

International Energy Outlook



For

Deloitte Oil and Gas Conference

November 18, 2014 | Houston, TX

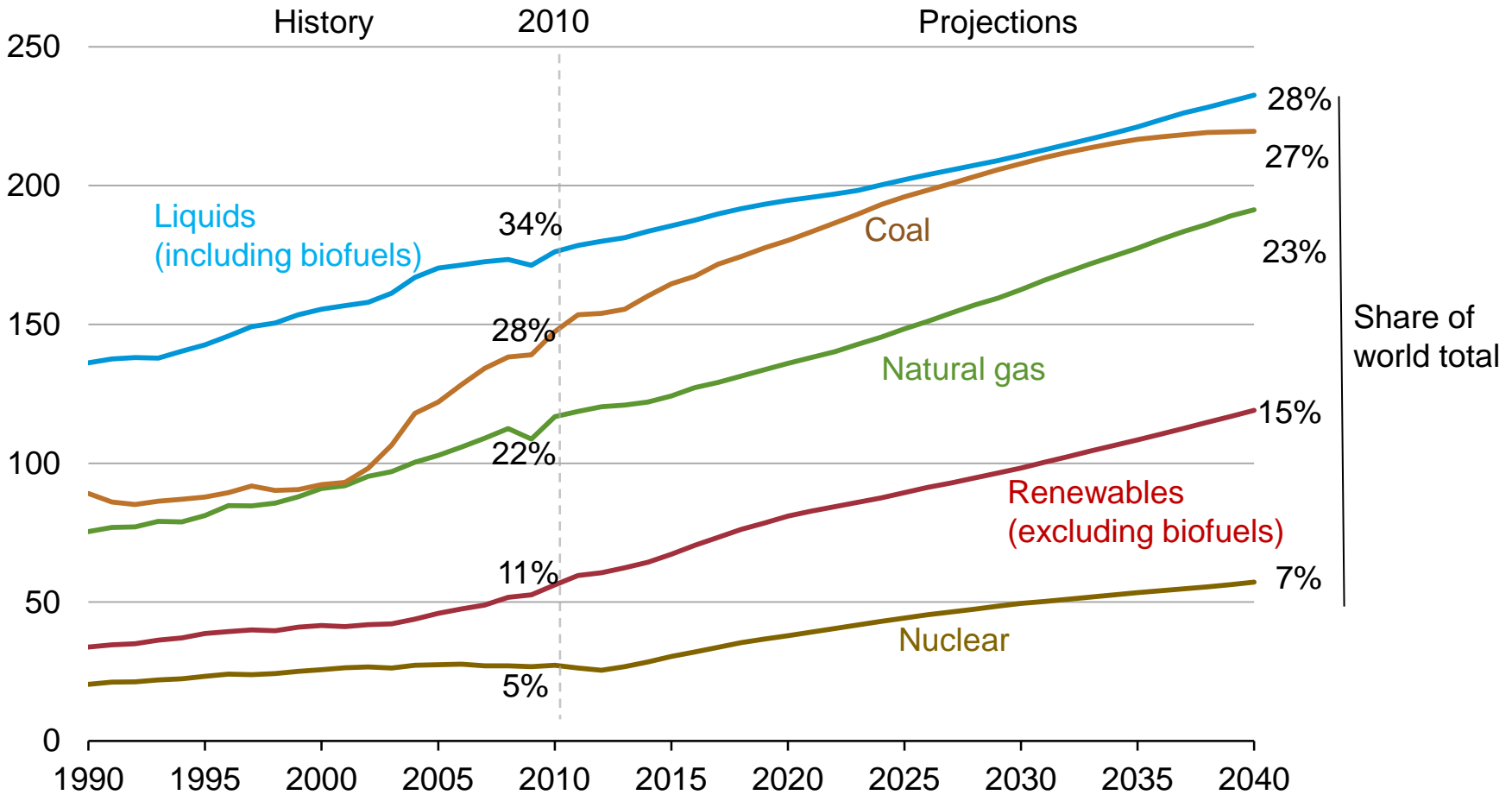
By

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U.S. Energy Information Administration

Renewable energy and nuclear power are the fastest growing sources of energy consumption; oil still dominates

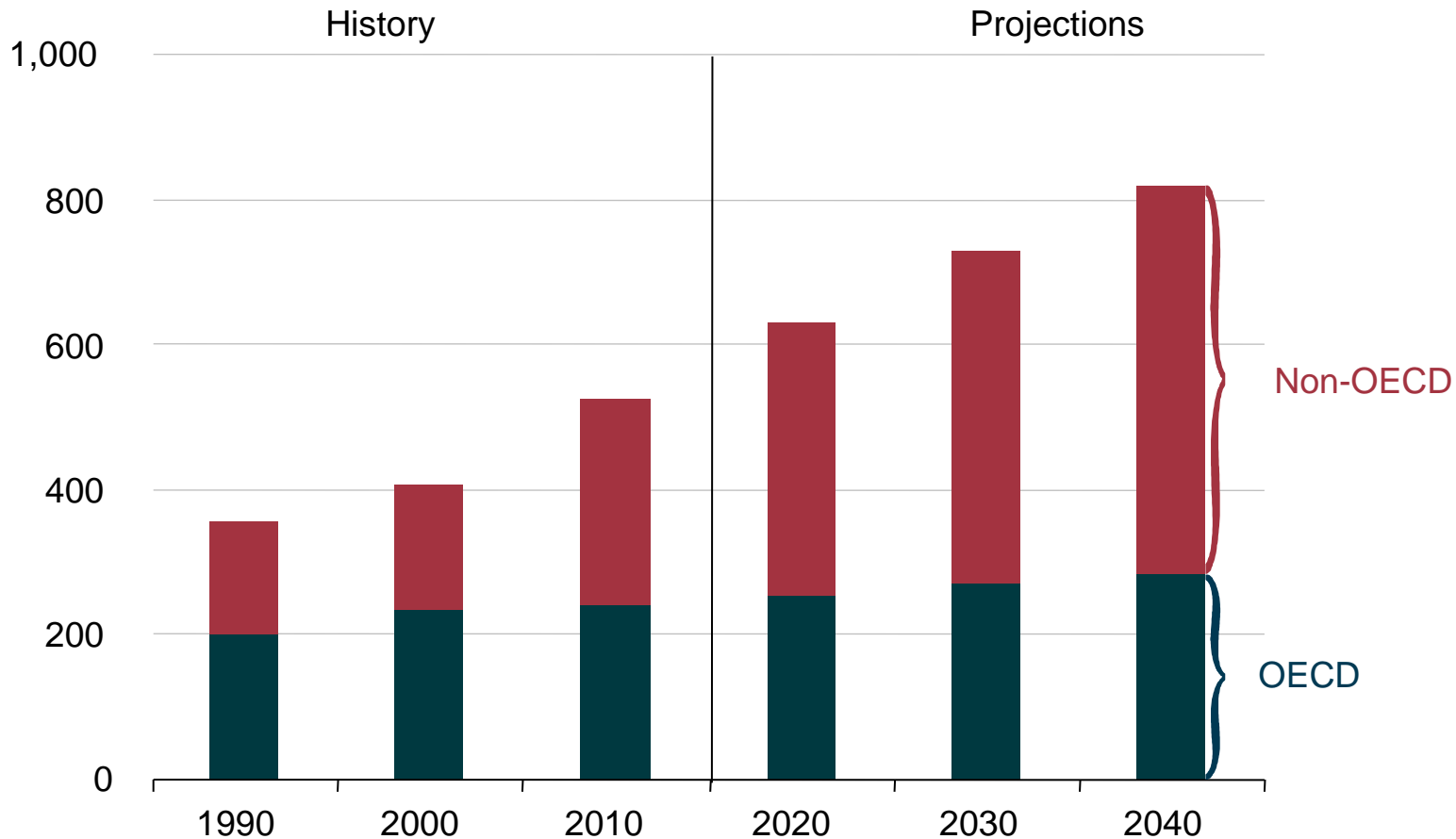
world energy consumption by fuel
quadrillion Btu



Source: EIA, International Energy Outlook 2013

World energy consumption growth is concentrated in non-OECD countries

world energy consumption, 1990-2040
quadrillion Btu

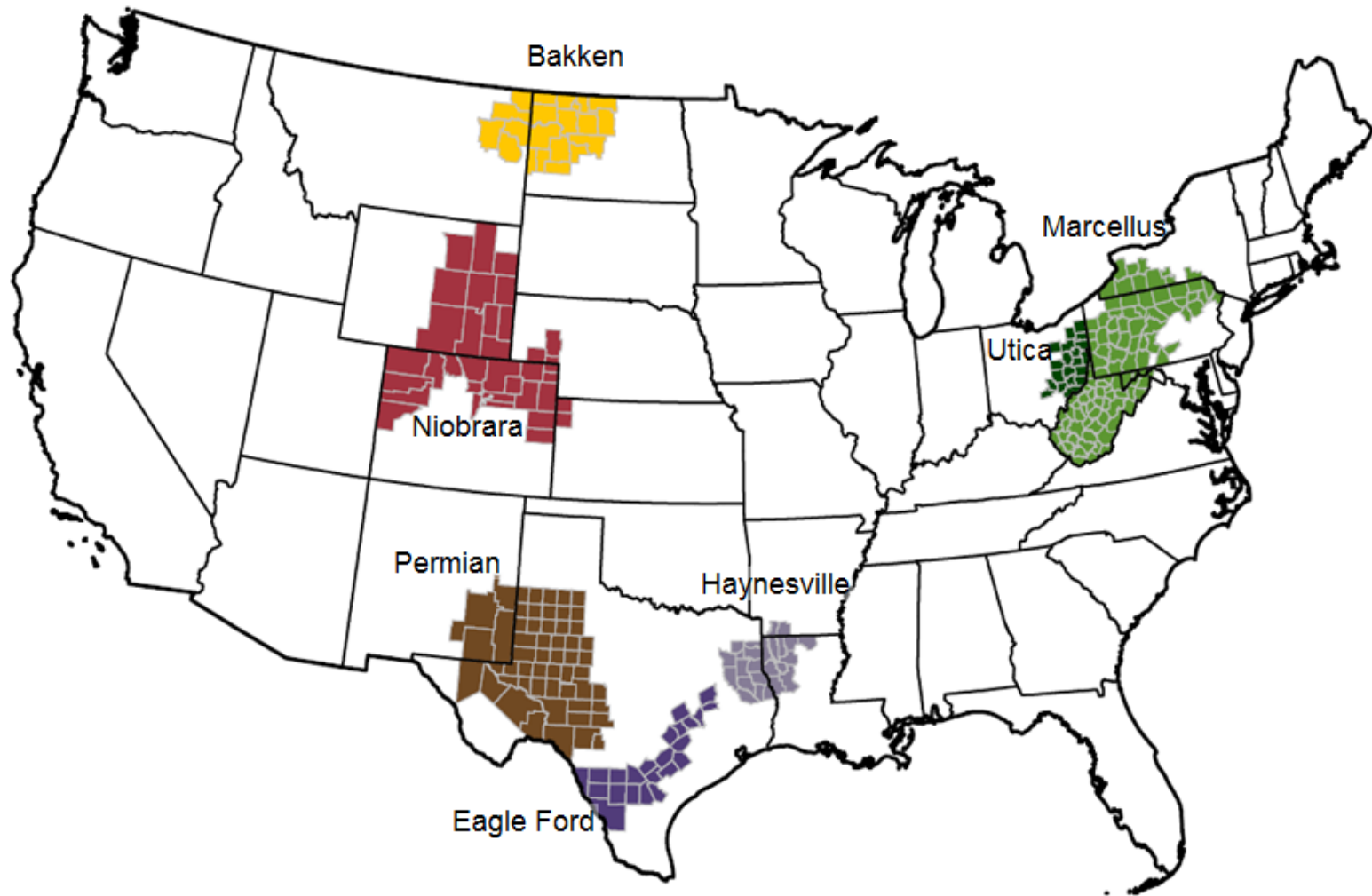


Source: EIA, International Energy Outlook 2013

Results from the IEO2014 Reference case

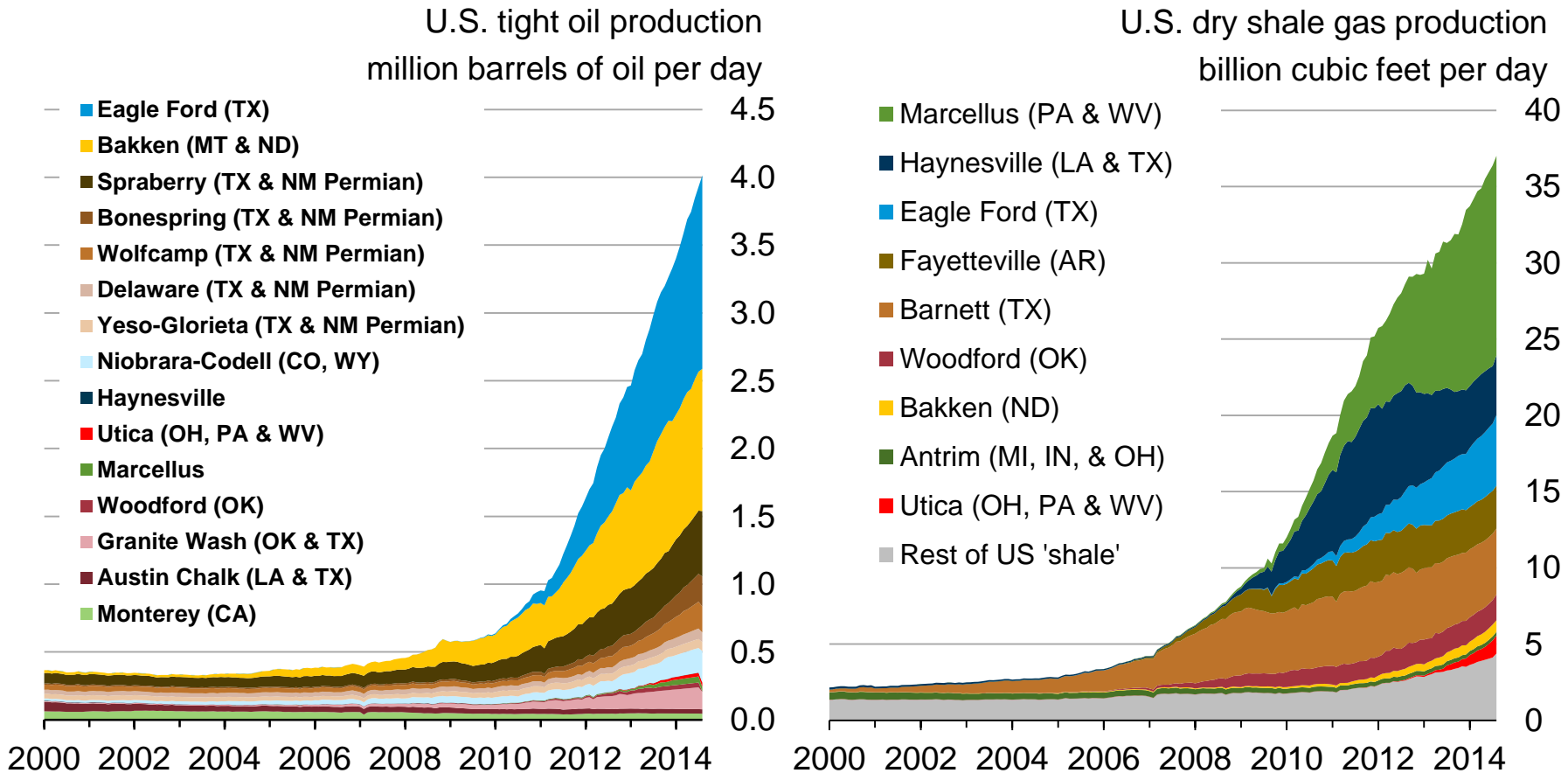
- World petroleum and other liquid fuels use increases by 38% between 2010 and 2040, all in the non-OECD
- Developing Asia (including China and India) and the Middle East account for 85% of the increase
- Increased demand requires 33 MMbbl/d of additional liquid fuels supplies to reach 119 MMb/d by 2040
 - OPEC crude and lease condensate increases by 14 MMbbl/d
 - Non-OPEC crude and lease condensate increases by 10 MMbbl/d
- Other liquid supplies (from NGPL, biofuels, CTL, GTL, and refinery gain) grow in importance, supplying 17% of total liquids production by 2040

These seven regions accounted for 95% of U.S. oil production growth and all U.S. natural gas production growth from 2011-2013



Source: EIA, Drilling Productivity Report

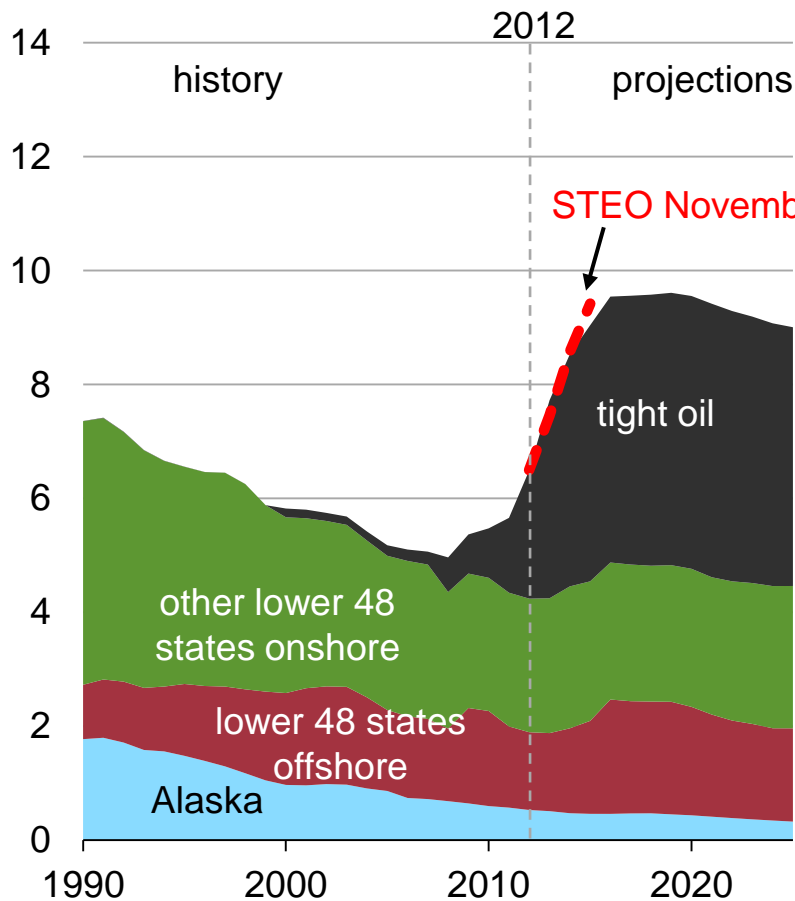
The U.S. has experienced a rapid increase in natural gas and oil production from shale and other tight resources



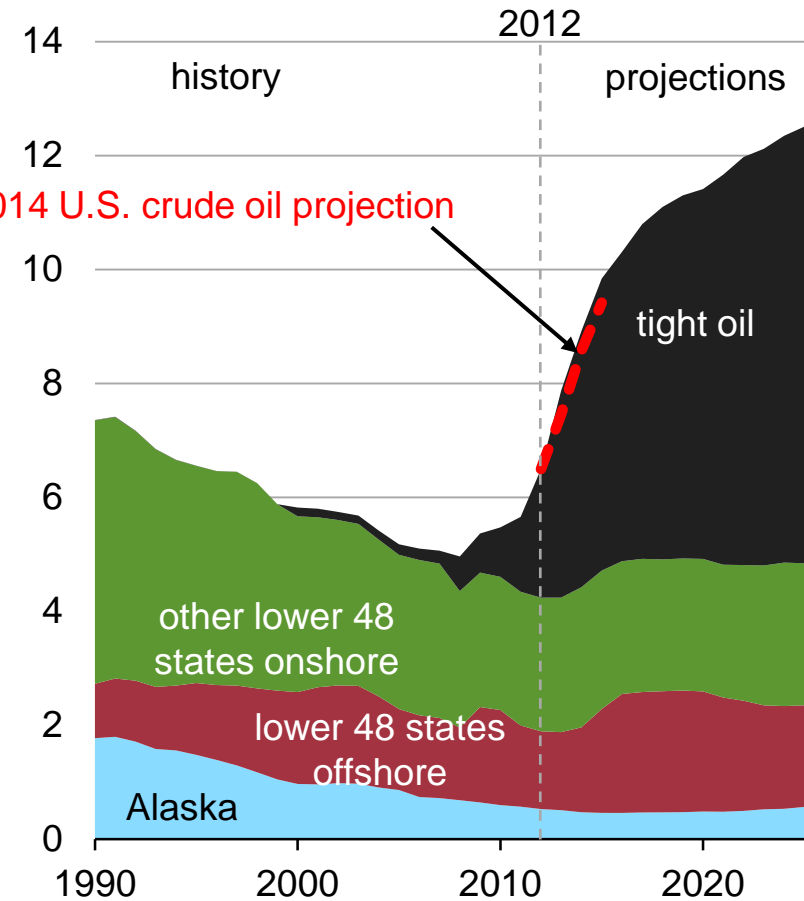
Sources: EIA derived from state administrative data collected by DrillingInfo Inc. Data are through August 2014 and represent EIA's official tight oil & shale gas estimates, but are not survey data. State abbreviations indicate primary state(s).

Resource and technology assumptions have major implications for projected U.S. crude oil production beyond the next few years

Reference case
million barrels per day



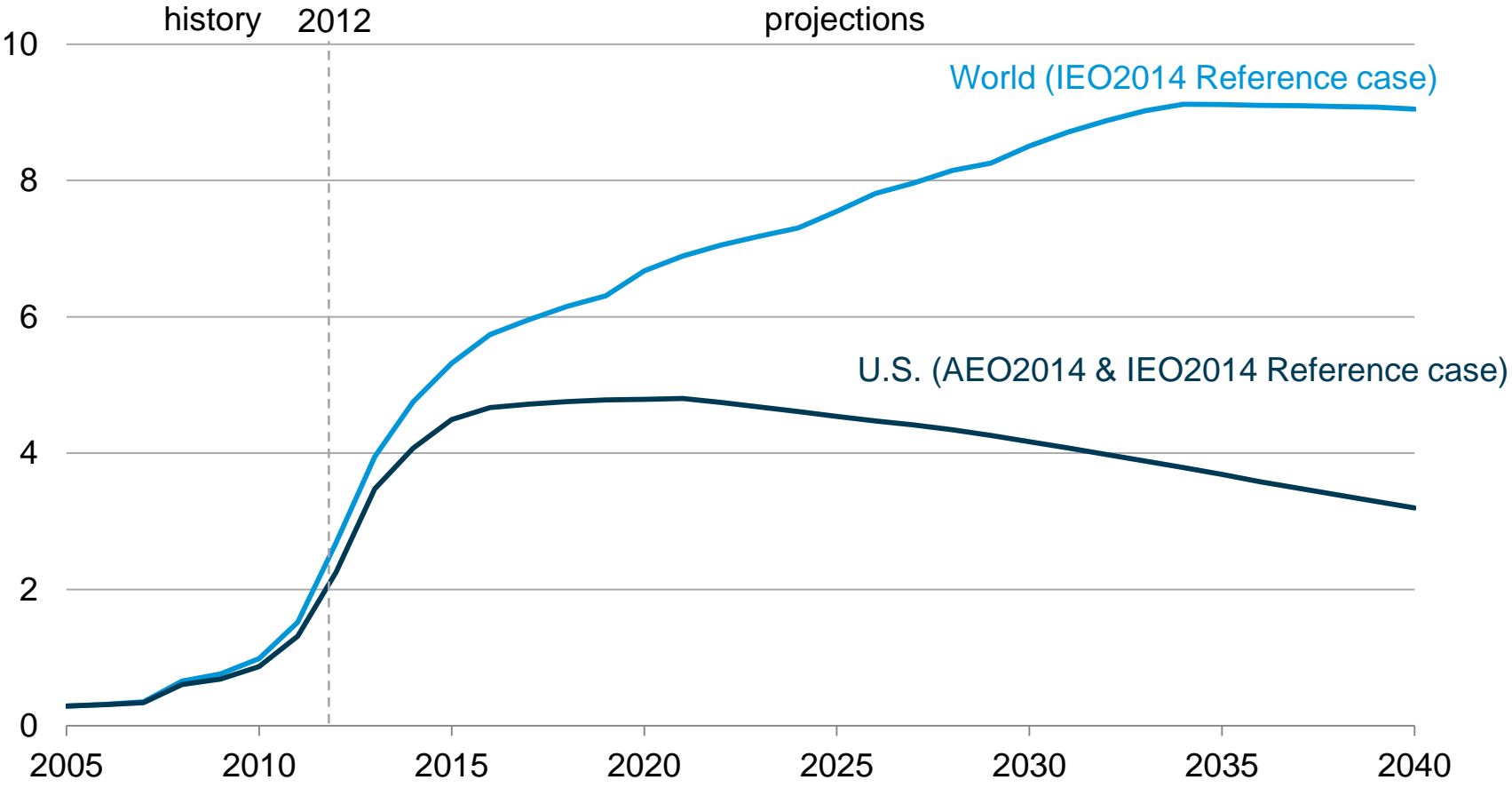
High Oil and Gas Resource case
million barrels per day



Source: EIA, Annual Energy Outlook 2014; Short Term Energy Outlook, November 2014

EIA Reference scenario shows world tight oil production increasing to almost 8 million b/d in 2025

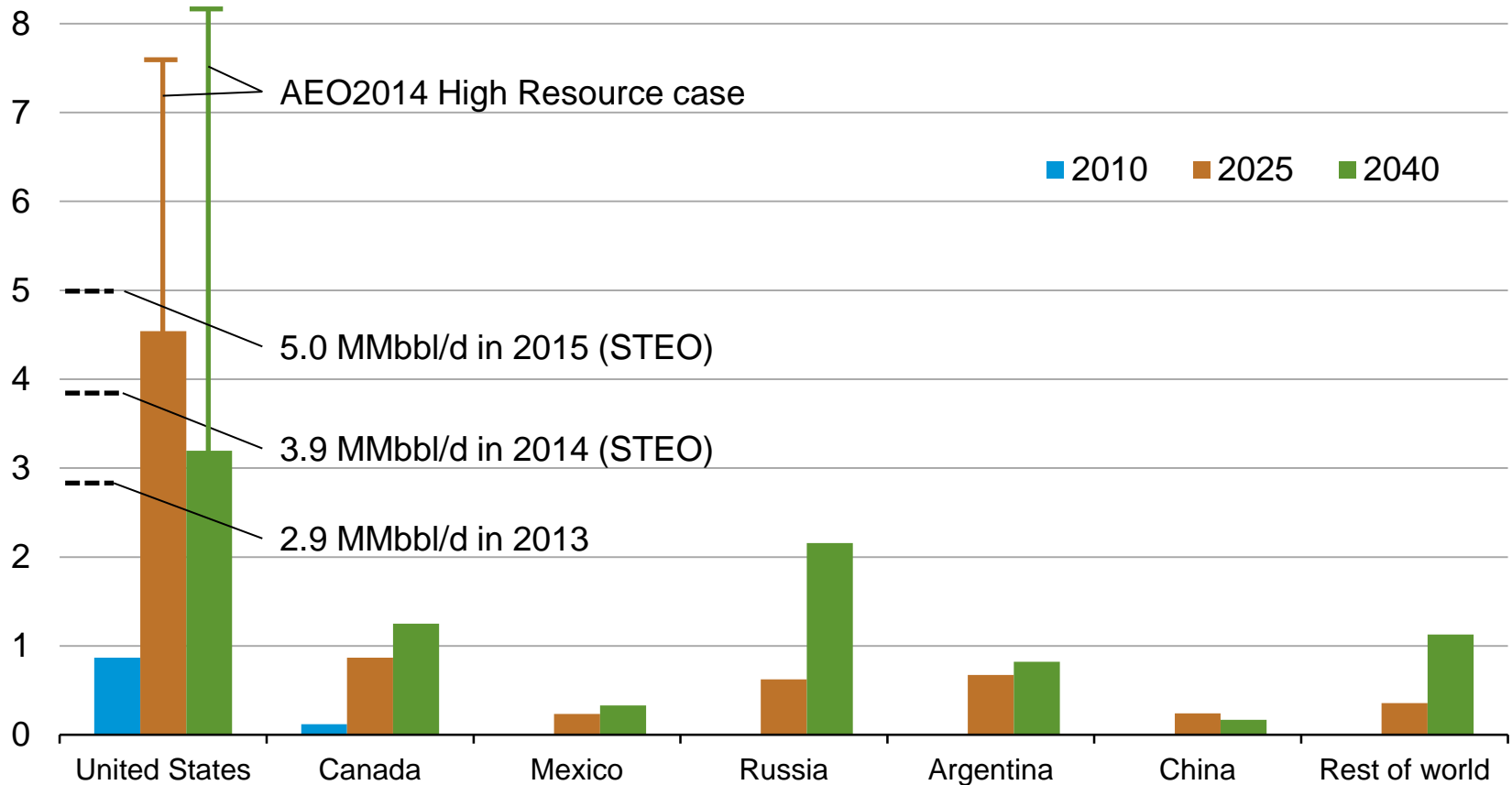
tight oil production
million barrels per day



Source: EIA, Annual Energy Outlook 2014 and International Energy Outlook 2014

Tight oil production will spread to nations outside of the United States and Canada over the projection

tight oil production, Reference case
million barrels per day

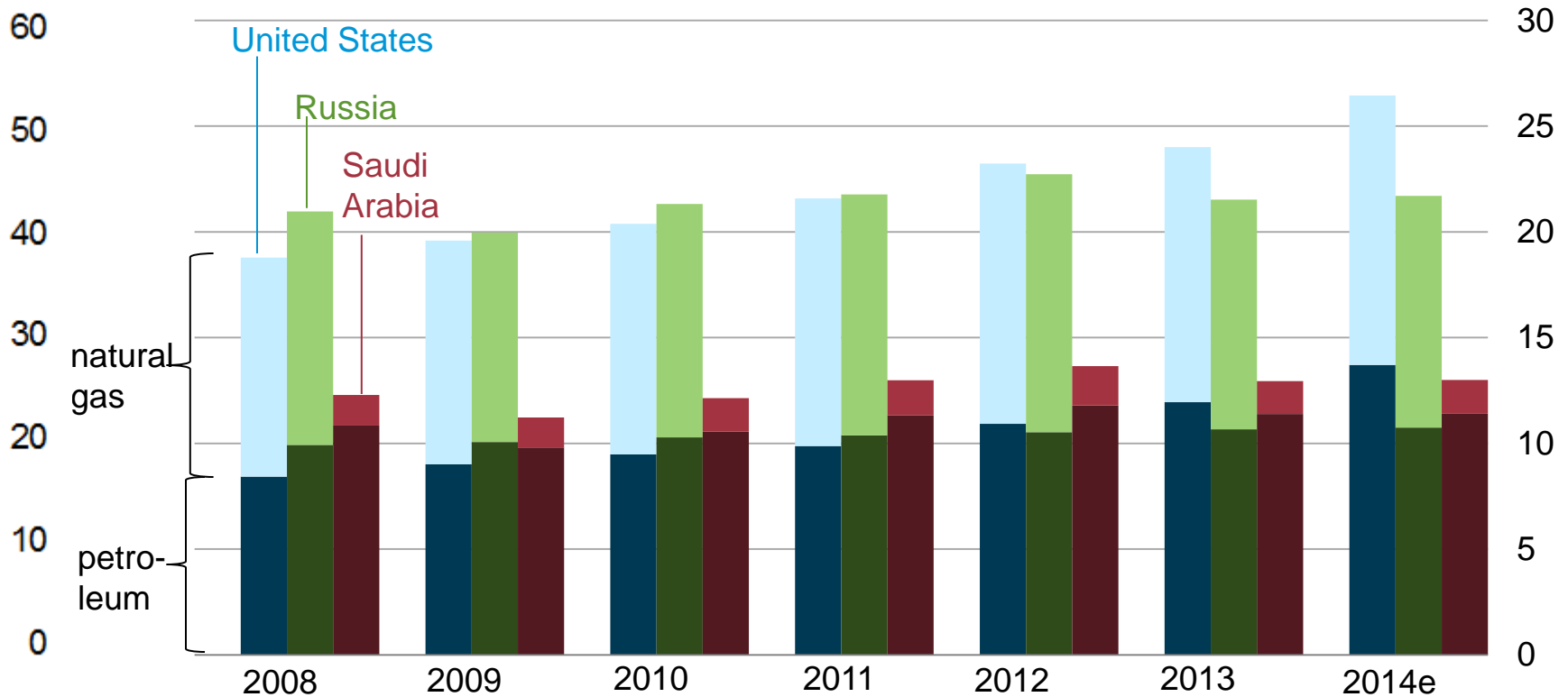


Source: EIA, International Energy Outlook 2014

U.S. is the largest producer of petroleum and natural gas in the world

estimated U.S., Russia, and Saudi Arabia petroleum and natural gas production
quadrillion Btu

million barrels per day of oil equivalent

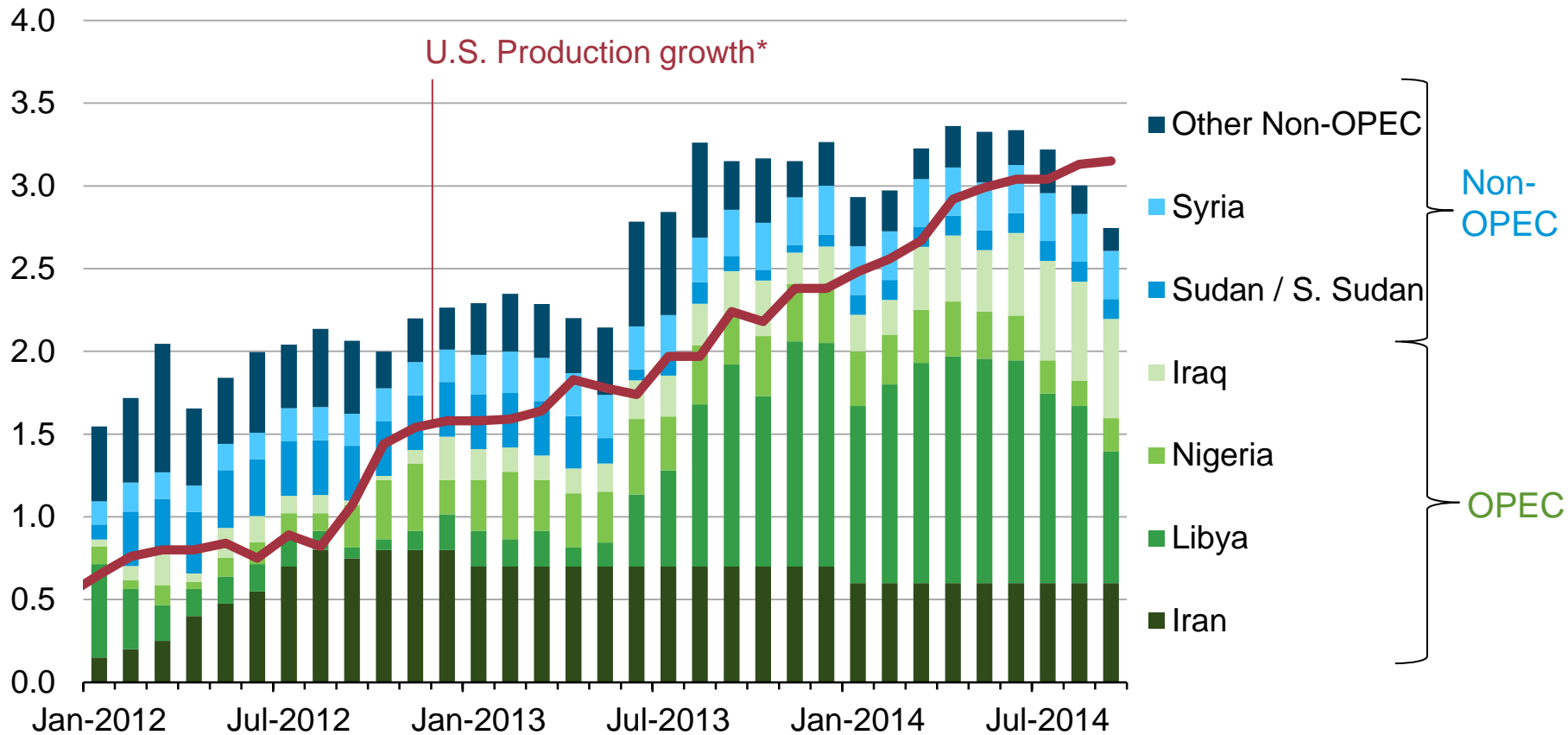


Source: U.S. Energy Information Administration

Note: Petroleum production includes crude oil, natural gas liquids, condensates, refinery processing gain, and other liquids, including biofuels; barrels per day oil equivalent were calculated using a conversion factor of 1 barrel oil equivalent=5.55 million British thermal units (Btu)

U.S. oil production growth helping to offset unplanned outages

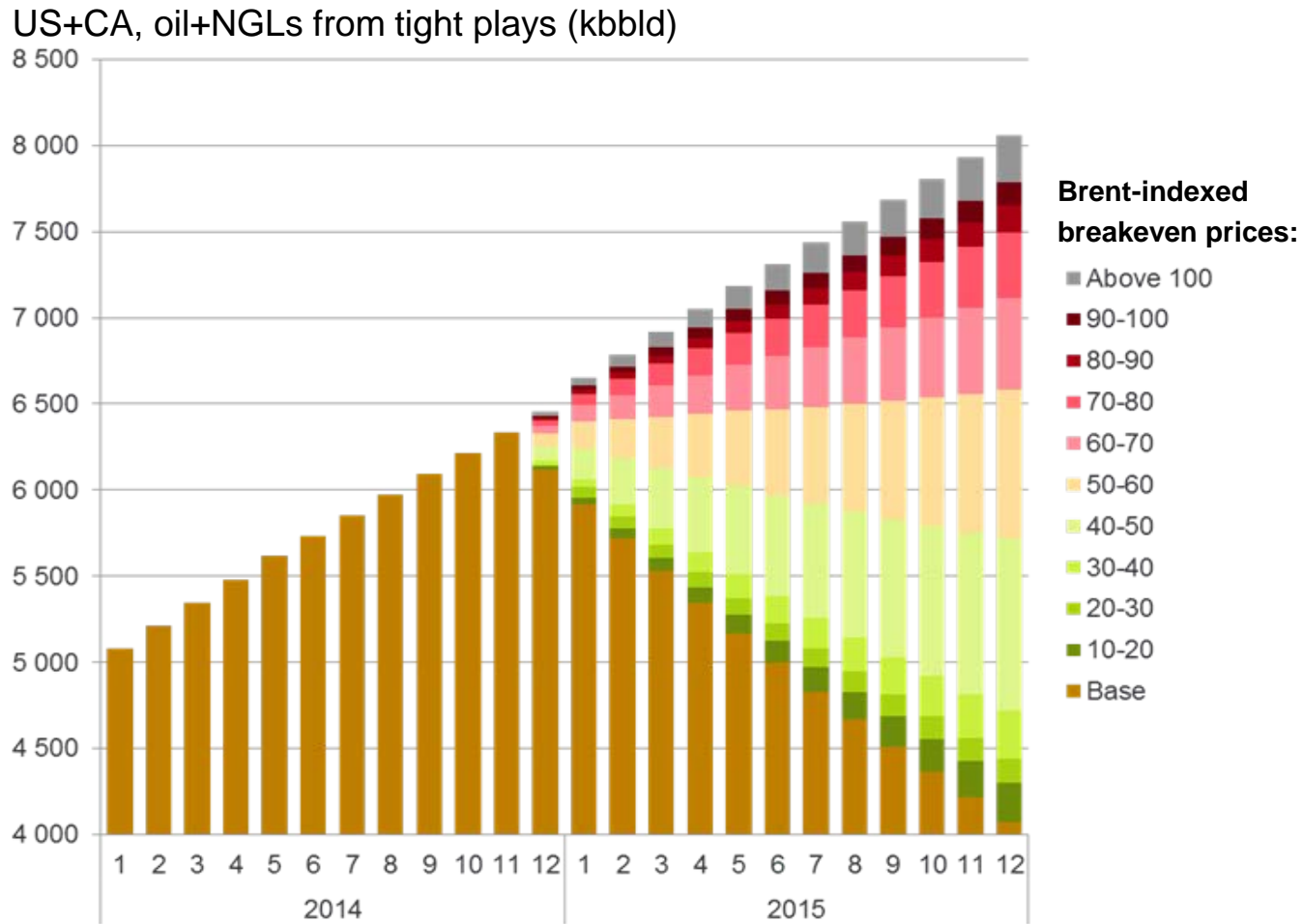
estimated unplanned crude oil production outages
million barrels per day



Source: EIA, Short-Term Energy Outlook, November 2014

*monthly production delta versus Jan. 2011 production level

Effect of low oil prices on U.S. shale oil production



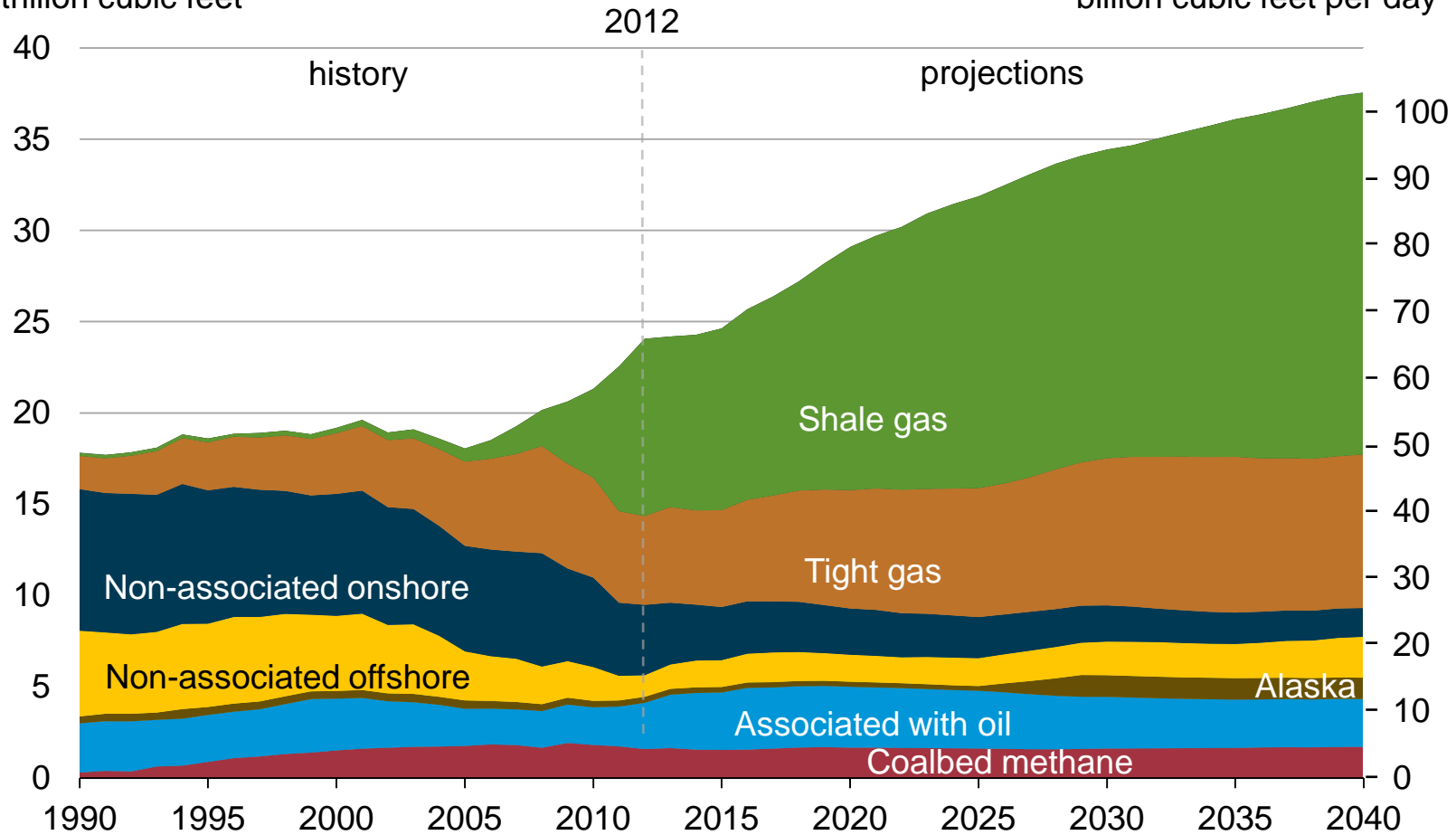
Source: Rystad Energy North America Quarterly Shale Report

U.S. shale gas leads growth in total gas production through 2040, when production exceeds 100 billion cubic feet per day

U.S. dry natural gas production

trillion cubic feet

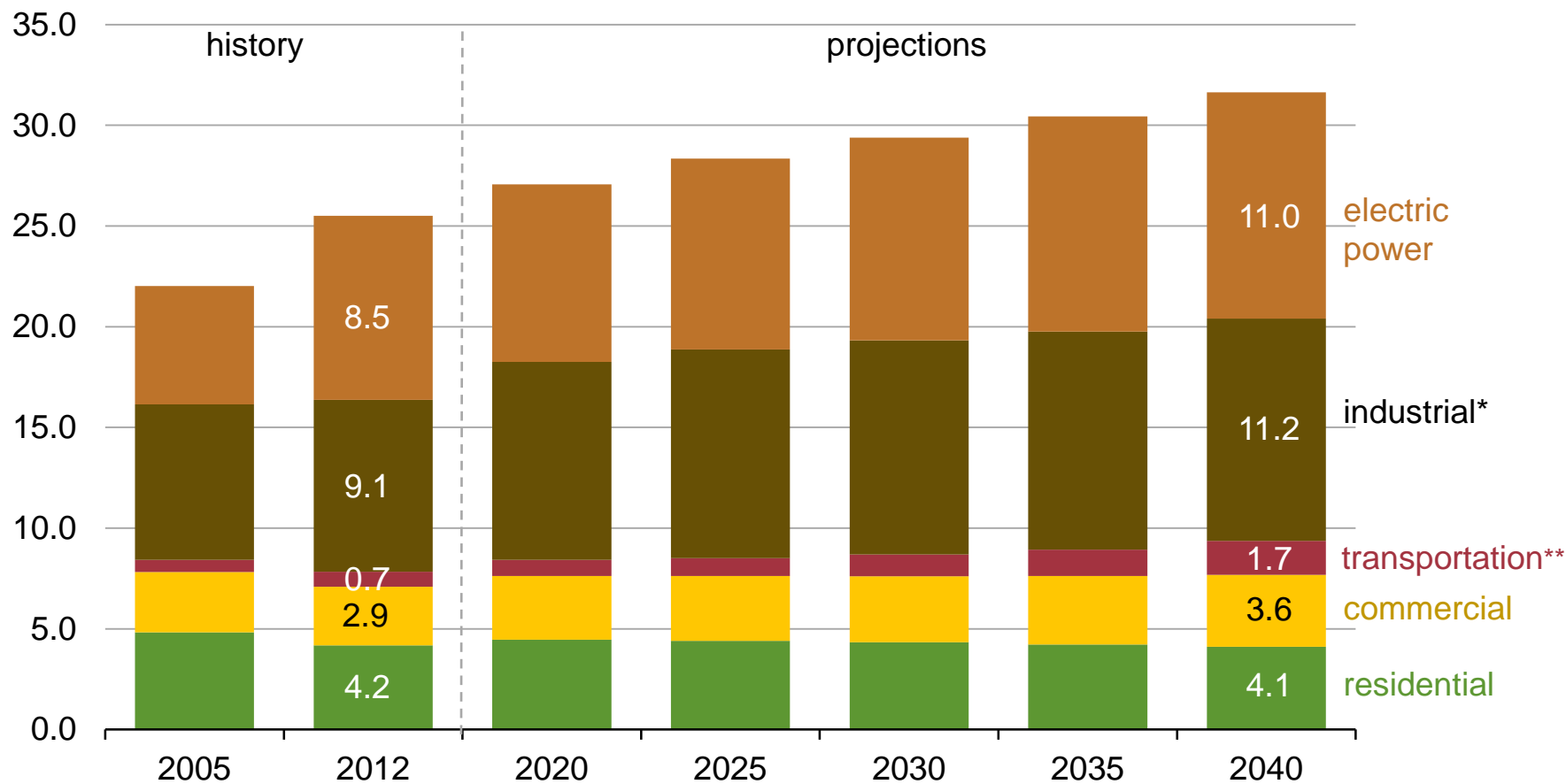
billion cubic feet per day



Source: EIA, Annual Energy Outlook 2014, Reference case

Natural gas consumption growth is driven by electric power, industrial, and transportation use

U.S. dry gas consumption
trillion cubic feet



Source: EIA, Annual Energy Outlook 2014, Reference case

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

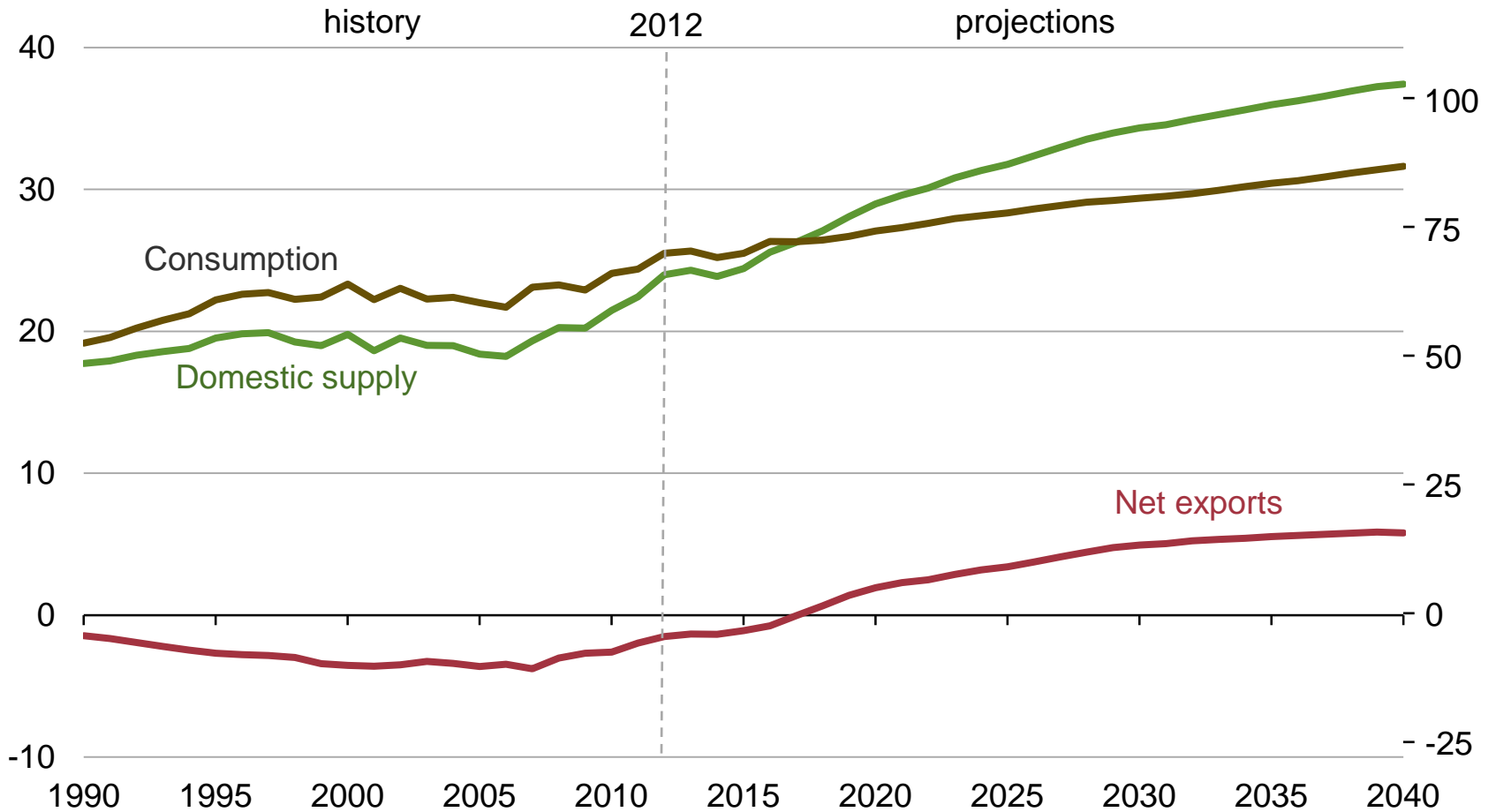
**Includes pipeline fuel

U.S. becomes a net exporter of natural gas in the near future

U.S. dry natural gas

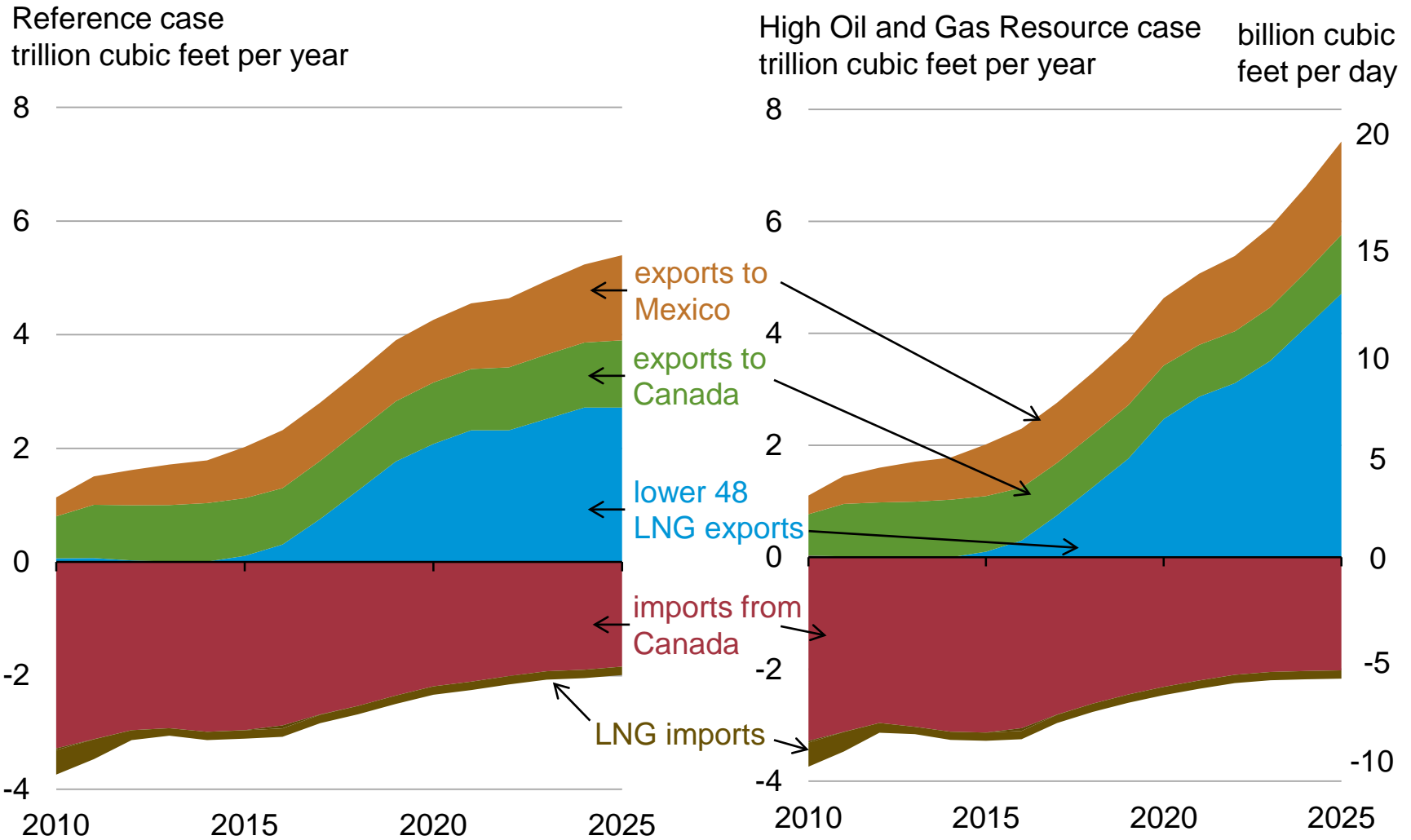
trillion cubic feet per year

billion cubic feet per day



Source: EIA, Annual Energy Outlook 2014 Reference case

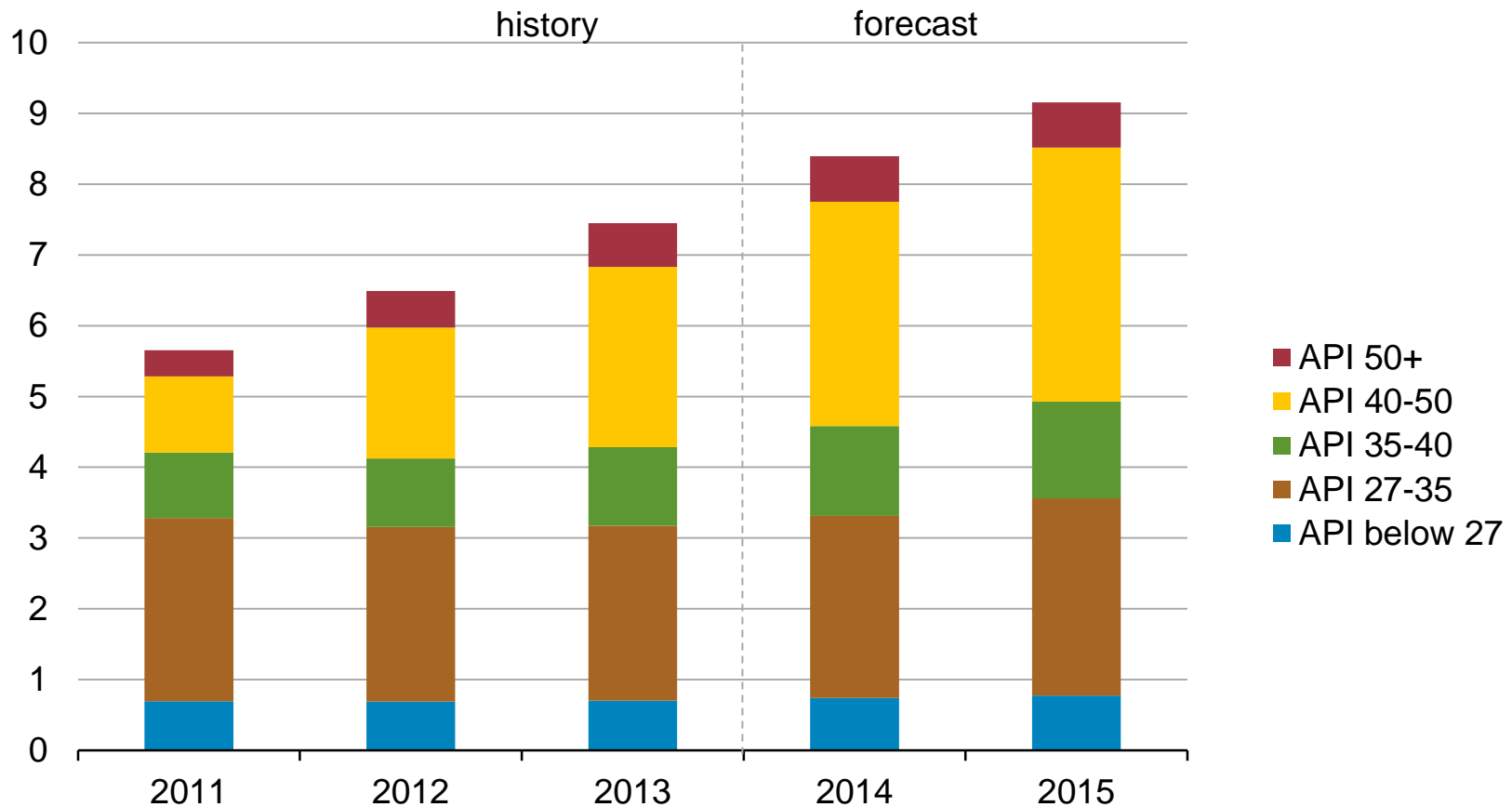
Projected U.S. natural gas trade depends on assumptions regarding resources and future technology advances



Source: EIA, Annual Energy Outlook 2014, Reference case and High Oil and Gas Resource case

Most of the growth in production between 2011 and 2015 consists of sweet grades with API gravity of 40 or above

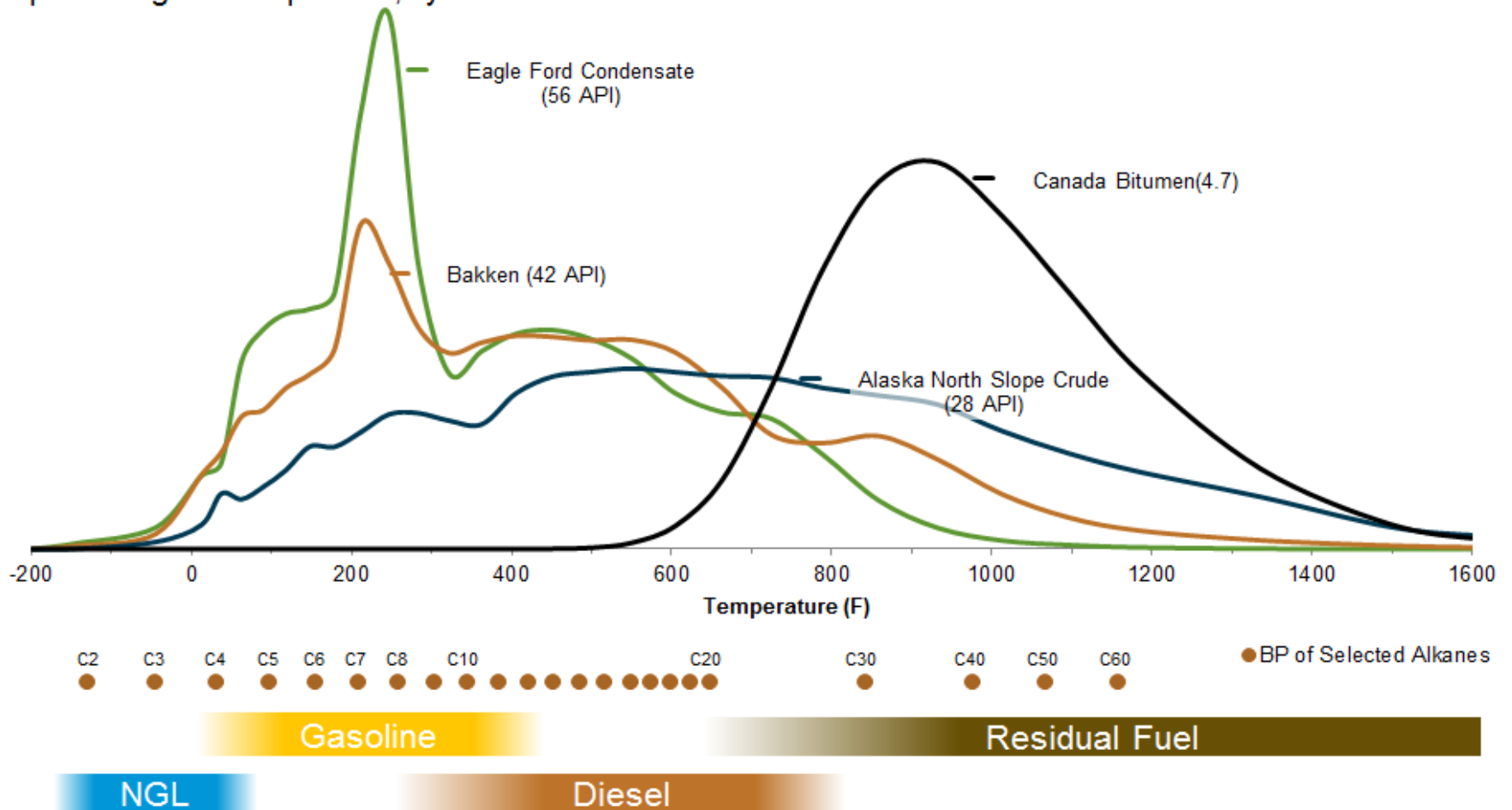
U.S. crude oil production by type
million barrels of oil per day



Source: EIA, DrillingInfo, Colorado DNR, Texas RRC. <http://www.eia.gov/analysis/petroleum/crudetypes/>

Crude oil and associated liquids contain a wide variety of hydrocarbons

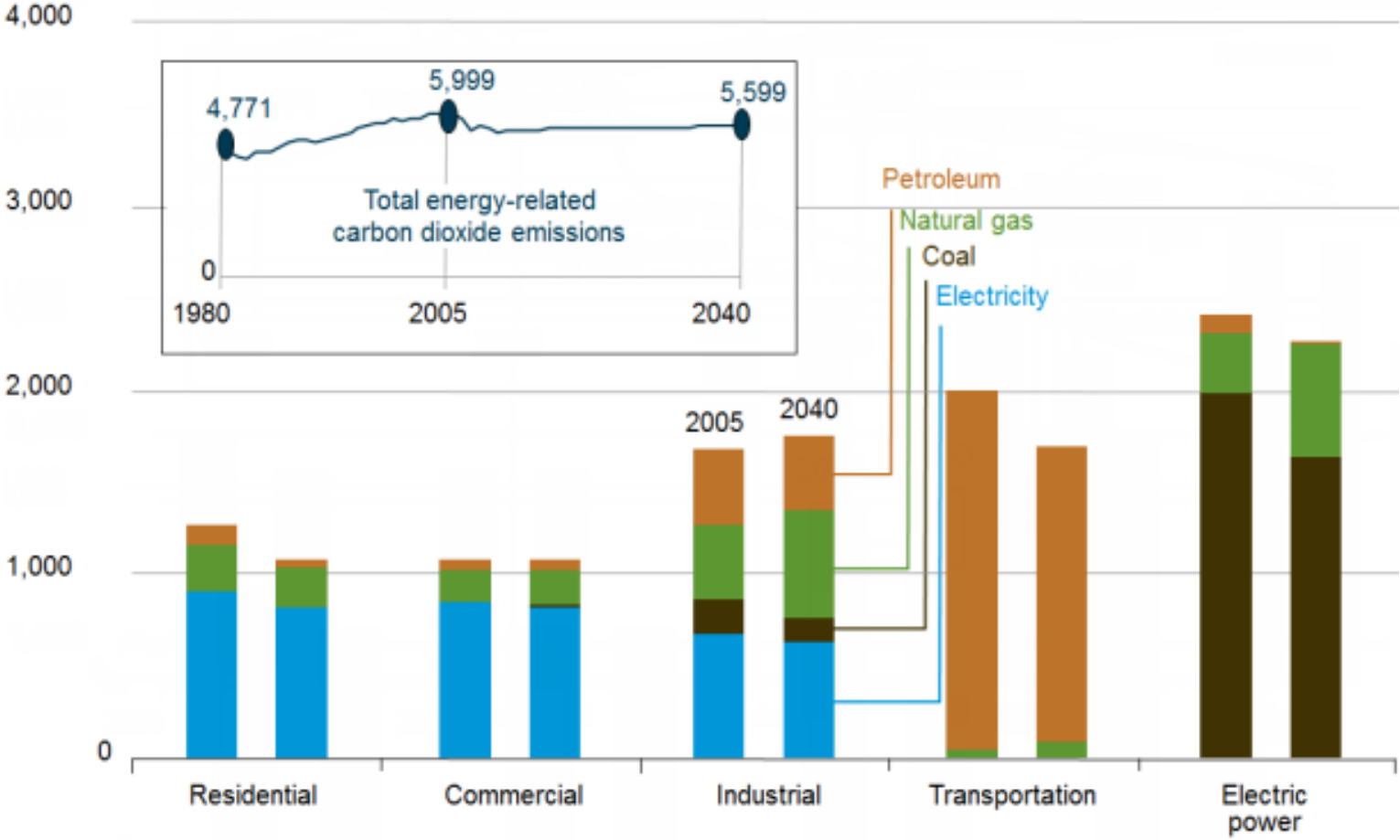
percentage of composition, by volume



Source: EIA via Harvey Crude Assay Management System

EIA projects declines in carbon dioxide emissions for all sectors except industrial relative to 2005

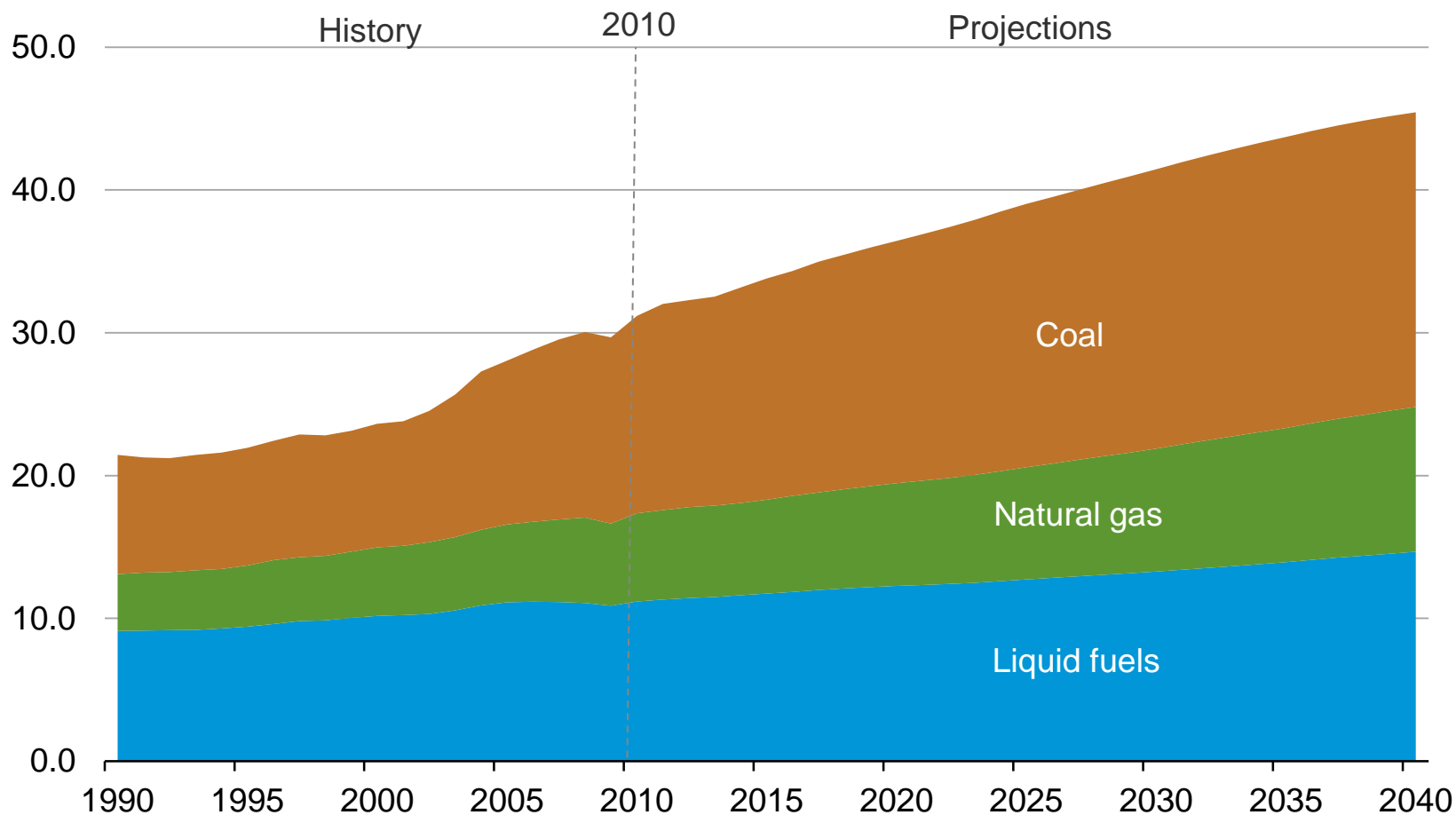
Figure MT-64. U.S. energy-related carbon dioxide emissions by sector and fuel in the Reference case, 2005 and 2040
million metric tons



Source: EIA Annual Energy Outlook 2014

Coal continues to account for the largest share of global energy-related carbon dioxide emissions throughout the projection

world energy-related carbon dioxide emissions by fuel
billion metric tons



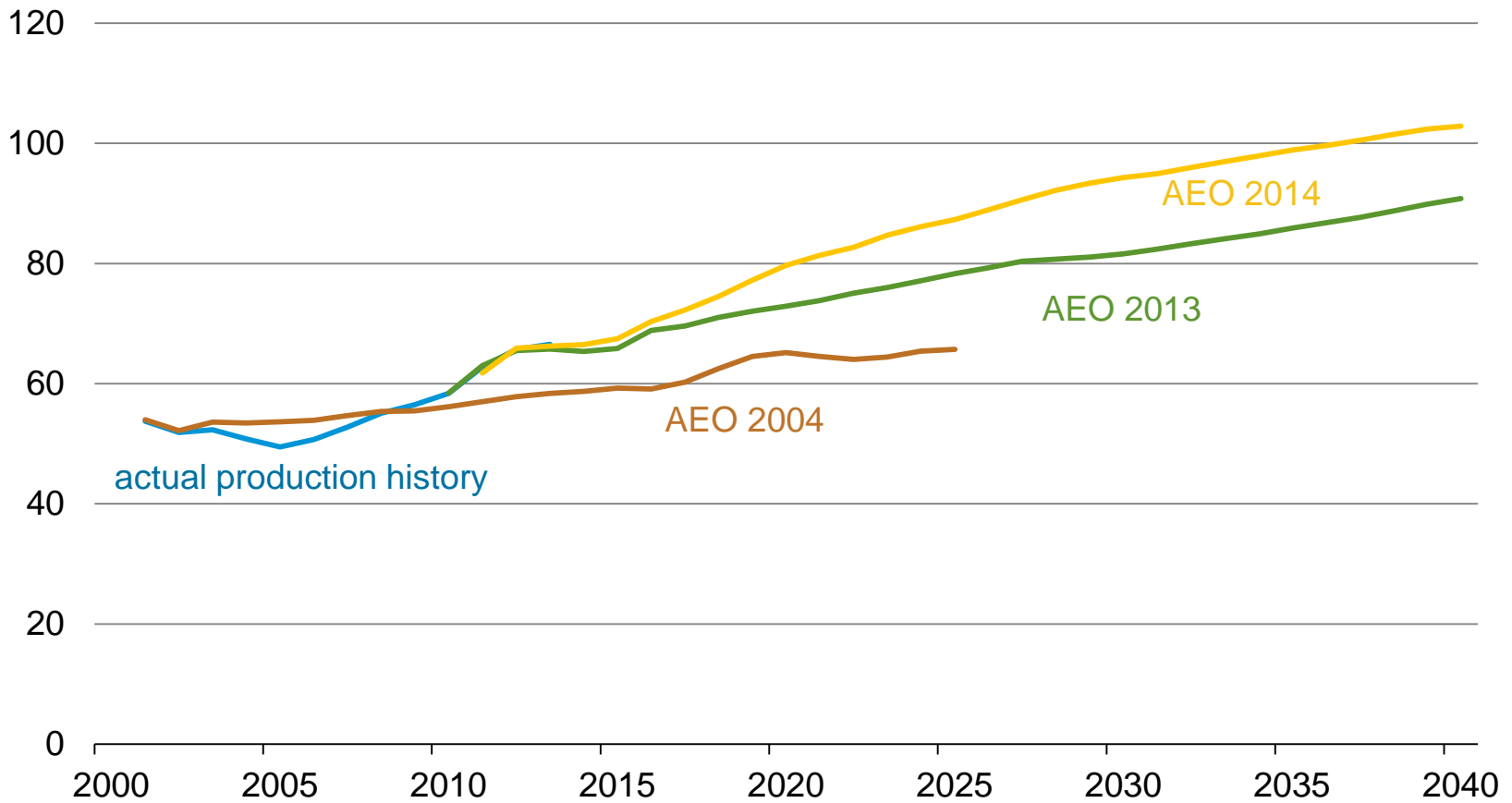
Source: EIA, International Energy Outlook 2013

Areas of uncertainty in the outlook

- Oil prices
- China's energy demand growth; particularly in transportation
- Increasing global trade of natural gas and hydrocarbon gas liquids in addition to oil
- Global development of tight oil and shale gas resources
- Policy decisions on crude oil exports
- Impact of geopolitical tensions on energy supply
- Constraints on CO₂

EIA natural gas production forecasts were revised up significantly between 2013 and 2014

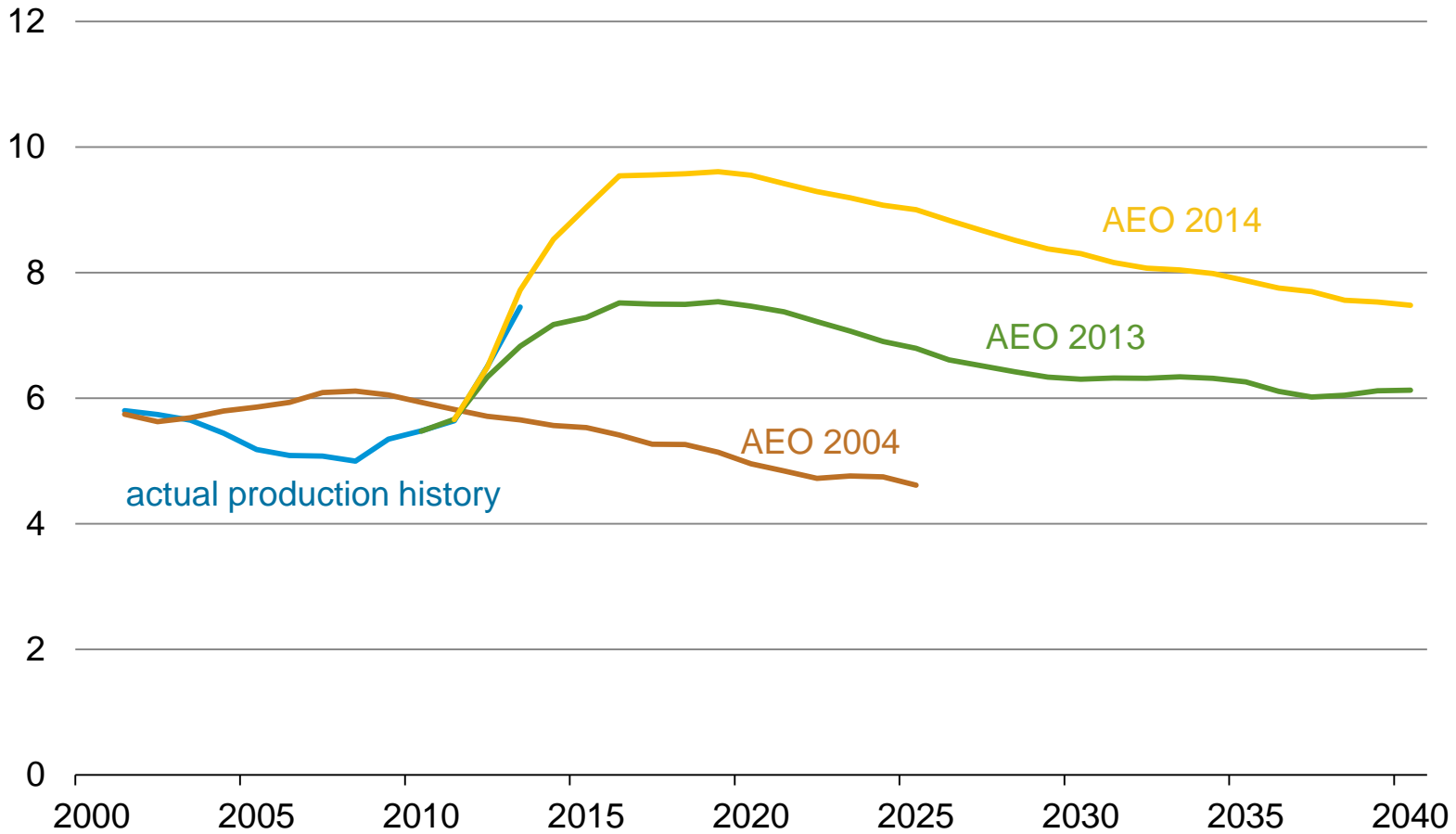
forecasted dry natural gas production
billion cubic feet per day



Source: EIA Annual Energy Outlook; EIA Monthly Natural Gas Production Report

EIA crude oil production forecasts were also revised up substantially between 2013 and 2014

forecasted crude oil production
million barrels per day



Source: EIA Annual Energy Outlook; EIA via state agencies

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 Portal | www.eia.gov/state

Drilling Productivity Report | www.eia.gov/petroleum/drilling/