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Global refining: Profiting in a downstream downturn

Amid long-term margin declines in the global refining market, players must move quickly to adjust their portfolio strategies.

by Emily Billing and Tim Fitzgibbon

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Refiners have been able to count on steady growth in oil demand for years—but not for much longer.[1] Over the past decade, rising incomes in developing countries and the popularity of vehicles with high fuel consumption in developed countries have pushed up oil demand by about 1.2 percent per year. However, some oil-fueled transportation is now being displaced by improvements in fuel efficiency, the rise of alternative fuels and electric vehicles, and the emergence of other transport options such as lift sharing.

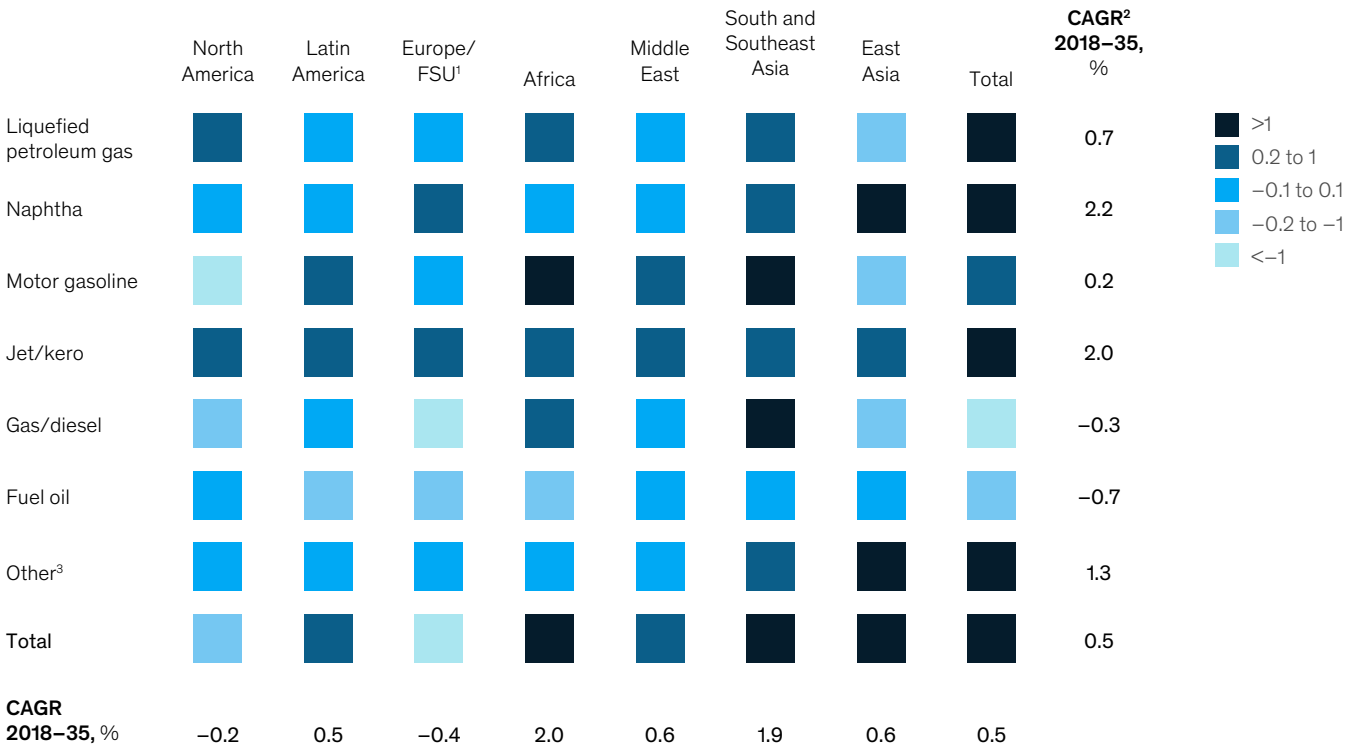
Between now and 2035, growth in global oil demand will slow to 0.5 percent per year, with demand for road transport peaking by 2026 and demand for oil overall peaking by 2032. The few sectors with continuing demand growth will be those with poor fuel substitutes, such as aviation, or nonfuel end uses, such as petrochemicals (Exhibit 1).

The pace of change will vary by region. Europe and North America will see demand for liquids falling by 0.3 percent per year from 2018 to 2035, particularly in road transport, as the adoption of electric vehicles accelerates. Developing regions, such as Asia, Africa, and Latin America, will continue to see some growth across most fuels, with the strongest in light ends (liquefied petroleum gas and naphtha) and transport fuels. Africa and South and Southeast Asia will see the fastest growth, with liquids demand growing at 1.9 and 2.0 percent per year, respectively, up to 2035.

Exhibit 1

Demand growth is shifting toward Asia and nonfuel end uses, such as petrochemicals.

Change in petroleum-product demand, 2018–35, million barrels per day



[1] Former Soviet Union.
[2] Compound annual growth rate.
[3] Includes reformate BTX (feedstock into aromatics unit at refinery), bitumen, lubes, waxes, petcoke, and other oil products.

Source: Energy Insights by McKinsey

[1] See Namit Sharma, Bram Smeets, and Christer Tryggestad, "The decoupling of GDP and energy growth: A CEO guide," *McKinsey Quarterly*, April 2019, McKinsey.com.

Yet refining capacity keeps growing

Despite the weakening outlook for global demand, refining capacity continues to grow. Global distillation capacity is expected to grow by 1.3 percent per year between 2019 and 2023, mostly as a result of greenfield additions in Asia (more than 2.4 million barrels per day) and the Middle East (more than 1.8 million barrels) (Exhibit 2).[2] In an attempt to capitalize on Asia's strong oil demand, refiners are investing in large new refineries and expanding existing ones, particularly in China and Southeast Asia. Capacity growth in Asia during 2019 is set to be the highest in recent times, with even more additions expected in 2020. Beyond 2025, 600 thousand barrels per day of distillation capacity and an equal amount of condensate splitters will be added to meet the region's continuing growth in demand for light product and naphtha.

A few projects are expected to be added in other regions too, but not on the same scale. In Africa, the 500 thousand barrel per day Dangote refinery is intended to alleviate persistent product shortages in oil-rich Nigeria. Even so, Africa will still rely heavily on imports of light products to meet still-growing demand.

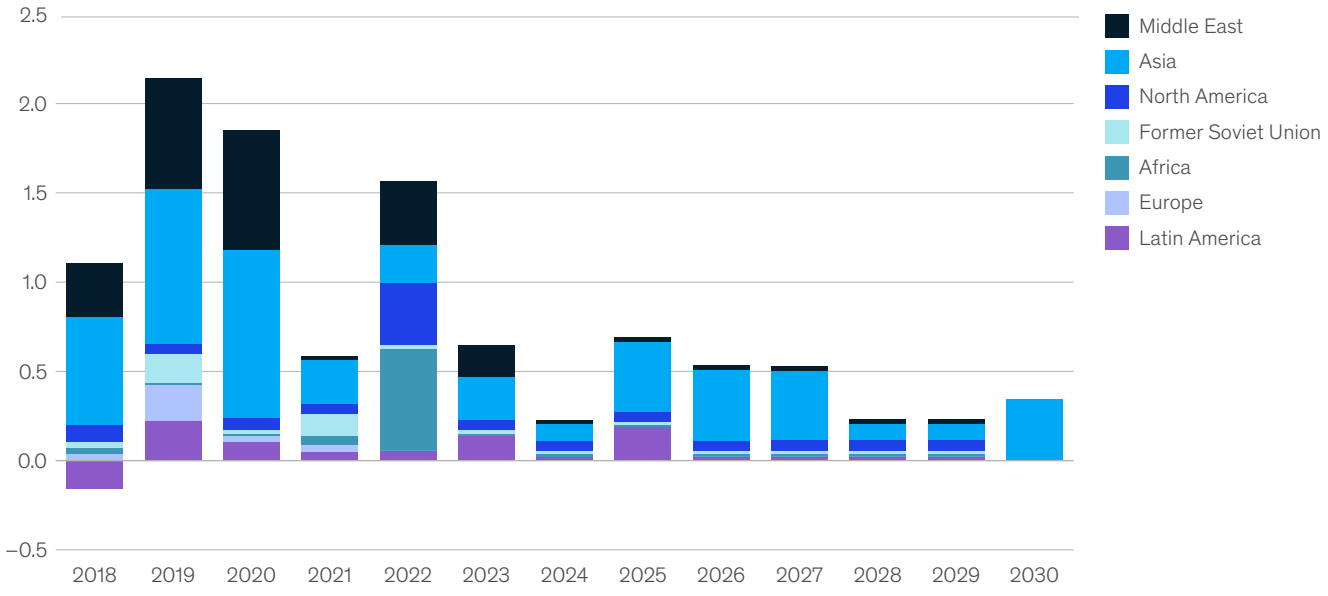
A mixed outlook for utilization

The combination of slowing growth in global demand and continuing expansion of refineries will cause global overcapacity to increase and utilization to decline. The implementation of IMO 2020—the agreement of the International Maritime Organization to limit the sulfur content in marine fuels to 0.5 percent—should temporarily boost utilization, with refineries running harder to supply low-sulfur diesel to replace higher-sulfur residual fuel oil in bunker markets.[3] By 2022, though, this effect should be offset by refiners' efforts to increase the supply of low-sulfur residual fuel oil along with shippers' investments in installing scrubbers to allow more

Exhibit 2

Refining capacity will grow, despite faltering demand.

Change in refining distillation capacity, million barrels per stream day



Source: Energy Insights by McKinsey; McKinsey analysis

[2] These figures include a 0.25 percent "creep factor" to account for debottlenecking up to 2030, except in Australia, Europe, and Japan, where market dynamics are expected to eliminate creep by 2023.
[3] See Emily Billing, Tim Fitzgibbon, and Anantharaman Shankar, "IMO 2020 and the outlook for marine fuels," September 2018, McKinsey.com.

high-sulfur residual use. The market is expected to shift quickly toward overcapacity and lower utilization, with different regions feeling the impact in different ways (Exhibit 3).

Europe will see the greatest downside, with light product demand starting to fall in 2021 and with utilization hit by a strong wave of capacity additions in Africa, Asia, and the Middle East. After a sharp fall from 83 percent in 2020 to 67 percent in 2023, utilization remains level through to 2030. These levels of utilization are likely to prove unsustainable for some refiners, triggering a wave of capacity rationalization.

By contrast, the Asian hub should see only a temporary reduction in throughput before growing regional demand pushes utilization back up again, with regional refiners showing restraint in adding more capacity. This brings Asia hub utilization beyond 80 percent by 2025, and up to 85 percent by the early 2030s.

On the US Gulf Coast, utilization is projected to fall only slightly, from 86 percent in 2020 to 84 percent in 2023, before continuing at this level. This higher utilization is supported by cheap crude from an excess of local supply coming from booming unconventional (shale oil) production. Gulf Coast refiners should continue to benefit from their installed base of highly complex and efficient capacity and their close proximity to Latin America, a structurally short market.

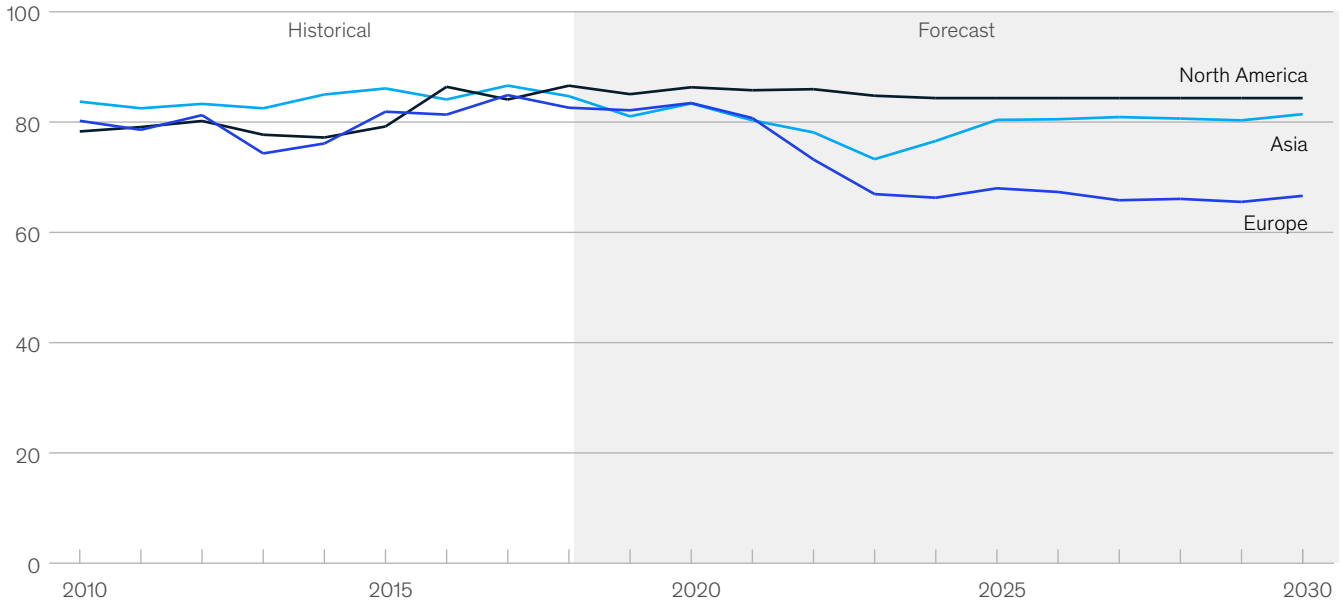
Rationalization is likely

This outlook for refinery utilization will lead to a new wave of rationalization, particularly in Europe. With structural disadvantages including weak local demand, inefficient refining capacity, and declining local crude supply, it is the region most susceptible to closures. Indeed, roughly 900 thousand barrels per day of distillation capacity would need to be closed to bring European hub utilization up to 80 percent in 2035.

Exhibit 3

Utilization falls sharply in Europe but remains healthy in Asia and North America.

Regional-hub[1] refining utilization, distillation capacity, % per stream day



[1] Asia = Singapore, South Korea, and Taiwan; Europe = Belgium, Netherlands, and United Kingdom; North America = US Gulf Coast.

Source: Energy Insights by McKinsey

Marginal assets in other mature markets also look likely to close. Australia, Northeast Asia, and the US East and West coasts, share similar characteristics: demand that is flat or falling; an installed refining base that includes plants with low complexity, high costs, or both; and locations that lack advantages in crude supply or attractive nearby opportunities for product export.

History suggests the path to rationalization will be slow and inefficient, with the least efficient plants (those with a simple configuration and high costs) not necessarily being the first to close.

Creating value in the downturn

Despite this challenging outlook for refining, there is some good news. Even with rationalization, the industry should remain sizable for decades to come, with significant pockets of profitability in some regions at some points in the cycle.

Refiners should act now to reposition their portfolios strategically for the challenging decade ahead. The approach they take will vary depending on their nature, asset focus, and financial position. Even so, a few themes are likely to be central to any successful long-term strategy.

First, more efficient assets can be restructured to shift refiners to the left-hand side of the cost curve. Second, refiners with marginal assets should be looking out for the best approach and timing for exit. Third, any new projects should be evaluated based on realistic views on short- and long-term market conditions and project economics. Fourth, as lengthening supply chains create a need for investment in logistics capacity, some players may see opportunities to diversify their assets or offerings. Finally, investors should be looking for opportunities in the margin cycle to acquire assets at a bargain price.

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