B2: Tax Subsidies to Energy

Tax Subsidies to Energy

Tax subsidies are the result of selective tax legislation[1] that benefit particular groups of people or industries in the economy. In effect, they share the costs of certain actions between the private sector and the government and impact investment decisions by increasing the expected returns associated with a particular pattern of economic activity. Tax subsidies may be applied in a number of ways to any one or a combination of economic variables (land, labor, capital).

While some provisions (e.g., the general investment tax credits) may be available to an entire class of economic activity, such provisions may still be viewed as subsidies because other classes of economic activity are placed at a relative economic disadvantage. In this case, for example, the government has made a decision to favor capital-based productive methods rather than alternatives (such as labor). Similarly, subsidies to new investment favor supply expansions (such as new power plants) over improved efficiency in the use of existing capacity (such as many demand-side management approaches) and constitute a *de facto* governmental choice of the method by which to meet market demand.

Tax subsidies are generally measured in reference to a normative or baseline tax system, and estimates assume no other changes in the tax code. Each tax expenditure is calculated assuming that there is no interaction with other provisions. As a result, the estimates can't be added directly together without errors, and the estimates provided in this chapter are first-order estimates and should not be viewed as more than that.

Since the government forgoes revenue that would have been collected had there been no special legislation and must make up those revenues through higher taxes on other economic activities, these policies have real costs. These costs are classified as "tax expenditures," and are estimated by the U.S. Treasury and by the Joint Committee on Taxation. Both groups estimate Treasury losses for tax subsidies independently. Although the Joint Committee on Taxation estimates are usually the lowest, this is not universally true for every provision. Since neither organization makes its estimation methods or assumptions public, we were not able to identify any cause for the differences.

The stated goal of tax subsidies, according to the General Accounting Office, is to promote some policy objective such as "economic growth or a desirable expenditure pattern by taxpayers."[2] However, there is a great deal of disagreement over whether particular tax benefits typically encourage "socially desirable" economic behavior.[3] Further, even if the policies are effective, they are static and may become ineffective or counterproductive as circumstances (be they demographic, technological, or economic) change. For example, percentage depletion allowances were significantly expanded when crucial minerals were needed for war efforts. As these initial conditions changed, the policies did not necessarily evolve with them.

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[1]Once legislation has been passed, rulings by the Internal Revenue Service or the Tax Court may later affect the size of the subsidy by narrowing or broadening the applicability of the provision.

[2]GAO, Tax Expenditures: A Primer, 1979, PAD-80-26, p. 6. The terms "tax subsidy" and "tax expenditure" are used interchangeably in this report.

[3]Tax subsidies, such as rapid amortization of pollution control equipment, may in fact have social benefits by accelerating the shift to less polluting means of production (though they may hide the benefits of less-polluting solutions). However, even here there is controversy over whether the tax benefits encourage behavior that would not have also occurred in the absence of the tax provision. Many tax subsidies, of course, also confer private benefits to energy consumers through lower energy prices, but there is not necessarily a social component to this benefit.

In summary, tax subsidies are neither inherently right or wrong. They are inherently distortionary, however, in that they alter patterns of economic activity to promote particular areas (targeted by Congress) that would not necessarily have received investment or consumer demand in the absence of the government intervention. The subsidies need to be considered as a real cost when evaluating alternative long-term energy options. These costs include the direct cost of increased taxes in other areas to individual taxpayers, and the indirect costs to the economy as a whole through the distortionary effect of the subsidies on R&D, investment, and consumption patterns.

There are a few issues to keep in mind regarding our net tax expenditure estimates. First, special taxes on energy (presented in the next chapter) have been treated as negative subsidies if they are used for general revenue purposes. If they are earmarked for specific energy-related uses, such as oil spill cleanup, they are considered user fees and are netted from the total government cost of dealing with the particular energy-related problem. Second, energy-payments such as royalties reflect a return to the resource-owner for selling the oil or minerals in question, and are not a tax. Finally, given the fact that the data regarding Treasury losses from tax provisions are somewhat crude and that interactions between the various tax preferences are not incorporated into these data, our quantification of the tax subsidy magnitude should be viewed as an estimate.

How Tax Subsidies Work

Tax subsidies increase expected returns by decreasing the costs associated with taxation. This is accomplished in four main ways: providing tax credits; altering the statutory tax rate; altering the taxable basis (i.e., the activities and expenses which are or are not included in the calculation of the tax base); and altering the taxable entity (such as by allowing losses from one corporation to off-set profits of another). Each of these methods of subsidizing private activity via the tax code has additional variants as well, which are described in more detail below.

Tax Credits. A portion of certain expenditures may be deducted from net taxes owed.

Altering the Tax Rate. Allowing one type of entity to pay a lower tax than others conveys a financial advantage to the firm with the lower tax rate.[4] Three approaches are used to accomplish this end.

- **Activities Exempt from Taxation.** Certain activities or products may be exempt from tax (e.g., the alcohol fuel tax exemption, or tax-exempt interest on certain types of bonds),[5] although like or substitute activities or products are fully taxed.

- **Entities Exempt from Taxation.** Entire entities, such as some publicly-owned utilities, may be exempted from taxation, although they may compete with other providers of the same product or service that are taxed.

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[4]The incidence of the tax benefit may vary by individual circumstance. For example, tax benefits for certain types of property may increase the market valuation for that property - in effect capitalizing a portion of the tax benefit. The benefit would be shared by the original property owner and by the new purchaser. While the net cost to the federal government (and therefore to the general taxpayer) is the same regardless of how the tax benefit is shared, the incidence of the tax benefit will affect how the subsidy is reflected in market pricing. (Barthold, 8/14/92).

[5]One study estimated that the federal tax exemption on interest from municipal securities reduced the interest costs of issuing those securities by 25 to 30 percent. (Brannon, 19).

- **Lower Tax Rate**. A particular type of firm or activity pays a lower percentage tax (such as capital gains taxes).

Altering the Taxable Basis. Although the actual percentage tax rate may remain constant, government intervention may redefine which activities must be included in the taxable basis to reduce the resultant net profit figure to which that percentage tax is applied. These policies encourage taxpayers to shift spending to the activities that will help them reduce their final tax bill. By altering either the timing or the size of tax deductions, the government creates incentives to engage in particular behavior. The current deduction for intangible drilling costs associated with oil, gas, and mineral exploration is an example of this type of provision.

- **Timing**. Policies may allow a company to deduct investment or construction costs at a rate far faster than the rate at which the assets are actually consumed (depreciated). Such intervention goes against traditional accounting methods of capital recovery.[6] Allowing current deductions conveys a subsidy by reducing current taxes (thereby increasing current profits) rather than future taxes. Since one dollar today could be invested and earn interest, it is worth more than a dollar in the future.

- **Amount**. By excluding certain portions of income from taxation, the government conveys a benefit on methods that produce that type of income. An example of this is the tax-free dividend re-investment allowance for certain electric utilities (no longer in effect). In some circumstances, the government may allow the deduction of items that were not actually incurred as a cost. Percentage depletion deductions, which are based on the gross value of ore mined rather than the investment to mine it, is an example of this phenomena.

Altering the Taxable Entity. By allowing taxpayers to consolidate their tax returns in ways generally restricted by the IRS, the government may facilitate the offset of taxable income in one area with losses from another area. In some cases, taxpayers may be able to use consolidation to gain more in reduced taxes than they had actually put into the money-losing enterprise. Redefining the taxable entity gives rise to tax subsidies in at least two ways.

- **Exceptions to General Rules of Taxation**. When Congress makes exceptions to these general guidelines of consolidation, a tax subsidy ensues. The oil and gas exemption from the passive loss rules (which limit the use of losses from an activity to offset profits in another) is an example of such a variance.

- **Shifting Profits Among Entities in a Vertically-Integrated Corporation**. When the taxable entity is difficult to define and transactions between divisions are not "arms length" transactions, corporations may shift "profits" among divisions through the use of transfer prices in order to reduce total tax burden. Admittedly, this category of tax subsidies is difficult to measure. However, there is some historical data suggesting that profit "management" and off-shore shipping subsidiary arrangements in the oil industry (no longer in existence) were used in conjunction with the Foreign Tax Credit provisions to practically eliminate taxes in that industry

[6]Although the goal is to match the depreciation period of capital with the useful life of that capital, in practice there is some gray area regarding how long the useful life really is. In general, it is much easier to tell when the depreciation period is clearly wrong, such as depreciating power plants over only 10 years, than to tell when it is exactly right.

for a long period of time.[7] These concerns were also a driving force behind revisions to rules governing income earned in foreign subsidiaries (Ambler, 3), and behind the current debate regarding the adequacy of taxes paid by foreign-owned corporations operating within the United States.

The Size of the Benefit

The financial loss to the U.S. Treasury from a particular tax subsidy depends on three factors: the size of the eligible industry or activity, the magnitude of allowable benefit, and the strictness with which eligibility is interpreted by the Tax Court. The important point to remember is that a 10 percent tax credit on oil and gas production can yield revenue losses far greater than a 50 percent solar energy credit, simply because of the relative sizes of the two industries.

The creation of an Alternative Minimum Tax (AMT) in the 1980s reduced the benefits of tax preferences for many in the energy sector. The AMT was developed to ensure that every profit-making venture paid some taxes. Thus, any eligibility for tax benefits below a company's AMT would not be able to be used. Conversely, any relaxation in AMT requirements (such as is provided to independent oil and gas producers in the Energy Policy Act of 1992) would result in higher tax expenditures. The Treasury and Joint Committee on Taxation estimates of tax expenditures used here already incorporate the impact of AMT on limiting the size of the subsidies.

The size of the tax expenditure may be measured in two ways: net present value and annual flow. The net present value (NPV) method evaluates the total value of tax losses from a provision going forward. This approach is especially valuable when examining the relative costs of alternative policy options to achieve changes in market behavior. For example, examining the NPV of losses from the oil and gas exceptions to passive loss restrictions would help policy makers determine whether there were more efficient mechanisms to achieve the goal of improved domestic oil security. NPV estimates require assumptions about discount rates, future (potentially long-term) market conditions, the marginal tax rates of taxpayers in each year, and interactions of the tax benefit in question with other tax options. The NPV method has the added advantage that tax expenditure estimates are never negative (i.e., increasing returns to Treasury) as new activity using them declines.[8]

The annual flow method examines the reductions in tax collections from a tax provision in a single year rather than the for the entire life of the provision. The annual flow method is used in our analysis for a number of reasons. First, data on the magnitude of these losses were available both from the U.S. Treasury and the Joint Committee on Taxation. Second, the flow-through approach provides the "snap-shot" of total support for energy in a particular year that we were trying to obtain. Both methods are useful, and the NPV method should be done during consideration of any new provisions.

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[7]See Glenn Jenkins, "United States Taxation and the Incentive to Develop Foreign Primary Energy Sources," in Gerard Brannon, ed., Studies in Energy Tax Policy. Cambridge, MA: Ballinger Publishing Co., 1975, pp. 203-245.

[8]Tax expenditure estimates for some tax provisions are negative, implying that the Treasury is receiving more money with the subsidy than it would have without it. This enigma may be understood in reference to the timing of payments in the following example. A $10 purchase which lasts 5 years would generate a $2 depreciation charge each year, which is tax deductible. If an accelerated depreciation provision allowed the investment to be depreciated in 2 years, rather than 5, the tax deduction in years 1 and 2 would be $5, but would be $0 for years 3-5. Thus, accelerated depreciation would yield a tax deduction $3 higher in years 1 and 2, but $2 lower in years 3-5. However, the net benefit to the firm is still positive, since it may collect interest on its tax savings from earlier years, if it chose to. In addition, taxes owed in later years may be paid in inflated dollars.

Treasury and JCT tax expenditure estimates, therefore, represent multiple years of investment behavior. Many tax subsidies allow items which are normally deducted from taxes over a 20-30 year period to be deducted in 10 years or less. In this example, for each of the first ten years after an investment is made, the Treasury will collect less tax revenue that it would have without the subsidy. Other provisions, such as investment tax credits, can only offset a certain amount of income. As a result, the credits may be "carried forward" and deducted against income in a future year.

Expanding this example to reflect aggregate investment in the economy means that for any single year of tax expenditure estimates (e.g., 1989), the deductions taken in 1989 from all earlier investments which have not yet been fully depreciated are included. To incorporate this multi-year aspect of investment tax credits and accelerated depreciation provisions, we use the aggregate share of energy investment between 1980 and 1989 to allocate the subsidies to energy types.

Who Gets the Money

Whether a tax subsidy is available to the producer or consumer of energy, benefits are shared between four parties: the producer (in the form of higher profits), the consumer (in the form of lower prices), the resource owner (in the form of higher royalties or rents), and the worker (in the form of higher wages). Increasing expected profits to either producers or resource-owners will increase the supply of a material brought to market. Increasing wage rates will attract more, and perhaps better skilled, workers. Reducing price to the consumer will increase the demand for the energy source. In all four cases, money is transferred from the general taxpayers to the specific entity (often a much smaller group of taxpayers, always a different group from the one making consumption decisions) who owns the energy minerals, develops them, or uses them as fuel. For this reason, we are not concerned with which party ends up with the subsidies, only that the entire amount goes into increasing the attractiveness of a particular energy type.

There are important distinctions among the size of incentives received by various types of taxpayers. For example, whereas corporate expenditures for improved energy efficiency are tax deductible, individuals are governed by a different set of tax rules. As a result, expenditures by individuals for exactly the same purpose must be made with after-tax income.[9]

One other important point about tax subsidies is that they are estimates, and measure the revenue loss or private benefit of a provision given current estimated levels of growth and the existence of the tax subsidies.[10] Although the actual deductions taken from a year could, in theory, be calculated from submitted income tax returns, in practice, such analyses are never publicly available. Therefore, tax expenditure estimates should not be interpreted as estimates of the increase in Federal receipts (or

[9]In 1989 the IRS ruled that cash reimbursements to homeowners for the purchase of energy-efficiency improvements provided through utility demand-side management programs were to be treated as taxable income to the homeowner. (JCT, 3/1/90, 4). The Energy Policy Act of 1992 changed the rules to allow such payments to be excluded (in full by homeowners, in part by commercial entities) from taxable income. Residential purchases of efficiency improvements not paid for via DSM programs are still generally made with after-tax income.

[10]The Treasury has also developed an "outlay equivalent" measure of tax subsidies. This measure estimates the value of the service to the recipient as if it had been provided by a direct agency outlay. Thus, outlay equivalents are pre-tax values; revenue loss estimates are after-tax.

reductions in budget deficit) that would accompany the repeal of the special provisions.[11] Such repeal could change economic growth and aggregate income, reducing aggregate demand and therefore overall tax collections. Second, since tax subsidies are enacted to encourage certain economic activity, removal of these subsidies would most likely yield significant changes in the level of activity occurring in the subsidized areas. Finally, tax subsidies may, to some degree, substitute for one another. Therefore, eliminating one or many of the subsidies would yield new tax avoidance behavior by taxpayers, and would affect the expected savings by removing any of the remaining provisions.[12]

Deviations from the Treasury Reference System Definition of Tax Expenditure

Prior to 1983, two types of provisions had been identified by Treasury as tax expenditures: deviations from general rules of taxation for a small sub-group of taxpayers, and more general deviations from some normative, comprehensive tax system. (OMB '91, A-59). Since 1983, deviations from such a normative system are no longer considered tax expenditures although the tax expenditure budget still estimates their magnitude. The rationale is that the benefits are available to all taxpayers.

However, some of these provisions do introduce bias into the tax system regarding the types of investments made. Since a main purpose of this study is to examine market distortions in the choice of energy substitutes, the inclusion of such provisions is necessary towards this end. Therefore, we include three such provisions as tax expenditures and use the Treasury estimates for them.

We diverge from the Reference System regarding accelerated depreciation, expensing of research and experimentation expenditures, and reduced tax rates on the first $100,000 of corporate income. All three incorporate the key characteristics of the other tax expenditures: they are financed by the general taxpayer, and they increase the returns to a certain type of activity. Accelerated depreciation provisions favor the creation of new capital over the use of labor or improved capital efficiency; expensing of R&D expenditures improves the economics of longer research cycles to those with shorter research cycles; and reduced rates on the first $100,000 of corporate income tax favors small businesses over larger businesses. Of these three provisions, only accelerated depreciation has significant impacts on our estimate of federal tax subsidies.

Since the provision of energy services ranges from capital intensive, multi-billion dollar, long-term projects such as nuclear power plants to small scale, short lead-time purchases of energy efficiency, even the Treasury-defined baseline tax system introduces significant distortions into energy markets. The accelerated depreciation provisions can skew the trade-offs made between new generating capacity and improved management of existing energy demand. In addition, statutorily-defined asset lives can create distortions even among capital equipment through differences in the size of the discrepancy between actual service lives and the depreciation period for tax purposes. This can subsidize the cost (and risk) of large capital projects, reducing the incentives to find substitutes on either the supply- or the demand-side.

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[11]Office of Management and Budget. "Special Analysis G: Tax Expenditures," Budget of the United States FY 1985, pp. G15-G17.

[12]For example, after the elimination of the capital gains tax benefits for timber, Treasury losses from deductions under the expensing allowance for timber interim management costs jumped from almost zero in 1986 to $130 million in 1987 and $278 million in 1988. (Temple, Barker & Sloane, Inc., II-12).

Description of Tax Subsidies Affecting the Energy Sector

The section that follows provides a detailed description of all the tax subsidies affecting energy. Tax subsidies to activities which consume certain types of energy, such as paper mills or mass transit systems, very likely influence the demand for energy services. However, these subsidies are beyond the scope of this report.

The section is organized by type of subsidy, and follows the presentation of tax subsidy types presented in this introductory text. Each tax subsidy is presented in seven sections: current status, a description of how the subsidy works, a brief legislative history, the main beneficiary energy types, the manner in which the subsidy magnitude may be calculated, eligible activities, and limitations. Not all categories are important for every subsidy. In addition, while the method for calculating the subsidy magnitude is presented for each provision, the actual quantified estimates are based on calculations by the U.S. Treasury and the Joint Committee on Taxation, and not on the application of the formula shown.

While most of the subsidies presented are still in existence, a few have expired or been repealed. These subsidies are included in this report for a number of reasons. First, many of these "eliminated" policies continue to have effects on the nation's energy mix either through residual benefits (such as outstanding bond issues or grandfather clauses) or through the subsidized capital base these subsidies helped create. Second, many of the "new" incentives proposed by Congress are actually the reestablishment of old subsidies. Finally, it is useful to have a listing of all energy subsidies in one document to serve as a reference.

TAX SUBSIDIES AFFECTING THE ENERGY SECTOR

Tax Expenditure	Status	Sector
Tax Credits		
Alcohol Fuel Income Tax Credit	Active	Business
Alternative Fuel Production Credit	Active	Business
Enhanced Oil and Gas Recovery Tax Credit	Began 1991	Business
Investment Tax Credits (ITCs) on New Machinery and Equipment	Residual Impact	Business
ITCs: Business Energy Credits (Conservation)	Narrowed	Business
ITCs: Business Energy Credits (Supply)	Narrowed	Business
ITCs: Residential Energy Credits (Conservation)	Expired	Individual
ITCs: Residential Energy Credits (Supply)	Expired	Individual
ITCs: Rehabilitation of Structures	Active	Both
Research and Development Tax Credit	Active[13]	Business
Tax Credit for Reforestation Expenses	Active	Business
Tax Credit for Electric Cars	Begins 1993	Both
Production Credit for Electricity from Wind and Closed-Loop Biomass	Began 1992	Business
Reductions in the Effective Tax Rate		
Activities or Products Exempt from Taxation		
Alcohol Fuels Excise Tax Exemption	Active	Business
Tax-Exempt Bonds for Public Power Facilities, Gas Utilities, and Multiple Utilities	Narrowed	Business
Tax-Exempt Bonds for Pollution Control Investments	Residual Impact	Business
Tax-Exempt Bonds for Solid Waste/Resource Recovery Facilities	Narrowed	Business
Tax-Exempt Bonds for Seaports, Harbors, and Wharves	Narrowed	Business
Tax-Exempt Bonds for Environmental Improvements at Hydroelectric Facilities	Begins 1993	Business
Tax Exclusion for Utility Payments for Demand Management	Partially Effective in 1992	Both

[13]This provision was active in 1989. It expired June 30, 1992, although Congressional efforts to extend it are underway.

Tax Expenditure	Status	Sector
Tax-Exempt Dividend Reinvestment for Public Utilities	Expired	Business
Exclusion of Payments in Aid of Construction of Gas and Electric Utilities	Repealed	Business
Exclusion of Mortgage Interest on Owner-Occupied Homes	Active	Individual
Exclusion of Black Lung Benefits	Active	Individual
Entities Exempt from Taxation		
Exemption of Certain Mutuals' and Cooperatives Income	Active	Business
Tax-Exempt Publicly-Owned Utilities and Federally-Owned Energy Enterprises	Active	Business
Reduced Tax Rates		
Capital Gains Exclusion and Capital Gains Treatment of Coal Royalties and Standing Timber	Partially Re-activated in 1990	Business
Graduated Corporate Income Tax	Active	Business
Reduced Tax on Income Earned by Qualified Nuclear Decommissioning Trusts	Begins 1994	Business
Reduced Tax on Capital Gains	Partially Re-activated in 1990	Business
Reductions in the Effective Taxable Basis		
Expensing of Costs Normally Capitalized		
Expensing of Construction-Period Interest	Repealed	Business
Expensing of Long-Term Research and Development	Active	Business
Expensing of Oil, Gas, and Mineral Exploration and Development Costs	Narrowed	Business
Expensing of Mine Closure and Reclamation Reserve Costs	Narrowed	Business
Expensing of Multi-Period Timber Growing Costs	Active	Business
Expensing of Tertiary Injectants	Active	Business
Deduction for Clean Fueled Vehicles and Fuel Storage and Distribution Facilities	Begins 1993	Both
Accelerated Depreciation of Certain Assets		
7-year Amortization of Reforestation Expenses	Active	Business
ACRS/Accelerated Depreciation of Machinery and Equipment	Residual Impact	Business

Tax Expenditure	Status	Sector
Accelerated Depreciation of Rental Housing	Residual Impact	Business
Accelerated Depreciation of Buildings Other than Rental Housing	Residual Impact	Business
Rapid Amortization of Railway Cars	Expired	Business
Rapid Amortization of Pollution Control Equipment	Expired	Business
Deferral of Required Income Tax Payments		
Deferral of Tax on Shipping Companies	Active	Business
Special Deductions		
Excess of Percentage Depletion Over Cost Depletion	Narrowed	Business
Utility Normalization of Federal Tax Overcharges	Active	Business
Deduction for Motor Carrier Operating Rights	Expired	Business
Special Definitions of the Taxable Entity		
Benefits Due to Specific Congressional Exemptions		
Gas and Oil Exception to Passive Loss Restrictions	Active	Business
Alternative Minimum Tax Relief for Oil and Gas Producers	Begins 1993	Business
Special Treatment of Alaskan Native Corporations	Residual Impact	Business
Allowance of Foreign Research Expenditures to Offset Domestic Income	Active	Business
Domestic International Sales Corporation	Expired	Business
Western Hemisphere Trade Corporations	Expired	Business
Benefits Due to Transfer Pricing		
Foreign Tax Credits	Narrowed	Business
Exclusion of Income from Foreign Sales Corporation Marketing Subsidiaries	Active	Business
Oil Shipping Subsidiaries	Repealed	Business
Safe Harbor Leasing	Residual Impact	Business

KEY TO TABLE:

Status. How is the provision currently affecting tax revenues.
Active. Provision is currently in effect.
Narrowed. Provision is currently in effect, but the applicability of the provision has been significantly narrowed by Congress.
Residual. Provision has expired or been repealed but continues to have budgetary impacts.
Expired. Provision expired as originally enacted by Congress.
Repealed. Provision was repealed by an act of Congress.

Provisions which have been enacted since 1989 have the date they first became effective, even if they are now active. This differentiates them from provisions included in our subsidy estimate.

Sector. This refers to the direct beneficiary of the tax policy, and can be either businesses, individuals, or both. Policies benefitting the business sector are often used by individuals as well, such as through the use of limited partnerships. However, since the target of the incentive is business, we treat it as such.

TAX CREDITS

- Alcohol Fuel Income Tax Credit
- Alternative Fuel Production Credit
- Enhanced Oil and Gas Recovery Tax Credit
- Investment Tax Credits (ITCs) on New Machinery and Equipment
- ITCs: Business Energy Credits (Conservation)
- ITCs: Business Energy Credits (Supply)
- ITCs: Residential Energy Credits (Conservation)
- ITCs: Residential Energy Credits (Supply)
- ITCs: Rehabilitation of Structures
- ITC: Electric Cars
- R&D Tax Credit
- Tax Credit for Reforestation Expenses
- Production Credit for Electricity from Wind and Biomass

Description

Tax credits subsidize particular economic behavior by allowing the tax payer to deduct a portion of a qualified expenditure from the net taxes owed. Thus, rather than reducing taxable income, tax credits actually directly reduce tax payments.

No Tax Credit

Tax rate	= 50%
Taxable income (or tax basis)	= $100
Taxes owed = (50%)($100)	= $50

With Subsidy

Tax rate	= 50%
Tax Basis	= $100
Taxes owed	= (50%)($100) = $50
Tax credit of 10% of a $50 geothermal investment = $5	
Net taxes after credit	= $50 - $5 = $45

Net Subsidy

The net tax subsidy from tax credits is the difference between the tax credit and the present value of the tax deductions the taxpayer is no longer eligible for after taking the credit[14]. In some cases, the tax credit may be subject to recapture. This means that if an investment does not produce for a statutorily-prescribed length of time, an investor must repay the initial amount of the tax credit to the government over a period of years. Recapture provisions encourage long-term investment rather than simply investment. In the case of recapture, the value of the subsidy would be equal to the current tax credit less lost depreciation deductions, minus the present value of the future repayments. We assume that the Treasury and JCT tax expenditure estimates incorporate recapture provisions.

Tax credits generally require that the taxpayer have taxes due to offset, and, in some instances, income from the same business area giving rise to the credits. However, historically, tax credits were somewhat transferable (such as through sale-leaseback or limited partnership arrangements). This transferability is at least partially reflected in our inclusion of tax benefits through Safe Harbor Leasing Arrangements.

[14]Prior to 1986, one half of the tax credit could also be depreciated and deducted from taxable income. The 1986 Tax Reform Act eliminated this benefit.

Alcohol Fuel Investment Tax Credit, Exemption from Motor Fuel Excise Taxes, and Import Tariff

STATUS: Active

DESCRIPTION: The investment tax credit and excise tax exemption work in tandem to ensure that all users of alcohol-based fuels (at least 10 percent alcohol) receive a tax benefit equivalent to 5.4 cents/gallon of gasohol motor fuels as a reduction in excise tax. The user of alcohol in applications where an excise tax is not assessed (e.g., agricultural use) is eligible for an income tax credit, equivalent to 54 cents/gallon of alcohol.[15] The Energy Policy Act of 1992 expanded the eligibility for this provision to alcohol blends of as low as 5.7 percent on a pro-rata basis. (JCT, 10/5/92). The choice of the tax credit or the excise tax exemption is up to the producer, but both benefits may not be claimed on the same fuel. With the excise tax exemption, the fuel retailer benefits by not having to pay federal motor fuels excise tax on gasohol sales (many states have similar exemptions as well). Alternatively, an equivalent tax credit may be claimed by the blender or producer of gasohol fuels. The eligibility of such fuels for the excise tax exemption is reduced accordingly.

Since the purpose of the policies was to develop domestic transport fuel substitutes, a tariff roughly equal to the domestic exemptions was levied on imported ethanol.

HISTORY: Benefits to alcohol-based fuels were enacted to encourage an increase in the diversity of motor fuels following two oil shocks of the 1970s. The income tax credits for production and blending of alcohol fuels were part of the Crude Oil Windfall Profits Tax Act of 1980. (Lazzari, 6/2/89, 1).

The maximum benefit through either the tax credit or excise tax exemption was set at 40 cents/gallon (for alcohol > 190 proof) in 1980. This was increased to 50 cents in the Surface Transportation Assistance Act of 1982 and to 60 cents in the Tax Reform Act of 1984, and reduced to 54 cents per gallon effective January 1, 1991. Lower proof alcohol (150-190 proof) received an initial credit of 30 cents/gallon and was increased or decreased the same percentage as the higher proof grade. (Since we rely on Treasury for our estimates of revenue lost from this tax provision, we did not need to know the mix between high and low proof ethanol).

Under the Omnibus Reconciliation Act of 1980, tariffs on imported ethanol were set at 10 cents/gallon in 1981, rising to 20 cents in 1982 and 40 cents in 1983. The Highway Improvement Act of 1982 increased this to 50 cents/gallon, and the Tax Reform Act of 1984 increased it to 60 cents. (Lazzari, 6/2/89, 12).

BENEFICIARY FUELS: Alcohol or methanol derived from biomass. Alcohols derived from oil or natural gas are not eligible. Alcohol derived from coal, wood, or urban waste is eligible for the fuel excise tax exemption, but not for any of the tax credits. However, owing to production economics, very little methanol is actually made from these sources. (Lazzari, 6/2/89, 3-4).

SUBSIDY MAGNITUDE: Whether claimed through the excise tax exemption or the investment tax credit, the total magnitude of the subsidy will be equal to the 5.4 cents/gallon of gasohol with 10% alcohol x gallons of domestic gasohol sold. (The 1989 estimates are based on the 6.0 cents/gallon exemption in effect at the time).

ELIGIBLE ACTIVITIES: Production, blending, and sale of gasohol or "straight" alcohol fuels.

LIMITATIONS: Alcohol from oil or natural gas is not eligible; alcohol from coal is eligible for the excise tax exemption only. Imports are exempted from the policies through an import tariff.

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[15]Since each gallon of gasohol contains at least 1/10 gallon of alcohol and is eligible for a 5.4 cents tax exemption, each gallon of alcohol can make ten gallons of gasohol eligible for the exemption. Thus, each gallon of alcohol provides a 54 cent tax exemption.

Alternative Fuel Production Credit

STATUS: Active.

DESCRIPTION: Provides a non-taxable $3/barrel of oil-equivalent (based on Btu content) production credit against the producer's income tax for several forms of alternative fuels. Since the $3.00 per barrel increases with inflation, the credit in nominal terms had risen from $3 in 1980 when the act was passed to about $4.40 in 1989. This figure is a maximum credit, as the actual credit decreases as the price of oil rises, the assumption being that higher oil prices increase the inherent attractiveness of substitutes.

HISTORY: The credit was originally enacted in the Windfall Profit Tax Act of 1980 (WPTA) to encourage production of alternative fuels. The eligibility for some alternative fuels has expired. For example, wood fuels sold prior to October 1983 and steam produced from spoiled agricultural byproducts (other than timber waste) sold prior to January 1985 were eligible for a production credit. (JCT, 3/1/90, 33). New facilities producing certain other alternative fuels (see "Beneficiary Energy Types" below) remain eligible for the production credit.

The WPTA created this benefit as a "window" for facilities placed into operation after 1979 and before January 1, 1990. The 1988 Technical and Miscellaneous Revenue Act extended this deadline to January 1, 1991. (JCT, 3/1/90, 5; Lazzari, 6/2/89, 11). The deadline has since been extended through December 31, 1992 (OMB '92, 3-25), and again, through January 1, 1997 (so long as a binding contract was entered prior to January 1, 1996). (DOE, 10/15/92, 25).

BENEFICIARY ENERGY TYPES: Oil produced from shale and tar sands; gas produced from geopressurized brine, Devonian shale, coal seams, tight formations, or biomass; liquid, gaseous, or solid synthetic fuels (such as methanol) produced from coal (including lignite), including such fuels when used as feedstocks. (JCT, 3/1/90, 32). Tight gas refers to natural gas found in formations of sandstone, siltstone, silty shale, and limestone, formations characterized by their low permeability. Gas is recovered by fracturing the rock. Devonian shale is a type of shale formation also characterized by low permeability. As with tight gas, rock fracturing is necessary to recover energy deposits. (OTA, 73,74).

SUBSIDY MAGNITUDE: [(Eligible source Btu/Barrel)/(Oil Btu/Barrel)] x [# Barrels Produced] x [$3/barrel] x [GNP inflator]

ELIGIBLE ACTIVITIES: In addition to the above eligible fuels, processed wood fuels (eligible for three years after the production facility was placed in service, provided that was in either 1980 or 1981) and steam produced from spoiled agricultural byproducts (which qualified through 1985) were also eligible. The credit for gas produced from Devonian shale was based on the price of deregulated natural gas rather than oil through 1982. (Shapiro, 25).

LIMITATIONS: The credit begins to be phased out when the price of oil reaches $23.50/barrel (1979$) and reaches zero once the price of oil rises above $29.50/barrel (1979$). Credits were also reduced in direct proportion to any other energy tax credits taken or tax-exempt financing used. Since many of these other credits have expired, these reduction provisions are no longer very important.

Gas produced from tight formations was eligible for the credit only if it fell under a special regulatory category of the Natural Gas Policy Act of 1978. After the Federal Energy Regulatory Commission deregulated natural gas in interstate commerce in 1987, the production credit was no longer available to this type of fuel. (JCT, 3/1/90, 33). The Omnibus Budget Reconciliation Act of 1990 once again eased the qualification of gas produced from tight sands after 1990. (EIA, 11/92, 113). As a result, Treasury losses in the 1990s are much higher than in 1989.

Alternative Fuel Production Credit

Part 1: Magnitude of Subsidy

Low Est.	High Est.
10	20

Source: OMB Fiscal '91 Budget, JCT "Estimates of Federal Tax Expenditures for FY 1989-1993."

Part 2: Estimate of Beneficiary Sectors

Eligible Fuels in FY89	Low Est.	High Est.
Oil from shale and tar sands (oil)	2.5	5.0
Gas from certain formations (gas)	2.5	5.0
Gas from biomass (biomass)	2.5	5.0
Gas from coal (coal)	2.5	5.0

In the absence of any data on production levels, the subsidy is split equally among the four fuels.

Investment Tax Credits

STATUS: Repealed for many energy types (see chart next page), but continues to have residual impacts from earlier investments. The Energy Policy Act of 1992 enacted some new tax credits.

DESCRIPTION: Investment tax credits allow a taxpayer to apply a certain percentage of the investment price of "qualified" purchases as a credit against federal income tax liabilities. Qualified behavior refers to specific types of investments, defined by the type of purchase and/or by what the purchase is used for. Investment tax credits act as grants from the federal government for particular eligible purchases. By reducing the barriers to eligible investments, the credits ostensibly increase investment activity.

Investment tax credits have played a large role in energy markets both through ITCs for all capital investments and through ITCs targeted for particular energy investments. Congress has changed the eligible activities and investment tax credit percentage rates numerous times. The main provisions are presented briefly in the following table, and explained in more detail below. ITCs tend to benefit capital-intensive industries the most, since ITCs cannot be earned on other types of spending. ITCs for specific energy investments could usually be taken in addition to those for regular investment, making the provisions additive.

Although only three provisions (geothermal; solar; and oil and gas enhanced recovery) are still active, the impact of the investment tax credit remains quite strong through a number of mechanisms. First, transition rules allowed investments past a determined stage of development to earn ITCs even after the benefits were repealed.[16] Second, ITCs earned during the active life of the provisions but not yet taken can be used at a later date. For these reasons, Treasury estimated revenue losses in 1989 from the generally-available investment tax provisions that had expired in 1986 at almost $6.6 billion (all sectors, not just energy). (OMB '91, A-72).

Finally, since the ITCs reduced the cost of establishing a long-lived capital infrastructure, to the extent that the benefits from the ITCs were skewed to particular types of energy, distortions in relative energy pricing remain, retaining a long-term tax-based cost advantage relative to competing incremental investments.

[16]Fifteen to 20-year property must have been placed in service prior to January 1, 1991 in order to be eligible. (Kiefer, 5/18/87, 7).

Investment Tax Credits Related to Energy

Qualified Investment	Credit Percentage	Enacted	Expired/ Repealed[17]
Any Income-Producing Equipment Except Utilities	7% 10%	1962 1975	1975[18] 1986
Income-Producing Equipment for Use By Utilities[19]	3% 4% 10%	1962 1971 1975	1969 1975 1986
Solar Energy	15% 12% 10%	1/1/86 1/1/87 1/1/88	12/31/86 12/31/87 Active
Geothermal	15% 10%	1/1/86 1/1/87	12/31/86 Active
Ocean Thermal	15% 10%	1/1/86 1989	12/31/88 12/31/91
Biomass	15% 10%	1/1/86 1/1/87	12/31/86 12/31/87
Wind	15%	1978	1985
Small-scale Hydroelectric	11%	1/1/80	12/31/85
Oil and Gas Enhanced Recovery	15%	1/1/91	Active
Residential Supply Credits (solar, wind, geothermal)	40%	1978	1985
Residential Conservation	15%	1978	1985
Commercial Conservation	10%	1978	12/31/82
Waste-to-Energy (under credits for recycling equipment)	10%	1978	12/31/85
Other: synfuels, geopressurized brine, shale oil, chlar-alkali fuel cells, cogeneration	10%	1978	12/31/82
Electric Cars	10%	1992	Begins 1993
Rehabilitation of Structures, Other than Historic Structures	10%	1986	Active

Sources: Russell and Bowhay '90, 1538; Heede, tax, 54-61; Kiefer, 11-18; Shapiro, 10; Lazzari, 1/24/85; JCT, 3/1/90; Sussman, 50; Sissine, 4/12/90, 6; Biv, 5/25/92; CRS, 11/92, 91, 101, 315.

[17]Many of the provisions that have expired had "affirmative commitment" provisions that allowed tax credits for investments contracted prior to the expiration date, but which did not enter service until as late as December 31, 1990. Thus, the provisions continued to exhibit budgetary impacts for a number of years. (Lazzari, 1/24/85, 6).

[18]The general ITC was suspended between October 10, 1966 and March 10, 1967, and then repealed in 1969. It was reinstated in 1971 and remained at 7% through 1975. (Kiefer, 11-18).

[19]Utilities originally received a lower ITC since the purpose of the provision was to reduce the risk of investments, and utility investments, with their guaranteed returns, were viewed as extremely safe to begin with. The utility ITC was suspended during the same periods as the general ITC.

General ITCs for Income-Producing Property Including Utilities

General ITCs provided a 10 percent investment tax credit for the purchase of any income-producing equipment until their repeal in the Tax Reform Act of 1986. Despite the repeal, this provision continues to have a budgetary impact five years later for the reasons stated above. Credits earned but not used (or earned when transition property is placed into service) may be carried forward for 15 years. However, the amount of the credits that may be taken are 65 percent of the pre-repeal levels, and the credit is fully taxable. Finally, the taxpayer must reduce her recoverable basis (i.e., the amount that may be depreciated) by the full amount of the credit rather than half the amount as was the case prior to 1986. (OMB, 1991 Budget, A-66).

Since utilities are monopolies and must have their rates approved by a regulatory body, investment tax credits created a dilemma. Because they reduced the cost of service, many rate boards began to reduce allowable power charges to reflect this cost decline. However, this treatment eliminated all incentives for new investment, for which the ITC had been enacted. Therefore, in 1971, rules for "normalizing" the added benefit were enacted.[20] (Kiefer, 11-18).

Geothermal, Solar, and Ocean Thermal

Commercial investments into these three types of energy properties remain eligible for investment tax credits at the rates shown in the chart above. The credits were extended through December 31, 1991 in the Omnibus Budget Reconciliation Act of 1990 (Sussman, 37). Credits for ocean thermal expired as planned. (CRS, 11/92, 91). Credits for geothermal and solar were extended through June 30, 1992, and made permanent in the Energy Policy Act of 1992. (JCT, 9/25/92).

Tax credits for solar and geothermal energy were enacted in the Energy Tax Act of 1978, effective after April 20, 1977. Ocean thermal credits were added in the Crude Oil Windfall Profit Tax Act of 1980. Slated to expire within 3-5 years after enactment, these credits were extended for 1-3 years as their expiration dates approached. Rates were phased down to the current rates in the Tax Reform Act of 1986. Solar energy for residential use is not eligible, and credits may not offset more than 25 percent of regular tax liability above $25,000, or the tentative minimum tax for the taxable year. (JCT, 3/1/90, 32).

Biomass, Wind, Waste-to-Energy, Synfuels, Other

Tax credits of 15% for investments into commercial wind facilities were available between 1978 and 1985. Benefits to waste-to-energy were available through tax provisions for recycling equipment, the definition of which included equipment used to produce energy from wastes. (Lazzari, 1/24/85, 19).

Hydroelectric

The hydroelectricity tax credits were enacted as part of the Crude Oil Windfall Profit Tax Act of 1980, and were targeted at small hydro facilities. The credit, set at a maximum of 11 percent, began to decline at 25 MW installed capacity, reaching zero at 125 MW. (Lazzari, 1/24/85, 25).

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[20]Normalization is an accounting process by which a windfall gain or loss is amortized over a period of years. Normalizing the benefits from an ITC means that a utility gets an interest-free loan from its customers. This would be similar to the situation in an unregulated (but not highly competitive) industry, since an ITC would not immediately be passed on to customers in the form of lower prices.

Oil and Gas Enhanced Recovery

The Omnibus Budget Reconciliation Act of 1990 introduced a 15 percent tax credit for costs attributable to projects for enhanced oil recovery and qualified exploration. The credit was effective beginning January 1, 1991. OBRA 1990 also modified and expanded the application of several tax preferences for extraction technologies. (Sussman, 50). As the price of oil rises above $28/barrel, the allowable tax credit percentage decreases, reaching zero at a price of $34/barrel. (Stathis, 9). However, these figures are to be indexed for future general inflation. (Barthold, 8/14/92).

Residential Supply Credits

Eligible sources included solar heating or cooling, photovoltaics, wind, and geothermal. The 40% investment tax credit applied only to the first $10,000 in costs. (Shapiro, 10). The credits expired in 1985.

Residential Conservation Credits

15% of the first $2,000 invested by a homeowner in residential efficiency equipment was eligible for a tax credit. Landlords were not eligible for the credit, and low income renters were generally not able to afford the conservation investments even with the ITC. (Heede, tax, 54). Eligible investments included insulation, efficiency equipment, storm windows, automatic setback thermostats, etc. The credits expired at the end of 1985.

Commercial Conservation Credits

Provided a 10 percent tax credit for qualifying equipment which would increase the energy efficiency of commercial or industrial facilities and processes. Qualifying equipment included such items as heat pumps, waste heat boilers, combustible gas recovery systems. (Heede, tax, 61; Lazzari, 19).

Electric Cars

The Energy Policy Act of 1992 instituted a 10 percent tax credit for electric cars, up to a maximum of $4000 per car. The credit is phased out between 2002 and 2005. (CRS, 11/92, 102).

Investment Credit for Rehabilitation of Structures, Other than Historic Structures

Provision allows a 10 percent investment tax credit for the rehabilitation of buildings used for business or productive activities and that were erected before 1936 for other than residential purposes. A small portion of this tax benefit supports end-use efficiency improvements in the rehabilitated structure. A more detailed description of tax-benefits to real-estate and how they benefit energy efficiency improvements may be found on page B2-30.

BENEFICIARY ENERGY TYPES: Only geothermal, solar, ocean thermal, oil, and gas benefit from current laws targeted at energy. End-use efficiency benefits from one housing tax subsidy. In addition, however, much of the past benefit went to the capital-intensive electricity sector, and the impacts continue today, and many of the expired provisions continue to exert residual budgetary impacts.

SUBSIDY MAGNITUDE: Investment tax credits are similar to a grant from the government. The subsidy is equal to the difference between a tax credit and the present value of any tax deduction for depreciation which the taxpayer may no longer use as a result of taking the tax credit.

ELIGIBLE ACTIVITIES: See individual descriptions above.

LIMITATIONS: Utility investments had to have a useful life of at least three years. All investments were subject to recapture provisions if the investments did not produce for a long enough period of time. Since the 1986 Tax Reform Act, the investment basis used to calculate the tax credit could not include the portion of the investment financed by a government subsidy (direct purchase, tax credit, or subsidized financing). (JCT, 3/1/90).

In addition, as mentioned at the beginning of the tax credits section, taxpayers require income in order to utilize the investment tax credits.

Investment Tax Credits - New Machinery and Equipment*

Part 1: Estimate of Subsidy Magnitude

	Low Estimate	High Estimate	
Treasury/JCT Tax Expenditure Estimates	3,800.0	8,560.0	Low estimate is from JCT
Energy Share of Total Capital Investment	20.17%	23.01%	Derived from CAPEX.WK1 and RENEWCAP.WK1
Tax Expenditure Due to Energy Sector	766	1,969	

Part 2: Allocation of ITC benefits to Particular Fuels

Energy Shares of Capital Spending Between 1980 and 1989

Energy Type		Amount ($Mils)	Shares of Energy Cap. Spending		ITC Benefits Low Est.	ITC Benefits High Est.
			Low	High		
Crude Oil		273,042	31.62%	31.32%	242	617
Natural Gas		192,626	22.31%	22.09%	171	435
Coal		74,052	8.58%	8.49%	66	167
Solar (Off-grid)		356	0.04%	0.04%	0	1
Ethanol		2,560	0.30%	0.29%	2	6
Biomass (Off-grid)		1,163	0.13%	0.13%	1	3
Electric						
Coal-Electric		86,457	10.01%	9.92%	77	195
Oil-Electric		2,433	0.28%	0.28%	2	5
Gas-Electric		5,646	0.65%	0.65%	5	13
Fission-Electric & Fuel Cycle		189,051	21.90%	21.68%	168	427
Hydro-Electric		5,201	0.60%	0.60%	5	12
Waste-to-Energy		6,491	0.75%	0.74%	6	15
Geothermal-Electric		5,413	0.63%	0.62%	5	12
Biomass-Electric		7,663	0.89%	0.88%	7	17
Wind-Electric		2,070	0.24%	0.24%	2	5
Solar-Electric		794	0.09%	0.09%	1	2
Fusion-Electric		0	0.00%	0.00%	0	0
Efficiency						
Utility DSM, Capitalized		0	0.00%	0.00%	0	0
End-Use Effic., Capitalized						
	Low Estimate	8,400	0.97%		7	
	High Estimate	16,800		1.93%		38
	Average	12,600				
Total Energy						
	Low Estimate	863,417	100.00%			
	High Estimate	871,817		100.00%		
	Average	867,617			766	1,969

See CAPEX.WK1 and RENEWCAP.WK1 for the more detail on the energy shares of capital investment.

*The line item in the Tax Expenditures Budget Appendix is "Investment credit, other than ESOP's, rehabilitation of structures, energy property, and reforestation expenditures." The "energy property" that is excluded is only that receiving ITCs under the alternative conservation and new supply provisions. However, all energy equipment was also eligible for the "normal" ITC for capital investment. These data reflect residual impacts of

Special Investment Tax Credits for Energy

Business Energy Investment Tax Credits - Conservation

A. Magnitude of Subsidy

Low Est	High Est	
1.3	1.3	Treasury/JCT Estimates

B. Allocation of subsidy: all to end-use efficiency

Business Energy Investment Tax Credits - Supply

A. Magnitude of Subsidy and Allocation

	Low Est	High Est	
Total	80.0	110.0	Treasury/JCT Estimates
Allocation			
Solar-Grid	9.7	13.3	Based on shares in Part B
Solar-Non-grid	4.4	6.0	Based on shares in Part B
Geothermal	66.0	90.7	Based on shares in Part B

B. Energy Types Eligible in 1989

	Capital Spending 1980-89	Percent	Source
Solar			
Solar Thermal - Grid	712		RENEWCAP.WK1
Solar Thermal - Non-Grid	250		RENEWCAP.WK1
Photovoltaic - Non-Grid	107		RENEWCAP.WK1
Photovoltaic - Grid	81		RENEWCAP.WK1
Tot. Grid	793	12.08%	RENEWCAP.WK1
Tot. Non-grid	357	5.44%	RENEWCAP.WK1
Geothermal - Grid	5,413	82.48%	RENEWCAP.WK1
Ocean Thermal	Note 1	0.00%	OTA, 102
All Eligible Types	6,563		

Notes:

(1) There are currently no commercial ocean thermal facilities. (See the U.S. Office of Technology Assessment. "Energy Technology Choices. Shaping Our Future," July 1991).

Research and Development Tax Credit

STATUS: Expired on June 30, 1992. However, an extension of the provision was introduced in the last Congress. (Barthold, 8/14/92).

DESCRIPTION: This provision provides a 20 percent tax credit for increases in qualified research and development expenditures. Increases are measured in reference to a "base" R&D spending which is calculated as the average ratio of R&D expenditures/gross receipts between 1984 and 1988. This ratio is set at a minimum of 3% (for start-up companies) and a maximum of 16%. (OMB '91, A-63).

HISTORY:

The Economic Recovery Tax Act of 1981 included a temporary tax credit for investment into R&D. It allowed an incremental tax credit equal to 25 percent of intangible expenses in excess of the average of the three preceding years. The provision has been renewed continually since then. The Tax Reform Act of 1986 set up statutory rules defining what constitutes "qualified" R&D expenditures.

BENEFICIARY ENERGY TYPES: Oil and gas are the main energy beneficiaries of this provision, although even these fuels make up only a small portion of overall private sector research and development based on R&D expenditure data from Data Resources, Inc. Much of the other private energy research is conducted by the Electric Power Research Institute and the Gas Research Institute, both research consortiums. We were unable to quantify subsidies accruing to these two organizations due a lack of data.

SUBSIDY MAGNITUDE:

(Increases in R&D)(20% tax credit) - (tax savings from expensing increases in R&D), where the tax savings from expensing increases in R&D = (increases in R&D)(1-tax rate)

This subsidy magnitude is calculated in reference to the expensing of R&D expenditures in the absence of the credit - itself a tax subsidy (presented later in this chapter). In the absence of special expensing provisions, the subsidy magnitude would be calculated:

(Increases in R&D)(20% tax credit) - Present value(tax deductions over the useful life of the R&D effort)(1-tax rate)

ELIGIBLE ACTIVITIES: Most private research and development activities.

LIMITATIONS: The eligible base for which a tax credit is claimed cannot exceed 50% of total R&D expenditures; and cannot include research carried out abroad, research in the social sciences or humanities, or research funded by grants. (Gravelle, 2).

Post-production research activities, duplication or adaption costs, and surveys and studies are not eligible for the R&D tax credit. (JCT, expiring '90, 17).

Tax Benefits for Research and Development Expenditures

Part 1: Magnitude of the Tax Subsidy

Tax Expenditures to be Allocated:	Low Estimate	High Estimate
Research and Development Tax Credit	625.0	1,590.0
Expensing of Long-Term Research and Development Expenditures	1,125.0	1,750.0
Foreign Research Expenditures Offset of Domestic Income	0.0	1.3

Differences between high and low estimates represent either different estimators (JCT versus Treasury), or revenue loss versus outlay equivelent estimates. See introduction to this chapter for detailed explanation.

Part 2: Research and Development Expenditures by Industry, Company Funds Only ($Millions)

Year	Total R&D Spend.	Petroleum Sector	% of Total
1986	52,647	1,867	3.5%
1985	51,439	2,101	4.1%
1984	48,298	2,173	4.5%
1983	42,861	2,030	4.7%
1982	39,512	1,981	5.0%
1981	35,428	1,780	5.0%
1980	30,476	1,401	4.6%
1975	15,582	693	4.4% See Note 3
1970	10,288	493	4.8%
	Average		4.5%

Notes:

(1) Federal funds are excluded since tax benefits are available only on corporate expenditures.

(2) Since R&D projects may have varying lives which would affect the magnitude of the tax benefit received, a historical average figure for petroleum's share is used.

(3) Data for 1975 was withheld to avoid disclosing proprietary data on a corporation. The petroleum spending figure is from DRI, and may include some federally-funded R&D.

(4) Choice of data years reflects data availability.

Sources:

(1) Data Resources inc., "Annual DRI/McGraw Hill Survey of Research and Development Expenditures, 1988-90," June 1988.

(2) U.S. Department of Commerce, "Statistical Abstract of the United States, 1990," Table 994

Part 3: Allocation of Tax Benefits to Fuel Type

Beneficiary Fuel: All to Oil*

	Low Est.	Oil Share	High Est.	Oil Share
R&D Tax Credit	625.0	28.3	1,590.0	72.0
R&D Expensing	1,125.0	50.9	1,750.0	79.2
Foreign R&D Offset	0.0	0.0	1.3	0.1

*Potential benefits through the tax code for electric power research (through the Electric Power Research Institute) or natural gas (through the Gas Research Institute) are excluded due to a lack of data.

Tax Credit and Seven Year Amortization for Reforestation

STATUS: Active.

DESCRIPTION: Allows small landowners to receive a 10% investment tax credit on up to $10,000/year spent to clear land and plant trees for the ultimate production of timber. In addition, up to $10,000 in reforestation expenses per tax year may be amortized over a 7-year period, rather than held until the point of timber sale, often more than 2 decades into the future. (Russell and Bowhay, 1989 pp. 2220-2223; JCT, 3/1/90, 5).

HISTORY: The 10% investment tax credit and 7-year amortization for reforestation expenditures were enacted in the 1980 Recreational Boating Safety and Facilities Improvement Act. The Tax Reform Act of 1986 repealed the general ITC, but retained the benefit for reforestation expenditures. (JCT, 3/1/90, 29).

BENEFICIARY ENERGY TYPES: Biomass (Wood)

SUBSIDY MAGNITUDE: The maximum benefit of the tax credit is 10% x $10,000, or $1,000 per landowner. The maximum benefit from the rapid amortization is the [PV(Deductions over 7 years) - PV(Deductions over the actual life of the asset)] x tax rate.

ELIGIBLE ACTIVITIES: Land clearing, reforestation. Direct costs to plant or seed for forestation and reforestation purposes, including site preparation, seed or seedling costs, labor, and tool costs.

LIMITATIONS: The upper limit of $10,000/year restricts this benefit primarily to small timber holders. Excess expenses may not be carried over to a future year.

Tax Subsidies to the Forest Sector

Part 1: Energy Share of Timber Use

	Mil. Cu. Ft. Roundwood Equiv.
Industrial Roundwood Production	14,575
Fuelwood Consumption	3,035
Total	17,610
Fuelwood Share*	17.2%

*Based on 1987 data. Estimate does not seem to include wood-derived energy used by the pulp, paper, and lumber industries, and should therefore be viewed as conservative.

Source: U.S. Dept. of Commerce, "Statistical Abstract of the United States, 1990," Table 1176.

Part 2: Tax Benefits for Timber Active in FY89

		Low Estimate Total	Low Estimate Biomass Share	High Estimate Total	High Estimate Biomass Share	
Tax Credit and 7-yr. Amortization for Reforestation Expenses		140.0	24.1	210.0	36.2	Note 1
Electric-Grid	87%		21.0		31.5	Note 2
Dispersed Use	13%		3.1		4.7	Note 2
Capital Gains Exclusion on Standing Timber		0.0	0.0	0.0	0.0	Provision was inactive in 1989
Expensing of Multi-period Timber Growing Costs		310.0	53.4	320.0	55.2	Note 1
Electric-Grid	87%		46.5		48.0	Note 2
Dispersed Use	13%		6.9		7.2	Note 2
Total Grid			67.5		79.5	
Total Non-Grid			10.1		11.9	
Total Wood Benefits			77.6		91.3	

Notes:

(1) Aggregate subsidy estimates from OMB FY 1991 Budget and/or Joint Committee on Taxation tax expenditure estimates. The differences between the high and low estimates is explained in the introduction to this chapter.

(2) Grid versus non-grid shares of wood fuel use are from RENEWCAP.WK1, which may be found in Chapter B7 of this document.

Production Credit for Electricity from Wind and Closed-Loop Biomass

STATUS: Active beginning in 1992. Was passed after 1989.

DESCRIPTION: Allows owners of qualified wind energy or closed-loop biomass facilities a 1.5 cent/kWh tax credit for electricity produced and sold to a third party. Wind plants placed in service between 1992 and July 1, 1999, and biomass plants placed in service between 1993 and July 1, 1999 are eligible to receive the credit for the first 10 years of production. (CRS, 11/92, 95,96).

Production tax credits are similar to investment tax credits, except that the output of useful energy rather than the amount of invested capital determines the size of the tax benefit.

HISTORY: This provision was passed as part of the Energy Policy Act of 1992.

BENEFICIARY ENERGY TYPES: Wind and closed-loop biomass. Closed-loop biomass must be produced in a sustainable manner, and such that the system of harvest and replanting does not increase net carbon emissions.

SUBSIDY MAGNITUDE: [1.5 cents/kWh] x [# kWh of eligible electricity sold], reduced for any of the conditions listed in the limitations section below.

ELIGIBLE ACTIVITIES:

LIMITATIONS: Facilities must be placed in service during the windows stated above and remain eligible for a maximum of 10 years. In addition, the credits are phased out as the price of electricity rises from 8 cents to 11 cents per kilowatt (inflation adjusted). Facilities receiving business energy or general investment tax credits are ineligible, and the credits are reduced proportionally to account for any other federal subsidies (including tax-exempt bonds) received. (CRS, 11/92, 95, 96).

ACTIVITIES OR PRODUCTS EXEMPT FROM TAXATION

- Alcohol Fuel Excise Tax Exemption **(See description on page B2-13 in the Tax Credit Section)**
- Tax-Exempt Bonds for Seaports, Harbors, and Wharves
- Tax-Exempt Bonds for Public Power, Gas Utilities, and Multiple Utilities
- Tax-Exempt Bonds for Pollution Control
- Tax-Exempt Bonds for Solid Waste/Resource Recovery
- Tax-Exempt Bonds for Environmental Improvements to Hydroelectric Facilities
- Tax-Exempt Dividend Reinvestment for Public Utilities
- Exclusion of Payments in Aid of Construction of Gas and Electric Utilities
- Exclusion of Mortgage Interest on Owner-Occupied Homes
- Exclusion of Black Lung Payments
- Exclusion of Utility Demand-Side Management Payments

Description

These tax subsidies reduce the taxable basis of an entity by exempting certain of their activities entirely from taxation. This reduces the costs of an activity relative to what it would have been without the subsidy, generating opportunities for either increased returns or improved market potential.

Example

Without Subsidy

Tax Rate = 50%
Taxable Basis = $100
Taxes = (50%)($100) = $50

With Subsidy

Tax Rate = 50%
Taxable Basis = $100 - revenues from exempt activity (assume $20)
= $100 - $20 = $80
Taxes = (50%)($80) = $40

Net Subsidy

Taxes without exemption - taxes with exemption = $50 - $40 = $10

Tax-Exempt Bond Issues

STATUS: Tax-exempt bond issues for municipally-owned energy facilities continue to be issued. Issues for private energy-related purposes were significantly restricted by the Tax Reform Act of 1986, although residual impacts from earlier investments remain. Some energy investments remain eligible for tax exempt issues, and a new provision, allowing tax-exempt bonds for environmental improvements at hydroelectric facilities, was passed in the Energy Policy Act of 1992. (JCT, 10/5/92, 2).

DESCRIPTION: Bonds are a financing tool used to raise money for large projects. The lender receives interest on the funds lent for a specified period of time, but no stake in the entity for which the money is used. Since the interest on this loan becomes income for the lender, it is generally taxed (so long as the lender is a taxpayer).

A number of special exceptions to this rule have been made by Congress. Certain bond issues are tax-exempt, meaning that the interest they earn is exempt from federal taxation. Since the interest income is tax-free, the lender is willing to lend the money at a lower interest rate. Thus, tax-exempt bonds reduce the cost of borrowing for the loan recipient. The federal government also loses tax revenues.

Most of the debates over tax-exempt bonds focus on how much a particular municipality should be allowed to issue, and for what purposes. The Tax Reform Act of 1986 restricted tax-exempt bond activity significantly, both in terms of allowable issue volumes and allowable uses.

Subsidies arise both through new bond issues (called "new issues" or "new capital") and repurchases of old debt to take advantage of lower interest rates (called "refundings").

HISTORY: The original intent of tax-exempt bond issues was to provide a federal subsidy to local projects by enabling State and local governments to borrow at lower interest costs.[21] However,

> there was nothing to prevent State and local Governments from also issuing private-purpose bonds to promote economic development and housing within their jurisdictions, while incurring little or no costs themselves. As a result, investment dollars were shifted away from other taxable, interest-producing alternatives... (Skelly and Kozielec, 45).

As the utilization of tax-exempt issues for private uses continued to grow, the federal government began to narrow the scope of allowable activities. Beginning in 1982 (under the Tax Equity and Fiscal Responsibility Act of 1982) issuers of private purpose tax-exempt bonds had to provide information to the IRS on the nature and uses of the bonds. Nonetheless, the dollar value of new issues increased from $57.2 billion in 1983 to $131.0 billion in 1985 (IDD, 5/92). By 1985, non-government use of tax-exempt bonds represented 54% of long-term tax-exempt bonds issued that year. (Skelly and Kozielec, 45).

The Tax Reform Act of 1986 (TRA) capped the use of private activity tax-exempt bonds at $50 per capita or a minimum of $150 million for each state (OMB'92, 3-27) and made the alternative minimum tax applicable to interest earned on newly issued private-purpose bonds. (CBO '91, 152). Transition rules set the cap at $75 per capita or $250 million per state through 1987. (Nybo, 9/22/92). TRA also eliminated the use of tax-exempt bonds for some purposes entirely, restricted advance refundings (described below) to governmental use and private exempt entity bonds, and restricted the issuance of state and local bonds to generate funds then invested into higher yield accounts. The cutoff date for issuing tax-exempt IDB's

[21] In 1988, the Supreme Court decisively rejected claims that the tax-exemption for state and local bonds was a Constitutional right. (Metcalf, 57).

for manufacturing facilities was extended through June 1992, with legislation currently pending to extend it further. (Nybo, 9/22/92).

The classification of bond issues differs by the group tracking them. Federal categorization is based partly on the end use and partly on the type of user. Thus, in their classification (student loan bonds, qualified mortgage bonds, private exempt entity bonds, and industrial development bonds), bonds under exempt entities or industrial development categories could be used to finance energy projects. In contrast, the private municipal bond tracking organizations (IDD and The Bond Buyer) track all tax-exempt bonds by the use of proceeds only. In addition, the data from Treasury and the private tracking organizations in terms of total issue volumes do not match exactly. This may be partly do to the inclusion or exclusion of debt from federally-owned facilities.

Since we are most interested in what the bonds are used for, we ignored Treasury bond classifications and totalled all expected losses from tax-exempt bond issues. This aggregate number was used as the base against which data from IDD Data Systems bond issuance data were compared on a percent-of-total volume basis. The underlying assumption here is that tax losses for a given dollar of tax exempt debt issued is constant across all use-of-proceeds categories. Differences in the interest rates charged to different classes of borrowers do exist, and introduce some error into our estimation method.

Docks, Wharves, Seaports, Harbors

Although the Treasury groups issues for docks, wharves, and harbors with those for airports and sports and convention facilities, IDD has disaggregated data for water-related infrastructure only. The use of tax-exempt bonds for publicly-owned docks and wharves remains in effect with no volume cap. Debt usage for sports and convention facilities, and for privately-owned docks, wharves, and airports, has been repealed. To the extent that these issues reduce the cost of docks and wharves, bulk users of those facilities (such as coal and oil) benefit. Residual budgetary effects from earlier issues remain, as do new issues for public facilities.

Solid Waste/Resource Recovery Facilities

Although most waste-processing industries remain eligible for tax exempt bonding so long as the input to the plant (i.e., the garbage) has a negative value (MacLean, 62), issues are subject to a cap instituted in the Tax Reform Act of 1986. (OMB '91, A-64). Waste-to-energy facilities were not eligible for tax exempt financing under the Energy Tax Act of 1978. Under the Windfall Profit Tax Act of 1980, however, the definition of "solid waste facility" was expanded to include steam generating plants where at least 50 percent of the fuel is solid waste or waste derived fuel (provided the derived fuel is produced at the same or adjacent facility). This included facilities to produce alcohol for use as a fuel from solid waste. (Shapiro, 31). The Tax Reform Act of 1986 eliminated the use of tax-exempt bonds for facilities producing steam or alcohol from solid waste. Facilities producing electricity remain eligible. (CRS, 11/92, 86).

Pollution Control

Tax-exempt issues for pollution control were eliminated in the Tax Reform Act of 1986. The tax-exempt bonds for pollution-control equipment were intended to ease the transition caused by federal environmental regulations. However, the bonds began to be used for more and more entire projects, rather than just incremental investments in pollution control equipment. By reducing the costs of pollution controls in new industrial facilities, the bonds were actually subsidizing investment in polluting technologies. In addition, since the tax-exempt bonds were available only for pollution controls which

are already required by the U.S. Environmental Protection Agency, they did not support new pollution control innovation. (Morgan, 4). According to Morgan, "86 percent of all pollution control bonds issued were used to finance energy facilities, and 84 percent were for power plants" in 1984. (Morgan, 3). Energy facilities that are more pollution intensive (coal and oil utilities) are the main energy beneficiaries of this policy.

New bond issues for pollution control in 1989 were less than one-quarter the 1985 level, but reflect either projects undertaken by municipal governments or which were grandfathered in the 1986 tax changes.

Private Power, Public Power, Gas Utilities, and Multiple Utilities

Eligible private energy facilities included small hydroelectric facilities, steam generating facilities (e.g., electric utilities) and alcohol production facilities (ethanol from biomass only). Benefits for small hydro expired in 1985; the others were repealed by the Tax Reform Act of 1986. Prior to tax reform, many private utilities got access to tax-exempt bond issues through arbitrage. In all instances, budgetary effects will continue for the life of the outstanding bond issues.

Public utilities, such as electrical generation and gas utilities, remain eligible for tax-exempt bond issues, and continue to make significant use of them. Multiple utility issues involve a single utility district which provides multiple services such as gas, water, sewerage, and power.

Environmental Improvements to Hydroelectric Facilities

The Energy Policy Act of 1992 created a new class of tax-exempt bond issues which may be used for environmental enhancements to licensed hydroelectric facilities. The bonds are exempt from tax-exempt bond volume caps. (DOE, 10/15/92, 26).

New Issues Versus Refundings

Tax-exempt bonds are generally refunded in order to take advantage of lower interest rates or less restrictive requirements than that available at the time of the original issue. New bonds will be issued under the now-available favorable bond climate, even if the original bonds are not yet callable.[22] Two refunding options are available. "Current refundings" involve new debt issued within 90 days of calling the old debt. "Advance refundings" are utilized to lock into low interest rates when the original debt has a number of years remaining before it can be called. (Nybo, 8/21/91; 9/22/92). This period can run as long as 2-5 years. During this lag period, there is actually double the amount of the initial offering outstanding, the whole amount of which is generating tax-exempt interest. Thus, while refundings reduce the tax-exempt interest payments in the later years of the issue's maturity, they increase the interest payments in the earlier years. Since the increased interest is closer to the present, it is likely that the real value of tax losses to the federal government will increase from advance refundings. Due to a lack of

[22]"Call" provisions allow the bond issuer to repay the entire debt earlier than the original maturity date (e.g., 30 years for a 30-year bond). This protects the issuer from large changes in interest rates. Since the bond-buyer benefits from interest rates which are above the current market, the call provision is an important point of negotiation between buyer and seller.

data, we were unable to estimate the impact of advance refundings on subsidy levels.[23] However, this impact was clearly significant for some years.

BENEFICIARY ENERGY TYPES: Tax-exempt bond issues primarily benefit capital-intensive sources of energy. Thus, the bulk of the benefits accrue to fission, oil, coal, and gas electric. Some benefits also accrue to waste-to-energy, alcohol, and small hydroelectricity.

SUBSIDY MAGNITUDE: The subsidy associated with a tax-exempt bond issue may be calculated in three ways:

Percent of Estimate. This measure simply looks at the proportion of the total dollar bond volume outstanding for a particular time frame and takes that percentage of total tax subsidies estimated for all tax-exempt debt estimated by Treasury and assigns it to a particular fuel. This method was used since it is the most straightforward and does not require data on weighted average interest rates.

Cost to the Government. This measure aggregates the taxable portion of income from tax-exempt bonds and multiplies it by the marginal tax rate of the taxpayer. Many of the investors in tax-exempt bonds are high tax-bracket taxpayers seeking to shelter income (the 1986 Tax Reform Act reduced the losses to Treasury from tax exempt bonds in part because the highest tax bracket was dramatically reduced).

Subsidy to the Borrower. Under this estimate, the magnitude of the subsidy is equal to [(market bond interest rate) - (tax-exempt bond interest rate)] x $Bond Issue.

Due to data limitations, we calculate the subsidy only using the percent of estimate method.

The additional subsidy from advance refundings is much more difficult to estimate and requires detailed knowledge on the interest rates and years for which two issues are outstanding of the refunded issues.

LIMITATIONS: Volume caps and use restrictions were already presented above.

[23]Estimating the net impact of advance refundings is made more difficult since, although the overall present value of the benefits increases, the annual nominal value of the tax loss increases in early years and decreases in later years over the losses without refunding.

Tax-Exempt Bond Issues

Part 1: Magnitude of the Subsidy

	Low Est.	High Est.
All Tax-Exempt Bond Issues	18,930.0	23,090.0

Sources: JCT, "Tax Expend. Ests. 1989-1993,"; OMB '91, A-73.

Part 2: Use of Tax-Exempt Bonds, By Sector - 1982-89

	All Issuers		Public Power		Gas Utilities		Pollution Control		Solid Waste/ Resource Recovery		Multiple Utilities		Seaports, Harbors, Etc.	
	New Capital	Advanced Refunding	New Capital	Advanced Refunding	New Capital	Advanced Refunding	New Capital	Advanced Refunding	New Capital	Advanced Refunding	New Capital	Advanced Refunding	New Capital	Advanced Refunding
1980	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1981	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1982	57,573.2	5,707.0	6,260.5	731.7	38.0	0.0	4,349.3	749.5	193.0	0.0	268.3	598.0	750.1	115.3
1983	57,244.0	16,558.1	5,402.2	2,460.0	81.7	0.0	2,697.1	694.0	725.0	26.6	335.1	350.6	387.9	165.5
1984	78,804.5	16,632.7	7,818.7	930.3	85.7	128.6	7,799.5	1,528.8	4,021.7	212.0	508.9	446.8	662.9	102.3
1985	131,000.0	67,357.8	8,414.1	14,274.2	489.3	108.5	7,886.0	1,650.1	3,490.5	102.5	794.4	1,087.6	769.8	462.9
1986	71,671.2	58,261.6	3,642.0	14,673.2	0.6	272.0	2,130.5	300.3	1,817.2	109.9	1,231.7	1,531.2	255.6	130.4
1987	70,288.9	37,284.5	1,649.3	7,931.2	173.4	142.4	1,638.8	684.9	1,200.3	42.6	447.7	160.7	100.3	141.9
1988	73,066.1	37,130.8	1,209.5	4,402.4	42.5	7.6	838.5	858.8	1,736.1	300.0	266.8	616.6	445.9	158.9
1989	87,928.5	31,325.3	3,314.7	4,835.3	201.4	139.5	969.3	587.2	1,863.9	527.0	533.6	626.6	440.9	308.5
Tot.	627,576.4	270,257.8	37,711.0	50,238.3	1,112.6	798.6	28,309.0	7,053.6	15,047.7	1,320.6	4,386.5	5,418.1	3,813.4	1,605.7
Pct.			6.01%	18.59%	0.18%	0.30%	4.51%	2.61%	2.40%	0.49%	0.70%	2.00%	0.61%	0.59%

Shares of Subsidy, Including New Capital Only							
Low Estimate	1,137.5	33.6	853.9	453.9	132.3	115.0	
High Estimate	1,387.5	40.9	1,041.6	553.6	161.4	140.3	

Notes and Sources:

(1) Data are from the IDD/PSA Municipal Bond Issues Database and were produced in May 1992.

(2) Advance refundings will affect overall tax expenditures; however, we did not have sufficient data to assess their impact. They are ignored in this estimate.

(3) Data prior to 1982 contains refinancing mixed with new capital. Inclusion of such data would overstate tax expenditures, since refinancing debt does not add to Treasury losses. As a result, the outstanding universe of bonds is assumed to be from 1982-89. While this may not be a bad estimate of the duration until callable, better data on bond duration and weighted average yields would yield better tax expenditure estimates.

Part 3: Allocation to Fuel Types

A. Public Power Bond Issues - Capital Spending 1980-89, by Fuel Source

Electricity Type	Amount ($Mils)	Share of Tot. Cap. Spending	Share of Subsidy Low Est.	Share of Subsidy High Est.
Coal-Electric	107,821	29.29%	333.2	406.4
Oil-Electric	6,186	1.68%	19.1	23.3
Gas-Electric	2,104	0.57%	6.5	7.9
Fission-Electric	217,557	59.10%	672.3	820.1
Hydro-Electric	11,989	3.26%	37.0	45.2
Waste-to-Energy	6,491	1.76%	20.1	24.5
Geothermal-Electric	5,413	1.47%	16.7	20.4
Biomass-Electric	7,663	2.08%	23.7	28.9
Wind-Electric	2,070	0.56%	6.4	7.8
Solar-Electric	794	0.22%	2.5	3.0
Fusion-Electric	0	0.00%	0.0	0.0
Efficiency				
Utility DSM, Capitalized	0	0.00%	0.0	0.0
Total Energy	368,088		1,137.5	1,387.5

E. Share of Multiple Utility Issues

(see Part E below)

Low Est.	High Est.
9.7	11.8
0.6	0.7
0.2	0.2
19.6	23.8
1.1	1.3
0.6	0.7
0.5	0.6
0.7	0.8
0.2	0.2
0.1	0.1
0.0	0.0
0.0	0.0
33.1	40.3

Notes to Part 3A:

(1) See CAPEX.WK1 for details on the derivation of these values.

(2) Fission utilities got access to tax-exempt debt both through large municipal projects (e.g., Rancho Seco in CA, Bonneville and the Washington Public Power System), and through limited investments made by mutual and cooperative utilities into large nuclear projects.

B. Gas Utilities

	Low Est.	High Est.
All to Gas	33.6	40.9

C. Pollution Control Issues

	Low Est.	High Est.
Total Subsidy	853.9	1,041.6

1 Historical Spending on Pollution Control, by Industry

Year	Total, All Business	Petroleum	% Share	Mining	% Share	Electric Utilities	% Share	Gas & Other Utilities	% Share	Railroads	% Share
1987	9,120	2,110	23.14%	170	1.86%	2,230	24.45%	50	0.55%	40	0.44%
1986	8,450	1,280	15.15%	250	2.96%	2,440	28.88%	50	0.59%	40	0.47%
1985	8,610	1,250	14.52%	320	3.72%	2,790	32.40%	70	0.81%	50	0.58%
1984	8,440	1,280	15.17%	370	4.38%	3,170	37.56%	80	0.95%	50	0.59%
1983	7,820	1,460	18.67%	260	3.32%	2,970	37.98%	70	0.90%	40	0.51%
1982	9,000	1,570	17.44%	380	4.22%	3,440	38.22%	110	1.22%	80	0.89%
1981	9,270	1,680	18.12%	320	3.45%	3,180	34.30%	90	0.97%	60	0.65%
1980	9,190	1,540	16.76%	370	4.03%	2,990	32.54%	60	0.65%	60	0.65%
1979	8,620	1,260	14.62%	450	5.22%	2,940	34.11%	60	0.70%	70	0.81%
1978	7,680	1,130	14.71%	430	5.60%	2,490	32.42%	30	0.39%	60	0.78%
1977	7,330	1,040	14.19%	360	4.91%	2,270	30.97%	30	0.41%	60	0.82%
1976	7,140	1,100	15.41%	270	3.78%	1,860	26.05%	50	0.70%	60	0.84%
1975	6,810	1,210	17.77%	140	2.06%	1,510	22.17%	40	0.59%	50	0.73%
1974	5,650	750	13.27%	150	2.65%	1,460	25.84%	40	0.71%	40	0.71%
1973	5,030	540	10.74%	140	2.78%	1,300	25.84%	30	0.60%	30	0.60%
Weighted Ave., 1980-1987			17.41%		3.49%		33.20%		0.83%		0.60%

Source: Data Resources Inc., "DRI/McGraw Hill Survey of Pollution Control Expenditures, 1988-1990," August 1989, p. 9.

2 Suballocation to Fuel Types

	Overall Share	Subsector Share	Adjustment Factor	Subsector/ Total	
Petroleum	17.41%				
Oil		100.00%		17.41%	Assumes all benefits go to refining sector rather than to extraction.
Mining	3.49%				
Coal		66.08%		2.31%	See CAPEX.WK1, Note 13.
Other		33.92%			
Electric Utility	33.20%				
Quads of Energy Input, 1989					
Coal	16.0	77.82%	94.00%	31.21%	Shares of total production scaled to estimate
Natural Gas	2.9	13.97%	1.00%	0.33%	the production-weighted pollution intensity of the fuel.
Oil	1.7	8.20%	5.00%	1.66%	Unscaled data from EIA, "Monthly Energy Review, 3/92, 33.
Total	20.5				
Gas & other Utility	0.83%	30.00%		0.25%	Assumes most benefit goes to sewage treatment rather than gas distribution.
Railroad	0.60%				
Coal Share		28.15%		0.17%	
Oil Share		2.55%		0.02%	

3. Summary

	Overall Shares	Share of Subsidy Low Est.	High Est.
Oil	17.43%	148.8	181.5
Coal	2.48%	21.1	25.8
Gas	0.25%	2.1	2.6
Coal-Electric	31.21%	266.5	325.1
Oil-Electric	1.66%	14.2	17.3
Gas-Electric	1.00%	8.5	10.4
Total - Energy Share	54.02%	461.3	562.7

D. Solid Waste/Resource Recovery

	Low Est.	High Est.	
Total Subsidy	453.9	553.6	
Estimated Share to waste-to-energy	50.0%	50.0%	Arbitrary assumption; IDD has a separate use category of landfills
Net subsidy to waste-to-energy	226.9	276.8	

(1) 50% allocation to waste-to-energy is an arbitrary one based on the fact that IDD tracks bond issues for sanitation and landfills separately. Therefore, this category is primarily waste-to-energy plants which benefit both energy production and solid waste

E. Multiple Utilities

	Low Est.	High Est.	
Total Subsidy	132.3	161.4	

Benefits mixed utility systems, including electric, sewer, water, and gas. Based on a listing of issues in 1985 and 1989 from IDD, about 1/4 of the issues seem to benefit electric or gas. We arbitrarily allocate this 1/4 according to the mix of capital spending since 1980.

Estimated Energy Share	0.25	0.25	
Subsidy to Energy Sector	33.1	40.3	See Part A above for allocation

F. Seaports, Harbors, Ports

	Low Est.	High Est.
Total Subsidy	115.0	140.3

Spending benefits both inland and coastal/ocean shipping.

	Share of Domestic Ship.	Inland Weight	Net	Share of Ocean Ship.	Ocean Weight	Net	Overall Shares
Coal	19.9%	78.9%	15.7%	10.7%	21.1%	2.3%	18.0%
Oil	37.8%	78.9%	29.8%	39.4%	21.1%	8.3%	38.1%

Notes:

(1) See ACORPS89.WK1 for more detail on these figures.

(2) Shares of domestic and ocean shipping reflect tons carried.

(3) Inland and coastal/harbor weights represent shares of ton-miles of shipping.

(4) "Net" is simply the product of the previous two columns; "overall net" is the sum of the two "nets."

Subsidy Allocation to Fuels	Low Est.	High Est.
Coal	20.7	25.2
Oil	43.9	53.5

Part 4: Summary of Subsidies through Tax-Exempt Bond Issues

	LOW ESTIMATE							HIGH ESTIMATE						
	Public Power	Gas Utilities	Pollution Control	Waste-to-Energy	Multiple Utilities	Seaports, Harbors	Total	Public Power	Gas Utilities	Pollution Control	Waste-to-Energy	Multiple Utilities	Seaports, Harbors	Total
Crude Oil	0.0		148.8		0.0	43.9	192.7	0.0		181.5		0.0	53.5	235.0
Natural Gas	0.0	33.6	21.1		0.0		54.7	0.0	40.9	25.8		0.0		66.7
Coal	0.0		2.1		0.0	20.7	22.8	0.0		2.6		0.0	25.2	27.8
Electric														
Coal-Electric	333.2		266.5		9.7		609.4	406.4		325.1		11.8		743.3
Oil-Electric	19.1		14.2		0.6		33.8	23.3		17.3		0.7		41.3
Gas-Electric	6.5		8.5		0.2		15.2	7.9		10.4		0.2		18.6
Fission-Electric	672.3				19.6		691.9	820.1				23.8		843.9
Hydro-Electric	37.0				1.1		38.1	45.2				1.3		46.5
Waste-to-Energy	20.1			226.9	0.6		247.6	24.5			276.8	0.7		302.0
Geothermal-Electric	16.7				0.5		17.2	20.4				0.6		21.0
Biomass-Electric	23.7				0.7		24.4	28.9				0.8		29.7
Wind-Electric	6.4				0.2		6.6	7.8				0.2		8.0
Solar-Electric	2.5				0.1		2.5	3.0				0.1		3.1
Fusion-Electric	0.0				0.0		0.0	0.0				0.0		0.0
Effic.-Capitalized DSM	0.0				0.0		0.0	0.0				0.0		0.0
Total, Energy Sector	1,137.5	33.6	461.3	226.9	33.1	64.5	1,956.9	1,387.5	40.9	562.7	276.8	40.3	78.7	2,387.0

Tax-Exempt Dividend Reinvestment for Public Utilities

STATUS: Expired.

DESCRIPTION:

Tax exempt dividend reinvestment provisions allowed stockholders in public utilities to exempt up to $750 in dividends from income if those dividends were reinvested into additional utility stock. The provision was authorized in the Economic Recovery Tax Act of 1981 (Barthold, 8/14/92), and expired at the end of 1985. (JCT, Est. of Fed. Tax. Expend '87-91, 6).

HISTORY:

BENEFICIARY ENERGY TYPES: Electricity

SUBSIDY MAGNITUDE: [$750] x [# stockholders contributing] x [average marginal tax rate of stockholders contributing].

ELIGIBLE ACTIVITIES: Investor-owned utilities.

LIMITATIONS:

Exclusion of Payments in Aid of the Construction of Gas and Electric Utilities

STATUS: Repealed. No longer has any budgetary impact.

DESCRIPTION: Payments made by customers to electric, gas, water, and sewage disposal utilities for the purpose of aiding the construction of new facilities were treated as contributions to capital rather than income, and were exempted from tax. Such contributions did not qualify for the investment tax credit, or become part of the utility's rate base. Payments of this type to public gas and electric utilities were given the same treatment retroactive to February 1, 1976. (OMB '81, 219).

These payments, in essence prepayments for future utility services, yielded tax-exempt income from the services provided by the assets financed by the contributions.

HISTORY: Eligibility of gas and electric utilities was conferred by the Revenue Act of 1978. The Tax Reform Act of 1986 repealed this provision for all years after 1986. Contributions in aid of construction are now treated as any other utility income, are fully taxable, and the assets they purchase are depreciable. Utilities were trying to get the taxes associated with these contributions included in the rate base, (Kiefer, 3/18/87, 16) although we do not know the outcome of this effort.

BENEFICIARY ENERGY TYPES: Gas and electricity.

SUBSIDY MAGNITUDE: Total Contributions to the utility x utility tax rate

ELIGIBLE ACTIVITIES:

LIMITATIONS:

Exclusion of Mortgage Interest on Owner-Occupied Homes and Other Tax Expenditure Items Benefitting Real Estate

A number of tax expenditures reduce the effective tax rate on residential construction; a few also provide benefits to commercial construction as well. In 1989, these provisions totalled over $70 billion in tax expenditures. One can argue that a portion of the subsidy to real estate investments overall provide benefits to improvements in the energy efficiency of building infrastructure.

Despite the large size of overall subsidies to real-estate, the portion which realistically benefits energy-efficiency improvements is far smaller. This is due to a number of factors:

- Only capital improvements are eligible for the tax provisions. This limits the applicability of the tax benefits to efficiency spending which occurs during the initial construction. While commercial retrofits may be tax-deductible, residential retrofits can access special tax rates only if financed by a home-equity loan. Many smaller scale efficiency improvements are simply purchased by homeowners on credit or with cash and don't get any special tax treatment.

- Energy use is but one concern of home construction. To the extent that reduced taxation reduces building costs, the savings are as (perhaps even more) likely to be used on increasing the living space (thereby increasing energy demands) as on efficiency improvements (decreasing energy demands).

- Rental units, other than in larger apartment buildings, generally have tenant-paid utility bills. This creates a perverse incentive where the capital costs of energy efficiency, and the operating costs for heating/cooling/lighting the home are paid by different people. The landlord has little incentive to invest in increased efficiency since the capital costs are often higher, but he doesn't realize the savings in operating costs. The tenant has little incentive to upgrade unless the lease period is long since the operating savings will not pay off the incremental capital costs.

- Many of the tax subsidies do not increase as energy-efficiency spending increases, suggesting that they are weak incentives for such spending. Similarly, a number of the subsidies are targeted at low-income housing which generally does not receive significant energy-efficiency investment.

Tax Subsidies to Real Estate Likely to Benefit Energy-Efficiency

Mortgage interest deduction for owner-occupied homes. Owner-occupants of homes may deduct mortgage interest on their primary and secondary residences from taxable income. The mortgages may be used to finance all kinds of construction-related activities, including improvements which increase the home energy efficiency.

Investment tax credit for rehabilitation of structures, other than historic structures. Provision allows a 10 percent investment tax credit for the rehabilitation of buildings used for business or productive activities and that were erected before 1936 for other than residential purposes.

Accelerated depreciation on rental housing and **Accelerated depreciation on buildings other than rental housing.** Changes in the tax rules reduced the expected service life for real estate from 40 years to 31.5 years for commercial real estate and 27.5 years for residential property. The shorter service life allows capital to be amortized more quickly, accelerating the rate at which tax deductions may be taken.

Real Estate Tax Benefits Unlikely to Benefit Energy-Efficiency Improvements

A number of tax benefits are targeted at lower-income home construction, and therefore are judged unlikely to stimulate investments into energy-efficiency since energy efficiency investments often increase per-unit construction costs and the builder generally does not benefit from the energy savings.

- The investment tax credit for low-income housing investments provides a tax credit on construction or rehabilitation of low-income housing.

- Tax-exempt bonds for owner-occupied housing are issued by state and local governments (only bonds issued prior to October 1990 are tax-exempt), with the proceeds used to finance first time low- and moderate-income home buyers. Only housing selling for less than 90 percent of the average area purchase price is eligible. Beginning in 1990, mortgage credit certificates must be issued instead. These certificates give the homeowner tax credits for a portion of the mortgage interest payments to reduce the share of subsidy accruing to bond-holders and financial middlemen.

- Tax-exempt bonds for rental housing use bond proceeds for the construction of low-income multi-family homes.

- Five year amortization for housing rehabilitation (which expired in December 1986, but had some residual impact in 1989) allowed rapid amortization of certain rehabilitation expenditures for low and moderate-income rental housing.

Three other real-estate subsidies were judged unlikely to support any increased energy-efficiency investments:

- The property tax deduction for owner-occupied homes allows home owners to deduct their local property taxes on their primary and secondary residences from their federal taxable income. Few home energy-efficiency improvements are likely to be reflected in property-tax assessments, which are primarily based on home size, location, and age.

- The exclusion of capital gains on home sales for persons aged 55 and over allows homeowners to claim a deduction of up to $125,000 on the capital gains from a home sale once in their lifetime. While some energy efficiency improvements may increase the value of the home (thereby increasing the ultimate capital gain), such a connection seems a weak one. Homeowners seem unlikely to invest in energy-efficiency improvements prior to home sale simply to increase their tax-shielded capital gains. Such improvements seem much more likely to be undertaken by the new resident who will directly benefit from the reduction in home energy costs during his ownership.

- The deferral of capital gains on home sales allows homeowners of any age who sell their home for more than they paid for it to defer paying taxes on the gain for a period of two years. After two years, the gain becomes taxable unless the homeowner has used the funds to purchase or build a new home. This tax benefit is excluded for the same reason as the provision above.

Tax Preferences Supporting Real Estate Creation and Rehabilitation

Part 1: Tax Subsidies to Real Estate and Allocation to Efficiency

	1989 Tax Expen		Shares to Efficiency (Note 1)	
	High Est.	Low Est.	High Est.	Low Est.
	($Millions)			
Tax Credits				
ITC for rehabilitation of structures (Note 3)	130	130	(2) 2.7	(2) 1.3
Reduced Tax Basis				
Mortgage interest exclusion, owner-occupied homes	34,190	30,800	139.8	75.5
Accelerated depreciation on rental housing	2,410	1,000	9.9	2.5
Accelerated depreciation on buildings other than rental housing (Note 3)	9,675	6,300	203.5	64.9
Total Real Estate Tax Breaks supporting efficiency	46,605	38,230	355.8	144.2
Commercial and Industrial Breaks (Note 3)	10,005	6,430	206.2	66.3
Residential Breaks	36,600	31,800	149.6	78.0

Notes to Part 1:

(1) Tax expenditure multiplied by the efficiency share of total construction from 1980-1989 from Part 2.

(2) High est. is generally the outlay equivalent and measures the pre-tax value of tax break. The low estimate measures the Treasury revenue loss. See chapter introduction for details.

(3) Benefit is not restricted to residential housing construction. The total commercial and industrial tax breaks are the sum of these items.

Sources: OMB '91, A-71,A-72; JCT, "Est. of Tax Expenditures, FY89-93."

Part 2: Spending on New Construction and Capitalized Energy Efficiency Expenditures, 1980-89

	Residential (1)	Non-Residential (2)
1989	196,551	103,358
1988	198,101	97,102
1987	194,656	91,994
1986	187,148	91,171
1985	158,474	95,317
1984	153,849	81,147
1983	125,251	65,675
1982	84,676	69,355
1981	99,241	64,695
1980	100,381	55,431
Total	1,498,328	815,245

Estimated Capitalized Efficiency Expenditures (Note 3)

	Residential		Non-Residential	
Low	3,675	0.25%	8,400	1.03%
High	6,125	0.41%	16,800	2.06%

Notes to Part 2.

(1) Residential construction includes both new construction and retrofits, either of which may be financed with home equity loans

(2) Value of new private construction put in place during each year, including integral machinery such as air conditioning systems
Source: U.S. Department of Commerce, "Statistical Abstract of the United States, 1990," Table 1263.

(3) Includes only capitalized spending since expensed spending not eligible for the tax breaks. Excludes efficiency upgrades paid for by utility demand-side management programs since those are not capitalized. Efficiency spending estimates are presented in more detail in data from RENEWCAP.WK1, found in Chapter B7.

Tax-Exemption of Black Lung Benefits

STATUS: Active.

DESCRIPTION: Disability payments to former coal miners out of the Black Lung Trust Fund, although income to the recipient, is not taxed. The treatment of this income is similar to the treatment of more general workers compensation benefits. While this provision certainly helps the victims, it also reduces the cost of the negative health affects of coal mining borne by coal producers.

HISTORY:

BENEFICIARY ENERGY TYPES: Coal

SUBSIDY MAGNITUDE: Benefits Payment x recipient tax rate

ELIGIBLE ACTIVITIES:

LIMITATIONS:

Exclusion of Utility Demand Reduction Payments

STATUS: Pending. Becomes active in 1993 for residential customers and 1995 for commercial customers. (JCT, 10/5/92).

DESCRIPTION: Residential utility customers may exclude the income they receive from utilities to install energy-efficient equipment and conservation improvements. Commercial customers may exclude 40 percent of such payments beginning in 1995, and 65 percent thereafter.

By excluding these payments from income, the value of the payments to customers is enhanced, making demand reduction less expensive for the utility. (CRS, 11/92, 99).

HISTORY: The provision was passed as part of the Energy Policy Act of 1992.

BENEFICIARY ENERGY TYPES: End-use efficiency

SUBSIDY MAGNITUDE: Benefits Payment x recipient tax rate

ELIGIBLE ACTIVITIES:

LIMITATIONS: Commercial improvements are ineligible until 1995, and only partially eligible thereafter.

Entities Exempt from Taxation

- Exemption of Certain Mutuals' and Cooperatives Income
- Tax-Exempt Publicly-Owned Utilities
- Tax-Exempt Government-Owned Entities

Description

Special rulings exempting one type of facility for taxation entirely while substitute providers are subject to normal tax rules create an advantage for the tax-free entity. A similar advantage may also arise from the type of ownership (e.g., public versus private). This advantage may have nothing to do with the quality or cost of service provided.

Example

Without Subsidy

Net Income = $100
Tax Rate = 50%
Taxes Paid = (50%)($100) = $50
After-Tax Income = Income - Taxes = $100 - $50 = $50

With Subsidy

Net Income = $100
Tax Rate = 0%
Taxes Paid = $0
After-Tax Income = $100 - $0 = $100

Therefore, the tax-exempt organization has more funds with which to fund operational expansion, to return to customers via price reductions, or to return to shareholders via a higher return on equity.

Exemption of Certain Mutuals' and Cooperatives' Income

STATUS: Active.

DESCRIPTION: This benefit was previously called "exemption of noncash patronage dividends." Noncash patronage dividends constitute essentially payments to users (since the users own the facility). They are rebates on any net revenues (profit), so that the enterprise operates on a break-even basis. So long as at least 85 percent of the revenues for the facility are derived from user fees (power charges) of members, then all dividends are exempt from corporate tax. Although the users then have to count these payments as income, corporate taxes have been avoided, and savings can be reflected in power charges.

HISTORY:

BENEFICIARY ENERGY TYPES: All forms of power used to generate electricity.

SUBSIDY MAGNITUDE:

(Eligible Mutual and Cooperative net income) x (34% corporate tax rate)

Although the mutuals and cooperatives, if not tax-exempt, would be able to utilize other tax preferences such as investment tax credits and accelerated depreciation, this would not affect the net estimates here. While the effective tax rate under this provision would decrease (decreasing the estimate magnitude), the magnitude of the other preference items (such as ITCs) would increase an equal amount.

In addition, because these suppliers do not set prices to provide any return on investment, "net income" is low compared to a profit making corporation. If pricing were closer to market rates, net income, and thus the value of their tax-exempt status, would both rise.

ELIGIBLE ACTIVITIES: Electric and telephone cooperative and mutual utilities. Only the electric share is counted in our subsidy estimate.

LIMITATIONS: The tax exclusion for income generated by publicly owned municipal utilities is not included in this estimate, but is calculated separately.

Exemption of Certain Mutuals' and Cooperatives' Income

Part 1: Estimate of Subsidy Magnitude

	Low Estimate	High Estimate
	725.0	1,015.0

Source: OMB, FY 1991 Budget, A-72.

Part 2: Allocation of Income Exemption to Energy

A. Net Income of Rural Electrification Borrowers, 1989

	Amount	Percent of Positive Earnings
Telephone Borrowers	613.4	44.37%
Electric Distribution Borrowers	769.2	55.63%
Power Supply Borrowers	(5.5)	
Total Positive Earnings	1,382.6	100.00%

B. Net Share to Energy

	MW Capacity	Pct. Share, by Fuel	Low Est.	High Est.	
Total Subsidy			725.0	1,015.0	
Electricity Share			55.63%	55.63%	
Net Subsidy to Electricity			403.3	564.7	
Energy Capacity of REA Borrowers, 1991					
Gas	3,133	10.07%	40.6	56.9	
Oil	1,647	5.29%	21.4	29.9	
Nuclear	3,268	10.50%	42.4	59.3	
Coal & lignite	22,925	73.69%	297.2	416.1	
Hydro	102	0.33%	1.3	1.9	
Refuse-Derived Fuel	37	0.12%	0.5	0.7	Allocated to waste-to-energy
Total	31,112	100.00%			

Notes and Sources:

(1) Estimates assume that REA borrowers are a good proxy for the earnings of the wider universe of mutuals and cooperatives. Since REA offers subsidized loans, we assume that most mutuals and cooperatives take advantage of them if possible.

(2) REA borrower earnings are from REA, " A Brief History of the Rural Electric and Telephone Programs," January 1991, pp. 39-47.

(3) REA electrical capacity by fuel is from REA, "REA Financed Generating Plants," January 1991, p. 36.

Tax Exempt Status, Publicly Owned Utilities

STATUS: Active.

DESCRIPTION: Publicly-owned utilities are exempt from paying federal taxes. Private utilities are not. Since the utilities do not have to include taxes in the rates they charge to customers, the cost of power is reduced from what would occur in the absence of the subsidy. In addition to reducing federal tax revenues, this tax-exemption reduces the incentive for consumers of that power to substitute efficiency for electricity.[24] Since publicly-owned power constituted 29.9 percent of power ownership in 1987, significant numbers of people were receiving these lower utility costs. (Stat. Abstract, 1990, Table 969).

Publicly-owned utilities are not entirely tax-exempt. They do generally pay state and local taxes. (Heede, Agency, 44). However, they do not pay federal taxes. In addition, their ability to issue tax-exempt debt reduces their cost of borrowing. However, this is a separate subsidy from tax-exemption of income.

HISTORY:

BENEFICIARY ENERGY TYPES: All forms of power used to generate electricity, and some gas companies as well.

SUBSIDY MAGNITUDE:

(Public Power net income) x (34% corporate tax rate)

Although the public utilities, if not tax-exempt, would be able to utilize other tax preferences such as investment tax credits and accelerated depreciation, this would not affect the net estimates here. While the effective tax rate under this provision would decrease (decreasing the estimate magnitude), the magnitude of the other preference items (such as ITCs) would increase an equal amount.

Finally, because these suppliers do not set prices to provide any return on investment, "net income" is low compared to a profit making corporation. If pricing were closer to market rates, net income, and thus the value of their tax-exempt status, would both rise.

ELIGIBLE ACTIVITIES:

LIMITATIONS: The tax exclusion for income generated by cooperative utilities, while very similar to this tax exemption, is quantified by Treasury and Joint Tax, while the tax-exempt status of publicly owned utilities is not. Because Treasury and JCT do estimate the tax-exemption for cooperatives, we present the tax-exemption for municipal utilities separately in this section to avoid confusion.

[24]The impact on pricing may be indirect. For example, prices may not fall with the added benefit going into increasing the return on equity for investors. However, in utilities, rate-of-return regulation and prices set by utility commissioners suggests that most of the savings from the tax-exemption would be reflected in lower prices to consumers.

Tax-Exempt Status of Publicly-Owned Electric Utilities

Part 1: Net Earnings of Publicly-Owned Utilities, 1989

	State and Local (1)	Federal	
Number of Utilities	1994	10	
Revenues	9,582.4	7,990.4	EIA, 3, 364
Net Income	126.7	704.5	
Return on Sales	1.32%	8.82%	

Notes:

(1) Net income figure includes a $584 million extraordinary write-off of the Rancho Seco Nuclear Plant by the Sacramento Municipal Utility District. Figures include data on facilities reporting to EIA which may not include the entire universe of publicly owned utilities. Data mix utilities with fiscal years ending on June 30th and December 31st.

Source: EIA, "Financial Statistics of Selected Publicly Owned Electric Utilities," 1989.

Part 2: Magnitude of Subsidy

Total Net Income, Publicly-Owned Utilities	831.2	From Part 1
Corporate Tax Bracket	34.00%	
Income Tax Liability, Were Utility Privately Owned	282.6	

Notes:

(1) The corporate tax bracket of 34% is significantly higher than the federal taxes actually paid by utilities in 1989 (which was around 6.5% operating revenues). However, using the lower estimate would be inappropriate because the difference between the marginal rate and the rate actually paid is, to a great extent, due to tax expenditure benefits such as accelerated depreciation and investment tax credits. These benefits, as they would accrue to publicly-owned utilities if they were privately-owned are not otherwise reflected in our estimates.

Part 3: Allocation to Fuel Types - Public Power Fuel Mix in 1989 (see Note 1)

Prime Mover	kWh Capac.	Pct. of Tot.	Subsidy
Hydro	57,654	34.28%	96.9
Fossil (notes 2 and 3)	99,605	59.02%	166.8
Coal-driven		67.71%	112.9
Oil-driven		24.81%	41.4
Gas-driven		7.48%	12.5
Nuclear	11,294	6.69%	18.9
Renewables	12	0.01%	0.0
Total	168,757		

Notes:

(1) Includes Cooperatives, Power Districts, State Projects, and Municipal and Federal Facilities. Inclusion of cooperatives in power mix may alter allocation percentages somewhat.

(2) Fossil includes both steam and internal combustion systems.

(3) Allocation to coal, oil, and gas powered capacity was done using the mix of Rural Electrification Administration borrowers shown on REA.WK1, part 6A. Since most federally-owned power capacity is hydro or fission, the use of REA borrowers (which do not include federal facilities) to allocate the fossil capacity is likely to be a good proxy. The percentages shown for coal, oil, and gas represent shares of REA-financed fossil-fueled capacity.

Sources: EEI, "Statistical Yearbook of the Electric Utility Industry, 1989," December 1990, Table 2.
REA, "REA Financed Generating Plants," January 1991, p. 41.

Tax Exempt Status, Government-Owned Entities

STATUS: Active.

DESCRIPTION: A number of large, government-owned enterprises are exempted from federal income taxes. These enterprises include both providers of energy and energy services, and financial-type institutions providing energy financing. This tax exemption reduces the cost structure of the government enterprise, making it more difficult for other sources of energy (such as demand-side efficiency) to compete. With increased competition between power districts more likely as a result of the Energy Policy Act of 1992, this tax exemption (coupled with the lack of required rate of return, discussed in chapter B4) will create a disadvantage for private supply-side power providers as well. While we were unable to quantify the value of most of these tax exemptions, we at least mention the areas affected below.

Federally-Owned Energy Production. These tax-exempt utilities, such as the Power Marketing Administrations and TVA, are quantified under the "Tax-Exempt Status, Publicly Owned Utilities," above. The tax-exemption of the Naval Petroleum Reserves is included in our high estimate.

Lending Institutions. The Rural Electrification Administration and the Export-Import Bank are able to provide lower cost loans to the energy sector as a result of their tax-exempt status. This is not included in our estimates.

Energy Service Organizations. The Uranium Enrichment Enterprise and Nuclear Waste Fund; the Strategic Petroleum Reserves; and the Army Corps operation and maintenance of domestic waterways, all provide important and valuable services to the nuclear fission, oil, and oil and coal sectors respectively. In each case, the tax-exempt status (and lack of a required rate of return) reduce the cost of these services, although this is not reflected in our estimates.

Market competitors must often pay full price for similar services. Oil users must pay full price for oil refining, including profit and tax components - though their nuclear counterparts receive cheap enriched uranium. Coal plants pay full cost for ash disposal; yet spent nuclear fuel will be disposed of tax-free and at break-even (if that). Subsidized water transport through the Army Corps tax-exempt status differs from the private sector engineering services that the rest of the energy sector must buy.

BENEFICIARY ENERGY TYPES: Fission (from UEE and the nuclear waste fund); oil (from SPR, the Army Corps, and Eximbank); coal (from the Army Corps and Eximbank); and various sources of electricity (from REA and Eximbank). Benefits to electricity from federal power ownership are presented on the previous page.

SUBSIDY MAGNITUDE: (Revenues) x (normal rate of return) x (34% corporate tax rate)

Calculating avoided taxes based on net income for these providers, who are (or were) monopoly suppliers would be ineffective since they generally have no residual cash flows that could be considered "net income." This is generally not a function of their inability to earn a return, but rather suggests that their current pricing is targeted, at most, to recover operating and capital costs. The method shown above calculates their tax liability on an imputed return-on-sales basis. Other estimation methods (e.g., imputed return on assets) may also be possible.

Although these enterprises, if not tax-exempt, would be able to utilize other tax preferences such as investment tax credits and accelerated depreciation, this would not affect the net estimates here. While the effective tax rate under this provision would decrease (decreasing the estimate magnitude), the magnitude of the other preference items (such as ITCs) would increase an equal amount.

REDUCED TAX RATES

- Capital Gains Treatment of Coal Royalties and Standing Timber
- Reduced Tax on Capital Gains
- Reduced Tax Rate on Income Earned by Qualified Nuclear Decommissioning Trusts
- Graduated Corporate Income Tax

Description

A lower tax rate on certain types of income is not as drastic as the total income exemption presented in the previous section, but it still increases the attractiveness of the activities that generate that lower taxed income.

Example

No Subsidy

Tax Rate = 50%
Taxable Basis = $100
Taxes = (50%)($100) = $50

Subsidy

Tax Rate = 40%
Taxable Basis = $100
Taxes = (40%)($100) = $40

Net Tax Subsidy

Tax Subsidy = Taxes owed under normal treatment of income - taxes owed under reduced tax rates
= $50 - $40 = $10

Lower Tax rate on Capital Gains, Including Coal Royalties and Standing Timber

STATUS: Inactive in 1989. However, was partially reintroduced in the 1990 Budget Act. (Barthold, 8/14/92). No budgetary impact in 1989.

DESCRIPTION: Income generated through the sale of capital assets was treated as capital gains income and taxed at a lower rate than wages. The energy sector has benefitted from a lower tax rate on capital gains in two ways. First, special rulings have resulted in income from coal royalties and from standing timber to be classified as capital gains though in both cases they originate from normal business activities. Second, the tax benefits on investments into capital reduce the required rate of return by investors somewhat, yielding a subsidy to capital intensive endeavors, of which energy is one.

General: The purpose of a lower capital gains tax is to encourage investment in capital, thereby increasing U.S. industrial productivity and improving the standard of living. Capital gains taxes were capped at 28 percent, versus the current cap of 31 percent on personal income (the top tax rates were greatly reduced in the Tax Reform Act of 1986). (Barthold, 8/14/92). There is much controversy over whether the theoretical justification for reduced taxes on capital is empirically supported. Nonetheless, the Tax Reform Act of 1986 set the capital gains tax rate equal to that of earned income, thereby eliminating the special benefits from capital investments. However, that same Act did not eliminate any of the laws dividing the two. If lower rates on capital gains are reinstated, benefits would also be reinstated to the energy sector.

The 1990 Budget Act did this, in effect, by raising the general personal income tax rate to 31 percent from 28 percent while retaining the maximum rate on capital gains at 28 percent. (Barthold, 8/14/92).

Timber Income: In some circumstances, profits from the sale of standing timber may be taxed at the lower capital gains rates instead of the ordinary rates. (JCT, 3/1/90, 5). This provision, while in effect, was estimated to reduce the imputed price of timber by 20 percent. (Ruston, H-97).

Coal Royalties: Lessors of coal deposits could arrange the terms of the lease so that the royalties were taxed as capital gains rather than as ordinary income. Since capital gains accrued to lessors, whereas percentage depletion benefits accrue to owners, the relative magnitude of the two will determine whether owning or leasing mining rights is more attractive. (Heede, tax, 75).

HISTORY: Until 1944, capital gains for timber were available only for the sale of a timber tract. Beginning in 1944, capital gains treatment was extended to cover timber harvesting. (Booz-Allen, 19). Benefits for coal were adopted in 1951 to extend to coal lessors the same treatment received by timber lessors. Capital gains benefits to both materials were deactivated by the Tax Reform Act of 1986. However, the laws remained on the books and were reactivated in 1990 when the individual tax rate rose, once again creating a disparity between income tax rates and capital gains rates.

BENEFICIARY ENERGY TYPES: Wood, Coal, energy capital infrastructure

SUBSIDY MAGNITUDE: (Income tax rate - capital gains tax rate) x (Magnitude of capital gains)

ELIGIBLE ACTIVITIES:

LIMITATIONS: Coal land had to be held for at least one year. Treating proceeds from leasing coal mining as capital gains precludes the land owner from also collecting percentage depletion. (Shapiro, 18).

Reduced Tax Rate on Income Earned by Qualified Nuclear Decommissioning Trusts

STATUS: Provision is active. Prior to changes in the tax rate in 1992, we did not view this item as a tax subsidy. However, changes brought by the Energy Policy Act of 1992 make it a tax subsidy now.

DESCRIPTION: Utility payments for nuclear decommissioning may go either into a qualified or a nonqualified trust. Regulations promulgated by the Nuclear Regulatory Commission in 1988 require that either type of decommissioning trust be external to the utility, thereby significantly reducing the risks of commingled funds or default. ("Utilities Move Closer to Nuclear Decommissioning External Trust Compliance," 21).

Qualified Trusts allow utilities to get current tax deductions for cash payments to a decommissioning trust. IRS rules (Section 1.46A-1 and sequential) require that the amount placed into the trust match future expected need, and over accruals can be assessed as part of taxable income. Any cash removed from the trust becomes part of taxable income, and income earned from Trust investments is also taxed. Contributions to the decommissioning trust can't begin until construction of the plant has commenced, and the contributions must be added to the rate base. Finally, investments were, until 1992, limited to extremely low risk Treasury bonds, municipal bonds, and bank deposits.

Through 1992, interest earned on qualified trusts were taxed at the full corporate rate of 34%, leading us to conclude that trust contributions were not subsidized in FY 1989. However, the Energy Policy Act of 1992 changed the tax rate on qualified trusts to 22% beginning in 1994, and dropping further to 20% in 1996. Following this change, we consider qualified nuclear decommissioning trusts a tax subsidy.

Nonqualified Nuclear Decommissioning Trusts do not allow current deductions for contributions. Rather, trust income is treated as utility income, and taxed at the utility's marginal tax rate. Due to many of the special tax provisions described in this chapter, the utility's marginal tax rate was usually substantially below 34% (although it is subject to some limitations such as the Alternative Minimum Tax). Following the Energy Policy Act of 1992 reduction the tax rate on qualified trusts, there is likely to be much less of a difference between the marginal tax on each type of trust.

Decommissioning contributions are not deductible from income until decommissioning begins, at which point expenses paid from a nonqualified trust may be deducted against taxable utility income going back to 1984. (Tuschen, 221). Finally, as a corporate trust, 70% of dividend income is exempt from taxation. (Rogers, 70).

Nonqualified trusts are free to invest in a wider range of options, including corporate bonds, stocks, and real estate, though local law and regulatory agencies may restrict the expected risk level of the portfolio. (Weinblatt et al, 207).

HISTORY: Prior law stated that decommissioning costs were deductible only when decommissioning actually occurred.[25] (Kiefer, 2/24/84, 10). Since then, accrual-based deductions have been allowed so long as the utility follows the rules set out above.

BENEFICIARY ENERGY TYPES: Nuclear fission

[25] As well as for the costs of removing offshore drilling platforms and the costs of reclaiming the land used for strip mining.

SUBSIDY MAGNITUDE: The reduced tax rate on income earned by qualified decommissioning trusts is expected to cost the Treasury $118 million for the four year period between 1994 and 1997. (JCT, 10/5/92). There was no subsidy in 1989.

ELIGIBLE ACTIVITIES:

LIMITATIONS: Trust fund contributions related to operations in the nuclear plant prior to 1984 must be held in a nonqualified trust. (Tuschen, 218). Funds which exceed the IRS's annual allowable contribution must also be put into a nonqualified trust. (Rogers, 70)

Graduated Corporate Income Tax

STATUS: Active.

DESCRIPTION: As a benefit to small businesses, the first $100,000 of corporate income was taxed at a lower rate. The current tiered structure of corporate taxes gradually ratchets up taxes from 15% on first $50,000; 25% on the next $25,000; to 34% on income over $75,000, with 39% levied between $100,000 and $335,000 to recapture the losses at the lower levels. (1991 budget, A-66)

With the norm as a flat tax rate (as in the budget method used by OMB prior to 1983), deviations from a flat tax rate do yield tax losses. However, in its later budget method, OMB built the tax brackets into its reference rules and does not view the graduated income tax as a subsidy.

Since many small businesses are involved with energy extraction, processing, transportation, equipment sales, the last estimate of subsidies included a fraction of this expenditure as a subsidy. (Heede, tax, 20).

We did not estimate the share of this subsidy benefitting the energy sector.

HISTORY:

BENEFICIARY ENERGY TYPES: Unknown.

SUBSIDY MAGNITUDE: (Regular corporate rate - small business rate) x (small business income)

ELIGIBLE ACTIVITIES:

LIMITATIONS:

Reductions in the Effective Taxable Basis: Expensing of Costs Normally Capitalized

- Expensing of Construction-Period Interest
- Expensing of Long-Term Research and Development
- Expensing of Mineral, Oil, and Gas Exploration and Development Costs
- Expensing of Mining Reclamation Reserves
- Expensing of Multi-Period Timber Growing Costs
- Expensing of Tertiary Injectants
- Deduction for Clean Fueled Vehicles

Description

Expensing costs which are normally capitalized reduces current taxes by allowing a larger current deduction from taxable income than would be allowed under traditional accounting methods of matching deductions with the asset service life. Although high current deductions will yield less later on to deduct from taxable income, the time value of money means that current deductions are worth more than future deductions. The example below assumes that $200 worth of costs are affected by the special expensing provisions.

Example

$200 million in power plant construction and new equipment costs may be deducted from taxable income in the first year, rather than in year 7 when the plant commences operation. The example assumes a 10% discount rate, and a tax rate of 30%.

No Subsidy

$200 million is deducted in Year 7. The present value of this deduction discounted at 10% is $112.9 million.

With Subsidy

$200 million is deducted in Year 1. The present value of this deduction is $200 million.

Net Subsidy

[PV(deduction with subsidy) - PV(deduction without subsidy)] x tax rate =

($200 million - $112.9 million) x 30% = $87.1 million x 30% = $26.1 million in reduced taxes

Tax savings from these types of provisions are influenced by (1) the size of the investments; (2) the size of the deductions; (3) the discount rate (cost of borrowing may be higher than 10%); and (4) the acceleration of the expensing (acceleration of tax deductions may be 20 years for some power plants rather than 7 years as shown here).

Expensing of Construction Period Interest/AFUDC

STATUS: Repealed. Although projects for which construction was "substantially" underway prior to repeal were grandfathered, neither the JCT or the Treasury tax expenditure estimates show losses from this provision. Although privately-owned utilities are still allowed to include an allowance for funds used during construction (AFUDC) in their rate base, they apparently can not deduct it from the current year's taxable income any more. In this report, we view inclusion of AFUDC in the rate base as a proper manner to recover the financing costs of construction, and deferral of tax deductions as consistent with the general principal of matching expenses with the useful service life of the equipment.

DESCRIPTION: Allowed businesses to expense rather than capitalize the interest costs incurred during plant or project construction, yielding a mismatch of interest deductions and the property's useful life. This subsidy benefitted large scale capital projects that were heavily financed with debt (such as electric utilities) more than other types of projects. Projects that took more years to complete (such as nuclear utilities) benefitted more than projects with shorter lead times. The reduction of capital costs created a lower cost energy infrastructure and lower energy prices than would have occurred without the subsidy.

In addition, this provision allowed construction-period interest to be expensed for tax purposes (thereby reducing current tax liabilities), but capitalized for book and rate-making purposes (increasing the allowable capital base on which the utility can earn a return). Although this provision was eliminated in TRA of 1986, budgetary impacts continue as long as projects continue.

HISTORY: This provision was part of the original income tax law of 1913. A revision was added in 1942 which enabled taxpayers to voluntary elect capitalizing interest costs. The Tax Reform Act of 1976 required that construction period interest for non-corporate taxpayers be capitalized and amortized over a 10-year period. (OMB, FY 1982, Spec. Analysis G, 218).

The uniform capitalization rules of the Tax Reform Act of 1986 requires costs incurred after December 21, 1986 to be capitalized rather than expensed. Only "property constructed by the taxpayer for which substantial construction occurred before March 1, 1986" was able to delay capitalization. This includes direct costs, taxes, interest, pensions and other employee benefits, and a portion of general and administrative costs. (Kiefer, 3/18/87, 10). Capitalization requirements for interest expenses assumes that the project was financed 100 percent by debt.

BENEFICIARY ENERGY TYPES: The largest beneficiaries were the nuclear and fossil-electric utilities.

SUBSIDY MAGNITUDE: [PV(construction-period interest deduction) - PV(construction-period interest amortization deductions once facility opens)] x tax rate.

ELIGIBLE ACTIVITIES:

LIMITATIONS:

Expensing of Long-term R&D Costs

STATUS: Active. **See spreadsheet associated with the R&D Tax Credit (page B2-20) for allocation of this subsidy.**

DESCRIPTION: This provision allows corporations to expense R&D costs rather than capitalizing them into the resulting project. R&D expensing yields a subsidy by allowing a current reduction in taxable income rather than a future reduction once the project is completed and reaches market. This ruling results from a difficulty in matching an R&D expenditure with a particular beneficiary product and from a difficulty in assessing the useful life of an R&D expenditure over which it should be amortized. (Gravelle).

HISTORY:

BENEFICIARY ENERGY TYPES: Energy types that currently have very high private sector R&D costs are the main beneficiaries.

SUBSIDY MAGNITUDE: Treasury tax expenditure estimates assume that all R&D expenditures lead to successful products and that these products have a life of 8 years. (OMB '92, 3-25). The subsidy value is equal to [PV(Tax deductions from expensing R&D) - PV(Tax deductions from capitalizing R&D and amortizing the cost over the life of the resultant innovation)] x tax rate.

ELIGIBLE ACTIVITIES: All research and development activities.

LIMITATIONS:

Expensing Exploration and Development Costs

STATUS: Active, although scope has been narrowed significantly in the 1980s.

DESCRIPTION: This provision allows certain costs associated with the exploration and development of mineral resources to be expensed in the year incurred, rather than being capitalized into the project cost and recovered over the productive life of the property, as is the norm with most capital ventures. The net financial effect is a reduction in taxable income in the present year rather than in future years. Some deductions (such as in mining) are subject to recapture once the property begins producing. This reduces the effective subsidy somewhat.

Although the taxpayer has the option of capitalizing productive wells or mines (JCT, 3/1/90, 23), this reduces the net tax subsidy so is generally not done. The expensing of dry wells is a provision under normal tax rules governing non-producing assets.

HISTORY: Expensing of exploration and development costs was originally established through regulations issued in 1916, with the rationale that such "intangible" costs were ordinary operating expenses.

> In the 1942 the Treasury recommended that the provisions be removed, but the Congress did not take action. Then, in 1945, a court decision invalidated the rules. In response, the Congress specifically built the provision into the 1954 tax law. Legislative history indicates that the justification for this provision was that it reduced uncertainty and thereby stimulated additional mineral exploration. (Shapiro, 12).

The growing revenue losses from this provision led Congress to gradually tighten up its provisions. The Tax Equity and Fiscal Responsibility Act of 1982 required integrated oil companies to capitalize part of their intangible development costs.[26] The Deficit Reduction Act of 1986 increased the IDCs that integrated firms had to capitalize, extended the amortization period for capitalized costs, and instituted the requirement that foreign IDCs be capitalized. (JCT, 3/1/90, 24).

The deductibility of mining exploration and development expenditures was established in 1951. The changes affecting oil and gas in later laws also applied to mining. (JCT, 3/1/90, 27).

BENEFICIARY ENERGY TYPES: Oil, gas, coal, uranium, geothermal, and all synthetic fuels derived from these sources.

SUBSIDY MAGNITUDE: Subsidy is equal to the [present value(tax rate)(deductions under expensing IDCs)] - [present value(tax rate)(deductions under amortization over asset life)]

The Battelle Memorial Institute study (Cone et al.) estimated that intangible drilling costs and percentage depletion increased crude oil production 3-10%, and reduced oil prices 10-25% during the 1950-1970 period. (Cited in GAO, EMD-82-20, p.10). Later restrictions on the use of these provisions have significantly reduced their impact on production costs.

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[26] In the early 1980s, 99% of the revenue lost from this provision was from oil and gas. (Shapiro, 12). Due to the restrictions on new deductions, and since expensing provisions increase tax deductions early in the property life but increase it later, IDC expensing provisions for oil and gas are actually increasing current Treasury receipts (albeit with inflated dollars). (JCT, Tax Expenditure Estimates '90-'94, 11).

ELIGIBLE ACTIVITIES: According to the Joint Committee on Taxation,

> IDCs [intangible development costs] include expenditures incident to and necessary for the drilling and the preparation of wells for the production of oil or gas (or geothermal energy), which are neither for the purchase of tangible property nor part of the acquisition price of an interest in the property. IDCs include amounts paid for labor, fuel, repairs, hauling suppliers, etc., to clear and drain the well site, construct an access road, and do such survey and geological work as is necessary to prepare for actual drilling. Other IDCs include costs of labor, etc., necessary to construct derricks, tanks, pipelines, and other physical structures necessary to drill the wells and prepare them for production. Finally, IDCs may be paid or accrued to drill, shoot, and clean the wells. IDCs also include amounts paid or accrued by the property operators for drilling and development work done by contractors under any form of contract. (JCT, 3/1/90, 22).

LIMITATIONS: Integrated oil companies may expense only 70 percent of the exploration and development costs; the remaining costs must be capitalized and amortized over 5 years. This holds true for the construction of shafts and tunnels for other fuel minerals as well. Foreign oil, gas, or mineral deposits must all be capitalized and amortized over a ten year period (or the life of the investment if this is shorter). (JCT, 3/1/90, 26; Tax Notes).

"At risk" and "recapture" provisions have been added to this law since 1954 to "limit the ability of high income taxpayers to shelter their income from taxation through investment in mineral exploration." (Shapiro, 12).

Tax Provisions Jointly Benefitting Oil and Gas

Part 1: Oil and Gas Activity and Production Value Ratios

	Drilling Activity					Value of Production			
Year	Producing Oil Wells Drilled	% Share (1)	Producing Gas Wells Drilled	% Share (1)	Dry Holes (2)	Oil	% Share	Gas	% Share
1990	10,814	54.18%	9,147	45.82%	7,691				
1989	10,118	53.23%	8,890	46.77%	8,165				
1988	13,290	61.69%	8,254	38.31%	9,982	37,477.4	55.46%	30,096.0	44.54%
1987	15,881	67.36%	7,697	32.64%	11,083	46,929.6	61.90%	28,888.6	38.10%
1986	18,272	69.92%	7,862	30.08%	12,107	39,631.7	54.89%	32,574.5	45.11%
1985	35,882	74.01%	12,600	25.99%	20,946	78,870.7	64.63%	43,167.0	35.37%
1984	43,515	74.84%	14,627	25.16%	24,864	84,110.0	63.43%	48,491.8	36.57%
1983	35,990	71.98%	14,013	28.02%	23,045	83,050.0	65.59%	43,570.0	34.41%
1982	38,388	67.38%	18,584	32.62%	25,545				
1981	42,520	68.29%	19,742	31.71%	26,972				
1980	32,120	65.22%	17,132	34.78%	20,234	67,930.0	67.92%	32,090.0	32.08%
	Wght. Ave.	68.17%		31.83%			62.85%		37.15%

Notes:

(1) Percentage share is of producing wells only.

(2) Dry holes are assumed to occur in proportion to the total wells drilled, and therefore do not alter the relative shares of oil and gas.

Source: DeGolyer and MacNaughton, "20th Century Petroleum Statistics, 1991," December 1991, p. 27.

Part 2: Tax Provisions Benefitting Both Oil and Gas

	Low Estimate			High Estimate			
	Total	Oil	Gas	Total	Oil	Gas	Allocation Basis
Expensing of Oil and Gas Explor. and Development Costs (Note 1)	(65.0)	(44.3)	(20.7)	(300.0)	(204.5)	(95.5)	Number of Wells Drilled
Percentage Depletion Allowance, Oil and Gas	390.0	245.1	144.9	530.0	333.1	196.9	Value of Production (oil and gas both have 10% depletion allowances)
Oil and Gas Exception to Passive Loss Reserves	135.0	92.0	43.0	300.0	204.5	95.5	Number of Wells Drilled
Total	460.0	292.8	167.2	530.0	333.1	196.9	

Sources: OMB, FY 1991 Federal Budget, A71 - A73; JCT, "Estimates of Federal Tax Expenditures for Fiscal Years 1989-1993."

Notes:

(1) The ability to expense oil and gas exploration and development costs creates a tax benefit through the timing of the allowed tax deduction. The provision generates higher deductions in the early years of an investment and lower deductions in later years. So long as new investment exceeds old investment, the Treasury will lose tax revenues on both a nominal and net present value basis. The decline in new investment in this case yields nominal revenue gains for Treasury since the old investments in their later stages have lower than normal allowed deductions. The real value of the tax provisions is unchanged, but has been realized in prior years. The high estimate is lower than the low estimate for this provision because larger subsidies in past years gives rise to larger nominal gains to Treasury later on.

(2) This estimate assumes that independent drilling activity for oil and gas follows the same pattern as the overall industry, since percentage depletion allowances allowances are now only available to independents.

Expensing of Exploration and Development Costs

Part 1: Magnitude of Subsidy

	Low Est.	High Est.	
Total Value	20.0	35.0	
Coal Share	19.1	33.4	
Uranium Share	0.5	0.8	See Part 2 below
Geothermal Share	0.4	0.8	

Sources: OMB, 1991 Federal Budget, A-71, JCT, "Estimates of Federal Tax Expenditures, FY1989-1993."

Part 2: Allocation to Fuels

Capital Expenditures for Energy Minerals, 1980-1989

	Cap. Ex. ($Mils)	Percent Shares	
Coal	74,474.5	95.4%	
Uranium	1,870.8	2.4%	Assumes 1989 spending = that in 1988
Geothermal	1,748.0	2.2%	
Total	78,093.3		

See CAPEX.WK1 for greater detail on the derivation of these values

Notes:

(1) These values are crude estimates for many reasons. First, as shown in CAPEX.WK1, there is large uncertainty regarding capital spending levels. In addition, while capital spending will track exploration and development costs, it is by no means a perfect proxy. The use of a 10-year average was necessary since we could not locate annual investment figures for geothermal. Expensing will generally occur in the first year possible. Therefore, this long range may introduce errors. Regardless, coal is likely to be the main beneficiary, although using a more precise allocation basis could shift estimates between uranium and geothermal.

Special Rules for Mine Closure and Reclamation Reserves

STATUS: Active.

DESCRIPTION: Allows costs for closure and reclamation of coal or ore mine sites to be accrued and deducted as the coal or ore is mined, rather than when the actual reclamation costs are incurred (i.e., after all the coal and ore has been mined). This provision subsidizes the cost of compliance with environmental regulations governing the recovery of mining properties.

Although the companies must now set up a reserve account and increase it annually by the amount of interest the reserve would have earned (calculated using the federal short-term borrowing rate), it does not appear as though the reserve must actually be held as a separate trust (Russell and Bowhay '90, 1848-53), thus exposing the reclamation costs to default risks. In the early 1980s this deduction was allowed even if the mining companies did not set aside funds for future reclamation purposes. (Morgan, 9).

This provision is similar to current deductions for nuclear decommissioning trusts. Since funds must be set into a reserve now, and that reserve must pay interest and is taxed if funds are withdrawn, mine operators no longer receive the time value of money from current deductions as they did in the early 1980s. The current structure gives rise to two potential problems, however. First, the funds, in cash, may not be available when the time comes to actually reclaim the mine site. Second, the firm must impute interest for the fund as the government's cost of borrowing. The government's borrowing rate, known in finance as the "risk-free rate" due to its negligible default risk, will be lower than the firm's own cost of borrowing. As a result, the mine operator ends up being able to finance a portion of his activities at the government's borrowing rate.

HISTORY: Reclamation of mine sites was required by the Surface Mining Control and Reclamation Act (SMCRA) of 1977. SMCRA allowed current deductions for reclamation liabilities that were fixed under state law or lease terms so long as the expenses deducted were reasonable. The Deficit Reduction Act of 1984 provided the option for taxpayer to deduct closure and reclamation costs in a uniform manner and in proportion to the actual depletion of the property (for mine closure deductions were based on the percent of the deposit mined; for reclamation deductions were based on the percent of land area disturbed in a year). (Russell and Bowhay '90, 1848-53).

BENEFICIARY ENERGY TYPES: All solid minerals, including coal, uranium, and some synfuels such as shale oil and tar sands. (Russell and Bowhay, '90, 1813).

SUBSIDY MAGNITUDE: [(Firm's short-term borrowing rate) - (Government short-term borrowing rate)] x (amount in internal reserve) plus any defaults on reclamation obligations.

ELIGIBLE ACTIVITIES:

LIMITATIONS:

Expensing of Mine Closure and Reclamation Reserves for Energy Minerals

Part 1: Magnitude of Subsidy

	Low Est.	High Est.	
Total Value	40.0	50.0	JCT "Ests. for FY89-93"; OMB '91, A-71.
Coal Share	39.0	48.8	
Uranium Share	1.0	1.2	See Part 2 below

Sources: OMB, 1991 Federal Budget, A-71 - A73; JCT, "Tax Expenditure Estimates for FY1989-1993."

Part 2: Allocation Between Energy Minerals

Capital Expenditures for Energy Minerals, 1980-1989

	Cap. Ex. ($Mils)	Percent Shares	
Coal	74,474.5	97.5%	
Uranium	1,870.8	2.5%	Assumes 1989 spending = that in 1988
Total	76,345.3		

See CAPEX.WK1 for greater detail on the derivation of these values.

Notes:

(1) These values are crude estimates for many reasons. First, as shown in CAPEX.WK1, there is large uncertainty regarding capital spending levels. In addition, while capital spending will be proportional to the volume of production (which is the basis allowed for accruing reclamation costs) it is by no means a perfect proxy. The use of a 10-year average reduces "lumpiness" in the data. Regardless of this uncertainty, coal is likely to be the main beneficiary, although using a more precise allocation basis could shift estimates between the fuels somewhat.

Expensing Multi-period Timber Growing Costs

STATUS: Active. **See spreadsheet following "Tax Credit and Seven Year Amortization for Reforestation" (page B2-21) for allocation of this subsidy.**

DESCRIPTION: General accounting rules require that goods produced for inventory used in one's own trade or business, or under contract to another party, must be capitalized. Timber production was specifically exempted from these rules, yielding a deferral of taxable income. The uniform cost capitalization rules enacted in the Tax Reform Act of 1986 do not apply to certain costs associated with producing and managing timber.

HISTORY:

BENEFICIARY ENERGY TYPES: Biomass (wood).

SUBSIDY MAGNITUDE: [PV(deductions with 7-year expensing) - PV(deductions with amortization over the asset life)] x tax rate.

ELIGIBLE ACTIVITIES: The indirect costs of a taxpayer stemming from timber operations, such as property taxes, interest, and general administrative expenses, are not required to be capitalized. (JCT, 3/1/90, 27). In addition, some interim management costs such as stand thinning, herbicide/pesticide applications, brush removal, and the labor and equipment to accomplish these tasks, may also be expensed. (Russell and Bowhay, 1989, 2220-2221).

LIMITATIONS: Only the direct costs of acquiring or growing timber must be capitalized and recovered through a depletion allowance or as a cost of timber sold. The direct costs of growing timber include amounts paid or incurred for seed or seedlings, for site preparation, and for planting (including the costs of tools and labor, and depreciation on machinery and equipment used for planting).

Since timber is a renewable resource, capitalized costs must be recovered through cost depletion rather than percentage depletion.

Expensing of Tertiary Injectants

STATUS: Active.

DESCRIPTION: Allows expensing rather than capitalization of chemical injectants used in the current tax year to enhance the process of recovering oil.[27] Tax expenditure estimates for this provision are made only by the Joint Committee on Taxation, rather than also by Treasury as is the case for most of the expenditure provisions.

HISTORY: Expensing of tertiary injectants was first allowed in the Crude Oil Windfall Profits Tax Act of 1980.

BENEFICIARY ENERGY TYPES: Oil

SUBSIDY MAGNITUDE:

Present value(Tax Rate)(Injectant Deduction with expensing) - Present Value(tax rate)(Deduction Under Capitalization)

ELIGIBLE ACTIVITIES:

LIMITATIONS: The reinjection of natural gas or crude oil (to maintain well pressure) is not eligible for this provision. (Russell and Bowhay '90, 1545-47).

[27]According to the Office of Technology Assessment, conventional oil recovery techniques can recover an average of 34 percent of the oil in place before well pressures dropped too low to force the oil up. Secondary and tertiary recovery techniques are designed to get a higher fraction of oil out of the ground. Some techniques increase the recoverable fraction to about 50 percent. (OTA, 1991, 68).

Deduction for Clean Fuel Vehicles

STATUS: Begins 1993.

DESCRIPTION: Provides tax deductions for the purchase of certain clean-fueled vehicles, and on facilities used to store or deliver clean fuels or electricity. Since these costs would otherwise have to be capitalized and depreciated over their statutory service lives, this deduction operates as the other expensing provisions. Deductions are for the portion of the vehicle cost attributed to the engine. (CRS, 11/92, 101).

HISTORY: The special deduction was passed as part of the Energy Policy Act of 1992, and is intended to help diversify the fuels used by the transportation sector.

BENEFICIARY ENERGY TYPES: Electricity and clean fuels. Clean fuels include natural gas, liquified natural gas, liquified petroleum gas, hydrogen, or other fuels composed of 85 percent methanol, ethanol, or any other alcohol, ether, or combination of the above.

SUBSIDY MAGNITUDE: Deductions are limited by the type of eligible purchase. Trucks and buses weighing over 26,000 lbs. may deduct up to $50,000; trucks and vans weighing 10,000-26,000 lbs. may deduct $5,000; and all other vehicles may deduct $2,000. Facilities used to store or deliver clean fuels or electricity are eligible for up to $100,000 in deductions. (CRS, 11/92, 101).

The tax benefit to commercial recipients is equal to the [(allowed deduction + PV(Depreciation of remaining capital costs)) - PV(normal deductions under depreciation)] x tax rate.

The tax benefit to an individual purchasing a clean-fueled vehicle would simply be the value of the allowed deduction x their tax rate, since individuals are not normally allowed to deduct the purchase cost of automobiles from their taxes.

ELIGIBLE ACTIVITIES: Purchases of clean vehicles or storage or distribution facilities to run them.

Accelerated Depreciation of Certain Assets

- 7-year Amortization of Reforestation Expenses (See entry in Tax Credits, page B2-21)
- ACRS/Accelerated Depreciation
- Accelerated Depreciation of Rental Housing
- Accelerated Depreciation of Buildings other than Rental Housing
- Rapid Amortization of Railway Cars
- Rapid Amortization of Pollution Control Equipment

Description

The accelerated depreciation of assets reduces the taxable basis in much the same way as special expensing provisions. By allowing rapid depreciation, tax deductions in the near future are higher than they would be if depreciation were matched with the actual service life of the investment. The example assumes a 7-year asset life, straight-line depreciation, and no salvage value.

Example

Without Subsidy

Tax Rate = 50%
Cost of Pollution Control Equipment = $100
Using Standard 7-yr Depreciation Period:
Annual Deduction (Years 1-7) = $100/7 = $14.30/yr

Assuming a 10% Discount Rate and that the first deductions occur at the end of Year 1, the Present Value of the 7 years of Deductions = $69.62

With Subsidy

Tax Rate = 50%
Cost of Pollution Control Equipment = $100
Using Accelerated 5-yr Depreciation Period:
Annual Deduction (Years 1-5) = $100/5 = $20.00/yr

Assuming a 10% Discount Rate and that the first deductions occur at the end of Year 1, the Present Value of the 7 years of Deductions = $75.82
(There are no deductions available in years 6 and 7)

Net Subsidy

[PV(deductions with subsidy) - PV(deductions without subsidy)] x tax rate =
($75.82 - $69.62) x (50%) = $6.20 x 50% = $3.10

Although this subsidy seems small at first glance, the savings in the energy sector are large due to (1) the size of the investments; (2) the discount rate (their cost of borrowing may be higher than 10%); (3) the acceleration of the depreciation relative to actual asset life (e.g., 4 versus 20 years rather than 5 versus 7); and (4) the allowable depreciation method (the double-declining balance method would recover the tax costs much more quickly than straight-line depreciation).

Accelerated Cost Recovery System/Accelerated Depreciation

STATUS: Repealed, but continues to have large budgetary impacts.

DESCRIPTION: Accelerated cost recovery policies enable companies to write off plant and equipment expenditures for tax purposes faster than the assets actually depreciate. This treatment of costs departs from the general accounting principal of matching income with the cost of producing that income and of depreciating assets over their useful lives.[28] Rules adopted in 1981 (and eliminated in 1986) were especially favorable to business by allowing shorter depreciation periods, pushing the bulk of the tax deduction very close to the point of investment.

Accelerated amortization favors long-lived capital over short-lived capital (since a larger difference between asset life for tax purposes and the actual asset life yields larger tax savings) and energy supply over energy conservation and efficiency (since capital equipment is eligible while consumer durables or home improvements such as insulation are not). While the TRA 86 lengthened capital lives, some of these distortions on consumption patterns remain.

There will always be some discrepancy between the asset life used for tax purposes (based on Congressional estimates of service lives for classes of capital) and that used for financial reporting purposes (based on corporate estimates of actual service life). However, tax provisions in the early 1980s purposefully accelerated depreciation to shorten asset write-off far below any reasonable estimate of asset life. For example, power plants were depreciated over 10 (for nuclear) to 15 years (for other fuels), although the lower bound estimates for service lives are at least 30 years. Accelerated depreciation methods (such as double-declining balance) further pushed the bulk of cost recovery to the beginning of asset life.

Subsidy estimates depend on what one considers as a "normal" asset life. While there may be some room to argue over this definition, the methods in use for most of the 1980s clearly conferred a subsidy. We use the pre-1983 asset lives as our base, since this is the basis for which data are provided in the Treasury and JCT tax expenditure estimates.

[28]Does an asset last 4 years or 5? Decisions such as this represent shades of gray in differentiating depreciation over asset life from accelerated depreciation. In the extremes, however, where capital equipment which is used for 35-40 years is depreciated in 5-10, the issue is not gray. One promising area for future research involves the disparity between book-accounting depreciation (which tries to match depreciation with asset life) in the energy industry and tax-accounting. Using a corporate statistical service such as Compustat a researcher could more accurately measure both the size and the distribution of accelerated depreciation and investment tax credit benefits.

Asset Class	Pre-Tax Reform Act of 1986 Depreciation Period/Method	Post 1986 Tax Reform Depreciation Period/ Method
Business Equipment	5 years/150% declining balance.	7 years/Double-declining balance.
Central Office Switching Equipment and Nuclear Fuel Assemblies		5 years/Double-declining balance.
Nuclear generating plant and most gas pipeline assets	10 years/150% declining balance.	15 years.
Most non-nuclear electric generating plants, electric transmission and distribution facilities, and gas plant and distribution facilities	15 years.	20 years/Double-declining balance.
Non-regulated cogenerators and renewable qualifying facilities	5 years.	20 years if sold to others; 15 years if large and used internally; shorter for small cogenerators. Renewable qualifying facilities under PURPA can use 5 yr./Dbl.-declining depreciation. (Porter, 9/21/92).
Waste-to-energy	5 years/straight line.	10 years/straight line.

Source: Kiefer, 3/18/87, 9; Waste-to-Energy from Chen, 3; Kriesberg, Double Jeopardy, 6; Porter, 9/21/92.

HISTORY: The first accelerated depreciation allowance was in the 1954 Internal Revenue Code. This allowed the use of any depreciation method that yielded depreciation deductions equal or less than the double-declining balance method. The rationale was that previous depreciation rules were not in line with economic reality, forcing corporations to write down assets more slowly than actual depreciation, thereby increasing the costs of investment and reducing incentives to invest.

As a result of this Act, utilities shifted to accelerated depreciation and rate boards began imputing such depreciation even for utilities that did not. The rate setters then flowed through these "savings" to the ratepayer, reducing rates, and therefore the taxable base, of the utilities. The Tax Reform Act of 1969 forced utilities to normalize tax credits and investments, or to use straight-line depreciation.

In 1971, the class life asset depreciation range system (ADR) was adopted. This shortened the depreciation lives for tax purposes by 20 percent. The difference between tax depreciation and book depreciation lives had to be normalized. Allowable depreciation schedules were again changed by the Economic Recovery Tax Act of 1981 (ERTA), which put into place the Accelerated Cost Recovery System (ACRS). This act further shortened tax depreciation lives but decelerated the calculation of depreciation amounts within shortened lives. This was accomplished by reducing the allowable declining balance method from 200 percent to 150 percent. (Kiefer, 11-14).

The Tax Reform Act of 1986 reversed the trend towards ever-faster capital write-downs, although in some cases (e.g., general business equipment) the depreciation method was accelerated. This Act increased depreciation periods from 5 to 7 for most manufacturing equipment and 10 years for long-lived equipment; and from 19 to 31.5 years for commercial real estate. (Powell, 12/86, 9,10). "For most types of property, the TRA lengthened the depreciation period but accelerated the depreciation method. For

most types of public utility property, however, the depreciation period was lengthened but the depreciation method remained unchanged" (Kiefer, 3/18/87, 9), and for general business equipment, the depreciation method was actually accelerated.

Transition rules retained most accelerated depreciation benefits for property entering service prior to January 1, 1991. (Kiefer, 3/18/87, 10). Some special rulings (such as for the Limerick 2 nuclear reactor) retained benefits so long as the plant enters service by January 1, 1992. (Kriesberg, Double Jeopardy, 6).

BENEFICIARY ENERGY TYPES:

This provision benefits large-scale capital intensive investments such as electric utilities more than other types of energy investments. It also favors long-lived capital investments more than short-lived investments. Nuclear and fossil-electric were the main beneficiary fuels.

Nuclear plants qualified for 10-year ACRS depreciation, versus the 15-year depreciation (which is also far shorter than actual asset life) for other long-lived generating plants. This difference in depreciation periods reduced the effective tax rate on nuclear plants by about seven percentage points. (Kiefer, 2/24/84, 2).

The ability to use double-declining balance depreciation within the artificially short time frame yielded a situation whereby a 30-year investment in a coal-fired power plant which could be written off in 15 years was actually fully depreciated within about 6½ years. Nuclear plants, with a 10 year write-down, could be written off in just four years once the double-declining balance method was used. (Morgan, 2)

SUBSIDY MAGNITUDE: Accelerated depreciation with amortization of differences between tax and book values yields a capital subsidy similar to an interest-free loan. The magnitude is the tax savings from permitting costs to be written off at a faster rate than the actual decline in asset value. The larger the difference between actual asset value and value shown in accounting for taxation, the larger the subsidy.

[PV(accelerated depreciation charges) - PV(depreciation charges over asset service life)] x tax rate

One study found that the accelerated depreciation provisions passed under the Economic Recovery Tax Act of 1981 cut the cost of borrowing for capital equipment in half.[29]

ELIGIBLE ACTIVITIES:

LIMITATIONS:

[29]Meyer, Stephen. "Tax Policy Effects on Investment: The 1981 and 1982 Tax Acts," Business Review. The Federal Reserve Bank of Philadelphia, Nov./Dec. 1984, pp. 3-14; cited in Franklin Associates, Ltd. and the Center for Economic Policy Analysis, Economic Incentives and Disincentives for Recycling of Municipal Solid Waste (DRAFT), December 1988, p. 40.

Accelerated Cost Recovery System - Accelerated Depreciation of Machinery & Equipment

Part 1: Estimate of Subsidy Magnitude

	Low Estimate	High Estimate	
Treasury/JCT Tax Expenditure Estimates	13,700.0	41,590.0	Low estimate is from JCT.
Energy Share of Total Capital Investment	20.17%	23.01%	Derived from CAPEX.WK1 and RENEWCAP.WK1
Tax Expenditure Due to Energy Sector	2,763	9,568	

Part 2: Allocation of ACRS benefits to Particular Fuels

Energy Shares of Capital Spending Between 1980 and 1989

Energy Type		Amount ($Mils)	Shares of Energy Cap. Spending		ACRS Benefits Low Est.	ACRS Benefits High Est.
			Low	High		
Crude Oil		273,042	31.62%	31.32%	874	2,997
Natural Gas		192,626	22.31%	22.09%	616	2,114
Coal		74,052	8.58%	8.49%	237	813
Solar (Off-grid)		356	0.04%	0.04%	1	4
Ethanol		2,560	0.30%	0.29%	8	28
Biomass (Off-grid)		1,163	0.13%	0.13%	4	13
Electric						
Coal-Electric		86,457	10.01%	9.92%	277	949
Oil-Electric		2,433	0.28%	0.28%	8	27
Gas-Electric		5,646	0.65%	0.65%	18	62
Fission-Electric & Fuel Cycle		189,051	21.90%	21.68%	605	2,075
Hydro-Electric		5,201	0.60%	0.60%	17	57
Waste-to-Energy		6,491	0.75%	0.74%	21	71
Geothermal-Electric		5,413	0.63%	0.62%	17	59
Biomass-Electric		7,663	0.89%	0.88%	25	84
Wind-Electric		2,070	0.24%	0.24%	7	23
Solar-Electric		794	0.09%	0.09%	3	9
Fusion-Electric		0	0.00%	0.00%	0	0
Efficiency						
Utility DSM, Capitalized		0	0.00%	0.00%	0	0
End-Use Effic., Capitalized						
	Low Estimate	8,400	0.97%		27	
	High Estimate	16,800		1.93%		184
	Average	12,600				
Total Energy						
	Low Estimate	863,417			0	
	High Estimate	871,817				0
	Average	867,617	100.00%	100.00%	2,763	9,568

See CAPEX.WK1 and RENEWCAP.WK1 for the more detail on the energy shares of capital investment

See accompanying text for description of the various opinions on accelerated depreciation-related tax expenditures

Accelerated Depreciation for Rental Housing and Buildings other than Rental Housing

See description in the section tax expenditures benefitting real estate, presented on page B2-30 accompanying the description of the mortgage interest exclusion on owner-occupied homes.

Specific Accelerated Depreciation Provisions Benefitting the Energy Sector

STATUS: Expired. No longer has budgetary impacts.

DESCRIPTION: While general accelerated depreciation provisions benefitted all capital purchases, Congress also enacted some specific rapid amortization provisions that benefitted the energy sector. These are presented individually below:

5-yr Amortization of Pollution Control Facilities. To ease the adjustments caused by increasingly stringent environmental regulations, Congress allowed investments into pollution control to be amortized more rapidly than other capital investments. (GAO/PAD-80-26, 44). For existing facilities, this provision subsidized compliance. For new facilities, this provision perhaps reduced the incentives eliminate rather than control pollution.

5-yr amortization on railroad rolling stock (rail cars). This provision allowed railroad rolling stock to be written off more quickly than other assets. The resulting subsidy to rail transport accrued in part to the rail transport of energy fuels such as coal. If 5 year amortization was selected, the beneficiary could not also claim an investment tax credit. The provision was eliminated in 1976 and applied to stock placed in service before January 1, 1976. Figures in years after expiration are negative since higher incomes than would have been reported w/out the provision are showing up now since new investments not subject to the rapid amortization. (GAO/PAD-80-26, 51; OMB FY82 budget, 220).

HISTORY:

Pollution Control. Rapid amortization was first implemented in 1969, at a time when the general investment tax credit was suspended. Once the ITC was reinstated in 1971, it had more favorable tax benefits for investment in pollution control equipment than did the rapid amortization, since the two could not both be used at the same time. Thus, in the Tax Reform Act of 1976, taxpayers were allowed rapid amortization plus 1/2 of the tax credit for properties put into place after 12/31/76. The Revenue Act of 1978 allowed rapid amortization plus the entire tax credit, for facilities placed in service after 12/31/78. Investments made with tax-exempt bonds were not eligible for this benefit. (OMB '81, 220).

BENEFICIARY ENERGY TYPES: Pollution-intensive fuels (coal, oil) and fuels moved by rail (primarily coal).

SUBSIDY MAGNITUDE: [PV(deductions with rapid amortization) - PV(deductions over asset life)] x tax rate.

ELIGIBLE ACTIVITIES:

LIMITATIONS:

Deferral of Required Income Tax Payments

- Deferral of Tax on Shipping Companies

Description

This policy works in the opposite manner as accelerated depreciation (which accelerates the claiming of tax deductions) by keeping tax deductions the same but decelerating the actual payments of the tax liabilities to the government. In both cases, the tax burden is shifted into the future, reducing its real cost to the taxpayer.

Example

Without Subsidy

Tax Rate = 50%
Taxable Basis = $100
Taxes = (50%)($100) = $50

With Subsidy

Tax Rate = 50%
Taxable Basis = $100
Income used for deferable expenses: $60
Income used for other purposes: $40
Taxes paid now = (50%)($40) = $20
Taxes deferred = (50%)($60) = $30

Net Value of Subsidy

When taxes could be deferred indefinitely, the value of the subsidy was simply $30. Since the deferral is now limited to 25 years, the value of the subsidy is equivalent to the taxes deferred today minus the present value of the deferred taxes in 25 years.

Assume a 10% discount rate
Present value of $30 paid back after 25 years, discounted @ 10% = $2.77
Net Subsidy = $30 - $2.77 = $27.23

Tax Deferral on Shipping Companies that are U.S. Flag Carriers

STATUS: Active.

DESCRIPTION: Certain shipping companies that operate U.S. flag vessels receive a deferral of income taxes on that portion of their income used for shipping purposes, primarily construction, modernization, and major repairs to ships, and repayment of loans to refinance these investments. This deferral was once indefinite, but has been limited to 25 years since January 1, 1987. (Tax Notes, 706).

HISTORY:

BENEFICIARY ENERGY TYPES: A large fraction of water shipping is for energy commodities, primarily oil, coal, and a small amount of natural gas liquids. To the extent that these fuels are carried in U.S. flag carriers, oil, coal, and NGLs benefit.

SUBSIDY MAGNITUDE: Income taxes paid without deferral - income taxes paid with deferral = (Income currently eligible for deferral)(tax rate) - PV(income that is tax-deferred)(tax rate)

ELIGIBLE ACTIVITIES:

LIMITATIONS:

Deferral of Tax on Shipping Companies

Part 1: Subsidy Magnitude ($ Millions)

	Low Est	High Est	
Estimated Subsidy Magnitude	100.0	115.0	OMB, 1991 Budget; JCT, "Ests. of Fed. Tax Expend., FY88-93"

Part 2: Energy Share of Oceangoing Shipping in U.S. Flag Carriers

A. Characteristics of U.S. Oceangoing Fleet, Active Fleet Related to Energy Transport

Type	Deadweight Tons	Percent	Commodities Carried
Bulk Carriers	972	5.49%	Ore/bulk/oil; ore/oil, and other combination bulk/oil carriers
Tankers	12,388	69.91%	Crude petroleum; petroleum product; chemicals; LNG; LPG; bulk wine, molassas
Total	17,720	75.40%	Share of program spending potentially accruing to energy

Source: MARAD 1989 Annual Report, p. 12, MARAD, "Merchant Fleets of the World as of January 1, 1990.

B. Oceanborne Shipping of Commodities, 1989 - By Tonnage

	Imports	Exports (Mil. tons)	Total	Percent Share (1)	Scaled to 100% (2)	Comment
Petroleum fuel products	379.4	29.5	408.9	45.89%	69.20%	Scaled percentages reflect narrow range of products
Coal fuel products	4.0	107.5	111.5	12.51%	18.87%	carried on vessel types in question
Chemicals	16.9	43.8	60.6	6.80%	10.26%	
Bulk liquid foods	6.7	3.2	9.9	1.11%	1.68%	Alcoholic beverages and vegetable oils only
Total, all Products	507.7	383.3	891.0	66.32%	100.00%	

(1) Commodity percent share of total oceanborne shipping.
(2) Commodity share of U.S. flag carriers potentially carrying fuels.

Source: U.S. Army Corps of Engineers, "Waterborne Commerce of the United States, 1989," National Summary, Table 2.

C. Oceanborne Shipping of Commodities, 1989 - by Value

	Imports	Exports ($Mil)	Total	% Share of Tot. Trade	Comment
Petroleum fuel products	49,030	2,860	51,890	6.35%	
Coal fuel products	320	3,960	4,280	0.52%	
Natural Gas	2,510	270	2,780	0.34%	
Power Generating machinery	11,790	14,165	25,955	3.18%	Tables E-6 and E-12
Total Energy	63,650	21,255	84,905	10.39%	Tables E-1 and E-2
Total, all Products	468,012	349,432	817,444		

Notes:
(1) Natural gas figures may include pipeline transfers between the U.S. and Mexico and Canada. This would overstate their share of the shipping-related subsidy.

Sources:
(1) Data on fuel trade are from EIA, "Annual Energy Review, 1990," pp. 75, 77.
(2) Other data and totals are from the Trade Tables (Appendix E) in U.S. International Trade Commission, "1992: The Effects of Greater Economic Integration Within the European Community on the United States: First Followup Report," March 1990

Part 3: Allocation of Energy Share of Program Expense to Fuels

	By Tonnage Low Est.	By Tonnage High Est.	By Value Low Est.	By Value High Est.
Shipping Tax Deferral - Total	100.0	115.0	100.0	115
Share of U.S. flag carrier capacity potentially carrying fuels	75.40%	75.40%	N/A	N/A
U.S. flag bulk carriers and tankers	75.4	86.7		
Coal Share	14.2	16.4	0.5	0.6
Oil Share	52.2	60.0	6.3	7.3
Gas	No data		0.3	0.4
Electric-general	No data		3.2	3.7
Other, non-energy cargo	9.0	10.3	89.6	103.1
Total Energy Share	66.4	76.4	10.4	11.9

Notes:
(1) The low estimate allocates the shipping subsidy in proportion to the value of commodities shipped. The rationale here is that shippers with more funds may be more likely to try to shelter them from taxation, utilizing as high a proportion of income for new ship construction as possible.
(2) The high estimate relies on the share of tonnage shipped. High volume will require more ships, while high value shippers may not be need number of ships their tax-sheltered income could purchase.
(3) By-tonnage estimates assume that U.S. flag carriers carry the same freight mix as overall merchant shipping.

Special Deductions

- Excess of Percentage Depletion Allowance over Cost Depletion
- Utility Retention of Excess Deferred Taxes
- Motor Carrier Operating Rights Deductions

Description

Special deductions allow a taxable entity to deduct peculiar things from taxable income which are not normally allowed. This may include money they have not spent, such as with percentage depletion allowances, or provisions which allow companies to collect excess taxes on behalf of the federal government and keep them for internal use.

Examples

Percentage Depletion
No Subsidy

Tax Rate = 50%
Taxable Basis = $100
Taxes Owed = (50%)($100) = $50

With Subsidy

Tax Rate = 50%
Taxable Basis = $100
Additional Deduction of Portion of Sales [Assume = $20, even though cost of mine is already fully depreciated]
Net Taxable Basis = $100 - $20 = $80
Net Taxes Owed = (50%)($80) = $40

Tax Overcollections
No Subsidy

Taxes collected from rate-payers = $100
Taxes paid to government = $100
Net gain = $0

With Subsidy

Taxes collected from rate-payers = $100
Taxes paid to government = $50
Net gain = $50

This gain will have to be paid back to rate-payers over 30 years. Aside from the fact that the rate-payers who receive the refund are not the same ones that overpaid the taxes, the value of the money returned will be far less than $50.

Again, assuming a 10% discount rate and equal payments over 30 years, the PV of the $50 refunded = $15.74. This yields a subsidy to the utility of $50 - $15.74, or $34.26.

Percentage Depletion Allowance

STATUS: Active. **Fuels other than oil and gas are quantified here. See spreadsheet on Tax Provisions Jointly Benefitting Oil and Gas following "Expensing Exploration and Development Costs" (page B2-46) for the allocation of benefits to oil and gas.**

DESCRIPTION: The percentage depletion allowance enables an independent fuel mineral producer or royalty owner to deduct a percentage of gross income from mineral production, thereby reducing the producer's taxable income base. This practice differs from the traditional cost depletion where outlays which are not expensed immediately are deducted over the productive life of the property. Whereas cost depletion is limited to the actual funds invested, percentage depletion allows for deductions in excess of that actually put into the property.

HISTORY: Depletion allowances were initially enacted to encourage development of natural resources - specifically minerals and oil and gas - during times of economic hardship (e.g., the World Wars). While it was the intent to rescind these tax benefits once economic activity picked up, intense lobbying efforts by the primary industries resulted in the retention of many depletion allowances.

The initial law (passed in 1918) allowed "discovery value depletion," based on the market value of a mineral deposit after discovery, rather than the cost of acquiring it. To avoid manipulations of this stated value (higher values would allow higher "recoveries"), percentage depletion, based on the amount of ore actually removed, was substituted in 1926. (Shapiro, 15).

The allowable rates (which vary by mineral as shown below) have gradually been reduced. In 1926 percentage depletion was first allowed for oil and gas, at a rate 27.5 percent. This was reduced to 22 percent in 1969, and 15 percent in 1975. The 1975 Tax Reform Act also repealed percentage depletion deductions for any parties other than independent producers and royalty owners, and established the other limitations presented below. (JCT, 3/1/90, 22).

The Tax Reform Act of 1986 disallowed depletion claims for payments (such as lease bonuses or advance royalties) where no production had actually occurred and instituted recapture provisions on certain depletion deductions. (Tucker and Jarnagin, 876).

The OBRA increased the allowable deduction for oil and gas from 50 percent to 100 percent of net property income and reduced the excess depletion amount subject to the alternative minimum tax. (OMB '92, 3-25).

BENEFICIARY ENERGY TYPES: Uranium (22%); Oil, gas, geothermal, and oil shale (15%); coal (10%)

SUBSIDY MAGNITUDE: The magnitude of the subsidy for a producer can be calculated as: [(Percentage depletion deduction) - (Cost depletion deduction)] x tax rate. The value of this provision over the life of a resource producing property = [PV(Σ% depletion deductions) - PV(Σcost depletion deductions)] x tax rate.

However, there may be some return of tax losses through the increased value in the price of drilling and mining rights (although this only holds for federal lands since on private land the value of this so-called tax capitalization would accrue to the resource owner).

ELIGIBLE ACTIVITIES: All fuel (and non-fuel) mineral extraction industries.

LIMITATIONS: Aside from geothermal energy, integrated producers are not eligible for percentage depletion allowances anymore. Since 1990, the maximum deduction for oil and gas is again 100% of the net income from the property as computed without percentage depletion, up from the 50% previously allowed. (OMB'92, 3-25). Independents must also produce less than 1,000 barrels of oil (or gas equivalent) per day (on average) to be eligible. (JCT, 3/1/90, 21)

Percentage deductions for coal and other solid mineral are limited to 50 percent of the taxable income from the property (Russell and Bowhay '90, 1801). Production from geothermal deposits is eligible for percentage depletion at 65 percent of net income, but with no limit on output and no limitation with respect to qualified producers. (OMB '92, 3-25).

Percentage Depletion Benefits, Other Fuels

Part 1: Magnitude of Subidy

Low Est.	High Est.	
135	220	OMB '91, A-70, JCT "Est. for FY89-93," 10.

Part 2: Allocation to Fuels

Energy Type	Allowable % Depletion	Value of Production 1988	Depletion Allowance Basis	Share of Tax Subsidy % of Basis	Low Est.	High Est.
Uranium	22%	355.5	78.2	3.40%	4.6	7.5
Geothermal	15%	671.6	100.7	4.38%	5.9	9.6
Coal	10%	21,205.0	2,120.5	92.22%	124.5	202.9
	Total		2,299.4			

Value of geothermal production = 10,300 million kWh in 1988 x an average 6.52 cents/kWh (sources: EIA; DOC '90).

Sources:

U.S. Department of Commerce, "Statistical Abstract of the United States, 1990," Table 965 (electricity prices).

U.S. Department of Commerce, "Statistical Abstract of the United States, 1991," Table 1216 (data on coal and uranium).

U.S. Department of Energy, Energy Information Administration. "Annual Energy Review, 1989," p. 239.

Allowance of Utilities to Normalize Tax Overcollections Resulting from the Reduction in the Corporate Income Tax

STATUS: Active.

DESCRIPTION: Private utilities (telephone, electric, water, telephone, and natural gas) collect federal taxes on their services through their normal billing process. As is true with industry in general, there is often a discrepancy between the depreciation used for management reporting purposes (where asset life is equal to the expected service life) and tax accounting (where assets are depreciated as fast as is allowed by law). This discrepancy shows up in the deferred tax account of the corporation. Deferred taxes will generally be greater in growing firms where there are large purchases of an ever greater quantity of capital assets. Tax provisions such as the Accelerated Cost Depreciation System (ACRS) increase deferred taxes because the discrepancy between the book and tax depreciation periods is larger than before. Similarly, Investment Tax Credits tend to increase deferred tax accounts since purchases of capital goods tend to increase. Deferred taxes follow the pattern of ITCs in that they increase tax benefits early on in the life of an asset, and decrease the value later on. In fact, normally deferred taxes are simply the accounting measure of the benefits incurred through tax provisions such as ACRS and ITCs, and counting them as subsidies would be double-counting the benefits already ascribed to these other provisions.

Utilities in the 1980s grew extremely large deferred tax accounts due to both tax provisions (ACRS and ITCs) and to the capital intensity of the industry. The utilities benefitted by retaining these excess taxes (essentially an interest-free loan) for as long as 20-30 years. (National Journal, 8/19/89, 2115). Deferred taxes are a part of normal business activity. However, the Tax Reform Act of 1986 reduced the top corporate rate from 46% to 34%, meaning that about 26% of the deferred tax account would now never have to be repaid to the government. (GAO/RCED-91-51, 8). Known as "excess" deferred taxes, this 26% is the point of controversy.

While the tax decrease occurred in a single year, the benefits of this change accrue over a series of years. This is because the overcollections have not been returned to rate-payers in a single year, and will likely be returned over many years. Our estimate measures the annual value of the utilities' retention of the excess deferred taxes for this period. In the interim, the utility has a large, internal pool of interest-free funds to invest in capital expansion or working capital. Since the cost of the funds is so much lower than other sources of debt, investment patterns may be altered.

HISTORY: Utility retention of tax overcollections has been controversial for a number of reasons. First, utilities generated extremely large deferred tax accounts (sometimes called "phantom" taxes) from tax collections from rate payers which ignored the substantial benefits accruing to the utilities as a result of accelerated depreciation and investment tax credit provisions. Second, since the utilities specifically collect for federal taxes from their ratepayers (rather than a corporation which would simply reduce taxes on earnings from other sources), their withholdings were quite visible. In fact, however, their reduced tax burden, and resulting increased earnings, is exactly the result of these tax policies in private, non-regulated corporations.[30] (Kiefer, 1-10). The major differentiating factor between utility tax overcollections and deferred taxes for a private industry is that competitive industries may choose to return the tax savings to their customers to retain market share while similar pressures for the utility are limited.

[30] As mentioned under the description of investment tax credits, there is an argument that public utilities, which are less risky due to regulated returns, should not benefit from as high an investment tax credit (and resulting tax overcollections) as does a private industry. (In fact, the tax credit for utilities was about half that available to unregulated corporations until 1975). This, however, is a separate issue.

In addition to the magnitude of the tax overcollections, a great deal of controversy surrounded how the extra taxes were returned to customers over time. Consumer advocates and many rate boards argued that the tax-related benefits should be "flowed-through" to ratepayers immediately through lower prices. Congress disagreed with this approach, believing that it defeated the original intent of ITCs and accelerated depreciation: encouraging increased capital investment. Therefore, the Tax Reform Act of 1969 restricted the flow-through of these tax benefits, and allowed only normalization (where the benefits are amortized over the life of the investment, reducing the annual cost of taxes a bit during each period) or straight-line depreciation. (Kiefer, 12). Section 203(e) of the 1986 Tax Reform Act required that even the excess collections be normalized. (GAO/RCED-91-51, 1).

To complicate matters still further, the reduction in corporate rates in 1986 created a wind fall for all companies since their tax rate on the deferred taxes dropped significantly. While normalization of deferred taxes under constant tax rates (and assuming no new investments) would eventually require that all deferred taxes be paid to the government, the drop in rates under tax reform meant that a large portion of the deferred taxes would, in fact, never be needed to pay a tax liability. There is little controversy over the fact of this windfall and its relative magnitude. The debate centers on how long the utilities should be allowed to retain the now-unnecessary deferred taxes.

Kiefer (3/18/87, 6) argues that even with the rate reduction, benefits to utilities are the same as to unregulated firms (i.e., both get a windfall), and that the private sector has no pressure to return these gains to customers through any method.[31] Again, however, the private sector is under pressure from competition to return some of these gains to the consumer while a utility is not.

BENEFICIARY ENERGY TYPES: Gas, and all fuels used to generate electricity.

SUBSIDY MAGNITUDE: The total size of the excess tax deferral from accelerated depreciation alone has been estimated at $17-19 billion (1989$). (GAO/RCED-91-51)). We did not find any reference to the value of deferred taxes from normalized ITCs. The total magnitude of the subsidy is the net present value of the interest on the excess funds that may be retained for internal use through normalization rather than paid out immediately. The longer the period of normalization, the larger the benefit. The value for a particular year is equal to the net funds outstanding in that year multiplied by the borrowing cost that would have had to be paid to borrow outside funds.

It is our judgment that tax overcollections are a result of the accelerated depreciation and investment tax credit provisions, and do not constitute a subsidy in their own right. However, the retention of excess taxes following the drop in marginal rates does constitute a subsidy since there are limited competitive forces (other than regulators) to share the windfall gain with consumers as would occur in a free market.

For our low subsidy estimate, we assume that utility boards serve as this competitive force and refuse rate increases in order to offset the value of the excess retention (thereby sharing the value via power rates). In this scenario, the net subsidy is zero. Our high estimate assumes that utility boards do not act in this way, and that the utilities gain the free use of funds for up to 30 years. Our methodology is described in greater detail on the accompanying worksheet.

[31] In an apparent contradiction, Kiefer also states in an earlier report (2/14/86, 24) that "Normalization is inappropriate, however, for tax reductions which do not fall into these [accelerated depreciation and investment tax credits] categories and are intended to have full effects in the current year, for example, a tax reduction."

Utility Normalization of Excess Deferred Taxes

Part 1: Magnitude and Distribution of Excess Deferred Taxes (See Note 1)

A. Size of Deferrals ($Bil.)	Excess Deferrals As of 12/31/87	Minimum Excess Deferrals as Of 12/31/88
Electric Companies	8.64	8.29
Telephone Cos.	7.09	6.3
Gas Pipeline Cos.	1.22	1.17
Local Gas Distrib. Cos.	0.86	0.81
Water Companies	0.08	0.07
Total	17.89	16.64

B. Benefit to Utilities of Avoided Borrowing	
Cost of Funds, Utility Sector in 1989	
Electric	9.92%
Gas	9.39%

Notes:

(A) Subsidy estimates are from U.S. GAO, "Public Utilities: Disposition of Excess Deferred Taxes," Sept. 1991. GAO/RCED-91-51

(B) Cost of funds are the weighted average of yields on new issues. They are from EEI, "Statistical Yearbook of the Electric Utility Industry, 1989," Table 78 and American Gas Association, "Gas Facts," 1991, Table 15-2.

Part 2: Maximum Allowable Payback Rate Given Normalization ($Millions)

Electric Sector

	Normalization Scenario			1 Year Flow-Through Scenario				
Year	Annual Repayment	Error Correction	Net Deferral	Annual Repymnt	Excess Funds Through Normalization	Avoided Borrowing Cost	Discount Factor	Present Value of Net Deferral
	(2)	(3)	(4)	(6)	(4-6)	(7)	(8)	(7*8)
1988	140.0	138.7	8,289.3	8,289.3	0.0			
1989	167.9	166.4	8,150.6	0	8,150.6	808.5	1.0000	808.5
1990	195.8	194.1	7,984.2	0	7,984.2	792.0	0.9098	720.6
1991	223.7	221.7	7,790.1	0	7,790.1	772.8	0.8276	639.6
1992	251.7	249.4	7,568.4	0	7,568.4	750.8	0.7530	565.3
1993	279.6	277.1	7,319.0	0	7,319.0	726.0	0.6850	497.3
1994	307.5	304.7	7,042.0	0	7,042.0	698.6	0.6232	435.3
1995	335.4	332.4	6,737.2	0	6,737.2	668.3	0.5669	378.9
1996	363.3	360.0	6,404.9	0	6,404.9	635.4	0.5158	327.7
1997	391.3	387.7	6,044.8	0	6,044.8	599.6	0.4692	281.4
1998	419.2	415.4	5,657.1	0	5,657.1	561.2	0.4269	239.6
1999	447.1	443.0	5,241.7	0	5,241.7	520.0	0.3884	201.9
2000	475.0	470.7	4,798.7	0	4,798.7	476.0	0.3533	168.2
2001	449.7	445.7	4,328.0	0	4,328.0	429.3	0.3214	138.0
2002	424.4	420.6	3,882.3	0	3,882.3	385.1	0.2924	112.6
2003	399.2	395.6	3,461.7	0	3,461.7	343.4	0.2660	91.4
2004	373.9	370.5	3,066.2	0	3,066.2	304.2	0.2420	73.6
2005	348.6	345.5	2,695.7	0	2,695.7	267.4	0.2202	58.9
2006	323.3	320.4	2,350.2	0	2,350.2	233.1	0.2003	46.7
2007	298.1	295.4	2,029.8	0	2,029.8	201.4	0.1822	36.7
2008	272.8	270.3	1,734.4	0	1,734.4	172.1	0.1658	28.5
2009	247.5	245.3	1,464.1	0	1,464.1	145.2	0.1508	21.9
2010	222.2	220.2	1,218.9	0	1,218.9	120.9	0.1372	16.6
2011	196.9	195.2	998.7	0	998.7	99.1	0.1248	12.4
2012	171.7	170.1	803.5	0	803.5	79.7	0.1136	9.1
2013	146.4	145.1	633.4	0	633.4	62.8	0.1033	6.5
2014	121.1	120.0	488.3	0	488.3	48.4	0.0940	4.6
2015	95.8	95.0	368.3	0	368.3	36.5	0.0855	3.1
2016	70.6	69.9	273.3	0	273.3	27.1	0.0778	2.1
2017	45.3	44.9	203.4	0	203.4	20.2	0.0708	1.4
2018	20.0	19.8	158.6	0	158.6	15.7	0.0644	1.0
2019	18.7	18.5	138.7	0	138.7	13.8	0.0586	0.8
2020	17.3	17.2	120.2	0	120.2	11.9	0.0533	0.6
2021	16.0	15.9	103.1	0	103.1	10.2	0.0485	0.5
2022	14.7	14.5	87.2	0	87.2	8.7	0.0441	0.4
2023	13.3	13.2	72.7	0	72.7	7.2	0.0401	0.3
2024	12.0	11.9	59.5	0	59.5	5.9	0.0365	0.2
2025	10.7	10.6	47.6	0	47.6	4.7	0.0332	0.2
2026	9.3	9.2	37.0	0	37.0	3.7	0.0302	0.1
2027	8.0	7.9	27.7	0	27.7	2.8	0.0275	0.1
2028	6.7	6.6	19.8	0	19.8	2.0	0.0250	0.0
2029	5.3	5.3	13.2	0	13.2	1.3	0.0227	0.0
2030	4.0	4.0	7.9	0	7.9	0.8	0.0207	0.0
2031	2.7	2.6	4.0	0	4.0	0.4	0.0188	0.0
2032	1.3	1.3	1.3	0	1.3	0.1	0.0171	0.0
2033	0.0	0.0	(0.0)	0	(0.0)	(0.0)	0.0156	(0.0)
	8,365	8,289.3			Total Present Value of Deferral			5,932.6
GAO Est:	8,290.0							
Error %:	0.905%							

Gas: Pipeline Companies and Local Gas Distribution Companies

	Normalization Scenario						1 Year Flow-Through Scenario				
Year	Annual Repayment (2)	Error Correction (3)	Annual % Of Total Repaid	Imputed Repayment, Local Gas (5)	Total Gas Normalization Payments (3+5)	Net Deferral (4)	Annual Repymnt (6)	Excess Funds Through Normalization (4-6)	Avoided Borrowing Cost (7)	Discount Factor (8)	Present Value of et Deferral (7*8)
1988	47.0	47.7	3.91%	33.6	81.4	2,079.7	2,079.7	0.0			
1989	69.0	70.0	5.74%	49.4	119.4	1,998.4	0	1,998.4	187.6	1.0000	187.6
1990	91.0	92.4	7.57%	65.1	157.5	1,878.9	0	1,878.9	176.4	0.9142	161.3
1991	89.5	90.9	7.45%	64.1	154.9	1,721.4	0	1,721.4	161.6	0.8357	135.1
1992	88	89.3	7.32%	63.0	152.3	1,566.5	0	1,566.5	147.1	0.7640	112.4
1993	89	90.3	7.41%	63.7	154.1	1,414.2	0	1,414.2	132.8	0.6984	92.7
1994	89	90.3	7.41%	63.7	154.1	1,260.1	0	1,260.1	118.3	0.6384	75.5
1995	88	89.3	7.32%	63.0	152.3	1,106.1	0	1,106.1	103.9	0.5836	60.6
1996	82	83.2	6.82%	58.7	141.9	953.7	0	953.7	89.6	0.5335	47.8
1997	72	73.1	5.99%	51.5	124.6	811.8	0	811.8	76.2	0.4877	37.2
1998	69	70.0	5.74%	49.4	119.4	687.2	0	687.2	64.5	0.4459	28.8
1999	59	59.9	4.91%	42.2	102.1	567.7	0	567.7	53.3	0.4076	21.7
2000	49	49.7	4.08%	35.1	84.8	465.6	0	465.6	43.7	0.3726	16.3
2001	39	39.6	3.25%	27.9	67.5	380.8	0	380.8	35.8	0.3406	12.2
2002	29	29.4	2.41%	20.8	50.2	313.3	0	313.3	29.4	0.3114	9.2
2003	22.7	23.0	1.89%	16.2	39.2	263.1	0	263.1	24.7	0.2847	7.0
2004	16.3	16.6	1.36%	11.7	28.3	223.9	0	223.9	21.0	0.2602	5.5
2005	10.0	10.2	0.83%	7.2	17.3	195.6	0	195.6	18.4	0.2379	4.4
2006	10.0	10.2	0.83%	7.2	17.3	178.3	0	178.3	16.7	0.2175	3.6
2007	10.0	10.2	0.83%	7.2	17.3	161.0	0	161.0	15.1	0.1988	3.0
2008	10.0	10.2	0.83%	7.2	17.3	143.7	0	143.7	13.5	0.1817	2.5
2009	10.0	10.2	0.83%	7.2	17.3	126.4	0	126.4	11.9	0.1661	2.0
2010	10.0	10.2	0.83%	7.2	17.3	109.0	0	109.0	10.2	0.1519	1.6
2011	10.0	10.2	0.83%	7.2	17.3	91.7	0	91.7	8.6	0.1388	1.2
2012	10.0	10.2	0.83%	7.2	17.3	74.4	0	74.4	7.0	0.1269	0.9
2013	10.0	10.2	0.83%	7.2	17.3	57.1	0	57.1	5.4	0.1160	0.6
2014	6	6.1	0.50%	4.3	10.4	39.8	0	39.8	3.7	0.1061	0.4
2015	2	2.0	0.17%	1.4	3.5	29.4	0	29.4	2.8	0.0970	0.3
2016	2	2.0	0.17%	1.4	3.5	26.0	0	26.0	2.4	0.0886	0.2
2017	2	2.0	0.17%	1.4	3.5	22.5	0	22.5	2.1	0.0810	0.2
2018	2	2.0	0.17%	1.4	3.5	19.0	0	19.0	1.8	0.0741	0.1
2019	2	2.0	0.17%	1.4	3.5	15.6	0	15.6	1.5	0.0677	0.1
2020	2	2.0	0.17%	1.4	3.5	12.1	0	12.1	1.1	0.0619	0.1
2021	2	2.0	0.17%	1.4	3.5	8.7	0	8.7	0.8	0.0566	0.0
2022	2	2.0	0.17%	1.4	3.5	5.2	0	5.2	0.5	0.0517	0.0
2023	1	1.0	0.08%	0.7	1.7	1.7	0	1.7	0.2	0.0473	0.0
	1,201.5	1,219.7	100.00%	860.0				Total Present Value of Deferral			1,032.0
GAO Est	1,220.0										
% Error	-1.52%										
Correct Factor	101.52%										

Part 3: Allocation of Subsidies to Fuel

	Value of Deferral
Low Estimate:	0

Assume local rate commissions alter approval of rate increases to, de facto, return excess collections.

High Estimate

	Value of Deferral 1989	Cap. Ex. 1980-89 (9)	Percent Shares	Est. Subsidy by Fuel	
Electric Sector Shares	808.5				
Coal-Electric		86,457	27.94%	225.9	
Oil-Electric		2,433	0.79%	6.4	
Gas-Electric		5,646	1.82%	14.8	
Fission-Electric		187,217	60.51%	489.3	Excludes capital spending on uranium mining.
Hydro-Electric		5,201	1.68%	13.6	
Waste-to-Energy		6,491	2.10%	17.0	
Geothermal-Electric		5,413	1.75%	14.1	
Biomass-Electric		7,663	2.48%	20.0	
Wind-Electric		2,070	0.67%	5.4	
Solar-Electric		794	0.26%	2.1	
Fusion-Electric		0	0.00%	0.0	
Efficiency					
Utility DSM, Capitalized		0	0.00%	0.0	
Total Electric Sector Spending		309,384		808.5	
Gas Pipelines & Distrib.	187.6			187.6	
Total, all Energy				996.2	

Notes:

(1) GAO estimates for the end of 1988, which are used for later calculations, assume the fastest possible payback during that year.

(2) Estimates of the annual returns of excess deferred taxes under normalization assume that the utilities are forced to return the funds to rate payers as fast is allowed under current law. If this does not happen, subsidies will be significantly higher. These figures were read off of a line graph. As a result, some errors in translation between graph and data points may have occurred. GAO had no data on the fastest return schedule for local gas distribution companies. We assume locals followed the same schedule as interstate gas pipelines. Note the large magnitude of the subsidy in the early years.

(3) This column corrects for overall errors from translating data from the graph so that the total repayment is correct. Some error may still remain in the timing of repayments. The overall percentage error is shown at the bottom of column 2.

(4) "Net Outstanding" is the amount of total deferred taxes remaining each year after returning funds to ratepayers at the fastest allowable normalization schedule.

(5) Assumes same repayment schedule as gas pipeline companies.

(6) The 1-year flow-through scenario assumes the return of all excess deferred taxes to ratepayers at the end of the first year (1988).

(7) The value of the deferral equals the excess funds retained using normalization multiplied by the long-term bond rate shown in Part 1.

(7a) Same as above.

(8) The discount factor is calculated using the relevant borrowing rates for gas and electric shown in Part 1.

(9) Time series data on capital spending by private sector utilities from 1980-89 is used to allocated the net subsidy to respective energy types. Since the excess deferred taxes originated from accelerated depreciation on capital investment following tax reforms in 1981, this is a fairly good allocation basis. However, some rulings on the estimated asset lives created larger discrepancies between the service life of the asset and the asset life used for tax purposes. Were this factor incorporated, benefits accruing to fission-electric would likely be larger. See CAPEX.WK1 and RENEWCAP.WK1 for more detail on the derivation of capital expenditure estimates. Investments into uranium mining have been removed from the spending estimates for the purpose of this allocation.

Deduction for Motor Carrier Operating Rights

STATUS: Expired. No longer has budgetary impacts.

DESCRIPTION: A special allowance for trucking interests allowed them to depreciate the value of their operating licenses, normally a nondepreciable intangible asset, over a 5-year period. Traditional tax laws do not allow the amortization of intangibles, such as "goodwill" to be tax deductible. (OMB, FY88, G-28).

HISTORY: The special provision was passed following trucking deregulation, after which operating licenses would have no values since market entry was now open to all. In order to reduce the losses to the existing truck operators, the value of those rights prior to deregulation became a tax-deductible expense, beginning in the 1981 tax year (after June 30, 1980).

The Tax Reform Act of 1986 extended this special treatment to bus operators and freight forwarders.

BENEFICIARY ENERGY TYPES: Any fuels carried by truck (primarily refined petroleum products).

SUBSIDY MAGNITUDE: PV(depreciation charges related to the intangible asset)(tax rate)

ELIGIBLE ACTIVITIES:

LIMITATIONS:

Special Definitions of the Taxable Entity

Benefits Due to Specific Congressional Exemptions

- Gas and Oil Exception to Passive Loss Restrictions
- Alternative Minimum Tax Relief for Oil and Gas Producers
- Special Treatment of Alaskan Native Corporations
- Foreign Research Expenditure Offset of Domestic Income
- Foreign Sales Corporations
- Domestic International Sales Corporations
- Western Hemisphere Trade Corporations

Description

By creating special classes of industries, Congress can confer a tax benefit based on the type of activity a firm is engaged in or the geographical area within which it operates.

This approach is similar to conveying a lower tax rate, more favorable payment schedule, or special allowed deductions to a subset of industries.

Gas and Oil Exception to Passive Loss Limitation

STATUS: Active. **See spreadsheet on Tax Provisions Jointly Benefitting Oil and Gas following "Expensing Exploration and Development Costs" (page B2-46) for the allocation this subsidy.**

DESCRIPTION: The Tax Reform Act of 1986 limited the ability of investors to apply losses from unrelated enterprises against the earnings of profitable ones. The goal was to prevent tax shelters that produced losses in excess of the funds an investor had invested as a way to offset the unrelated taxable earnings. This exemption allows investors with a working interest[32] in the oil or gas operation to aggregate tax losses from gas and oil investments with income from all other sources. (OMB 1991, A-64).

HISTORY: After the Tax Reform Act of 1986, deductions from passive activities (trade or business activities in which the taxpayer does not materially participate, such as a limited partnership and rental activities) could no longer be deducted against other income of the taxpayer. (Battersby, 32).

The justification for the oil and gas exemption is as follows:

> The working interest exception was based on the view that in certain situations, for example oil and gas exploration and development, factors such as financial risk, rather than material participation, should be the relevant standard for determining whether losses from passive activities should be allowed. Due to the world-wide decline in oil prices, Congress decided that relief for the oil and gas industry warranted that tax benefits be provided to attract certain outside investors. (JCT, 3/1/90, 25).

Since market reactions to "factors such as financial risk" is simply to demand a higher return, the main purpose of this provision was to subsidize that risk taking.

BENEFICIARY ENERGY TYPES: Oil and gas. A timber exception to the passive loss restrictions was also proposed in 1989 but was not enacted.

SUBSIDY MAGNITUDE: (Income not otherwise eligible as a tax deduction)(tax rate)

ELIGIBLE ACTIVITIES:

LIMITATIONS: Since investors are still subject to the alternative minimum tax, benefits from this provision are somewhat limited.

[32] A working interest is an interest in an oil or gas property "burdened with the cost of development and operation of such property. Rights to overriding royalties, production payments, extraction profits, and the like, do not constitute working interests." (Russell and Bowhay, 1990, p. 1031).

Alternative Minimum Tax Relief for Oil and Gas Producers

STATUS: Active as of December 31, 1992.

DESCRIPTION: The Alternative Minimum Tax limits the applicability of tax preference items to ensure that all profitable enterprises paid at least some tax. This AMT tax relief provision permanently repeals some of the restrictions on the use of tax preferences to reduce taxable income by independent oil and gas producers and royalty owners.

While the AMT relief does not create any new tax deductions, it removes restrictions on the use of existing provisions, thereby increasing the revenue losses to Treasury. Prior to the Energy Policy Act of 1992, oil and gas producers were generally subject to the Alternative Minimum Tax if deductions for IDCs exceeded 65% of the taxpayer's net income for oil and gas properties for the taxable year, or if deductions for percentage depletion exceeded 65 percent of the taxpayer's pre-depletion taxable income. (JCT, 9/25/92, 7).

Eligible tax payers will now be able to more fully utilize tax benefits from the expensing of intangible drilling costs (IDCs) and percentage depletion benefits. Unlike across-the-board reductions in tax rates, the AMT relief is targeted to the oil and gas industries only. Adjustments to current earnings, which increased taxable income by requiring that IDCs be capitalized and depreciated over 5 years, are also no longer required. (JCT, 9/25/92, 7).

HISTORY: Due to very low tax rates in certain industries, the Alternative Minimum Tax was created to broaden the tax base by ensuring that all profitable enterprises paid at least some taxes, regardless of their eligibility for tax preference items. The exemptions to the AMT for independent oil and gas producers, and royalty owners, was passed as part of the Energy Policy Act of 1992.

BENEFICIARY ENERGY TYPES: Oil and gas.

SUBSIDY MAGNITUDE: (Income not otherwise eligible as a tax deduction)(tax rate) - PV(depreciation charges over the service life of the investment)(tax rate)

ELIGIBLE ACTIVITIES: Independent oil and gas production.

LIMITATIONS: Integrated oil and gas producers are not eligible. The increased use of intangible development cost deductions can reduce the taxable income, as calculated by the Alternative Minimum Tax method, a maximum of 30 percent beginning in 1993, and 40 percent beginning in 1994. (DOE, 10/15/92, 25).

Special Treatment of Alaskan Native Corporation Losses

STATUS: Active.

DESCRIPTION: General tax provisions restrict profitable corporations from reducing their tax liabilities by merging or buying corporations with accumulated net operating losses (NOLs) and as yet unrefunded claims to investment credits. Alaska Native Corporations have a limited exemption from these restrictions that includes NOLs and credits claimable prior to April 26, 1988. (Tax Notes, 705). This limited exemption lasts for 15 years after the NOL or credit claim was first experienced.

As a result of these special provisions, the Alaskan Native Corporations can utilize (through selling) tax benefits without actually having net income or taxes due in core activities. This enables unprofitable activities to continue at the expense of the general tax payer, and generates additional losses to the Treasury.

HISTORY:

BENEFICIARY ENERGY TYPES: To the extent that Alaskan Native Corporations are involved in energy activities (e.g., extraction), this rule may yield tax subsidies to energy.

SUBSIDY MAGNITUDE: (Amount of extra operating losses sold) x (marginal tax rate of the purchaser)

ELIGIBLE ACTIVITIES:

LIMITATIONS:

Special Benefits for Alaskan Native Corporations

Part 1: Native Corporations and Lines of Business

Regional Corps.	Revs. in 1989	Revs. in 1988	# of Divisions/ Subsids.	# Oil	Revenue Weight* Oil	# Electric	Revenue Weight* Elect.	
Ahtna Inc.	7.9	6.4	9	4.5	3.2			Minerals development subsidiary
Aleut Corporation	3.9	2.1	3	0	0.0			
Arctic Slope Regional Corp.	112.8	93.7	15	6	37.5			
Bering Straits Native Corp.	1.1	37	8	1	4.6			
Bristol Bay Native Corp.	34.6	31.9	5	2	12.8			
Calista Corp.	4.9	14.3	6	1	2.4			
Chugach Alaska Corp.	57.2	49.6	5	0	0.0			
Cook Inlet Region Inc.	57.9	52.1	12	4	17.4			
Doyon Ltd.	45.6	41	3	1	13.7			
Koniag Inc.	2.7	13	1	0	0.0			
NANA Regional Corp.	31.6	24.7	11	3	6.7	1	2.2	Electric utility
Sealaska Corp.	110.7	267.6	1	0	0.0			
Thirteenth Regional Corp.	0.7	0.5	4	1	0.1			
	471.6	633.9	83	23.5	98.3	1	2.2	
				28.3%	15.5%	1.2%	0.4%	

*The Revenue-Weight column is the percent of divisions in the firm involved with either gas or oil, multiplied by the firm revenue.
This weighting assumes that larger subsidiaries have more NOLs to sell.

Part 2: Allocation to Energy Type

	Low Est. $Mils	High Est. $Mils	
Estimated tax expenditure in FY89	660.0	660.0	
Share due to oil	102.4	186.9	
Share due to electricity	2.3	8.0	Allocated to fossil-electric
Electric - Gas	0.8	2.7	
Electric - Coal	0.8	2.7	
Electric - Oil	0.8	2.7	

Part 3: Assumptions and Sources of Error

(1) All subsidiaries contribute equal amounts to revenues and generation of Net Operating Losses for Sale. Subsidiary level data were not available on Lotus One Source.
(2) NOLs are available in proportion to 1988 revenues, and remain available to all native corporations in 1989.
1988 revenues are used to better reflect NOL sales, which begin to taper off in 1989.
(3) Subsidiaries involved in "resource development," or "land development," or general mining are not involved with energy resources.
(4) No data on the smaller, village corporations are included.
(5) In actuality, NOLs reflect historical losses, not just in 1988, and some firms no longer have them available. More detailed subsidiary-level data would be necessary to improve estimates.

Source: Arlitia Jones and Judith Fuerst Griffin, "ANCSA Corporations: How they Fared in 1989," Alaska Business Monthly, Nov. 1990.

Domestic International Sales Corporations (DISCs)

STATUS: Expired.

DESCRIPTION: The DISC is a special form of corporation which may defer income tax on a portion of its profits. The provision was created to subsidize exports, thereby improving the U.S. balance of trade. At least 1/2 of the DISC's income is taxed through its stockholders each year, whether or not the income is actually distributed. This prevents an unlimited tax deferral of all income. However, the firm receives a subsidy in two ways. First, the portion of income that is taxed is taxed only at the shareholder level (versus normal dividends which are paid out of corporate after-tax income). Second, up to 1/2 of the income may be tax deferred for multiple years, and in some cases indefinitely.

Since a DISC need not actually produce the items it exports, many acquire export property from its parent corporation or an affiliated corporation and then sells the property abroad. (Gianelos, 11). Therefore, large corporations can shelter foreign sales from taxes by setting up DISC subsidiaries.

HISTORY: DISCs were established by the Revenue Act of 1971 to "provide a system of tax deferral and an inducement to increase U.S. exports." (Gianelos, 11). The Tax Reduction Act of 1975 eliminated DISC benefits from exports of natural resource products such as oil, gas, and minerals subject to percentage depletion allowance. Due to GATT pressure, the Deficit Reduction Act of 1984 ended the existence of large DISC exporters. They were replaced by Foreign Sales Corporations (FSCs) abroad. FSCs are foreign subsidiaries through which export sales will be made. A portion of the export income of eligible FSCs is exempt from U.S. income tax.

Although DISC benefits ended in 1984, accumulated tax-deferred profits of existing DISC's continued for a number of additional years, and were exempted from taxation. (Gianelos, 12). Small exporters were allowed to retain a classification as an "Interest Charge DISC," which allowed them to defer tax payments until profits are distributed, but charged them interest on the deferred taxes. (Treasury, '86 Corp. Returns, 83).

BENEFICIARY ENERGY TYPES: It is clear that energy benefitted from the early years of the DISC provisions since Congress saw fit to restrict benefits to that sector in 1975. Benefits remained available to natural resource producers who did not claim percentage depletion allowances after 1975 (Harzok, 290).

SUBSIDY MAGNITUDE: (Income not otherwise eligible for deferral)(tax rate) - PV(income deferred)(tax rate)

As shown in the following tables, although exports through DISCs remained a significant portion of total exports, energy-related exports constituted at most (assuming unrealistically that all exports in the categories are energy-related) $37 million in tax deferred income benefits by 1980. This suggests that residual benefits to the energy sector following the end of DISC provisions in 1984 were insignificant.

DISC Exports Share of Total U.S. Exports

Year	DISC Exports ($B)	Tot. Exports ($B)	DISC/Total
1973	44.8	70.8	63.28%
1974	66.8	97.9	68.23%
1975	73.2	107.1	68.35%
1976	82.7	114.8	72.04%
1977	85.9	121.2	70.87%
1978	99.6	143.6	69.36%
1979	132.0	181.7	72.65%
1980	154.1	220.6	69.85%

Source: Harzok, 290.

Use of DISC Benefits by any Sector Partially Related to Energy

Industry	DISC Tax-Deferred Income (millions)	Percent of Total Deferrals
Metal mining, iron ores, coal mining products and services	12.9	0.36%
Transportation, electric, gas, and sanitary services	0.6	0.02%
Miscellaneous wood products	23.4	0.65%
Maximum Total - Energy Related	36.9	1.03%
All products and services[33]	3,606.1	

Source: Harzok, Jeffrey. "Domestic International Sales Corporation Returns, 1980," in the Internal Revenue Service, Compendium of Studies of International Income and Taxes, 1985, p. 301.

ELIGIBLE ACTIVITIES: In order to be eligible for this form of incorporation, a firm had only to export products that qualify as export property, which are manufactured, produced, grown, or extracted in the United States. This applies to both items produced by the firm itself, or by someone other than the DISC. (Gianelos, 11).

LIMITATIONS: After 1975 a large portion of natural resource exports were exempted from the provision if the producer also got percentage depletion allowances.

[33]There is no listing for oil and gas extraction-related activities.

Western Hemisphere Trade Corporation Deduction

STATUS: Expired; no longer has budgetary impacts.

DESCRIPTION: Another special corporation classification enacted by Congress, the Western Hemisphere Trade Corporation classification made the firm eligible for a deduction equivalent to a reduction of 14 percentage points in the United States corporate tax rate. To qualify for this benefit, a domestic corporation had to do all of its business within the Western Hemisphere and be predominantly engaged in the active conduct of a trade or business outside the United States. Through the creation of specialized subsidiaries, large integrated operators were able to take advantage of this provision.

HISTORY: The WHTC deduction was enacted in 1942 during a period of high, war-related, U.S.taxes and low taxes in other Western Hemisphere countries. The provisions

> were aimed at insuring that U.S. corporation would not operate at a disadvantage in competing with foreign corporation. Their purpose was to increase U.S. corporate activity in the hemisphere and retain U.S. ownership of foreign investments which, if placed in the control of foreign corporations, might eventually pass over to foreign interests. (Conc et al, 209).

The deduction was repealed in the Tax Reform Act of 1976, reducing the credit from 14 to 11 percent beginning in 1976, and reducing it to zero by 1979.

BENEFICIARY ENERGY TYPES: Insignificant impact.

SUBSIDY MAGNITUDE: (14% reduction in tax rate)(taxable income)

In 1980, the oil and gas extraction industry was the single largest user of the WHTC deduction, yet claimed only $774,000 in deductions. (States, 51). As the WHTC was then being phased out, industry utilization of the provision continued to decline.

ELIGIBLE ACTIVITIES:

LIMITATIONS:

Allowance of Foreign Research Expenditures to Offset Domestic Income

STATUS: Active. **See spreadsheet associated with the R&D Tax Credit (page B2-20) for allocation of this subsidy.**

DESCRIPTION: Foreign research expenditures could not historically be used to offset domestic income. Congressional action suspended these rules between 1981, 1986, and 1988 enabling all research and experimentation expenditures to be deducted from a corporation's domestic income. (OMB, FY89, G-35).

Because of the manner in which foreign tax credits are calculated, increasing the allocation of research and development expenditures can increase the allowable foreign earnings credited against U.S. taxation. (Brumbaugh, 4/4/89, 3).

HISTORY: Regulations issued in 1977 were promulgated to achieve a reasonable allocation of R&D expenses between foreign and domestic operations, recognizing that domestic R&D often benefits foreign subsidiaries as well. These requirements were overturned by legislative action. "Currently, 64 percent of both U.S.-and foreign-based R&D expense are allocated to their respective income sources. The remaining R&D expenses must then be allocated on the basis of gross sales or gross income. These rules are effective through August 1, 1991." (OMB '92, 3-25).

BENEFICIARY ENERGY TYPES: Unclear, although a 1983 Treasury Report found that the impact of the regulations is concentrated among a small number of large, mature, multinational firms. (Brumbaugh, 4/4/89, 10).

SUBSIDY MAGNITUDE: (Amount of foreign research expenditures offset against domestic income)(tax rate), since an equivalent amount of income would otherwise have been taxed.

ELIGIBLE ACTIVITIES:

LIMITATIONS:

Benefits Due to Transfer Pricing

- Foreign Tax Credits
- Foreign Sales Corporations
- Oil Shipping Subsidiaries
- Safe Harbor Leasing

Description

As is apparent from the range of tax policies outlined thus far, not all entities are taxed at the same rate or in the same manner. While some policies try to target particular beneficiaries, some corporations are sometimes able to shift profits among parts of their operations to take advantage of the least-taxed portions of their business. We are not claiming that such shifting is unrestricted, pervasive, or easy - only that it both possible and can be difficult to detect.[34] Generally, profit shifting is accomplished through the use of transfer prices. Vertically-integrated corporations provide inputs from one division to downstream processes. Depending on the price "charged" to the downstream user, the company can show high profits at virtually any stage of the transfer chain. When applied skillfully, the use of transfer pricing can significantly reduce the overall tax burden of the entire operation.

Example

10 barrels of crude oil extracted from Saudi Arabia are sold to a corporate refining subsidiary. The revenues from the sale (10 barrels x price/barrel) form the revenues for the drilling operation and the cost of raw materials for the refining operation. The cost of production (say $5/barrel) is a constant. The cost of refining (say $3/barrel) is also a constant, as is a $20 price for the sale of the refined products to consumers. Thus:

Taxable Income for the Drilling Operation =
(10 barrels x T) - (10 barrels x $5 extraction cost/barrel) = 10T - $50,
where T = the transfer price/barrel

Taxable Income for Refining Operation =
(10 barrels x $20/barrel sale price) - (cost of crude purchase [10T]) - (10 bbl x $3/bbl to refine) =
$200 - 10T - $30 = $170 - 10T

If the transfer price is high (assume $12/bbl), net income for the drilling operation is (10)(12) - (50) = $70, while the net income for refining is $170 - (10)(12) = $120. A low transfer price of $5 will yield pretax profits of $0 for the drilling operation and $120 for the refining operation.

The actual transfer prices used will depend on the tax rates on the particular operations.

[34]For a description of the difficulties in measuring the impact of transfer pricing on taxation see U.S. GAO, International Taxation: Problems Persist in Determining Tax Effects of Intercompany Prices, June 1992. GAO/GGD-92-89.

Foreign Tax Credits

STATUS: Active, although narrowed.

DESCRIPTION: Foreign tax credits allow a U.S. corporation to deduct taxes paid on foreign operations from the firm's U.S. tax liability. The purpose of the provisions is to avoid double taxation on earnings and to let a corporation operating abroad carry approximately the same income tax burden as if it were operating in the US. (Gianelos, 9). However, the credits can lead to subsidies in four ways (Jenkins, 236):

- Firms can work with foreign governments to reduce royalty payments (which are tax deductible) in return for higher taxes (which yield tax credits). Since many foreign governments receive both the royalties and the taxes, this arrangement does not cause many problems, and the savings can be split between the foreign government and the corporation.[35]

- Firms can shift profits to the least-taxed operations via transfer prices.

- Firms could defer income tax liabilities through transfer pricing with tanker subsidiaries (described in more detail in the next page).

- Firms receive a tax credit rather than a tax deduction on taxes paid. The domestic equivalent, federal, state, and local taxes receive deductions, not credits.

Government revisions to the tax code have tried to prevent two abuses of the foreign tax credit. The first abuse involves the creation of passive loss-making subsidiaries (where losses can far exceed investment), to offset real profits in other operations. The second problem involved the ease and degree with which excess foreign tax credits could be applied to U.S. taxes owed.

HISTORY: As established in the Revenue Act of 1918, the foreign tax credit allowed corporations to reduce tax liability by the amount of the foreign income tax without limitation. Where foreign taxes exceeded the U.S. rate, corporations simply reduced the taxes paid on domestic operations. The Revenue Act of 1921 put limitations on the credit to the lesser of the actual foreign taxes paid or the U.S. tax rate on the foreign earnings, thereby limiting the tax offset to foreign operations.

Provisions continued to be tightened in the Revenue Act of 1962 which reduced the ability to commingle investments abroad to restrict corporate reductions of US taxes by offsetting foreign credits with additional investment income from unrelated investments having little or no foreign taxes. Beginning in 1980, separate foreign tax credit limitations were instituted for different types of income (investment interest, DISC dividends, foreign oil-related income, and all other income from foreign sources). (States, 41,42). The 1982 Tax Equity and Fiscal Responsibility Act (TEFRA) eliminated the separate limitation on the foreign tax credit for foreign oil-related income, thereby relaxing the restrictions on commingling foreign tax credits. (Mose, '84, 59).

Prior to TEFRA, carryover of foreign tax credits was limited to a 2-year carryback and a 5-year carry-forward, limiting the amount of time that surplus foreign tax credits could offset domestic taxes. Further, the carryover of excess taxes was limited to 2 percent of the foreign oil and gas extraction taxable

[35]For example, the Saudi Arabian government placed a 50% tax on the profits of the ARAMCO oil concession yielding a single year drop in ARAMCO's domestic taxes from $44 million to $6 million while the Saudi government's share increased from $44 million to $110 million. (Cone et al, 210).

income for the current year. TEFRA eliminated the 2 percent limitation, increasing the ability to use earned foreign tax credits. (Mose, '84, 59).

The Tax Reform Act of 1986 required that income and costs from different foreign sources be segregated into separate "baskets," with foreign tax credits allocable only on a per-country basis, rather than on all foreign earnings. (Ambler, 3). This change prevents the commingling of profits and losses from countries with widely varying tax rates, thereby reducing the ability of companies to shift profits or to use excess foreign tax credits. The difficulty in using excess foreign tax credits creates additional distortions of its own, however. Since additional foreign tax credits have no value, corporations have an incentive to shift the costs of foreign operations to domestic ones in order to reduce U.S. tax liabilities. (EIA, 8/85, 1.18).

BENEFICIARY ENERGY TYPES: Primarily oil.

Prior to the limitations instituted in the 1980s, the petroleum industry was adept at reducing taxes almost to zero. According to Professor Glenn Jenkins of Harvard Law School,

> Because of the unique industrial structure of [the petroleum] sector, we find that to a much greater degree than other industries it is able to operate in areas with high nominal tax rates and yet pay little tax on its income from activities in these areas...In the foreign petroleum industry, so many foreign tax credits are at present available from producing countries that United States integrated petroleum operations would pay approximately zero tax on foreign income, even if no other tax preferences were allowed." (Jenkins, 203, 214).

Jenkins claim is supported by Treasury data which showed that the "oil and gas extraction and integrated petroleum industries together accounted for more than $3.2 billion of the $4.2 billion in unused foreign taxes carried to 1980." (States, 44). Jenkins estimated that in 1966 and 1970, the effective rate of income tax in the petroleum industry's European operations was 0.57% of European assets versus 4.0% for manufacturing. (Jenkins, 227).

SUBSIDY MAGNITUDE: The magnitude of the subsidy from foreign tax credits is extremely difficult to estimate since it requires a detailed comparative analysis of corporate profits and taxes for foreign operations. We had no data on which to make an estimate.

Foreign Sales Corporations

STATUS: Active.

DESCRIPTION: Foreign Sales Corporation provisions exempt a portion of a U.S. exporters' foreign trading income to the sales functions role as a foreign corporation. Earnings of foreign corporations are not taxed until earnings are sent to U.S. entities as dividends. (OMB '92, 3-24). To the extent that profits have been shifted to this untaxed subsidiary through transfer pricing, this provision can be a subsidy to energy.

HISTORY: Foreign Sales Corporations replaced DISCs due pressure from GATT trading partners that the DISC organizational structure was subsidizing U.S. exports.

BENEFICIARY ENERGY TYPES: We do not know the extent to which energy industries benefit from this provision.

SUBSIDY MAGNITUDE: (Income shifted to FSC that otherwise would have been part of the firm's tax basis)(tax rate) - PV(income eventually repatriated)(tax rate)

ELIGIBLE ACTIVITIES:

LIMITATIONS: FSCs must maintain offices in both a foreign country and in the U.S. for book keeping purposes.

Tax Deferral on Tanker Subsidiaries and the Foreign Tax Credit

STATUS: Repealed. No longer has budgetary impacts.

DESCRIPTION: Income from Controlled Foreign Corporations (CFCs) that are tanker subsidiaries could be excluded from taxable income in the current year. This treatment differs from that normally accorded to CFCs, which would include a prorated share of earnings as current taxable income. By combining this provision with the foreign tax credit, corporations could shift income from either the producing or consuming country to the tanker subsidiary, generally located in regions of the world with extremely low tax burdens.[36] Once income was sheltered in these countries, the corporation could decide whether

> to repatriate dividends to their corporate parents, using the excess tax credits from the producing countries to offset U.S. taxes due, or to use these funds to make loans to other foreign affiliates of the parent corporation. (Jenkins, 235).

The result was a tax deferral of significant portions of oil company income.

HISTORY:

Concerns over the shifting of passive income to tax havens led to the Subpart F provisions of the Foreign tax code in 1962. This provision reduced the ability to defer by treating some portion of it as a "deemed contribution" to U.S. shareholders that was subject to taxation. (Ambler, 4).

Prior to the Tax Reform Act of 1986, shipping income was subject to Subpart F provisions only to the extent that it exceeded the increases in investment in shipping operations. In 1986, TRA made all shipping income subject to Subpart F. (Brumbaugh, 5).

BENEFICIARY ENERGY TYPES: Oil

SUBSIDY MAGNITUDE: (Shifted income otherwise part of the tax basis)(tax rate) - PV(tax-deferred shifted income later repatriated)(tax rate).

This provision is one of the mechanisms by which foreign tax credits are reduced. We assume the estimates of the Energy Information Administration regarding tax increases following changes in the foreign tax credit provisions in the Tax Reform Act of 1986 include gains from the repeal of the tanker subsidiary income deferral.

ELIGIBLE ACTIVITIES:

LIMITATIONS:

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[36]For example, the effective tax rate in 1968 was 3 percent of income in Liberia and 0.4 percent in Panama. (Jenkins, 235). It is interesting to note that although much of the benefit from oil tanker subsidiaries has been eliminated in the U.S. tax code, Liberia still retained the largest share of the world's tanker fleet at late as 1987. In that year, the country had 25.1% of total registrations (in deadweight tonnage), more than four times that of the United Kingdom and 3½ times the level of Japan. This is down from over 32% of world tonnage in 1977. (Gilbert Jenkins, 407).

Safe Harbor Leasing

STATUS: Repealed, but continued to have budgetary effects in 1989.

DESCRIPTION: Safe harbor leasing arrangements allow a corporation to transfer accelerated tax and investment tax credits to another corporation through a sale-leaseback provision. The selling corporation could then gain back at least a portion of the tax benefits by negotiating a leasing arrangement at below-market rates. Technically, these leasing arrangement do not create any new tax benefits; they simply allow "better" utilization of existing ones.

Like ITCs, safe harbor leases yield tax losses early in the life of an asset through higher deductions and nominal gains later through lower deductions. Since the lease provisions were repealed so long ago, many of the assets benefitting from this arrangement are entering the "negative" part of the deduction cycle, and the provision shows up as gaining money for the Treasury. In reality, these are nominal gains only; the time value of deferring the tax payment remains with the private sector.

HISTORY: The safe harbor leasing provision was introduced in 1981 along with the highly accelerated depreciation and investment tax provisions. Although repealed in 1982, budget effects remain for the duration of the leases entered into in 1982.

BENEFICIARY FUELS: Primarily electric; evidence on the energy share of these leases is mostly anecdotal. For example, some of the utilities which defaulted on Rural Electrification Administration loans made use of safe harbor leases. Since electrical utilities did generate such high investment tax credits through their huge capital spending, it is likely that they also made use of safe harbor leasing whenever possible.

SUBSIDY MAGNITUDE: (Magnitude of tax deductions not otherwise usable)(tax rate of firm purchasing the assets) - (Any increases in net income of firm selling the assets from reduced lease payments)(tax rate of leasing firm).

Although the lease arrangements share the tax benefits, the loss to the government is the whole thing. Lacking highly specific data on who used safe harbor leases, we allocate this provision based on shares of capital spending from 1981-1989.

ELIGIBLE ACTIVITIES: Any capital assets eligible for accelerated depreciation or investment tax credits.

LIMITATIONS:

Safe Harbor Leasing Arrangements

Part 1: Estimate of Subsidy Magnitude ($Millions)

	Low Estimate	High Estimate	
Treasury/JCT Tax Expenditure Estimates	(390.5)	(710.0)	See Note 1
Energy Share of Total Capital Investment	20.17%	23.01%	Derived from CAPEX.WK1 and RENEWCAP.WK1
Tax Expenditure Due to Energy Sector	(79)	(163)	

Part 2: Allocation of Safe Harbor benefits to Particular Fuels

Energy Shares of Capital Spending Between 1980 and 1989

Energy Type		Amount ($Mils)	Shares of Energy Cap. Spending		Safe Harb. Benefits	
			Low	High	Low Est.	High Est.
Crude Oil		273,042	31.62%	31.32%	(24.9)	(51.2)
Natural Gas		192,626	22.31%	22.09%	(17.6)	(36.1)
Coal		74,052	8.58%	8.49%	(6.8)	(13.9)
Solar (Off-grid)		356	0.04%	0.04%	(0.0)	(0.1)
Ethanol		2,560	0.30%	0.29%	(0.2)	(0.5)
Biomass (Off-grid)		1,163	0.13%	0.13%	(0.1)	(0.2)
Electric						
Coal-Electric		86,457	10.01%	9.92%	(7.9)	(16.2)
Oil-Electric		2,433	0.28%	0.28%	(0.2)	(0.5)
Gas-Electric		5,646	0.65%	0.65%	(0.5)	(1.1)
Fission-Electric & Fuel Cycle		189,051	21.90%	21.68%	(17.2)	(35.4)
Hydro-Electric		5,201	0.60%	0.60%	(0.5)	(1.0)
Waste-to-Energy		6,491	0.75%	0.74%	(0.6)	(1.2)
Geothermal-Electric		5,413	0.63%	0.62%	(0.5)	(1.0)
Biomass-Electric		7,663	0.89%	0.88%	(0.7)	(1.4)
Wind-Electric		2,070	0.24%	0.24%	(0.2)	(0.4)
Solar-Electric		794	0.09%	0.09%	(0.1)	(0.1)
Fusion-Electric		0	0.00%	0.00%	0.0	0.0
Efficiency						
Utility DSM, Capitalized		0	0.00%	0.00%	0.0	0.0
End-Use Effic., Capitalized						
	Low Estimate	8,400	0.97%		(0.8)	
	High Estimate	16,800		1.93%		(0.1)
	Average	12,600				
Total Energy						
	Low Estimate	863,417	100.00%			
	High Estimate	871,817		100.00%		
	Average	867,617			(78.8)	(163.3)

Notes:

(1) Negative numbers denote nominal gains to Treasury versus tax collections without the provision. This curious outcome occurs because the Safe Harbor allowances ended in the early 1980s, and real tax savings in the earlier years of past investments are now being paid back. See chapter text for more detailed on negative tax expenditures. It is important to remember, however, that even provisions which are now nominally negative provided tangible gains to industry in earlier years through the time-value of money. The low estimate assumes that 55% of the tax benefits accrued to utilities by selling the tax benefits, and 45% to non-energy purchasers. The high estimate assumes that all benefits stayed within the energy sector. While this allocation yields a high estimate which is smaller than the low estimate, in the early years of the provision, the result would have been the reverse. The 55% allocation figure mentioned above is based on personal communication with Peter Merrill, Price Waterhouse, 3/27/92.

(2) See CAPEX.WK1 and RENEWCAP.WK1 for the more detail on the energy shares of capital investment.

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Federal Energy Subsidies:

Energy, Environmental, and Fiscal Impacts

Technical Appendix
(Appendix B)

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April 1993

The Alliance to Save Energy
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