

Issue

In a future world of 8.5 billion people in 2035, the Energy Information Administration's (EIA) projected 50% increase in energy consumption will require true "all of the above" energy resource use from oil, gas, renewables, nuclear, and coal. In particular, coal will continue to be the world's energy cornerstone, providing more incremental energy over that same time period than any other single fuel.

Coal has long been a centerpiece of a low-cost, high-reliability electricity grid. Today there are 1.3 billion people across the globe without access to electricity and 2.7 billion people who do not have clean cooking facilities. The problem is spread across the developing world, but it is particularly severe in sub-Saharan Africa and developing Asia, which together account for 95% of people in energy poverty. Without a commitment to achieve universal energy access it has been estimated that by 2030, there will be an additional 1.5 million premature deaths per year caused by household pollution from burning wood and dung and through a lack of access to clean water, basic sanitation and healthcare. Modern energy sources are essential to meeting these challenges.¹

Figure 1. Global Energy Poverty



Source: EIA, World Energy Outlook, 2011

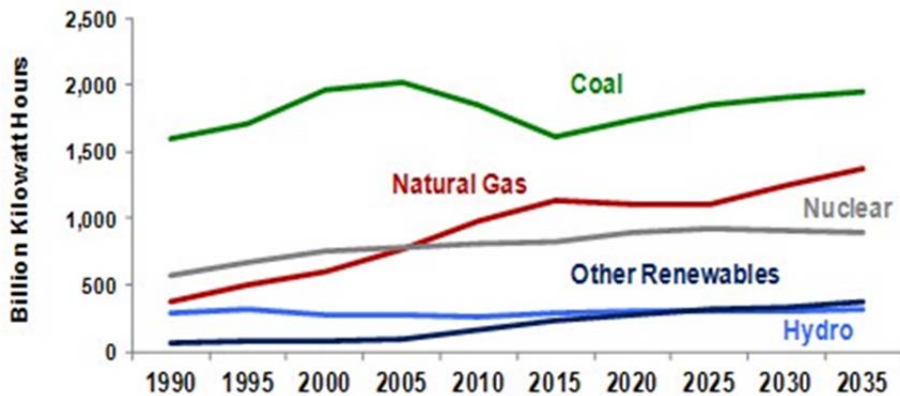
Coal currently supplies around 30% of primary energy and 41% of global electricity generation. From 2001 to 2011, global consumption of coal rose 56%, as oil consumption slowed. Coal use is forecast to continue to rise over 50% by 2030, with developing countries responsible for 97% of this increase, primarily to meet improved electrification rates.²

Coal is the most widely available fossil fuel energy resource. Unlike gas and oil, it is widely distributed, both geographically and in terms of resource ownership. Its abundance provides energy security to many countries because its supply will last significantly longer than gas or oil.

¹ Coal: Energy for Sustainable Development, 2012, World Coal Association

² World Coal Association, 2012

Figure 2. Global Electrical Power Generation by Source



Source: EIA, 2011

Almost half of the world's energy demand over the past ten years was provided by coal (Figure 3). All other fuels combined, including oil, natural gas, renewables and nuclear energy, accounted for the other half. In fact, every year over the last decade coal has been the world's fastest growing energy source, driven by Asian demand and regional abundance of the fuel.

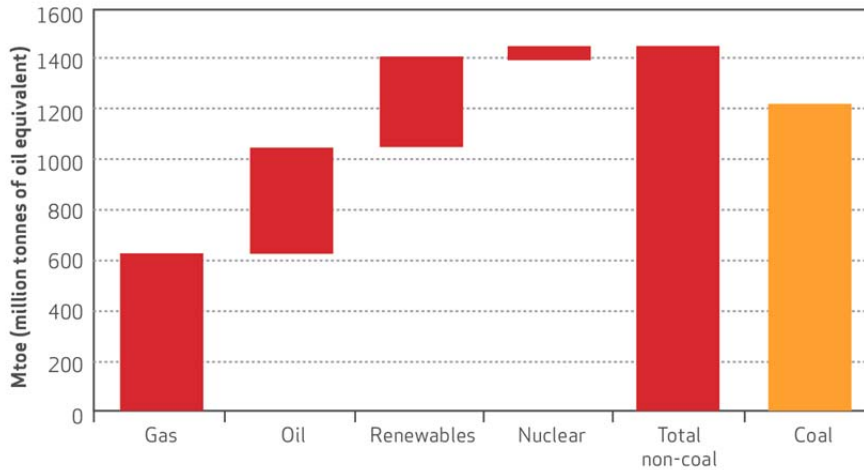
China's market for the commodity is projected to double in the next few years. More than three-fourths of China's energy production comes from coal, making it the world's No. 1 coal consumer. China imported only about 5.5 million tons of coal from the United States in 2011, which accounted for 3 percent of its 182 million tons of imports, according to a report by the Carnegie Endowment.

More than any other nation, America can control its own electrical energy destiny. Coal can be the foundation of that control. Almost 30% of the world's coal reserves are in the United States. The ability to utilize domestic coal reserves to address problems of energy access reduces reliance on imported energy, particularly oil and gas, which are often sourced from unreliable and unstable markets. Utilization of coal to complement renewable energy sources, particularly wind, reduces the risk of an intermittent supply.

The National Coal Council³ has identified its vision for U.S. coal. First, coal's abundance and widespread distribution present the means to produce electricity reliably and affordably. Second, coal's versatility allows conversion to liquid transportation fuels, natural gas, and chemicals. Third, improving coal's environmental performance through advanced coal technologies coupled with CO₂ capture and storage, including enhanced oil recovery (EOR), will not only make it possible to meet climate policy goals, but also open more doors to the beneficial use of CO₂. Finally, the dynamic activity associated with deploying advanced coal, carbon capture and EOR technologies will stimulate the economy, provide jobs, revive established industries, and create new ones.

³ Harnessing Coal's Carbon Content to Advance the Economy, Environment, and Energy Security, National Coal Council, June 2012. Society for Mining, Metallurgy and Exploration, Inc. | 12999 East Adam Aircraft Circle, Denver, CO 80112 303 948 4250

Figure 3. Incremental World Primary Energy Demand by Fuel, 2000-2010 (Mtoe)

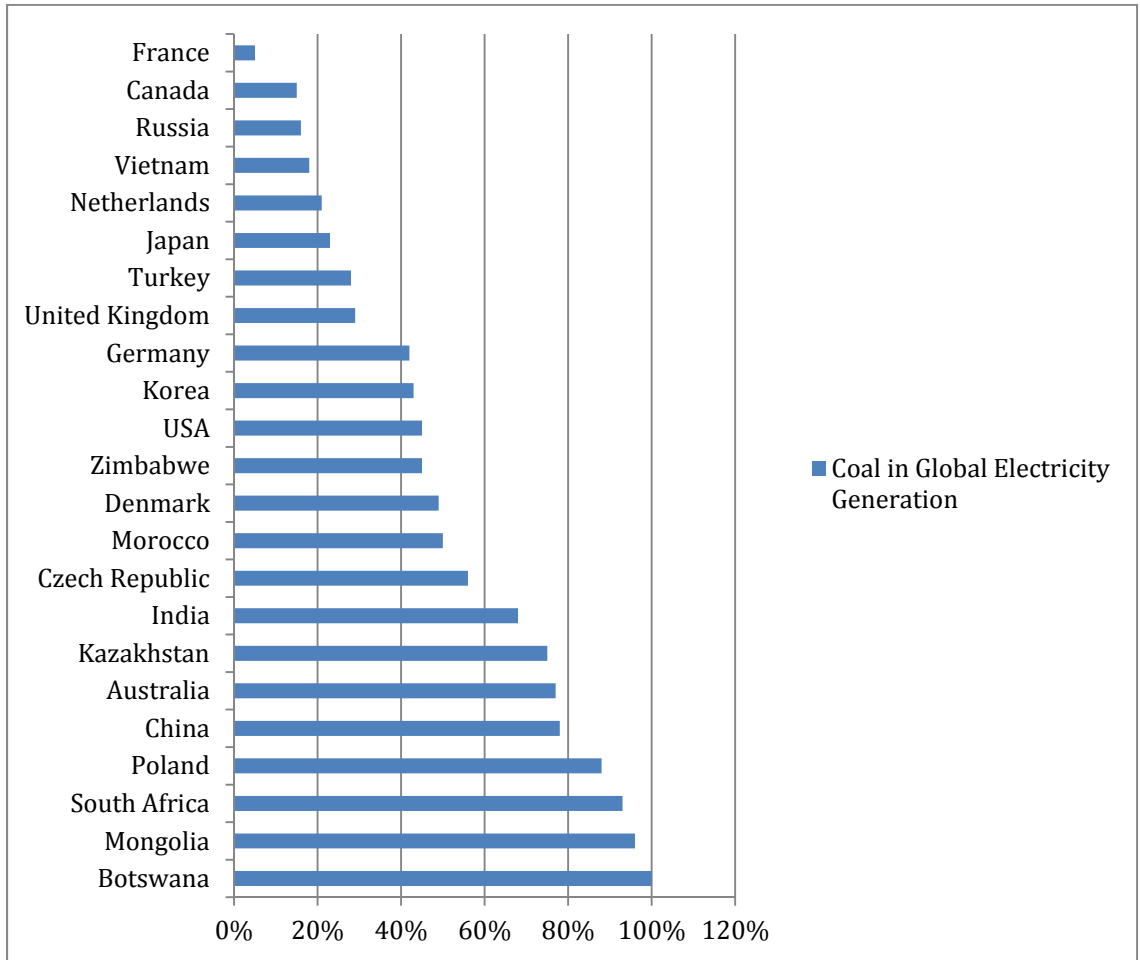


Source: IEA World Energy Outlook 2011

Background

Coal is a strategic resource that is widely recognized as essential for a modern quality of life, is a key contributor to sustainable development, and an essential element in enhanced energy security. The International Energy Agency (IEA) estimates that global electricity demand could double by 2035, as more people get basic access to electricity around the world and household energy consumption grows in the developing world. The percentages of national electrical production fueled by coal presented in Figure 4 support this estimate. Global coal demand will increase substantially over the coming decades. Global coal production increased for the 12th straight year in 2011, by more than 6 percent, according to EIA. More than 90 gigawatts of new coal-fueled power capacity will come online in 2012, largely in the developing world.

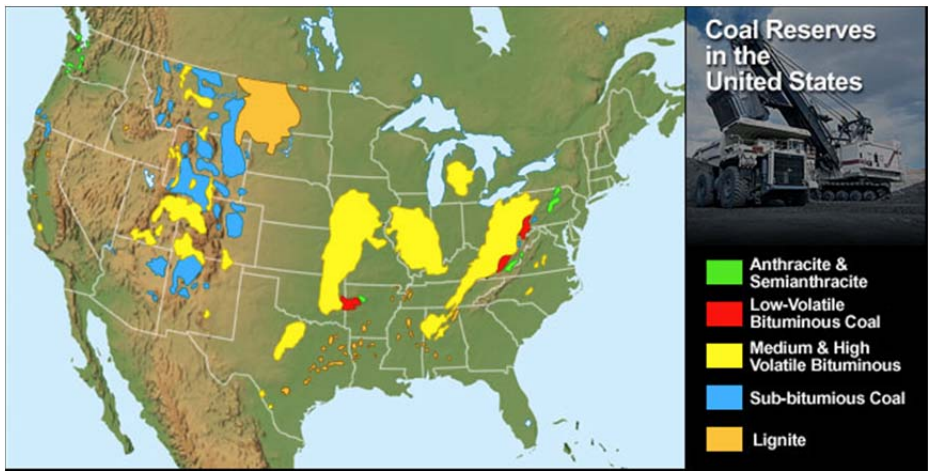
Figure 4. Coal in Global Electricity Generation by Country



Source: IEA Electricity Information, 2011

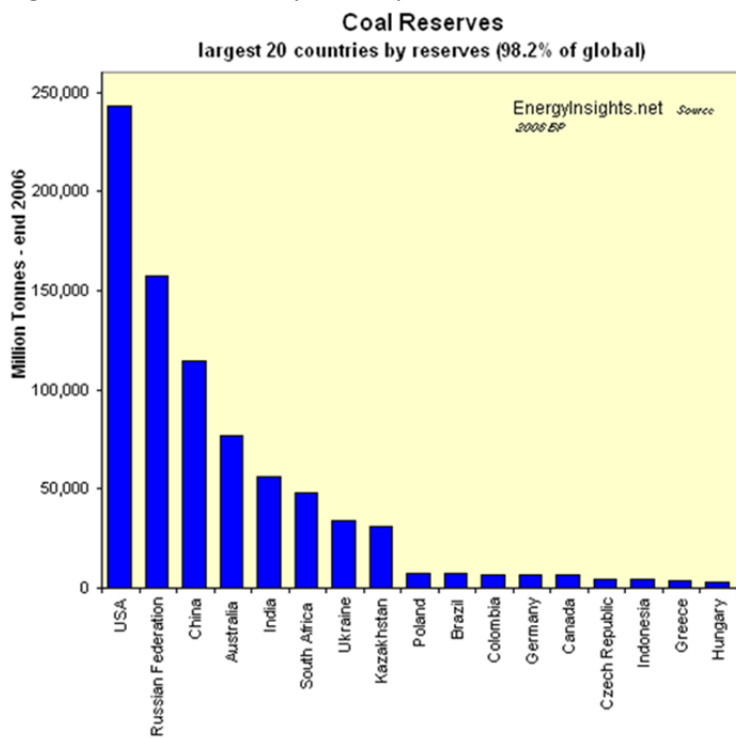
Proven coal deposits exist on every continent. The United States has the world’s largest supply of known recoverable reserves, or about 24 percent. Coal is found in 38 U.S. states, and nearly one-eighth of the country lies over coal beds. Top coal-mining states by tonnage include: Wyoming, West Virginia, Kentucky, Pennsylvania, Montana, Texas, Indiana, Illinois, North Dakota, Ohio, and Colorado.

Figure 5. Coal Reserves in the U.S. (Source: USGS 2012)



Coal supplies in the U.S. are far more plentiful than domestic oil or natural gas; they account for 95 percent of the country’s fossil fuel reserves and more than 60 percent of the world’s fuel reserves. The U.S. has about 240 billion tons of recoverable coal, which could last about 235 years if consumed at the same rate as today. To meet energy and metallurgical needs, the U.S. mines about one billion tons of coal per year. In 2011, world production of coal was 7.7 billion metric tons.

Figure 6. Coal Reserve by Country



Source: BP 2008

It has been estimated that there are over 860 billion tons of proven coal reserves worldwide (Fig 6). Some deposits are estimated to have as much as 400 years of production remaining and new technologies for utilizing coal resources, such as underground coal gasification, are likely to boost coal’s future role in energy supply even further. Coal reserves are available in almost every country worldwide, with recoverable reserves in around 70 countries. The largest reserves are in the U.S., Russia, China, Australia and India, respectively. Importantly, many countries with significant energy poverty challenges also have significant coal reserves.

SME Statement of Technical Position

EMPLOYMENT & PRODUCTION

- Nearly half of U.S. electricity and 40% of global electricity is generated from coal.
- 9 out of every 10 tons of coal mined each year in the U.S. is used for domestic electricity generation (steam coal). There is a growing export market for both metallurgical coal (for making steel) and steam coal.
- Each person in the U.S. uses 3.4 tons of coal annually. The global average is less than 1 ton per year.
- Coal is one of the most affordable sources of power fuel per million Btu, historically averaging less than one-quarter the price of petroleum.
- The U.S. produces about 1 billion tons of coal annually, whereas global production of coal is about 7.7 billion tons per year.
- Approximately two-thirds of today's domestic coal production, by tonnage, results from surface, rather than underground mining. Mountaintop mining in Appalachia contributes approximately 10 percent of all coal mined in the U.S. and is roughly 40 percent of the coal mined in West Virginia and Kentucky.
- For each coal mining job, an additional 3.5 jobs are created elsewhere in the U.S. economy.
- U.S. coal mining directly employs about 142,000 people with an average wage of \$73,000 per year.
- Coal directly provides more than seven million jobs worldwide and indirectly supports many more millions.
- In 2010, the coal industry invested more than US \$7 billion in capital expenditures in developing countries.

ECONOMIC, ENVIRONMENTAL & SOCIAL CHALLENGES

Challenges to the U.S. coal industry include striving for zero mine fatalities, maintaining compliance with stricter mine safety rules, reductions in U.S. thermal coal demand due to competition from low-priced natural gas, stricter environmental regulations affecting the cost of producing and using coal, and weaker international and domestic economies.

- Mine safety and worker protection must remain a top priority.
- The coal industry must develop and implement new technologies to mitigate concerns related to subsidence, acid rock drainage, properly engineered coal ash retention structures, and Appalachian coal mining techniques.
- The U.S. EPA has issued regulations greatly reducing the number of new coal-fired power plants that will be built in the coming decades without carbon capture and storage. However, full-scale, commercial carbon capture and storage is still in the research and development stage.
- In the U.S., the share of electric power generation fueled by natural gas is projected to increase from 24% in 2010 to 27% by 2035, while the share of renewable energy will grow from 10% to 16% over that same period. Coal-fired power generation will fall to 39% of power generation, but remain the leader.
- Due to the escalating cost of imported liquefied natural gas in Europe and other regions coupled with the decline of domestic coal usage in base power generation, major coal and energy companies in the U.S. are investing in the export supply chain. The Netherlands, United Kingdom, South Korea, Japan, China, India, Brazil, Canada, Mexico and Morocco are top export destinations for U.S. metallurgical (steel-making) and steam coal (electrical power generation).
- Currently, U.S. coal companies are investing more than \$500 million to increase the coal export supply chain capacity to meet rising overseas demand.
- Western coal, including low-sulfur coal from the Powder River Basin of Wyoming and Montana, is expected to become an increasingly important part of the U.S. export market as port facilities on the West Coast are permitted and built.

SUMMARY

All energy sources, including nuclear, hydro, wind, solar and other renewables, have some role to play in contributing to the electrical power grid. However, for the foreseeable future, base load power generation through the use of fossil fuels, and especially with coal, is the most cost-effective way to provide affordable, safe and reliable electricity at the scale that is needed to achieve genuine access to modern electricity services world-wide. Coal is, and will continue to be, the backbone of global electricity generation. Export of U.S. coal to energy resource-poor countries will contribute significantly to reducing global energy poverty. Further, in the U.S., distinct environmental, economic and social challenges to the continued use of coal must be balanced with an acknowledgment by policymakers that coal is still a viable energy source, is essential to national security, and should be included in any discussion of a long-term “all of the above” energy policy.