

WHAT THERMODYNAMICS TELLS US ABOUT ENERGY ECONOMICS AND THE FUTURE OF OIL SHALE

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Energy is essential to the World's economy. With adequate supplies of reasonably-priced energy, wealth can be generated. With limited supplies or high prices, economies will contract. Impending limitations on the supply of conventional petroleum is generating concern for the future and creating a search for alternatives. An objective view of these alternatives points to oil shale as a candidate that can supply large quantities of affordable energy. Oil shale can, and must, play a significant role in sustaining human economy.

At its most fundamental level, energy can only be derived from three sources, fossil energy (effectively stored solar energy), nuclear, and solar (in its various forms). Nuclear and solar are better at making electricity; fossil resources are better at making fuels and chemicals. But fossil fuels are also relied upon for electric power generation, and there are practical limits to how much electricity can be substituted for fuel. Solar energy also requires the occupation of large acreages of land and requires substantial energy input into the equipment manufacture. Free market forces will normally winnow technologies that are not thermodynamically competitive; it is the implementation of government subsidies that runs the danger of skewing economics that override fundamental thermodynamic considerations.

The presentation will quantify the thermodynamics of shale oil production, and show how thermodynamics are a strong measure of economic competitiveness. Oil shale promises not only energy self-sufficiency, but an investor can have the confidence that oil shale is, and will be, economically competitive with other sources of energy. The presentation will further look at the energy return on investment (EROI) for a variety of fuels and gauge, in a general economic framework, what are the consequences of developing these energy alternatives.

The presentation will comment on the role that high energy prices played in the current world economic downturn and the negative effects of energy disinvestment on recovery. Will investment in proving unconventional oil resources be an attractive anticipatory investment in resupplying an economic recovery? The relationship of energy supply and price to economic health begs lessons for the future. What can we expect from the relationship between energy price and availability, and economy? What does this tell us about the long-term viability of oil shale?