

Appendix A

Studies of Federal Government Energy Interventions

Introduction

Over the past two decades, the extent of Federal Government interventions in energy industries has been considerably reduced. Price controls for domestic oil and natural gas production were largely eliminated in the early 1980s. The Tax Reform Act of 1986 reduced or eliminated many tax expenditures, several of which figured prominently in earlier studies. The Energy Policy Act of 1992, while introducing incentives for renewable energy and alternative transportation fuels, set the stage for the eventual privatization of Department of Energy uranium enrichment activities. The Energy Policy Act, in conjunction with FERC Orders 888 and 889, also required vertically integrated electric utilities to prepare for deregulation by posting prices for and allowing access to transmission networks. Thus, in comparing different studies of federal energy subsidies, it is helpful to keep in mind the date when the study was prepared (Table A1). More recent studies containing time series data tend to show a decrease in the amount of subsidies over the past 10 years. This appendix summarizes EIA's review of recent energy subsidy studies, describes interventions generally considered in the literature on energy subsidies, and briefly reviews the studies individually.

Beyond that, there are many differences in the manner, purpose, and scope of the estimation of energy subsidies (Table A2). As was noted in Chapter 1, the term "subsidy" has been widely interpreted in the literature. This report focuses on subsidies that involve direct market intervention and primary energy sources, thereby excluding Federal regulatory activities, attempts to internalize externalities, programs involving the provision of services, and all State and local government programs. In addition, though there may be general agreement that a certain intervention has some subsidizing effect, there may be no consensus as to the method of its measurement. Therefore, some reports may quantify certain provisions while others may simply describe the program without placing a valuation on it.⁶¹ Finally, there may be consensus as to the fact of a subsidy and the method of measurement, but reasonable independent evaluations may yield different quantities.

⁶¹Table A3 displays tax expenditures explicitly quantified in EIA's 1992 Service Report, its 1999 update (this report), and the various reports reviewed. Table A4 displays direct expenditures (and selected Federal programs), including several that fall outside the primary energy scope of this report. All dollar values have been converted to 1999 dollars, except where values are cumulative or projected. Note that various reports may reference specific programs and line items differently, making direct comparisons difficult.

Table A1. Other Studies of Federal Energy Subsidies

| Title | Author/Organization | Published | Year(s) of Subsidy Estimate |
|--|--|------------------|------------------------------------|
| <i>Federal Energy Subsidies: Direct and Indirect Interventions in Energy Markets</i> | Energy Information Administration | 1992 | FY 1992 |
| <i>Federal Energy Subsidies: Energy, Environmental, and Fiscal</i> | Koplow, Alliance to Save Energy | 1993 | 1989 |
| <i>Energy Use and Emissions of Carbon Dioxide: Federal Spending and Credit Programs and Tax Policies</i> | Congressional Budget Office | 1990 | FY 1990 |
| <i>Energy Taxes and Subsidies</i> | Brannon, Ford Foundation | 1974 | 1970s |
| <i>An Analysis of Federal Incentives Used To Stimulate Energy Production</i> | Pacific Northwest Laboratory (Battelle) | 1980 | FY 1978 |
| <i>The Hidden Costs of Energy</i> | Heede, Morgan, and Ridley, Center for Renewable Resources and Rocky Mountain Institute | 1985 | 1984 |
| <i>Money to Burn? The High Costs of Energy Subsidies</i> | Kosmo, World Resources Institute | 1987 | 1984 |
| <i>Fueling a Competitive Economy</i> | Romm and Lovins, Rocky Mountain Institute | 1993 | 1990s |
| <i>Federal Incentives for the Energy Industries</i> | Management Information Services, Inc. | 1998 | 1950s-1997 |
| <i>Oil Slickers: How Petroleum Benefits at the Taxpayers Expense</i> | Wahl, Institute for Local Self-Reliance | 1996 | 1996 |
| <i>Paying the Piper: Subsidies, Politics and the Environment</i> | Roodman, Worldwatch Institute | 1996 | 1990s |
| <i>Hazardous Handouts</i> | Ryan, Northwest Environment Watch | 1995 | 1990s |

Sources: See Appendix D.

Table A2. Summary Comparison of Findings

| Report (Author, Year) | Type, Coverage, and Method of Study | Summary, Comment |
|---|---|--|
| Energy Information Administration, 1992 | Service report covering all fuels, enumerative. | Estimated at \$5.6 billion. Subsidies characterized as direct expenditures, tax expenditures, trust funds and excise taxes, and R&D. Regulation effects described in detail, but not included in total estimate. |
| Koplow, Alliance to Save Energy, 1993 | Policy report covering all fuels, enumerative. | Estimated at \$27 to \$45.9 billion. Subsidies characterized as tax benefits, agency programs, and direct market interventions, including Price-Anderson. |
| Brannon, Ford Foundation, 1974 | Academic study commissioned for public review. | No estimate of subsidy total. Wide-ranging, detailed examination of taxes and subsidies which affected energy disposition in the early 1970s. |
| Battelle, 1980 | Policy analysis covering all fuels, delivered under contract to DOE. | Estimated Federal program subsidies at \$31.4 billion. Estimated cumulative Federal incentive for energy at \$252 billion since 1918. |
| Congressional Budget Office, 1990 | Covers all fuels with respect to CO2 emissions, enumerative. | Classified subsidy programs as either contributors to emissions or not: excise taxes (reduce emissions), R&D (increase emissions), tax preferences (both), and direct spending (mostly increase). |
| Heede, Morgan, Ridley, Center for Renewable Resources, 1984 | Policy report covering all fuels, enumerative. | Estimated at \$66.1 billion. Subsidies described as tax expenditures, agency outlays, and loans/guarantees. Does not include LIHEAP, uranium enrichment, or Price-Anderson. |
| Kosmo, World Resources Institute, 1987 | Comparative economic study of subsidies, focusing on national economic impacts. | Estimated subsidy to U.S. electricity consumers at \$91 billion. |
| Rocky Mountain Institute, 1992 | Qualitative policy essay. | Subsidies neither specified nor quantified. |
| Management Information Services Inc., 1998 | Policy report covering all fuels, cumulative, examines subsidy mix. | Subsidies quantified over a five-decade period. Estimated as \$564 billion cumulatively since the 1950s. |
| Institute for Local Self-Reliance, 1996 | Study of petroleum industry subsidies nationally, and Minnesota specifically. | Estimated direct tax subsidies to petroleum industry at \$3.9 billion. Total indirect, external costs (defense, environmental costs) estimated as \$87.5 billion. |
| Northwest Environment Watch, 1995 | Environmental policy, Pacific Northwest impacts, public power and automobiles. | Cited EIA (1992) estimates on public power subsidies. Largest quantified estimate was \$1.3 billion to Bonneville Power Administration. |

Note: All dollar estimates are given in 1999 dollars.

Sources: See Appendix D.

Government Interventions Considered in Other Studies

Regulations

The issue of subsidy in energy policy analysis extends beyond consideration of actions involving some form of financial commitment by the Federal Government. Subsidy-like effects could flow from a range of regulations imposed by the Government on energy markets. Regulations may directly subsidize a fuel by mandating a specified level of consumption, thereby creating a market that might not otherwise exist.⁶² More often, however, Federal regulations penalize rather than subsidize a targeted fuel. To the extent that regulations on coal emissions raise the costs of coal use, the competitive opportunities for alternatives, including renewables, natural gas, and conservation, are enhanced. The additional costs that influence the consumption of coal versus other fuels do not involve any exchange of money between the Government and buyers and sellers of energy, but they have indirect impacts on resource allocation and the relative prices of energy products.

Because the effects of regulation are indirect, most reports on energy subsidies avoid the subject, and those which address the topic in general avoid specific valuations. The 1992 service report by the Energy Information Administration (EIA) described the issue at length and provided estimates for several programs, but did not include these findings in the total subsidy estimate.⁶³ Similarly, Douglas Koplow and the Alliance to Save Energy discussed the issue but did not include a figure in their final estimate.⁶⁴

Non-Internalized Externalities

Much current debate on energy policy focuses on externalities associated with energy use. Many analysts believe that, to the extent that government policies fail to recover the environmental costs of pollution from energy producers, they implicitly subsidize particular forms of energy production and consumption. According to this view, failure to internalize recognized externalities in the context of current fuel use may have the effect of causing conventional energy to be underpriced in comparison with other energy sources. For instance, some advocates of renewable energy claim that this form of “subsidy” is central to the continued dominance of fossil fuels as a component of energy supply.

In fact, the effort to deal with environmental concerns has become a central feature of Federal energy policy. Substantial costs that formerly were outside the market mechanism have, through the implementation of a series of taxes and regulations, been internalized to energy markets.

Several of the reports, however, emphasized that much more needs to be done before this issue is fully addressed. The Institute for Local Self-Reliance estimated that as much as \$31 billion is not internalized in the aggregate cost of motor gasoline.⁶⁵ Unable to quantify most environmental externalities, the Center for Renewable Resources concluded that its estimate was “conservative,” calling these environmental costs “large” and “important.”⁶⁶ Energy

⁶²For example, the imposition of oxygenate requirements for gasoline in the winter of 1992 stimulated demand for alcohol-based additives.

⁶³Energy Information Administration, *Federal Energy Subsidies: Direct and Indirect Interventions in Energy Markets*, SR/EMEU/92-02 (Washington, DC, November 1992), pp. 71-80.

⁶⁴D.N. Koplow and The Alliance to Save Energy, *Federal Energy Subsidies: Energy, Environmental, and Fiscal Impacts* (Lexington, MA: The Alliance to Save Energy, 1993), pp. 9-10. See also p. 76, Appendix A-10, which discusses dozens of regulations, their points of intervention in energy markets, and their consequent effects.

⁶⁵J.B. Wahl, *Oil Slickers: How Petroleum Benefits at the Taxpayer's Expense* (Washington, DC: Institute for Local Self-Reliance, 1996).

⁶⁶H.R. Heede, R.E. Morgan, and S. Ridley, *The Hidden Costs of Energy* (Washington, DC: Center for Renewable Resources, October 1985), p. 7.

externalities in the Pacific Northwest, in particular electricity and automobiles, were emphasized especially by John Ryan and Rhys Roth.⁶⁷

Transportation Programs

The Federal Government spends billions of dollars on transportation-related programs of various kinds, a considerable portion of which is funded by excise taxes on fuels or transportation-related activity. Transportation programs include construction of Federal highways, waterways, and airports; provision of air traffic control services; and extensive transportation safety and research and development programs. (Transportation programs are excluded from the analysis in this report, because they are not directed at energy consumption *per se*, and because they do not distinguish between the fuels used.⁶⁸)

Koplow included estimates for the Coast Guard, the Maritime Administration, and the Federal Railroad Administration in the subsidy total,⁶⁹ and H.R. Heede (Center for Renewable Resources) also estimated costs incurred by the Coast Guard.⁷⁰ Strikingly, David M. Roodman reported total expenditure on highway-related services at \$88 billion, and he estimated that the total non-internalized cost of highway driving could be as high as \$114 billion annually if costs attributable to congestion, lost time, wasted fuel, and additional accidents were included.⁷¹

Defense Expenditures

Some studies of Federal energy subsidies characterize U.S. defense expenditures related to the security of the Persian Gulf as energy subsidies. In addition to the technical question of what proportion of U.S. national security expenditures ought to be attributed to this mission, it is an exercise in judgment as to whether the expenditures confer a financial benefit to U.S. energy producers or consumers, and whether the level of defense expenditures bears any functional relationship to domestic energy prices. Strategic defense expenditures constituted more than half the subsidy estimated by the Institute for Local Self-Reliance, but were not emphasized elsewhere in the literature.

Tax Preferences for Investment or Research and Development

The Federal tax code contains provisions that favor corporate spending on research and development and the acquisition of capital assets over other forms of business expenses. Because energy industries historically have required heavy investment in fixed capital (power generation plants, tankers, offshore platforms, pipelines, oil refineries) and have consequently used these provisions, some analysts view such provisions of the tax code as energy subsidies. As in the case of transportation programs, however, the effects of tax code provisions on energy production or consumption are incidental to the intended purpose.

Tax provisions, however, play a large role in studies conducted in the 1980s. Koplow attributed roughly one-third of total energy subsidies to accelerated depreciation of equipment and machines and the Investment Tax Credit.⁷²

⁶⁷J.C. Ryan, *Hazardous Handouts: Taxpayer Subsidies to Environmental Degradation* (Seattle WA: Northwest Environmental Watch, 1995).

⁶⁸In practice, however, transportation energy use is dominated by petroleum products.

⁶⁹D.N. Koplow and The Alliance to Save Energy, *Federal Energy Subsidies: Energy, Environmental, and Fiscal Impacts* (Lexington, MA: The Alliance to Save Energy, 1993), p. 74.

⁷⁰H.R. Heede, R.E. Morgan, and S. Ridley, *The Hidden Costs of Energy* (Washington, DC: Center for Renewable Resources, October 1985), p. 26.

⁷¹D.M. Roodman, *Paying the Piper: Subsidies, Politics, and the Environment* (Washington, DC: Worldwatch Institute, 1996), p. 42. Roodman cited U.S. Department of Transportation, *Highway Statistics 1994*, and McKenzie et al., *The Going Rate: What It Really Costs To Drive* (Washington, DC: World Resources Institute, 1992).

⁷²D.N. Koplow and The Alliance to Save Energy, *Federal Energy Subsidies: Energy, Environmental, and Fiscal Impacts* (Lexington, MA: The Alliance to Save Energy, 1993), p. 10.

Five years earlier, Heede attributed about half the total subsidy to these tax provisions.⁷³ Most of these provisions were reduced or eliminated by the Tax Reform Act of 1986.

Provision of Services

A number of Government programs take the form of provision of services. For example, the Federal Power Marketing Administrations are required by law to sell electricity preferentially to selected customers. The Price-Anderson Act makes the Federal Government a guarantor to nuclear power generators. The Strategic Petroleum Reserve may also function as a form of insurance for oil consumers, in the sense that the program normally confers benefits on oil consumers in the form of a reduction of the price risk associated with choosing to consume petroleum. Virtually all the reports reviewed here, including EIA's 1992 Service Report, recognize and itemize these types of subsidies. By definition, this report considers only the Price-Anderson Act.

Provision of Loans

Federal loans may confer financial benefits to recipients if the fees and interest rates charged do not compensate the Government for its cost of funds or if the funds are made available at lower cost than the borrower could otherwise obtain from private markets. In practice, Federal loans related to energy (or Federal tax exemptions on State and local debt incurred for energy projects) are made almost entirely for electricity. Examples include loans to Federal Power Marketing Administrations, loans made by the Rural Utilities Service, and tax exemptions for municipal bonds issued to fund energy projects. Providing loans of this type is widely recognized as an energy subsidy which can be estimated straightforwardly, and most of the literature includes these loans in total estimates of subsidy.

Review of Previous Studies

Ford Foundation Study

In 1971, the Ford Foundation authorized a comprehensive review of Federal energy policy. By 1974, the advent of the "energy crisis" had fundamentally altered the energy policy context, making Gerard M. Brannon's examination of energy tax and subsidy policy timely.⁷⁴ Brannon examined prevailing energy policy from the standpoint of economics, and suggested many of the policies that were implemented later in the 1970s and 1980s. Brannon concluded that the Government should remove or reduce subsidies that stimulate oil and gas production, and that the cost of petroleum ought to fully reflect the considerable security costs involved. He also weighed various pollution abatement alternatives, the proper role of excise taxes, and the possibility of "trust funds." Finally, he recommended an expansion of policy to promote renewable energy sources and energy-conserving technologies.

DOE Study of Federal Incentives for Energy Production

By the late 1970s, the Department of Energy (DOE), seeking to ascertain reasons for solar energy's inability to penetrate the energy market, commissioned a study to determine the extent of subsidy to traditional, fossil fuel supply obtained through Federal programs.⁷⁵ The report hypothesized that the public was overly sensitive to price signals emanating from energy markets, creating a perception of market failure, and that this justified vigorous Federal intervention to shift aggregate supply of energy to the right, restoring the intersection of the demand curve

⁷³H.R. Heede, R.E. Morgan, and S. Ridley, *The Hidden Costs of Energy* (Washington, DC: Center for Renewable Resources, October 1985), p. 26.

⁷⁴G.M. Brannon, *Energy Taxes and Subsidies* (Cambridge, MA: Ballinger, 1974).

⁷⁵Pacific Northwest Laboratory, *An Analysis of Federal Incentives Used To Stimulate Energy Production*, PNL-2410 REV.II, prepared for DOE under contract EY-76-C-06-1830 (February 1980).

and the subsidized supply curve to the prevailing price perception. Such action would favor existing sources of energy production and make it difficult for alternatives, especially solar energy, to compete.

The report identified eight means by which Federal programs had achieved this supply shift, including the creation of organizations, tax exemptions or reductions, fees, disbursements, legal requirements, traditional regulation, research and development, and actual market activity. Taken together, these subsidies amounted to \$31.4 billion. Of this, more than three quarters was attributed to DOE, the Tennessee Valley Authority (TVA), and the Army Corps of Engineers, and more than 82 percent was attributed to either electricity, nuclear, or coal programs.⁷⁶ While the report suggested some specific, creative policies that might boost the competitiveness of solar energy, the ultimate recommendation was simply to employ the Government's ability to subsidize, appending solar incentives to the list of existing Federal subsidies.

CBO Study: Energy Subsidies and Consequent Effect on Carbon Emissions

The Congressional Budget Office (CBO) responded to growing interest in the environmental effects of energy consumption with an examination of subsidies directed at fossil energy use and consequent emissions effects.⁷⁷ The CBO study considered expenditure, credit, and tax programs that directly affect energy use. The study also underscored the difficulty in tabulating energy subsidies by excluding several large Government regulatory interventions, fuel efficiency standards, regulation of nuclear generation facilities, the exclusion of interest on home mortgages, and Federal spending on highways. Even so, more than 10 forms of tax preferences, 13 forms of energy taxes, 5 key energy production and credit programs, and 6 major research and development initiatives were examined (Tables A3 and A4).

The main finding was that any energy impacts favoring fossil fuel use, thus increasing emissions, were small relative to those programs that either favored other sources (such as nuclear generation) or imposed excise taxes, thereby reducing emissions. The report described and quantified many other Federal provisions that affect energy consumption and emissions, the provision of power through Federal Power Marketing Administrations (PMAs), research and development programs, the Low Income Home Energy Assistance Program (LIHEAP), and subsidies to nuclear generation, but concluded that any measurable effects would be small relative to the size of the associated energy sector.

The Alliance to Save Energy: Expanding the Subsidy Discussion

The study with the longest list of subsidies was prepared by Douglas Koplow for the Alliance to Save Energy (The Alliance).⁷⁸ The report arrived at two estimates for total subsidies, a high figure of \$46 billion and a low of \$27 billion, largely by applying a broad definition to the concept of subsidy (Tables A3 and A4). The Alliance defined subsidy as any Government-provided good or service (including risk-bearing instruments) which otherwise would have to be obtained under market conditions, and any reduction in tax burden compared to the standard treatment for a similar activity. Further, the report assumed a zero budget baseline⁷⁹ and, in contrast to CBO and others, included and itemized subsidies to housing and transportation if they significantly benefitted the energy sector.

⁷⁶Energy Information Administration, *Annual Energy Review 1997*, DOE/EIA-0384(97) (Washington, DC, July 1998), Table 10, p. 92.

⁷⁷Congressional Budget Office, *Energy Use and Emissions of Carbon Dioxide: Federal Spending and Credit Programs and Tax Policies* (Washington, DC, December 1990).

⁷⁸D.N. Koplow, *Federal Energy Subsidies: Energy, Environmental, and Fiscal Impacts* (Lexington, MA: Alliance To Save Energy, 1993).

⁷⁹That is, all expenditures to energy and all tax breaks constitute subsidy to the recipient.

Table A3. Comparison of Selected Tax Expenditure Estimates
(Million 1999 Dollars, Outlay Equivalents)^a

| Provision | EIA 1999 Service Report | EIA 1992 Service Report | Alliance to Save Energy (High) | Congressional Budget Office | Center for Renewable Resources | Institute for Local Self-Reliance |
|---|-------------------------|-------------------------|--------------------------------|-----------------------------|--------------------------------|-----------------------------------|
| Capital Gains Treatment of Coal Royalties | 85 | 11 | Not estimated | | 165 | |
| Expensing of Exploration and Development . . . | -90 | -63 | -337 | 280 | 2,337 | 146 |
| Enhanced Oil Recovery Credit ^b | 245 | ^c 23 | 25 | 24 | Not estimated | 101 |
| Exception from Passive Loss Limitation for Working Interest in Oil and Gas Properties | 35 | 114 | 382 | | | 62 |
| New Technology Credit | 40 | 74 | 2,504 | | | |
| Alternative Fuel Production Credit | 1,030 | 764 | 25 | 12 | | 787 |
| Alcohol Fuel Credit | 15 | 91 | 25 | 43 | 323 | |
| Excess of Percentage over Cost Depletion | 295 | 1,170 | 954 | 634 | 2,668 | 1,026 |
| Exclusion of Interest on Certain State and Local Bonds | | 211 | 1,816 | 183 | | 187 |
| Alcohol Fuels Excise Tax Exemption | 725 | 525 | 617 | 487 | 323 | |

^aData for Congressional Budget Office and Institute for Local Self-Reliance are revenues foregone.

^bEnhanced Oil Recovery was added as a result of the Energy Policy Act of 1992.

^cIncludes only tertiary injectants, which were an expense item in 1992.

Note: Blank cells indicate the report made no mention of the item. "Not estimated" indicates a provision acknowledged by the authors but not quantified.

Sources: See Appendix D.

The report provided costs for 1989, the latest year for which the authors (writing in 1992) could find full, reliable data. Costs were divided among tax benefits, Federal agency program interventions, and other market interventions.⁸⁰ Like several other reports on energy subsidies, including EIA's 1992 report, the report by Koplow included provisions and programs that had been discontinued or discouraged, accounting for their "residual" effects. Chief among these items was accelerated depreciation of machinery and equipment, phased out by the Tax Reform Act of 1986, estimated at just over \$12 billion.⁸¹

The Alliance report supplied both a high and a low estimate, along with an explanation of the methods used in arriving at each figure (Table A5). The estimates differed in two respects: the high figure used less conservative estimation methods for certain program losses, and it measured not only the revenue foregone but also a market value estimation of indirect benefits accruing from the Government's intervention.⁸² Table A5 shows the differences as they pertain to the 10 largest subsidies in the report. Overall, the high estimate was nearly twice as large as the low.

⁸⁰Other quantified market interventions were two, the Price-Anderson assumption of nuclear liability and the under-accrual of funds necessary for nuclear decommissioning.

⁸¹Besides accelerated depreciation, investment tax credits for new machinery and equipment (\$2.5 billion) and tax-exempt bonds for pollution control equipment (\$716 million) were also important residual items.

⁸²For example, the 1989 revenue foregone from oil and gas percentage depletion exemption was estimated by Treasury at \$496 million (ASE's low estimate of the tax expenditure), but since the tax expenditure increases taxable income, a grant of \$674 million (ASE's high estimate) would be needed to produce a \$390 million benefit after taxes.

Table A4. Comparison of Selected Direct Expenditures
(Million 1999 Dollars)

| Provision | EIA 1999 Service Report | EIA 1992 Service Report | Alliance to Save Energy (High) | Congressional Budget Office | Center for Renewable Resources |
|---|-------------------------------|-------------------------------|--------------------------------------|--------------------------------|--------------------------------------|
| Direct Expenditure Items | | | | | |
| DOE Research and Development | 1,567 | 2,331.1 | ^a 3,538.5 | 3,070.7 | 6,085.0 |
| Clean Coal | ^b 183 | 288.7 | 241.6 | 675.1 | |
| DOE Conservation | -- | 298.9 | | 54.8 | |
| Synthetic Fuels Subsidies | 0 | 82.2 | | | 150.3 |
| Power Marketing Administrations: Total | -- | 394.8 | 783.9 | | 625.2 |
| Alaska Power Administration | -- | 3.7 | 10.0 | | |
| Southeastern Power | -- | 28.0 | 90.7 | | |
| Southwestern Power | -- | 28.9 | 53.9 | | |
| Western Area Power | -- | 343.4 | 67.5 | | |
| Bonneville Power Administration | -- | -9.7 | 561.7 | | 390.7 |
| Costs of Regulators | | | | | |
| Bureau of Reclamation | -- | 113.0 | Not estimated | 130.4 | 255.5 |
| Nuclear Regulatory Commission | -- | 433.6 | 441.8 | | 700.3 |
| Mining Safety and Health | -- | 107.3 | 148.4 | | 175.8 |
| Office of Surface Mining | -- | 123.2 | 348.5 | | 187.9 |
| Minerals Management Service | -- | 237.3 | 213.3 | 214.5 | 243.5 |
| Bureau of Land Management | -- | 95.8 | Not estimated | | 136.8 |
| Provision of Services | | | | | |
| Rural Utilities Service (RUS) | -- | | 1,505.6 | 1,112.5 | 5,960.3 |
| RUS, Federal Loans | -- | 50.2 | | | |
| Corps of Engineers Projects | -- | 528.3 | 817.7 | 411.9 | 1,535.9 |
| Tennessee Valley Authority | -- | 654.9 | 164.8 | 538.6 | 1,170.7 |
| Price-Anderson Act | 9,260 | 3,423 | 3,179 | -- | -- |

^aRegulatory enforcement activities.

^bDOE R&D totals for EIA 1999 and EIA 1992 include outlays for clean coal.

Note: Blank cells indicate the report made no mention of the item. "Not estimated" indicates a provision acknowledged by the authors but not quantified.

Sources: See Appendix D.

The Alliance concluded that this pattern of subsidies, by encouraging the consumption of fossil fuels, prevented a free market in energy, degraded the environment, slowed the development of renewable energy sources, and ignored possibilities associated with energy efficiency improvements. The inclusion of residual subsidies tended to support the conclusion that a level playing field for energy alternatives might be very difficult to achieve.

Table A5. Alliance to Save Energy, Comparison of Selected High and Low Estimates
(Million 1999 Dollars)

| Provision | High Estimate | Low Estimate | Difference |
|--|---------------|---------------|---------------|
| Accelerated Depreciation of Machinery and Equipment | 12,168 | 3,514 | 8,654 |
| DOE Energy R&D | 2,702 | 2,512 | 190 |
| Strategic Petroleum Reserve | 2,622 | 2,209 | 413 |
| Investment Tax Credits | 2,504 | 974 | 1,530 |
| Tax Exempt Bonds Issued by State and Local Authorities | 716 | 586 | 130 |
| Rural Utilities Service (Loans) | 1,506 | 1,428 | 78 |
| Uranium Enrichment Enterprise | 1,306 | 355 | 951 |
| Utility Normalization of Excess Deferred Taxes | 1,267 | 0 | 1,267 |
| Black Lung Trust Fund | 1,578 | 1,465 | 113 |
| Subtotal, Displayed Provisions | 26,369 | 13,043 | 13,326 |
| Total | 45,876 | 26,999 | 18,877 |

Source: Alliance to Save Energy, *Federal Energy Subsidies: Energy, Environmental, and Fiscal Impacts*, Tables 3 and 4.

1992 EIA Service Report

In contrast to The Alliance, EIA's 1992 service report quantified a smaller number of Federal subsidies while acknowledging that many other Federal interventions, most very difficult to quantify, undoubtedly acted as subsidies.⁸³ Like The Alliance, EIA also relied on Federal outlay numbers and netted out receipts to some programs, arriving at an overall estimate of \$5.6 billion, with a high allowance of \$11.4 billion. EIA classified the subsidies as both income and excise tax expenditures, direct expenditures, and research and development (Tables A3 and A4).

Tax expenditures, the largest of which was the excess of percentage over cost depletion exclusion, comprised just over half of the total in EIA's 1992 report. Direct expenditures amounted to \$3.9 billion, and research and development subsidies totaled \$2.3 billion, almost half of which went to nuclear programs. EIA then reduced this subsidy total by over \$3.4 billion for excise taxes collected without offsetting liabilities, virtually all of which were attributed to taxes on motor gasoline and highway diesel, in arriving at the final estimate. With the excise taxes thus attributed entirely to petroleum, oil actually showed a negative subsidy of \$2.4 billion. All other fuels were allocated a positive subsidy value.

Although it did not include them in the total estimate, EIA's 1992 service report described at length other Federal interventions that acted to subsidize the energy sector, chief among them, public power issues and various forms of regulation. The report found four subsidized areas: access to inexpensive Federal hydropower through PMAs, access to Rural Electrification Administration (now the Rural Utilities Service) credits, tax-exempt borrowing rights, and exemption from Federal income tax. The study estimated that the full cost of providing electricity could exceed the price actually obtained by \$4.8 billion. It also estimated costs associated with several regulatory programs, including unleaded and oxygenated gasoline, oil storage tank safety, automobile efficiency (CAFE) standards, and

⁸³Energy Information Administration, *Federal Energy Subsidies: Direct and Indirect Interventions in Energy Markets*, SR/EMEU/92-02 (Washington, DC, November 1992).

two interventions functioning as subsidies, the Price-Anderson Act and the Alaska North Slope oil export ban. Valued at roughly \$29 billion, these energy-related regulatory programs dwarfed the quantified overall subsidy estimate of \$5.5 billion.

The 1992 EIA report, while acknowledging and itemizing indirect subsidies, stressed that subsidies must affect the choice between energy and non-energy capital investment. The report therefore excluded some tax considerations and chose not to include strategic considerations such as defense expenditures in the Persian Gulf and the Strategic Petroleum Reserve.

Recent Studies: Management Information Services, Inc., and Green Scissors

Management Information Services, Inc. (MISI), conducting a study of the cumulative effects of energy subsidies, found that by 1997 Federal subsidies for energy had amounted to \$564 billion (1997 dollars) over the last five decades, roughly half of which went to the oil industry in the form of tax expenditures.⁸⁴ MISI considered eight categories of Federal activity⁸⁵ and quantified subsidies in six. In contrast to other findings, MISI found that subsidies to renewable sources (\$90 billion) outpaced those to natural gas (\$73 billion), coal (\$68 billion), or nuclear energy (\$61 billion).⁸⁶ MISI itemized Federal research and development spending for nuclear, coal, and solar sources, reporting 1997 figures of \$130 million, \$227 million, and \$259 million, respectively. MISI concluded that since renewable sources have contributed only marginally to the Nation's energy supply, solar research and development subsidies are disproportionately large and should be redirected to nuclear and fossil energy research.

The Green Scissors series of reports identified areas of Federal spending that subsidize environmental degradation.⁸⁷ Sixteen Federal energy programs were cited as wasteful, several of which contain subsidy activities, most notably the Power Marketing Administrations,⁸⁸ Clean Coal Technology Program,⁸⁹ Coal Research and Development,⁹⁰ various tax expenditures for petroleum,⁹¹ and loans to the Rural Utilities Service.⁹² According to Green Scissors, scaling back or eliminating entirely these programs would result in savings of nearly \$16 billion over 5 years.

Other Reports

Eight years before the Alliance to Save Energy report, the Center for Renewable Resources estimated total Federal subsidies at \$66 billion and asserted that current policy strongly favored fossil fuels over renewable sources and energy efficiency.⁹³ Although the report did not include LIHEAP or uranium enrichment costs, it still arrived at a relatively high figure, including the accelerated cost recovery system (\$17.8 billion) and the Investment Tax Credit (\$8 billion) and omitting the effect of excise taxes (principally, motor gasoline and highway diesel), which reduced total energy subsidies by discouraging energy consumption (Tables A3 and A4).

⁸⁴Management Information Services, Inc., *Federal Subsidies and Incentives for the Energy Industries* (Washington, DC, December 1998).

⁸⁵Organizations, taxes, fees, disbursements, requirements, traditional and nontraditional Government services, and market activity, the same categories identified by the Pacific Northwest Laboratory report delivered under contract to DOE in 1980.

⁸⁶MISI included subsidies estimated at \$62.5 billion cumulatively to hydroelectricity in the renewable total of \$90 billion.

⁸⁷Friends of the Earth, *Green Scissors 98: Cutting Wasteful and Environmentally Harmful Spending* (Washington, DC, 1998).

⁸⁸Subsidy estimated as \$400 million annually.

⁸⁹\$1.5 billion since 1984.

⁹⁰\$107 million, FY 1998.

⁹¹\$48.5 million, FY 1998.

⁹²Estimated at \$60 million annually.

⁹³H.R. Heede, R.E. Morgan, and S. Ridley, *The Hidden Costs of Energy* (Washington, DC: Center for Renewable Resources, October 1985).

In another report from the mid-1980s, *Money to Burn? The High Cost of Energy Subsidies*, Mark Kosmo deduced that cost-of-service electricity regulation produced a subsidy estimated at \$91 billion per year.⁹⁴ Kosmo, writing for the World Resources Institute, argued that the U.S. regulatory practice of pricing electricity at average historic cost, rather than marginal cost, constituted a huge subsidy to electricity consumers.⁹⁵

Joseph Romm and Amory Lovins suggested reducing the number of supply-side subsidies, pursuing “more efficient, cleaner and cheaper energy options,” and giving them “a fair chance to compete.”⁹⁶ The Institute for Local Self-Reliance (ILSR), focusing on petroleum subsidies only, estimated that the petroleum industry received subsidies of \$87.5 billion in 1996.⁹⁷ ILSR computed the estimate using tax expenditures (\$3.9 billion), defense or protection costs (\$52 billion), and environmental or health costs (\$31 billion). It did not include excise tax effects in the analysis (Table A3). Stephen Moore, writing of the need to end corporate subsidies generally, mentioned several energy activities, including loans to the Rural Utilities Service and tax expenditures for ethanol.⁹⁸ Other reports analyzed the environmental effects attributable to subsidized activities (only some of which are energy specific) in the Pacific Northwest,⁹⁹ the OECD countries,¹⁰⁰ and around the world,¹⁰¹ calling for a reduction or complete removal of certain subsidies.

⁹⁴M. Kosmo, *Money to Burn? The High Costs of Energy Subsidies* (Washington, DC: World Resources Institute, 1987).

⁹⁵Ten years later, the falling cost of bulk power generation has produced the phenomenon of “stranded costs,” in many areas, suggesting that marginal costs are now lower than regulated prices in many areas. This, of course has given impetus to the restructuring initiative.

⁹⁶J.J. Romm and A.B. Lovins, “Fueling a Competitive Economy,” *Foreign Affairs* (Winter 1992/1993), pp. 44-62.

⁹⁷J.B. Wahl, *Oil Slickers: How Petroleum Benefits at the Taxpayer's Expense* (Washington, DC: Institute for Local Self-Reliance, 1996), web site www.ilsr.org.

⁹⁸S. Moore, *Welfare for the Well-Off: How Business Subsidies Fleece Taxpayers* (Stanford, CA: Hoover Institute, 1999).

⁹⁹J.C. Ryan, *Hazardous Handouts. Taxpayer Subsidies to Environmental Degradation* (Seattle, WA: Northwest Environmental Watch, 1995).

¹⁰⁰Organization for Economic Cooperation and Development, *Improving the Environment Through Reducing Subsidies* (Paris, France, 1998).

¹⁰¹D.M. Roodman, *Paying the Piper: Subsidies, Politics, and the Environment* (Washington, DC: Worldwatch Institute, 1996).