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CHAPTER 2  
**Introduction**

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At the request of the Senate Energy and Natural Resources Committee, OTA has studied the history and status of efforts to develop the oil shale resources in Colorado, Utah, and Wyoming. The Committee's request called for a complete assessment of shale oil recovery technology in general and of the current Federal Prototype Oil Shale Leasing Program in particular.

The remaining chapters of this volume deal with the general context of oil shale development. The following subjects are discussed,

- Chapter 3—"Constraints to Oil Shale Commercialization: Policy Options to Address These Constraints"—describes some alternative objectives that might be pursued to control the growth of the industry. Four development scenarios are used as a framework for identifying the obstacles that might inhibit or preclude the establishment of industries of various sizes before 1990, (This analysis is based largely on information contained in the subsequent chapters.) The congressional policies that might be directed to these obstacles are then discussed. Given these obstacles and policies, the relative degree to which each scenario would attain each objective for development is then described.
- Chapter 4—"Background"—describe the oil shale region, discusses the resources, outlines the processes for extracting shale oil and other materials, and summarizes the history and status of development efforts in the United States and abroad.

Chapter 5—"Technologies"—describes the mining and processing methods that could be employed to recover shale oil and to refine it to finished fuels. The advantages and disadvantages of the various processes are presented and their status summarized. Research, development, and demonstration needs are iden-

tified, and some possible Government policies are discussed.

- Chapter 6—"Economic and Financial Considerations"—deals with the costs of recovering shale oil and with the risks that inhibit oil shale projects. These risks include the absence of certainty about the capital cost estimates for commercial plants, the future of conventional oil prices and their impact on shale oil prospects, and the adequacy of U.S. equipment manufacturing and construction and design capacity for rapid deployment of a large industry. The need for Government subsidies is evaluated. A number of financial incentives are examined for their influence on the breakeven price for syncrude from shale oil, the probability of project financial loss, and the net cost to the Government. No explicit attempt has been made to compare the economics of shale oil with that of other synthetic fuels nor with possibilities such as conservation or solar energy. Such a comparison is outside the scope and mandate of the present study. The chapter assumes that the commercial prospects of shale oil will continue to be determined until the end of this century by its cost and price relationship with conventional oil.
- Chapter 7—"Resource Acquisition"—discusses the characteristics of the oil shale lands that are owned by the Federal Government and by private parties. The possible need for involving additional Federal land is related to the level of shale oil production that is desired, and to the provision of other types of encouragement, such as subsidies. The principal mechanisms for providing such land—leasing and land exchange—are described and evaluated.
- Chapter 8—"Environmental Considerations"—discusses the implications of de-

velopment for the environment and for the workers. Separate discussions are provided for the potential effects on air quality, water quality, land characteristics, and the health and safety of the workers. In each case the legal framework governing the effects is described, the potential impacts of development are discussed, the proposed control technologies are evaluated, and the areas of uncertainty are identified. A discussion is also included of the procedures that control the issuance of environmental permits for oil shale projects. Possible governmental policy responses are discussed for each area of concern.

- Chapter 9—"Water Availability"—deals with the implications of oil shale development for the region's scarce water supply. The water resources themselves are described, and the institutional framework that governs their allocation is discussed. Water requirements of conventional users are projected to the year 2000 and compared with the physical resources to determine if surplus water might be available to support an oil shale industry. Mechanisms and policies for making additional water available are discussed.
- Chapter 10—"Socioeconomic Aspects"—deals with the effects of development

on the small, rural communities that characterize the oil shale region. The population increases that might accompany development are estimated, and the abilities of the communities to accommodate this growth are evaluated. The nature of the potential impacts is discussed and possible policy responses are presented.

Volume II presents a history of the current Federal Prototype Oil Shale Leasing Program, together with an analysis of a prior leasing attempt which, although unsuccessful, affected the character and conduct of the Prototype Program. The problems encountered in the Program since its inception are discussed, and the status of development on the lease tracts is described. The ability of the Program to achieve its original objectives is evaluated.

Each aspect of this assessment is based on recent publications, on contractor reports prepared for OTA, and on the independent investigations of the project staff. The results are current as of February 1980. It is important to note that the oil shale situation is in a state of flux and that new developments may significantly alter the status and outlook of the industry and affect the accuracy of any conclusions presented herein.