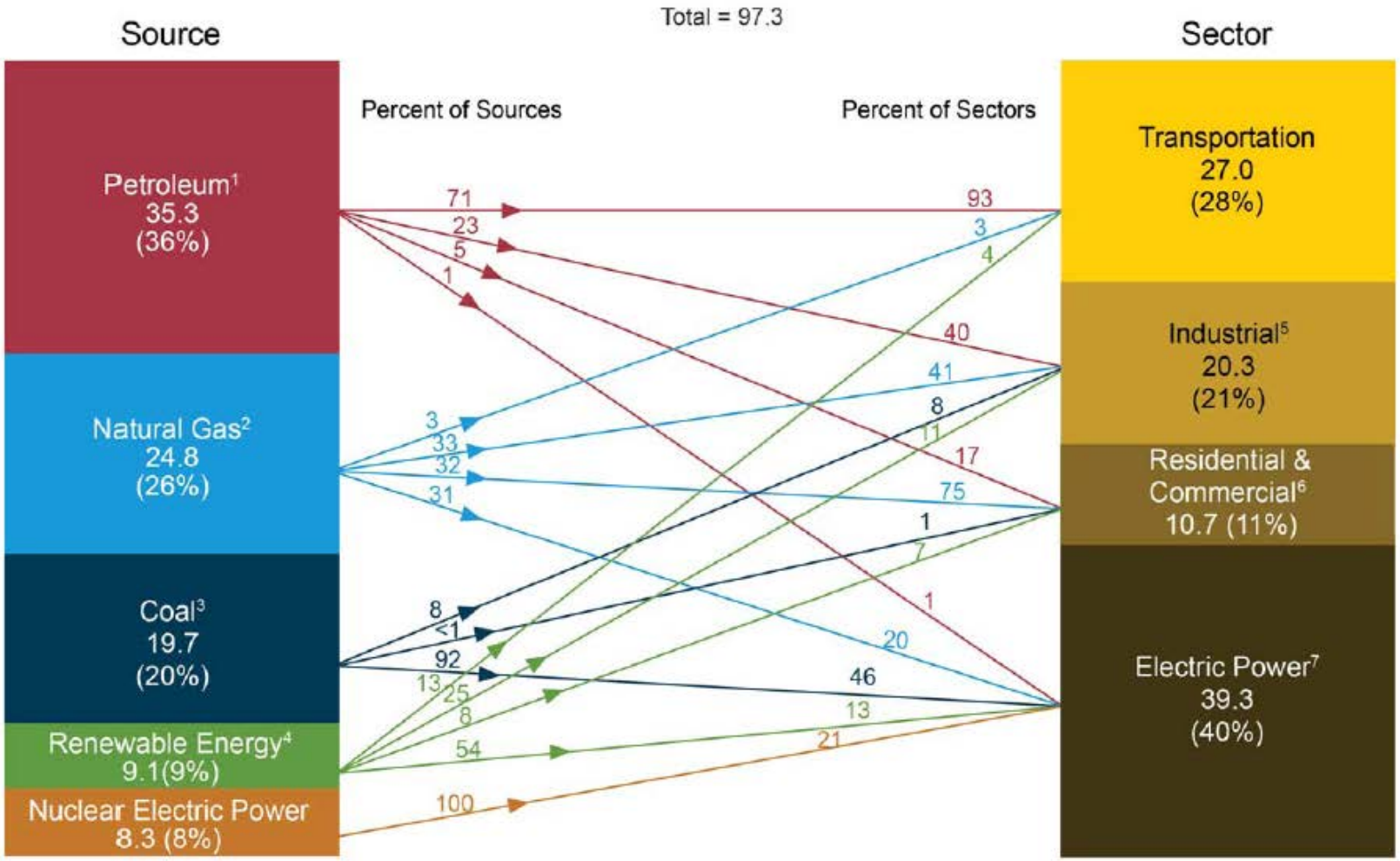
Outlook for coal and electricity

for
National Coal Council
November 1, 2013 | Washington, DC

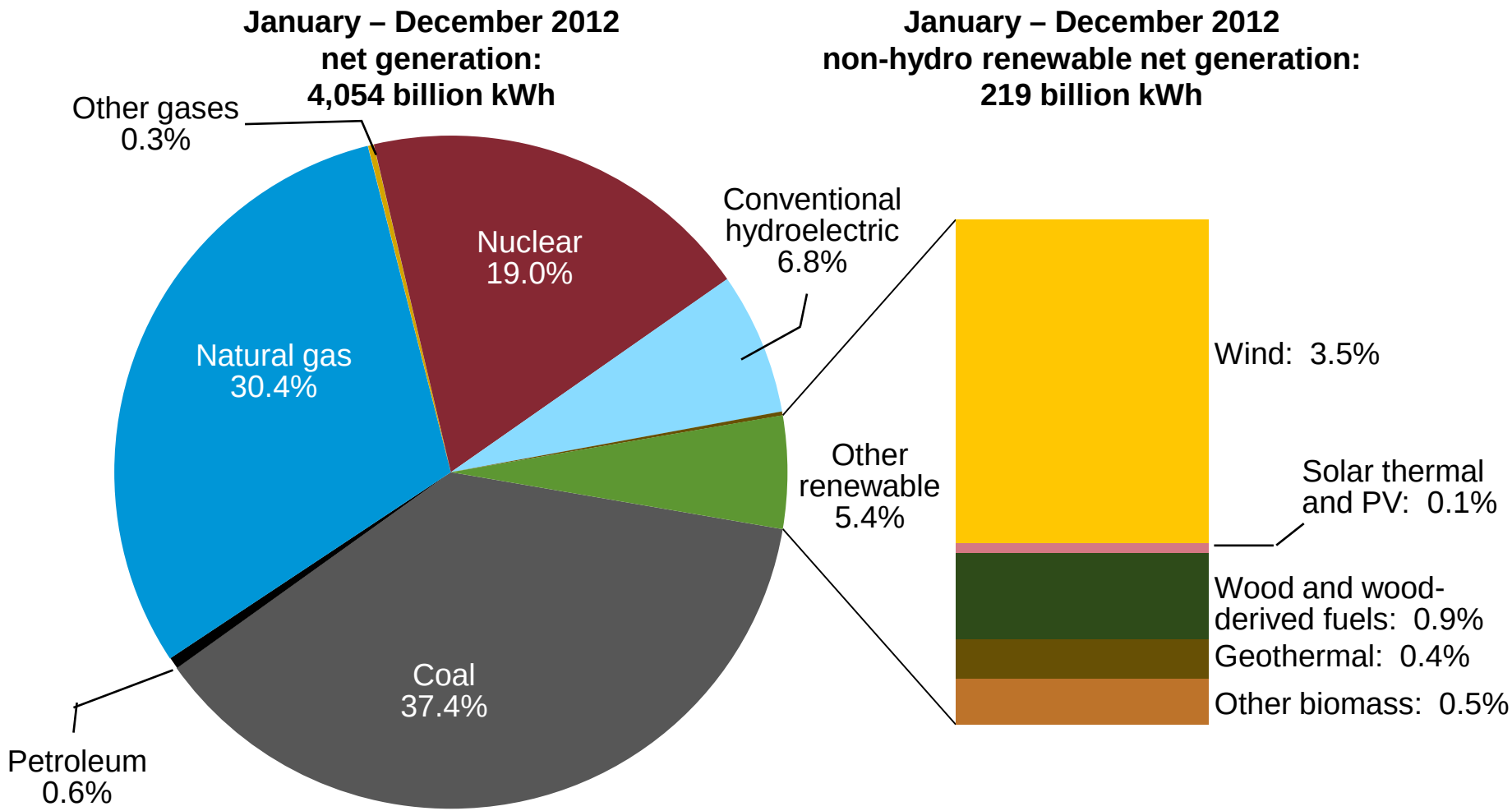
by
Howard Gruenspecht, Deputy Administrator

Coal accounted for 20% of the domestic energy supplied in 2011; almost all of it was used to generate electricity



Source: EIA, Annual Energy Review 2011

In 2012, U.S. electricity generation was 69% fossil fuels, 19% nuclear, and 12% renewables

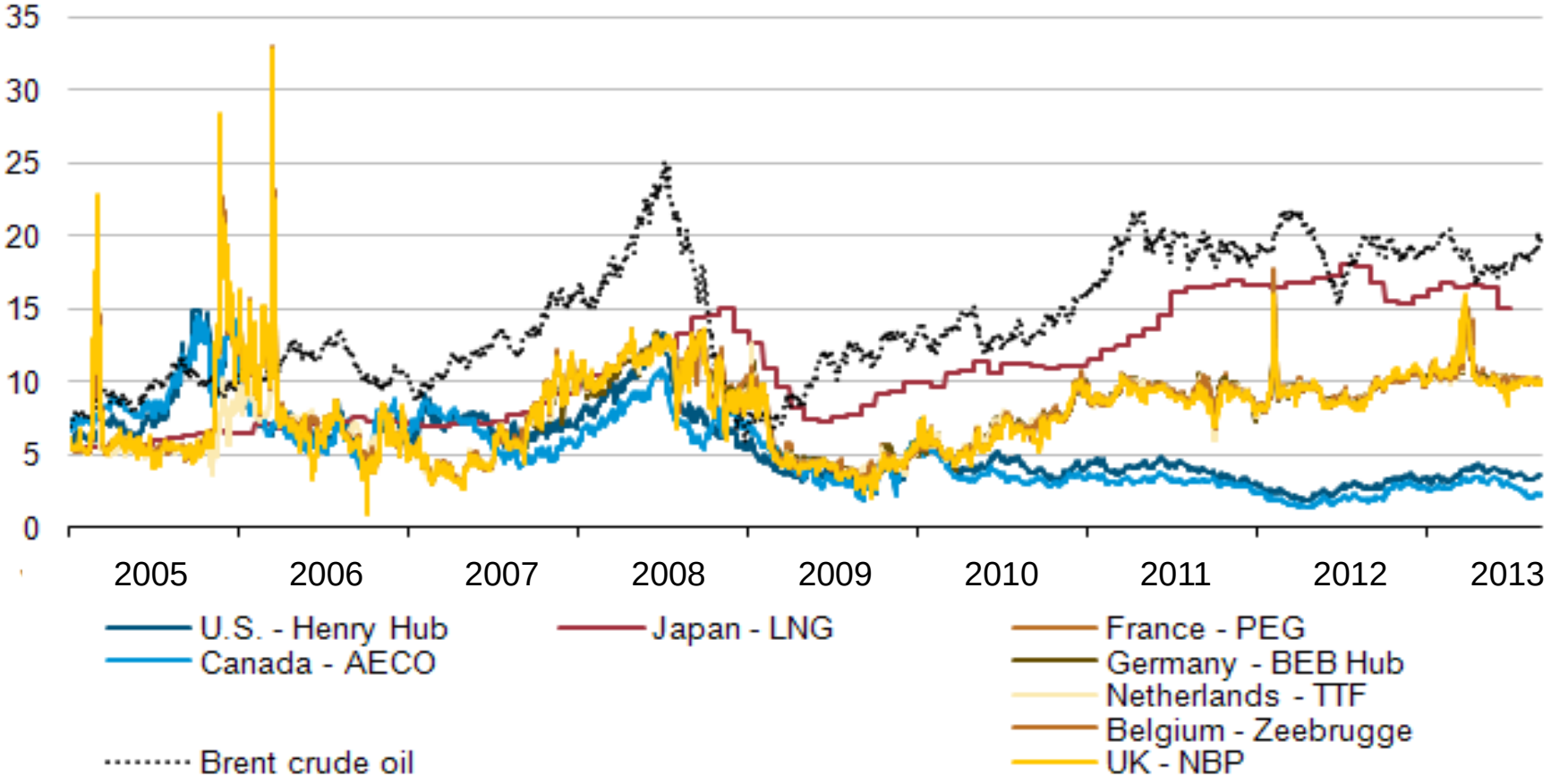


Source: EIA, Electric Power Monthly, February 2013

Spot natural gas prices vary significantly across global markets since 2008

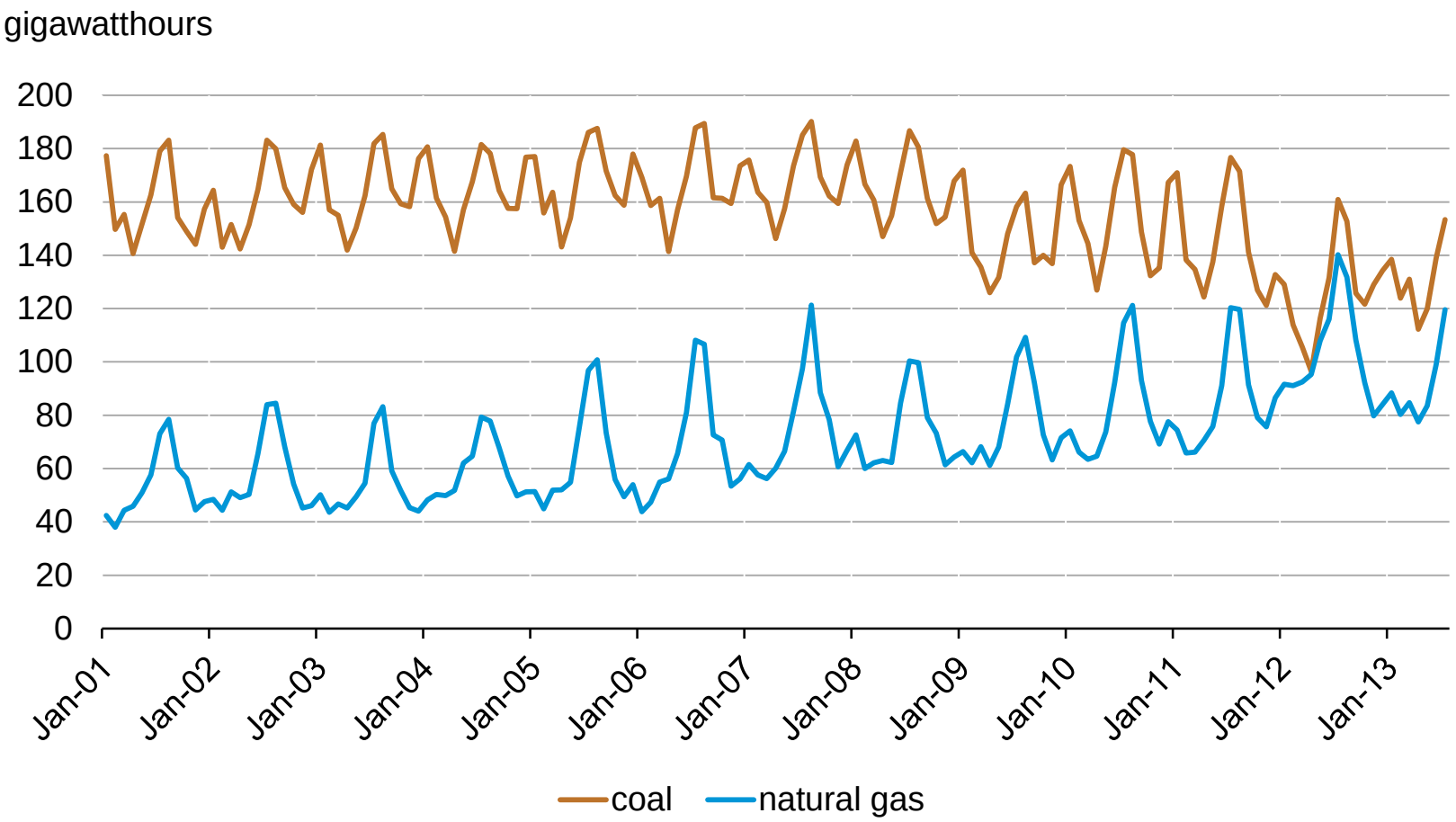
global spot natural gas, crude oil, and LNG prices

U.S. dollars per million British thermal unit



Source: Derived from Bloomberg, L.P.

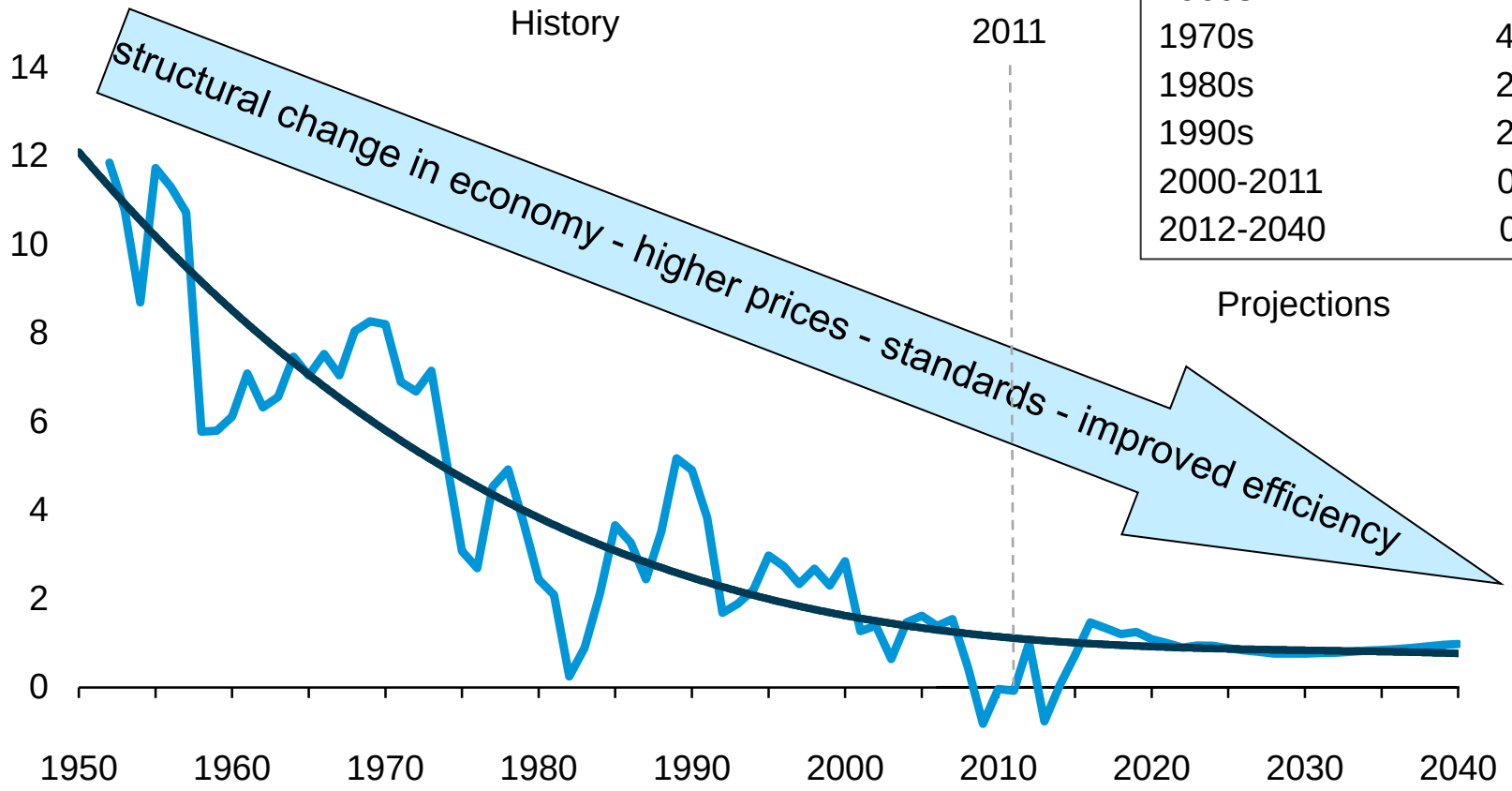
U.S. electricity output from natural gas and coal



Source: EIA, Electric Power Monthly

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

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

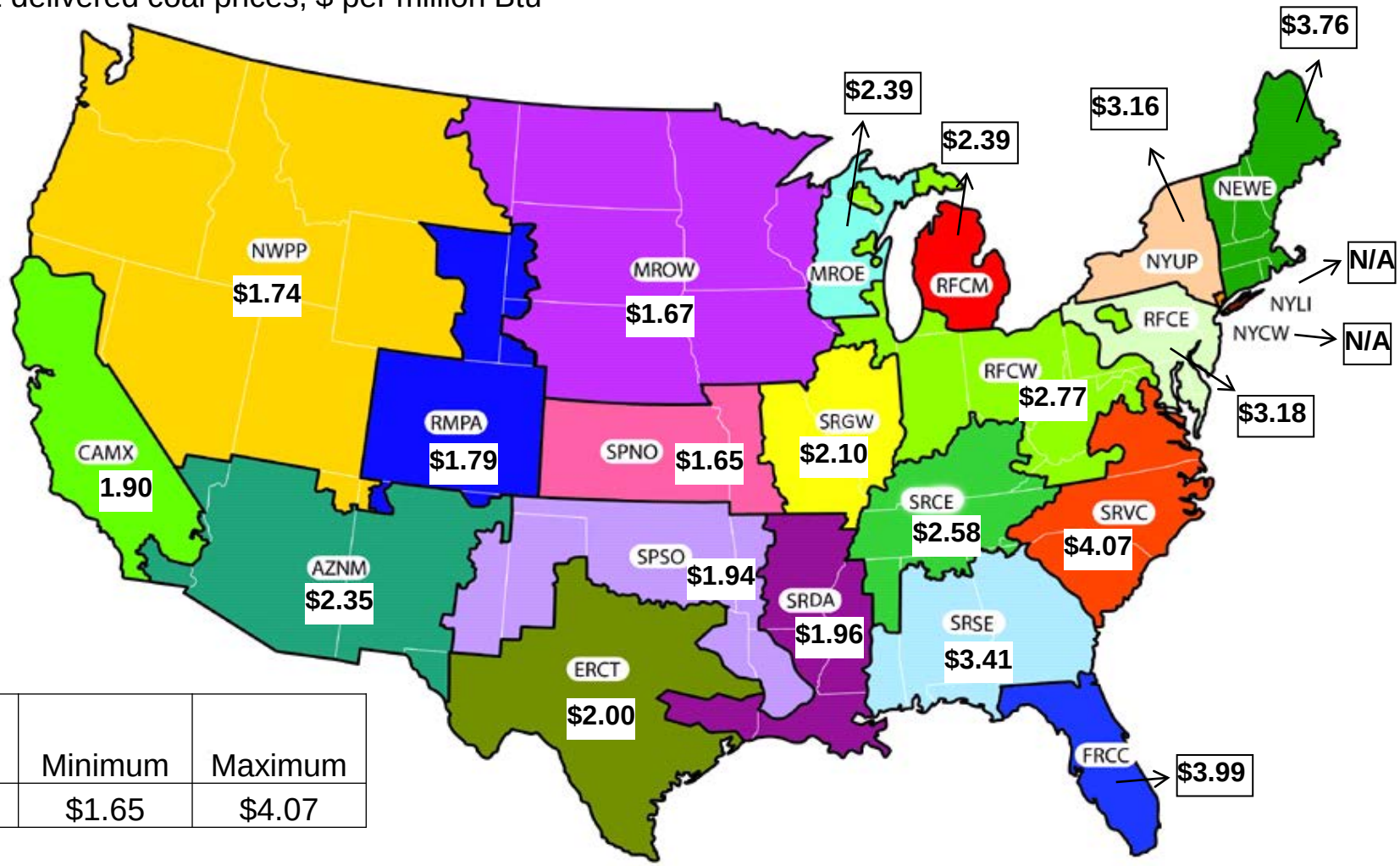


Period	Annual Growth
1950s	9.8
1960s	7.3
1970s	4.7
1980s	2.9
1990s	2.4
2000-2011	0.9
2012-2040	0.9

Source: EIA, Annual Energy Outlook 2013

The average delivered price of coal to electricity generators varies widely across U.S. regions – transport costs are a key reason

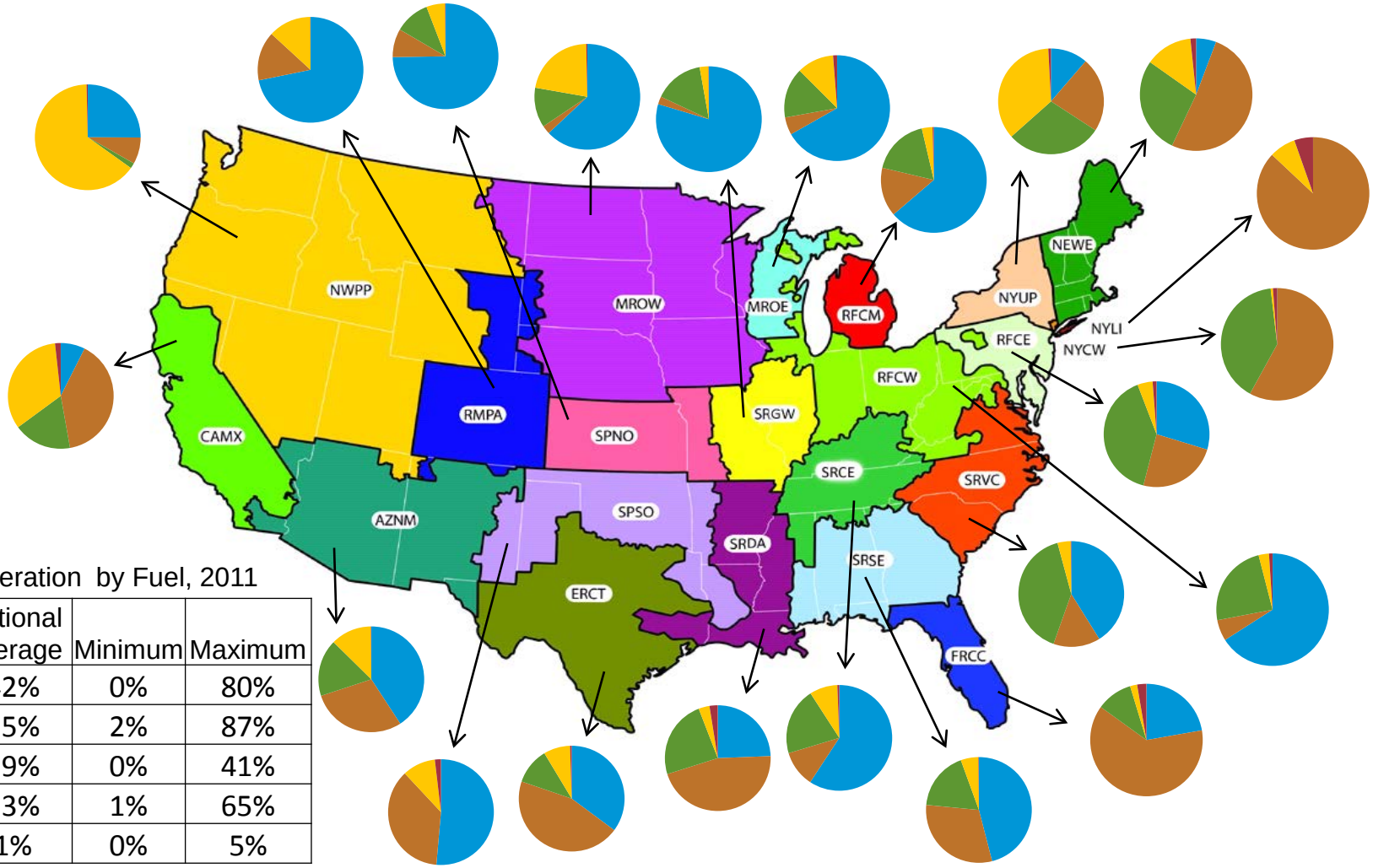
2011 delivered coal prices, $ per million Btu



National Average	Minimum	Maximum
$2.38	$1.65	$4.07

Source: EIA, Annual Energy Outlook 2013

The fuel mix for electricity generation varies widely across U.S. regions (2011)

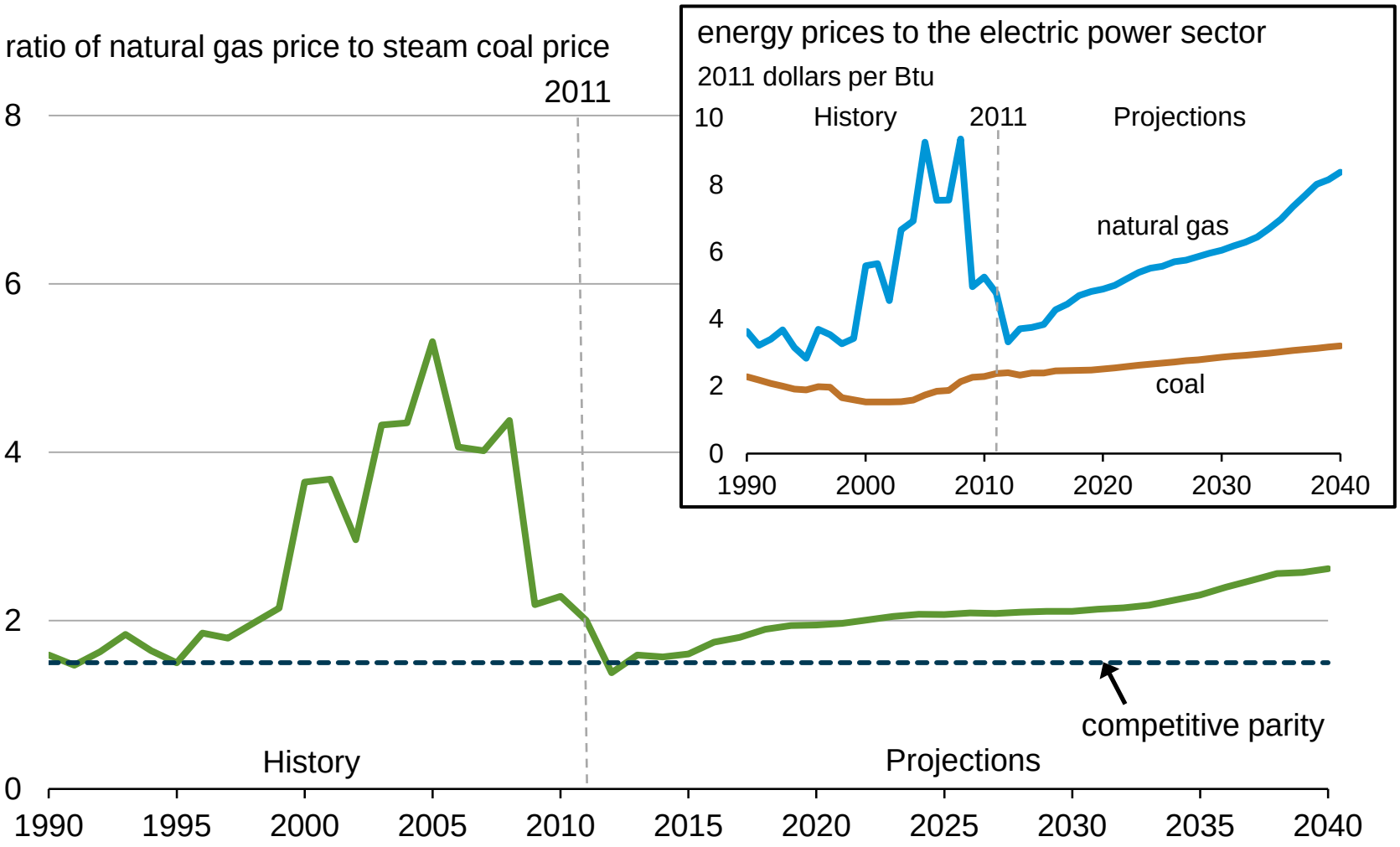


Share of Generation by Fuel, 2011

	National Average	Minimum	Maximum
Coal	42%	0%	80%
Natural Gas	25%	2%	87%
Nuclear	19%	0%	41%
Renewables	13%	1%	65%
Oil / Other	1%	0%	5%

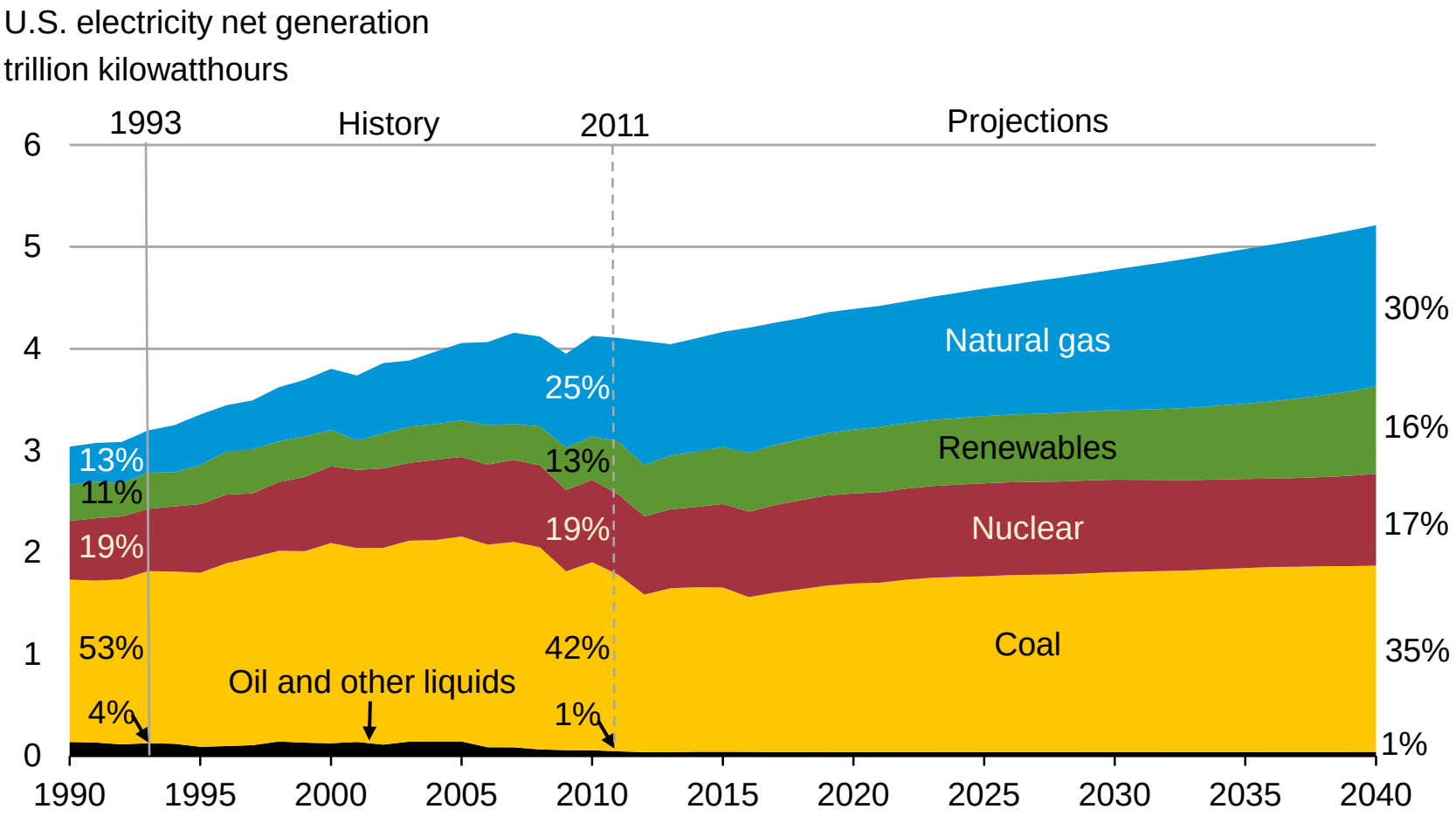
Source: EIA, Annual Energy Outlook 2013, based on Form EIA-923

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



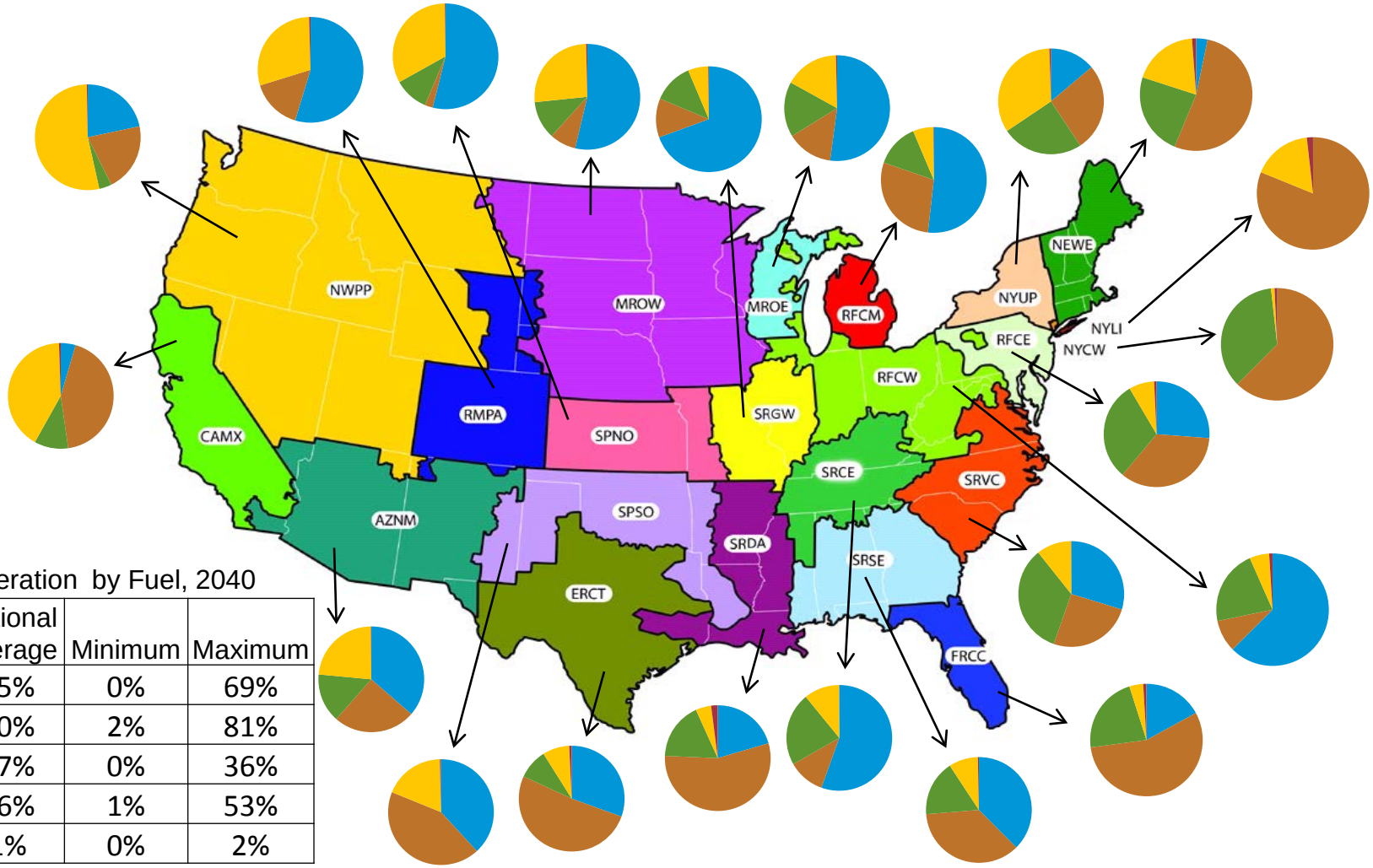
Source: EIA, Annual Energy Outlook 2013

The U.S. electricity mix in EIA's reference case gradually shifts to lower-carbon options, led by growth in gas and renewable generation



Source: EIA, Annual Energy Outlook 2013

The projected fuel mix for electricity generation by region (2040)

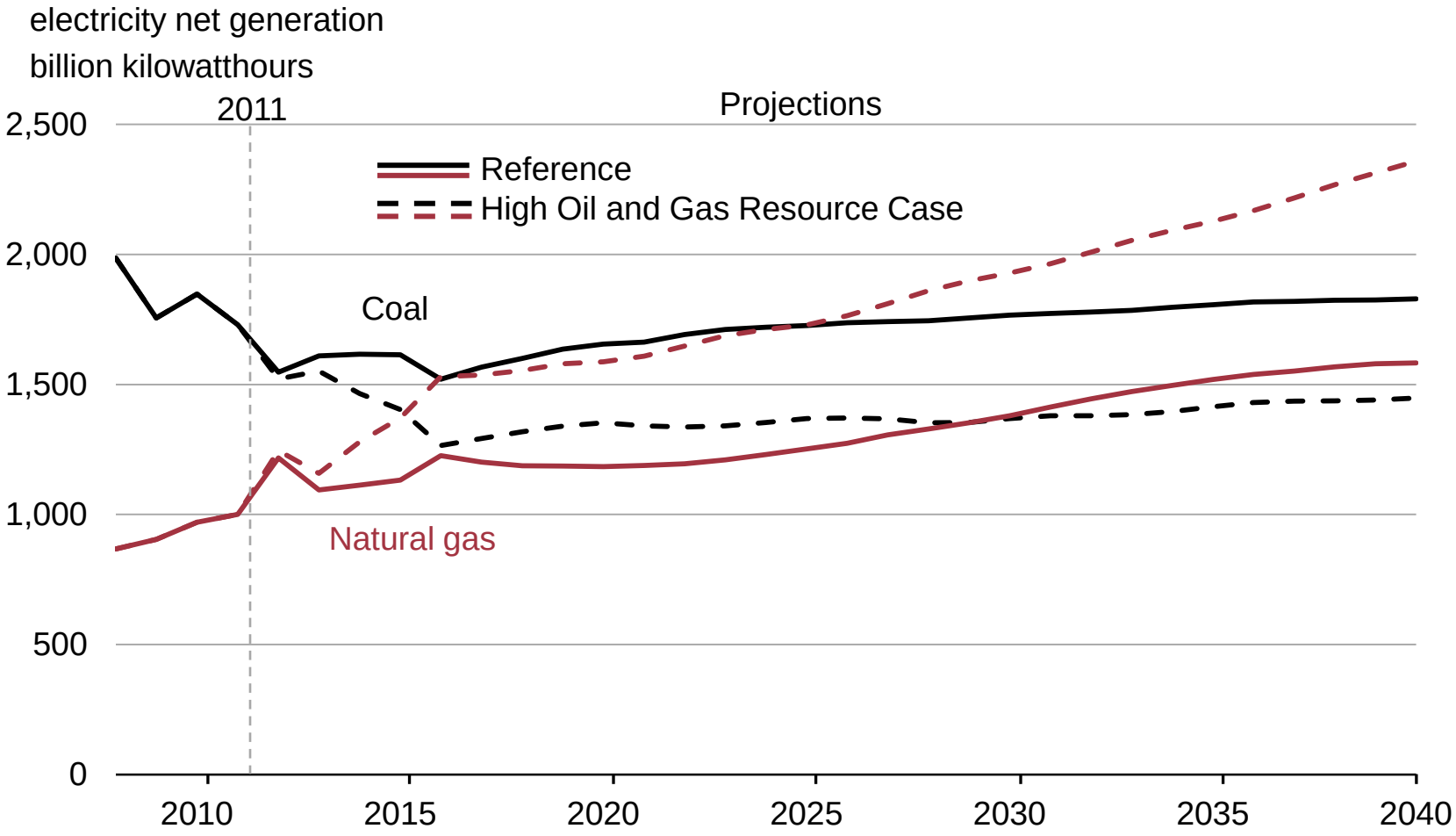


Share of Generation by Fuel, 2040

	National Average	Minimum	Maximum
Coal	35%	0%	69%
Natural Gas	30%	2%	81%
Nuclear	17%	0%	36%
Renewables	16%	1%	53%
Oil / Other	1%	0%	2%

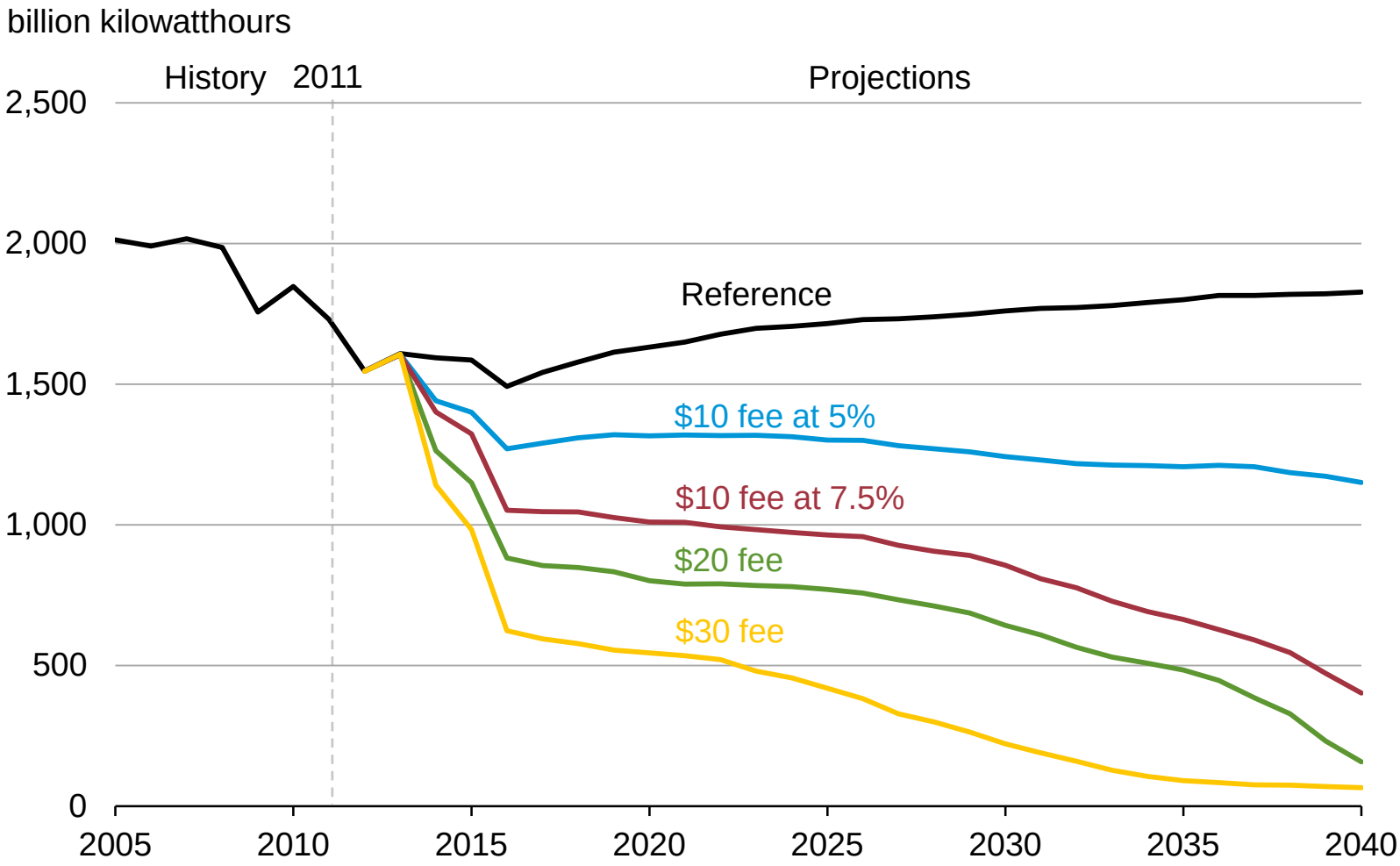
Source: EIA, Annual Energy Outlook 2013

With lower natural gas prices in the High Oil and Gas Resource Case, coal is permanently displaced as the leading generation source in the near future



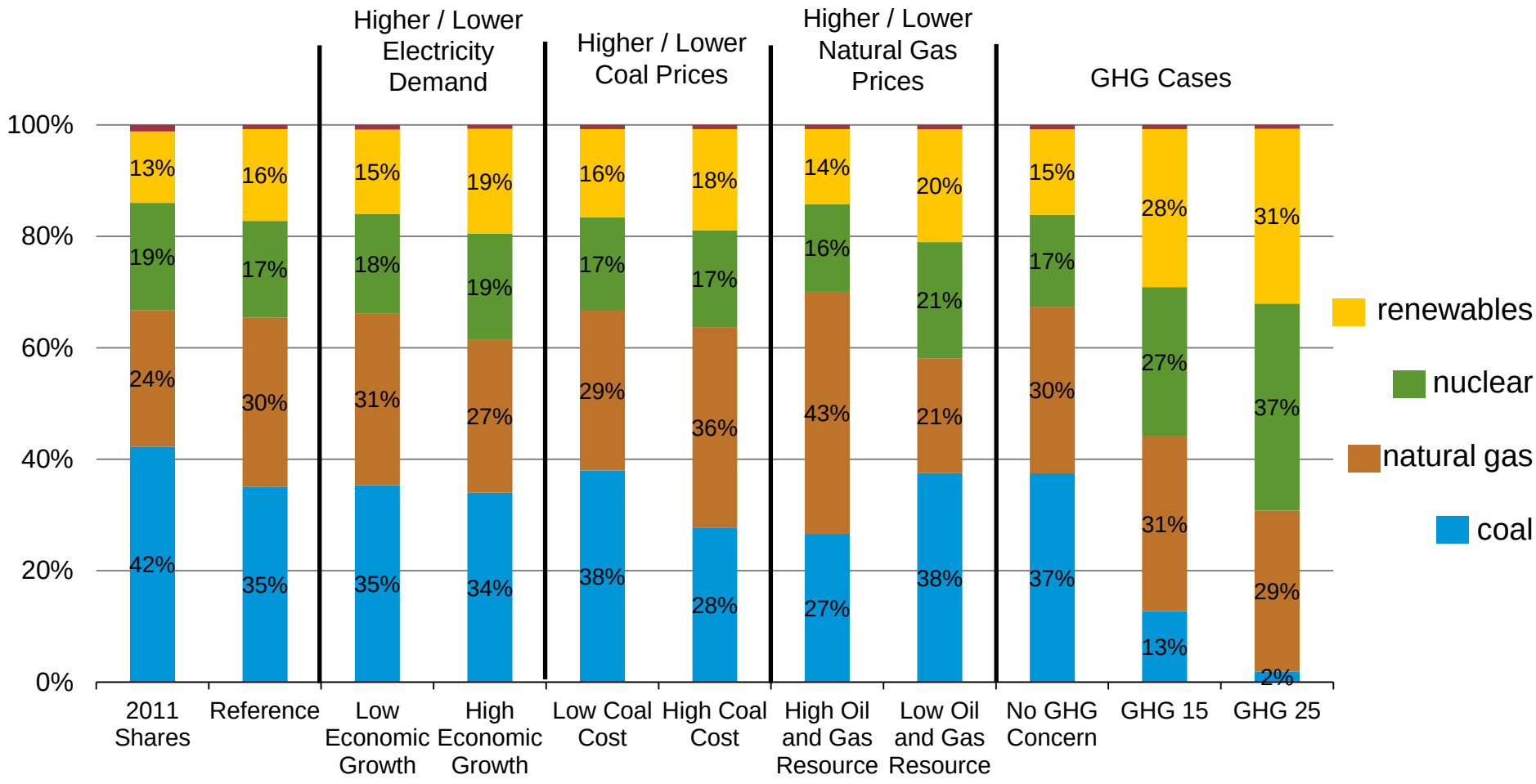
Source: EIA, Annual Energy Outlook 2013

Coal generation in alternative electricity sector CO_2 fee cases



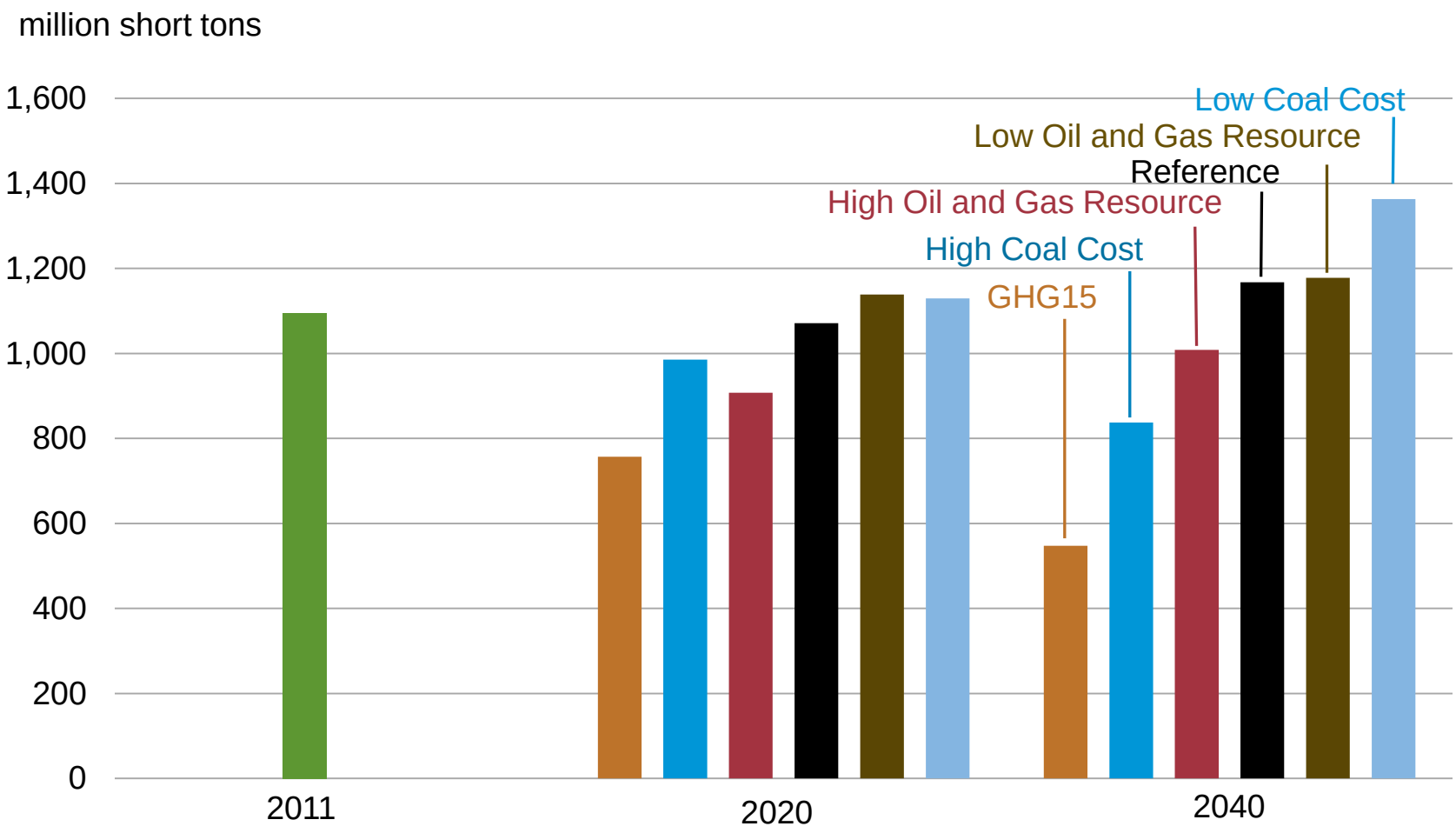
Source: EIA, Annual Energy Outlook 2013

Projected electricity generation shares of different fuels are sensitive to fuel prices and policy developments



Source: EIA, Annual Energy Outlook 2013

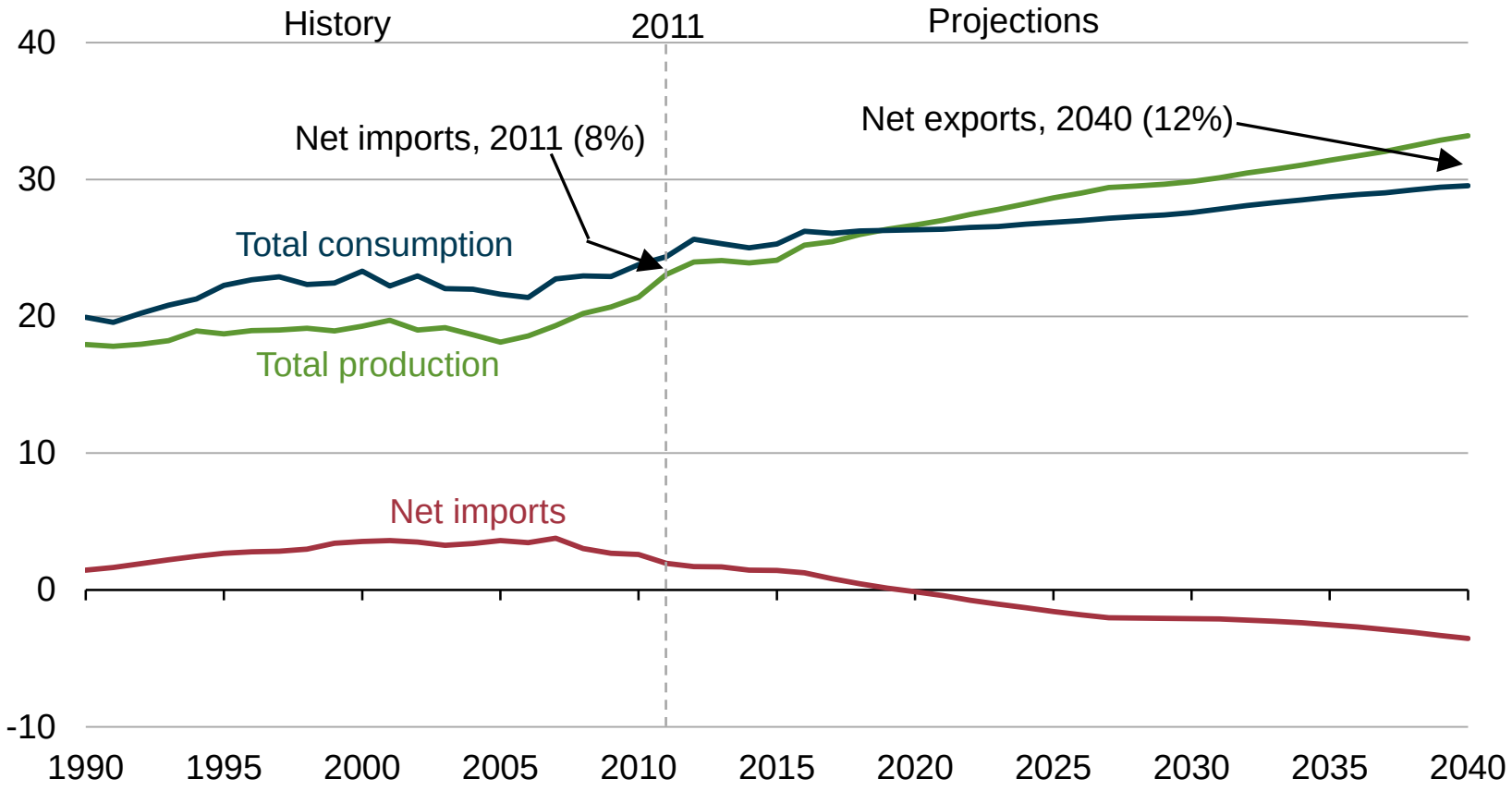
U.S. coal production is very sensitive to both markets and policies



Source: EIA, Annual Energy Outlook 2013

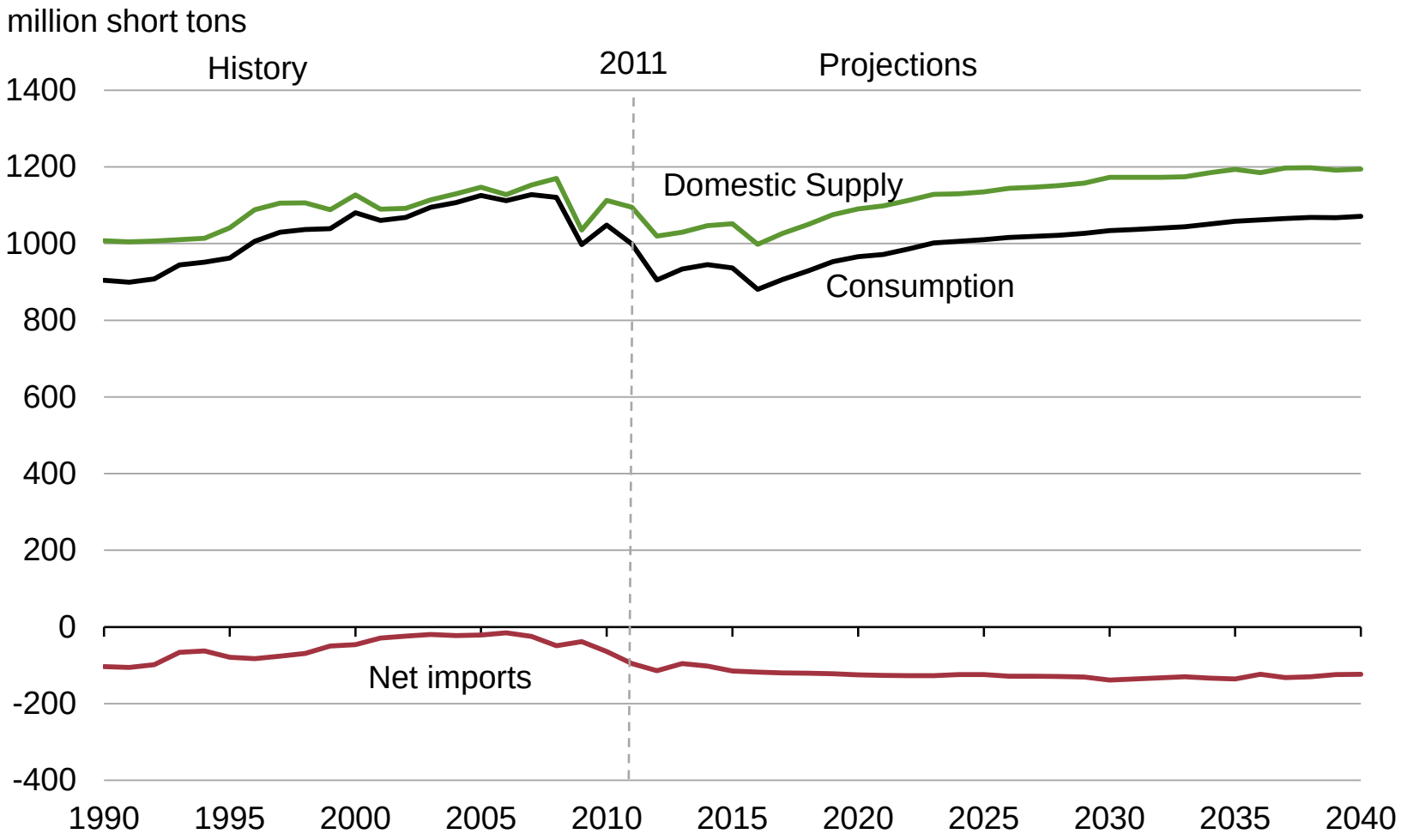
Total U.S. natural gas production, consumption, and net imports in the Reference case, 1990-2040

natural gas supply and consumption
trillion cubic feet



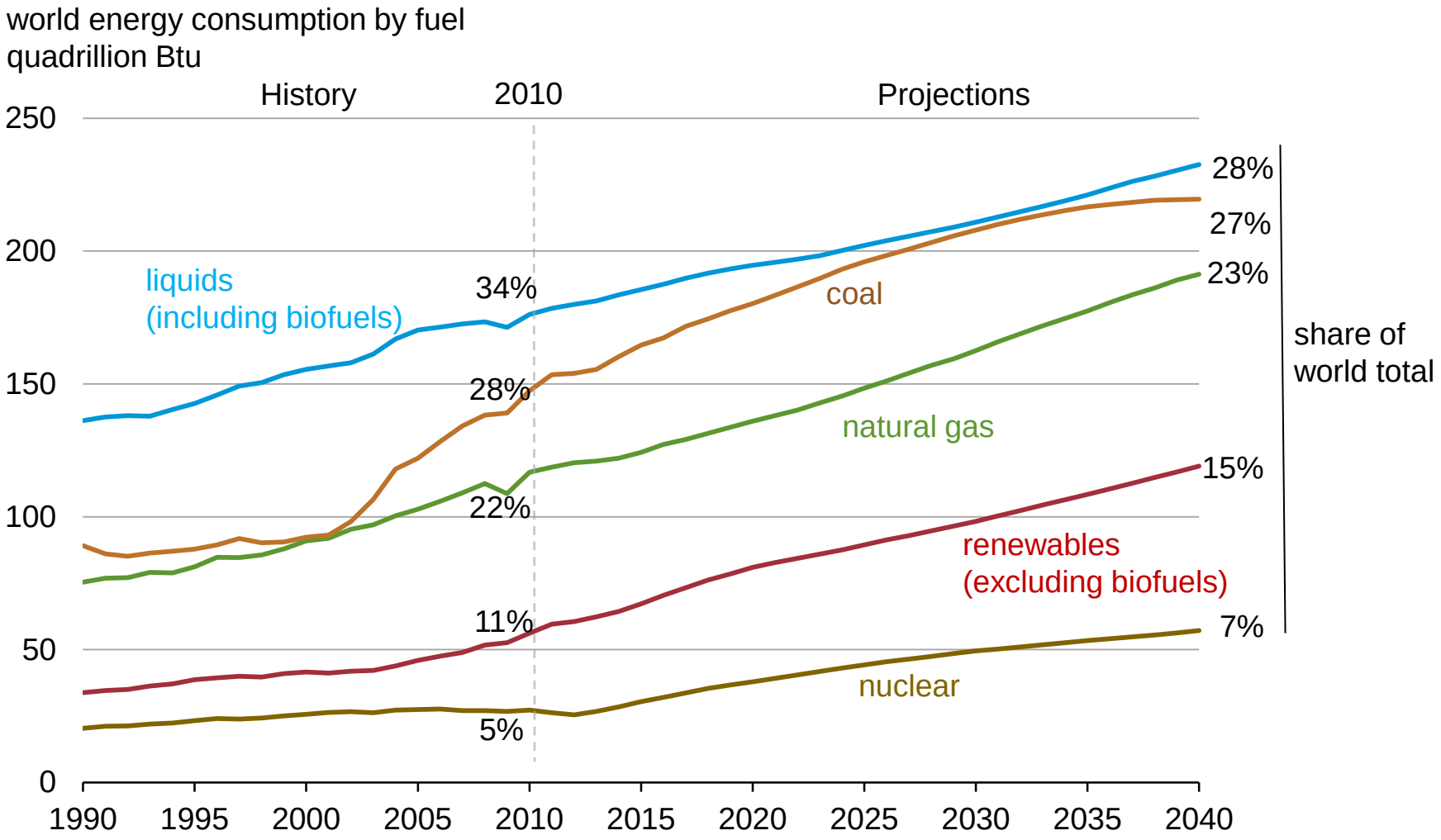
Source: EIA, Annual Energy Outlook 2013

U.S. continues to be a net exporter of coal



Source: EIA, Annual Energy Outlook 2013

Renewable energy and nuclear power are the fastest growing sources of energy to 2040, but fossil fuels continue as the dominant fuels



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/forecasts/aeo

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

International Energy Outlook | www.eia.gov/forecasts/ieo

Today In Energy | www.eia.gov/todayinenergy

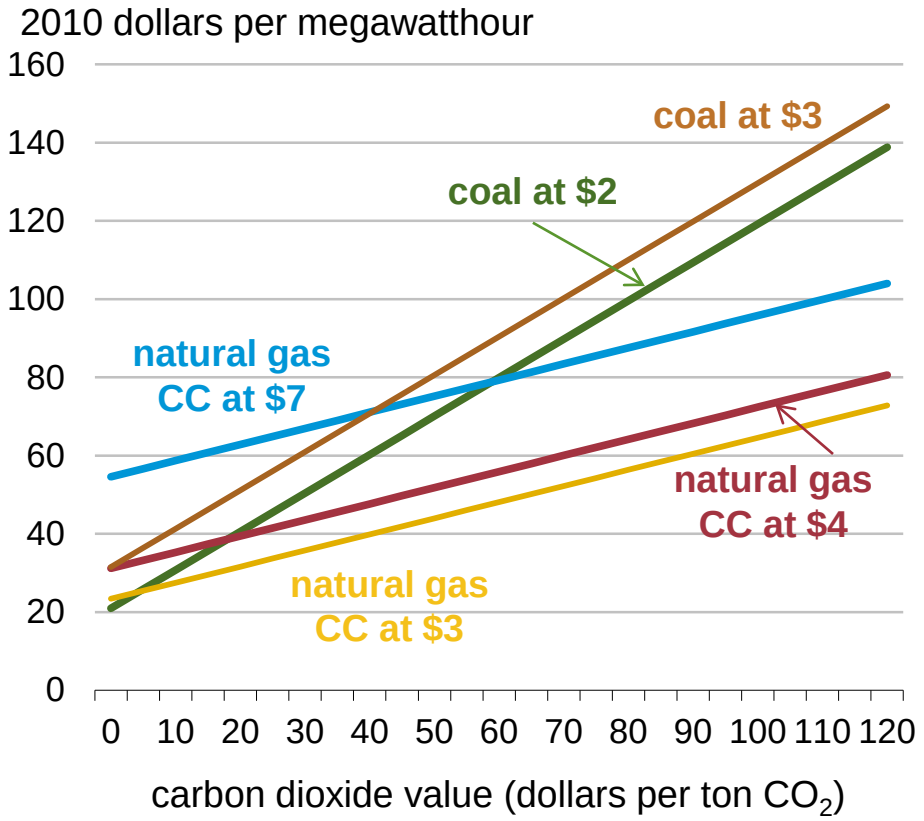
Monthly Energy Review | www.eia.gov/totalenergy/data/monthly

Annual Energy Review | www.eia.gov/totalenergy/data/annual

State Energy Portal | http://www.eia.gov/state/

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