

# **RAND: U.S. OIL SHALE RESOURCES ARE THREE TIMES LARGER THAN THE CURRENT OIL RESERVES IN SAUDI ARABIA**

## ***YET CONGRESS RECENTLY VOTED TO MAKE IT ILLEGAL TO DEVELOP U.S. OIL SHALE RESOURCES***

With oil prices at an all-time high, Americans are facing escalating gas, diesel, and aircraft fuel increases. Oil prices are projected to increase further.

Congress, however, has made it illegal to develop vast domestic oil resources in large parts of the United States.

The most startling Congressional prohibition on domestic oil production concerns the recently enacted ban on the development of oil shale resources in parts of Colorado, Utah, and Wyoming in the Green River Formation. According to a Rand Study estimate, this reserve contains over one trillion barrels of oil, with 800 billion barrels fully recoverable, or three times the current oil reserves as Saudi Arabia:

*The largest known oil shale deposits in the world are in the Green River Formation, which covers portions of Colorado, Utah, and Wyoming. Estimates of the oil resource in place within the Green River Formation range from 1.5 to 1.8 trillion barrels. Not all resources in place are recoverable. For potentially recoverable oil shale resources, we roughly derive an upper bound of 1.1 trillion barrels of oil and a lower bound of about 500 billion barrels. For policy planning purposes, it is enough to know that any amount in this range is very high. **For example, the midpoint in our estimate range, 800 billion barrels, is more than triple the proven oil reserves of Saudi Arabia.** Present U.S. demand for petroleum products is about 20 million barrels per day. If oil shale could be used to meet a quarter*

*of that demand, 800 billion barrels of recoverable resources would last for more than 400 years.*

**(James T. Bartis, et. al., "Oil Shale Development in the United States: Prospects and Policy Issues" (Santa Monica: RAND Corporation, 2005), p. ix. [http://rand.org/pubs/monographs/2005/RAND\\_MG414.pdf](http://rand.org/pubs/monographs/2005/RAND_MG414.pdf)) (emphasis added)**

The same RAND study indicated that technology exists today that would allow oil shale extraction and that the process would be cost effective once the price of a barrel of oil was \$95 (p. x). The price of a barrel of oil today is around \$130.

However, Shell Oil has been investing in technology that would make extraction much cheaper than standard pit mining:

*Shell Oil Company has successfully conducted small-scale field tests of an insitu process based on slow underground heating via thermal conduction. Larger scale operations are required to establish technical viability, especially with regard to avoiding adverse impacts on groundwater quality. Shell anticipates that, in contrast to the cost estimates for mining and surface retorting, the petroleum products produced by their thermally conductive in-situ method will be competitive at crude oil prices in the mid-\$20s per barrel.*

**(James T. Bartis, et. al., "Oil Shale Development in the United States: Prospects and Policy Issues" (Santa Monica: RAND Corporation, 2005), p. x. [http://rand.org/pubs/monographs/2005/RAND\\_MG414.pdf](http://rand.org/pubs/monographs/2005/RAND_MG414.pdf))**

In short, if the Congress removed its prohibition, America could develop a substantial amount of its oil needs from domestic oil shale resources rather than relying on foreign governments.

The Energy Policy Act of 2005 specifically declared that it was the policy of the United States to recognize oil shale as a strategically important domestic resource. Section 369 states:

*DECLARATION OF POLICY.—Congress declares that it is the policy of the United States that—*

- (1) United States oil shale, tar sands, and other unconventional fuels are strategically important domestic resources that should be developed to reduce the growing dependence of the United States on politically and economically unstable sources of foreign oil imports;*
- (2) the development of oil shale, tar sands, and other strategic unconventional fuels, for research and commercial development, should be conducted in an environmentally sound manner, using practices that minimize impacts; and*
- (3) development of those strategic unconventional fuels should occur, with an emphasis on sustainability, to benefit the United States while taking into account affected States and communities.*

**(Energy Policy Act of 2005, [http://www.epa.gov/oust/fedlaws/publ\\_109-058.pdf](http://www.epa.gov/oust/fedlaws/publ_109-058.pdf))**

Yet, buried in a Department of Interior appropriations bill passed in December 2007 was an amendment that prevented establishing regulations for leasing land to drill for oil shale. The House passed that amendment, proposed by Rep. Mark Udall of Colorado, on June 27, 2007, by a vote of 219-215.

On May 15, 2008 in a 15-14 vote, the Senate Appropriations Committee rejected an amendment by Sen. Wayne Allard (R-CO) to allow oil shale drilling and overturn the Udall moratorium.

**(<http://www.rockymountainnews.com/news/2008/may/15/panel-defeats-attempt-end-oil-shale-moratorium/>)**

The same day as that partisan vote, Terry O'Connor, Vice President of External and Regulatory Affairs for Shell Exploration and Production Company, testified before the Senate Energy Committee on developing oil

shale. Mr. O'Connor pointed directly to Udall's amendment as hampering research efforts in environmentally sound shale oil extraction:

*...this moratorium may well have a chilling effect on our efforts to develop this resource in the future. Ironically, preventing BLM from issuing regulations around any oil shale regulations also could have the unfortunate effect of undermining our efforts to develop carbon minimization solutions, as they would relate to oil shale development. Major commercial scale decisions for development take years to research, design and analyze. Although we are still in the research phase of our development activities, we would be helped greatly by regulatory stability on everything from diligence requirements and royalty rates to conversion fees and operating and environmental standards in order to make informed decisions, even in the RD&D stage that will lead to responsible development....Lack of clarity about the economic and environmental regulations governing a potential commercial development of oil shale will add significant additional risk to our potential research investment. Shell urges Congress to allow the BLM to create such a regulatory framework.*

**(Terry O'Connor, "Testimony of Terry O'Connor...Before the United States Senate Energy Committee," U.S. Senate Energy Committee, May 15, 2008: <http://energy.senate.gov/public/files/OConnorTestimony051508.pdf> )**

On June 9, 2008, the largest non-governmental holder of oil shale reserves in Utah, the Oil Shale Exploration Company (OSEC), announced a partnership with investors from multiple countries to pursue more research in developing oil shale in Utah:

*Oil Shale Exploration Company ("OSEC"), a Utah based private company, announced it has signed an agreement with affiliates of Brazilian integrated energy company Petroleo Brasileiro S/A ("Petrobras") and Japanese investment and trading company Mitsui & Co Ltd. ("Mitsui") pursuant to which Petrobras and Mitsui acquired rights to 10%-20% interests each in an oil shale joint venture with OSEC. Petrobras has also agreed to undertake a*

*technical, economic and environmental commercial feasibility study testing its Petrosix oil shale processing technology on lands owned or leased by OSEC in Utah. Mitsui will also provide advice for project management. The Petrosix® oil shale processing technology is a low emission proprietary retort technology developed by Petrobras and has been successfully used by Petrobras to commercially produce oil from shale for over 30 years at its shale Industrialization Business Unit in São Mateus do Sul, Brazil under strict environmental regulatory legislation. In 2007, Petrobras' average oil production from shale was approximately 4,600 barrels per day.*

**(OSEC Press Release, June 9, 2008:**

**<http://www.oilshaleexplorationcompany.com/news.asp> )**

It should also be noted that any leasing would have to comply with Section 526 of the Energy Independence and Security Act of 2007, which reads:

*No Federal agency shall enter into a contract for procurement of an alternative or synthetic fuel, including a fuel produced from nonconventional petroleum sources, for any mobility-related use, other than for research or testing, unless the contract specifies that the lifecycle greenhouse gas emissions associated with the production and combustion of the fuel supplied under the contract must, on an ongoing basis, be less than or equal to such emissions from the equivalent conventional fuel produced from conventional petroleum sources.*

**(Energy Independence and Security Act of 2007,**

**[http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=110\\_cong\\_bills&docid=f:h6enr.txt.pdf](http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=110_cong_bills&docid=f:h6enr.txt.pdf) )**

The amendment from Congressman Udall is the only current blockage to developing oil shale, while Section 526 of EISA also hamstring timely progress. But both OSEC and Shell Oil demonstrate that major companies are willing to invest in oil shale if Congress will overturn Udall's rider. That Shell's technology appears so promising is further indication that any

development would be both economically viable and sensitive to environmental concerns.