

Highlights of [GAO-13-72](#), a report to the Chairman, Committee on Commerce, Science and Transportation, U.S. Senate

Why GAO Did This Study

Coal is a key domestic fuel source and an important contributor to the U.S. economy. Most coal produced in the United States is used to generate electricity. In 2011, 1,387 coal-fueled electricity generating units produced about 42 percent of the nation's electricity. After decades of growth, U.S. coal production and consumption have fallen, primarily due to declines in the use of coal to generate electricity.

According to the Environmental Protection Agency (EPA), using coal to generate electricity is associated with health and environmental concerns such as emissions of sulfur dioxide, a pollutant linked to respiratory illnesses, and carbon dioxide, a greenhouse gas linked to climate change. In response to recent environmental regulations and changing market conditions, such as the recent decrease in the price of natural gas, power companies may retire some units, which could affect the coal fleet's generating capacity—the ability to generate electricity—and the amount of electricity generated from coal. Power companies may also retrofit some units by installing controls to reduce pollutants.

GAO was asked to examine (1) how the fleet of coal-fueled electricity generating units may change in the future in terms of its generating capacity and other aspects and (2) the future use of coal to generate electricity in the United States and key factors that could affect it. GAO conducted a statistical analysis of plans for retiring coal-fueled units, interviewed stakeholders, and reviewed information on industry plans and long-term forecasts by EIA and others. GAO is not making any recommendations in this report.

View [GAO-13-72](#). For more information, contact Frank Rusco at (202) 512-3841 or ruscof@gao.gov.

October 2012

ELECTRICITY

Significant Changes Are Expected in Coal-Fueled Generation, but Coal Is Likely to Remain a Key Fuel Source

What GAO Found

Retirements of older units, retrofits of existing units with pollution controls, and the construction of some new coal-fueled units are expected to significantly change the coal-fueled electricity generating fleet, making it capable of emitting lower levels of pollutants than the current fleet but reducing its future electricity generating capacity. Two broad trends are affecting power companies' decisions related to coal-fueled generating units—recent environmental regulations and changing market conditions, such as the recent decrease in the price of natural gas. Regarding retirements, forecasts GAO reviewed based on current policies project that power companies may retire 15 to 24 percent of coal-fueled generating capacity by 2035—an amount consistent with GAO's analysis. GAO's statistical analysis, examining data on power companies that have announced plans to retire coal-fueled units, found that these power companies are more likely to retire units that are older, smaller, and more polluting. For example, the units companies plan to retire emitted an average of twice as much sulfur dioxide per unit of fuel used in 2011 as units that companies do not plan to retire. Based on the characteristics of the units companies plan to retire, GAO estimated additional capacity that may retire. In total, GAO identified 15 to 18 percent of coal-fueled capacity that power companies either plan to retire or that GAO estimated may retire—an amount consistent with the forecasts GAO reviewed. Regarding retrofits, the coal-fueled generating fleet may also become less polluting in the future as power companies install controls on many remaining units. Regarding new coal-fueled units, these are likely to be less polluting as they must incorporate advanced technologies to reduce emissions of regulated pollutants. Coal-fueled capacity may decline in the future as less capacity is expected to be built than is expected to retire.

According to stakeholders and three long-term forecasts GAO reviewed, coal is generally expected to remain a key fuel source for U.S. electricity generation in the future, but coal's share as a source of electricity may continue to decline. For example, in its forecast based on current policies, the Energy Information Administration (EIA) forecasts that the amount of electricity generated using coal is expected to remain relatively constant through 2035, but it forecasts that the share of coal-fueled electricity generation will decline from 42 percent in 2011 to 38 percent in 2035. Available information suggests that the future U.S. use of coal may be determined by several key factors, including the price of natural gas and environmental regulations. For example, available information suggests that the price of coal compared with other fuel sources will influence how economically attractive it is to use coal to generate electricity. EIA assessed several scenarios of future fuel prices and forecasts that coal's share of U.S. electricity generation will fall to 30 percent in 2035 if natural gas prices are low or 40 percent if natural gas prices are high. In addition, some stakeholders told GAO that the future use of coal could be significantly affected if existing environmental regulations become more stringent or if additional environmental regulations are issued. For example, EIA forecasts that two hypothetical future policies that reduce carbon dioxide emissions from the electricity sector by 46 percent and 76 percent would result in coal's share of U.S. electricity generation falling to 16 and 4 percent in 2035, respectively.

EPA provided technical comments that were incorporated as appropriate.