

U.S. Energy Outlook



For

*International Association for Energy Economics/American Economic Association
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By

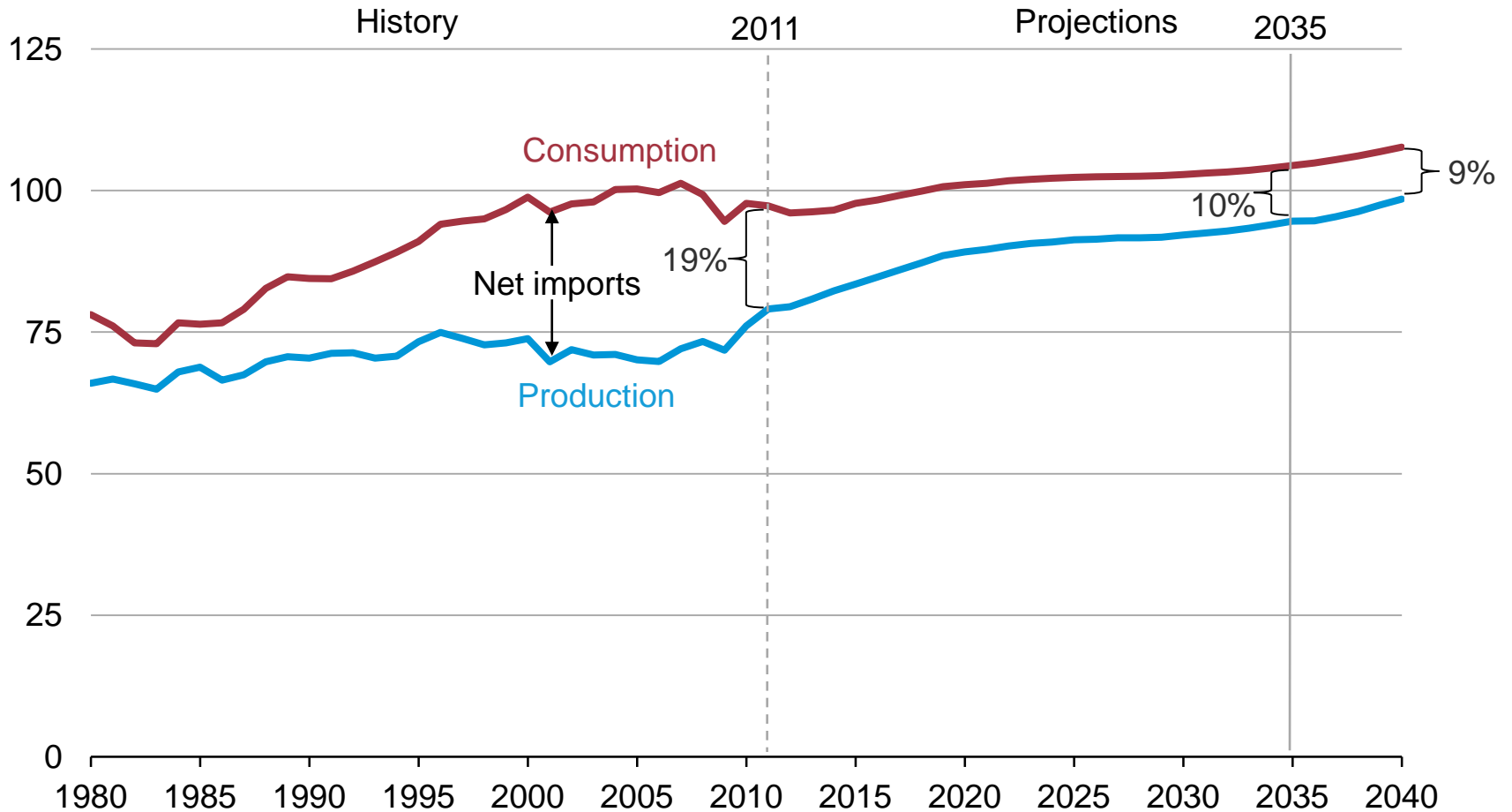
Adam Sieminski, Administrator

Annual Energy Outlook 2013 projections to 2040

- Growth in energy production outstrips consumption growth
- Crude oil production rises sharply over the next decade
- Motor gasoline consumption reflects more stringent fuel economy standards
- The U.S. becomes a net exporter of natural gas in the early 2020s
- U.S. energy-related carbon dioxide emissions remain below their 2005 level through 2040

Growth in energy production outstrips growth in consumption leading to reduction in net imports

U.S. energy production and consumption
quadrillion Btu

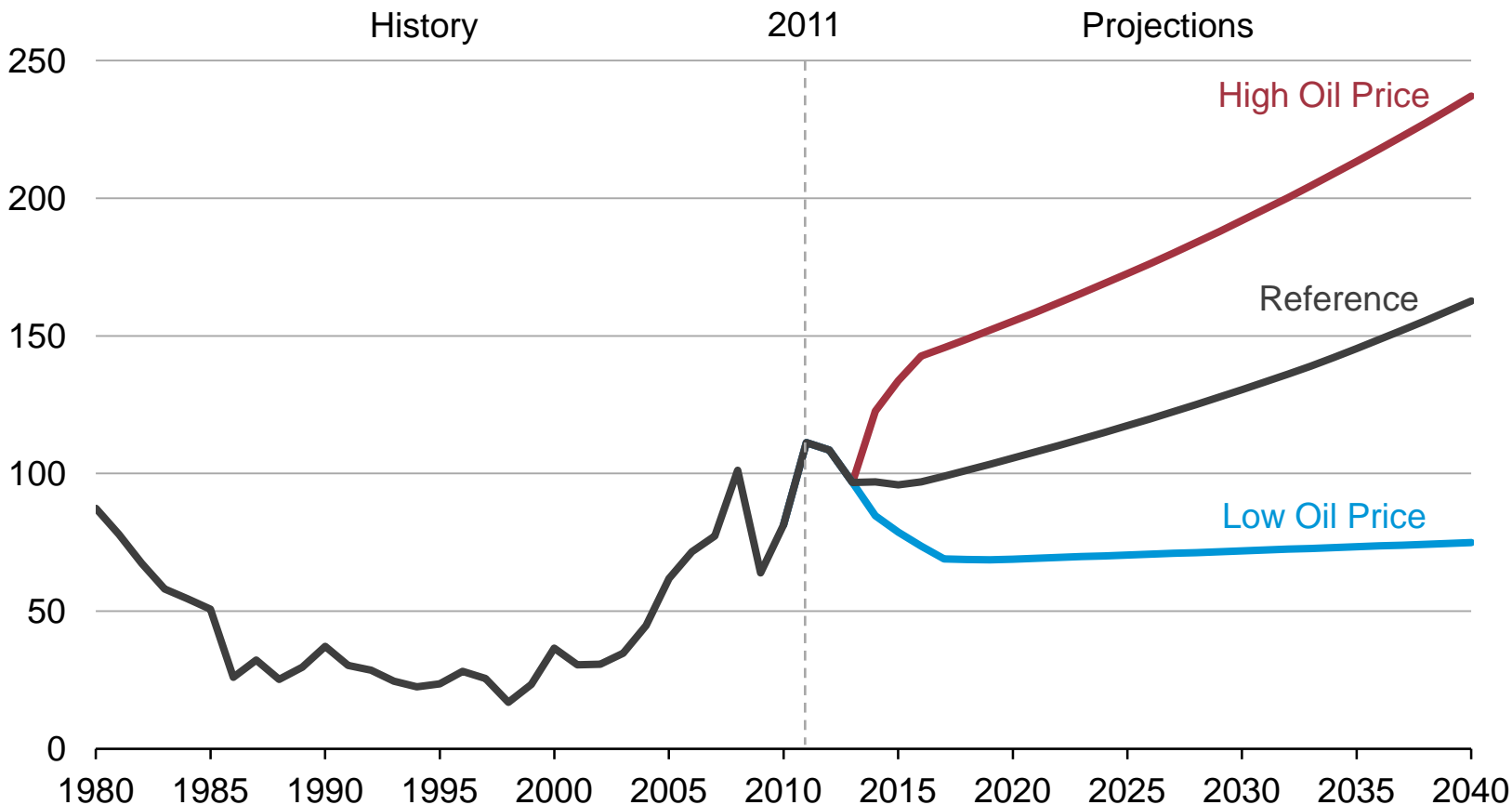


Source: EIA, Annual Energy Outlook 2013 Early Release

Petroleum

Reference case oil price initially drops and then rises steadily, but there is uncertainty about the future trajectory

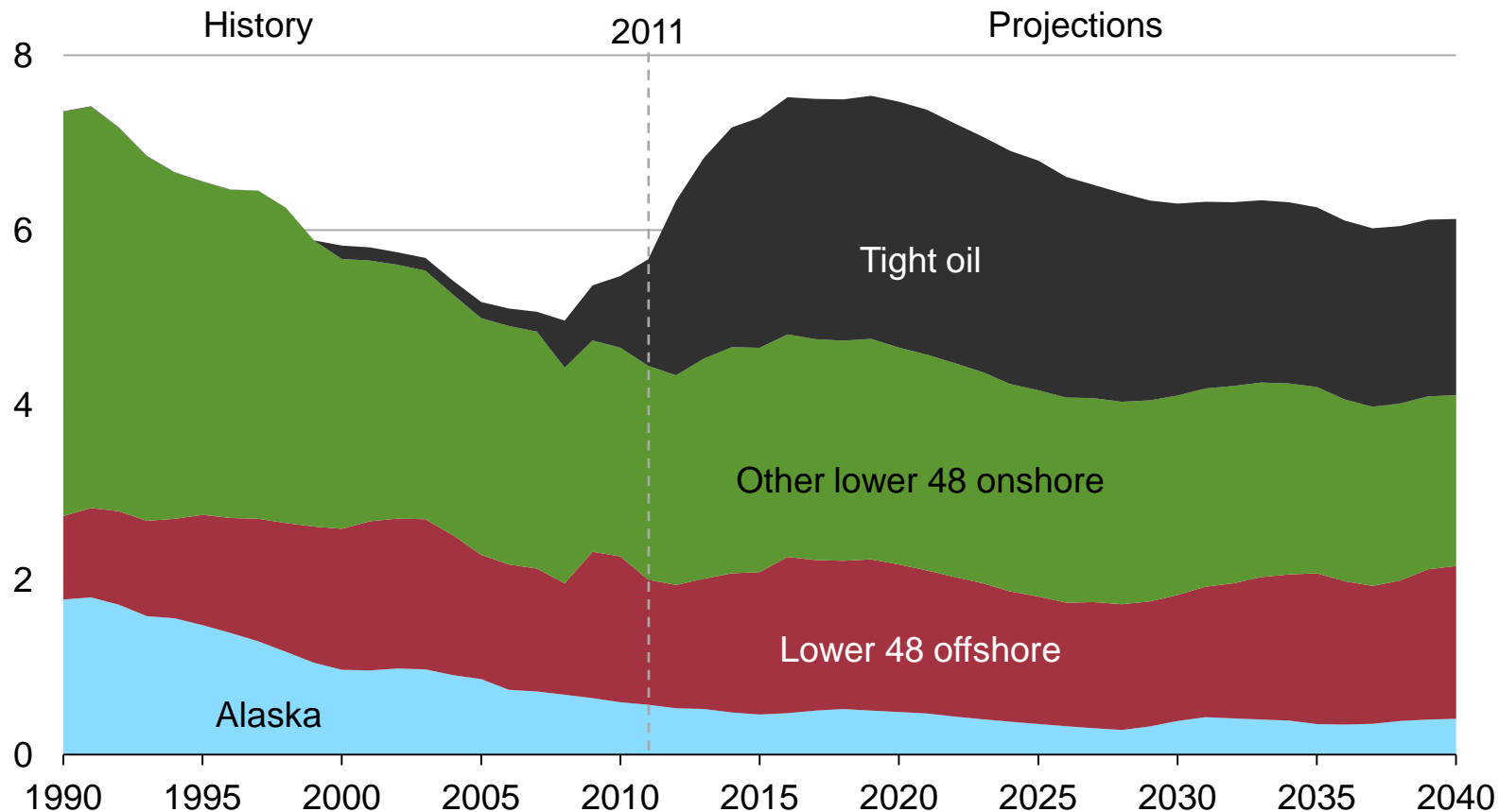
Annual average spot price of Brent crude oil
2011 dollars per barrel



Source: EIA, Annual Energy Outlook 2013 Early Release

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

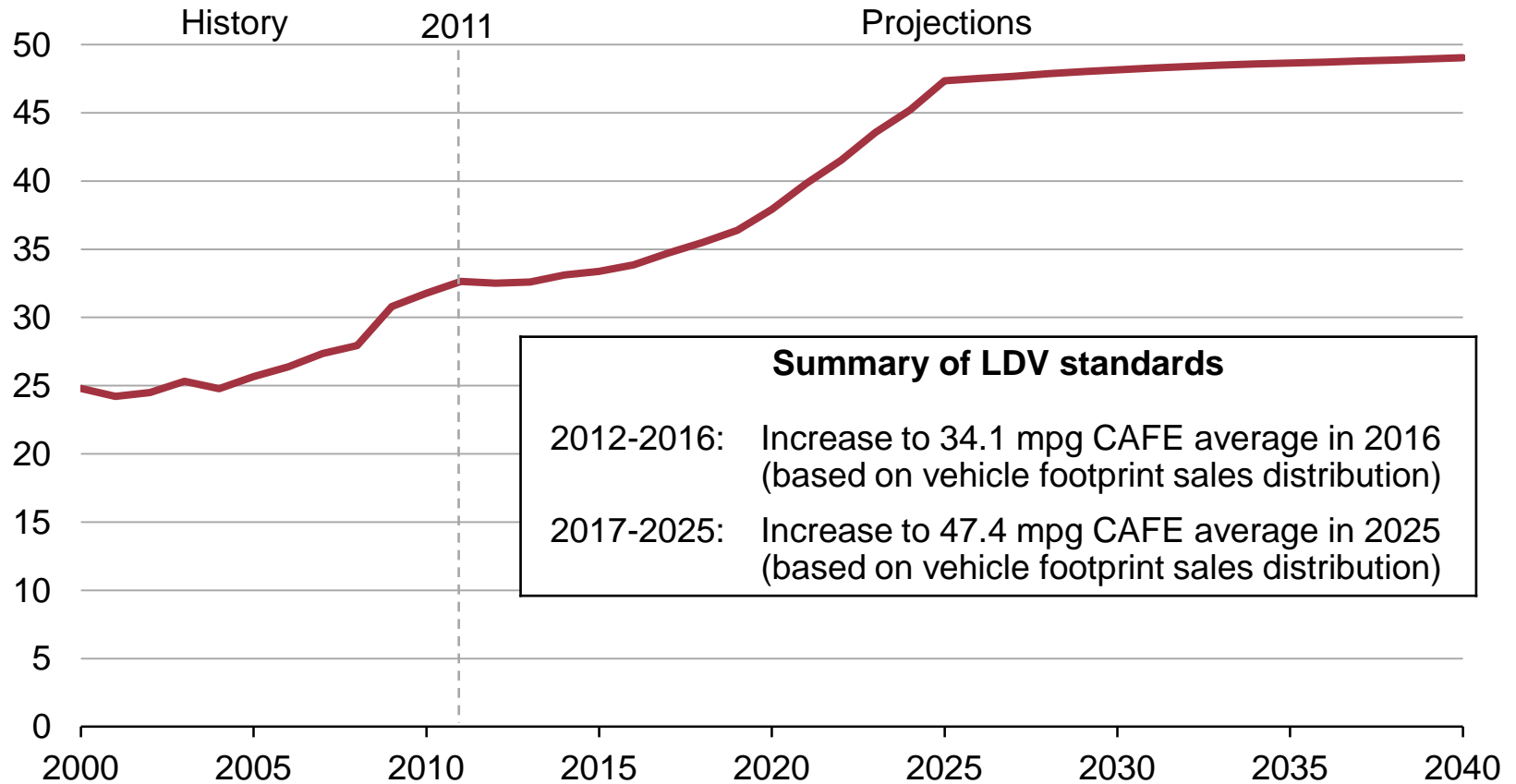
U.S. crude oil production
million barrels per day



Source: EIA, Annual Energy Outlook 2013 Early Release

New light-duty vehicle fuel economy approaches 50 mpg by 2040

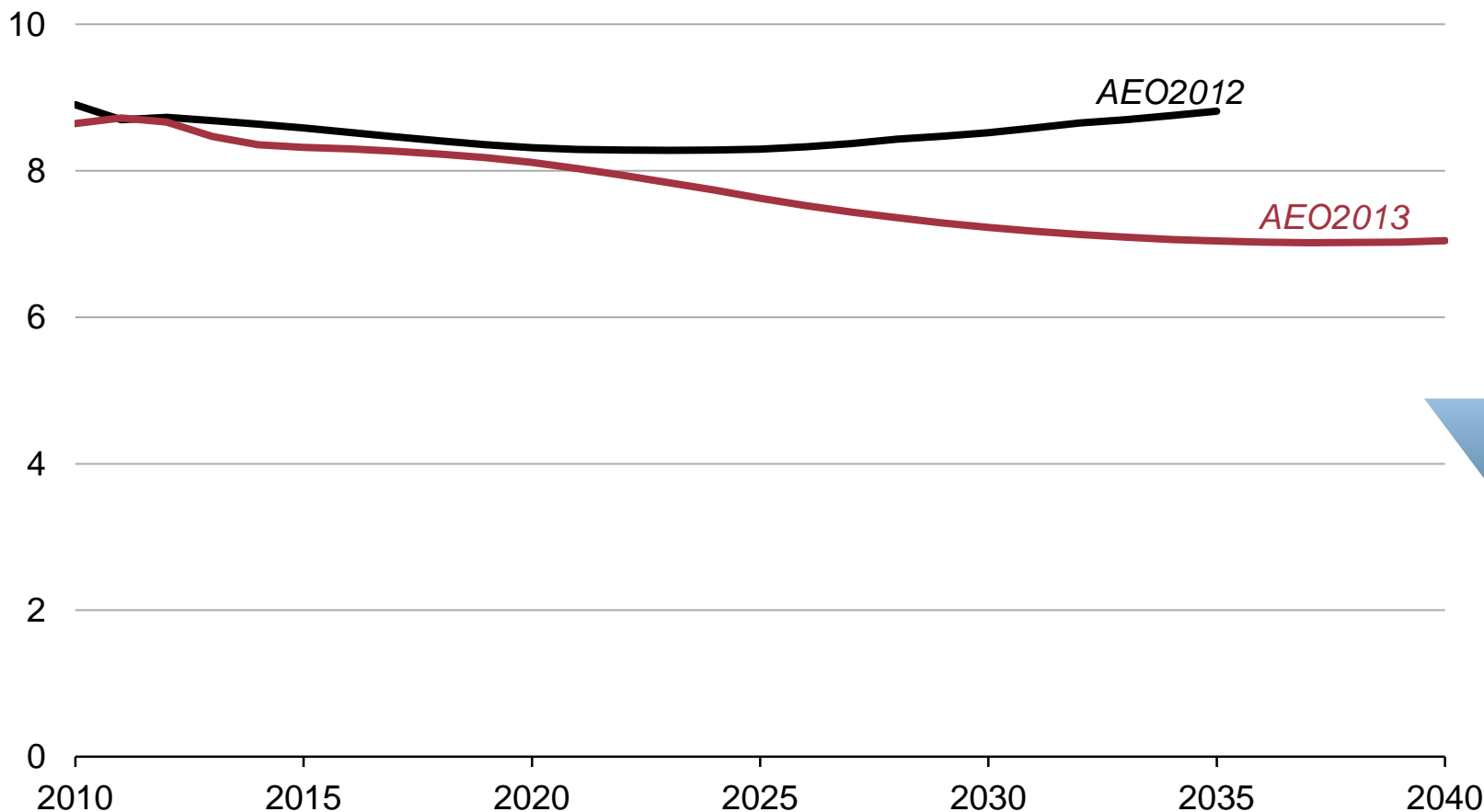
New LDV fuel efficiency
miles per gallon



Source: EIA, Annual Energy Outlook 2013 Early Release

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

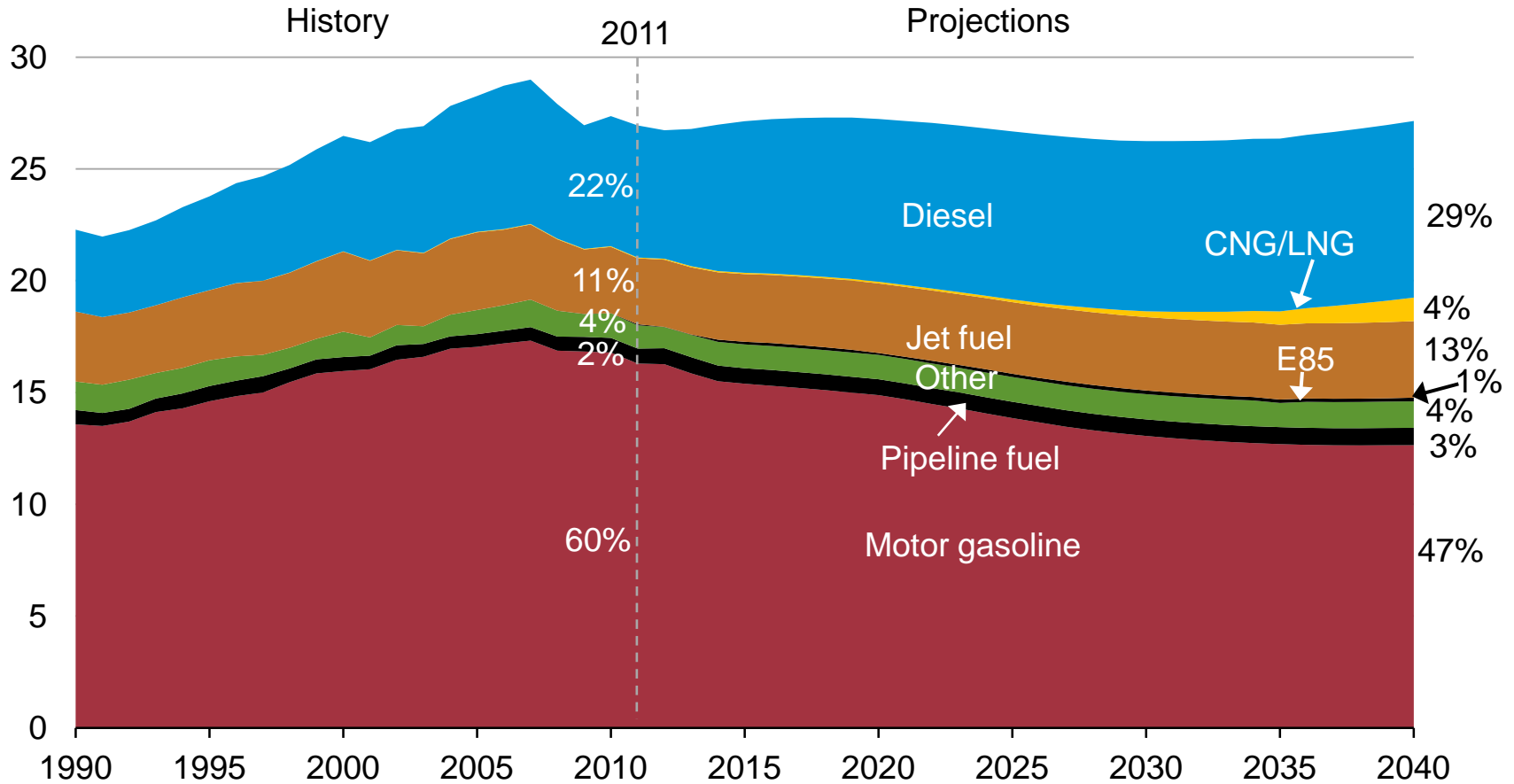
Light-duty vehicle liquids consumption
million barrels per day



Source: EIA, Annual Energy Outlook 2013 Early Release

Transportation sector motor gasoline demand declines

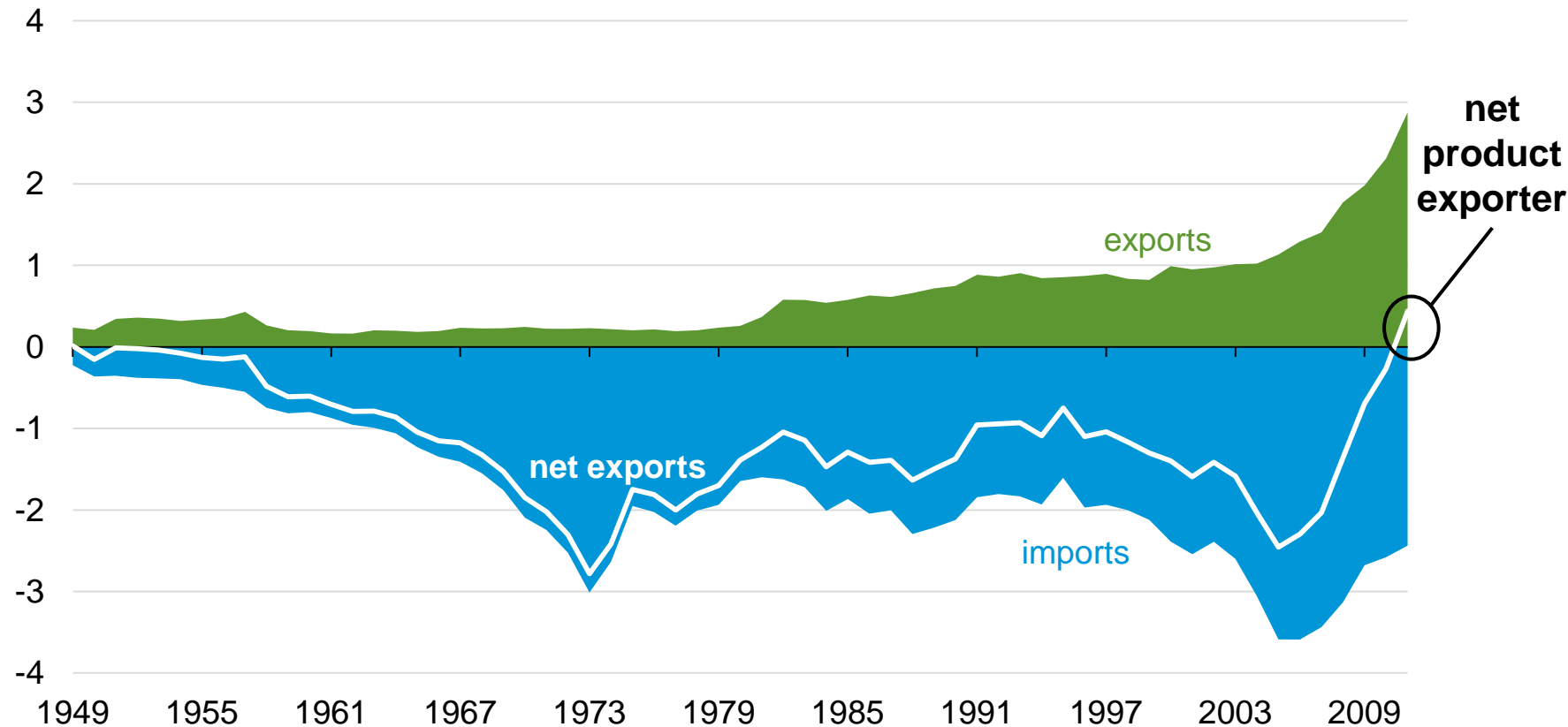
Transportation energy consumption by fuel quadrillion Btu



Source: EIA, Annual Energy Outlook 2013 Early Release

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

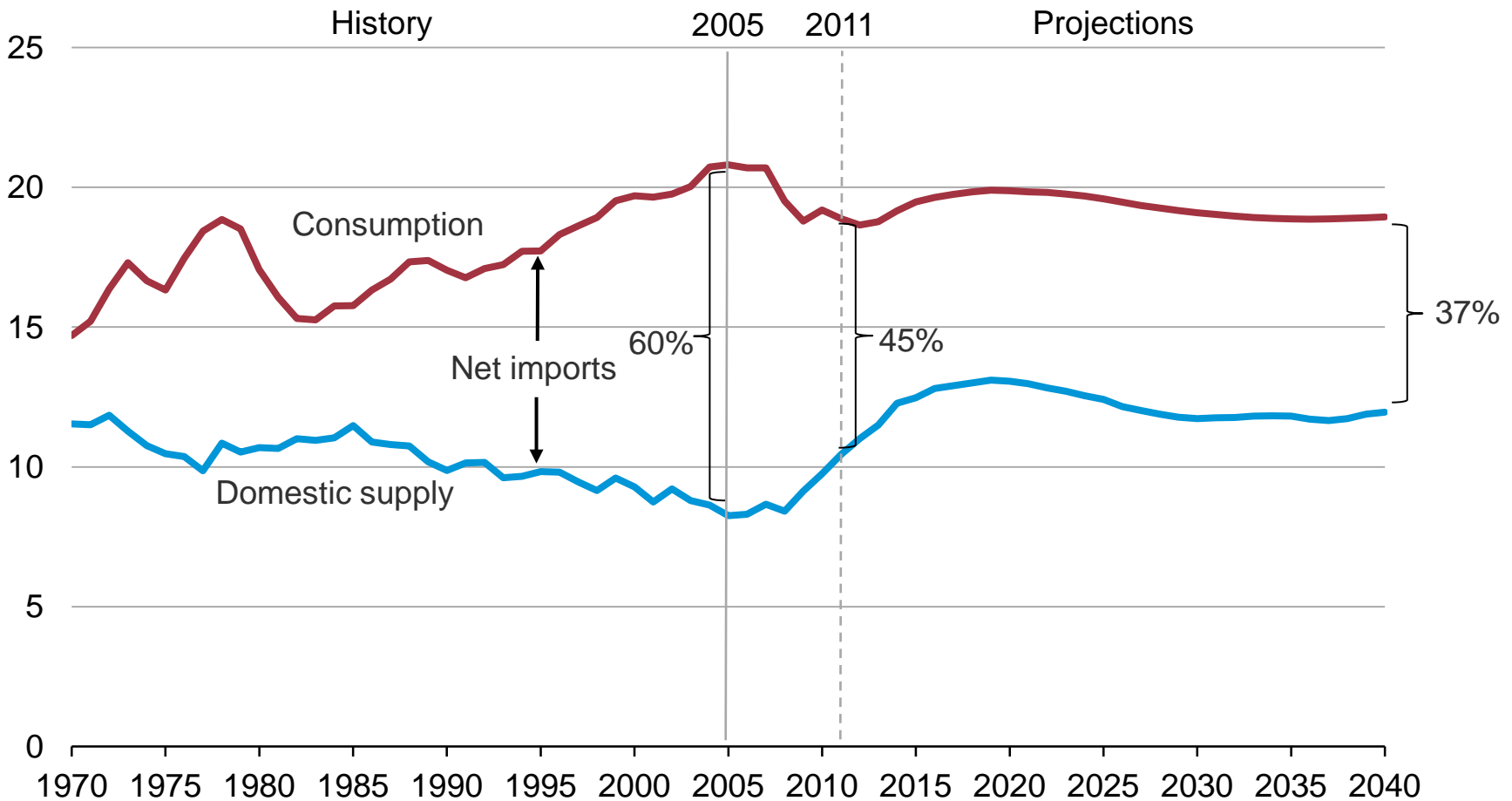
Annual U.S. net exports of total petroleum products, 1949 – 2011
million barrels per day



Source: EIA, Petroleum Supply Monthly

U.S. dependence on imported liquids declines

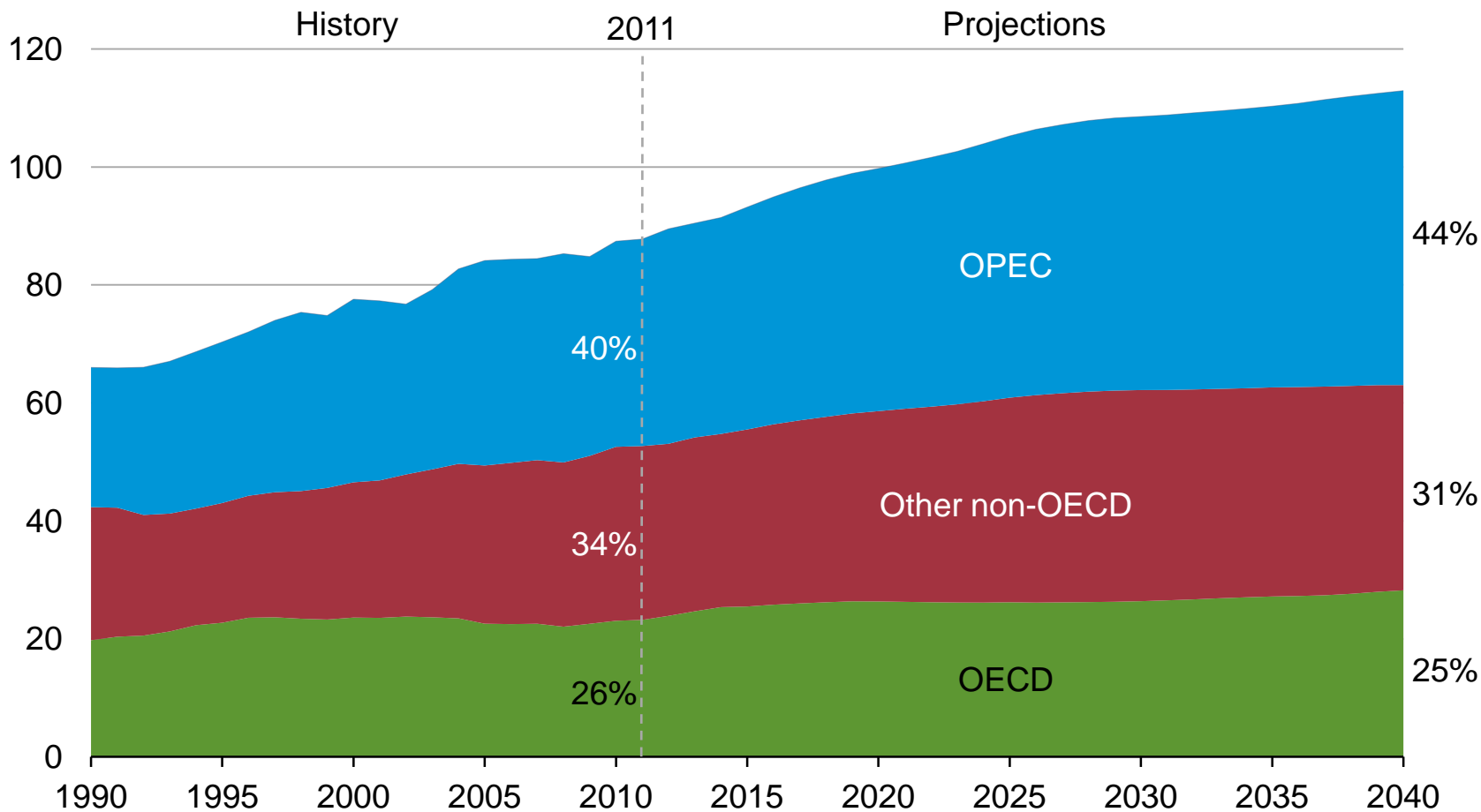
U.S. liquid fuel supply
million barrels per day



Source: EIA, Annual Energy Outlook 2013 Early Release

Global liquids supply increases 26 percent with regional market shares relatively stable

Global liquids supply
million barrels per day

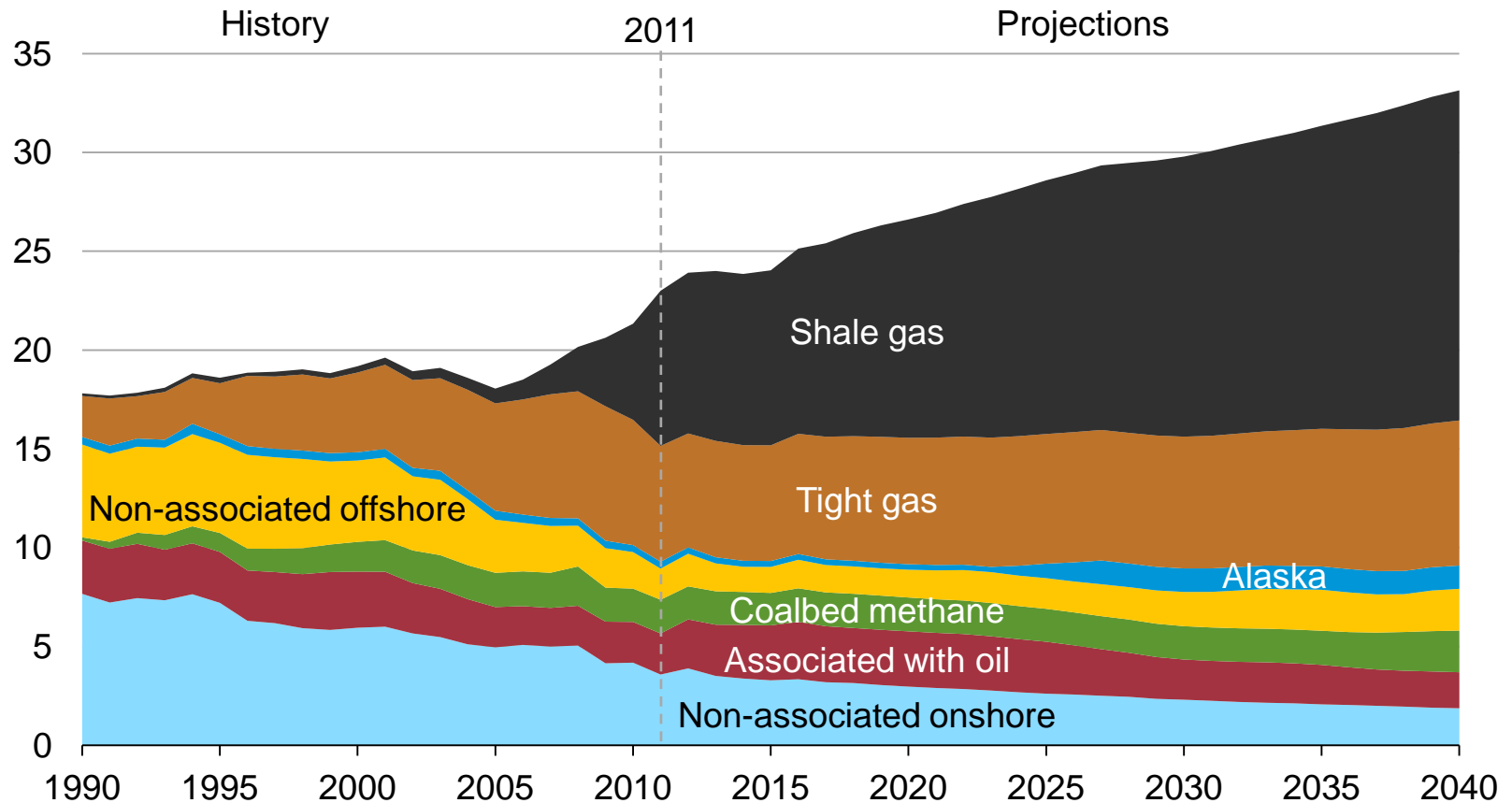


Source: EIA, Annual Energy Outlook 2013 Early Release

Natural Gas

Shale gas production leads growth in production through 2040

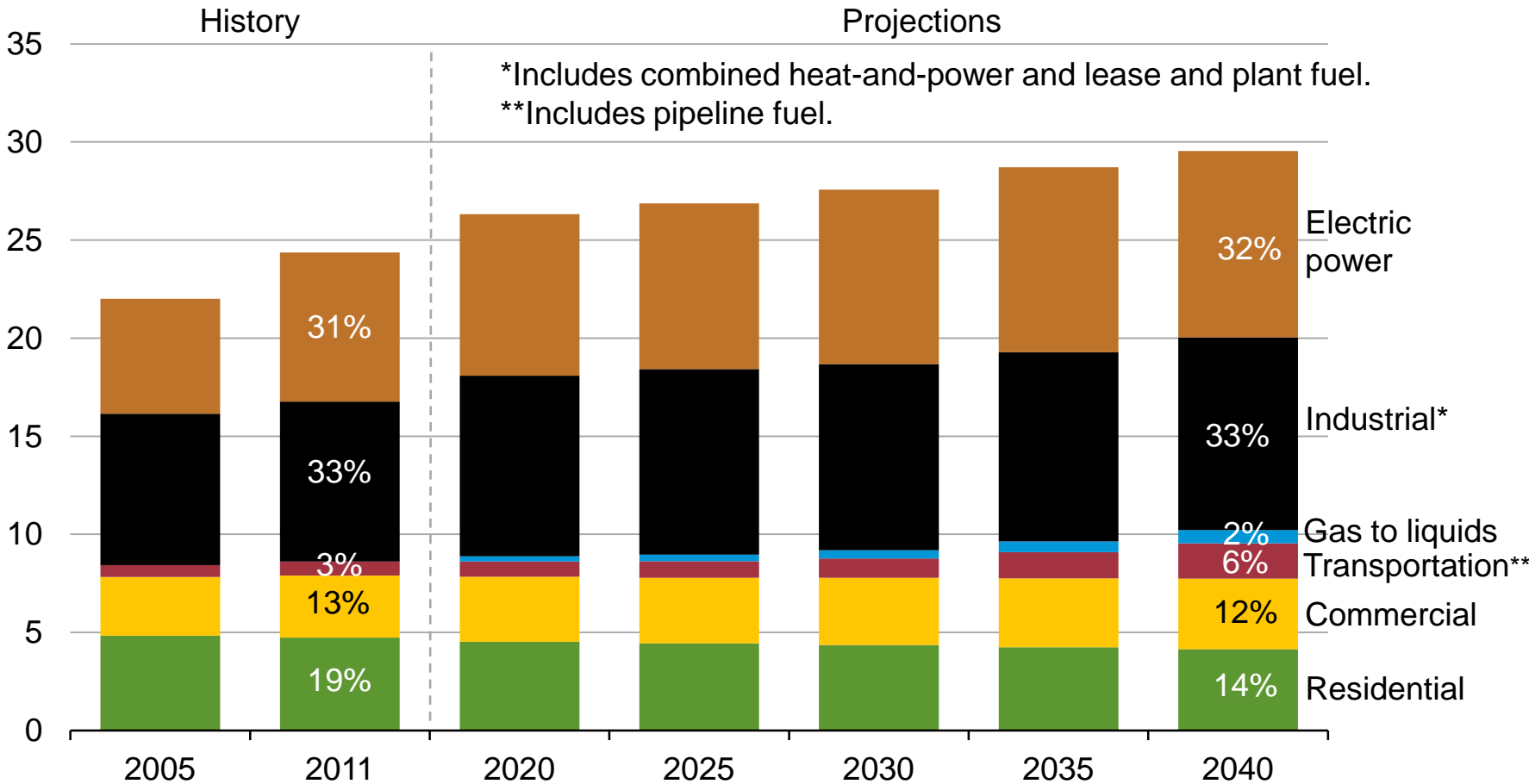
U.S. dry natural gas production
trillion cubic feet



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

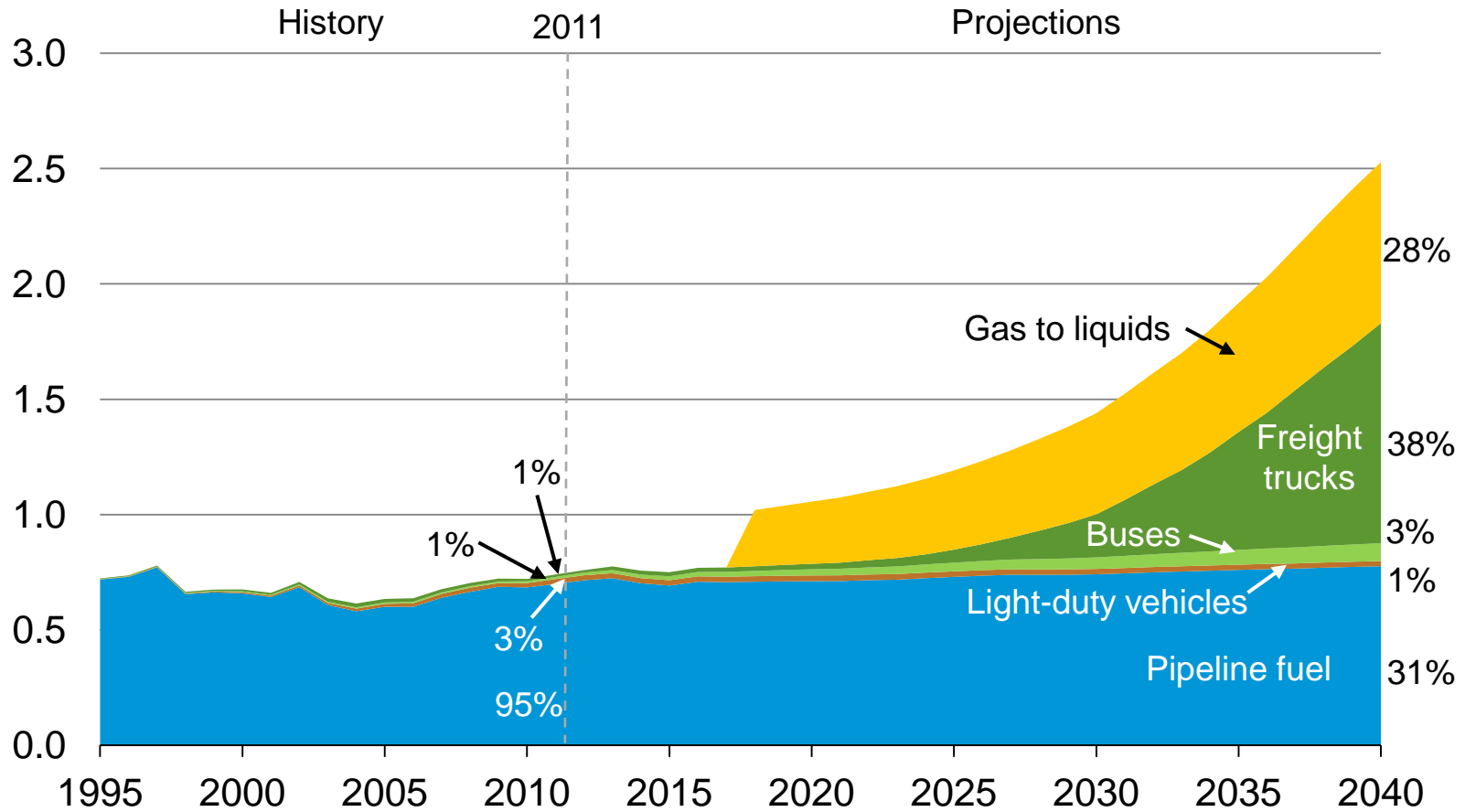


*Includes combined heat-and-power and lease and plant fuel.
**Includes pipeline fuel.

Source: EIA, Annual Energy Outlook 2013 Early Release

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

U.S. natural gas consumption
quadrillion Btu

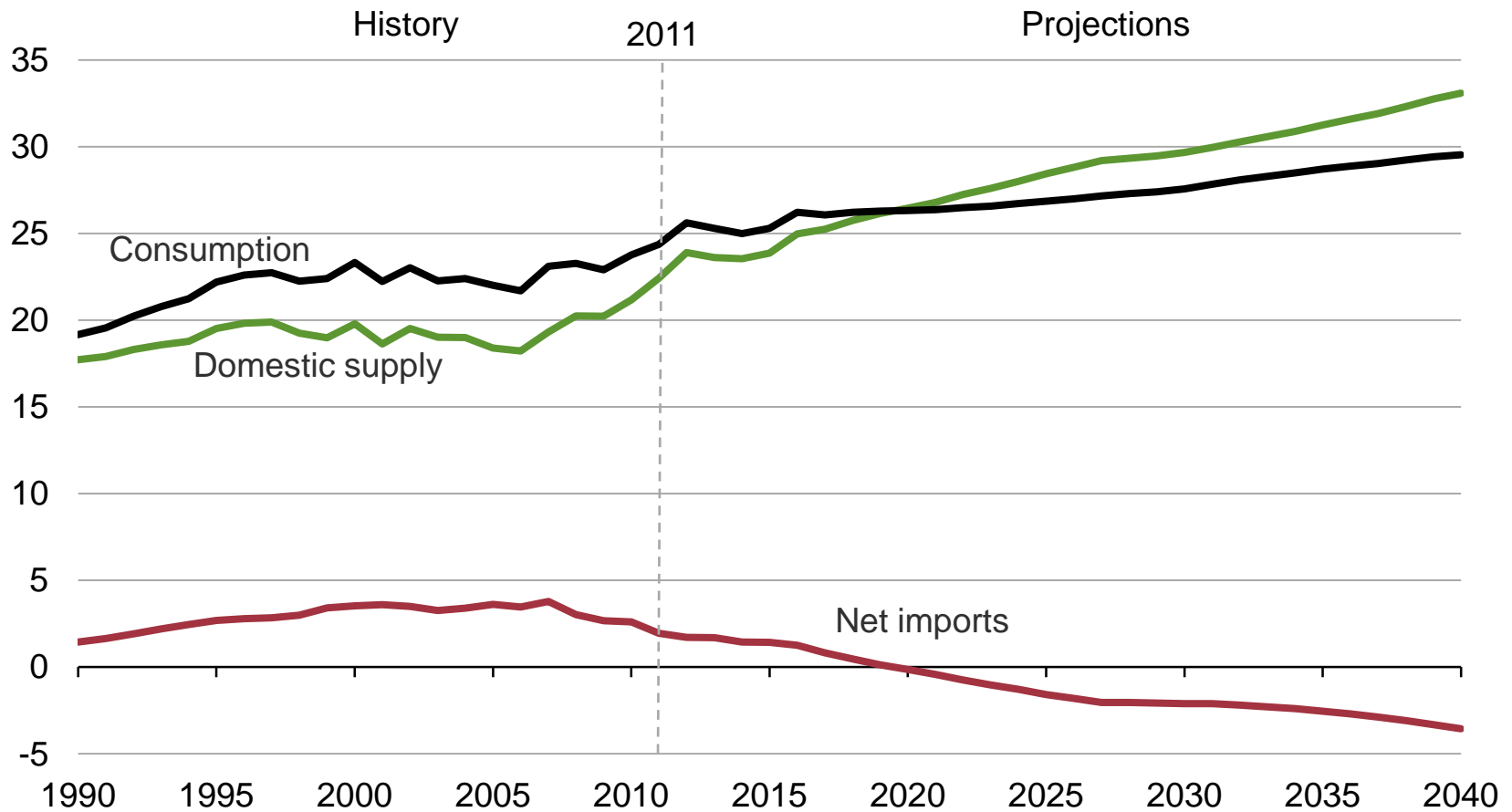


Note: Gas to liquids includes heat, power, and losses.

Source: EIA, Annual Energy Outlook 2013 Early Release

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

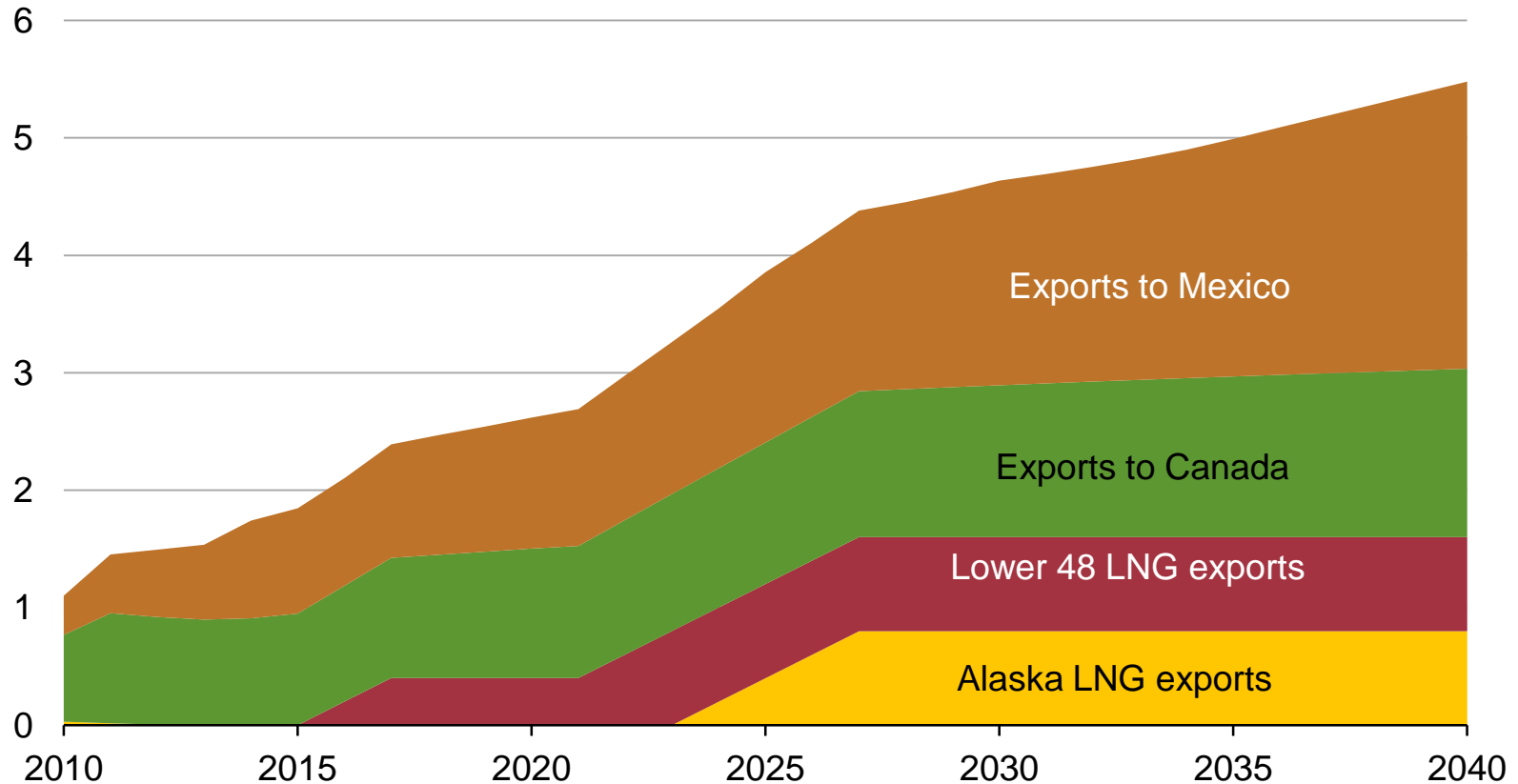
U.S. dry gas
trillion cubic feet



Source: EIA, Annual Energy Outlook 2013 Early Release

Total natural gas exports nearly quadruple by 2040 in the AEO2013 Reference case

U.S. natural gas exports
trillion cubic feet

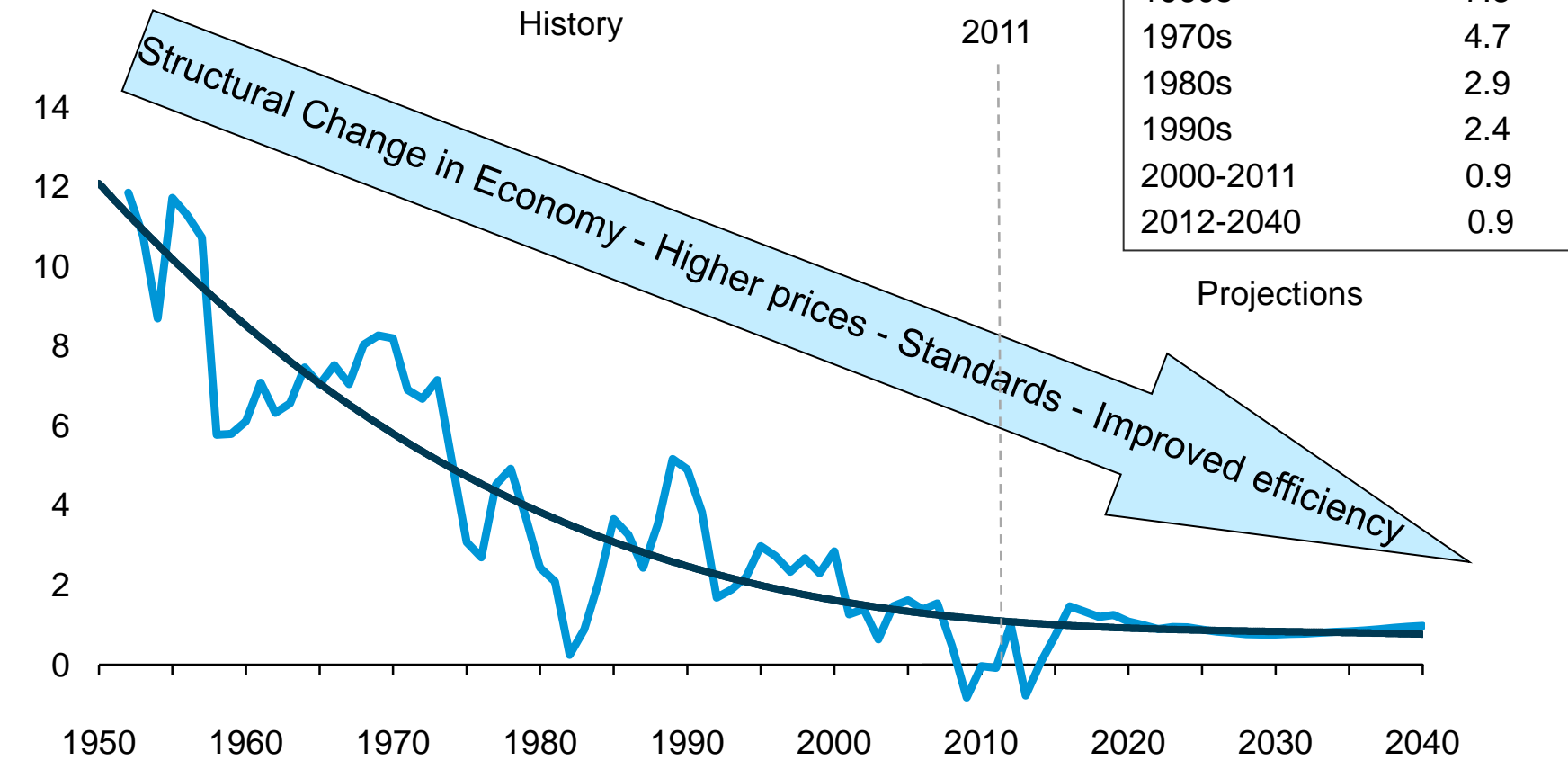


Source: EIA, Annual Energy Outlook 2013 Early Release

Coal and Electricity

Growth in electricity use slows, but still increases by 28% from 2012 to 2040

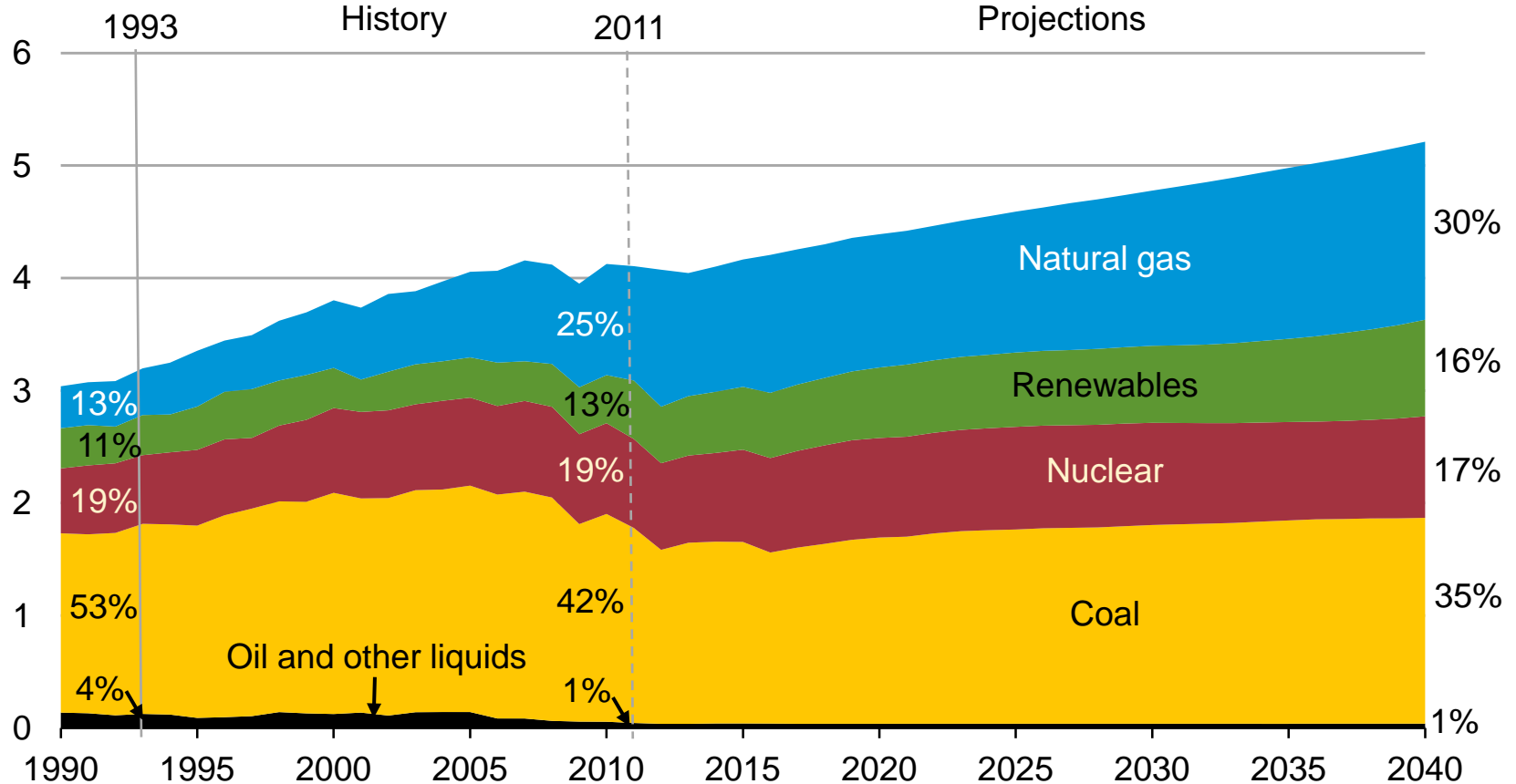
U.S. electricity use
percent growth (3-year rolling average)



Source: EIA, Annual Energy Outlook 2013 Early Release

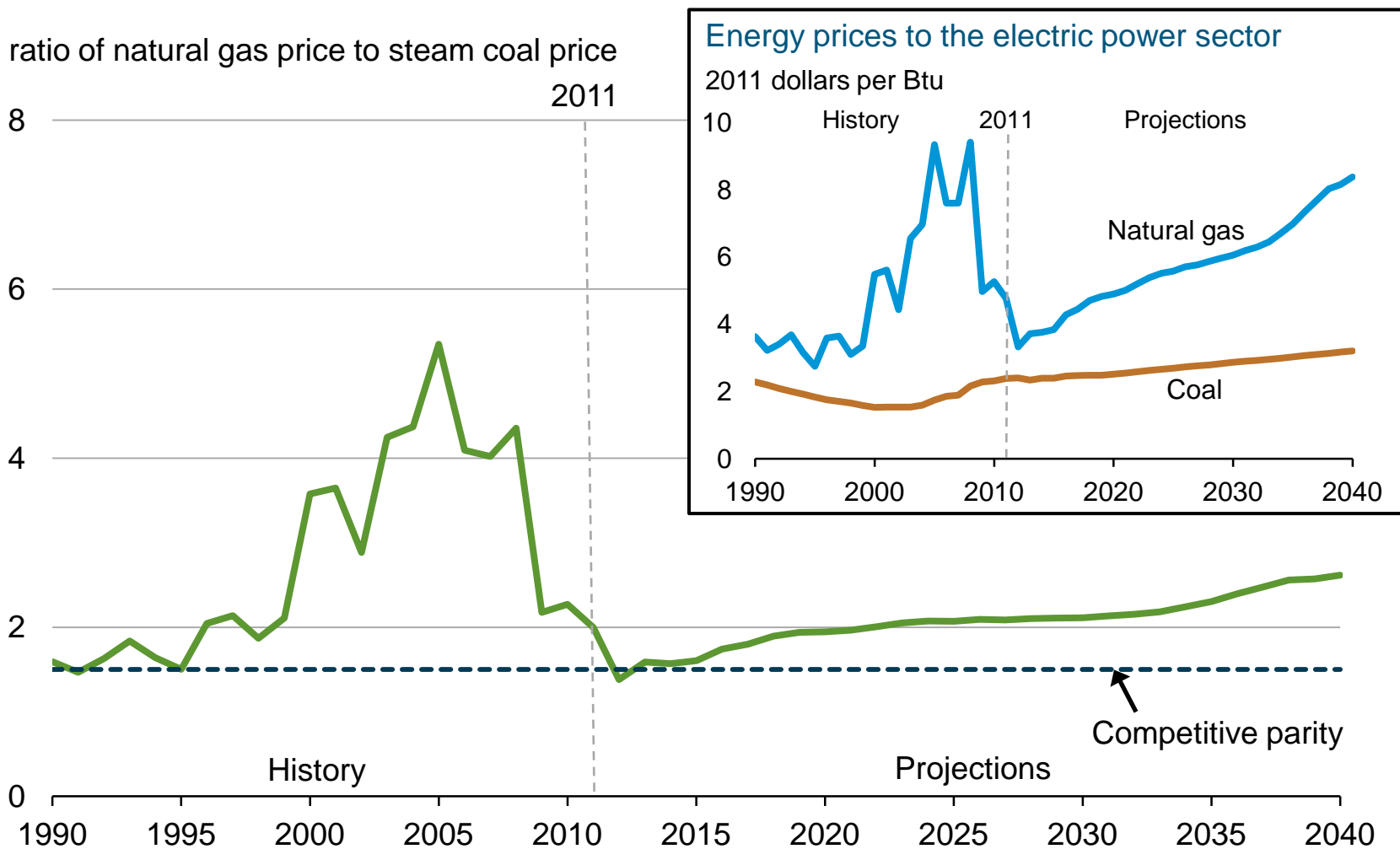
Over time the electricity mix shifts toward natural gas and renewables, but coal remains the largest fuel source

U.S. electricity net generation
trillion kilowatthours



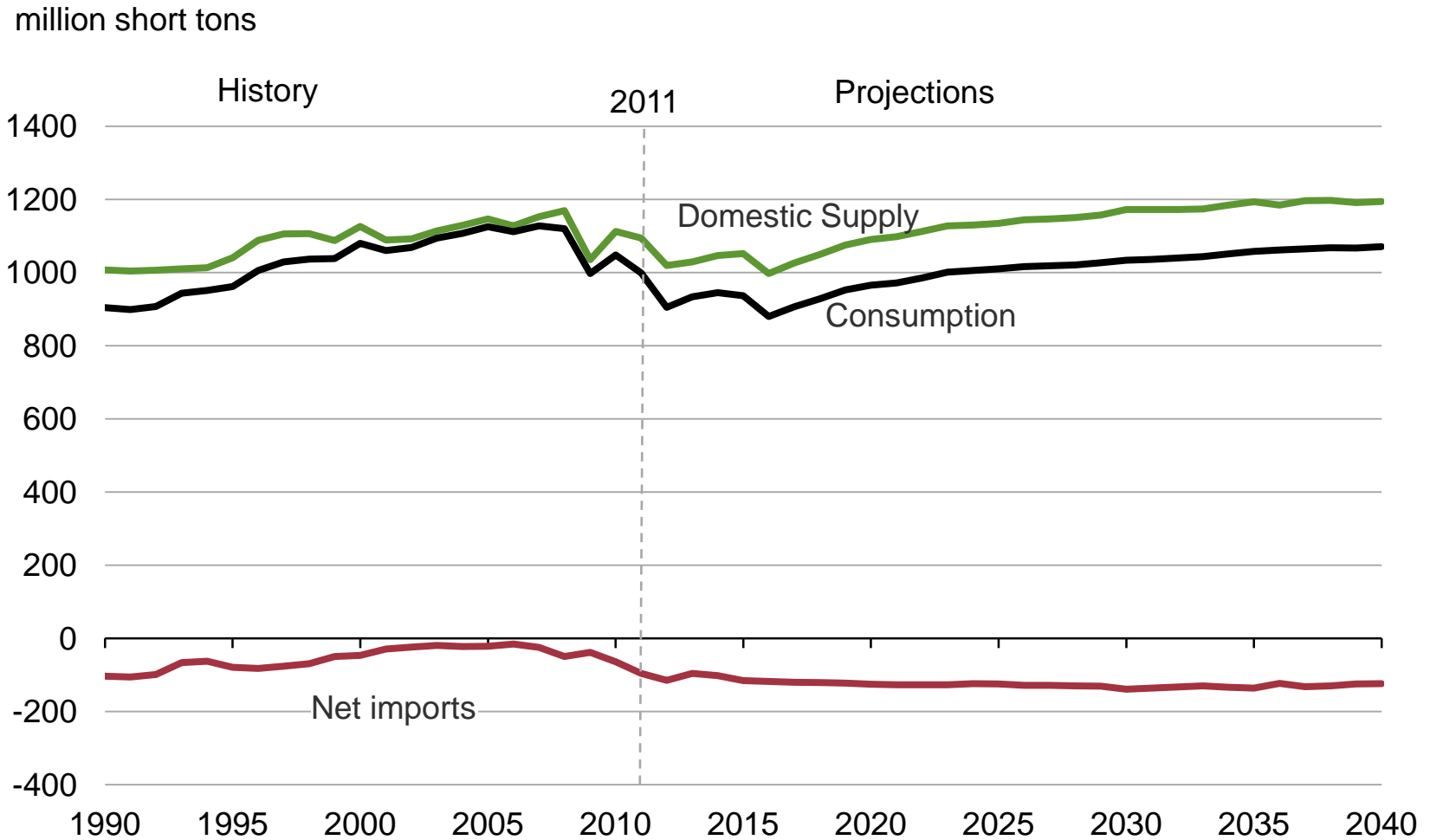
Source: EIA, Annual Energy Outlook 2013 Early Release

Coal regains some competitive advantage relative to natural gas over time on a national average basis



Source: EIA, Annual Energy Outlook 2013 Early Release

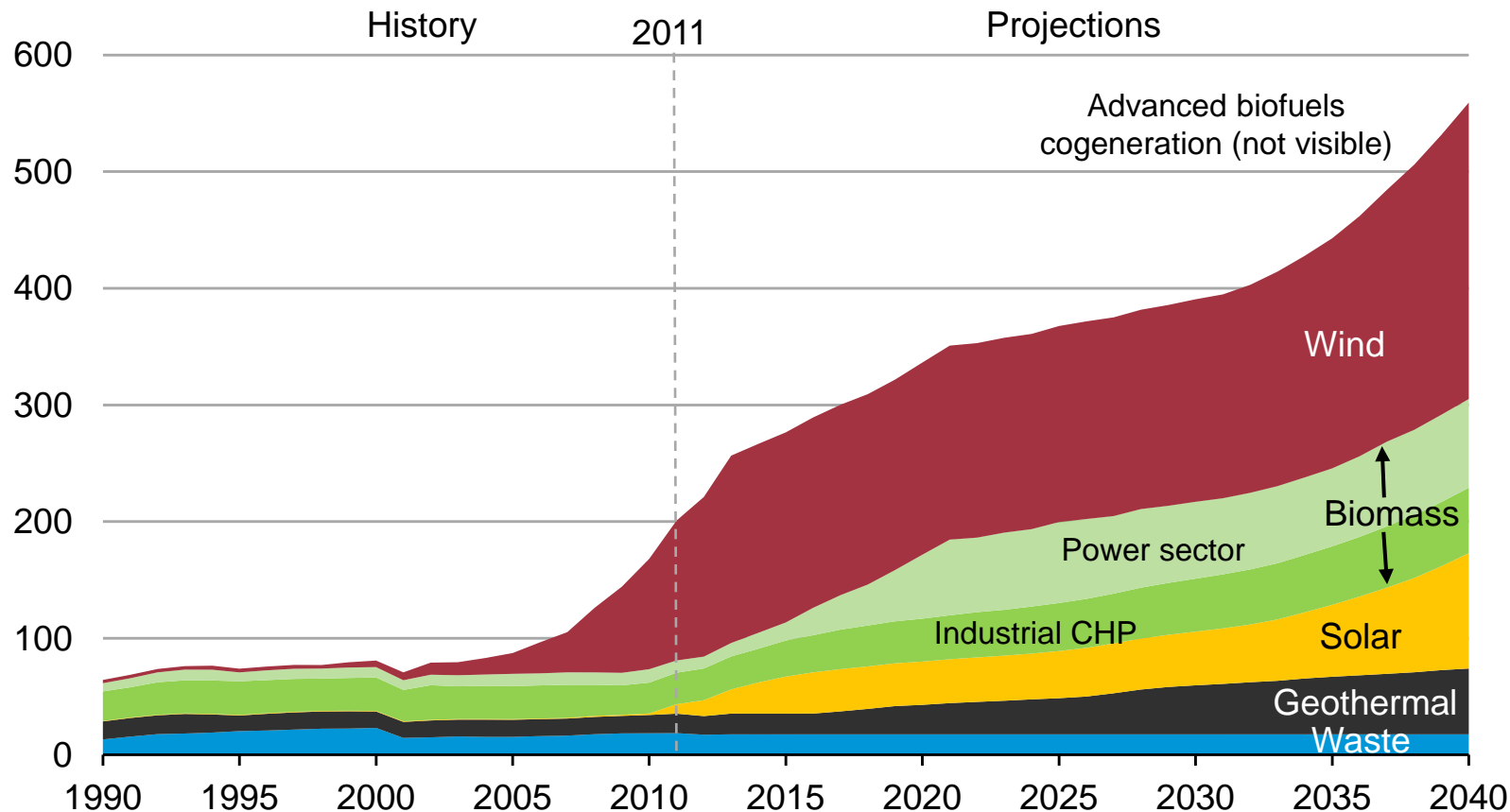
U.S. continues to be a net exporter of coal



Source: EIA, Annual Energy Outlook 2013 Early Release

Non-hydro renewable generation more than doubles between 2011 and 2040

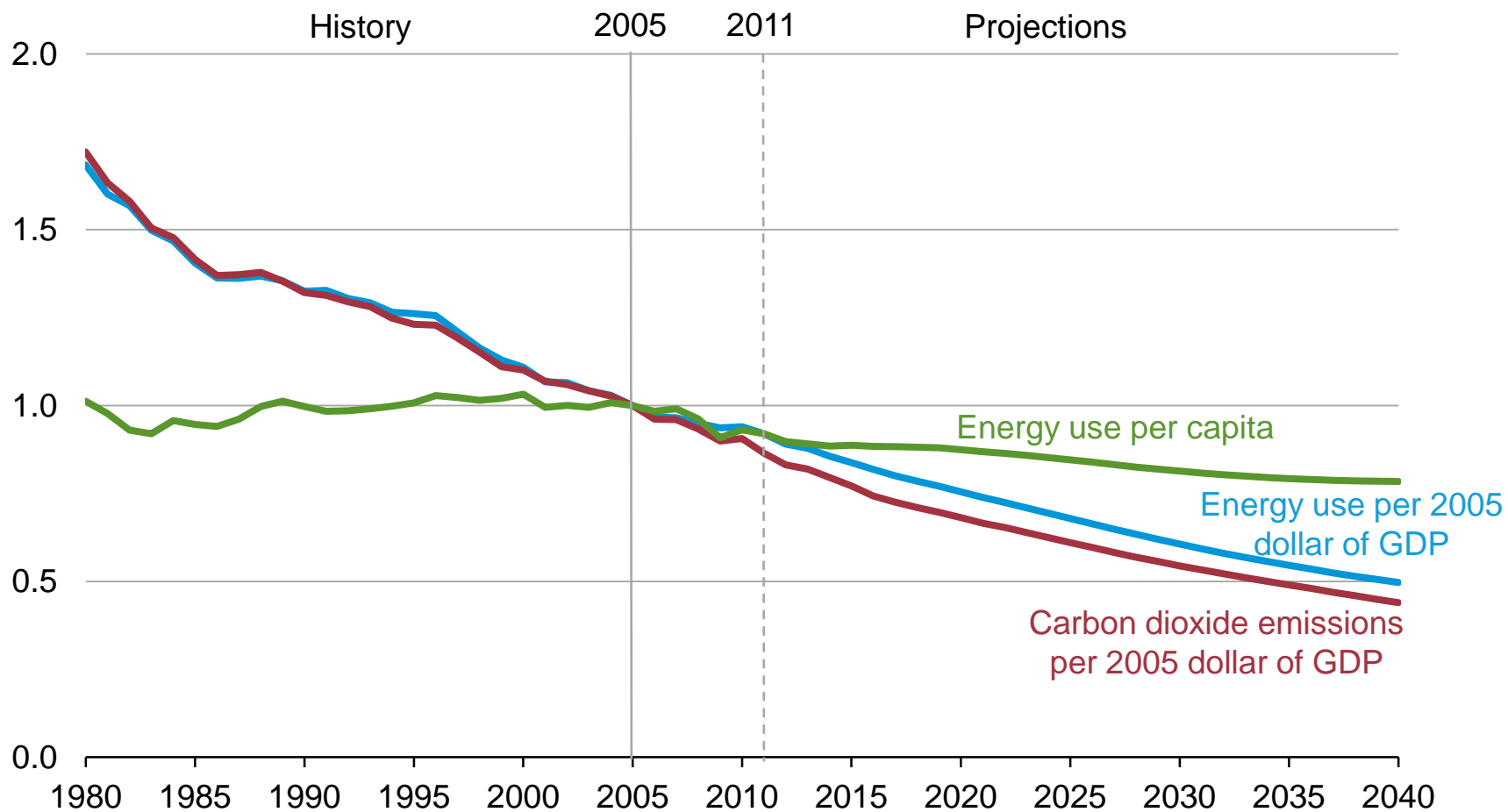
Non-hydropower renewable generation
billion kilowatthours per year



Source: EIA, Annual Energy Outlook 2013 Early Release

Energy and CO₂ per dollar of GDP continue to decline; per-capita energy use also declines

Energy and emission intensity index, 2005=1

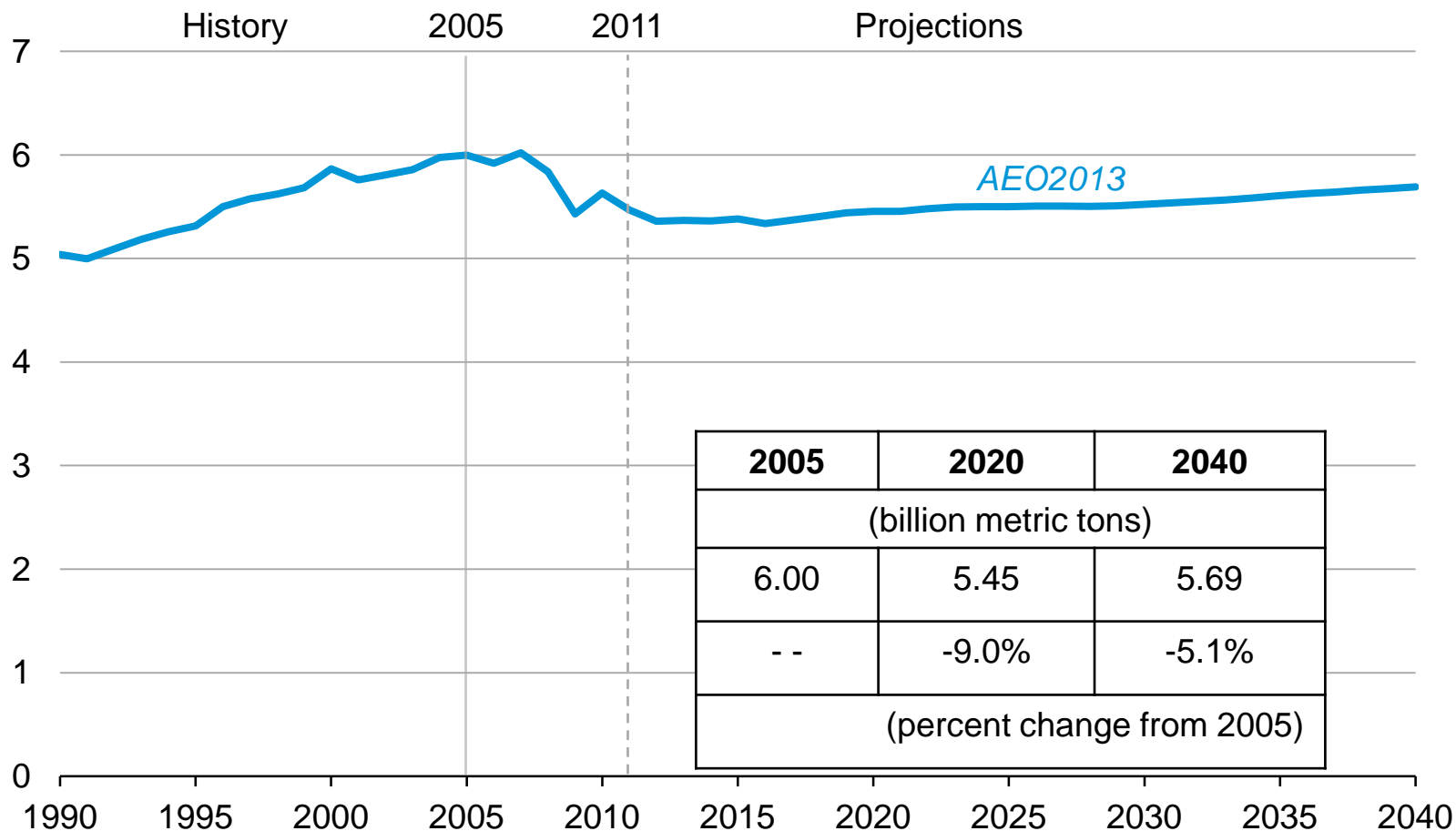


Source: EIA, Annual Energy Outlook 2013 Early Release

In the *AEO2013* Reference case, energy-related CO₂ emissions never get back to their 2005 level

Carbon dioxide emissions

billion metric tons



Source: EIA, Annual Energy Outlook 2013 Early Release

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

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