

U.S. Hydrocarbon Exports Grow Across the Board

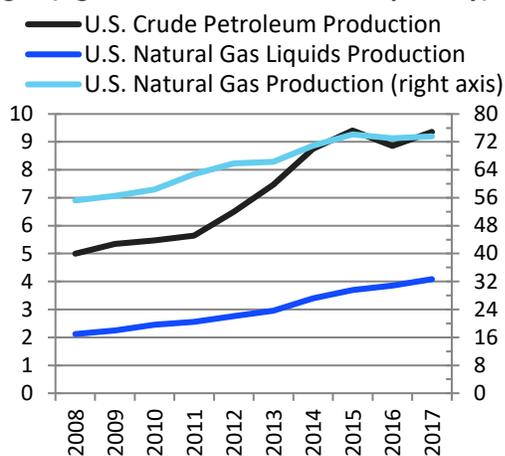
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In the past decade (2008-17), the United States has emerged as a major producer and exporter of hydrocarbons. Advances in production techniques sharply increased U.S. crude petroleum and natural gas output, supporting U.S. exports of these hydrocarbons and their refined products. The value of U.S. hydrocarbon exports has increased for every product group, even though crude prices were at significantly lower levels in 2017 than in 2008. Projected higher crude prices and planned infrastructure capacity additions could raise these U.S. exports to record dollar values in 2018 and 2019.

I. Major Factors Affecting U.S. Hydrocarbon Exports

The growing value of U.S. hydrocarbon¹ exports reflects improved productivity of U.S. producers and rising global demand, tempered by fluctuating crude prices. U.S. production of crude petroleum, natural gas, and natural gas liquids (NGLs)² rose substantially in the past decade (figure 1), owing to continued advances in technology such as hydraulic fracturing and horizontal drilling that reduced breakeven prices. Access to cheaper domestic crude inputs also made U.S. petroleum refineries more competitive. On the demand side, global economic growth generally increases consumption of transportation fuels (petroleum products), electricity (generated from natural gas and coal), and petrochemicals and plastics (derived from NGLs and some petroleum products). Thus, U.S. hydrocarbon exports increased steadily over the past decade, only declining in dollar value when sharp drops in the price of Brent crude³ dampened the export value for crude petroleum, petroleum products, and some NGLs (figure 2). Environmental policies encourage more efficient energy consumption, but also have shifted global demand toward cleaner fuels—dulling demand for coal and fuels with higher sulfur content while increasing demand for natural gas and ultra-low-sulfur diesel (the top U.S. petroleum product export).

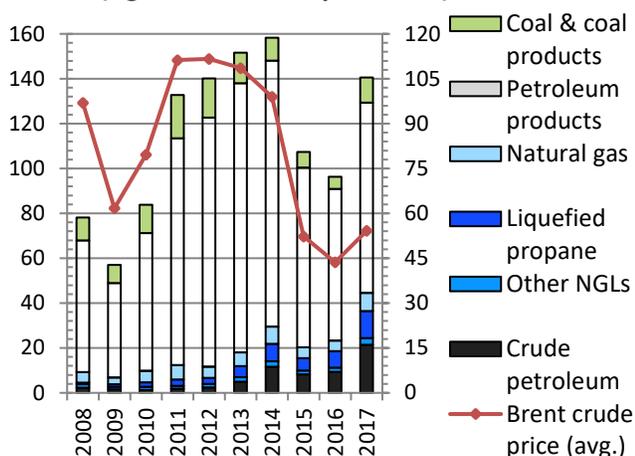
Figure 1: U.S. production of crude petroleum and NGLs (million barrels per day) and natural gas (right axis, billion cubic feet per day)



Source: [EIA](#) (accessed July 20, 2018).

Note: NGLs production includes net refinery yield.

Figure 2: U.S. domestic exports of hydrocarbons (left axis, billions of dollars) and price of Brent crude (right axis, dollars per barrel)



Source: [USITC DataWeb](#)/USDOC (accessed February 8, 2018); [EIA](#), "[Spot Prices](#)" (accessed March 7, 2018).

¹ Hydrocarbons is a group of carbon-based energy products consisting of crude petroleum; petroleum products (refined from crude petroleum); natural gas and natural gas liquids; and coal, coke, and related coal products.

² NGLs are hydrocarbon components found in natural gas that are separated from methane at natural gas processing plants, including ethane, propane, and butane. They are also by-products of refining crude petroleum.

³ Brent is a high quality crude that serves as a major benchmark for global crude prices.

II. Post-2017 Outlook for U.S. Hydrocarbon Export Growth

Crude Petroleum: U.S. crude exports have increased in volume and value since the removal of export restrictions at the end of 2015 and are likely to continue rising, particularly as rebounding prices encourage more U.S. production and increase export values. An agreement by 21 other countries to cut crude output in 2017 further supported U.S. crude exports (see [“U.S. Crude Petroleum Exports Expand to Asia”](#)). Participating countries have since agreed to allow significant output increases in 2018, responding to declining global crude inventories, supply risk associated with Iran and Venezuela, and rising crude prices. However, of the 21 countries, only Saudi Arabia, Iraq, the United Arab Emirates, and Russia are believed to have significant spare capacity to rapidly increase production. The U.S. Energy Information Administration (EIA) forecasts that the average price for Brent will rise from \$54 per barrel in 2017 to \$72 in 2018 and \$69 in 2019. Higher crude prices and relatively low breakeven prices for U.S. producers are enabling more domestic crude output, which EIA forecasts will rise from 9.4 million barrels per day (mb/d) in 2017 to 10.8 mb/d in 2018 and 11.8 mb/d in 2019. Meanwhile, domestic demand is relatively flat; U.S. refineries have been running close to capacity (91 percent utilization rate in 2017) and are focusing investments on optimizing their operations, capping potential crude processing capacity growth in the short term. Pipeline capacity constraints have made it less efficient to transport crude from inland production sites to Gulf Coast ports and refineries, but planned additions will increase capacity on these routes from about 3.4 mb/d to 5 mb/d by the end of 2019.

Petroleum Products: U.S. petroleum product exports have limited potential for further volume growth due to already high refinery capacity utilization, but rising crude prices could greatly increase their value. As noted above, planned refinery investments will not add significant capacity in 2018 and 2019. EIA also forecasts that U.S. consumption of motor gasoline and diesel will increase slightly—from 13.3 mb/d in 2017 to 13.4 mb/d in 2018 and 13.5 mb/d in 2019—diverting some production away from exports.

Natural Gas & NGLs: U.S. propane export growth is maturing, but natural gas exports are still poised for rapid growth. Liquefied propane has been the main source of U.S. export value from natural gas and NGLs since 2014. U.S. propane production growth, declining domestic consumption, and limited export capacity started depressing domestic propane prices in 2010. However, investments in export capacity enabled rapid growth in U.S. propane exports, from 171,000 b/d in 2012 to 905,000 b/d in 2017. U.S. propane exports grew enough to rebalance the market, pushing U.S. propane prices back up near global crude prices in 2017. Meanwhile, U.S. natural gas exports are still ramping up. Pipeline exports to Mexico are growing, and new liquefied natural gas (LNG) terminals have enabled higher value exports to overseas markets. Sabine Pass, the first LNG export terminal in the lower 48 states, started up in 2016. A second terminal, Cove Point, started up in April 2018. U.S. LNG export capacity grew from 1.4 billion cubic feet per day (bcf/d) at the end of 2016 to 2.1 bcf/d at the end of 2017. Planned expansions and additional terminals are expected to increase U.S. LNG export capacity to 9.6 bcf/d by the end of 2019.

Coal: U.S. exports of coal started to recover in 2017—after five years of steady decline—but remain vulnerable to global market conditions. Weather-related supply disruptions in Australia and elevated global prices (particularly for coal used in steelmaking) supported the recovery in U.S. export values. EIA forecasts that coal exports will remain well above 2016 levels (60 million short tons) but decline from 2017, falling from 97 million short tons to 93 million short tons in 2018 and 86 million short tons in 2019.

Sources: EIA: [Short-Term Energy Outlook](#) (accessed July 23, 2018); [“U.S. Gulf Coast Port Limitations Impose Additional Costs,”](#) May 16, 2018; [“Weekly Supply Estimates”](#) (accessed July 20, 2018); [“U.S. Petroleum Product Exports Continued to Grow in 2017,”](#) March 21, 2018; [“U.S. Propane Prices and Crude Oil Prices Re-Link,”](#) February 28, 2018; [“U.S. Liquefied Natural Gas Exports Have Increased,”](#) December 7, 2017; [“U.S. Coal Exports Increased by 61%,”](#) April 19, 2018; [Quarterly Coal Report](#) (Q4 2017); Mersie, [“Chinese, Others Clamor for Crude Exports,”](#) May 24, 2018. *Oil & Gas Journal*, [“Americas, African Refiners Maintain Focus,”](#) December 4, 2017, 22–28. Smith, Razzouk, and Mahdi, [“OPEC+ Agrees to Oil-Supply Boost,”](#) June 23, 2018. [USITC DataWeb/USDOC](#) (accessed February 8, 2018).

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