

**FINANCING OPTIONS FOR THE
STRATEGIC PETROLEUM RESERVE**

**The Congress of the United States
Congressional Budget Office**

PREFACE

In the Energy Policy and Conservation Act of 1975 and the Energy Security Act of 1980, the Congress has supported the Strategic Petroleum Reserve (SPR). Previous Congressional Budget Office (CBO) studies have discussed the potential benefits the SPR can convey during oil import interruptions. Yet the costs of acquiring the SPR have continually increased and its funding from general revenues may be jeopardized during periods of austere budgets.

At the request of the Oversight and Investigations Subcommittee of the House Energy and Commerce Committee, the Congressional Budget Office has prepared this analysis of SPR financing options. In keeping with CBO's mandate to provide objective analysis, this report contains no recommendations.

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SUMMARY

U.S. vulnerability to disruptions in imported oil supplies led the 95th Congress to authorize the creation of a Strategic Petroleum Reserve (SPR) in the Energy Policy and Conservation Act (EPCA) of 1975. Previous Congressional Budget Office (CBO) studies have demonstrated that the SPR could be highly effective in mitigating some of the adverse economic effects associated with supply interruptions. One projection, for example, indicated that in the absence of a reserve, a year-long shortfall of 2 million barrels per day in 1984 would reduce projected GNP by approximately \$146 billion (3.6 percent) and increase the unemployment rate by 1.1 percentage points and the inflation rate by 7 percentage points. Drawing down a 750 million barrel reserve could avert virtually the entire impact of such a disruption.

These benefits notwithstanding, the SPR program has experienced numerous difficulties and delays. Of the 1 billion barrels of storage capacity authorized by the Congress, only 250 million have been completed, with 150 million more slated for completion by 1985. Furthermore, the reserve now contains only 121 million barrels of oil. In response to the tight world oil market caused by the Iranian Revolution, the Department of Energy (DOE) suspended oil purchases in February 1979, only to resume them at the direction of the Energy Security Act passed by the Congress in 1980.

FINANCING THE RESERVE

Current Administration plans call for a fill rate of 200,000 barrels per day for the remainder of fiscal year 1981, and 230,000 barrels per day in fiscal year 1982. Together with the 121 million barrels of oil now in the reserve, this would create a reserve of 250 million barrels by the end of 1982. Maintenance of the latest Administration plan for filling the reserve, which averages about 195,000 barrels per day over the next seven years, would create a 750 million barrel reserve by the end of 1989.

Filling the reserve under this schedule would require total additional budget authority for oil of \$36.7 billion in fiscal years 1981-1989, including the supplemental \$1.3 billion sought by the Administration for fiscal year 1981. A supplemental appropriation is necessary because of the cessation of the entitlements benefits the reserve received while oil price controls were still in effect. Annual budget requirements for the SPR fluctuate with the

planned rate of fill, rising from \$4.4 billion in fiscal year 1981 to a peak of \$7.4 billion in fiscal year 1987. The total cost of a 750 million barrel reserve, including the funds appropriated to date, is estimated to be \$44.8 billion.

Together, these significant budgetary impacts and the compelling benefits of the SPR have recently focused attention on methods to attract private funds into the SPR program. This paper analyzes four of these financing options:

- o Public Capitalization of the SPR (or SPR "certificates"). This option would allow private investors to speculate in oil by purchasing title to the value of a specified quantity of oil in the reserve. The return on the investment would depend solely on increases in the value of oil, and could be realized by trading the certificates on a secondary market, redeeming them upon reserve depletion, or holding them to maturity. This approach is used in the bill submitted by Congressman Gramm (H.R. 2304).
- o Debt Financing of the SPR. This alternative could be achieved by the federal government through the issue of a new series of bonds, the sole purpose of which would be to raise money for the SPR program. The new debt instrument could bear either a market rate of interest or a yield related to the rate of oil price appreciation.
- o Development of an Industrial Petroleum Reserve (IPR). This type of financing would shift the focus, and much of the burden, of the oil stockpiling program to the private sector. Several policies could result in an IPR. Using the authority provided by the EPCA, the President could require all importers and refiners to store up to 3 percent of their consumption in a separate emergency inventory. Alternatively, the government could provide financial incentives--tax credits or direct subsidies, for example--to firms increasing their inventories. Another plan would use the EPCA authority, but would allow those firms required to store oil only to show evidence that someone is storing the oil for them. Thus, with this last plan, some speculative capital might be attracted from outside the industry.
- o Mandated Private Contributions to the SPR. Firms importing, refining, or domestically producing oil could be directed to supply specified amounts of oil to the SPR. The government could impose these costs on the firms (to the extent that they were unable to pass the costs onto consumers), or subsidize them.

Further, the oil or the market value of the oil could be guaranteed to each contributor in the event of reserve depletion. Senator Kassebaum's bill, S. 707, typifies this approach.

These options are not all mutually exclusive, nor would their implementation preclude continuing the current program. Each plan offers some advantages and disadvantages when compared to the others, and some combination of approaches may be appropriate, to enable more flexible responses to a range of supply interruptions.

EVALUATION OF SPR FINANCING OPTIONS

Alternative ways of financing the SPR can be evaluated by several criteria. The most important of these concerns the distribution of the economic costs, benefits, and risks associated with the creation and depletion of the SPR. Four other criteria are discussed later in this section.

Economic Costs and Risks

Stockpiling oil entails a resource cost to society, as it displaces alternative economic activity and possibly more productive investment, and limits available funds for alternative social uses. Nevertheless, the reserve program benefits all sectors of the economy by reducing the adverse effects of oil supply interruptions. Drawing upon reserve oil during an interruption would bolster employment, contain inflation, and maintain the profit margins of firms. Finally, upon depletion, revenues would accrue to the owners of reserve oil--whether they be the federal government or private sector participants.

The costs for developing a reserve, however, can be shifted among various groups, depending on the financing method chosen. The total costs for alternative methods would differ slightly, as a result of different institutional arrangements and, in some cases, economies of scale. In addition, Treasury debt financing would offer the lowest expected cost of all types of borrowing.

Yet, the bulk of SPR costs are inescapable, although they may be fully offset by the sales of SPR oil if the price of oil rises faster than the rate of return on an alternative investment--presumably the interest rate on Treasury bills. Thus, whoever finances the SPR assumes the risk that oil prices will not rise faster than the rate of interest. Under the current arrangement, in which oil is purchased through direct government expenditures, the taxpayers bear the risk. Plans that force firms to hold inventories

or contribute oil to the SPR would transfer the burden to the oil industry, which, in turn, could pass on some of the costs to consumers. Since the abilities of individual firms to acquire and store oil vary, some firms would be placed at a competitive advantage. Financing methods that rely on the speculative demand of individuals would shift the SPR costs from the taxpayers or firms to those individuals most willing to assume the risks in order to capture possible speculative gains. Thus, private financing arrangements would allow the economy to benefit from the oil provided by the reserve during an interruption, but without requiring that taxpayers bear the risks regarding the rate of increase of oil prices.

Other Criteria

The financing options can also be measured against the following four criteria.

- o Degree of Federal Control. To the extent that the SPR remains in the hands of the federal government, the option should preserve an appropriate level of federal control over reserve management.
- o Budgetary Effects. The option must have a predictable effect on the budget, and must provide SPR oil efficiently.
- o Speed and Level of Acquisition. The option must allow for as rapid a buildup of the reserves as necessary.
- o Producer Nation Response. The response of producer nations, which are opposed to the acquisition of SPR oil, must be assayed.

Degree of Federal Control. Both the public capitalization and debt financing plans would preserve maximum federal control over the SPR. Should the securities sold to the public to underwrite the SPR be denominated by the rate of oil price increase, it is possible that some SPR security holders might pressure for a depletion of the SPR while its price is perceived to be at a maximum. Transferable titles, however, leading to an active secondary market for SPR securities, might diffuse this pressure. Mandating firms to contribute oil to the SPR would allow the government physical control of the oil. The contributors, having both an interest in the SPR and an active role in the oil market, might, however, be able to pressure the SPR administrator to their advantage. IPR options would reduce the federal government's control of the SPR. If firms were given control over their IPR reserves they might not choose to use them when the government sought to deplete the IPRs, opting to hoard the reserves in expectation of higher oil prices in the short term.

Despite these potential disadvantages, a combination of policies, with the associated mix of federal and private control might be appropriate. The federal government is unlikely to draw upon its centralized reserve in any situation short of a very severe supply interruption. During smaller disruptions, it might be desirable for the government to authorize the private sector to release IPR oil, and allow firms to bring their oil to the market as they see fit.

Budgetary Effects. While the current program entails large expenditures, it does allow the federal government to capture the revenues resulting from reserve depletion. The budgetary effects of the four alternative financing plans would depend on both the structure of each plan and the degree to which it succeeds. Plans that call for off-budget financing would make no significant demands on the federal budget, unless insufficient investment of private capital required supplemental federal expenditures to achieve desired fill rates. Public capitalization of the SPR and plans that allow each firm to fill its IPR with oil held by private individuals for speculative purposes fall within this group, since the public would buy oil and receive the receipts of SPR depletion sales under these arrangements. Issuance of bonds yielding a return determined by the rate of oil price increases could require annual, but unpredictable, interest payments.

There is no guarantee, however, that any of these speculation-based plans would succeed in filling the SPR or IPR at the desired rate. If they fell short, some back-up system would be required to make up the difference, presumably using public funds, as in the current program. Thus, these plans would have no budget effect for each barrel of oil that they acquired, but could have a serious budgetary effect if they did not succeed in attracting enough private capital to fill the SPR. This effect would be equivalent to that of the current program for the same quantity of oil, but without the benefit of advance planning.

Debt financing of the SPR at the market rate of interest would have the budgetary effect of conventional debt financing by borrowing money at prevailing market rates. Plans to provide incentives to firms to hold extra inventories would affect the budget. Given the uncertainties surrounding firms' willingness to hold oil in response to incentives and the extent of the incentives required, the budgetary effect cannot be estimated with any degree of reliability. The budgetary effect of mandating oil contributions to the SPR would depend largely on the degree to which the government subsidized the contributions. If, for example, the government provided the carrying charges of the contributed oil, the short-term budget effect would be similar to that of debt financing. Plans to decree that firms hold an IPR would have no direct budgetary effect, but might well create equity problems within the refining industry.

Speed and Level of Acquisition. Those SPR financing plans that are based on speculative demand for oil--public capitalization of the SPR, debt financing of the SPR using securities denominated by the rate of oil price increase, and plans for speculative purchase of firms' IPRs--would not guarantee speedy completion of a strategic reserve. Plans to decree the existence of an IPR or to offer incentives for its creation might face difficulties in securing compliance. Inventories might be manipulated to present the illusion of compliance, or tank and pipeline bottoms (inventories that cannot be used) might be depicted as IPR oil. Mandating contributions would likely require noncompliance penalties but these might be easier to monitor. Debt financing of the SPR at market rates of interest, however, would provide enough financing to secure reserve oil if it is decided to buy it expeditiously.

None of the financing options would conflict with the goal of creating new storage capacity efficiently. New capacity can be drawn from three sources--new salt dome facilities, newly constructed above-ground storage, and renovation of old facilities. Salt dome storage capacity currently costs only \$2 to \$3 per barrel, compared to \$12 to \$16 per barrel for new above-ground steel tanks. The costs of renovation vary, depending on the specific characteristics of the existing facilities, the availability of which is unclear. Since salt dome storage capacity, the least expensive type, requires long lead times, an aggressive oil acquisition strategy would likely entail the higher costs of new, above-ground storage capacity.

Producer Nation Response. Although producer nation response to stockpiling is a central issue in acquiring SPR oil, the possible responses by producers would not vary significantly among the options considered here. Both governments and firms offer advantages and disadvantages as SPR procurers. Producers could easily react to open government purchases with political threats of production cutbacks. Political considerations move in two directions, however, as the producer nations often require certain U.S. goods or services. Given their regular pattern of crude purchases, firms could possibly purchase oil that could be diverted to SPR uses without detection. Yet, the increasingly common "destination" contracts between OPEC nations and Western consumers, in which crude destinations are stipulated, would be abrogated if such diversions occurred. Firms might be reluctant to endanger their relationships with OPEC producers for the sake of the reserve. Therefore, none of the options considered in this paper present a clear advantage in reducing the chance of adverse producer nation responses.

LEGISLATION TO REDUCE FEDERAL SPR COSTS

Much Congressional attention has focused on methods to reduce the federal expenditures for the SPR. Two recently introduced bills attempt to do this by shifting all or some of the costs to the private sector.

Private Equity Petroleum Reserve Act. On March 4, 1981, Congressman Gramm introduced the Private Equity Petroleum Reserve Act (PEPRA), H.R. 2304, which would amend the Energy Policy and Conservation Act to finance the SPR through speculative private investment. The bill authorizes the Secretary of Energy to issue 10-year negotiable certificates, denominated in barrels of oil. It sets forth a number of terms, including the pricing mechanisms and exclusion from price controls. Thus, the bill provides some of the details necessary to implement a public capitalization plan. Some problems, however, remain unsolved. The price control exemption might be needed to attract investors, but could also commit the government to allow prices to rise during future interruptions. Since the bill establishes no restrictions or limitations on the size of the allowable investment, the capital market effects remain uncertain. Finally, the bill allows the immediate sale of oil currently in the reserve, which, if sold, would reduce the future flexibility of the SPR administrator.

Strategic Petroleum Reserve Amendments of 1981. On March 12, 1981, Senator Kassebaum introduced S. 707, the Strategic Petroleum Reserve Amendments of 1981. The bill mandates that each importer of more than 75,000 barrels of crude oil per day contribute five days of imports to the SPR annually. The government would pay each contributor an annual fee of 10 percent of the purchase price for 11 years. In the event of an emergency drawdown, the contributors would receive either oil or a payment for the oil. Any such payment would be equal to the world market price at the time of distribution, less any fees already paid, with a maximum payment of the average world price prevailing during the three months preceding drawdown.

The bill remains unclear about whether the government or the firms would own the oil after 11 years, since it omits any reference to the treatment of the oil after this period. Transferring ownership to the government would place a serious burden on the contributors, since they would not only be providing oil, but a very low interest loan to the government as well. If, on the other hand, the oil reverted to the firms, the federal government would burden the firms with the cost of the oil, but the 10 percent annual fee would cover some of the carrying charges.

While the Kassebaum bill would burden the contributing firms with some of the financial risks of the SPR, it would not provide a decentralized,

privately held reserve to complement the SPR. Concomitantly, though, it would provide little incentive for firms to reduce their conventional inventories. By focusing on crude oil and ignoring petroleum products, however, the bill would tend to subsidize foreign refineries.

RELATED ISSUES

In addition to the evaluating criteria discussed above, several related issues should be kept in mind when considering alternative financing options.

SPR Security Design and Capital Market Effects

In devising a new SPR security, the Congress would determine where in the capital market it would compete for investor attention. SPR securities tied to the rate of oil price appreciation would be competitive with other "inflationary hedges," such as gold, real estate, or other commodity futures. Securities tied to the market rate of interest would be indistinguishable from other standard government securities, such as Treasury notes, bonds, and bills. The minimum investment required would also affect the position of SPR securities in capital markets. If SPR securities were issued in small denominations, they might compete with savings accounts, the predominant source of mortgage funds. On the other hand, high minimum investment requirements might preclude some classes of investors from buying the securities.

Retaining the SPR Program within DOE

The primary advantage of moving the SPR program from the Department of Energy to a separate administrative body is the independence such an entity would have. This independence might assist in filling the reserve through improving investor confidence in the reserve's management and financial integrity. Some measure of freedom from Civil Service personnel selection procedures, as is afforded the Synthetic Fuels Corporation, might help attract expert management from the financial community. On the other hand, this independence could diminish Congressional control of the SPR program. Moreover, SPR purchases have, to some degree, been coordinated with other major consuming nations, in order not to place inordinate pressure on spot markets for oil. This coordination might suffer if the SPR is administered by an independent entity.

Depletion or Termination

Emergency depletion of the SPR will occur in a recessionary economic environment and amid substantial inflation. Under these conditions, there might be strong pressure to implement some type of price controls on SPR oil. Such a policy decision would eliminate the speculative value of any SPR security based on the price of oil. It might be necessary to stipulate how the SPR will be depleted and sold well before the depletion occurs in order to inspire investor confidence. Some reference price for SPR sales might be stipulated in any SPR security.

If the SPR is never used, it will inevitably be terminated and sold. Securities with a relatively short maturity, three years for example, would require frequent rollover, but might facilitate an active market. Issuing SPR securities for a longer fixed term, would permit a reappraisal of the SPR when its securities start to mature. Since the SPR will be acquired over the next 10 years, securities would be issued in annual waves, and would mature in annual waves. Thus, the SPR could be terminated gradually, as its securities were called in. IPR options, on the other hand, could leave firms with large excess inventories that could be drawn down at once, disrupting the market. IPR holding requirements could, however, be phased out slowly to avoid this problem. If the SPR were built with mandated contributions, a slow phasedown of requirements and a carefully planned reserve drawdown would also be needed to avoid market instability.

CHAPTER I. INTRODUCTION

Seven years after the oil embargo of 1973-1974, the United States remains vulnerable to interruptions in the supply of foreign oil. Political instability in the Middle East and the resulting volatility of the world oil market continue to threaten the West's oil supplies. Yet despite conservation and intensified domestic production efforts, this country still imports 35 to 40 percent of its oil supplies.

The Strategic Petroleum Reserve (SPR), authorized by the Energy Policy and Conservation Act of 1975, could mitigate many adverse economic consequences of a supply disruption by providing a standby source of oil. Although SPR crude oil purchases were halted temporarily because of tight market conditions resulting from the Iranian Revolution in 1979, they were resumed late in 1980, as mandated by the Congress in the Energy Security Act. The SPR now holds about 121 million barrels, slightly more than 10 percent of the 1 billion barrel reserve authorized by the Congress.

Since its inception in 1975, the reserve's progress has been slowed by technical, political, and economic factors. Although most of the technical problems have been solved, delays in storage capacity construction could constrain the rate of oil acquisition. Oil producing nations generally oppose the buildup of strategic reserves, and consuming nations fear the price increases that could result from increased stockpiling. Moreover, the Strategic Reserve's funding from general revenues may be jeopardized as many federal activities compete for fewer resources in a period of austere budgets.

These factors may force the Congress to consider financial and administrative alternatives to the current reserve program. Financing alternatives include:

- o Establishing a special government debt instrument to finance the SPR, which would be similar in its budgetary impact to the current system;
- o Allowing the public to purchase certificates representing a specified quantity of reserve oil as a speculative asset;
- o Using existing authority to create an Industrial Petroleum Reserve; and
- o Mandating oil industry firms to contribute oil directly to the SPR.

In addition to choosing among these options, the Congress may need to decide whether the Department of Energy should continue to manage the SPR program, or whether a separate entity, such as a quasipublic corporation, should be established for this purpose.

Chapter II provides background on the Strategic Petroleum Reserve program and describes the obstacles to its completion. Comparable foreign experience in financing oil stockpiling and production is also discussed. In Chapter III, alternate SPR financing arrangements are described and evaluated using several important criteria. The criteria include the distribution of the SPR costs, risks, and benefits; the level of federal control; the budgetary effects of alternate financing schemes; the prospects for rapid SPR acquisition under each arrangement; and possible producer nation responses to them. Chapter IV discusses some related issues, including the effects of private SPR financing on capital markets, alternative methods to administer the SPR, and termination and depletion of the SPR program.

CHAPTER II. BACKGROUND ON THE STRATEGIC PETROLEUM
RESERVE

This chapter opens with a discussion of the important economic benefits derived from a completed Strategic Petroleum Reserve--whether it be the 1 billion barrel reserve mandated by the Congress or the 750 million barrel goal now planned by the Reagan Administration. It then reviews the current status of the SPR and the obstacles, both past and present, to completing an adequate reserve. The chapter concludes with a summary of relevant foreign policies, both those developed by other industrialized nations to cope with an interruption in imported oil supplies, and the Mexican and British experiences in financing petroleum production with oil-backed bonds.

BENEFITS OF THE RESERVE

The security of U.S. imported oil supplies depends upon a number of political and economic factors. These include the level and source of U.S. imports, the tightness of the world oil market, and the political stability of the oil-exporting countries and their relations with the United States. The United States currently imports between 6 and 7 million barrels of crude oil and products a day--about 35 to 40 percent of domestic oil demand. As the United States recovers from the 1980 recession, a large portion of the ensuing increases in domestic demand will likely be met with additional imports. An uninterrupted supply of foreign oil is by no means certain. In fact, such events as the Iranian Revolution in 1979 and the Iraq-Iran War begun in 1980, point to the likelihood of future supply interruptions.

According to numerous studies, a national oil stockpile could be an effective means to mitigate some of the economic dislocations associated with an oil supply interruption. During an interruption, drawing upon reserve oil would tend to moderate oil price increases and lessen potential losses in aggregate economic activity, as measured by the Gross National Product (GNP). Using the Wharton Econometric Forecasting Model to project effects in a sample year, 1984, a CBO study indicated that a year-long national oil shortfall of 2 million barrels per day could reduce GNP by about \$146 billion (3.6 percent of projected real GNP). ^{1/} Such a shortage could also increase the unemployment rate by about 1.1 percentage points

^{1/} See Congressional Budget Office, An Evaluation of the Strategic Petroleum Reserve (June 1980).