May 10, 2012

UNCONVENTIONAL OIL AND GAS PRODUCTION

Opportunities and Challenges of Oil Shale Development

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Highlights

Highlights of GAO-12-740T, a testimony before the Subcommittee on Energy and Environment, Committee on Science, Space, and Technology, House of Representatives

Why GAO Did This Study

Fossil fuels are important to both the global and U.S. economies, and "unconventional" oil and gas resources—resources that cannot be produced, transported, or refined using traditional techniques—are expected to play a larger role in helping the United States meet future energy needs. With rising energy prices one such resource that has received renewed domestic attention in recent years is oil shale. Oil shale is a sedimentary rock that contains solid organic material that can be converted into an oil-like product when heated. About 72 percent of this oil shale is located within the Green River Formation in Colorado, Utah, and Wyoming and lies beneath federal lands managed by the Department of the Interior's Bureau of Land Management, making the federal government a key player in its potential development. In addition, the Department of Energy (DOE), advances energy technology, including for oil shale, through its various offices, national laboratories, and arrangements with universities.

GAO's testimony is based on its October 2010 report on the impacts of oil shale development (GAO-11-35). This testimony summarizes the opportunities and challenges of oil shale development identified in that report and the status of prior GAO recommendations that Interior take actions to better prepare for the possible future impacts of oil shale development.

View GAO-12-740T. For more information, contact Anu K. Mittal at (202) 512-3841 or mittala@gao.gov.

What GAO Found

In its October 2010 report, GAO noted that oil shale development presents the following opportunities for the United States:

- *Increasing domestic oil production.* Tapping the vast amounts of oil locked within U.S. oil shale formations could go a long way toward satisfying the nation's future oil demands. Oil shale deposits in the Green River Formation are estimated to contain up to 3 trillion barrels of oil, half of which may be recoverable, which is about equal to the entire world's proven oil reserves.
- *Socioeconomic benefits.* Development of oil shale resources could lead to the creation of jobs, increases in wealth, and increases in tax and royalty payments to federal and state governments for oil produced on their lands. The extent of these benefits, however, is unknown at this time because the ultimate size of the industry is uncertain.

In addition to these opportunities and the uncertainty of not yet having an economical and environmentally viable commercial scale technology, the following challenges should also be considered:

- *Impacts on water, air, and wildlife.* Developing oil shale and providing power for oil shale operations and other activities will require large amounts of water and could have significant impacts on the quality and quantity of surface and groundwater resources. In addition, construction and mining activities during development can temporarily degrade air quality in local areas. There can also be long-term regional increases in air pollutants from oil shale processing and the generation of additional electricity to power oil shale development operations. Oil shale operations will also require the clearing of large surface areas of topsoil and vegetation which can affect wildlife habitat, and the withdrawal of large quantities of surface water which could also negatively impact aquatic life.
- *Socioeconomic impacts.* Oil shale development can bring an influx of workers, who along with their families can put additional stress on local infrastructure such as roads, housing, municipal water systems, and schools. Development from expansion of extractive industries, such as oil shale or oil and gas, has typically followed a "boom and bust" cycle, making planning for growth difficult for local governments. Moreover, traditional rural uses would be displaced by industrial uses and areas that rely on tourism and natural resources would be negatively impacted.

GAO's 2010 report found that federal research efforts on the impacts of oil shale development did not provide sufficient data for future monitoring and that there was a greater need for collaboration among key federal stakeholders to address water resources and research issues. Specifically, Interior and DOE officials generally have not shared information on their oil shale research efforts, and there was a need for the federal agencies to improve their collaboration and develop more comprehensive baseline information related to water resources in the region. GAO made three recommendations to Interior, which the department generally concurred with and has already begun to take actions to address.