Annual Energy Outlook 2013
Early Release Reference Case

AEO2013 Early Release Rollout Presentation
Paul H. Nitze School of Advanced International Studies
Johns Hopkins University
December 5, 2012 | Washington, D.C.

by
Adam Sieminski, Administrator

Key results from the *AEO2013* Reference case:

- Growth in energy production outstrips consumption growth
- Crude oil production, particularly from tight oil plays, rises sharply over the next decade
- Natural gas production is higher throughout the Reference case projection than it was in *AEO2012*, serving the industrial and power sectors and an expanding export market
- Motor gasoline consumption reflects the introduction of more stringent fuel economy standards, while diesel fuel consumption is moderated by increased natural gas use in heavy-duty vehicles
- The U.S. becomes a larger exporter of natural gas and coal than was projected in the *AEO2012* Reference case
- All renewable fuels grow, but biomass and biofuels growth is slower than in *AEO2012*
- U.S. energy-related carbon dioxide emissions remain more than five percent below their 2005 level through 2040, reflecting increased efficiency and the shift to a less carbon-intensive fuel mix

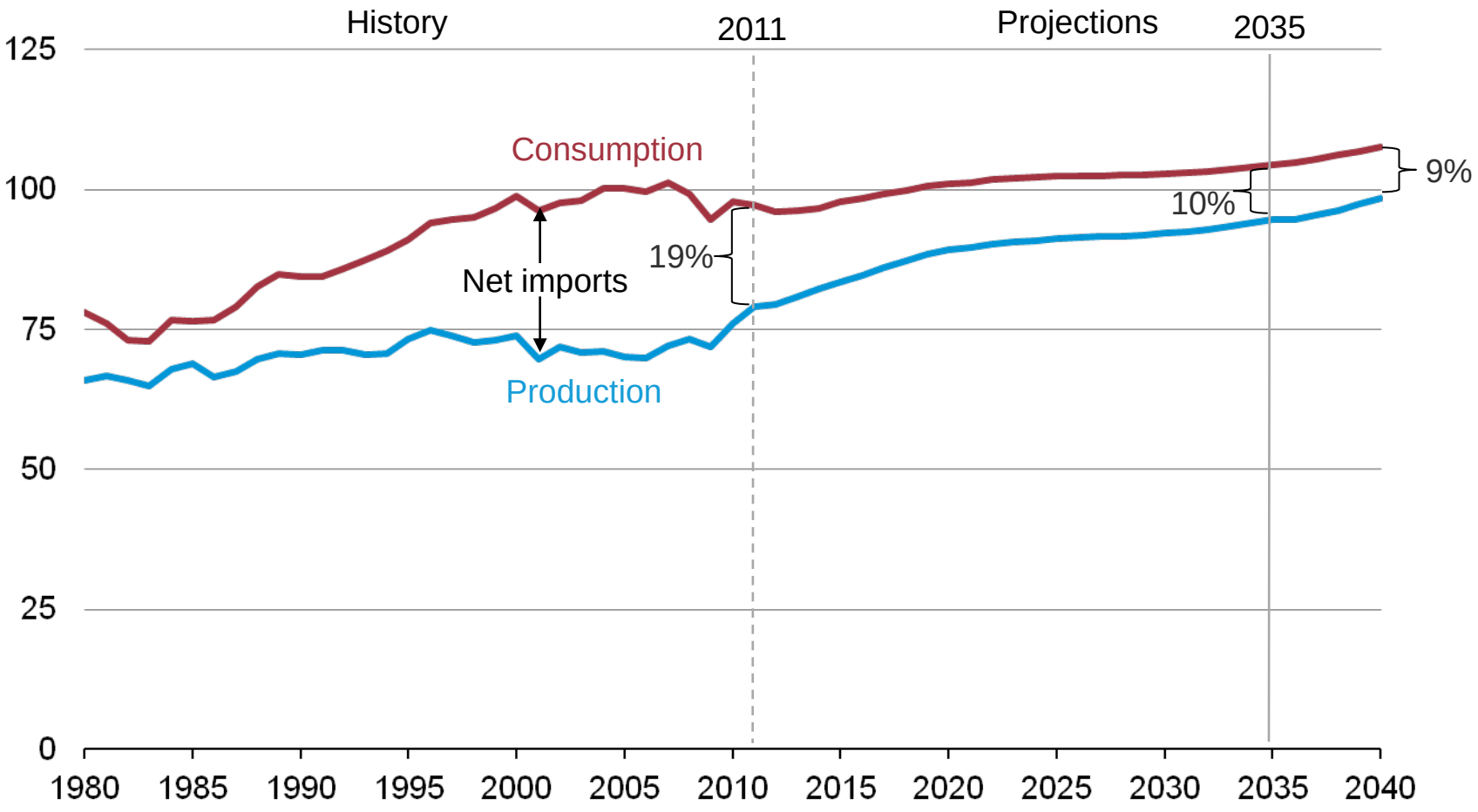
What is included (and excluded) in developing EIA's "Reference case" projections?

- Generally assumes current laws and regulations
  - excludes potential future laws and regulations (e.g., proposed greenhouse gas legislation is not included)
  - Sunset provisions as specified in law (e.g., renewable production tax credits expire at the end of 2012)
- Some grey regulatory areas
  - adds a premium to the cost of financing CO_2-intensive technologies to reflect current market behavior regarding possible future policies to mitigate greenhouse gas emissions
  - assumes implementation of existing regulations that enable the building of new energy infrastructure and resource extraction
- Includes technologies that are commercial or reasonably expected to become commercial over next decade or so
  - includes projected technology cost and efficiency improvements, as well as cost reductions linked to cumulative deployment levels
  - does not assume revolutionary or breakthrough technologies

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

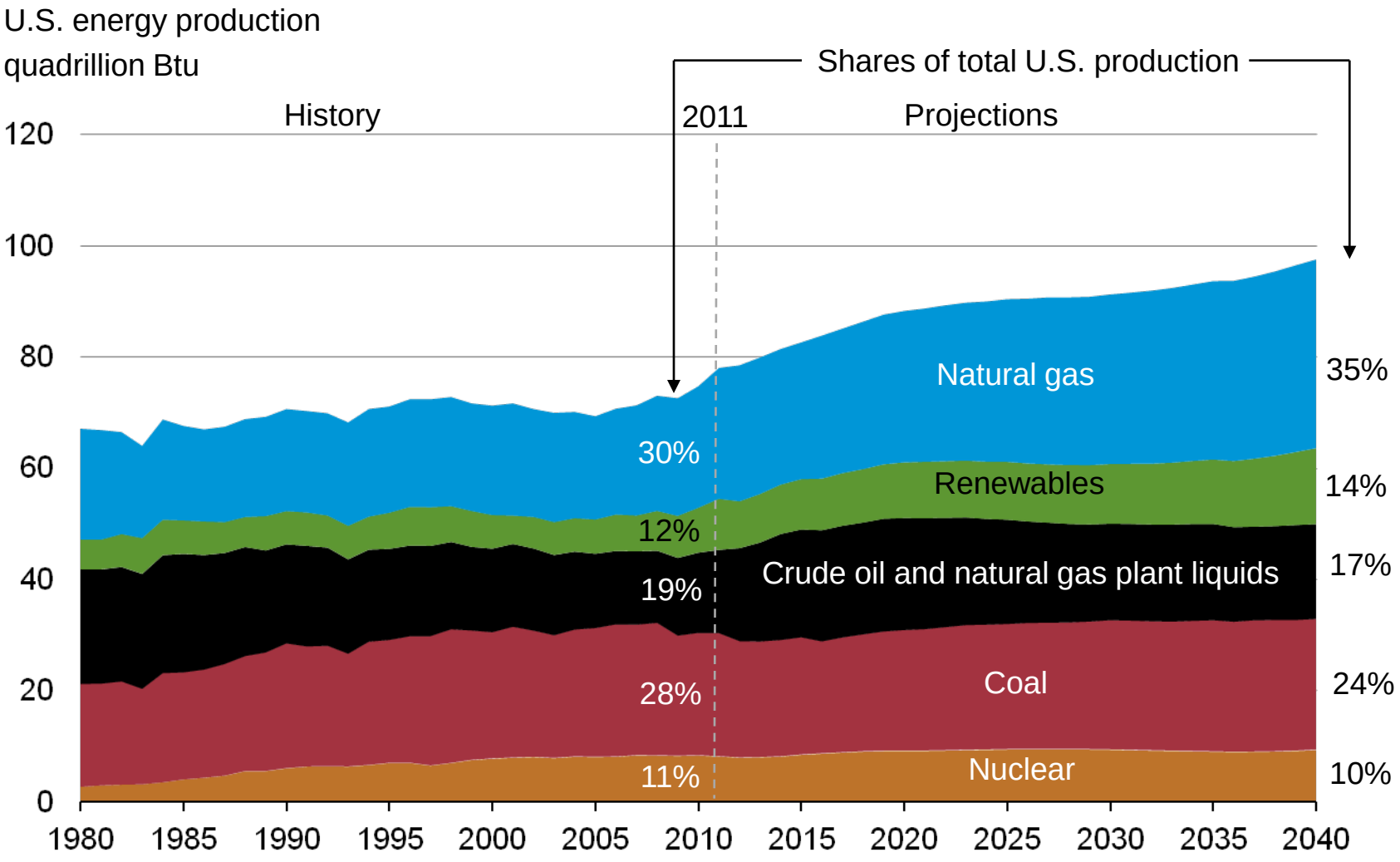
U.S. energy production and consumption

quadrillion Btu



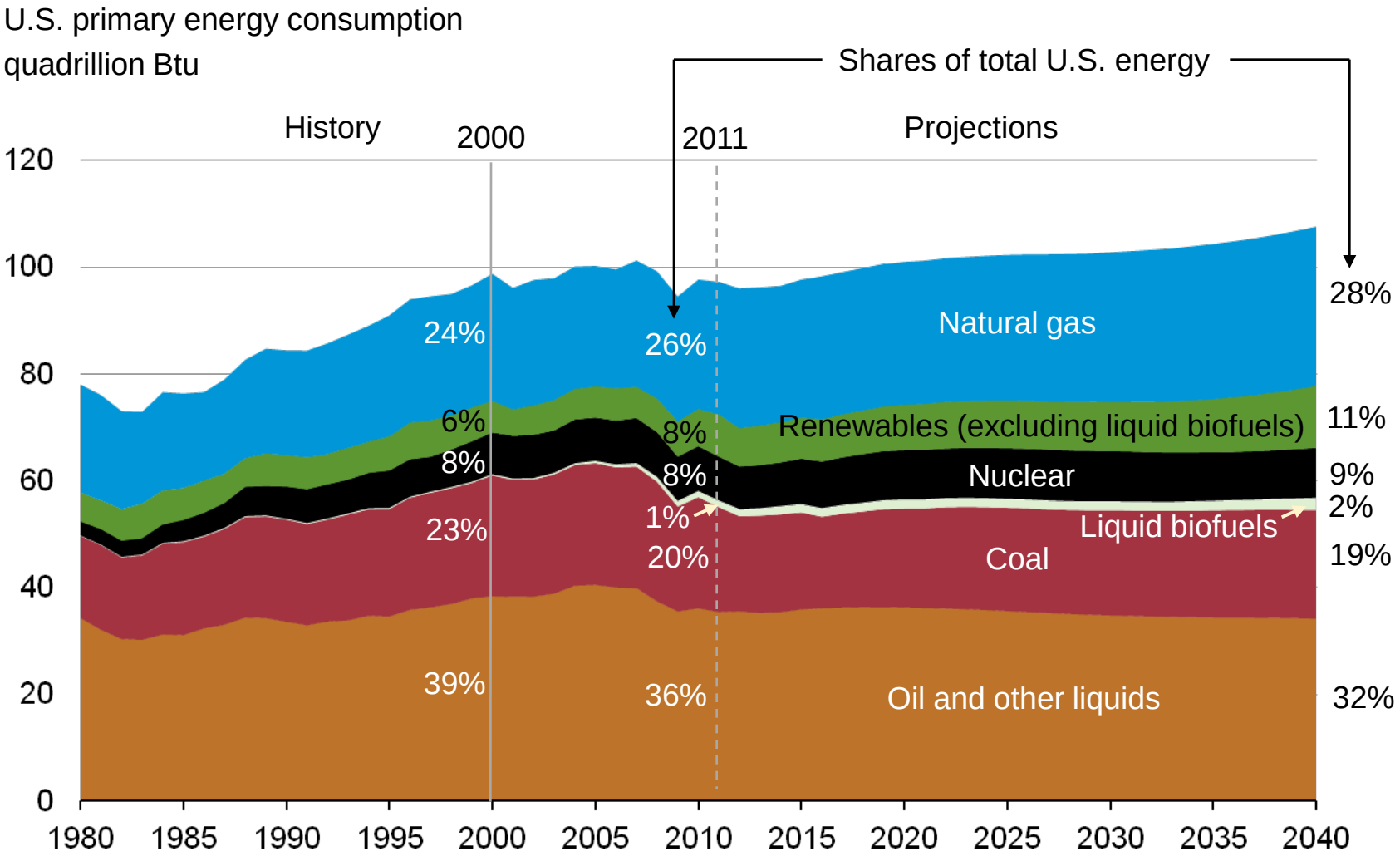
Source: EIA, Annual Energy Outlook 2013 Early Release

Domestic production grows rapidly over projection period, particularly natural gas and renewables, and liquids in the near term



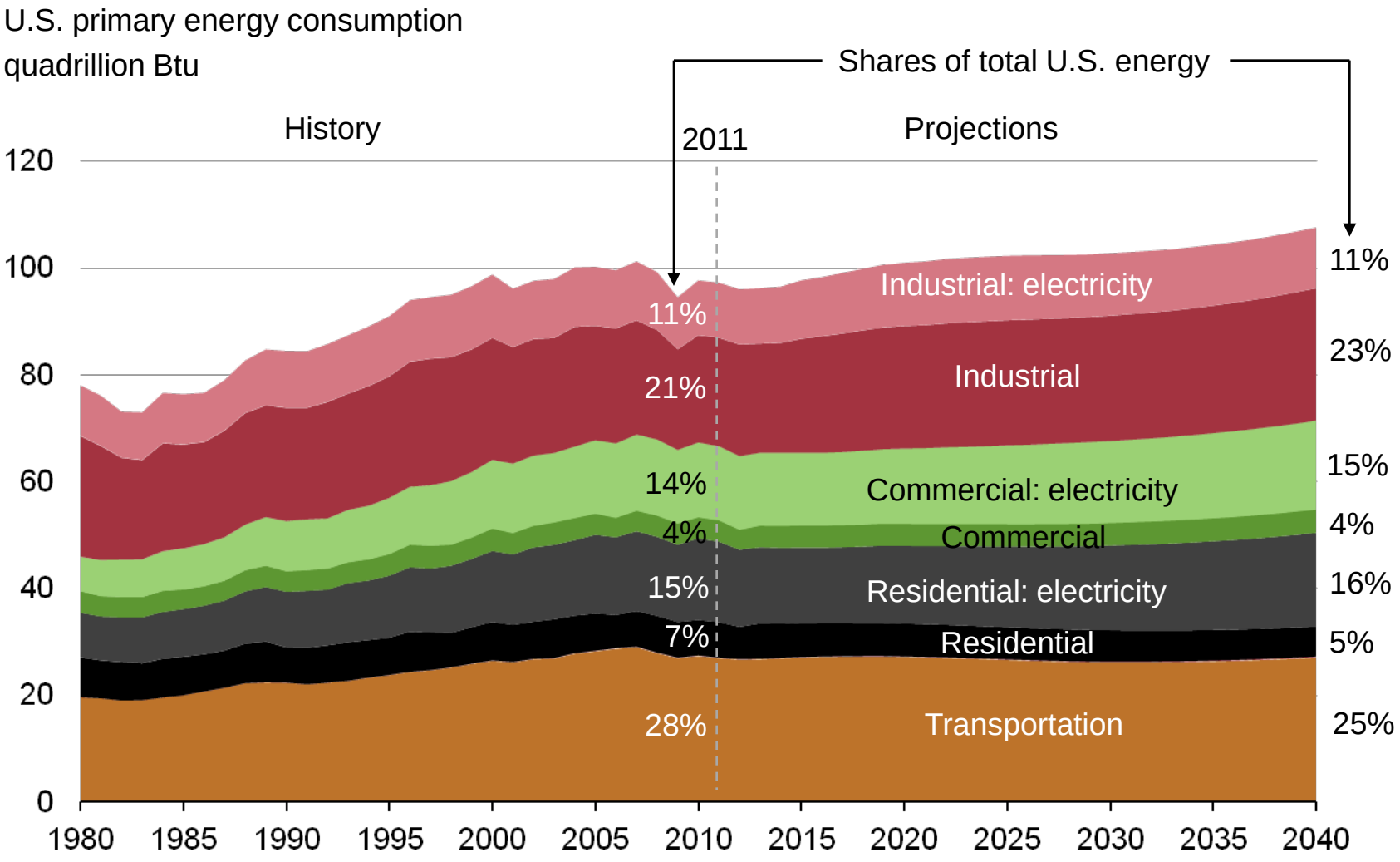
Source: EIA, Annual Energy Outlook 2013 Early Release

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



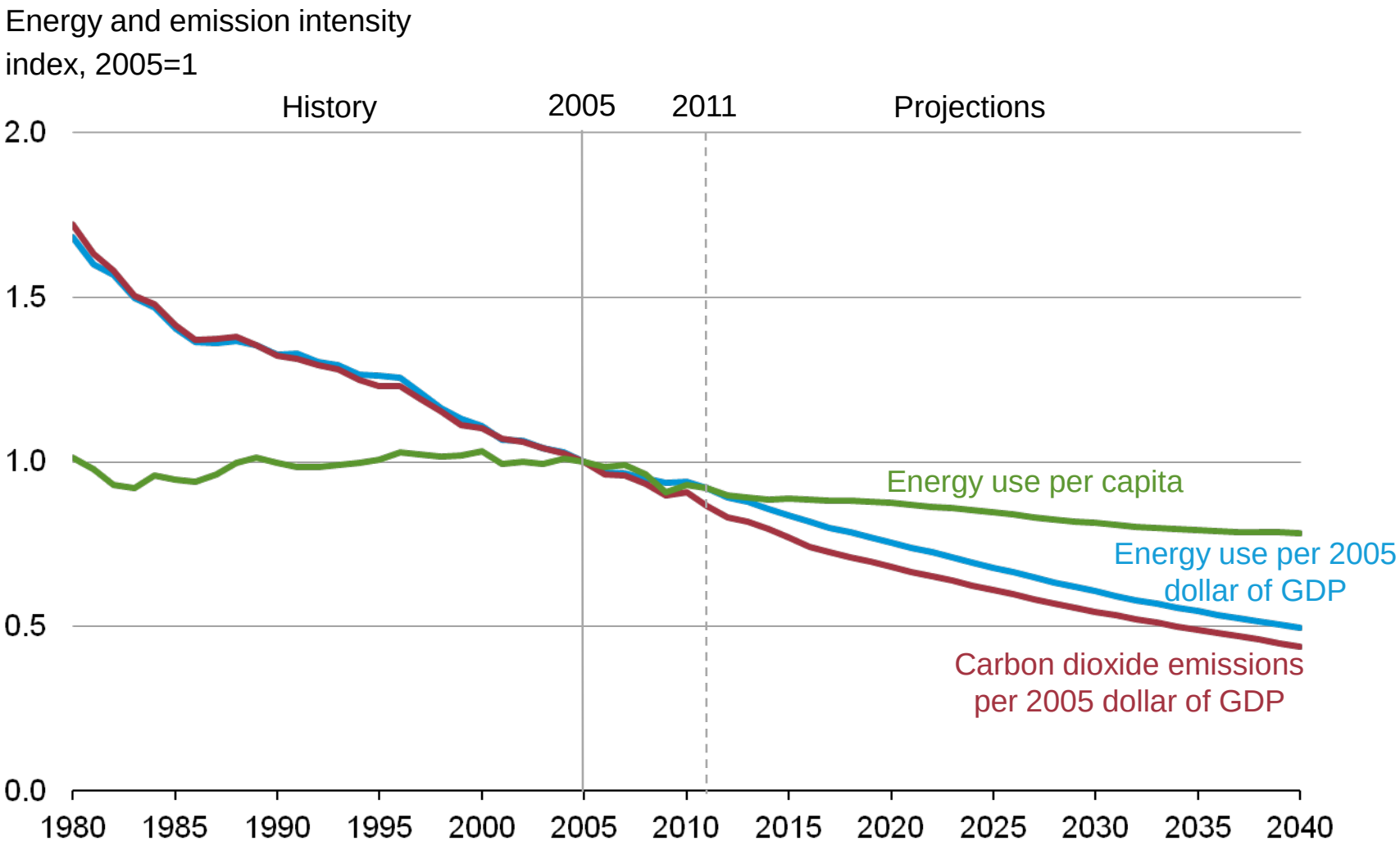
Source: EIA, Annual Energy Outlook 2013 Early Release

U.S. energy use is slowed by rising energy prices and the adoption of new efficiency standards for vehicles



Source: EIA, Annual Energy Outlook 2013 Early Release

Energy and CO_2 per dollar of GDP continue to decline; per-capita energy use also declines

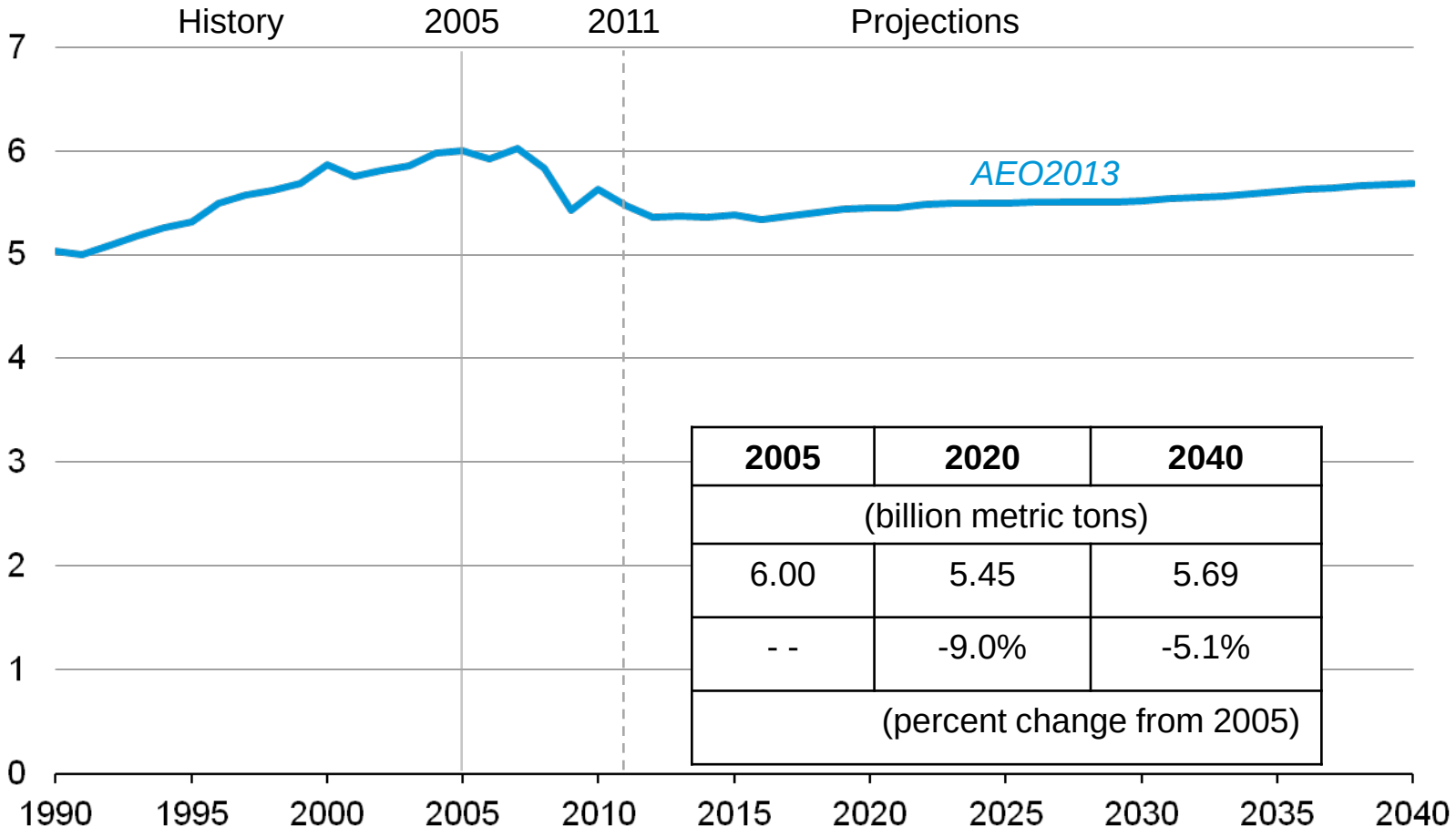


Source: EIA, Annual Energy Outlook 2013 Early Release

In the *AEO2013* Reference case, energy-related CO_2 emissions never get back to their 2005 level

Carbon dioxide emissions

billion metric tons



2005	2020	2040
(billion metric tons)		
6.00	5.45	5.69
- -	-9.0%	-5.1%
(percent change from 2005)		

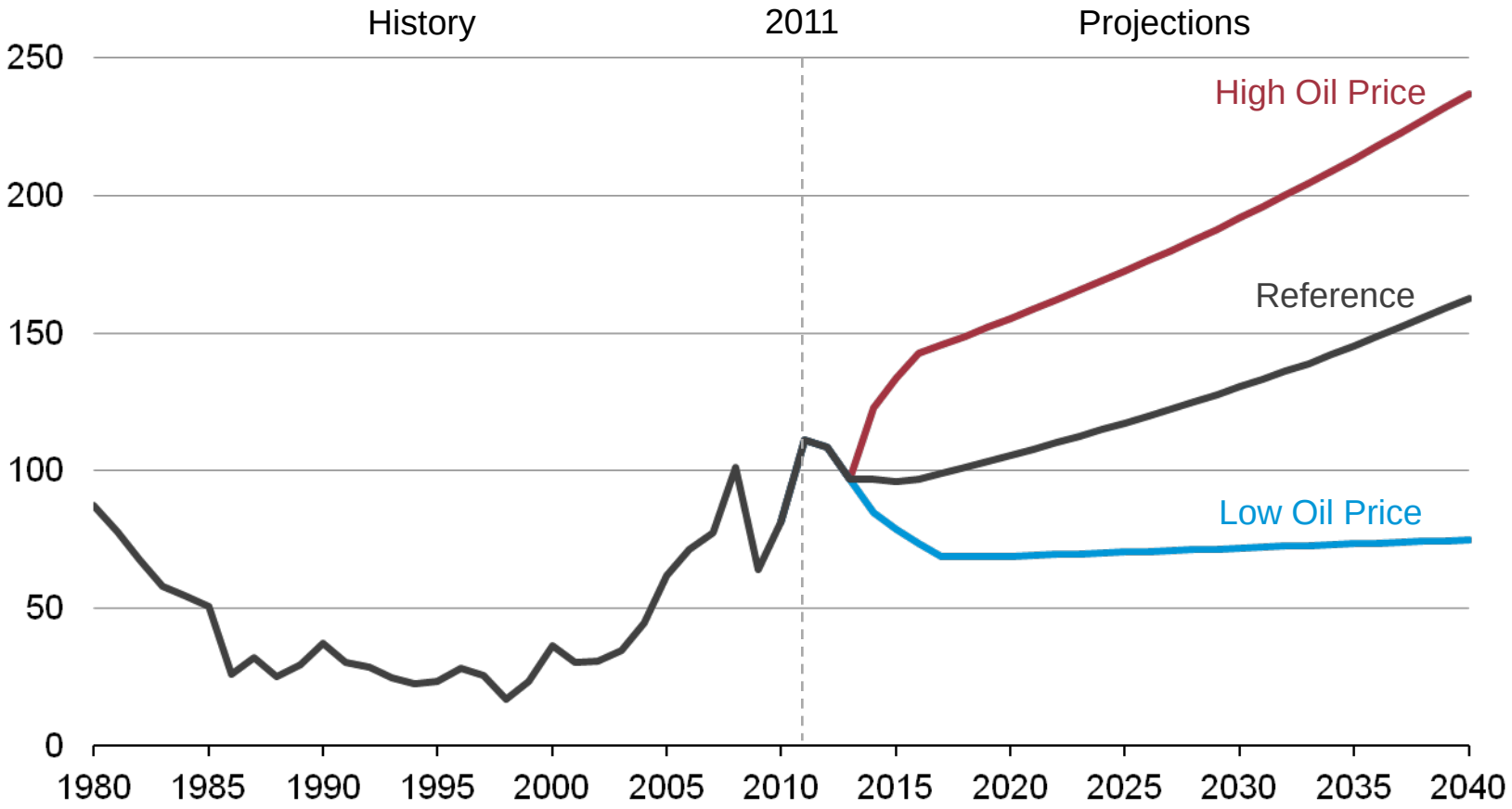
Source: EIA, Annual Energy Outlook 2013 Early Release

Petroleum and other liquid supply

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

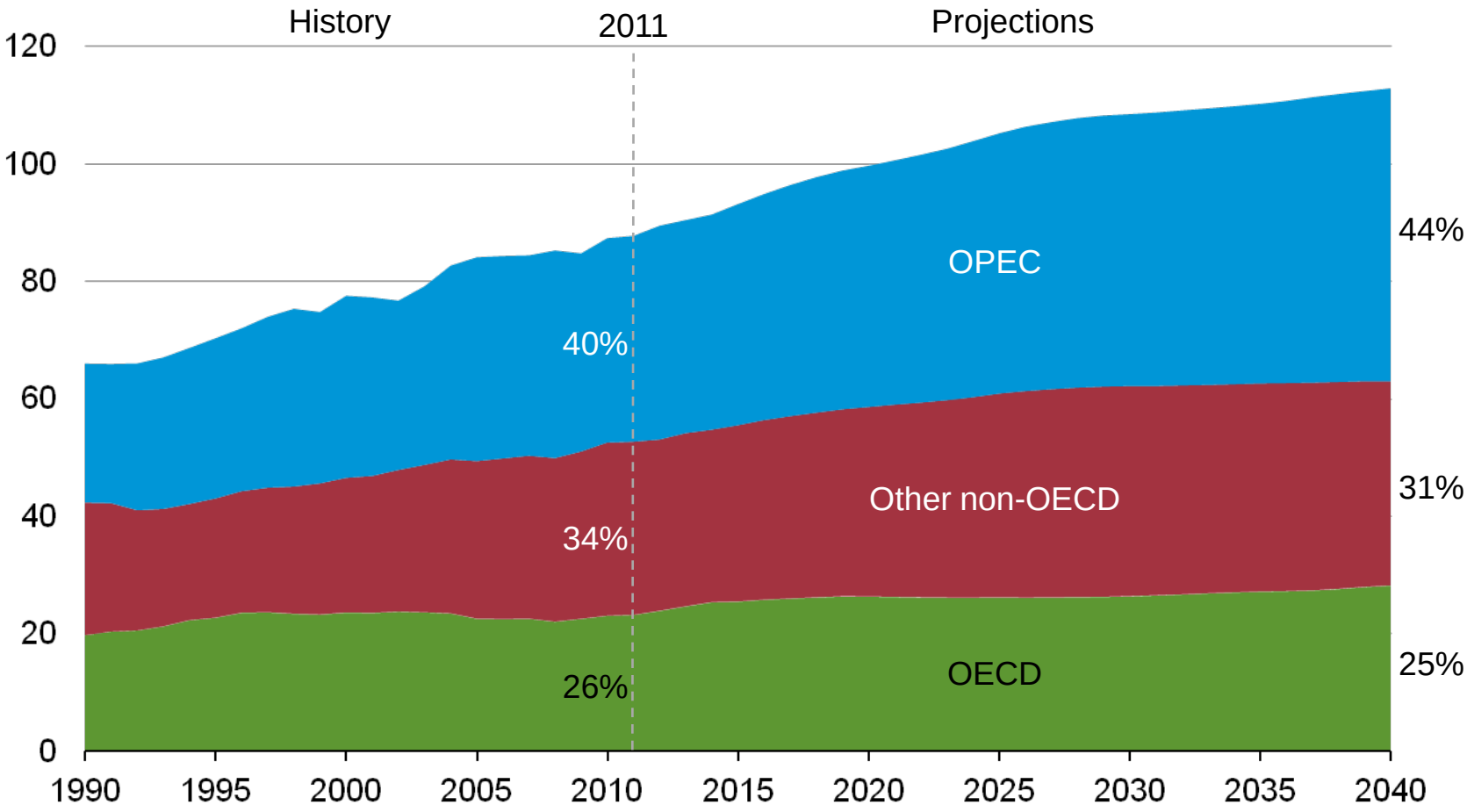
2011 dollars per barrel



Source: EIA, Annual Energy Outlook 2013 Early Release

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

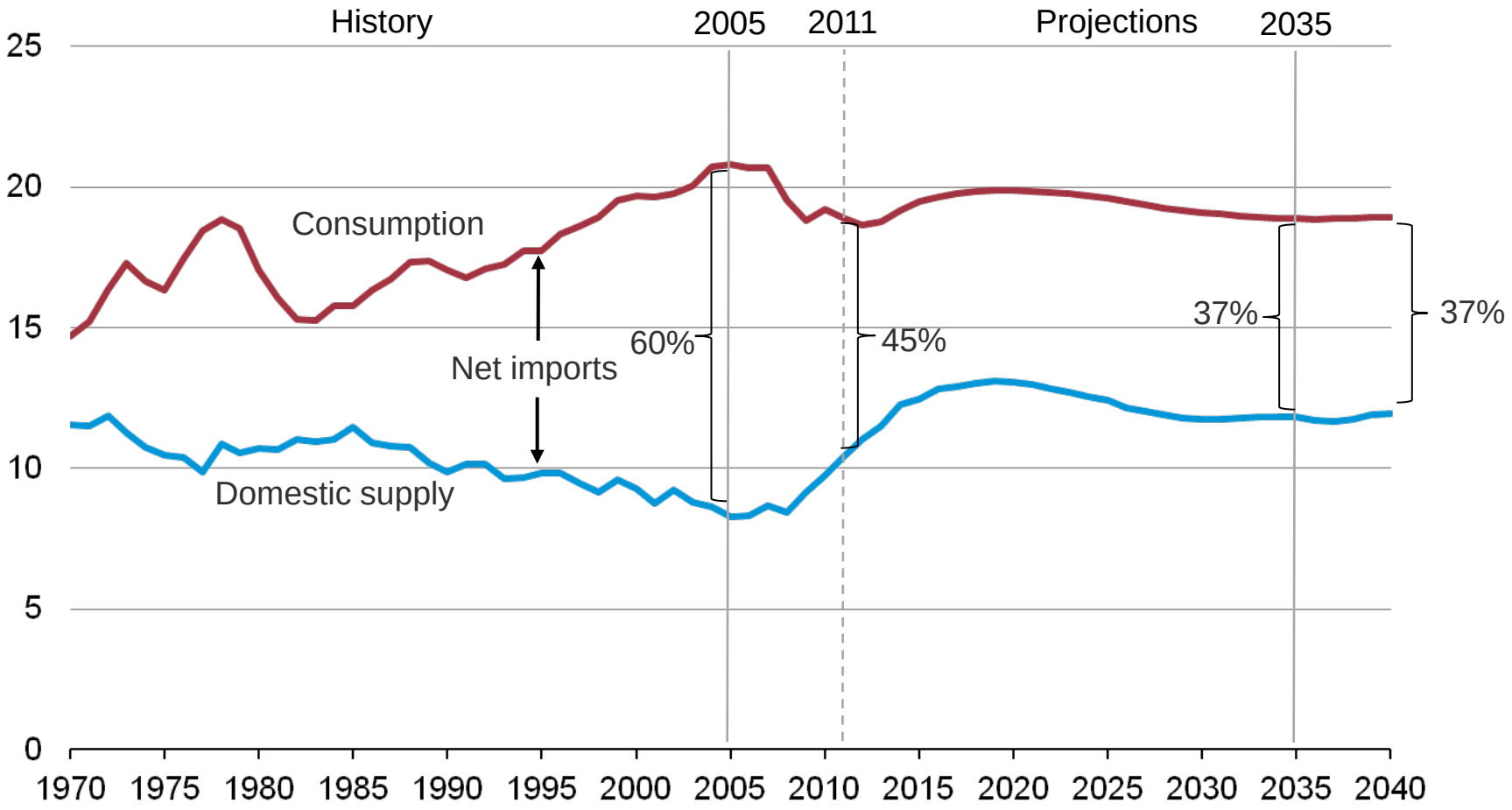
Global liquids supply
million barrels per day



Source: EIA, Annual Energy Outlook 2013 Early Release

U.S. dependence on imported liquids declines

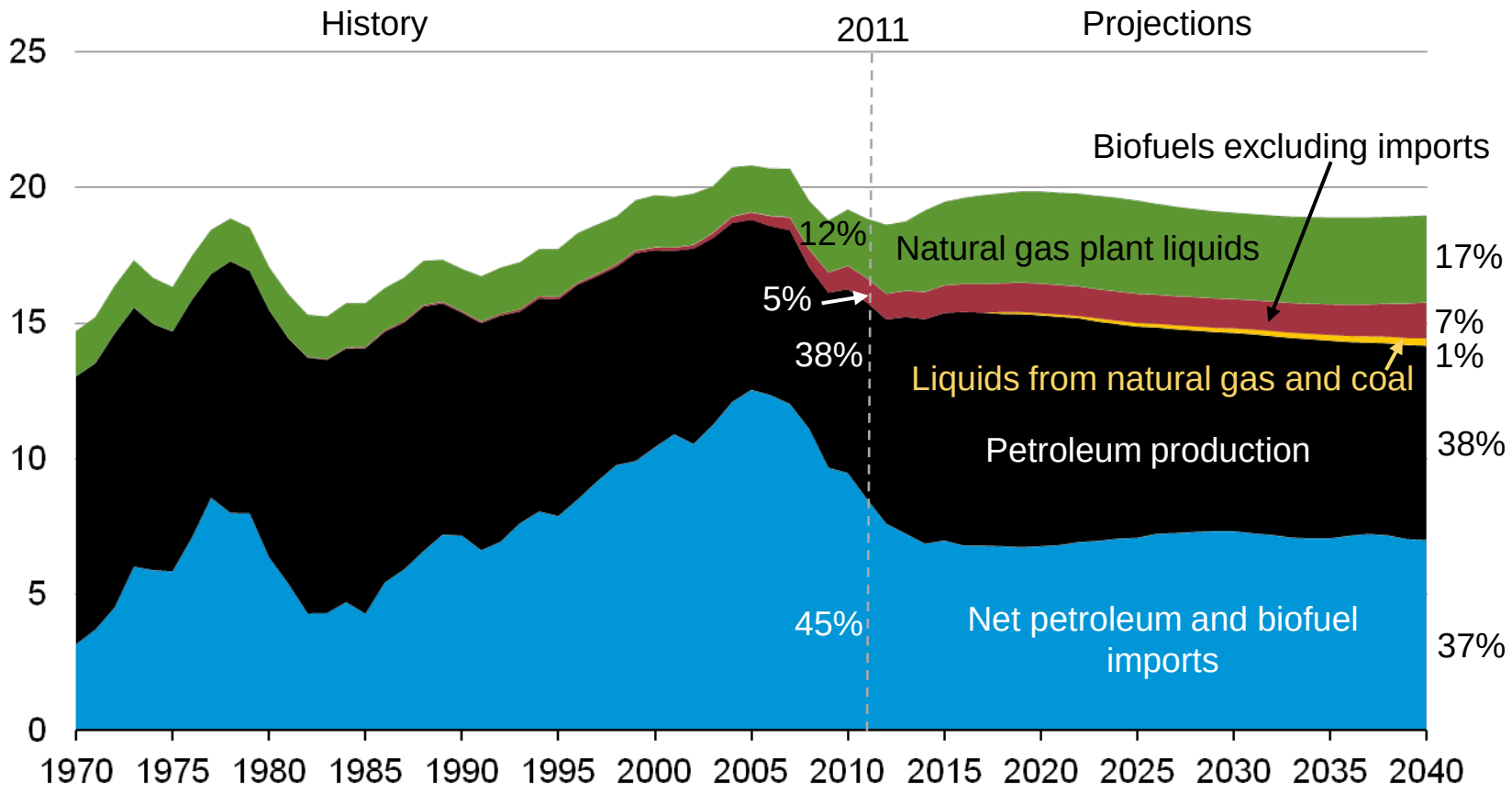
U.S. liquid fuel supply
million barrels per day



Source: EIA, Annual Energy Outlook 2013 Early Release

U.S. import share of liquid fuels declines due to increased production of tight oil and gas liquids, and greater fuel efficiency

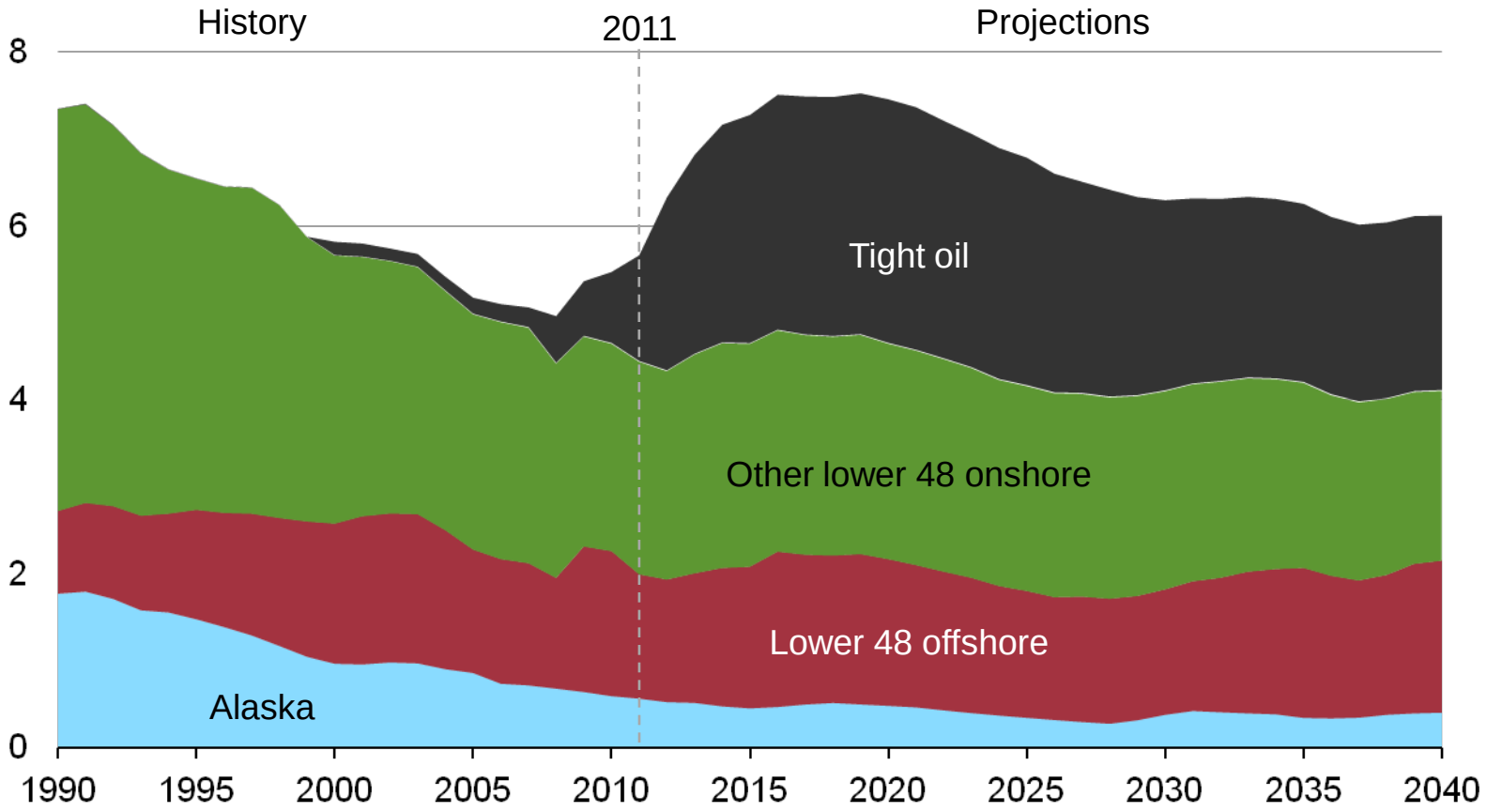
U.S. liquid fuels supply
million barrels per day



Source: EIA, Annual Energy Outlook 2013 Early Release

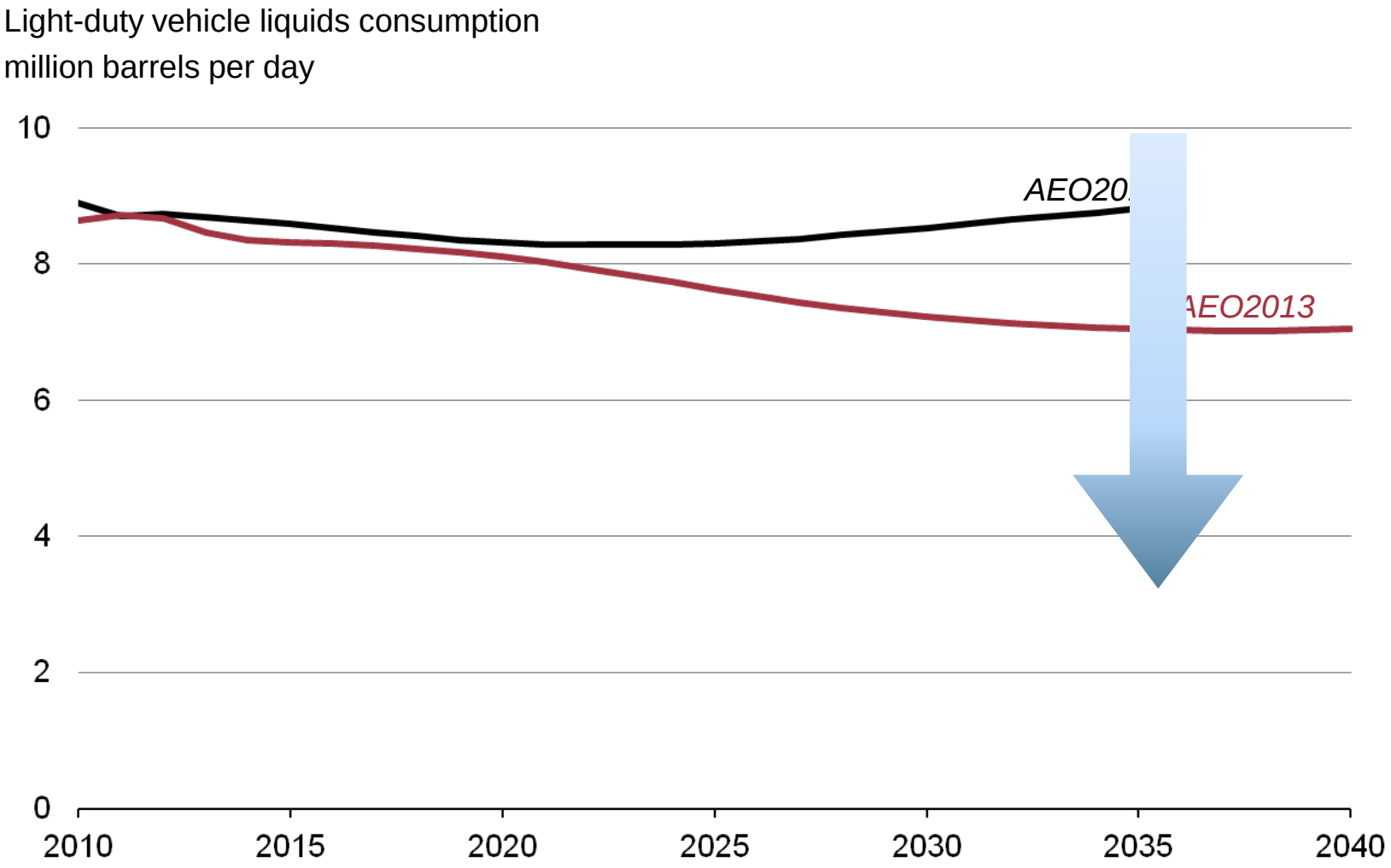
U.S. tight oil production leads a growth in domestic production of 2.6 million barrels per day between 2008 and 2019

U.S. crude oil production
million barrels per day



Source: EIA, Annual Energy Outlook 2013 Early Release

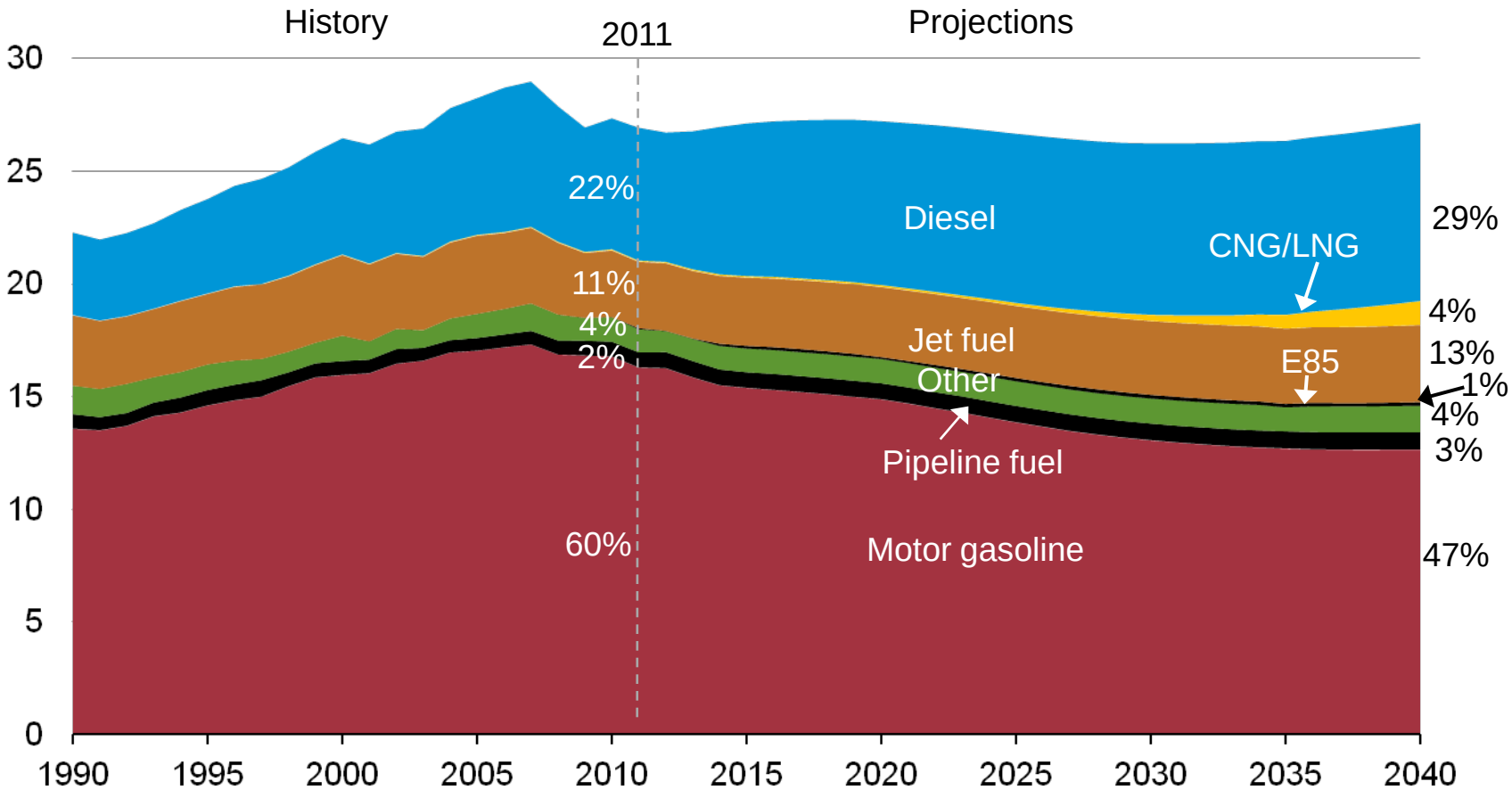
Light-duty vehicle liquids consumption is lower primarily due to more stringent CAFE standards



Source: EIA, Annual Energy Outlook 2013 Early Release

Transportation sector motor gasoline demand declines

Transportation energy consumption by fuel
quadrillion Btu

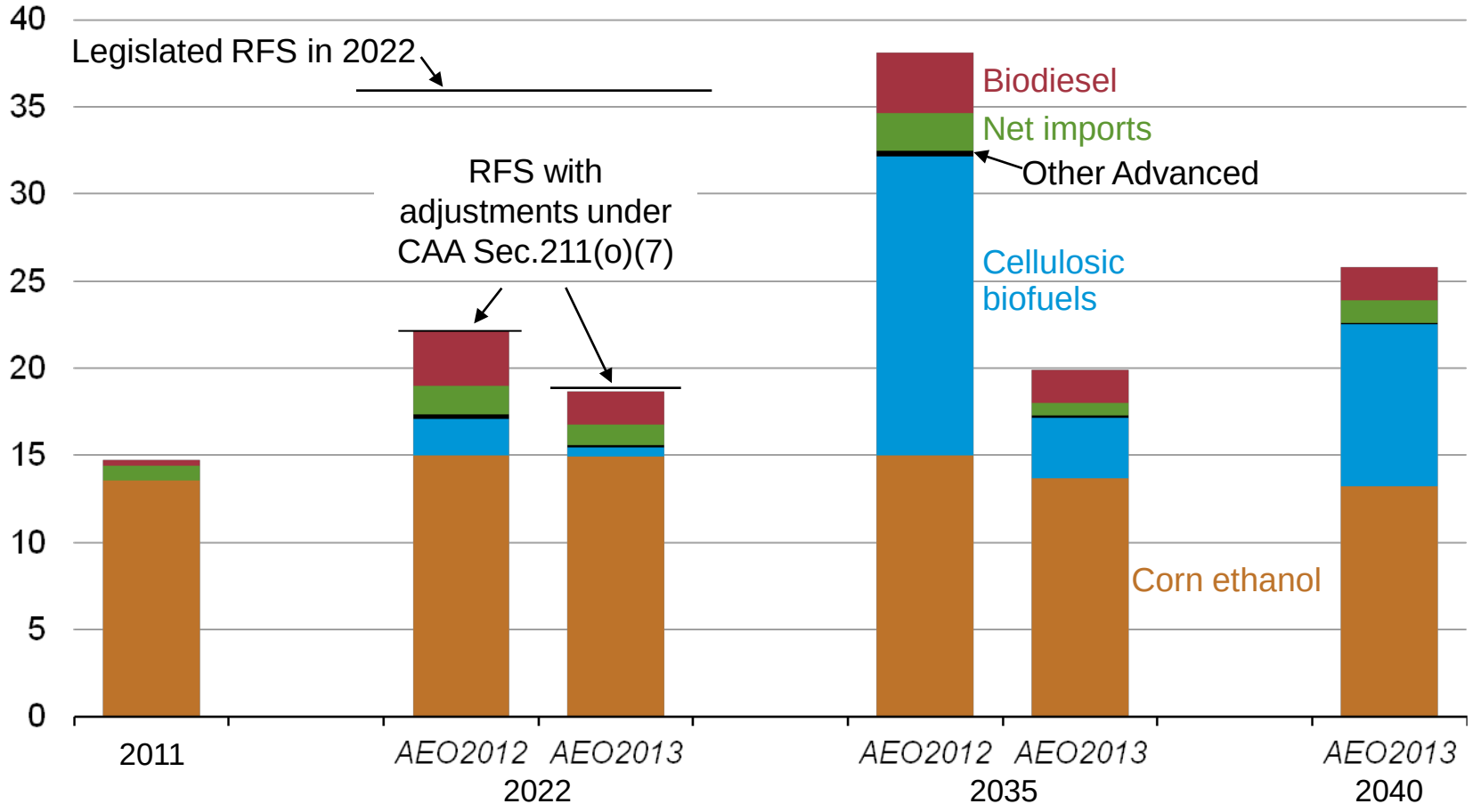


Source: EIA, Annual Energy Outlook 2013 Early Release

Biofuels grow at a slower rate due to lower crude oil prices and slower growth in E85 sales

Renewable fuel standard credits

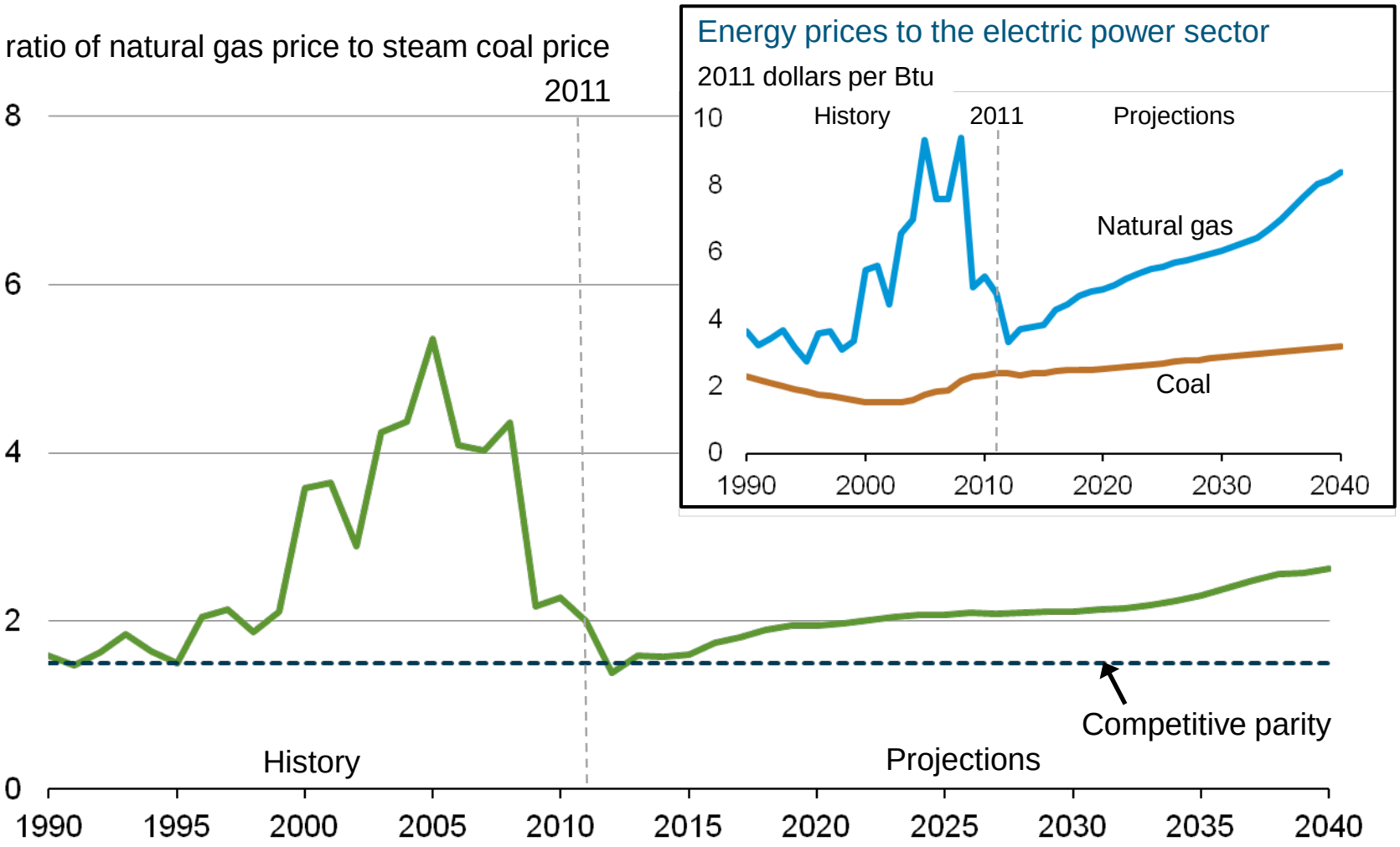
billions ethanol-equivalent gallons



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

Natural gas

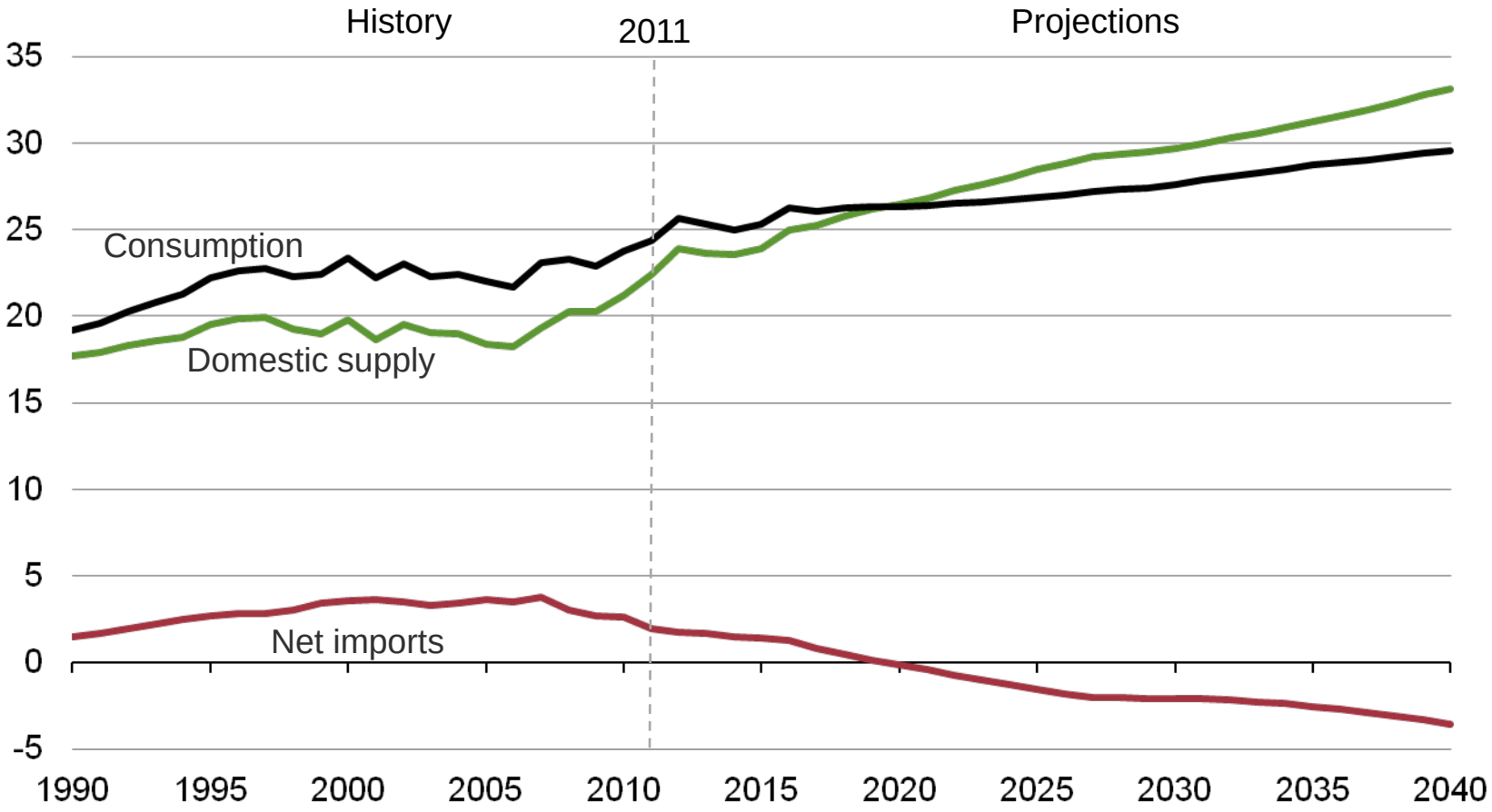
Coal regains some competitive advantage relative to natural gas over time on a national average basis



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

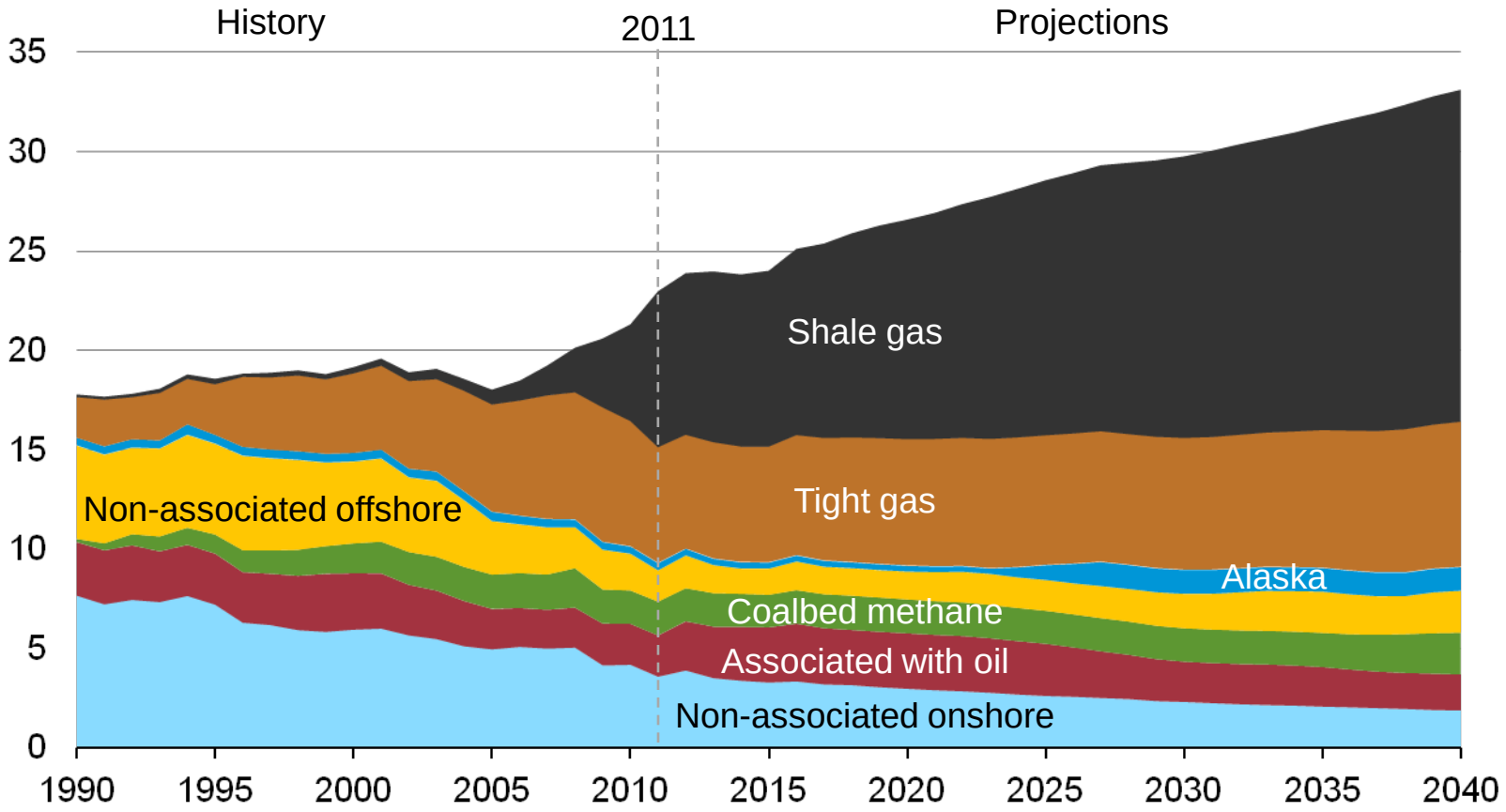
U.S. dry gas
trillion cubic feet



Source: EIA, Annual Energy Outlook 2013 Early Release

Shale gas production leads growth in production through 2040

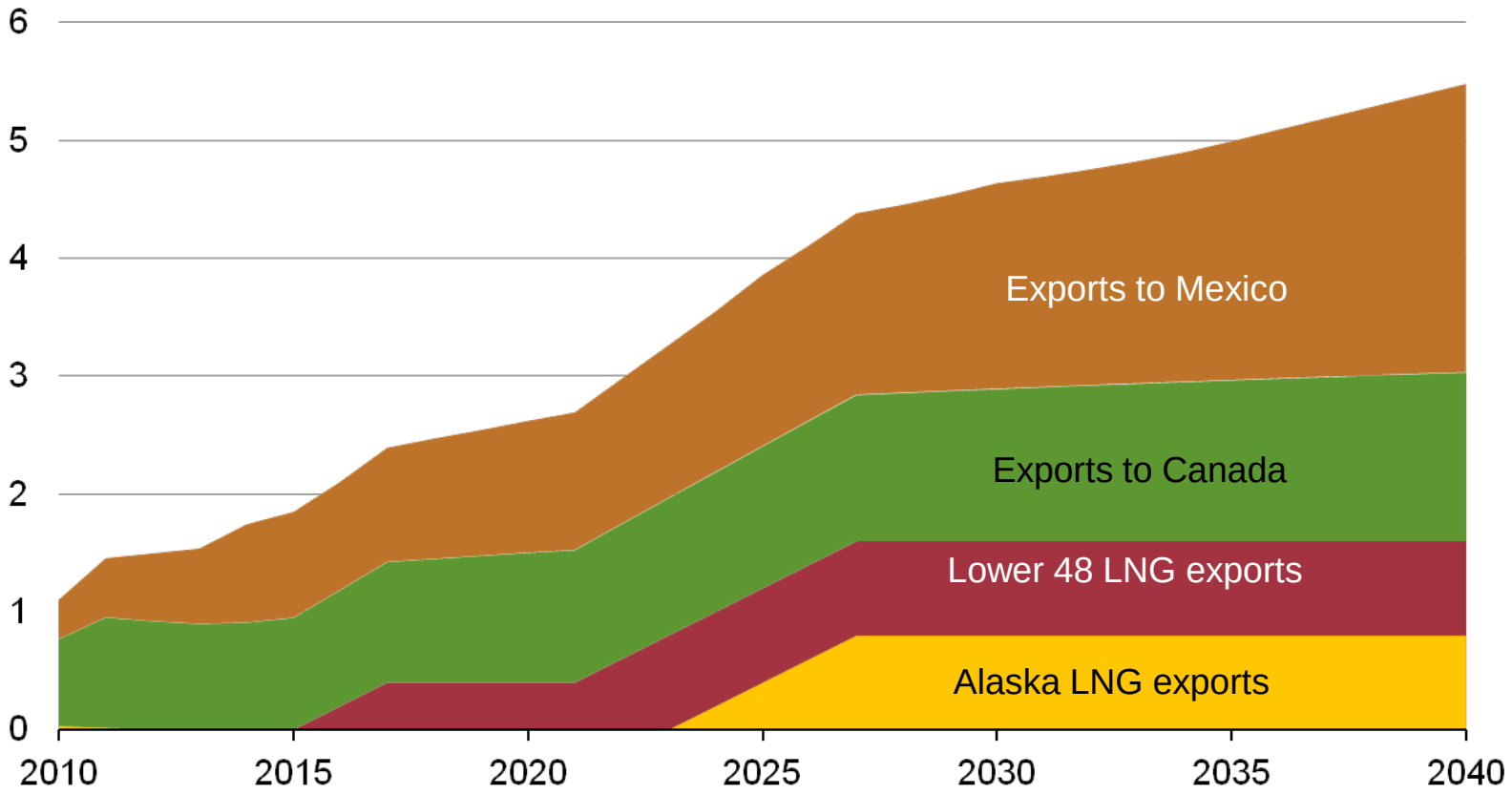
U.S. dry natural gas production
trillion cubic feet



Source: EIA, Annual Energy Outlook 2013 Early Release

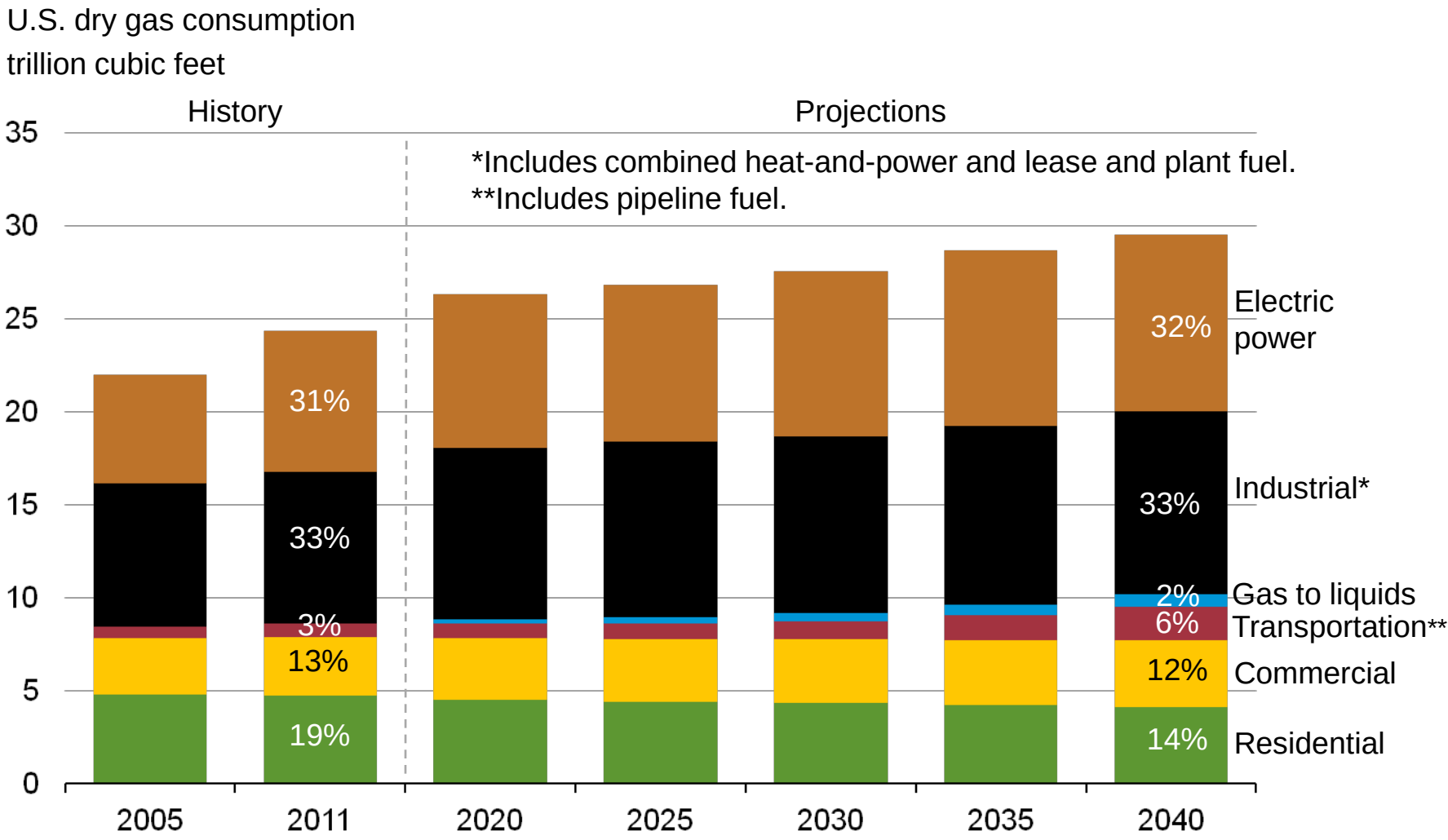
Total natural gas exports nearly quadruple by 2040 in the *AEO2013* Reference case

U.S. natural gas exports
trillion cubic feet



Source: EIA, Annual Energy Outlook 2013 Early Release

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

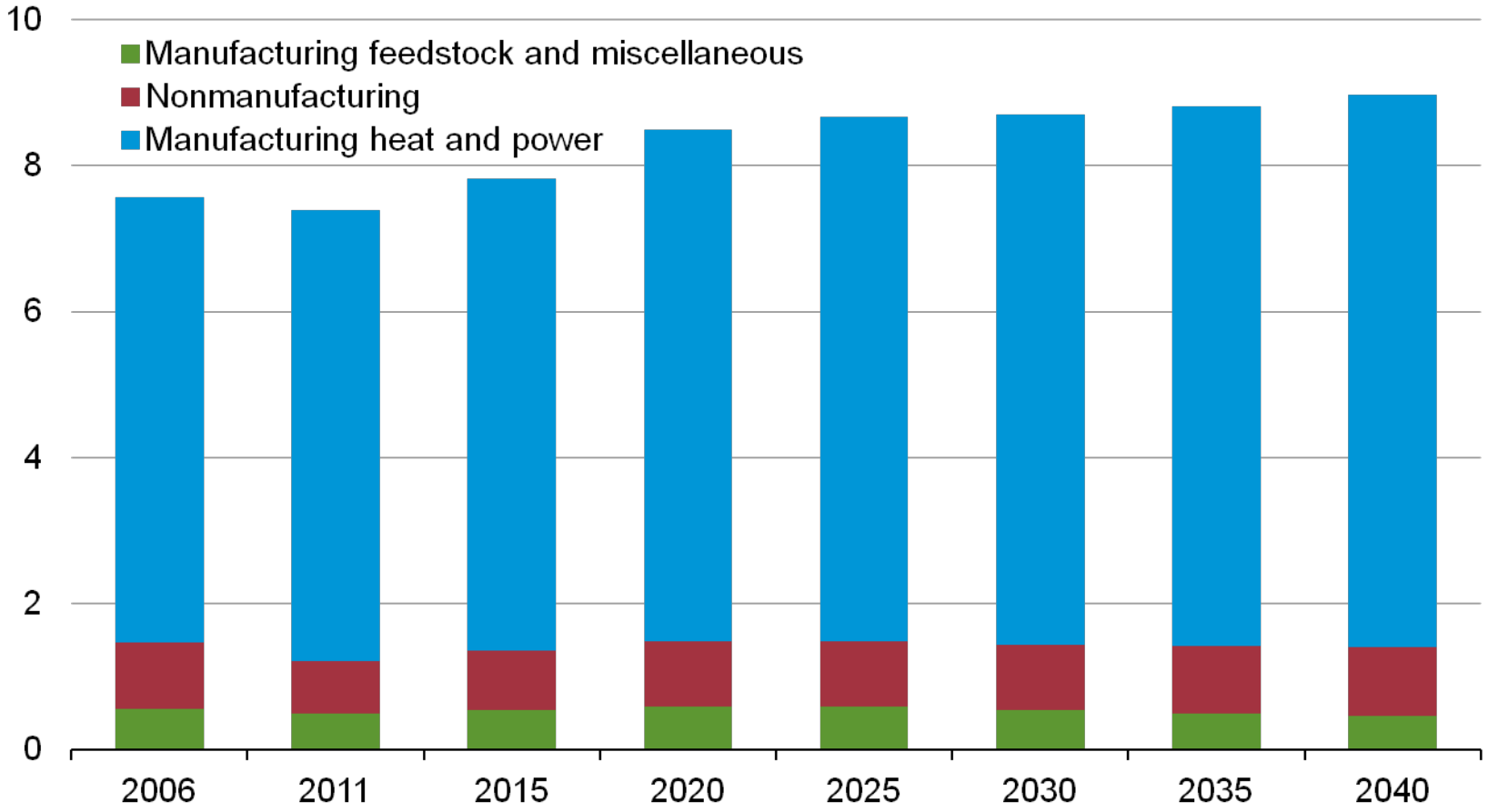


Source: EIA, Annual Energy Outlook 2013 Early Release

Industrial natural gas usage grows, especially before 2025

Industrial natural gas consumption

quadrillion Btu



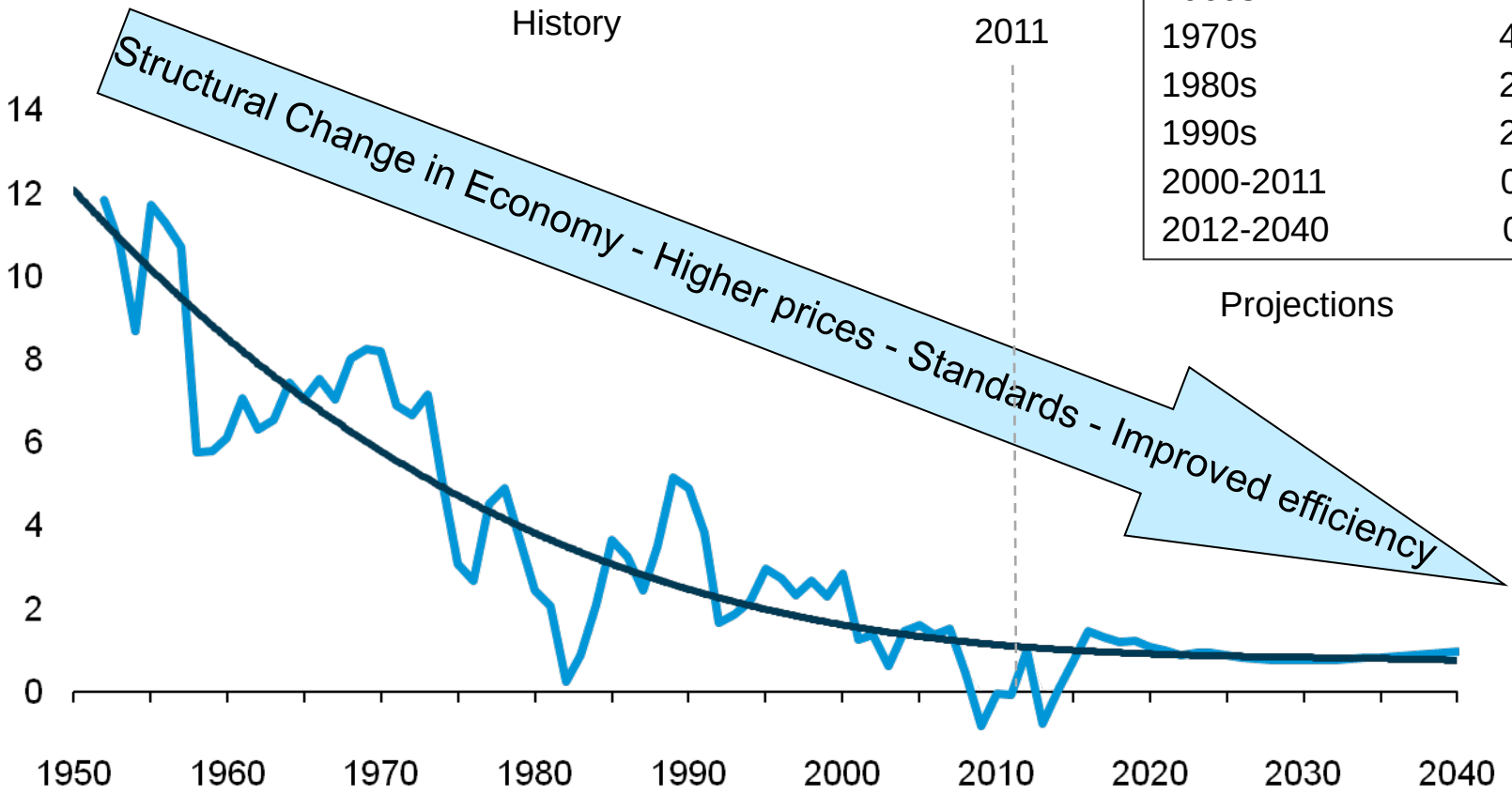
Source: EIA, Annual Energy Outlook 2013 Early Release

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)

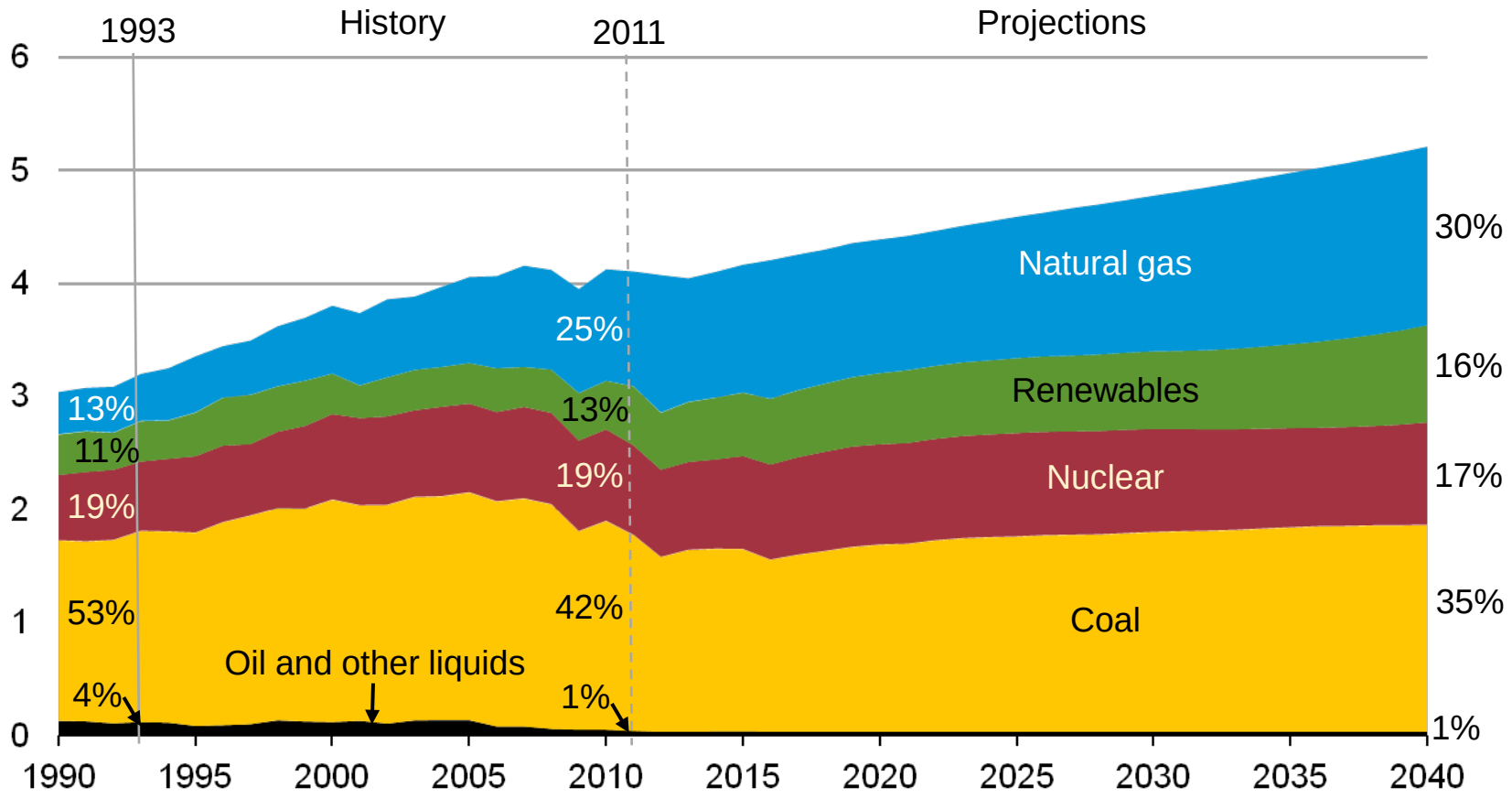
Period	Annual Growth
1950s	9.8
1960s	7.3
1970s	4.7
1980s	2.9
1990s	2.4
2000-2011	0.9
2012-2040	0.9



Source: EIA, Annual Energy Outlook 2013 Early Release

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

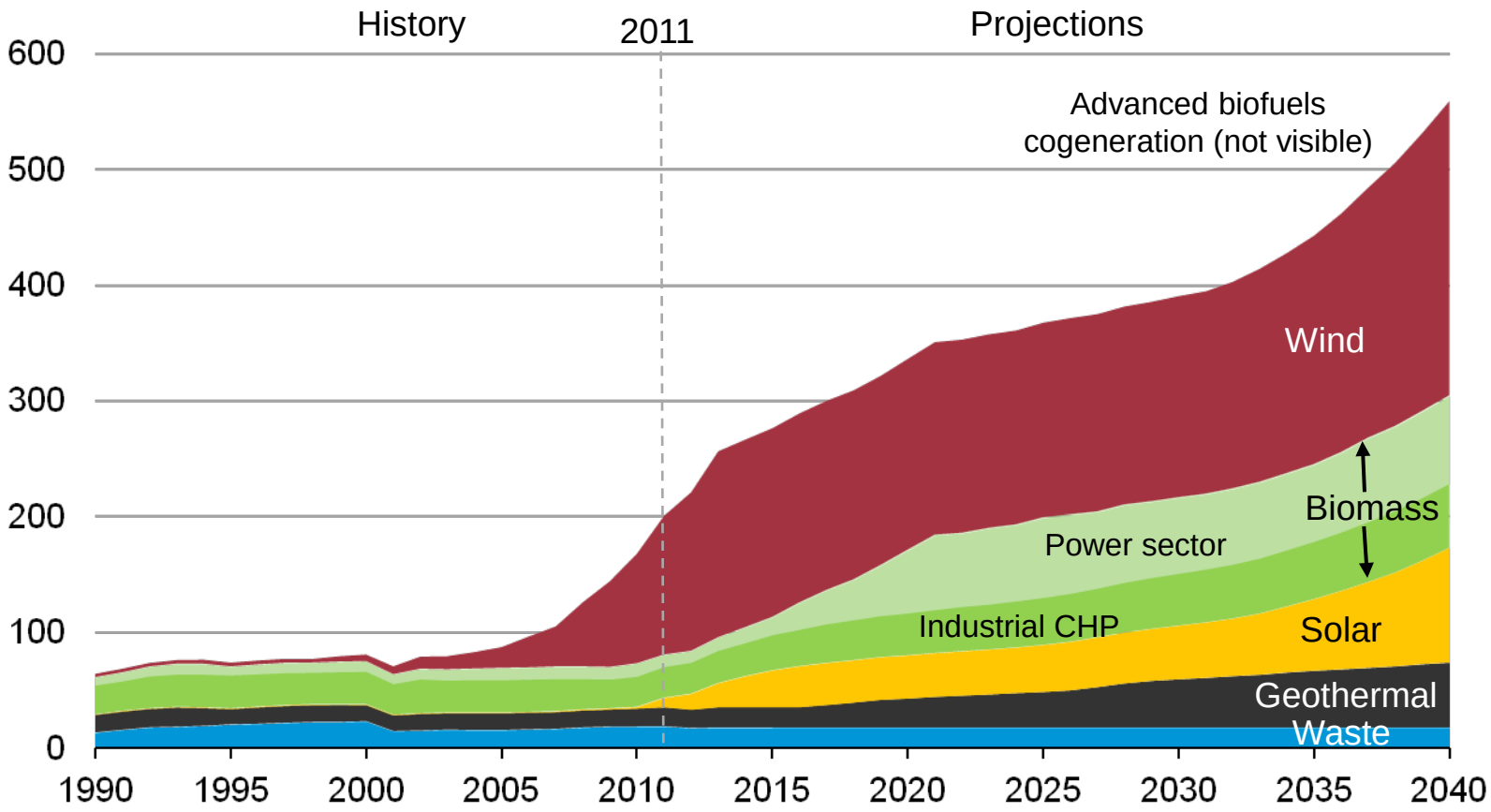
U.S. electricity net generation
trillion kilowatthours



Source: EIA, Annual Energy Outlook 2013 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

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