Statement of
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before the
Committee on Energy and Natural Resources
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NOTICE
This statement is not available for public release until it is delivered at 2:00 p.m. (EST), Tuesday, March 20, 1990.

Mr. Chairman and Members of the Committee, I appreciate the opportunity to present the views of the Congressional Budget Office (CBO) concerning the size and financing of the Strategic Petroleum Reserve (SPR) as part of your hearings on the proposed Energy Policy and Conservation Act Amendments (S. 2088). CBO will also provide for the record of this hearing a Staff Memorandum covering a number of detailed questions raised by the Committee staff. I will focus here on two broad questions:

- Should the SPR be expanded from 600 million barrels to 750 million barrels only or further to 1 billion barrels?
- Should the government purchase the additional oil for the SPR or lease it from oil producers?

BACKGROUND

The Energy Policy and Conservation Act of 1975 authorized a petroleum reserve with a minimum size of 500 million barrels and a maximum size of 1 billion barrels. The purpose of this SPR is to protect the U.S. economy and national security interests from the consequences of a severe disruption in oil supplies. That protection will come directly through the price-stabilizing effects of the sale of SPR oil. Since world oil prices will be reduced, all petroleum consumers in this country and in the world will benefit.

The SPR currently holds about 580 million barrels, enough to replace current net oil imports for about 80 days. However, the SPR facilities are designed to release oil at a maximum rate of 3.0 to 3.5 million barrels per day, or about half the current daily net imports. Administration policy has favored a reserve of 750 million barrels. That policy was first set in 1982, when net oil imports had reached a two-decade low of 4.3 million barrels per day. Since then, net imports have grown nearly 50 percent.

SIZE OF THE STRATEGIC PETROLEUM RESERVE

The Department of Energy (DOE) has completed a study that recommends expanding the SPR to only 750 million barrels. In contrast, the Oak Ridge National Laboratory completed a study more than a year ago that recommended expanding the SPR to 1 billion barrels or more. Both studies base their recommendations on cost-benefit analysis, using similar and appropriate methodologies. Their differences arise from judgments about uncertain future developments in world affairs, oil markets, and the economy. Both studies assumed the same discount rate.

The Likelihood of Disruptions

The SPR provides a measure of insurance against potential disruptions in world oil supplies. Such disruptions did occur in the 1970s as a result of political and military turmoil in the Middle East. Expanding the SPR reflects a concern that large oil supply disruptions may occur in the future. How large the strategic reserve should be depends on this likelihood. Expected benefits from an expanded SPR are directly proportional to the probability of large disruptions.

The DOE study assumes a much lower probability of an oil supply disruption than did the earlier Oak Ridge study. Based on an assessment of risks by the Central Intelligence Agency, the DOE study assumed that an annual probability of large disruptions would be about 1 percent. "Severe" disruptions were judged to be those accounting for 15 percent or more of the demand by market economies, or about 10 million barrels per day in 2010, and lasting six months. The figure for disruptions of a similar size in the Oak Ridge study would be a range of 4 percent to 22 percent, although Oak Ridge only considered three-month disruptions. Despite the difference in the expected duration of large disruptions, the DOE remains much more optimistic about energy security.

To underscore the importance of these assumptions, if the DOE probability of large disruptions were raised to 2 percent or 3 percent, an expansion of the SPR to 1 billion barrels would be justified using the criterion DOE used to accept the 750 million barrel SPR. Given the important consequences of these assumptions, the Committee may want to hear from those who make these assessments--in closed session, if necessary.

CBO can offer little help in assessing the reasonableness of the two estimates on the likelihood of disruptions in oil supply. It is worth noting, however, that the world has changed a great deal in the last few years and even the last few months. The end of the Iran-Iraq War has made the Persian Gulf, a region in which we feared oil supply disruptions for many years, a less volatile place. Oil-producing countries are increasingly investing in oil refining and marketing activities in consuming countries and, thus, have a greater interest in the stability of oil prices. Changes in Eastern Europe and the Soviet Union also suggest a politically more stable world in the future, although local conflicts that have been contained in the bipolar world may escalate in a multipolar environment.

The Availability of Offsetting Supplies

Even if political or military events were to cause oil supply to be disrupted in some regions of the world, an oil crisis might not develop. Excess production capacity and usable inventories of oil in other parts of the world could significantly lessen the severity of a disruption. These inventories include strategic reserves in West Germany and Japan and a portion of private stocks above minimum operating levels elsewhere. The limited ability of the United States to switch some uses from petroleum to other fuels on short notice can also help.

DOE estimates total offsets of these types at 7.5 million barrels per day currently, compared with total world production of about 65 million barrels per day. These offsets are assumed to remain large for at least the next five years and then to decline as world demand catches up with world production capacity (most of which is in the OPEC Gulf states). A noticeable loss of oil on world markets may not even be possible until after 2000 because of these offsets.

This view, however, appears to understate some serious risks. Will excess capacity continue in regions relatively invulnerable to disruptions, or will oil markets tighten more rapidly than DOE envisions? Will other consuming countries continue to hold large strategic stocks? And, most

important, will decisions be made to use excess capacity and stocks rapidly and fully in the event of a crisis? CBO has not conducted an independent analysis of these offsets, but a simple example illustrates the importance of these assumptions. Lower levels of offsets mean any disruption in supply will have a more severe impact. If DOE's assumed total offsets of about 7 million barrels per day (on average for the next 30 years) were cut to 4 million barrels per day, the difference in costs and benefits for the 1 billion barrel SPR would be comparable with that for the 750 million barrel SPR already endorsed by DOE.

Responses of the Economy

In today's largely unregulated oil market, the economic harm from a disruption in oil supply will not be caused by the inability of our industries and homes to buy oil, but rather by the effects of the price increase needed to bring demand into line with supply. Numerous economic studies exist on how movements in oil prices affect the economy and on how best to measure the benefits of government actions that would mitigate price increases. Both the DOE and the Oak Ridge studies reflect this thinking and use appropriate measures of the benefits from having a larger SPR available in the event of a disruption. But these measures depend on uncertain conjectures about how

the economy and demand for oil would respond to any sudden increase in oil prices.

Experience has shown that, in the face of severe disruptions, oil companies do not immediately reduce their private inventories and oil users do not immediately reduce purchases. In fact, they do just the opposite, adding to inventories and filling gas tanks. They respond in this way, of course, because they cannot know at the outset of a disruption how much supply will be lost, how long the disruption will last, or how high prices will rise. Speculative hoarding of oil can be a rational economic response and can reallocate supplies to later dates, when they will be needed more. But such actions can be destabilizing in the near term, as increased demand for storage drives prices up further and spurs more hoarding.

The growth of forward oil markets may have dampened speculative shifts in supply and demand by providing an alternative channel for speculating in or hedging against uncertain oil prices. Forward markets allow traders to buy or sell oil for future delivery at prices locked in today, so they can speculate by buying oil contracts rather than by hoarding oil. This system worked well when oil prices fell by more than 50 percent in early 1986 and, more recently, this past winter when record cold temperatures pushed up the demand for heating oil. There is always a question, however, of whether the market can accommodate the strains of a major disruption in oil supplies.

The DOE assumes there would be no speculative price movements during a disruption, despite the likelihood of such events. If prices were driven higher during a disruption than DOE assumes--perhaps as a consequence of speculative incentives to hold oil--then the benefits of a larger SPR may be underestimated in the DOE study and a further expansion of the SPR might be warranted.

Discount Rates

The benefits of an expanded SPR will come in future years after the costs of expanding the reserve have been incurred. To make a comparison of the benefits and costs that occur at different times, analysts reduce these figures to present-value terms using a real discount rate (that is, applied to inflation adjusted data). Two effects of discounting should be noted. First, for any given discount rate, the SPR benefits, which are more distant, will be lowered more than the SPR costs, which are more immediate. Second, lower discount rates result in higher discounted values, so that the ratio of benefits to costs will increase with a lower discount rate. Thus, the choice of a discount rate can be crucial for the outcome of the decision on expanding the SPR. However, the level of impact will depend on additional assumptions about

the rate at which the SPR is filled and the rate of growth in world oil prices, which also affect the relative timing of costs and benefits.

The real discount rate used by DOE and Oak Ridge is 10 percent, a rate encouraged by the Office of Management and Budget for use by the Executive Branch. CBO's view is that the discount rate used to estimate the present value of future benefits from government outlays should be commensurate with the real cost of government spending. That real cost is the cost of private investment displaced, measured as the real return (net of inflation) on longer-term government securities. That return indicates the rate of compensation required by the private sector (of late, the foreign private sector) to forgo its own investment. By this criterion, a more appropriate discount rate may be as low as 3 percent or 4 percent.

Given DOE's assumed SPR fill rate (75,000 barrels per day) and growth in real oil prices (3.5 percent), the difference between the costs and expected benefits of the 1 billion barrel SPR declines only marginally as the discount rate is lowered from 10 percent to 3 percent. The present value of measurable benefits does rise more rapidly than that of costs as the discount rate is reduced but would only approach costs at a near zero rate. Because both costs and benefits are influenced by growth in oil prices as well as by the discount rate, it is difficult to say how a change in the discount rate would affect the outcome of the cost-benefit analysis.

Could One Billion Barrels Be Justified?

An expansion of the SPR to 1 billion barrels rests most critically on several assumptions: the likelihood of large supply disruptions; the amount of offsetting supplies available from unaffected sources during a disruption; the response of demand for oil during a supply emergency; and the discount rate used to reduce future costs and benefits to present-value terms.

By DOE's own accounting, the costs of expanding the SPR from 600 million to 750 million barrels exceed the expected incremental measurable benefits by $1.06 billion (in 1988 dollars). In effect, this amounts to the insurance premium that the nation is willing to pay for the added security. The nonmeasurable benefits listed by DOE, which justify this higher cost, are described in terms of the deterrent value of the SPR and the protection of national security. If the 250 million barrel expansion to 1 billion barrels generated nonmeasurable benefits that were as great as those for the preceeding 150 million barrels, a 1 billion barrel SPR could be justified by any changes in assumptions that reduced the difference between costs and benefits on that final expansion to less than $1.06 billion.

CBO is not in a position to judge the soundness of specific assumptions. However, I have tried to indicate the sensitivity of DOE's results to the assumptions that are made about the likelihood of a disruption, the availability of additional oil supplies during a disruption, and the discount rate.

LEASING OIL FOR THE STRATEGIC PETROLEUM RESERVE

In addition to the issue of appropriate size of the SPR, there is the question of how additions to the SPR should be financed. Recently, a good deal of attention has focused on the potential advantages to leasing rather than buying additional barrels of oil for the SPR. A federal lease is a contractual agreement by the government, as lessee, to pay some periodic rent for a building or commodity, while the lessor retains ownership. Two general approaches to oil leasing were considered by DOE. The first is lease/option, in which the United States would effectively be renting the oil it holds in storage, while retaining an option to buy that oil outright at any time of its choosing. The second is lease/purchase, in which the United States would lease the oil for a set number of years after which it would become the outright owner of the oil. Lease/purchase is a way of financing ownership over a number of years.

Three general points need to be made with respect to lease arrangements. First, oil leasing, with or without the option to buy, will not have any effect on the calculation of benefits from the SPR, so long as the terms of the lease leave the government with complete control over disposition of the leased oil. Thus, the merits of leasing versus purchase must rest on cost considerations alone. Second, the decision to lease oil should be based on economic costs, not necessarily on how lease costs are treated in the budget. In any case, the budgetary treatment of government leasing arrangements is still under discussion, and there is no assurance that a lease arrangement would necessarily have less of a budget impact than a straightforward purchase. Third, leasing oil for any significant period of time, such as a decade or more, would almost certainly result in greater cost than direct federal purchase, unless the U.S. government can negotiate a leasing agreement with another country that is willing to provide oil for the SPR at below-market rates.

Budgetary Treatment of Oil Leasing

The Congressional Budget Office, the Office of Management and Budget, and the Budget Committees of both Houses are currently working together to formulate principles for treating federal lease costs in the budget. In particular, this group is focusing on the budgetary treatment of multiyear

contracts, such as lease/purchases for federal buildings. Leasing oil, with or without the option to buy, could be treated similarly to lease/purchases of buildings in at least some cases. The key issue is the government's long-term commitment.

In general, CBO's position has been that budget scorekeeping should look beyond the specific form of a financial transaction (for example, government lease) and instead reflect the substance of a transaction. Budgetary treatment should reflect the federal government's true financial commitment. For many lease/purchase arrangements, this means counting the actual acquisition costs right away, rather than counting some artificially low, annual lease payments that do not reflect the true cost of federal ownership. However, this is not a closed case.

The concern over the size of the SPR is more about the long-term security of oil supplies than it is about market events in the near term. Thus, no matter what the duration of any lease arrangement for filling the SPR, the mechanism can be looked on as a long-term commitment if the United States exercises full control over the disposition of that oil. In leasing oil, the government is effectively acquiring the oil when it takes possession of it. It can be argued that the budget should record budget authority and outlays that are equal to the greater of (1) the full purchase price of the oil or (2) the total payments required by the lease. If this were done, a lease would have

a smaller budgetary impact than a straightforward purchase only if the leasing actually resulted in the United States acquiring oil at a lower cost.

Economic Costs of Leasing Versus Buying

Because the federal government has a lower cost of borrowing than private financial entities, the least costly approach for most capital acquisitions by the federal government is a direct purchase using regular Treasury financing. In the short term, the government would be able to reduce its cash outlays by leasing rather than by buying a commodity. Over a long period, however, leasing buildings or commodities is almost always more expensive than direct government purchase.

Only under extraordinary circumstances might it be cheaper for the government to lease than to buy. Such circumstances could exist in the case of potential oil leasing for the SPR if any countries were willing to lease oil at below-market rates. Any cost concessions could result in lower federal costs of reaching and maintaining a given reserve size. However, potential lease arrangements and future oil market conditions both entail significant uncertainties, and these uncertainties make it impossible either to endorse or simply to dismiss the possibility of oil leasing.

Because many oil-exporting countries have unused production capacity and oil production costs that are considerably below the current world price for oil, some countries may be willing to lease oil to the U.S. government at below-market costs. OPEC countries, for example, could conceivably export volumes of oil for lease that are in excess of the cartel's agreed quotas for oil sales, while providing that oil at an effective cost below the market price. However, there is certainly no guarantee of such cost concessions. Along these lines, the possibility of a favorable lease arrangement assumes that the OPEC cartel does not significantly change its current quota system in a way that would limit the incentives of producers to lease oil.

In contrast, the U.S. government would probably incur leasing costs that were comparable with market prices if it were to lease oil competitively from private firms. CBO agrees with the DOE conclusion that a long-term competitive lease of oil would be likely to have a greater cost than direct purchases. Other means of financing reviewed in the DOE report do not show any promise for further reducing real federal spending for the SPR. Regular Treasury financing of direct federal purchase already provides the least costly method.

Terms of Potential Oil Leases

The lease terms for oil and for oil storage facilities could raise a number of public policy issues. The DOE report examined several issues, including whether the authority to sell leased oil leaves the United States with effective control over the oil, and whether other laws and regulations related to oil imports should apply.

Some oil-producing countries have apparently expressed interest in retaining some option to get their oil back when the lease expires at some price agreed to in the lease. Beside the obvious but not insurmountable concern this would pose for the full U.S. control of its SPR and the physical damage that repeated oil release could cause to the SPR facilities, CBO does not see the necessity of physically returning oil. If oil producers see potential profits in leasing oil, those profits could be achieved by taking possession of any comparable quality (or appropriately discounted) oil that the United States could acquire on open markets and deliver under terms of the lease. In any case, the option to release SPR oil into the market at any time should rest exclusively with the United States.

With respect to issues regarding the applicability of other laws and regulations, CBO sees no compelling reason why the government should exempt itself from such restrictions unless it results in some major cost

concessions. Cargo preferences, environmental impact statements, normal contractual procedures, and import duties and charges are all well-intentioned programs with clear policy objectives. For example, legislative requirements for the use of U.S. flag vessels are based on national security concerns (maintaining a viable merchant fleet), on safety and environmental concerns, and on a desire to benefit U.S. shipping. Before any significant volume of oil imports is excused from the 50-percent U.S. flag shipping requirement mandated by the Cargo Preference Act for SPR acquisitions, careful consideration would have to be given to whether the cost advantages would outweigh the consequences for national security and safety.

CBO has not studied the advantages and disadvantages of exempting lessors of oil from federal or local taxes. Tax exemption can be a powerful tool for channeling investments and would probably ensure some cost concessions from oil producers. But these concessions might not make up for the loss of federal revenues, which would increase the deficit. In addition, it is difficult to see how a change in tax laws could discriminate between national and private oil companies in this area--exempting only oil-producing countries--without encouraging creative maneuvers for subverting its intent.

CONCLUSIONS

CBO does not find any significant difference between the basic cost-benefit methodology used by DOE and that used in other recent studies in coming to its conclusion that the SPR be filled only to 750 million barrels. DOE's recommendation that the SPR not be expanded to 1 billion barrels rests on key assumptions related to the likelihood of large supply disruptions; the amount of offsetting supplies that may be available from unaffected sources during a disruption; and the response of demand for oil during a supply emergency. I have described the alternative assumptions that demonstrate how critically the recommendation for expanding the SPR depends on DOE's assessment in those areas.

Given any particular goal for oil stocks, the federal government should acquire oil for the reserve in the most economically efficient manner. As DOE suggests, leasing oil directly from another country could result in real economic savings under certain favorable assumptions. Therefore, it does not seem warranted to discourage attempts to acquire strategic reserves of oil by leasing. CBO believes that the budgetary treatment of any lease should reflect the true federal costs of oil. If obtaining oil through a leasing arrangement that provides real economic savings to the government were possible without hampering the ability of the President to respond to energy emergencies, that option should be undertaken. A proper system of budgetary accounting would

recognize such savings. Similarly, if oil leasing ultimately costs more than direct purchases of oil, the budget should reflect such costs.