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Oil Shale – A Local Asset under Global Constraint

Abstract

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I. THE PAST

Expectations in the 1970s, that the vast resources of oil shale could raise world oil shale production to 150 to 200 Mt (million t) by 2000, have been grossly disappointed, primarily for lack of viability and - less - environmental concerns. Worse, world production of oil shale declined from its peak in 1981 at 47 Mt to 16 Mt in 2000, recovering thence to an estimated 21.4 Mt in 2007. Important locally (in Estonia, Brazil and China and, less in Germany, Israel and Russia), the contribution of oil shale to meeting world energy demand remained close to nil.

II. THE PRESENT

The rising prices for competing transportation and power station fuels on the world market during 2000-mid 2008 revived interest in oil shale. Feasibility studies highlighted the potential strategic advantage of oil shale as a domestic fuel for securing energy supplies, alleviating the balance of payment and enhancing employment. New oil shale operations were said to be technically feasible, environmentally acceptable and viable. But costs needed to be kept below the prices of competing fuels, assumed to be driven upwards by the depletion of reserves. However, to date, this message did not "carry": oil shale capacities extended notably in China and Brazil only.

III. THE FUTURE

Regarding the next three or four decades, conventional oil and gas reserves suffice to cover projected world demand, the more so if demand grows less than hitherto expected. Oil prices are projected to rise to 110$/bbl (IEA) – 115$/bbl (EIA) by 2020 and to 122$/bbl (IEA) – 130$/bbl (EIA) by 2030. Such price levels could encourage the combustion of oil shale and the production of shale oil, whose future costs are estimated at between 20$/bbl and 60$/bbl. However, opportunities appear to be site-specific rather than general. In any case, investors will have to bear in mind geological, technical and institutional uncertainties and in particular, **additional charges** resulting from climate change mitigation policies (and in Estonia, from the application of the EU Directive on Large Combustion Plants). These policies would hit oil shale harder than its competitors and **may place even existing oil shale operations at risk.**

IV. AN ENABLING AGENDA

Such uncertainties could, though, be attenuated by a determined and concerted action by

- governments to enhance policy predictability and planning security: this implies inter alia determining climate change mitigation policies; defining the role of oil shale in energy policies; easing regulatory processes when a multitude of authorities are involved; incentivising early investors in carbon capture and storage (CCS) or pressurized fluidized bed combustion (PFB); supporting CO_2-related RD&D and international technology transfer as part of an international effort
- industry to maintain entrepreneurship: this implies inter alia controlling costs and risks; preparing for CCS and PFB; bringing in-situ extraction to maturity; designing new units "capture-ready"; assisting emerging oil shale countries (consulting, equity investments, CDM projects); enhancing the value of shale oil products; utilising waste
- academia and developers to focus on CO_2-related RD&D: this implies inter alia adapting CCS technology to oil shale operations; appraising and reducing CO_2 emissions in in-situ and surface retorts and fluidized beds; testing carbon dioxide storage in shale deposits; cooperating internationally.

Given these conditions, world oil shale production might rise from 21.4 Mt in 2007 to a conservative 38.7 Mt in 2020, driven by expansion particularly in China and Jordan. Here and elsewhere, oil shale could serve as a bridge fuel towards a sustainable energy economy without, however, attaining the global significance which its vast resource base suggests.

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