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## How Huge Is 10 Million Barrels/Day in 2018?

Volume less significant than 1970,  
but shale growth rate is influential.

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### Morningstar Commodities Research

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### Data Sources for This Publication

U.S. Energy Information Administration

OPEC

To discover more about the data sources used, click here.

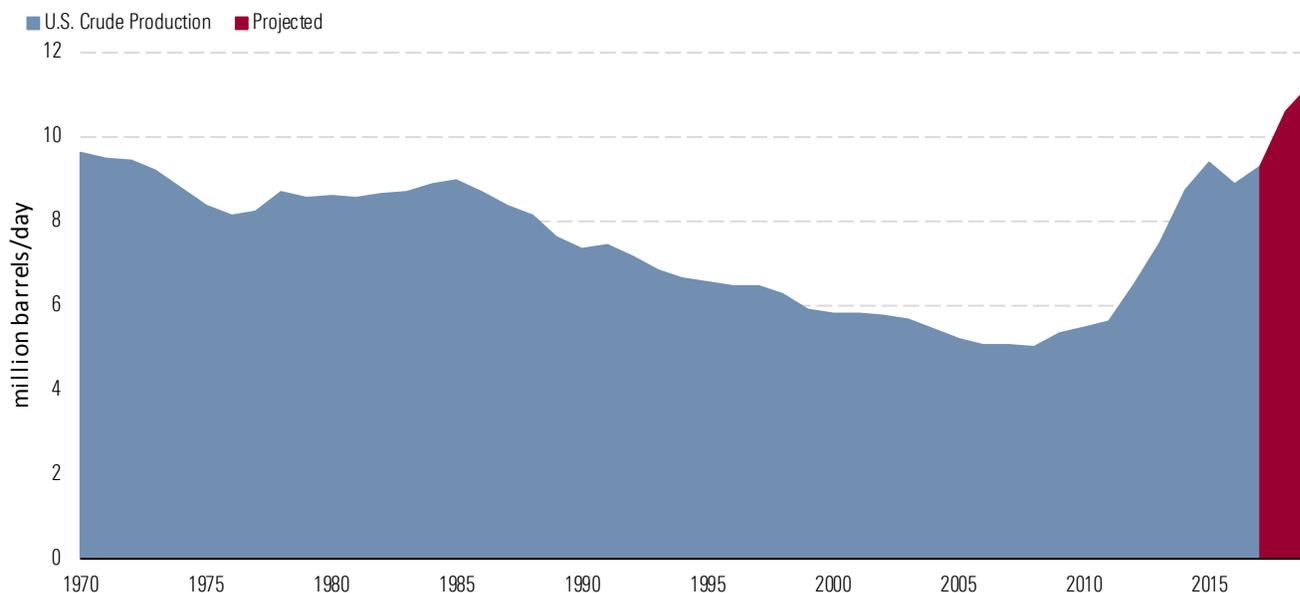
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### Significant Hyperbole

Earlier this month, the Energy Information Administration reported that U.S. crude production in November 2017 passed 10 million barrels/day for the first time since November 1970—47 years ago. The latest EIA short-term energy outlook estimates that production reached 10.1 mmb/d in December 2017 and 10.2 mmb/d in January 2018, and it expects output to average 10.6 mmb/d in 2018 and 11.2 mmb/d in 2019. These estimates indicate the United States has already surpassed Saudi Arabia and will top Russia as the world's largest crude producer next year. Significant hyperbole surrounds this turn of events brought about by a dramatic increase in domestic shale production in the past five years. We wondered if the hype is deserved. In reality, U.S. crude production today meets just 56% of domestic needs, compared with 89% in 1970, and its share of world output has fallen to 12% in 2017 from 21% in 1970. This note looks at how the U.S. domestic oil market and the country's role in international markets have changed since 1970.

### Peak Supply

U.S. crude oil production—from onshore basins in the Lower 48 and Alaska and offshore basins in the Gulf of Mexico and offshore California—peaked at an annual average 9.6 mmb/d in 1970 and then began a 38-year decline trend to 5.0 mmb/d in 2008, somewhat mitigated by an increase in Alaska production during the 1980s (Exhibit 1). Production began to recover with new Gulf of Mexico discoveries raising output by 0.4 mmb/d in 2009 before the BP Macondo disaster halted drilling in 2010. The oil shale era began in earnest in the summer of 2011 and saw a 4.0 mmb/d surge in output between 2010 and 2015. The oil price crash in 2015 stopped the shale boom in its tracks with a 0.6 mmb/d decline in overall production during 2016. The recovery commenced in the latter half of 2016, and production gained 5% in 2017 to average 9.3 mmb/d. EIA projections for 10.6 mmb/d in 2018 would represent a 14% increase in output, with the new boom expected to slow to 6% growth in 2019 or an 11.2 mmb/d annual average tally. According to EIA, production in December 2017 and January 2018 already surpassed the previous record of 10.04 mmb/d set in November 1970.

**Exhibit 1** U.S. Crude Production 1970-2017

Source: EIA, Morningstar

**Higher Demand Today**

In 1970, oil markets in the U.S. and the rest of the world were much different from today. At the time, U.S. production of 9.6 mmb/d represented 89% of the 10.9 mmb/d of crude processed by domestic refineries with average imports of 1.3 mmb/d (75% from Venezuela and just 2% from Saudi Arabia) meeting the balance of demand. There were 276 U.S. refineries in 1970, according to EIA data, with operating capacity of 12.0 mmb/d. Today there are half as many refineries (137) with 55% more capacity (18.6 mmb/d), meaning that average refinery size has more than tripled from 43 thousand barrels/day in 1970 to 136 mb/d as of Jan. 1, 2017. Despite returning to 1970 levels last year, the 9.3 mmb/d crude production in 2017 represented just 56% of the 16.6 mmb/d processed by refineries. As a result, imports were far higher than in 1970 at 7.9 mmb/d last year, although newly permitted crude exports increased to an average 1.1 mmb/d, reducing net imports to 6.8 mmb/d. Suffice to say, the U.S. remains heavily dependent on imports in 2018.

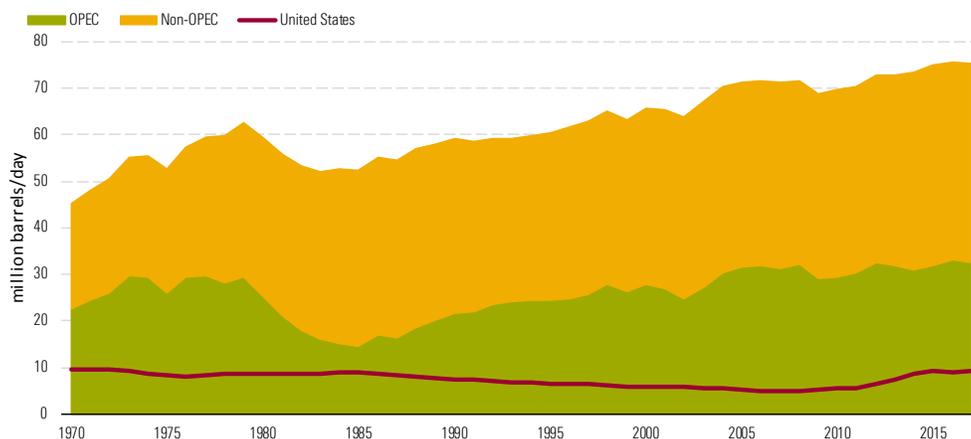
Refineries in 1970 supplied 5.8 mmb/d of gasoline and 2.5 mmb/d of diesel/heating oil to the U.S. market as well as 2.2 mmb/d of residual fuel oil (mostly consumed by power generators). By 2016 (the last full year of data from EIA), U.S. refineries supplied an average 9.3 mmb/d of gasoline and 3.9 mmb/d of diesel/heating oil into the domestic market while residual fuel oil sales fell to 0.3 mmb/d with the retirement of oil-fired generation. The 60% increase in gasoline supplied reflects significant growth in U.S. population (up by about 120 million since 1970) and vehicle traffic. The Department of Transportation registered 108 million vehicles in 1970 and 264 million in 2015 (latest data)—a 244% increase that more than offset improvements in vehicle efficiency. The first CAFE standards regulating fuel efficiency came into effect in 1975, when the average passenger vehicle managed 13.5 miles/gallon

compared with a fleetwide average of 35 mpg in 2016. So while Americans drive more-efficient vehicles today, the larger driver and vehicle population requires increased refinery output to meet domestic demand. At the same time, U.S. refineries are exporting more gasoline and diesel than ever, adding to the demand for crude feedstock.

### Lower World Market Share

In world terms, the U.S. was easily the world's largest crude producer in 1970 with 9.6 mmb/d, followed by Russia with 6.3 mmb/d, then Iran and Saudi Arabia with 3.8 mmb/d each (according to OPEC). In 2017, Russia was the largest producer with 10.3 mmb/d, followed by Saudi Arabia at 10.0 mmb/d and the U.S. in third place with 9.3 mmb/d. Exhibit 2 shows world supply of crude oil by OPEC and non-OPEC countries since 1970 based on OPEC historical data (these numbers do not include gas liquids). U.S. production is shown on the chart separately (red line) but is also part of the non-OPEC total. Based on this data, in 1970, OPEC had 50% and the U.S. 21%, respectively, of the 45.2 mmb/d world total. By 2017, OPEC had 43% and the U.S. 12% of the 75.3 mmb/d total. During that 47-year period, U.S. production declined and has only just recovered to its previous peak, while OPEC production increased 43% from 22.6 mmb/d in 1970 to 32.4 mmb/d in 2017. While OPEC and the U.S. have both lost market share, OPEC retained a higher portion of world output while the U.S. stood still.

**Exhibit 2** World Crude Production 1970-2017



Source: OPEC, Morningstar

### Outside Influence

Within this changing picture over the past 47 years, the relative clout of U.S. crude production is higher today than pure numerical analysis suggests it deserves. That's because shale producers increased output so rapidly—by 4 mmb/d between 2010 and 2015—and appear set to do so again in 2018 after recovering from the price shock of 2015. This proven ability to turn on the taps even with lower prices means the U.S. is set to become not only the world's largest producer but also the marginal player ramping up production to meet new demand. This role as swing producer is guaranteed as long as OPEC and its allies support prices by restricting production. The OPEC agreement effectively hands market

share to U.S. producers on a plate. The only remedy for OPEC to combat the loss of market share is to repeat its 2015 strategy of flooding the market to drown shale producers, a tactic that failed then and would probably fail again. Until then, a rising tide of demand should absorb growing shale output in the form of increased exports, allowing the U.S. to regain its number-one producer crown together with an outsize influence on the world market. ■■

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