

**A. Role of the OCS in the Future US. Energy Supply.**

In 1973, the United States consumed petroleum liquids at a rate of 17.3 million barrels per day (or 6.3 billion barrels per year). Of this amount, 11.1 million barrels per day were produced from U.S. sources and 6.2 million barrels (35.9%) per day were imported.<sup>1</sup> At the 1973 rate of consumption, and without imports, it is estimated that '7.4 -years' supply of discovered oil and gas remain in U.S. territories.<sup>2</sup> Considering the varying reliability of foreign sources of supply along with the potential for severe economic and social disruption which could result from any severe shortage of energy supplies, the unknown quantities to be found on the OCS assume major importance.

Present production of crude petroleum from the OCS is 0.9-1.0 million barrels per day, or about 10% of the total production from U.S. reserves.<sup>3</sup> Offshore Louisiana provides about 95% of all U.S. offshore production from the OCS. A corresponding quantity of gas (about 9 billion cubic feet per day) is also produced on the OCS, representing about 15% of the total U.S. production. Several recent studies estimate that a substantial proportion (about one-third) of U.S. oil resources available for the future are most likely to be discovered in the OCS regions.<sup>4</sup>

It is important to note there are no proven reserves in the OCS frontier areas under consideration; no drilling has been done. However, initial estimates of resources expected to be discovered have been made by the U.S. Geological Survey (USGS) based on broad geological and geophysical data which have been collected and analyzed. This information is more reliable in some areas than others, but it is quite subjective until some reasonable exploration effort, including drilling, has been accomplished. The following table presents these USGS estimates of resource potential for the major OCS regions.<sup>5</sup>

OCS Frontier Area	Estimated oil (billion barrels)	Estimated gas (trillion cubic feet)
Atlantic (North, Mid and South).....	8 to 16.....	50 to 100.
Gulf of Mexico (areas not explored to date).....	18 to 36.....	150 to 300.
Pacific—California, Oregon, Washington (areas not explored to date).....	4 to 8.....	5 to 10.
Alaska (all basins).....	28 to 56.....	150 to 300.
<b>Total.....</b>	<b>58 to 116.....</b>	<b>355 to 710.</b>

<sup>1</sup> Federal Energy Administration, "Project Independence Task Force Report—Oil : Possible Levels of Future Production," November 1974, p. II-9.

<sup>2</sup> Attachment F, "An Analysis of Oil and Gas on the Outer Continental Shelf." Section H. contains further discussion of resource needs and depletion.

<sup>3</sup> Derived from U.S. Department of the Interior Bureau of Mines, "Petroleum Statement, Monthly," November, 1974, Table 3a, p. 7.

<sup>4</sup> Attachment F, Section II. See especially p. 9.  
<sup>5</sup> U.S. Department of the Interior Geological Survey, "USGS Releases Revised U.S. Oil and Gas Resource Estimates," (news release) March 26, 1974.

To put these estimates in perspective, the possible output from key areas at peak production has also been estimated. In the Mid-Atlantic region, for example, such production could be as much as 740,00 barrels of oil per day (or about 7% of this nation's total 1973 oil production) and 4.4 billion cubic feet of gas per day (some 8% of present total U.S. gas production). In the Gulf of Alaska, estimates suggest the possibility of producing 1.5 million barrels of oil per day and 6 billion cubic feet of gas per day.

### ***B. Current and Proposed OCS Leasing***

Oil and gas exploration and production on the OCS was initiated soon after passage of the OCS Lands Act of 1953. Regions defined as the OCS are those portions of offshore lands beyond the three mile limit for the majority of coastal states. While by far most OCS leasing and production from 1954 to the present has been in the Gulf of Mexico, some leasing and production has been accomplished off California. Leases also have been let on the OCS off Florida, Mississippi, Alabama, Washington and Oregon.

Present Department of the Interior lease practices and management of the OCS are detailed in Attachment A, OCS Lands Act of 1953 . . . " and Attachment B, "Department of the Interior OCS Orders 1-12." The following is a brief summary of present practices and procedures,

The Department's Bureau of Land Management specifies areas for intended lease based on both industry and government estimates of potential reserves and other factors. (See Appendix 1, "OCS Leasing Procedures. . . ") This is followed by an accelerated collection and analysis of geophysical data from the specified region by both the U.S. Geological Survey and private companies to determine the best prospects for drilling and the amounts of reserves expected. Simultaneously, baseline environmental and geophysical studies are conducted to provide some degree of detection of possible adverse effects.

A request for nominations of specific tracts of interest is then published in the Federal Register. Publication also provides an opportunity for interested parties to comment on why specific tracts in an area should or should not be leased.

A draft environmental impact statement (DEIS) is prepared by the Bureau of Land Management (BLM) and submitted to the Council on Environmental Quality (CEQ) for publication. A public hearing on the DEIS is held 30 days after publication by CEQ, and a final environmental impact statement is prepared and submitted by BLM to CEQ. During this process USGS refines its estimates of the value of the resources.

The decision on whether a lease sale will be held, and if so, which tracts are to be offered and on what terms, is made by the Secretary of the Interior. Typically, leases are sold for a cash bonus plus 16 2/3% royalty. The Department estimates values of each tract offered, and industry cash bids must equal or exceed this estimate.

Under present lease practices, sales of leases are made before the existence of recoverable reserves, if any, is proved. No exploratory drilling-only method which can determine the actual existence

of the resource-is possible under these practices.<sup>o</sup>The estimates of reserves have been made solely by geological and geophysical means, which include seismic soundings, studies of gross geological features, and research on magnetic and gravitational field variations. While these estimates incorporate the soundest of professional judgments, they can and often do vary widely.

The Department of the Interior has planned to accelerate leasing of OCS frontier areas over the next four years and is now proceeding with that plan. The stated goal is to lease over a four year period all the remaining OCS areas considered to have significant oil or gas potential. Six lease salesperyear preplanned.

This proposed OCS planning schedule is shown in Figure II-1 on page 13, with an accompanying map (Figure II-2) of the OCS regions of interest for oil and gas.

The status of this leasing schedule, as of March 1975, is shown in Table II-1. It is evident that some time slippage has occurred. The Mid-Atlantic region leasing was delayed pending a supreme Court decision, rendered March 18, 1975, which held that the Federal government, not the individual states, holds jurisdiction over the contested OCS areas.

During 1975, plans call for five areas to be actually leased. Two of these are in the Gulf of Mexico; the others are off Southern California, in the Gulf of Alaska, and in the Mid-Atlantic.

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<sup>o</sup> Exploratory drilling cannot determine precisely the extent of the resource, however. The drilling of a few exploratory wells serves rather to refine the estimate.

FIGURE II-1

NOVEMBER 1974

PROPOSED OCS PLANNING SCHEDULE

SALE AREA	MONTHS											
	J	A	S	O	N	D	J	F	M	A	M	J
South Texas												
Central Gulf												
Southern California												
State - Federal Cook Inlet												
Gulf of Alaska												
Mid-Atlantic												
MAFLA, Gulf of Mexico (Deep)												
North Atlantic												
South Atlantic												
Southern California												
Bering Sea (Including Kodiak)												
Gulf of Alaska (Including Kodiak)												
Gulf of Mexico (Deep)												
So. California (Deep)												
So. California (Deep) (Shallow B. Deep)												
Shallow B. Deep												
Shallow B. Deep												
Outer Bristol basin												
North Atlantic (Shallow B. Deep)												
So. California (Deep)												
South Atlantic (Blake Plateau)												
Bering Sea (Including Kodiak)												
Gulf of Alaska (Including Kodiak)												
Aleutian Shelf												
No. California, Wash., Oregon												
Church Sea (Blake Plateau)												



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BSI - Baseline Studies Initiated  
 C - Call for Nominations  
 ND - Nominations Due  
 T - Announcement of Tracts  
 DES Draft Environmental Statement  
 PH - Public Hearing  
 FES Final Environmental Statement  
 N - Notice of Sale

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Sales are contingent upon technology being available for exploration  
 listed will not be made until completion of all necessary studies of  
 the environmental impact and the holding of public hearings as a  
 result of the environmental, technical, and economic studies employed  
 not to hold any sale on this schedule  
 1/ Site may conduct sale  
 2/ These sales could be contingency sales for either G-1 of Alaska (39) or  
 Mid Atlantic (40)

FIGURE II-2

## OCS Regions of Interest for Oil/Gas Exploration

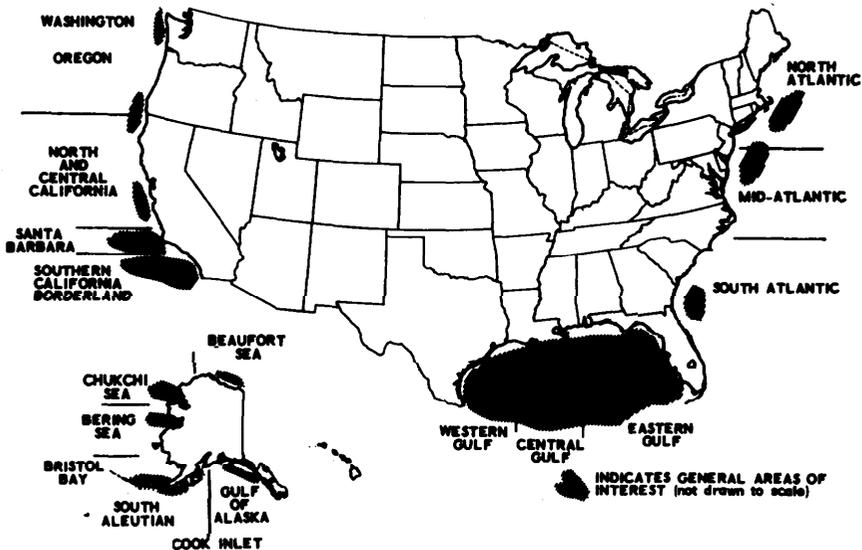


Table II-1.—Status of leasing schedule (as of March 5, 1975)

1. Central Gulf (sale No. 38) :	
Draft Environmental Impact Statement (EIS) .....	Dec. 20, 1974
Public hearing .....	Jan. 21, 1975
Final EIS .....	March 1975
Sale .....	May 1975
2. Southern California (sale No. 35) :	
Draft EIS .....	Feb. 21, 1975
Public hearing .....	April 1975
Final EIS .....	July 1975
Sale .....	Sept. 1975
3. Gulf of Alaska (sale No. 39) :	
Tract selection .....	March 1975
Draft EIS .....	April 1975
Public hearing .....	May 1975
Final EIS .....	Sept. 1975
Sale .....	Nov. 1975
4. Mid-Atlantic (sale No. 40) :	
Call for Nominations .....	Delayed pending Supreme Court decision.
Announcement of tracts .....	
Draft EIS .....	
Public hearing .....	
Sale .....	
5. MAFLA, Gulf of Mexico (deep) (sale No. 41) :	
Announcement of tracts .....	March 1975
Draft EIS .....	May 1975
Public hearing .....	June 1975
Final EIS .....	Oct. 1975
Sale .....	Dec. 1975
6. Bering Sea (sale No. 45) :	
Announcement of tracts .....	April 1975
Draft EIS .....	Sept. 1975
Public hearing .....	Nov. 1975
Final EIS .....	Feb. 1975
Sale .....	April 1976

### *C. Proposals for Change in the Present System*

During 1973 and 1974, oil and gas shortages, along with the growing dependence of the United States on imported petroleum, focused attention on the possibilities of increasing domestic production. Many bills were introduced in the 93rd Congress for the purpose of amending the Outer Continental Shelf Lands Act in order to stimulate more exploration and production from offshore regions. Hearings were held during May 1974 before the Subcommittee on Minerals, Materials and Fuels of the Senate Committee on Interior and Insular Affairs. Seven bills were before this committee, which heard considerable testimony on them from various private and public sectors. Only one of the bills, the Energy Supply Act of 1974 (S. 3221) was passed by the Senate. (None was passed by the House.) A bill identical to S. 3221 was introduced (S. 521) in the 94th Congress along with numerous others relating to OCS oil and gas exploration and production. Referred to the Senate Committee on Interior and Insular Affairs, they raise questions about alternatives to the present leasing system, including specifically the separation of offshore exploration activities from development and production, which are addressed in this report.

At OTA's request, the Congressional Research Service has prepared a detailed analysis of some of these bills, and a comparison of two of them, for this report. These analyses and comparisons are contained in Attachments C, D, and E.<sup>7</sup>

No attempt has been made in this report to relate any of the exploration alternatives analyzed to specific provisions of the proposed legislation. Rather, the purpose of this study is to describe and assess the possible technical alternatives, in response to the joint request of the Senate Committees on Commerce and Interior, which specifically asked OTA to analyze the feasibility of separating exploration from development and production of oil and gas on the Outer Continental Shelf. (The requesting letters to OTA are in Attachment G.)

### *D. OCS Issues*

#### 1. PUBLIC AWARENESS II. ABILITY OF RESOURCE INFORMATION

Knowledge of presently available and future supplies of depletable energy resources is fundamental to national energy planning policy, but there are varying opinions on how much quantifiable information is necessary and can, in fact, be obtained to facilitate this planning.

Estimates on such depletable resources as oil, gas and coal vary widely, as do projections of the time required to develop alternatives to these energy sources. Since petroleum and natural gas are the most widely used energy resources in the U. S., many believe that it is essential to know much more precisely how much of these resources remain domestically. Their rationale is that it is not possible to frame a coherent policy relative to oil and gas imports, conservation of domestic supplies, and rate of development of alternate energy sources, in the face of major uncertainties about domestic oil and gas reserves. Many also believe that it is not possible to develop plans to minimize the adverse impacts associated with the extraction of oil and gas resources

<sup>7</sup>In addition, a comparison of bills amending the OCS Lands Act—S. 426, S. 521 and other bills—became available to the Task Force as this report was in final preparation and is included in Appendix 2.

unless the extent and nature of these resources are known prior to their production and development. And finally, many believe that it is not possible to assure that the public receives fair value on its OCS oil and gas resources unless the extent of these resources is known prior to their sale.

In each of the options presented and compared in this report, a primary consideration is their effectiveness in making more knowledge of the OCS resources publicly available prior to actual development and production of the resources.

## 2. PUBLIC CONTROL OF RESOURCE DEVELOPMENT

Under the present OCS leasing system, the company successfully bidding on an OCS lease tract has reasonable assurance that it can proceed from exploration to development and production without major interruption. While the developer must file, after discovery, a production plan for review and action by the Department of the Interior, this process traditionally has not resulted in unanticipated delays.

Concern has been expressed by representatives of many states adjacent to potential oil and gas resources in OCS frontier regions about the management of development that may occur in these new regions. Many argue that effective management of offshore and, in particular, onshore impacts is not possible under the present system. They note that the major impacts occur during development and production and contend that, under the present system, decisions affecting these are mainly controlled by the developer. Those who support the present system argue that the long lead time required to begin production from a successful tract allows ample opportunity to plan for impacts. They further contend that any new mechanisms that provide for more public control over development and production decisions could introduce prolonged delays, which in turn could impose unfair economic burdens on the developer and aggravate domestic oil and gas shortages. Those favoring greater public control over development contend that states, local governments, and others may take legal action, which could have the same or even greater delaying effects, if provision for such control is not made through changes in the present system.

The possibility of such delays introduces another element of uncertainty, which is considered in this report, into national energy planning and management.

Another argument advanced for greater public control over the development of oil and gas reserves in the frontier areas is that production of these reserves as rapidly as possible, which is encouraged by the present system, may not be in the long-term national interest. The basis for this concern is the great uncertainty about the amount of remaining undiscovered recoverable oil and gas reserves, a major fraction of which are assumed to lie in the OCS. If recent conservative estimates of these reserves are correct, then it may be desirable to produce these reserves at lower than the maximum efficient rate, and to accept a relatively high level of imports, in order to avoid a period of extremely heavy dependence on imports if domestic reserves are exhausted before alternative sources (e.g., oil shale, coal synthetics) can be brought on line in sufficient quantities to replace them. On the other hand, if the

more optimistic estimates of remaining resources are correct, then development of domestic production as quickly as possible in order to reduce imports appears to be desirable, since there would still be ample time to develop acceptable alternative sources of hydrocarbons to replace the declines in production of natural resources when they ultimately occur.

The problem, according to proponents of greater public control, is that the current system commits OCS resources to rapid production before adequate information about resource levels is available for determining the optimum rate of production, and without an adequate mechanism for regulating production at the desirable rate. Others argue that it is clear that OCS resources should be developed as quickly as possible, that whatever resources in fact exist in the OCS frontier areas can be brought to market most rapidly under the present system, and that stronger controls over development and production would simply cause additional delays in meeting short-term energy needs. This analysis considers the extent to which the alternatives under consideration will affect public control over the development of OCS resources, and the delays in production that any changes might produce.

### 3. RETURN TO THE PUBLIC

Since OCS oil and gas belong to the public, one important criterion for assessing any method for leasing these resources is the extent to which that method leads to an equitable division of the returns from development of those resources between the public and the developers. A basic feature of the current system is the fact that OCS lands are leased to private developers under conditions of great uncertainty about the amount of oil or gas they actually contain, since the existence of hydrocarbons can only be established by exploratory drilling which does not occur until after tracts have been leased. Proponents of exploration prior to leasing for production argue that it is unwise, perhaps even irresponsible, for the government to sell the rights to resources with great potential value without having a very clear idea of how much they are really worth. In this vein, some maintain that the relatively greater ability of the oil companies to estimate the true resource potential of OCS lands, compared to the ability of the Department of the Interior, makes it likely that the public has been receiving less than fair return for its resources. Others argue that competition in the bidding process insures that the public will receive a fair return, and some maintain that the public has received more than a fair return because of over-optimism about resource potential on the part of the winning bidders. This report considers the effects on the return to the public of a reduction of uncertainty about resource potential resulting from exploratory drilling prior to leasing for production, and, in particular, examines the effects on the relationship of bids to the true value of the resources being offered for sale.

### 4. EFFICIENCY OF EXPLORATION

Some geophysical exploration already has been conducted in OCS frontier areas, but there has been no exploratory drilling. An issue addressed in this report is whether greater efficiency of exploration can be achieved by changes in the present leasing system.

Efficiency is measured in terms of both time and financial costs, which often must be considered together. Some feel that any change in the existing system would introduce those delays they see as normally imposed by the operational preparations required to accommodate such change. And some contend that, owing to the extent of the area to be explored and the constraints of finite (or limited) supplies of equipment and competent personnel, variations in time and costs will be of marginal importance. They note that the risks of not finding resources at any given drilling site are substantial. Some say the efficiency of exploration would be increased if leasing were by traps-large areas-as opposed to the present practice of leasing tracts, relatively small areas (5,670 acres) which are geographically defined. Similarly, it has been suggested that leasing concentrate on the best potential target areas, overlooking marginal areas until later, on the presumption that this would make exploration more efficient.

There are also those who maintain that it would cost the government and public significantly more in time and money for it to undertake exploration programs, as opposed to industry exploration alternatives, because of the government's relative lack of appropriate management experience and professional personnel. Further, some hold that existing government planning and procurement requirements would impose delays if the present system is changed.

Each of the issues above is considered in the context of the various alternatives addressed in this report.