

A road not traveled: Development of an improved oil shale retort

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The tripling of oil prices over the last few years has generated renewed interest in producing petroleum from oil shale and tar sand. Tar sand processing is an economic reality: oil (or more properly bitumen) is already present as a liquid, which can be easily recovered by simple extraction techniques. Larger scale mining equipment in recent years have resulted in even better economics. With oil shale, oil is present as a mineral (kerogen) which must be heated before oil can be recovered. While some *in-situ* processes possess financial potential, above-ground retorting of oil shale has yet to achieve economic success. Even given the vastly increased oil prices, processing units remain small, construction costs rise in step with oil prices and energy use is still high. Thus, viable economics remain elusive. Development stopped after "Black Monday" in 1982, with no viable technology identified. As with tar sands, the route to achieving economic viability in oil shale processing must be through larger processing units. The one technology that offers such potential for large size is fluid bed retorting. In this paper, a review, discussion and analysis will be provided of previous fluid-bed development efforts. A design will then be described which eliminates many of the problems experienced with earlier fluidized solids configurations and allows much larger throughputs.