

TABLE 7. NET DEFICIT REDUCTION UNDER A 5 PERCENT AD VALOREM TAX ON DOMESTIC ENERGY CONSUMPTION UNDER ALTERNATIVE OIL PRICE ASSUMPTIONS
(By fiscal year, in billions of current dollars)

Revenues and Outlays	1987	1988	1989	1990	1991
Pre-tax Oil Price: \$23.00 per Barrel					
Revenues					
Gross tax receipts	20.7	21.2	22.0	22.7	23.3
Total offsets	(5.2)	(5.3)	(5.5)	(5.7)	(5.8)
Net revenue increase	15.5	15.9	16.5	17.0	17.1
Outlays					
Increased federal energy costs	0.4	0.4	0.4	0.4	0.4
Offsetting receipts	<u>a/</u>	<u>a/</u>	<u>a/</u>	<u>a/</u>	<u>a/</u>
Net outlay increase	0.4	0.4	0.4	0.4	0.4
Net Deficit Reduction	15.1	15.6	16.2	16.6	17.1
Pre-tax Oil Price: \$18.00 per Barrel					
Revenues					
Gross tax receipts	19.2	19.8	20.7	21.4	22.1
Total offsets	(4.8)	(4.9)	(5.2)	(5.3)	(5.5)
Net revenue increase	14.4	14.8	15.5	16.0	16.5
Outlays					
Increased federal energy costs	0.3	0.3	0.3	0.3	0.3
Offsetting receipts	<u>a/</u>	<u>a/</u>	<u>a/</u>	<u>a/</u>	<u>a/</u>
Net outlay increase	0.3	0.3	0.3	0.3	0.3
Net Deficit Reduction	14.1	14.5	15.2	15.7	16.2
Pre-tax Oil Price: \$13.00 per Barrel					
Revenues					
Gross tax receipts	17.8	18.4	19.3	20.1	20.8
Total offsets	(4.4)	(4.6)	(4.8)	(5.0)	(5.2)
Net revenue increase	13.3	13.8	14.5	15.1	15.6
Outlays					
Increased federal energy costs	0.3	0.3	0.3	0.3	0.3
Offsetting receipts	<u>a/</u>	<u>a/</u>	<u>a/</u>	<u>a/</u>	<u>a/</u>
Net outlay increase	0.3	0.3	0.3	0.3	0.3
Net Deficit Reduction	13.0	13.5	14.2	14.8	15.3

SOURCE: Congressional Budget Office.

NOTE: Numbers may not add because of rounding.

a. Less than \$50 million.

TABLE 8. NET DEFICIT REDUCTION UNDER A COMBINATION OF A \$2.50 OIL IMPORT TARIFF AND A 6 CENT PER GALLON MOTOR FUELS TAX UNDER ALTERNATIVE OIL PRICE ASSUMPTIONS
(By fiscal year, in billions of current dollars)

Revenues and Outlays	1987	1988	1989	1990	1991
Pre-tax Oil Price: \$23.00 per Barrel					
Revenues					
Gross tax receipts	10.2	10.5	10.9	11.3	11.7
Increased windfall profit tax	0.7	0.4	0.4	0.2	0.2
Total offsets	(2.2)	(2.2)	(2.2)	(2.2)	(2.3)
Net revenue increase	8.7	8.8	9.1	9.3	9.6
Outlays					
Increased federal energy costs	0.2	0.2	0.2	0.2	0.2
Offsetting receipts	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
Net outlay increase	0.1	0.1	0.1	0.1	0.1
Net Deficit Reduction	8.6	8.7	9.0	9.2	9.6
Pre-tax Oil Price: \$18.00 per Barrel					
Revenues					
Gross tax receipts	11.3	11.8	12.3	12.9	13.5
Increased windfall profit tax	0.2	0.1	a/	a/	a/
Total offsets	(2.2)	(2.3)	(2.3)	(2.4)	(2.5)
Net revenue increase	9.3	9.6	10.0	10.5	11.1
Outlays					
Increased federal energy costs	0.2	0.2	0.2	0.2	0.2
Offsetting receipts	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
Net outlay increase	0.1	0.1	0.1	0.1	0.1
Net Deficit Reduction	9.2	9.5	10.0	10.4	11.0
Pre-tax Oil Price: \$13.00 per Barrel					
Revenues					
Gross tax receipts	12.5	13.3	14.1	15.0	15.9
Increased windfall profit tax	0.0	0.0	0.0	0.0	0.0
Total offsets	(2.3)	(2.4)	(2.5)	(2.7)	(2.8)
Net revenue increase	10.2	10.8	11.6	12.3	13.1
Outlays					
Increased federal energy costs	0.2	0.2	0.2	0.2	0.2
Offsetting receipts	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
Net outlay increase	0.1	0.1	0.1	0.1	0.1
Net Deficit Reduction	10.1	10.8	11.5	12.2	13.0

SOURCE: Congressional Budget Office.

NOTE: Numbers may not add because of rounding.

a. Less than \$50 million.

CHAPTER III

OIL TAXES AND ENERGY POLICY

Beyond their budgetary impact, oil taxes would have important effects on the level of oil imports, the domestic producing and refining industries, and the output of competing fuels such as coal and natural gas. These and other energy policy considerations are the subject of this chapter.

EFFECTS OF OIL TAXES ON THE LEVEL OF OIL IMPORTS

Oil import reductions resulting from taxes would be larger at lower oil prices. (All of the oil import reduction estimates presented in this section are approximate, and depend on certain assumptions regarding demand and supply elasticities. While the absolute levels of oil import reductions are therefore uncertain, the various options can be ranked in terms of their effects with some confidence.) At oil prices of \$23.00 per barrel, 1987 U.S. oil imports would decline by roughly 400,000 barrels per day under an oil import tariff, by around 300,000 barrels per day under an oil excise tax, by perhaps 100,000 barrels per day under a motor fuels tax, by 100,000 barrels per day under an energy tax, and by 100,000 barrels per day under a combination of an import tariff and a motor fuels tax. At oil prices of \$18.00 per barrel, using the same elasticity assumptions, oil imports would decline by 600,000 barrels per day under an import tariff, by 400,000 barrels per day under an excise tax, by 100,000 barrels per day under a motor fuels tax, by less than 100,000 barrels per day under an energy tax, and by 200,000 barrels per day under a combination import tariff motor fuels tax. Correspondingly, at oil prices of \$13.00 per barrel, imports would decline by 900,000 barrels per day under a tariff, by 500,000 barrels per day under an excise tax, by 100,000 barrels per day under a motor fuels tax, by 300,000 barrels per day under an energy tax, and by less than 100,000 barrels per day under a combination import tariff/motor fuels tax.

Oil Demand Effects

A tax that raised the prices of most oil and oil products, as would an import tariff or an oil excise tax, would be likely to have a stronger impact on oil consumption than would a motor fuels tax or a broad-based energy tax that

produced equal amounts of revenue. A tax that directed the entire tax burden to one commodity, such as gasoline, would limit significantly the inexpensive possibilities for conservation and fuel substitution. Broader-based taxes, in contrast, would offer a wider range of possibilities for reducing oil demand.

The long-term response to such taxes is usually greater than the short-term, since over the longer period energy-using capital, like the vehicle fleet or the stock of housing structures, can adjust to higher prices. But long-run effects depend on the expectations of consumers. If taxes are viewed as a temporary revenue raising measure, consumers are less likely to invest heavily in oil conservation by buying new capital equipment and more fuel-efficient autos, or by switching fuels. The quantity of fuel saved, therefore, will be less than if oil taxes are viewed as permanent. In the latter case, savings in oil consumption will increase over time.

Oil Supply Effects

The United States has a disproportionate share of the world's high-cost oil. For this reason, a tariff could reverse some of the production decline that will occur if prices remain near \$13.00 per barrel or lower. A large fraction of U.S. oil production comes from stripper wells--that is, wells that produce less than ten barrels per day. Their high costs and low revenue mean that when prices fall it often becomes uneconomic to maintain them. These wells are often run until additional maintenance is required, at which time they are abandoned and sealed permanently. Over time, if oil prices remain low, oil production will fall slowly, but permanently.

Based on conventional estimates of the responsiveness of supply to price changes, CBO estimates that stripper capacity would decline by 500,000 barrels per day in the first year that prices remained at \$13.00 per barrel. Other estimates are roughly consistent with this level. The Interstate Oil Compact Commission, an organization of states with stripper wells, estimates that 640,000 and 280,000 barrels would be lost in the first year if prices remained at \$10.00 and \$15.00, respectively. Interpolation would give an estimate in the neighborhood of 400,000 at the \$13.00 level.^{1/} Another industry trade source estimates that 4.0 million barrels per day of production in the United States, Canada, and Western Europe would become uneconomic as prices fell from \$24.00 per barrel to

1. For more details, see Interstate Oil Compact Commission, *Impact of Decreasing Crude Oil Prices on Stripper Oil Wells, Production and Reserves* (Oklahoma City: no date).

\$12.00.^{2/} Texas Eastern estimates that at \$12.00 the U.S. loss would eventually total 1.5 million barrels per day, but that it would take several years to accumulate to this level. It is difficult to derive a first-year loss from this figure, however. Other industry sources estimate that the short-term production loss might be substantially less than the 400,000 to 500,000 barrels per day discussed above. All such estimates suffer from a lack of detailed knowledge of the cost structure of individual producers.

An oil import tariff could encourage domestic oil production and exploration, while an oil excise tax could discourage such production and exploration by reducing the price received by domestic producers. An energy tax would discourage the production of all domestic energy resources, including oil. To the extent that a motor fuels tax reduced oil demand, it would lower the prices received by producers as well, and therefore would also discourage domestic oil production.

The extent to which oil supplies would change, and the manner in which they did so, would again depend on whether the taxes were deemed temporary or permanent. An import tariff considered to be temporary would give producers incentives to exploit existing reserves at a more rapid rate, but not to increase their exploratory efforts. A tariff deemed permanent, however, would encourage more prospecting but would not change the intertemporal pattern of production from existing reserves. The reverse would be true for taxes that penalized oil exploration. An excise tax on oil that was permanent would lower current production from known reserves, but would leave the country with greater resources in later years.

Again, the effectiveness of an oil import tariff in encouraging domestic oil supply must be compared with that of other energy policy instruments. Stripper oil could be purchased for the Strategic Petroleum Reserve to keep those wells open. Domestic production has been encouraged in the past by tax incentives given to independent oil producers to encourage exploration and development.^{3/} But the larger integrated oil producers have been denied such subsidies, even though they produce much more, in terms of barrels of oil equivalent (boe) per well, than the industry as a whole. (The comparable figures in the 1980-1984 period were 377,000 boe for the wells of integrated producers as against only 75,000 boe for the industry as a whole.^{4/}) If the major aim is to encourage oil finds, changing

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2. See L.J. Deman, "An Oil Price Floor?" (Texas Eastern Transmission Corporation: Houston, November 1985).
 3. Congressional Budget Office, "Analysis of Special Tax Provisions Affecting Independent Oil and Gas Producers," Special Study (May 1983).
 4. *Petroleum Intelligence Weekly*, January 27, 1986, p. 8.

the tax rules might substitute for an oil tariff. On the other hand, such tax subsidies represent a revenue loss, and imply that finding and depleting domestic oil deposits is a more efficient way to reduce oil import dependence than is conservation.

Finally, it should be noted that none of these policies would have a large impact on the long-term domestic supply of oil. Since 1979, more than half the drilling rigs in the world have been operating in the United States; yet despite the high oil prices during most of this period, proven U.S. reserves have not kept pace with U.S. oil consumption.^{5/}

EFFECTS OF OIL TAXES ON COMPETING FUELS

Both an import tariff and an excise tax on oil would tend to encourage the use of non-petroleum energy sources. Both would increase the price of oil to industrial users and utilities, where oil competes with other fuels such as coal and natural gas.

Most industrial fuel users are "dual-fuel capable"--that is, they can switch almost instantly from oil to gas for their heat or steam needs. Thus, natural gas competes strongly with residual oil even in the short run. Gas also competes with distillate, or home heating oil, but less so than with residual fuel. Higher prices for oil products would, therefore, lead fuel users to switch to natural gas, except in the case of an energy tax that taxed natural gas and oil almost equivalently.

But the natural gas market is marked by rigidities that remain from its period of federal regulation. When most gas was regulated at a price well below its oil-equivalent price, pipelines (which supply gas to local distribution companies) eagerly bought new supplies at prices that were far higher than regulated prices in an effort to maintain deliveries to valued customers, secure in the belief that they could "roll in" these higher-cost supplies with their endowments of cheaper, regulated gas.^{6/} As a result, large quantities of gas were contracted to pipelines at high prices that are unaf-

5. Energy Information Administration, *1984 Annual Energy Review* (Washington, D.C.: Government Printing Office, 1985), pp. 67 and 79. See also *Petroleum Intelligence Weekly*, February 3, 1986, p. 8.

6. See Congressional Budget Office, *Understanding Natural Gas Price Decontrol* (April 1983), and *Natural Gas Price Decontrol: A Comparison of Two Bills* (November 1983).

fordable in today's market. The upward pressure on gas prices resulting from an oil import tariff or excise tax might, therefore, not be translated into greater gas supplies, since gas supplies are already going unused while these contract problems are renegotiated and resolved.

Oil prices do not affect the price of coal directly, but do so over time. This short-run independence is because coal and oil do not compete directly in many applications. While both produce electricity, utilities already have made significant attempts to replace oil-fired baseload generating equipment with coal. Moreover, the lead times required to increase coal supply are long. Thus, the imposition of an oil import tariff would increase the demand for coal, and with it the price of coal and the incentives for new coal supply, but only by small amounts in the short term. At the other extreme, an energy tax would penalize the production of coal. Moreover, to the extent that coal prices did change, it is more likely that they would do so because both coal and oil compete with natural gas.

EFFECTS OF OIL TAXES ON DOMESTIC OIL REFINERIES

A two-tiered oil tariff, such as that proposed by S. 1507, would levy a tariff of \$10.00 per barrel on imported refined products in conjunction with a \$5.00 per barrel tariff on imported crude oil. Its advocates argue that the refining industry needs to be protected because of national security concerns, because U.S. environmental regulations impose a special burden on the industry hampering its ability to compete with foreign refineries, and also because U.S. refiners are facing subsidized foreign competition. This section discusses these arguments and outlines some of the effects a two-tiered tariff would have on consumers and on the refining industry.

National Security

Refining capacity would be a security concern for the United States only if U.S. consumers had access to crude oil but were not able to refine it. Given current and projected worldwide excess petroleum refining capacity, this seems unlikely. Any shortage will be of crude oil, not of refining capacity.

At current import levels, a cutoff of refined products from the Persian Gulf--the most severe possible product disruption--would be of minor concern compared to a cessation of crude oil flow. In 1985, the United States was importing only 60,000 barrels per day of petroleum products from the Persian Gulf, or about 1 percent of its total oil imports and less than 0.4 percent of its total oil consumption.^{7/} Enough excess capacity is avail-

7. *Petroleum Supply Monthly* (December 1985), pp. 44-45.

able at home and abroad to more than compensate for such a loss in refined products. In Rotterdam, Western Europe, and the Pacific basin, refineries are operating well under capacity.

The level of petroleum product imports is not projected to reach levels in the future that could cause concern for national security. The highest estimate of light product imports over the next five years is 1.3 million barrels per day. Other studies place the likely level at 0.4 to 0.8 million barrels per day.^{8/} Current operable refining capacity in the United States is 15.8 million barrels per day.^{9/} Even if some of that capacity is illusory, the loss of a few hundred thousand barrels per day in refining capacity would not pose a security or economic threat to the United States even though it would represent a substantial economic loss to those directly involved.

Moreover, the problems faced by U.S. refiners are not primarily caused by increased product imports. The 15 percent decline in U.S. refining capacity stems mainly from the large decrease in demand following the rapid oil price increases of the late 1970s. In 1978, U.S. oil refiners and product importer's supplied 18.8 million barrels per day of refined petroleum products to U.S. consumers. By 1985, they were supplying only 15.7 million barrels per day, a 16 percent decline. Over this period, petroleum product imports fell from an average of 2.3 million barrels per day in the 1970s to less than 2.0 million barrels per day in the 1980s. As a share of U.S. consumption, product imports have risen only from 11 percent of domestic consumption in 1978 to 12 percent in 1985.^{10/} Gross import figures do not give the complete story, since many product imports need further refining and blending in the United States before they can be used. For instance, in 1985, imports of unfinished oil and blending stock were as large as those of finished gasoline imports.^{11/}

8. See *Outlook for Light Product Imports into the United States* (New York: Petroleum Industry Research Foundation, June 1985), p. VI-3. See also Pace Company Consultants & Engineers, *The Effect of Increasing Petroleum Products Imports of the United States Refining Industry* (Washington, D.C.: Independent Refiners Coalition, June 1985), p. 3. The United States has always imported heavy fuel oil; the increase in imported light products is a more recent concern.

9. *Weekly Petroleum Status Report*, January 24, 1986, p. 4.

10. *Petroleum Supply Monthly* (December 1985), pp. 2-3. See also Energy Information Administration, *Annual Energy Review 1984* (Washington, D.C.: Government Printing Office, 1985), pp. 89 and 105.

11. *Petroleum Supply Monthly* (December 1985), p. 45.

Even if refining capacity were viewed as a constraint in the event of an import shortfall, the more appropriate response might be to fill a portion of the Strategic Petroleum Reserve with refined products rather than with crude. The additional cost to the economy would be only the differential between the costs of crude oil and refined products on those millions of barrels the government bought, the carrying cost of resources tied up in the reserve, and the more costly storage such a scheme would require, as compared with the cost of a \$5.00 extra tariff on all oil products.

Environmental Costs in the Refining Industry

Another argument for a two-tiered tariff is that the pollution abatement costs imposed on refiners by U.S. environmental laws render them uncompetitive. S. 1997 would impose an additional \$3.00 tariff on the basis of this factor alone. U.S. refiners' pollution abatement costs are, however, probably less than \$0.50 per barrel. They arise from three sources: conventional pollution abatement costs; fees to support the Superfund; and the cost of reducing lead in gasoline.

U.S. pollution regulations add an estimated \$0.30 to the cost of refining each barrel of oil. In 1983, pollution abatement operating costs, including capital depreciation, were \$1.8 billion for the petroleum refining industry.^{12/} This was offset by material and energy recovered in the pollution abatement process, which reduced its net pollution control to \$1.3 billion. When spread over almost 4.4 billion barrels of crude oil and other inputs processed in 1983, the refiners' net pollution abatement costs came to \$0.30 per barrel.^{13/} In addition to the pollution abatement costs, a charge of 0.79 cents per barrel is imposed on all oil used as chemical feedstock, whether crude or refined, imported or domestic, to pay for the cleanup of abandoned hazardous waste sites.^{14/} Proposals have been made to raise this fee by several cents per barrel, but the additional charge would be applied to all oil and therefore would not affect the competitive position of U.S. refiners.

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12. Bureau of the Census, *Current Industrial Reports, Pollution Abatement Costs and Expenditures 1983* (Washington, D.C.: Government Printing Office, 1985), p. 40. Other data sources report higher gross pollution abatement costs, but it is difficult to adjust these for resource recovery and capital depreciation.
 13. *Weekly Petroleum Status Report* (January 24, 1986), p. 4.
 14. Joint Committee on Taxation, *Background and Issues Relating to House Bills for Reauthorization and Financing of the Superfund* (Washington, D.C.: Government Printing Office, 1985), p. 11.

The Environmental Protection Agency has estimated that the cost of reducing the lead in leaded gasoline is less than two cents per gallon (or \$0.84 per barrel).^{15/} Leaded gasoline currently accounts for 20 percent of the petroleum products refined in the United States, and its share of output is projected to decrease independently of the lead rules.^{16/} These rules therefore should cost U.S. refiners no more than 16 cents per barrel of crude oil refined. The cost of reducing lead varies roughly in proportion with the cost of crude oil, and consequently an oil tax that raised the cost of crude oil would increase the cost of reducing lead.

Finally, all U.S. industries bear some pollution abatement costs; the refining industry is not entitled to special protection on that ground. Moreover, oil producing countries building new refining capacity may value their environmental amenities differently than does the United States. For them, economic development may have priority over a cleaner environment. In that respect, these countries could be thought of as exporting their environmental quality to the United States. Prohibiting them from doing so would lead to the typical costs of trade restriction: higher costs in the United States, and lower output and employment in the industries that use refined products as an input.^{17/}

Subsidized Foreign Competition

U.S. refiners have also argued that they need a two-tiered tariff because the U.S. industry is being hurt by subsidized competition. Specifically, some countries have been building modern refineries as part of their economic development plans, and governments have been subsidizing them through a variety of mechanisms.

In the past, "low-priced" product exports have been a means by which OPEC members cheated on their cartel arrangements. There is anecdotal evidence that the internal transfer price of crude oil to national refineries

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15. U.S. Environmental Protection Agency, *Costs and Benefits of Reducing Lead in Gasoline: Final Regulatory Impact Analysis* (February 1985). See also, Department of Energy, *Gasoline Octane Enhancement: Technology, Economics, and Environmental, Health and Safety Considerations* (July 1985).
 16. Energy Information Administration, *1984 Petroleum Supply Annual* (Washington, D.C.: Government Printing Office, 1985), p. 48.
 17. Congressional Budget Office, *Environmental Regulation and Economic Efficiency* (March 1985), pp. 96-7.

was often below the price at which it was available for export.^{18/} It is difficult to estimate the degree of subsidy, since to do so would require detailed knowledge of the selling prices and quantities of every product sold by the refineries in question, but there is evidence that this strategy was widely used.^{19/} Given the amount of refining capacity that was being planned for OPEC countries, this subsidy seemed likely to depress profit margins for years to come and eventually reduce investment and capacity in the U.S. refining industry.^{20/}

The recent drops in the price of oil have limited the ability of foreign producers to engage in this type of cross-subsidy. Led by Saudi Arabia, many are now pricing their crude oil for export at what are called "netback prices," under which a refiner buying crude oil pays a price equal to the sales value of the products at the time the crude oil is delivered to the refinery. Netback pricing makes natural resource subsidies very difficult, since if the subsidy drives down product prices in the importing country it will also drive down the netback price and, at the limit, eliminate the value of the subsidy.

It would be premature to say that the introduction of netback pricing has eliminated every form of subsidized foreign competition for U.S. refiners. Only one form of subsidy has been eliminated. Those remaining are likely to be more transparent, however, as well as illegal. In that case, more vigorous enforcement of current trade law may be preferable to new legislation.^{21/}

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18. For an extended discussion of such "natural resource subsidies," see CBO, "The Economic Effects of Countervailing Duties on Natural Resource Input Subsidies," Staff Working Paper (September 1985).
 19. See Petroleum Industry Research Foundation, "Outlook for Product Imports into the United States" (June 1985), p. II-4.
 20. On the other hand, many of the plans for increasing OPEC refinery capacity have been shelved because they proved unfeasible or because of the increasing financial constraints of OPEC governments. See Henry Lee and Bijan Mossaver-Rahmani, "Emerging Trends in U.S. Refining and Petroleum Product Trade: Implications for Energy Security Policy" (Cambridge: Harvard University, Kennedy School of Government, December 1985), pp. 21-22.
 21. For a discussion of state-owned firms and some problems in current international trading agreements, see Kenneth Dam, *The Gatt: Law and International Economic Organization* (Chicago: University of Chicago Press, 1970), pp. 316-332. For a more recent discussion, see Gary Hufbauer and Joanna Erb, *Subsidies in International Trade* (Washington, D.C.: Institute for International Economics, 1984), pp. 100-102.

Effects of a Two-Tiered Tariff on
Consumers and the Refining Industry

A tariff of \$5.00 per barrel on crude oil and \$10.00 per barrel on refined products would raise consumer prices and increase domestic refiner and shipping company profits. As long as demand remained below about 16.5 million barrels per day of refined products, domestic refining capacity would presumably be able to provide for all U.S. product needs without imports. In this case, the \$5.00 surcharge on refined products would raise no revenue, though it would prevent the country from consuming the cheapest supplies of refined oil products. (See Table 1 for current and projected consumption levels.) Beyond the 16.5 million barrel level, domestic consumption would outstrip domestic refining capacity and refined products would be imported despite the \$5.00 penalty. Domestic product prices would rise in response, and from the perspective of U.S. consumers the effects would be roughly the same as a \$10.00 tariff on crude oil. The additional costs would, however, only profit domestic refiners and shippers. Because crude oil could be imported with only a \$5.00 tariff, there would be little upward pressure on domestic crude oil prices beyond the initial \$5.00. Thus, the added tariff on refined products would provide little incentive for oil exploration and/or development.

U.S. refiners have a rated capacity of 16.5 million barrels per day of oil products. Because a barrel of oil expands in volume when it is refined, refiners can supply products in quantities greater than their input capacity ratings. Current estimates suggest that they could refine 15.8 million barrels of crude oil per day.^{22/} In 1984, the average refinery gain was 4.4 percent.^{23/} The crucial question in estimating the limits of domestic supply is how closely domestic refiners could approach their rated capacity. The \$5.00 differential of a two-tiered tariff would provide them with strong incentives to run their refineries at capacity. In the longer term, they could reopen facilities that are now closed as uneconomic.

Even if domestic refining capacity was sufficient nationally to cover domestic consumption, the East Coast would suffer disproportionately under a two-tiered tariff because of additional transport costs. The area circumscribed by District I of the Petroleum Administration for Defense accounts for 80 percent of imports of gasoline and blending components, 90 percent

22. *Weekly Petroleum Status Report*, March 7, 1986, p. 4. It is uncertain whether all of the rated capacity would be available if needed.

23. Energy Information Administration, *Petroleum Supply Annual 1984* (Washington, D.C.: Government Printing Office, 1985), p. 48.

of residual fuel oil imports, and two-thirds of all oil product imports. ^{24/} The high level of imports means that spare refining capacity in the district is minimal: perhaps 215,000 barrels per day. ^{25/}

In the event of a two-tiered tariff, District I would have to import 50 percent more refined petroleum products from other parts of the country than it normally does to avoid the extra \$5.00 levy. Currently, gross shipments of petroleum products into this district from other parts of the country total roughly 2.7 million barrels per day, and the district relied on imports of foreign products of 1.3 million barrels per day in 1985. ^{26/}

Much evidence suggests that the existing transportation system would be able to accommodate a 1.3 million barrel per day increase in interdistrict traffic, but at a cost. Currently, roughly 75 percent of interdistrict traffic flows through oil pipelines, while trucks, tankers, and barges handle the remainder. ^{27/} Oil pipelines are currently operating at roughly 85 percent of capacity and could provide an additional 300,000 to 450,000 barrels per day. As noted above, the district has about 200,000 barrels per day of unused refining capacity--not all of which would be readily available. Halting petroleum product shipments from District I to other districts (about 300,000 barrels per day) might also help fill needs, but would in turn produce shortages in the Midwest (District II). The remainder of the 1.3 million barrels per day would have to be shipped in by tankers or barges under the U.S. flag. Petroleum product carriers that are currently laid up could carry approximately 300,000 barrels per day. The remaining 50,000 to 200,000 barrels per day would have to be obtained by the use of converted crude oil carriers, barges, and rearranged scheduling. While the industry might be able to accomplish this, it would be a costly undertaking because the Jones Act and cabotage laws make transportation using U.S.-flag ships quite expensive. At current transportation rates, the additional cost would be as high as \$0.50 per barrel. Moreover, domestic tanker rates would probably rise significantly under higher traffic.

24. Energy Information Administration, *Petroleum Supply Annual 1984* (Washington, D.C.: U.S. Government Printing Office, 1985) pp. 52-53. See also *Petroleum Supply Monthly* (December 1985), pp. 40-41.

25. *Petroleum Supply Annual 1984*, p. 82.

26. *Ibid.*, p. 41. Imports in 1984 were similar (*Petroleum Supply Annual 1984*, p. 53).

27. *Petroleum Supply Annual 1984*, pp. 66-68.

Over time, these transportation capacity constraints would be reduced as refineries currently shut down were reopened. Most of the shutdown capacity is either old or inefficient. In District I, capacity of 440,000 barrels per day was shut down during the 1981-1985 period. Nationally, close to 3.0 million barrels per day of capacity has been shut down in the last five years.^{28/} With the \$5.00 per barrel cushion provided by the two-tiered tariff, much of this capacity would become economic again. Half of it was built during the 1970s to take advantage of biases in oil price control and entitlements regulations (such as the so-called "small refiners' bias"), and proved uneconomic after the lifting of the price controls.^{29/} Of these refineries, many lack the capacity to produce a high yield of gasoline and other lighter products, or to use the lower grades of crude oil that are becoming more common. A two-tiered tariff would once again encourage the building of such refineries.

A VARIABLE TARIFF

Several proposals have been made to vary the level of an energy tax according to the level of oil prices. S.1997 would set a crude oil import duty to equal the difference between the world market price for oil and a reference price of \$22.00, with a 50 cent minimum. Some refined product imports would face a similar tax, but would bear an additional \$3.00 per barrel "environmental outlay adjustment." Refined product tariffs would also be adjusted for heat content. The reference price and the environmental outlay adjustment would be adjusted annually for inflation. This report does not include the net budgetary effects of this proposal, since the revenues obtained would depend on the oil price assumption chosen. Since 1970, the price of oil has increased or decreased three times by amounts of \$10.00 or more, and future price levels appear no less uncertain. Thus, whatever the advantages of S.1997 for energy policy, its budgetary effects are difficult to appraise.

Rationale

A variable tariff would support the U.S. oil industry and would put downward pressure on OPEC oil prices, but fail to address the "social cost" rationale

28. Henry Lee and Bijan Mossavar-Rahmani, *Emerging Trends in U.S. Refining and Petroleum Product Trade: Implications for Energy Security Policy* (Cambridge: Harvard University, Kennedy School of Government, December 1985), p. 44.

29. *Ibid.*, p. 41.

for oil taxes. Instead, it would implicitly assume that the social premium attached to oil imports is higher at low prices and is nonexistent at prices above some arbitrary level. Under the provisions of S. 1997 no tariff would have been imposed in 1980, although the U.S. Strategic Petroleum Reserve barely existed, world prices were at an all-time high, and two major oil producers (Iraq and Iran) were engaged in a war that could have spread to the rest of the Persian Gulf. Today, however, when the Strategic Petroleum Reserve is large and excess capacity exists both within and outside OPEC, the tariff would be high. Thus, the tariff's chief advantages would be that it could protect most U.S. stripper wells, and could help reduce the federal deficit at the expense of foreign oil producers.

S. 1997 also raises one central energy policy question: how would the Congress determine the reference price? The intent of the bill is to stabilize the industry at roughly its current size, but whether \$22.00 is a more appropriate benchmark than, say, \$18.00 cannot be determined with any confidence. The average variable cost of producing oil in the United States in 1984 was roughly \$5.00 per barrel, excluding windfall profit tax. On the other hand, according to one industry source, at a level of \$22.00 per barrel between 5 percent and 10 percent of stripper wells, accounting for between 0.5 percent and 1 percent of oil and natural gas liquids production, become uneconomic.³⁰ Lowering the reference trigger price from \$22.00 to \$18.00 would, according to the same source, eliminate another 1.0 percent of production, but would channel \$23 billion more into the hands of oil consumers.

Technical Issues

The bill also raises several technical issues. These have to do with the \$3.00 environmental outlay adjustment, the inflation adjustment calculation, and the method of adjusting product imports for heat content. Also, certain product imports would be exempt from the tariff. The first issue has been dealt with in a previous section; this section discusses the others.

Inflation Adjustment. The reference price and the environmental outlay adjustment would be recalibrated annually to take account of "inflation" as measured by per capita GNP. But changes in per capita GNP may reflect changes in three variables: inflation, economic growth, and population. Only one of these--inflation--is relevant to the question of whether oil drilling and production costs have risen sufficiently to warrant a new reference price.

30. See Interstate Oil Compact Commission, *Impact of Decreasing Crude Oil Prices on Stripper Wells, Production and Reserves*.

Heat Content. S.1997 would adjust the tariff on some refined product imports according to their heat content. However, the value of refined products is generally inversely correlated with their heat content. The tariffs on more expensive refined products would, under this provision, be set lower than those for cheaper products. Tariffs on refined products would still be more than those for crude oil, because product tariffs would bear the additional \$3.00 environmental outlay adjustment. However, if the Congress eliminated the environmental quality adjustment, or reduced it to the level of actual expenses incurred (perhaps \$0.30 per barrel, as noted above), most product tariffs would be lower than those for crude oil. Such a tariff could be devastating to the U.S. refining industry.

Product Exemption. The bill would exempt home heating oil, process fuels, and residual fuel oil from the tariff. In 1984, these products accounted for roughly 25 percent of domestic consumption.^{31/} Exempting them from the tariff would encourage foreign refiners to increase their exports of these products to the United States. Domestic refiners, whose crude oil costs would have risen by the amount of the tariff, would find their profits very much reduced. The refining process will always result in the production of a certain amount of residual and distillate fuel oil, although the proportions vary according to the type of crude oil and other factors.^{32/} Because they will always have these products to sell, U.S. refiners will have no choice but to match foreign prices even when they are exempted from an import duty.

OTHER ISSUES

The Strategic Petroleum Reserve

A previous CBO paper discussed the possibility of imposing an oil import tariff to finance the Strategic Petroleum Reserve (SPR).^{33/} The SPR now contains about 495 million barrels of oil, and is being filled at a rate of about 29,000 barrels per day. While this is far from the 750 million barrels originally envisioned by the Congress, it still affords substantial protection against oil import disruption. The SPR drawdown capacity has only been

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31. Energy Information Administration, *1984 Annual Energy Review* (Washington, D.C.: Government Printing Office, 1985), p. 113.
 32. In a modern U.S. refinery, distillate and residual fuel oil account for 40 percent of the yield from even a "light" crude oil, such as that obtained from the North Sea. See "Oil Markets Reconsidered--1984 and Beyond," *Petroleum Intelligence Weekly*, April 22, 1985.
 33. Congressional Budget Office, *Charging for Federal Services* (December 1983).

tested once, making drawdown rate estimates somewhat uncertain. Current estimates are that the SPR could be drawn down at a rate of 3.3 million barrels per day for at least 90 days.

In its efforts to reduce U.S. oil vulnerability, the government is expected to spend \$3 billion in 1987 and more in later years. At current fill rates, the SPR is projected to cost roughly \$500 million each year for the next five years, including both oil purchases and building and operations costs. The current fill rate is roughly one-tenth the 1981 fill rate of 292,000 barrels per day. Federal agencies also engage in a sizable amount of energy research and development to reduce U.S. oil dependence. While much of this expenditure would continue even if there were no energy problem, vulnerability provides a significant part of its rationale. Such research is projected to cost more than \$2.5 billion in 1987, including work in fossil energy, energy supply, and energy conservation, and to increase in subsequent years.

A proposal to dedicate oil tariff revenues to a more rapid expansion of the SPR would raise two issues: whether it would be appropriate to dedicate such revenues, and whether the 750 million barrel target should be maintained or reduced. One cost of dedicating revenues is the loss of fiscal control by the Congress. Even if the need for the activity should decline, the steady provision of dedicated revenues would maintain it, and the Congress would lose one avenue for reducing the deficit. The main advantage is that applying user fees to federal activities forces users to confront the costs of their actions. An oil import tariff would be a user fee. It could be considered an insurance premium applied to the "risks" posed by oil import dependence, as discussed above. To the extent that consumers force the economy to bear certain risks--such as vulnerability to oil import disruption, which necessitates military expenditures to defend oil supply routes or foreign oil fields--it can be argued that they should pay these added social costs.

A second issue is whether the SPR target of 750 million barrels should be maintained. When the expansion to 750 million barrels was originally contemplated, U.S. oil consumption, imports, and OPEC imports were all higher than they are now. Achieving the target would thus provide more protection than originally intended, as measured in days of supply. On the other hand, lower oil prices may increase U.S. imports dramatically in the next five years, and a larger SPR would then be required in the event of future world oil disruptions.

Benefits of Cooperation

Oil taxes would have their maximum effects on prices if imposed by all or most major oil-consuming countries. Since the United States accounts for only one-third of world oil consumption (outside the centrally planned economies), its actions can have only a limited effect on world oil prices. The six other major industrial countries belonging to the Organization for Economic Cooperation and Development (OECD) represent 60 percent of the demand, and so would add much greater leverage should they choose to work together with the United States in imposing new oil taxes. Action in concert would force producers of oil to reduce their prices, thus easing the burden of the tax.

Such concerted action is hindered by the fact that the United States has been the only major oil consumer not to implement sizable oil taxes since the first oil price shock in 1973. In fact, until President Carter's decision to decontrol oil in 1979, U.S. oil prices were regulated at a level below world oil prices. Aside from the 9 cent gasoline tax and 15 cent diesel fuel tax that support the Highway Trust Fund, and an incidental tax devoted to Superfund, no federal taxes are imposed on energy consumption in the United States. Higher U.S. oil taxes will thus be required before the level of energy taxation is equal among the major industrialized countries.

Most other industrialized countries have much larger oil consumption taxes than the United States. Their gasoline taxes are typically in the neighborhood of \$1.00 per gallon, with additional taxes and/or import duties on distillate and residual fuel oils in the \$1.00 to \$1.50 per barrel range--although distillate fuel oil taxes in Europe sometimes exceed \$10.00 per barrel.^{34/} It should be noted that these countries tend to rely much more on consumption taxes as revenue sources than the United States does; for that reason many products, not just oil, have higher taxes placed on them.

Some of these countries have already begun to discuss placing additional taxes on oil and/or energy in response to the recent oil price drops. The British government has proposed an additional motor fuels tax of 10 cents per gallon. Several European countries have already boosted their taxes on various motor fuels, and several more are expected to follow.^{35/} According to industry observers, of the major European consuming countries, only West Germany is not likely to raise its oil taxes.

34. For a survey of foreign oil taxes, see Energy Information Administration, *International Energy Annual 1984* (Washington, D.C.: Government Printing Office, 1985), pp. 47-61.

35. *Petroleum Intelligence Weekly* (March 10, 1986), p. 2.