



Highlights of [GAO-09-548](#), a report to congressional committees

## TECHNOLOGY TRANSFER

### Clearer Priorities and Greater Use of Innovative Approaches Could Increase the Effectiveness of Technology Transfer at Department of Energy Laboratories

#### Why GAO Did This Study

The Department of Energy (DOE) spends billions of dollars each year at its national laboratories on advanced science, energy, and other research. To maximize the public's investment and to foster economic growth, federal laws and policies have encouraged the transfer of federally developed technologies to private firms, universities, and others to use or commercialize. The American Recovery and Reinvestment Act of 2009 further emphasized the role of such technologies for addressing the nation's energy, economic, and other challenges.

Congress requested GAO to examine (1) the nature and extent of technology transfer at DOE's laboratories; (2) the extent to which DOE can measure the effectiveness of its technology transfer efforts; and (3) factors affecting, and approaches for improving, DOE's efforts. GAO analyzed documents and data and spoke with officials at DOE headquarters and all 17 DOE national laboratories.

#### What GAO Recommends

GAO is recommending a number of actions, including that DOE articulate departmental priorities and a definition for technology transfer, improve its performance data, and ensure that laboratories have sufficient expertise and a systematic approach for identifying their commercially promising technologies. In commenting on a draft of this report, DOE generally agreed with the findings but did not comment on the recommendations.

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#### What GAO Found

Although DOE's laboratories routinely share their technologies, capabilities, and knowledge with outside entities, it is difficult to assess the full extent of technology transfer efforts because policies defining technology transfer are unclear and headquarters and laboratory officials do not always agree on which activities should be included. Certain activities performed for or with private companies, universities, and state or local governments are widely regarded as technology transfer, including (1) performing research on behalf of or in collaboration with these entities; (2) licensing the laboratories' existing technologies for such entities to use or commercialize; and (3) allowing these entities access to the laboratories' unique facilities and equipment for their own research. Successful technology transfer efforts have focused on a variety of areas ranging from cancer treatment to biofuels. DOE and laboratory officials do not agree, however, on whether research sponsored by other federal agencies should be considered technology transfer, and DOE's policies are unclear on this. Although work for other federal agencies—worth about \$1.8 billion in 2008—may result in technologies that are eventually transferred to the marketplace, in the short run, the work entails sharing federal research and technologies with other federal agencies for noncommercial aims.

DOE cannot determine its laboratories' effectiveness in transferring technologies outside DOE because it has not yet established departmentwide goals for technology transfer and lacks reliable performance data. The Energy Policy Act of 2005 required DOE to establish goals for technology transfer and provide Congress its implementation plan no later than February 2006; DOE has not yet done so. While some DOE laboratories and program offices have begun articulating their own technology transfer goals, these vary widely. In addition, DOE performance data on technology transfer activities are problematic because data accuracy and completeness are questionable.

A number of factors can constrain the extent to which DOE laboratories transfer their technologies, although some are using approaches to help increase the likelihood that promising technologies will be commercialized. Officials at the 17 laboratories identified three primary challenges: (1) competing staff priorities or gaps in expertise needed to consistently identify promising technologies or potential markets; (2) lack of funding to sufficiently develop or test some promising technologies to attract potential partners; and (3) lack of flexibility to negotiate certain terms of technology transfer agreements. Some laboratories have used innovative approaches, such as inviting entrepreneurs to evaluate their research and commercialize a technology or tapping into outside funding for the additional development needed to attract commercial interest. Approaches used by other federal laboratories may offer additional ways for DOE to improve its technology transfer. These efforts are especially important given the goals of American Recovery and Reinvestment Act of 2009 and the additional funding provided to DOE to meet those goals.