

The world of oil shale - General and Indian scenario and its cost analysis

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The purpose of this paper is to (1) discuss the geology and summarize the resources of selected deposits of oil shale in varied geologic settings from different parts of the world, including an Indian Scenario and its prospects and (2) present information on selected deposits developed since 1990 and (3) cost analysis for oil shale development. Deposits of oil shale are found in many parts of the world. These deposits, which range from Cambrian to Tertiary age, may occur as minor accumulations of little or no economic value or giant deposits that occupy thousands of square kilometers and reach thicknesses of 700 m or more. Oil shale was deposited in a variety of depositional environments and commonly in association with deposits of coal, as in India where oil shale is found interbedded with coal. Recoverable resources, determining grade of oil shale, origin of organic matter, thermal maturity of organic matter, classification of oil shale and evaluation of oil shale resources are explained in detail in the poster. A recent small demonstration of the Shell In-situ Conversion Process (ICP) showed that after several years of in situ central heating with peripheral wall freezing, a small array of holes about 500m deep (in a chosen location) can produce ~10,000 bbl of light, sweet crude, before running dry. The economics of shale oil are limited by the time constant for thermal diffusion from the heater wells. The current mean cost of industrial electrical power is \$18/GJ, but the cost from clean coal with 90% of its CO₂ sequestered will probably be \$28/GJ by 2015. Hence, the total heating cost (mostly during the first two years) will be \$360K per heater (for a deposit 100 m thick, with a 10 m grid). Oil production would begin two years after initial heating, rise for a year or two, and then quickly decline. Our evaluation suggests that shale oil is unlikely to contribute more than 0.5% to global oil production by 2020.