europe
European pricing includes export rebate mechanism from 2031 onward
Source: S&P Global Commodity Insights.

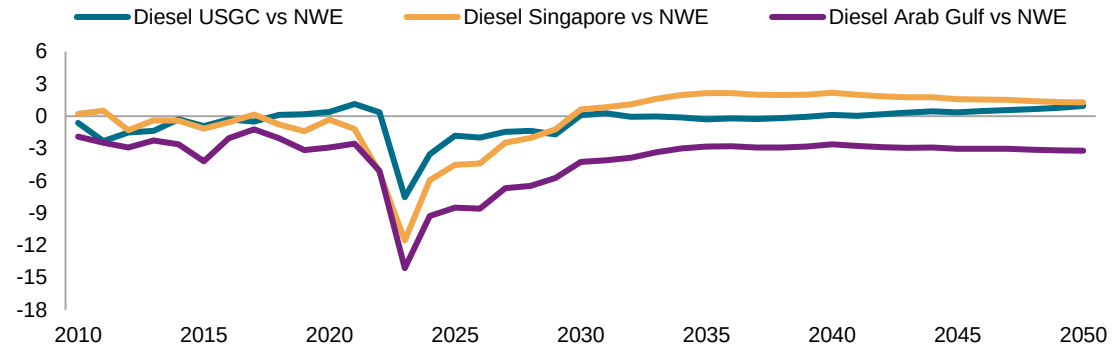
S&P Global
Commodity Insights

Greater battle for diesel export market share when Europe becomes net exporter

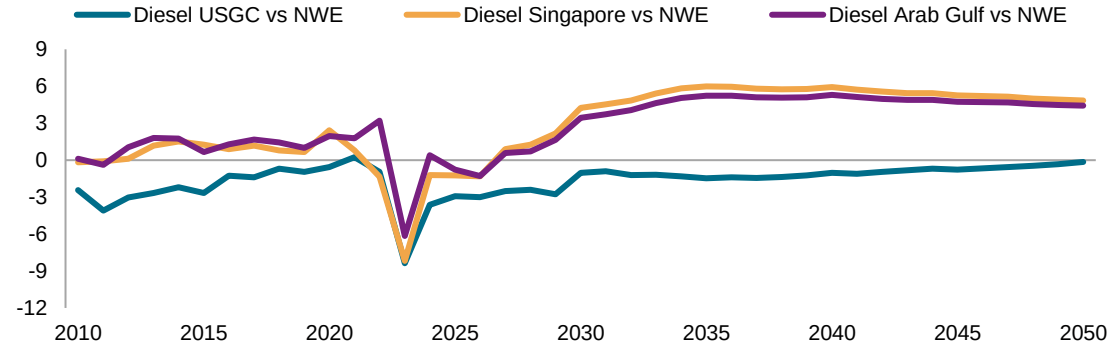
Near-term, we expect the Middle East to account for the lion's share of Europe's incremental diesel imports following the EU embargo, before becoming Southern Africa's main supplier longer term, whereas United States exports will remain most competitive in Latin America

- Since the invasion of Ukraine and the ban on Russian oil products, Europe has had to find alternatives to replace Russian imports and satisfy its strong appetite for diesel. Europe is backfilling Russian diesel primarily from the Middle East, which sees an increase in refinery capacity, while imports from the United States are expected to decline from the late 2020s.
- However, diesel demand in Europe is on a declining path, with peak demand already reached. Europe is expected to become a net exporter of diesel by the mid-2030s and will need to fight for market share overseas.
- Export share in the African market will be divided by subregion based on geographical advantages: North and Northwest Africa would be dominated by imports from Europe, East Africa by the Middle East and India, whereas West and South Africa are likely to become the key battlegrounds between the main exporting enclaves.
- Under the ETS/CBAM, we assume European exporters will be granted compensation when exporting their lower-carbon, higher-cost products to remain competitive.
- The Middle East is also expected to become Southern Africa's main supplier of diesel, while U.S. imports will gain ground, mainly in West Africa, where they will meet European and Indian products.
- In Latin America, the United States is expected to have the largest slice of the cake, with Europe, Russia, and India competing for remaining market share.

Diesel landed cost in South Africa relative to NWE (constant 2024 $/b)



Diesel landed cost in Brazil relative to NWE (constant 2024 $/b)

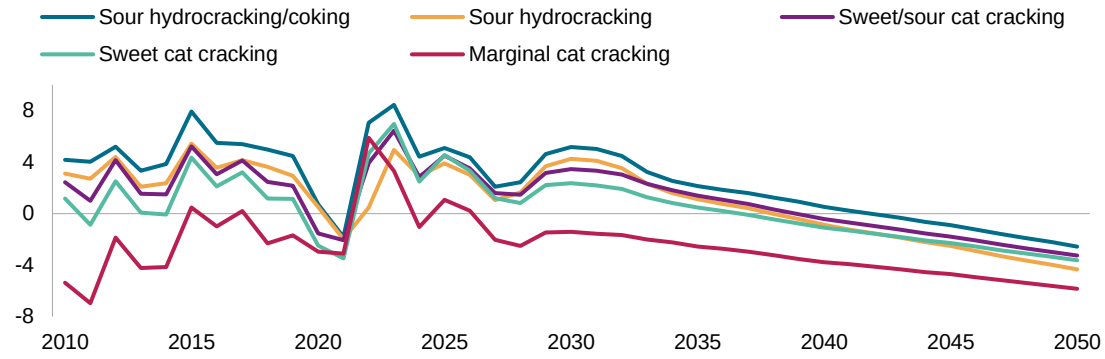


Data compiled November 2025.
When negative, arbitrage is disadvantageous for Europe
European pricing includes export rebate mechanism from 2031 onward
Source: S&P Global Commodity Insights.

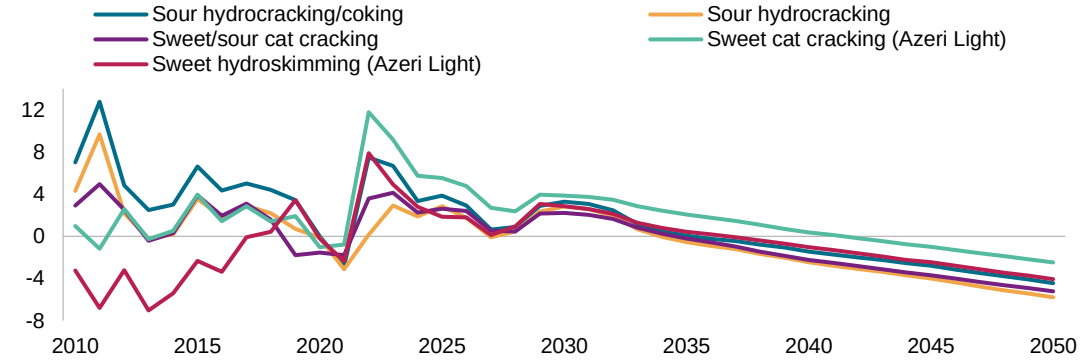
By the end of the decade a new wave of refinery closures will briefly boost margins, after which all fuel-only benchmarks move into negative territory

- After robust margin years from 2022 to 2024, buoyed by diesel but weighed down by high natural gas prices, a wave of fresh capacity additions and slowing demand growth pressure margins once again, reaching a low point in 2027-2028.
- After an expected round of closures in Europe around the end of this decade—potentially overshooting what is strictly necessary—the early 2030s would provide a period of stronger margins as markets tighten. We expect this to be a temporary reprieve though, as world consumption of refined products would have already peaked by then.
- From the mid-2030s, Europe becomes a net exporter of diesel and will target the two remaining import markets—Africa and Latin America—where it faces competition from the United States, Middle East, and India, generally cost-advantaged exporters that are likely to face a lower cost of compliance, especially around carbon taxation.
- Similar competition is expected as refiners need to place their gasoline surplus, owing to the rapid domestic demand erosion.
- During this period, more radical yield shifts will have to take place, away from transport fuels and into petrochemical feedstocks and specialty products. We expect most fuels-only margins to be cash negative before 2040, while the high carbon emissions cost is likely to prompt costly means of abatement to mitigate declining margins.
  All “last men standing” would need to generate supplemental revenue from other, likely low-carbon, streams.

Northwest Europe yardstick net cash refining margins (Constant 2024 $/b)



Mediterranean yardstick net cash refining margins (2024$/b)

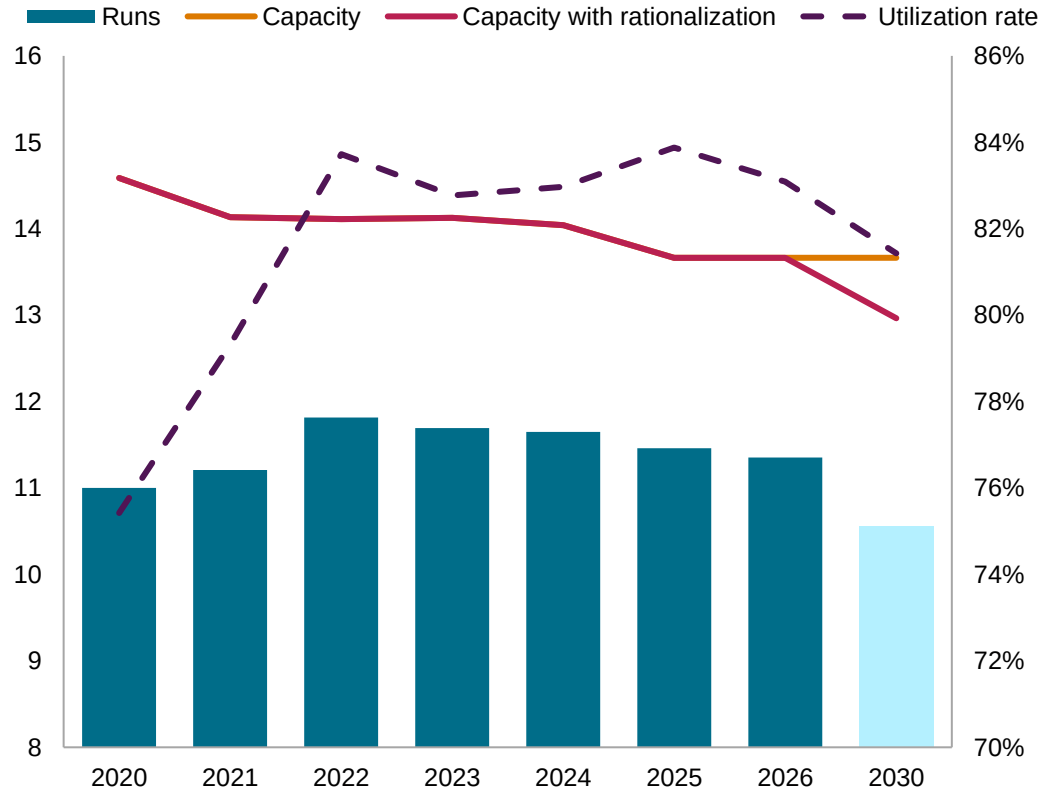


Data compiled November 2025.
Source: S&P Global Commodity Insights

European refining: Sanctions, security concerns and unplanned closures temper rationalization through 2030

- **Margins and rationalization outlook (2026–2030):** European refining has long been on the cusp of a period of significant transition, shaped by short-term strength in cracks and long-term structural challenges. In 2026, both gasoline and diesel cracks are expected to remain strong. Gasoline strength will be supported by delays in Dangote refinery ramp-ups, ongoing closures in Europe, and sustained demand. In 2027 and 2028, the margins for European refineries that are highly reliant on exports are expected to turn negative, increasing pressure on these refineries to close.
- **Rationalization expectation lowered to ~700,000 b/d to 2030**: To maintain a sustainable utilization rate of around 80% by 2030, significant capacity reductions will be required. Preliminary estimates suggest a reduction to approximately 500,000-700,000 barrels per day, less than the previous forecast of 1 million barrels per day. In addition, closures outside of Europe that arise from large investment decisions, corporate strategy, and regulatory environments could create a more balanced Atlantic Basin.
- **Europe will still bear the brunt of Atlantic Basin closures** due to its structural disadvantages including the highest gas and electricity costs, elevated labor expenses, stringent carbon compliance requirements, and limited political support for the refining sector. As Europe's Emission Trading System (ETS) is made more stringent, investments – particularly necessary decarbonization investments - at weaker refineries will be in question.

Europe crude runs and rationalization forecast, million b/d



Data compiled November 2025.
Source: S&P Global Commodity Insights.

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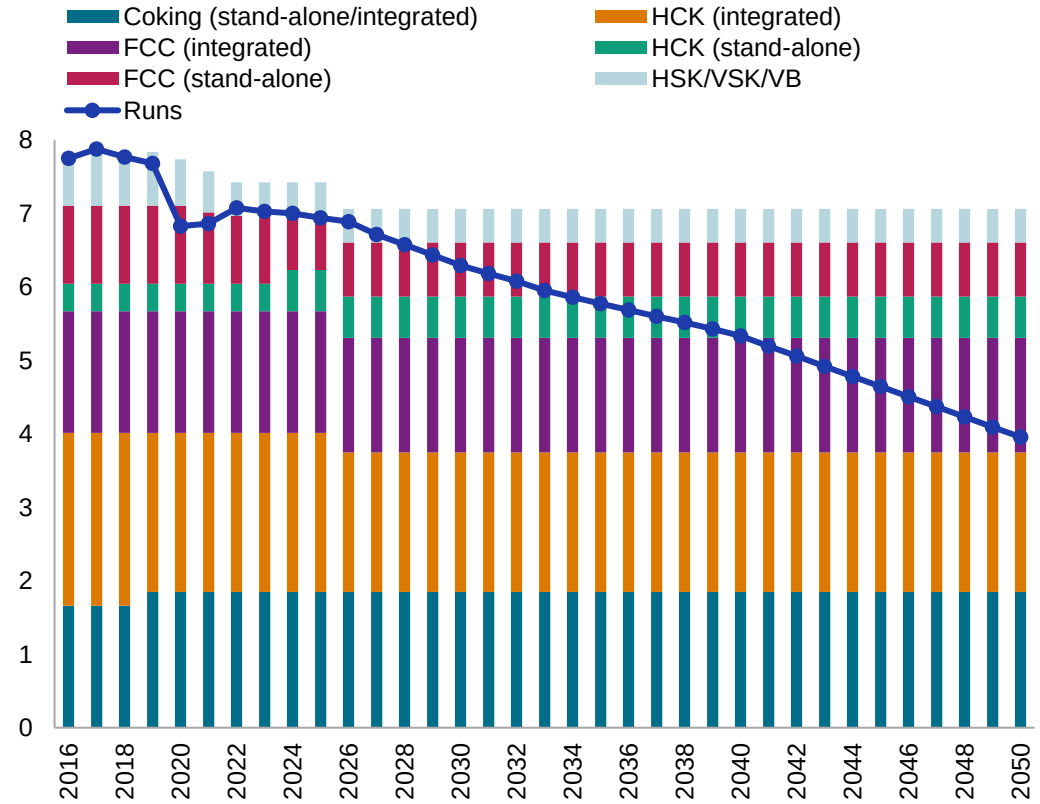
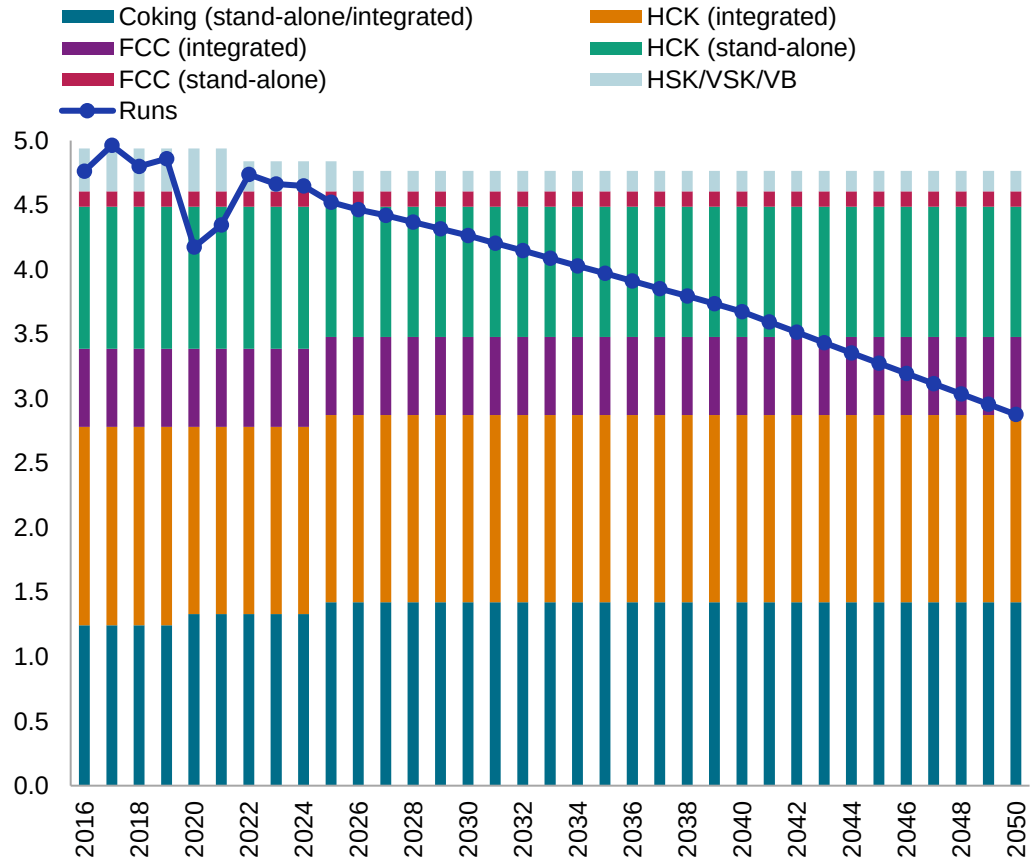
In the long term even, sophisticated capacity will need rationalizing or repurposing

North and Central Europe crude runs relative to installed capacity (million b/d)



South Europe crude runs relative to installed capacity (million b/d)



Data compiled November 2025.

HCK = hydrocracker, FCC = fluidized catalytic cracker, HSK = hydroskimmer, VSK = vacuum skimmer, VB = visbreaker

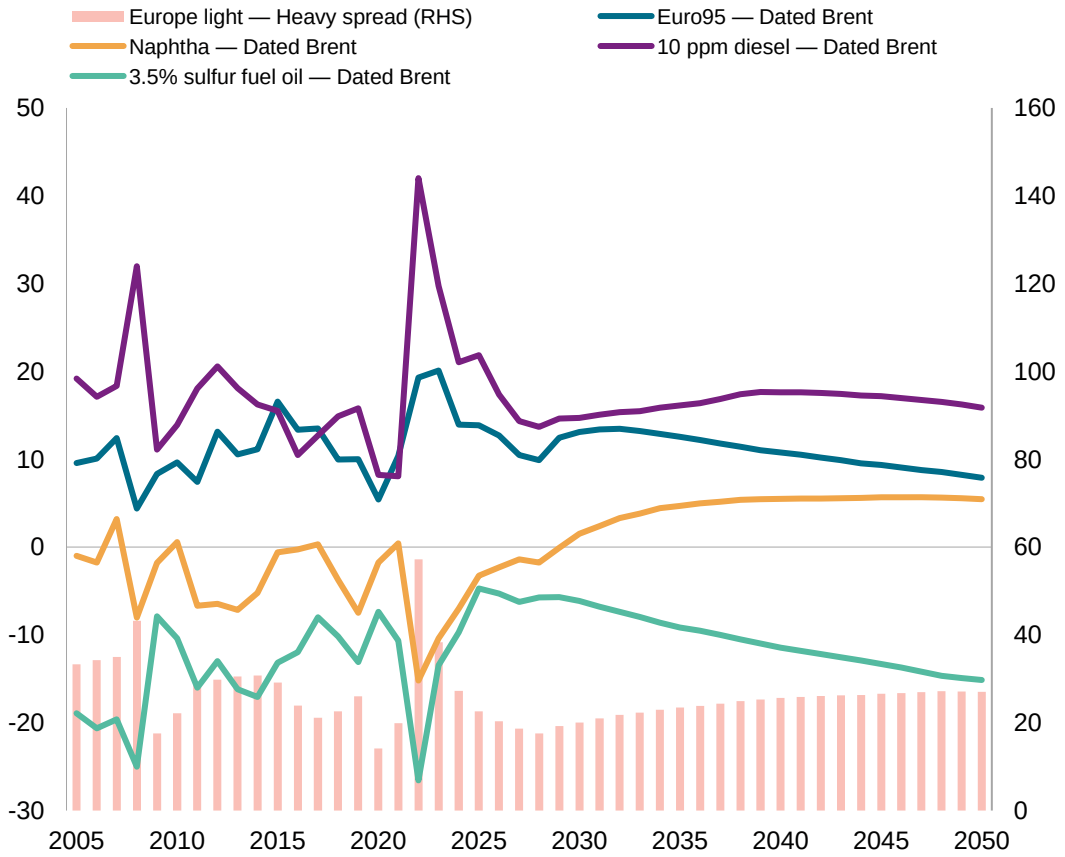
Sour crude considered for refining margins is Urals until 2021, then Arab Light from 2022. Crude runs do not include small-scale specialties refineries; refinery configuration picking order is illustrative based on 2016–19 average margins and is not intended to reflect a future order of profitability. Excludes small-scale specialties refineries. All capacities shown at 90% of their calendar-day capacity

Source: S&P Global Commodity Insights, Refinery Cost & Margin Analytics

Long-term price forecast for Europe shows gasoline and naphtha converging

Diesel cracks to decline near-term in line with new capacity and stagnating global demand growth, while long-term gasoline and naphtha cracks reflect the electrification of the car fleet and continued strong petrochemical appetite

Northwest Europe crack spreads (constant 2024 $/b)



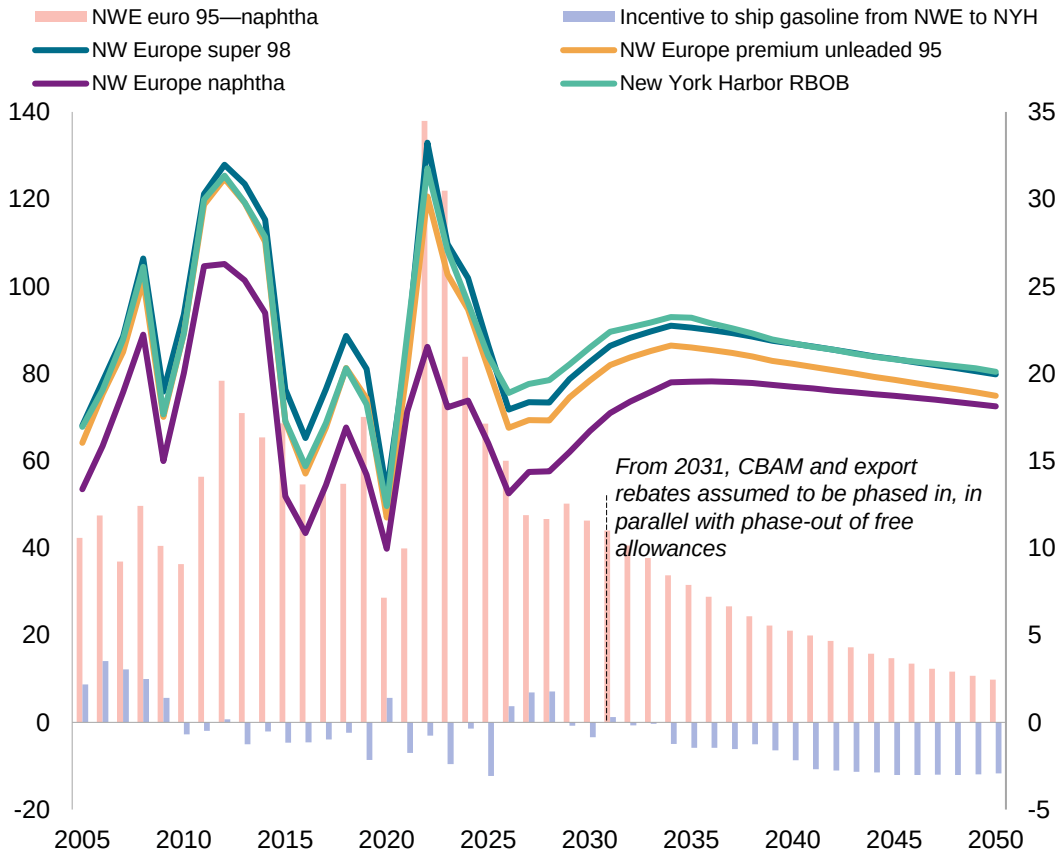
Data compiled November 2025.
Source: S&P Global Commodity Insights.

- **Gasoline** cracks are expected to decline in the short-term from but should remain stronger than previously anticipated due to surging demand in North America, Africa and Europe. In the long-term, car sales will continue to shift to alternative powertrains, in part accelerated by increasing pressure from emissions targets and bans on internal combustion engines, significantly affecting gasoline demand. After a margin rebound around 2030, gasoline cracks will begin to decline again, dipping below $8/b by 2050.
- **Gasoil/diesel cracks** are expected to weaken significantly through 2028 from current strength due to incremental supply from east of Suez. From the early 2030s, diesel cracks will increase modestly on the of back carbon costs before stabilizing during the last decade despite declining European diesel demand. After becoming a net exporter, Europe will have to compete for market share in import regions, keeping downward pressure on cracks.
- **Naphtha crack spreads** remain price takers from the growing Asian market, set to increase strongly from the late 2020s, mainly due to a lack of alternative steam cracker feedstocks to meet high demand for plastics and fibers. European cracks are expected to flip to a structural premium from 2030.
- In the near-term, we expect the **3.5% sulfur fuel oil crack** to strengthen from negative $27/b in 2022 to negative $6-5/b range in the second half of the decade. Through 2030, global crude supply growth is predominantly light sweet crude from the Permian. As a result, the overall demand for vacuum bottoms increases relative to the available supply, making HSFO stronger. From the early 2030s onward, our sour residue balances show that medium/heavy sour crude supply growth and decarbonization of shipping and stationary sectors would depress HSFO cracks once again, in order to incentivize further deep conversion capacity additions, most likely creep projects.

Gasoline and naphtha pricing

European gasoline arb to NYH to close in the early 2030s, as European exporters need to find new outlets for their surplus

Northwest Europe gasoline and naphtha pricing (constant 2024 $/b)



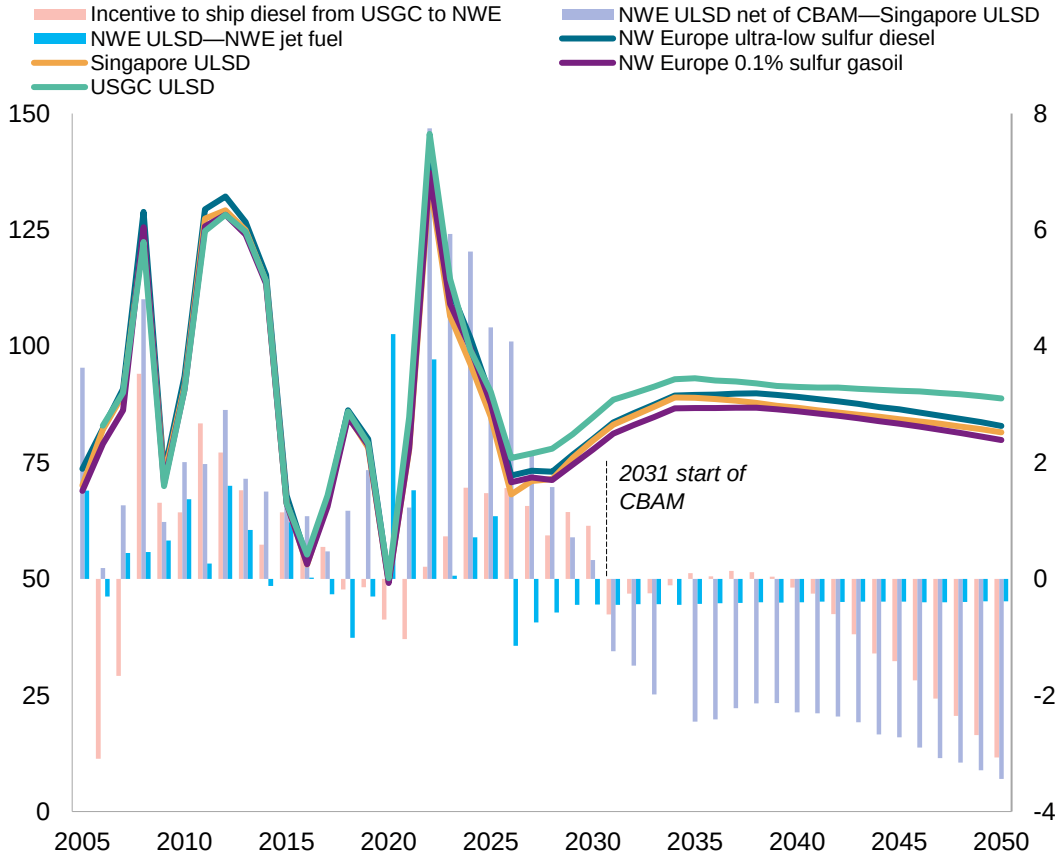
Data compiled November 2025.
Source: S&P Global Commodity Insights.

- Northwest European 95 RON **gasoline** is expected to trade about $17/b above naphtha this year, still driven by healthy gasoline demand coupled with supply concerns in the absence of Russian blendstocks and vacuum gasoil (VGO), while naphtha cracks tumble amid high crude runs, strong NGL supply growth and sluggish petrochemical demand.
- The mogas-**naphtha** spread keeps on narrowing, as continued naphtha demand growth from petrochemicals supports Far East export netbacks while vehicle electrification eats into gasoline strength.
  In the outer years of the forecast, a sharper decline in gasoline demand, combined with a sustained demand pull on naphtha, compresses mogas-naphtha spreads below $3/b on a volume basis.
- Gasoline **arbitrage** to New York Harbor (NYH) remains open, or nearly so, in the near-term but is expected to close by the mid-2030s, potentially sooner if export rebates to offset carbon costs are not considered. PADD 1 demand is declining, and gasoline should then benefit from low, if any, export incentives to NYH. However, in the long-term, more and more European flows are being redirected to Africa, where the start-up of Dangote refinery in Nigeria is reducing West Africa's net import needs, putting additional pressure on European exporters to find outlets for surplus gasoline.
- **Super 98** premium to unleaded Euro 95 remains high but is expected to contract slightly in the near-term. The cost of octane continues to be supported by high baseline octane needs in Europe, changes in gasoline specification around the world, and continued strong growth in aromatics demand. In the longer term, the cost of octane is modestly above average because the aromatics demand growth offsets the impact of falling gasoline demand.

Middle distillates pricing

In the long-term, Europe becomes a net exporter of diesel, competing for market share in Africa and Latin America, with exported product from the US and Middle East, while jet fuel is expected to move to a structural premium over diesel in line with changing demand trends

Northwest Europe middle distillates pricing (constant 2024 $/b)



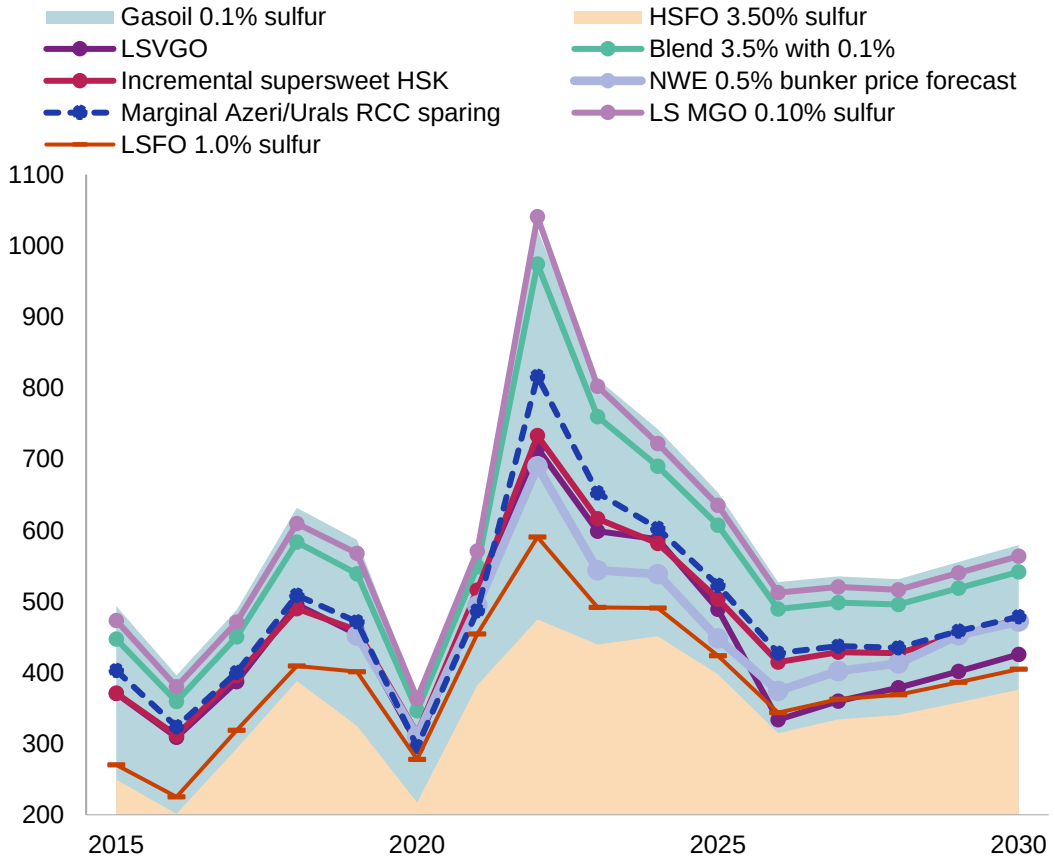
Data compiled November 2025.
Note: From 2031 onwards, EU CBAM is included into "incentive to ship diesel from USGC to NWE" curve
Source: S&P Global Commodity Insights.

- European **diesel** consumption is continuously declining, as the light vehicle fleet continues to shifts towards gasoline and alternative drivetrains. In the near term, diesel cracks are expected to decline due to plentiful supply.
  - Europe is increasingly sourcing additional supply from the Middle East and USGC. Meanwhile, the EU's 18th sanctions package aims to close loopholes in diesel imports. This refined product import ban primarily affects India and Turkey, but both have adapted, as much of the diesel coming from these two countries now meets compliance requirements.
  - Europe is expected to become a net exporter of diesel before the mid-2030s. Thereafter, Europe is expected to experience a significant drop in local demand, outpacing the impact of refinery rationalization and efforts to shift yields away from diesel.
  - Consequently, the remaining European refineries will need to enhance their diesel export capability. As US, Asian, and European diesel meet in sub-Saharan Africa and Latin America, interregional price differentials are set by the battle for market share in these import markets.
  - Without export rebate, it is very difficult to envisage European diesel to be competitive against Middle East and USGC in Africa and Latin America
- **Jet fuel** strengthens relative to diesel, and jet fuel consumption is on track to surpass 2019 levels by the end of the year. The long-term jet fuel price is set by a modest "max-jet" blending signal, as strong sustainable aviation fuel penetration reduces demand for fossil jet fuel.
- Spreads between 10 parts per million (ppm) diesel and **1,000 ppm heating gasoil** reflect the swings in cost of desulfurization as natural gas prices fall gradually.

VLSFO bunker pricing

Europe's VLSFO price is expected to settle around $85 per metric ton below marine gasoil, in cracking parity with heavy, sweet feedstocks

VLSFO 0.50% sulfur bunker assessments (constant 2024 $/ton)

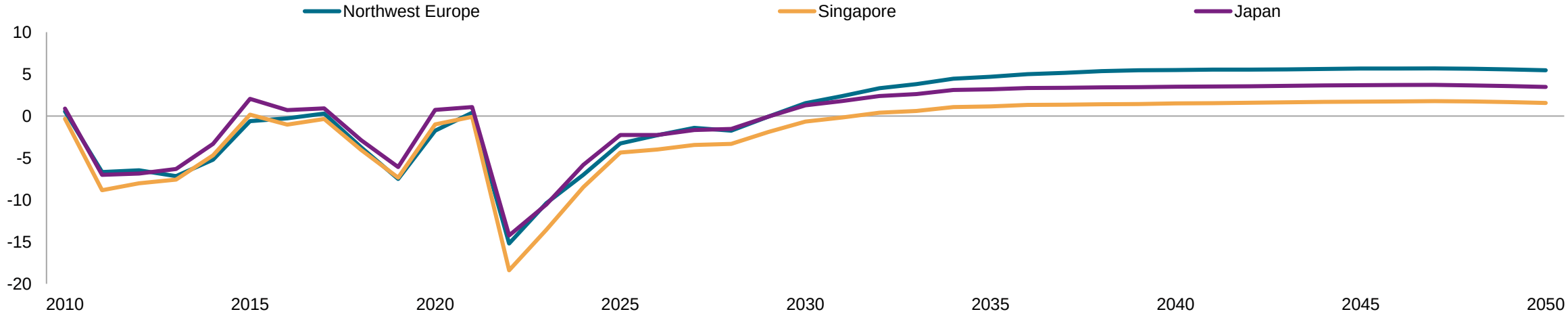


Data compiled November 2025.
IMO = International Maritime Organization
Source: S&P Global Commodity Insights.

- S&P Global Commodity Insights analyzed various pathways to produce **VLSFO** 0.50% sulfur, including back-out of sweet residue from residue catalytic crackers and from incremental supersweet hydroskimming of North Sea crude.
  - Between 2023 and 2025, VLSFO prices dived below incremental supersweet hydroskimming parity values, and remained far below incremental cracking and "overblending", reflecting plentiful supplies in Europe and elsewhere. In 2024-2026, VLSFO weakens as Dangote refinery operates in hydroskimming mode. Once Dangote RFCC fully operational, VLSFO is expected to strengthen again, with about 600,000 b/d of VLSFO-making crude processed in RFCC mode.
  - However, longer term, we continue to tie VLSFO prices to incremental supersweet hydroskimming, though short-lived price spikes may occur, especially when strong gasoline demand drives the sweet feedstocks market, while the latter tightens further over rationalization of marginal capacity.
  - In the second half of the decade, VLSFO demand growth globally stalls due to carbon intensity and vessel efficiency targets, and competition from alternative marine fuels, such as scrubbed HSFO, LNG, biofuels or hydrogen carriers, spurred by a carbon price.
  - We expect VLSFO about $100/mt below marine gasoil, on similar price tracks for net exporters Northwest Europe and the Mediterranean.
  - In May 2025, the Mediterranean Sea became a 0.1% sulfur emission control area (ECA), putting further downward pressure on VLSFO producers in the region.
- Traditionally quoted **LSFO** 1.00%S has become less relevant as a stand-alone product because its utility demand wanes, and it has disappeared from the bunker market. As a fall-out of VLSFO blending economics, the LS-HS fuel oil spread is therefore largely determined by VLSFO and HSFO prices.

Naphtha cracks will exceed historical averages, prompting refiners to shift yields toward naphtha, with investment in hydrocrackers a critical part of the solution

Naphtha cracks in Asia and Europe relative to Dated Brent (constant 2024 $/b)



- We have slightly lowered the naphtha price outlook in the near-term compared to last quarter. While we anticipate the market to remain weaker prior to 2030, we expect a growing call on naphtha from 2030. Strong EV penetration rates in mainland China are allowing refiners to shift yields toward petrochemical feedstocks, resulting in lower demand for naphtha. In Europe, the trend is similar, with refiners gradually adjusting yields away from transportation and other fuels, and toward naphtha.
- Our global forecast anticipates substantial greenfield investment in petrochemical-focused conversion units. However, in Europe we expect marginal supply to come from incremental investment at existing refineries. We also expect “max-naphtha mode” for hydrocrackers to see improving economics, justifying operational switches and potentially revamp investment decisions.
- In price-setting region Asia, we forecast a structural shift in naphtha cracks, with firmly positive margins from the early 2030s onward. Therefore, we anticipate “price taker” Europe to experience an increase in naphtha cracks, flipping to a structural premium by the early 2030s.
- Despite current market weakness, naphtha is projected to exhibit some growth potential through 2050, supporting the cracks. In the outer years of the forecast, European naphtha cracks will even exceed Japan naphtha cracks owing to GHG cost.

Data compiled November 2025.
Source: S&P Global Commodity Insights.

Links to S&P Global Commodity Insights Fuels and Refining research and resources

- Insight: US sanctions Lukoil and Rosneft: Impacts to Russian refining and refined product exports (24 Oct 2025)
- Insight: SOCAR buys IP, gains leading position in Italian downstream sector (20 Oct 2025)
- Insight: By 2027, Asia's oil story is no longer about relentless growth, but about selective resilience (16 Oct 2025)
- Insight: Australia's tighter gasoline specifications and the implications (16 Oct 2025)
- Insight: Bapco Refinery expansion marks a new chapter for Bahrain's product exports (13 Oct 2025)
- Insight: Naphtha on the rise: Navigating supply challenges and seasonal demand in Asia (13 Oct 2025)
- Insight: Refined product alert: Fire breaks out at Chevron's 290,000-b/d El Segundo refinery (6 Oct 2025)
- Insight: The Future of US Biofuels: Legislative Changes and Market Dynamics (29 Sep 2025)
- Insight: Market rumors of a potential Trafigura takeover of Rubis: is Africa's next fuel retail behemoth a deal away? (25 Sep 2025)
- Insight: Refining: Opportunities and threats in Iberian downstream (25 Sep 2025)
- Insight: Fujairah refineries face feedstock disruptions following UAE's maritime ban on Sudan (4 Sep 2025)
- Insight: Fundamentals of renewable natural gas (2 Sep 2025)
- Insight: From Discounts to Disruption: Russian crude oil, US tariffs and a new reality for India's refining sector (21 Aug 2025)
- Insight: Rags to riches — When does naphtha become a premium product? (15 Aug 2025)
- Market Briefing Refining Margin Report: 12 Nov 2025
- Market Briefing Refining Margin Report (daily)
- Scheduled Update Global Fundamentals Refining and Marketing Annual Strategic Workbook – 2025 (June 2, 2025)
- Scheduled Update Global Crude Oil Markets Annual Strategic Workbook, 2025 (June 4, 2025)
- Methodology Global and Regional Crude Oil and Refined Product Markets Methodology (Dec. 9, 2024)
- Methodology Integration of heritage Platts Analytics and heritage IHS Markit short-term oil supply: The new outlook explained (Aug. 18, 2023)
- Methodology Integration of heritage Platts Analytics and heritage IHS Markit short-term oil demand: The new outlook explained (July 25, 2023)

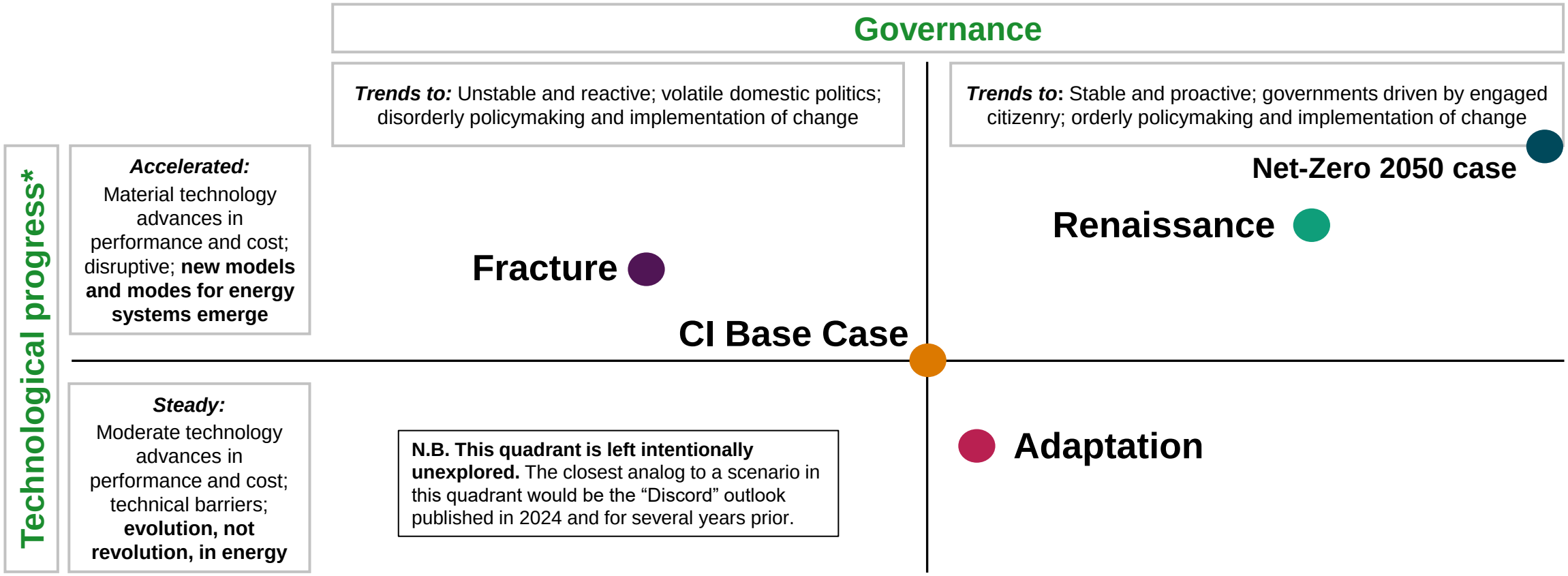
Selected recent reports, event materials and datasets. Access to individual reports depends on client subscriptions.

Scenarios

We are including excerpts from the recently released scenario outlook. This year, we have three new scenarios other than our Base Case also know as Annual Strategic Workbook Outlook (ASW 2025) released in May 2025. For detailed analysis please visit Connect or Platts Connect.

3 new scenarios, alternative to the ASW 2025, also known as CI Base Case, plus a Net-Zero 2050 case, emerged from the technology and governance matrix

Technology and governance trend matrix and locations of new scenarios and Net-Zero 2050 case



*From 2024 levels.
Net Zero case is not covered in this publication.
Source: S&P Global Commodity Insights.

The 2025 scenarios all build forward from the mid-2020's marked global increase in volatility and fragmentation of international relationships and trade

Commodity Insights Energy and Climate Scenarios and net-zero cases: Overview

CI Base Case 2025

The Commodity Insights base case view of the energy future. A world attempting to manage the instability and uncertainty of the early- to mid-2020s and facilitate an energy transition that conclusively pivots the global energy system away from fossil fuels, while still meeting the growing energy needs of developed and emerging economies alike. In this effort, the world is not entirely unsuccessful: the energy system of 2060 is far less reliant on fossil fuels than in 2025, and GHG emissions have seen decades of sustained decline, although the energy transition is far from complete.

Adaptation

Balancing fossil-fuel-powered economic growth against heightened global warming. Countries pivot toward strategies that emphasize adaptation to climate change via stronger, more resilient economies over emissions mitigation. This pragmatic focus on economic growth underpins robust energy consumption and resilient demand for fossil fuels, especially oil and gas, through the long term. Adaptation positions the benefits of a faster-growing global economy in the near to medium term against the risks of accelerated climate change in the longer term.

Fracture

Accelerated technological progress in a weak policy and governance environment. Rapid technological advancements, but also complex governance issues, and significant shifts in global energy dynamics as some markets decarbonize very rapidly, while others lag. The combination of poor governance and accelerated technological progress has profound implications for geopolitics and economics, as well as environmental issues such as climate change, creating a complex and often difficult future for energy markets and society at large.

Renaissance

Emerging markets play a key role in driving a late but accelerated energy transition. Profound shifts in the global balance of power, resulting in a more multipolar geopolitical landscape that is marked by a faster-than-expected rise of key EMDEs, which play a significant role in driving strong global economic growth and a more accelerated pathway of clean energy technology (CET) across the world.

Net-Zero 2050 case

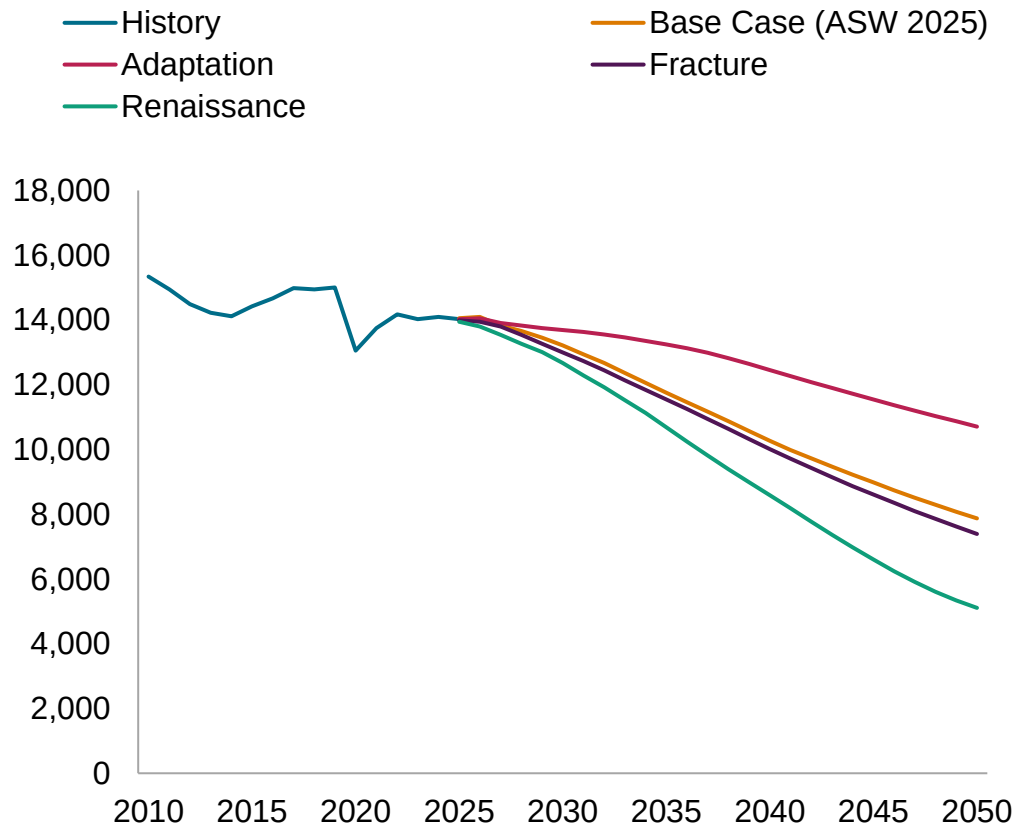
Net-Zero 2050

Illustrating a speculative and challenging path to global net-zero GHG emissions by 2050.

Commodity Insights considers a country or region to have effectively reached "net-zero" emissions once GHG emissions have fallen to less than 1% of their 2024 level and remain at that level over the course of a year.
Source: S&P Global Commodity Insights.

Europe: after passing peak refined product demand, our outlook shows continued decline across all scenarios in the region

Europe total refined product demand, Thousand b/d



Refined product demand is inclusive of biofuels and FT-fuels.
Data compiled: Aug 18, 2025.
Source: S&P Global Commodity Insights.

- Total refined product demand will continue to drop in the region across all scenarios, dropping most by 64% in the Renaissance scenario and 24% in the Adaptation scenario by 2050 from the current level. Jet fuel and naphtha demand will show resilience in our long-term forecast.
- Adaptation
  - Decline is slower due to stronger economic growth.
  - EV adoption still reduces gasoline and diesel use.
  - Feedstocks hold steady with modest industrial support.
- Fracture
  - Faster decline in oil demand than the Base Case.
  - Diesel demand drops significantly; gasoline also pressured.
  - Feedstocks decline slightly but remain more resilient.
- Renaissance
  - Sharp decline in oil demand driven by aggressive decarbonization.
  - Diesel and gasoline demand fall steeply.
  - Feedstocks decline modestly but remain more stable than transport fuels.

Appendix

NOTICE TO CLIENTS: INTRODUCTION OF THE GREENHOUSE GAS COSTS

As part of ongoing enhancements, we now account for greenhouse gas (GHG) emissions and their associated cost towards our refined product price and margin forecast for applicable markets. This is an additional consideration to our forecasting process, in which the GHG emissions cost will have a wide-range impact from the “cost passed on” to refined product pricing, leading to higher prices and crack spreads, as well as refinery “margin erosion”, leading to lower margins in the absence of investment in abatement.

We have implemented the costs associated with greenhouse gas emissions from the second quarter 2024 outlook because the European Union (EU) already has an existing and in-practice ‘cap and trade’ system to reduce emissions via a carbon market, i.e. EU Emissions Trading System (ETS), while the Singapore and California markets have a carbon tax for domestic industries (including refining) and established ‘cap and trade’ system, respectively.

For now, we assume the European, California (US West Coast), Singapore, Japan, and Korea markets continue with their respective GHG reduction policies, while USGC, the Middle East, and many emerging markets (such as Latin America and Africa) are not assumed to develop an equivalent emission reduction program.

For our European analysis, we are including a Carbon Border Adjustment Mechanism (CBAM) for refined products to take effect from 2031 with 9 years phase-in to 2040, during which, free allowances are phased out at the same pace as CBAM ramps up.

While not part of the current* CBAM policy, we also assume that European exporters will be granted compensation when exporting their lower-carbon, higher-cost products, i.e. an export rebate. From 2026, a discussion around this addendum will be part of the Commission’s assessment of the effectiveness of CBAM Phase 1, and its impact on the export of European products. This export compensation mechanism is assumed to appear in parallel with CBAM ramp-up. We believe this is the most likely scenario as the Commission is determined to ensure global competitiveness while removing risk of carbon leakage for exports. This will be a balancing act between trialogue negotiations (Commission, Parliament, and Council) and compliance of World Trade Organization (WTO) rules i.e. fair trade.

* Current CBAM policy refers to Phase 1 starting with a limited number of sectors

NOTICE TO CLIENTS: UPDATED YARDSTICK REFINERIES

From second quarter 2023 Long-term Outlook (LTO) onwards, we have updated our yardstick refinery configurations and margins. Purpose is to be closer to actual refinery operations and to offer more up-to-date margin estimates.

- These new yardsticks were retroactively applied from 2020, consequently historical margins for 2020-2022 will differ from our previous publications.

Key changes

- Natural gas use as refinery fuel instead of low-sulfur fuel oil, together with a move to TTF-indexed natural gas pricing for hydrogen production
  - Given the record-high natural gas prices in 2H2021, 2022 and 1H2023, some refinery margins may have fallen significantly compared to previous publications, especially heavy hydrogen-consuming benchmarks such as sour hydrocrackers or deep conversion complexes
- Electricity purchases (from the grid) instead of being generated internally, reducing the total internal refinery fuel consumption compared to prior benchmarks
- Introduction of VLSFO sales at finished-grade VLSFO price
  - Sweet benchmarks with significant VLSFO yields such as Azeri-processing plants in the Mediterranean are positively affected by this change, as finished-grade VLSFO prices are higher than the previously used sulfur escalator
- In Northwest Europe, introduction of Eurobob non-oxy as the key gasoline blend
  - In Northwest Europe, our benchmarks are based on production of Eurobob non-oxy, as it becomes increasingly relevant as a product amid widespread E10 roll-outs.
  - We do continue to publish finished gasoline prices as part of the price set.
  - In the Mediterranean Basin, we continue to base our yardstick refineries on finished gasoline given the lower prevalence of E10.
- We updated our crude assays to the most recently available versions. Consequently, some refinery outputs may show minor changes

In addition, historical prices are now aligned with S&P Global Platts data. Furthermore, we have adjusted the reference densities used in the crackspread calculations in line with those used in *Platts European Marketscan*. Most visible change is that all fuel oil grades now use 6.35 barrels per metric ton regardless of sulfur level.

Price forecast approaches and philosophy are different for short, medium, and long term

Forecast horizons:

- **Short term** (24 months)
  - Evaluation of current market versus balanced market equilibrium level—how “long/short” is the current market?
  - Accounts for market momentum, inventory levels, trade dynamics, capacity outages, etc.
  - Seeks to reflect industry response from current condition forward over a period of months based on available capacity, feedstocks, ability to arbitrage and other constrains

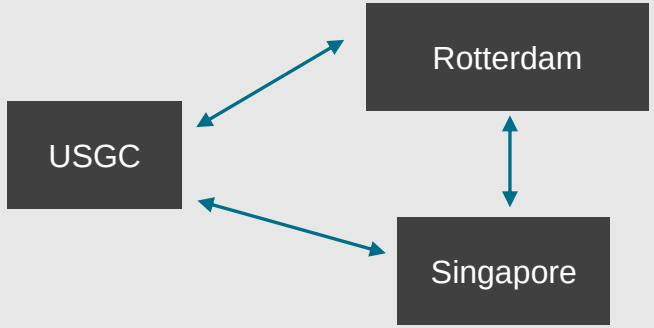
- **Medium term** (approximately 5–10 years)
  - Balance starting from short-term balance and incorporating investment and capacity changes
  - Addresses cyclic dynamics of market—reversion to the mean as defined by long-term equilibrium

- **Long term** (currently to 2050)
  - Based on long-term demand trends, projections of costs and technology developments
  - Equilibrium pricing set by incremental and reinvestment economics for selected benchmarks assets (e.g., margin integrated naphtha cracker in Asia or return on coking upgrade project in Asian refinery).
  - Capacity additions modeled to meet demand growth—seeking resultant price that allows profitable supply without overbuild

Refining and price forecast methodology

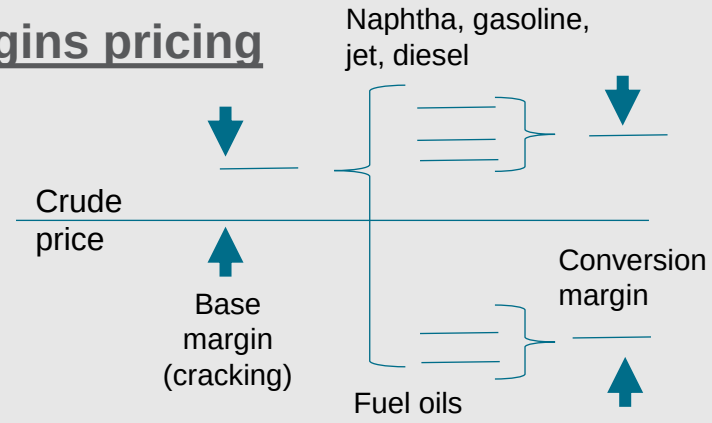
Refining utilization and margins

Margin input in each major region. Arbitrage established to support trade flows



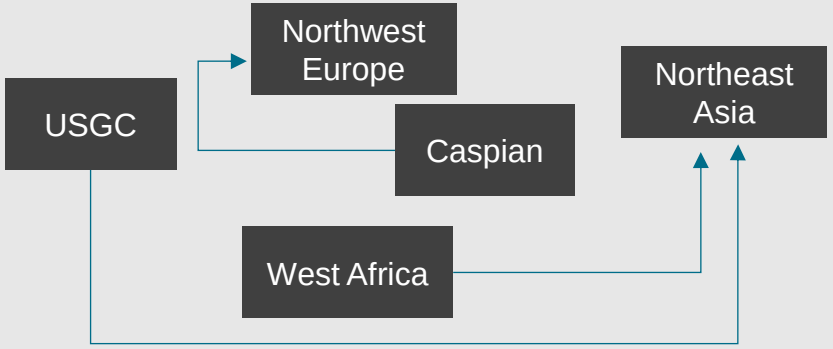
Refining margins pricing

Base margins set at stay-in-business levels. Conversion projects and new build refineries provided investment returns in only certain markets

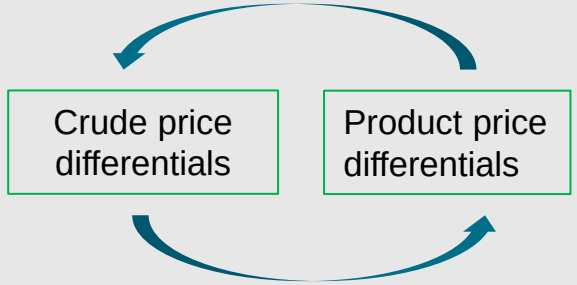


Crude pricing: Trade and quality

Crude FOB price relationships determined through marginal-refining economics and transportation



Crude product pricing



Crude and product price relationships inter-related through refining economics.

Relationship based in each regional market

Source: S&P Global Commodity Insights.

Contact us

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