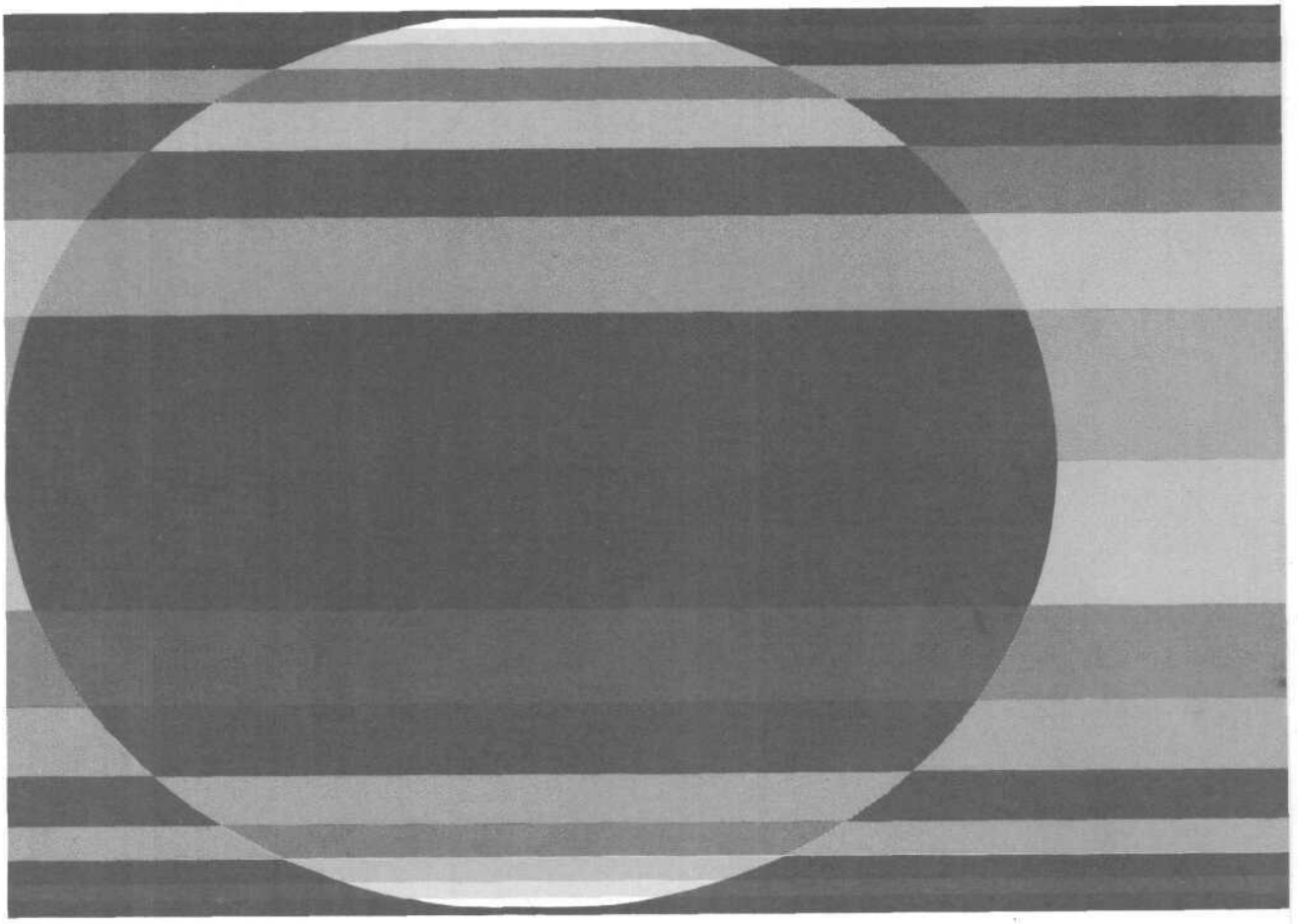
BACKGROUND PAPER

The Decontrol of Domestic Oil Prices: An Overview

May 1979



Congress of the United States
Congressional Budget Office
Washington, D.C.

THE DECONTROL OF DOMESTIC OIL PRICES: AN OVERVIEW

The Congress of the United States
Congressional Budget Office

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PREFACE

On April 5, 1979, the President announced his decision to decontrol domestic oil prices over the period from June 1, 1979, to October 1, 1981, at which time all controls would expire. Since the President was given discretionary authority over the pricing of domestic crude oil during this period by the Energy Policy and Conservation Act (EPAA) of 1977, only new legislation could limit this authority. If the decontrol plan proceeds, the Congress must then decide whether excess profits taxes on the increased producer revenues are needed and how to use these increased tax revenues.

At the request of the Senate Energy and Natural Resources Committee, the Congressional Budget Office has prepared this analysis of the President's plan. In keeping with CBO's mandate to provide objective analysis, this report contains no recommendations.

The report was prepared under the supervision of Raymond C. Scheppach of CBO's Natural Resources and Commerce Division with the assistance of Everett M. Ehrlich, who also contributed to individual chapters. Major sections of the report were written by Lawrence Oppenheimer, Beth Blattenberger, James Sawyer, and Mark Sharefkin of the Natural Resources and Commerce Division; Lawrence DeMilner and Stephen Zeller of the Fiscal Analysis Division; Charles Davenport, Peter Karpoff, and Michael Deich of the Tax Analysis Division; and John J. Korbel of the Human Resources and Community Development Division. Kevin Mann and John Meggs also assisted with the report.

Robert L. Faherty and Patricia H. Johnston edited the manuscript, assisted by Brice S. McDaniel. The several drafts were typed by Angela Z. Evans, Phyllis Gustely, Lynne Zett, and Misi Lenci.

Alice M. Rivlin
Director

May 1979

CONTENTS

TABLES

TABLES-CONTINUED

48-429 O - 79 - 2

SUMMARY

On April 5, 1979, the President announced his decision to decontrol domestic crude oil prices gradually starting on June 1, 1979, so that domestic prices would reach the world price by October 1, 1981. Since the Energy Policy and Conservation Act (EPCA) of 1975 gave the President discretionary authority to decontrol prices during that period, only new legislation by the Congress could limit the exercise of that authority.

The President's decontrol plan would generate large increases in revenues to the oil producers over what they would have received under a continuation of controls. Thus, the Congress must decide how these increased producer revenues from decontrol can be put to best use. The President has proposed that the Congress enact a "windfall profits tax" to capture some of these revenues and to establish an Energy Security Fund that would channel these captured revenues to investments in energy research and development, to assistance for mass transit, and to assistance for low-income households burdened by higher energy prices. Alternative uses of these revenues that might also be considered include allowing them to remain with the private sector to finance exploration for new oil or using them to provide general tax relief.

THE DECONTROL OF DOMESTIC OIL PRICES

The Current System of Controls. Although government policy had affected the price and availability of crude oil for sometime, direct federal regulation of crude oil prices was introduced by the Emergency Petroleum Allocation Act of 1973 and was modified in 1975 by EPCA. Essentially, the present regulatory system divides all domestic crude oil into the following three classifications, or tiers:

- Old oil, or lower-tier oil, which is oil from properties that began producing before 1973. Currently, about 3.0 million barrels per day of old oil are produced and it receives a price of approximately $5.86 per barrel at the wellhead.

- New oil, or upper-tier oil, which is oil from properties that began producing during or after 1973. Approximately 3.0 million barrels per day of domestic production are new oil and it receives a price of about $13.06 per barrel at the wellhead.

- Uncontrolled oil, which is oil that earns as much as refiners are willing to pay for it. Three types of oil are allowed this treatment: Alaskan North Slope oil, Naval Petroleum Reserve, and "stripper" oil--that is, oil from wells that produce 10 or fewer barrels per day. Approximately 2.6 million barrels per day of current domestic production are uncontrolled and receive a price of about $18.50 at the refinery gate. 1/

Under EPCA the average, or composite, price for these three types of domestic oil (with some special adjustments for stripper oil) can increase at a rate up to 10 percent per year. 2/ Barring new legislation, all controls on domestic oil prices will end on October 1, 1981, and domestic production will receive world prices.

The President's Decontrol Decision. In order to phase out controls on domestic crude oil, the President has decided to:

- Redefine all old oil as new oil between June 1, 1979, and October 1, 1981; and simultaneously

- Raise the price of new oil to the world price by October 1, 1981, so that by that date all old oil will have become new oil and all new oil will receive the world price.

Relative to an indefinite continuation of controls, the President's plan would entail both benefits and costs. The following benefits are critical:

- Increasing domestic oil prices to the world level would encourage consumers to reduce their demand for oil through both the substitution of alternative fuels and outright conservation. The price increase for oil would also encourage investment in solar and synthetic fuels, but it would not be sufficient to make unconventional fuels such as liquefied coal or shale oil economical. By 1985, it is estimated that decontrol would decrease demand for oil by

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1/ Technically, Alaskan oil can only receive the upper-tier price at the wellhead, but because of high transportation costs it receives the world price at the refinery.

2/ The President can authorize increases in the composite prices that are greater than 10 percent, subject to a veto by one house of the Congress.

approximately 215,000 barrels per day. 3/ The potential savings are expected to be substantially greater during the late 1980s and early 1990s since energy is used primarily in connection with capital goods such as industrial boilers and automobiles which take 5 to 20 years to replace.

- o Decontrol would stimulate additional supply from tertiary recovery, new discoveries, and existing oil from proven reserves. 4/ In total, these three major sources should provide 200,000 and 405,000 barrels per day of additional supply by 1981 and 1985, respectively.

- o The demand reductions and supply increases would decrease oil imports by approximately 620,000 barrels a day by 1985, or about 5 percent of total U.S. oil imports in that year. This would represent a shift of approximately $6 billion in the 1985 U.S. balance of payments. In later years, as demand reductions continue to grow, the magnitude of the oil import relief would continue to increase.

- o Adoption of the world price could improve U.S. relations with member nations of both the Organization for Economic Cooperation and Development (OECD) and the Organization of Petroleum Exporting Countries (OPEC), which view the current subsidy of domestic energy consumption created by price regulation as evidence of U.S. unwillingness to address the energy problem.

The President's plan would also impose the following costs:

- o The price increases for domestic oil would increase inflation, and they might slow economic activity and increase unemployment. By the end of 1982, it is estimated that decontrol would increase the level of prices by 0.6 to 0.8 percent above that anticipated if controls were continued. If OPEC continues to increase the real price of oil over this period, the inflationary impact of decontrol

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3/ This estimate, like all others presented in this paper, presumes that the full increase in the cost of crude is passed on to consumers. If refiners have to absorb a percentage of the increase, the demand response will be proportionately lower.

4/ Tertiary recovery is a technology that injects either heat or chemical compounds into an oil reservoir to loosen oil so that it will flow more freely.

could be considerably higher. The effects on real Gross National Product (GNP) and unemployment are relatively minor and generally occur after 1982.

- Low-income families would pay a disproportionate share of their income on the higher oil prices caused by decontrol. Specifically, decontrol would cost an additional $64 per family for the lowest fifth of families as ranked by income; this would represent approximately a 1.3 percent decline in their real income by 1982. In contrast, families in the highest fifth of the income distribution would suffer only a 0.5 percent decline in their real income by 1982. Any increases in real OPEC prices would worsen the impact on low-income families.

- The price increases under decontrol would transfer what has been a windfall income gain for consumers, who have been paying less than the world price for oil, to a windfall profit for producers, who will be receiving higher prices for oil that could have been produced at current prices. Relative to an indefinite continuation of controls, and assuming no increase in real OPEC prices, this windfall profit to producers would total approximately $68.9 billion between 1979 and 1985. If OPEC prices increased by 3 percent in real terms over this period, the windfall would be an additional $25.7 billion.

The benefits and costs summarized above are all relative to an indefinite continuation of the present controls under EPCA. If EPCA were not extended--that is, if decontrol became effective abruptly on October 1, 1981, rather than phased over the 28-month period--then most of the benefits and costs would take place at that time. As compared with all-at-once decontrol, the President's program has the advantage of phasing the price increase over a longer period of time and providing for an earlier supply response. By 1985, however, the effects of a phased and a sudden decontrol would be virtually identical.

Alternatives to the President's Decontrol Plan. Two alternatives to the President's decontrol plan are analyzed in this study. The first, the middle-price option, would decontrol all truly new oil and raise old oil to the upper-tier price, but would maintain the controls indefinitely on upper-tier oil. The second, the modified EPCA option, would decontrol truly new oil and elevate all marginal wells to the upper tier, but would maintain controls on other upper- and lower-tier oil. Both alternatives are compared with an indefinite continuation of current controls.

- The middle-price option. This option would decrease the producer revenues substantially from the $68.9 billion attributable to the President's program to approximately $24.4 billion over the period from 1979 to 1985. It would also retain most of the supply response--that is, 335,000 of the 405,000 barrels per day estimated for the President's plan. The demand reduction would be about 100,000 barrels per day, or less than one-half of that attributable to the President's plan. This option would reduce both the burden on low-income families and the impact on inflation, which would most likely be less than one-half the impact of the President's plan.

- The modified EPCA option. This option would stimulate production approximately 160,000 barrels per day in new supply as a result of the provisions to decontrol new oil and to elevate marginal lower-tier oil to the upper-tier price. Very little reduction in demand would occur with this option (less than 50,000 barrels per day by 1985) because the additional producer revenues would be only about $9.3 billion over the 1979-1985 period. The benefit of this option, however, could be little additional inflation and little negative impact on low-income households.

THE TAX ISSUES

Additional profits on lower- and upper-tier oil may be considered "windfalls" if price increases were not anticipated by producers and are therefore not needed to make existing production profitable. In addition, higher prices may be deemed a windfall if they are the product of OPEC's monopoly power, which distorts world oil markets.

Whether or not windfall profit taxes are considered appropriate depends not only on these equity considerations, but also on how much new supply could be obtained under the President's plan, and on whether additional revenues are necessary to finance this supply. If the price on the new supply offers sufficient incentives for firms to borrow and invest, then the additional revenues from existing oil could be taxed away. On the other hand, if revenues are required for the investment, then they could be left with the oil producers.

The President's Tax Proposals. The President proposes to apply a 50 percent tax rate to the additional producer revenues after exempting certain types of lower-tier oil. Of the total $68.9 billion in windfall revenues that producers would receive between now and 1985, $51.4 billion is assumed to be the base for the windfall profits tax. The tax on this base would be $25.7 billion between 1979 and 1985; the residual $25.7 billion, as

well as the $17.5 billion exempted from the windfall tax base, would be taxed through the normal corporate income tax. These revenues would yield a corporate tax liability of another $4 billion over the 1979-1985 period. Thus, of the $68.9 billion in windfall revenues, a total of $29.7 billion would be taxed away from the producers. If the windfall were subject only to corporate income taxes, approximately $13.3 billion would be taxed away. The windfall tax, therefore, more than doubles producers' liabilities on windfall income.

Alternative Tax Options. Three alternatives to the President's tax proposals are analyzed in this study:

- A 75 percent windfall tax rate on upper-tier oil and a 50 percent rate on lower-tier oil would, over the 1979-1985 period, collect $38 billion out of the $68.9 billion windfall; $37 billion would be collected through windfall taxes and $1 billion through corporate income taxes. As compared with the President's proposals, this option would tax an additional $8.3 billion, or 12 percent of the windfall.

- A 25 percent windfall tax rate would produce $12.8 billion in windfall tax liability between 1979-1985 and $8.6 billion in normal corporate income tax, for a total of $21.4 billion. Tax liabilities would thus be $8.3 billion less than those that would result from the President's proposals.

- A "plowback" provision would allow producers to deduct increases in drilling expenditures from the windfall profits tax base. Based on CBO assumptions about the amount of new investment in exploration and development, it is estimated that this provision would allow producers to deduct $31.9 billion from the windfall profits tax base between now and 1985, leaving a base of $19.5 billion during this period and windfall tax liabilities of $9.7 billion. Total tax liabilities, after corporate income taxes are added in, would equal $19.5 billion. This liability would be $6.2 billion more than what the total liability would have been under the normal corporate income tax.

The Marginal Tax Rate. The above tax estimates are extremely sensitive to the assumed marginal corporate income tax, which in turn depends primarily upon the amount of new investment in exploration and development. Essentially, the opportunity to treat drilling costs as expenses instead of capital outlays permits producers to shelter substantial windfall revenues and the income from new production. In recent years, with the high rate of inflation and the high level of exploration, expense deductions

have been sufficient to offset nearly half of the tax that would be due if the statutory rate of 46 percent were applied to all companies. Under the CBO assumptions concerning expenditures for exploration and development, the marginal tax rate is approximately 13 percent for 1980, decreases to 6 percent in 1981 and 1982, and then increases over time to 26 percent in 1985. The marginal rate changes over time because of two factors: when producers make new expenditures on exploration and production that reduce taxable income, and when they receive revenues from new supplies that increase revenues. Over the 1979-1985 period, CBO estimates that the average marginal tax rate would be approximately 15 percent.

ENERGY SECURITY FUND

The President has proposed that the Congress establish an Energy Security Fund, which would redistribute tax revenues to low-income households, to mass transit, and to energy investments that assist in the transition to a more energy-efficient economy. Given CBO's revenue estimates and no increase in real OPEC prices, the President's program would create approximately $30 billion in revenues for the trust fund over the 1979-1985 period.

The Trust Fund Mechanism. The Congress has used trust funds in the past to finance large capital projects; the funds have been obtained by taxes on specific uses. The primary examples are the Highway Trust Fund and the Airport and Airway Trust Fund. Trust funds, however, have several important drawbacks from the standpoint of budgetary and policy coordination. First, since trust funds are only marginally affected by the budget resolutions and the appropriations process, they limit the Congress' control over the federal budget. Second, since both energy investments and mass transit already have relatively large federal programs, additional expenditures from a trust fund would create coordination problems both for the Congress in authorizing and appropriating these programs and for the Executive agencies in administering them. Finally, since revenues are extremely sensitive to future OPEC price increases, which are difficult to predict, it may be difficult to plan the expenditures from such a fund.

Energy Investments. The President recommends spending additional funds on a demonstration plant for solvent-refined coal, a development program for synthetic liquids, and additional research and development (R&D) on coal. Such technologies are feasible, and they would increase the probability that cost-effective synthetic fuel could be produced during the next 15 to 20 years. This program should, however, be viewed as providing technical information for future commercial plants rather than providing any domestic production. Alternative options for R&D funds over the longer

48-429 O - 79 - 3

run include fusion, solar photovoltaic, solar heating and cooling, and several fission technologies.

Mass Transit. The mass transit funding recommended by the President is primarily to purchase new buses and to rehabilitate existing rail systems. Although there are significant differences in the energy efficiencies of the various modes of urban transportation, it may nevertheless be difficult to get people to switch from automobiles to buses, which are about three times more energy-efficient than automobiles. Through 1985, it is assumed that funds would be available to purchase about 8,000 additional buses--a 15 percent expansion in the total U.S. fleet. The potential energy saving from such a proposal would, however, be less than 10,000 barrels of oil per day. The expansion would also add to current operating costs for bus companies and would thus create greater pressure for increased federal assistance.

Low-Income Assistance. CBO estimates that oil price decontrol would increase the nation's oil bill by $12.2 billion in 1982 if real OPEC prices remain constant and by $15.8 billion if there is a 3 percent per year increase in real OPEC prices. Since it is assumed that all price increases will be passed through to consumers, households will ultimately bear the burden of these additional oil expenditures. Assuming no real OPEC price increase, the increase in 1982 for families with annual incomes under $5,800 will be $64 and for families with annual incomes between $5,800 and $11,400 the increase in 1982 will be $99. (All increases are stated in 1979 constant dollars.) To offset these increases for both incomes classes, the federal government would have to provide assistance amounting to between $3.0 billion and $3.7 billion, depending upon whether future real increases in OPEC prices occur.

Alternatives to the Energy Security Fund. If the Congress determines that the new revenues resulting from decontrol can be put to best use through taxation, spending options other than those recommended by the President can be considered, including the following:

- No earmarking of funds. One major option would be to separate the tax decision from the expenditure decision. If the tax is enacted, then it would be up to the budget and appropriations committees of the Congress to decide on the use of the funds through the normal budget process. These committees could recommend spending on projects similar to those of the President or on other programs, or they could decide to decrease the size of the deficit. This option would provide the Congress with more effective budget control and with greater potential for overall

planning and policy coordination than the President's proposed trust fund.

- A fund for oil exploration. A second option would be to use the funds to finance exploration and development of oil reserves in non-OPEC developing nations. The major advantage of such a fund is that there is probably greater likelihood of finding relatively large oil reserves outside the United States than in the United States because of the amount of exploration that has already taken place in this country. An exploratory program by the U.S. government might, however, be redundant with existing efforts.

- Reductions in payroll taxes. A third major option would be to allow the additional tax revenues to be used to decrease payroll taxes. If it is assumed that 50 percent of the additional revenues are applied to employee taxes and 50 percent to employer taxes, then there could be some reduction in the rate of inflation attributable to the President's decontrol plan. Although considerable uncertainty surrounds these estimates, such a proposal would improve the price level by an estimated 0.3 percentage point by 1984.

CHAPTER I. INTRODUCTION

The Energy Policy and Conservation Act (EPCA) of 1975 gave the President discretionary authority over the pricing of domestic crude oil during the period from June 1, 1979, to October 1, 1981, at which time all controls would expire; only new legislation by the Congress could limit this authority. On April 5, 1979, the President announced his decision to decontrol domestic oil prices gradually over this 28-month period, at the end of which domestic prices would have reached the world price. At the same time, the President asked the Congress to legislate a windfall profits tax on the additional revenues that would accrue to the oil producers as a result of decontrol. Revenues from both the windfall profits tax and the corporate income taxes the producers would pay on their increased revenues would flow into an Energy Security Fund. These funds would then be redistributed to low-income households to ease the burden of higher energy prices and to mass transit and "energy investments" to assist in the transition toward a more energy-efficient economy. 1/ This trust fund mechanism would require new legislation.

The President's decision to decontrol prices would entail both benefits and costs. On the benefit side, it would increase oil prices, thereby encouraging energy consumers to reduce their demand for oil through both the substitution of alternative fuels and outright conservation. This reduction in demand would continue the adjustment to higher oil prices that was begun with the dramatic increases in 1973-1974. This adjustment process evolves gradually since energy is used primarily in connection with capital equipment, which normally takes from 5 to 20 years to replace. The price increases resulting from decontrol would also encourage investments in solar energy and conservation, but the increases would probably not be sufficient to make unconventional fuels such as liquefied coal or shale oil economic. Higher domestic oil prices would also encourage increased oil production from older wells and would stimulate exploration for new production. The combination of reduced demand and increased supply would decrease the overall U.S. dependence on oil imports.

1/ "Energy investments" include research and development of fossil fuels, the construction of a refined products reserve, and numerous tax incentives.

On the cost side, price increases for domestic oil would accelerate inflation; they might also slow economic activity and increase unemployment. These price increases would place a new burden on low-income households. Moreover, they would transfer what has been a windfall income gain for consumers, who have been paving less than the world price for oil, to a windfall profit for producers, who will be receiving higher prices for oil that could be produced at the current, lower, regulated prices. Both the impact on low-income households and the transfer of windfall income could be minimized by tax and rebate initiatives similar to those proposed by the President.

The magnitude of these costs and benefits of the President's program are influenced primarily by two factors: namely, the baseline with which the President's program is compared, and the assumption about how much of the price change is passed through from refiners to ultimate consumers.

In this analysis, the Congressional Budget Office (CBO) has compared the President's plan with an indefinite continuation of the price controls now in place. Since the legislation that mandates price controls on domestic oil expires October 1, 1981, domestic oil prices would increase to world levels on that date unless new legislation were enacted. Consequently, most of the effects on demand, supply, and inflation that are currently attributed to the President's plan would take place anyway in October 1981.

With respect to the magnitude of the price change that is passed on to consumers, CBO has assumed that it is 100 percent. This assumption, however, is the subject of some debate, since competition from imported products might prevent U.S. refineries from raising prices for domestic products by the full amount of the crude oil price increase. It is possible that as little as two-thirds of the price increase would be passed on to consumers since Europe, which has excess refinery capacity, could export refined products to the United States. If a lower percentage were used, it would lower the inflationary impact, reduce the adverse effects on low-income households, and lower the demand response; it would not, however, influence the supply response.

This analysis treats only the major energy and economic effects, such as the demand reduction, the supply response, the inflationary impact, additional producer revenues, and potential tax revenues; it is not a comprehensive treatment of the oil pricing question. The paper does, however, analyze several alternative pricing strategies as well as a number

of alternative tax options, such as a higher and a lower windfall profits tax rate and a "plowback" provision. 2/

If a windfall profits tax is enacted, a major question will be how to use those funds. The President has recommended the enactment of an Energy Security Fund, which would channel funds into three major programs: a rebate to low-income households, mass transit assistance, and energy investments. This report examines these three programs and then compares them with three alternatives: a revolving fund for oil exploration in less developed countries; and a rollback of payroll taxes; and no earmarking of the revenues--that is, allowing the decisions about use of the revenues to be made by the normal federal budget process.

Chapter n of this report gives background information on the current system of oil price controls and then describes both the base case (continuation of the controls) and the President's plan. The second chapter also identifies the several tax and decontrol alternatives that are analyzed in subsequent chapters. Chapter III addresses the overall effects of decontrol on demand and supply, which together lead to reductions in oil imports. Chapter IV discusses producer revenues, as well as tax revenues from the President's proposals and the alternatives. Chapter V specifies the macroeconomic effects of decontrol. Chapter VI focuses on the question of the trust fund and examines the advantages and disadvantages of using the additional revenues to finance mass transit and energy investments; it compares these uses with those of financing oil exploration in less developed countries, or rolling back payroll taxes, or not earmarking the revenues. The last chapter analyzes the impact of decontrol on low-income households.

2/ Under a "plowback" provision, a tax credit would be allowed to oil producers on increased revenues that are reinvested in the exploration and development of oil.

CHAPTER II. THE PRESIDENT'S PLAN AND ALTERNATIVE STRATEGIES

This chapter provides background information on the present system of domestic crude oil pricing and describes the President's plan for phased decontrol and a windfall profits tax. Alternative pricing and taxing strategies are also presented.

CURRENT DOMESTIC CRUDE OIL PRICING

Although the price and availability of crude oil have been affected by government policy for some time, the present system of federal regulation of crude oil prices was first introduced by the Emergency Petroleum Allocation Act (EPAA) in 1973 to soften the impact of higher OPEC oil prices and to prevent what the Congress considered would be windfall gains for domestic producers. The current regulatory procedure was developed in EPAA, in the Energy Policy and Conservation Act (EPCA) of 1975, and in a series of amendments and executive actions since EPCA's passage. Barring new legislation, all controls on domestic oil prices will end on October 1, 1981.

Currently, about 6.0 million barrels per day, out of total domestic production of 8.6 million barrels per day, are controlled. These controls create a significant price difference between domestic and imported crude: as of January 1979, the average barrel of domestic crude purchased by a refiner cost about $11.00; the average barrel of imported crude cost $15.47.

The present regulatory system divides all domestic crude oil into the following three classifications, or tiers:

- Old oil, or lower-tier oil, which is oil from properties that began producing before 1973;
- New oil, or upper-tier oil, which is oil from properties that began producing during or after 1973; and
- Uncontrolled oil, which is oil that earns as much as refiners are willing to pay for it. Three types of oil are allowed this treatment:

48-429 O - 79 - 4

Alaskan North Slope oil, 1/ Naval Petroleum Reserve oil, and "stripper" oil--oil from wells that produce 10 or fewer barrels per day.

Old Oil. About 3.0 million barrels per day of old oil (35 percent of current domestic production) is currently produced. Old oil is allowed a price of about $5.86 per barrel at the wellhead, so that refiners pay $5.86 plus transportation costs before "entitlements" treatment. 2/ The volume of oil classified as old decreases over time, as reservoirs are gradually depleted and their production levels fall. The Department of Energy (DOE) assigns every old well a "base period control level" (BPCL), which is an adjusted approximation of this natural rate of decline and tells DOE and the producer how much an old well should be capable of producing, given its history. If a well produces 100 barrels, and its historical decline rate has been 1.5 percent per month, then its BPCL for the coming month will be 98.5 barrels. Any production from that well in excess of 98.5 barrels is considered new, or upper-tier, oil for pricing purposes. Thus, over time, more and more old oil receives the upper-tier price as time passes through the mechanism of declining BPCLs. This procedure gives the producer an incentive to keep production above the BPCL, in order to receive the higher price for the reclassified new oil.

A property producing old oil also can be "retired," or shut down. If a well shuts down for a year or more and then resumes production at a level of 10 barrels per day or less, then its oil moves from the lower-tier to the stripper well category, and its price is freed from controls.

New Oil. About 3.0 million barrels per day (35 percent) of domestic production is new oil, which is allowed a price of about $13.06 per barrel at the wellhead. The volume of new oil increases over time, through both new discoveries and the transfer of old oil to new through the BPCL mechanism.

1/ Although Alaskan oil can net no more than the upper-tier price at the wellhead, it is allowed to compete freely in order to recoup some of the enormous cost of transportation to the continental United States.

2/ Under the entitlements system, all domestic refineries are entitled to equal proportions of lower, upper, and uncontrolled oils, so that their average crude oil costs are equal. This system will be eliminated as the tiers are merged and brought to the world price.

Uncontrolled Oil. Finally, about 2.6 million barrels per day (30 percent) of current domestic production is uncontrolled and receives a price of about $18.50 at the refinery gate. The wellhead revenues from this oil are equal to the refinery gate price minus the cost of transporting it to the refinery from the field. The refinery gate price is determined, in turn, by the cost of imports. Transportation costs vary greatly among the three types of uncontrolled oil--Alaskan, Naval Reserve, and stripper. Since stripper oil is generally sold in small quantities to local refiners, it carries a small transportation charge, as does Naval Reserve oil, which is produced and sold primarily to nearby California refineries.

Alaskan oil, on the other hand, incurs sizable transportation charges, especially when shipped to the Gulf Coast -through the Panama Canal. Because of these costs, Alaskan oil nets the producer even less than the upper-tier wellhead price. Although, according to law, Alaskan oil cannot receive net revenues of more than the wellhead price for upper-tier, the transportation differential makes this constraint irrelevant.

With minor technical adjustments, the prices of lower-tier, upper-tier, and uncontrolled oils are combined into a weighted average, called the domestic composite price of crude oil. According to the EPCA, the President can increase this domestic composite price by no more than 10 percent annually, with the price increase distributed between the upper- and lower-tiers. 3/ (Uncontrolled oil is not subject to regulation, and, therefore, cannot be "awarded" price increases.)

Controlled domestic crude prices offer both advantages and disadvantages. Regulated prices ease the burden that would exist on households if domestic crude prices were to rise to world levels. Lower oil prices also subsidize both economic activity in general and the domestic refining industry in particular. In addition, domestic price regulation helps hold down energy prices for consumers and thus limits the inflationary effects of OPEC price increases.

The costs associated with these advantages, however, are large. By subsidizing domestic oil consumption and restricting domestic production, lower prices encourage imports. Each additional 100,000 barrels of oil

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3/ There is a special exception for the President to increase more than 10 percent subject to a veto of one house of the Congress.

imported per day now adds about $650 million to the balance of payments deficit. Moreover, the current system is cumbersome to administer and often inefficient, and it is a source of uncertainty in industry investment decisions. It may be possible to provide many of the benefits of the existing system without encountering these costs.

PRICING ALTERNATIVES

The President's Decontrol Decision

Currently, the price of about 6.0 million barrels of oil per day is controlled, either in the lower- or upper-tier. In order to phase out controls on domestic crude oil, the President has decided to:

- Redefine all old oil as new oil between June 1, 1979, and October 1, 1981, by releasing specific volumes of old oil to the upper-tier; and simultaneously

- Raise the price of new oil (including the redefined old oil) to the world price by October 1, 1981.

Old Oil. To hasten the movement of oil from the old to the new category, the rate of decline of the BPCL on old oil property will be increased from the present average of about 1.5 percent per month to an artificial rate of 3.0 percent per month for every property, starting in January 1980. In addition to this accelerated decline, some old oil will be transferred to the upper-tier through the "marginal" and "tertiary" classifications.

Marginal wells are "almost stripper" wells--that is, their production ranges from 10 to 35 barrels per day. These wells produce about 640,000 barrels per day of old oil. Eighty percent of this oil, or approximately 512,000 barrels per day, would be transferred to the upper tier on June 1, 1979. The remaining 20 percent, or 128,000 barrels per day, would be moved into the upper-tier on January 1, 1980.

Finally, old oil would be classified as new if it is produced through tertiary recovery projects. (Tertiary recovery is a technology that injects either heat or chemical compounds into an oil reservoir to loosen the oil so that it will flow more freely.) If a tertiary project has been certified by DOE, it is now allowed to receive the world price. Under the decontrol plan, for every barrel of certified tertiary oil produced, a certain

number of "companion" barrels would be transferred from old to world prices. (The Administration has not yet decided on the exact number of companion barrels.)

The transfer of marginal wells and tertiary companion oil, and the accelerated decline rate of old oil, would account for the redefinition of all old oil. By October 1, 1981, there would be no old oil left, since it would have all been redefined as new.

New Oil. While old oil is being moved into the new oil classification, the price of new oil will be allowed to rise to the world price by October 1, 1981, in equal monthly increments that are estimated to be 32¢ per barrel per month. After that date, all domestic oil would receive the world price. Decontrol would have been accomplished.

New Discoveries. As was mentioned above, genuinely new oil discoveries currently are assigned to the upper-tier. As of June 1, 1979, these new discoveries would be decontrolled and thus allowed to receive the world price. The exact definition of what constitutes new discoveries is yet to be finally determined. CBO has assumed that something similar to the definition used in the Natural Gas Policy Act is followed. This act classifies new gas as that which comes from wells either 1,000 feet deeper than or 2.5 miles from an existing well, or that which the relevant state agency certifies as being from a new field.

Alternative Pricing Strategies

Two alternative pricing strategies are compared with both the base case of extended EPCA controls and the President's decontrol plan:

- A "middle price case," under which the lower-tier oil is gradually transferred into the upper-tier as specified by the President, but the price of upper-tier oil is held constant in real terms. New discoveries and tertiary production are allowed the world price, however.

- A "modified EPCA case," under which lower- and upper-tier oils are controlled at their present prices, but marginal lower-tier oil is allowed the upper-tier price. New discoveries and all tertiary oil would be decontrolled.

These alternatives are discussed in detail in Chapter IV and will be compared with the President's plan in discussing producer revenues, supply responses, and demand reductions.

TAXING ALTERNATIVES

The President's Tax Proposals

No special federal taxes now exist on crude oil at the wellhead. Since the President's crude oil decontrol plan would result in large new revenues for the industry, the President has proposed a windfall profits tax to recoup some of this new income for the public. This windfall profits tax is essentially an excise tax and, therefore, would be applied to the new income realized on each barrel. Any remaining profits would be subject to conventional corporate income taxation. Thus, decontrol would add to federal tax receipts through both windfall taxes and increases in conventional corporate income taxes.

The President's windfall taxes consist of the following three parts:

- Lower-tier tax: a tax on the difference between the lower-tier price and the "constructive" upper-tier price (the upper-tier price that would result from an indefinite continuation of EPCA controls) that would be applied to old oil that is transformed into new oil at a rate greater than 2 percent per month.

- Upper-tier tax: a tax on the difference between the constructive and actual upper-tier prices. This tax would be applied to all upper-tier oil, including old oil as it becomes new under the decontrol proposals.

- World price tax: a tax on any constant dollar prices above $16.00 per barrel as of the fourth quarter 1979. This tax would be applied to stripper oil and oil from new discoveries. The tax would therefore apply to any price that reflects an OPEC "surcharge," as is currently the case.

Each of these taxes is applied at a rate of 50 percent.

As previously stated, old oil would be allowed to decline at its current rate (1.5 percent per month on average) until January 1, 1980. After that date, it would be transformed into new oil by lowering every individual BPCL at an artificial rate of up to 3 percent per month. Any revenues derived from transforming old oil into new at a rate greater than 2 percent per month, however, would be subject to windfall taxation. Those revenues derived from transforming old oil into new at a rate of up to 2 percent per month would be subject to corporate income taxation only. Since this

transformation would have occurred at the current rate of about 1.5 percent per month (or less) anyway, only the additional revenues for oil released to the upper-tier between the natural rate of decline and 2 percent would create a new net addition to corporate income taxes.

The tax on upper-tier windfalls would be applied to the difference between the upper-tier constructive price (the price that would have resulted from an indefinite extension of EPCA) and its actual price (the world price it would receive under decontrol). This tax would be applied to all upper-tier oil, including old oil as it becomes new oil and oil released through the proposed marginal and tertiary mechanisms in excess of the natural rate at which marginal and tertiary oil would have become upper-tier had EPCA controls continued indefinitely.

The tax on OPEC real price increases would be applied to all freely uncontrolled oil, except that from the Alaskan North Slope and the Naval Petroleum Reserve. For stripper, tertiary, and oil from new discoveries, this would constitute a new tax on existing revenues. All other oil, except Alaskan, would eventually receive the world price at the refinery as the upper-tier price rises to the world level, and any real OPEC price increases received for this oil would therefore be taxed as part of the upper-tier tax. Alaskan is excepted, as stated earlier, because its wellhead price is below its regulatory ceiling.

Alternative Tax Options

This report presents four alternative tax options:

- The President's proposed 50 percent tax on additional revenues;
- A higher tax of 50 percent on lower-tier additional revenues and 75 percent on upper-tier additional revenues (in which most of total new revenues occur);
- A lower tax, using an across-the-board 25 percent tax rate; and
- A plowback provision that would allow producers to deduct added expenditures on exploration from their windfall tax liability, and would then apply a 50 percent rate to the remainder.

These options are discussed in detail in Chapter IV.

CHAPTER III. OIL IMPORT REDUCTIONS

A major benefit from decontrol would be a reduction in oil imports. Such a reduction would decrease the U.S. vulnerability to supply disruptions, improve the U.S. balance of trade, and reduce some of the pressures for OPEC to raise oil prices. The reduction would be accomplished in two ways: domestic consumption would be constrained slightly because of the higher oil prices consumers would pay under the President's plan, and domestic production of crude oil would be encouraged because of the higher prices producers would receive for their oil. The plan to increase the production of domestic crude oil accounts for about 65 percent of the reduction of imports in 1985. Since the mechanisms affecting both production and consumption become increasingly effective through time, they would be even larger in 1990 than in 1985. Although the reductions will not be great enough to stop the continued growth of imports, the plan will limit the rate of growth.

Imports in 1979 are about 9 million barrels per day. By 1985, if controls were continued, imports would be about 12.3 million barrels per day. Relative to that base, production and consumption responses have been estimated for three alternative price proposals, as follows:

President's Plan. In 1985, the President's plan would decrease demand by approximately 215,000 barrels per day and increase domestic production by 405,000 barrels per day for a 620,000 barrels per day reduction in potential 1985 oil imports.

Modified EPCA Case. This proposal--continued price controls on upper- and lower-tier oil--would stimulate approximately 160,000 barrels per day of new supply by 1985, but would not have any noticeable impact on demand, because aggregate prices would rise very little over those of the base case. This supply increase would translate into a similar amount of oil import reduction in 1985.

Middle-Price Case. This alternative price proposal--continued price controls on upper-tier oil--would increase domestic supply by approximately 335,000 barrels per day by 1985 and decrease demand by approximately 100,000 barrels, for a net oil import reduction of approximately 435,000 barrels per day in 1985.

48-429 0 - 79 - 5

The next two sections provide additional detail on the supply and demand responses attributable to the President's plan. All the estimates are relative to an indefinite continuation of price controls.

REDUCTION IN CONSUMPTION OF PETROLEUM PRODUCTS

As shown in Table 1, the increased prices for crude oil and petroleum products resulting from the President's decontrol plan, as compared with continued controls, would reduce oil consumption by an estimated 215,000 barrels per day by 1985. The reduction would result from the substitution of alternative fuels, such as coal in large boilers, and direct conservation. The estimated decrease is only about 1 percent of projected 1985 oil consumption, however. A primary reason for this is that the percentage change in the price of oil is small--about 9 percent. Since other costs, such as refining and marketing, do not increase directly with crude prices, the impact on the final product is smaller--for example, 3 percent for gasoline and 4 percent for home heating oil. For many goods or services, the higher price of oil is only one component of the cost of a final product, such as an airplane ticket. Thus, the percentage change in the price of such items would be even smaller than the price change of fuel products.

TABLE 1. PETROLEUM CONSUMPTION BY SECTOR: IN THOUSANDS OF BARRELS PER DAY

Sector	1978 Actual	1985 Continued Controls	1985 Reduction in Demand from Decontrol
Transportation	9,800	10,740	-85
Electric Utilities	1,750	2,290	-25
Residential/ Commercial	3,550	3,570	-40
Industrial	3,450	4,580	-65
Total	18,550	21,180	-215

Another major reason for the small effect on demand is the rate of adjustment. It takes time for the stock of buildings and vehicles to be replaced by more fuel-efficient substitutes, and retrofitting of existing capital equipment often takes several years. In fact, adjustment to the large oil price increases of 1973-1974 is still taking place. Although many retrofittings or fuel substitutions are already economic at current oil prices, there are limits to the rate of adjustment because of lack of information on appropriate technologies and the inability of individuals to borrow to finance improvements.

The demand reductions in this report are based on CBO judgments about the demand responsiveness to price changes (elasticities); the judgments were made, in turn, after surveying previous empirical work on this subject. 1/ Elasticities differ by sector, depending upon the availability and price of substitutes, future expectations, and the specific type of capital equipment that uses the petroleum products. Because of the length of time needed to purchase more energy-efficient capital equipment, the elasticities are higher for 1985 than they are for 1982--that is, the demand reduction is much greater by 1985.

Transportation

The greatest absolute savings--85,000 barrels per day by 1985--would be expected from the transportation sector, since it is the largest consumer of petroleum. 2/ However, the limited ability to substitute other fuels for

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1/ Econometric estimates of demand elasticities have been summarized by Lester Taylor, "The Demand for Energy: A Survey of Price and Income Elasticities," in William Nordhaus, ed., International Studies of the Demand for Energy (North Holland, 1977); and Energy Modeling for an Uncertain Future, Supporting Paper #2 of the Committee on Nuclear and Alternative Energy Strategies (National Academy of Sciences, 1978). Generally, long-run and short-run elasticities are estimated. "Long-run" implies the amount of time necessary to change the capital equipment involved in energy use, but that may be difficult to determine in practical applications. The definition of "short-run" may vary. Different models measure demands for different categories in different end uses and at different points in the system (crude or delivered product) so that comparison of elasticities is very difficult.

2/ This assumes an elasticity of 0.2 for 1985.

petroleum would curtail the magnitude of potential savings. Electricity accounts for less than 1 percent of transportation energy and its use cannot be increased greatly by 1985. Gasohol is growing in popularity in the midwestern states, but, again, large amounts are not expected to be available by 1985, and, in any event, it can only replace 10 percent of a gallon of gasoline when utilized.

Without decontrol, much of the conservation in transportation fuel results from EPCA fuel economy standards for automobiles. Still, many authorities do not expect EPCA standards for new cars to be strictly adhered to. CBO predicts an average fuel economy for new cars of only 23.3 miles per gallon as opposed to the 27.5 specified in the law for 1985. A price increase could possibly induce better adherence to the regulations.

Electric Utilities

The savings by electric utilities--25,000 barrels per day by 1985--would be modest relative to their level of consumption. 3/ Although there are a number of alternative fuels (coal, natural gas, and nuclear) for utility use, and fuel costs are a large part of the cost of producing electricity, utilities would have little incentive to change their mix of fuels because the prices of their fuels would not be greatly affected by the President's plan. Most petroleum consumed by utilities is imported residual fuel oil. The price of such fuel is set by world markets and by OPEC. The prices actually paid by utilities would be raised slightly by the President's plan but not enough to have more than a moderate effect.

There are further limitations to the ability of utilities to reduce oil consumption. Because it is expensive to transport electricity over long distances, it is advantageous to generate power close to the point of end use, but there are obvious problems involved in locating either new coal or nuclear plants in large urban areas or in converting old plants from oil to coal. Both natural gas and hydroelectric power supplies will be limited in the future. For all these reasons, it is unlikely that petroleum would be substantially reduced as a fuel in existing electric power plants in the foreseeable future. Regulations do, however, restrict the use of petroleum in new generating facilities.

3/ The assumed elasticity for the electric utility sector is 0.2 for 1985.

Residential and Commercial

Price decontrol is estimated to reduce demand in this sector by approximately 40,000 barrels per day by 1985. 4/ Since natural gas and electricity (heat pumps) are already more economical than oil in most regions for residential and commercial use, little growth in petroleum consumption is expected, even without decontrol. Electricity is likely to be the fastest growing oil substitute, as natural gas becomes more expensive and restricted in supply, and as heat pumps, which are more efficient than resistance heating, are more widely marketed.

Historically, the share of oil in residential and commercial fuel use has not changed very much. It was about the same in 1950 as it is today--37 percent. During this period, oil use first rose slightly and then started to fall slowly, and is still falling today. The most dramatic change since World War II has been the replacement of coal with gas and electricity. Coal once held half of the market, but now accounts for only a small percent and is unlikely to increase its share. Electricity, and to a lesser extent solar heat and wood, will capture the new market, but the change in the residential component is expected to be slow.

Industrial

Oil demand for industrial use is expected to be approximately 65,000 barrels per day lower in 1985 because of decontrol. 5/ The share of petroleum for industrial fuel use was the same in 1950 and 1975—19 percent. Nonfuel uses of hydrocarbons by industry (for example, lubricants and asphalt) are about 75 percent oil. The industrial sector has experienced considerable substitution of gas and electricity for coal over time. Coal constituted nearly 60 percent of industrial fuel at the end of World War n, but is now only 22 percent. Although the use of electricity continues to grow slowly, recent natural gas curtailments induced many industries to consider gas an unreliable supply of energy and to switch to oil, which is the simplest quick substitute for natural gas. Coal is still a practical fuel for boilers, but boilers consume only around one-third of industrial fuel, and new clean air laws tend to counter the cost differential that would otherwise increasingly favor coal. Additional problems, such as land availability for

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4/ An elasticity of 0.2 is assumed for this sector for 1985.

5/ An elasticity of 0.3 is assumed for this sector.

coal storage, limit the feasibility of burning coal in urban locations. For nonboiler fuel demand, technology exists for burning coal in up to 20 percent of industrial applications, although even in these instances problems remain. In many applications, the need for precise control of temperatures and for even, clean burning renders the use of coal infeasible at present. 6/ Therefore, although some coal will substitute for oil in industrial use, oil consumption is likely to continue to grow.

INCREASE IN PRODUCTION OF PETROLEUM

The President's plan is estimated to increase domestic oil supply by 205,000 barrels per day by 1981 and 405,000 by 1985. Essentially, the plan provides incentives for three types of additional production, as follows:

- o Acceleration of oil production from proven reserves;
- o Tertiary recovery; and
- o Exploration for new discoveries.

Production from currently known, or proven, reserves would be stimulated by gradually increasing the prices of such oil, thereby increasing the incentives for additional investment. The plan would increase the price for incremental production from tertiary recovery by allowing the release of certain amounts of "companion," nontertiary oil to world price levels for each tertiary barrel produced. Exploration for new domestic reserves in new fields would be stimulated by increasing the price allowed for all new discoveries and, in a very limited way, by providing additional "cash flow" through higher prices for other categories of crude oil.

This section estimates the probable increase in domestic production from the incentives in the President's plan. This response is in addition to that expected under the base case of continued controls through 1985. In the base case, all oil produced from the Alaskan North Slope, Naval

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6/ Congressional Budget Office, Replacing Oil and Natural Gas With Coal; Prospects in the Manufacturing Industries, Background Paper (August 1978); and Energy and Environmental Analysis, Inc., Technical Potential for Coal Use in Industrial Equipment Other than Boilers (April 6, 1978).

Petroleum Reserves, tertiary recovery, and stripper wells would receive the world price. Upper- and lower-tier prices would continue under the current controls. Given these assumptions, production in 1979 and 1985 for both the base case and the President's plan is summarized in Table 2. A detailed discussion of these estimates is provided below.

Production from Proven Reserves

By 1985, production from known reserves would be about 210,000 barrels per day more because of decontrol than under continued controls. Crude oil from the nation's proven reserves (about 27.8 billion barrels) is currently being produced at a rate of about 8.6 million barrels per day, or 3.1 billion barrels per year. 7/ Most of the production comes from mature fields or properties in which (1) the geology is fairly well understood; (2) the various owners have established working relationships; and (3) the relative benefits of alternative production/investment plans have been calculated. In the aggregate, production from this large variety of fields or properties is declining.

The plan provides financial incentives to encourage producers to invest and thereby accelerate production. Prices would be increased to world levels, although a portion of the increase would be subject to the proposed windfall profits tax. Many producers are now witholding investments in anticipation of higher prices in the future. Most producers appear to expect that eventually both lower- and upper-tier oil will be priced at world levels and that the prospective gain is significant enough to be worth the wait, especially for those with lower-tier oil. Accordingly, their incentives to produce oil now are minimal. In fact, in a number of cases, current economic incentives encourage allowing production to decline toward stripper levels so that the properties can receive world prices through that mechanism.

The above factors indicate that a gain in production would be likely if the price of oil was increased. They are offset, however, by the fact that most of the properties are old fields that have produced 50 to 95 percent of their ultimately recoverable reserves. Thus, resource potential (short of tertiary recovery) is relatively small and constrained by geological factors.

7/ American Petroleum Institute, Reserves of Crude Oil, Natural Gas Liquids and Natural Gas in the United States, News Release (April 30, 1979).

TABLE 2. DOMESTIC CRUDE OIL PRODUCTION UNDER THE BASE CASE AND THE PRESIDENT'S PLAN a/: IN MILLIONS OF BARRELS PER DAY

	1979 Estimated	1985 Base Case	1985 President's Plan
Production from Proven Reserves			
Lower-Tier	2.7	0.8	0.9
Upper-Tier	3.1	1.6	1.6
Stripper	1.3	0.8	0.8
Alaskan and Naval Petroleum Reserves	1.3	1.7	1.7
Total	8.4	4.9	5.0 b/
Production from Additional Reserves			
Extensions to Present Fields	0.2	1.6	1.7
New Discoveries	--	0.5	0.6
Tertiary	--	0.4	0.5
Total	0.2	2.5	2.8
Total Production	8.6	7.4	7.8

SOURCE: The 1979 actual estimates are from the U.S Department of Energy, Energy Review, (April 1979); the 1985 estimates were derived by CBO.

a/ In 1982, the increase in supply resulting from the President's plan would be about 275,000 barrels per day. About 80 percent of the increase would be in accelerated production of lower-tier oil. By 1985, the increase in supply would be about 405,000 barrels per day.

b/ This table shows all of the incremental supply from proven reserves as being from lower-tier wells. In actuality, some increase would also occur in upper-tier wells.

Price incentives that stimulate new investment would increase ultimate recovery in the aggregate, but the predominant effect would be a short-term acceleration of production after price increases, followed by a decline that might eventually drop below the base case. To increase ultimate recovery substantially, tertiary recovery would be necessary. A broad increase of prices for all upper- and lower-tier oil, however, would not result in substantial new tertiary recovery.

In 1979, total upper- and lower-tier oil production will be about 5.8 million barrels per day. Under the base case, this level is expected to decline to about 2.4 million barrels per day in 1985 (excluding production of about 1.6 million barrels per day in extensions to present properties). Under the President's plan, however, price incentives would stimulate investment to increase production during 1980 to 1986. While the production increment in specific cases would be of very short duration, the cumulative effect would be spread over a number of years because all new investment would not occur simultaneously. The total effect would probably peak in 1982 to 1983 at about 200,000 to 250,000 barrels per day--representing an increase of about 3 percent in domestic production--and then decline to about 210,000 barrels per day by 1985.

Production From Additional Reserves

Tertiary Recovery. About 250,000 to 300,000 barrels of oil per day are now being produced by processes that are considered tertiary production under the President's plan. 8/ Most of the current production is from thermal-recovery projects, which burn a proportion of the produced oil in order to provide steam for re-injection. CBO estimates that this production would grow to 405,000 barrels per day by 1985 under current controls and that the President's plan would increase this by an additional 85,000 barrels per day.

A variety of studies have projected the potential resources that could eventually be added by tertiary recovery but that cannot now be considered proven resources. Most recent studies estimate that resources fall within a range of 15 to 45 billion barrels at present world prices, but that many years would be required to develop those resources. Because the capital requirements and operating costs per barrel are large in comparison to conventional

8/ "U.S. Enhanced Recovery Marked by Uncertainties," Oil and Gas Journal (September 11, 1978).

48-429 O - 79 - 6

recovery and because risks are high, the industry has invested in tertiary recovery with great care. Virtually all projections for tertiary production made in the mid-1970s now seem to be too high. Estimates for 1982 and 1985 are being continually lowered because of the need for long lead times, air quality problems, and higher than expected costs. Projections for 1985 range from 300,000 barrels per day to about 1.2 million barrels if the production receives world prices. CBO has estimated that tertiary production at the world prices without companion barrels would be about 405,000 barrels per day in 1985, mostly through thermal recovery.

The President's plan is designed to reduce economic risk and provide short-term returns on the initial investment. In return, DOE must approve the specific projects. Although the exact details of the plan have not yet been released, it is designed to accelerate development of a number of technologies that seem on the brink of commercial application. The most likely candidate for the most investment in the short term is injection of carbon dioxide (CO_2). The industry estimates, however, that it will be more than five years before production from this technology could be significant because of the time required to develop a source of CO_2 and to pipe it to the oil field. A variety of chemical processes are even less advanced than those using CO_2, and should be expected to have even longer development times.

DOE anticipates approval of 75 to 100 tertiary projects under this program. Many of the projects would not be in full operation by 1985, and it should be expected that production from a number of the projects would be disappointing. Major projects, which would encompass entire large fields, are estimated to provide no more than 15,000 barrels per day and only one or two such large projects are likely to be in operation by 1985, at the earliest. Many projects would barely reach commercial size, and a proportion would probably have been funded under the base case anyway.

The program of releasing companion barrels of lower-tier oil would slightly accelerate the projects and reorient investment into technologies that have long-term prospects. As a result, while the program would not provide a large amount of incremental production by 1985, it could substantially affect investment and production by 1990 or 1995. At best, the program in 1985 would stimulate approximately 85,000 barrels per day over and above what would have occurred under the current controls.

New Discoveries. This plan would free the price of oil produced from new fields. By 1985, production from new fields would likely be about 110,000 barrels per day greater as a result of the President's plan. While the actual definition of what constitutes a new field has not been determined, CBO has assumed that it will be similar to that used for natural gas. For natural gas, a discovery must qualify as a "new field" under current state regulations or be 2.5 miles beyond or 1,000 feet below existing fields. 9/

The potential new production can be projected by estimating the levels of exploratory drilling and discovery rates. The level of exploratory drilling depends primarily on the price of new oil and the capacity of the drilling industry, while estimates of new discoveries depend primarily on recent experience concerning new discoveries per foot drilled. Past performance indicates that the initial discovery is usually less than half the reserves ultimately discovered within the new field. The eventual revisions, extensions, and new pools are discovered or established through developmental drilling and through increases in recoverable reserves resulting from higher prices. On average, the reserves of the original discovery are doubled within 5 to 10 years after the discovery. 10/ Given the level of new discoveries, future production can be estimated using lag factors and production profiles based on past performance. In Table 3, the various drilling, reserve, and production rates for the base case and the President's plan are summarized.

This analysis concludes that production from new fields in 1985 would be about 280,000 barrels per day if price controls on upper-tier oil were continued and 390,000 barrels per day if controls were eliminated. The difference between cases would be modest in 1985, but would increase

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9/ The most liberal definition of new discoveries is all oil flowing from wells that commenced operating in 1979 or after. If this interpretation is used, production in this category would be greater than the estimate in this paper but accelerated production from known reserves would be smaller.

10/ R.E. Mast and Janet Dingier, "Estimates of Inferred and Indicated Reserves for the United States," Geological Survey Circular 725 (1975), pp. 73-78.

TABLE 3. NEW DISCOVERIES: DRILLING, RESERVES, AND PRODUCTION

	1982		1985	
	Base Case	President's Plan	Base Case	President's Plan
Successful Exploratory Drilling (million feet per year) a/	8.8	10.4	7.3	10.6
New Field Discoveries (million barrels per year) b/	176.0	209.0	146.0	212.0
Secondary Discoveries (million barrels per year)	150.0	195.0	295.0	350.0
Total Discoveries in New Fields (million barrels per year)	326.0	404.0	441.0	562.0
Annual Production from New Field Discoveries (million barrels per year) c/	60.0	71.0	280.0	390.0

SOURCE: Derived from analysis in a forthcoming CBO report, The Changing Energy Problem; A Perspective.

a/ Most new oil would result from new field discoveries that, in turn, result from exploratory drilling. It is more valid for the purposes of this analysis to project successful exploratory drilling than to project all drilling because of the problem of separating dry oil wells from dry gas wells. Exploratory drilling is primarily a function of wellhead prices that the industry expects to receive when production occurs.

b/ The "finding rate" for new fields is about 24 barrels per successful exploratory foot drilled in 1979. This rate has declined from a level of 35 barrels per foot in 1970 and is likely to be about 18 barrels per foot in 1985.

c/ The ratios between reserve discoveries and production are affected by start-up times and the wellhead price of oil.

through time. 11/ It should also be noted that in both cases production from new fields would be much less in 1985 than production from extensions to the large, old fields that are already producing.

Conclusions

The aggregate increase in domestic production for 1985 would be 405,000 barrels per day if current price controls are eliminated. About half the potential increment would result from accelerated production from old fields. The remaining half would be divided between incremental tertiary recovery and production from new fields. If controls were continued, total crude oil production in 1985 is projected to be about 7.4 million barrels per day. If the President's plan were adopted, production would increase to 7.8 million barrels per day--an increase of 5.4 percent over the base case. In both cases, production would decline from its present level of 8.6 million barrels per day.

11/ After 1985, production from discoveries in new frontier areas could be significant, but new discoveries in frontier areas are not likely to be produced before 1985. At the present time, there is very little production in Outer Continental Shelf areas that is known to be economical at uncontrolled prices that is not economical at upper-tier prices.

CHAPTER IV. PRODUCER REVENUES AND FEDERAL TAXES

This chapter discusses the amount of additional producer revenues that would be generated by decontrol as well as two critical tax issues--the windfall profit taxes and the effective corporate income tax rates. New producer revenues are estimated for three alternative pricing scenarios: the President's decontrol plan, the middle-price case (continued price controls on upper-tier oil), and the modified EPCA case (continued price controls on both upper- and lower-tier oil). All are compared to the base case of continued controls. These figures are given in current dollars under two OPEC price assumptions--constant real prices and a 3 percent annual increase in real OPEC prices. Critical tax issues related to decontrol are then discussed, specifically, the concept of what constitutes a "windfall" profit and what the effective marginal corporate income tax rate would be on additional producer revenues. Lastly, estimates of the tax liabilities for four tax options are presented: the President's 50 percent windfall tax, a 75 percent tax rate on windfalls originating from raising the upper-tier price to the world price, a 25 percent across-the-board tax rate, and a "plowback" proposal.

PRODUCER REVENUES

Estimates of producer revenues are based on a CBO projection of future U.S. oil production as indicated in Chapter III and price assumptions stated in Chapter II. The estimates for the three alternative pricing strategies are presented in Table 4.

The President's Plan

CBO estimates that the President's decontrol decision would create $68.9 billion in additional producer revenues from existing oil between 1979 and 1985. These revenues would rise from $0.7 billion in 1979, to $4.8 billion in 1980, to $11.0 billion in 1981, and to a peak of $13.8 billion in 1982, and then would decline gradually for the next several years. In addition, from 1979 to 1985, domestic producers would receive new revenues of $13.9 billion on the new supplies produced in response to higher prices. Thus, expected revenue gains to the oil industry would amount to $82.8 billion over this period.

TABLE 4. WINDFALL REVENUES ACCRUING TO DOMESTIC PRODUCERS FROM LOWER- AND UPPER-TIER OIL RESULTING FROM ALTERNATIVE DECONTROL PROPOSALS: IN MILLIONS OF CURRENT DOLLARS

Calendar Year	President's Plan	Middle-Price a/ Case	Modified b/ EPCA Case
1979	749	749	967
1980	4,785	2,460	1,530
1981	10,978	4,024	1,393
1982	13,836	4,936	1,317
1983	13,351	4,440	1,296
1984	12,942	4,076	1,348
1985	12,203	3,672	1,496
Total	68,864	24,357	9,347

a/ Assumes an indefinite continuation of the controls on upper-tier oil.

b/ Assumes an indefinite continuation of the controls on upper-tier and lower-tier oil.

The Middle-Price Case

An alternative to the President's pricing plan is the middle-price case, under which lower-tier oil would be transferred to the upper-tier, but controls on the upper-tier would be extended and upper-tier prices held constant in real terms. This option would greatly reduce additional producer revenues by maintaining the difference between the upper-tier and world prices. It would create $24.4 billion in additional revenues from existing oil from 1979 to 1985, with a peak of $4.9 billion in 1982. The difference in

cumulative additional revenues for existing oil under the President's case and the middle-price case is $44.5 billion between now and 1985. New supplies induced under this proposal would generate $9.1 billion in new revenues over the 1979-1985 period, compared to $13.9 billion under the President's plan, so that total new industry revenues would total $33.5 billion.

When the middle-price case is compared to the President's plan, several advantages and disadvantages can be observed. The middle-price case produces less inflation since it reduces the national oil bill. Between 1980 and 1985, total oil bills for the economy would be lower by about $8 billion annually under the middle-price case than under the President's plan, even when the incremental substitution of domestic supply for imports and the additional demand reduction that result from the President's plan are taken into account. Ultimate increases in the price level by 1982 under the middle-price case would be considerably lower than would occur under the President's plan and thus the effect on low-income households would also be less. By 1985, petroleum product prices, such as that for gasoline, would be 4 cents higher under the President's plan, and 1 cent higher under the middle-price case, when compared to an extension of price controls.

The middle-price case also has disadvantages, however. While the supply response from new discoveries and tertiary production resulting from decontrol would be unaffected by continued controls on upper-tier properties, failure to raise upper-tier price levels to the world price would result in the forfeiting of some accelerated production from old fields (about 70,000 barrels a day by 1985). It would also decrease demand by about 100,000 barrels per day as opposed to the 215,000 barrel reduction from the President's plan. It is also argued that failure to adopt world energy prices would continue to strain relations with both Organization of Economic Cooperation and Development and OPEC nations.

The Modified EPCA Case

A second alternative to the President's pricing plan is a modified continuation of EPCA. Lower- and upper-tier price controls would be retained, but lower-tier marginal oil would be allowed the upper-tier price as of June 1, 1979. Oil from new discoveries and tertiary recovery would also be decontrolled but there would be no special incentive for tertiary recovery. This plan would increase producer revenues by only $9.3 billion over the 1979 to 1985 period, relative to current controls, and would induce new supplies valued at $1.9 billion, resulting in total new industry revenues of $11.2 billion. This increment would have virtually no effect on inflation when compared to an indefinite continuation of controls.

The cost of this plan would be less demand reduction and fewer new supplies. Since oil prices would be about the same under the modified EPCA case and present EPCA regulations, the demand reduction would probably be less than 50,000 barrels per day. Moreover, this plan would limit new supplies to 160,000 barrels per day more than under current regulations. Relative to the President's plan, about 250,000 barrels per day would be lost because of reduced accelerated production from known fields and from reduced tertiary production.

Real OPEC Price Increases

All the previous estimates in this section have been predicated on the assumption that real OPEC prices remain constant over this period. But since real price increases will most likely occur, CBO estimated the additional revenue effects of the President's plan using an annual 3 percent real OPEC price increase. Real OPEC price increases of this magnitude would raise total new revenues from existing oil from $68.9 billion to $94.6 billion between 1979 and 1985. The value of new supplies induced by decontrol would equal $16.0 billion over this period. Thus, total new producer revenues created by decontrol would amount to $110.6 billion over this seven-year period.

Real OPEC price increases also accentuate the differences between the President's plan and the middle-price case. By 1985, the annual difference in the aggregate national oil bill between these two cases would rise from about $8 billion, with constant real OPEC prices, to about $15 billion in the face of rising real prices. Moreover, rising OPEC prices would widen the differences in the windfall revenues under the middle-price case and the President's plan. In 1985, for example, the President's plan would generate $8.5 billion more in additional revenues from existing oil than the middle-price case ($12.2 billion versus $3.7 billion). If real OPEC prices should increase, this difference would rise to $15.8 billion ($20.0 billion versus $4.2 billion).

Both of these cases can be compared to the modified EPCA case. If OPEC prices increased at 3 percent per year in real terms, this case would result in additional revenues of $10.4 billion between now and 1985, compared to $9.3 billion with constant prices. In addition, real OPEC price increases would raise the value of new supplies induced by the decontrol of new discoveries from $1.9 to $2.3 billion, for total new industry revenues of $12.7 billion. Table 5 presents estimates of additional revenues received for existing oil under the President's plan, the middle-price case, and the modified EPCA case with rising OPEC prices.

TABLE 5. WINDFALL REVENUES ACCRUING TO DOMESTIC PRODUCERS FROM LOWER- AND UPPER-TIER OIL RESULTING FROM ALTERNATIVE DECONTROL PROPOSALS, ASSUMING RISING REAL OPEC PRICES: a/ IN MILLIONS OF CURRENT DOLLARS

Calendar Year	President's Plan	Middle-Price Case	Modified EPCA Case
1979	749	749	967
1980	5,483	2,462	1,532
1981	13,143	4,036	1,405
1982	17,462	4,984	1,365
1983	18,347	4,565	1,421
1984	19,400	4,354	1,626
1985	20,040	4,229	2,053
Total	94,624	25,379	10,369

a/ Assumes a 3 percent annual increase in real OPEC prices.

TAX ISSUES

The tax issues associated with the President's decontrol plan include the following:

- What constitutes a windfall revenue gain and how it should be taxed.
- How much income tax oil companies actually pay after allowing for the special tax treatment for new drilling.

Windfall Profits

The President has proposed to tax the windfall profits that accrue to oil producers from (1) decontrolling the price of upper- and lower-tier oil, thereby allowing it to increase to current world levels, and (Z) from any real OPEC price increases above a given price as of April 1, 1979.

Decontrolling Upper- and Lower-Tier Oil. Whether or not the additional revenues generated by decontrol of upper- and lower-tier oil should be considered a windfall, and so taxed, depends primarily on two considerations--equity and efficiency.

Equity--While the term equity is very difficult to define in this context, it is influenced by previous price expectations and the existence of an international cartel (OPEC) that is currently setting world oil prices. If the higher prices resulting from decontrol were not expected by the industry when it decided to explore for and develop production wells, then the additional revenues could be considered a windfall. If, on the other hand, at the time the companies made this investment, they expected decontrol to occur after the expiration of EPCA, then equity would indicate that they should receive the additional revenues.

It is difficult to judge previous expectations, since investments to explore and produce currently flowing oil took place over a twenty-to-fifty-year period. Expectations undoubtedly have changed markedly over time. It is probable, however, that investments to produce old oil were made with lower expectations than the current world price level.

The other component of the equity debate concerns the so-called market power of OPEC. If OPEC prices merely approximate a true market price and the cartel, in fact, has no monopoly power, then domestic oil producers should be allowed this price if, in fact, it was expected when they originally invested. On the other hand, if OPEC members are adjusting supply so as to maintain a higher than market price, then the domestic oil producers could be taxed on their additional producer revenues. The evidence suggests that the OPEC price is somewhat above the true market price, but the magnitude of the difference is debatable.

Efficiency--The second issue to consider in treating windfalls is efficiency--namely, whether or not the imposition of windfall taxes would impair the domestic industry's ability to explore for and produce oil. The President's windfall taxes would apply to the additional revenues that upper- and lower-tier oil would receive if sold at the world price. Most economists view the question of efficiency in terms of the prices allowed for new oil production: If the price of oil is high enough, investors will undertake the

investment required to produce it. All the investment funds need not come from oil companies' internal cash flow, they argue, for the high price would be enough to attract the necessary capital from outside investors. Viewed in this context, the incentives proposed by the President to encourage new oil exploration and development appear adequate. For truly new oil, the producers would be allowed the world price, curently over $16.00 per barrel. For marginal wells, the President would more than double the allowed price, from $6.00 to about $13.00 per barrel over the next six months. For expensive tertiary recovery, the marginal revenue to the producers would actually exceed the world price, since producers undertaking tertiary projects would also be allowed more rapid decontrol for already flowing oil. Moreover, the price incentives cited here would be largely unaffected by windfall taxes which would not be applied to the "margin" where additional supplies would be produced.

Some producers, along with segments of the banking community, have argued that, because oil exploration and development is a relatively risky investment, it is difficult to obtain external financing and internally generated funds are a necessity. Therefore, they reason, without the additional cash flow, the required investment for exploration and development would not occur. This view, however, is inconsistent with normal business behavior. With the large price incentives in the President's program, all of the domestic oil that could be produced at a price of $16.00 per barrel should be produced. If increased cash flow would result in even more oil production, then this new production would not have occurred at a $16.00 price, although this is the price that it would receive. It is extremely doubtful that increased cash flow would be used to subsidize the production of oil that is unprofitable at the world price. Moreover, existing studies demonstrate that the petroleum industry has sufficient access to capital markets and is capable of borrowing funds. Thus, the President's price incentives would probably be sufficient to conduct domestic exploration and production efforts, and any additional revenues for existing oil would exceed the amount required to expand supply.

Future Real OPEC Price Increases. In addition to the windfall taxes on additional revenues resulting from raising lower- and upper-tier oil to the world price, the President has proposed a third tax on real OPEC price increases above and beyond the market barrel price as of April 1, 1979, before the subsequent imposition of surcharges. This marker barrel price (the price of Saudi light oil, the benchmark against which other crudes are assigned prices based on quality differentials) was $14.54 per barrel on that date, and oil sold at that price in the Persian Gulf would land on the U.S. coast at a price of about $16.00 per barrel. Since OPEC oil competes with domestic oil from its coastal landing point, domestic wellhead prices could rise over $16.00 per barrel only if OPEC prices rise. (In fact, this is

currently the case--domestic stripper oil is now receiving $18.00 per barrel, since surcharges have added to the OPEC landed price with which stripper competes.) Thus, under the President's program, this $16.00 per barrel figure is assumed to be the "world incentive" price, and any wellhead price received in excess of this price is deemed a windfall and will be taxed at the windfall rate of 50 percent.

When lower- and upper-tier oil reach the world price, any incremental revenues resulting from OPEC price increases over the world incentive level would also be taxed at the windfall rate as part of the upper-tier tax. Since a separate tax on OPEC price increases over the world incentive level would only affect oil that does not rely on decontrol to reach the world price, it essentially would be a tax on stripper oil, the only kind of domestic oil that currently receives the world price, and on new discoveries, which would be decontrolled immediately under the President's plan. 1/ The tax will therefore be applied to the wellhead revenues of this oil in excess of the real equivalent of $16.00 per barrel.

The important effects of this tax proposal would grow over time. Although future OPEC price increases may not be as dramatic as those witnessed over the past several months, real price increases are very likely as the oil market tightens over the late 1980s and early 1990s. For example, should OPEC prices rise by 3 percent in real terms annually between now and 1985, the price of stripper and newly discovered oil would be $7.00 per barrel higher than the market incentive price. If 3 percent real price increases continued through 1991, this difference would rise to $22.29 per barrel, and since the upper-tier tax as proposed by the President would expire on January 1, 1991, all domestic oil would then be subject to the tax on real OPEC price increases. With these conditions, the 1991 tax liability of producers would be $30.1 billion, an amount greater than the peak liability for producers between 1979 and 1985 under the President's proposals.

Whether or not these additional domestic producer revenues, resulting from increases in the OPEC oil prices are windfalls also depends on the equity and efficiency arguments, as outlined in the previous section. The critical factor concerning equity is whether or not the OPEC price approximates a true market price or is substantially above a market approximation. If the price is competitive, it should not be taxed; if it is a

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1/ Sales of oil from Naval Petroleum Reserve also receive a price close to stripper's, but the Administration would presumably exempt the government from this tax.

monopoly price, it should be taxed. The efficiency argument, on the other hand, depends primarily on whether or not the oil producers could efficiently utilize the additional funds to find and produce additional oil. While this depends on the probability of locating new reserves and the assumed inflation rate on exploration and development, it now appears that small increases in the real price of OPEC oil would generate considerable additional revenues. Whether or not the companies could productively use these funds in the exploration and development of domestic oil is difficult to determine.

Between 1979 and 1985, under the CBO base case, the tax on real OPEC price increases would create total new liabilities of $5.5 billion. Liabilities would be $713 million in 1980, $793 million in 1981, and $933 million in 1982, rising to $1.1 billion by 1985. These liabilities would be incurred, by and large, because any OPEC surcharges ($1.20 per barrel in the base case) are viewed as increments above the market incentive price.

Should OPEC prices rise by 3 percent annually, these estimates would increase. Total liabilities would rise from $5.5 billion to $11.5 billion over the 1979-1985 period. Annually, liabilities would be $0.9 billion in 1980, $1.3 billion in 1981, and $1.8 billion in 1982, rising to $3.5 billion by 1985.

The Effective Marginal Tax Rate on Corporate Income

Decontrol of oil prices would create significant income gains for oil companies even after imposition of the proposed windfall tax. These income gains would produce added federal receipts from the corporate income tax. Because of the write-offs for oil drilling, the size of these added tax receipts would depend heavily on the investment responses of oil producers including the level of profits from those efforts.

Corporate taxes are calculated by applying a tax rate to an income base. The income base is defined as revenue less allowable deductions. Operating expenses, other taxes, and accelerated depreciation of invested capital are normally allowed as deductions from gross revenue to arrive at taxable income.

Tax provisions relating to oil companies, however, provide some additional tax benefits for exploration and development costs--benefits not generally available for investment in other industries. In particular, the oil industry is allowed to claim drilling costs as immediate deductible expenses, rather than capital outlays which would be recoverable over the life of the project of which they are a part. Therefore, for accounting purposes, oil companies frequently show a large share of their nominal tax liability as

"deferred taxes" which are offset by deductions taken over the life of the projects from which they arise. For tax purposes, however, the deductions are taken promptly and reduce the taxes on current income. This procedure substantially shelters the income -derived from prior projects from current taxation. In recent years, drilling expenditures have provided expense deductions large enough to offset nearly half of the tax that would have been due if the statutory rate of 46 percent were applied to oil company net incomes without this "intangible drilling cost" provision. 2/ The opportunity for oil companies to deduct intangible drilling costs from income amounts to a plowback provision against the corporate income tax.

As shown in Table 6, calculation of the taxes on new profits attributable to decontrol starts with the incremental revenues and subtracts expenses and universally available investment-related deductions to arrive at profits from decontrol using standard tax treatment. From this amount, oil companies are allowed the additional tax deduction for drilling to arrive at their increase in taxable income resulting from decontrol. The added corporate profits tax receipts result from application of the statutory rate of 46 percent to the estimated gain in taxable income, allowing for all deductible expenses from incremental income and subtracting the estimated increase in investment tax credits from the tentative tax liability. The increase in corporate tax averages 15 percent of profits from decontrol over the period 1979-1985. The effective rate beyond 1985 depends heavily on drilling after that time.

The assumed increase in drilling expenditures resulting from decontrol rises from an extra $200 million in 1979 to a peak of an extra $6.5 billion in 1982, and declines to an extra $3.6 billion by 1985. This new investment produces substantial deductions that reduce tax liabilities on decontrol-related income for 1979 through 1985. The estimated tax rate starts at 13 percent in 1980, drops as low as 6 percent in 1981 and 1982 when added investment is a large percentage of revenues from decontrol, and then rises gradually to 26 percent by 1985, when assumed incremental investment has declined as a percentage of revenues from decontrol. Examination of 10-K data submitted to the Securities and Exchange Commission indicate that crude oil producers have recently paid an average tax rate of 30 percent on overall net income.

2/ This study assumes that drilling-related investments are 70 percent intangible drilling cost (expensed), and 30 percent capital investment (depreciated over 10 years using double declining balance). Nearly all of the 30 percent share is considered eligible for the investment tax credit.

TABLE 6: DERIVATION OF EFFECTIVE CORPORATE TAX RATES ON INCOME GAINS

REVENUE FROM DECONTROL

Less: Decontrol Expenses
1. Windfall Profits Tax
2. Operating Costs (Royalties, State Taxes, Production Costs)
3. Amortization of Incremental Investment

PROFITS FROM DECONTROL (Using Standard Tax Treatment)

Less: Intangible Drilling Cost Deductions in Excess of Amortization

CHANGE IN TAXABLE INCOME

Times: Corporate Tax at Statutory Rate (46%)
Less: Investment Tax Credit

INCREASE IN TAX LIABILITY FROM DECONTROL ($5.9 BILLION)

Added Tax as a Percent of:	
Revenue from Decontrol	5 percent
Profits from Decontrol	15 percent
Change in Taxable Income	38 percent

These tax estimates depend on several key assumptions: the expansion of drilling expenditures, the revenues resulting from newly discovered oil, and the production costs for newly discovered oil. Under CBO assumptions for incremental drilling expenditures, success rates, and production costs, the effective corporate income tax rate on the net income from decontrol (allowing write-offs for amortization of investment outlays) is 15 percent. The corporate tax rate on income from decontrol after the imposition of windfall taxes (but before the deduction of increased expenses and intangible drilling costs) is estimated at 9 percent.

The estimated tax levy on the $82.8 billion of income resulting from decontrol from 1979 through 1985 would be $25.7 billion in windfall taxes on lower- and upper-tier oil and an additional $5.5 billion would result from the windfall tax paid by stripper and newly discovered oil based on OPEC price increases. Oil companies would also pay $4.0 billion in additional corporate income tax levies and $4.1 billion in additional state taxes. An estimated $10.0 billion would be spent for added production costs and royalties, and $32.1 billion for increased investment. This would leave $1.4 billion (less than 2 percent of the estimated $82.8 billion of income from decontrol) for other investments or distribution to oil company stockholders.

Windfall Tax Options

The President's decontrol plan would generate $68.9 billion in windfall income on existing production and an additional $13.9 billion in revenues from new production between 1979 and 1985. The $68.9 billion in windfall revenues is the base to which the four following alternative tax options will be compared:

- The President's 50 percent windfall profits tax.
- A higher tax that assumes a 75 percent tax on the upper-tier windfall.
- A lower tax that assumes a 25 percent across-the-board windfall tax.
- A plowback proposal that allows deduction of new drilling and exploration expenses from the windfall tax base before application of a 50 percent windfall tax rate.

For each of these tax options, windfall tax rates were applied to the windfall tax base as defined by the President. Thus, lower-tier oil from marginal wells, oil released to accompany tertiary production, and oil declined at a rate greater than the natural rate but less than 2 percent per month were not included in the windfall tax base until they reached the upper tier. The results for the four options are summarized in Table 7.

The President's Windfall Tax. The President's proposals would apply a 50 percent rate to windfalls from decontrol, after the above mentioned exemption of some lower-tier oil. Out of the $68.9 billion in windfall revenues, $51.4 billion would be treated as the base for a windfall profits tax. The difference, $17.5 billion, would be exempted under any of several categories defined by the proposals.

TABLE 7. PRODUCER TAX LIABILITIES RESULTING FROM ALTERNATIVE WINDFALL TAX PROPOSALS a/: IN MILLIONS OF CURRENT DOLLARS

Calendar Year	President's Proposals	High-Windfall Rate	Low-Windfall Rate	Plowback Case
1979	195	195	195	195
1980	1,635	1,993	1,199	899
1981	4,646	5,936	3,265	2,822
1982	5,881	7,683	4,120	3,577
1983	5,647	7,475	4,042	3,567
1984	5,701	7,310	4,142	3,846
1985	5,960	7,434	4,485	4,552
Total	29,665	38,026	21,448	19,458

a/ Includes corporate income tax liability.

Windfall tax liability on this $51.4 billion would be $25.7 billion between 1979 and 1985. The $25.7 billion remaining after windfall taxation, plus the $17.5 billion specifically exempted from windfall taxation, would be taxed through the conventional corporate income tax. Using CBO's assumptions concerning the effective marginal corporate rate, these revenues would yield corporate tax liability of $4.0 billion over the 1979 to 1985 period. Coupled with windfall taxes, a total of $29.7 billion out of the $68.9 billion of windfall revenues would be taxed. If this windfall had been subject to corporate income taxes only, liabilities of $13.3 billion would have resulted. Hence, windfall taxes, as proposed by the President, more than double the tax liability that would have been incurred under corporate income taxes alone.

Higher Windfall Tax. To put the President's proposals in context, estimates have been made for higher and lower windfall taxes. The higher windfall tax was computed by applying a 50 percent windfall tax rate to lower-tier oil and a 75 percent tax rate to upper-tier windfalls. This differential rate reflects the belief that oil production economics justify upper-tier prices on old oil since a greater supply response is expected from older wells and this requires new investment. It should be noted that these rates were applied to the same windfall base as were the President's. Such a scheme would result in a tax liability, including both windfall and conventional corporate income taxes, of $38.0 billion out of the $68.9 billion windfall, of which $37.2 billion would be collected through windfall taxes, and $0.8 billion through corporate income taxes. Compared to the President's proposals, this tax would produce an incremental $8.3 billion, or 12 percent of the total windfall between now and 1985.

Lower Windfall Tax. This lower 25 percent rate reflects the belief that domestic producers are entitled to receive the larger share of windfalls resulting from both decontrol and OPEC price increases, irrespective of revenue needs for exploration and development. Between 1979 and 1985, this rate would produce $12.8 billion in windfall tax liabilities and $8.6 billion in regular corporate income taxes, for a total of $21.4 billion in tax liabilities. These liabilities would be $8.3 billion less than those that would result from the President's proposals.

Plowback. A second, hypothetical lower tax proposal takes the form of a plowback provision. Producers would be allowed to deduct expenditures for new drilling from the 50 percent windfall tax base for their upper- and lower-tier oil, until all of these windfall profits were used up. The argument for a plowback provision is that even world prices for new oil discoveries are insufficient to encourage new exploration and development. With world price incentives for new discoveries in the President's plan, a plowback provision would represent a subsidy to producers that would raise their incentives to a level over the world price. Under a full plowback provision, new exploration and production expenditures are assumed to create deductions against the windfall tax base of $2.3 billion in 1980, $5.7 billion in 1981, and $7.2 billion in 1982, for a total of $31.9 billion from 1979 to 1985. This total would be subtracted from the $51.4 billion windfall tax base, leaving a windfall tax liability of $9.7 billion, which, when added to the $9.8 billion corporate income tax liability under plowback, would result in a total new tax liability of $19.5 billion between 1979 and 1985. This would be $10.2 billion less than the President's proposals and $6.2 billion more than the revenues that would have resulted from a simple application of the corporate income tax to the entire windfall.

CHAPTER V. THE IMPACT ON THE ECONOMY

This chapter presents estimates of the likely effects of decontrol and the proposed windfall profits tax on the overall economy. The major economic impact of decontrol will be on the rate of inflation. Relative to an indefinite extension of controls, the cumulative impact on the level of prices is estimated to be an increase of about 0.6 to 0.8 percent by the end of 1982. Compared with an immediate elimination of controls, the President's plan merely spreads these price rises over a longer period of time. The effects on real Gross National Product (GNP) and unemployment are estimated to be small and to occur mostly after 1980.

In this chapter, four key issues that influence the impact of decontrol and the windfall profits tax on the economy are discussed:

- The response of consumers to the rise in oil prices;
- The speed of the oil companies in investing a portion of their new after-tax earnings;
- The ability of the federal government to return quickly the extra tax revenues to the private sector; and
- The response of monetary policy.

Finally, empirical estimates of the effects of the President's plan on prices and the real (constant dollar) economy are presented.

Impact of Decontrol

Consumers could cushion the impact of higher oil prices in a number of ways. First, consumers could reduce their savings or borrow more in an attempt to maintain present consumption levels. In the current circumstances, however, many economists believe that the savings rate is already low and that the burden of consumer debt is beginning to reach a critical level. Second, consumers could decrease real consumption, not only of

energy-related products, but of other items as well. 1/ Over the medium term, as the price effects of decontrol further erode real spendable income, it is reasonable to expect some reduction in real economic activity.

Perhaps the major uncertainty underlying the estimated effects of decontrol is what would happen to the increased profits accruing to the oil producers. Some of these extra corporate profits would be taxed away by the existing corporate income tax. Still more profits would be captured by the proposed windfall profits tax. 2/ The President has proposed that most of these receipts be redistributed to low-income households, to mass transit assistance, and to energy investment. If the increase in federal revenues is not matched by new expenditures or reductions in other taxes, the federal deficit will be reduced or the surplus will be increased, depending on the state of the economy in the relevant budget year. This resulting tighter fiscal policy will exert a restrictive effect on the economy.

It is generally believed that federal spending increases have a somewhat larger medium-term effect on the economy than do federal tax decreases of the same amount--especially if these taxes are corporate taxes. 3/ Consequently, even if the proposed spending is somewhat less than the increase in corporate taxes, the effects on output and employment should approximately balance out. It is reasonable to assume, however, that the spending of these funds will not be synchronized with the receipt of extra corporate tax revenues. Given the high capital intensity of some of the possible projects to be funded through the Energy Security Fund and the degree of planning that must be done before these projects can begin, the rate of actual spending for these projects will probably be much lower than

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1/ Some would argue that consumption might actually be temporarily stimulated in the short-run by decontrol if consumers decide to switch to more energy-efficient cars, applicances, and the like, sooner than they had previously planned. This would necessarily result in additional borrowing and still further reductions in saving.

2/ The windfall profits tax is discussed in Chapter IV. Estimates of the increased federal government receipts are shown in Table 7.

3/ For a discussion on spending and tax multipliers, see Congressional Budget Office, Understanding Fiscal Policy, Background Paper (April 1978), Chapter III.

the rate at which tax revenues flow into the Treasury. If spending were to lag behind taxes, then the total decontrol package would exert a net restrictive fiscal influence on the economy.

The increase in after-tax corporate profits could be disposed of in three ways: increased investment, reduced borrowing, and higher dividends. The smaller independent oil companies, which account for about one-third of newly discovered oil, have limited opportunities to invest in anything other than exploration and drilling, whereas the major oil companies have numerous avenues of investment in both nonpetroleum energy and in nonenergy areas. The net effect of decontrol on investment, of course, is the difference between the positive thrust coming from the increase in productive reinvestment of higher corporate profits and the negative impact of a weaker economy as higher prices and a possibly tighter fiscal policy feed back on consumer demand.

Dividend payments by the oil companies might rise as a result of decontrol. These payments would be directed at a relatively high-income portion of the population, however, and would increase savings relative to consumption. Because the magnitudes of reallocated consumer savings and reduced corporate borrowings are expected to be quite small, interest rates would be little affected by decontrol.

It is unlikely, however, that the additional profits accruing to the oil companies would be respent quickly enough to replace the reduction in consumer spending during the decontrol period. First, as pointed out above, government spending would have to rise almost the full amount of the extra corporate income tax revenues. Second, extra corporate dividends would have to be largely respent by their recipients, and the actual expenditures for any resulting additions to investment might lag behind the consumption reductions. In addition, if the oil companies reduce their indebtedness, this could put downward pressure on interest rates and stimulate additional investment, but this would occur with an even longer lag. By the mid-1980s, however, it is likely that the economy will have less consumption and more investment than the base-case scenario, and this additional investment may ultimately improve labor productivity and help lower the rate of inflation by easing cost pressures on firms.

On international markets, the dollar might strengthen with decontrol because of the favorable impact on the U.S. balance of payments, as the quantities of oil imports are reduced by decreased domestic demand and increased domestic supply. Appreciation, or at least slowing of depreciation, of the dollar would aid domestic inflation by slowing the rate of price

increases of imported goods. On the other hand, it could retard somewhat the growth of exports and thus dampen the degree of improvement in the balance of payments.

Empirical Estimates

This section presents estimates of the effects of decontrol and the windfall profits tax on prices, output, and employment. The rates of inflation, real output, and unemployment under the President's plan are compared with what the rates would have been with an indefinite extension of controls (the base case). The period of analysis is divided into two three-year segments: 1979-1981 and 1982-1984. Although the quantitative results presented here offer some flavor of the likely outcome of decontrol, they depend on the specific assumptions made about the response of consumers, the oil companies, and the federal government. A summary of these results is presented in Table 8.

Inflation. The effect of decontrol on inflation will begin gradually, adding no more than 0.1 percentage point to the inflation rate in 1979. The effect will add about 0.2 percentage point in 1980 and 0.3 percentage point in 1981. During and after decontrol, some feedback effects resulting from larger wage increases stimulated by the initial price increases are likely to occur. Lagged results of this effect should add another 0.1 percentage point to the inflation rate in 1982. In the following years, any additional price impact should be negligible as further lagged feedback effects are dampened by a slightly weaker level of economic activity. The cumulative impact on the level of prices as a result of decontrol is thus likely to be a rise of between 0.6 and 0.8 percent by the end of 1982.

These estimates assume that the prices of substitute fuels are constant and that 100 percent of the price increase from decontrol is passed on to consumers. In the event that refiners absorb some of this cost because of competition from imported refined products such as residual fuel oil, the inflationary impact will be proportionately smaller. For the purposes of comparison, the economy without decontrol is assumed to have the domestic composite price for crude oil increasing at the rate of inflation through 1985. World oil prices are assumed to be unaffected by decontrol.

Output and Employment. The economy experiences the largest increases in prices in the first three years, but the impact on the real economy becomes most noticeable in the second three years. By 1981, the unemployment rate is virtually unchanged, while real output is at most 0.3

percent lower than the base case. By 1984, the unemployment rate is projected to be only 0.1 to 0.2 percent above the base case, while the level of output is still less than 1 percentage point below the scenario of no decontrol. Furthermore, the effects of past increases in prices are beginning to decrease by the mid-1980s, and the gap in real output is expected to be closing rather than widening as the economy moves into 1985 and beyond.

TABLE 8. ESTIMATED ECONOMIC EFFECTS OF DECONTROL: DIFFERENCES FROM THE BASE CASE

Economic Variable	1979-1981	1982-1984
Real Output a/ (Annual percent growth rate, GNP in 1972 dollars)	0.0 to -0.1	0.0 to -0.2
Prices (Annual percent change in the Implicit GNP Inflator)	+0.1 to +0.3	0.0 to +0.2
	1981	1984
Unemployment Rate (Percent Difference in Level)	0	0.0 to +0.2
Price Level (Percent Differences in Implicit GNP Deflator)	+0.5 to +0.5	+0.6 to +0.8

An important factor in these estimates is the assumed monetary response of the Federal Open Market Committee (FOMC) to decontrol. If the FOMC sought to bring the level of prices back to the no-decontrol baseline by 1984, for example, interest rates would rise and demand in the

private sector would be dampened. In such a scenario, the price effects of decontrol would be smaller and the output and employment effects would be larger than the estimates presented here, which assume a partial accommodation of the additional inflation by the FOMC.

CHAPTER VI. ALTERNATIVE REVENUE USES

If oil prices are decontrolled, the Congress will face a critical decision on the distribution and use of the additional revenues. One alternative, which was discussed briefly in Chapter IV, would allow the oil producers to keep these revenues under the assumption that they would invest the funds in additional exploration and development, thereby increasing domestic oil production. An alternative would be to enact a windfall profits tax to recoup the funds for the public and to use the funds to ease the transition to a more energy-efficient economy.

The President has proposed the latter strategy, which includes the establishment of an Energy Security Fund to redistribute the tax revenues to low-income households to soften the burden of higher energy prices and to mass transit and energy investments to assist in the transition. This chapter analyzes the advantages and disadvantages of a trust fund mechanism per se and then discusses the transit and investment uses recommended by the President. Several alternative spending options are also presented. The rebate to low-income households is addressed separately in Chapter VII. The various proposed tax credits and the effectiveness of a regional petroleum product reserve are not discussed in this report since the expenditures for these items are expected to be far less than those for mass transit and energy research and development.

THE TRUST FUND MECHANISM

In the past, the Congress has used trust funds principally to finance projects requiring large capital expenditures. Since the completed projects are used primarily by specific groups of people, the view was that these users should pay for the capital expenditures through user charges. The prime examples of these trust funds are the Highway Trust Fund through which federal gas taxes are used to finance the construction of the interstate highway system and the Airport and Airway Trust Fund through which taxes on commercial and general aviation are used to construct airports and airways.

Trust funds do, however, have some major disadvantages from budgetary and policy coordination standpoints. First, with their long-term earmarking of funds, trust funds limit budgetary control since they are only

marginally affected by budget resolutions and the appropriation process. Second, since there are already relatively large federal programs for both energy investments and mass transit, additional expenditures from a trust fund would create coordination problems for the Congress in their authorization and appropriation processes and for the executive agencies in the administration of these programs. Finally, since the revenue flow into the fund would be extremely sensitive to future OPEC prices, which are difficult to predict, it might be difficult to plan and manage the expenditures from such a fund. This would be particularly true for energy investments, which are primarily long-term capital projects.

ENERGY RESEARCH AND DEVELOPMENT

The President has specified several major energy research and development (R&D) programs for funding by the Energy Security Fund. Essentially, the program is oriented toward short-run fossil fuel development, including a second solvent refined coal (SRC) demonstration plant, a development program for other synthetic liquid fuels (including gasoline substitutes), and additional funding for coal R&D. These programs are all realistic candidates for additional funding. It may be possible, however, to reduce the funding levels of other R&D programs and apply the savings to these programs. The individual programs recommended by the President are outlined in the next section. After the President's proposals are discussed, some alternative options, which primarily represent long-run R&D projects, are presented.

The President's Proposals

Solvent Refined Coal. Solvent refined coal is a promising synthetic fuel for the replacement of residual fuel oil or gas used in intermediate- and peak-load plants in the electric utility industry. Because of its low sulfur content and high heat values, SRC burns fairly cleanly and is not expected to require the expensive stack gas-scrubbing equipment usually needed to burn coal.

DOE is now completing conceptual design studies for two SRC processes, SRC-I (producing a solid product) and SRC-II (producing a liquid one). At the completion of these studies, DOE plans to construct a 6,000-ton-per-day demonstration plant for one of the two SRC processes. Monies from the Energy Security Fund would be used to build the second SRC demonstration plant. (One plant has already been requested.) Capital costs

for each demonstration plant are expected to be about $600 million, and operating costs are expected to run about $100 million for the total anticipated operating time of two to three years. The demonstration plant would produce about 1 £5,000 barrels per day of oil equivalent. A second demonstration plant would provide engineering and cost information regarding the processes, which could speed the transition to commercial plant construction. The commercial application would not, however, begin to affect the reduction of oil imports until the early 1990s.

Although little is known about the characteristics of commercial SRC plants, information now available suggests that only very large commercial SRC plants could achieve low per unit prices for their product. It appears that the desirable commercial plant scale for either SRC process would be about 30,000 tons of coal input per day. Capital requirements for such a plant are expected to be on the order of $2 billion. The product cost would be about $25 to $35 per barrel of oil equivalent.

Synthetic Liquids. Although the President's proposals for additional R&D for synthetic liquid fuels are not spelled out in detail in the public documentation, this seems to be a large and high-priority program. Of all the synthetic fuels under consideration, the case for liquid fuels seems most compelling.

Substitutes are available for most end uses of fuel. For example, although natural gas is preferable for industrial, residential, and commercial space heating, an electricity/heat pump combination can be used if gas is not available. But the transportation sector is almost totally dependent upon one liquid fuel or another, and nonliquid fuel forms are poor substitutes at best. Eventually, a variety of substitute liquid fuels will be essential to supplement diesel fuel, kerosene, and gasoline.

The major U.S. resources from which liquid synthetic fuels can be made are oil shale and coal. There are extensive oil shale deposits in Colorado, Wyoming, and Utah. Research and development by several corporations suggests that, if oil shale is mined and then processed above ground (termed surface retorting), oil could be produced from shale at a relatively modest cost of, say, $20 to $30 per barrel. If the mineral could be processed underground (on-site processing), thereby eliminating the mining step and much of the equipment, even lower costs of about $15 to $25 per barrel would be possible. The on-site technologies are being pursued by several groups.

Fuel liquids from coal would probably be more expensive than liquids from oil shale, with an anticipated minimum cost of $25 per barrel. The most expensive processes, such as that employed at the Sasol plant in South Africa, would probably cost in the range of $40 to $50 per barrel of oil equivalent.

Whether using oil shale or coal, the production of liquid synthetic fuels faces numerous obstacles. Technological and other uncertainties are pervasive. If plants were built in the West, consumption of scarce water and deteriorating air quality would be potential problems. All liquid synthetic fuel processes seem to require large plant size, with investments in the $1 to $2 billion range, to bring per unit costs down to reasonable levels. Raising such large sums of money and engaging in very large construction projects pose serious challenges. Additional federal assistance could be valuable at this time, if it were used to reduce the uncertainties associated with developing a synthetic liquids industry.

Environmental Control Technologies for Coal. The third proposal for fossil energy R&D support from the Energy Security Fund involves accelerated development of technologies that would permit the increased use of coal without lowering environmental standards. The proposed R&D priorities are:

- Improved combustion processes that would allow the substitution of coal for an increased portion of the oil currently burned in oil-fired facilities.
- Accelerated materials and components research that would assist efforts to produce liquids and gases from coal.
- The development of improved mining systems that would increase safety, productivity, and health.
- The development of advanced coal-cleaning technologies that might be used alone or in combination with stack gas-scrubbing systems to burn coal cleanly.

All of these technologies would facilitate the transition to coal as a major energy source.

Alternative Energy R&D Technologies

If the Energy Security Fund is enacted by the Congress, the proposals recommended by the President would be reasonable short-term spending

options to assist in the transition to alternative energy sources. However, some long-term alternatives could also be serious candidates for additional funding, specifically solar, fusion, and fission energy. 1/

Solar. The solar energy research and development program is particularly important because solar energy has two unique advantages. First, solar energy is renewable. Second, it can be used with negligible environmental disruption. But in each potential solar energy application, cost is the critical barrier to expanded solar energy use. In solar heating and cooling of buildings, additional federal assistance might allow exploitation of economies of scale and, moreover, cut distribution costs sufficiently to make solar energy nearly cost competitive. In the science of solar photovoltaic electricity, more intensive research in semiconductor physics in general, and in the photoelectric properties of semiconductors in particular, might help reduce the substantial cost gap that now bars this energy source from practical application. Both technologies are candidates for increased funding.

Fusion. Fusion energy could prove to be a depletion-proof source of central station electricity that is free from the waste disposal and reactor safety problems that currently bar expanded use of nuclear fission-based reactors. But both scientific and commercial feasibility remain to be established. While impressive recent experiments have indicated that scientific feasibility--that is, net fusion energy production--may be achieved soon, many extremely difficult materials and engineering problems will stand between that achievement and a commercial fusion reactor. An expanded effort in the development and testing of candidate materials and components for fusion reactors might help ensure that engineering and materials problems do not restrict fusion reactor development.

Fission. Two lines of long-term fission reactor development might benefit from funding by the Energy Security Fund. Among nonbreeder reactors, one is both relatively far along in development and attractive on both safety and proliferation-resistance grounds--the High Temperature Gas Reactor (HTGR), particularly the direct-cycle variant in which a gas turbine, rather than an intervening steam cycle, is employed.

1/ Additional information can be found in CBO, "The Energy Research and Development Budget: An Overview," unpublished Staff Draft Analysis (March 16, 1979).

Among breeder reactors, the best known--the Liquid Metal Fast Breeder Reactor--was selected as a leading breeder technology long before the associated proliferation problems were sufficiently appreciated, and it has been successfully developed elsewhere. But there are several other kinds of breeder reactors, particularly the thorium-cycle breeder reactor, that may have superior nonproliferation characteristics. Exploration of this or an alternative breeder reactor, which is impossible at current funding levels, might be undertaken with Energy Security Fund financing.

MASS TRANSIT

While full details on the Energy Security Fund are not yet available, it does call for federal grants for mass transit capital improvements. These funds would be used primarily for the purchase of new buses and rehabilitation of existing rail systems. The thrust of the program would be to reduce automobile gasoline consumption by providing additional urban transport capacity.

Background

Transportation for people in urban areas consumes about one-fourth of the nation's petroleum, or about 10 percent of all energy. Except for travel in the central parts of older cities, such as Boston or New York, most of this energy is consumed by the automobile. There are significant differences among the energy efficiencies of the different modes of urban transportation. A previous CBO study found that, on a door-to-door basis, after adjusting for the energy used in vehicle manufacture, in route construction, and for round-about journeys, the most energy-efficient modes were vanpools and buses, while the average automobile was among the least efficient. 2/ Vanpools and buses are about three times as efficient as the typical auto and twice as efficient as new rail transit systems, such as those in San Francisco and Washington, D.C. Because of their reliance on greater speed and amenities such as air conditioning and escalators, newer rail transit systems are significantly less energy-efficient than are older rail systems, such as those in Boston, Chicago, New York, and Philadelphia.

2/ CBO, Urban Transportation and Energy; The Potential Savings of Different Modes, Committee Print by the Senate Committee on Environment and Public Works (September 1977).

The amount of energy that can be saved by a particular mode of transportation depends on its ability to attract riders from less efficient modes. For example, new carpools result in very large energy savings because they typically attract riders from single-occupant automobiles--a very inefficient mode. In contrast, although new rail transit is usually thought of as very energy efficient, CBO's analysis shows that the typical new rail system increases energy consumption since it attracts many of its riders from even more efficient buses. Depending on the energy source for electric generation, however, rail transit systems still might result in some petroleum energy savings. Thus, the proposals to concentrate efforts on buses and older rail systems to conserve energy in mass transit appear reasonable. Certainly, additional grants for new mass transit rail systems would be counter-productive in terms of energy savings.

Potential Energy Savings

The expanded funding for mass transit would probably influence energy consumption in two ways: increased bus patronage and increased ridership on new rail systems. The increased bus grants should encourage a modest expansion in bus patronage. Although energy savings from this expanded usage would be negligible in the early years, by 1985 savings could be between 5,000 and 10,000 barrels of oil per day. The estimated energy savings are based on the assumption that an additional 8,000 buses, a 15 percent expansion in the fleet size, would be purchased. Such an expansion is likely, however, to add to current operating deficits and thus to greater pressure for increased federal operating aid.

These calculations assumed that most of the funds earmarked for buses were used to purchase new buses, as apparently is assumed by the Administration. It might be possible to increase the investments that improve bus productivity. Examples include exclusive bus lanes and contra-flow lanes that permit buses, carpools, and vanpools to bypass regular highway traffic; park and ride facilities; ramp metering to improve the flow of traffic on freeways; and coordinated traffic lights, including signals that can be activated by buses. 3/ Such a program would have the advantage of increasing the productivity of the more than 50,000 transit buses in the fleet instead of merely increasing the size of the fleet.

3/ Some of these options are discussed in more detail in CBO, Urban Mass Transportation; Options for Federal Assistance (February 1977), pp. 40-50.

The added money for buses and older transit systems should allow a reallocation of existing federal mass transit funds to permit the starts of two new rail transit systems between now and 1985. But, as discussed above, these new rail systems are likely to be less energy-efficient than older ones. Because of the normal planning and construction delays, however, new rail systems would probably not be operating much before 1985.

Alternative Mass Transit Proposal

Since vanpools and carpools show even greater energy savings than do buses, a program to encourage their use could result in substantially greater energy savings than the mass transit program proposed by the President. Currently, both vanpools and carpools are operated almost entirely on a voluntary basis without government aid or involvement. Lack of funds does not appear to be the most important factor in their success or failure, so that a new program of federal financial aid is unlikely to have a large effect on the use of vanpools and carpools. Rather, institutional problems, such as concerns over liability insurance and lack of information, appear to be the major constraints.

SPENDING ALTERNATIVES

There are several alternatives for spending the additional tax revenues that would be generated by decontrol through the excess profits and corporate income taxes. Three options are addressed in this analysis:

- Do not earmark funds--that is, allow the budget and appropriations committees of the Congress to decide on the use of the funds.
- Establish a fund to expedite development of petroleum in non-OPEC countries.
- Roll back payroll taxes.

No Earmarked Funds. Since spending decisions are usually made independently of revenue decisions, a major alternative would be not to establish a fund to spend the tax revenues. Instead the budget and appropriations committees--the committees traditionally concerned with such decisions--would decide how to use the funds. These committees could recommend spending on projects similar to those of the President or other

programs, or they could decide to decrease the size of the deficit. Such an option would have distinct advantages over the President's proposed Energy Security Fund in terms of budget efficiency and overall planning and policy coordination.

Fund to Expedite Development of Petroleum in Non-OPEC Countries. An alternative use for the President's proposed energy fund is to use the fund to finance exploration and development of oil resources in countries that have potential resources and do not belong to OPEC. 4/ In theory, there is little reason to believe that such a fund is necessary because private entrepreneurs have been exploring for oil in virtually all countries since the turn of the century. As a practical matter, however, a fund might be beneficial for several reasons:

- Recent price increases have increased the probability that many "semi-explored" provinces have economically attractive deposits of oil.
- Private firms may not have sufficient access to risk capital to invest in exploration as fast as is socially desirable.
- Some countries have restricted private oil companies from the development of the countries' oil resources.

The need for this kind of fund or for this type of exploration is, however, very controversial. One side argues that exploration has been inadequate in many nations because of political restrictions, instability, or availability of nearby, inexpensive fuels. As evidence, one study claims that 95.7 percent of the world's exploratory drilling has been accomplished on only half of the prospective areas. 5/

The other side contends that patterns of exploration have been more thorough than is apparent. About half of the non-North American exploratory wells drilled between 1967 and 1976 were in the developing and non-

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4/ See CBO, A Strategy for Oil Proliferation; Expediting Petroleum Exploration and Production in Non-OPEC Developing Countries, Staff Working Paper (February 23, 1979).

5/ Congressional Research Service, Project Interdependence; U.S. and World Energy Outlook Through 1990 (November 1977), Chapter XX.

OPEC countries, and 71 of the 113 developing countries had exploratory wells drilled in that decade. 6/ Furthermore, 68 percent of the potential basins in the world (almost all of the basins that are not under polar ice or in deep ocean areas) have been explored to a degree that seems sufficient to find "giant" fields. Fields of this size now account for about 75 percent of the world's known reserves. According to this view, exploration of the "neglected" areas would not provide an important contribution to world reserves. 7/

On balance, it appears that there are potential benefits in using public funds to finance exploratory drilling investments in neglected areas in return for some assurances of future supplies if discoveries are made. But it is unlikely that such discoveries would be substantial.

Reduction in Payroll Taxes. Since the inflationary effects and the increased burden on low-income households are two of the most critical costs of decontrol, it is important to consider alternatives that might offset them. One such option would be to use the additional tax revenues from decontrol to reduce other taxes. While a personal tax cut might be considered, this has the critical disadvantage of stimulating demand and, hence, inflationary pressures. An alternative would be to reduce equally the employer and employee shares of payroll taxes. Although such a proposal would have the effect of breaking the link to direct financing of the social security system, it is estimated that such tax reductions would, on balance, lead to a lower rate of price increases by reducing the cost of labor compensation to employers.

A reduction in social security taxes would be relatively easy to implement. And, if the tax rate was reduced rather than the taxable wage base, after-tax wages would rise quickly and would reduce the adverse impact of higher energy prices almost immediately. In addition, the timing of the reduction could be closely phased with the increases in federal tax revenues resulting from decontrol. This would be an important advantage over spending programs that often do not "spend out" as quickly as intended. Finally, as discussed in Chapter VII, the coverage of payroll taxes is such

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6/ Exxon Corp., Exploration in Developing Countries (New York: Exxon, June 1978).

7/ Richard Nehring, Giant Oil Fields and World Oil Resources (Santa Monica, Calif.: Rand Corporation, 1978).

that, in conjunction with existing government transfer programs, most of the population affected by higher energy prices would receive additional funds.

The tax cut proposal considered here assumes that the size of these social security payroll tax reductions just equals the increase in tax receipts from decontrol, as shown in the first column of Table 9, and that 50 percent of this reduction accrues to employers and 50 percent to employees. For comparative purposes, the last column of Table 9 shows the currently legislated increases in social security taxes.

TABLE 9. ADDITIONAL TAX RECEIPTS RESULTING FROM DECONTROL AND LEGISLATED INCREASES IN SOCIAL SECURITY TAXES: IN BILLIONS OF CURRENT DOLLARS

Calendar Year	Additional Tax Receipts from Decontrol a/	Legislated Increases in Social Security Taxes b/
1980	1.6	0.5
1981	4.6	15.1
1982	4.9	20.7
1983	5.6	23.7
1984	5.7	27.2

a/ Estimates for the President's plan as described in Chapter IV.

b/ Base estimates assume wage base grows with the rate of inflation.

The employee portion of the tax cut would be indistinguishable from a reduction in federal personal income taxes, except for distributional considerations which are believed to be very small. The employer share,

however, would be expected to lead to a reduction in prices as firms pass on these savings to consumers in lower prices. 8/ Because there is little historical experience with such tax cuts, the empirical evidence to confirm such behavior by firms is modest. Consequently, these estimates must be treated as highly uncertain. The substitution of the payroll tax reduction for the proposed expenditures would have virtually no effect on the real economic growth. The improvement in the price level, however, is estimated to be roughly 0.3 percentage point by 1984. This deflation benefit results from the net impact of the payroll tax reduction and also from the reduction in federal spending. Consequently, such an option could reduce the cumulative inflationary impacts of the President's proposals by nearly half.

8/ For a discussion of these taxes, see CBO, Aggregate Economic Effects of Changes in Social Security Taxes, Technical Analysis Paper (August 1978). The estimates presented here assume two-thirds of the employers, tax reductions are passed forward.

CHAPTER VII. DISTRIBUTIONAL IMPACT AND ASSISTANCE TO LOW-INCOME FAMILIES

Under the President's plan, part of the incremental revenues resulting from oil price decontrol would be redistributed to low-income families. These families pay a disproportionate share of their income for energy-related goods and services and would, therefore, bear a disproportionate burden of any fuel price increase passed on to consumers. The Administration anticipates that this assistance would average $100 a year for the "typical" low-income household.

To assess the potential burden of oil price decontrol and the need for assistance to low-income families, this chapter first reviews the current distribution of oil expenditures by income class and region of residence. Second, future family expenditures on oil and the impact of decontrol are examined. Because of the uncertainty about future OPEC pricing policies, the distributional effects of decontrol are analyzed under two alternative assumptions: constant real OPEC prices, and a 3 percent per year increase in real OPEC prices. As in all other sections of this report, it is assumed that all added crude oil costs attributable to decontrol are inevitably passed through to consumers. Finally, alternative mechanisms to distribute revenues for low-income assistance are analyzed.

CURRENT FAMILY EXPENDITURES ON OIL

In 1978, gasoline and home heating oil consumption by households accounted for 39 percent of total U.S. oil consumption. 1/ The remainder was used for utilities and commercial, industrial, and governmental purposes. Consumers bear the burden of rising oil prices both directly through the purchase of petroleum products such as gasoline for their cars or fuel oil to heat their homes and indirectly through the purchase of goods and services that use oil in their production. These burdens vary considerably for families at different income levels and in different geographic regions. The remaining part of this section draws upon earlier CBO findings and

1/ Includes 5.9 million barrels per day of gasoline and 1.3 million barrels per day of heating oil and kerosene.

focuses on direct expenditures by families on gasoline and fuel oil for home heating, and indirect expenditures by families on oil through purchases of other goods and services. 2/

Gasoline

A number of factors such as location of employment, availability of alternative modes of transportation, and auto efficiency affect the level of family gasoline consumption. On average, the absolute amount a family spends on gasoline rises with its income (see Table 10). The reason for this is that as incomes rise families tend to drive more, have more cars, utilize autos for commuting purposes, locate outside of core cities in areas where public transportation is inadequate or unavailable, and drive automobiles that are less fuel efficient. Expressed as a proportion of income, however, the percentage of income spent on gasoline falls as income rises; that is, the relative burden of family gasoline expenditures is regressive. For example, in 1973-1974, the lowest fifth of families as ranked by money income (those with less than $3,700 a year in money income) spent, on average, 6.5 percent of their cash income on direct expenditures for gasoline, as compared with 3.2 percent for the highest fifth of the income distribution. 3/

Since not all families own automobiles and families differ in their driving habits and needs, expenditures for families with similar incomes may vary considerably. Moreover, the way car ownership and gasoline expenditures vary among families, in relation to their incomes, causes the distribution of the percent of income spent on gasoline within income classes to vary considerably according to the level of income. For example, more than half the families in the lowest income quintile do not own vehicles and therefore cannot be expected to incur significant gasoline expenses. In fact, many of these low-income families, which are predomi-

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2/ Congressional Budget Office, President Carter's Energy Proposals; A Perspective, Staff Working Paper, 2nd ed. (June 1977).

3/ Throughout this analysis, income is used as a measure of ability to pay. In fact, at the low end of the income distribution, consumption expenditures for some families exceed income, indicating that these families have available other resources such as savings, loans, and some income transfers that are not included in money income. The income ranges in 1973-1974 for each fifth are noted in Table 10.

TABLE 10. AVERAGE ANNUAL GASOLINE EXPENDITURES a/ PER FAMILY FOR FAMILIES RANKED BY MONEY INCOME AND FOR FAMILIES BY REGION AND AREA OF RESIDENCE, 1973-1974

Families	Average Annual Gasoline Expenditures, All Families		Average Annual Gasoline Expenditures, Families with Vehicles Only		Percent of Families Owning One or More Vehicles
	Dollars	Percent of Income	Dollars	Percent of Income	
Ranked by Money Income b/					
Lowest fifth	161	6.5	340	13.7	43.5
Second fifth	338	6.2	430	7.8	75.9
Third fifth	493	5.3	538	5.8	90.1
Fourth fifth	589	4.4	615	4.5	94.7
Highest fifth	718	3.2	731	3.3	97.7
By Region and Area					
Northeast	418	4.2	554	5.5	73.8
North Central	476	5.0	559	5.8	83.3
South	462	5.8	566	6.9	80.0
West	488	5.3	564	6.1	85.0
SMSA c/	458	4.8	568	5.8	79.0
Other urban	420	5.0	509	6.0	81.5
Other rural	501	6.7	573	7.5	85.5
All Families	461	5.1	561	6.1	80.5

SOURCE: Calculated by CBO, based on data from the Consumer Expenditure Survey Series; Diary Survey, July 1973-June 1974, U.S. Department of Labor, Bureau of Labor Statistics. Survey figures are adjusted to be consistent with aggregate estimates of family gasoline consumption.

a/ Retail market value. In addition to crude oil, includes all refining and marketing costs.

b/ In 1973-1974, the income ranges for each fifth were: lowest fifth, under $3,700; second fifth, $3,701 to $7,300; third fifth, $7,301 to $11,200; fourth fifth, $11,201 to $16,450; highest fifth, $16,451 and over. Unrelated individuals are counted as one-person families.

£/ Standard Metropolitan Statistical Areas.

nantly older, retired people or single-parent families, do not typically work and therefore do not use a car for commuting purposes. For those who do commute, however, gasoline expenditures may be considerable and particularly burdensome. For example, average annual gasoline expenditures in 1973-1974 for families with vehicles in the lowest income fifth were $340, or 13.7 percent of income for these families, as compared with $161 or 6.5 percent when averaged across all low-income families. One study of 1975 gasoline expenditures which examined variation within income classes found that, among those in the lowest tenth of the income distribution, 56 percent incurred no gasoline expenditures at all, while 11 percent incurred gasoline expenditures that exceeded one-fifth of their family income. At the highest tenth of the income distribution, virtually all families owned one or more vehicles and about fourfifths spent less than 5 percent of family income on gasoline for driving purposes. 4/

Gasoline expenditures differ not only by level of income but also by region of residence. For example, in 1973-1974, gasoline expenditures for families ranged from an average of $488 a year in the West to $418 a year in the Northeast. Because incomes are, on average, higher in the Northeast than in other regions, the disparity in relative burdens between the Northeast and the other regions is even greater; for example, 4.2 percent of income was spent on gasoline by families in the Northeast, as compared with 5.8 percent by families in the South. These differences reflect, in part, the rural nature of the South with its long travel distances and dependence on automobiles as the primary mode of transportation. Similarly, there is greater dependence on automobiles in the West and North Central regions than in the Northeast, which has more concentration of population in metropolitan areas together with alternative modes of transportation and shorter commuting distances. For example, average gasoline expenditures were roughly 10 percent higher in rural areas than in metropolitan areas; gasoline expenditures were 6.7 percent of family income in rural areas, as compared with 4.8 percent for families living in metropolitan areas.

Heating Oil

Families also use petroleum products in the form of various fuel oils to heat their homes and indirectly as inputs to produce other home energy

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4/ James N. Morgan, "Trends in Driving and Commuting," in Five Thousand American Families, vol. VI (Ann Arbor: University of Michigan, Survey Research Center, 1978), p. 414.

sources such as electricity. 5/ Factors that affect household use of energy include income as reflected in the types and sizes of residential housing units (small apartments versus large detached homes), conservation habits, and regional differences in climate and relative abundance of various energy sources. Thus, expenditures for heating fuel and other home energy sources vary according to family income and areas of residence. 6/

Direct family expenditures on fuel oil rise with income, though the burden of these expenditures is regressive. In 1973-1974, the lowest fifth of families spent an average of $49 a year on home fuel oil, as compared with $101 for the top fifth of families (see Table 11). Since large numbers of families do not heat with fuel oil and use, for example, natural gas or electricity, expenditures for those who use fuel oil are much higher; for example, the average annual expenditure for fuel oil users was $36Z, as compared with $72 when averaged across all families. The increase in home fuel oil expenditures as income rises reflects the greater incidence of home ownership and larger homes among higher-income families. Nevertheless, as was the case with gasoline consumption, home fuel oil expenditures impose a greater relative burden on those with lower incomes; families in the lowest fifth spent 2.0 percent of their income on heating oil, as compared with 0.5 percent for the highest quintile.

Though fuel oil represents only about 15 percent of home energy expenditures (excluding gasoline) and thus oil price increases may have, on average, a small direct impact on families, variations in the consumption and availability of home energy sources may impose relatively larger burdens on families in regions that rely primarily on fuel oil for home heating. Fuel oil accounts for about 27 percent of home energy expenditures for families in the Northeast, as compared with about 10 percent of home energy expenditures for those in other regions. Given the severe winters in the North, use of fuel oil for heating purposes exacerbates the disparity between fuel oil usage in the Northeast and that in warmer regions of the country which depend primarily on energy sources such as electricity or natural gas. Moreover, though incomes are generally higher in the Northeast, the relative burden of fuel oil expenditures for families in the

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5/ This analysis includes distillate (number 2 home heating oil) and kerosene, but excludes propane.

6/ For a comprehensive evaluation of home energy expenditures see Wayne L. Hoffman, The Distribution of Home Energy Expenditures by American Households in 1977-1978, Working Paper (Washington, D.C.: The Urban Institute, May 1979).

TABLE 11. AVERAGE ANNUAL HEATING OIL AND KEROSENE EXPENDITURES a/ PER FAMILY FOR FAMILIES RANKED BY MONEY INCOME AND BY REGION AND AREA OF RESIDENCE, 1973-1974

Families	Average Annual Heating Oil and Kerosene Expenditures			Heating Oil and Kerosene as Percent of Home Energy Expenditures c/
	Dollars	Percent of Income	Percent with Expenditures b/	
Ranked by Money Income d/				
Lowest fifth	49	2.0	16.1	15.1
Second fifth	66	1.2	18.1	16.3
Third fifth	53	0.6	19.9	12.0
Fourth fifth	89	0.7	22.5	15.4
Highest fifth	101	0.5	23.1	14.5
By Region and Area				
Northeast	160	1.6	33.2	27.3
North Central	52	0.6	17.5	10.0
South	45	0.6	18.2	9.6
West	39	0.4	9.7	10.8
SMSA e/	61	0.6	16.5	12.7
Other urban	81	1.0	17.8	17.2
Other rural	108	1.4	36.4	19.9
All Families	72	0.8	19.9	14.6

SOURCE: Calculated by CBO, based on data from the Consumer Expenditure Survey Series; Diary Survey, July 1973-June 1974, U.S. Department of Labor, Bureau of Labor Statistics. Survey figures are adjusted to be consistent with aggregate estimates of household heating oil and kerosene consumption.

a/ Retail market value. In addition to crude oil, includes all refining and marketing costs.

b/ Calculated from Consumer Expenditure Interview Survey, 1972-73; Annual Expenditures and Sources of Income Cross-Classified by Family Characteristics, 1972-73 Combined, U.S. Department of Labor, Bureau of Labor Statistics.

£/ Home energy includes heating oil and kerosene, propane, natural gas, electricity, coal, and wood.

d/ See Table 10 for income boundaries of each fifth.

e/ Standard Metropolitan Statistical Areas.

Northeast is greater than for those in other regions; fuel oil expenditures were 1.6 percent of income in the Northeast, as compared with about 0.5 percent elsewhere.

Indirect Expenditures on Oil

Families pay for oil indirectly through their purchases of goods and services that use oil as an input in their production. Industries such as steel, agriculture, food processing, and transportation rely on oil as a major source of energy and pass these oil costs on to consumers through higher prices. In 1973-1974, these and other indirect oil expenditures cost families, on average, $415 a year--only about 20 percent less than family expenditures on gasoline and heating oil (at their retail cost)--and were 4.6 percent of money income (see Table 12). These indirect expenditures are assumed to include crude oil used in the production of consumer goods and oil used in the production of investment goods that would actually result in costs to consumers only at some time in the future. Indirect expenditures also include oil used by governments and a small amount of input oil costs that would fall on consumers of U.S. export goods.

Indirect family expenditures on oil depend on family consumption expenditures. Family consumption expenditures generally rise with income; however, these expenditures as a proportion of income decline as income rises. Assuming that indirect family expenditures on oil are proportional to consumption patterns (excluding gasoline and home heating oil) across the income distribution, the lowest fifth of families in 1973-1974 spent an average of $193 a year for crude oil through indirect purchases, as compared with $684 a year for the highest fifth of families. Relative to income, however, these expenditures were regressive; that is, the lowest fifth of families spent 7.8 percent of their income on indirect crude oil expenditures, as compared with 3.1 percent for the highest quintile.

FUTURE EXPENDITURES ON OIL AND IMPACT OF DECONTROL

In the future, family expenditures on oil will depend upon family consumption of gasoline for automobiles, use of fuel oil for home heating purposes, and indirect purchases of oil through general consumption expenditures. Future consumption of petroleum products will depend upon several factors that are difficult to predict, such as changes in the price of oil, in the demand for oil as family incomes rise, in family consumption patterns, in the availability and price of alternative energy sources and modes of transportation, in the ability to conserve, and in technological advances toward the more efficient use of resources.

TABLE 12. AVERAGE ANNUAL INDIRECT EXPENDITURES ON OIL a/ PER FAMILY FOR FAMILIES RANKED BY MONEY INCOME, 1973-1974

Families Ranked by Money Income b/	Dollars	Percent of Income
Lowest Fifth	193	7.8
Second Fifth	294	5.4
Third Fifth	397	4.3
Fourth Fifth	464	3.4
Highest Fifth	684	3.1
All Families	415	4.6

SOURCE: Calculated by CBO, based on the Consumer Expenditure Interview Survey, 1972-73: Annual Expenditures and Sources of Income Cross-Classified by Family Characteristics, 1972-73 Combined, U.S. Department of Labor, Bureau of Labor Statistics; and Consumer Expenditure Series; Diary Survey, July 1973-June 1974, U.S. Department of Labor, Bureau of Labor Statistics. Adjusted to aggregate levels of U.S. domestic crude oil expenditures.

a/ Crude oil costs only.

b/ See Table 10 for income boundaries of each fifth.

Extension of Price Controls

In 1982, under a continuation of domestic oil price controls (the base case) and no increase in real OPEC oil prices, U.S. families would spend both directly and indirectly $136.1 billion on crude oil or, on average, 8.7 percent of family income (see Table 13). The lowest fifth of families would spend 14.7 percent of their income on oil, whereas those in the top quintile would devote only 5.7 percent of their income to oil expenditures.

Under a continuation of controls--assuming that real OPEC prices are not increased and that EPCA auto efficiency standards are met--direct

TABLE 13. DOMESTIC OIL EXPENDITURES UNDER CONTINUATION OF PRICE CONTROLS AND INCREASES IN EXPENDITURES FROM THE PRESIDENT'S DECONTROL DECISION, TOTAL AND PER FAMILY, UNDER ALTERNATIVE OPEC PRICE INCREASES, 1982: IN DOLLARS

Families Ranked by Money Income a/	Domestic Oil Expenditures Under Continuation of Price Controls							Increase Induced by Decontrol				
	Gasoline		Heating Oil and Kerosene			Total b/			Heating Oil and		Total	
	With Refining Costs c/	Crude Cost Only	With Refining Costs c/	Crude Cost Only	Indirect Expenditures	Dollars	Percent of Income	Gasoline	Kerosene	Indirect Expenditures	Dollars	Percent of Income
Constant Real OPEC Prices												
Lowest fifth	314	147	105	65	492	704	14.7	12	7	45	64	1.3
Second fifth	660	308	142	89	703	1,100	10.5	26	9	64	99	0.9
Third fifth	962	449	113	70	950	1,469	8.3	38	7	87	132	0.7
Fourth fifth	1,148	536	191	119	1,169	1,824	7.0	45	12	107	164	0.6
Highest fifth	1,400	654	216	135	1,637	2,426	5.7	55	14	149	218	0.5
All families	898	419	154	96	992	1,507	8.7	35	10	91	135	0.8
Total expenditures for all families (in millions)	81,068	37,856	13,854	8,650	89,544	136,050	—	3,176	873	8,170	12,219	—
Three Percent per Year Increase in Real OPEC Prices												
Lowest fifth	324	161	110	71	506	738	15.5	16	8	55	79	1.7
Second fifth	681	339	150	96	759	1,190	11.3	33	11	84	128	1.2
Third fifth	994	494	119	76	1,025	1,595	9.0	48	9	113	170	1.0
Fourth fifth	1,186	590	201	130	1,261	1,980	7.6	57	15	139	212	0.8
Highest fifth	1,447	720	228	147	1,766	2,632	6.2	70	17	195	282	0.7
All families	928	462	162	104	1,070	1,636	9.4	45	12	118	175	1.0
Total expenditures for all families (in millions)	83,746	41,670	14,589	9,385	96,581	147,636	--	4,038	1,119	10,651	15,808	--

SOURCE: Congressional Budget Office.

a/ See Table 10 for income boundaries of each fifth. These boundaries are increased by 92 percent to reflect projected growth in family money income from 1973-1974 to 1982.

b/ Does not include refining and marketing costs for gasoline and heating oil.

£/ Retail market value of gasoline and heating oil. In addition to crude oil, includes all refining and marketing costs.

expenditures by families on gasoline and home heating oil at their market value would be $94.9 billion by 1982, a 6 percent increase over 1978 expenditures after inflation is taken into account. This increase reflects oil price inflation and moderate increases in aggregate consumption as a result of growth in the number of families and greater automobile usage. On a per family basis, however, real expenditures on gasoline are projected to rise by less than 5 percent from an average of $461 a year in 1973-1974 to $483 in 1982 in 1973-1974 dollars ($898 in 1982 dollars). Thus, with family income growing on average only slightly faster than the rate of inflation, the future burden of these expenditures is projected to be virtually unchanged; that is, 5.1 percent of family income in 1973-1974 and 5.2 percent in 1982. Some families, however, such as those unable to conserve and alter their level of consumption, those living in areas without alternative sources of energy for home heating purposes, and those whose incomes are fixed or have not kept pace with inflation, would experience greater burdens from rising oil prices. 7/

The President's Plan

CBO estimates that, with constant real OPEC prices, oil price decontrol would increase the nation's oil bill by $12.2 billion in 1982. These additional expenditures would ultimately come from families either through their direct purchase of petroleum products at higher prices or indirectly through their consumption of other goods and services that use oil in their

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7/ It is difficult to estimate with any certainty the distributional outcomes of current and future energy expenditures. For example, part of the expected reduction in family gasoline consumption comes from future fuel efficiencies. Low-income families will be less likely to purchase the new, presumably more fuel-efficient automobiles of the future. The used cars that low-income families typically buy are likely to be less fuel-efficient models from the mid-1970s. The poor may, however, choose from the more economical of the current stock of automobiles, while those higher up the income distribution who are capable of purchasing more fuel-efficient automobiles may still prefer to buy the less economical cars to be produced under EPCA standards. On balance, it is assumed these factors are offsetting, so that changes in expenditures across the income distribution from 1973-1974 to 1982 are considered to be proportional.

production. 8/ Direct expenditures by families on gasoline and heating oil would increase by $4.0 billion, while indirect family expenditures on oil would increase by $8.2 billion. 9/ With an increase in real OPEC prices of 3 percent per year, the nation's oil bill would rise by $15.8 billion over a continuation of price controls; about one-third of this increase would be for family expenditures on gasoline and heating oil, and the other two-thirds for indirect oil expenditures.

Families at different income levels would be affected differently by decontrol and additional expenditures may result in relatively greater burdens for families in the lower-income classes. For example, under the assumption of constant real OPEC prices, $3.0 billion of additional family expenditures would be by families in the lowest two-fifths of the income distribution--that is, families with incomes of less than $11,400 a year in today's dollars (first quarter, 1979). For the lowest fifth (those with less than $5,800 a year in family income), average family consumption expenditures would increase $64 a year, with more than 70 percent of this increase coming from indirect oil expenditures. Those higher up the income distribution would see their consumption expenditures rise much more; for example, the top fifth of families would spend, on average, an additional $218 a year. But higher-income families also have a greater ability to pay; additional expenditures resulting from decontrol would represent 1.3 percent of income for families in the lowest fifth and only 0.5 percent for families in the highest quintile. 10/

8/ Additional expenditures resulting from higher prices on oil used in the production of investment goods, goods purchased by governments, and export goods are included in the burden on households, inasmuch as domestic consumers will eventually bear most of the burden of these higher costs.

9/ The CBO estimates of decontrol on household gasoline consumption assume a 0.16 price elasticity of demand for gasoline; that is, with a 1 percent rise in the price of gasoline the quantity of gasoline demanded would fall by 0.16 percent.

10/ Profits from decontrol are not reflected in money income of families who hold oil company stock. Since many of these households are in the higher income categories, figures in Table 13 understate the difference in relative burdens of decontrol on the rich and poor. At the other end of the income distribution, however, incomes that rise with inflation such as social security and some welfare benefits have not been adjusted to reflect growth in these benefits from oil price rises.

ASSISTANCE FOR LOW-INCOME FAMILIES

The President has suggested setting aside through the Energy Security Fund up to $800 million (in 1982) in revenues from a windfall profits tax and the normal corporate income tax to assist low-income families. According to the President, increases in real OPEC prices would not affect this level of assistance. The President would provide $100 a year to the "typical" low-income household, though who would be considered low-income has yet to be specified. 11/ If low-income families are considered to be those in the lowest fifth, $1.2 billion in assistance would have to be provided to offset fully the effects of decontrol on this population. If the second-lowest fifth of families were also included, an additional $1.8 billion would be needed for low-income assistance. This assumes, of course, constant OPEC prices in real terms. With a 3 percent yearly increase in real OPEC prices, CBO estimates $1.4 billion and $2.3 billion in assistance would have to be provided to the bottom two fifths of families, respectively. 12/

Not all low-income families would be affected in the same way by rising oil prices. While most families in the lowest fifth would generally feel the indirect effects of decontrol through their general expenditures on goods and services, incomes for many of these low-income families will rise automatically with the price level (that is, indexed social security, Supplemental Security Income, and food stamp benefits) and thus offset some of the costs of decontrol. Low-income families not receiving indexed transfer benefits would feel the full indirect burden of oil price increases. Non-gasoline expenditures for families in the lowest fifth would rise by $930 million or, on average, $52 a year per family. On top of increases in indirect oil expenditures, low-income families with significant gasoline expenditures would feel the direct effect of decontrol; for example, gasoline expenditures for the lowest fifth would rise by $220 million, and the average increase for those with some gasoline expenditures would be $28 a year.

Mechanisms for Assisting Low-Income Families

There are several possible ways to provide assistance to low-income families affected by decontrol. The Administration has yet to propose a

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11/ See Office of the White House Press Secretary, Fact Sheet on the President's Proposals for the Windfall Profits Tax and the Energy Security Trust Fund (April 5, 1979).

12/ These estimates do not include possible offsets resulting from increases in federal transfer payments that are indexed to keep pace with inflation.

specific method for distributing low-income assistance, but it is considering several options, including the following:

- o Increasing benefits in current cash or in-kind welfare programs;
- o Providing block grants to states to distribute to their low-income populations as a form of emergency assistance;
- o Using an expanded tax credit under the federal income tax; and
- o Rolling back payroll taxes.

Increasing Welfare. Additional support could be provided through several current cash welfare programs such as Aid to Families with Dependent Children (AFDC) or the Supplemental Security Income (SSI) program for the needy aged, blind, or disabled--though SSI benefits are already adjusted automatically for price rises--and through the food stamp program, which also adjusts benefits for food price inflation. Gasoline and other oil-related expenditures could be treated as deductions in computing benefits, or basic benefits could be increased by a fixed amount.

Use of current welfare programs would have several advantages. First, administrative structures are already in place. Benefits could be conditioned on a test of need, and administrators of such programs are experienced in dealing with low-income households. Utilizing current structures would minimize additional administrative costs. Second, some programs are administered by the states, and benefits could be adjusted to deal with localized needs. Third, with the provision of benefits on a monthly basis, these programs could be responsive to current needs in offsetting higher gasoline and other energy expenditures as they occur. Fourth, in the case where benefits are increased by a fixed amount, benefits are based on income as a measure of need and are not related directly to a particular oil expenditure. Such a benefit encourages substitution of less costly energy sources and would be consistent with policies to encourage conservation. Fifth, roughly one-quarter of all low-income families (that is, the bottom two fifths of the income distribution) are currently receiving benefits from cash welfare programs or food stamps and, thus, a significant number of low-income households could receive immediate relief. Sixth, increasing benefits under the food stamp program would have the advantage of providing benefits for all low-income families and would thus benefit the working poor, many of whom incur direct expenditures on gasoline.

On the other hand, use of some welfare programs would have a number of disadvantages. First, since traditional cash welfare programs are categorical--that is, restricted to specific groups--it could be difficult to

use them to assist some of the low-income population hurt by rising oil prices. Welfare programs such as AFDC and SSI generally assist those in single-parent families (mostly women) or those who are elderly or disabled. The working poor, and especially intact families, are not generally assisted by welfare programs, except for the food stamp program. Yet, the working poor would be precisely those families who would feel the direct effects of oil price increases through increased gasoline expenditures. Second, since AFDC is a federal/state program, administered by states under federal guidelines with some federal financial participation, the federal government may have limited control over how benefits are adjusted and may be unable to assure equitable treatment of individuals from state to state. Third, options that allow deductions of actual oil expenditures would not encourage conservation. Furthermore, there could be increased administrative costs associated with recomputing benefits based on expenses as they occur.

Providing Block Grants to States. Attempting to provide assistance to low-income households through the mechanism of a block grant for emergency assistance may have many of the disadvantages associated with improving cash welfare benefits and few of the advantages. The Community Services Administration currently distributes benefits at the state and local levels through its Emergency Energy Assistance Programs (EEAP). These programs have assisted the poor in a number of ways, including payment of back energy bills. EEAP could be one way to provide the block grants to states, though it is unclear how effective the program has been to date. Although block grants can be categorical—that is, earmarked for specific purposes—the federal government would have little control over how funds would be distributed. If traditional welfare mechanisms such as AFDC were utilized, benefits would not be targeted on the working poor.

On the other hand, one advantage of a block grant from the federal perspective is that the grant could be adjusted to reflect regional differences in dependence on petroleum products, such as higher fuel oil expenditures in the Northeast. Furthermore, from a budgetary perspective, a block grant affords greater control over the commitment of federal dollars to this type of low-income assistance.

Using an Income Tax Credit. Another way to offset rising oil expenditures for low-income households is to establish a refundable tax credit for low-income households or to expand the current earned income credit. The refundable tax credit could be based on income and, in order not to support the rich, could be phased out as earnings rise. It would not subsidize a particular energy expenditure but rather would meet the general income needs of low-income households, encourage substitution, and remain consistent with conservation goals. The earned income credit, which rises with earnings for low-income families, would have the advantage of

directing benefits at those who would most likely bear the burden of rising gasoline expenditures--namely, the working poor. Both the general tax credit and the earned income credit would have the advantage of building on the current tax system and would have a relatively marginal impact on administrative costs.

One disadvantage of the uniform credit approach is that benefits are not related to actual expenditures so that some poor may realize a windfall while others with sizable out-of-pocket expenditures, who may already be conserving and unable to reduce oil expenditures further, would receive insufficient support. Also, an approach providing credits to the entire low-income population based on income as a measure of need, not just to those who incur additional oil expenses, would be less well targeted than an actual expenditure approach. A disadvantage of a credit based on actual gasoline expenditures is that, unless households adjust their withholding (which seems unlikely given uncertainty regarding future gasoline expenditures), the credit would not be responsive to current needs. Finally, the federal government has relatively little control over the costs of any of these tax credits.

Rolling Back Payroll Taxes. The working population hurt by oil price decontrol could also be helped by a reduction in payroll taxes. This option is discussed in Chapter VI of this report.

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