

East Coast Refining After the Shale Boom

Is the honeymoon over for PADD 1 operators?

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Data Sources for this Publication

- CME Group
- EIA
- ICE Futures

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Imported Crude Cheaper Than Domestic Barrels Again

The shale boom breathed new life into East Coast refineries that were under threat of closure by their owners between 2009 and 2012. Now some of those same refineries are under threat again, suffering poor margins as well as expensive compliance with environmental regulations.

After enjoying three years of improved margins through access to advantaged domestic crude, delivered by rail from North Dakota, five Atlantic Coast refineries are once again paying international prices for imported crude in 2016 after differentials between domestic benchmark WTI and international equivalent Brent narrowed to \$1 per barrel in the wake of the crude price crash and an end to the federal ban on most crude exports.

This note provides highlights from our recently published East Coast Refining Outlook.

East Coast Refining Fundamentals

Our analysis focused on seven refineries operating in PADD 1 (Exhibit 1). Two plants were not included because they do not produce transport fuels (that is, gasoline, diesel, or jet kero). These are the 11 thousand barrel per day American Refining Group plant in Bradford, Pennsylvania, that produces lubricants and the 42 mb/d asphalt plant in Paulsboro, New Jersey, owned by private equity investor Lindsay Goldberg and operated by Axon Specialty Products.

Exhibit 1 Transportation Fuel Refineries in PADD 1

| Refinery | State | Company | Capacity | Category |
|-------------------------------|-------|-------------------------------|----------|-------------------|
| Bayway | NJ | Phillips66 | 238000 | Large Independent |
| Paulsboro | NJ | PBF | 160000 | Large Independent |
| Delaware City | DE | PBF | 182200 | Large Independent |
| Philadelphia Refining Complex | PA | Philadelphia Energy Solutions | 335000 | Private Equity |
| Ergon Newell | WV | Ergon | 22300 | Privately Owned |
| Warren | PA | United Refining | 65000 | Privately Owned |
| Trainer | PA | Monroe/Delta | 190000 | Small Independent |
| | | Total | 1192500 | |

Source: EIA, Morningstar

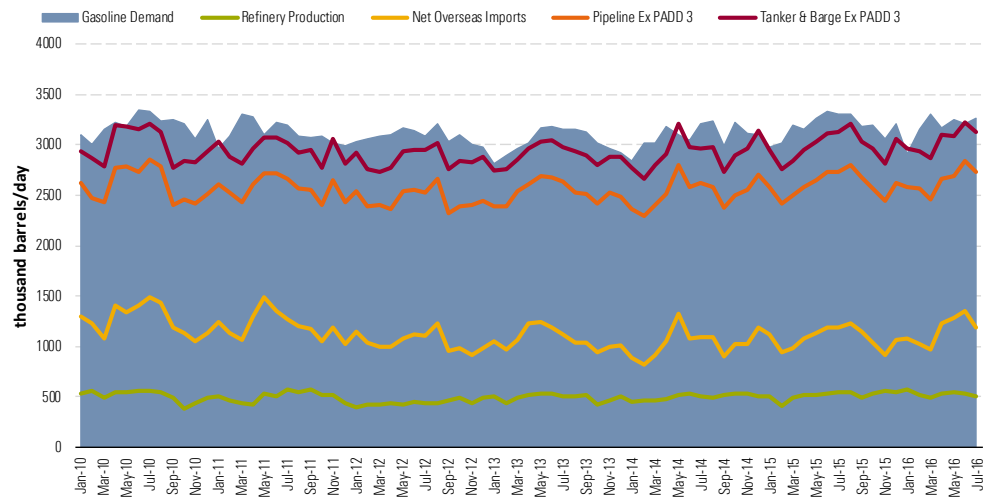
The total operating capacity of these seven refineries is 1.2 million barrels/day (source: EIA). The plants are owned either by independent refiners or by private firms. The largest owner by capacity is PBF

Energy, which operates two refineries in Delaware City, Delaware, and Paulsboro, New Jersey. The second-largest is Philadelphia Energy Solutions, or PES, which operates the 330 mb/d Philadelphia Refining Complex close to Philadelphia. The third-largest is the 238 mb/d Phillips 66 Bayway refinery in Linden, New Jersey, and the fourth-largest is Delta Airlines, the parent company of Monroe Energy, which operates a 190 mb/d refinery at Trainer, Pennsylvania. The two remaining plants are the 65 mb/d United Refining in Warren, Pennsylvania, and the 22 mb/d Ergon refining in West Virginia.

Northeast Refined Product Supply and Demand

PADD 1 refinery economics should be viewed in the context of the large deficit between regional refined product demand and the capacity of local refineries to meet that demand. Because the Northeast has a large population and relatively few refineries, demand for gasoline and diesel is several times larger than refinery output. For example, EIA data shows that in 2016 through July, PADD 1 refineries produced an average 0.53 mmb/d of gasoline—representing just 16% of regional demand of 3.18 mmb/d. Over the same period, PADD 1 refineries produced 0.32 mmb/d of distillate (diesel and heating oil), or 27% of the 1.2 mmb/d regional demand. The balance of refined product supply is sourced from outside the region: by pipeline from the Gulf Coast, by tanker and barge from the Gulf Coast, and by waterborne imports. As the balancing supply is from imports, refined product prices are set in the international market. Exhibit 2 shows PADD 1 gasoline demand (shaded area) and sources of supply (stacked lines), which are detailed in our Outlook.

Exhibit 2 PADD 1 Gasoline Supply/Demand



Source: EIA, Morningstar

Crude Supply

Prior to the shale boom, East Coast refineries relied exclusively on international markets for crude feedstock, priced against Brent. Because both products and crude were priced internationally, PADD 1 refineries held little or no competitive advantage over rivals in the North Atlantic Basin. During the period following the Great Recession in 2008, as product demand declined, refining margins in the North

Atlantic suffered as a result of overcapacity. As a result, several plants were shuttered, including on the East Coast, because of poor returns.

Refineries in PADD 1 experienced a renaissance during 2013-15, when midstream operators developed routes to deliver cheaper domestic supplies of shale crude — priced against WTI and discounted because of booming shale production — over land by rail to the East Coast. This access to discounted shale crude reduced (temporarily, as it turned out) their reliance on international crude and provided an advantage over Atlantic Basin competitors, improving their performance and leading at least two shuttered plants to be restarted.

A combination of market events since 2015 has greatly reduced the flows of shale crude to East Coast refineries in 2016. First, a build-out of pipeline infrastructure to relieve Midwest congestion reduced shale crude discounts to coastal crude. Then, the oil price crash accelerated the narrowing of the WTI discount to Brent that justified crude-by-rail shipments to PADD 1. The narrow discount no longer covered crude-by-rail freight cost and made imports more attractive again. Finally, the end to the federal ban on most U.S. crude exports in December removed an artificial barrier keeping domestic crude discounted, leveling the playing field with international competitors and pushing the Brent premium over WTI down to an average \$1/barrel in 2016 (through September).

Refinery Spotlight

With their access to advantaged priced crude removed in 2016, East Coast refiners are now operating in the same difficult environment that led to closures between 2009 and 2012. Crude and refined product prices are set in the international market, leaving refining margins determined by the lowest-priced competitors in the Atlantic Basin. As U.S. refiners, they are at a disadvantage in this market because of additional costs associated with U.S. environmental regulations. These include the cost of meeting Renewable Fuel Standard mandates to either blend renewables with gasoline and diesel or purchase renewable identification number, or RIN, credits to meet federal targets, as well as investment to reduce the sulfur content in gasoline to meet Tier 3 regulations (both detailed in our September note: [Refiners Hit By Lower Margins and Higher Costs](#)). The traditional Northeast heating oil market is also under threat because of prolific cheap natural gas from the Marcellus.

Within this challenging environment, individual refineries perform differently depending on the cards that they hold. Our outlook reviews the strengths and weaknesses of the seven East Coast refineries. Those owned by larger independent companies are in better shape to survive the latest downturn in PADD 1 margins because they typically have downstream wholesale or retail networks that improve margins and reduce exposure to RIN blending costs. United Refining and Ergon are located away from the coastal market and are better-insulated from the more competitive environment. Ergon is a specialized plant that produces minimal transport fuels. The weakest performers are the large Philadelphia refineries owned by PES and Monroe Energy. These refineries are exposed to high RIN costs and do not have downstream network revenue to offset the impact of lower refining margins.

Refining Outlook

Despite lower margins, PADD 1 refiners appear to be more positive about the refining environment in 2016 because average run rates (through Sept. 30) were at 88%, as high as the 2015 average. Recently, PADD 1 refiners have benefited from higher gasoline prices and a dip in inventories after the Colonial pipeline leak in September, as well as the perceived impact of Hurricane Matthew in October. The tentative OPEC accord on production limits in Algiers at the end of September has increased crude prices but has also led to higher refined product prices, supporting margins.

Prospects of a recovery to the kind of margins experienced between 2013 and 2015, when they had access to advantaged crude delivered by rail, seem limited for PADD 1 refineries in the current environment. If OPEC crude output measures lead to a recovery in oil prices, we expect U.S. shale production to recover and keep a lid on prices going forward. However, even with higher U.S. production, in the absence of the export ban, domestic crude is unlikely to be available to East Coast refineries at sufficient discount to support rail transportation. In the short term, the challenge for PADD 1 refineries is to survive and remain profitable in a low-margin market. In the longer term, there are prospects for a better refining environment in PADD 1, based on future expansion of oil production in the Utica Basin which lies beneath the region. ■■

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