

Outlook for shale gas and tight oil development in the U.S.



For

Council on Foreign Relations

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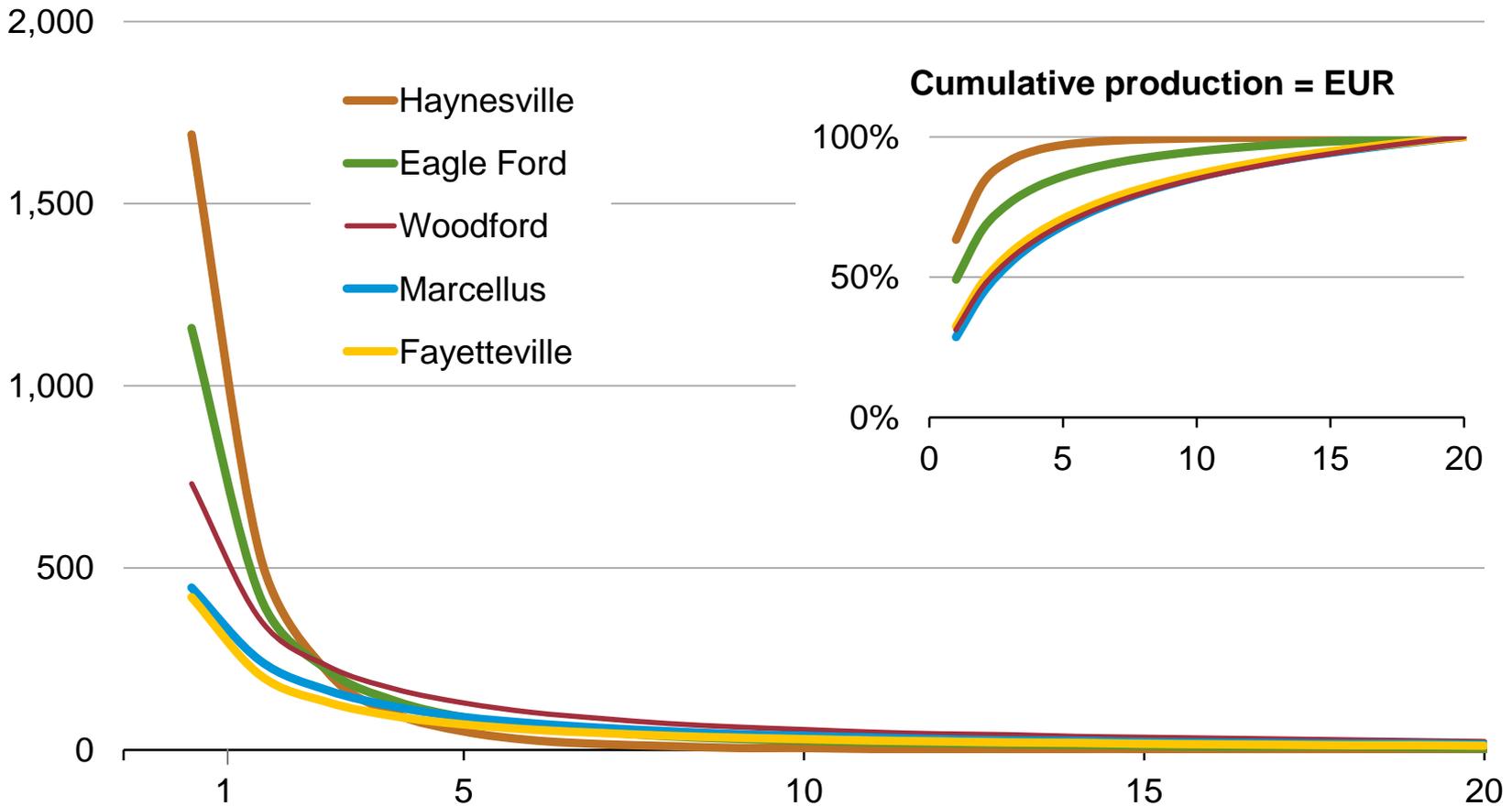
By

Adam Sieminski, Administrator

U.S. Shale Gas

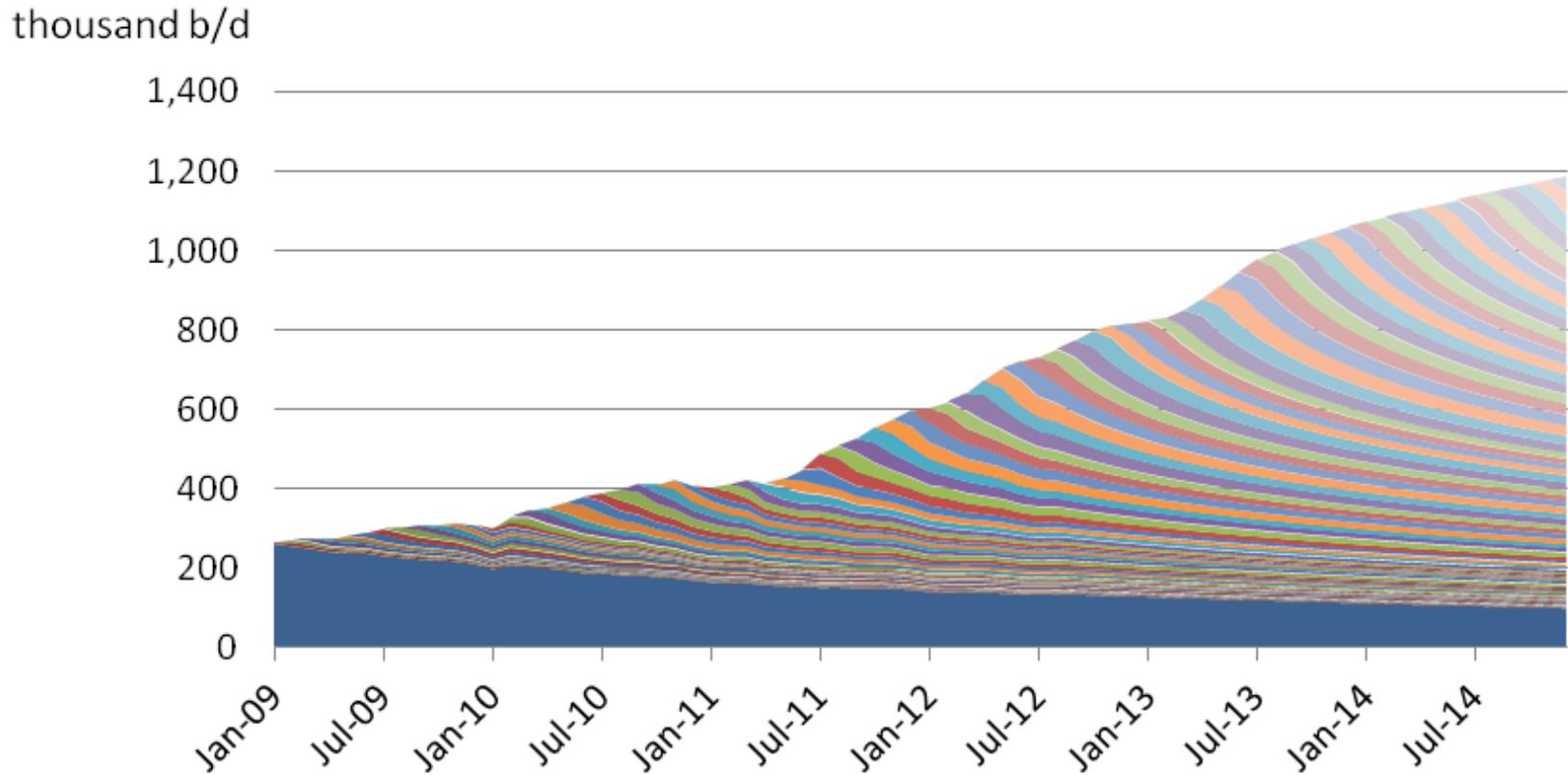
An average well in shale gas and other continuous resource plays can also have steep decline curves, which require continued drilling to grow production

million cubic feet per year



Source: EIA, Annual Energy Outlook 2012

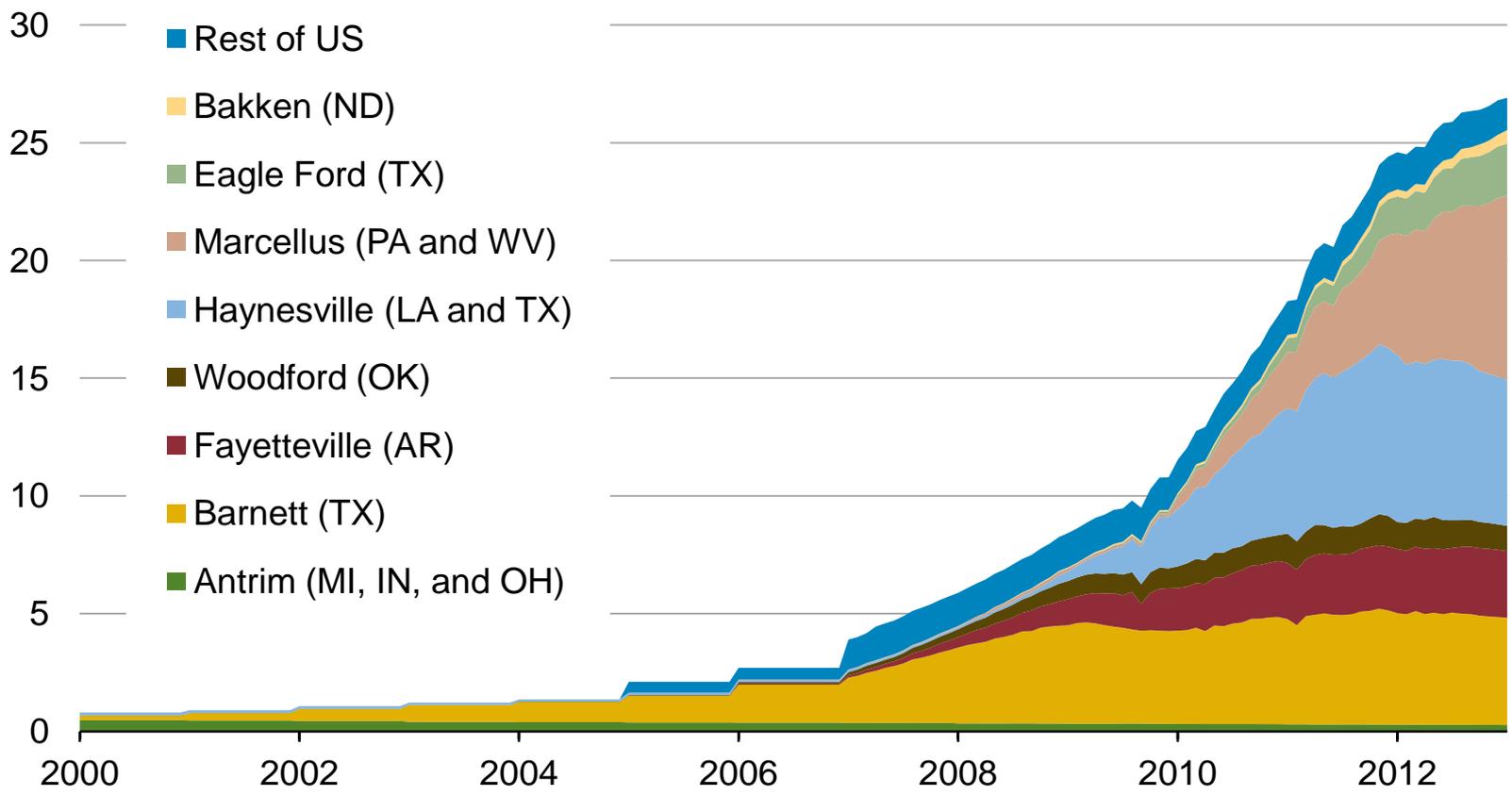
For example: Oil production by monthly vintage of wells in the Williston Basin



Source: Drilling Info history through August 2012, EIA Short-Term Energy Outlook, February 2013 forecast

Domestic production of shale gas has grown dramatically over the past few years

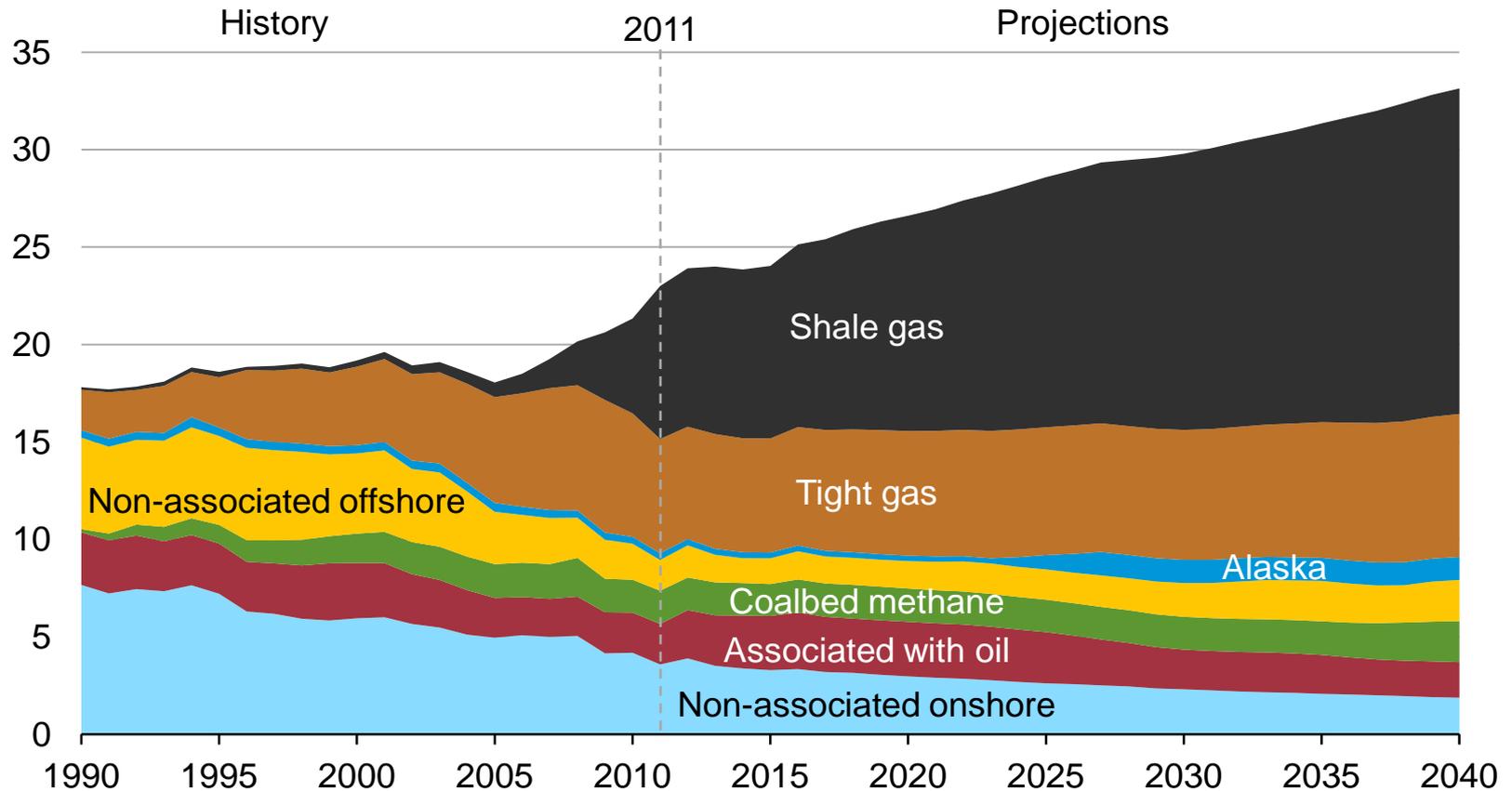
shale gas production (dry)
billion cubic feet per day



Sources: LCI Energy Insight gross withdrawal estimates as of January 2013 and converted to dry production estimates with EIA-calculated average gross-to-dry shrinkage factors by state and/or shale play.

Shale gas leads growth in total gas production through 2040

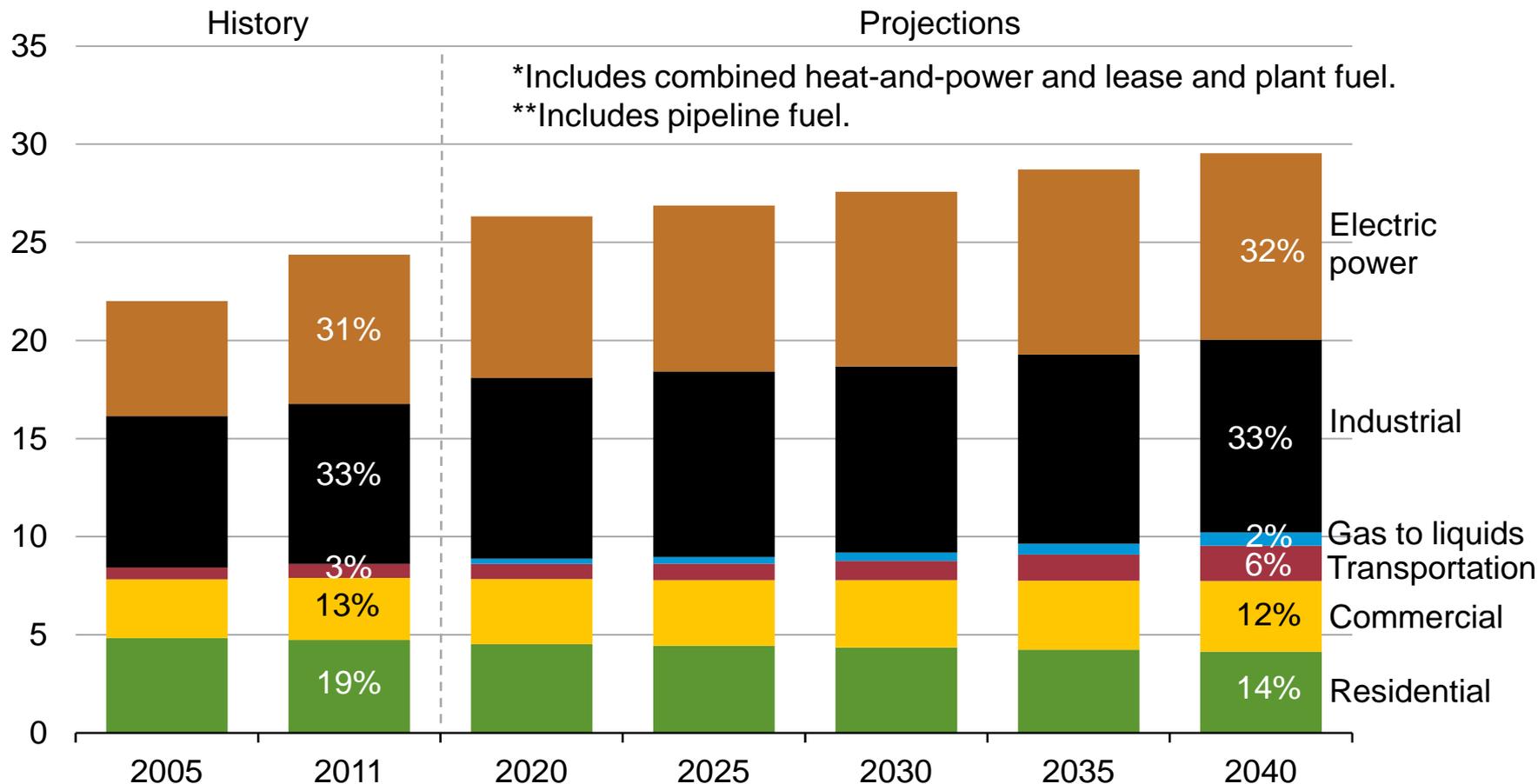
U.S. dry natural gas production
trillion cubic feet



Source: EIA, Annual Energy Outlook 2013 Early Release

Natural gas consumption is quite dispersed with electric power, industrial, and transportation use driving future demand growth

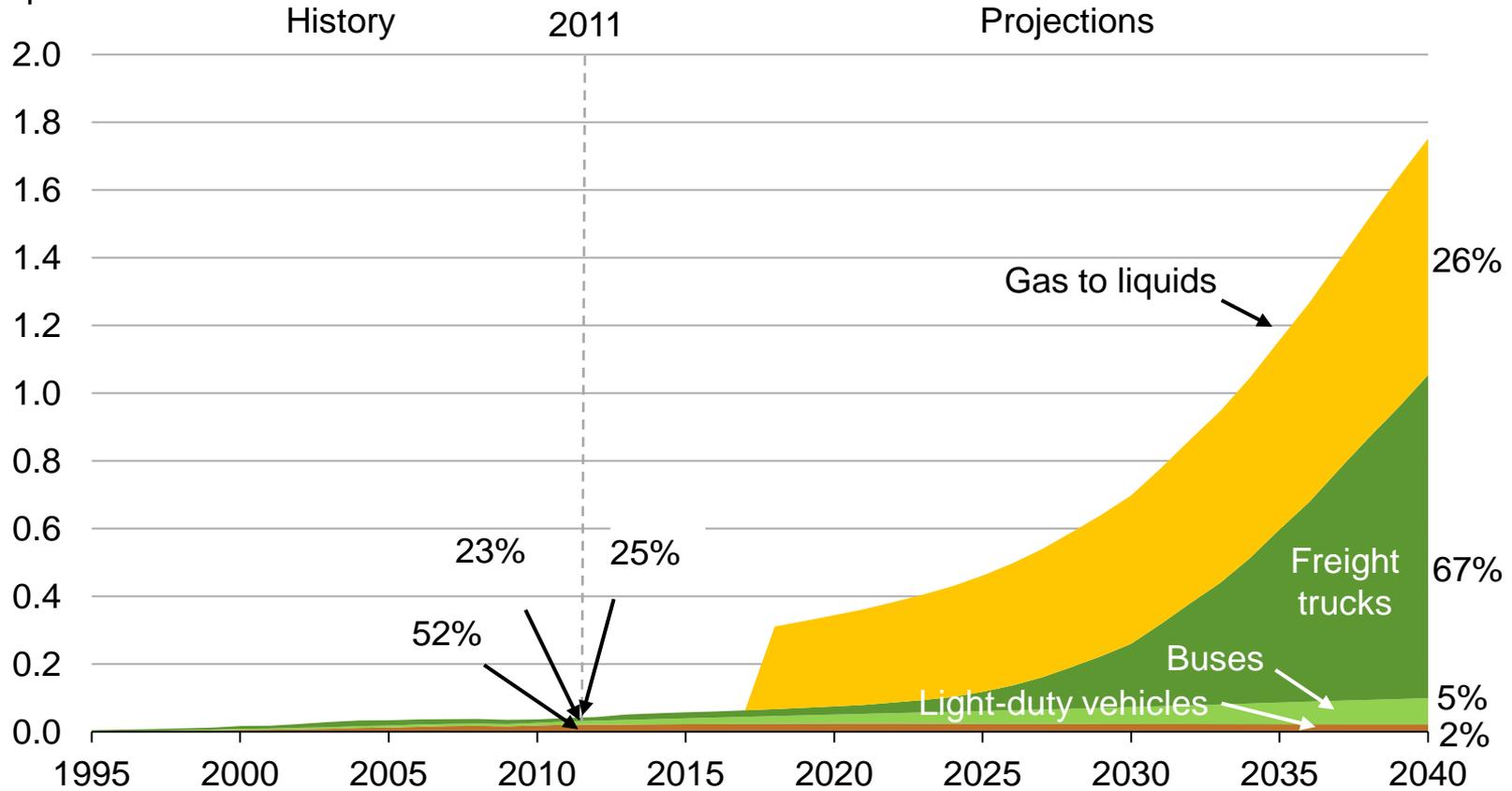
U.S. dry gas consumption
trillion cubic feet



Source: EIA, Annual Energy Outlook 2013 Early Release

Growth of natural gas in transportation, excluding pipeline use, led by heavy duty trucks (LNG) and gas to liquids (diesel)... marine and rail to come?

U.S. natural gas consumption
quadrillion Btu

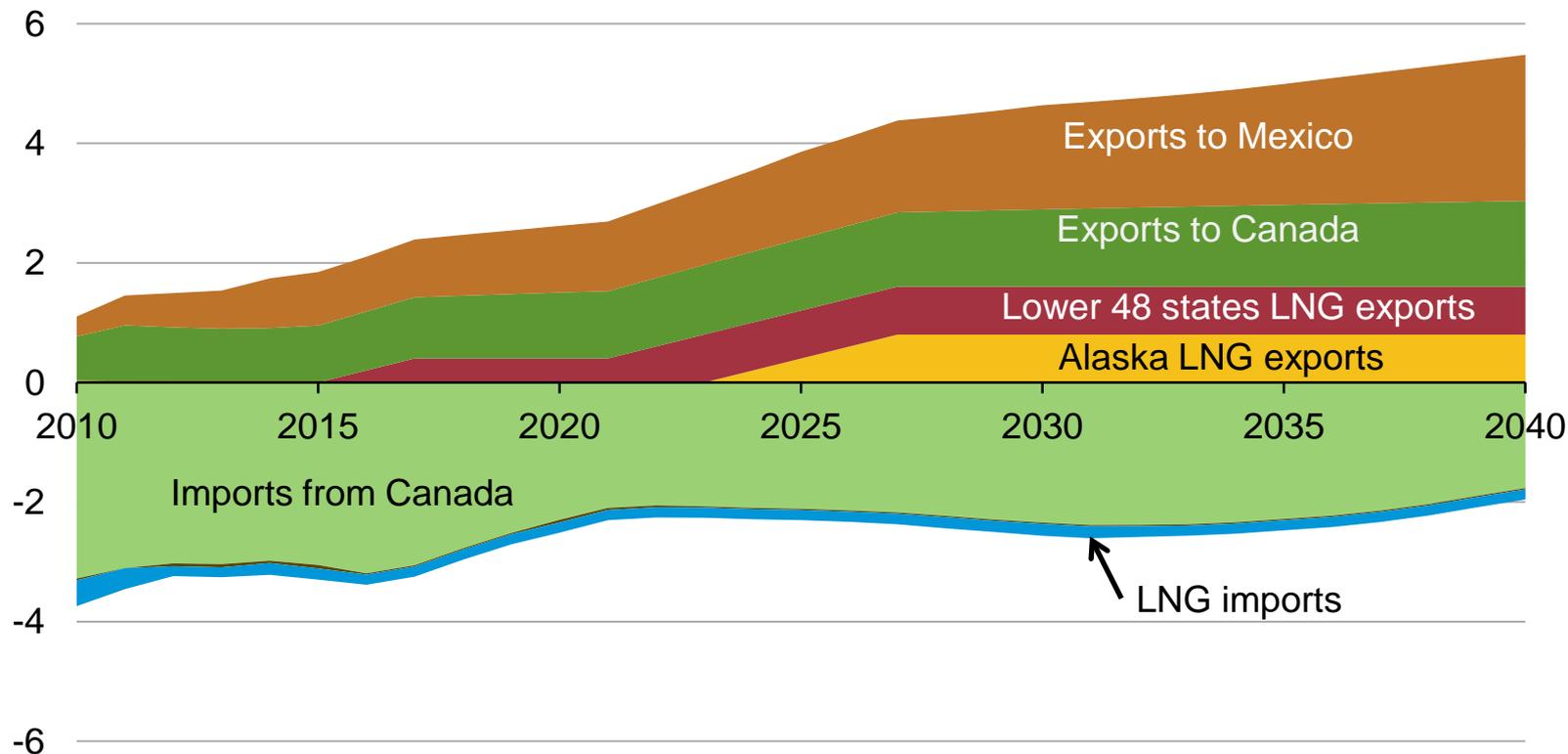


Note: Gas to liquids includes heat, power, and losses.

Source: EIA, Annual Energy Outlook 2013 Early Release

The U.S. is projected to be both an exporter and importer of natural gas

U.S. natural gas imports and exports
trillion cubic feet

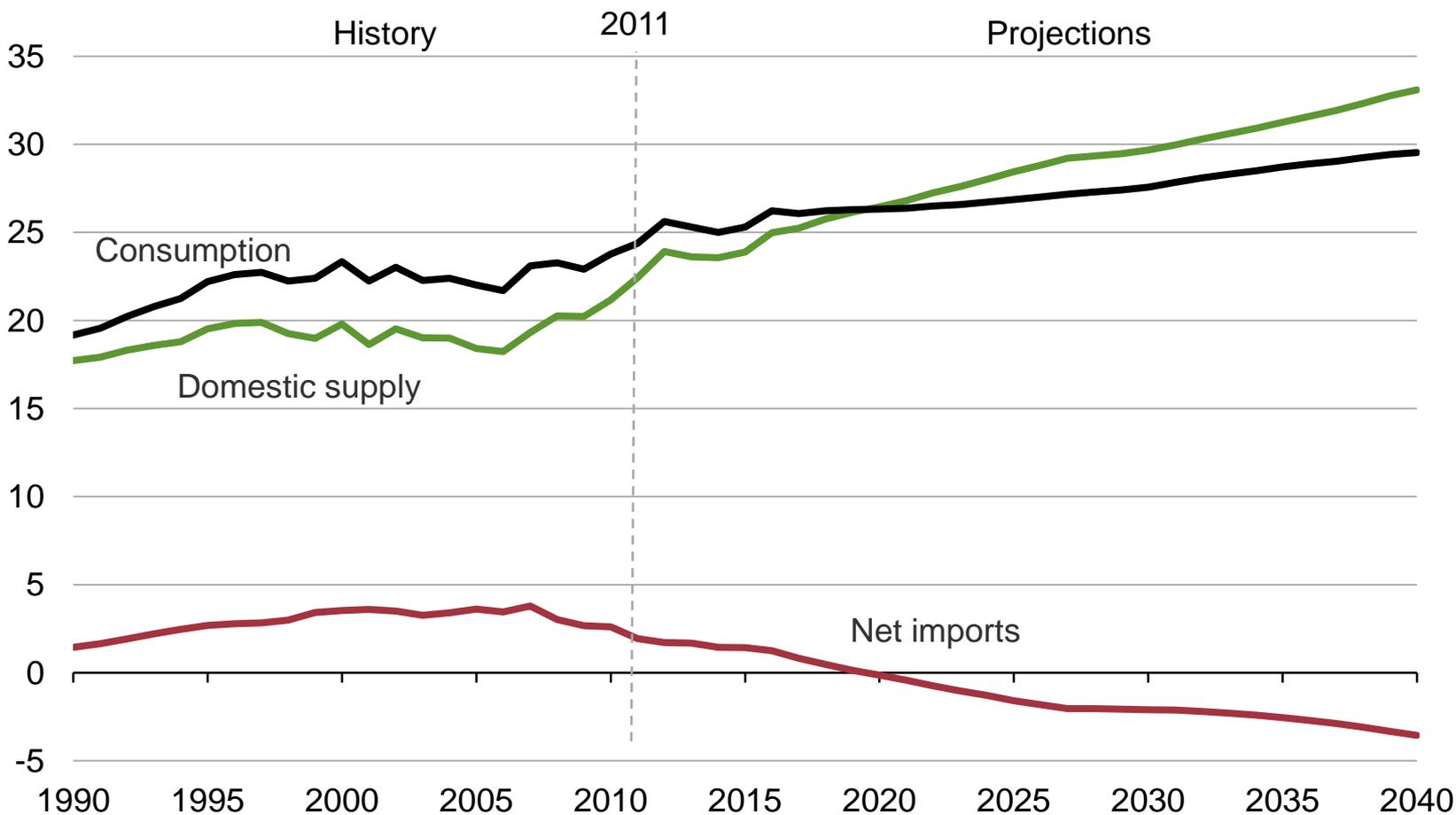


Source: EIA, Annual Energy Outlook 2013 Early Release

Domestic natural gas production grows faster than consumption and the U.S. becomes a net exporter of natural gas around 2020

U.S. dry gas

trillion cubic feet

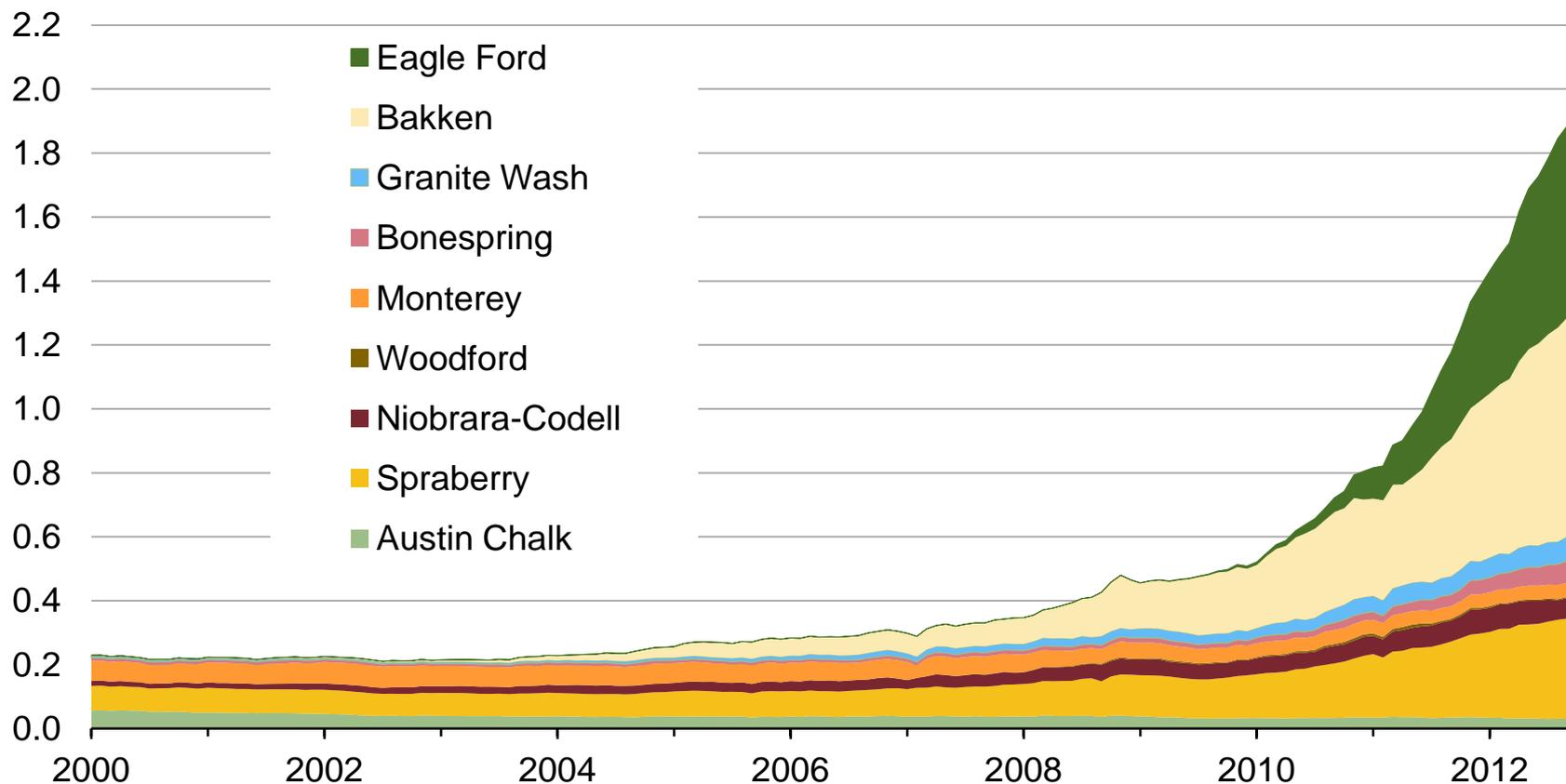


Source: EIA, Annual Energy Outlook 2013 Early Release

U.S. Tight Oil

Domestic production of tight oil has grown dramatically over the past few years

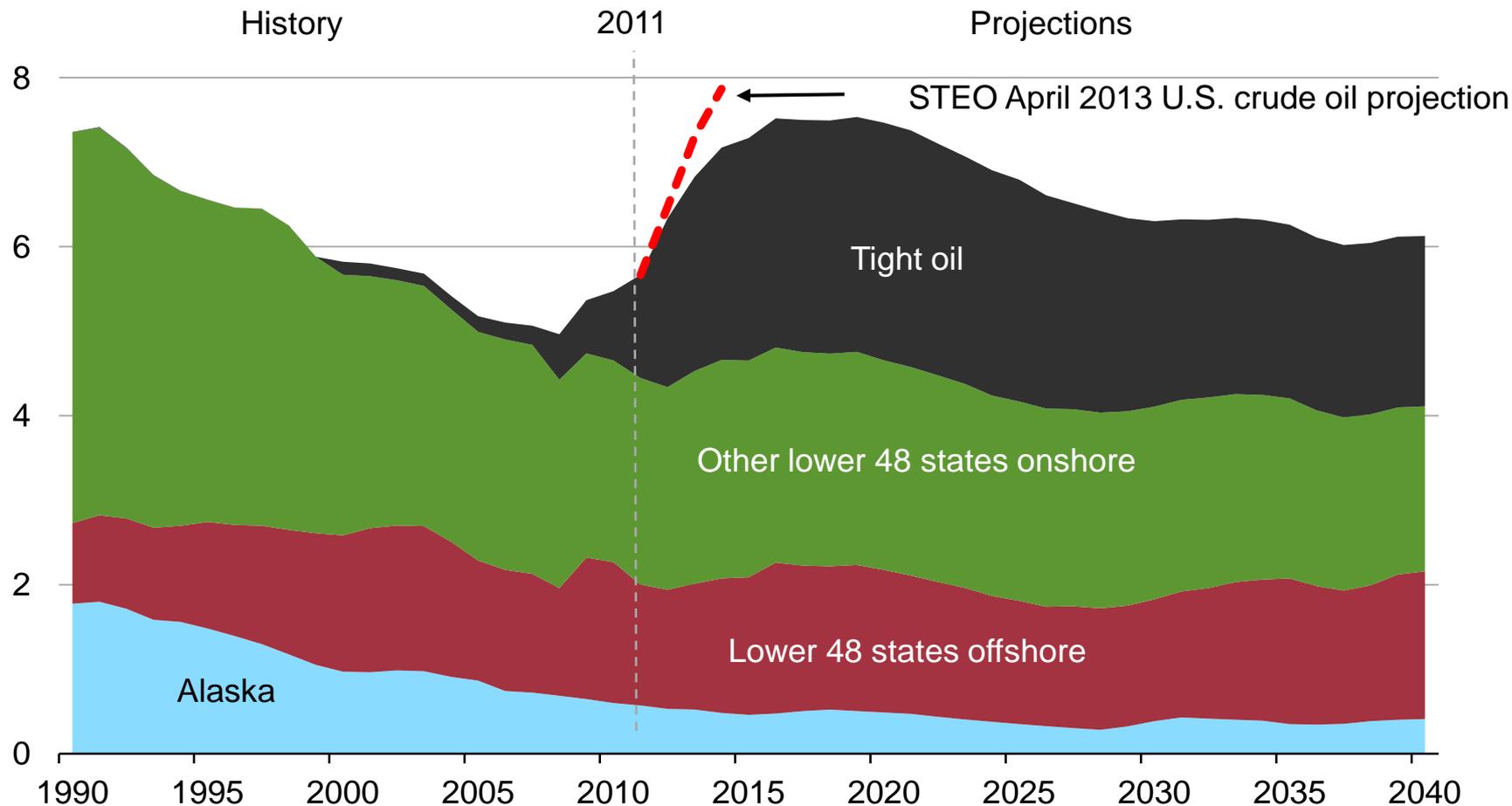
tight oil production for select plays
million barrels per day



Source: Drilling Info (formerly HPDI), Texas RRC, North Dakota department of mineral resources, and EIA, through October 2012.

U.S. tight oil production leads a growth in domestic production of 2.6 million barrels per day between 2008 and 2019

U.S. crude oil production
million barrels per day

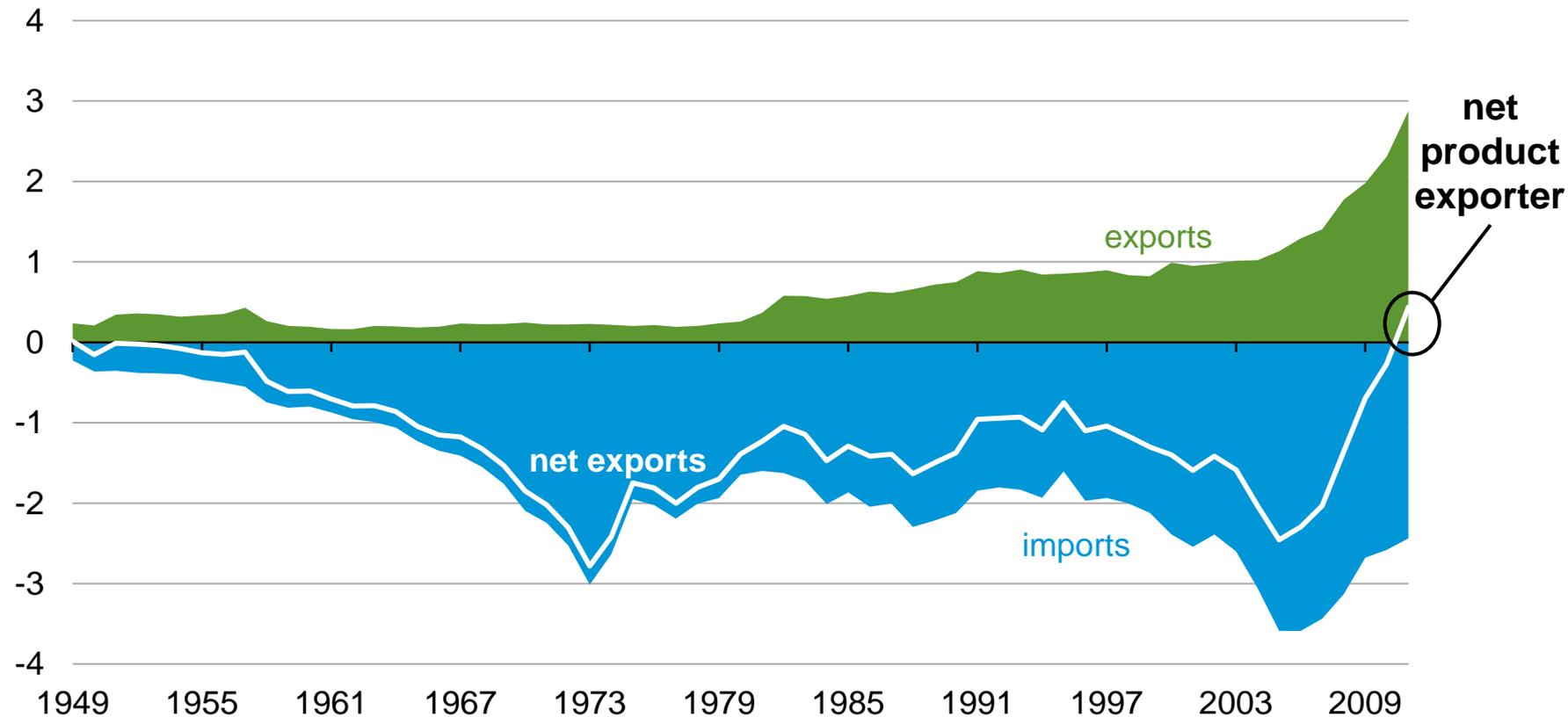


Source: EIA, Annual Energy Outlook 2013 Early Release and Short-Term Energy Outlook, April 2013

U.S. petroleum product exports exceeded imports in 2011 for first time in over six decades

annual U.S. net exports of total petroleum products, 1949 – 2011

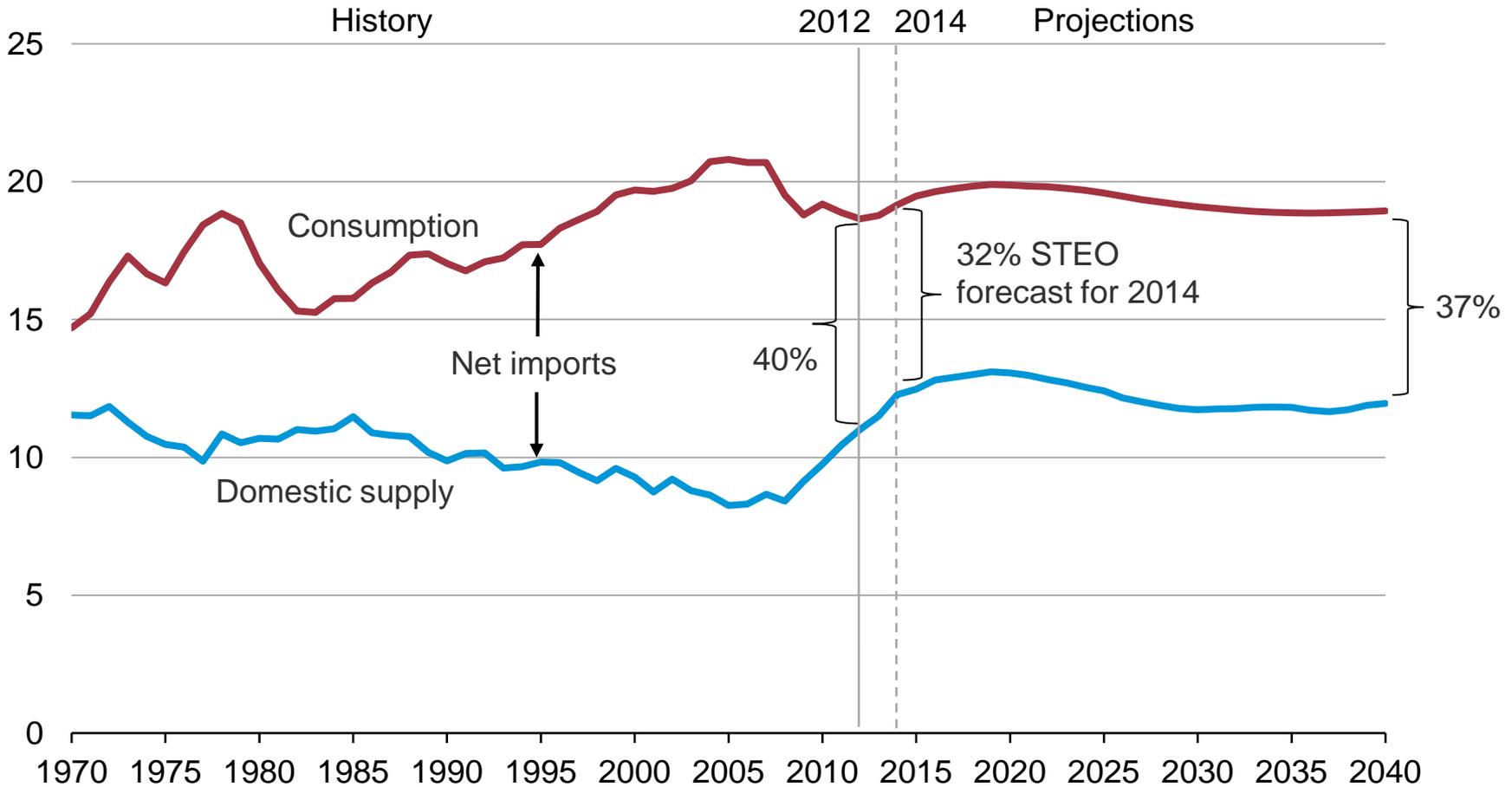
million barrels per day



Source: EIA, Petroleum Supply Monthly

U.S. dependence on imported liquids depends on both supply and demand

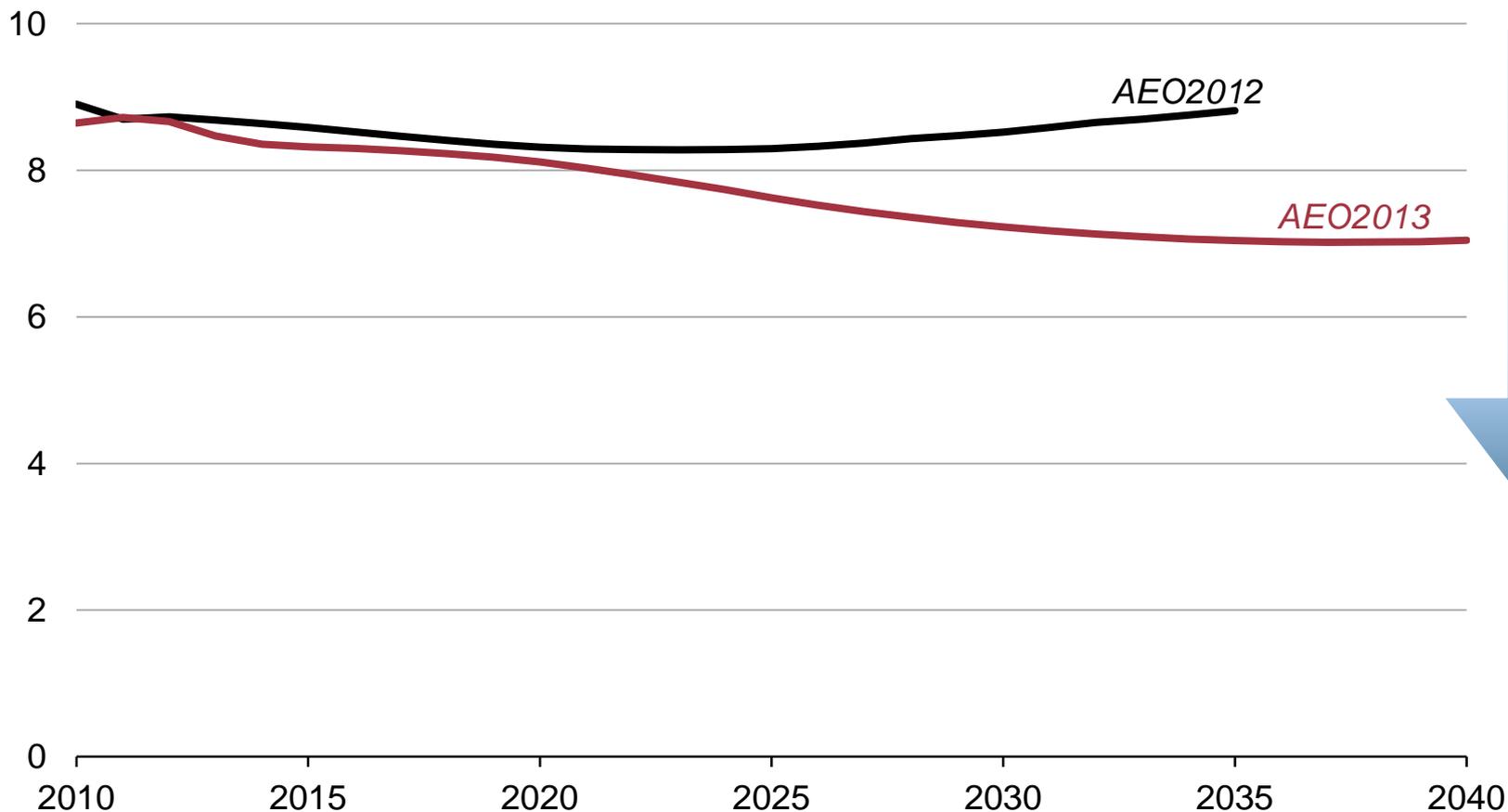
U.S. liquid fuel supply
million barrels per day



Source: EIA, Annual Energy Outlook 2013 Early Release and Short-Term Energy Outlook, April 2013

Light-duty vehicle liquids consumption is lower primarily due to more stringent CAFE standards

light-duty vehicle liquids consumption
million barrels per day



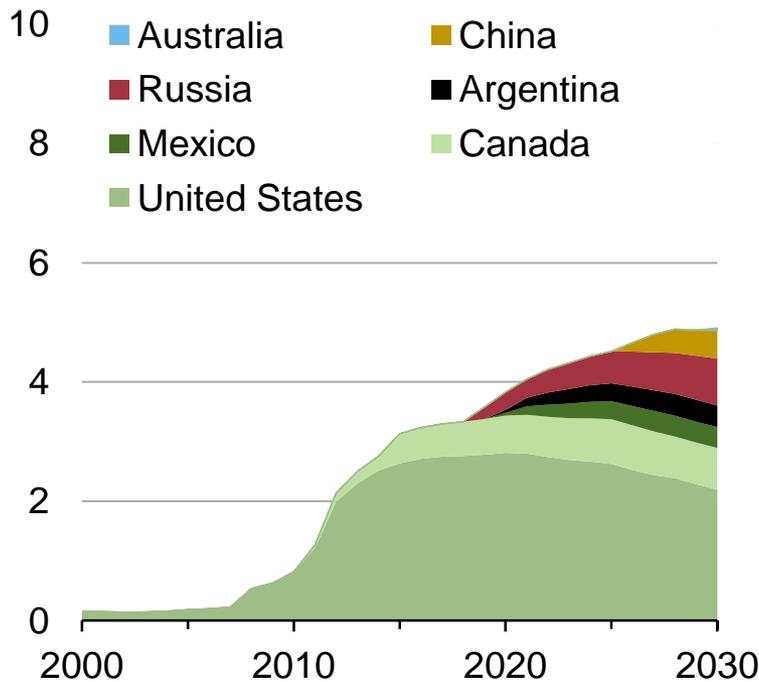
Source: EIA, Annual Energy Outlook 2013 Early Release

Global tight oil production comparisons

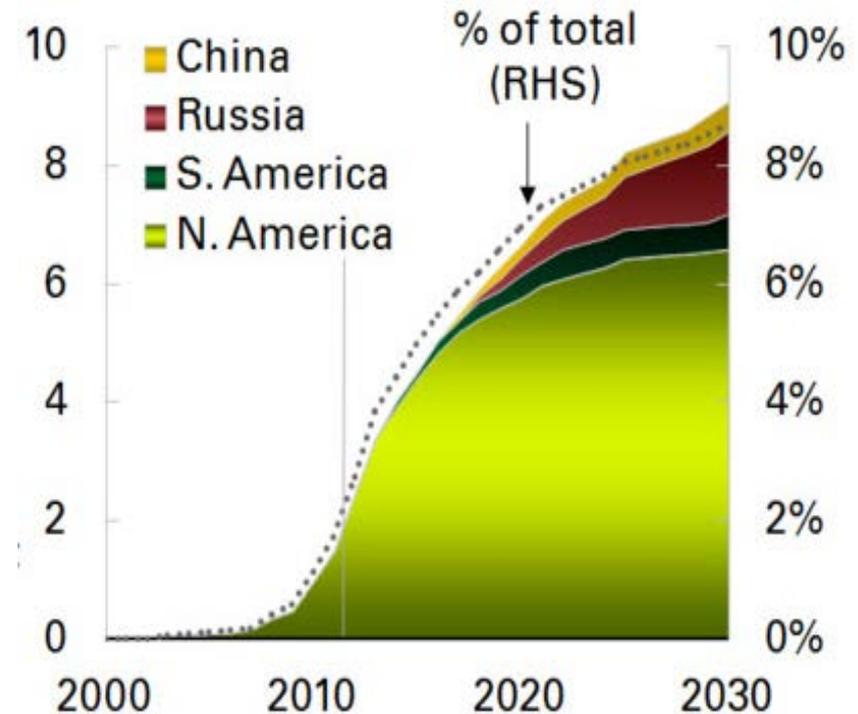
IEO2013 DRAFT

BP Energy Outlook 2030

million barrels per day



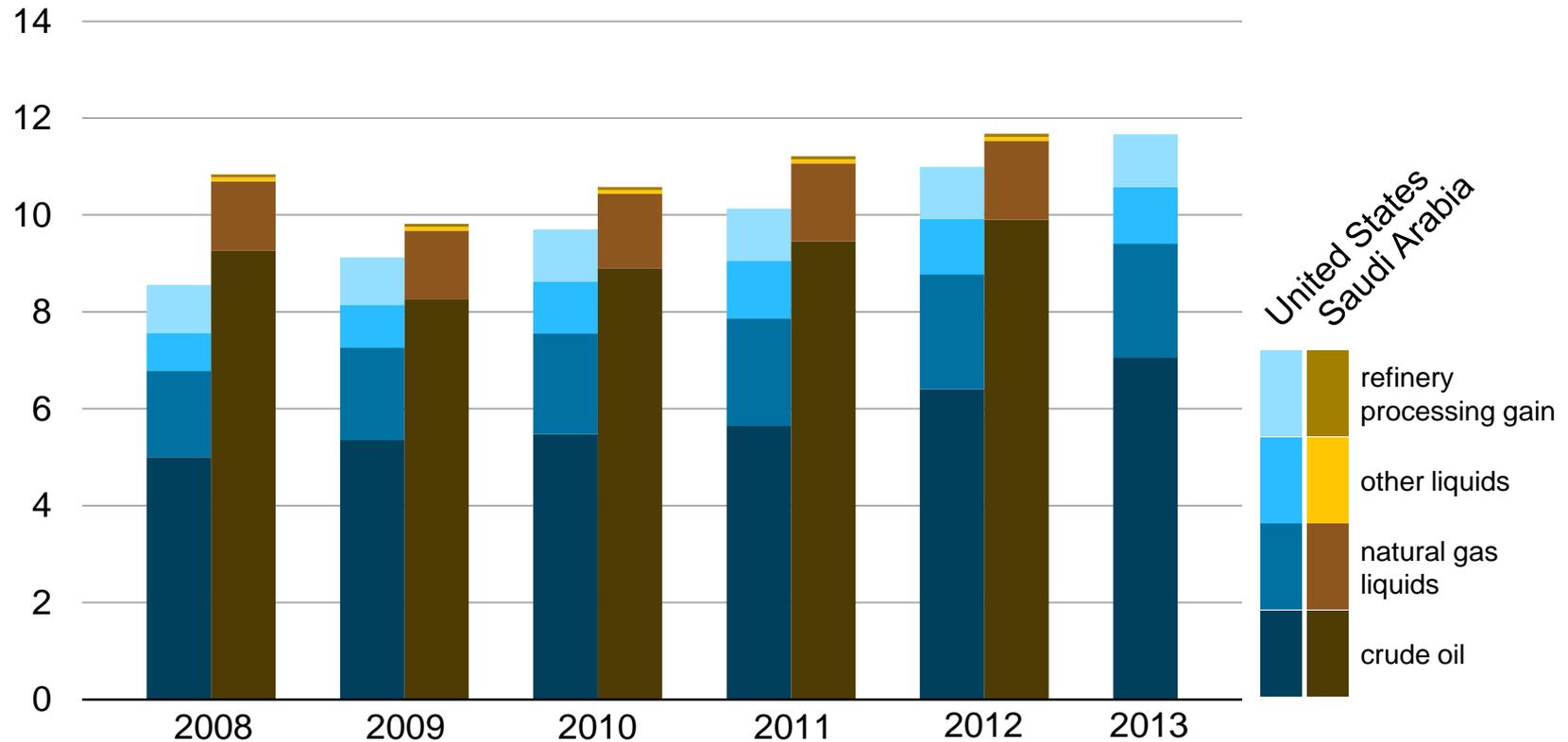
Mb/d



Source: EIA, Preliminary International Energy Outlook 2013 and BP Energy Outlook 2030, www.bp.com/energyoutlook

U.S. and Saudi Arabian crude oil and petroleum liquids production

million barrels per day



Note: Volumes for 2012 and 2013 are projected. Refinery gain for Saudi Arabia is estimated as one half of U.S. refinery gain on a percentage basis

Source: EIA, *This Week in Petroleum*, Dec 19, 2012

For more information

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

Annual Energy Outlook | www.eia.gov/forecasts/aeo

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

International Energy Outlook | www.eia.gov/forecasts/ieo

Today In Energy | www.eia.gov/todayinenergy

Monthly Energy Review | www.eia.gov/totalenergy/data/monthly

Annual Energy Review | www.eia.gov/totalenergy/data/annual