

Issues impacting methodology for quantitative assessments of oil shale

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The foundation of developing any assessment methodology is to first ask, "What are the questions?" A typical question is, "How much oil-shale resource exists in the world (or in a certain area)?" Closer examination shows that refinement of that question is necessary. The answer varies according to geologic characteristics of the shale, to technology assumptions, to economic considerations, and even to the definition of what is or is not counted as an oil shale. Societal relevance of the assessments is an important consideration. Who is asking the questions and why? Which questions can be reasonably answered based on the data available and which cannot? Are estimates of in-place resources misleadingly large when considering relevance to available resources in a specific time frame? Scale is one of the most critical considerations applied to assessment questions. Oil-shale deposits around the world vary considerably in the amount of data available to describe them. Some, like the Green River Formation oil shale of the United States, are documented in great detail with much geographically referenced data available to construct three-dimensional models of the deposit. Other deposits have only rudimentary geologic descriptions. Data availability constrains what questions can be answered and at what scales. Probabilistic methods provide a context for comparisons between deposits whose characteristics are well known and those deposits that are poorly constrained. Probabilistic methods are also appropriate for comparing volumetric estimates of discovered deposits with estimates of undiscovered deposits, even though very different methodologies may have been used to develop the estimates. Probabilistic methodologies can be quickly developed using one of the Monte Carlo programs that are readily available. An additional principle in constructing an assessment methodology is transparency. Estimates are considerably more defensible if the methodological calculations are explained and the input variables are documented.