Coal projections from the Annual Energy Outlook 2011 Early Release

Presented to the Rail Energy Transportation Advisory Committee of the Surface Transportation Board

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Key Results for the AEO2011 Early Release

- Coal remains the dominant fuel because of the large amount of existing capacity but there are relatively few new coal plants
- Increased estimates for U.S. shale gas resources drive increased production and lower prices for natural gas
- Non-hydro renewables and natural gas are the fastest growing electricity generation sources
- U.S. carbon dioxide emissions rise slowly, but do not pass 2005 levels again until 2027
- By basin, generally higher minemouth coal prices in AEO2011 compared to AEO2010

AEO2011: Some relevant assumptions

- Current laws and regulations, excludes pending regulations that will likely affect coal (8 gigawatts of coal plant retirements by 2035 in AEO2011)
- **Environmental rules representation in the AEO (same as AEO2010)**:
  - SO2 and NOx: Clean Air Interstate Rule (CAIR) modeled as cap and trade
  - Mercury: modeled as a 90 percent Maximum Achievable Control Technology (MACT) for several coal demand regions based on State-level initiatives
  - CO2: Regional Greenhouse Gas Initiative (RGGI)
- **Renewable energy**:

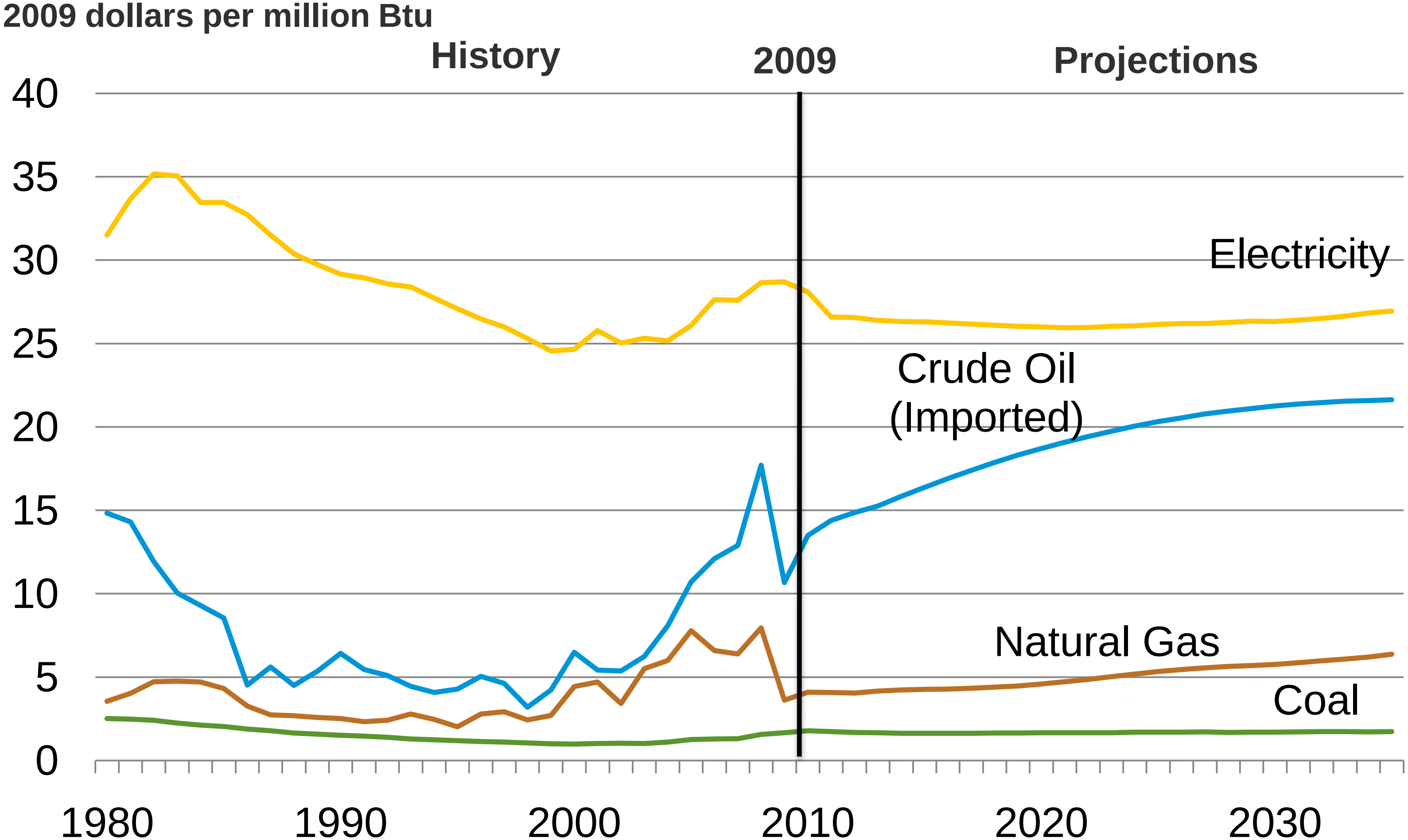
30 States and the District of Colombia have Renewable Portfolio Standards(RPS) --no new programs since AEO2010

Renewable production tax credits (PTC) and investment tax credits are assumed to expire

AEO2010: Some relevant assumptions

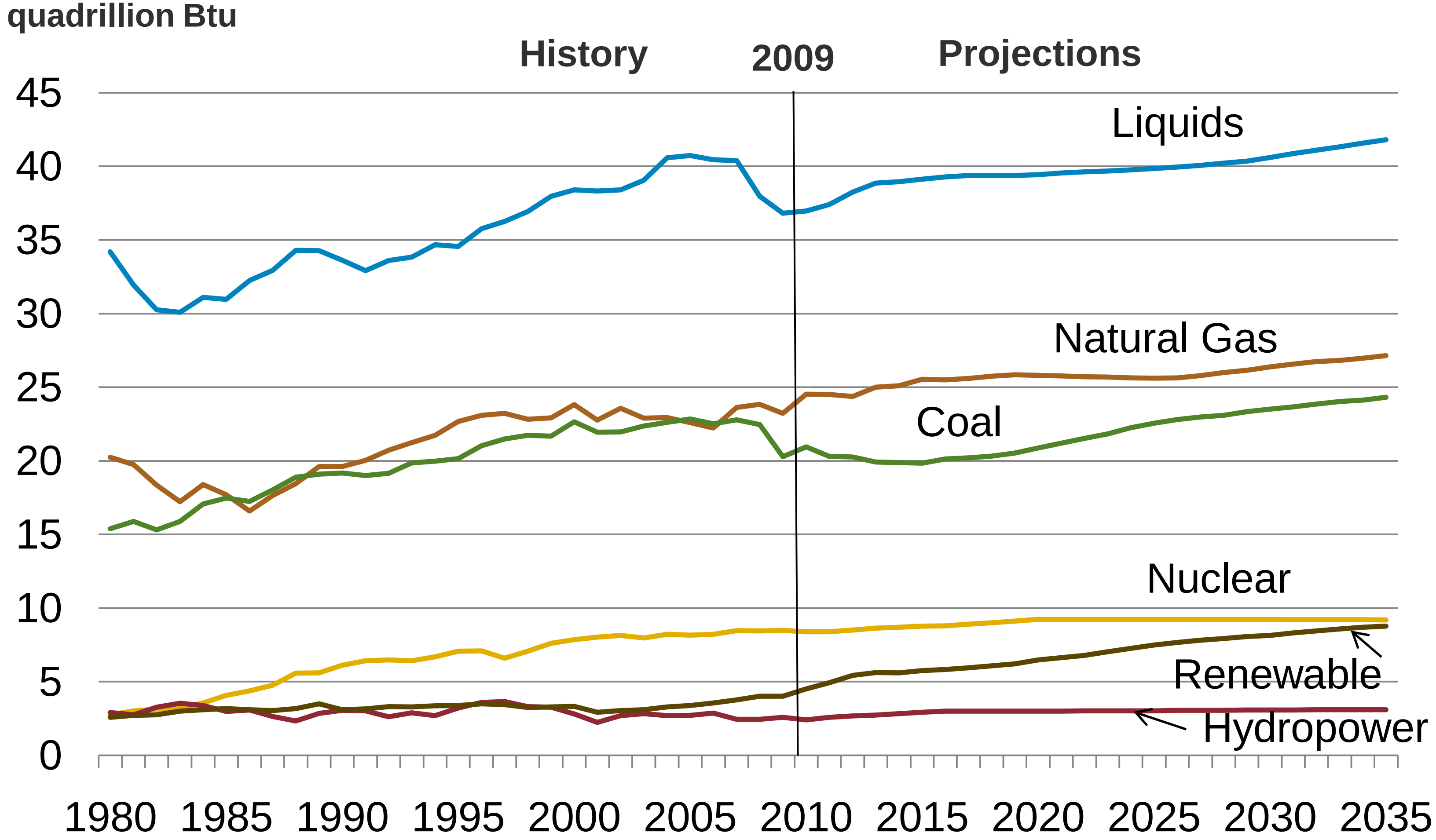
- Higher assumed capital costs for coal plants in the AEO2011 compared to the AEO2010
- 3% higher cost of capital for coal plants (including coal-based synthetic liquid plants) for greenhouse gas intensive projects
- Represent impacts of the U.S. EPA's interim permit review guidelines for surface coal mining operations
- The first commercial coal-based synthetic liquids plant is not allowed until 2015
- 2 gigawatts of coal w/ carbon capture and sequestration (CCS) assumed by 2017 (investment tax credits in the Energy Improvement and Extension Act of 2008 and funding from the American Recovery and Revitalization Act)
- New Rocky Mountain coking coal supply curve (6 million tons of production in 2035)

Energy prices, 1980-2035



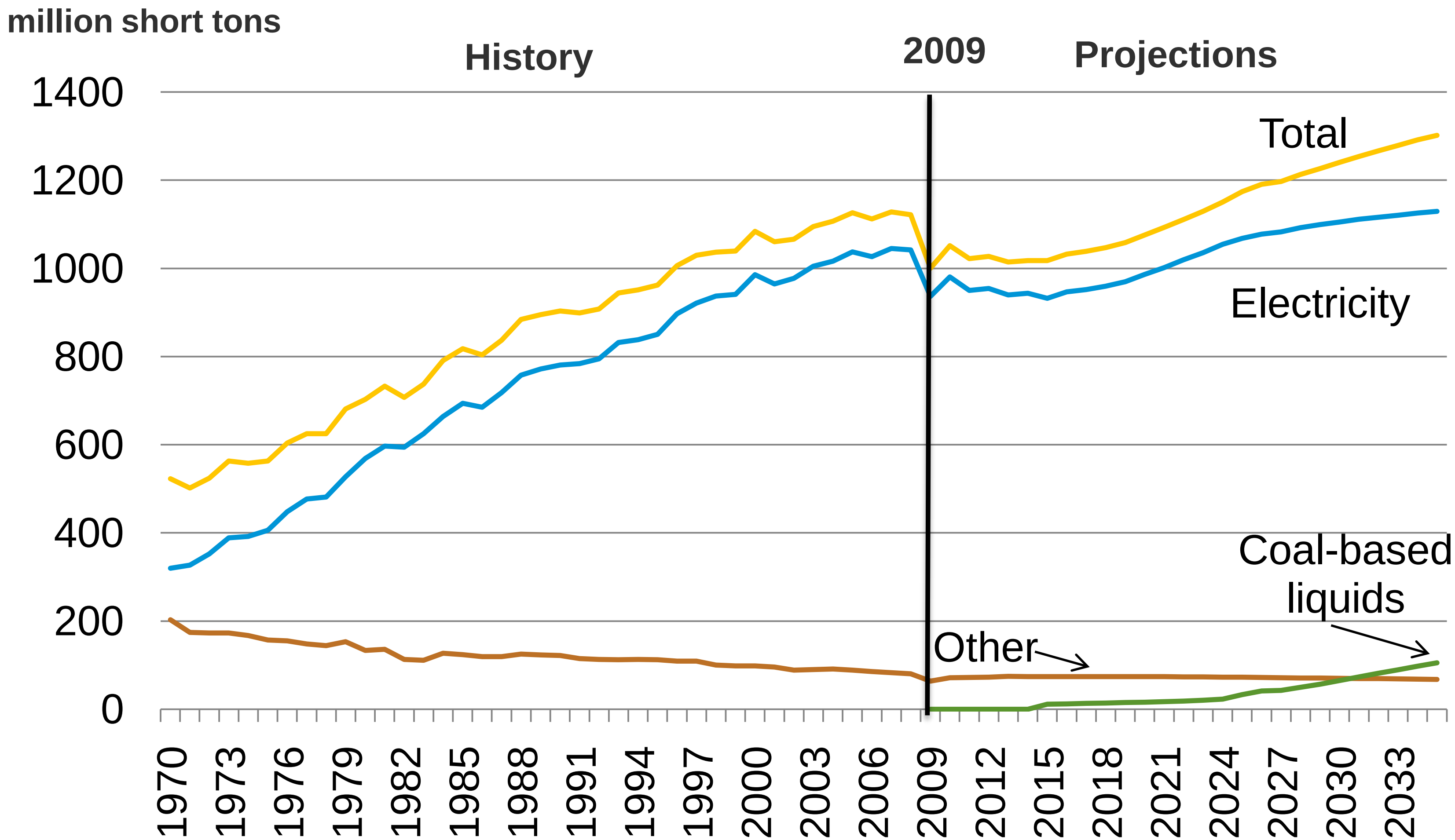
Source: Annual Energy Outlook 2011 Early Release

Energy consumption by fuel, 1980-2035



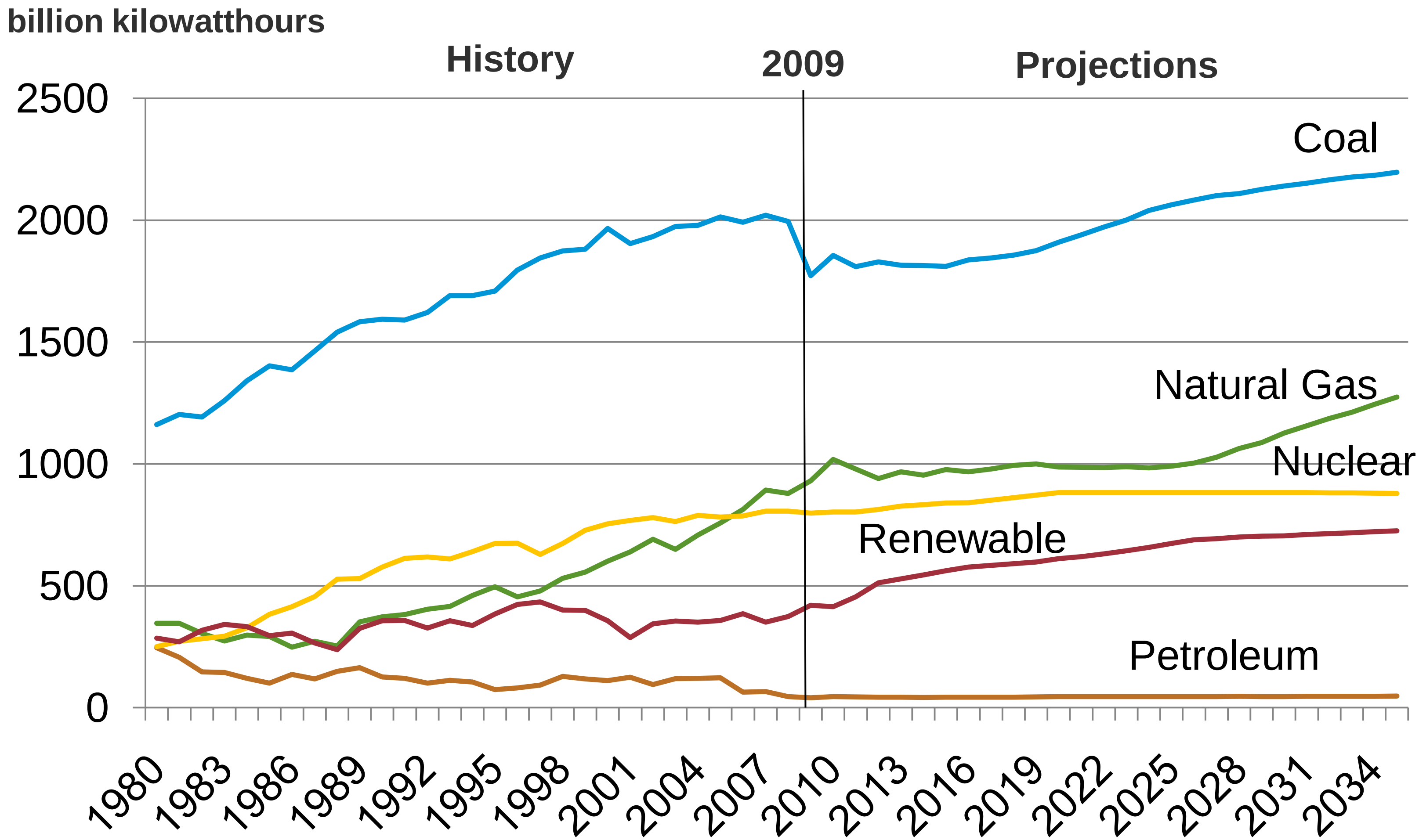
Source: Annual Energy Outlook 2011 Early Release

Coal consumption by sector, 1970-2035



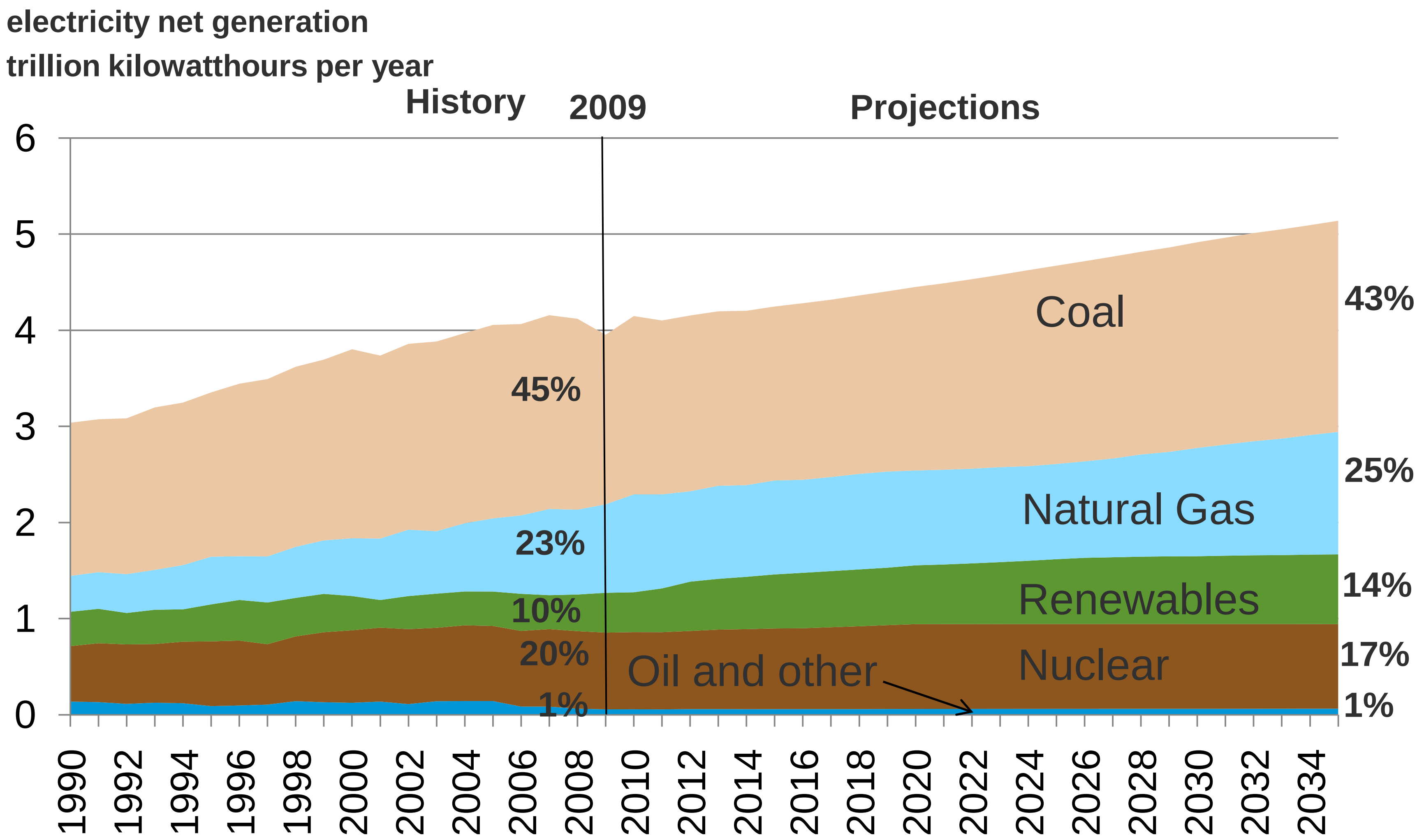
Source: Annual Energy Outlook 2011 Early Release

Electricity generation by fuel, 1980-2035



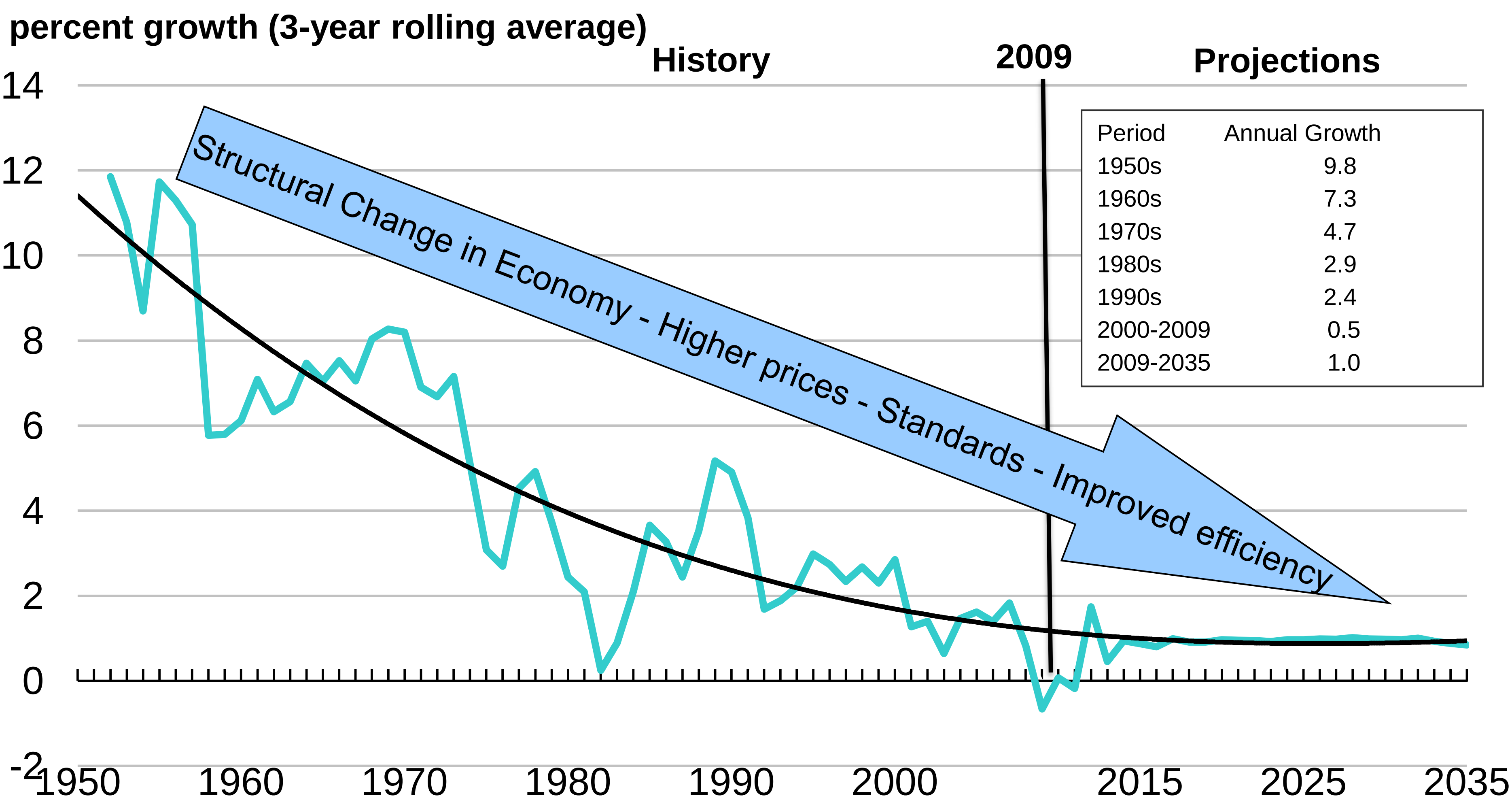
Source: Annual Energy Outlook 2011 Early Release

Coal's share of generation falls as natural gas and renewables rise

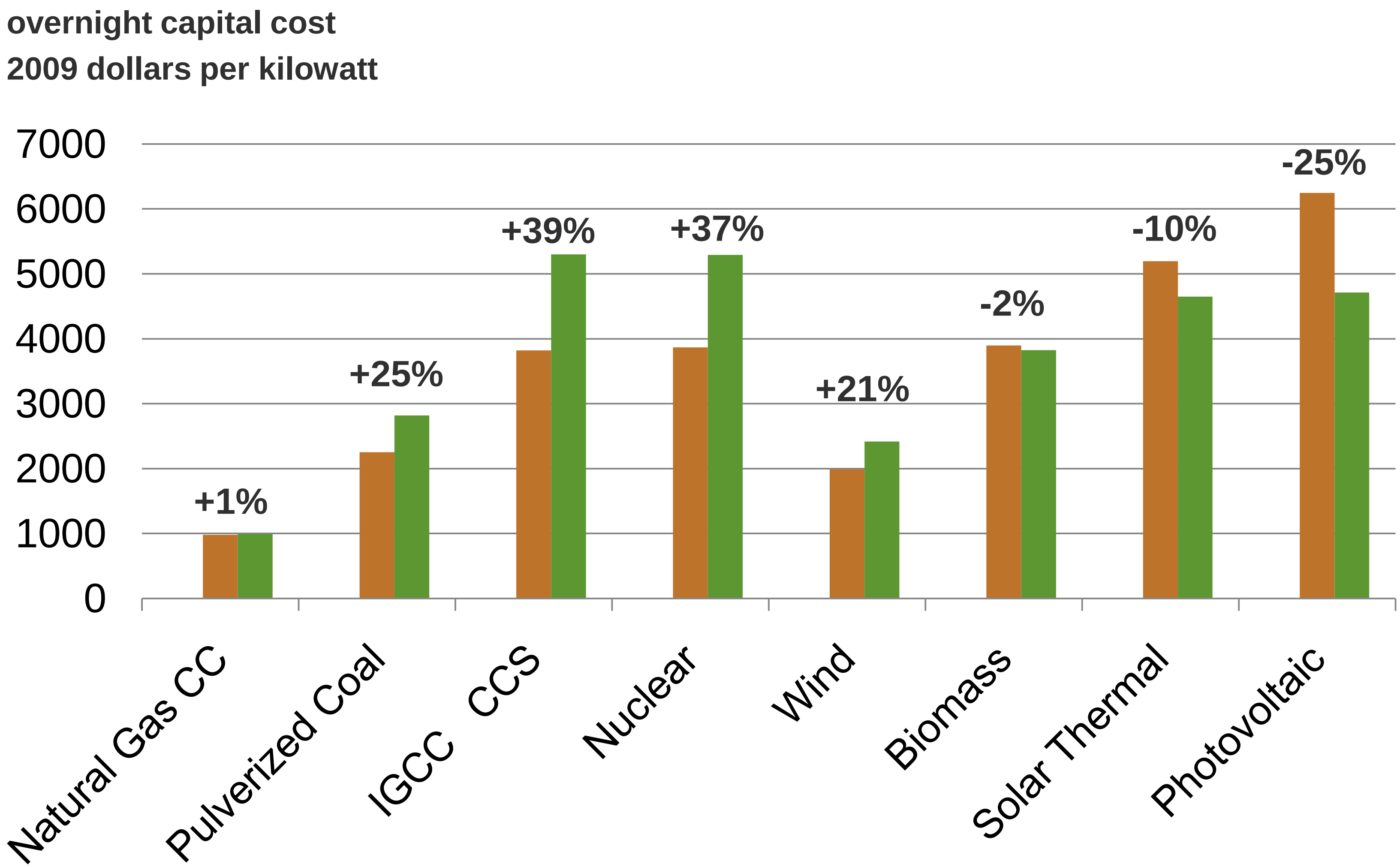


Source: Annual Energy Outlook 2011 Early Release

While projected electricity consumption grows by 30%, the rate of growth has slowed

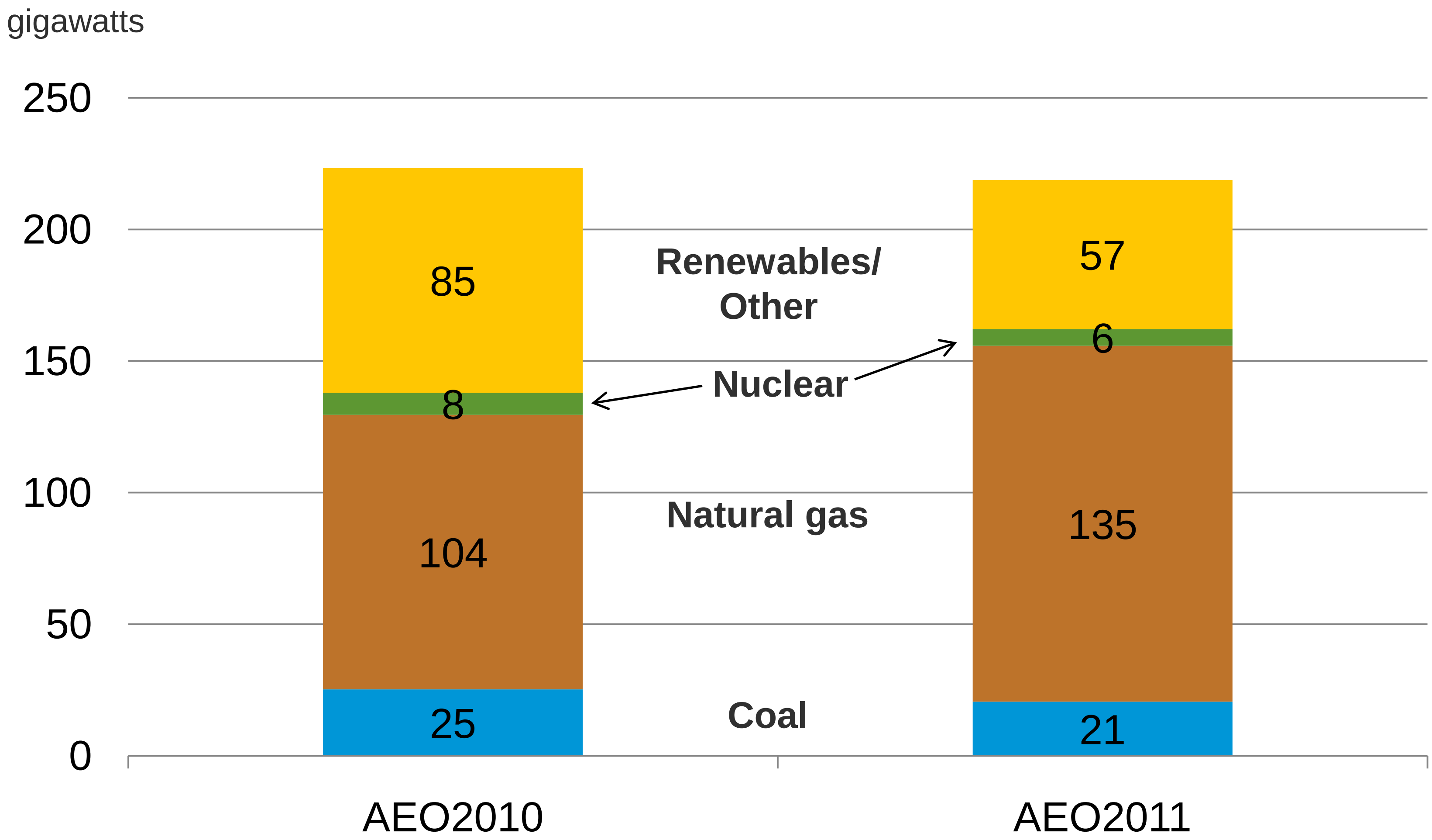


Updated capital costs for electricity plants show increases for coal, nuclear, and wind while solar costs decline



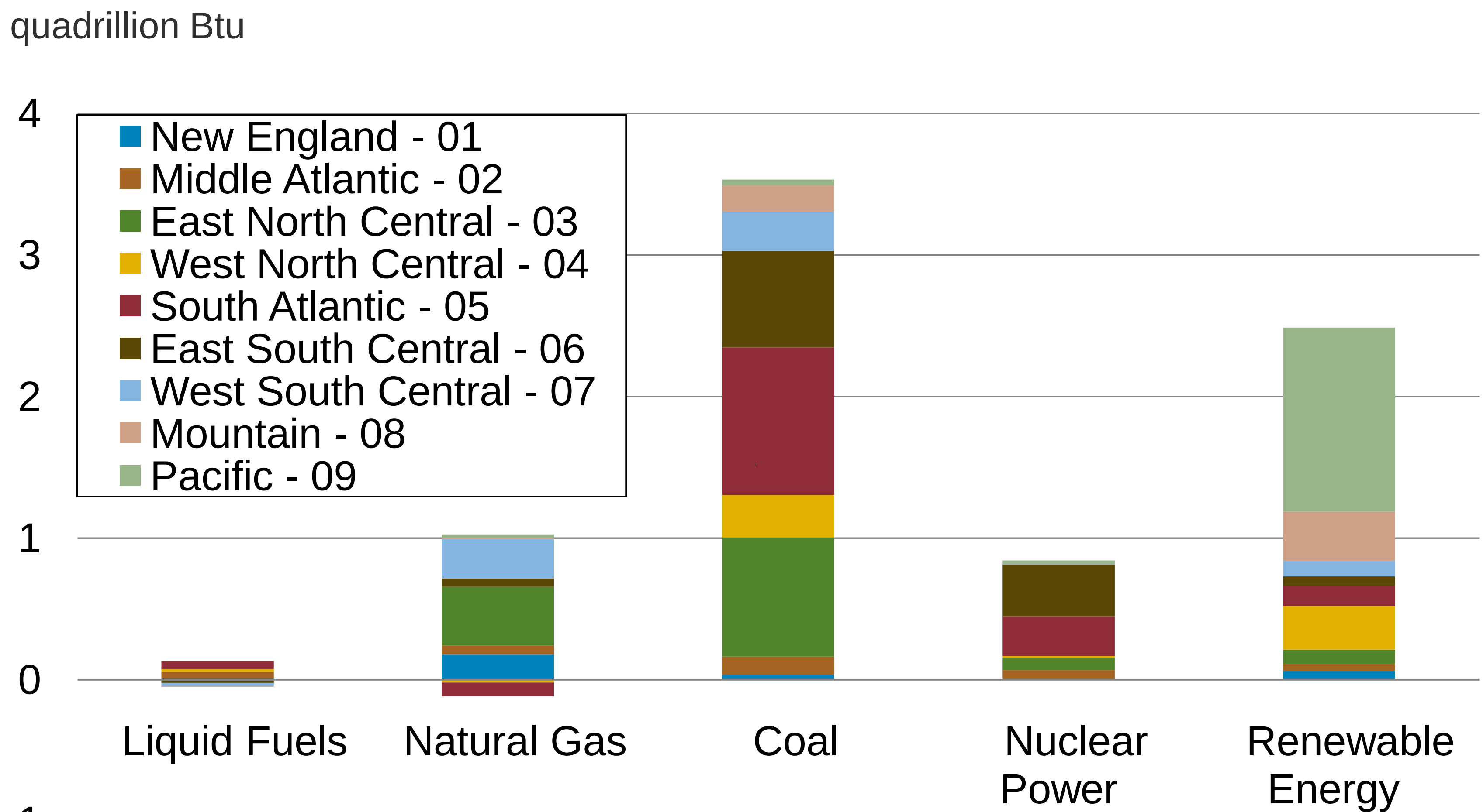
Source: Annual Energy Outlook 2011 Early Release

Cumulative electricity generating capacity, 2010-2035



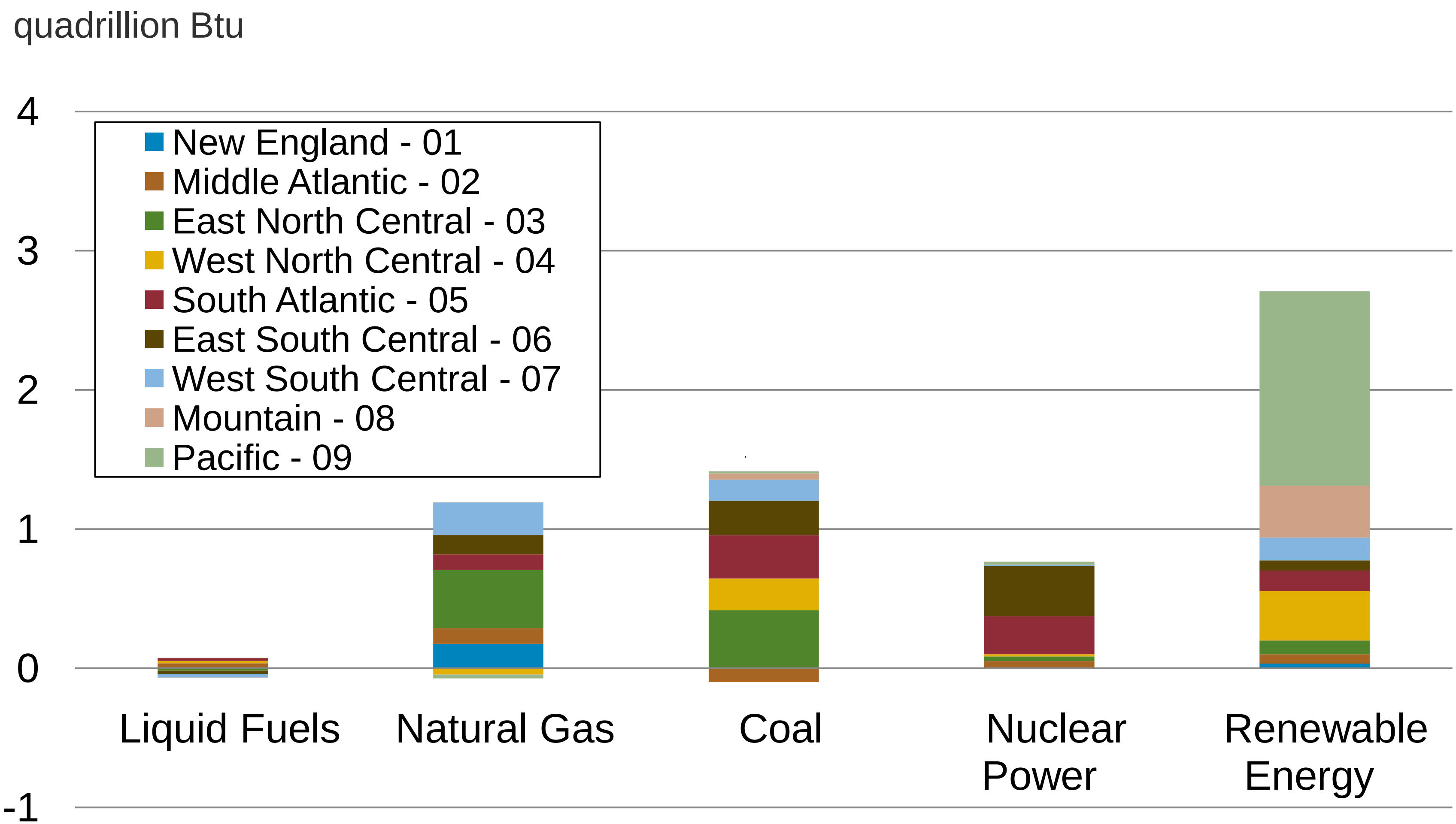
Source: Annual Energy Outlook 2011 Early Release and Annual Energy Outlook 2010

Net Change in Energy Use for Electricity By Fuel Source and Census Division, 2009-2035

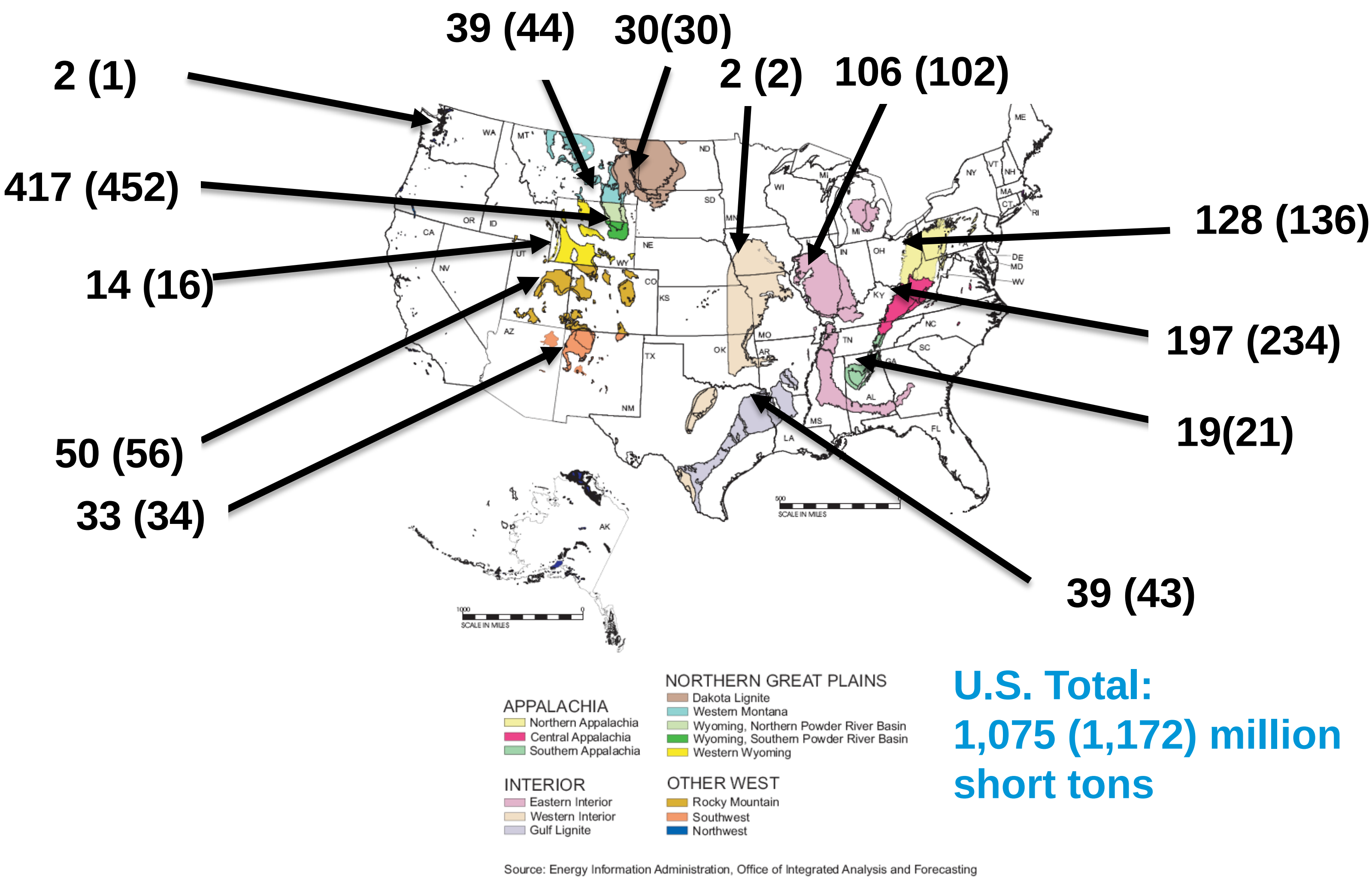


Source: Annual Energy Outlook 2011 Early Release

Net Change in Energy Use for Electricity By Fuel Source and Census Division, 2008-2035

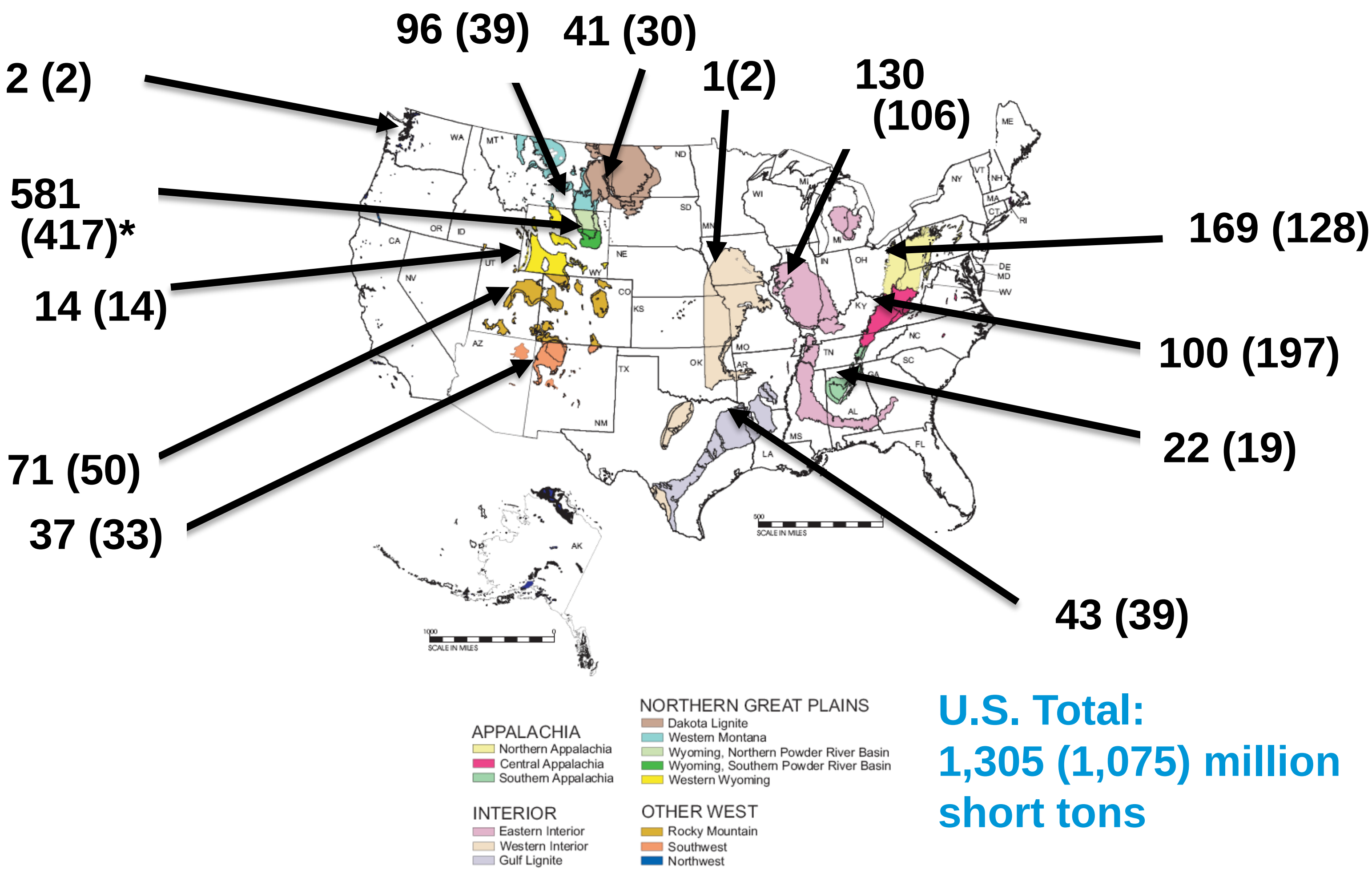


Coal production, 2009 (and 2008) (million short tons)



U.S. Total: 1,075 (1,172) million short tons

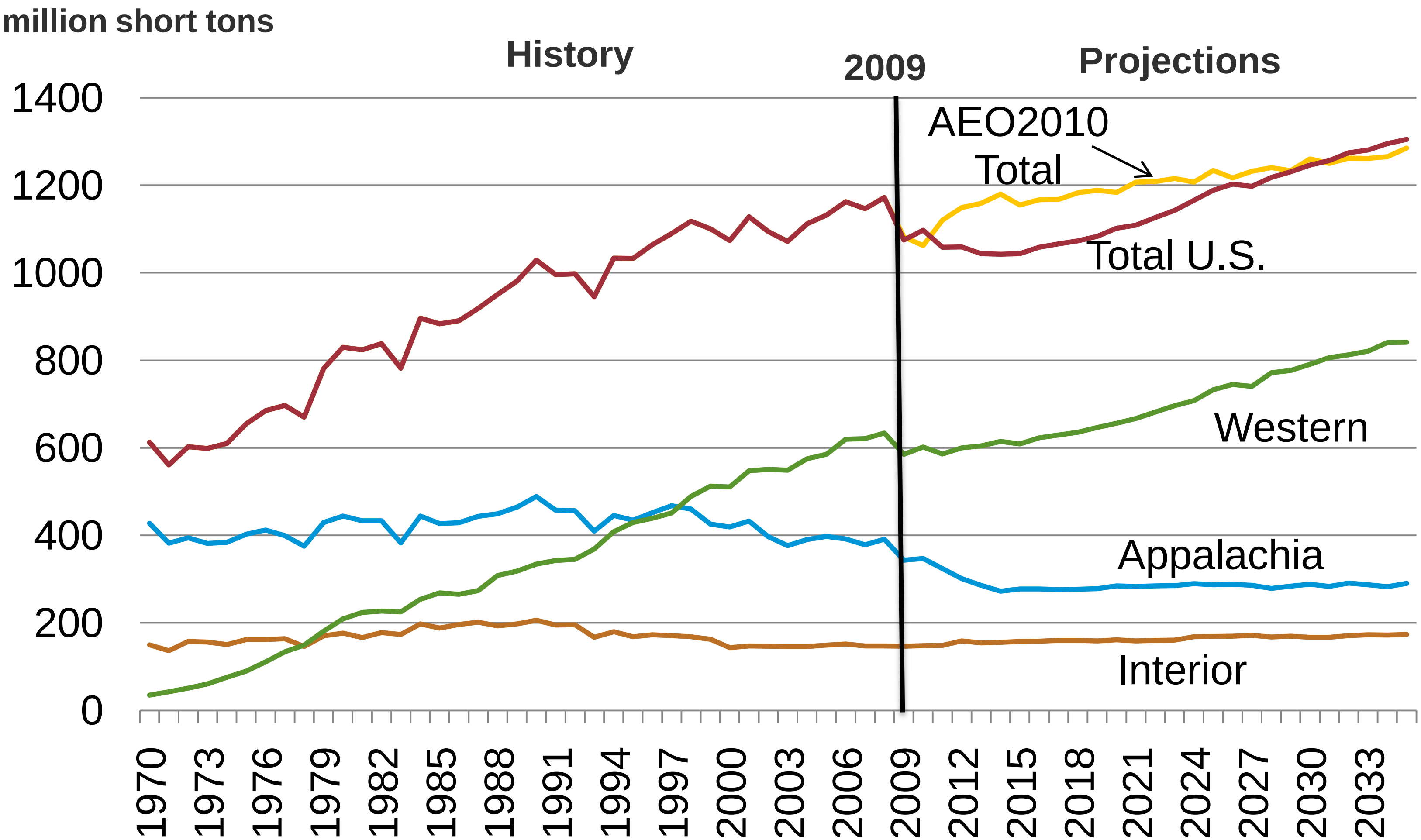
Coal production, 2035 (and 2009)
(million short tons)



Source: Energy Information Administration, Office of Integrated Analysis and Forecasting

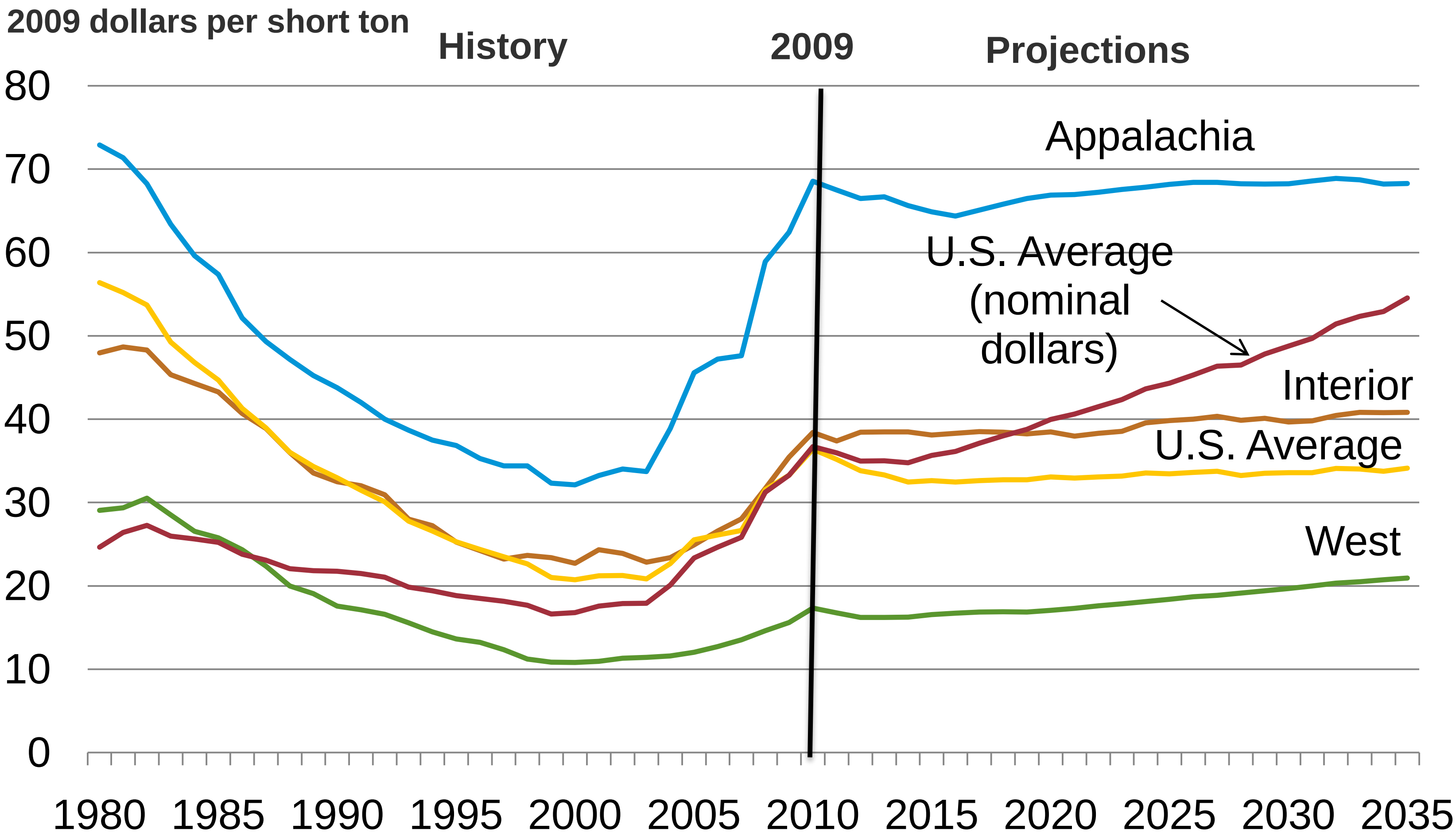
U.S. Total: 1,305 (1,075) million short tons

Coal production by region, 1970-2035



Source: Annual Energy Outlook 2011 Early Release and Annual Energy Outlook 2010 Reference

Average minemouth coal prices by region, 1980-2035



Source: Annual Energy Outlook 2011 Early Release

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For more information

- U.S. Energy Information Administration home page | www.eia.gov
- Short-Term Energy Outlook | www.eia.gov/steo
- Annual Energy Outlook | www.eia.gov/aeo
- International Energy Outlook | www.eia.gov/ieo
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U.S. Census Divisions

	Census Division	States Included
1.	New England	CT, MA, ME, NH, RI, VT
2.	Middle Atlantic	NY, PA, NJ
3.	East North Central	OH, IN, IL, MI, WI
4.	West North Central	MN, IA, ND, SD, NE, MO, KS
5.	South Atlantic	WV, MD, DC, DE, VA, NC, SC, GA, FL
6.	East South Central	KY, TN, AL, MS
7.	West South Central	TX, LA, OK, AR
8.	Mountain	MT, WY, ID, CO, UT, NV, AZ, NM
9.	Pacific	AK, HI, WA, OR, CA