

The Impact of Refining Sector Changes on Patterns of Oil Product Trading

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The global oil market is undergoing a profound transformation, the depth of which is inadequately captured by the popular cliché ‘the new oil map’. For the changes underway in the market go beyond a mere geographical reallocation of supply and demand or even refining capacity. The supply chain itself – the way oil is being delivered from the wellhead to end-users – is transforming. The old system, in which crude trading was largely global but refining and distribution were mostly local, is being turned on its head. Product trading is globalising and the product supply chain is getting both longer and more fragmented, an evolution which carries significant implications for supply security and prices.

Those tectonic shifts in product trading are first and foremost a consequence of the evolution in the refining industry. According to the International Energy Agency’s recently released *Medium-Term Oil Market Report (MTOMR)* 2013, global refining capacity is slated to jump by 9.5 mb/d from 2012 to 2018. That expansion far exceeds the forecast increase in crude supply capacity (8.4 mb/d) over the same period, let alone that in global demand (6.9 mb/d). Virtually all of the expected increase in refining capacity will come from emerging market and industrialising economies. China alone, extending recent trends, is expected to account for roughly 45 percent of the increment, followed by the Middle East with nearly 25 percent. This would bring refineries in advanced economies outside of the United States under severe pressure. Some 4 mb/d of OECD crude distillation capacity has already been idled or earmarked for shutdown since the 2008 financial crisis, including 1.2 mb/d last year alone and 0.8 mb/d in 2011. To keep utilisation rates at traditional, pre-financial crisis levels, another 4.5 mb/d of capacity or more may have to shut down in the next few years. European refineries, some 15 of which will have closed by end-year since 2008, would be most at risk.

Changing demand patterns only partly

account for these refining shifts. For the first time this quarter, the non-OECD region is expected to consume more oil than the OECD, a gap which is forecast to widen steadily over the next few years. Taken in aggregate, however, non-OECD refining capacity is expanding much faster than regional demand. The non-OECD region already accounts for more than 50 percent of global refining capacity, a share projected to jump much higher by 2018, the end of the *MTOMR* forecast period. However steep the current contraction in European oil demand may appear, the region’s refining capacity is also falling even faster than its oil use. European product imports – despite weak economic and demand growth – are surprisingly robust.

Changes in refining capacity, compounding the impact of shifting supply and demand patterns, are redirecting crude and product trade flows. Despite a projected increase in global oil demand, the *MTOMR* forecasts that international crude trade will drop by 900,000 b/d. This will be more than offset by rising product flows. Crude oil is increasingly being refined near the wellhead: this is true both of North America, where rising production of US Light, Tight Oil (LTO) and Canadian oil sands is displacing crude imports, and of the Middle East, where refining capacity expansions are keeping more crude at home for internal use or to be exported as products.

The redistribution of regional capacity is thus resulting in a significantly longer supply chain. Refining is increasingly becoming an export industry. A string of refining powerhouses dots the coastal lines of the ‘new oil map’. The United States, which only yesterday ranked as the world’s number one net product importer, has virtually overnight become one of its top two exporters – thanks to falling domestic demand, cheap natural gas and a growing supply of ‘price-advantaged’ domestic crude. Indian refiners, whether state- or privately owned, continue to build up their refining capacity, in large part for export. In China, where demand growth has recently shifted to a lower gear,

refiners nevertheless continue to aggressively expand. As a result, diesel, gasoline and jet fuel exports have surged, and are expected to keep growing as more refining capacity comes on stream in the next few years. The Middle East, led by Saudi Arabia, is expanding downstream through joint ventures with foreign partners to diversify its economy and capture more of the value chain. While that is partly meant for domestic purposes, meeting local demand at subsidised prices clearly is not what the foreign partners have in mind. Russia has long been a large product exporter as well as a major crude supplier.

At the other end of the trade, more and more countries – whether they are undergoing economic expansion like Latin America or contraction like Europe – are growing dependent on product imports. OECD Europe, for example, has long relied on imports to meet its jet fuel needs, but its dependence is reaching new highs – despite weak demand. The region is generally short middle distillates, including diesel and jet fuel. In France, net imports of jet fuel from non-European countries now roughly equal domestic production; in the United Kingdom, they recently passed it as the top supply source. Import dependence would increase dramatically if more European refining capacity were to close. Across the Atlantic, Mexico is going down a similar path with rising imports of gasoline (now superior to domestic production) and diesel. Contrary to accepted wisdom, this is not all due to rising demand, but also, whether by design or accident, to falling domestic output. Although state oil company PEMEX keeps several aggressive refinery expansion projects on the books, in practice it may have found it expedient to rely on US imports rather than splurge on its own capacity.

As the product supply chain becomes longer, it is also getting more fragmented. No longer are product markets supplied predominantly by vertically integrated international oil companies or local refiners firmly embedded in their markets and often supported by their own local

distribution network. Enter a new cast of characters: new independent refiners, independent distributors, profit-seeking transportation and storage companies recently spun off from refining companies or integrated IOCs, foreign National Oil Companies (NOCs) increasingly active in international product markets beyond their borders and – most importantly – international trading houses. Traders like Gunvor admit to a shift in their core business from crude to product trade. Their customers increasingly rely on them to meet their fuel needs.

For consumer markets, increased reliance on long-haul product imports comes with both risks and benefits. Trading companies are inherently nimble and quick to spot arbitrage opportunities. But their incentives differ markedly from those of refiners. Whereas the latter seek to leverage their refining assets by running their plants as high as possible, trading firms thrive on arbitrage opportunities and volatility. The inherent risk of a refiner-based supply model is thus that of overproduction and low refining margins, whereas that of a trader-based supply chain is undersupply.

The longer the supply chain, the higher the risks of disruption. Unless oil is pre-positioned near markets, long-haul suppliers tend not only to be slow but can even appear reluctant to respond to supply disruptions. That is not just a direct function of extended sailing times. Given the lags of long-haul trade, suppliers can be understandably hesitant to respond to remote supply disruptions, lest the issue be corrected before their shipments reach destination or others get there first. That is why refinery accidents in the insulated, hard-to-reach US West Coast market

often have such a steep impact on local prices and the resulting supply shortfalls can take months to fix. In the case of European jet imports, many of the region's top suppliers – Saudi Arabia, Kuwait, the United Arab Emirates, Qatar and India – are themselves not risk-free.

Increased reliance on long-haul product trade thus necessarily translates into higher storage requirements, which in turn carries price implications. There must be a wide enough price differential between product import markets and suppliers to cover transport costs and capital costs over sailing periods. There must also be a wide enough spread between prices in the low- and high-demand seasons to cover storage and capital costs. The current transformation of the product supply chain might thus translate into increased price volatility. Shifts in US product pricing over the last 10 years may be a harbinger of future trends: the spread between New York Harbour and US Gulf Coast gasoline prices has generally widened at the margin as the East Coast has progressively become more dependent on Gulf Coast shipments to supplement local refining output in meeting demand. That increase could pale, however, in comparison to future price spreads between product importers and exporters.

Finally, as the product supply chain gets more vertically fragmented, it will also become more integrated horizontally. This will support the emergence of a new international trading infrastructure. Global refining capacity already is getting increasingly concentrated around major regional hubs, clusters of giant plants geared to serve both local and long-haul markets. The Reliance-Essar combo in Jamnagar, in India's Gujarat state, is a case

in point, as are the Houston or Corpus Christi clusters in Texas. To support international product trade, these global refining hubs will need to be backed by a network of large import and export terminals, global trading hubs located at strategic locations to facilitate access to market and break-bulk and bulk-building operations. The Caribbean islands, long established as storage and terminal nexus for crude and residual fuel oil at the crossroads of several major tanker routes, is thus being revamped and expanded to double as a platform for light product trade. Several tank farms – BORCO in the Bahamas, the NuStar facility in St Eustatius and others – are reportedly developing light product storage capacity there. Other large international terminals are likely to sprout at locations ranging from Northwest Europe to Fujairah to South Korea to Singapore to support the growth in international trade.

One cannot fully appreciate the impact of the growth in non-OECD refining if one sees it simply as an effect of the growing in non-OECD demand. Rather, the regional reshuffle in refining capacity will likely usher in a whole new chapter in product supply and pricing. This will entail new requirements for product storage, price discovery and reporting, and hedging. Market transparency may suffer if inventory changes at non-OECD storage hubs are not adequately reported. Market participants may also support the emergence of new product benchmarks to reflect the changing reality of trade flows and the shifting supply chain. Finally, governments and private companies will be forced to reassess supply risks and revisit their emergency preparedness measures. ■