Annual Energy Outlook

Preliminary results for oil, natural gas, & liquid fuels

for

Oil and Gas Supply, Natural Gas Markets, & Liquid Fuels Markets Working Group

September 21, 2017 | Washington, DC

by

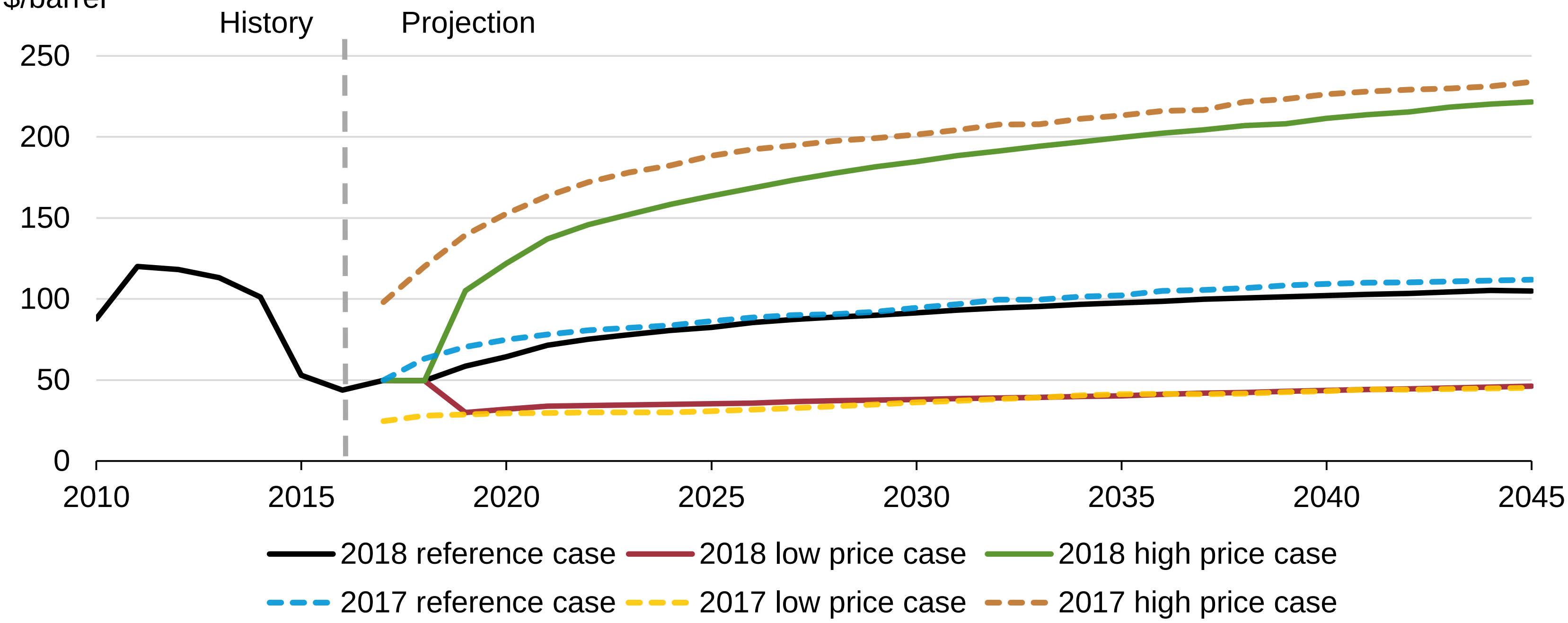
John Staub, Office Director for Petroleum, Natural Gas, and Biofuels Analysis

WORKING GROUP PRESENTATION FOR DISCUSSION PURPOSES
DO NOT QUOTE OR CITE AS RESULTS ARE SUBJECT TO CHANGE

Brent crude oil prices are lower compared to *AEO2017*

Brent crude oil spot price

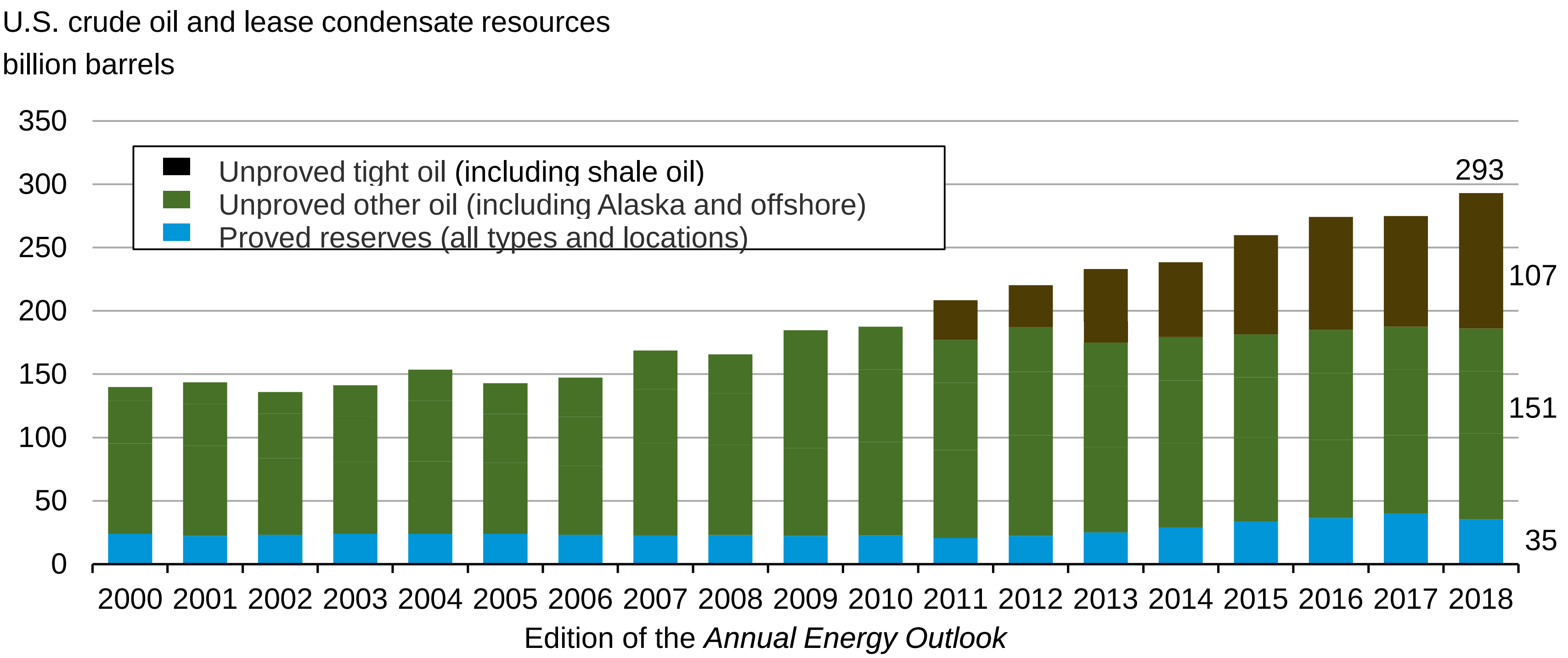
$/barrel



Source: Preliminary AEO2018 runs, dated as of 9/19/17

Oil and Gas Supply

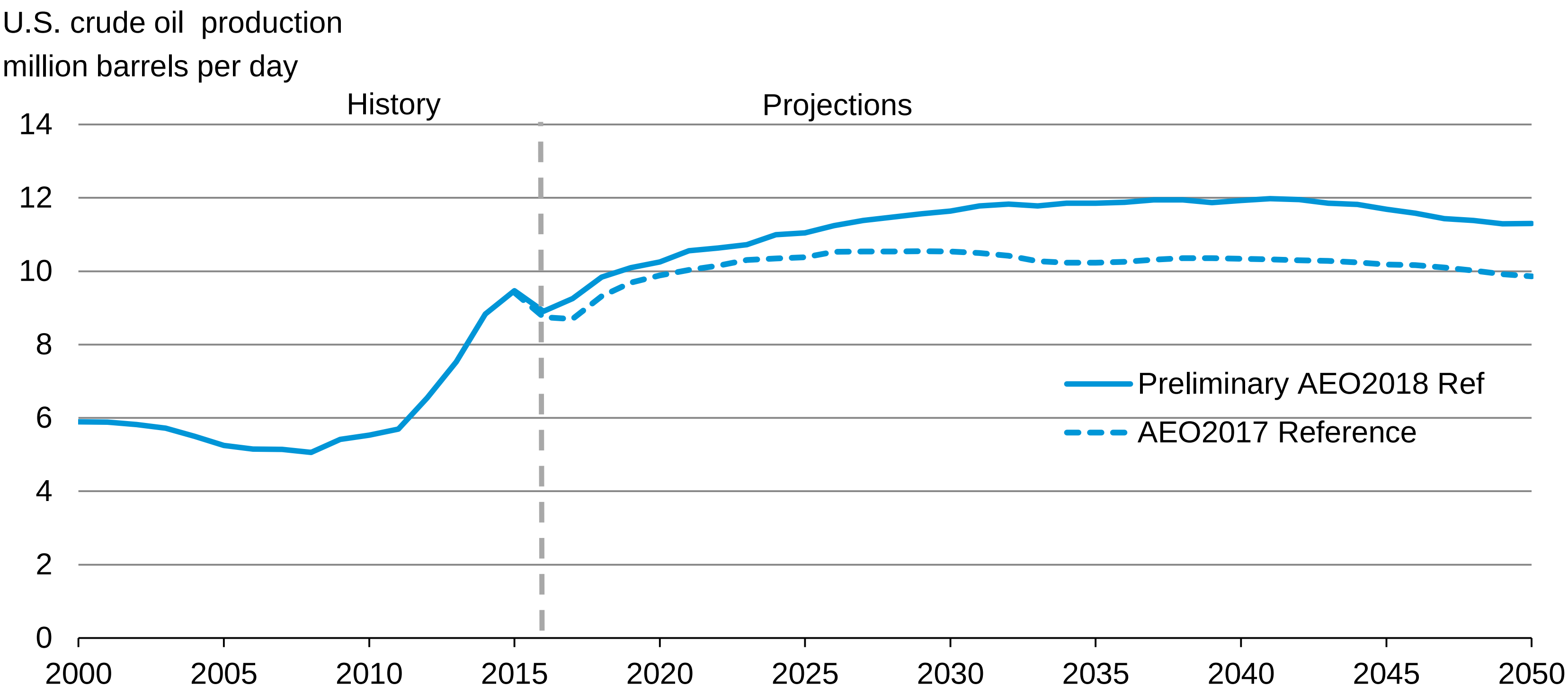
Multiple factors have contributed to crude oil resource estimate increases over the years, with tight oil contributing recently



Source: U.S. Energy Information Administration, Annual Energy Outlook 2018 and prior editions

Note: Resources are as of January 1 of two years prior to the "edition" year of the AEO (e.g. AEO2018 is 1/1/2016).

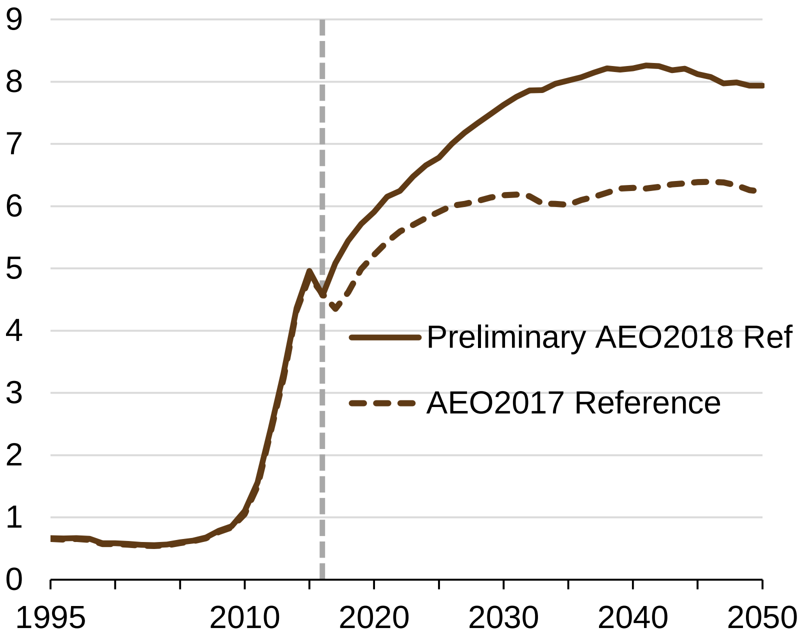
U.S. crude oil production is higher than last year's AEO



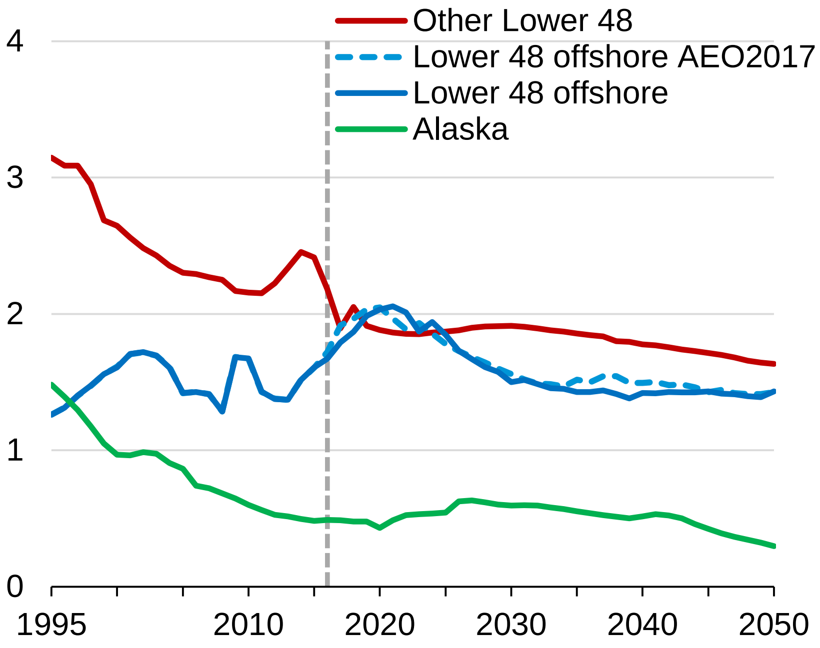
Source: Preliminary AEO2018 runs, dated as of 9/19/17

Higher tight oil resources lead to higher total domestic crude oil production in AEO2018

U.S. tight oil production
million barrels per day



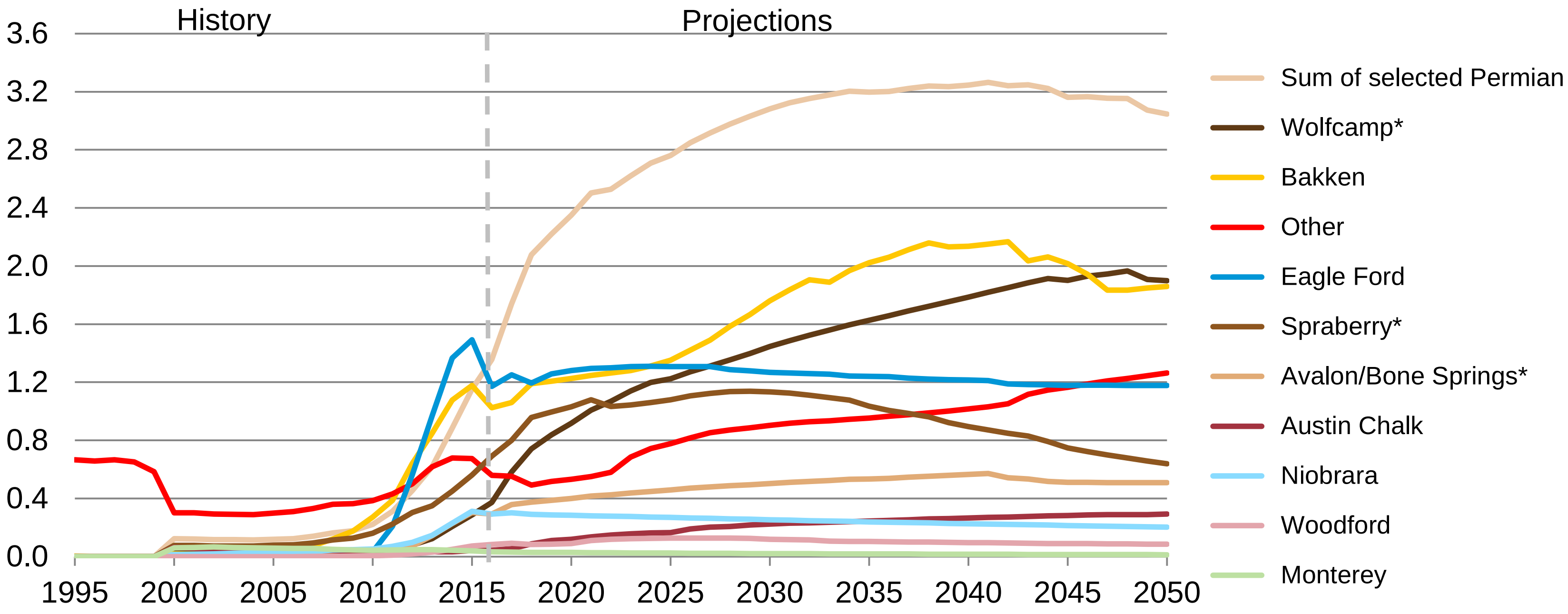
U.S. crude oil production other than tight oil
million barrels per day



Source: Preliminary AEO2018 runs, dated as of 9/19/17

Bakken and Wolfcamp lead growth in tight oil production

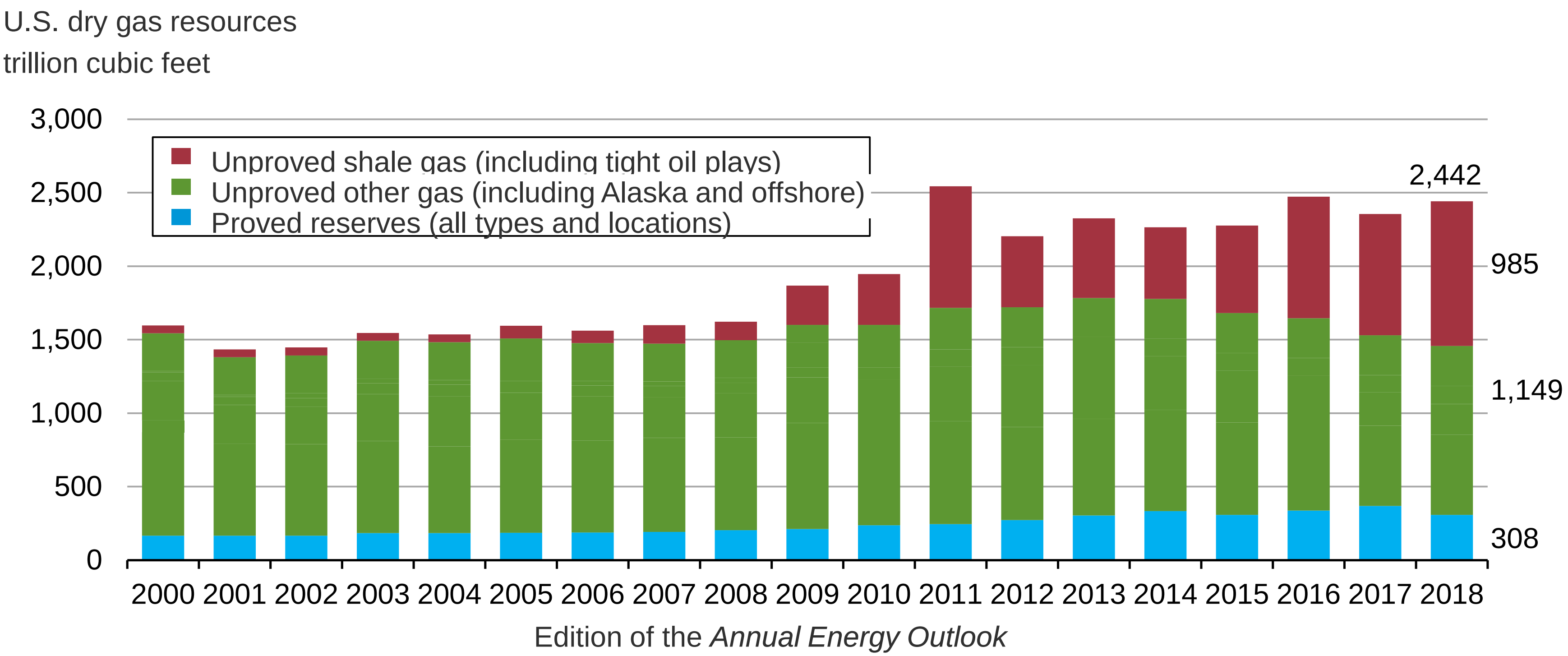
Crude oil production by selected tight oil plays
million barrels per day



*Permian Basin

Source: Preliminary AEO2018 runs, dated as of 9/19/17

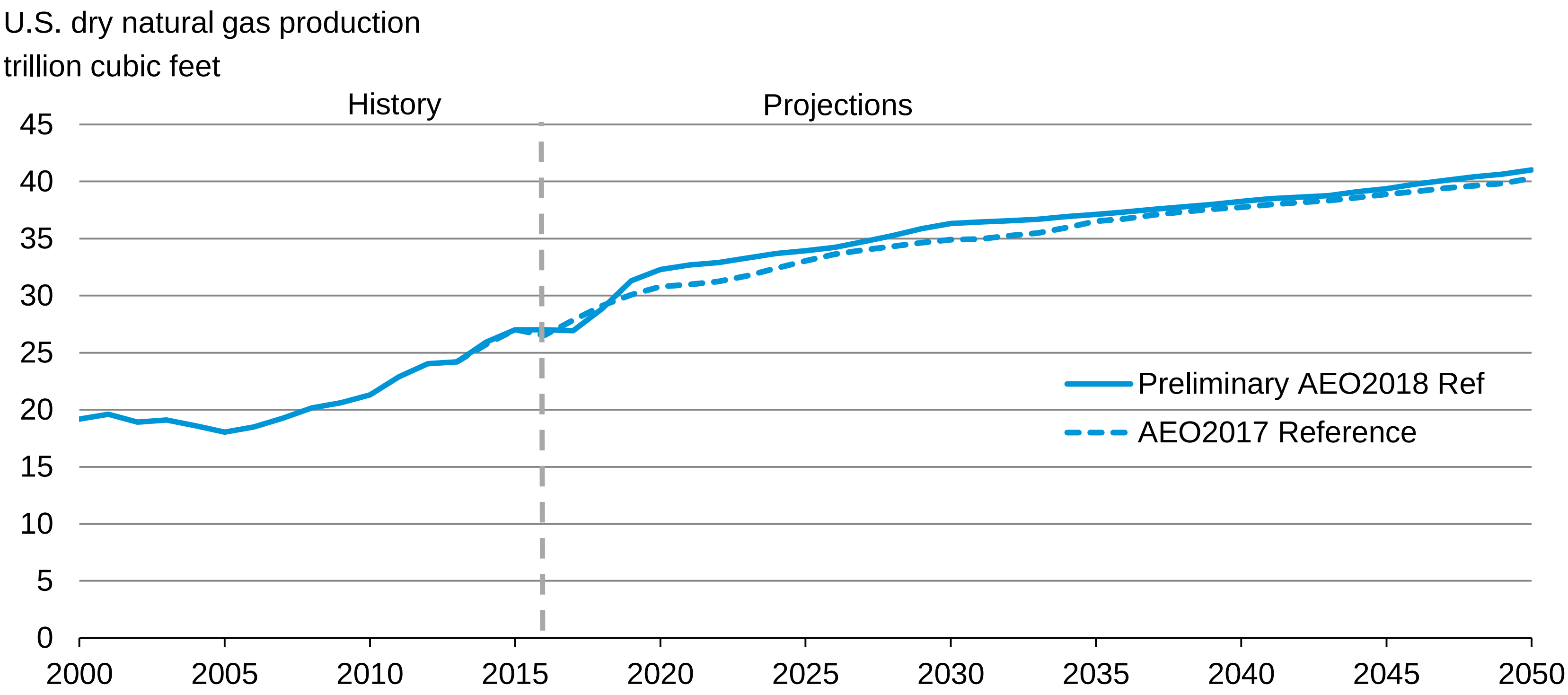
Technically recoverable natural gas resources reflect new information, a combination of assessments and EIA updates



Source: U.S. Energy Information Administration, Annual Energy Outlook 2018 and prior editions

Note: Resources are as of January 1 of two years prior to the "edition" year of the AEO (e.g. AEO2018 is 1/1/2016).

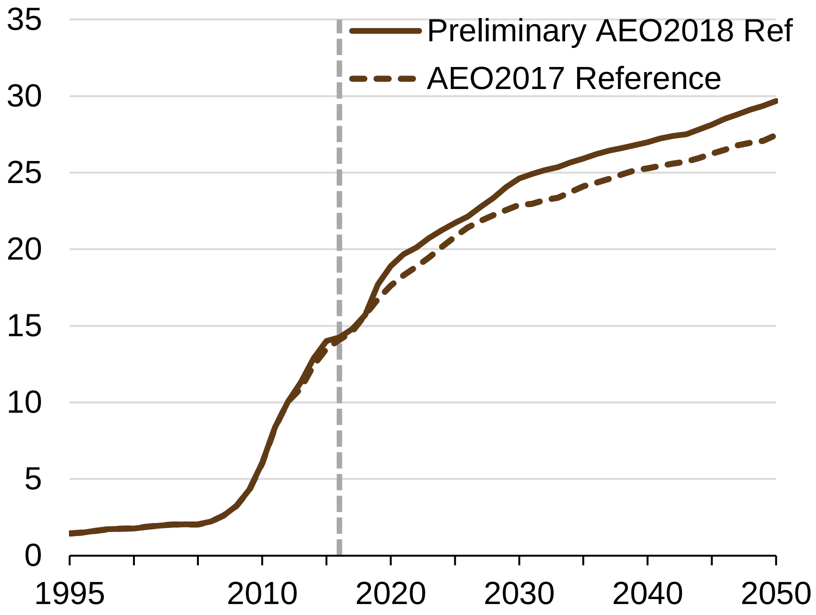
U.S. dry natural gas production is higher than last year's AEO



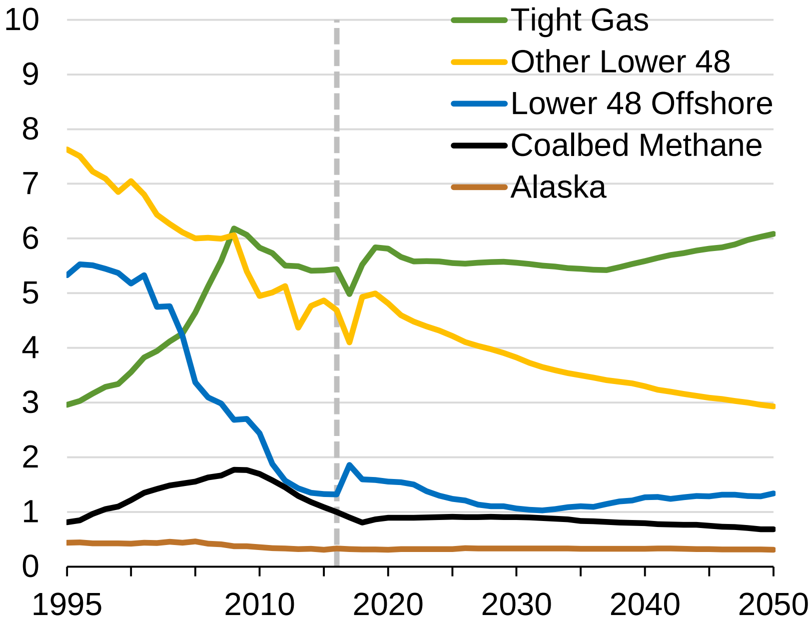
Source: Preliminary AEO2018 runs, dated as of 9/19/17

Shale gas leads growth in U.S. dry natural gas production in AEO2018

U.S. dry shale gas production
trillion cubic feet



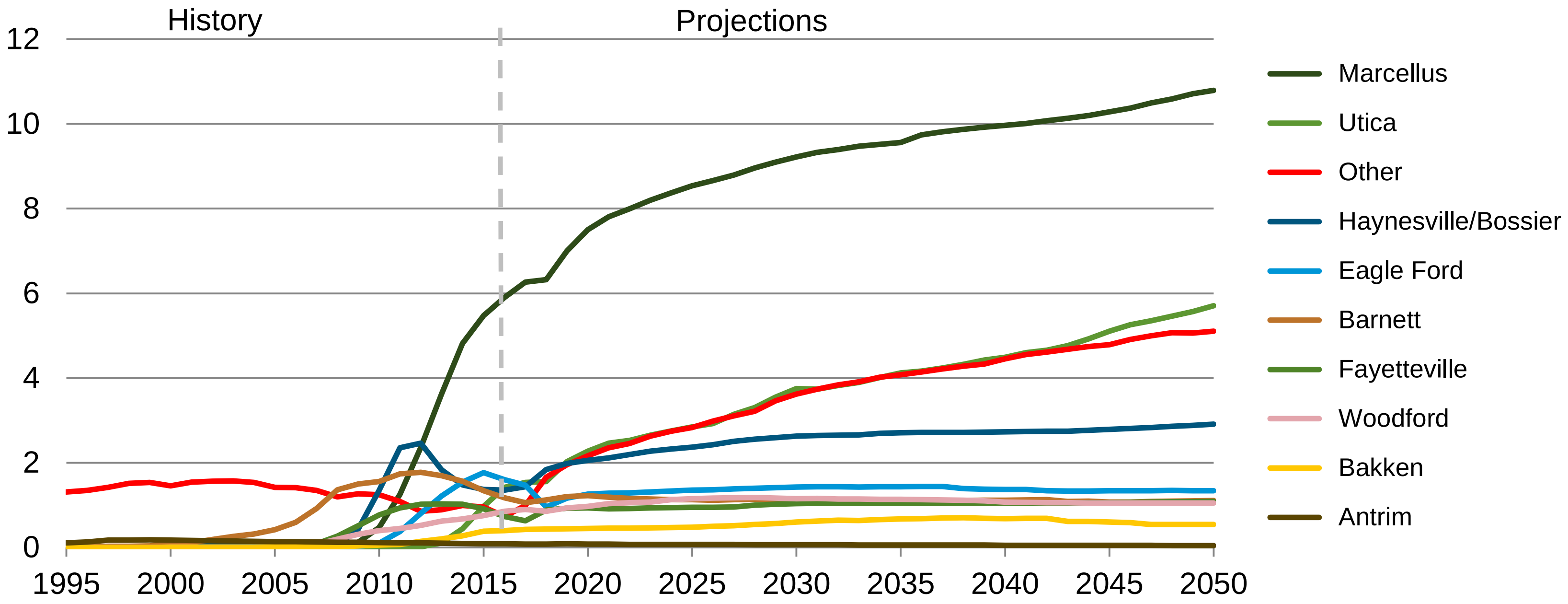
U.S. dry natural gas production
trillion cubic feet



Note: Shale gas includes natural gas production in tight oil plays.
Source: Preliminary AEO2018 runs, dated as of 9/19/17

Marcellus and Utica lead production of U.S. shale gas

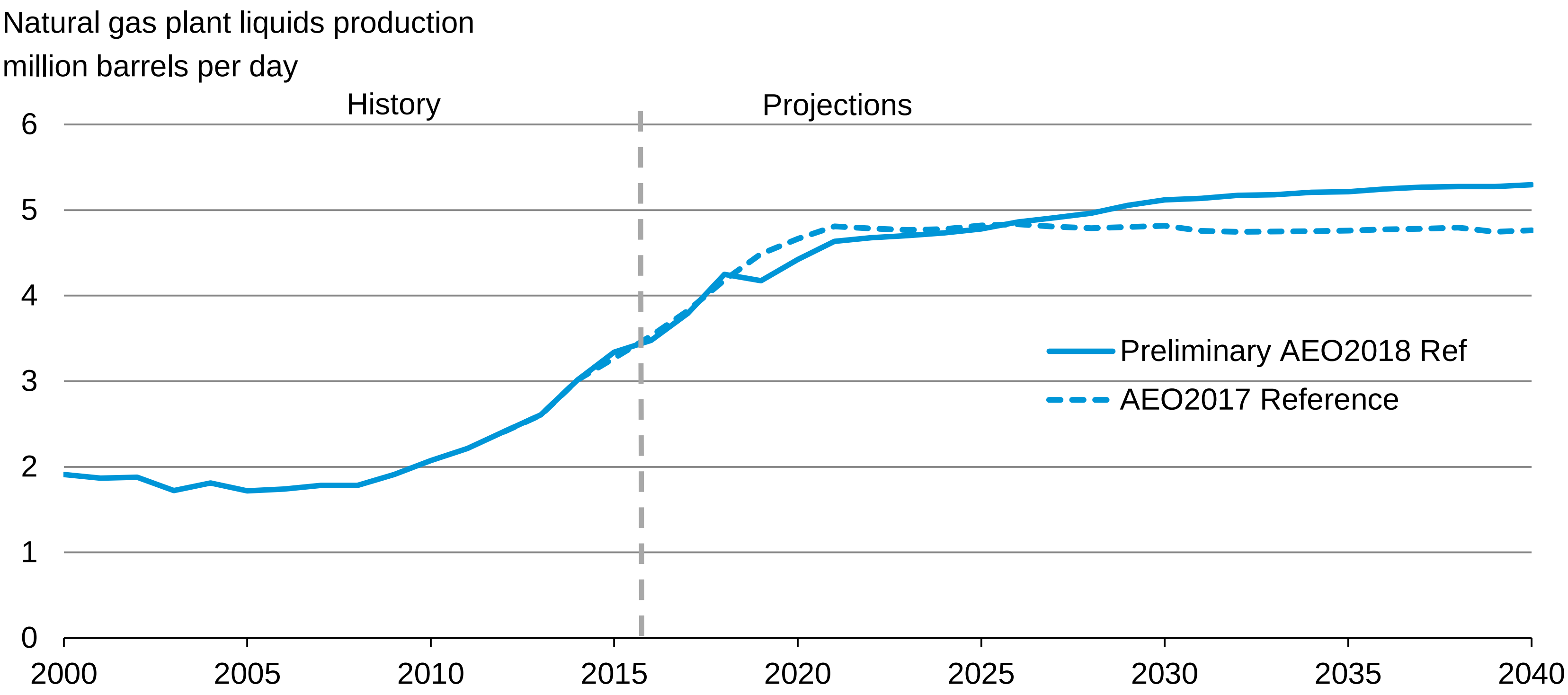
Dry natural gas production by selected shale play
trillion cubic feet



Note: Other includes natural gas production in tight oil plays.

Source: Preliminary AEO2018 runs, dated as of 9/19/17

NGPL production is higher than last year's AEO

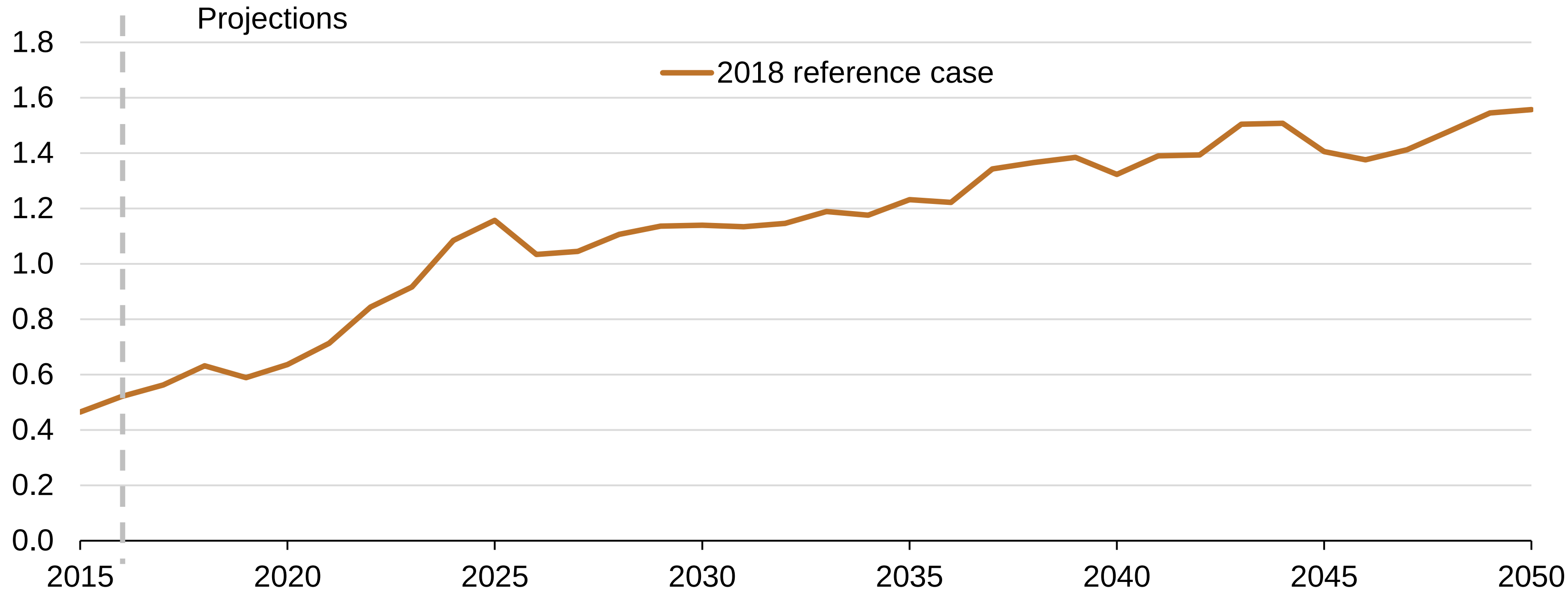


Source: Preliminary AEO2018 runs, dated as of 9/19/17

Liquid fuels markets

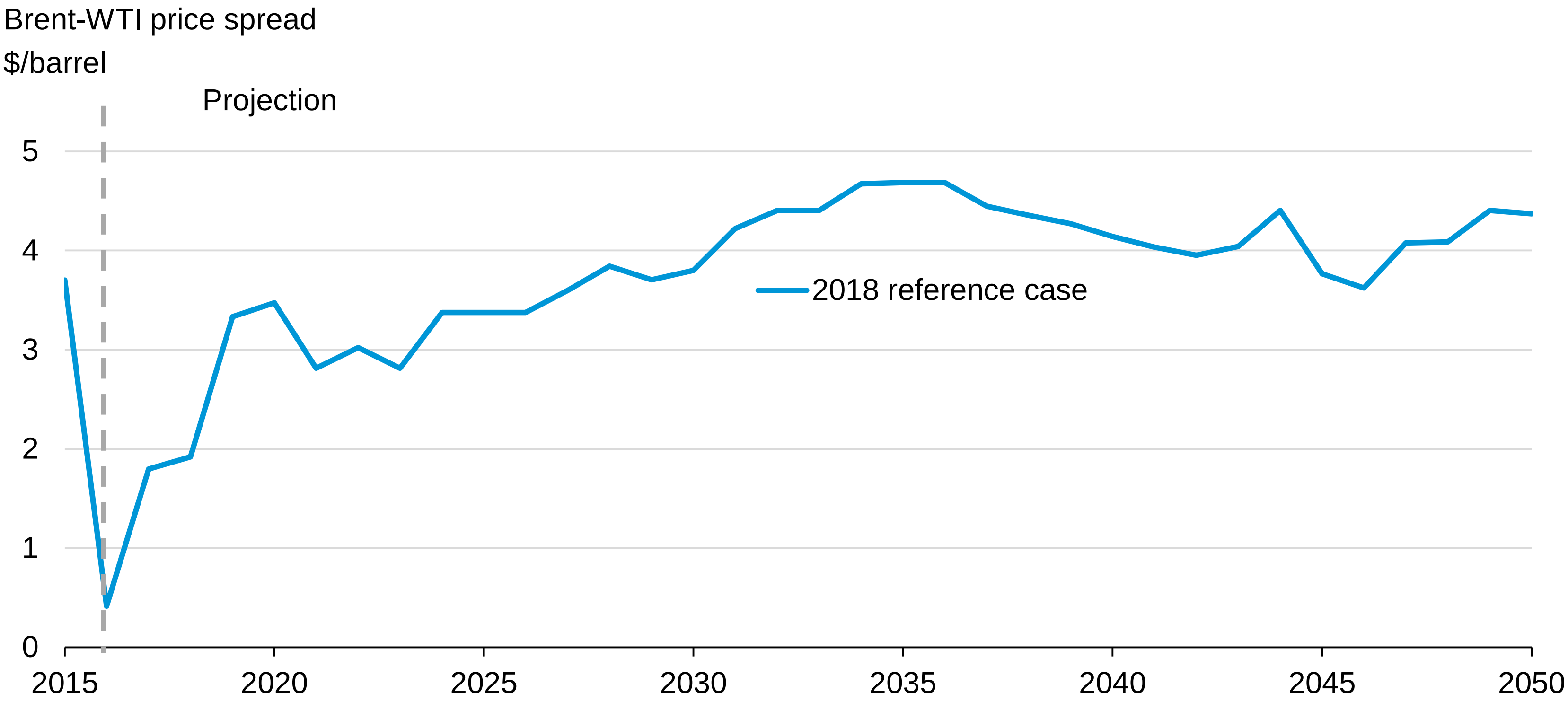
Crude oil exports rise through most of the projection period

U.S. crude oil exports
million barrels per day



Source: Preliminary AEO2018 runs, dated as of 9/19/17

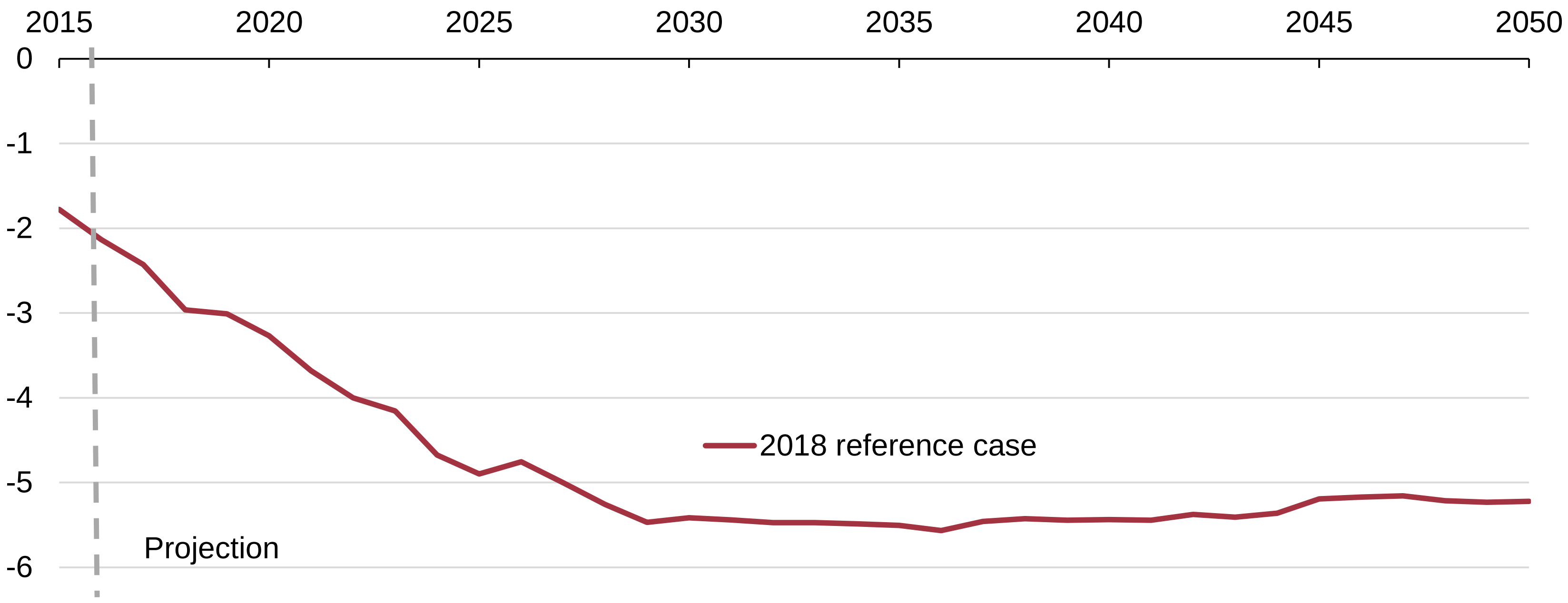
The Brent-WTI price spread widens and then levels off in the projection period



Source: Preliminary AEO2018 runs, dated as of 9/19/17

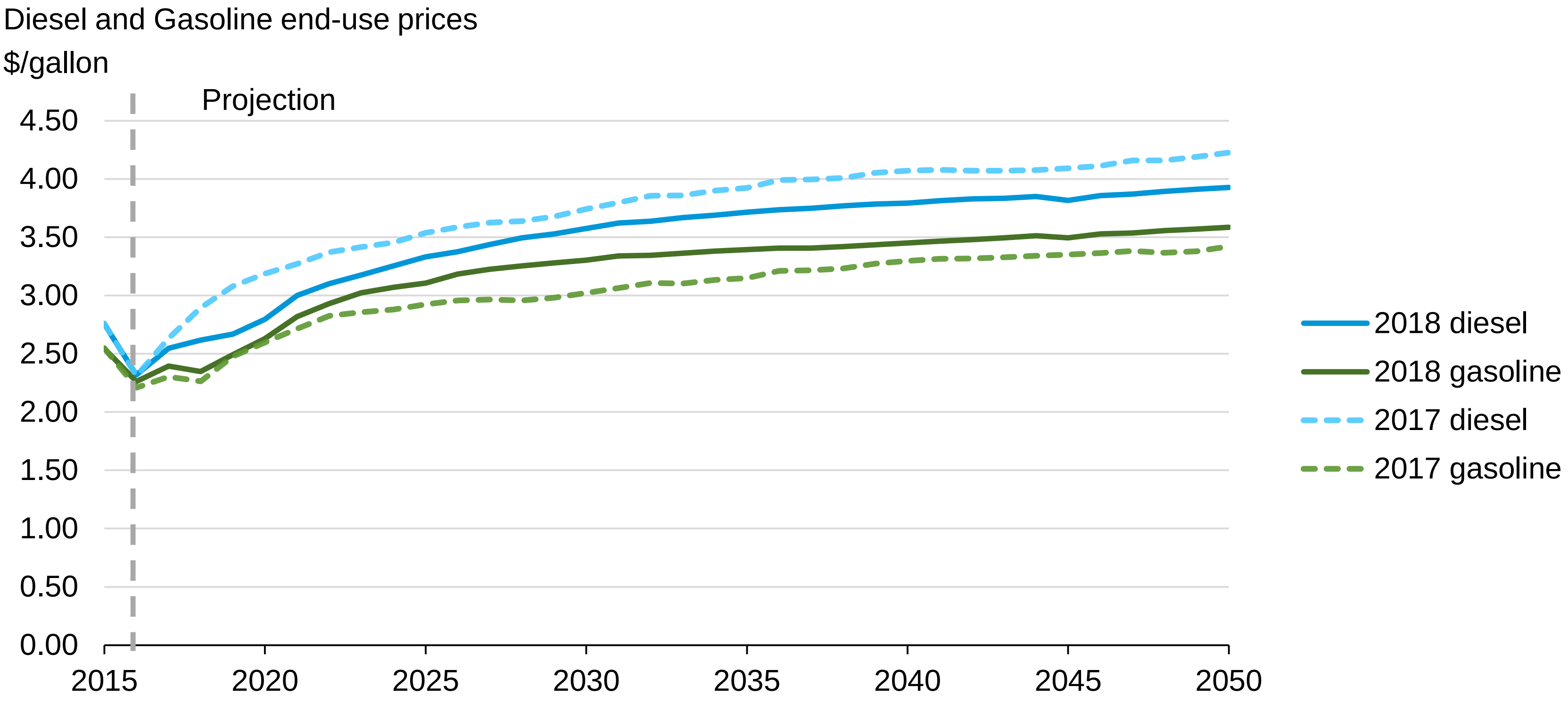
Net imports of petroleum products are largely driven by trends in domestic petroleum product consumption

Net petroleum product imports
millions of barrels per day



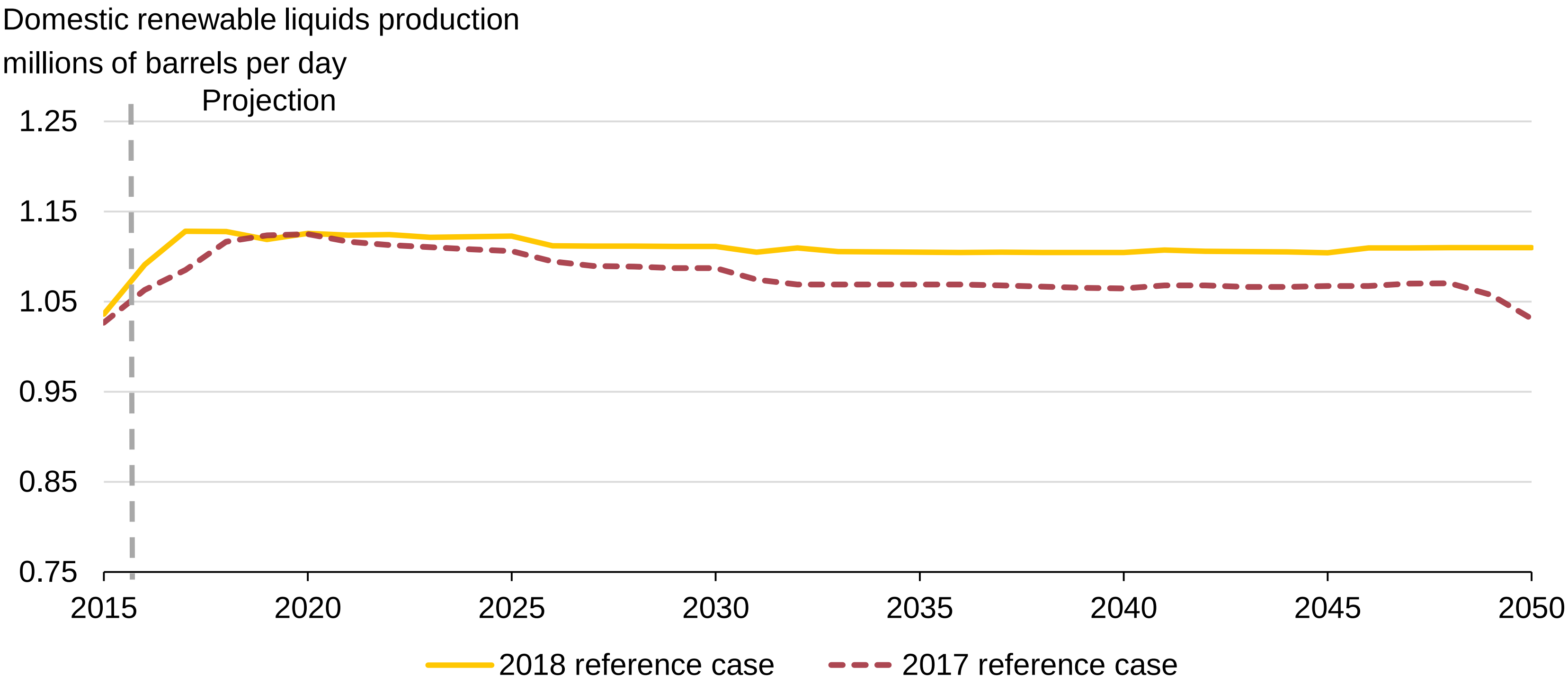
Source: Preliminary AEO2018 runs, dated as of 9/19/17

After updating taxes, distribution costs, and international supply/demand curves, the spread between gasoline and diesel will be lower in *AEO2018*



Source: Preliminary AEO2018 runs, dated as of 9/19/17

Renewable liquids production is higher in AEO2018, resulting from updates to feedstock prices

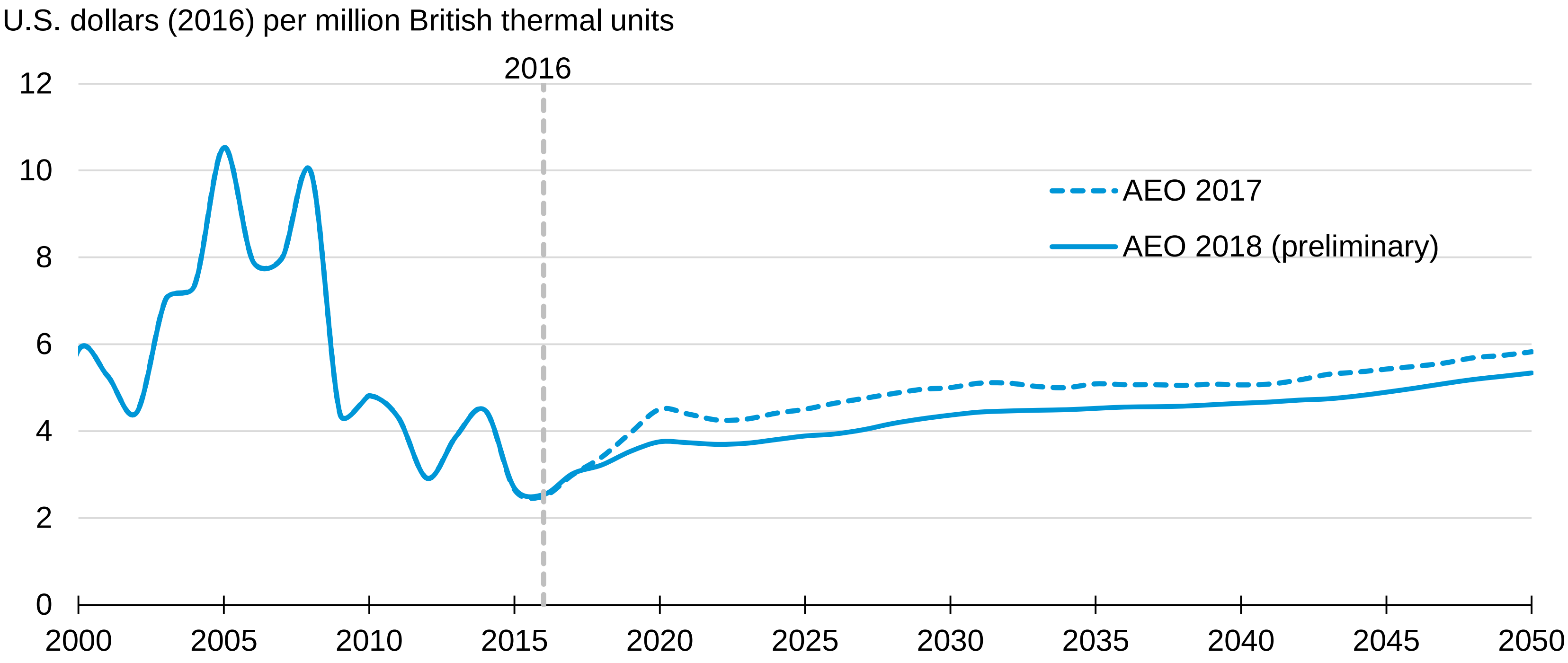


Note: Includes ethanol, biodiesel, and other advanced renewable production.

Source: Preliminary AEO2018 runs, dated as of 9/19/17

Natural gas markets

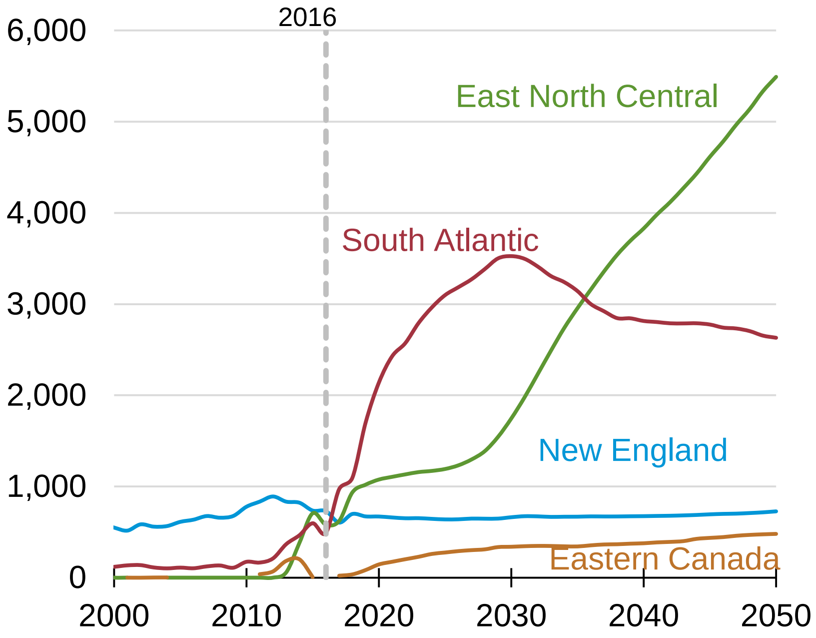
Henry Hub spot prices are lower than AEO 2017, particularly in the mid-term through the early 2020s



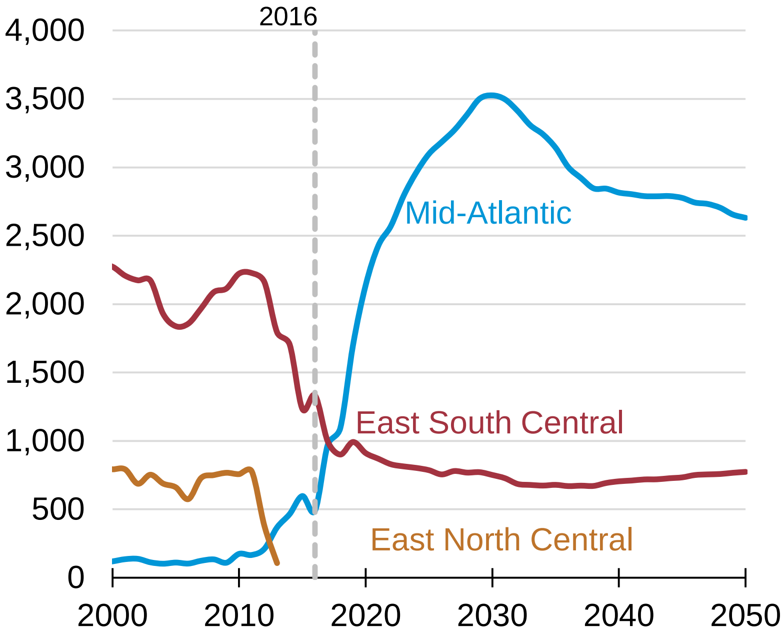
Source: Preliminary AEO2018 runs, dated as of 9/19/17

Regional flows, particularly out of the Northeast and into the South Atlantic, reflect the continuing reversal of historical trends

Flows out of Mid-Atlantic
billion cubic feet per year



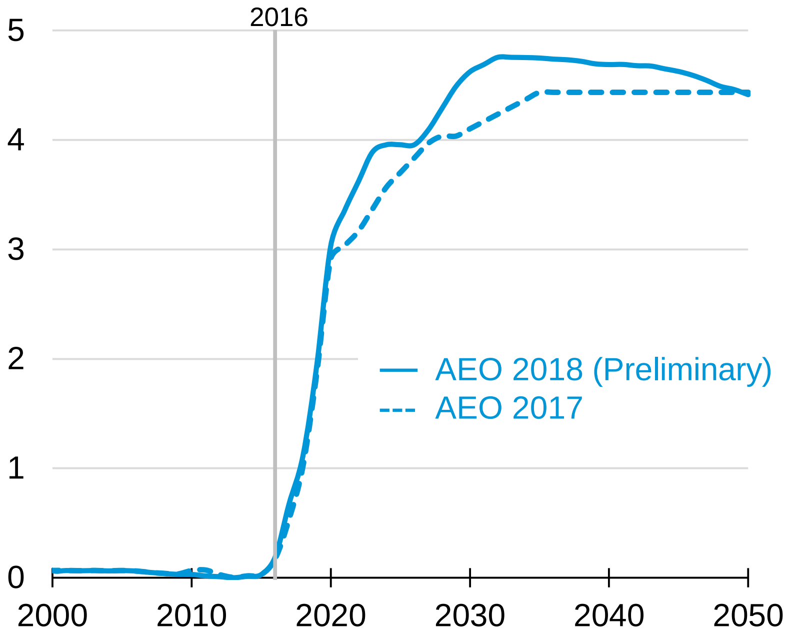
Flows into South Atlantic
billion cubic feet per year



Source: Preliminary AEO2018 runs, dated as of 9/19/17

U.S. LNG exports are expected to increase, with capacity being built in Texas and Louisiana; capacity utilization will depend on regional supply prices

Total U.S. LNG exports
trillion cubic feet per year

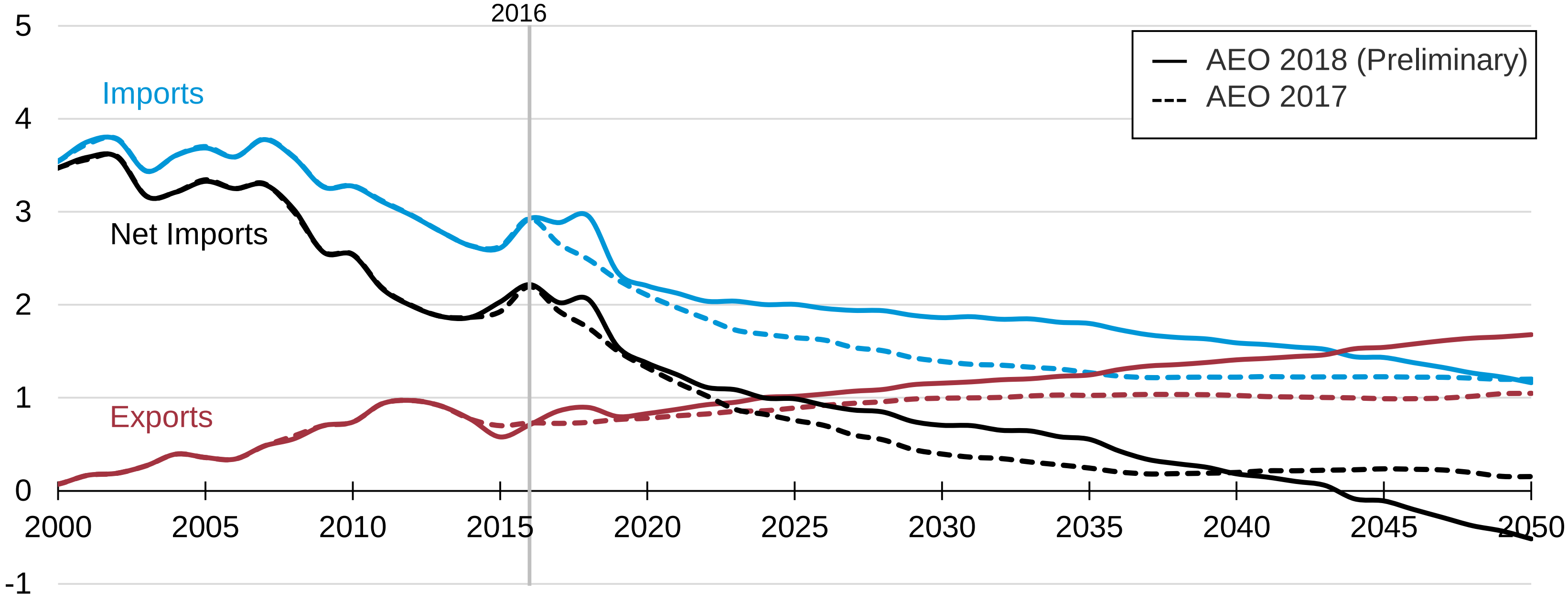


- Preliminary results; data updates still needed
- Changes from AEO 2017 include:
  - Elba Island (GA, 0.35 Bcf/d) LNG export capacity currently under construction
  - Lower shipping costs (last updated 2009) to reflect changes in fleet
  - Utilization of LNG export capacity solved in optimization model

Source: Preliminary AEO2018 runs, dated as of 9/19/17

U.S. imports from Canada continue to decline while U.S. exports into eastern Canada rise due to increased pipeline capacity and production in the Marcellus and Utica

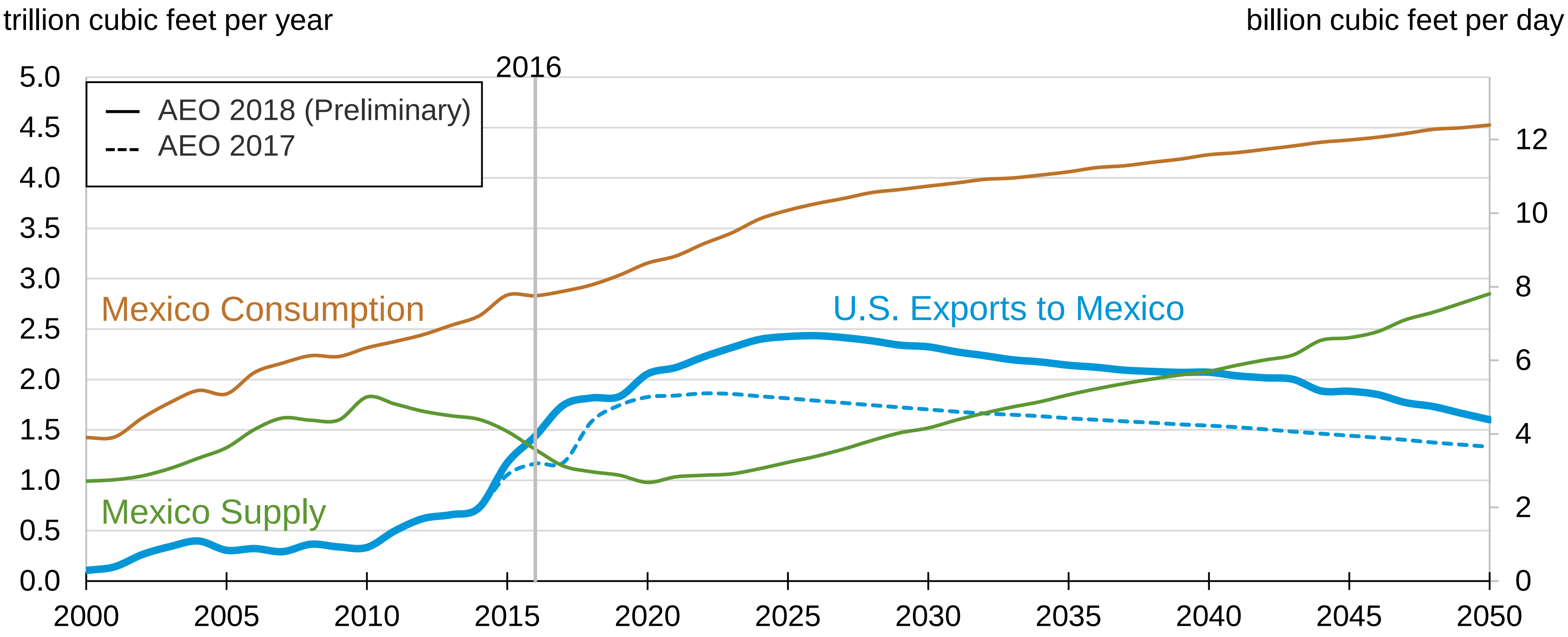
U.S. natural gas trade with Canada
trillion cubic feet per year



Source: Preliminary AEO2018 runs, dated as of 9/19/17

U.S. natural gas exports to Mexico continue their growth through the mid-2020s because of increasing demand in the electric power sector and decreasing natural gas production in Mexico

U.S. natural gas trade with Mexico



Source: Preliminary AEO2018 runs, dated as of 9/2017

Contacts for liquid fuels markets including biofuels

For questions about the Liquid Fuels Market Module contact:
Elizabeth May: elizabeth.may@eia.gov

For questions about the International Energy Module contact:
Adrian Geagla: adrian.geagla@eia.gov

For questions about Biofuels contact:
Steve Hanson: steve.hanson@eia.gov

Liquid Fuels Markets Team Lead:
James Preciado: james.preciado@eia.gov

Biofuels and Emerging Technologies Team Lead:
Mindi Farber-DeAnda: mindi.farber-deanda@eia.gov

Contacts for oil and natural gas supply and natural gas markets

For questions about Oil & Gas Supply Model and Lower 48 onshore contact:
Dana Van Wagener: dana.vanwagener@eia.gov

For questions about Lower 48 offshore and Alaska contact:
Terry Yen: terry.yen@eia.gov

Exploration and Production Team Lead:
Meg Coleman: meg.coleman@eia.gov

For questions about NGTDM, NGMM design, and comparisons between models:
Joe Benneche: joseph.benneche@eia.gov

For questions pertaining to NGMM, design in AIMMS, suggestions for improvements to new model:
Katie Dyl: kathryn.dyl@eia.gov

Natural Gas Markets Team Lead:
Peter Gross: peter.gross@eia.gov

We welcome feedback on our assumptions and documentation

- Working group meetings http://www.eia.gov/forecasts/aeo/workinggroup/
- The AEO Assumptions report http://www.eia.gov/forecasts/aeo/assumptions/
- NEMS Model Documentation
  - Oil and gas supply https://www.eia.gov/outlooks/aeo/nems/documentation/ogsm/pdf/m063(2017).pdf
  - Natural gas transmission and distribution http://www.eia.gov/forecasts/aeo/nems/documentation/ngtdm/pdf/m062(2014).pdf
  - LFMM https://www.eia.gov/outlooks/aeo/nems/documentation/lfmm/pdf/m059(2014).pdf
- Working papers series http://www.eia.gov/workingpapers/

For more information

U.S. Energy Information Administration home page | www.eia.gov

Short-Term Energy Outlook | www.eia.gov/steo

Annual Energy Outlook | www.eia.gov/aeo

International Energy Outlook | www.eia.gov/ieo

International Energy Statistics database | www.eia.gov/ies

To receive emails concerning releases related to the Annual Energy Outlook or other EIA publications, please subscribe at https://www.eia.gov/tools/emailupdates/.

We have a new central AEO email address: AnnualEnergyOutlook@eia.gov