

Oil Shale's Challenges Merit Further Review

Oil shale development will benefit from more research and further discussion

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OVERVIEW:

The viability of proposed oil shale development remains tenuous due to a number of technical, environmental, regulatory, and economic challenges, as summarized in a 2009 report by Headwaters Economics (and updated in 2010).¹ In light of the many obstacles that a commercially viable oil industry would have to overcome, continued research, review, and public comment on this potential industry are necessary and sound public policy steps.

The potential scale of this industry and associated public investments coupled with the complexity of feasibility and technical questions suggest a role for a formal, non-biased review to establish the costs and benefits associated with large-scale public investment in oil shale. These issues should be addressed before policy makers and the public can effectively engage in a final decision-making process that will have tremendous economic, fiscal, social, and environmental impacts.

SHORTAGE OF NON-BIASED, CURRENT RESEARCH

The current information base for making informed decisions about oil shale development is outdated, lacks transparency, and raises more questions than it answers about oil shale as a realistic fuel source.

Viability assessments based on dated studies or proprietary data:

The only comprehensive study of a potential U.S. oil shale industry dates to 2005 and does not, for example, address the impact of price volatility on the maturation of the oil shale industry.² This development undermines the relevance of the report's economic benefit analysis, as many analysts project significant volatility in world crude oil prices to continue.

The use of proprietary data in economic modeling, such as the National Strategic Unconventional Resource Model (NSURM) decision support tool—the primary model used to estimate the benefits of aggressive incentive packages for the oil shale industry—is out of step with public demands for corporate accountability and fiscal responsibility in the public sector. The NSURM also showed that, even in the most generous policy scenario modeled, oil shale would not show a net return for at least 25 years.³

Current peer-reviewed studies confirm major hurdles for oil shale:

One peer-reviewed study states that the “reasonable estimate of the emissions range [for oil shale from a “lifecycle” standpoint] is between 1.25 to 1.75 times those from conventional oil.”⁴

¹ Headwaters Economics (2010). [Oil Shale in the West: 14 Unanswered Questions](#).

² Bartis, J. T., et. al. (2005). [Oil Shale Development in the United States: Prospects and Policy Issues](#). Report prepared for the National Energy Technology Laboratory of the U.S. Department of Energy. Washington, D.C.: RAND Corporation.

³ U.S. DOE, Office of Naval Petroleum and Oil Shale Reserves, [National Strategic Unconventional Resource Model: A Decision Support System](#), 2006.

⁴ Brandt, A.R. et. al. (2010). Carbon Dioxide Emissions from Oil Shale Derived Liquid Fuels. In Oil Shale: A Solution to the Liquid Fuels Dilemma, O. Ogunsola, Editor. ACS Symposium Series 1032. American Chemical Society: Washington, D.C.

QUESTIONS TO ADDRESS IN FURTHER RESEARCH:

Infrastructure

- **Feasibility, cost/benefit, and impact analysis of expanding pipeline/refinery capacity:**
Existing refinery and pipeline infrastructure would require major upgrades to accommodate oil shale distillate. Construction of these resources prompts a need for a full assessment of their impact on land, water, air, and wildlife.
- **Feasibility, cost/benefit, and impact analysis of building auxiliary power plants:**
Adding the necessary power plants to fuel oil shale production may be difficult, as coal-fired and nuclear power plants face approval hurdles themselves.
- **Economic and environmental impact analysis of water demand:**
As a 2010 GAO report noted, the projected water usage demands of oil shale development—hundreds of thousands of acre-feet per year—greatly exceed water availability in the Colorado River Basin.⁵ The Colorado River is an already over-adjudicated, domestically and internationally contested water source.
- **Regional preparedness and community impacts:**
Predictions about the commercial viability of oil shale depend on developing an industry at a volume, 2.5 million barrels of oil/day, that would dwarf all previous industrial development in eastern Utah and western Colorado by several orders of magnitude.⁶ The region is not currently equipped to manage change on this scale. Recent experience with the rapid build-up of natural gas production in 2004-2007 created serious fiscal, social, and environmental strains, suggesting weaknesses in existing policies concerning impact mitigation, revenue collection and distribution, and services delivery.

Economic viability

- **Impacts of volatility in price of oil and availability of other energy sources:**
Predictions of the cost-effectiveness of oil shale assume that crude oil prices will continue to rise and that investment in and development of alternative fuel and energy sources (as well as energy conservation) will not have an effect on fossil fuel dependency.
- **Economies of scale:**
Neither existing production techniques nor new technologies that are in development have ever actually functioned at the scale that industry and government experts predict would be required to make Western oil shale financially viable.

Economic efficiency

- **Comparative analysis:**
The costs and benefits of the sizable public investment necessary for this fuel source should be evaluated alongside comparable investments in other energy sources, including alternative fuels as well as energy conservation.
- **Speculation on amount of economically recoverable oil shale:**
A critical issue in an efficiency analysis is the actual contribution of existing oil shale operations to energy supplies in Estonia and China; both require strong government support and contribute minimal energy.

⁵ GAO, [Report to Congressional Requesters. Energy-Water Nexus: A Better and Coordinated Understanding of Water Resources Could Help Mitigate the Impacts of Oil Shale Development](#), October 2010. URS Corporation, [Energy Development Water Needs Assessment \(Phase I Report\)](#), prepared for Colorado, Yampa, and White River Basin Roundtables Energy Subcommittee. September, 2008. See also, AMEC Corp. [Technical: Task 2 of the Energy Water Needs Assessment Phase II Study](#).

⁶ U.S. Department of Energy, Energy Information Administration, [“Country Energy Profiles”](#). Accessed 1/27/11.