FACT SHEET – OIL SHALE

What is oil shale?

The term oil shale refers to sedimentary rocks that contain solid bituminous materials (called kerogen) that is released as petroleum-like liquids when the rock is heated.

Oil shale was formed millions of years ago by deposition of silt and organic debris on lake beds and sea bottoms. Over long periods of time, heat and pressure transformed the materials into oil shale in a process similar to the process that forms oil, however the heat and pressure was not as great. Oil shale generally contains enough oil that it will burn without any additional processing and is known as "the rock that burns".

When heated to high temperatures an oil-like substance and combustible gas can be extracted from the rock, which can be refined to produce clean petrol and diesel, electricity generation and be used as a raw material in the chemical and construction materials industries.

History

The oil shale industry has been operating in countries around the world for more than 100 years, with a process for extracting oil from shale rock first patented in England in 1694. The oil crisis of the early 1970s saw many multinational oil companies and government agencies investing large sums of money into oil shale research and development as an alternative hydrocarbon source.

However, American oil companies abandoned oil shale demonstration facilities in the 1980s on the grounds that production was not economically viable. Relatively high prices for conventional oil stimulated interest and development of better oil shale technology, but oil prices eventually fell and major research and development activities mostly ceased.

An oil shale demonstration plant in Queensland, Australia produced 700,000 barrels of oil between 2001 and 2003, and oil shale still remains a major energy source for Estonia (who account for 70% of world production) and the commodity is also being exploited in China, Brazil, Germany, Israel and Russia.

Resources and commercial viability

Total world resources of oil shale are conservatively estimated at 2.6 trillion barrels[1]. The largest deposits in the world are found in the United States 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 1.2 to 1.8 trillion barrels[2] . Not all resources in place are recoverable, however, even a moderate estimate of 800 billion barrels of recoverable oil from oil shale in the Green River Formation is three times greater than the proven oil reserves of Saudi Arabia.

Brazil has nine significant oil shale deposits. The size, location and quality of shale oil deposits in the Paraiba Valley and the Irati Formation have attracted the most attention. The two contain an estimated 1.4 billion barrels of in-situ shale oil with total resources of three billion barrels[3] .

Australia's oil shale resource is estimated to be around 58 billion tonnes or 4,531 million tonnes of shale oil[4] with significant deposits located in northern Queensland and Tasmania. This resource has the potential to significantly increase if research and development investigations into the processing of shale oil lead to the development of a commercial plant.

In 2007, prices for crude oil have risen again to levels that may make oil shale-based oil production commercially viable, and both major energy corporations such as Shell and governments worldwide are interested in pursuing the development of oil shale as an alternative to conventional oil.

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1 American Association of Petroleum Geologists

2 Oil shale and Sand Tars Leasing Program

3 U.S. Department of the Interior. U.S. Geological Survey.

4 U.S. Department of the Interior. U.S. Geological Survey.

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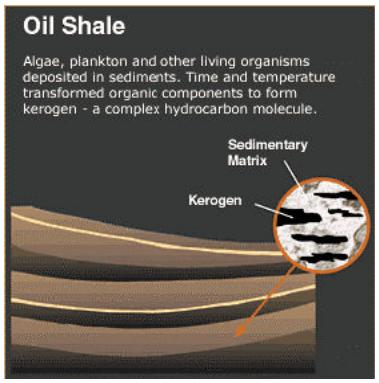
Tasmanite Oil Shale

This variety of oil shale found at Boss Energy's Latrobe Oil Project is unique to Tasmania and has advantages over other Australian oil shales in that it can be used as a source of bitumen as well as oil and power generation.



The shale is also unique among world oil shales because its kerogen arises principally from its content of fossil oil spores. Unlike other oil shales, oil from Tasmanite spores may be physically separated from the waste material. Tasmanite can therefore be extracted by relatively cheap physical processes such as froth flotation.

Government Assistance

Conventional oil reserves in Australia are declining and will not be sufficient to meet Australia's current needs. The Australian Government is encouraging the development of commercially viable non-traditional oil fuel sources, in recognition of the role they may play as future energy resources.

The mining process

Oil shale can be mined and processed to generate oil similar to oil pumped from conventional oil wells. Extracting oil from oil shale is more complex than conventional oil recovery methods. The oil substances in oil shale are solid and cannot be pumped directly out of the ground. The oil shale must first be mined and then heated to a high temperature (a process called retorting), the resultant liquid must then be separated and collected. An alternative and currently experimental process referred to as *in situ* retorting involves heating the oil shale while it is still underground, and then pumping the resulting liquid to the surface.

Mining and processing

Oil shale can be mined using one of two methods: underground mining or surface mining**.** After mining, the oil shale is transported to a facility for retorting. The vessel in which retorting takes place is known as a retort. After retorting, the oil must be upgraded by further processing before it can be sent to a refinery and the spent shale must be disposed of, often by putting it back into the mine. Eventually, the mined land is reclaimed.