
Executive Summary

Purpose

By letter dated November 13, 2000, then-Secretary of Energy Bill Richardson requested that the National Coal Council conduct a study on measures which the government or the government in partnership with industry could undertake to improve the availability of electricity from coal-fired power plants. His letter requested that the Council address improving coal-fired generation availability in two specific areas:

- improving technologies at coal-fired electric generating plants to produce more electricity; and
- reducing regulatory barriers to using these technologies.

The Council accepted the Secretary's request and formed a study group of experts to conduct the work and draft a report. The list of participants of this study group can be found in Appendix D of the report.

Findings

The study group found the following.

- Nationally, approximately 40,000 megawatts of increased electrical production capability is possible now from existing coal-fired power plants.
- Such increased electricity supply can be available through the installation of standard improvements and clean coal technologies. This will have the important effect of increasing efficiency and decreasing emissions per megawatt from such modified plants, thereby improving air quality.
- Such plant efficiency and increased electricity production capability may only be realized if a return to historic regulatory policy is made.
- Coal-based electricity will be important for many years into the future. Therefore, regulations and policies employed should encourage the clean use of this resource through accelerated installation of more efficient, cleaner technologies.

The study was divided into two major sections: technology and regulatory reform. The focus of the technology section is on achieving more electricity from existing and new coal-fired power plants using technologies that improve efficiency, availability, and environmental performance. The discussion is divided into three subsections:

- a) achieving higher availability/reliability in the existing fleet of coal-fired plants;
- b) Increasing generation output of existing coal-fired plants; and
- c) Determining opportunities for repowering existing facilities with clean coal technologies as well as building new advanced clean coal technology generation facilities.

Analysis of the U.S. utility industry infrastructure of coal plants reveals a significant potential for increasing generation capacity by taking well-tested measures to improve the reliability/availability of older facilities. This effort, which will come mainly from improvements on the steam generators of these older plants, can create 10,000 MW of new capacity.

Techniques to recover lost capacity and increase capacity above nameplate have been collected from a combination of research studies by utility industry organizations such as EPRI and actual case studies which are detailed in the report. The nameplate capacity of coal units older than 20 years is approximately 220,000 MW; however, due to derating, the existing capacity is only about 200,000 MW.

This group of plants has the potential for both capacity restoration (about 20,000 MW) and/or improvement (about 20,000 MW). It is estimated that this increased capacity of 40,000 MW could be recovered within 36 months. This can allow the economy to grow while new generation facilities are sited, constructed, and brought into service.

For new coal-fired power generating capacity, Pulverized Coal Combustion in supercritical steam plants (a mature technology) is available with minimal emissions, high efficiency, and at very favorable total production cost.

Repowering of an old existing coal fired power plant with a single modern steam generating unit, equipped with commercially proven emissions controls results in significant reductions in the total amounts of emissions even while substantially increasing the total MWh output of the facility.

Integrated Gasification Combined Cycle (IGCC) has become a commercially available technology for both greenfield and repowering applications. IGCC is a clean, new technology option insensitive to fuel quality variation.

While natural gas will fuel the majority of new capacity additions during this time period there are currently about 321,000 MW of coal-fired capacity in service. While not all of this capacity can be targeted for the new technologies discussed in this report, it is estimated that 75% of it can be retrofitted with one of these technologies. This additional increase in capacity is estimated to be 40,000 MW and much of it could be brought on line in the next three years. This minimizes economic impacts while new generation facilities are sited, constructed, and brought into service without increasing emissions at existing facilities and, in some cases, lowering emissions. Approximately 25% of existing facilities can be targeted for repowering with much cleaner and more efficient coal-based power generation.

However, unless there is a significant change in regulatory interpretation and enforcement regarding the installation of new technologies at existing power plants, it is not likely that any of this additional low-cost, low emission electricity will be produced. The recent change in enforcement procedures by EPA (reinterpreting as violations of the Clean Air Act what had heretofore been considered routine maintenance at power plants) has had a direct and chilling effect on all maintenance and efficiency improvements and clean coal technology installations at existing power plants. EPA has brought legal action against 11 companies and 49 generation facilities since 1998 under the New Source Review section of the 1990 Clean Air Act. The companies involved believe that they were conducting routine maintenance needed to keep these plants in good condition. The result has been that no new efficiency, availability, or environmental improvement has occurred since 1998 when EPA changed its enforcement policy. A return to the historic interpretation of this one regulation alone would allow plant operators the opportunity to install technologies discussed in the report. If just a three percent increase in capacity could be achieved through reducing outages and increasing plant efficiency, it could result in over 11,500 MW of coal-based capacity being added to the current fleet while continuing the downward trend in emissions.

Several other existing regulations seem to be in conflict with the country's attempt to maximize the use of domestic energy sources. Environmental regulation should be harmonized with the energy and national security goals of the country.

Recommendations

The National Coal Council strongly recommends that the country, with the Department of Energy in the lead, develop a clear, comprehensive energy policy that supports the maximum use of domestic fuel sources, continues to protect the environment by implementing strong but balanced environmental regulations, and harmonizes conflicting regulations affecting energy development and use. Government and industry should work in partnership to achieve the desired goals and remove those regulatory barriers that create obstacles to achieving those goals while preserving environmental performance.

Specifically, the Council recommends that the Department of Energy take the following actions.

- Initiate and lead a dialogue with EPA, with the goal of returning to the traditional pre-1998 interpretation of the New Source Review section of the 1990 Clean Air Act.
- Promote accelerated installation of clean and efficient technologies at new and existing coal-fired power plants.
- Initiate and lead a dialogue with EPA to promote coordinated regulations for ozone attainment into a single compliance strategy.
- Initiate and lead a dialogue with EPA and electricity generators to establish credible and uniform emissions targets, which will provide regulatory certainty for a sufficient period in the future to assure electricity generators that they can achieve a return on investments for performance and environmental improvements.
- Lead the country's effort to develop a clear, comprehensive, and secure energy policy that maximizes the use of domestic fuels, including coal, while continuing the downward trend in emissions.