

U.S. Energy Outlook



For

Baltimore Chartered Financial Analyst Society

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By

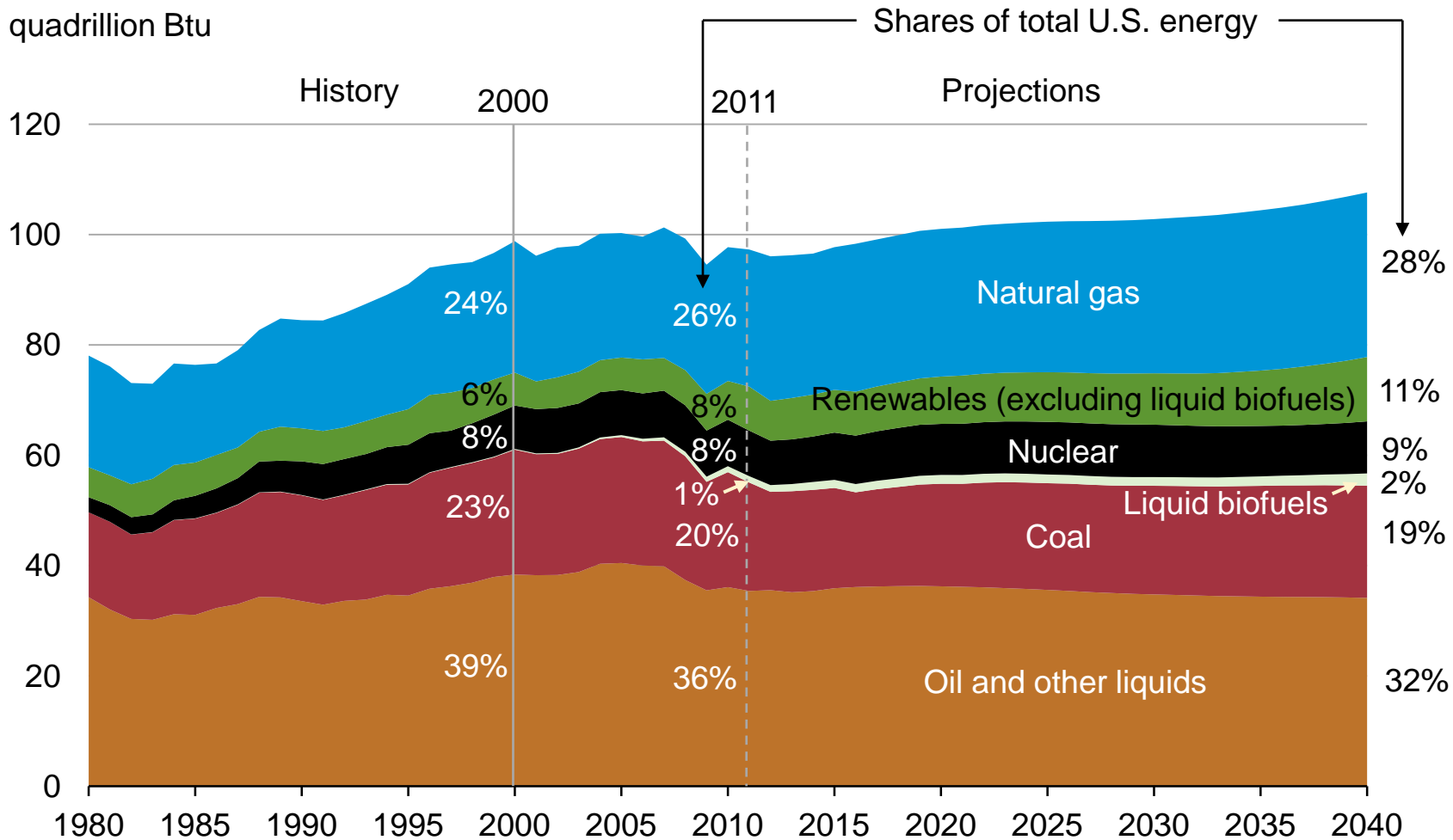
Adam Sieminski, Administrator

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

U.S. energy use grows slowly over the projection reflecting improving energy efficiency and slow, extended economic recovery

U.S. primary energy consumption
quadrillion Btu

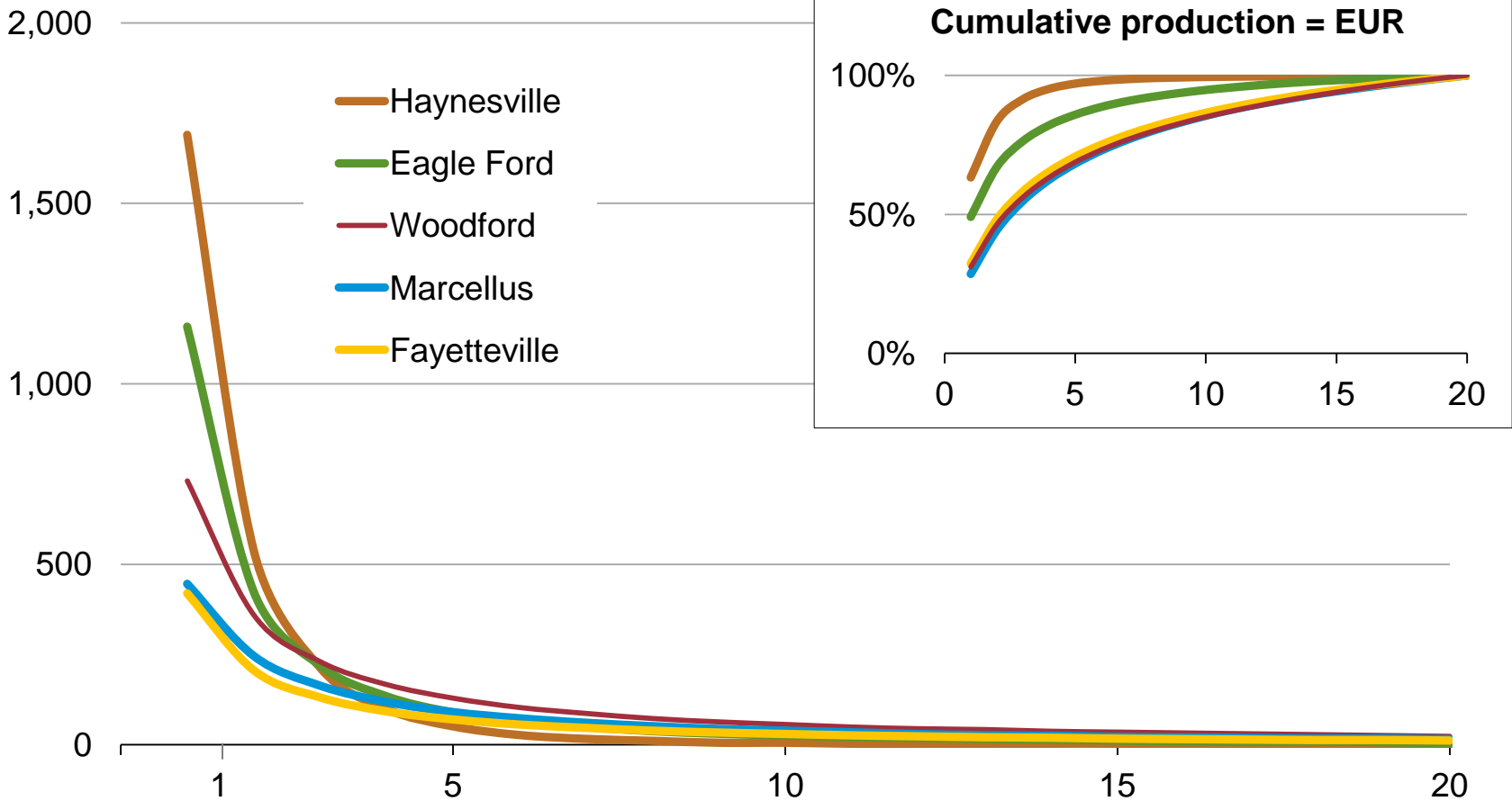


Source: EIA, Annual Energy Outlook 2013 Early Release

U.S. Shale Gas

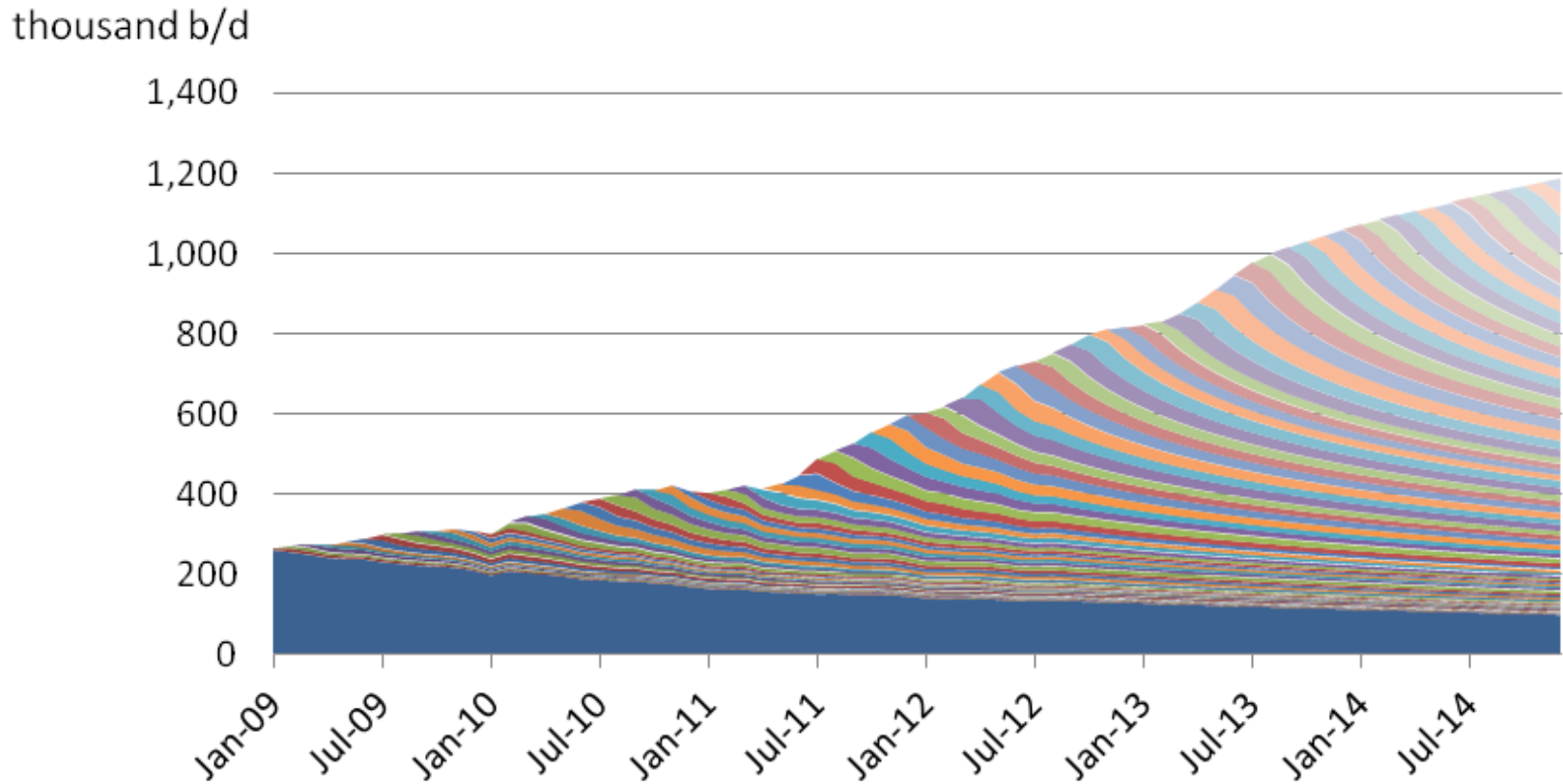
An average well in shale gas and other continuous resource plays can also have steep decline curves, which require continued drilling to grow production

million cubic feet per year



Source: EIA, Annual Energy Outlook 2012

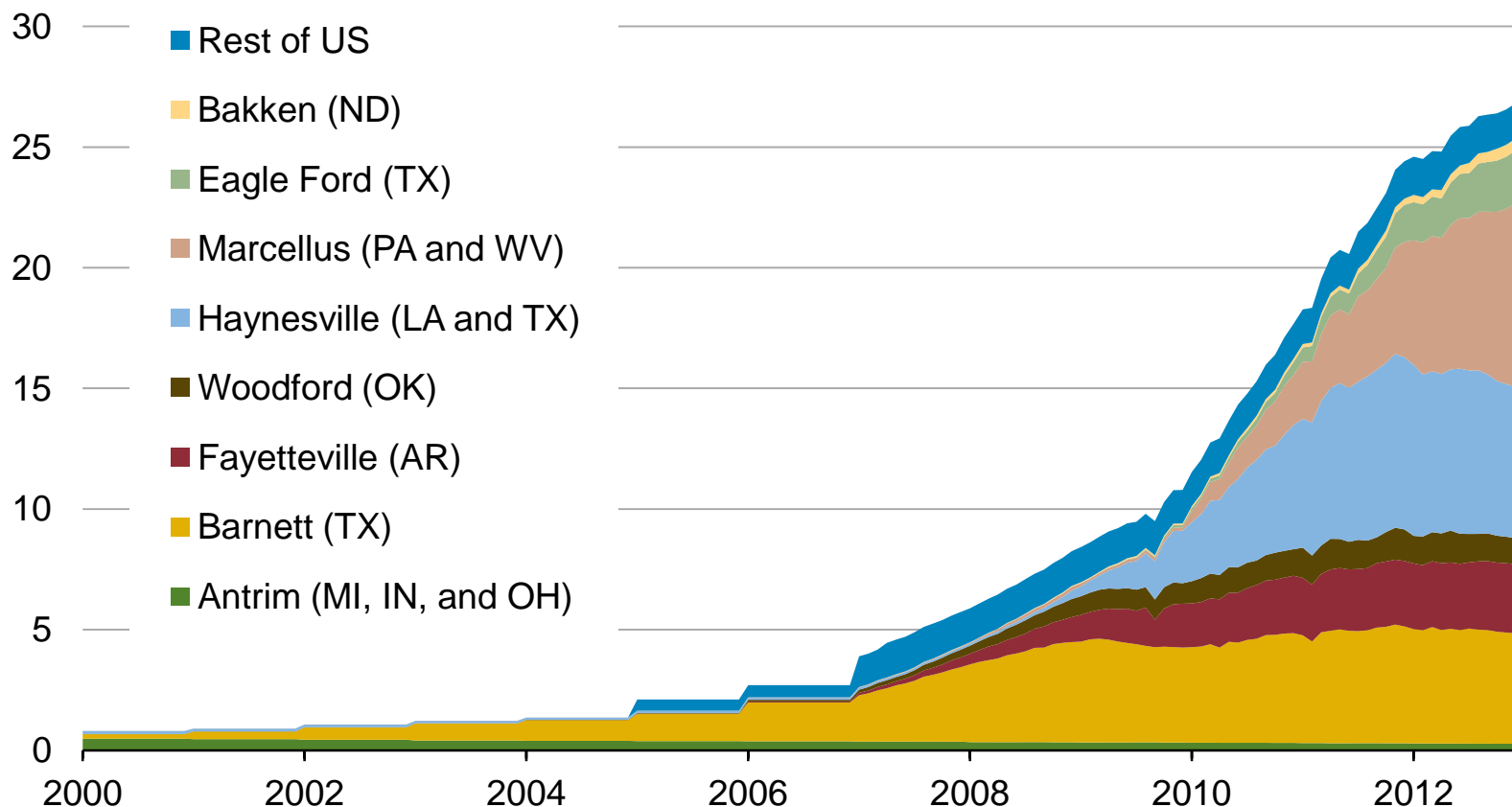
For example: Oil production by monthly vintage of wells in the Williston Basin



Source: DrillingInfo 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

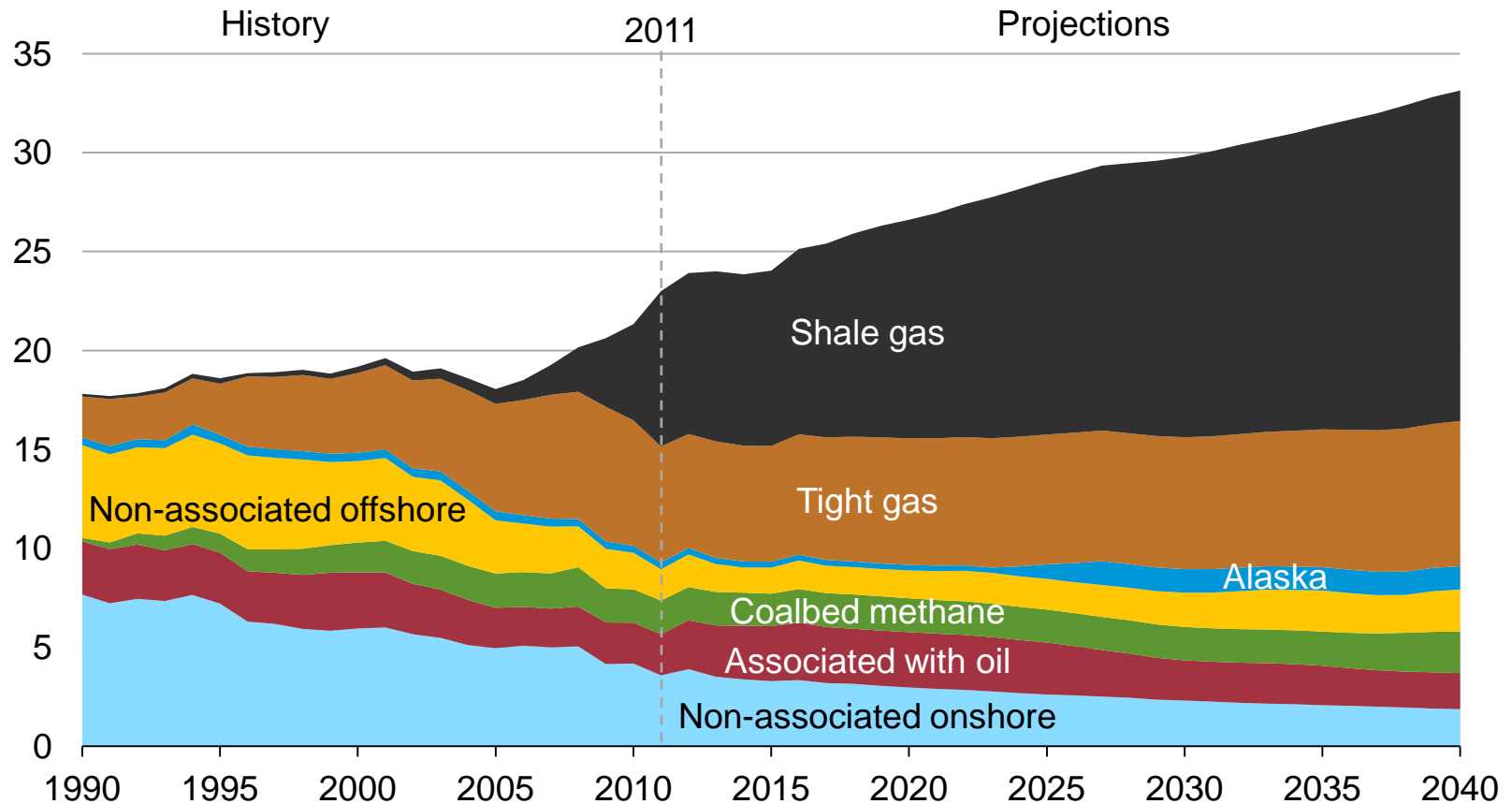
shale gas production (dry)
billion cubic feet per day



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

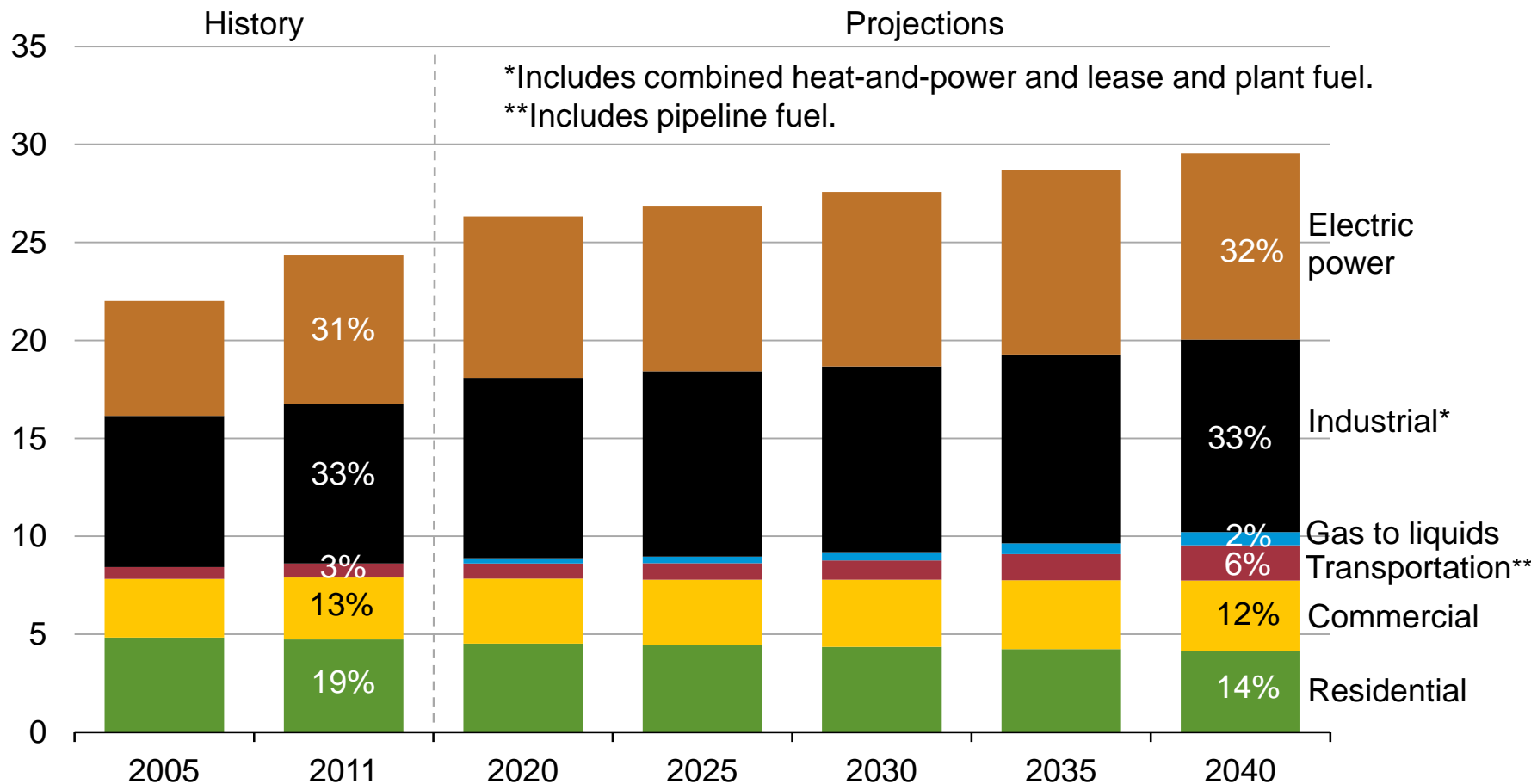


Source: EIA, Annual Energy Outlook 2013 Early Release

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

U.S. dry gas consumption

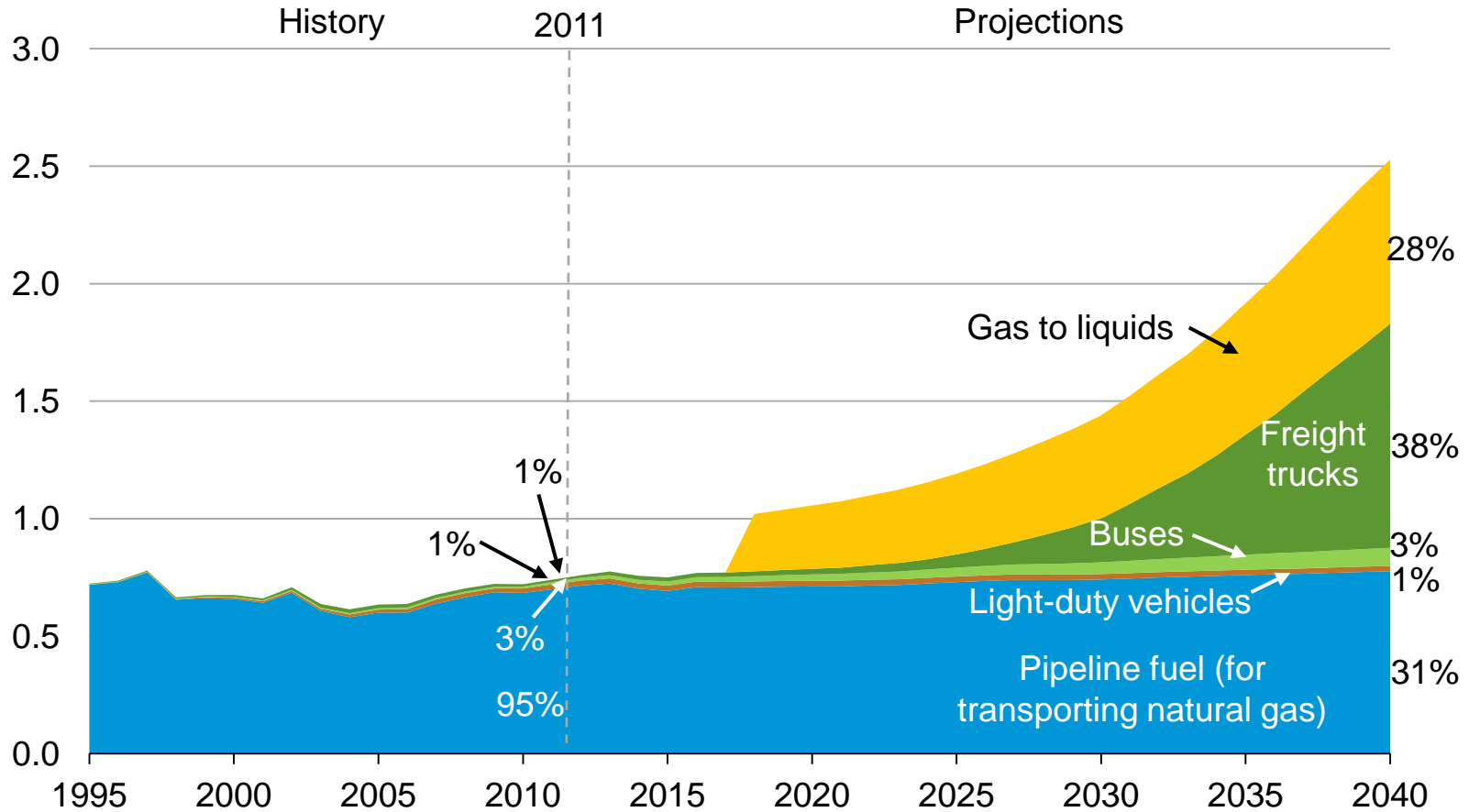
trillion cubic feet



Source: EIA, Annual Energy Outlook 2013 Early Release

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

U.S. natural gas consumption
quadrillion Btu

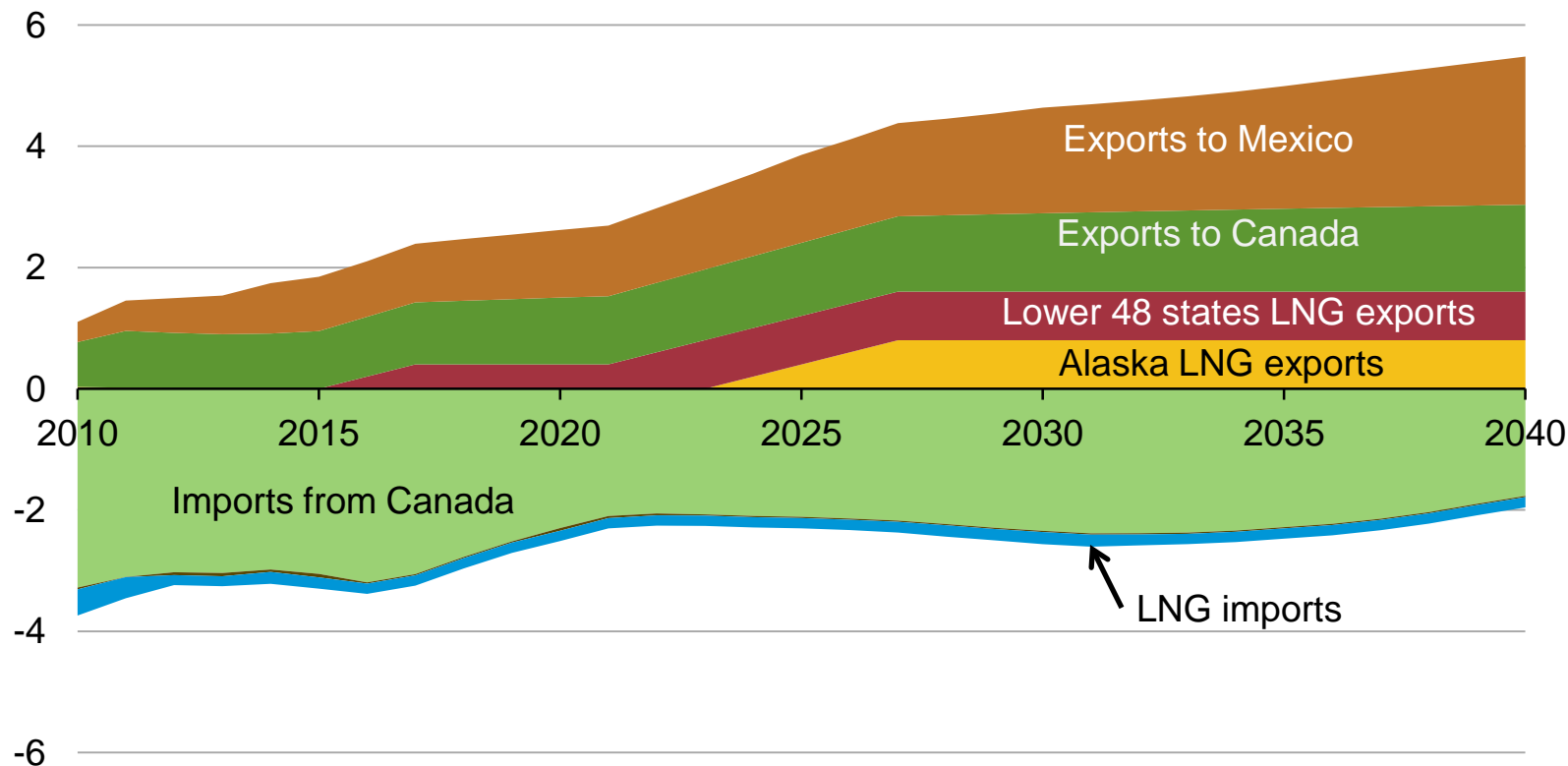


Note: Gas to liquids includes heat, power, and losses.

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

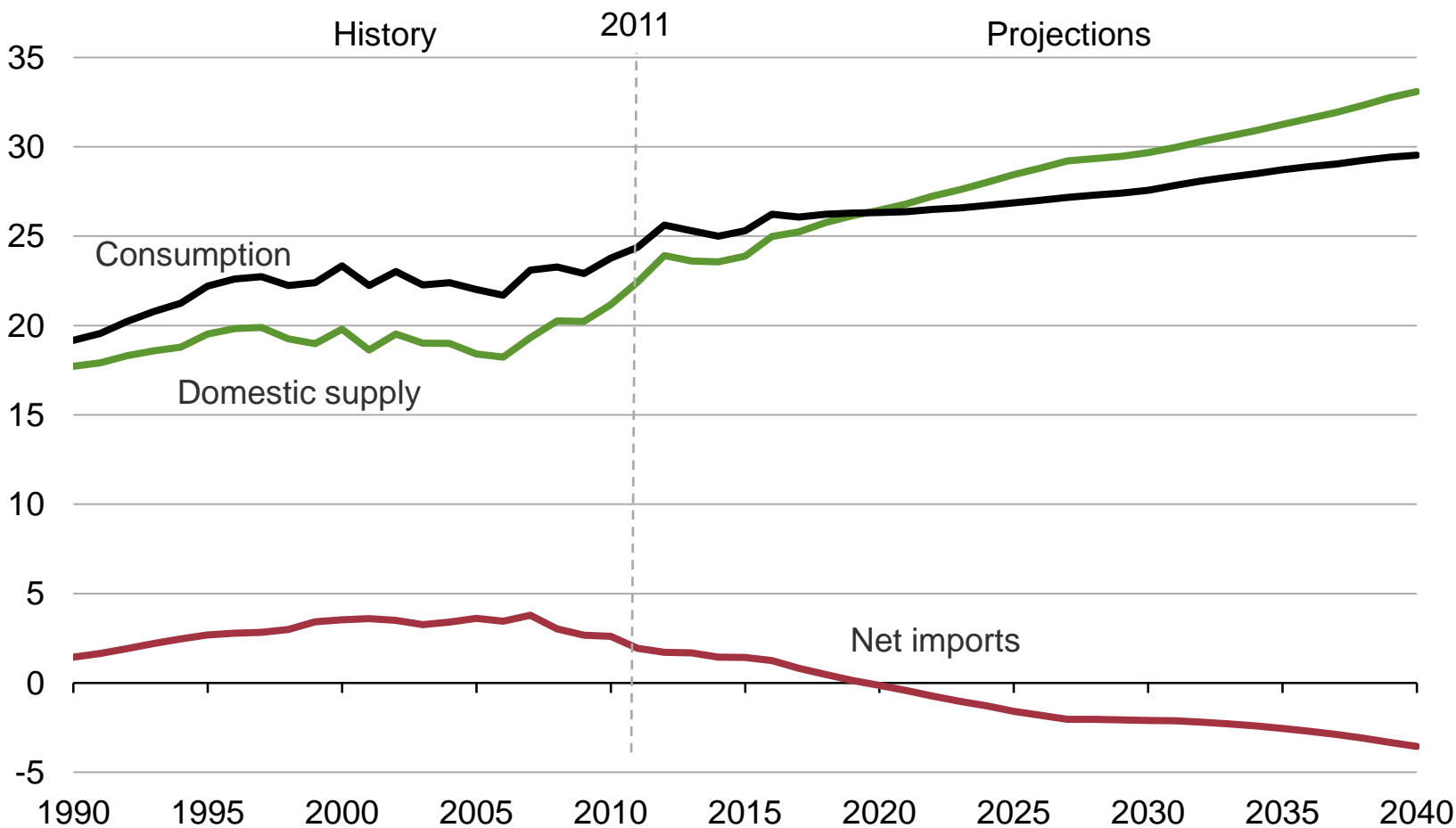


Source: EIA, Annual Energy Outlook 2013 Early Release

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

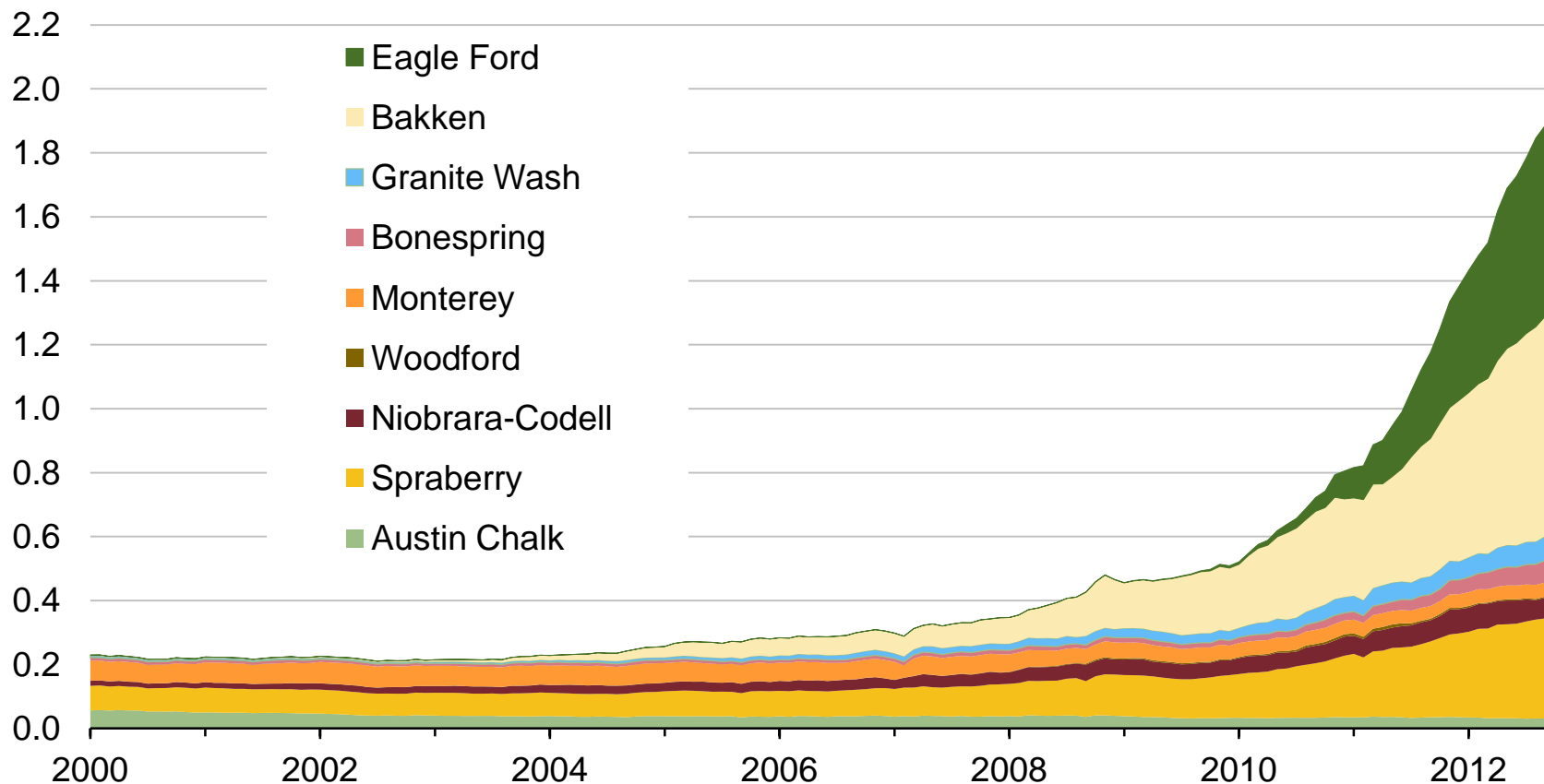


Source: EIA, Annual Energy Outlook 2013 Early Release

U.S. Tight Oil

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

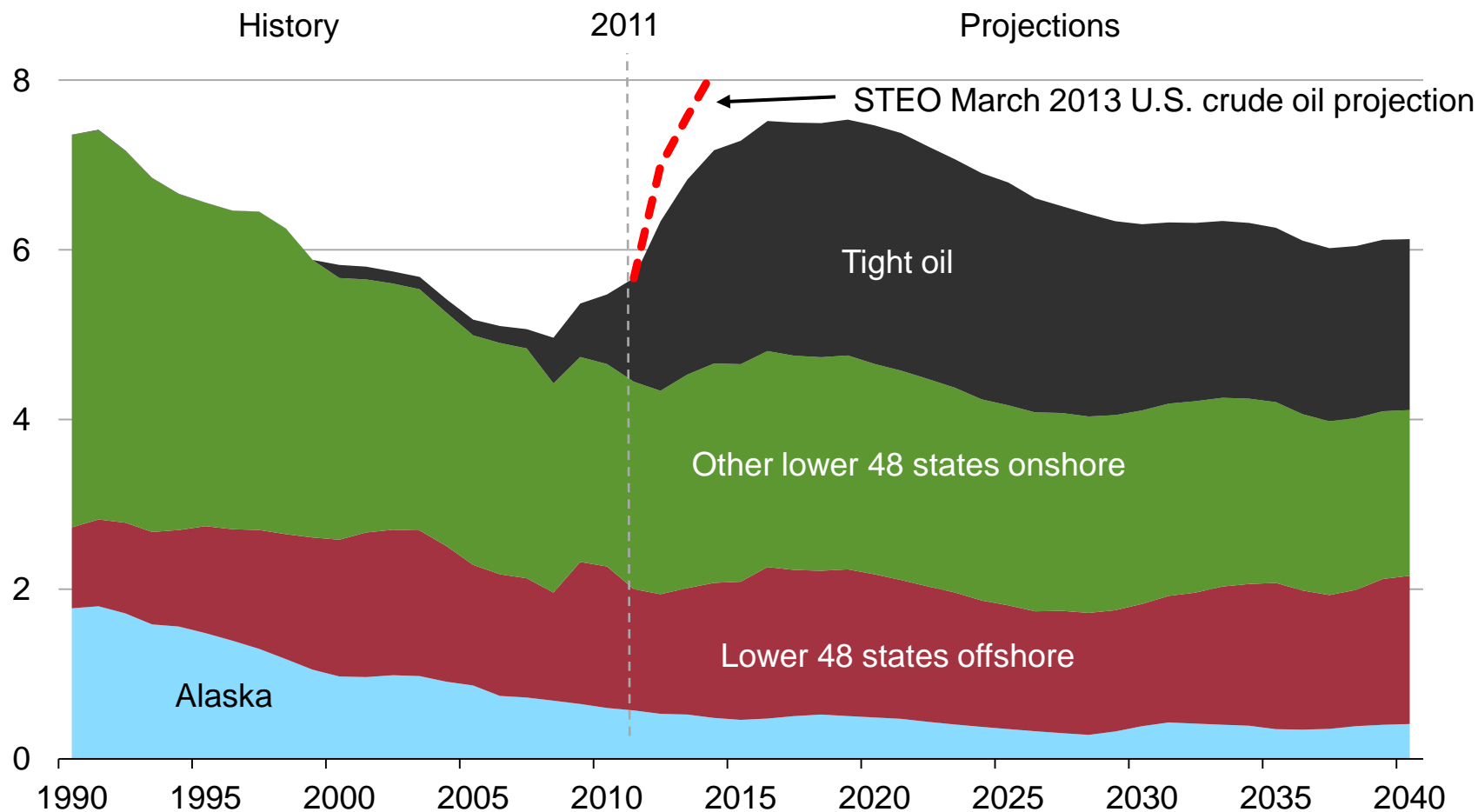
tight oil production for select plays
million barrels per day



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

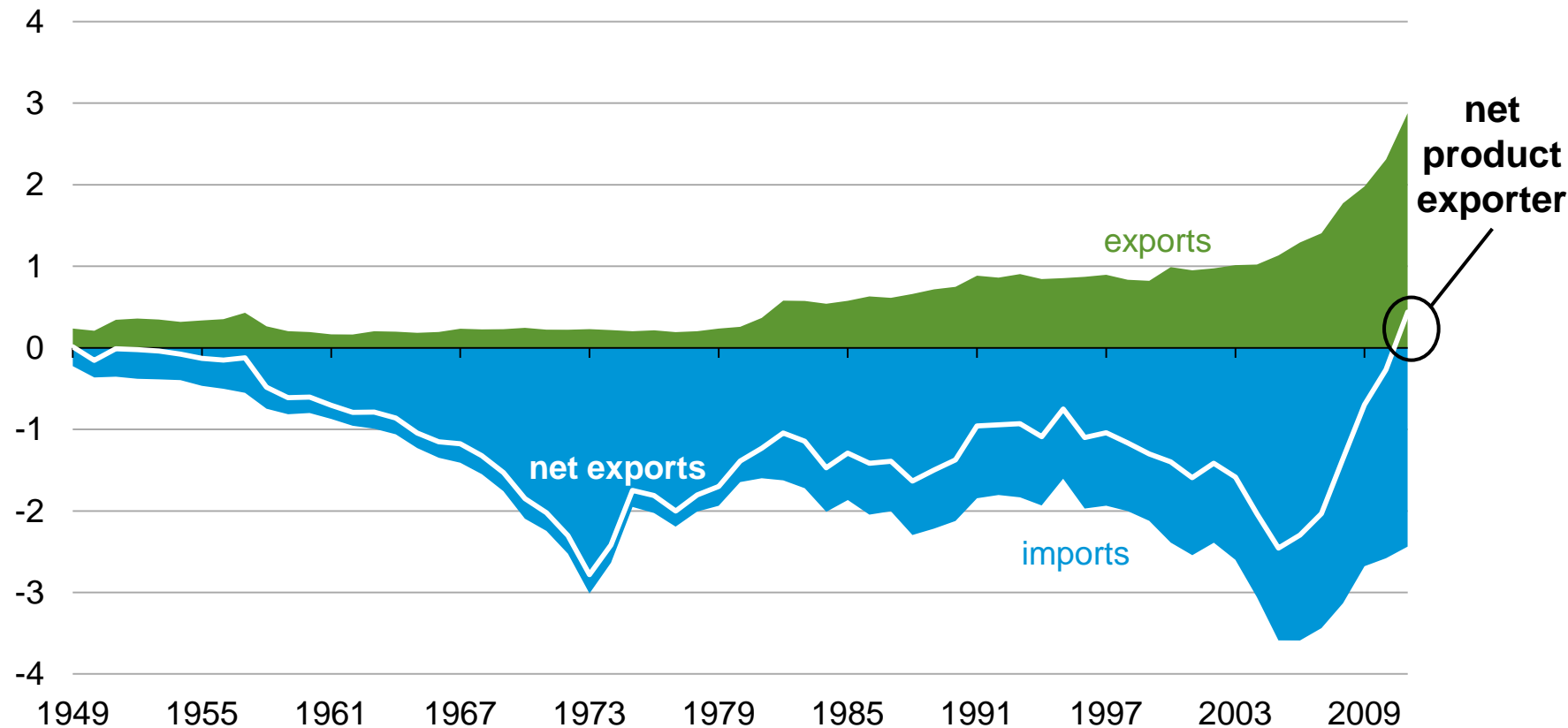


Source: EIA, Annual Energy Outlook 2013 Early Release and Short-Term Energy Outlook, March 2013

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

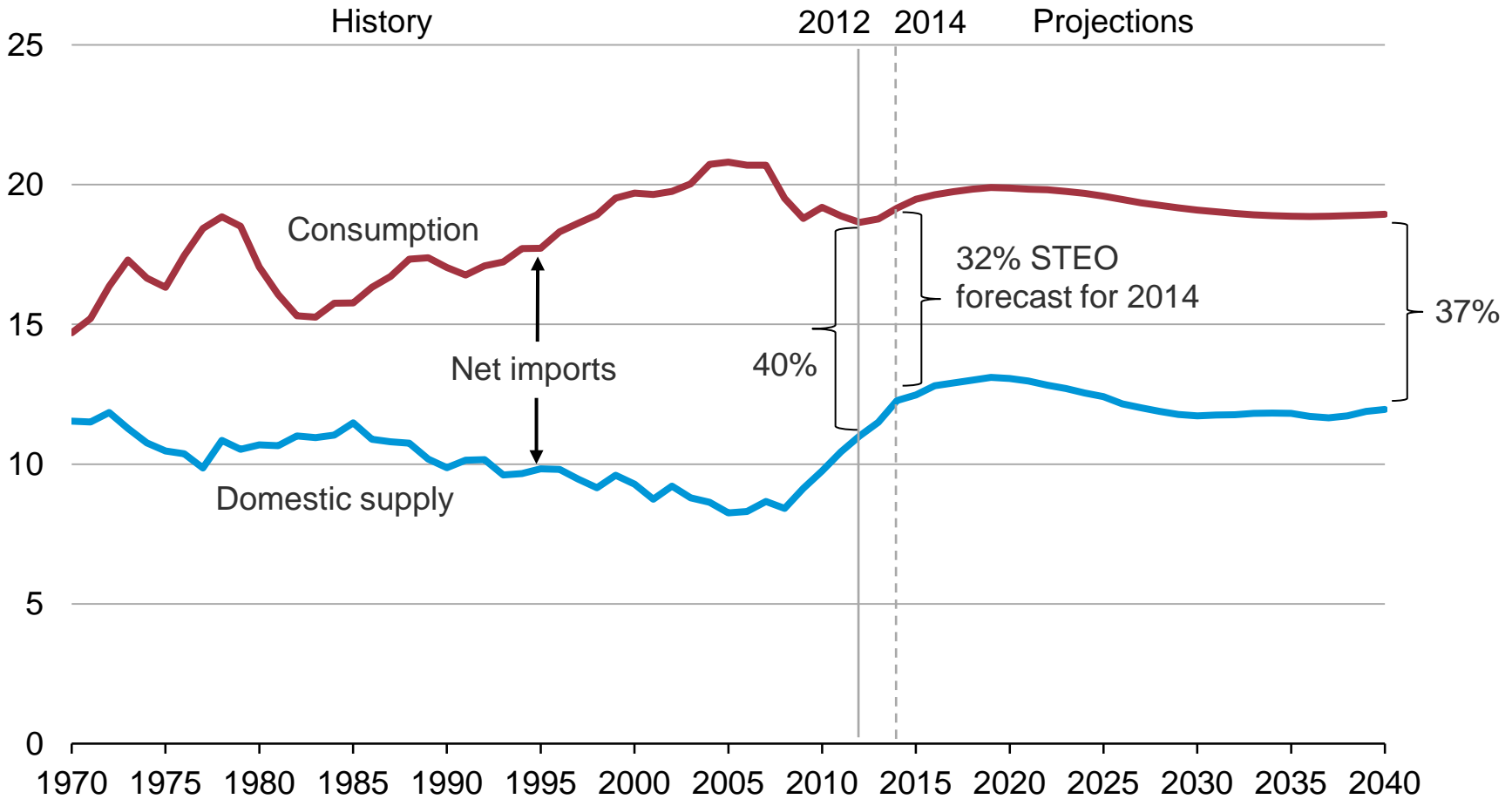
million barrels per day



Source: EIA, Petroleum Supply Monthly

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

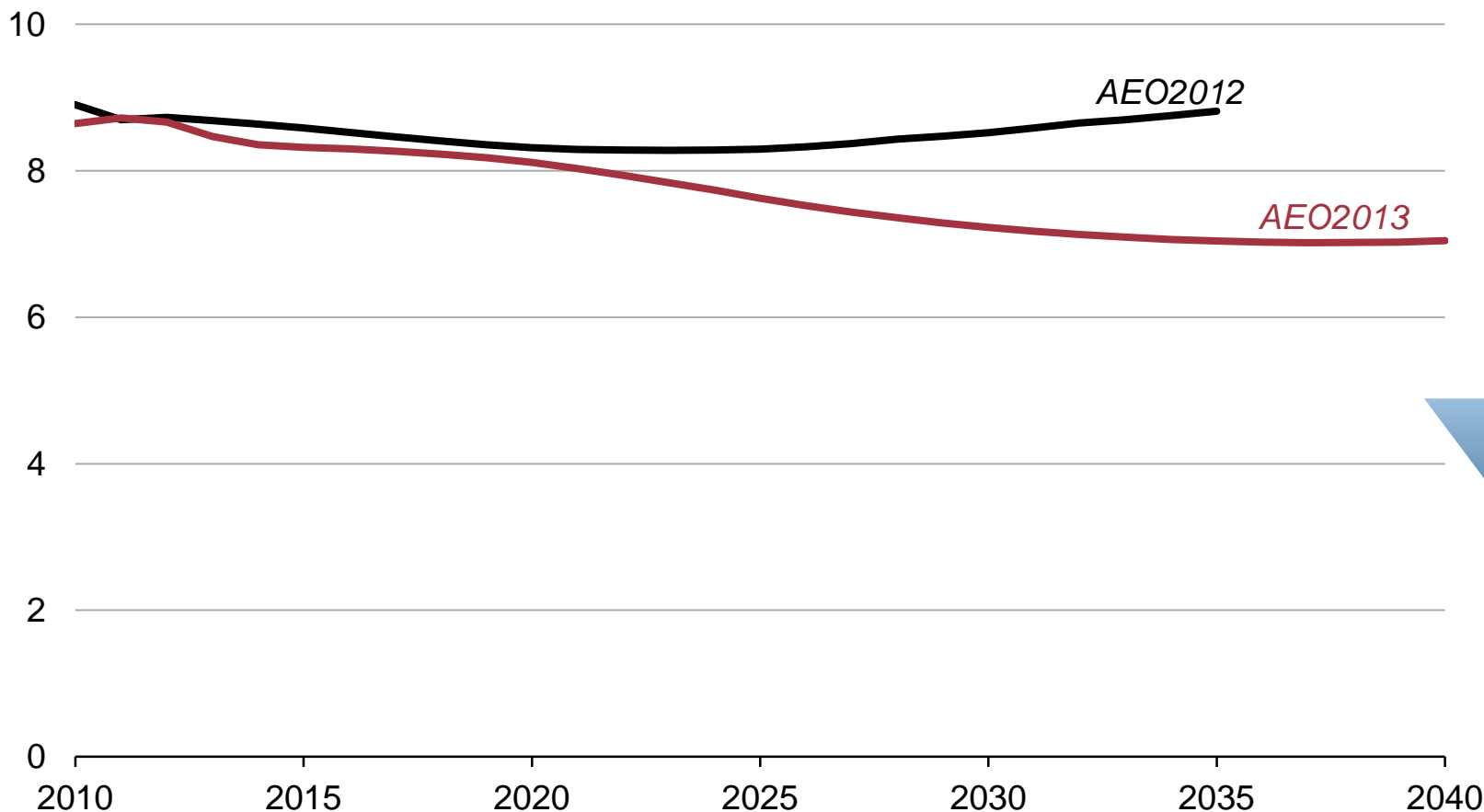
U.S. liquid fuel supply
million barrels per day



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

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

light-duty vehicle liquids consumption
million barrels per day

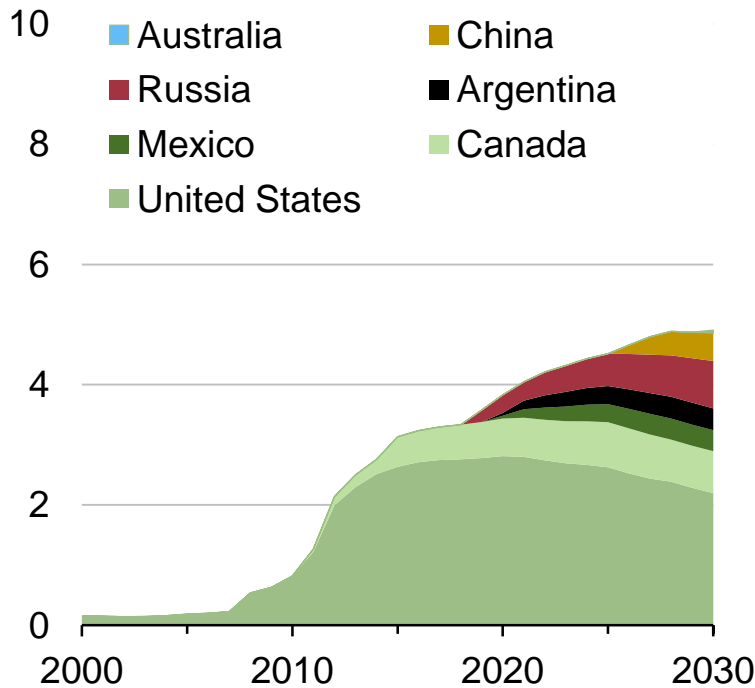


Source: EIA, Annual Energy Outlook 2013 Early Release

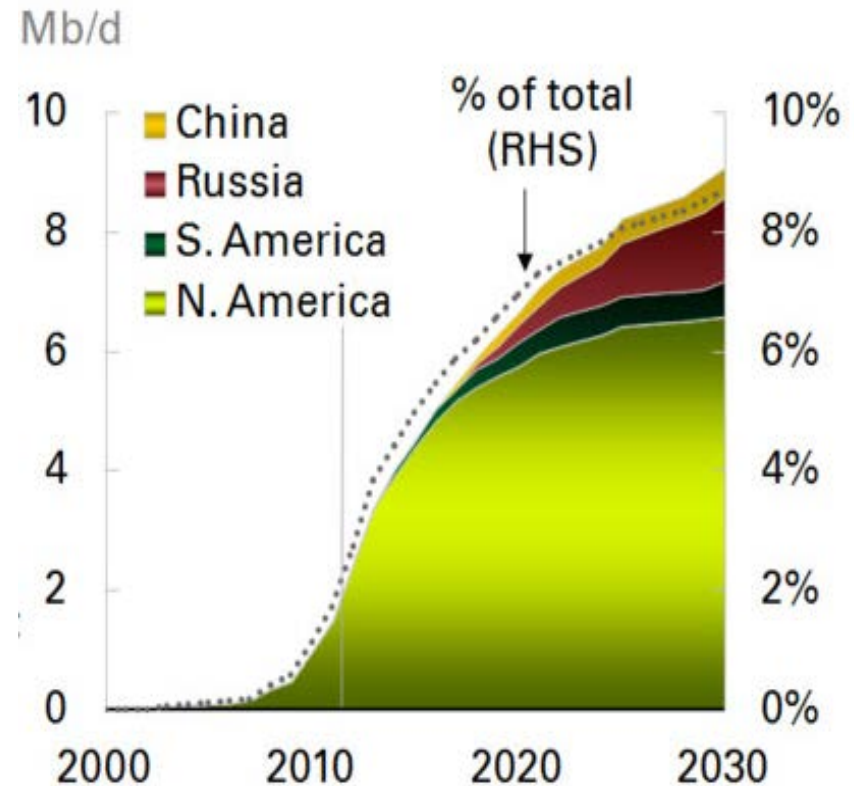
Global tight oil production comparisons

IEO2013 DRAFT

million barrels per day



BP Energy Outlook 2030

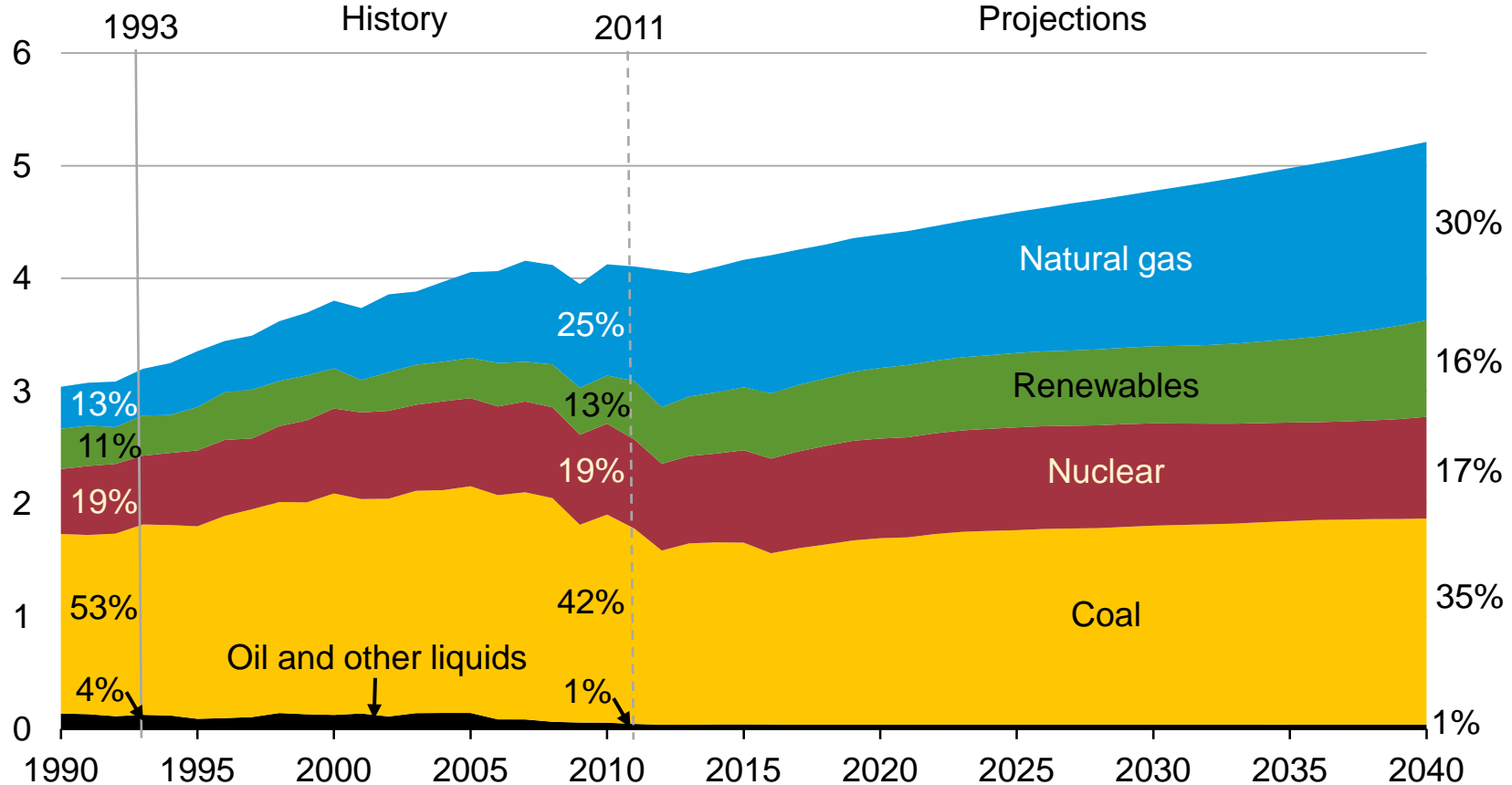


Source: Preliminary International Energy Outlook 2013 and BP Energy Outlook 2030, www.bp.com/energyoutlook

U.S. Coal and Electricity

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

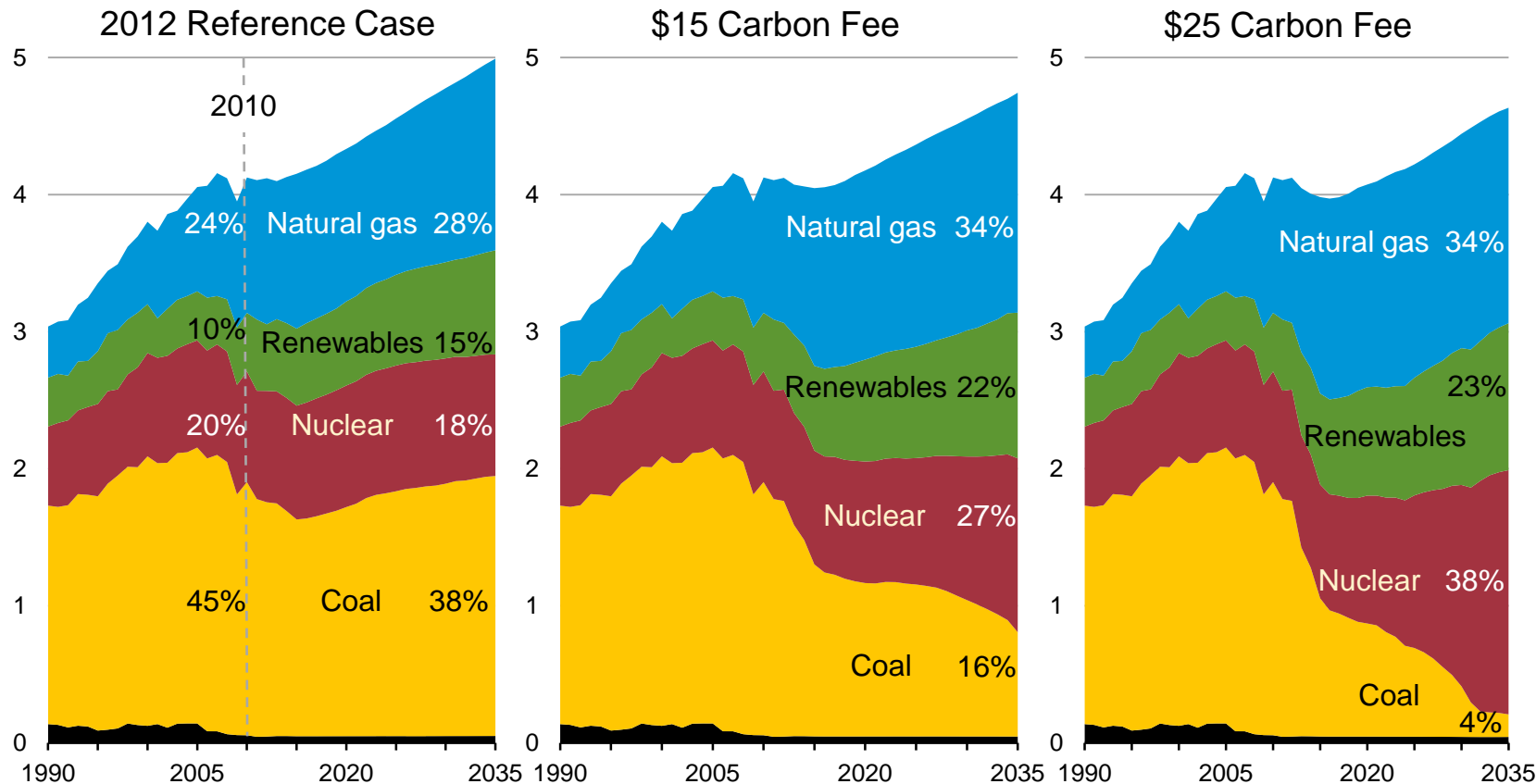
U.S. electricity net generation
trillion kilowatthours



Source: EIA, Annual Energy Outlook 2013 Early Release

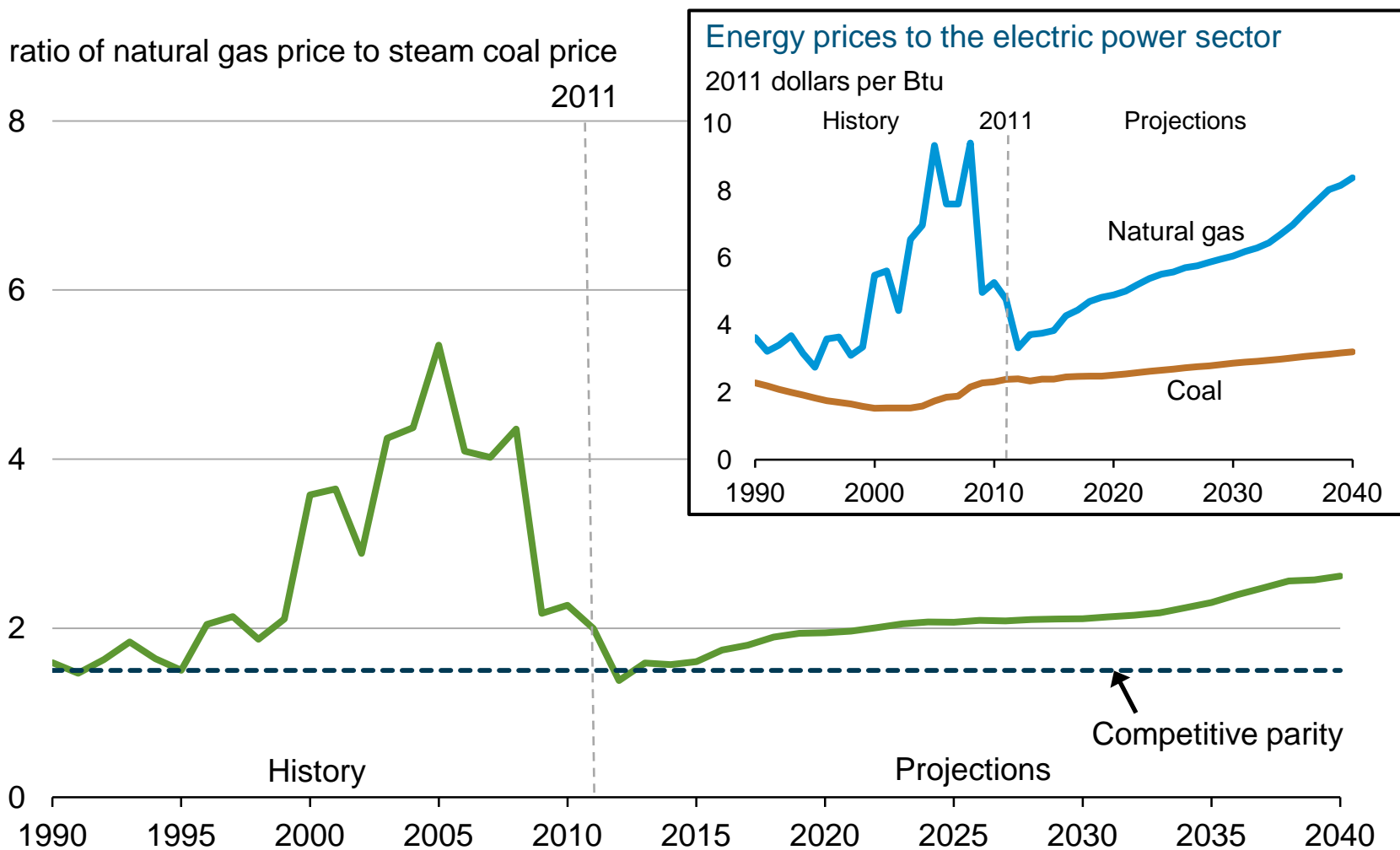
Changing electricity generation mix in *AEO2012* reference case and carbon fee allowance side cases

U.S. electricity net generation
trillion kilowatthours



Source: EIA, Annual Energy Outlook 2012

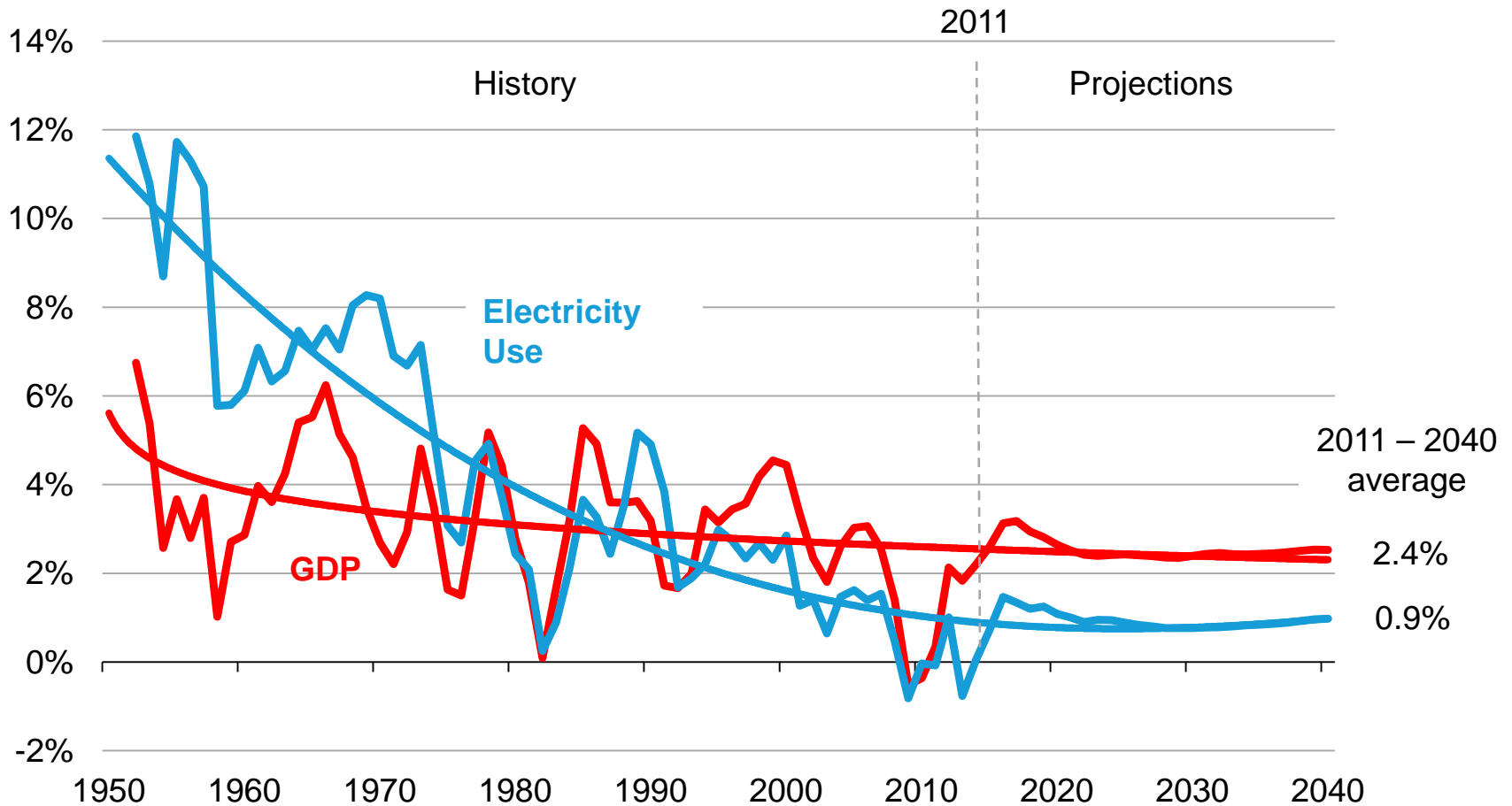
Coal regains some competitive advantage relative to natural gas over time on a national average basis



Source: EIA, Annual Energy Outlook 2013 Early Release

U. S. electricity use and economic growth, 1950-2040

Percent growth (3-year compounded annual growth rate)

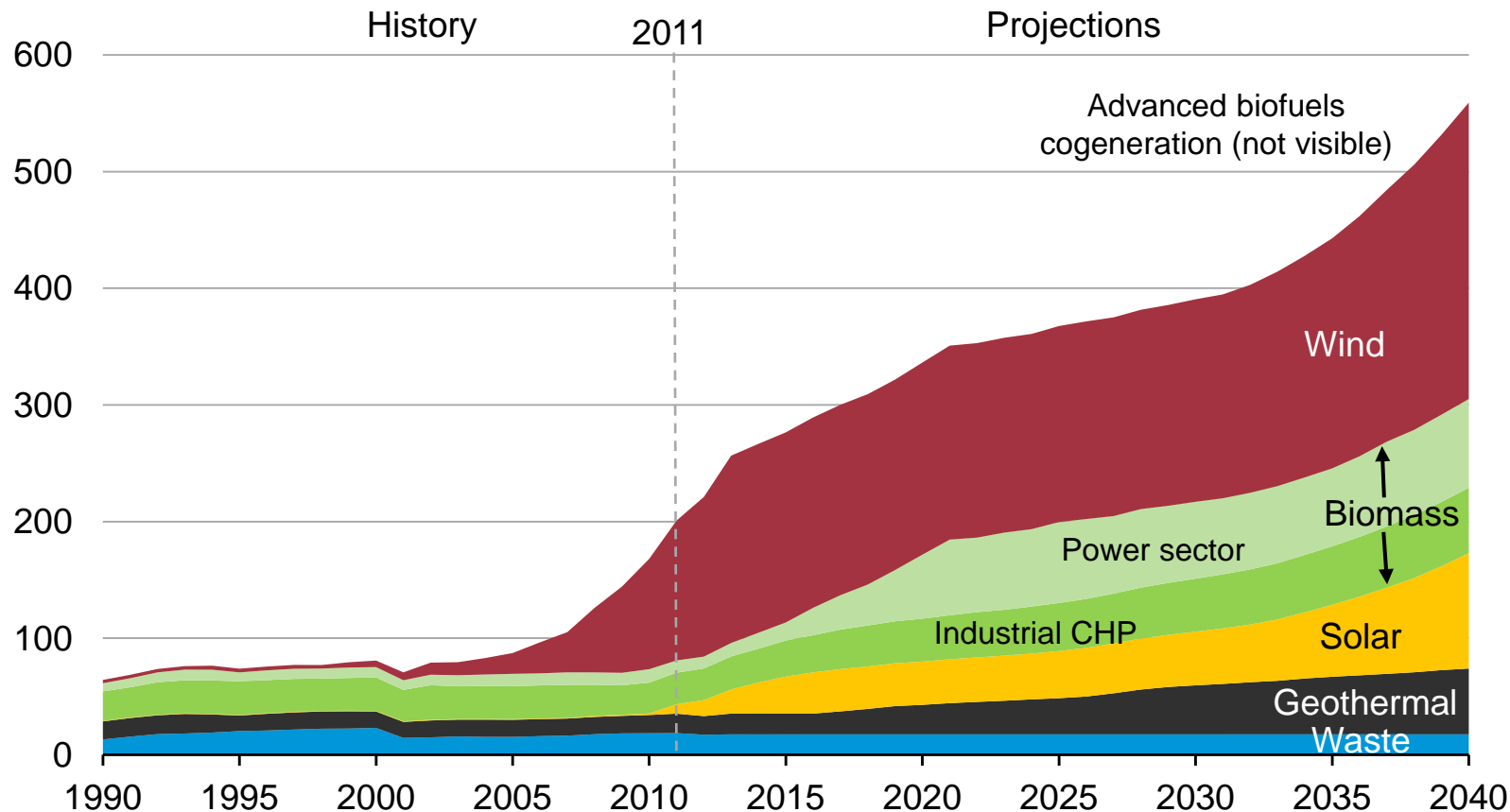


Source: EIA, Annual Energy Outlook 2013 Early Release

U.S. Renewables and Biofuels

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

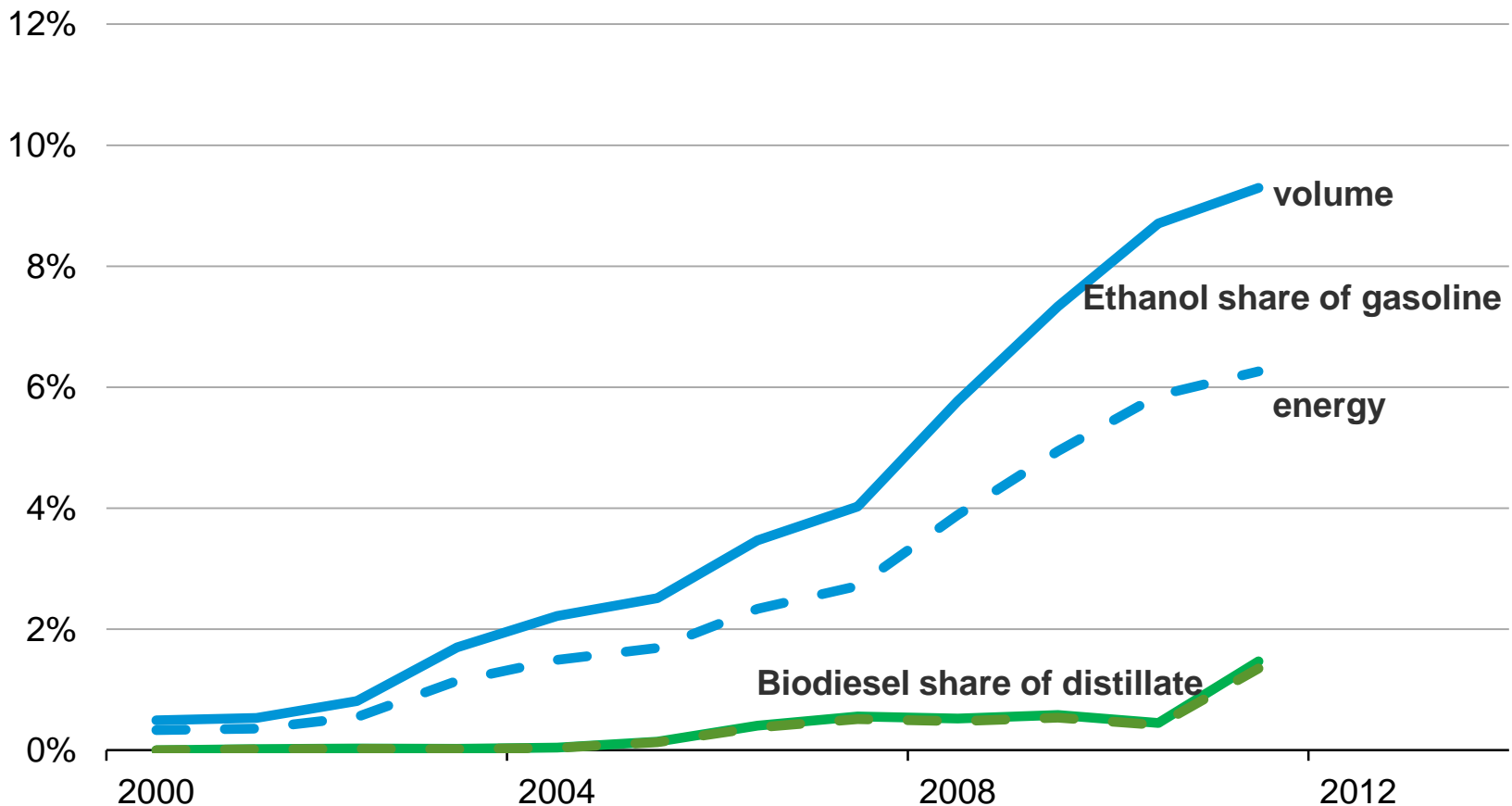
non-hydropower renewable generation
billion kilowatthours per year



Source: EIA, Annual Energy Outlook 2013 Early Release

Despite recent growth, ethanol and biodiesel provide a modest share of U.S. motor fuels

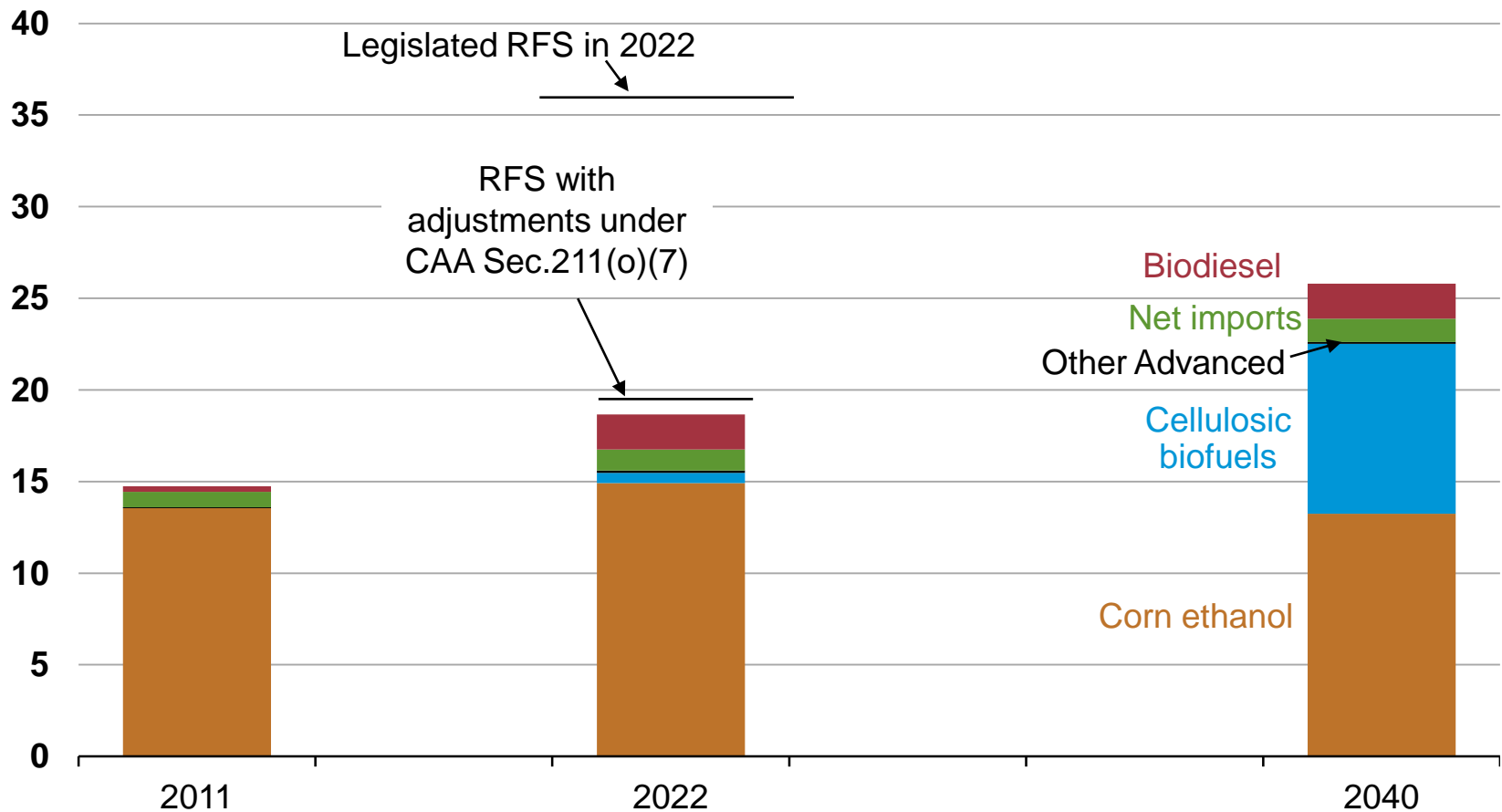
biofuel consumption



Source: EIA, Short-Term Energy Outlook, November 2012

Biofuels grow at a slow rate due to lower near-term crude oil prices and slow growth in sales of high-percentage ethanol blends such as E85

renewable fuel standard credits
billions ethanol-equivalent gallons

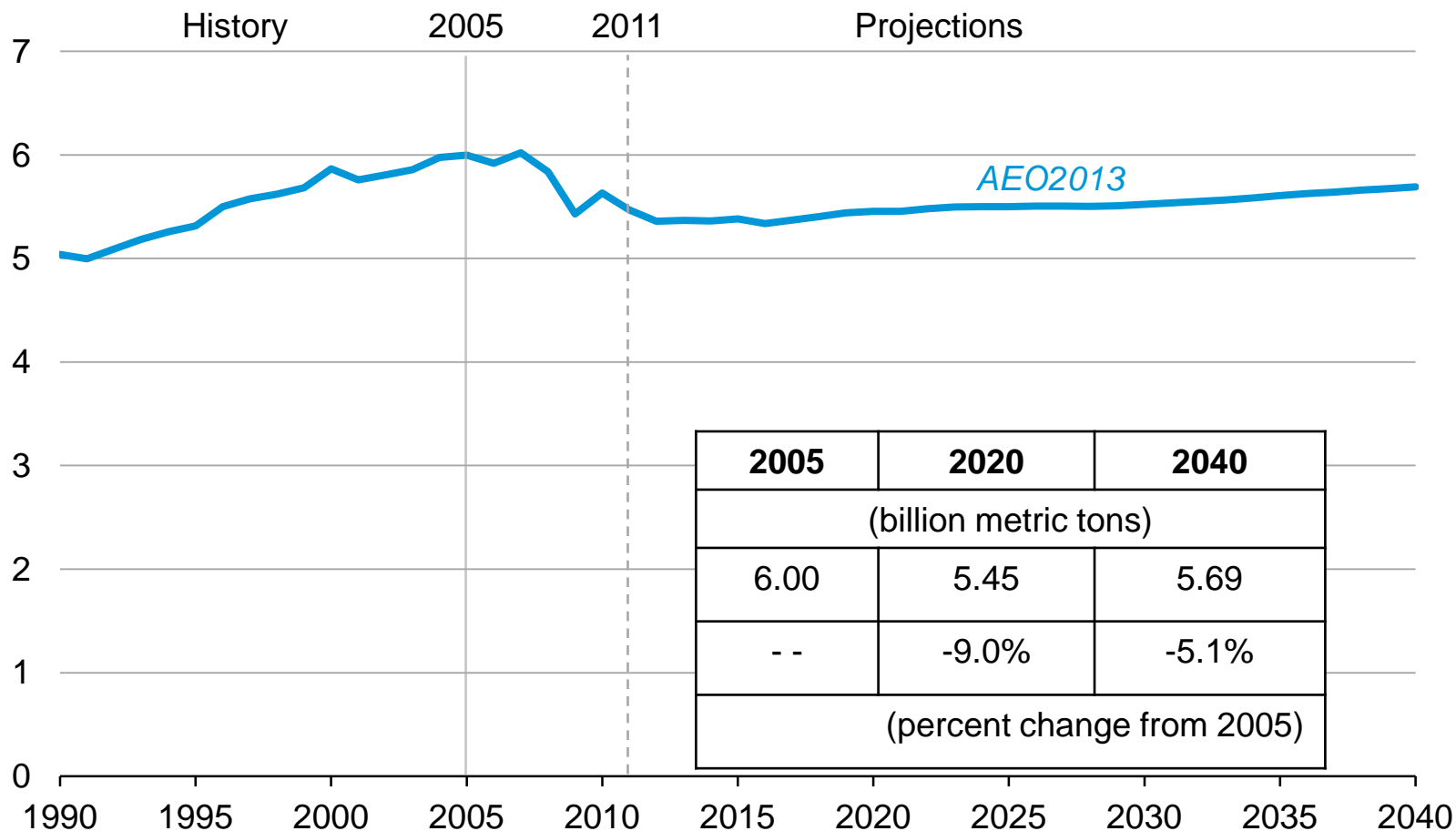


Sources: EIA, Annual Energy Outlook 2013 Early Release and EIA, Annual Energy Outlook 2012

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

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

Annual Energy Outlook | www.eia.gov/aeo

International Energy Outlook | www.eia.gov/ieo

Monthly Energy Review | www.eia.gov/mer

Today in Energy | www.eia.gov/todayinenergy