

# *Annual Energy Outlook 2013*

## *Future of U.S. Domestic Oil and Gas Production*



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*For*  
*International Energy Forum*  
*January 21, 2013 | Riyadh, KSA*

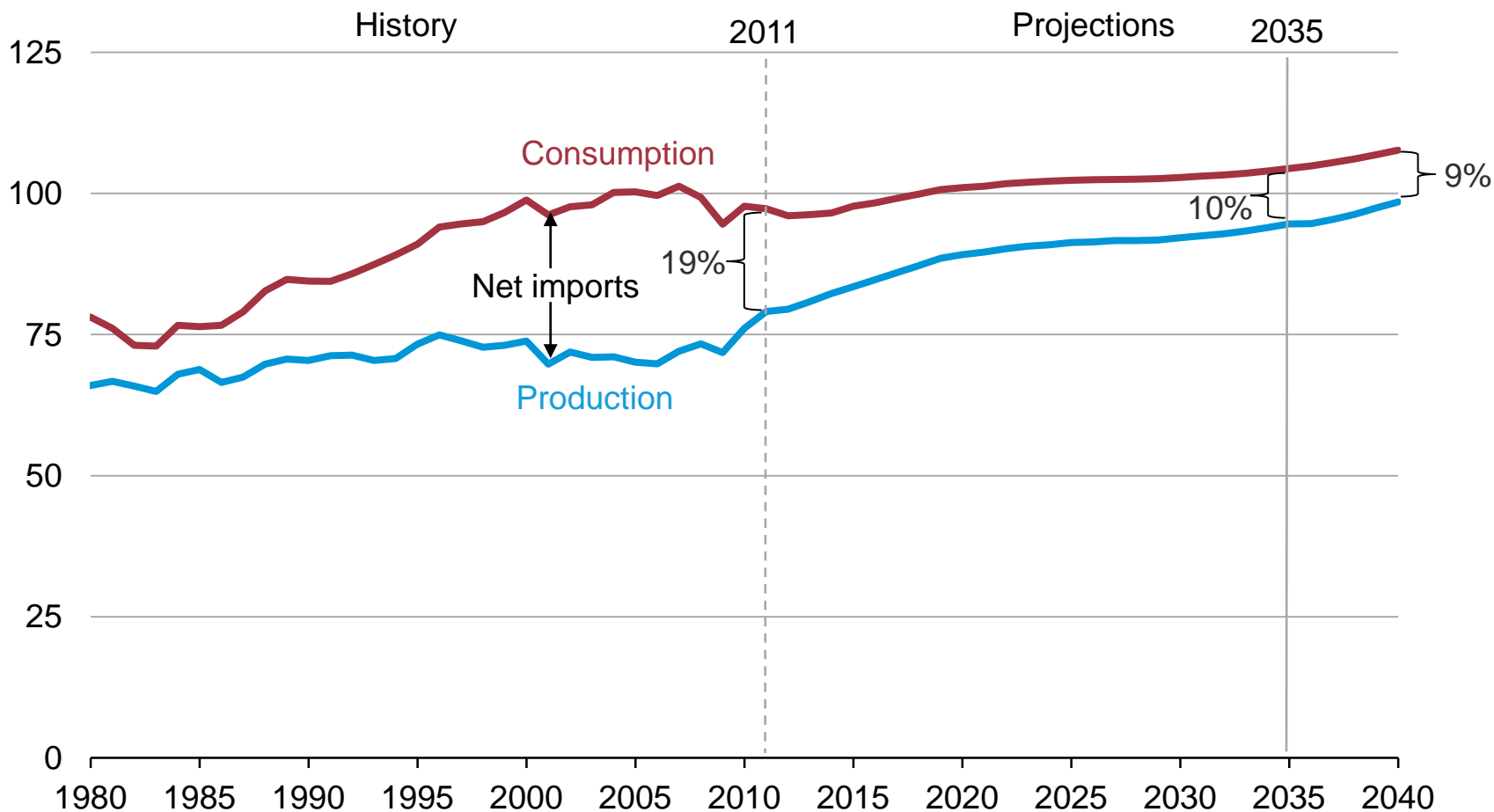
*By*  
*Adam Sieminski, Administrator*

## *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

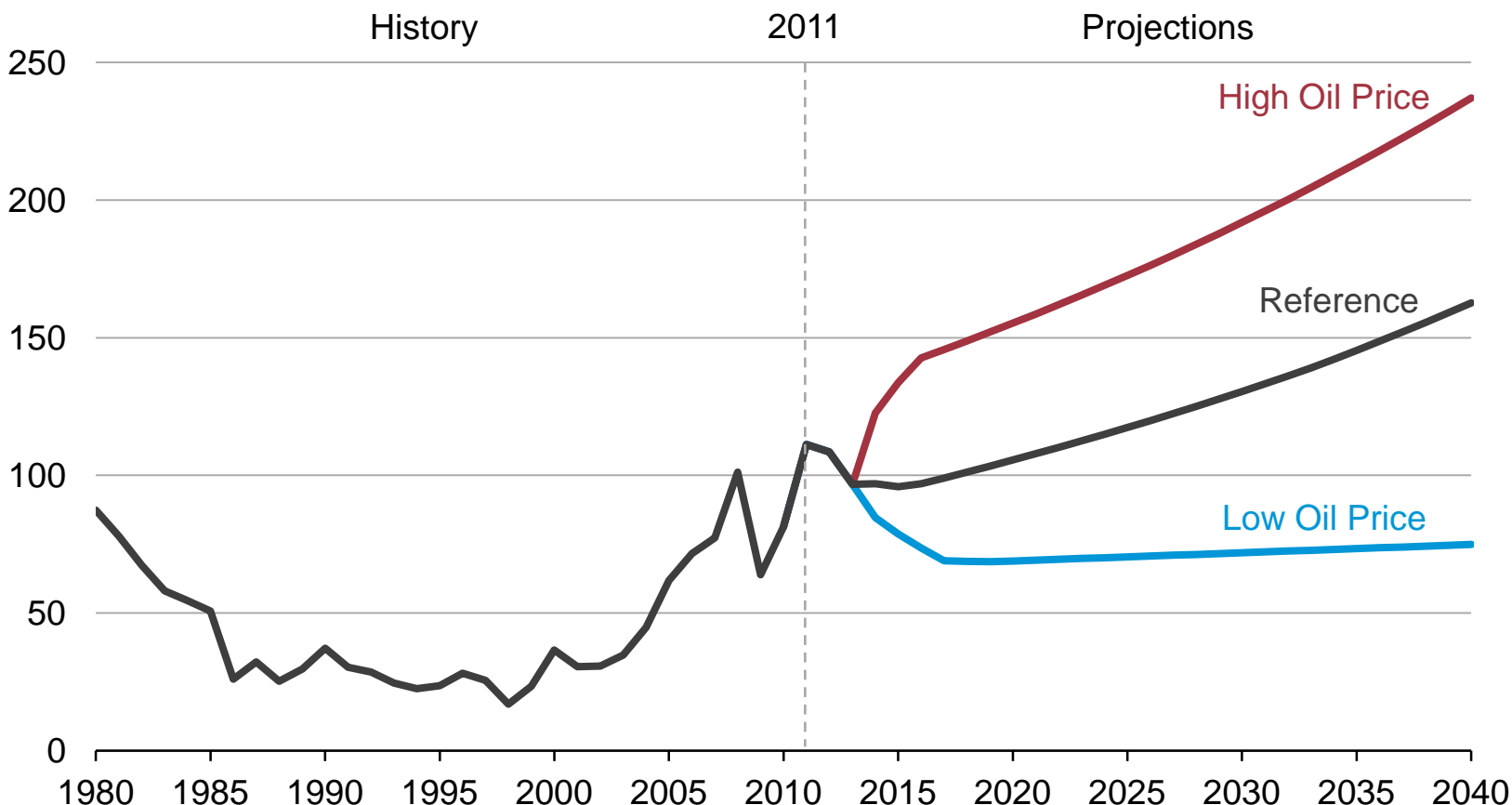


Source: EIA, Annual Energy Outlook 2013 Early Release

# Petroleum

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

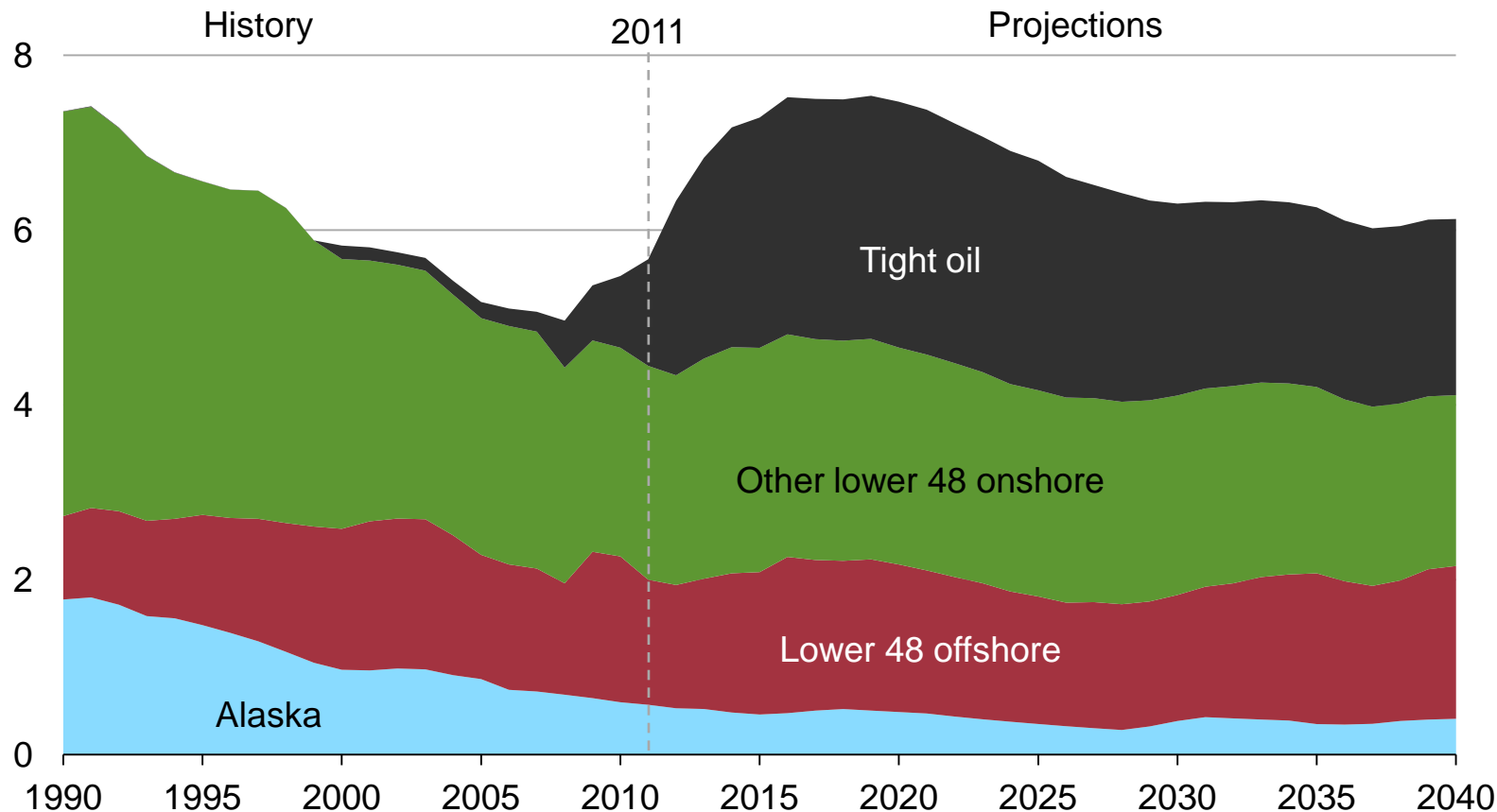
Annual average spot price of Brent crude oil  
2011 dollars per barrel



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

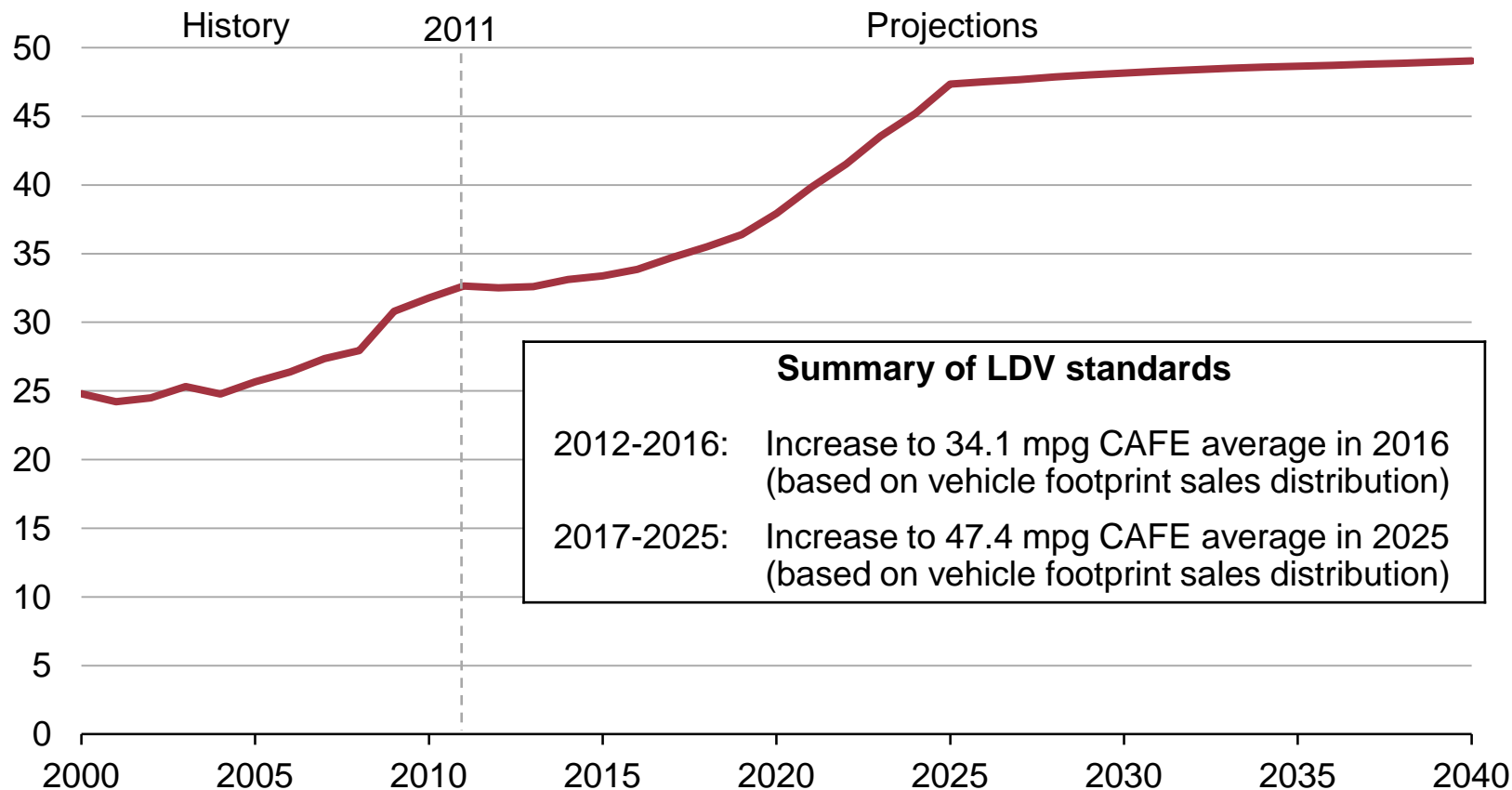
U.S. crude oil production  
million barrels per day



Source: EIA, Annual Energy Outlook 2013 Early Release

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

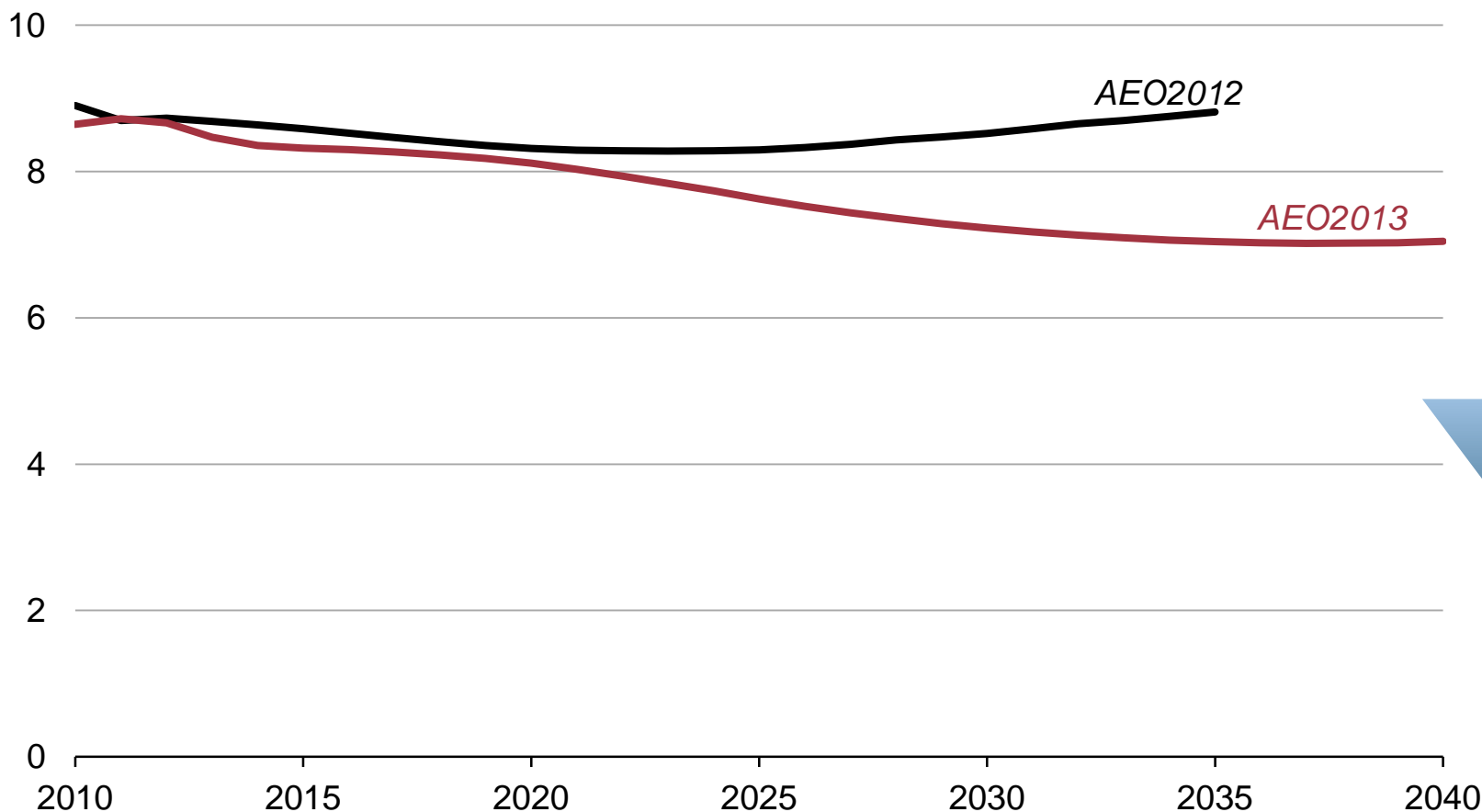
New LDV fuel efficiency  
miles per gallon



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

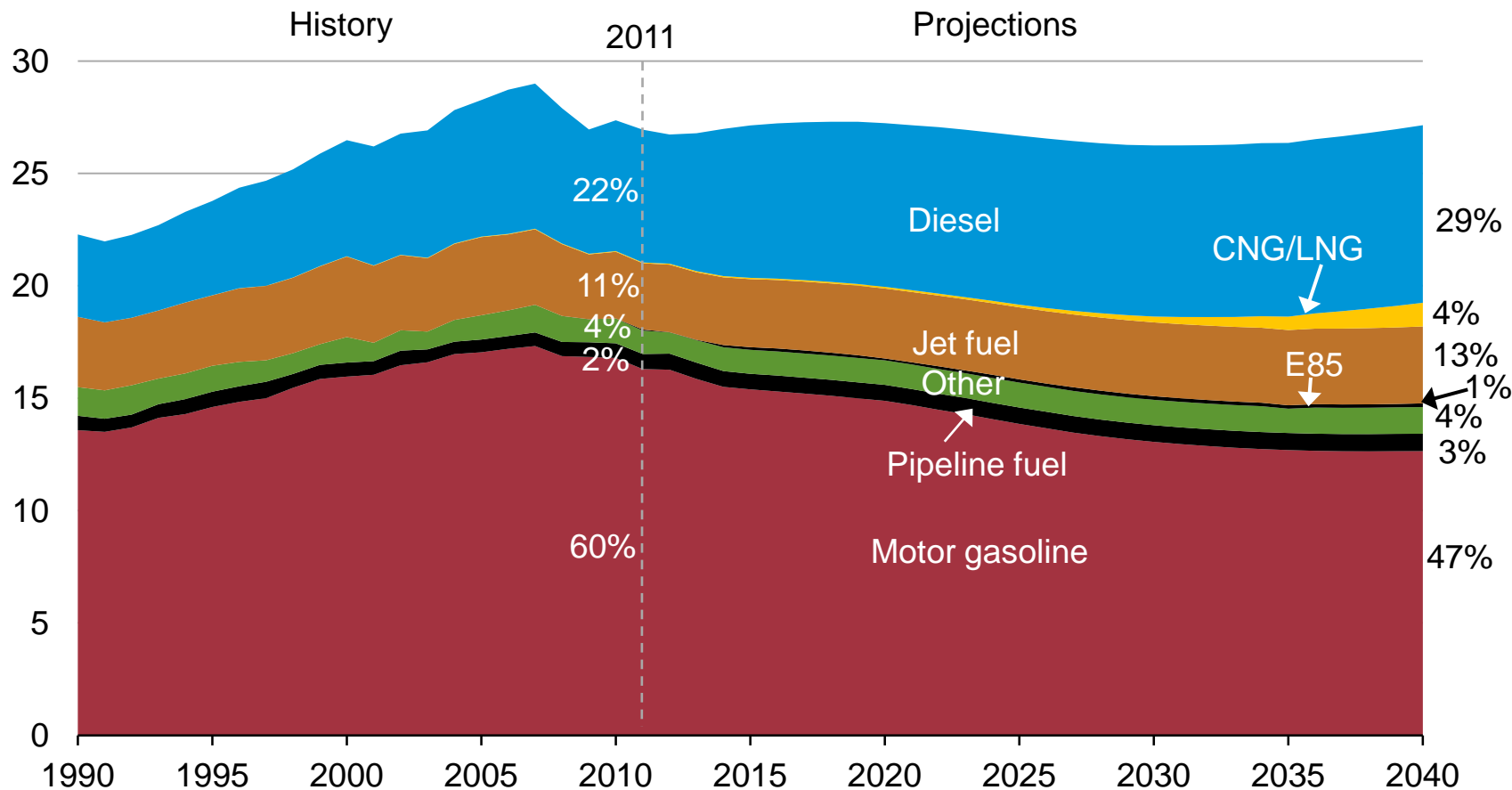


Source: EIA, Annual Energy Outlook 2013 Early Release



# Transportation sector motor gasoline demand declines

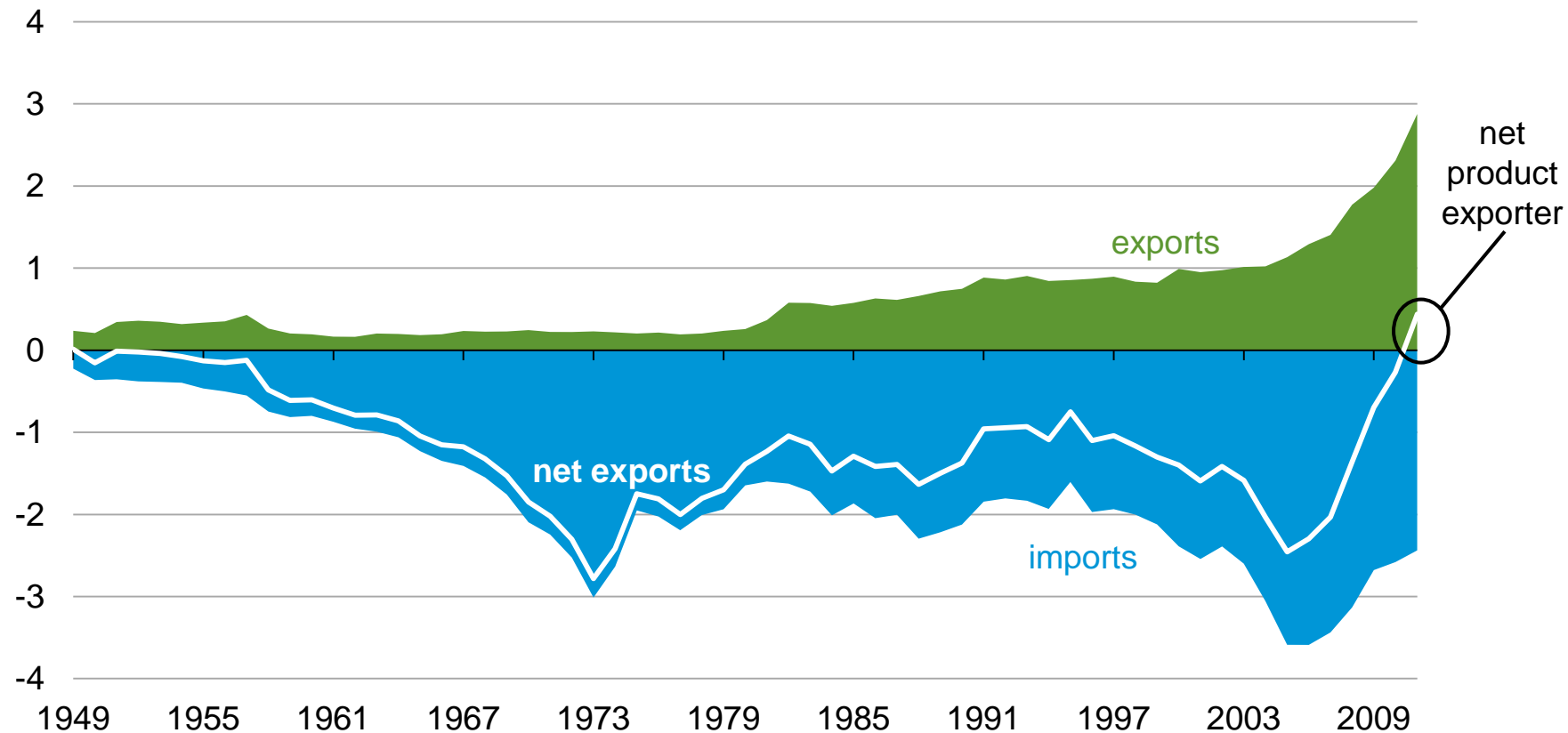
Transportation energy consumption by fuel  
quadrillion Btu



Source: EIA, Annual Energy Outlook 2013 Early Release

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

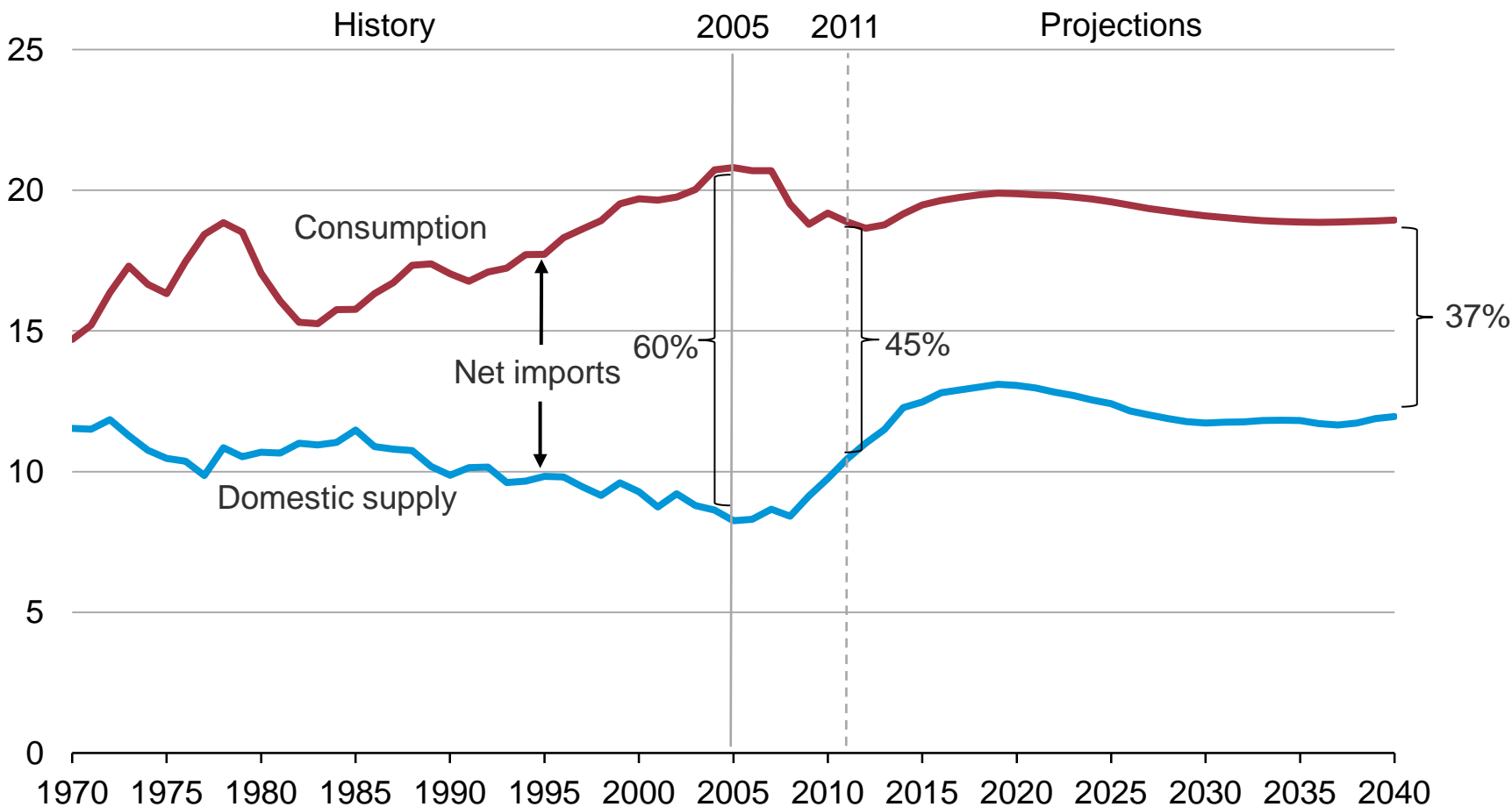
Annual U.S. net exports of total petroleum products, 1949 – 2011  
million barrels per day



Source: EIA, Petroleum Supply Monthly

# U.S. dependence on imported liquids declines

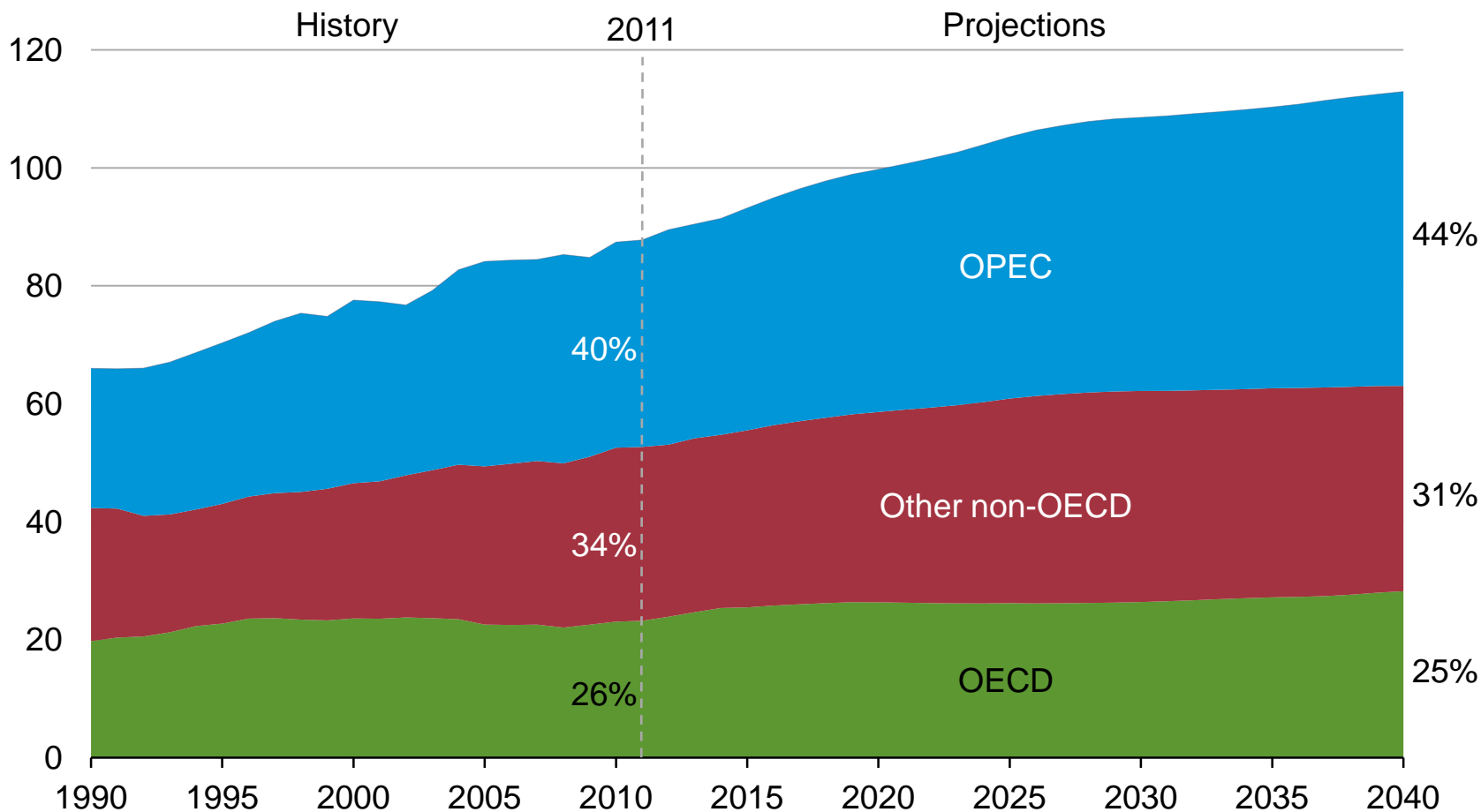
U.S. liquid fuel supply  
million barrels per day



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



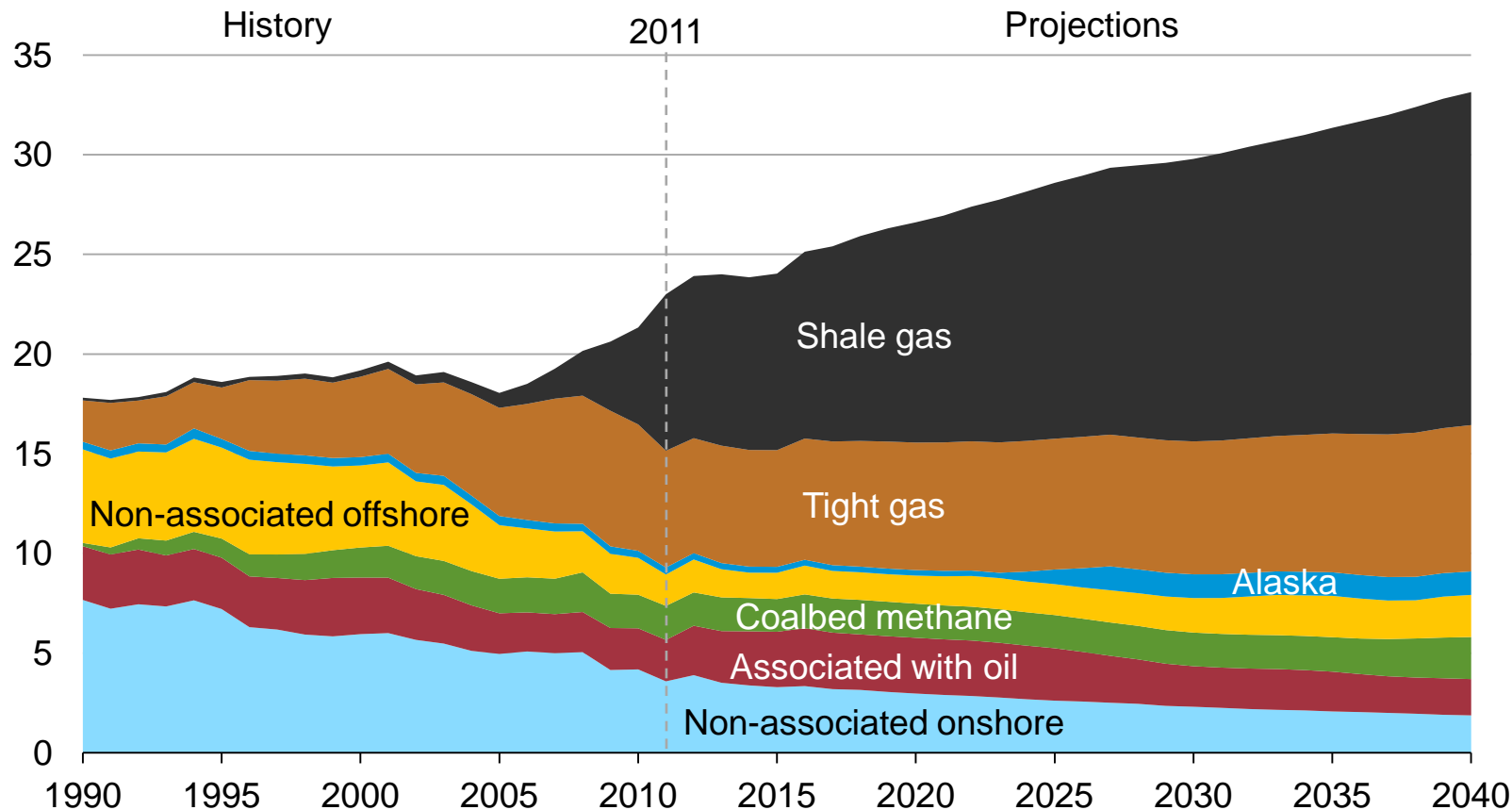
Source: EIA, Annual Energy Outlook 2013 Early Release

# Natural Gas

# Shale gas production leads growth in production through 2040

U.S. dry natural gas production

trillion cubic feet

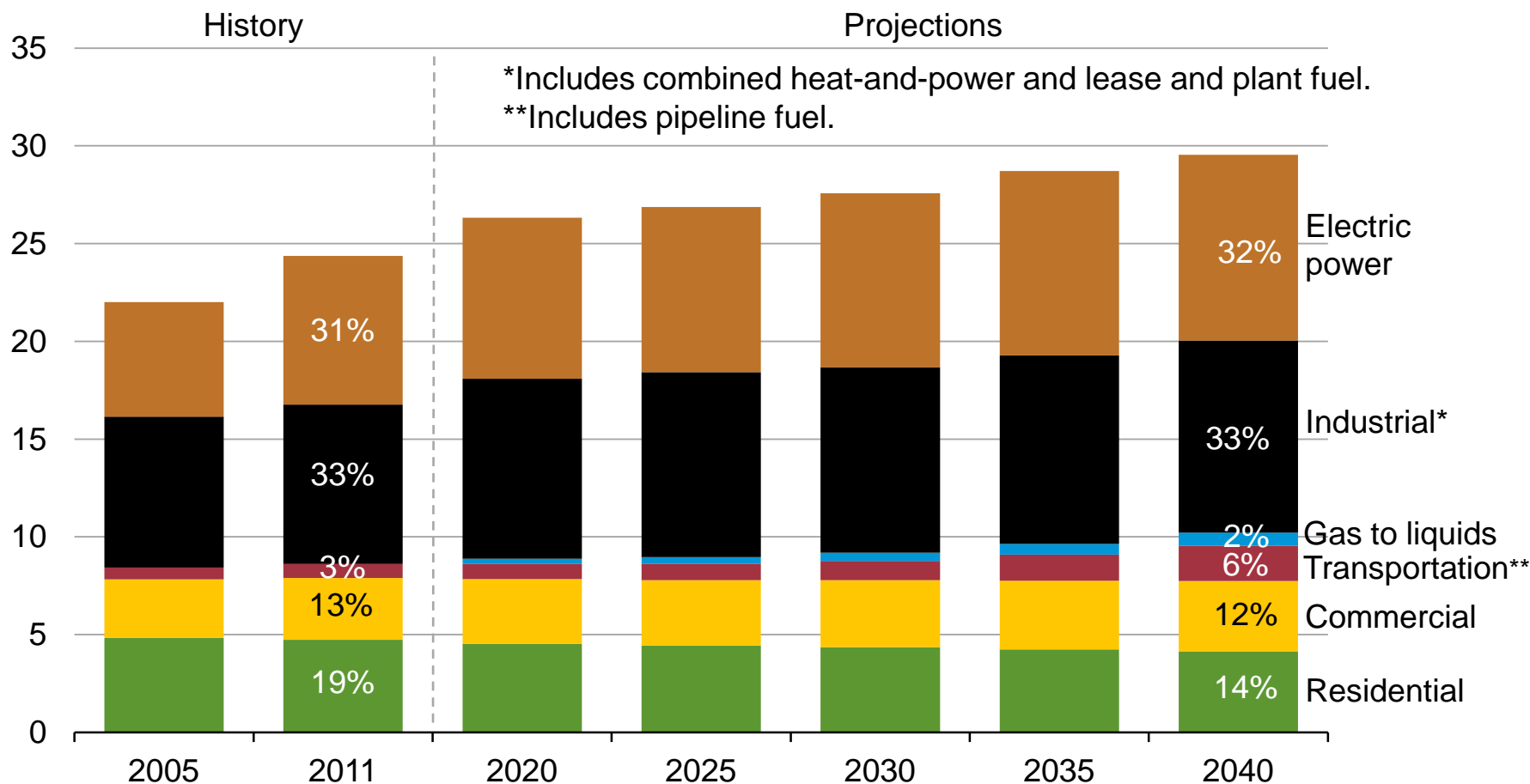


Source: EIA, Annual Energy Outlook 2013 Early Release

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

U.S. dry gas consumption

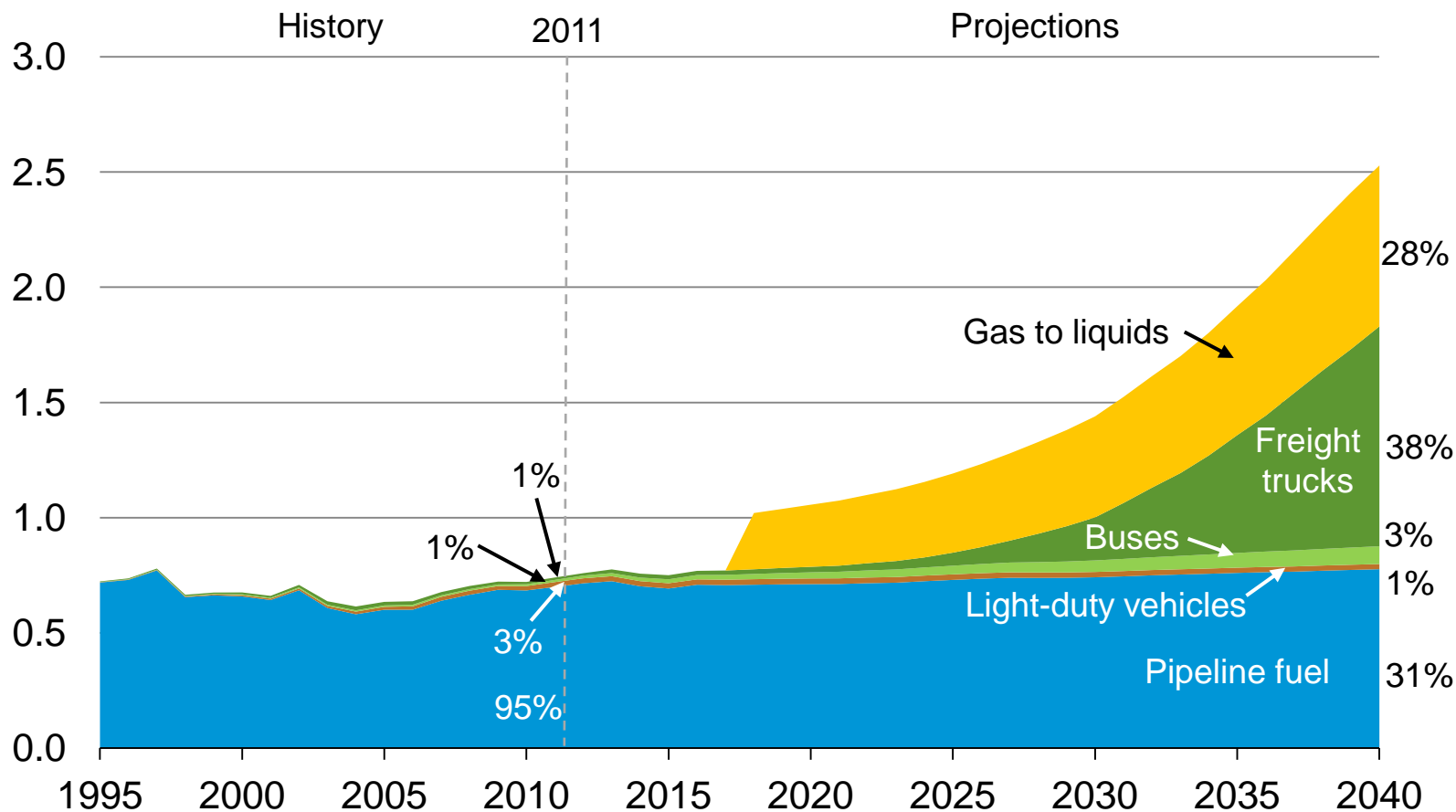
trillion cubic feet



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



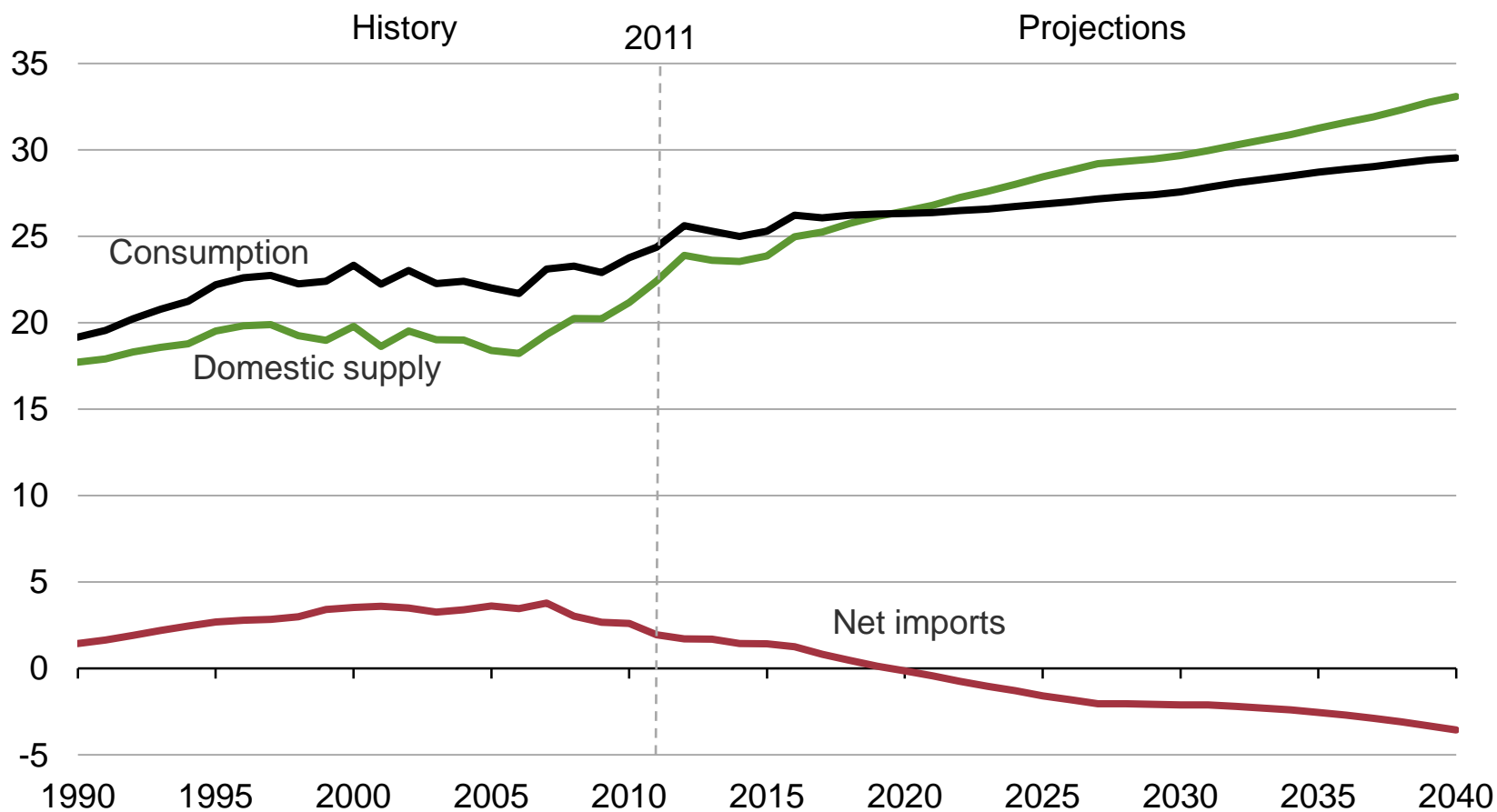
Note: Gas to liquids includes heat, power, and losses.

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

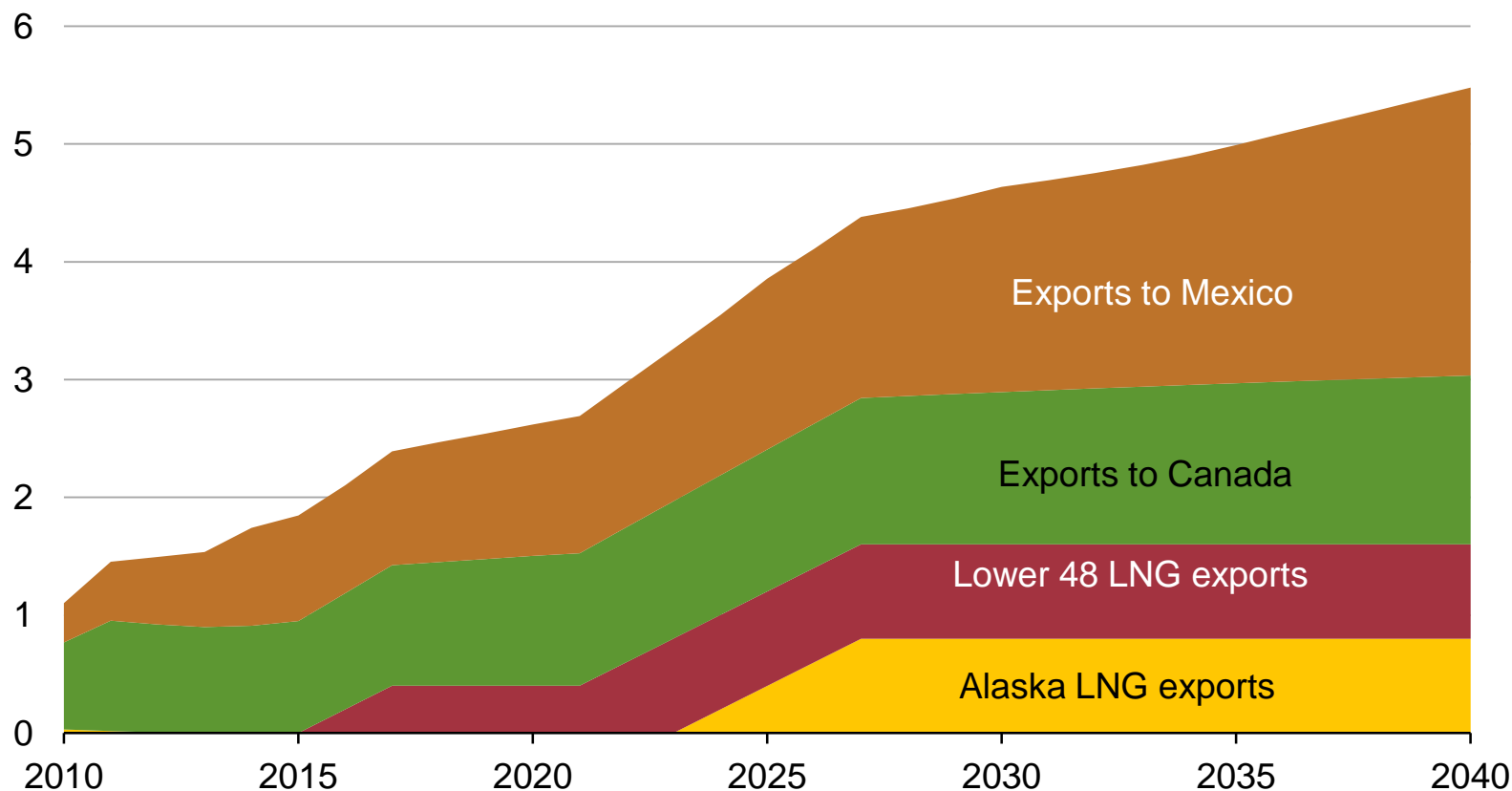
U.S. dry gas  
trillion cubic feet



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

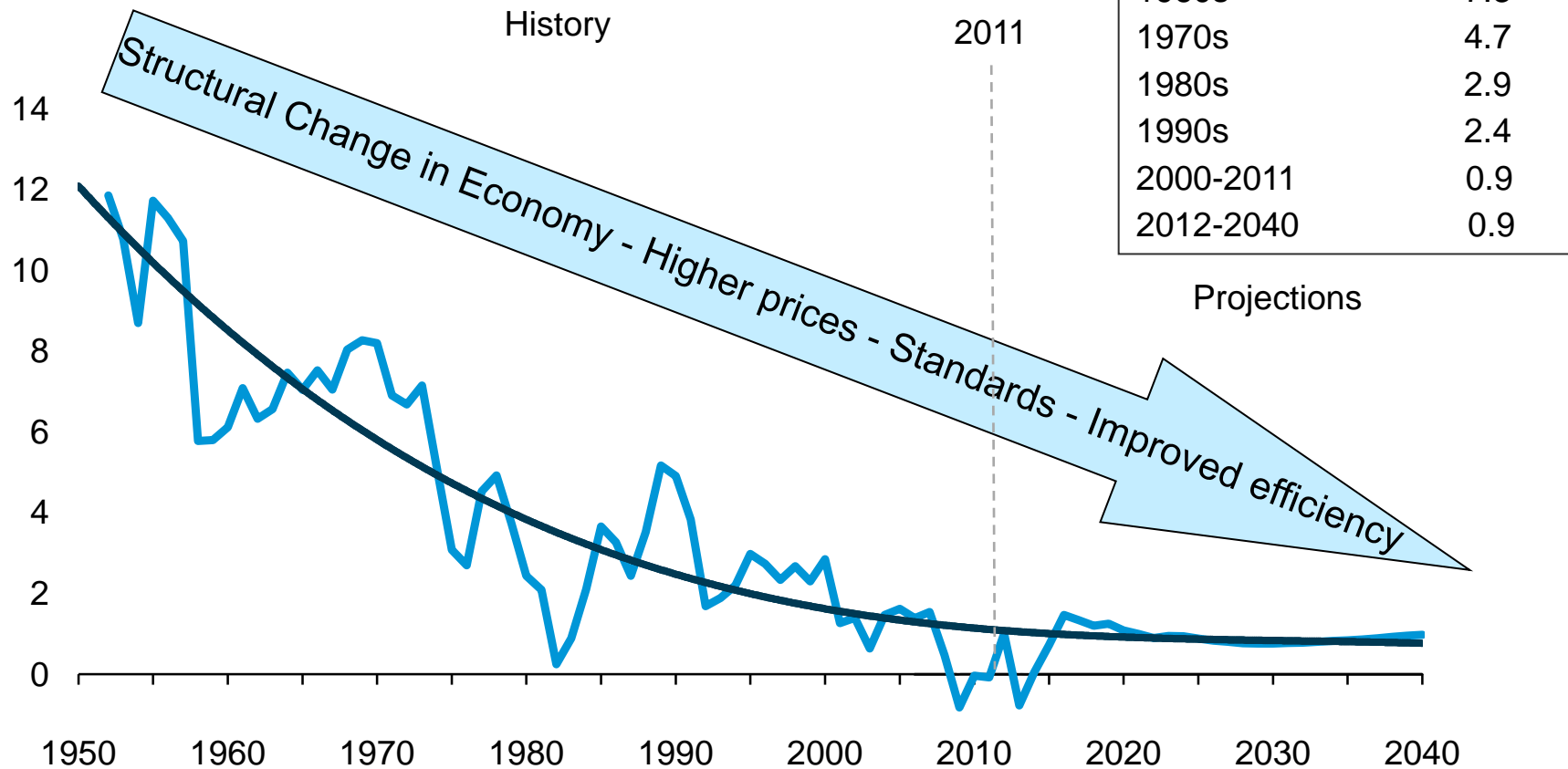


Source: EIA, Annual Energy Outlook 2013 Early Release

# Coal and Electricity

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

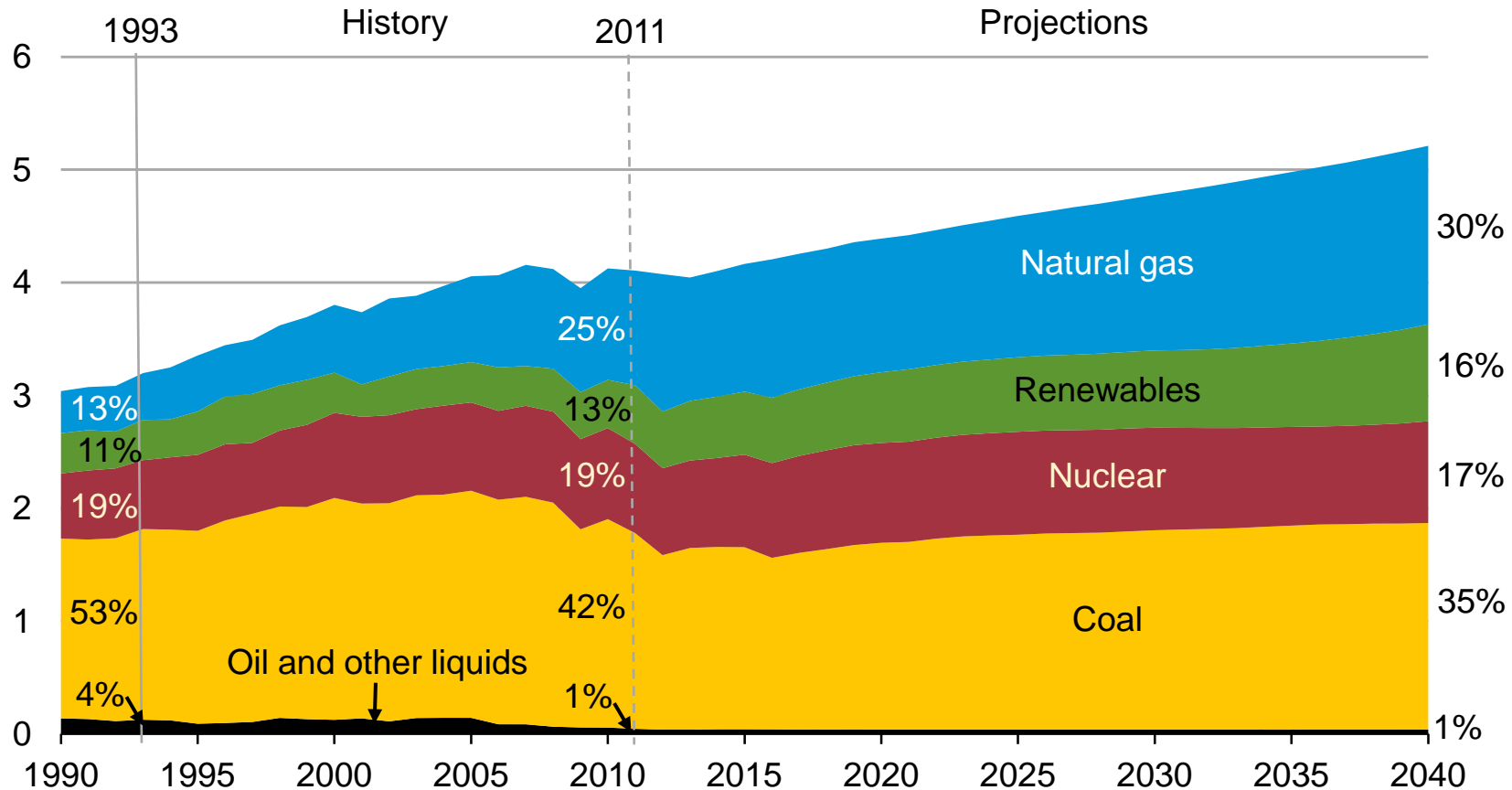
U.S. electricity use  
percent growth (3-year rolling average)



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

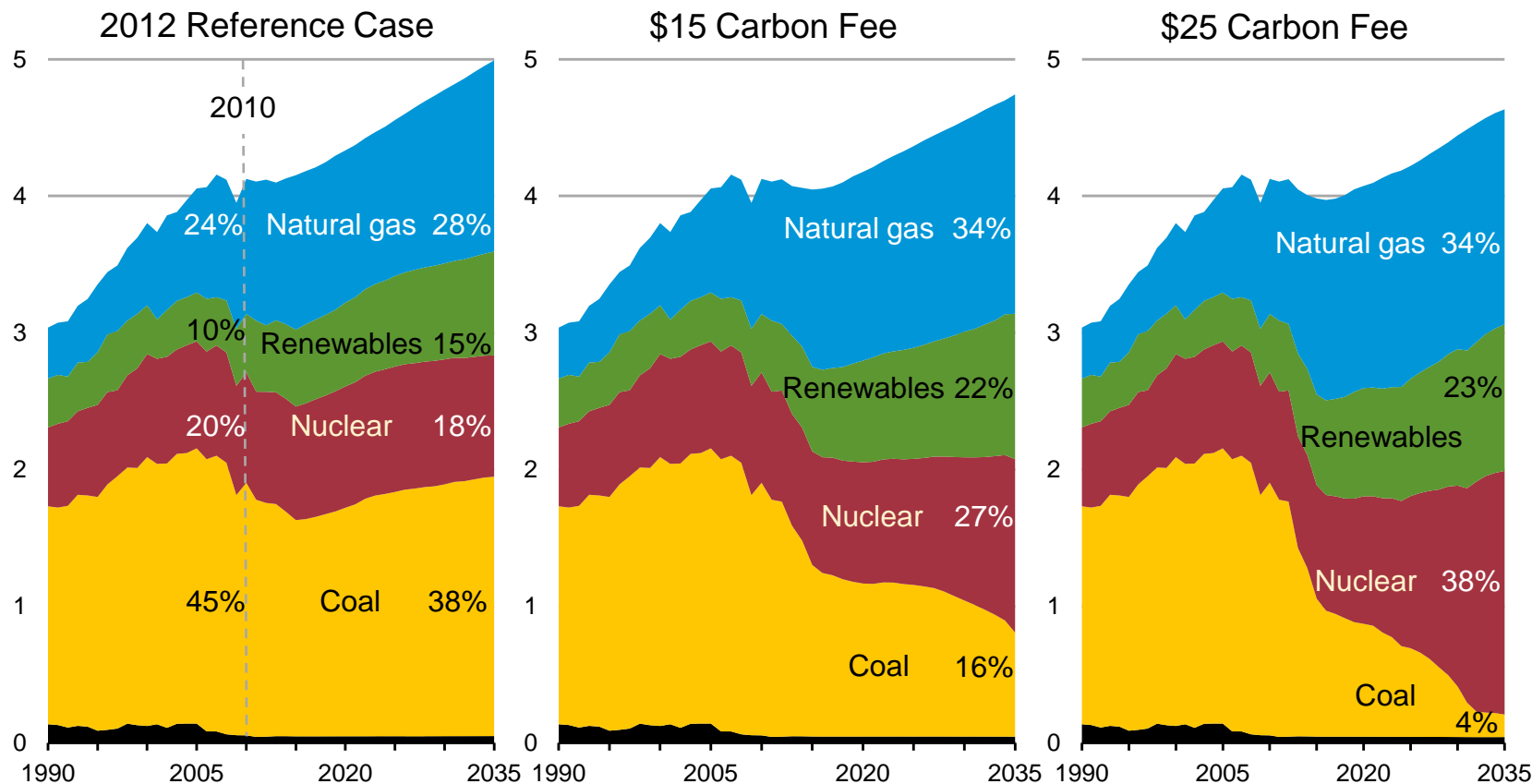
U.S. electricity net generation  
trillion kilowatthours



Source: EIA, Annual Energy Outlook 2013 Early Release

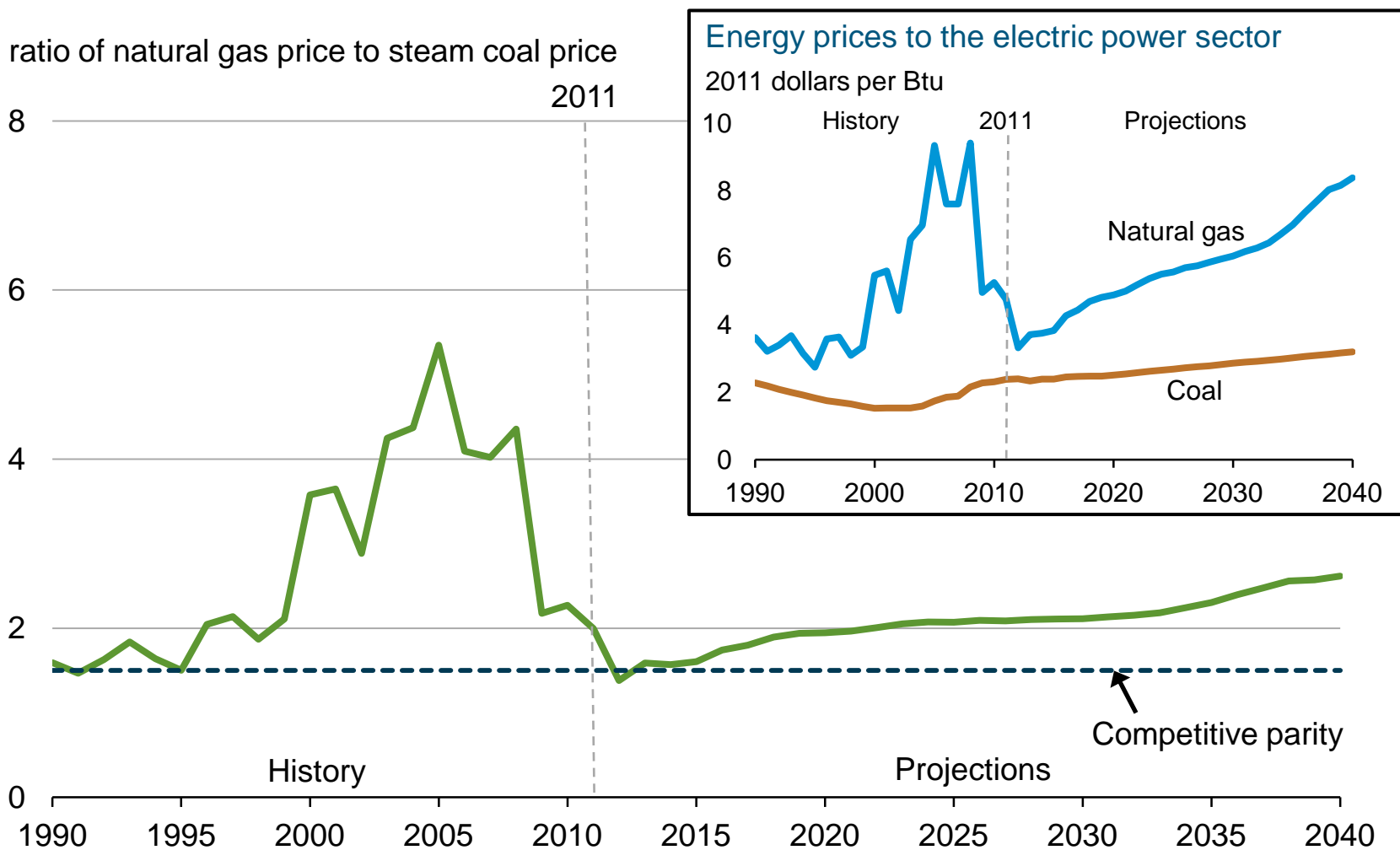
# Changing electricity generation mix in *AEO2012* reference case and carbon fee allowance side cases

U.S. electricity net generation  
trillion kilowatthours



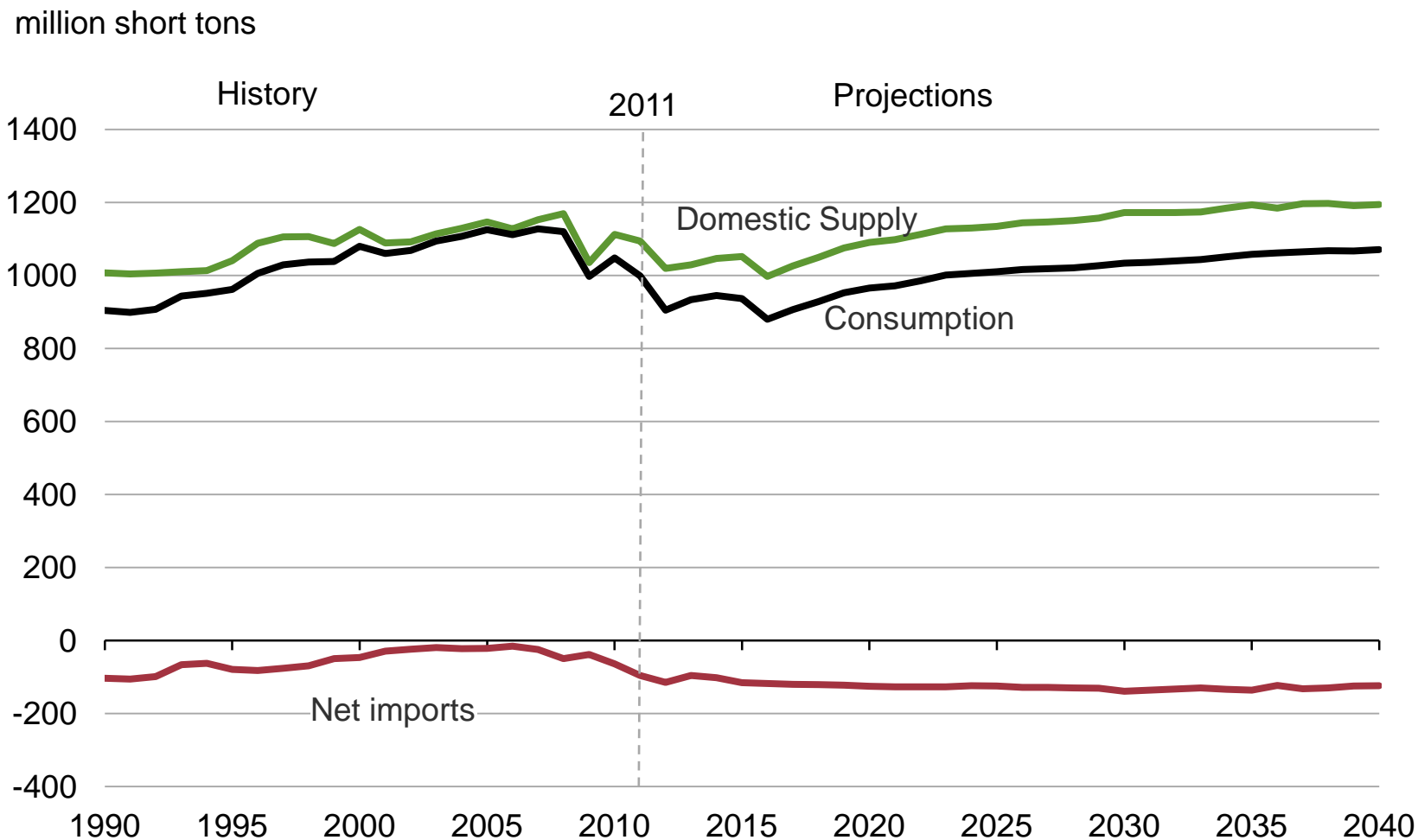
Source: EIA, Annual Energy Outlook 2012

# 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. continues to be a net exporter of coal

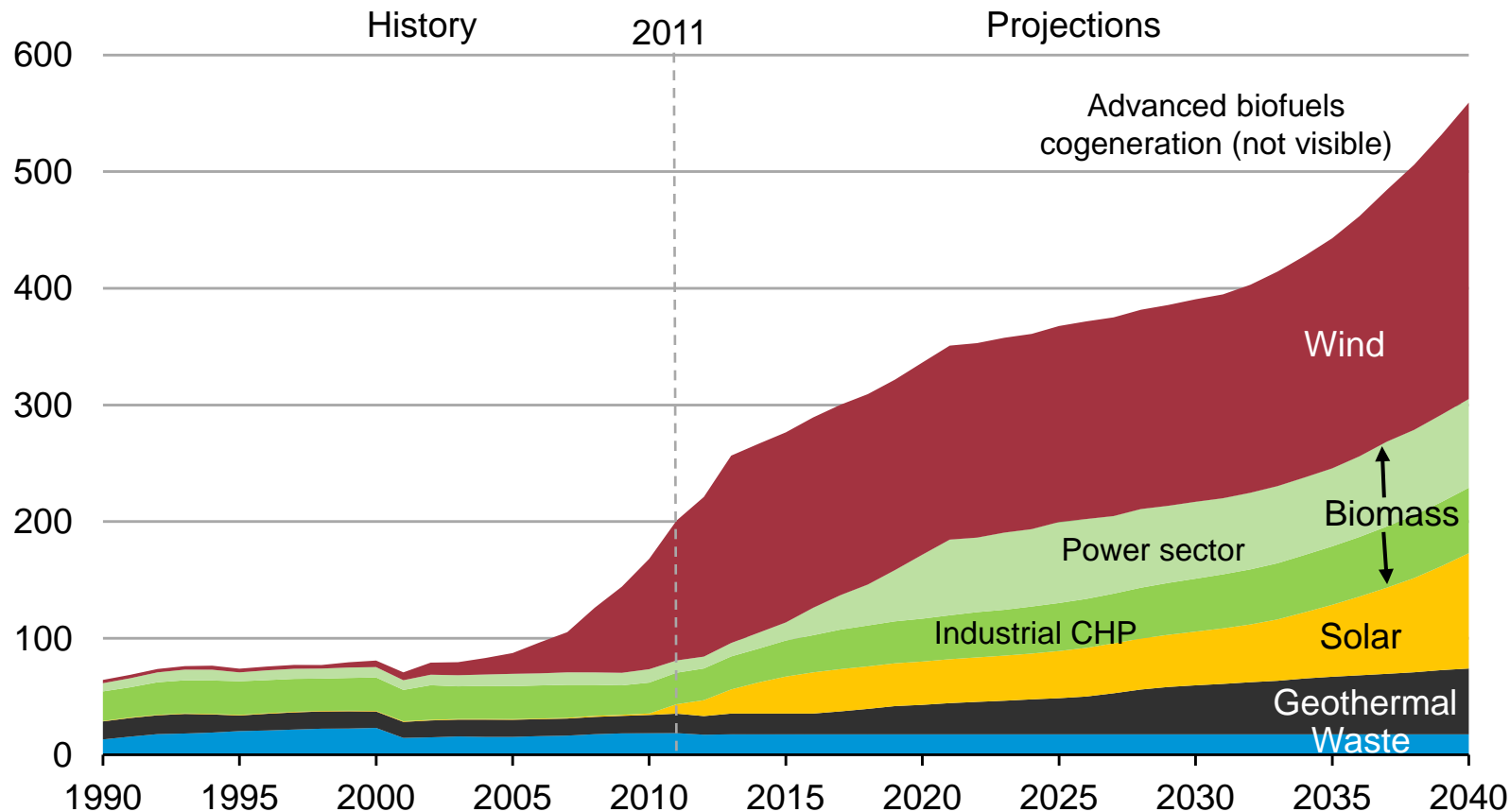


Source: EIA, Annual Energy Outlook 2013 Early Release



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

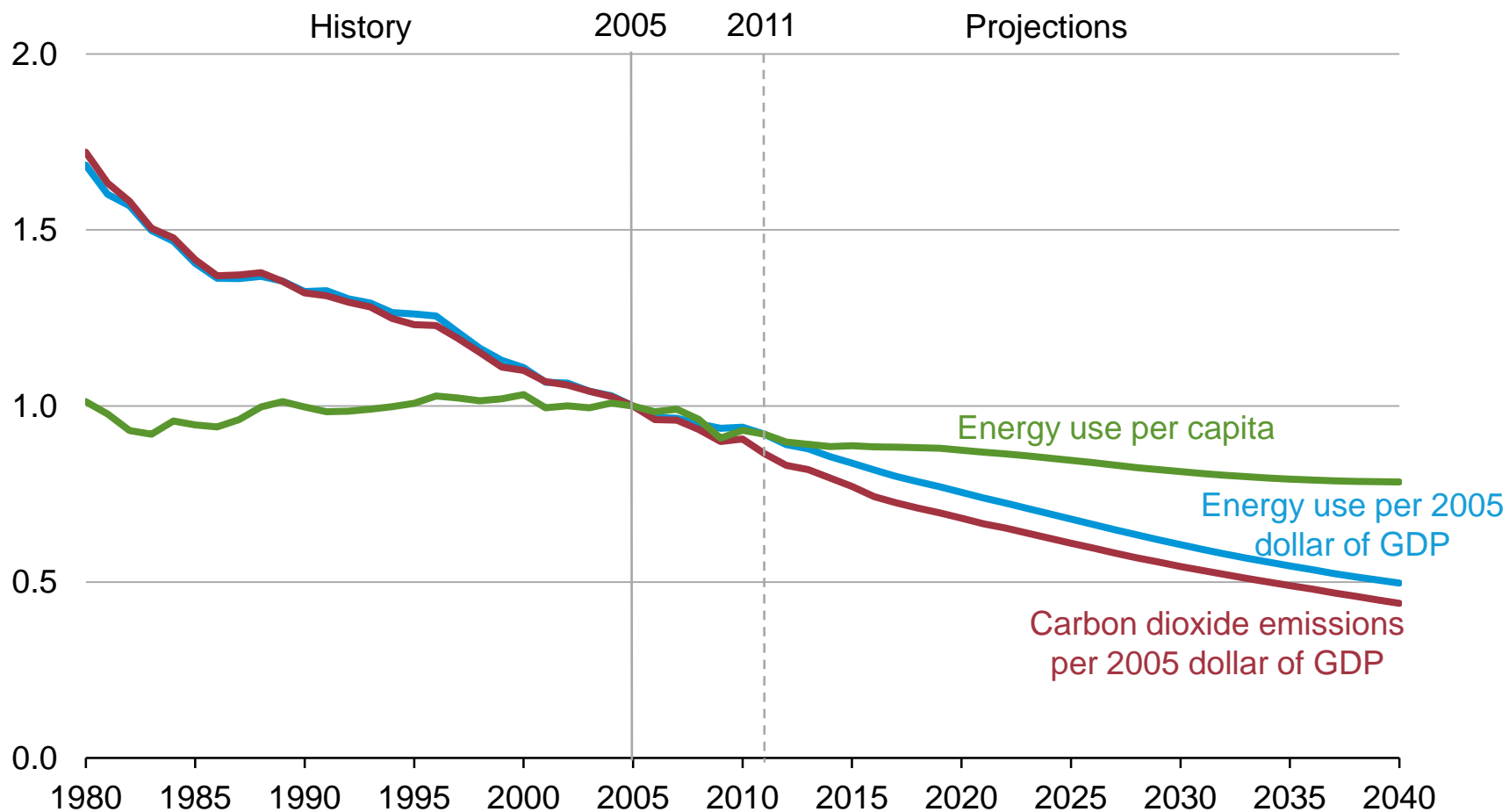
Non-hydropower renewable generation  
billion kilowatthours per year



Source: EIA, Annual Energy Outlook 2013 Early Release

# Energy and CO<sub>2</sub> per dollar of GDP continue to decline; per-capita energy use also declines

Energy and emission intensity  
index, 2005=1

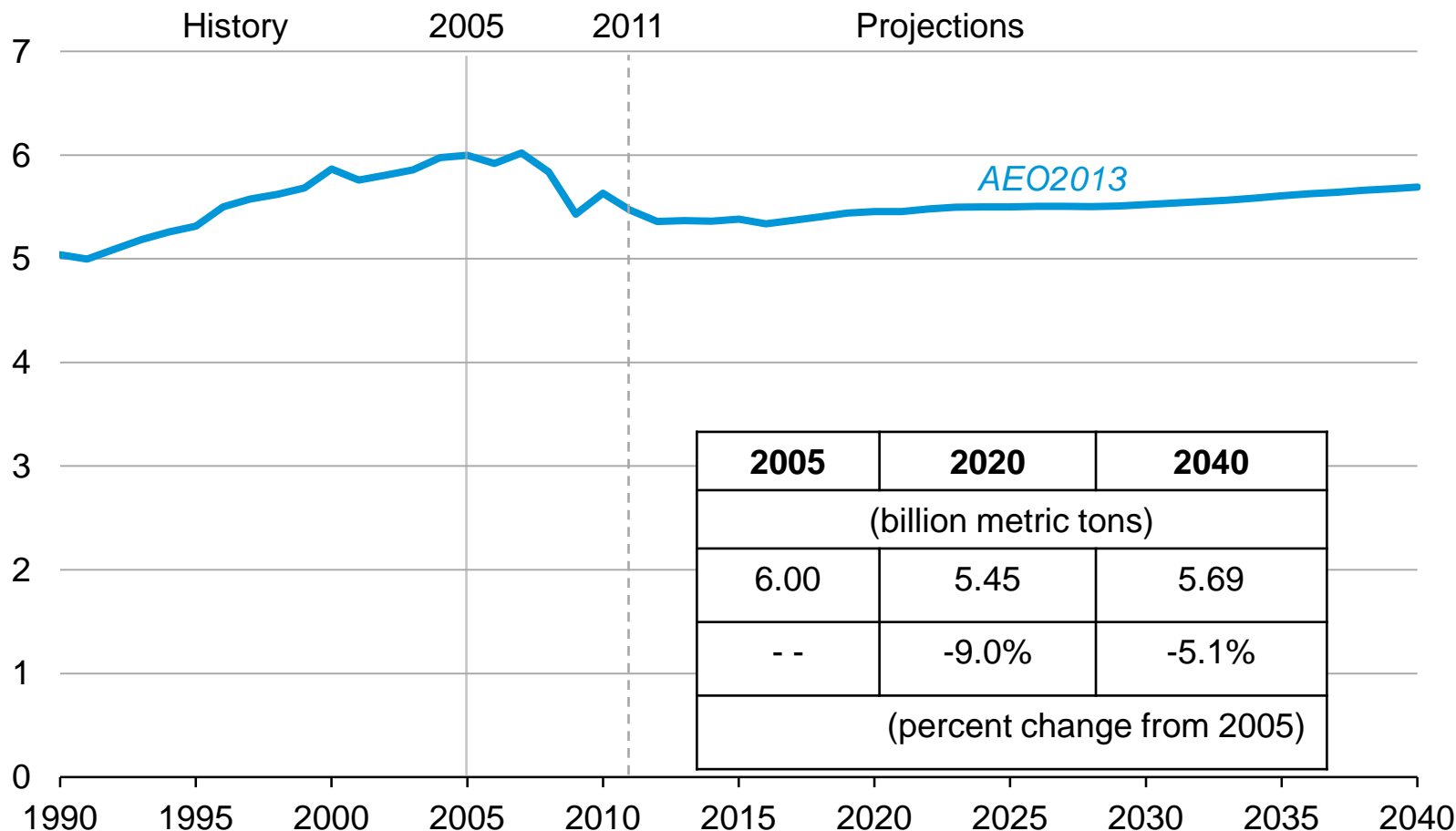


Source: EIA, Annual Energy Outlook 2013 Early Release

# In the *AEO2013* Reference case, energy-related CO<sub>2</sub> 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](http://www.eia.gov)

Annual Energy Outlook | [www.eia.gov/forecasts/aeo](http://www.eia.gov/forecasts/aeo)

Short-Term Energy Outlook | [www.eia.gov/forecasts/steo](http://www.eia.gov/forecasts/steo)

International Energy Outlook | [www.eia.gov/forecasts/ieo](http://www.eia.gov/forecasts/ieo)

Today In Energy | [www.eia.gov/todayinenergy](http://www.eia.gov/todayinenergy)

Monthly Energy Review | [www.eia.gov/totalenergy/data/monthly](http://www.eia.gov/totalenergy/data/monthly)

Annual Energy Review | [www.eia.gov/totalenergy/data/annual](http://www.eia.gov/totalenergy/data/annual)