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# RESEARCH AND DEVELOPMENT

## DOE Could Enhance the Project Selection Process for Government Oil and Natural Gas Research

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Highlights

Highlights of GAO-09-186, a report to the Chairman, Subcommittee on Energy and Water Development, Committee on Appropriations, U.S. Senate

### Why GAO Did This Study

Although competitive oil and natural gas markets generally provide incentives for companies to invest in research and development (R&D), some industry experts believe these companies may underinvest in certain areas. A recent GAO report noted important criteria for the Department of Energy (DOE) to consider in evaluating its oil and natural gas R&D efforts—including the likelihood that industry would perform the research without federal funding. The Office of Management and Budget has raised similar concerns. In this context, GAO was asked to review (1) how much U.S. industry has invested in oil and natural gas R&D over the last 10 years, and the current focus of these activities; (2) how DOE's oil and natural gas R&D funding and activities compare with industry's; and (3) to what extent DOE ensures that its oil and natural gas R&D would not occur without federal funding. GAO reviewed DOE and U.S. industry data for oil and natural gas R&D spending, and interviewed DOE officials and representatives from various segments of the industry.

### What GAO Recommends

To better ensure that DOE selects oil and gas R&D projects that industry is unlikely to pursue, GAO recommends DOE's project selection process include a formal assessment of the likelihood that the R&D would not have occurred without federal funding. DOE provided only technical comments which we incorporated as appropriate.

To view the full product, including the scope and methodology, click on GAO-09-186. For more information, contact Mark E. Gaffigan (202) 512-3841 or gaffiganm@gao.gov.

### What GAO Found

From 1997 through 2006, the U.S. oil and natural gas industry spent at least $20 billion on R&D, and currently focuses mostly on near-term (within about the next 2 years) production challenges. The nature of R&D varies by type of company. For example, major oil companies tend to have in-house R&D facilities, and though most of their projects are designed to meet near-term needs, they also conduct some longer-term research. Similarly, service companies, which specialize in providing technologies to facilitate exploration and production, focus their R&D primarily on their clients' immediate needs, but also conduct some longer-term research. In contrast, larger independent companies generally do not conduct in-house R&D; instead, they may buy new technologies from other companies and adapt them to meet their needs, and also may participate in research partnerships. Smaller independent companies do not generally conduct R&D, but some obtain or become aware of technology from other companies, trade publications, or professional associations.

From 1997 through 2006, DOE's total funding for oil and natural gas R&D totaled significantly less than industry's—about $1 billion versus at least $20 billion—and, in contrast to industry's focus on near-term challenges, DOE's R&D focuses on both near- and longer-term challenges. Some examples of DOE's projects that have had a near-term focus include projects that develop more advanced drilling and imaging tools, and enhance oil recovery. An example of a DOE project that has had a longer-term, high-risk focus is evaluating the potential use of methane hydrates, which are molecules of methane trapped inside a lattice of ice, as a future energy source—an area that industry officials said was generally beyond their time horizon for R&D.

DOE keeps abreast of industry R&D activities and uses a project selection process to ensure that its efforts support industry R&D; however, DOE does not formally assess whether industry would undertake this R&D without federal funding. Based on its awareness of industry needs gathered from its interactions with industry, DOE develops research priorities that drive its project solicitations. Individual oil and natural gas projects are screened to ensure that the applicant (1) explains the significance of the problem the proposal addresses, (2) demonstrates understanding of the current technology and information gaps, and (3) considers the likelihood that the project will advance the current state of technology. While these efforts help to ensure that DOE is informed about industry activities, DOE does not formally assesses the likelihood that industry would have conducted the R&D without federal funding, nor does it explicitly include such an evaluation in its screening criteria. For instance, GAO found that several of DOE's projects addressing challenges in advanced drilling and improved recovery of oil and natural gas were similar to activities conducted by industry. In this regard, in its review of DOE's oil and natural gas R&D budget, the Office of Management and Budget has challenged DOE to better justify the need for certain government research. By making a more formal evaluation in its screening process, DOE could better demonstrate that it selects projects that industry is unlikely to pursue.