

Natural Gas Markets: Recent Changes and Key Drivers



for

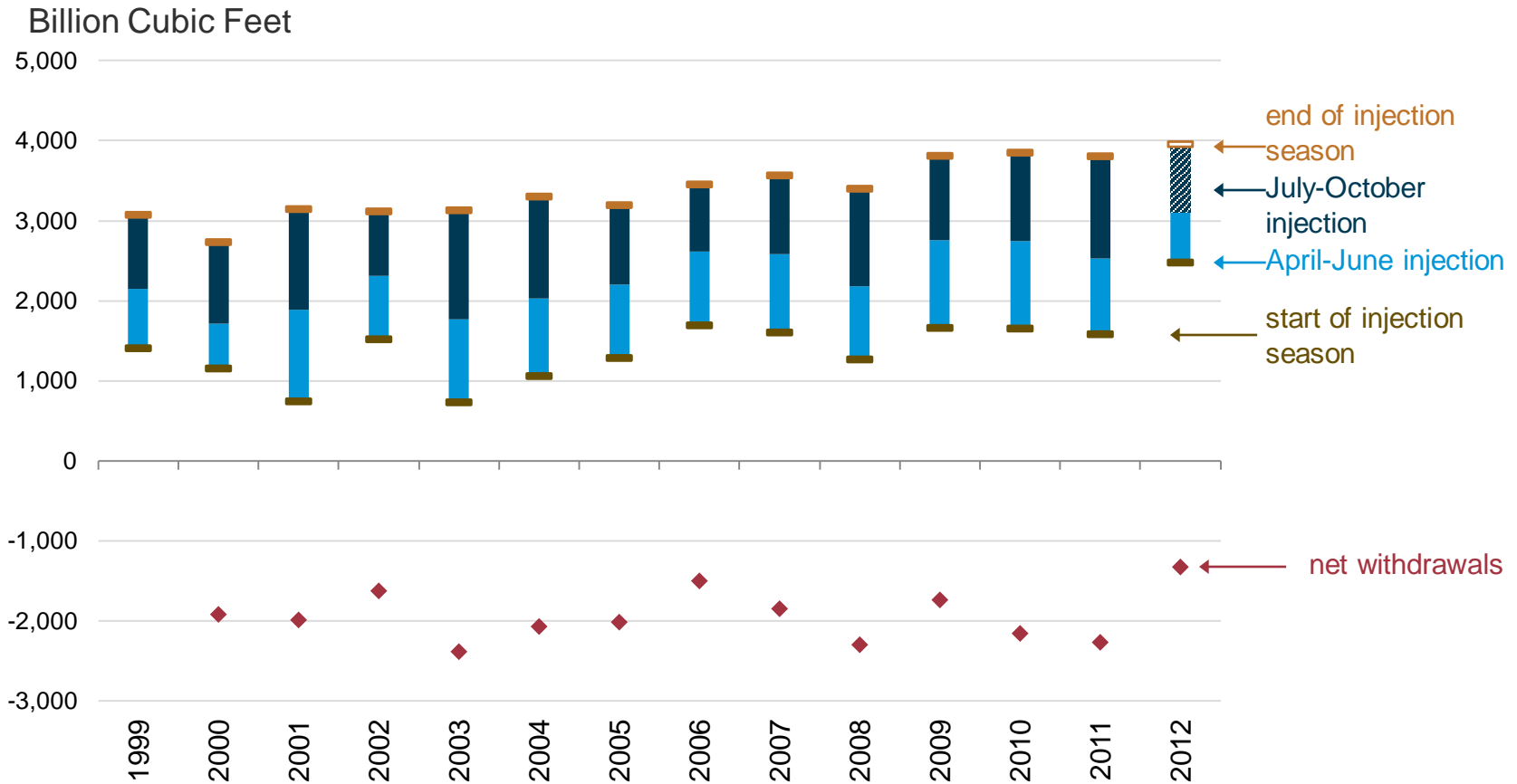
LDC Gas Forum

September 11, 2012/ Chicago, Il

by

Howard Gruenspecht, Deputy Administrator

U.S. Natural Gas Injection Season 1999-2012

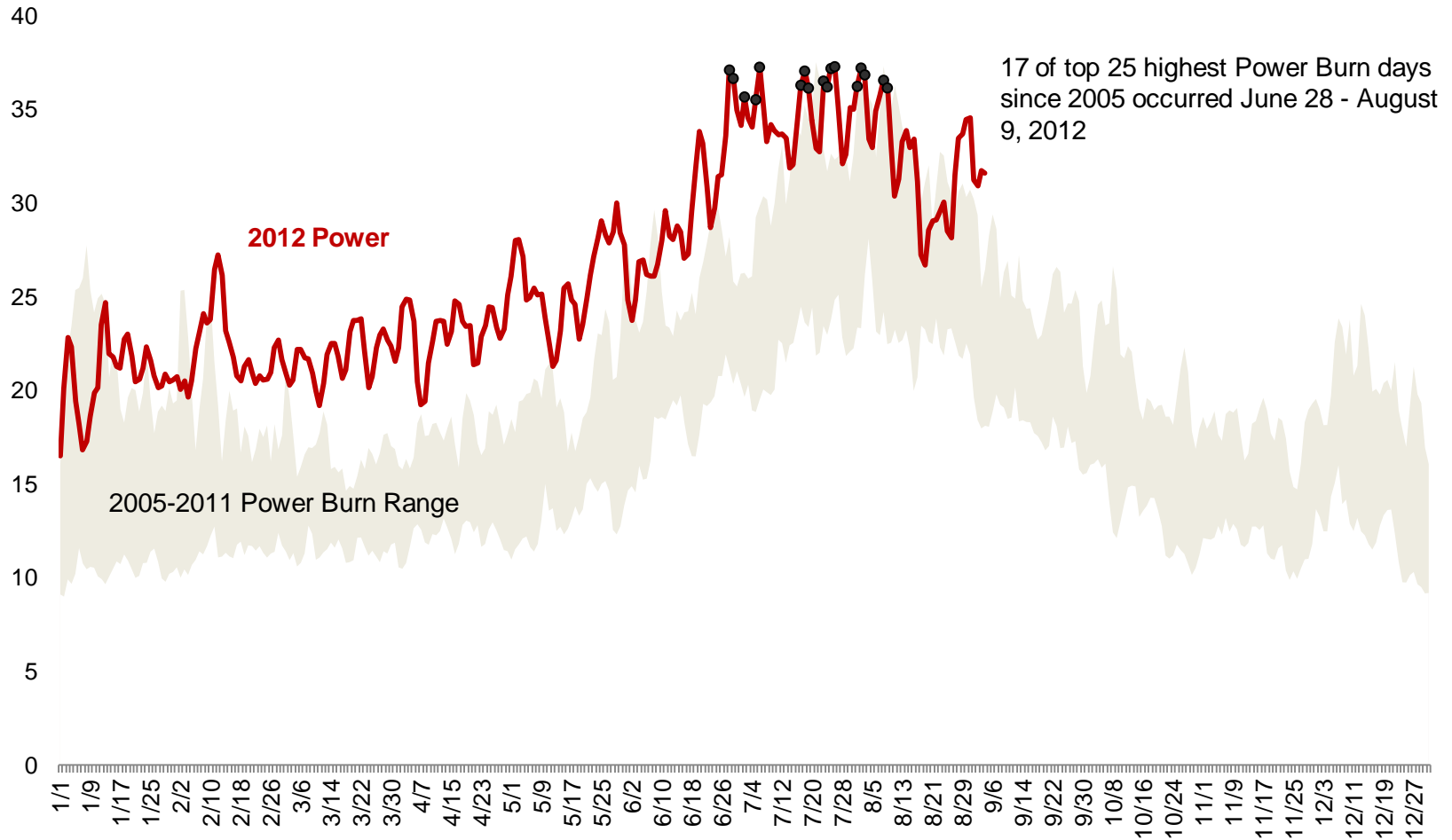


Note: Net withdrawals occur during the heating season following the prior injection season (for example the 2012 net withdrawals are the 2011 end of the season minus the 2012 start of season)

Source: U.S. Energy Information Administration Short Term Energy Outlook

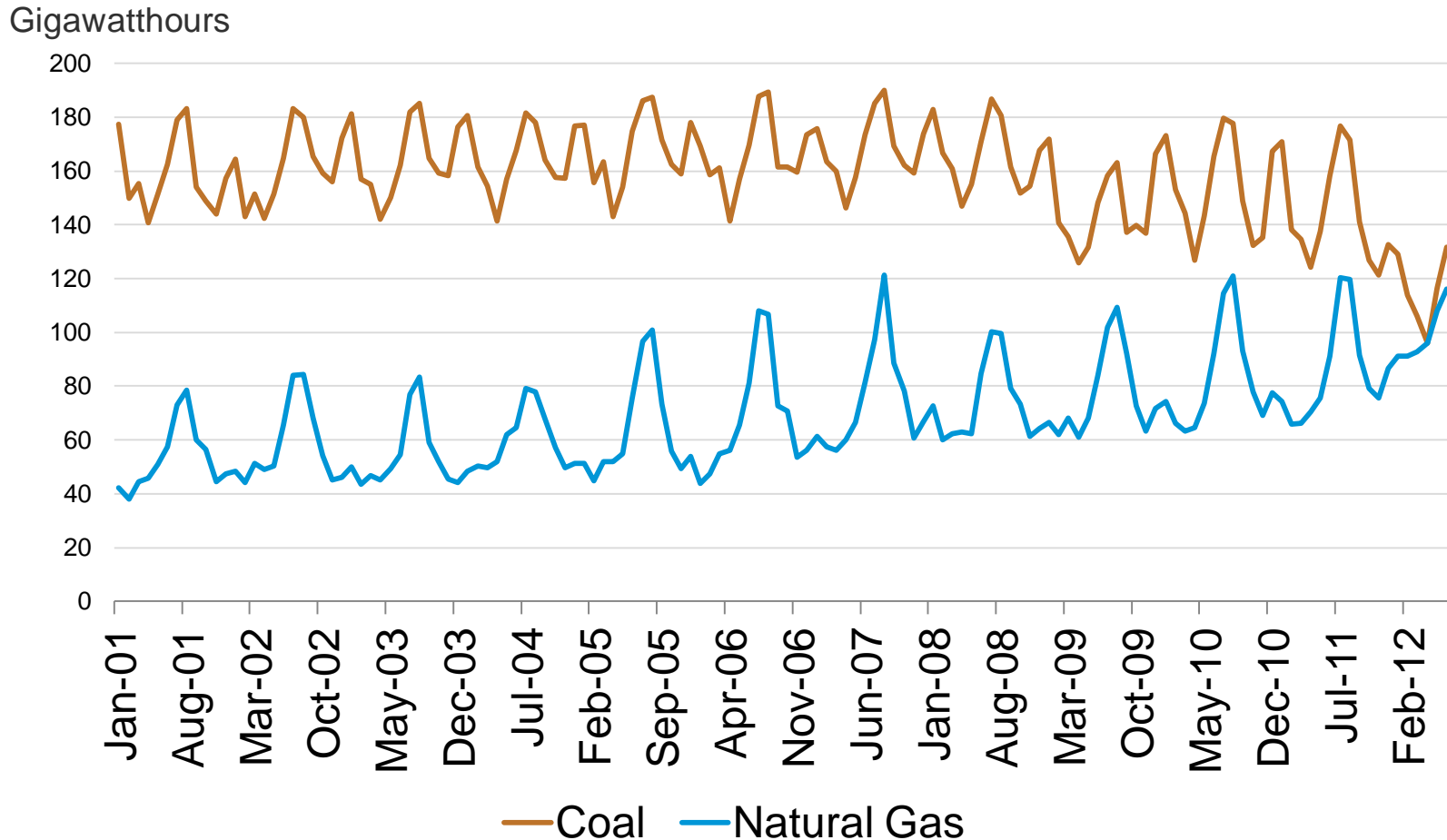
Natural Gas use for electric power

Billion cubic feet per day



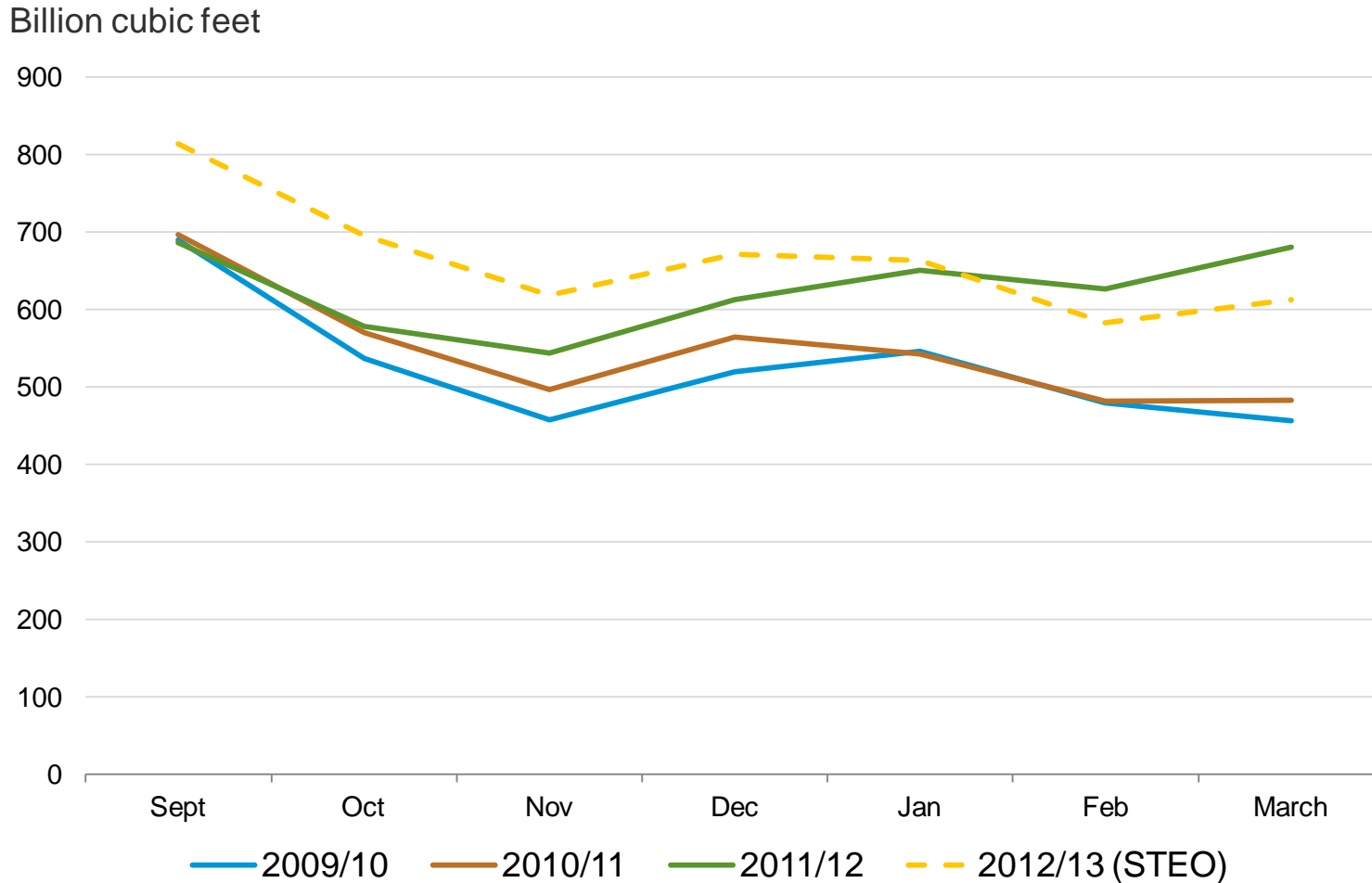
Source: U.S. Energy Information Administration based on Bentek Energy, LLC

U.S. Electricity Output from Natural Gas and Coal



Source: U.S. Energy Information Administration Electric Power Monthly

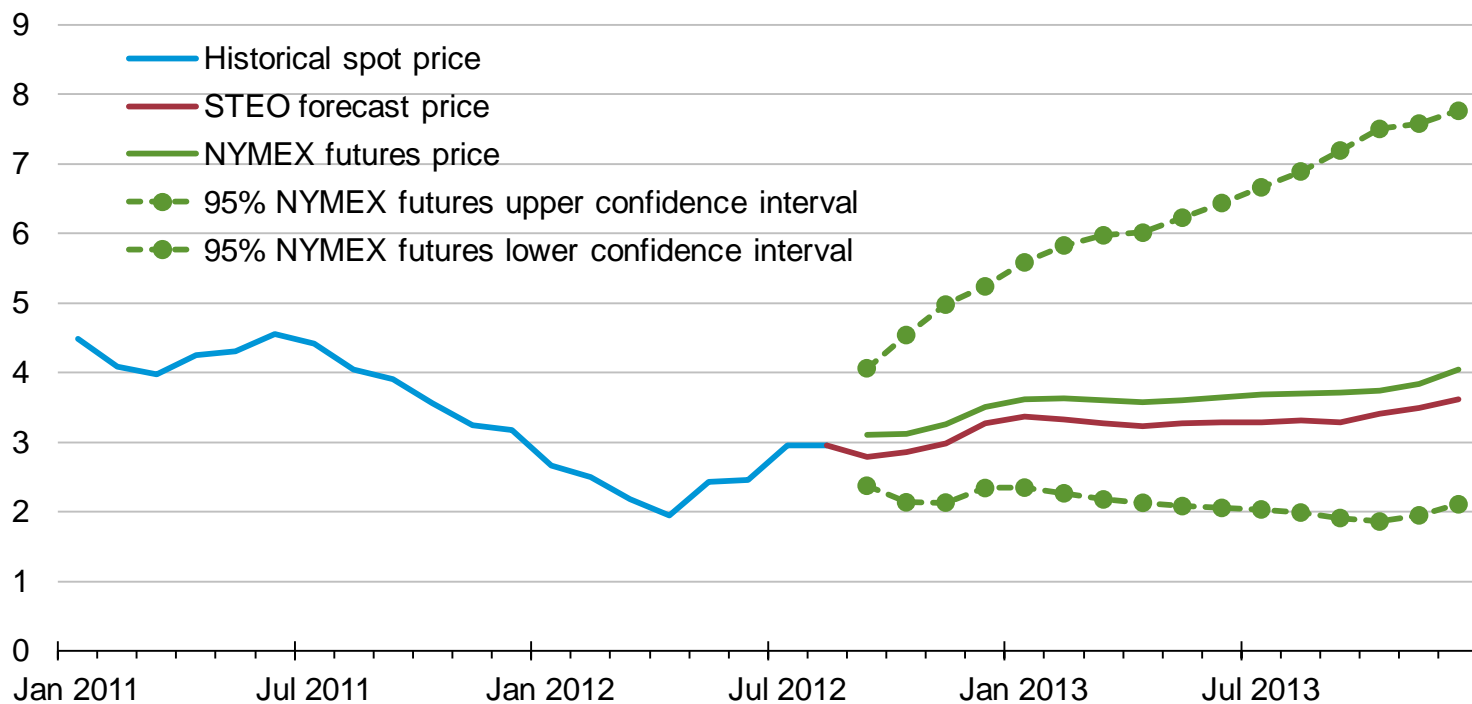
Electric Power Sector Natural Gas Consumption: Sept thru March



Source: U.S. Energy Information Administration Short Term Energy Outlook

Henry Hub Natural Gas Price

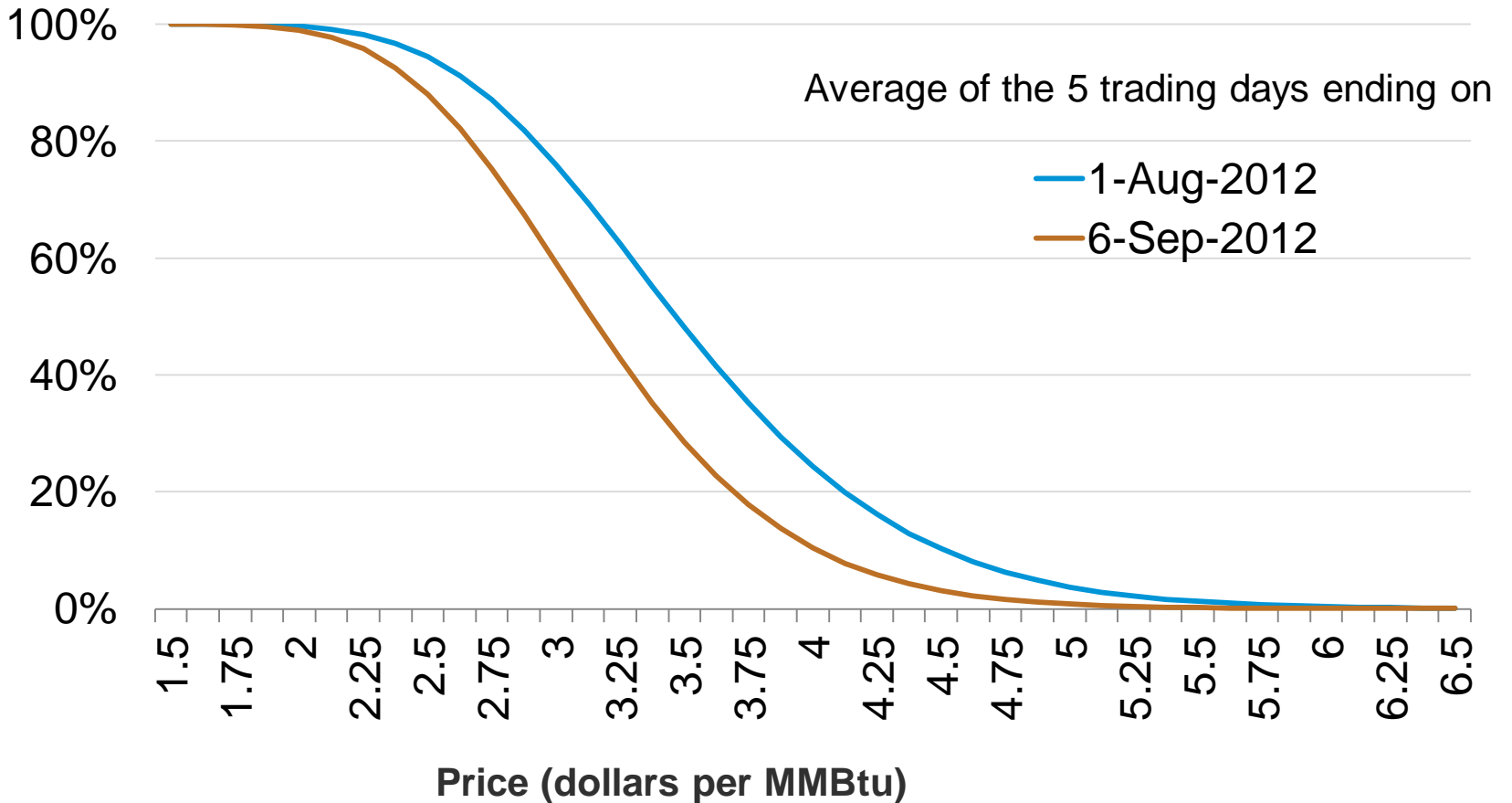
Dollars per million btu



Note: Confidence interval derived from options market information for the 5 trading days ending August 2, 2012. Intervals not calculated for months with sparse trading in near-the-money options contracts.

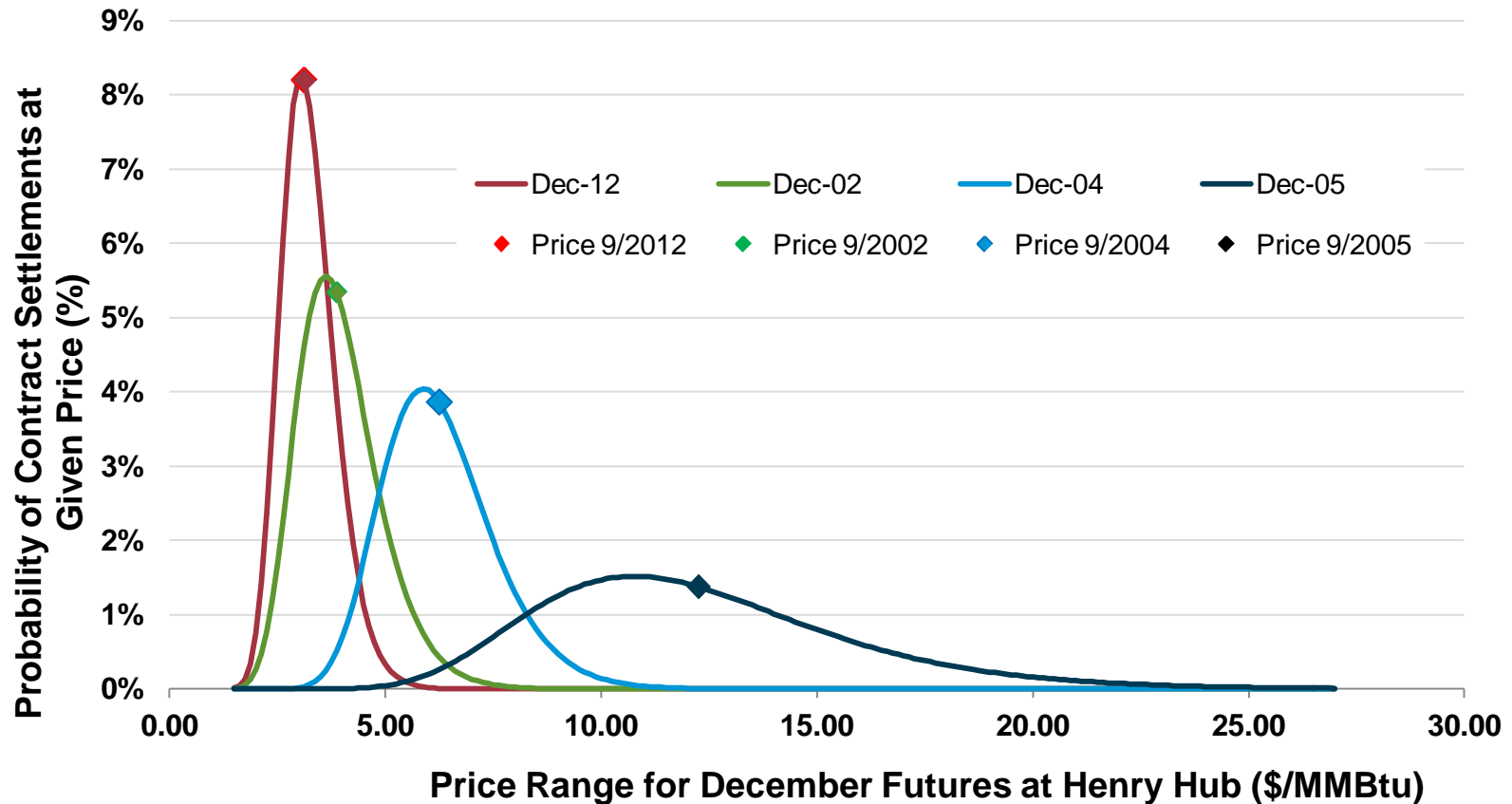
Source: U.S. Energy Information Administration Short Term Energy Outlook

Probability of the December 2012 Henry Hub contract expiring above price levels



Source: U.S. Energy Information Administration, based on the CME Group

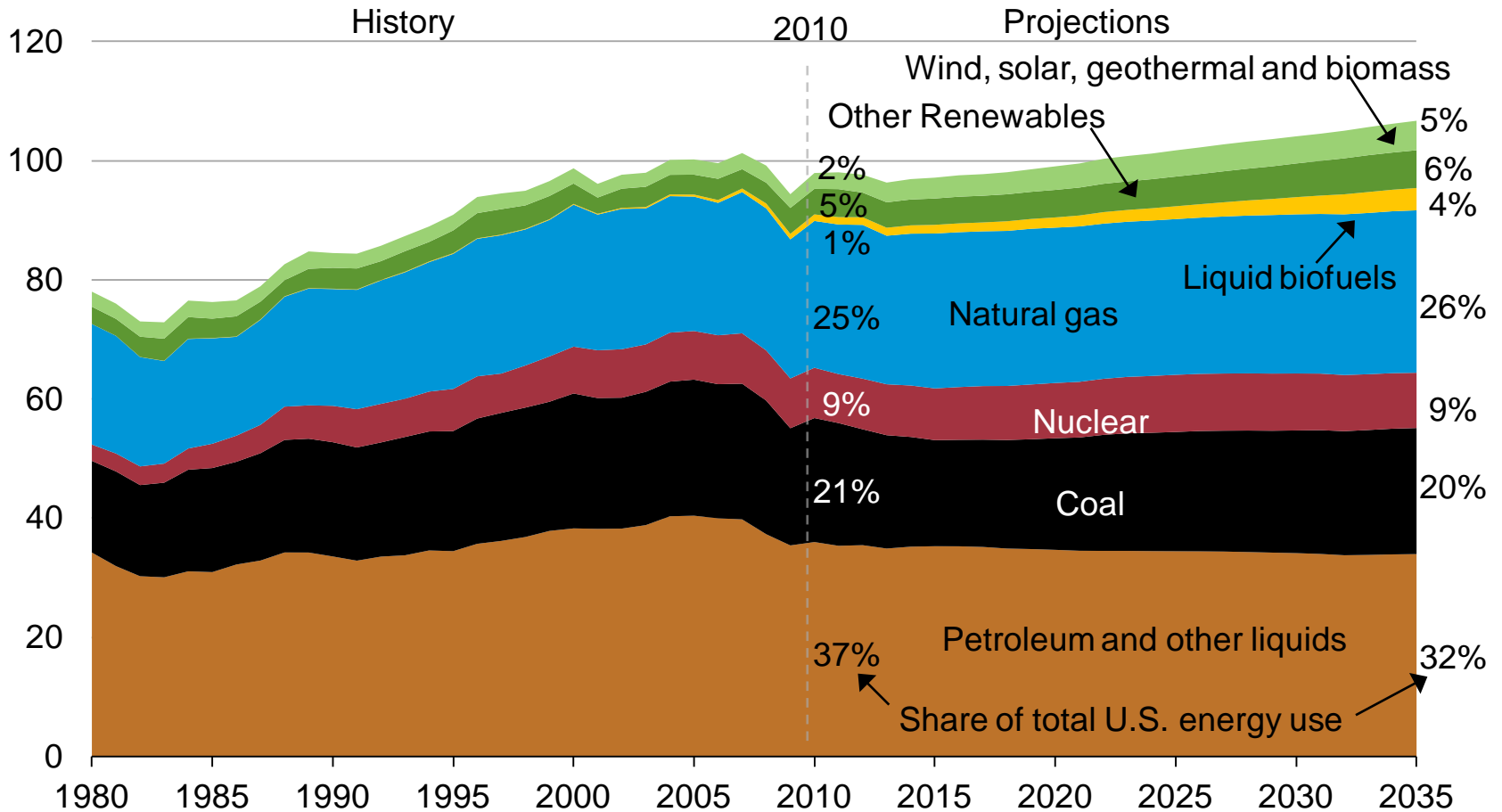
September Probability Distributions of December Future Contracts With Actual Contract Prices Traded in September



Source: U.S. Energy Information Administration based on Bloomberg, LLC

Primary energy use by fuel, 1980-2035

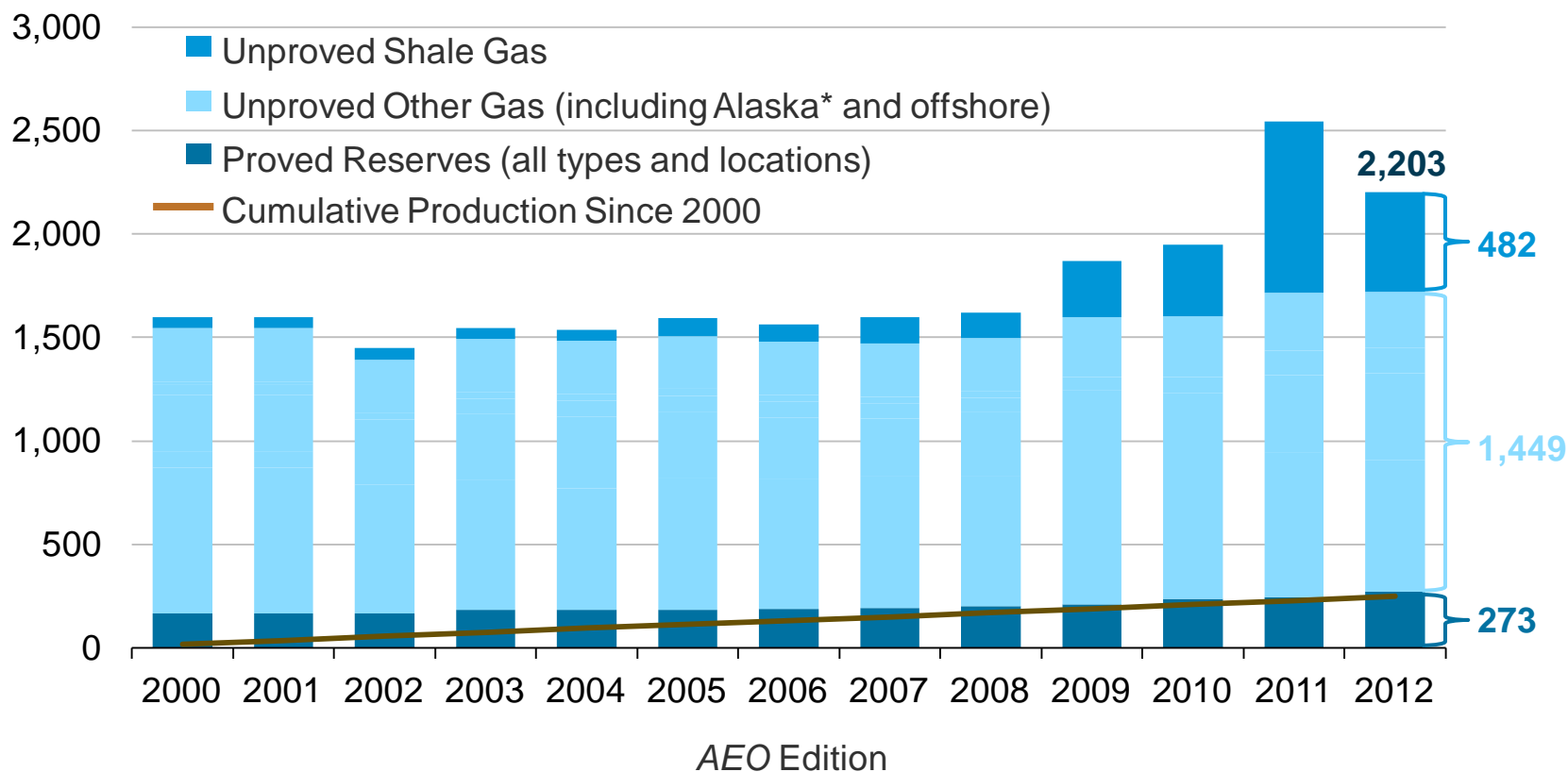
U.S. energy consumption
quadrillion Btu



Source: EIA, Annual Energy Outlook 2012

Technically recoverable dry gas resources

*U.S. dry gas resources
trillion cubic feet*



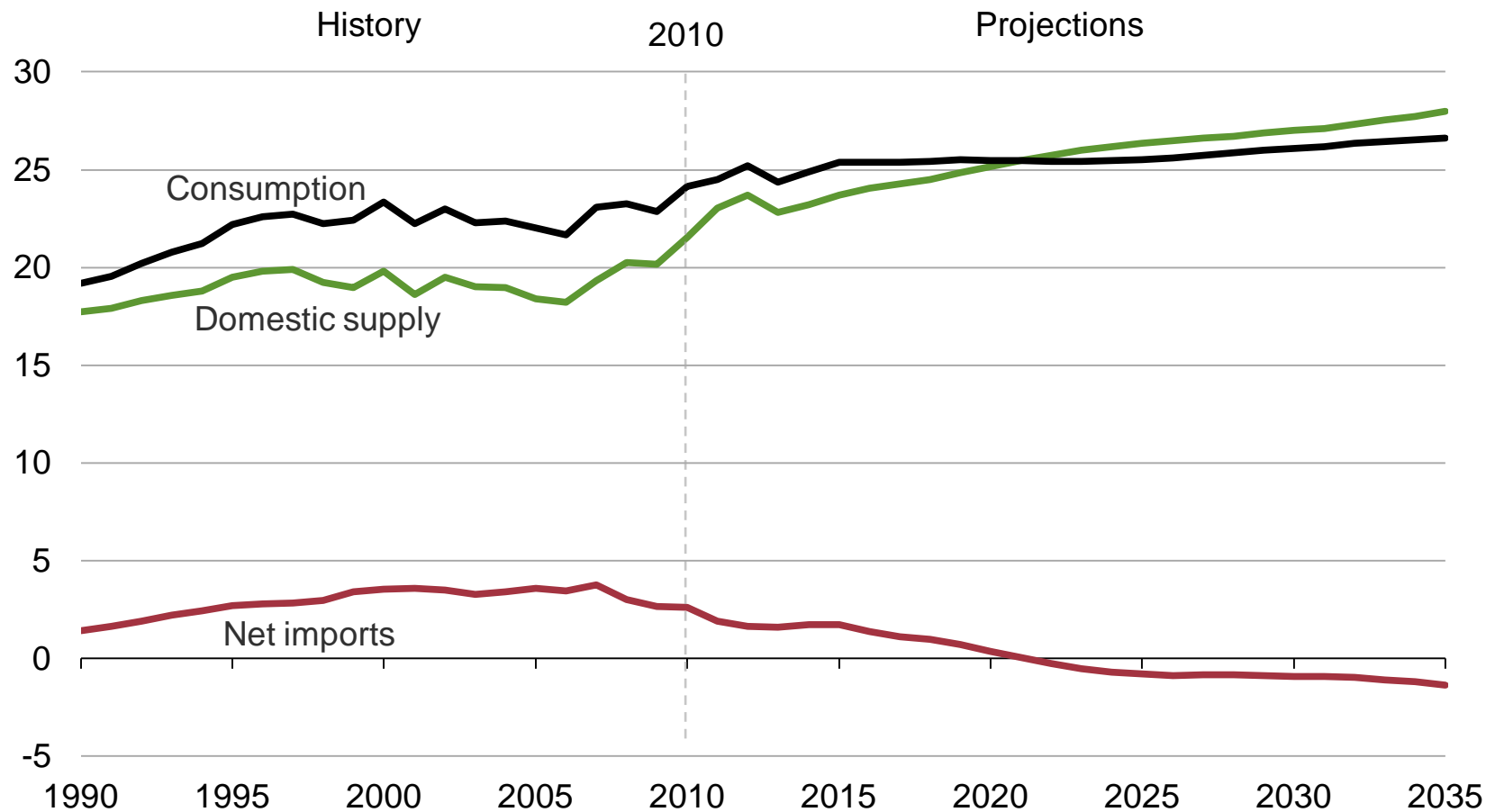
**Alaska resource estimates prior to AEO2009 reflect resources from the North Slope that were not included in previously published documentation.*

Source: EIA, Annual Energy Outlook 2012

Domestic natural gas production grows faster than consumption

U.S. dry gas

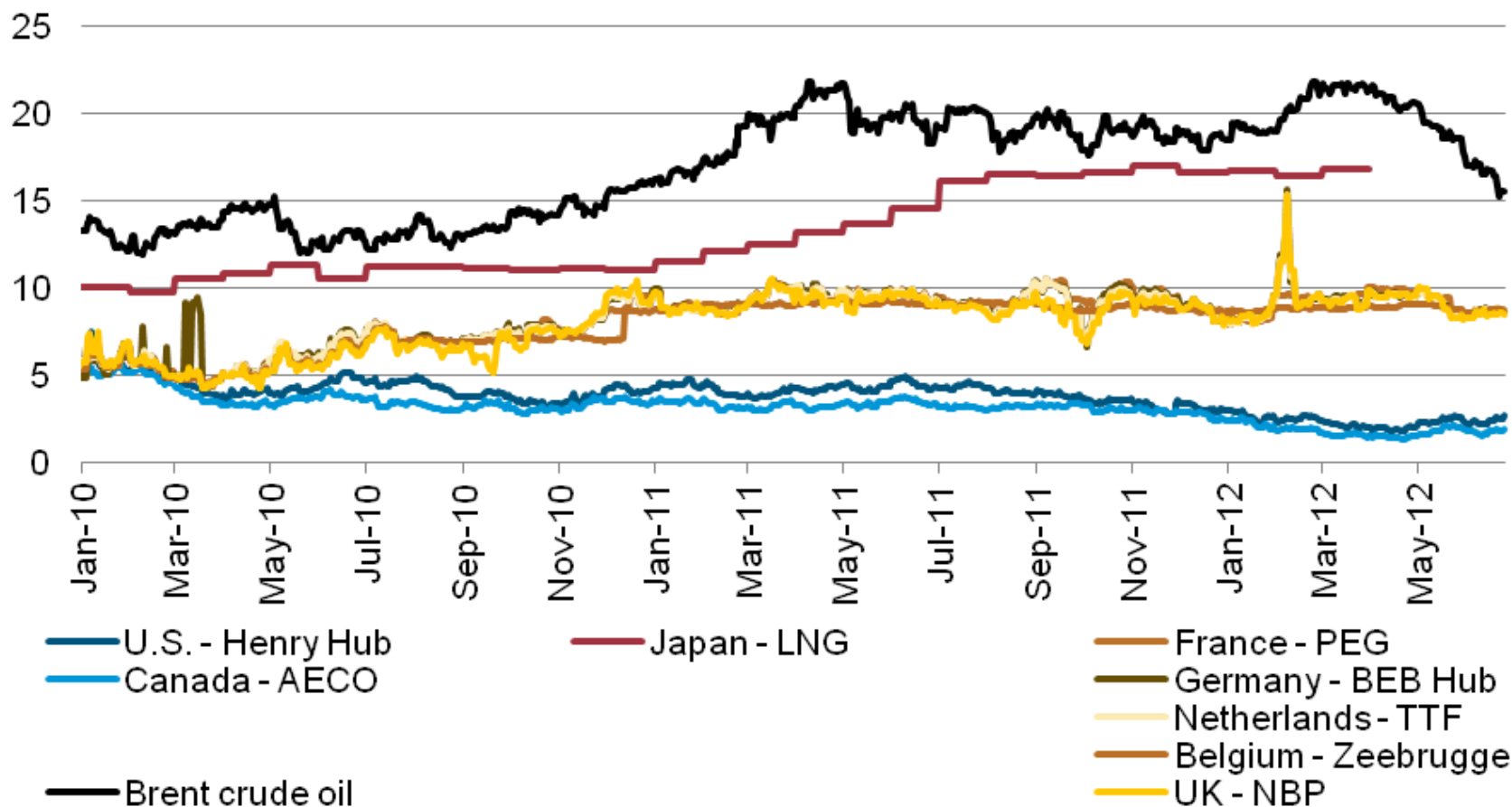
trillion cubic feet per year



Source: EIA, Annual Energy Outlook 2012

Global spot natural gas and crude oil prices vary widely

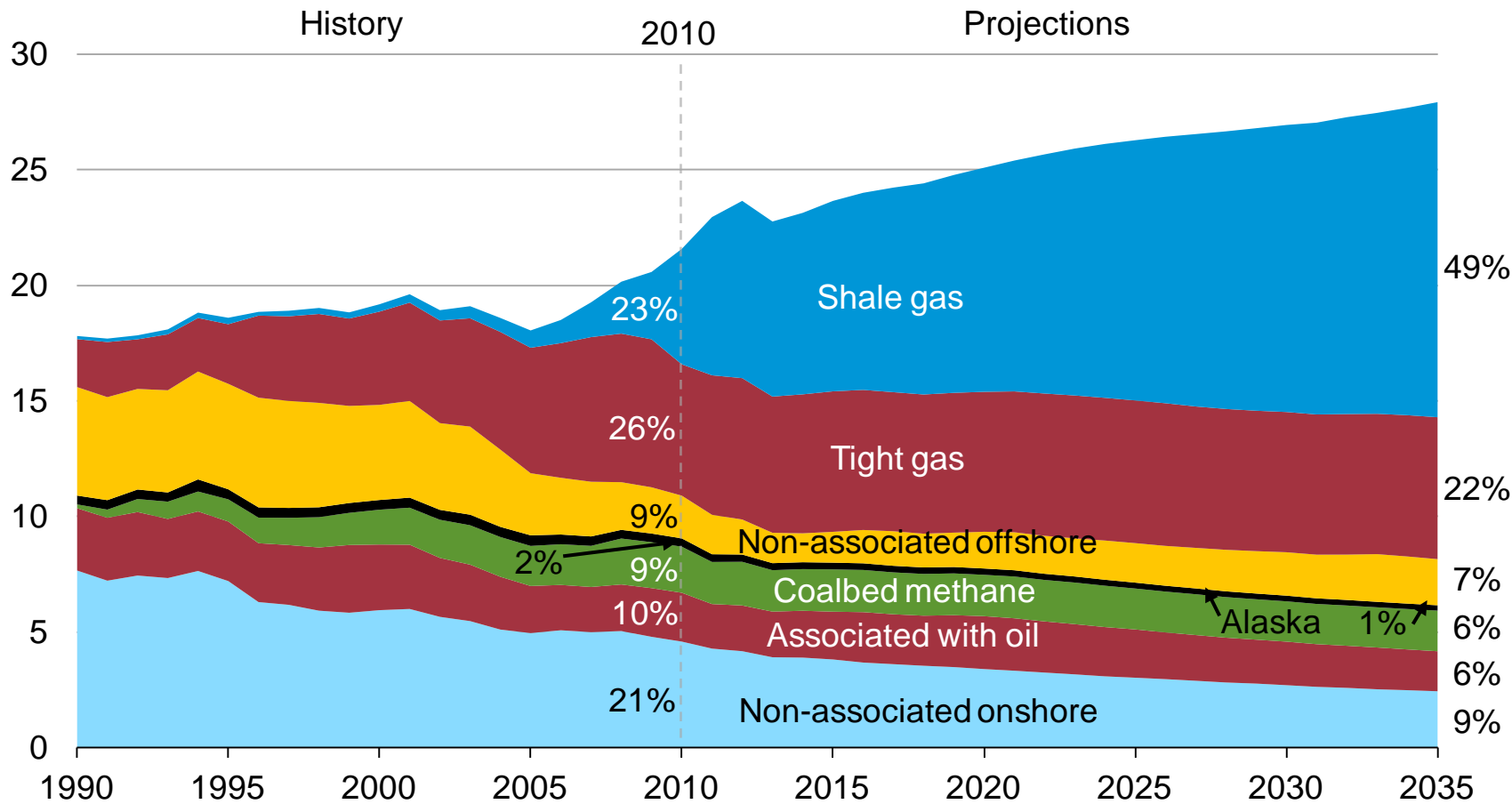
Global spot natural gas and crude oil prices
U.S. dollars per million British thermal unit



Source: EIA based on Bloomberg as of 6/25/2012

Shale gas offsets declines in other U.S. natural gas production sources

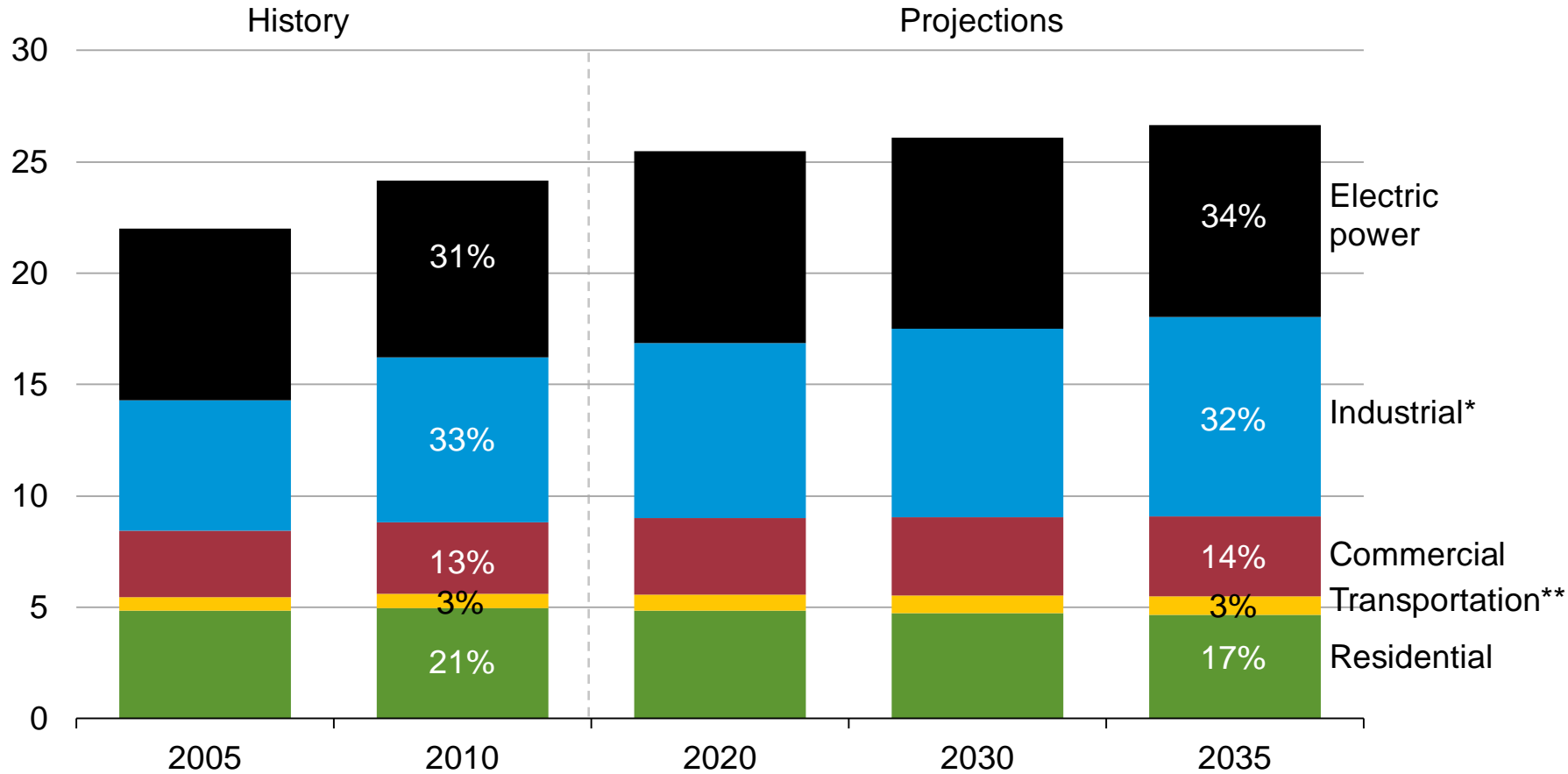
U.S. dry gas production
trillion cubic feet per year



Source: EIA, Annual Energy Outlook 2012

Electric power and industrial use drives much of the future domestic natural gas demand growth in the Reference case

U.S. dry gas consumption
trillion cubic feet per year

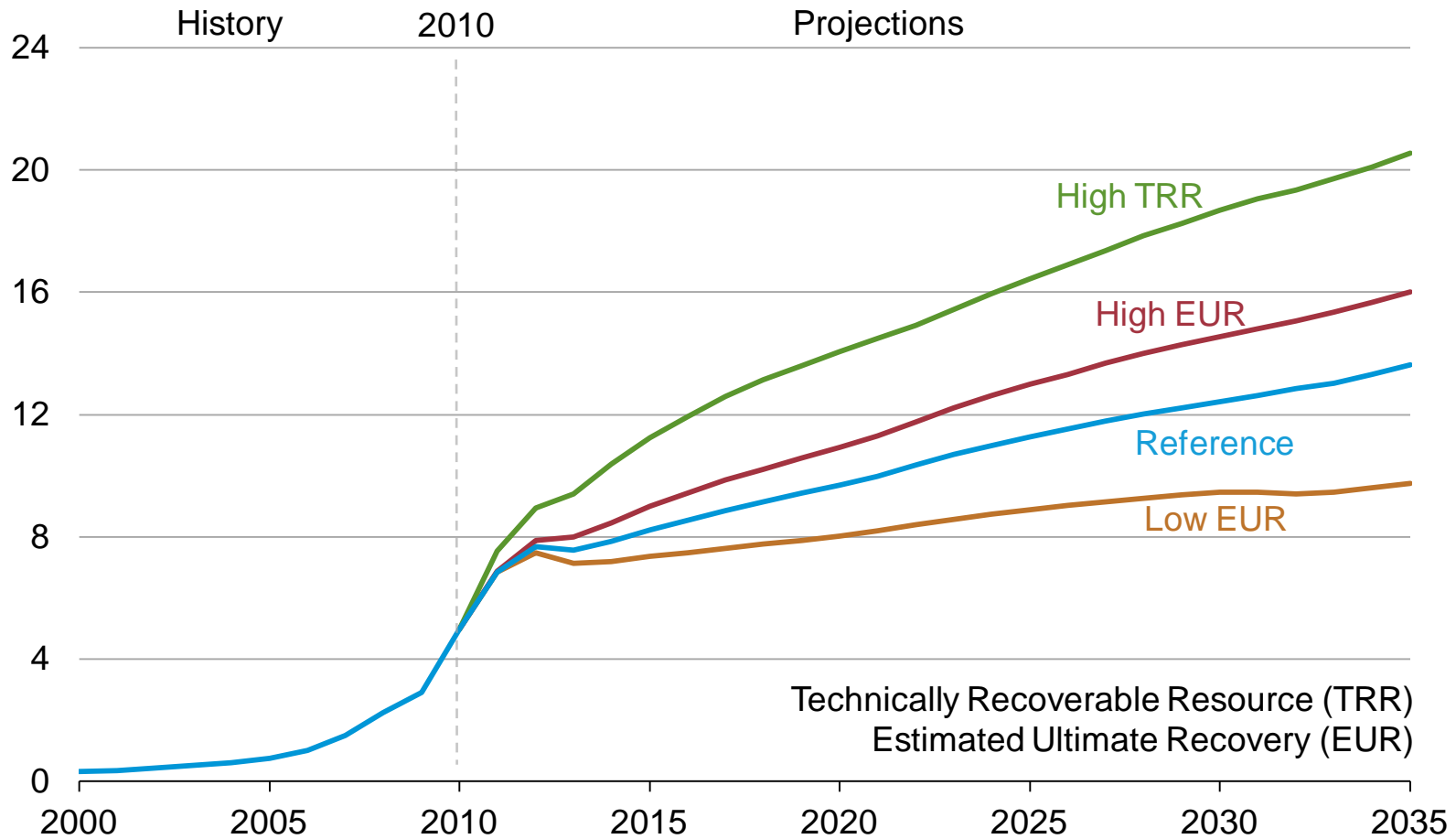


*Includes combined heat-and-power and lease and plant fuel. **Includes pipeline fuel.

Source: EIA, Annual Energy Outlook 2012

U.S. production of shale gas in four cases, 2000-2035

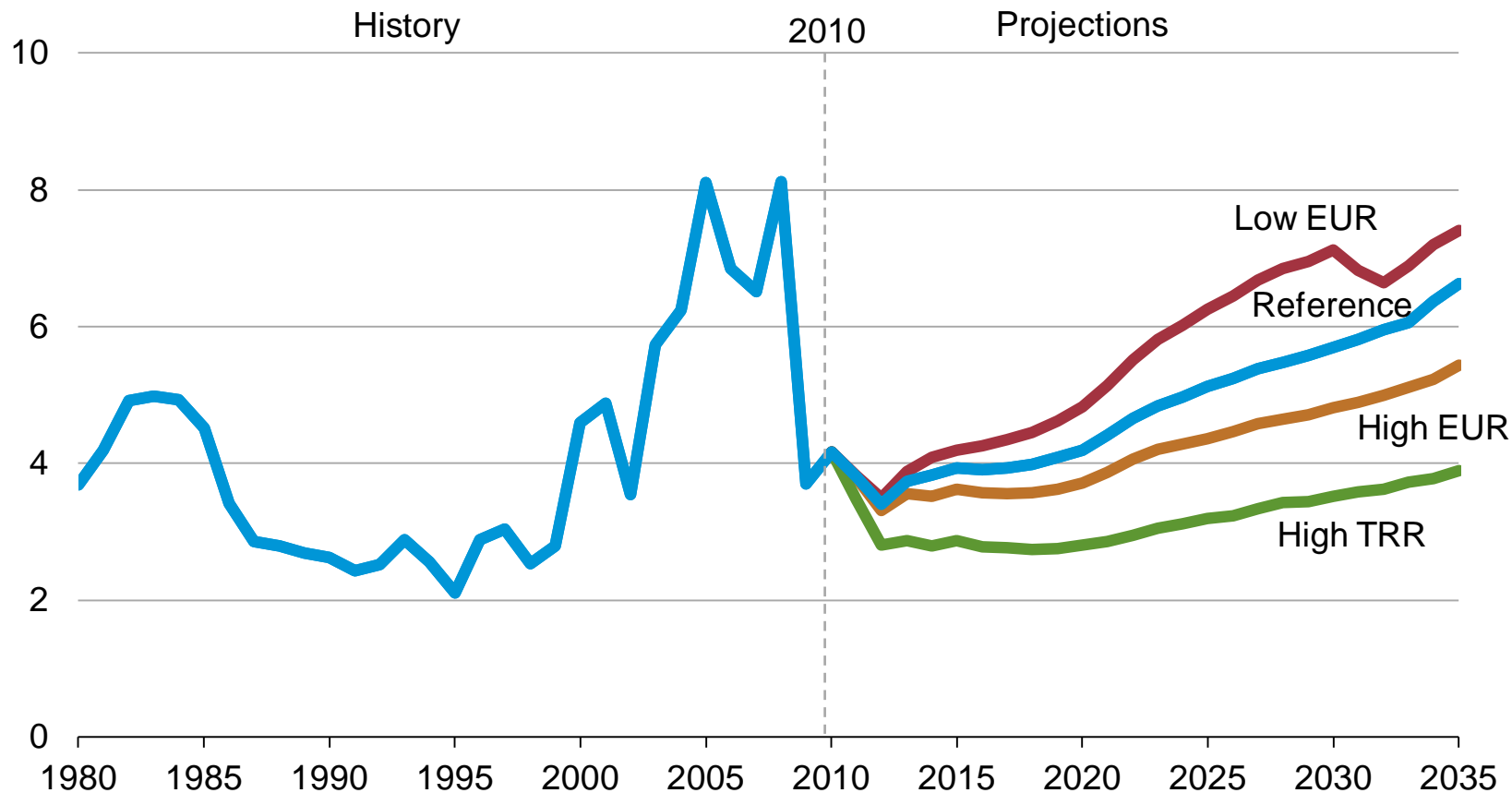
dry natural gas production
trillion cubic feet



Source: EIA, Annual Energy Outlook 2012

Natural gas price projections vary based on resource base assumptions

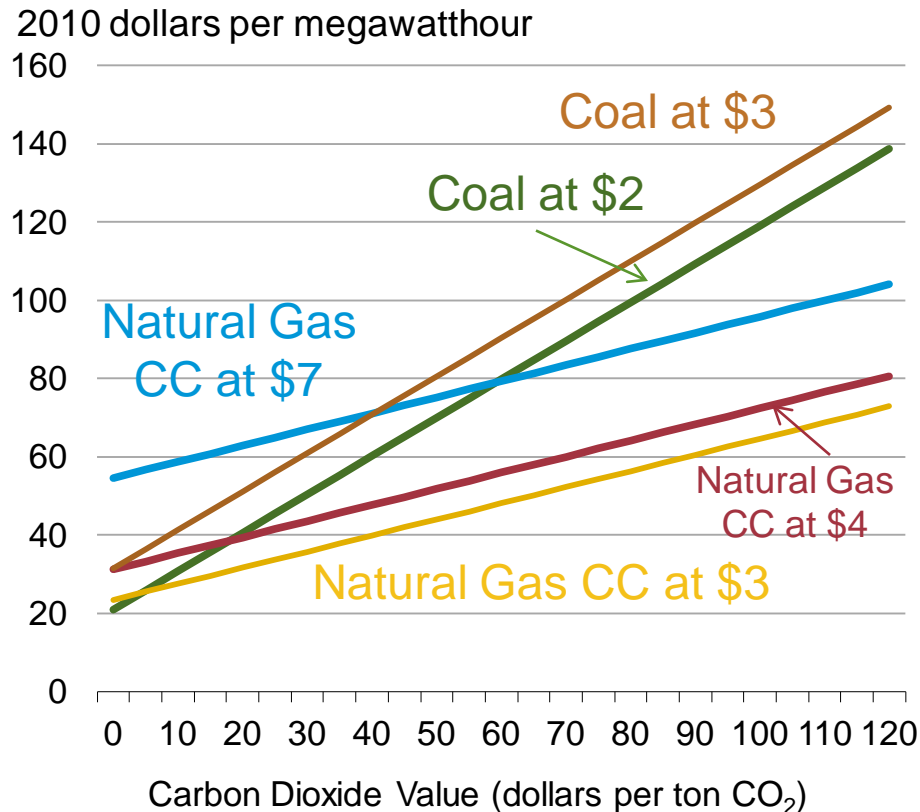
lower-48 average natural gas wellhead price
2010 dollars per thousand cubic feet



Source: EIA, Annual Energy Outlook 2012

Operating costs: existing plants with and without a value on carbon

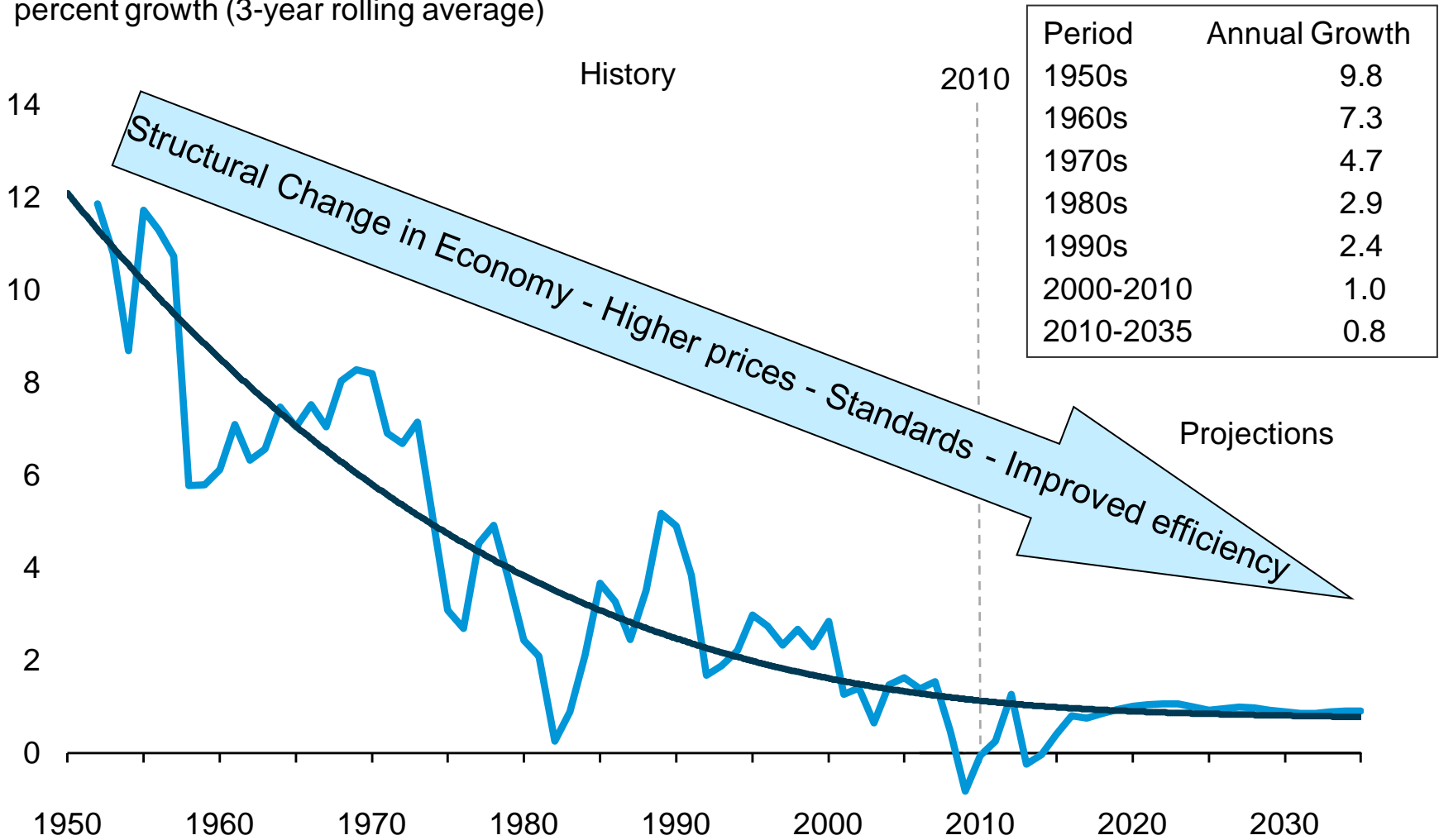
Fuel Cost for Existing Coal and Combined Cycle Natural Gas Units with a Value Placed on Carbon Dioxide Emissions



- The “crossover point” for least-cost dispatch of coal and natural gas capacity depends on both fuel prices and the carbon value. At lower natural gas prices, the “crossover” occurs at a lower carbon value.
- Environmental operating costs and retrofit costs for pollution controls at existing coal-fired plants can “raise the bar” for their continued operation.
 - For retrofit decisions, the unit’s perceived “useful life,” which plays a critical role, can be affected by views regarding future climate policies

While electricity consumption grows by 21% over the projection, the annual rate of growth slows

percent growth (3-year rolling average)

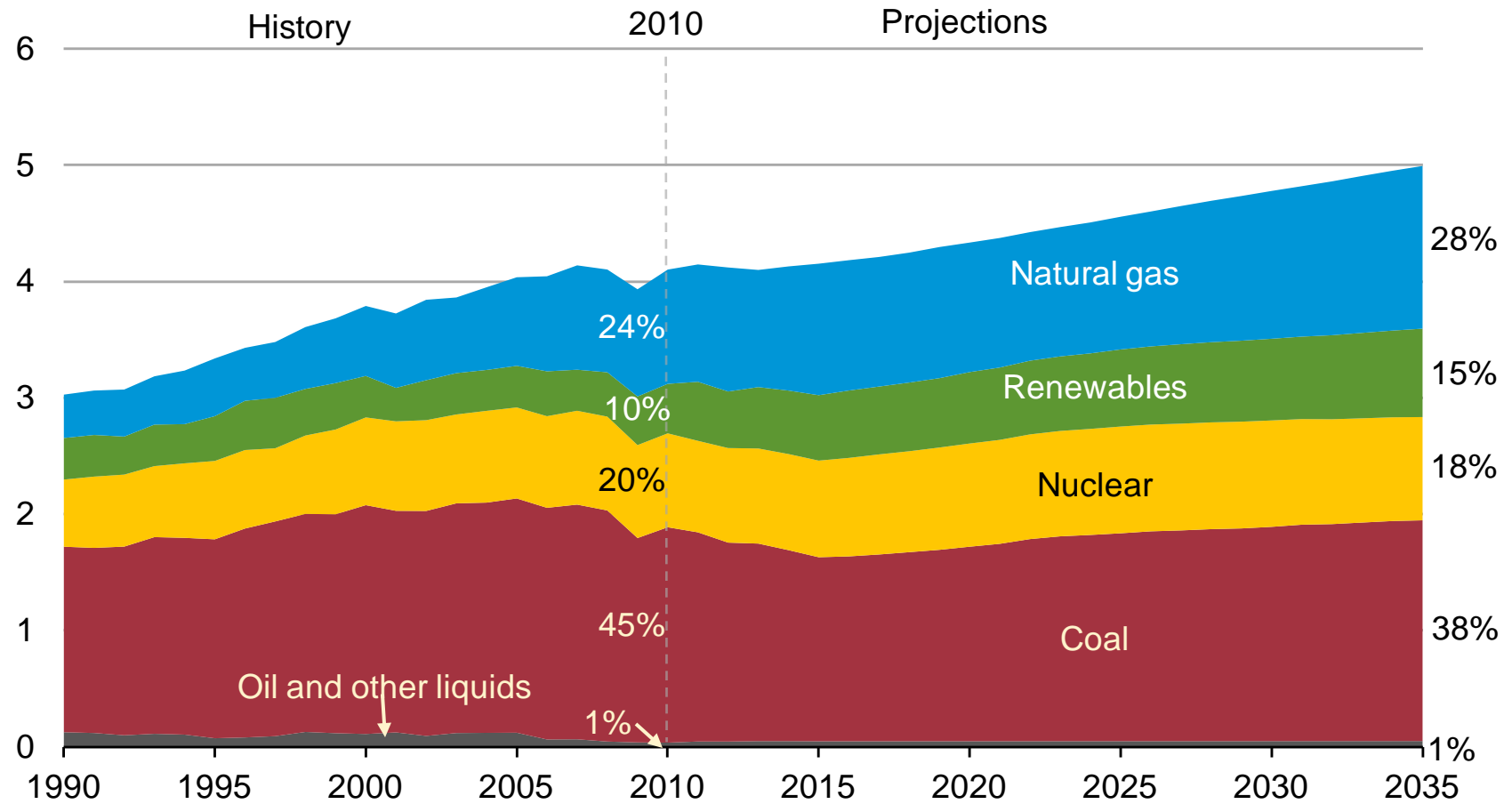


Source: EIA, Annual Energy Outlook 2012

Electricity mix gradually shifts to lower-carbon options, led by growth in renewables and natural gas

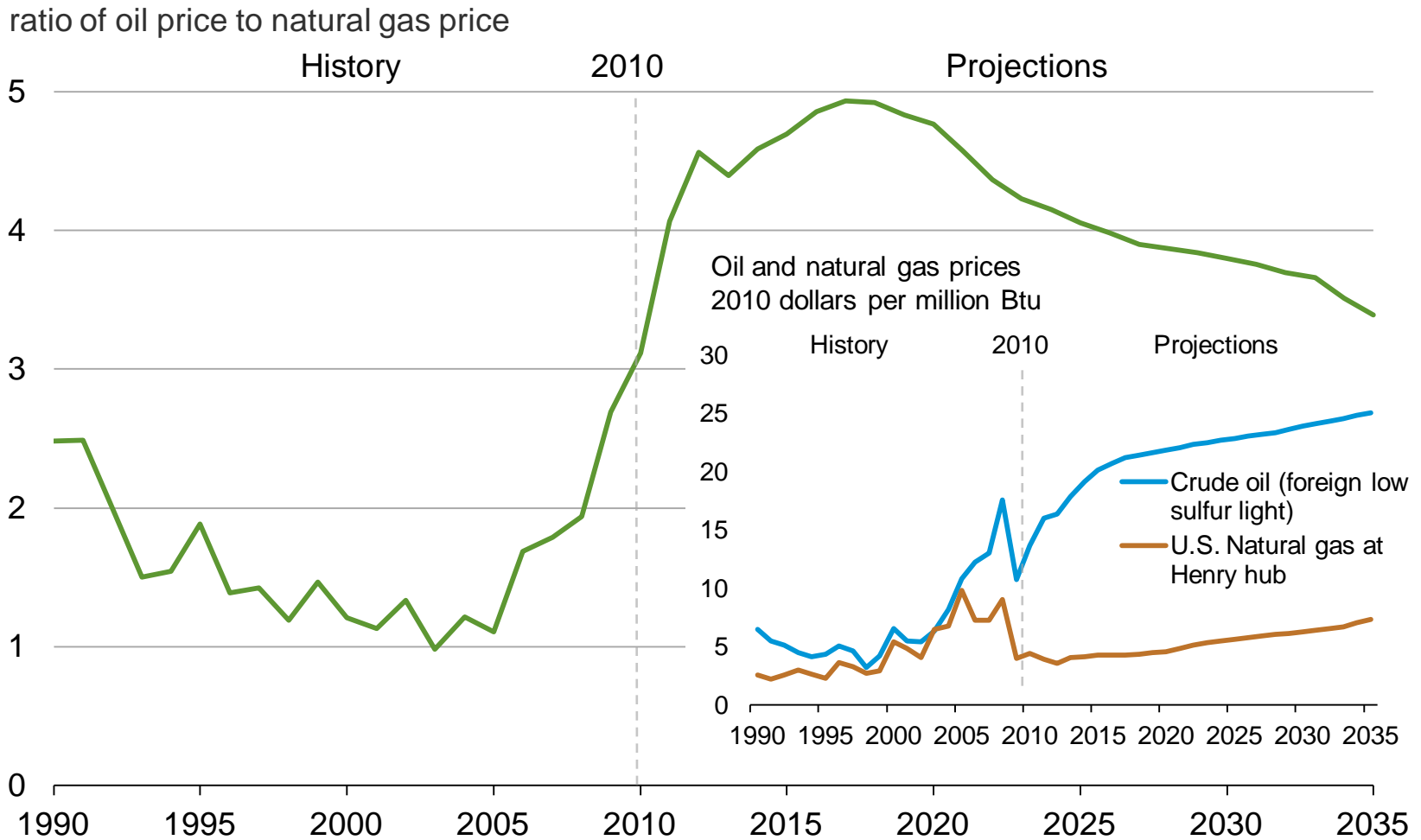
electricity net generation

trillion kilowatthours per year



Source: EIA, Annual Energy Outlook 2012

The ratio of oil to natural gas prices remains high through 2035 in EIA's AEO2012 Reference case projection



Source: EIA, Annual Energy Outlook 2012

For more information

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

Today In Energy / www.eia.gov/todayinenergy

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

Annual Energy Outlook / www.eia.gov/aeo

Monthly Energy Review / www.eia.gov/mer

EIA Information Center

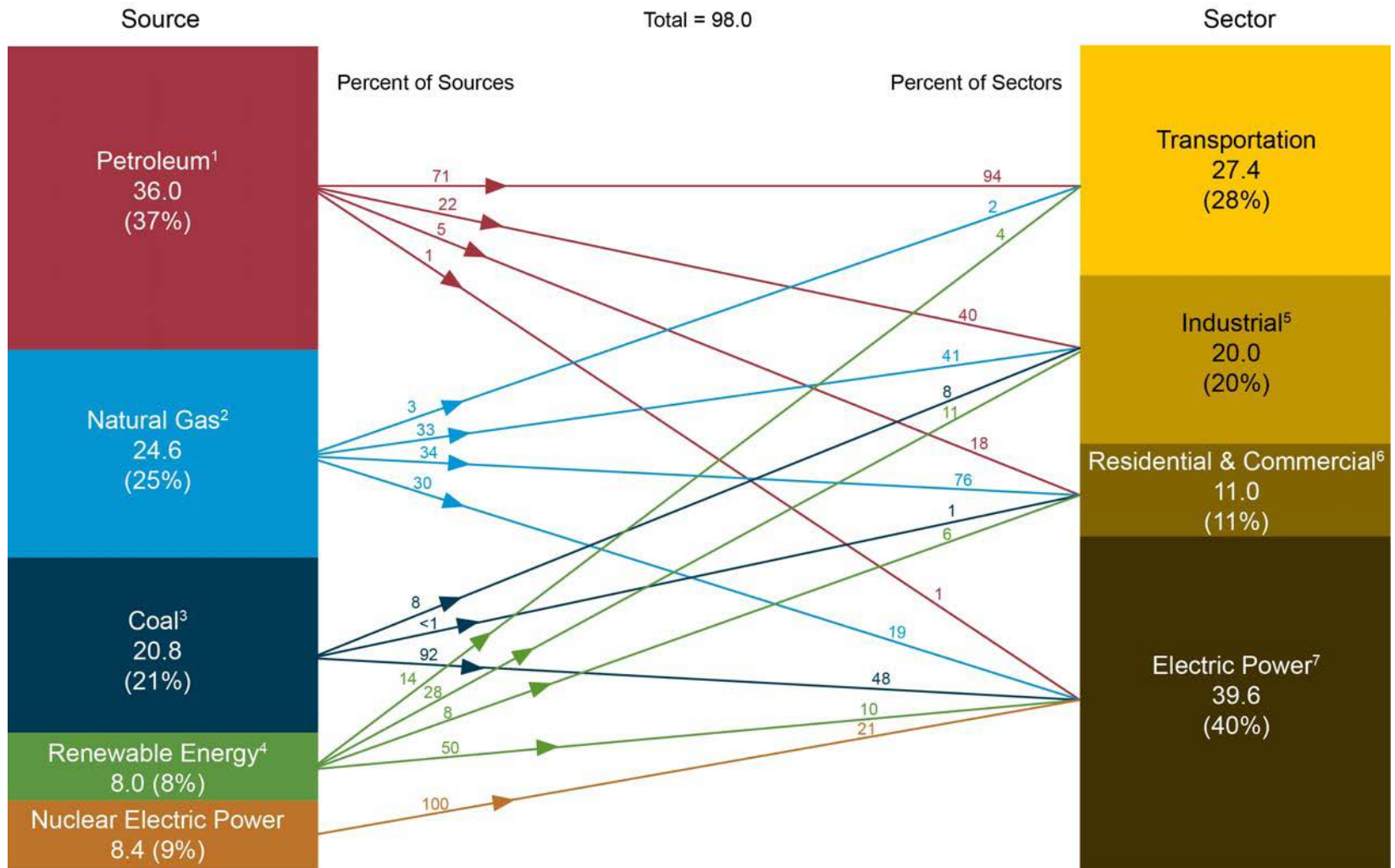
InfoCtr@eia.gov

Our average response time is within three business days.

(202) 586-8800

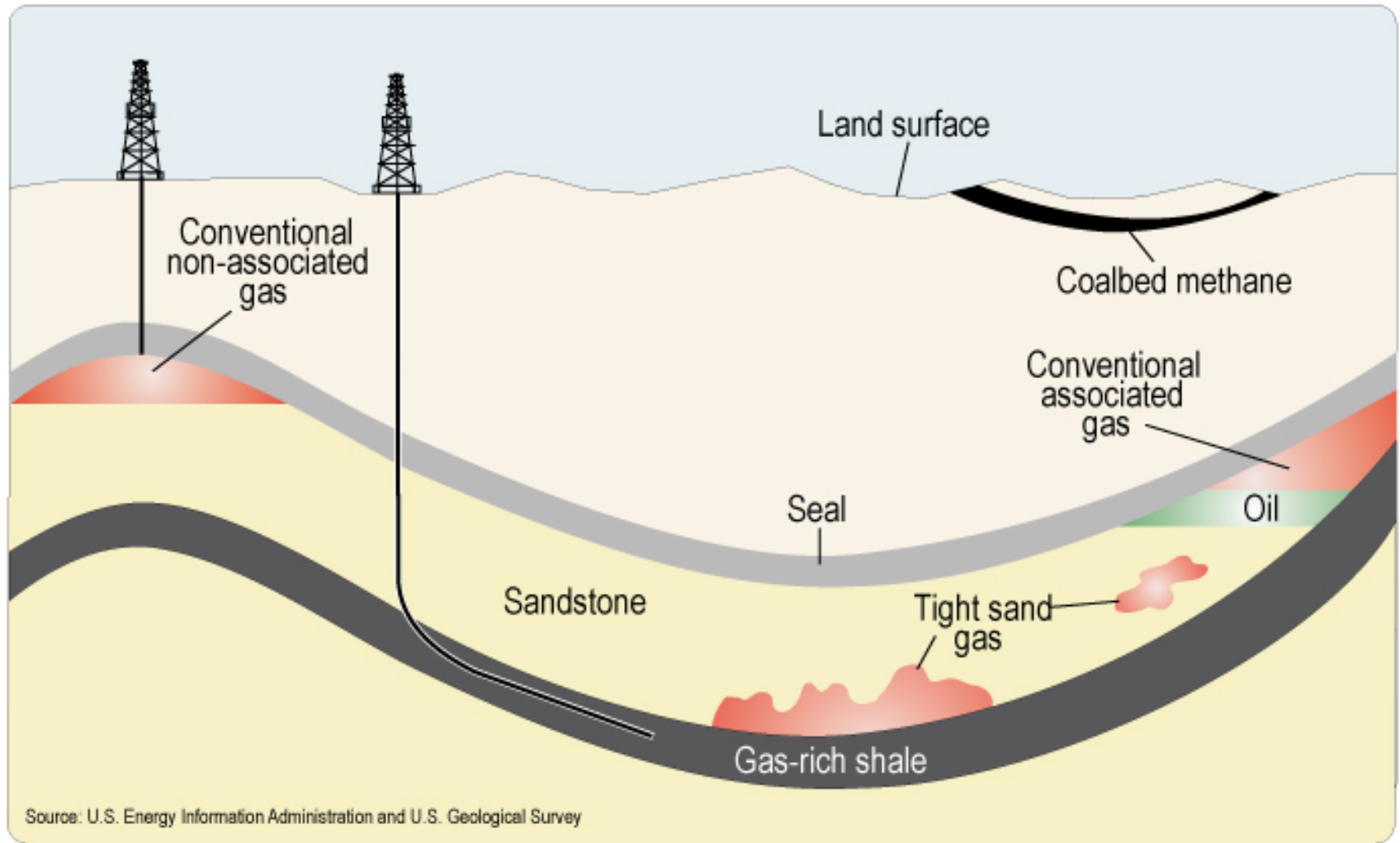
24-hour automated information line about EIA and frequently asked questions.

U.S. Energy Breakdown by Fuel and Sector



Source: EIA Annual Energy Review 2010

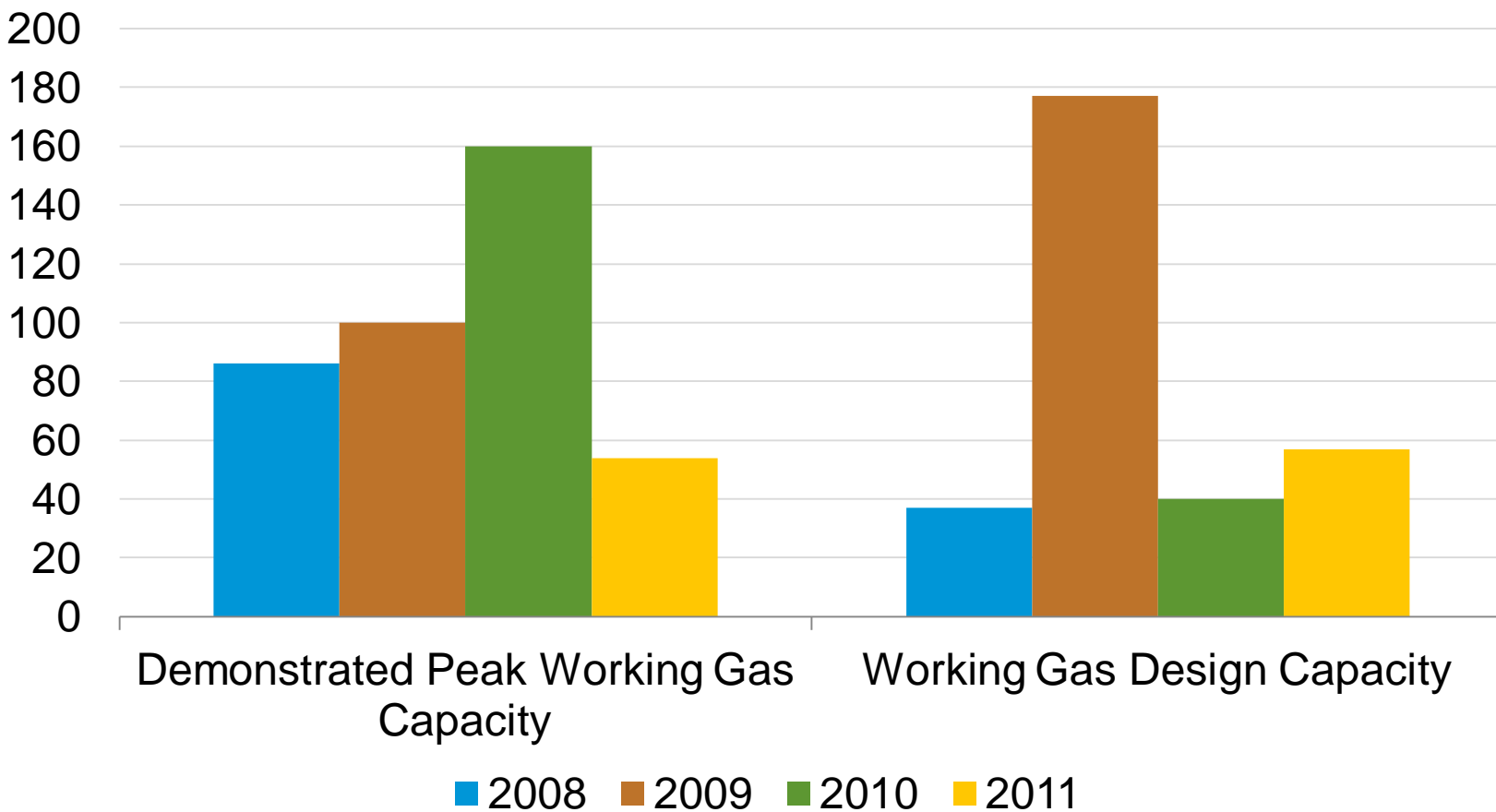
Underground sources of natural gas



Source: modified from [U.S. Geological Survey Fact Sheet 0113-01](#).

Working Underground Natural Gas Storage Capacity Additions, 2008-2011

Billion cubic feet



Source: U.S. Energy Information Administration Peak Underground Working Natural Gas Storage Capacity Report