

U.S. Crude Petroleum Exports Expand to Asia

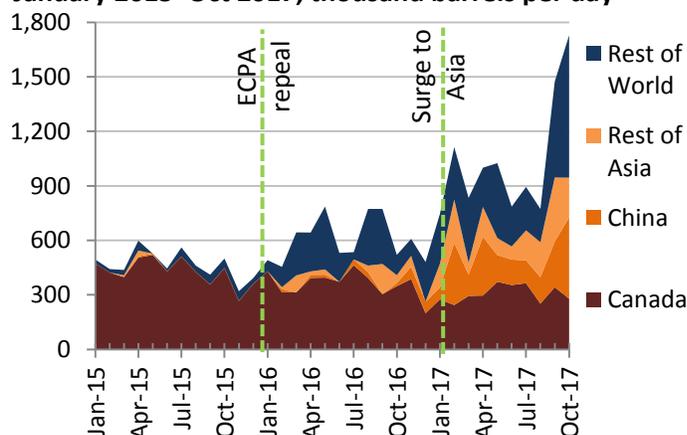
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For four decades, starting in 1975, U.S. crude exports were effectively restricted to Canada. But the resurgence in U.S. crude output since 2008, repeal of the crude export restrictions in 2015, and joint reduction of output from 21 other crude producers in 2017 have collectively transformed the United States' role in global crude markets. These changes have enabled a surge in U.S. crude exports to markets in Asia previously considered too far away from major U.S. Gulf Coast ports to be profitable.

I. U.S. Crude Exports Grow, Expand beyond Canada

A rebound in U.S. crude production (spurred by advances in onshore drilling technology) started the transformation in U.S. crude exports. U.S. output rose from 5 million barrels per day (mb/d) in 2008 to 9.4 mb/d in 2015. The rapid output growth boosted U.S. crude exports,¹ which were mostly limited to Canada due to restrictions under the Energy and Conservation Policy Act of 1975 (ECPA).² By 2015, the United States accounted for over 60 percent of Canadian crude imports.³ As U.S. crude continued to saturate the Canadian import market, pressure rose to allow U.S. crude exports to other countries. In response, President Obama signed a bill repealing the ECPA's restrictions on December 18, 2015.

Figure 1: U.S. monthly crude exports by destination, January 2015–Oct 2017, thousand barrels per day



Source: EIA, "Exports by Destination," accessed January 3, 2018.

After the ECPA: Trends in 2016 and 2017

U.S. crude exports to non-Canadian markets grew rapidly in the year after the ECPA restrictions ended, while exports to Canada stayed relatively flat (figure 1).

A second shift occurred at the start of 2017: U.S. crude exports grew further, driven by a surge in exports to Asia. Over a third of U.S. crude exports went to Asia in the first half of 2017, even though the long distance from U.S. Gulf Coast ports to Asian ports results in high shipping costs.⁴ These U.S. exports compete with Middle Eastern and Russian crudes, which have lower shipping costs to Asia.

II. Why Asia? The OPEC Deal and Two Gradual Trends Support the 2017 Shift in U.S. Crude Exports

Three developments helped U.S. crude exporters overcome the transportation cost disadvantage to Asia. One of these developments immediately preceded the shift in U.S. exports to Asia: 21 crude-producing countries, including 11 members of the Organization of Petroleum Exporting Countries (OPEC) and Russia, agreed in December 2016 to reduce their overall crude output by 1.8 mb/d starting in 2017.⁵

¹ The United States is still a net importer of crude petroleum; exports rose due to a mismatch between U.S. supply and refinery demand. Output growth came mostly from low-permeability formations such as shale rock, containing crude with relatively low density and sulfur content (i.e., light and sweet). Many large U.S. refineries had already made investments in their facilities to process more imported crudes with higher density and sulfur content (i.e., heavy and sour) by the time U.S. output rebounded.

² U.S. crude exports to non-Canadian destinations before December 2015 reflect exceptions to the ECPA, such as re-exports, exports from Alaska, and licensed exports of condensate (an ultralight crude) after light processing through a splitter.

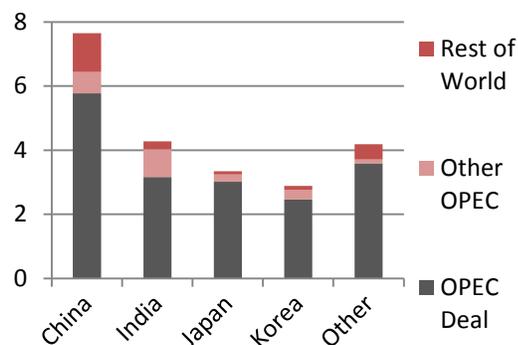
³ NEB, "Market Snapshot: Canadian Crude Oil Imports from the U.S. Decline in 2016, Overseas Imports Increase," Feb 21, 2017.

⁴ Alaska exported 1 million barrels to China in May, but all other U.S. crude exports to Asia in the first six months of 2017 came from ports in Texas and Louisiana. USITC, [Interactive Tariff and Trade DataWeb database](#) (accessed November 2, 2017).

⁵ The 21 countries are Algeria, Angola, Azerbaijan, Bahrain, Brunei, Ecuador, Equatorial Guinea, Gabon, Iraq, Kazakhstan, Kuwait, Malaysia, Mexico, Oman, Qatar, Russia, Saudi Arabia, South Sudan, Sudan, the United Arab Emirates, and Venezuela.

Asian refineries depended heavily on these 21 countries for crude imports before the deal took effect, sourcing over 80 percent of their crude imports from them (figure 2). This dependency likely motivated Asian refineries to diversify their crude supply by importing more U.S. crude in 2017.

Figure 2: Asian crude import sources,^a 2016, million barrels per day



Source: IHS Markit GTA database (accessed Aug 24, 2017); HS code 2709, quantity data converted to barrels per day using 7.33 barrels to a metric ton, 6.2898 barrels to a kiloliter, and 365 days for 2016.

Two longer-term developments also facilitated the sudden shift in U.S. crude exports to Asia: contango pricing and steady crude demand growth in Asia. Since spot prices dropped in 2014, crude has generally been priced in contango (i.e., futures contracts are priced at a premium). This gives a higher selling price to cargos that arrive later, making routes with longer shipping times—such as U.S. Gulf Coast to Asia—more profitable.⁶ Meanwhile, Asian demand for crude has continued to grow, to support rising production of refined petroleum products. Asia accounted for over a third of global crude petroleum refining in 2016 (processing about 28 mb/d), and its net refining capacity is projected to have grown by 0.45 mb/d in 2017.⁷ China's crude imports rose to 8.55 mb/d in the first half of 2017,⁸ reflecting both refining capacity growth and China's stockpiling of crude to develop strategic inventories.⁹

III. The Future of U.S. Crude Exports to Asia

U.S. crude exports to Asia still face logistical barriers, and some of the trends which supported their rise in the first half of 2017 are now fading. In the second half of 2017, China started scaling back its inventory stockpiling; in October, U.S. crude prices moved out of contango.¹⁰ Meanwhile, traders must still load U.S. crude exports to Asia onto very large crude carriers (VLCCs) using inefficient ship-to-ship transfers. VLCCs are used for long-distance crude trade, but U.S. ports can only load exports onto smaller vessels. VLCCs carrying U.S. crude have also faced difficulties selling to India, Asia's second-largest market. India requires its crude importers to use domestic vessels, but it has no VLCCs.

In July 2017, however, India's government authorized one cargo of U.S. crude imports on a foreign-owned VLCC each month through March 2018.¹¹ One VLCC can carry up to 2.2 million barrels of U.S. crude.¹² In addition, the Louisiana Offshore Oil Port could start loading U.S. crude directly onto VLCCs in early 2018, using existing infrastructure designed for offloading imports.¹³

Sources: All U.S. production, import, and export data from the U.S. Energy Information Administration (EIA). See [“Crude Oil Production,”](#) [“Imports by Area of Entry,”](#) and [“Exports by Destination.”](#) Accessed September 18, 2017.

^a “Other OPEC”: Iran, Libya, and Nigeria supported the deal but were not subject to output cuts. Iran was allowed to increase its output by up to 90,000 b/d since its crude industry was still recovering from sanctions that were lifted under the 2015 nuclear deal. Libya and Nigeria were exempt because ongoing civil conflicts in both countries frequently result in disruptions to their crude supply. However, both African countries have been under pressure to commit to capping their output. Bloomberg, [“Iran Says OPEC Must Address Rising Libya, Nigeria Oil Output,”](#) September 24, 2017 (updated September 25, 2017).

⁶ IHS Fairplay, [“US Crude Export Surprise: VLCCs to Asia Top Aframax to Europe,”](#) May 5, 2017.

⁷ BP, [“Oil: Refinery Throughput,”](#) [BP Statistical Review of World Energy 2017,](#) June 2017, 22; Reuters, [“Asia Set for Biggest Refining Capacity Jump in Three Years,”](#) December 19, 2016.

⁸ Reuters, [“Global Refiners Brace Themselves as China Cements Its Oil Market Dominance,”](#) August 4, 2017.

⁹ Reuters, [“China's Crude Oil Buying Spree Looks Set to Continue – IEA,”](#) October 12, 2017.

¹⁰ Ibid.; CNBC, [“The Oil Market Just Did Something It Hasn't Done for Nearly Three Years,”](#) November 1, 2017.

¹¹ *Economic Times*, [“Indian Oil Corp Buys First Shale Oil from US,”](#) August 13, 2017.

¹² EIA, [“Oil Tanker Sizes Range from General Purpose to Ultra-Large Crude Carriers on AFRA Scale,”](#) September 16, 2014.

¹³ Bloomberg, [“America's Biggest Oil Port Wants to Be a Two-Way Street,”](#) July 24, 2017.