
Demand Recovery Won't Halt Refinery Shrinkage

Lower throughput threatens competitiveness.

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Data Sources for This Publication
EIA

Closures and Sales

According to the Energy Information Administration's annual survey, total U.S. refinery capacity stood at a record 19.15 million barrels/day on Jan. 1. That's likely the peak point for an industry that was already shrinking in 2019, a year marked by plant closures and a pivot toward renewable diesel. Then came the coronavirus. Between January and October, refinery throughput averaged just 14.3 mmb/d, or 76% of available capacity. The sudden loss of demand and throughput this year after a lackluster 2019 spurred refiners to slate about 1.1 mmb/d of capacity for closure and put a further 0.5 mmb/d up for sale. This note reviews U.S. refining in the light of current and future demand as prospects for a coronavirus vaccine turn investors' thoughts to recovery.

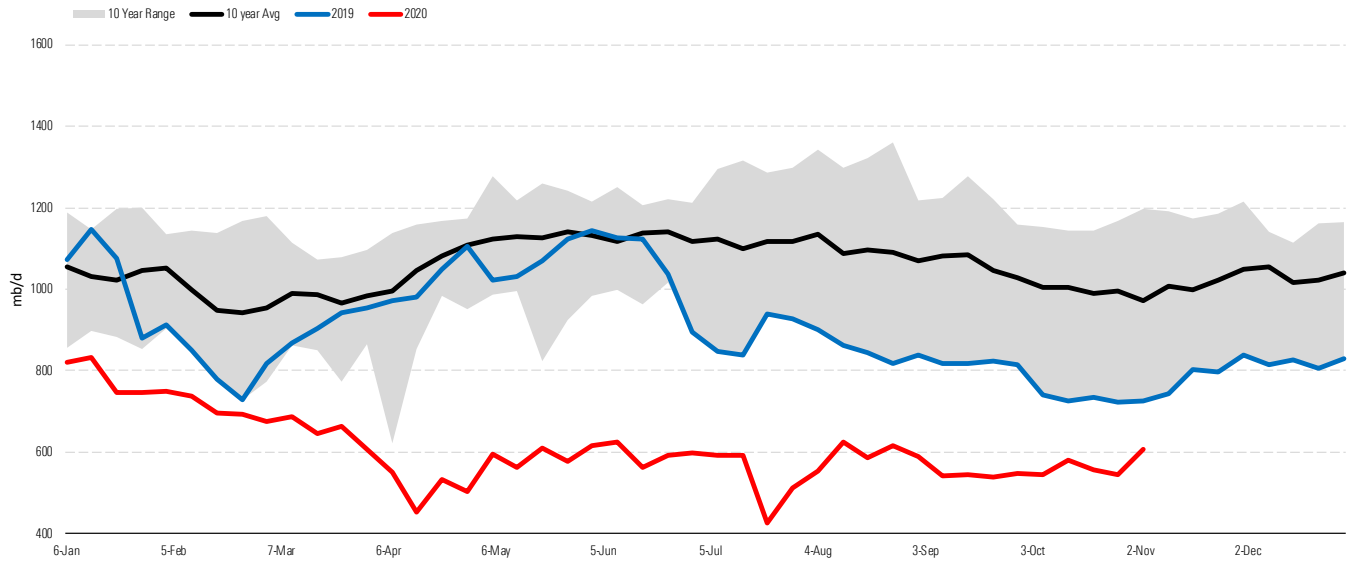
Previously

After a record-breaking 2018, U.S. refiners enjoyed a quieter 2019 with reduced throughput and tighter margins (see our January note [Reduced Throughput and Tighter Margins](#)). However, nothing prepared the industry for the impact of nationwide lockdowns this year since March, as low crude prices and product demand crushed margins (see our July note [U.S. Refiners' Worst Second Quarter in a Decade](#)).

Coronavirus Impact

As mentioned above, refinery runs this year averaged 14.3 mmb/d between January and October, or 76% of the 18.5 mmb/d available operable capacity, in the wake of the coronavirus pandemic. That left 4.2 mmb/d unused in an era where U.S. refiners have regularly operated above 90% capacity. The impact of the slowdown hit hardest on East and West Coast refiners located in Department of Energy Petroleum Administration for Defense Districts I and V, where higher operating costs turned refining margins negative and forced operators to consider shutdowns.

On the East Coast, EIA data shows refinery throughput dropping to an average 553 thousand barrels/day in April, or 63% of operable capacity, bottoming out at 425 m/d in mid-July and then recovering to average 567 mb/d in October, according to weekly surveys. As of the end of October, PADD I refineries were running at 63% of their 10-year average throughput and 17% below last year's levels (Exhibit 1).

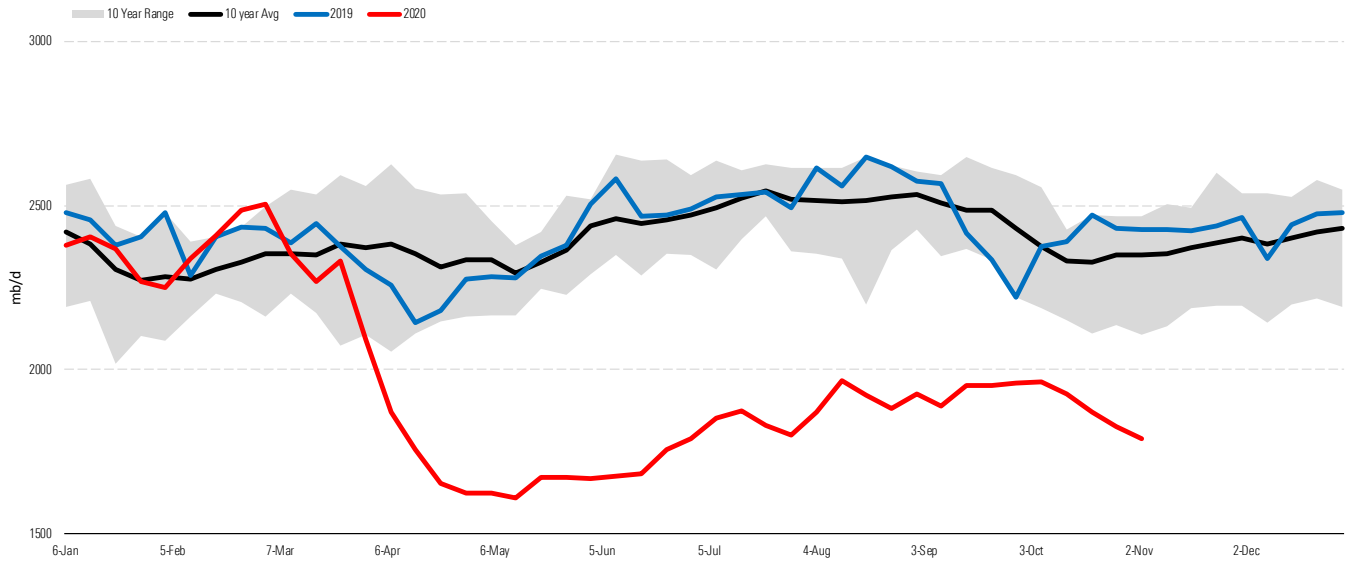
Exhibit 1 Seasonal East Coast Refinery Crude Throughput

Source: EIA, Morningstar.

PADD 1 throughput hasn't recovered from the loss of Philadelphia Energy Solutions' 335 mb/d Philadelphia plant to a fire and subsequent closure in June 2019. The pandemic further reduced the region's refinery stack this year. In March, the 130 mb/d North Atlantic refinery in Newfoundland on Canada's Atlantic coast—a major source of supply to PADD I—was shut and may not reopen if its owners can't find a buyer. In early November, PBF Energy announced plans to shutter 85 mb/d of production at its Paulsboro, New Jersey, refinery. Another Philadelphia refinery, the 190 mb/d Monroe Energy plant owned by Delta Air Lines, has been for sale with no takers for over a year. One of the region's only positive developments, the planned reopening of the 200 mb/d Limetree Bay refinery in St. Croix, U.S. Virgin Islands, has met with continued delays and, according to Reuters, will jeopardize its processing agreement with BP if it isn't online by December.

West Coast refiners haven't fared much better than their PADD I counterparts, with run rates at the end of October still 26% below this time last year and 24% below their 10-year average (Exhibit 2). PADD V crude throughput averaged 1.8 mmb/d in April, bottomed out in May at 1.6 mmb/d, and has only recovered to 1.9 mmb/d on average in October, according to weekly EIA surveys. That's nearly a million barrels/day below available operating capacity. Plant owners reading the writing on the wall have been closing or trying to sell facilities. Refineries in California and Washington are worst hit, with Marathon closing its 166 mb/d Martinez, California, plant for good in August and Phillips 66 announcing the same month that its 120 mb/d Rodeo, California, plant will be converted to renewable diesel production by 2023. In Washington, Shell plans to sell its 145 mb/d Anacortes refinery or close it if a buyer can't be found.

Exhibit 2 Seasonal West Coast Refinery Crude Throughput



Source: EIA, Morningstar.

Nationwide, refinery closure announcements and conversions to renewable diesel (see [Sixfold Increase in Renewable Diesel Capacity Coming!](#) for more on this topic) amount to at least 1.1 mmb/d of capacity losses (Exhibit 3). A further 0.5 mmb/d of capacity is up for sale with scant sign of buyers in today's low-margin environment. Even more capacity is currently idled as owners have either advanced planned maintenance or shuttered plants to avoid heavy losses until demand recovers. These include three Louisiana refineries additionally disrupted this year by a worse-than-usual hurricane season. In this environment, there's little sign of new capacity to counter the closures. ExxonMobil has delayed until 2023 its planned 200 mb/d expansion to a Beaumont, Texas, refinery, and as we mentioned, the opening of the rebuilt Limetree Bay plant in St. Croix has been delayed. Other new projects on the drawing board are all small refineries under 50 mb/d capacity planned for North Dakota and Texas over the past few years. Some of these plants have received permits, but none have been constructed and all will struggle to attract investment until overall demand recovers.

Exhibit 3 Refinery Closures

Company	Location	State	Capacity (mb/d)
PES	Philadelphia	PA	335
Targa	Channelview	TX	35
Marathon	Martinez	CA	166
Marathon	Gallup	NM	26
Phillips 66	Rodeo	CA	120
Holly Frontier	Cheyenne	WY	48
Marathon	Dickinson	ND	19
PBF	Paulsboro	NJ	85
CVR	Wynnewood	OK	20
Shell	Convent	LA	211
	Total		1065

Source: Company reports, Morningstar.

Recovery Tied to Exports

Any refining recovery requires an available COVID-19 vaccine to restore public faith in travel and a return to 2019 levels of transport fuel demand. For U.S. refining, recovering international demand for refined product exports is also critical. That's because domestic industry growth, particularly in the Gulf Coast region, has been driven for years by exports. EIA annual data shows that total U.S. gross distillate exports of 1.3 mmb/d in 2019 represented 32% of the 4.1 mmb/d domestic market, and gross gasoline exports of 0.9 mmb/d represented 10% of the 9.3 mmb/d domestic market. Between 2010 and 2019, average exports of gasoline and jet kerosene from the PADD III Gulf Coast region tripled, and distillate exports doubled. During that period, an average 88% of gasoline, 84% of distillate, and 71% of jet kerosene exports came from PADD III.

While the Gulf Coast has been the export engine, regions like the East and West Coasts have continued to import refined products. Nevertheless, the U.S. has been a net refined product exporter since 2011, averaging 2.9 mmb/d of overseas shipments of all products in 2019. Net exports even continued to grow in 2020, averaging 3.1 mmb/d between January and October, but that reflected lower imports as demand shrank in the pandemic, rather than expanding exports.

The bottom line is that U.S. refiners produce more than the domestic market needs, so the key to recovery lies in the resurgence of international demand. Except for liquid petroleum gases largely exported to Asia, most refined product exports in 2019 were to Central or South America. And LPG exports are largely produced by natural gas processing plants, not refineries. That means U.S. refined product export recovery depends heavily on Latin America, Mexico, and Brazil. Typically, these countries buy from the lowest-cost supplier, so U.S. refineries need to remain competitive to keep their business.

During the shale era, access to lower-priced domestic crude and cheap natural gas fuel allowed Gulf Coast refiners to run their plants efficiently at high-throughput levels and compete on price for overseas market share. Looking forward, we expect this environment to get tougher for U.S. refiners. Expected

lower shale production in coming years will reduce access to advantaged crude, and domestic natural gas fuel costs are being driven up by demand for liquefied natural gas exports. These factors reduce Gulf Coast competitiveness. A build-out of large efficient export refineries in Asia in the coming decade also threatens U.S. refined product export market share.

Domestic Pressures

In the domestic market, pressures on hydrocarbon refined product demand come from several directions. We've already mentioned the impact of renewable diesel, where U.S. refiners can grab market share and margins by converting existing plants, but only at the expense of traditional crude processing throughput. That loss of traditional throughput increases costs for other products, threatening export competitiveness. As we pointed out last week (see [U.S. Energy Election Winners 2020](#)), the new Biden administration favors higher obligations for refiners to blend renewable fuels like ethanol, which reduces market share for traditional refineries. In general, gasoline consumption faces pressure from increased market penetration of alternative-fuel vehicles such as electric cars and tighter federal Corporate Average Fuel Economy limits that make existing gas vehicles more efficient. For refiners, long-term trends away from fossil fuels are affecting access to investment and driving renewable agendas at major oil companies like BP and Shell.

On the Ropes

U.S. refining is on the ropes, and the coronavirus pandemic has arguably hastened its demise by providing consumers a vision of alternatives to heavy travel schedules. Positive news about a vaccine last week opens a path for refined product demand to recover, but not before the industry shuttered 1.1 mmb/d of refining capacity and put another 0.5 mmb/d up for sale. This signals that shrinking capacity is here to stay and that further consolidation is needed to return the industry to profitability. In that context, the bigger challenge is finding buyers willing to increase their exposure to refining at a time when investors generally are shying away. ■■

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