

Transformation of the U.S. energy landscape



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EIA principles

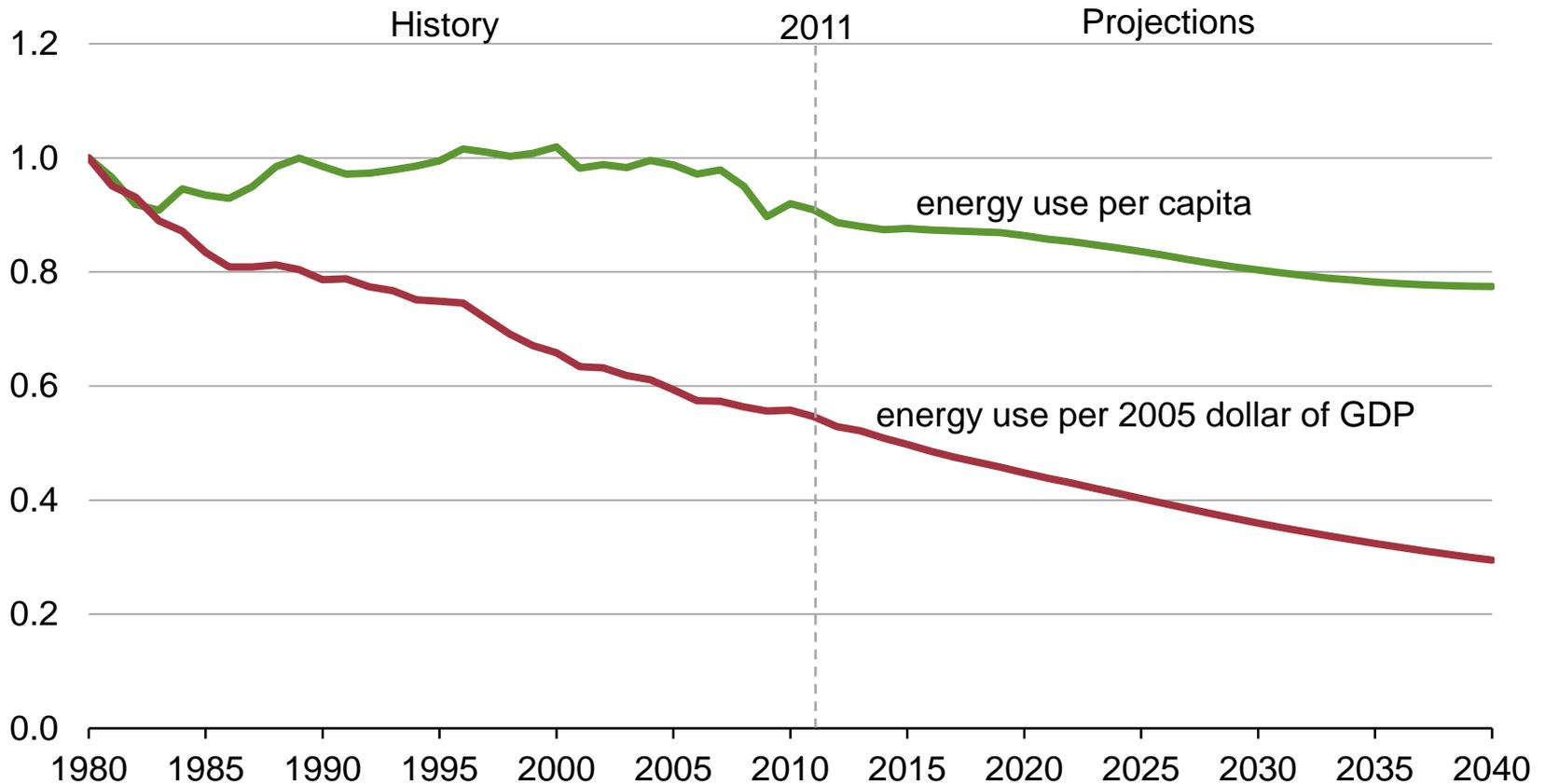
- Established as the single, independent federal government authority for energy information and mandated to collect, assemble, evaluate, and analyze energy information
- Provide relevant energy statistics and analysis as a public good
- Be accurate and objective
- Protect the confidentiality of respondents
- Maintain the public trust



U.S. Overview

Energy use per capita and per dollar of gross domestic product

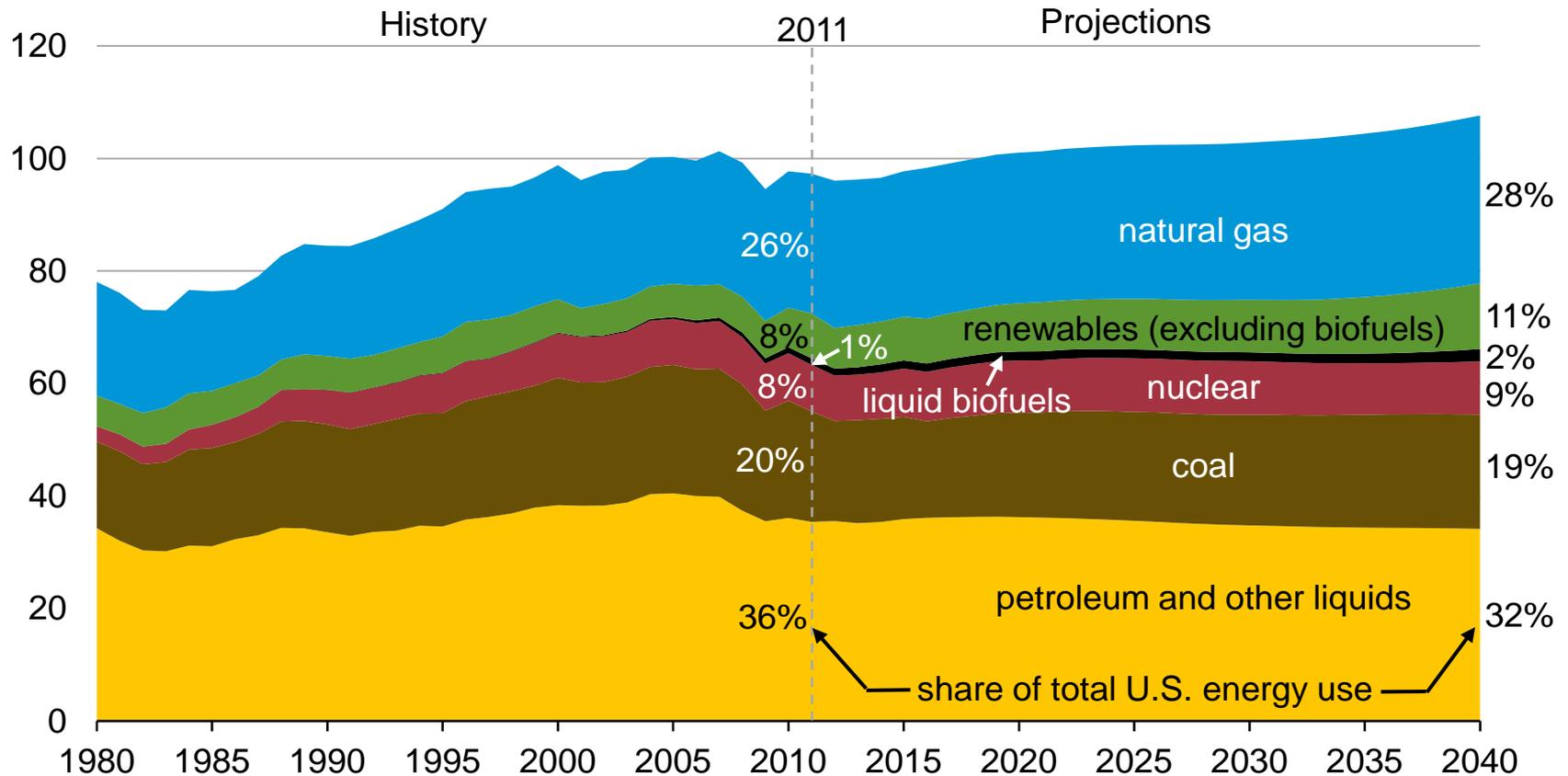
U.S. energy intensity
index, 1980 = 1.0



Source: EIA, Annual Energy Outlook 2013

Natural gas and renewables increase their share of primary energy use through 2040

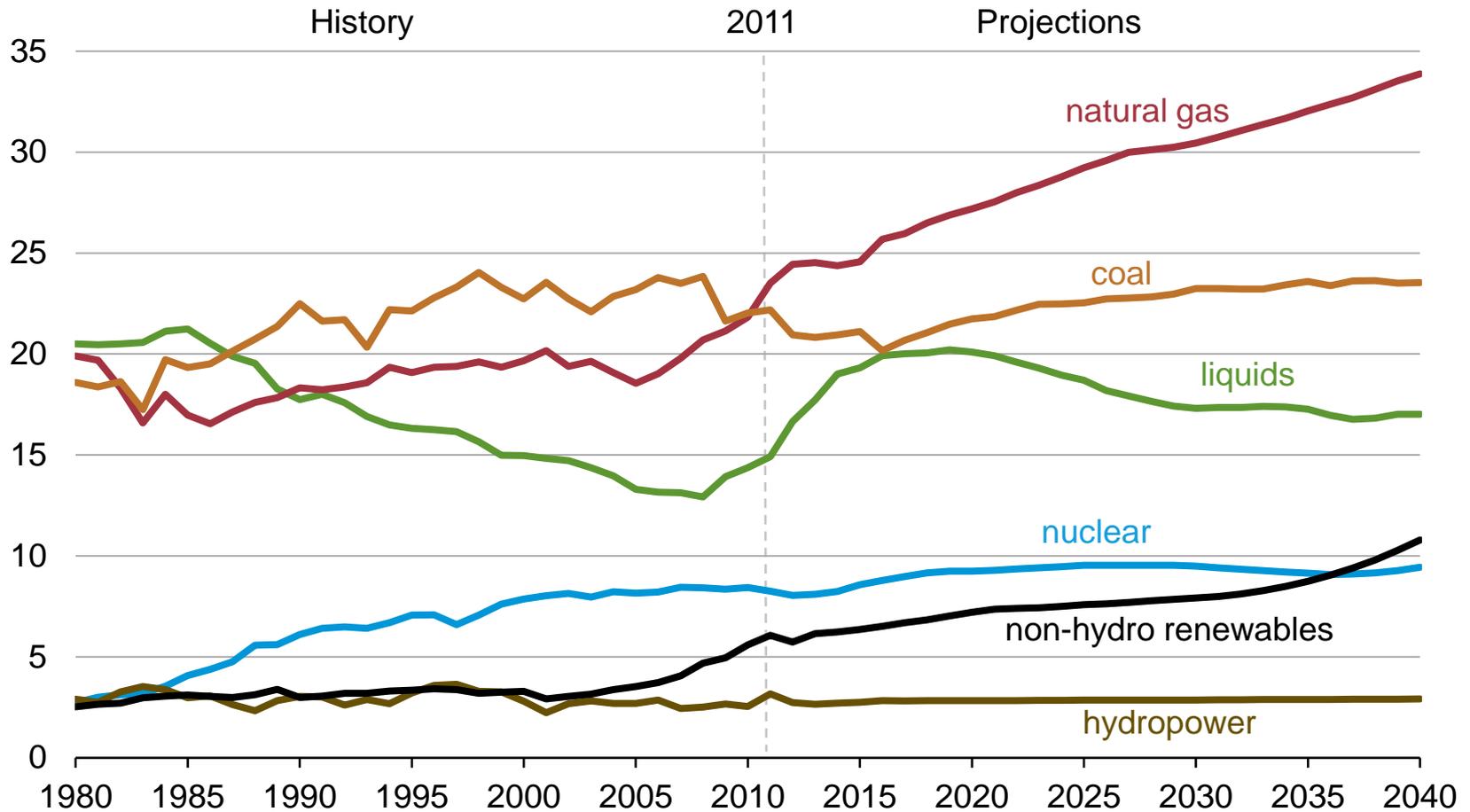
U.S. energy consumption
quadrillion Btu



Source: EIA, Annual Energy Outlook 2013

Energy production by fuel – natural gas dominates through 2040

U.S. delivered energy production
quadrillion Btu



Source: EIA, Annual Energy Outlook 2013

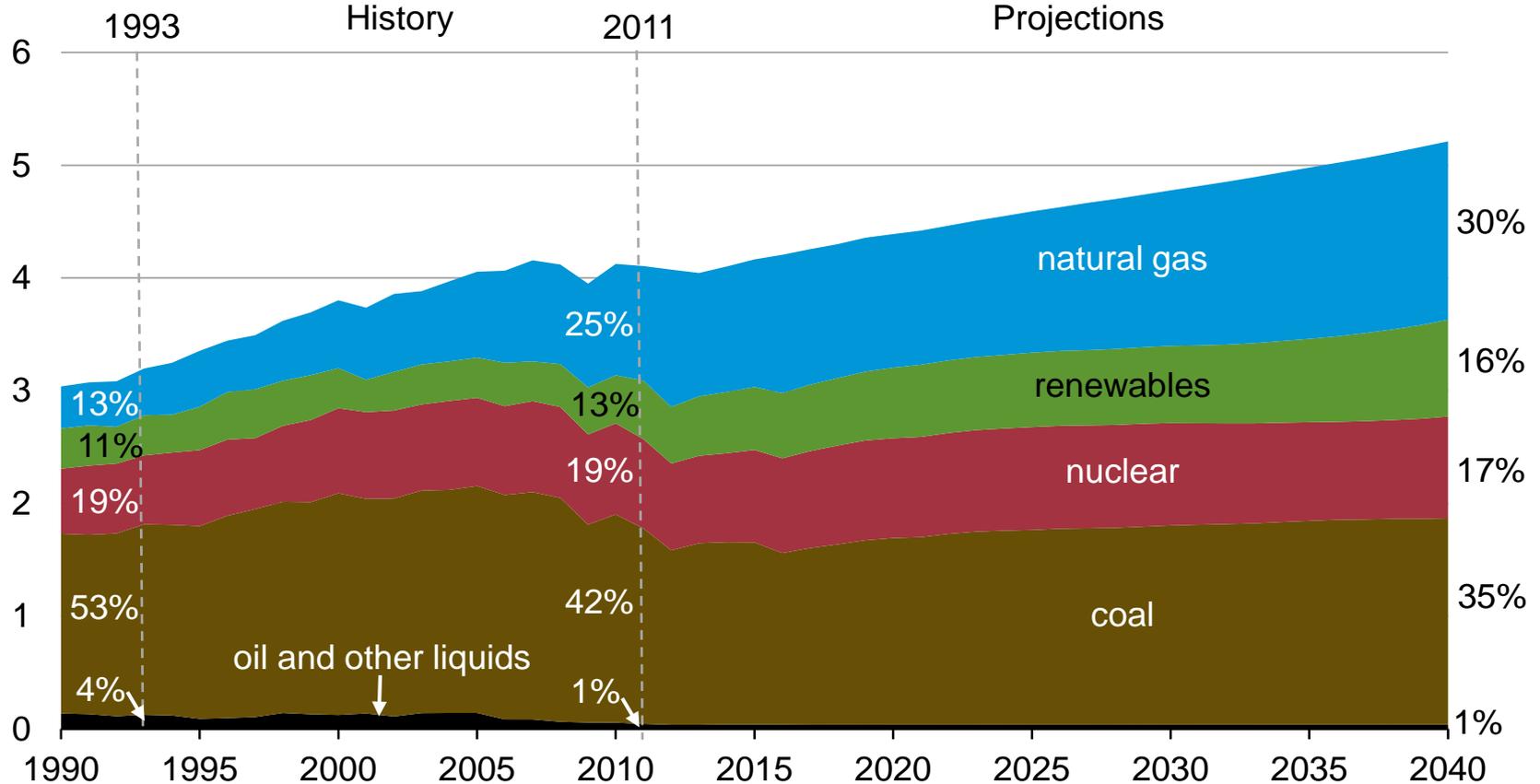
Why we ~~might could~~ will be wrong?

- Changing policies and regulations
- Changing consumer preferences
- Faster / slower economic growth
- Faster / slower technological progress
- Different relative fuel prices
- Technological breakthroughs

Renewable energy

Over time the electricity mix gradually shifts to lower-carbon options, led by growth in natural gas and renewable generation

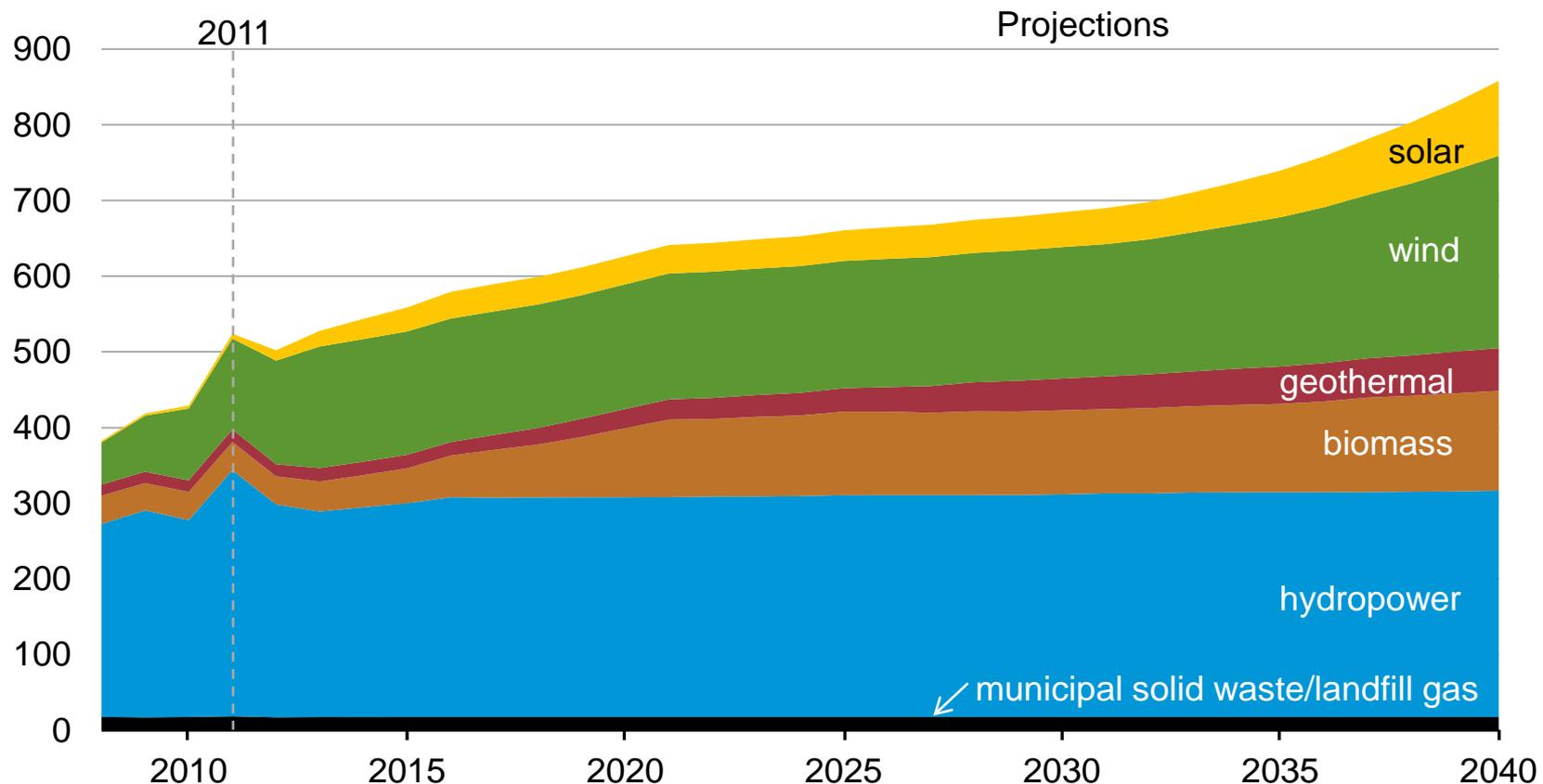
U.S. electricity net generation
trillion kilowatthours



Source: EIA, Annual Energy Outlook 2013

Renewable electricity generation by type, including end-use generation, 2008-2040

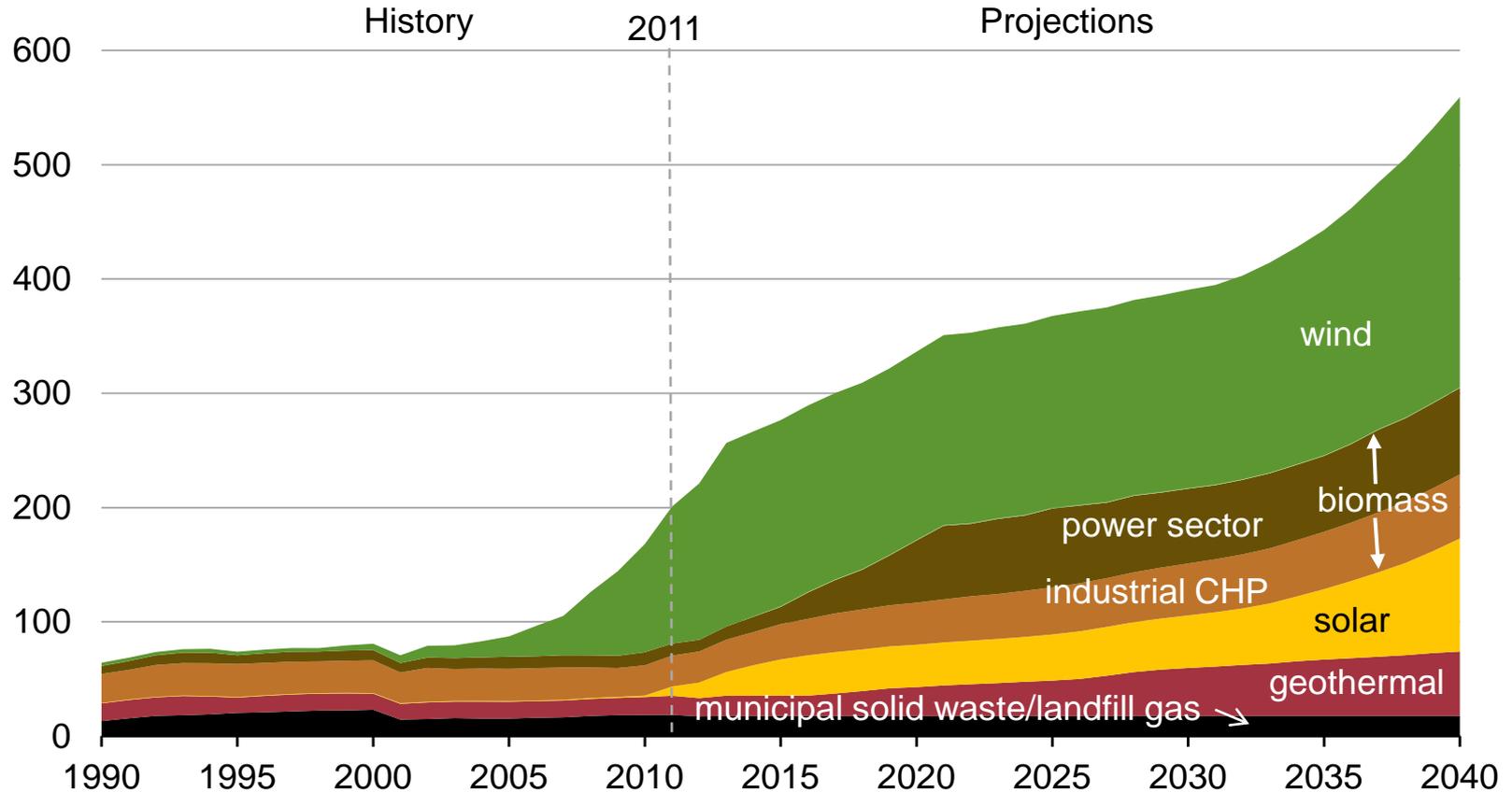
U.S. electricity net generation
billion kilowatthours



Source: EIA, Annual Energy Outlook 2013

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

U.S. non-hydropower renewable generation
billion kilowatthours per year

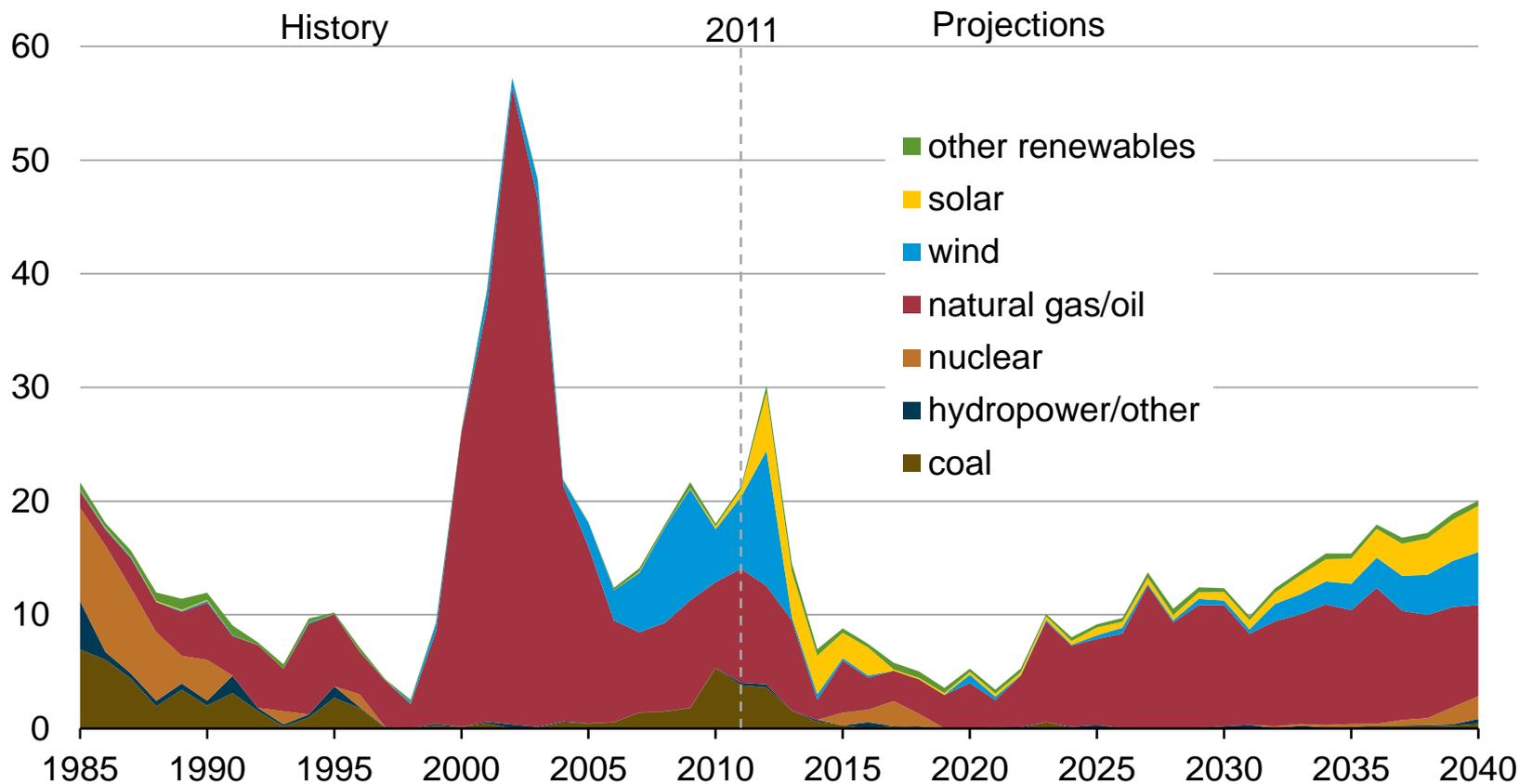


Note: Advanced biofuels (cogeneration) not visible

Source: EIA, Annual Energy Outlook 2013

Natural gas continues to make up the largest share of additions to electricity generating capacity through the projection

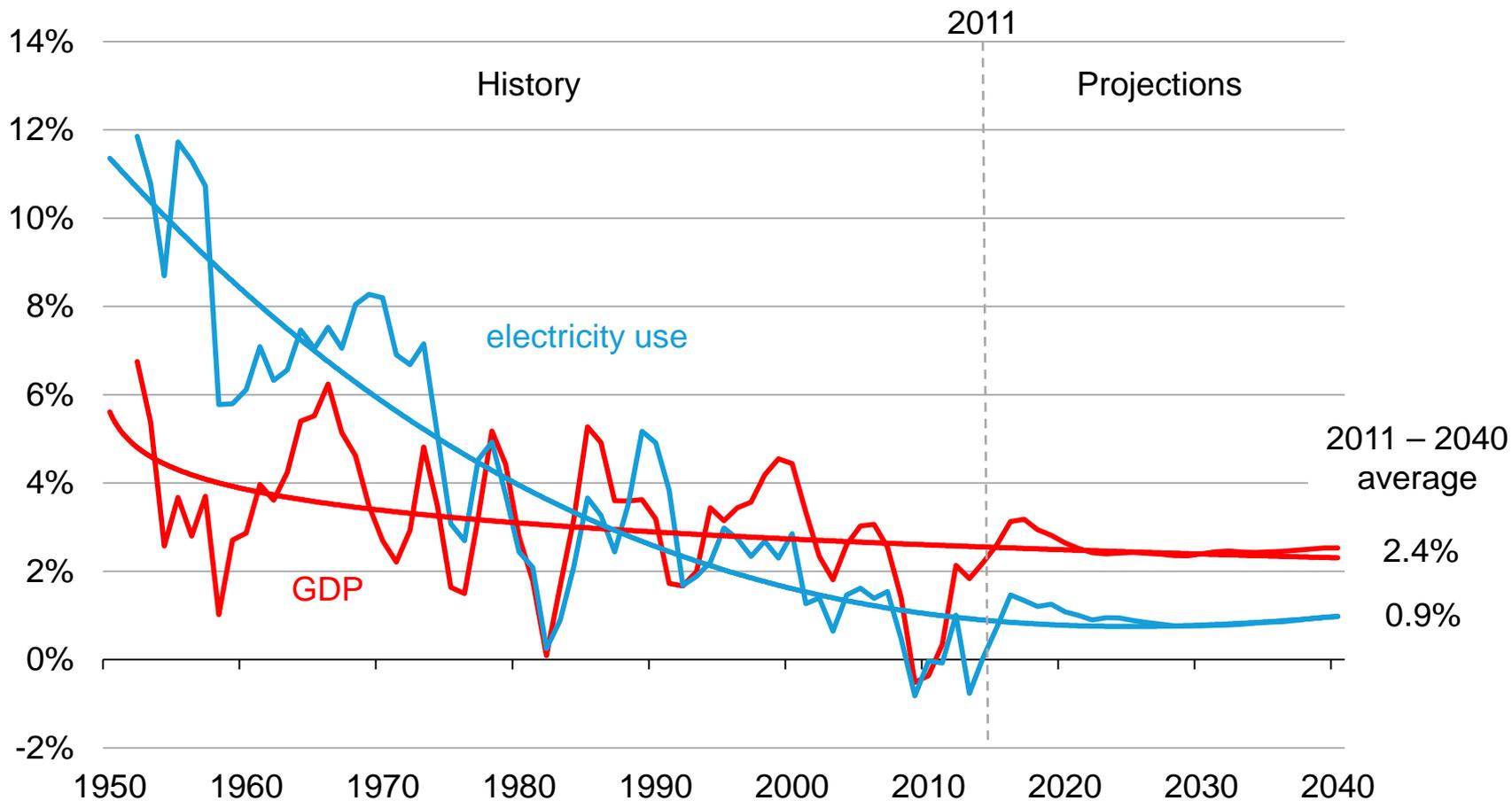
U.S. capacity additions
gigawatts



Source: EIA, Annual Energy Outlook 2013

U.S. growth in GDP flattens out while growth in electricity use declines through most of the projection

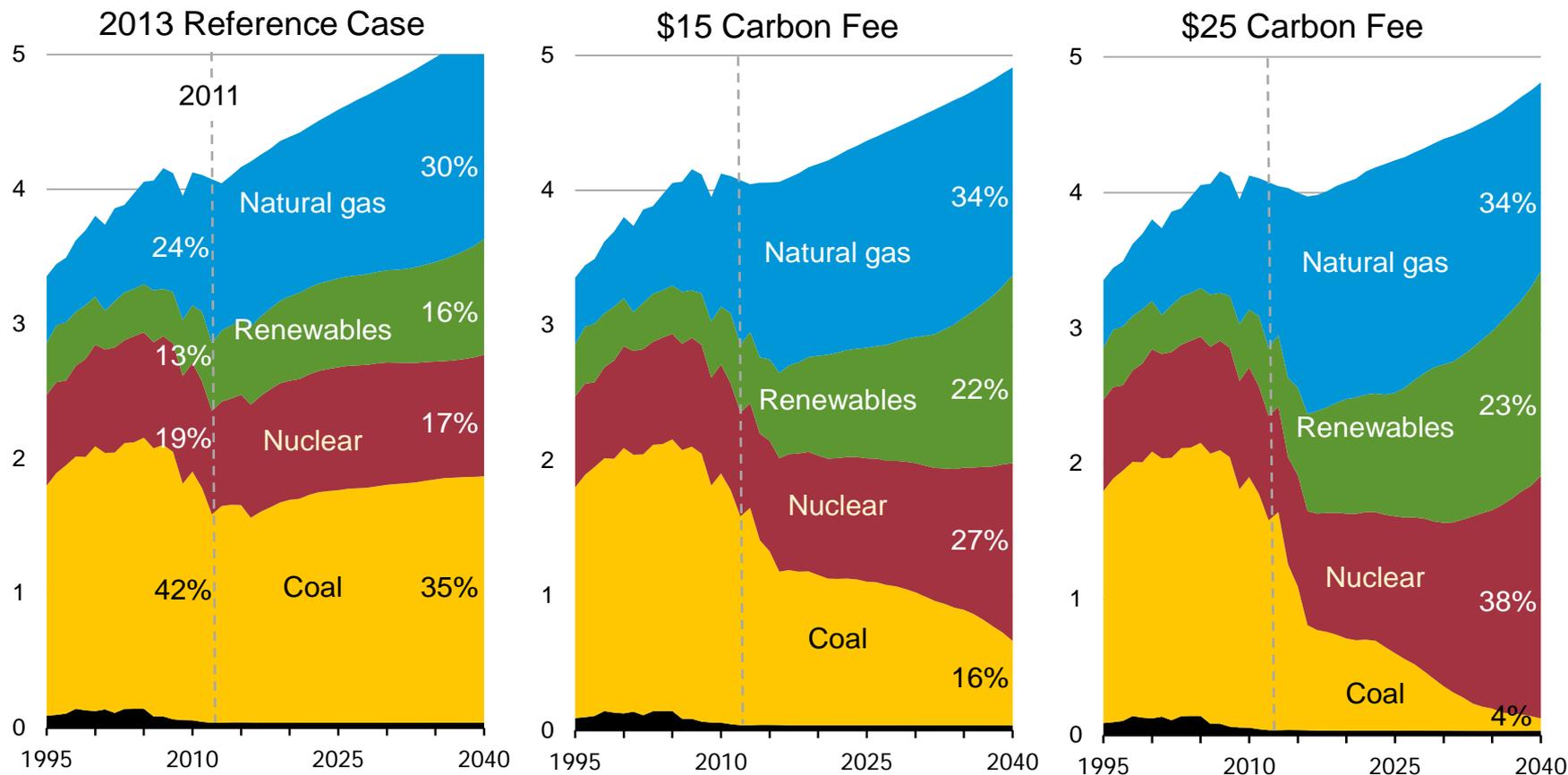
percent growth (3-year compounded annual growth rate)



Source: EIA, Annual Energy Outlook 2013

Changing electricity generation mix in *AEO2013* reference case and carbon fee allowance side cases

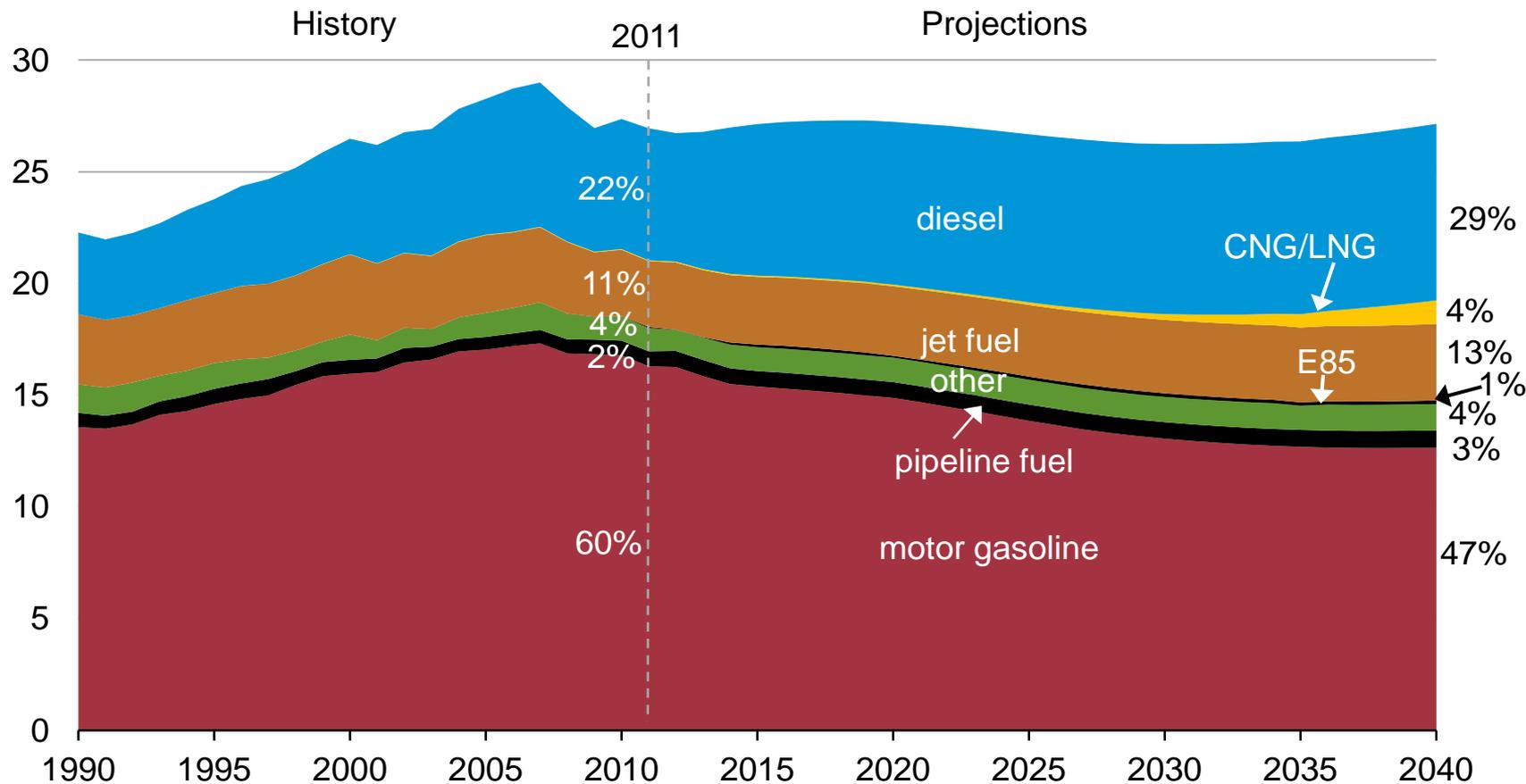
U.S. electricity net generation
trillion kilowatthours



Source: EIA, Annual Energy Outlook 2013

Transportation sector motor gasoline demand declines while diesel demand increases

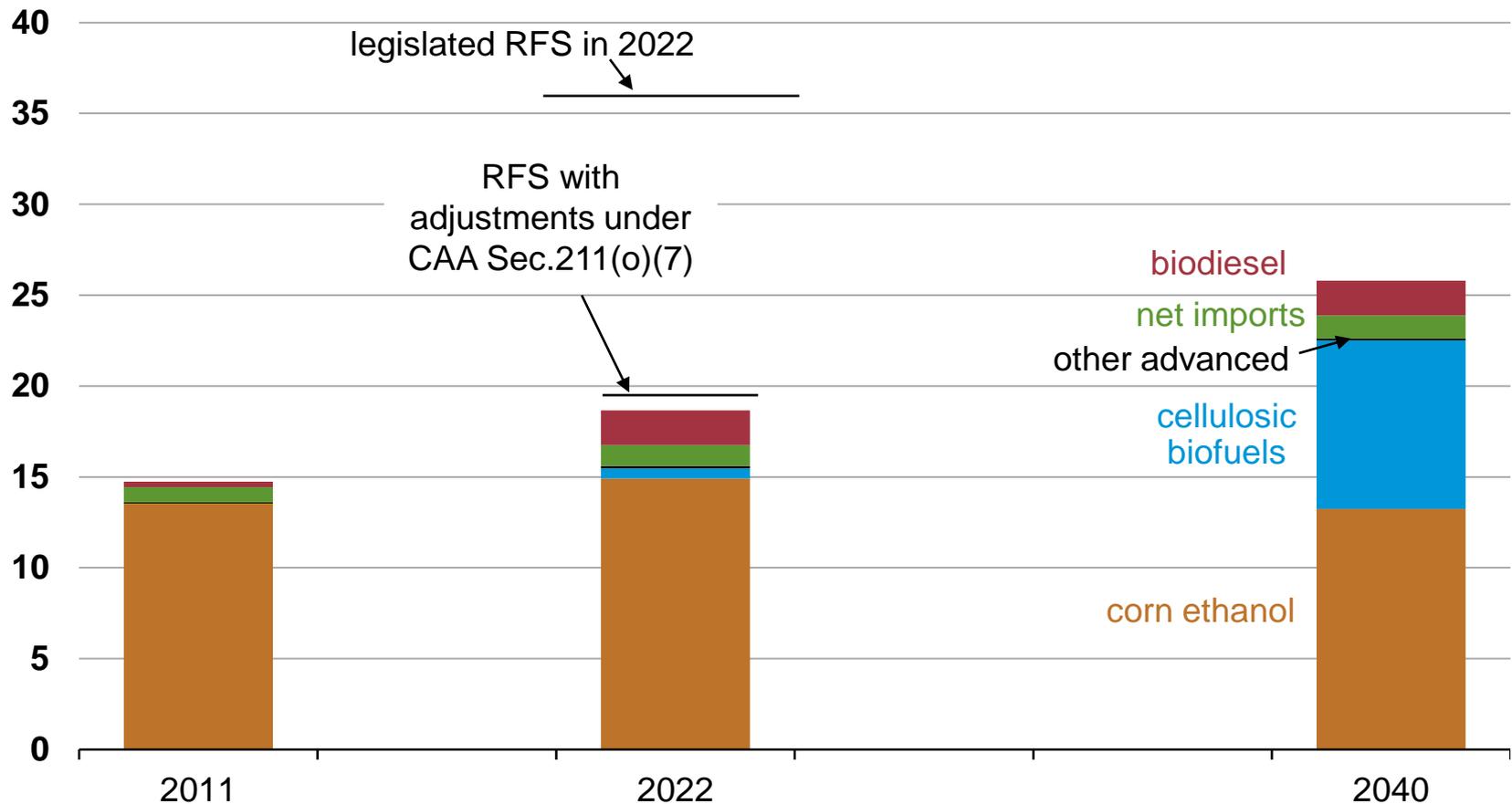
U.S. transportation energy consumption by fuel quadrillion Btu



Source: EIA, Annual Energy Outlook 2013

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

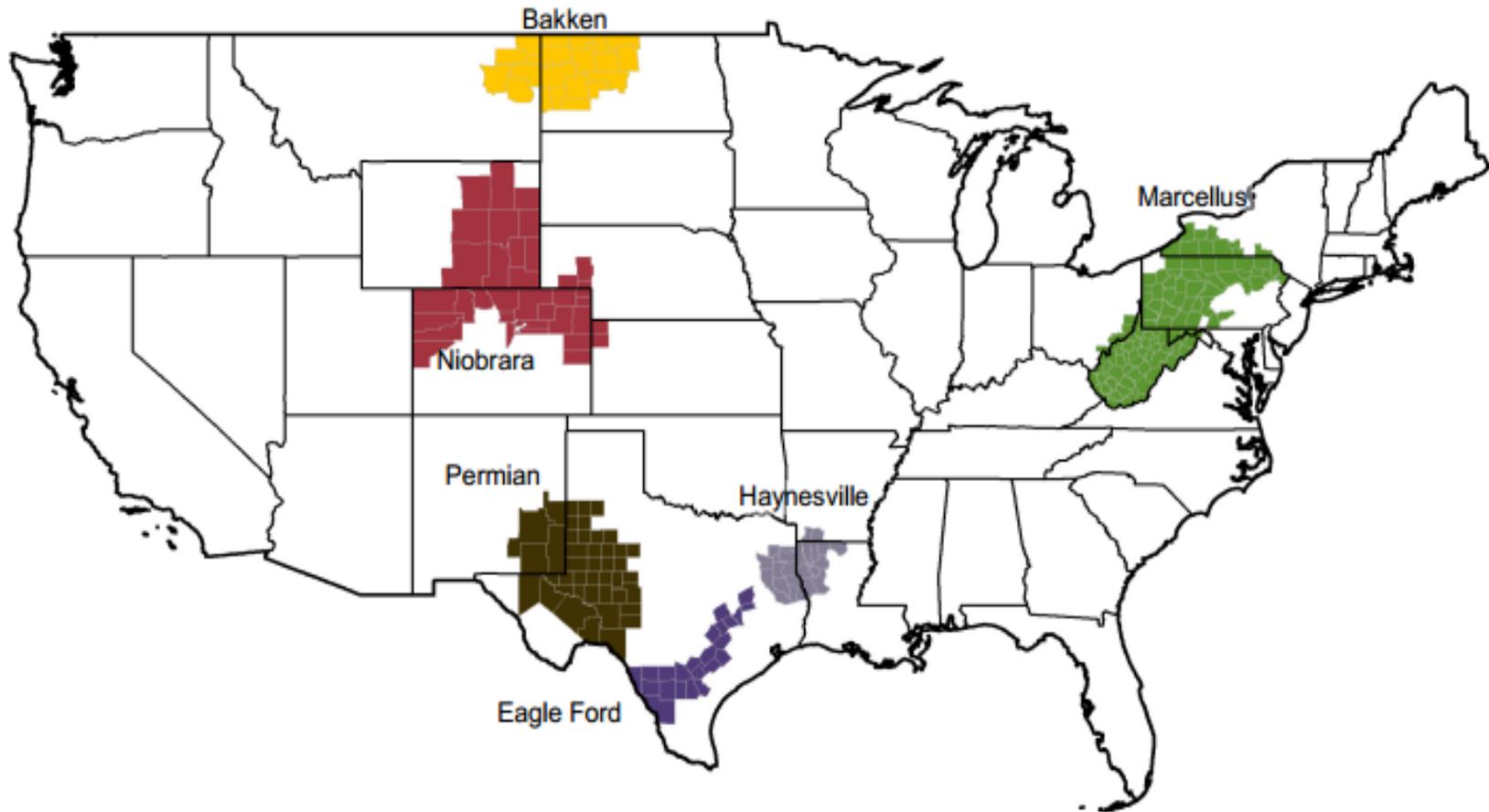
renewable fuel standard credits
billions ethanol-equivalent gallons



Sources: EIA, Annual Energy Outlook 2013

Domestic resource dynamics

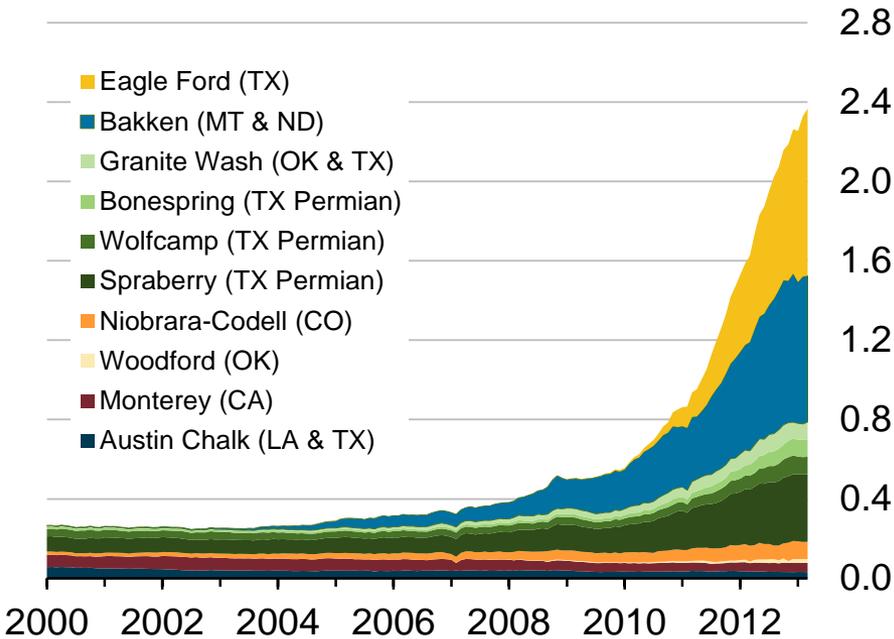
Six key plays account for nearly all recent growth in production



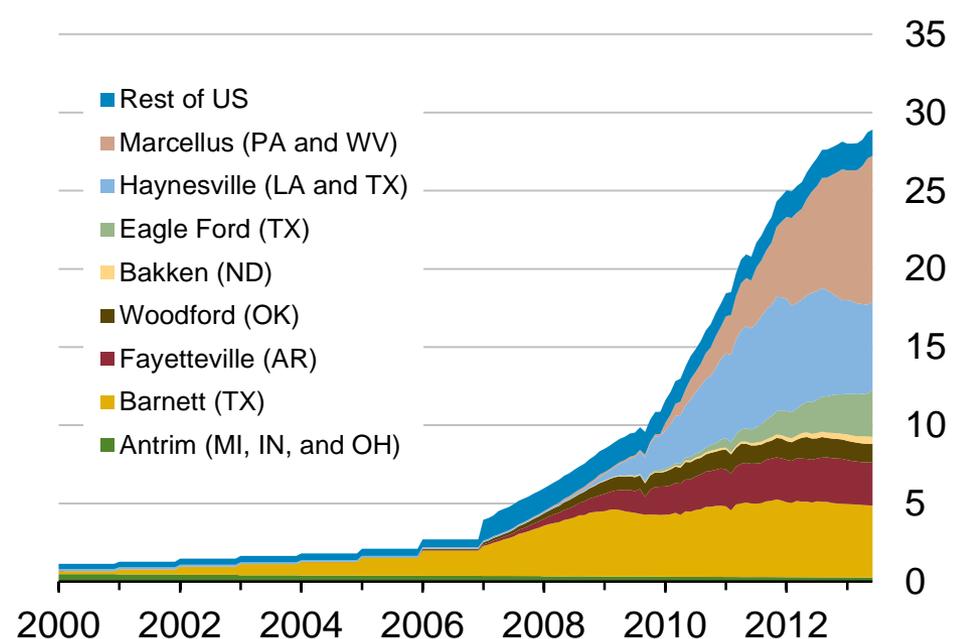
Source: EIA, *Drilling Productivity Report*

The U.S. has experienced a rapid increase in natural gas and oil production from shale and other tight resources

U.S. shale and tight oil production
million barrels per day



U.S. dry shale gas production
billion cubic feet per day

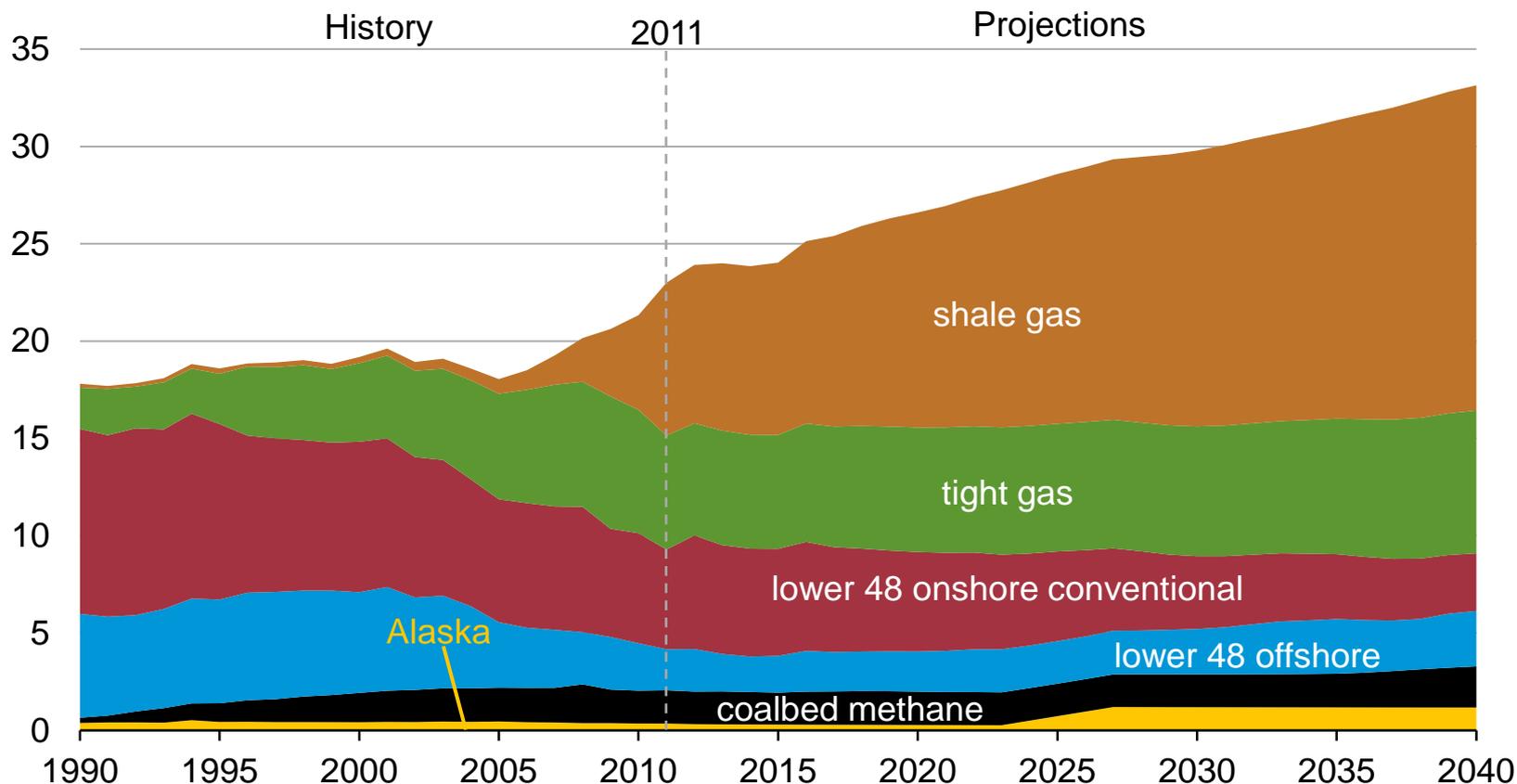


Note: Dry shale gas production data are based on LCI Energy Insight gross withdrawal estimates as of June 2013, converted to dry production estimates with EIA-calculated average gross-to-dry shrinkage factors by state and/or shale play.

Source: EIA based on DrillingInfo and LCI Energy Insight

Natural gas production in the United States has dramatically increased from shale and tight sources

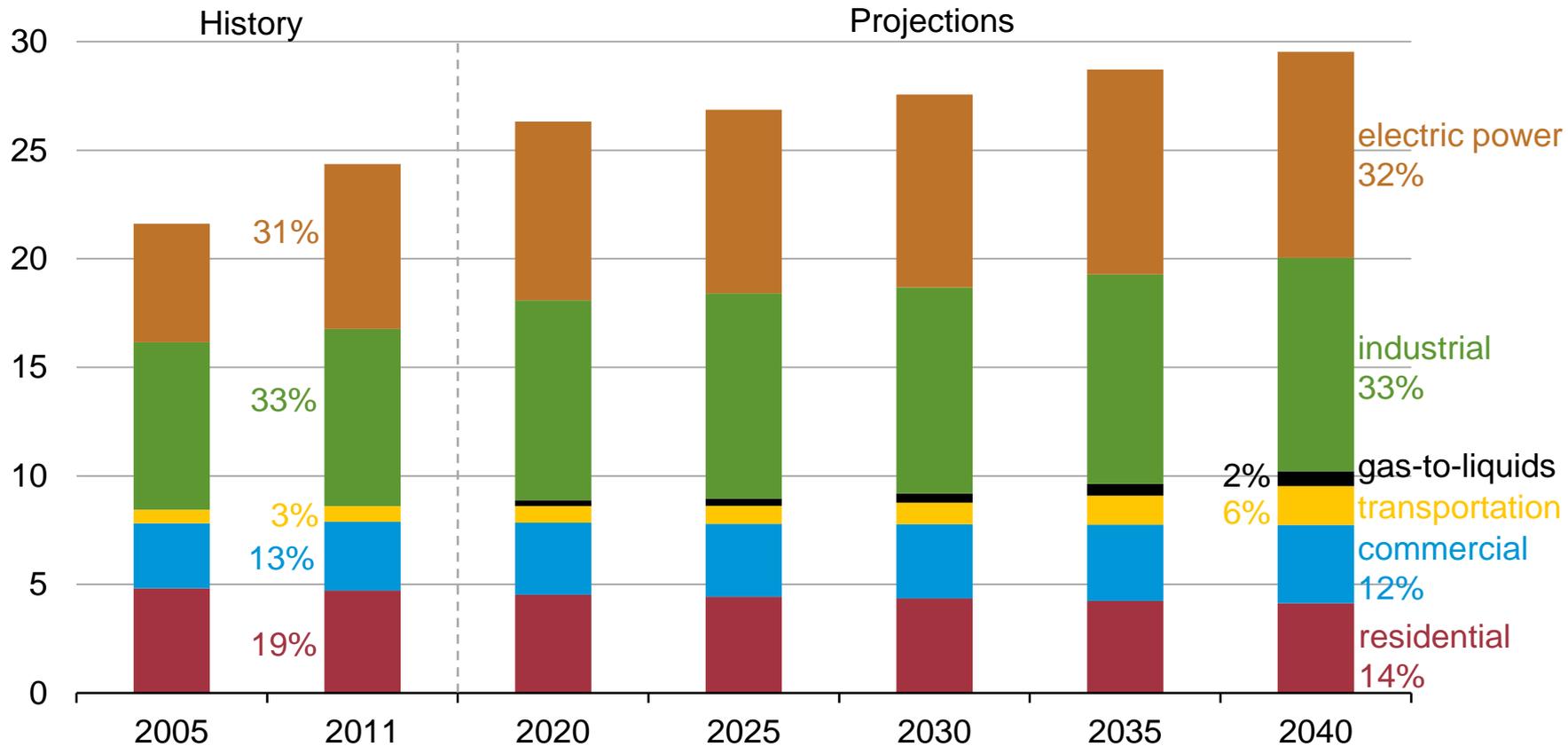
U.S. natural gas production
trillion cubic feet



Source: EIA, Annual Energy Outlook 2013

Largest increase in share of natural gas consumption occur in the transportation sector

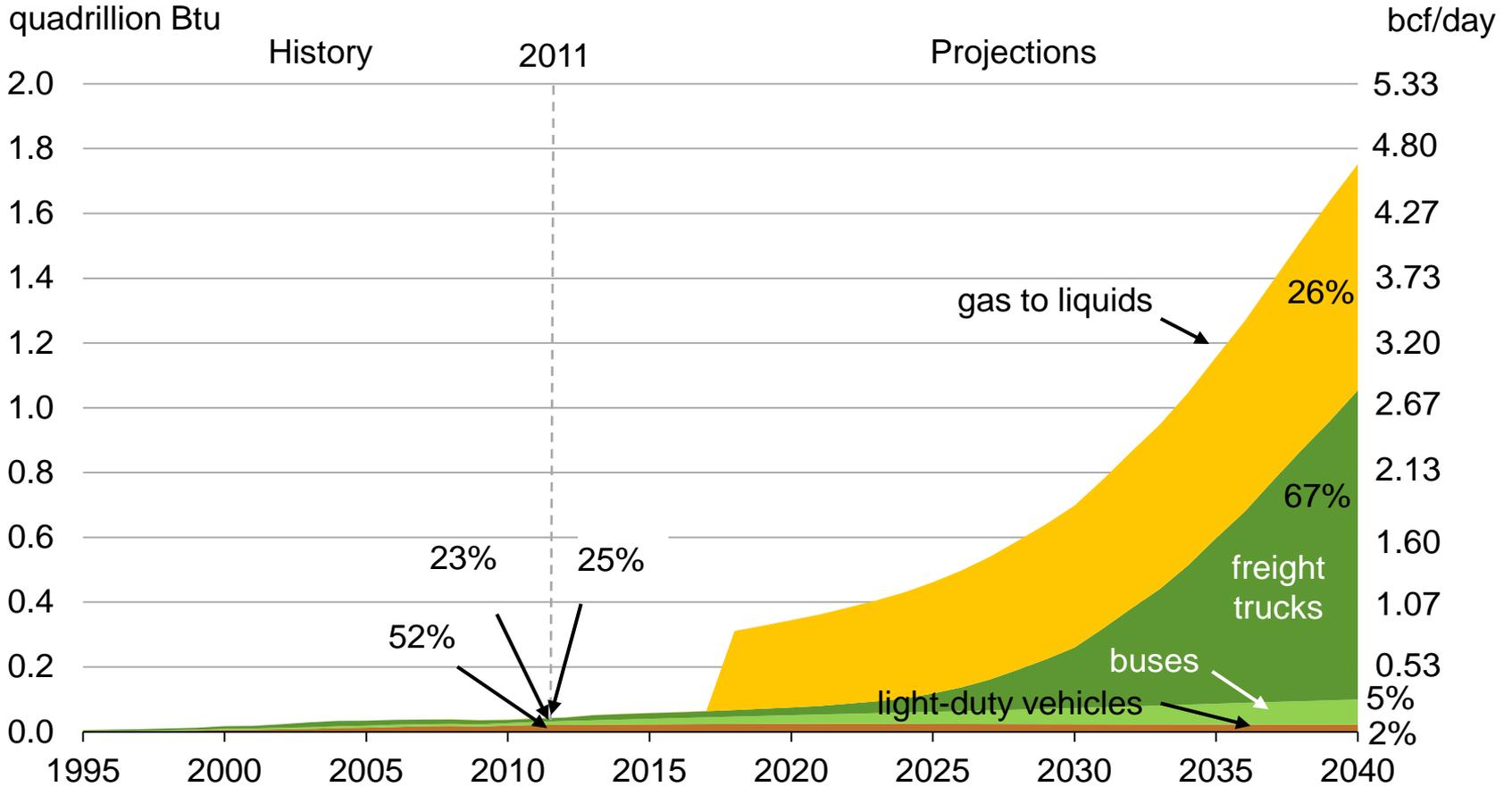
U.S. dry natural gas consumption
trillion cubic feet



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

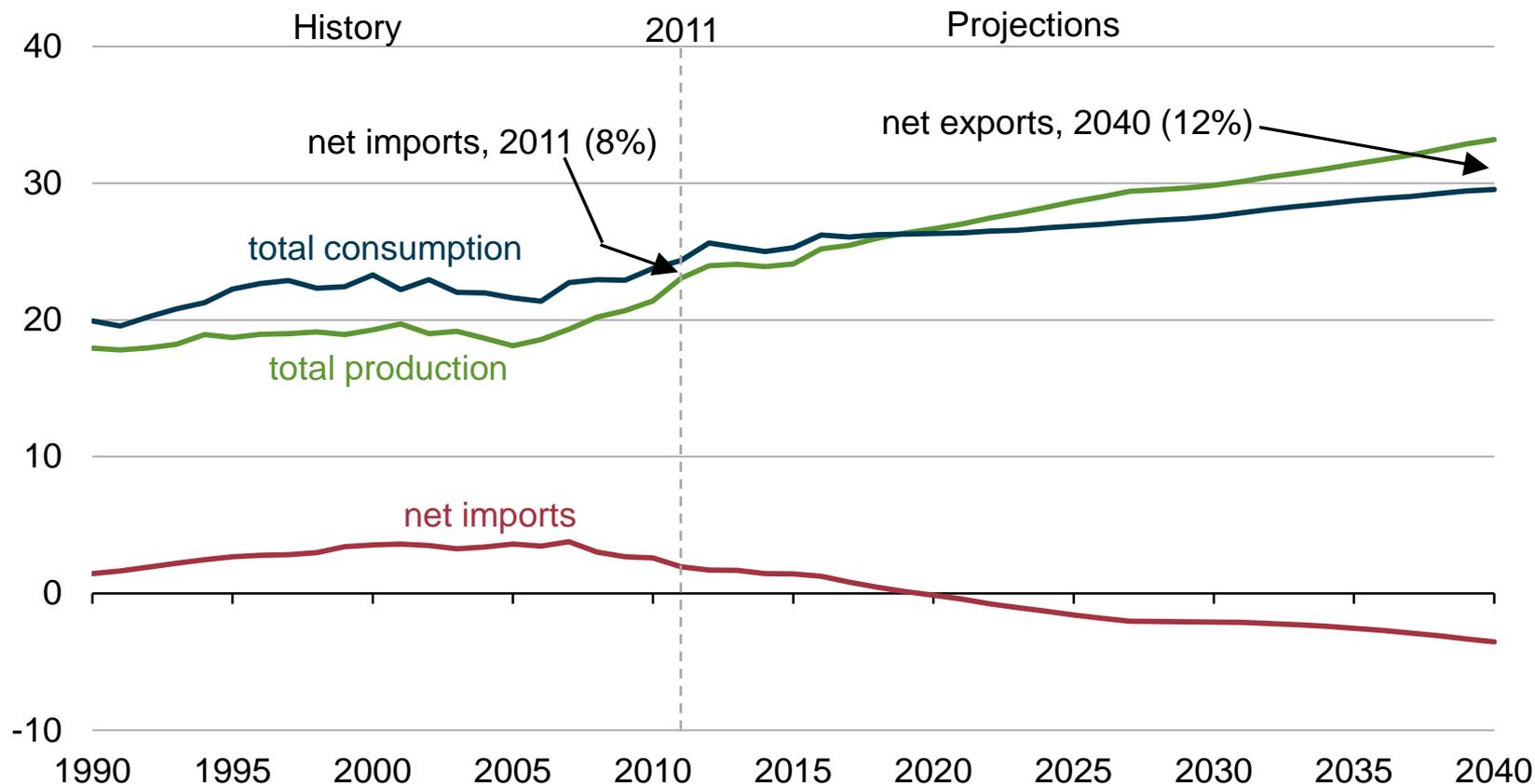


Note: gas to liquids includes heat, power, and losses

Source: EIA, Annual Energy Outlook 2013

Total U.S. natural gas production, consumption, and net imports in the Reference case

U.S. natural gas supply and consumption
trillion cubic feet

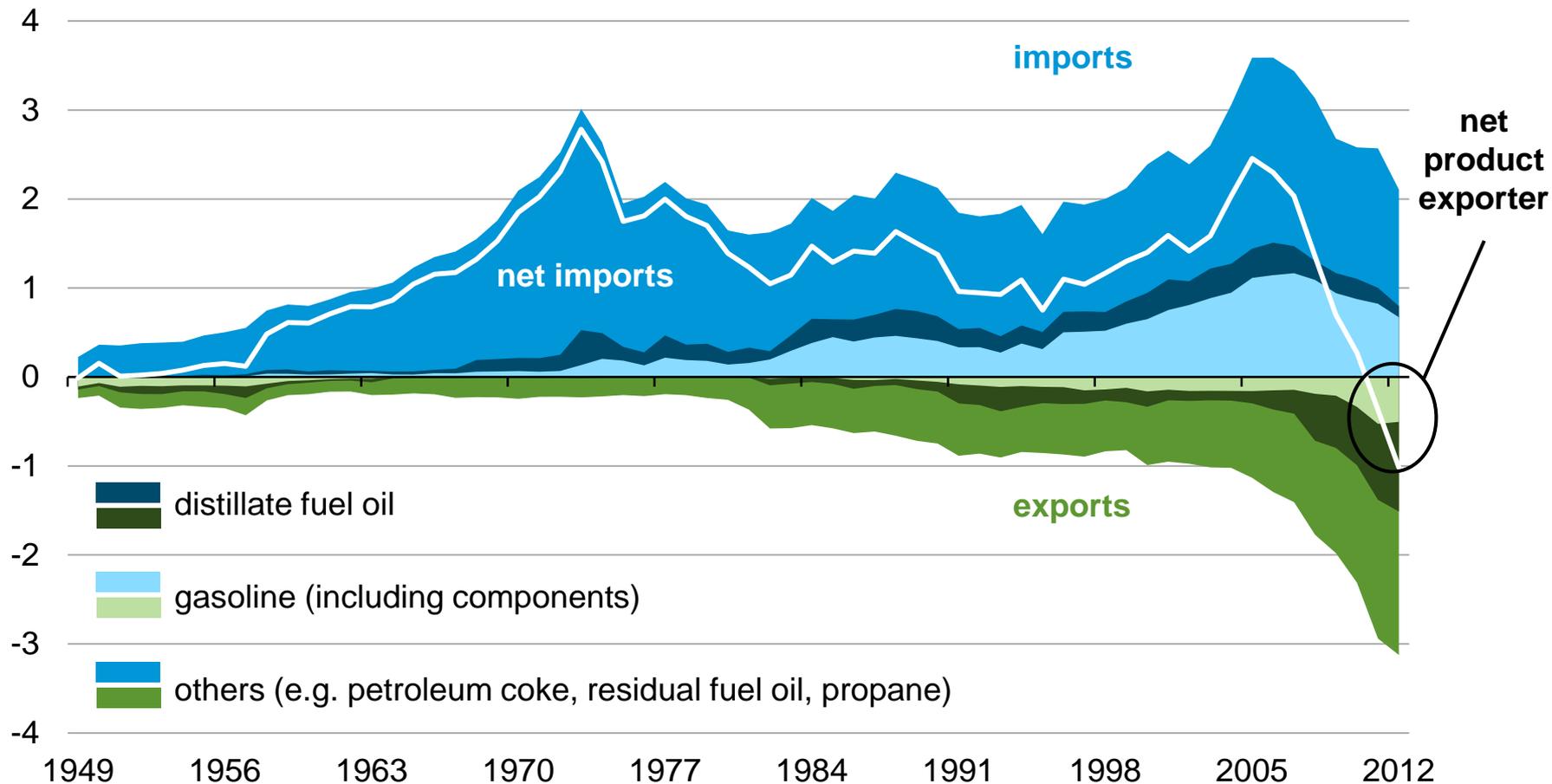


Source: EIA, Annual Energy Outlook 2013

Domestic crude availability and low natural gas prices have supported product exports

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

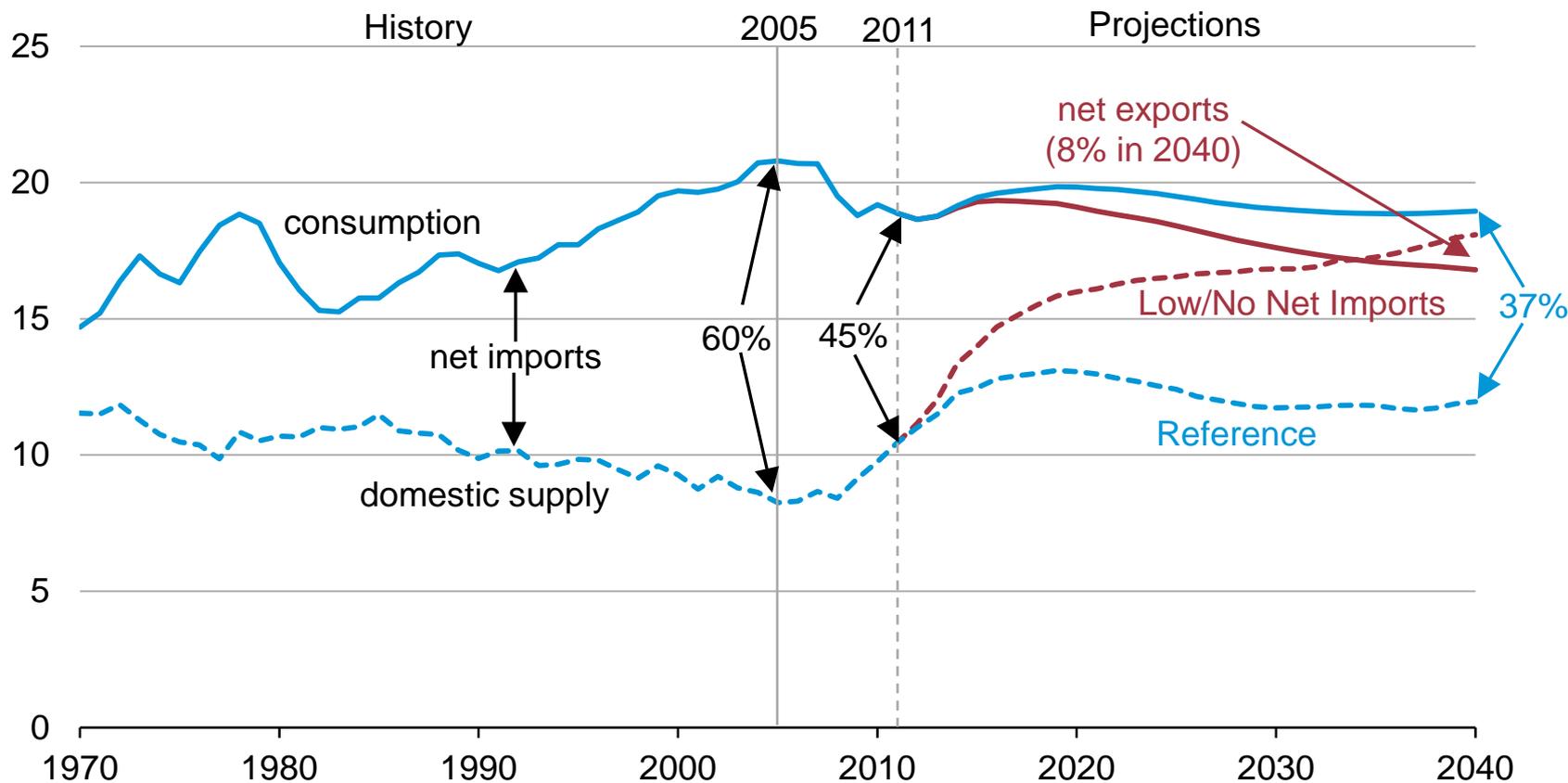
million barrels per day



Source: EIA, Petroleum Supply Monthly and Annual Energy Review

United States becomes net exporter of liquids under high resource and decreased demand scenario

U.S. net import share of supply
million barrels per day

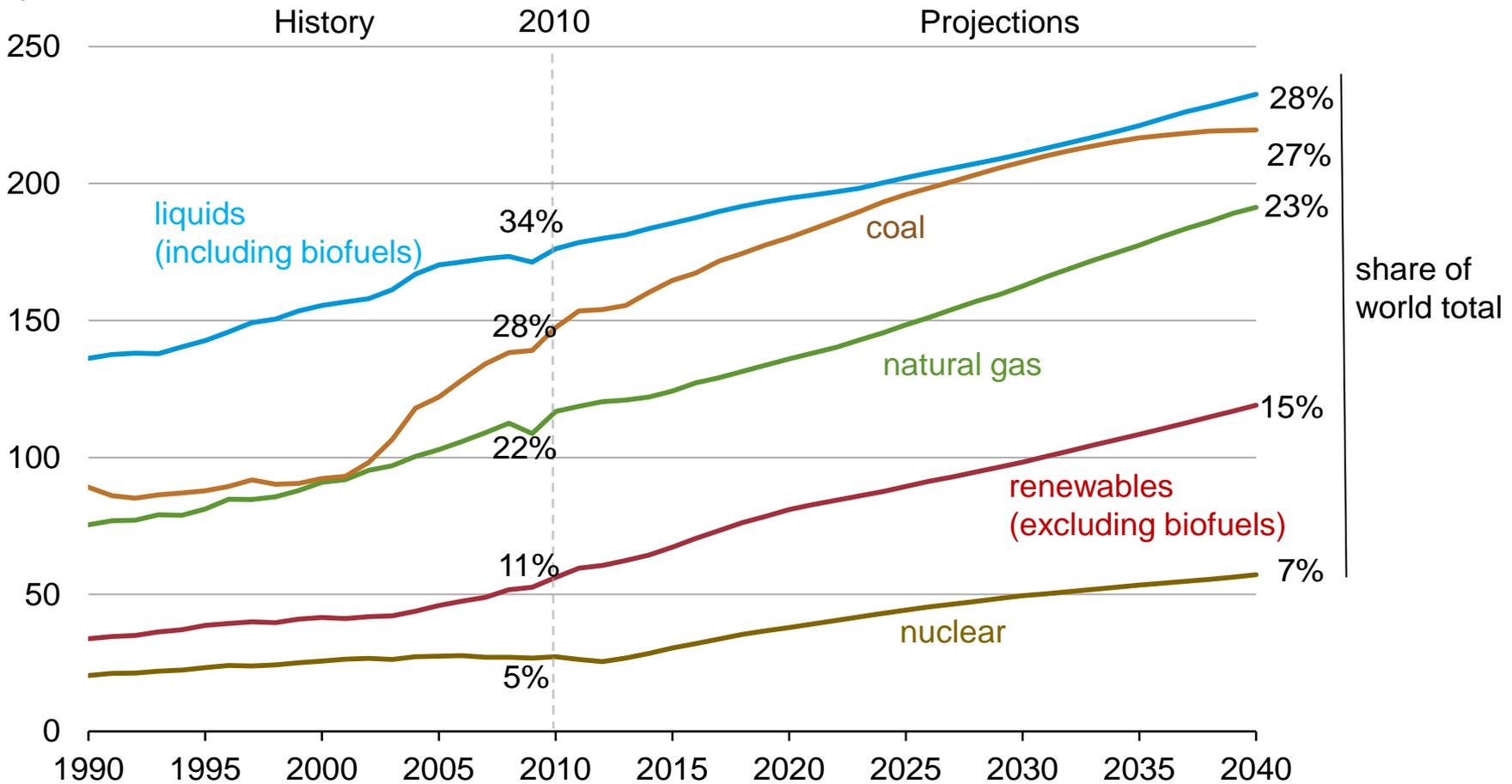


Source: EIA, Annual Energy Outlook 2013

Global issues

Renewable energy and nuclear power are the fastest growing source of world energy consumption out to 2040

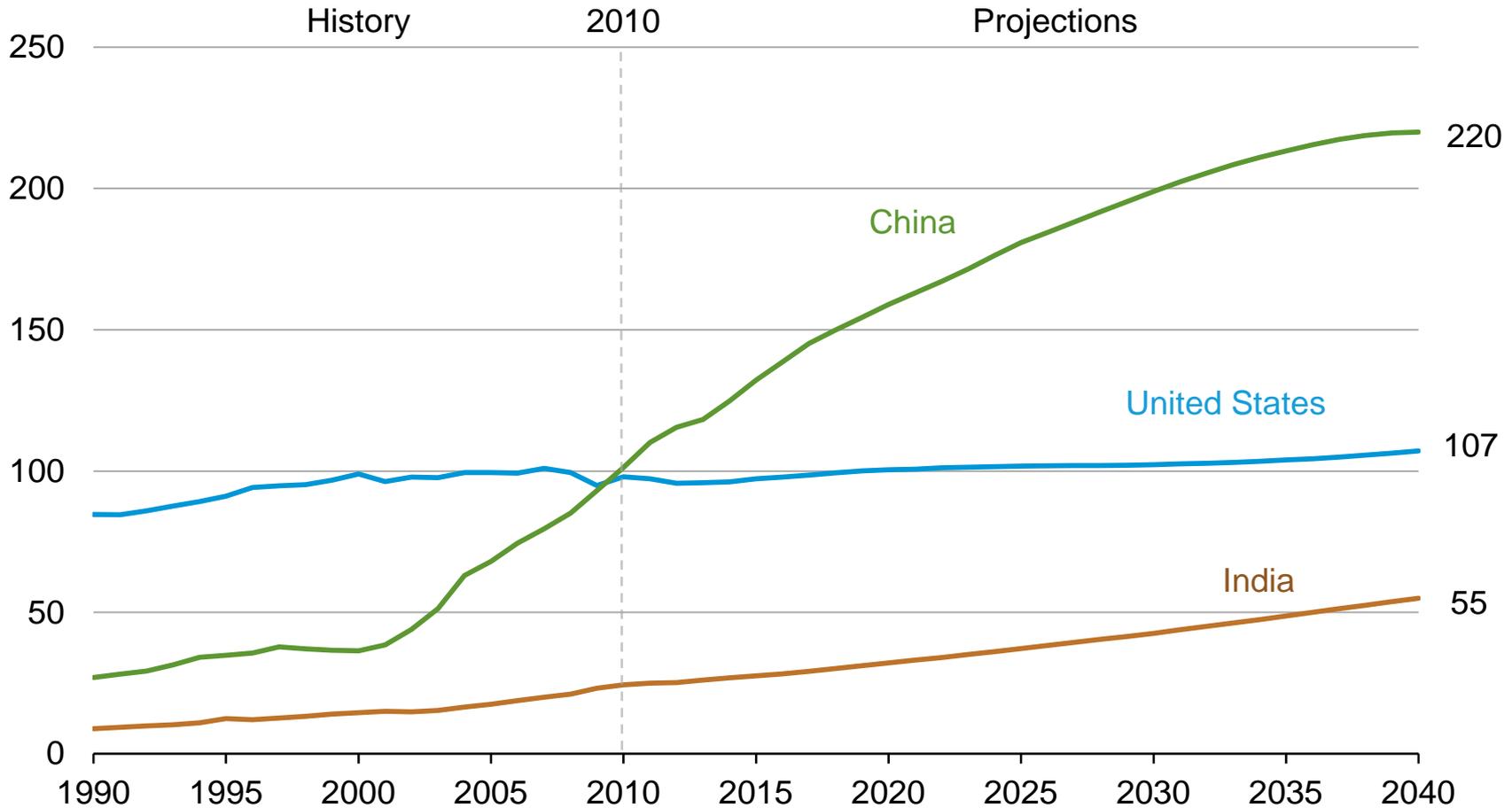
world energy consumption by fuel
quadrillion Btu



Source: EIA, International Energy Outlook 2013

By 2040, China's energy use will be double the U.S. level; India's a little more than half despite its faster GDP growth

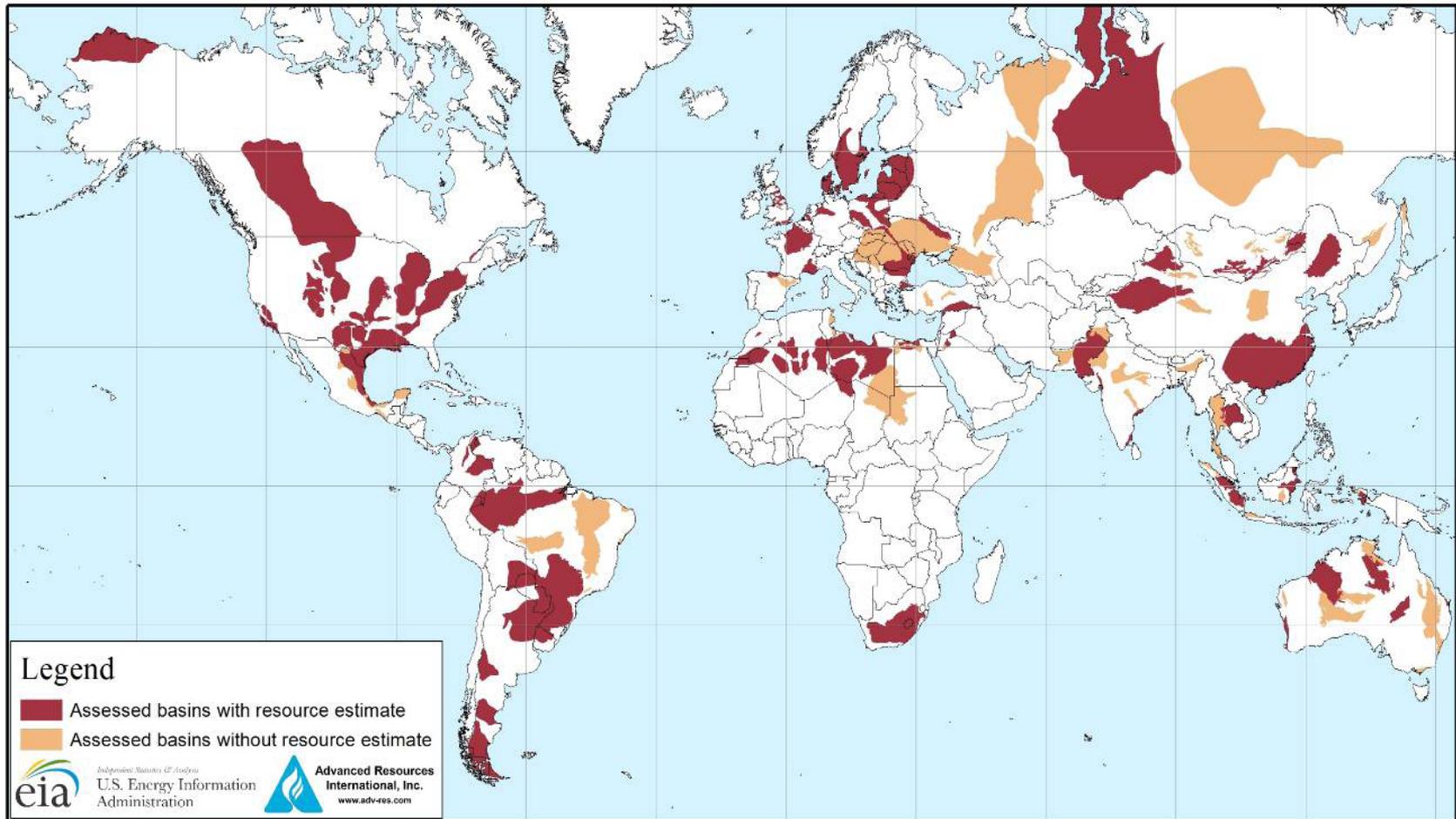
energy consumption by selected country
quadrillion Btu



Source: EIA, International Energy Outlook 2013

Shale oil and gas have the potential to dramatically alter world energy markets

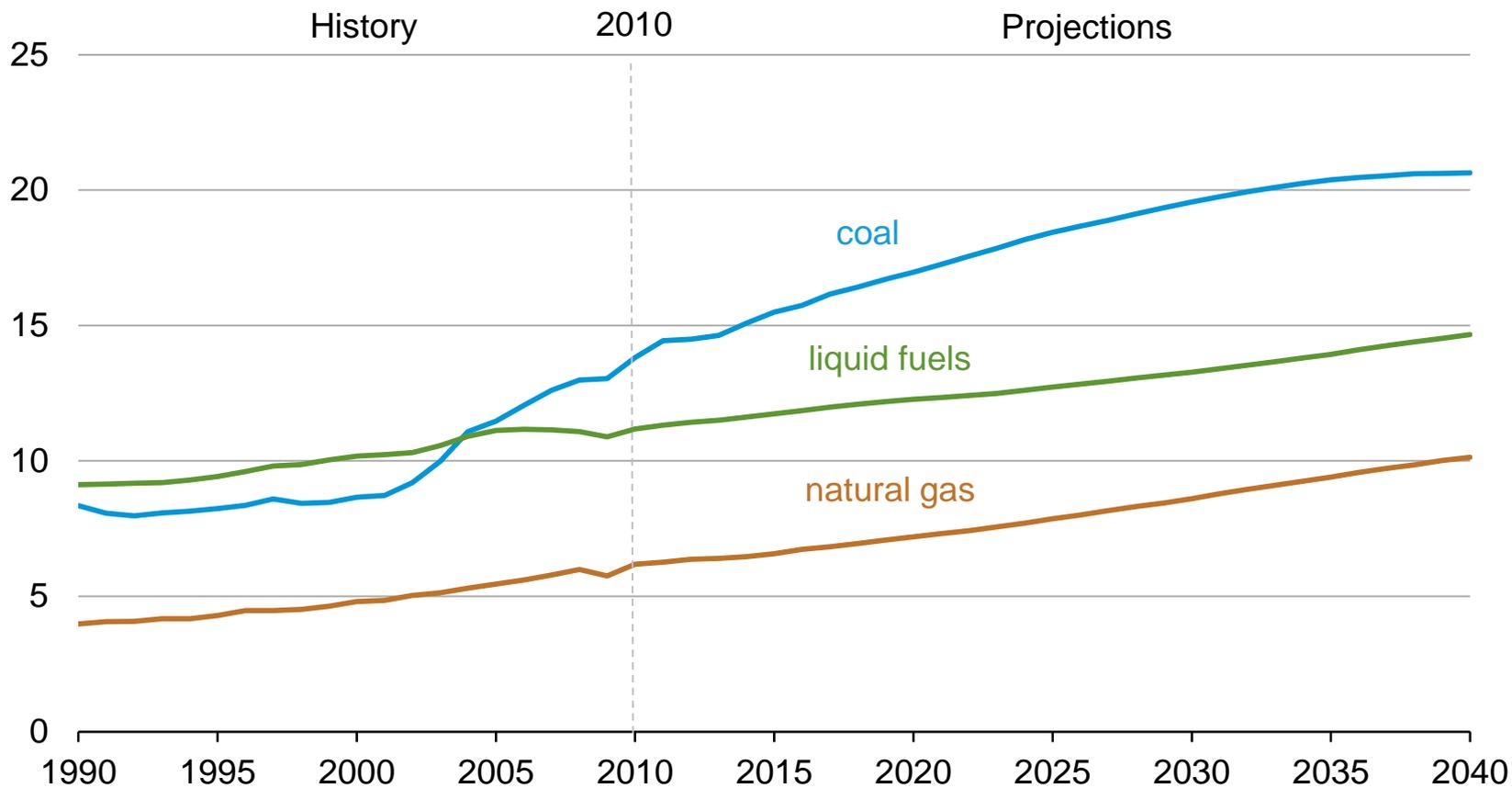
map of basins with assessed shale oil and gas formations
May 2013



Source: United States: EIA and USGS; Other basins: ARI

World energy-related carbon dioxide emissions by fuel type

world carbon dioxide emissions
billion metric tons



Source: EIA, International Energy Outlook 2013

For more information

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

Annual Energy Outlook | www.eia.gov/aeo

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

International Energy Outlook | www.eia.gov/ieo

Monthly Energy Review | www.eia.gov/mer

Today in Energy | www.eia.gov/todayinenergy

State Energy Profiles | <http://www.eia.gov/state>

Drilling Productivity Report | <http://www.eia.gov/petroleum/drilling/>