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CLEAN COAL

DOE's Decision to Restructure FutureGen Should Be Based on a Comprehensive Analysis of Costs, Benefits, and Risks

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Highlights

Highlights of GAO-09-248, a report to congressional requesters

Why GAO Did This Study

Coal-fired power plants generate about one-half of the nation's electricity and about one-third of its carbon dioxide (CO_2) emissions, which contribute to climate change. In 2003, the Department of Energy (DOE) initiated FutureGen—a commercial-scale, coal-fired power plant to incorporate integrated gasification combined cycle (IGCC), an advanced generating technology, with carbon capture and storage (CCS). The plant was to capture and store underground about 90 percent of its CO_2 emissions. DOE's cost share was 74 percent, and industry partners agreed to fund the rest. Concerned about escalating costs, DOE restructured FutureGen. GAO was asked to examine (1) the original and restructured programs' goals, (2) similarities and differences between the new FutureGen and other DOE CCS programs, and (3) if the restructuring decision was based on sufficient information.

GAO reviewed best practices for making programmatic decisions, FutureGen plans and budgets, and documents on the restructuring of FutureGen. GAO contacted DOE, industry partners, and experts.

What GAO Recommends

GAO recommends that DOE re-examine its restructuring decision, based on the comparative costs, benefits, and risks of the original and restructured programs, as well as other incremental options for modifying the original program. DOE provided technical comments but did not comment on the report's recommendations.

To view the full product, including the scope and methodology, click on GAO-09-248. For more information, contact Mark E. Gaffigan at (202) 512-3841 or gaffiganm@gao.gov.

What GAO Found

The original FutureGen program and the new restructured FutureGen program attempt to use CCS at coal-fired power plants to achieve near-zero CO_2 emissions and to make CCS economically viable. However, they take different approaches that could affect CCS's commercial advancement. First, the original program aimed at developing knowledge about the integration of IGCC and CCS at one plant; in contrast, the new program could provide opportunities to learn about CCS at different plants, such as conventional ones that use pulverized coal generating technology. Second, the original program was operated by a nonprofit consortium of energy companies at one plant, while the new program called for CCS projects at multiple commercial plants.

The new, restructured FutureGen differs from most DOE CCS programs. The new FutureGen would develop and integrate multiple CCS components at coal-fired plants (including CO_2 capture, transportation, and storage underground). Other programs concentrate on only one CCS component and/or a related component (e.g., capture or capture and compression). However, Round III of DOE's Clean Coal Power Initiative (CCPI) is a cost-shared partnership with industry that funds commercial CCS demonstrations at new and existing coal-fired plants. The new FutureGen is most like CCPI in that both fund CCS commercial demonstrations at several plants to accelerate CCS deployment and require that participants bear 50 percent of the costs, but DOE expects the new FutureGen to have more funding for commercial demonstrations than CCPI. Moreover, the new FutureGen targets a higher amount of CO_2 to be captured and stored (at least 1 million metric tons of CO_2 annually per plant) than CCPI (300,000 metric tons).

Contrary to best practices, DOE did not base its decision to restructure FutureGen on a comprehensive analysis of factors, such as the associated costs, benefits, and risks. DOE made its decision, largely, on the conclusion that costs for the original FutureGen had doubled and would escalate substantially. However, in its decision, DOE compared two cost estimates for the original FutureGen that were not comparable because DOE's $950 million estimate was in constant 2004 dollars and the $1.8 billion estimate of DOE's industry partners was inflated through 2017. As its restructuring decision did not consider a comprehensive analysis of costs, benefits, and risks, DOE has no assurance that the restructured FutureGen is the best option to advance CCS. In contrast to the restructuring decision, DOE's Office of Fossil Energy had identified and analyzed 13 options for incremental, cost-saving changes to the original program, such as reducing the CO_2 capture requirement. While the Office of Fossil Energy did not consider all of these options to be viable, it either recommended or noted several of them for consideration, with potential savings ranging from $30 million to $55 million each.