

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



For

Washington Association of Money Managers

April 18, 2013 | Washington, DC

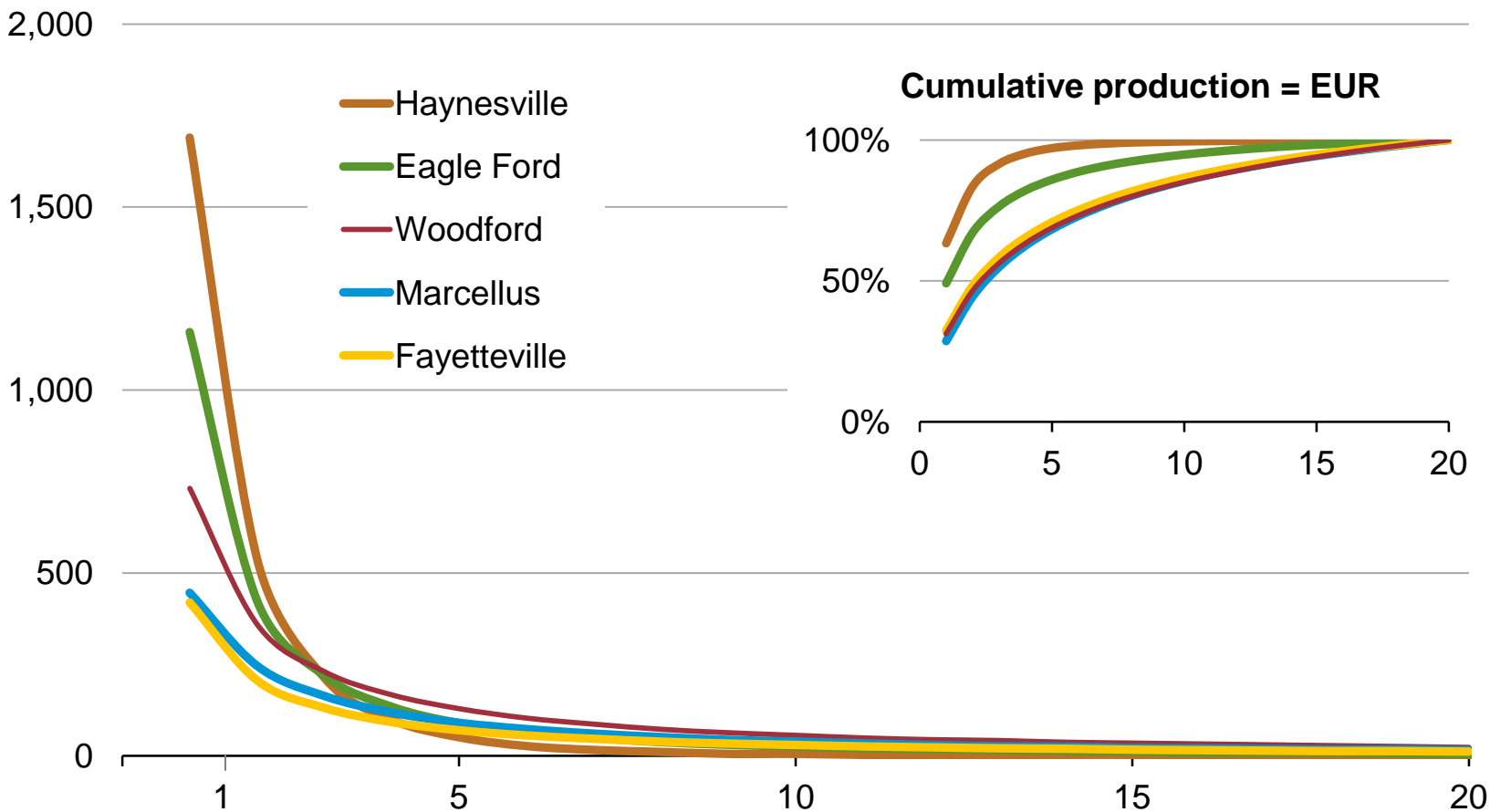
By

Adam Sieminski, Administrator

U.S. Shale Gas

An average well in shale gas and other continuous resource plays has steep decline curves

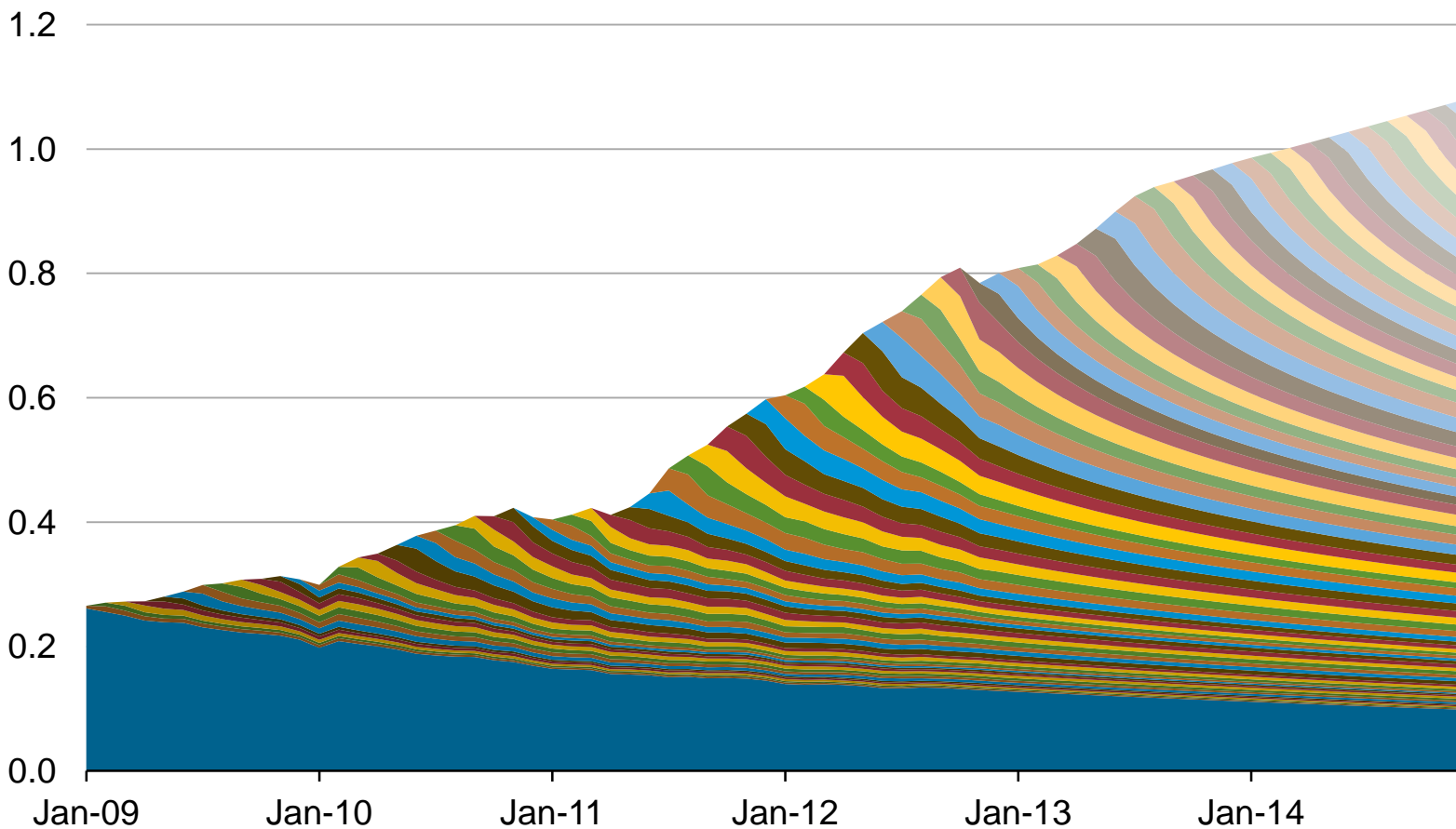
million cubic feet per year



Source: EIA, Annual Energy Outlook 2012

Oil production by monthly vintage of wells in the Williston Basin – production grows with continued drilling

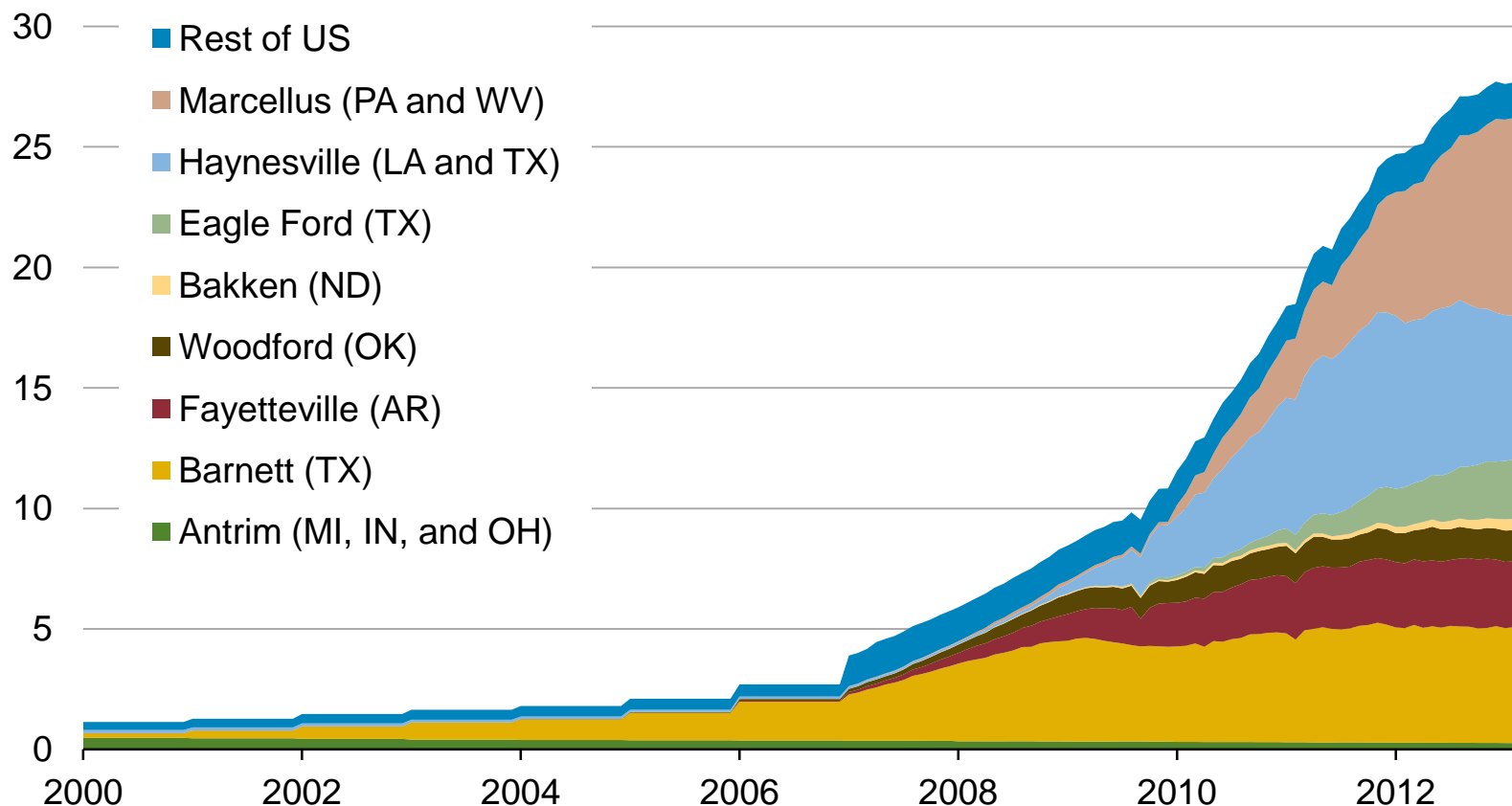
million barrels per day



Source: DrillingInfo history through December 2012, EIA Short-Term Energy Outlook, April 2013 forecast

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

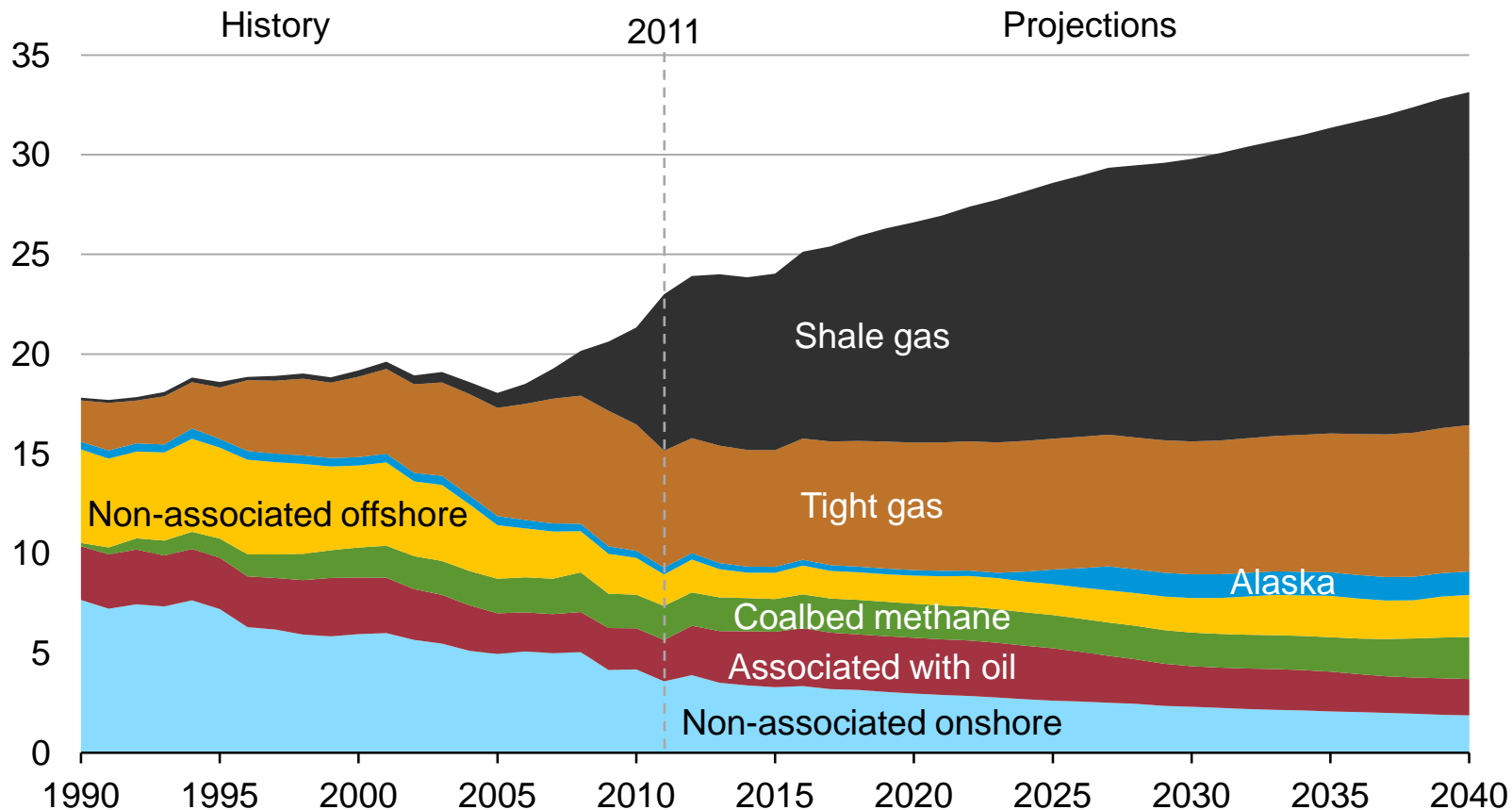
shale gas production (dry)
billion cubic feet per day



Sources: LCI Energy Insight gross withdrawal estimates as of March 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 to reach half of U.S. output

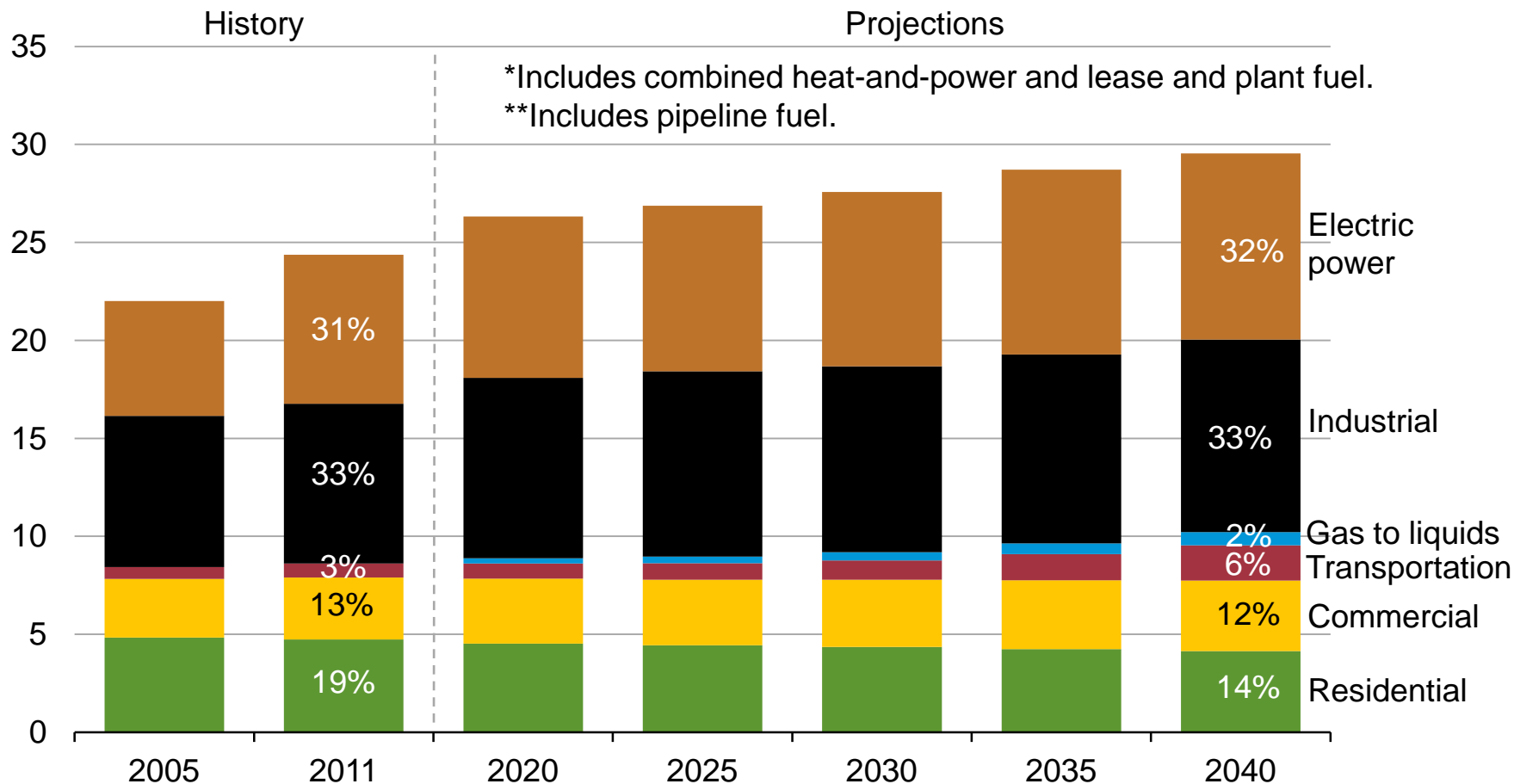
U.S. dry natural gas production
trillion cubic feet



Source: EIA, Annual Energy Outlook 2013

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

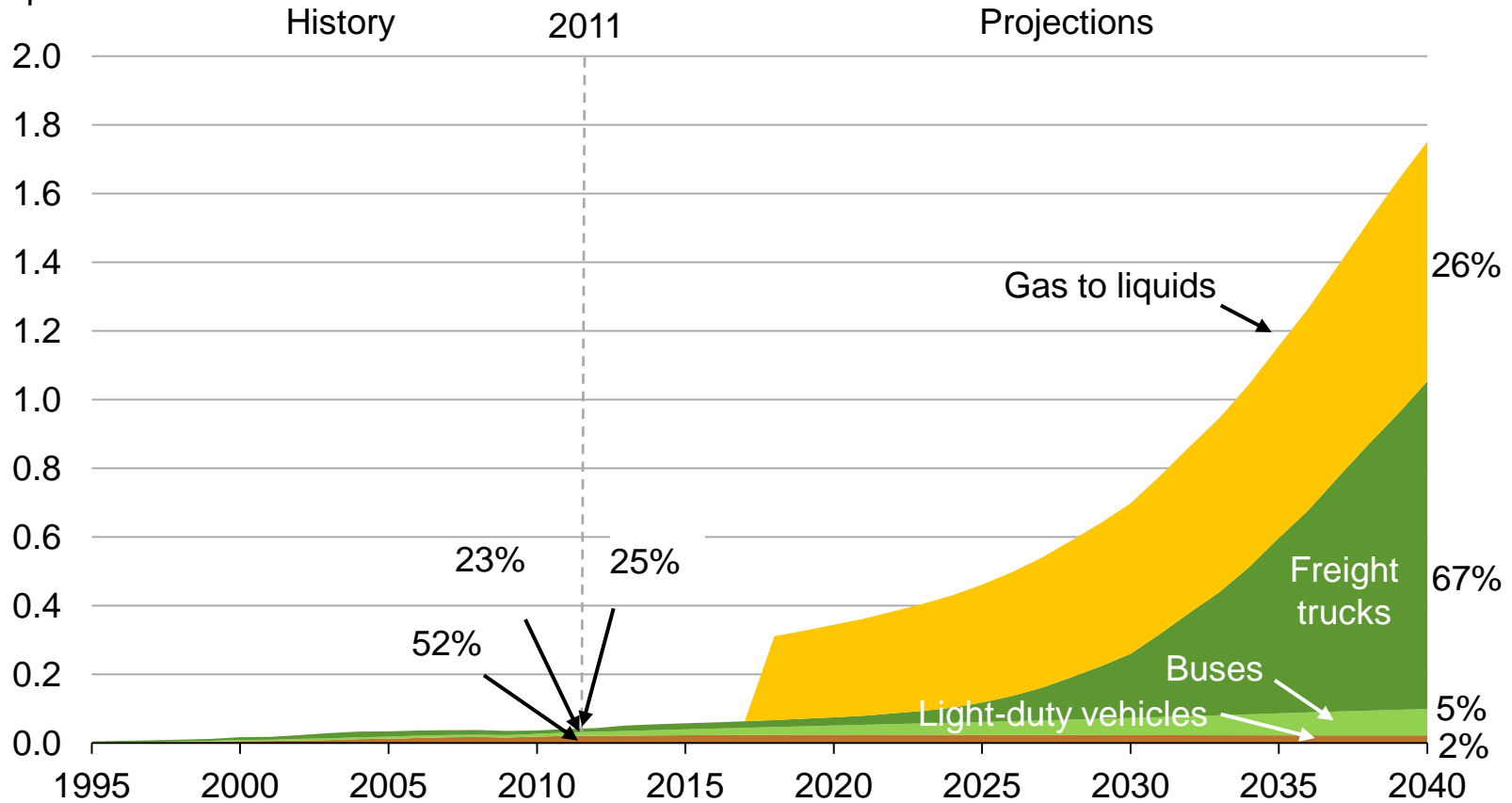
U.S. dry gas consumption
trillion cubic feet



Source: EIA, Annual Energy Outlook 2013

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?

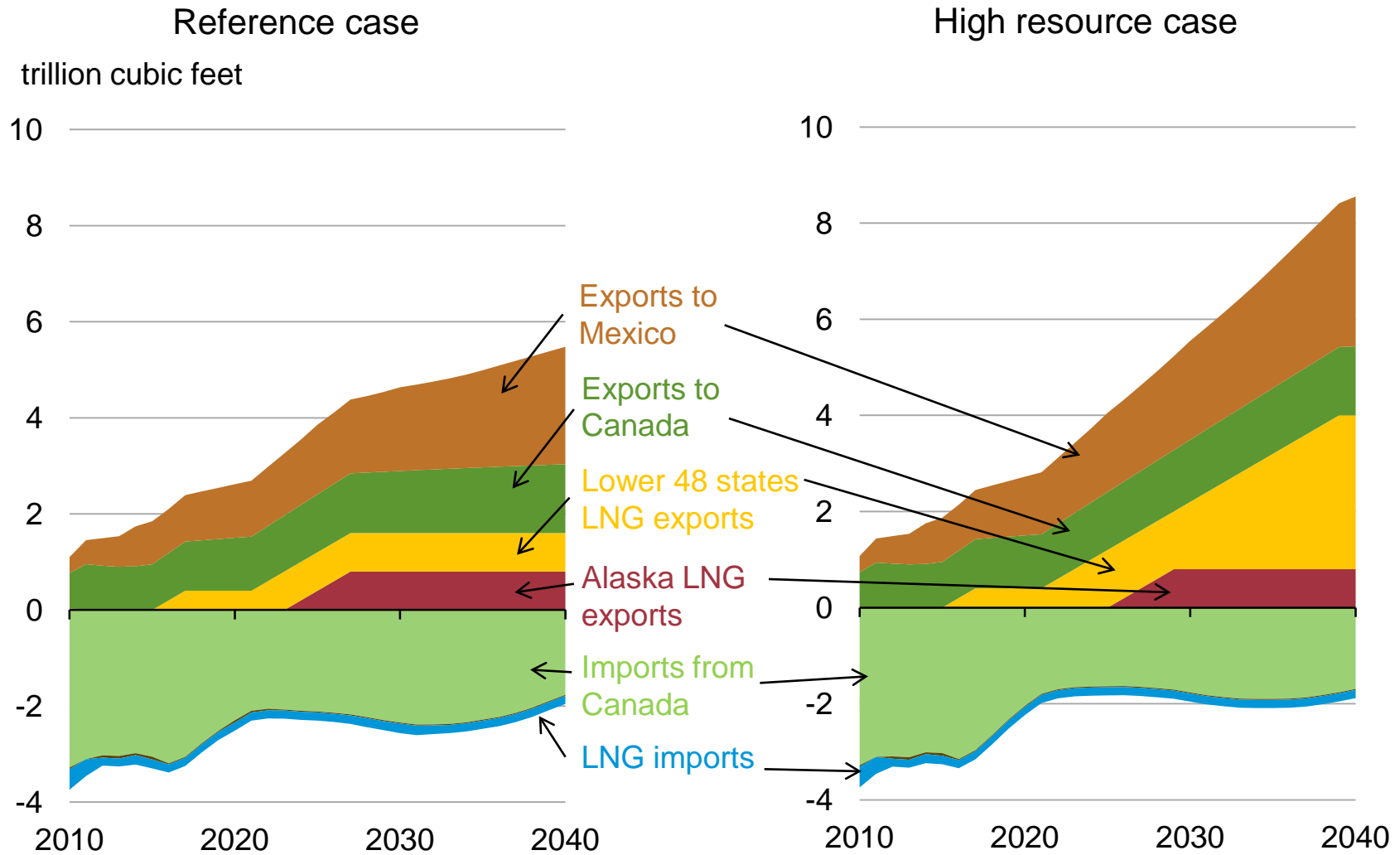
U.S. natural gas consumption
quadrillion Btu



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

Source: EIA, Annual Energy Outlook 2013

U.S. natural gas imports and exports

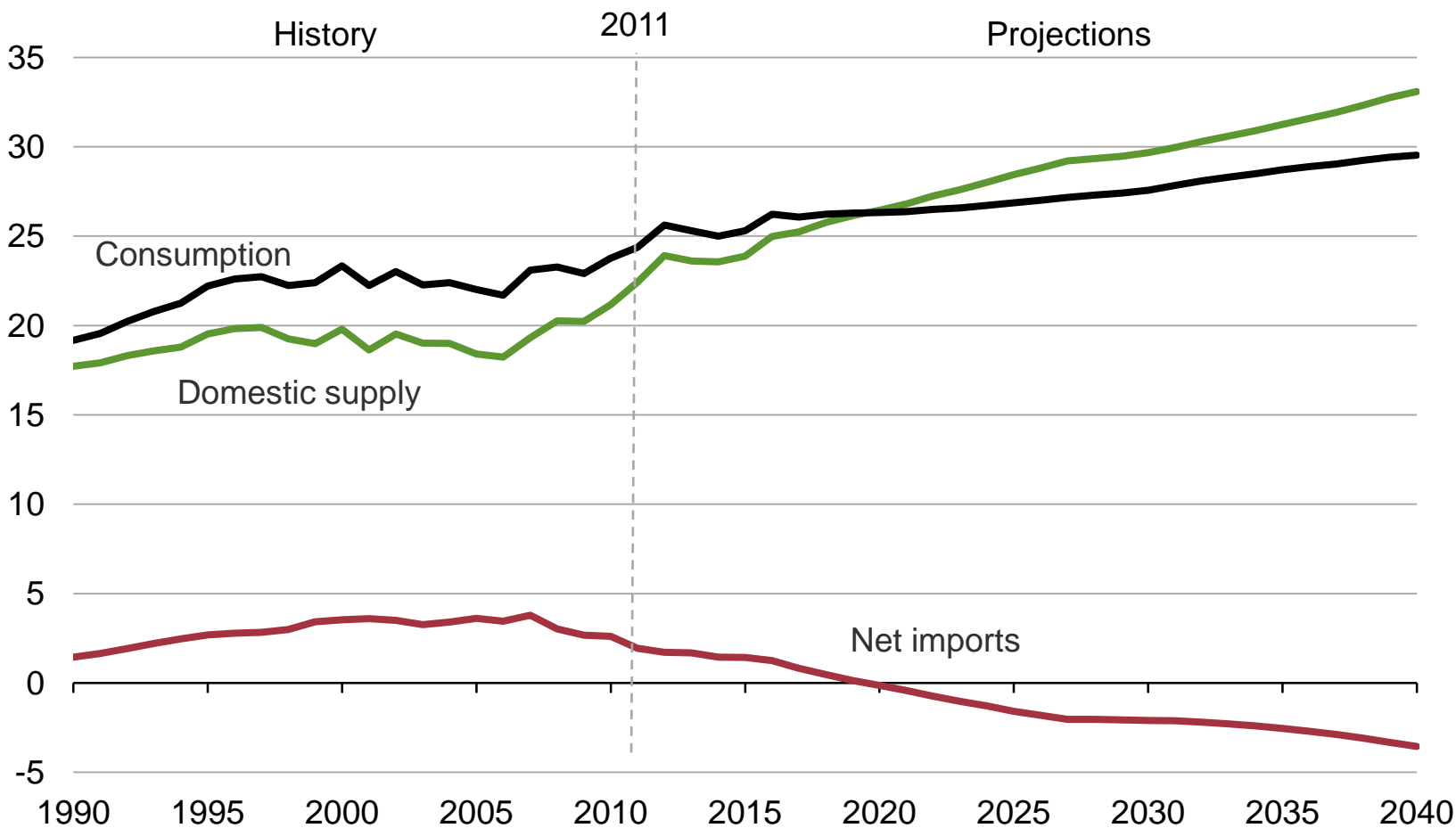


Source: EIA, Annual Energy Outlook 2013

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

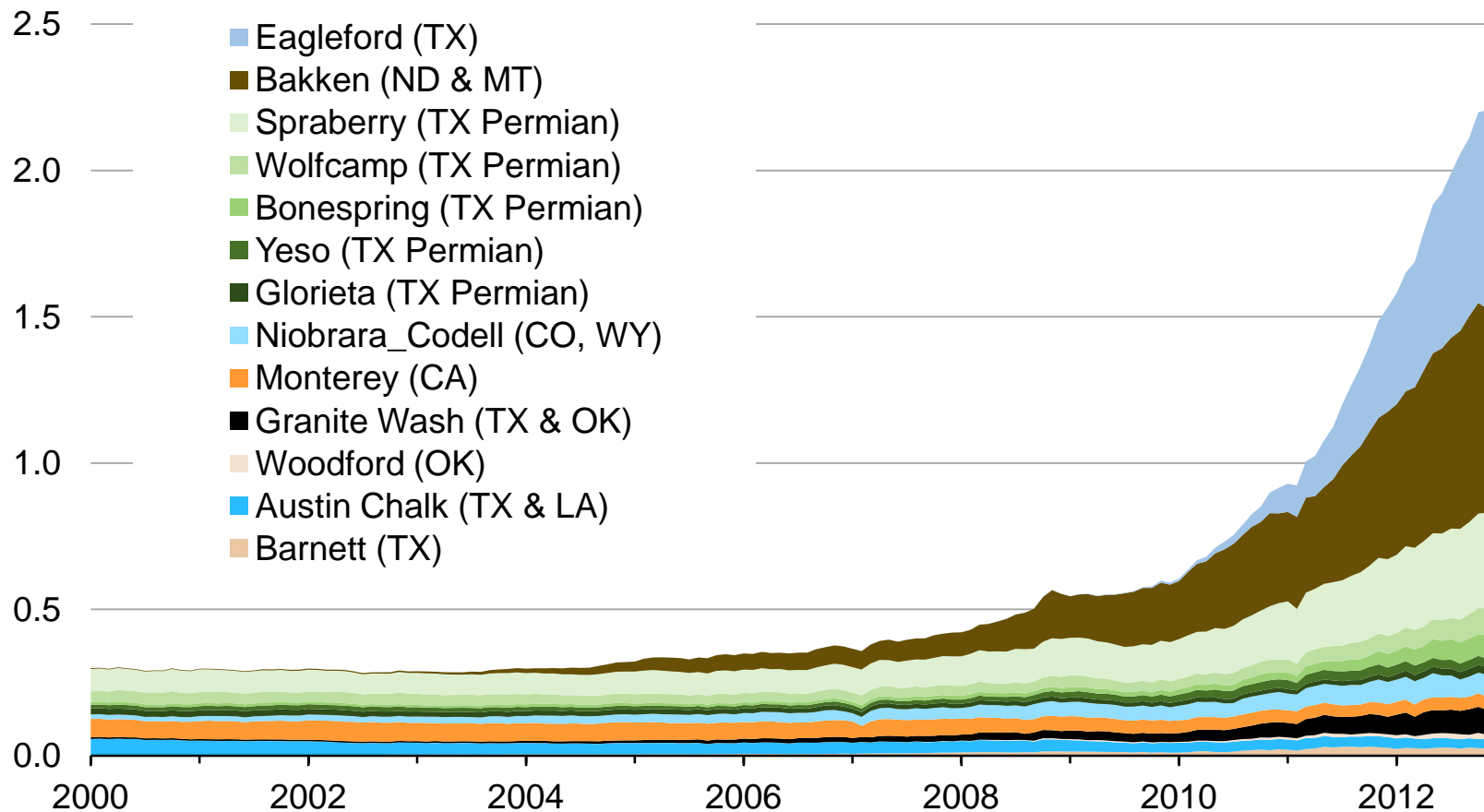


Source: EIA, Annual Energy Outlook 2013

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

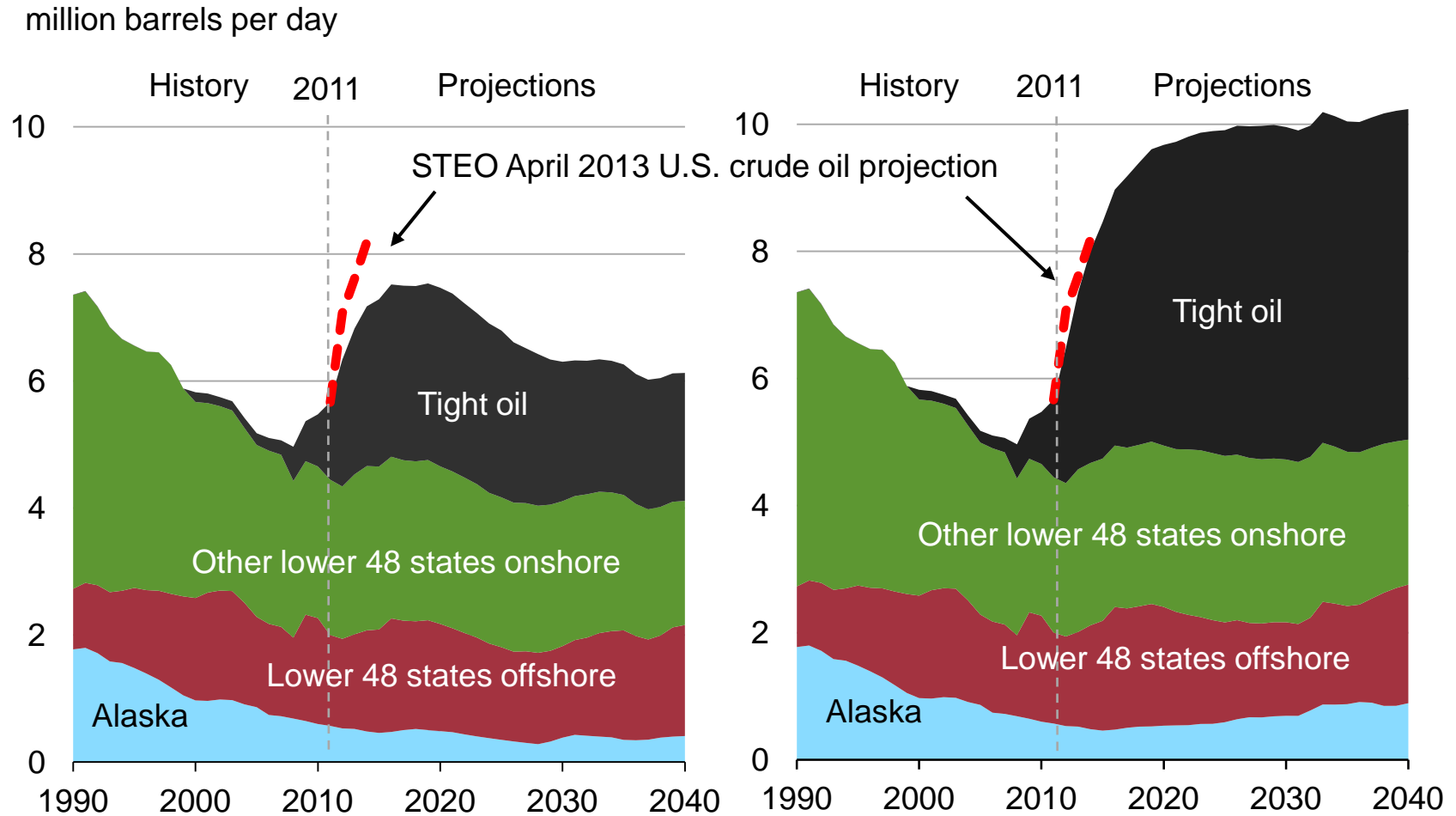


Source: Drilling Info (formerly HPDI), Texas RRC, North Dakota department of mineral resources, and EIA, through December 2012

U.S. tight oil production leads growth in domestic production

Reference case

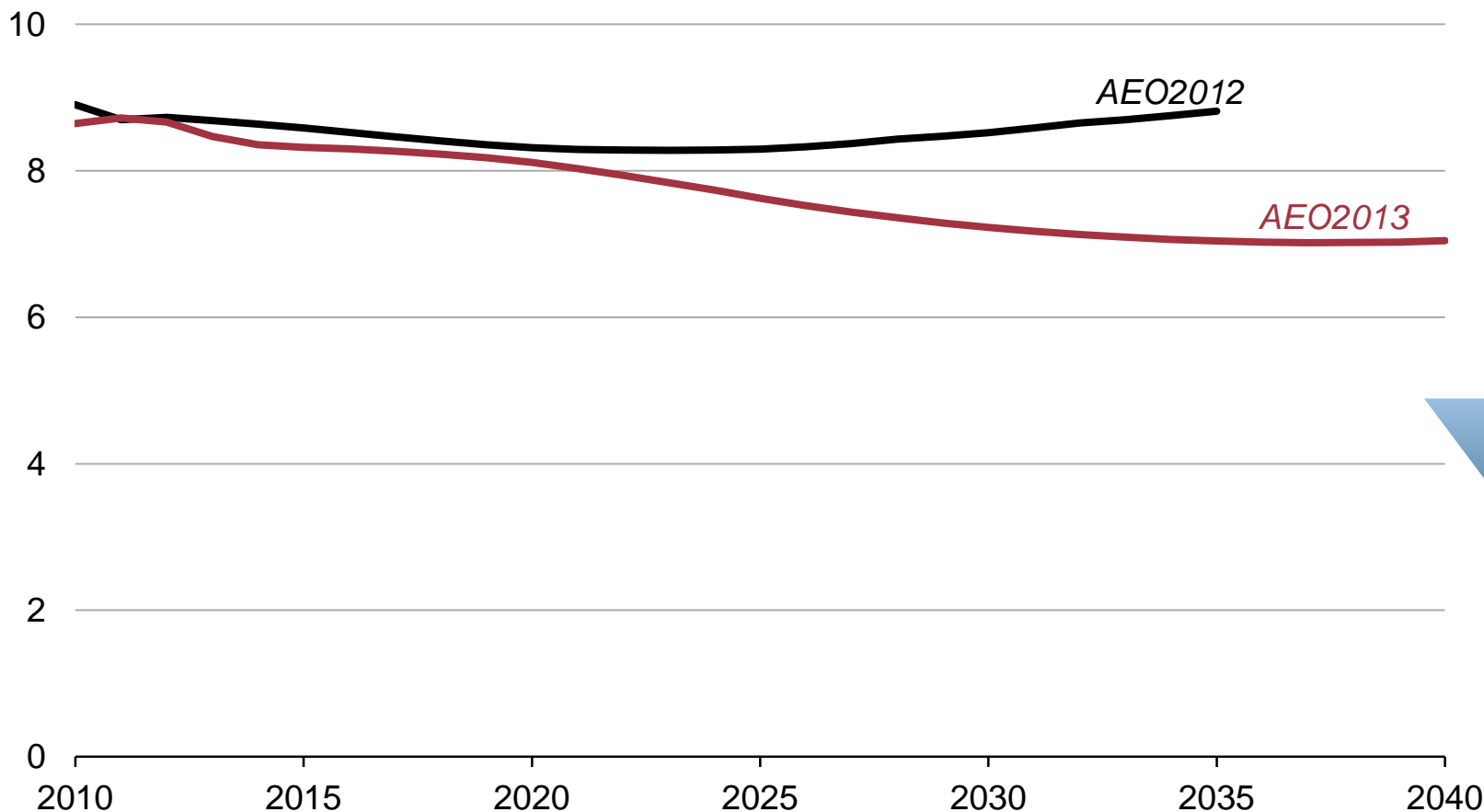
High resource case



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

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

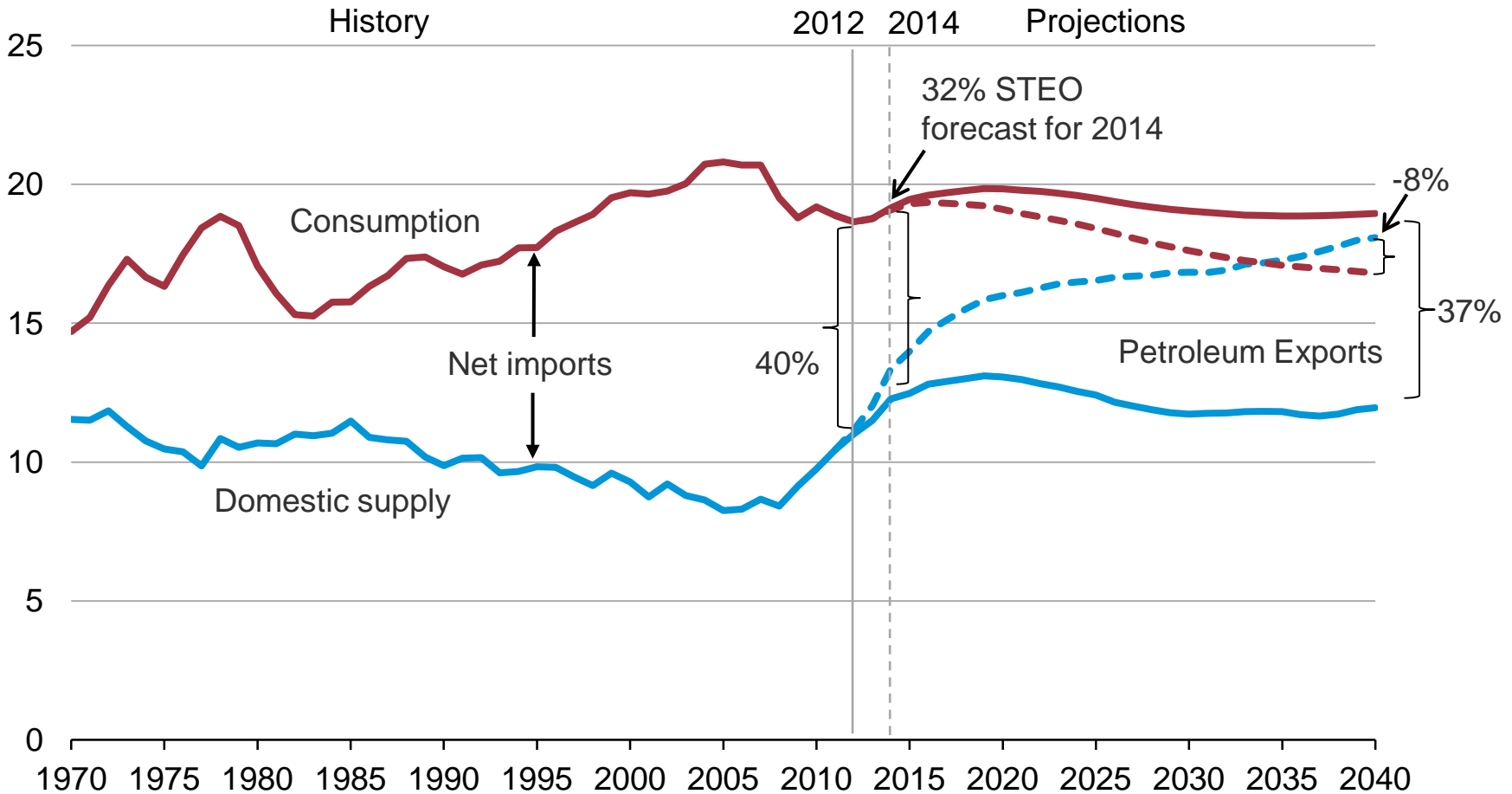
light-duty vehicle liquids consumption
million barrels per day



Source: EIA, Annual Energy Outlook 2013

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

U.S. liquid fuel supply
million barrels per day



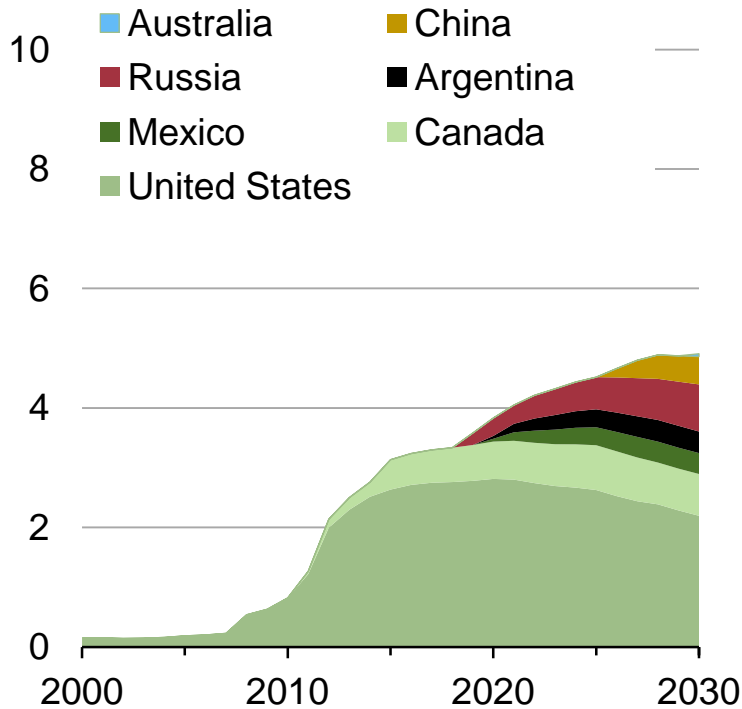
Source: EIA, Annual Energy Outlook 2013 and Short-Term Energy Outlook, April 2013

Global tight oil production comparisons

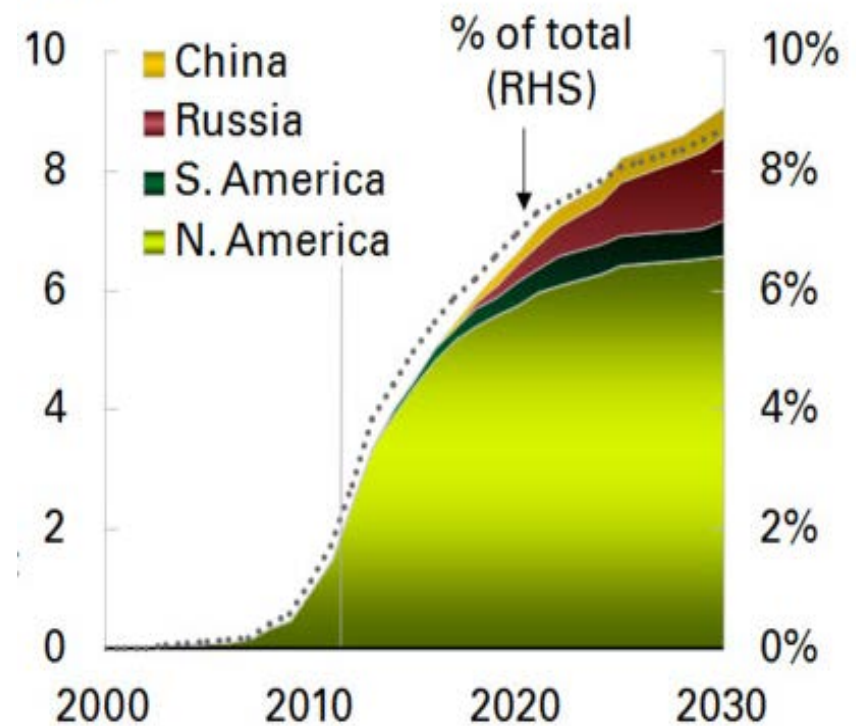
IEO2013 DRAFT

BP Energy Outlook 2030

million barrels per day



Mb/d



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

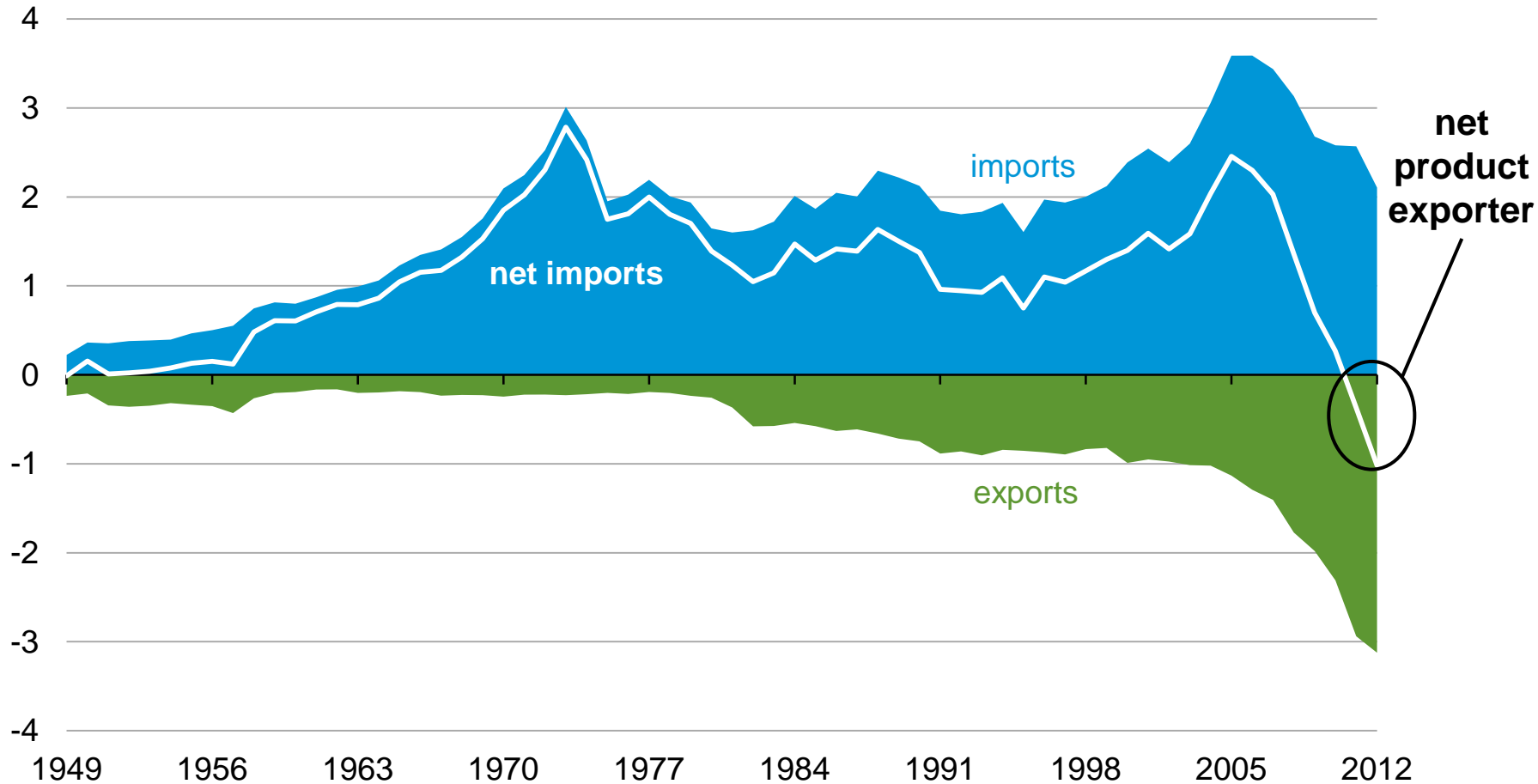
Uncertainties that could slow global growth of shale gas and tight oil

- Resource quantities and distribution
- Surface vs. mineral rights
- Risk appetite of industry participants
- Infrastructure and technology
- Environmental constraints

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

annual U.S. net imports of total petroleum products, 1949 – 2012

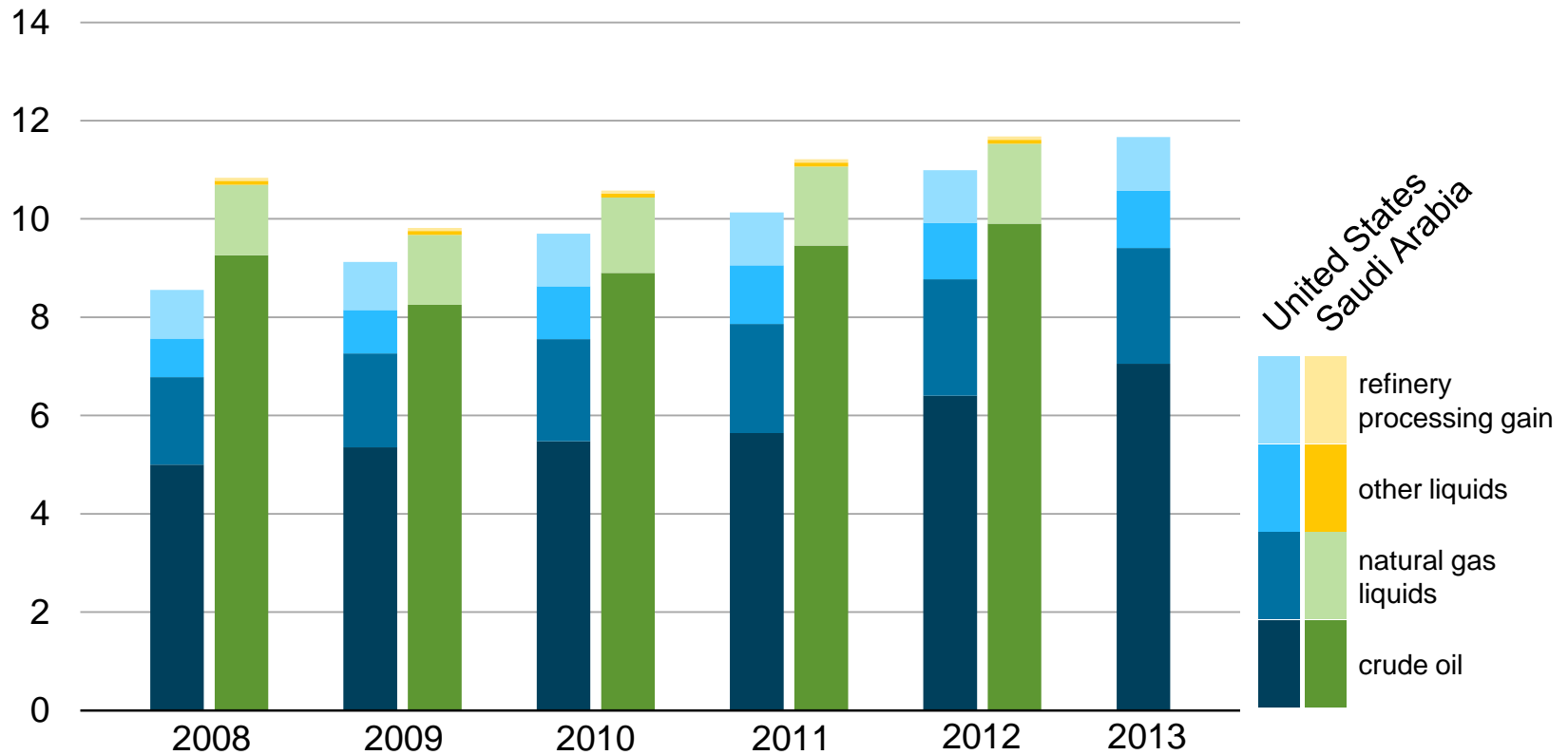
million barrels per day



Source: EIA, Petroleum Supply Monthly and Annual Energy Review

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

EIA's strategic priorities

- **Transforming data operations**

Essential to radically improve our data collection and management processes. EIA must improve business processes, employing common, maintainable IT systems and platforms and incorporating smarter ways of using third-party data

- **Increasing analytical impact**

A key part of our mission is to bring context and meaning to the information we convey. To do this, we must modernize our core modeling tools to improve our energy outlooks and increase the availability of resources for analyses beyond our current product slate

- **Improving the customer experience**

EIA must ensure that its customers have access to critical information how and when they need it. We need to re-imagine the way we disseminate our data and analysis and leverage technology to meet evolving customer needs

- **Enabling our mission**

To hire, motivate, and retain the best and brightest. We need to give them the technological and developmental tools they need to grow and succeed, and maintain an environment of openness and collaboration

- **Finding and adapting the best of what others are doing**

Both inside and outside of government

Increasing demand for current market analysis from EIA

- Gas markets – LNG exports and impact on domestic prices over time
- Oil and gas production data (federal lands vs. rest), forecasts, and reserves
- Crude and product markets, refining and midstream changes
 - Types of refining capacity in different regions (crude preferences)
 - Rail transportation
 - Jones Act tanker availability
 - Refinery availability and outage analysis including regional price impacts
 - Exports of refined products and impact on domestic prices
 - Disposition of increased domestic tight light crude production
- Renewable Fuels Standard / RINS / cellulosic ethanol
- Growth of natural gas use in transportation
- International disruptions and ongoing sanctions-related analyses



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Southern Company

Aldo Flores-Quiroga

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Chairman
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Register at: www.fbcinc.com/EIA

June 17-18, 2013 · JW Marriott · Washington, DC

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