

## **The Elusive Bonanza: oil shale in Colorado - is it possible to "pull the sword from the stone**

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Buried underground in Colorado and Utah are a trillion tons of oil shale. Throughout the 20th century, men have tried and tried again to unlock the energy in these rocks. To date, all efforts have failed. Nevertheless, every twenty or thirty years, when energy prices spike, a new attempt is mounted. The persistence is understandable: whoever unlocks this resource would capture a trillion dollar prize. However, oil shale's record of accomplishment is not encouraging. The rocks are stubborn, an elusive bonanza, promising much, delivering little. Despite a century of trying and \$10 billion in investment, oil shale currently provides an infinitesimal 0.0001 (or one ten-thousandth) of world energy. This paper explores the thermodynamic and energetic principles that make oil shale so difficult to unlock.

Will oil shale someday provide a significant proportion of U.S. petroleum? It is intriguing to compare the status of Canadian tar sands and Colorado oil shale. Both resources contain equivalent energy content. Alberta tar sands are now economic; production exceeds 1,000,000 barrels a day, and may double in coming years. Global production of oil shale, on the other hand, has never exceeded 25,000 b/d, and has fallen by half since 1980. This paper will compare and contrast the chemical, physical, geological, and thermodynamic differences between these two unconventional resources to explain better why one's future is so promising, the other's so uncertain. The paper concludes by asking, Will oil shale ever be economic? And if so, at what price?