

Brenda S. Pierce

Program Coordinator

Energy Resources Program

U.S. Geological Survey

U.S. Department of the Interior

Testimony

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Hearing on the Future of Federal Coal:

Status, Availability and Impact of Technological Advances in Using Coal to Create Alternative Energy Resources

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Mr. Chairman and Members of the Subcommittee, thank you for the opportunity to appear here today to discuss with you the U. S. Geological Survey's role in studying, understanding, and assessing the Nation's coal resources.

Coal is an important domestic energy resource in the United States. Currently, more than half of the electric power generated in this country relies on coal as a fuel source. Energy is vital to the continued expansion of our economy and to the improvement of the quality of life for Americans. However, an imbalance exists between our energy consumption and domestic energy production, resulting in growing amounts of imported energy resources. One possible way to bridge this widening gap is to consider alternative technologies for coal use.

The U.S. Geological Survey (USGS) promotes and supports scientific investigations of geologically based energy resources. These research efforts include the geology of oil, gas, and coal resources, emerging resources such as gas hydrates or underutilized resources such as geothermal. The USGS also researches the effects associated with energy resource occurrence, production, and/or utilization. The results of these investigations provide impartial, robust scientific information about energy resources and directly support the U.S. Department of Interior (DOI) mission of protecting and managing the Nation's natural resources. Collectively, this information advances the scientific understanding of energy resources, contributes to plans for a balanced and secure energy future, and facilitates the evaluation and strategic use of resources.

Coal Resources

National and global energy demand and resource consumption are forecast to increase significantly over the next 20 to 30 years. The Energy Information Administration (EIA) projects that global energy consumption will grow by almost 50 percent by 2025. Most of these increases will manifest themselves through increased production of fossil fuels. As stated earlier, coal accounts for more than 50 percent of the electricity generated in this country. Coal has been and will continue to be important to the U.S. standard of living. Coal is projected to continue to provide a relatively inexpensive, domestic fuel for electric power generation. The locations of the major U.S. coal deposits and the relative in-ground resources of the major coal beds are generally well known. However, estimates of what portion of these in-place resources is technically and economically recoverable remain uncertain.

The USGS recently completed resource assessments of the five top coal producing regions in the U.S. – the Appalachian Basin, Gulf Coast, Illinois Basin, Colorado Plateau, and the Northern Rocky Mountains and Great Plains. The assessments focused on 60 coal beds and coal zones within these regions because they are expected to supply the bulk of U. S. coal production for the next few decades.

The USGS also conducted numerous local- to State-scale availability and recoverability studies throughout the 1990's. Results of several studies were compiled, and the volumes of coal that could be produced typically amounted to only 10 to 20% of the original in-place resource – an unexpected conclusion. Because these studies were conducted on a local scale, the results may not be translatable to the scale of coal-bearing basins. However, if subsequent research determines that similar results exist at the basin scale, these results would significantly alter the perception of the U.S. coal reserve base.

Therefore, USGS has embarked on a systematic inventory of the U.S. coal reserve base, representing a marked departure from previous in-place coal resource assessments. Although the terms “resource” and “reserve” are often used interchangeably, the two terms have distinctly different meanings. Coal resources are the volumes of the coal in beds with only minor restrictions placed upon the distribution and without regard to whether the deposits are economically extractable. The term “reserve” applies to that portion of the coal resource that can be recovered economically with the application of extraction technology available currently. The term “reserve” implies that an economic evaluation has been performed on the coal resource taking into account such factors as coal depth and thickness, coal quality, mining method, restrictions (environmental, mined out areas, and the like), and many other factors. Consequently, the reserve base is always much less than the in-place resources.

The USGS has spent the last year revising its coal resource assessment methodology to determine the subset of in-place resources that is technically and economically recoverable on a basin-wide scale. In other words, USGS will start assessing the reserve base of the United States. The USGS will focus on research efforts working with agencies that have land and resource management responsibilities, such as the Bureau of Land Management and Office of Surface Mining, and those agencies that use USGS resource projections for their mission work, such as the Energy Information Administration (EIA), so as to incorporate the needs of these customers into our products.

Once the development of the revised coal assessment methodology was completed, an external peer review of the methodology was conducted. The peer review consisted of experts from State agencies, other Federal agencies, and industry. With this input, the USGS further refined the methodology, and is now in the process of conducting a reserve estimate for the Gillette coal field of the Powder River Basin, the largest supplier of coal in the United States. The results of this effort are expected in winter of 2006, followed by reserve estimates for the entire Powder River Basin by the end of 2007. Subsequent coal reserve base studies will be valuable in understanding how much of the domestic coal endowment is technologically available and currently economic to produce.

The United States produces approximately one billion tons of coal per year, with production steadily rising over time. Almost all of this production is used for electric power generation. Our imports are still very small (a little over 30 million short tons in 2005), but they are increasing. The U.S. also exports coal (about 50 million short tons in 2005), mainly to Canada, but also Europe and other countries. The amount of coal exported is also increasing.

According to the EIA, 72% of the projected increase in coal demand in the reference case scenario between 2004 and 2030 is attributed to the electric power sector and 28% is for production of synthetic fuels from coal using coal to liquids (CTL) technologies. The use of coal gasification technologies can also produce alternative fuels, such as hydrogen, as well as synthesized gas for industrial applications. Competition for coal use among these technologies will merit consideration in decisions regarding our coal resources and coal reserve base.

Coal Quality

Studies of coal quality parameters have been a core component of the USGS Energy Resources Program research portfolio. The USGS has long conducted studies improving the understanding of the quality of the U.S. coal endowment. However, it is not an easy task to collect and analyze sufficient samples to fully understand this complex resource. Therefore, USGS has recently focused its efforts on studies that examine the feed coals and coal combustion products from individual coal-fired power plants (commonly referred to as “cradle-to-grave studies”). Coal quality parameters that will be examined include elements in coal that can potentially have adverse effects on environmental quality and/or may be slated for regulation. Given the increasing attention on the impacts of coal utilization, coal-quality research must address a more comprehensive suite of coal quality-related issues beyond the fundamental coal quality parameters such as ash yield, sulfur content, and heating value. This more comprehensive approach is vital to future coal assessments and future use of coal in this country.

Using available basic coal quality parameters, a reconnaissance-level survey can begin to identify coal resources that may have potential for use with various alternative technologies. However, additional process-specific parameters will be needed to more precisely evaluate and assess suitable resources. Working with experts in various conversion and combustion technologies, development of these parameters can be accomplished to determine the appropriate level of USGS contribution.

Conclusion

In conclusion, Mr. Chairman, coal is an important component of the Nation's energy portfolio, which powers our expanding economy. The U.S. Geological Survey has been working with other agencies and has taken steps in several scientific endeavors to better understand our coal resource endowment, the quality of those resources, and how those resources may contribute to our coal reserve base and the Nation's energy mix. We stand ready to respond to the ongoing need for energy development from a variety of sources and in new ways.

Thank you for the opportunity to highlight a few of the steps USGS has taken to improve the understanding of the Nation's coal resources. This concludes my testimony. I would be happy to answer any questions you may have.