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U.S. Department of Energy Field Efforts to Sequester CO₂ in Geologic Formations

Nearly one third of the carbon emissions in the U.S. come from power plants. Since electric generation is expected to increase and fossil fuels will continue to be the dominant fuel sources, there is growing recognition that the energy industry can be part of the solution to reduce greenhouse gas emissions by capturing and permanently sequestering CO₂. Long-term storage of carbon dioxide (CO₂) in underground geologic formations has the potential to be a viable concept in the near future. Many power plants and other large point sources of CO₂ emissions are located near geologic formations that are amenable to CO₂ storage. In many cases, injection of CO₂ into a geologic formation can enhance the recovery of oil and gas which can offset the cost of CO₂ capture and storage. The U.S. Department of Energy's (DOE) R&D program for CO₂ sequestration in geologic media is a comprehensive effort to bring about this concept in a timely and acceptable method. The primary goal of the research in this area is to understand and validate the behavior of CO₂ when stored in geologic formations so that CO₂ can be sequestered for the long term in a manner that is secure and environmentally acceptable. Researchers under contract to DOE are trying to determine what effective, safe, and cost-competitive options are available for geologic storage of CO₂ emissions generated from coal, oil, and gas power plants. Currently, the planned and on-going research and technology development includes initiatives to develop baseline information necessary to make decisions about potential demonstration and verification sites for CO₂ geologic storage. This paper presents an updated of DOE-sponsored field tests for injection of CO₂ into existing oil reservoirs, deep saline reservoirs, and unmineable coalbeds. All of these field tests and planned larger-scale efforts will help to predict, validate, and monitor migration and ultimate fate of injected CO₂.