

1. Renewable Energy Production Incentive (REPI)

Description

The Renewable Energy Production Incentive (REPI) is part of an integrated strategy in the Energy Policy Act of 1992 (EPACT) to promote increases in the generation and utilization of electricity from renewable energy sources, and to advance renewable energy technologies. This program, authorized under EPACT Section 1212, provides financial incentive payments for electricity produced and sold by new qualifying renewable energy generation facilities. Eligible electricity production facilities are those owned by State and local government entities (such as municipal utilities) and not-for-profit electric cooperatives that started operations between October 1, 1993, and September 30, 2003. Qualifying facilities are eligible for annual incentive payments of 1.5 cents per kilowatthour (1993 dollars and indexed for inflation) for the first 10-year period of their operation, subject to the availability of annual appropriations in each Federal fiscal year of operation. Criteria for qualifying facilities and application procedures are contained in the rulemaking for this program. Qualifying facilities must use solar, wind, geothermal (with certain restrictions as contained in the rulemaking), or biomass (except for municipal solid waste combustion) generation technologies.

Revenue Loss/Outlay

Procedures for annual payments to qualifying facilities for the REPI program are contained in the rulemaking. Payments are dependent upon the availability of annual appropriations. If there are insufficient appropriations to make full payments for electricity production from all qualifying facilities, "Tier 1" applicants receive incentive payments first. Tier 1 qualifying facilities are facilities that use solar, wind, geothermal, or closed-loop (dedicated energy crops) biomass technologies to generate electricity. Tier 1 receives either full payments or *pro rata* payments if funds are insufficient to cover all requests. If funds are available after making full payments to these facilities, payments from the remaining funds are then made to "Tier 2" qualifying facilities. These facilities use open-loop biomass technologies, such as landfill methane gas, biomass digester gas, and plant waste material that is co-fired in a generation facility to generate electricity. If there are insufficient funds to make full payments to all Tier 2 qualifying facilities, payments are made to those facilities on a *pro rata* basis. *Pro rata* payments result in a portion of the electricity production being fully paid and the remainder not receiving payment. Electricity for which payment is not made may be added to the next fiscal year's electricity production and submitted by the qualifying facility for payment consideration, providing the annual application is made in a timely manner within the 10-fiscal-year eligibility window.

In the first year of the REPI program, there were sufficient appropriations to make full production incentive payments of \$693,120 (nominal dollars) to the owners of all qualifying facilities. In the second year of the REPI program, there were sufficient appropriations to make full production incentive payments of \$2,398,472 (nominal dollars) to the owners of all qualifying facilities. For the third year of the REPI program, the available funds of \$2,490,893 (nominal dollars) were insufficient to make full production incentive payments to the owners of all qualifying facilities. Therefore, full payments have been made for electricity produced by Tier 1 facilities, and partial payments on a *pro rata* basis have been made for Tier 2 facilities. For the fourth year of the REPI program, the available funds of \$2,853,997 (nominal dollars) were insufficient to make full production incentive payments to the owners of all qualifying facilities. Therefore, full payments have been made for electricity produced by Tier 1 facilities and partial payments have been made for Tier 2 facilities on a *pro rata* basis. The fifth year of the REPI program received \$4,000,000 from Congress. This appropriation did not cover requests for reimbursement. Tier 1 was fully funded; Tier 2 funding was prorated on the basis of production.

1999 REPI Payments^a

Receipt	Energy Source	Payment (1999 Dollars)
Gainesville Regional Utilities, FL	Solar	47
Sacramento Municipal Utility District, CA	Solar	73,605
New York Power Authority, NY	Solar	16,710
Traverse City Power and Light, MI	Wind	11,257
Waverly Light and Power, IA	Wind	1,431
Kotzebue Electric Association Inc., AK	Wind	3,342
Clay Central/Everly Community School District, IA	Wind	865
Platte River Power Authority, CO	Wind	14,911
Central Valley Financing Authority, CA	Biomass digester gas	359,281
Snohomish County, WA	Wood waste	1,803,268
City of Dane, WI	Landfill methane	50,272
City of Glendale, CA	Landfill methane	588,013
Emerald Peoples' Utility District, OR	Landfill methane	91,524
Lycoming County, PA	Landfill methane	71,909
Pacific Northwest Generating Cooperative, OR	Landfill methane	154,754
University of California, Los Angeles, CA	Landfill methane	337,037
Monterey Regional Waste Management District, CA	Landfill methane	131,711
Jacksonville Electric Authority, FL	Landfill methane	112,707
Sonoma County Central Disposal Site, CA	Landfill methane	177,356

^aApplied to fiscal year 1998 production and prior year unpaid production.

Source: U.S. Department of Energy, Office of Power Technologies, web site www.eren.doe.gov/power/repi.html.

Rationale

REPI complements EPACT Sections 1914 and 1916, which provide tax incentives to certain private sector entities for certain types of new renewable energy generation facilities. The application of these changes to the U.S. Tax Code is administered by the Internal Revenue Service. The REPI program is managed by the Department of Energy. The regulations for the administration of the REPI program are contained in Title 10 to the Code of Federal Regulations, Part 451 (10 CFR 451). The final rulemaking, which contains clarifying supplementary information, is contained in 60 FR 36959.

Major Form(s) of Energy/Fuel Cycle Stage(s) Affected

Solar, wind, geothermal (with certain restrictions as contained in the rulemaking), or biomass (except for municipal solid waste combustion) generation technologies used to produce electricity by new generating facilities (which started operation between October 1, 1993, and September 30, 2003) owned by Publicly owned utilities.

Impact

The net impact of REPI has been minor, accounting for 528,899,024 kilowatthours in 1998, less than 0.02 percent of total electricity production in that year.

Net Electricity Production by REPI Qualifying Facilities, 1994-1998

Fiscal Year	Electricity Production (Kilowatthours)
1994	42,255,235
1995	152,609,779
1996	176,950,310
1997	458,021,775
1998	528,899,024

Source: U.S. Department of Energy, Office of Power Technologies, web site www.eren.doe.gov/power/rep.html.

2. Capital Gains Treatment of Royalties on Coal

Description

Owners of coal mining rights who lease their property usually receive royalties on mined coal. If the owners are individuals, these royalties can be taxed at the lower individual capital gains tax rate of 20 percent rather than at the higher regular individual top tax rate of 39.6 percent. In order to claim capital gains treatment, the royalty owner must own the property for a minimum of 1 year and meet other simple requirements. Owners who elect the capital gains tax rate cannot also elect percentage depletion. The capital gains treatment of coal royalties is provided for by law and has been in effect since the early 1950s.

Revenue Loss/Outlays

Estimated Revenue Loss and Outlay Equivalent, 1987-2004
(Million Nominal Dollars)

Fiscal Year	Revenue Loss			Outlay Equivalent ^a (Total)
	Individuals	Corporations	Total	
1987	45	5	50	65
1988	^b	^b	^b	^b
1989	0	0	0	0
1990	0	0	0	0
1991	5	0	5	10
1992	10	0	10	10
1992	10	0	10	10
1993	10	0	10	15
1994	10	0	10	10
1995	15	0	15	15
1996	15	0	15	15
1997	50	0	50	50
1998	60	0	60	80
1999	65	0	65	85
2000	65	0	65	85
2001	70	0	70	95
2001	70	0	70	95
2003	75	0	75	100
2004	80	0	80	105

^aAn outlay equivalent is the amount of outlay that would be required to provide the taxpayer the same after-tax income as would be received through the tax preference.

^bLess than \$2.5 million.

Note: All estimates have been rounded to the nearest \$5 million.

Source: Office of Management and Budget, *Analytical Perspectives, 2000* (Washington, DC, 1999). Also earlier editions.

The "Revenue Loss" data in the tabulation above were generated by the U.S. Treasury Department. They are the difference between estimated Federal income tax payments in a reference case and estimated actual Federal income tax payments. The reference case assumes that royalties on coal are taxed at the regular rate. The actual case assumes that the royalties are taxed at the capital gains tax rate to the extent taxpayers so choose.

Rationale

The capital gains treatment of coal royalties was apparently adopted for three reasons: (1) to encourage additional production, (2) to place coal on the same tax footing as lumber, and (3) to provide a benefit to long-term lessors who might not benefit substantially from percentage depletion.

Major Form of Energy/Fuel Cycle Stage(s) Affected

Coal production.

Impact

The capital gains treatment of royalties on coal causes Federal income tax payments by royalty owners to be lower than they otherwise would be, which encourages leasing and subsidizes production. However, those impacts are quite small because the capital gains provision cannot be used simultaneously with the percentage depletion provision. The capital gains tax rate dropped from 28 percent to 20 percent in 1997. This accounts for the higher estimated revenue loss beginning in 1997.

3. Expensing of Exploration and Development Costs: Oil, Gas, and Other Fuels

Description

Tax law allows energy producers, principally oil and gas producers, to write off (i.e., expense) certain exploration and development (E&D) expenditures rather than capitalizing them and depreciating them over time. The most important of these expenditures consist of intangible drilling costs (IDCs) associated with oil and gas investments. Integrated oil companies can expense 70 percent of their IDCs for successful domestic wells and 100 percent for unsuccessful domestic wells. The remaining 30 percent must be amortized over 5 years. Nonintegrated (independent) oil producers can expense 100 percent of their IDCs for all domestic wells. The 70-percent provision also applies to surface stripping and other selected expenditures for fuel minerals other than oil and gas (principally coal). The remainder must be amortized over 5 years.

The option to expense IDCs (and dry hole costs) of oil and gas wells was originally based on regulations issued in 1916. A court invalidated the regulations in 1945, but Congress subsequently gave its approval to the treatment and it became law in 1954. The option to expense mine development expenditures and the option to expense mine exploration expenditures were formalized in law in 1951 and 1966, respectively.

Integrated oil companies were constrained to expensing only 85 percent of their IDCs by a 1982 tax law. The percentage was subsequently reduced to 80 percent by the Tax Reform Act of 1984 and to its present 70 percent by the Tax Reform Act of 1986.

Revenue Loss/Outlays

The “Revenue Loss” data in the tabulation below were generated by the U.S. Treasury Department. They are the difference between estimated Federal income tax payments in a reference case and estimated actual Federal income tax payments. The reference case assumes that relevant IDCs and certain other E&D expenditures are cost depleted. The actual case assumes that they are expensed.

The data in the table have been mostly negative since fiscal year 1987. The negative values imply a payment to the Government of funds that it had loaned (tax deferrals), mostly to oil companies, in earlier periods. In a normal growth situation, the values would be positive. However, as a result of the sharp drop in oil E&D expenditures resulting from generally lower oil prices during the past several years, repayments of old “loans” have outweighed the receipt of new ones.

Estimated Revenue Loss and Outlay Equivalent: Oil, Gas, and Other Fuels, 1987-2004^a
(Million Nominal Dollars)

Fiscal Year	Revenue Loss			Outlay Equivalent ^b (Total)
	Individuals	Corporations	Total	
1987	425	-1,065	-640	-640
1988	455	-805	-350	-350
1989	560	-590	-30	-30
1990	-70	-385	-455	-455
1991	-95	-185	-280	-280
1992	-40	-15	-55	-55
1993	-15	90	80	80
1994	0	-70	-70	-70
1995	-70	-215	-285	-285
1996	-60	-180	-240	-240
1997	-35	-115	-150	-150
1998	-20	-90	-110	-130
1999	-15	-55	-70	-90
2000	NA	-10	-10	-20
2001	NA	-15	-15	-25
2002	NA	NA	NA	NA
2003	5	25	30	40
2004	10	30	40	45

^a“Other Fuels” are assumed to be primarily coal.

^bAn outlay equivalent is the amount of the outlay that would be required to provide the taxpayer with the same after-tax income as would be received through the tax preference.

NA = not available or not applicable.

Note: All estimates have been rounded to the nearest \$5 million.

Sources: **1987-1996:** Office of Management and Budget, *Budget of the United States Government, Fiscal year 1996* (Washington, DC, 1996). Also earlier editions. **1997-2004:** Office of Management and Budget, *Analytical Perspectives, 2000* (Washington, DC, 1999). Also earlier editions.

Major Form(s) of Energy/Fuel Cycle Stage(s) Affected

Crude oil, natural gas, and coal production.

Rationale

Intangible drilling costs were asserted by producers to be conventional operating expenses that therefore should be expensed. The provision is intended to encourage additional mineral exploration and development. It was explicitly codified to reduce uncertainty concerning its status in order to encourage further exploration and development.

Impact

This tax deferral provision has historically been one of the most important for oil and gas producers. The rapid writeoffs have added to other incentives to engage in exploration and development. As a result, domestic crude oil production has been greater than it otherwise would have been, and capital has been diverted from more productive activities. The increased output has contributed to making oil prices lower than they otherwise would be, despite OPEC's price-controlling position, and to constrained growth for nonconventional forms of energy.

4. Exception From Passive Loss Limitation for Working Interests in Oil and Gas Properties

Description

Owners of working interests in oil and gas properties are exempt from the “passive income” limitations, which limit the ability of individuals to offset their losses from passive activities against active income. Passive losses remaining after being netted against passive incomes can only be carried over to future-period passive incomes. The passive loss limitation provision and the oil and gas exception to it apply principally to partnerships and individuals rather than to corporations.

Revenue Loss/Outlays

Estimated Revenue Loss and Outlay Equivalent, 1987-2004

(Million Nominal Dollars)

Fiscal Year	Revenue Loss			Outlay Equivalent ^a (Total)
	Individuals	Corporations	Total	
1987	NA	NA	NA	NA
1988	55	0	55	75
1989	135	0	135	135
1990	180	0	180	245
1991	80	0	80	100
1992	80	0	80	100
1993	50	NA	50	50
1994	90	NA	90	50
1995	55	NA	55	55
1996	60	NA	60	60
1997	45	NA	45	45
1998	30	NA	35	30
1999	35	NA	35	35
2000	35	NA	35	35
2001	35	NA	35	35
2002	40	NA	35	40
2003	40	NA	40	40
2004	40	NA	40	40

^aAn outlay equivalent is the amount of the outlay that would be required to provide the taxpayer with the same after-tax income as would be received through the tax preference.

NA = not available or not applicable.

Note: All estimates have been rounded to the nearest \$5 million.

Sources: **1987-1993:** Office of Management and Budget, *Budget of the United States Government, Fiscal Year 1993* (Washington, DC, 1992). Also earlier editions. **1994-2004:** Office of Management and Budget, *Analytical Perspectives, 2000* (Washington, DC, 1999). Also earlier editions.

The "Revenue Loss" data in the tabulation above were generated by the U.S. Treasury Department. They are the difference between estimated Federal income tax payments in a reference case and estimated actual Federal income tax payments. The reference case assumes that there are no exceptions to the passive loss limitations. The actual case assumes that exceptions are granted principally to noncorporate taxpayers.

Rationale

Working interests in oil and gas properties were exempted from the loss limitations in the Tax Reform Act of 1986. Factors that contributed to the adoption of the exemption included concern about the availability of investment funds for oil and gas development, given the collapse in oil prices that occurred during the same year the Act was passed.

Major Form(s) of Energy/Fuel Cycle Stage(s) Affected

Crude oil and natural gas production.

Impact

The major impact of the exception from the passive loss limitation is on business organizations that develop oil and gas properties. A shift toward the unlimited liability partnership form is likely, because the exception applies mainly to that form. Any shift is likely to be small because of the increased risk associated with unlimited liability. Nevertheless, some increase in exploration and development of oil and gas properties is likely as the subsidy attracts new capital.

5. Enhanced Oil Recovery

Description

Taxpayers are able to claim a general business credit allowing for the expensing of enhanced oil recovery investment. The enhanced oil recovery credit applies to the application of one or more tertiary recovery methods. The credit phases out when the price of oil exceeds \$28 per barrel in the preceding year. Enhanced oil recovery (EOR) is the extraction of the oil that can be produced from a petroleum reservoir greater than that which can be economically recovered by conventional primary and secondary methods. EOR methods usually involve injecting heated fluids, pressurized gases, or special chemicals into an oil reservoir in order to produce additional oil. The credit was provided for in the Energy Policy Act of 1992.

Revenue Loss/Outlays

Estimated Revenue Loss and Outlay Equivalent, 1993-2004

(Million Nominal Dollars)

Fiscal Year	Revenue Loss			Outlay Equivalent ^a (Total)
	Individuals	Corporations	Total	
1993	NA	NA	NA	NA
1994	5	80	85	120
1995	5	80	85	115
1996	5	75	80	110
1997	5	90	95	145
1998	10	130	140	215
1999	10	150	160	245
2000	10	170	180	285
2001	15	195	210	325
2002	15	225	240	375
2003	15	260	275	425
2004	20	300	320	490

^aAn outlay equivalent is the amount of the outlay that would be required to provide the taxpayer with the same after-tax income as would be received through the tax preference.

NA = not available or not applicable.

Note: All estimates have been rounded to the nearest \$5 million.

Note: For the year 1997, the credit was called a "new technology credit."

Sources: **1993-1996:** Joint Committee on Taxation (Staff), *Estimates of Federal Tax Expenditures for Fiscal Years 1992-1996* (Washington, DC, 1996). Also earlier editions. **1997-2004:** Office of Management and Budget, *Analytical Perspectives, 2000* (Washington, DC, 1999). Also earlier editions.

Rationale

The purpose of the credit for enhanced oil recovery is to boost levels of domestically produced oil and gas bypassed by conventional production.

Major Form(s) of Energy/Fuel Cycle Stage(s) Affected

Oil and natural gas production.

Impact

According to the Department of Energy, enhanced oil recovery has increased domestic oil production by 580,000 per day.¹⁰²

¹⁰²Energy Information Administration, *Annual Energy Outlook 1999*, DOE/EIA-0383(99) (Washington, DC, December 1998), p. 132.

6. Alternative Fuel Production Credit

Description

An alternative (or nonconventional) fuels income tax credit applies to qualified fuels from wells drilled or facilities placed in service between January 1, 1980, and December 31, 1992, and sold through the year 2002. The qualified fuels are (1) oil produced from shale and tar sands; (2) gas from geopressurized brine, Devonian shale, coal seams, tight formations, or biomass; (3) liquid, gaseous, or solid synthetic fuels produced from coal; (4) fuel from qualified processed wood; and (5) steam from solid agricultural byproducts.

The tax credit for these fuels is \$3 per barrel of oil-equivalent produced. (Conversion factors are used to convert the various fuels into their crude oil equivalent for purposes of calculating the credit.) The credit is fully effective when the price of crude oil is \$23.50 per barrel or less and phases out gradually as the price of oil rises to \$29.50 per barrel. All prices as well as the credit are specified in 1979 dollars, but for actual use they are indexed for inflation relative to that base. The credit is reduced if certain other energy subsidies, such as government grants and tax-exempt financing, are used.

The alternative fuel production credit was established by the Windfall Profit Tax Act of 1980 and became effective in the same year. The principal additional changes that have occurred since the 1980 Act have been to extend the time limits by which wells or facilities must be placed in service and fuels sold in order to be eligible for the credit. In 1989, legislation allowed a 1-year extension of the time limits. The Omnibus Budget Reconciliation Act of 1990 provided an additional 2-year extension. The 1990 act also greatly eased the qualification for gas produced from tight sands after 1990. The qualification had been sharply constrained by Executive Branch rulings and judicial decisions.

Revenue Loss/Outlays

The "Revenue Loss" data in the tabulation below were generated by the U.S. Treasury Department. They are the difference between estimated Federal income tax payments in a reference case and estimated actual Federal income tax payments. The reference case assumes that the alternative fuels receive no production credit. The actual case assumes that the credit is granted.

Estimated Revenue Loss and Outlay Equivalent, 1987-2004
(Million Nominal Dollars)

Fiscal Year	Revenue Loss			Outlay Equivalent ^a (Total)
	Individuals	Corporations	Total	
1987	(^b)	10	10	25
1988	(^b)	10	10	15
1989	(^b)	10	10	15
1990	(^b)	10	10	15
1991	50	205	255	380
1992	90	360	450	670
1993	120	640	760	995
1994	140	760	900	NA
1995	150	820	970	NA
1996	150	850	1,000	NA
1997	30	680	710	NA
1998	45	815	860	1,100
1999	45	765	810	1,030
2000	40	720	760	975
2001	40	680	720	915
2002	35	640	675	860
2003	15	420	435	555
2004	5	120	125	165

^aAn outlay equivalent is the amount of the outlay that would be required to provide the taxpayer with the same after-tax income as would be received through the tax preference.

^b\$2.5 million or less.

NA = not available or not applicable.

Note: All estimates have been rounded to the nearest \$5 million.

Sources: **1987-1993**: Office of Management and Budget, *Budget of the United States Government, Fiscal Year 1993* (Washington, DC, 1992). Also earlier editions. **1994-2004**: Office of Management and Budget, *Analytical Perspectives, 2000* (Washington, DC, 1999). Also earlier editions.

Rationale

The alternative fuel tax credit is one of several measures adopted in the early 1980s to encourage the development of synthetic fuels produced by nonconventional means or sources. The credit is designed to encourage capital investment in alternative fuel production by protecting producers of those fuels against the effects of oil price reductions.

Major Form(s) of Energy/Fuel Cycle Stage(s) Affected

Oil and natural gas production.

Impact

The tax credit provision has had a substantial impact on the production of alternative fuels. The fuel most affected has probably been gas produced from coal seams. The recent impact has been large both because it was expected that the credit would expire for wells and facilities not placed in service by a certain date and because crude oil prices have been low. The credit for qualified gas was about \$0.1 per million Btu in 1998, or about one-half the wellhead price of domestically produced natural gas in that year. The extent to which other nonconventional fuels have been affected is less certain. Generally, however, the credit has caused oil and gas supplies to increase beyond levels that would otherwise have been reached.

The alternative fuels provision extends the applicable time period for the so-called "Section 29" tax credit as it applies to the production of some alternative (or nonconventional) fuels. The extension applies only to gas from biomass and to liquid, gaseous, or solid synthetic fuels produced from coal in facilities placed in service through 1996 (pursuant to a written binding contract in effect before 1996) and sold through the year 2007. Prior to the extension the years were 1992 and 2002, respectively. In the case of a facility that produces coke or coke gas, however, the extended dates apply only if the original use of the facility commenced with the taxpayer. The original dates continue to apply to all qualified alternative fuels not mentioned above. Those fuels include oil produced from shale and tar sands and gas from geopressurized brine, Devonian shale, coal seams and tight formations. Most of the credits appear to be related to gas from coal seams.¹⁰³

¹⁰³Energy Information Administration, *Performance Profiles of Major Energy Producers 1993*, DOE/EIA-0206(93) (Washington DC, January 1995), p. 17.

7. New Technology Credit: Investment Energy Tax Credit

Description

The 10-percent investment tax credit, otherwise known as the business energy tax credit, has been permanently extended as part of the passage of the Energy Policy Act of 1992 (EPACT). Anyone who invests in or purchases qualified solar¹⁰⁴ or geothermal energy property can take the credit, up to 10 percent of the investment or purchase and installation amount, when income tax forms are filed. Only commercial entities can take the credit. (This credit should not be confused with the residential tax credit, which permanently expired in 1985.) The credit cannot be claimed for property used mainly outside the United States, used by governmental units and foreign persons and entities, or used by a tax-exempt organization (unless the property is used mainly in an unrelated trade or business).¹⁰⁵

In 1978, Congress approved the Energy Tax Act of 1978. This act established a 10-percent investment tax credit for photovoltaic (PV) projects, as well as a 15-percent energy tax credit added to an existing 10-percent investment tax credit for solar, geothermal, and wind generation facilities. The Tax Reform Act of 1986 eliminated the 10-percent investment tax credit, extended the energy tax credit until 1988 but reduced that credit from 15 percent to 10 percent, and eliminated wind as a candidate for any credits. The business tax credit was extended on a year-to-year basis until 1992, when the passage of EPACT made the 10-percent business tax credit for solar (PV and thermal) and geothermal permanent (Section 1916).

¹⁰⁴Solar property eligible for the investment credit uses solar energy to generate electricity, to heat, cool, or provide hot water for use in a structure, or to provide process heat.

¹⁰⁵The Federal Government also offers a Modified Accelerated Cost Recovery System (MACRS), which allows for a 5-year accelerated depreciation for all solar energy equipment (U.S. Code Citation: 26 USC Sec. 168). Without MACRS, depreciation for such equipment would be done over the standard 20-year period.

Revenue Loss/Outlays

Estimated Revenue Loss and Outlay Equivalent, 1987-2004¹⁰⁶ (Million Nominal Dollars)

Fiscal Year	Revenue Loss			Outlay Equivalent ^a (Total)
	Individuals	Corporations	Total	
1987	10	140	150	180
1988	0	80	80	95
1989	0	80	80	110
1990	0	75	75	110
1991	0	75	75	110
1992	0	45	45	65
1993	0	55	55	85
1994	0	60	60	80
1995	0	30	30	195
1996	0	60	60	40
1997	0	25	25	80
1998	0	30	30	30
1999	0	30	^b 30	40
2000	0	35	^b 35	45
2001	0	40	^b 40	50
2002	0	40	^b 40	55
2003	0	35	^b 35	55
2004	0	35	^b 35	40

^aAn outlay equivalent is the amount of the outlay that would be required to provide the taxpayer with the same after-tax income as would be received through the tax preference.

^bAccording to the Department of treasury, the investment tax credit portion is one-fourth to one-third of this total; the remainder is the production tax credit, which is discussed in the next fact sheet.

Note: May include unknown amounts that apply to tax expenditure provisions that expired before January 1, 1992, and which were not new technology credits.

Note: All estimates have been rounded to the nearest \$5 million.

Sources: **1987-1992:** Office of Management and Budget, *Budget of the United States Government, Fiscal Year 1993* (Washington, DC, 1992). Also earlier editions. **1993-2004:** Office of Management and Budget, *Analytical Perspectives, 2000* (Washington, DC, 1999). Also earlier editions.

Rationale

EPACT contains several provisions that encourage investment in renewable energy technologies by private and public entities. Under the Act, businesses can take a 10-percent business investment tax credit for purchases of solar and geothermal energy property. EPACT made this credit permanent so that solar and geothermal energy industries will no longer be burdened with the prospect of a continually expiring and reinstated credit.

¹⁰⁶These tax expenditures include a production tax credit for wind-generated electricity. See the next Fact Sheet, "New Technology Credit: Production Tax Credit."

Major Form(s) of Energy/Fuel Cycle Stage(s) Affected

Qualified solar and geothermal energy property.

Impact

Even with existing incentives, the higher costs of solar and geothermal energy sources have limited their commercial application.

8. New Technology Credit: Production Tax Credit

Description

The Energy Policy Act of 1992 (EPACT) enacted the production tax credit as Section 45 of the Internal Revenue Code of 1986. The credit is phased out if the price of wind-generated electricity is sufficiently high. The production tax credit provides a 1.5 cents per kilowatthour credit (adjusted for inflation) for electricity produced from a facility placed in service after December 31, 1993, and before July 1, 1999, for the first 10 years of the facility's existence. In 1999, the Internal Revenue Service set the production tax credit at 1.7 cents per kilowatthour. Renewable energy sources that qualify for the tax credit are wind and "closed loop" biomass power facilities that utilize biomass grown exclusively for energy production (no closed loop biomass facilities are in operation). The credit is only available if the wind energy equipment is located in the United States and electricity is sold to an unrelated party. Under current law, the tax credit qualification date expired on July 1, 1999. Legislation has been introduced in both Houses of Congress to extend the qualification date for the production tax credit beyond the current expiration date.

Revenue Loss/Outlay

The value of the Production Tax Credit for wind is included in the Investment (Business) Energy Tax Credit values in the preceding fact sheet.

Rationale

Wind is a clean, renewable energy source that may help to protect public health, secure a cleaner environment, enhance America's national security through energy independence, and reduce pollution. The credit is intended to enhance the development of technology to utilize wind energy sources and to promote competition between wind energy sources and conventional energy systems.

Major Form(s) of Energy/Fuel Cycle Stage(s) Affected

Wind and closed loop biomass.

Impact

Since its inception, the production tax credit has supported wind energy development and production. A number of States, including California, Minnesota, and Iowa, have had a number of new wind turbines installed prior to the expiration of the tax credit on July 1, 1999. However, the production tax credit alone may have been insufficient to spur the growth of wind power. Other forces have also contributed to the growth in wind power, including State incentives and mandates, research and development, testing programs, and green power or other environmental programs. Although wind is not yet cost competitive with other energy sources, the growth in wind power is helping the industry to become more cost competitive.

9. Renewable Transportation Fuels: Ethanol

Description

Federal financial incentives for renewable fuels in the transportation sector, strictly speaking, are limited to ethanol. Ethanol is produced from grain crops, with corn being the primary feedstock. The main use of ethanol is for gasohol (a blend of 90 percent unleaded gasoline and 10 percent ethanol, E-10) and for lower blends of ethanol to meet oxygenated gasoline requirements. Ethanol used in gasohol and other oxygenated gasoline blends meets the definition of a replacement fuel, but not of an alternative fuel. Two higher blends of ethanol, E-85 and E-95 are being used as alternative fuels in limited amounts. The value of the tax expenditure for renewable transportation fuels is \$15 million in fiscal year 1999.

The Federal tax code contains four overlapping tax incentives for ethanol: the 5.4 cents per gallon excise tax exemption, the 54 cents per gallon blender's tax credit, the 10 cents per gallon small ethanol production tax credit, and the alternative fuels production tax credit. The tax credit continues at 54 cents per gallon through 2000, then drops to 53 cents per gallon in 2001-2002, 52 cents per gallon in 2003-2004, and 51 cents per gallon in 2005-2007. Because the tax credit applies to the ethanol component of the fuel, the effective credit for ethanol blends is a function of the ethanol percentage in the blend. Gasohol, for example, is typically 10 percent ethanol and 90 percent gasoline. A credit of 54 cents per gallon for the ethanol translates into a credit of 5.4 cents per gallon for the 10-percent ethanol blend.

The alcohol fuel income tax credit and its associated excise tax credit were initially implemented in the early 1980s. The income tax credit was initially 40 cents per gallon minus the amount of excise tax exemption, which was 4 cents per gallon. Some changes have been made since that time. The most recent resulted from the Omnibus Budget Reconciliation Act (OBRA) of 1990, which reduced the income tax credit from 60 cents per gallon to 54 cents per gallon. The excise tax credit was also reduced, from 6 cents per gallon to 5.4 cents per gallon. The 1990 OBRA also introduced the small producer income tax credit of 10 cents per gallon. These provisions went into effect on January 1, 1993. The value of the \$725 million excise tax exemption on taxable motor gasoline mixed with ethanol is far greater than the \$15 million ethanol tax expenditure cited above.

Revenue Loss/Outlays

The "Revenue Loss" data in the tabulation below were generated by the U.S. Treasury Department. They are the difference between estimated Federal income tax payments in a reference case and estimated actual Federal income tax payments. The reference case assumes that no income tax credits are granted. The actual case assumes that the income tax credit exists and that the excise tax credit remains in effect.

Estimated Revenue Loss and Outlay Equivalent, 1987-2004
(Million Nominal Dollars)

Fiscal Year	Revenue Loss			Outlay Equivalent ^a (Total)
	Individuals	Corporations	Total	
1987	(^b)	5	5	10
1988	(^b)	5	5	10
1989	0	(^b)	(^b)	(^b)
1990	0	(^b)	(^b)	(^b)
1991	0	0	0	0
1992	0	80	80	80
1993	10	10	20	20
1994	10	10	20	20
1995	5	5	10	10
1996	5	5	10	10
1997	10	10	20	20
1998	5	10	15	15
1999	5	10	15	15
2000	5	10	15	15
2001	5	10	15	15
2002	5	10	15	15
2003	5	10	15	15
2004	5	10	15	15

^aAn outlay equivalent is the amount of the outlay that would be required to provide the taxpayer with the same after-tax income as would be received through the tax preference.

^bLess than \$2.5 million.

NA = not available or not applicable.

Note: All estimates have been rounded to the nearest \$5 million.

Sources: **1987-1993:** Office of Management and Budget, *Budget of the United States Government, Fiscal Year 1993* (Washington, DC, 1992). Also earlier editions. **1994-2004:** Office of Management and Budget, *Analytical Perspectives, 2000* (Washington, DC, 1999). Also earlier editions.

Rationale

The Energy Policy Act of 1992 (EPACT) sets a national goal to displace 10 percent of the petroleum content of light-duty motor vehicle fuels by 2000. For 2010, the goal is 30 percent. The alternative fuels specified in EPACT that may replace petroleum are natural gas, methanol, ethanol, propane, electricity, hydrogen, and certain other fuels that may be developed in the future. In addition, the Clean Air Act Amendments of 1990 (CAAA90) require that, beginning in 1998, 30 percent of new vehicles purchased by centrally fueled fleets in certain pollution nonattainment areas¹⁰⁷ must use “clean fuels,” as well as meeting more stringent tailpipe emission standards. The requirement increases to 70 percent of all fleet vehicles by 2000. Clean fuels include alternative fuels as well as other fuels such as biodiesel. The emphasis in EPACT was to encourage the purchase of “alternative fueled vehicles” (AFVs) in fleets and the

¹⁰⁷Initially, the areas affected included 19 States and 22 designated high-pollution geographic areas.

establishment of alternative refueling facilities. Accordingly, most of the EPACT alternative fuel incentives are indirect—principally mandating the purchase of AFVs in certain fleets.

Major Form(s) of Energy/Fuel Cycle Stage(s) Affected

Ethanol production and alternative fueled vehicles.

Impact

Even with existing incentives, E-85 is not competitively priced with gasoline on a per-Btu basis. Any short-term increase in E-85 (or E-95) consumption is therefore likely to be motivated either by environmental considerations or as a consequence of fulfilling EPACT's AFV mandates.

10. Excess of Percentage Over Cost Depletion: Oil, Gas, and Other Fuels

Description

Independent oil and gas producers and royalty earners, and all producers and royalty owners of certain other natural resources, including mineral fuels, may take percentage depletion deductions rather than cost depletion deductions to recover their capital investments. Under cost depletion, the annual deduction is equal to the unrecovered cost of acquisition and development of the resource times the proportion of the resource removed during that year. Under percentage depletion, taxpayers deduct a percentage of gross income from resource production at rates of 10 percent for coal; 15-percent for oil, gas, oil shale and geothermal deposits; and 22 percent for uranium. However, two special provisions apply to oil and gas. First, percentage depletion for independent producers and royalty earners is limited to 1,000 barrels per day. Second, the 15 percent rate is increased by 1 percentage point for each dollar that the average wellhead price of domestically produced crude oil is less than \$20 a barrel. The maximum increase allowed is 10 percentage points. This special provision applies only to oil and gas wells with marginal production, generally defined to include production from stripper wells and from wells substantially all of whose production is heavy oil. Marginal production eligible for the higher rate has a prior claim on the 1,000 barrel per day limitation.

The percentage depletion deductions based on gross income are subject to net income limitations. The annual deduction is limited to 100 percent of net income from the property for oil and gas and 50 percent of net income for other mineral fuels. Since percentage depletion is based on gross income, the resultant allowances can exceed the actual acquisition and development costs for the property from which the resource is extracted.

Percentage depletion for oil and gas properties became law in 1926. It was extended to most other minerals, including mineral fuels, in 1932. Whoever is eligible for percentage depletion must use it rather than cost depletion. This provision reduces the tax burden on independent oil and gas producers and royalty owners by repealing, for them, the excess percentage depletion tax preference for oil and gas for taxable years beginning after December 31, 1992. Excess preferences are preferences that are added back to the regular tax base in calculating income tax liabilities under the alternative minimum tax (AMT) system. The oil and gas provisions have been changed several times since they were first introduced in 1926.

Revenue Loss/Outlays

The "Revenue Loss" data in the tabulation below were generated by the U.S. Treasury Department. They are the difference between estimated Federal income tax payments in a reference case and actual Federal income tax payments. The reference case assumes that cost depletion is used. The actual case assumes that percentage depletion is used.

Estimated Revenue Loss and Outlay Equivalent: Oil, Gas, and Other Fuels,^a 1987-2004
(Million Dollars)

Fiscal Year	Revenue Loss			Outlay Equivalent ^b (Total)
	Individuals	Corporations	Total	
1987	595	345	940	1,360
1988	385	205	590	895
1989	320	205	525	740
1990	550	245	795	1,080
1991	470	245	715	975
1992	490	255	745	1,025
1993	265	830	1,095	1,540
1994	265	845	1,110	1,565
1995	265	800	1,165	1,500
1996	275	830	1,105	1,560
1997	285	860	1,145	1,620
1998	55	200	255	285
1999	55	205	260	295
2000	55	210	265	300
2001	55	215	270	310
2002	55	220	275	320
2003	55	225	280	325
2004	55	235	290	335

^a“Other Fuels” are assumed to be primarily coal.

^bAn outlay equivalent is the amount of the outlay that would be required to provide the taxpayer with the same after-tax income as would be received through the tax preference.

Note: All estimates have been rounded to the nearest \$5 million.

Sources: **1987-1996:** Office of Management and Budget, *Budget of the United States Government, Fiscal Year 1996* (Washington, DC, 1996). Also earlier editions. **1997-2004:** Office of Management and Budget, *Analytical Perspectives, 2000* (Washington, DC, 1999). Also earlier editions.

Rationale

Percentage depletion for oil and gas properties was introduced as a substitute for a related provision (discovery-value depletion) that had been adopted for a wide range of resources during World War I to stimulate production, but which was fraught with administrative problems. Discovery-value depletion was based on the market value of the deposit after discovery rather than on the cost of the property, as is done for cost depletion. Congress subsequently extended percentage depletion to a wide range of other minerals to be consistent with the treatment of oil and gas.

Major Energy Form/Fuel Cycle Stage(s) Affected

Crude oil, natural gas, and coal production, as well as minor energy forms, include uranium, oil shale, and geothermal.

Impact

Percentage depletion had the effect of substantially increasing the development of existing property, because the total depletion claimed could exceed the original investment. The increase in output benefitted producers (operators and royalty holders) through increased royalties and higher after-tax profits. Consumers also benefitted as a result of lower prices. The benefits to producers were considered so substantial that beginning in 1969 percentage depletion rates were reduced for oil and gas, major oil and gas companies were excluded from the percentage depletion provisions (1975), and other restrictive measures were adopted.

11. Nuclear Power Plants: Nuclear Energy Research Initiative

Description

In January 1997, the President tasked his Committee of Advisors on Science and Technology (PCAST) to evaluate the current national energy research and development (R&D) portfolio and to provide a strategy to address the Nation's energy and environmental needs for the next century. In the November 1997 report responding to this request, the PCAST Energy Research and Development Panel determined that restoring a viable nuclear energy option to meet future energy needs is important and that a properly focused R&D effort should be implemented by the U.S. Department of Energy (DOE) to address obstacles to achieving this option. These obstacles include issues related to proliferation, economics, nuclear waste, and safety. The panel recommended that technologies to be addressed include, but not be limited to, work on proliferation-resistant reactors or fuel cycles; new reactor designs with higher efficiency, reduced cost, and enhanced safety to compete in the global market; lower output power reactors for applications where larger reactors may not be advantageous; and new techniques for on-site and surface storage and for permanent disposal of nuclear waste.

DOE created the Nuclear Energy Research Initiative (NERI) to address and help overcome the technical and scientific obstacles to the future use of nuclear energy in the United States. NERI is also expected to help preserve the nuclear science and engineering infrastructure within the Nation's universities, laboratories, and industry to advance the state of nuclear energy technology and to maintain a competitive position worldwide. DOE believes that, in funding creative research ideas at the Nation's science and technology institutions and companies, solutions to important nuclear issues will be realized, and a new potential for nuclear energy in the United States will emerge.

NERI R&D will involve scientific and engineering research, development, and demonstrations designed to produce advanced technologies that address nuclear energy's key issues. The primary areas in which the DOE will seek research proposals in fiscal year 1999 include:

- Proliferation-resistant reactor and fuel technologies
- New high-efficiency reactor designs
- Advanced low-power reactor designs and applications
- New technologies for on-site and surface storage of nuclear waste
- Advanced nuclear fuel
- Fundamental nuclear science and technology.

The NERI program features a competitive, peer-reviewed R&D selection process to fund researcher-initiated R&D proposals from universities, national laboratories, and industry.

The Department's response to the PCAST recommendations proposed the Nuclear Energy Plant Optimization (NEPO) program in coordination with the Electric Power Research Institute (EPRI) and NERI. Congress approved funding for the NERI program in fiscal year 1999 but denied funding for NEPO. The goal of NEPO is to develop and demonstrate technologies that can enhance safe, reliable, and economic operation of U.S. nuclear power plants through their current and renewed license terms. The Department has included both programs in its budget request for 2000.

DOE will continue to support the NERI program to stimulate innovative research at U.S. universities and provide for a modest increase in the reactor upgrade program to improve the operation and maintenance of U.S. university research reactors. The Department will support education and research grants; supply fresh fuel to and transport spent fuel from university research reactors; fund reactor equipment upgrades; and continue the conversion of university reactor fuel cores from highly enriched uranium to low-enriched uranium.

The fiscal year 2000 request provides for a new Nuclear Energy Plant Optimization (NEPO) activity to cooperate with industry in developing advanced technologies to enhance the long-term operability of U.S. nuclear power plants. NEPO will accomplish two major tasks:

- Laboratory benchmark of technology to reduce stress crack corrosion in nuclear plant components
- Demonstration of a prototype method for nondestructive measurement of steam generator tube cracking.

Revenue Loss/Outlay

The appropriation for these programs is \$30 million in fiscal year 1999: \$19 million for NERI and \$11 million for university research. The fiscal year 2000 request for NEPO is \$5.0 million (nominal dollars).

Rationale

The primary mission of the NERI is the long-term advancement of nuclear energy science. As a result, NERI will address both innovative technologies that can be developed and implemented over the next 10 years and revolutionary technologies that can be implemented over the next 30 years.

Major Form(s) of Energy/Fuel Cycle Stage(s) Affected

Nuclear energy.

Impact

The NERI sponsors new and innovative scientific and engineering research and development to address the key issues affecting the future of nuclear energy, and to preserve our nation's nuclear science and technology infrastructure. In accomplishing this goal, the following objectives have been established for the NERI program: develop advanced reactor and fuel cycle concepts and scientific breakthroughs in nuclear technology to overcome scientific and technical obstacles to expanded future use of nuclear energy in the United States, including issues involving nuclear proliferation, unfavorable economics, and nuclear waste disposition; advance the state of U.S. nuclear technology to maintain a competitive position in overseas and domestic markets; and promote and maintain nuclear science and engineering infrastructure to meet future technical challenges and improve the performance, efficiency, reliability, economics, and other attributes to enhance nuclear energy applications.

Fulfillment of these objectives will provide advanced technologies that will allow nuclear energy to become a significant global source of electricity in the 21st century. In addition, it will allow the United States to retain its technical competence and human resource and knowledge base and strengthen its world leadership position in nuclear energy technology and the underlying sciences.

12. Waste/Fuel/Safety (Environmental Management)

Description

After the Department of Energy (DOE) ceased most nuclear weapons production operations in the late 1980s, it established a program to manage the legacy of contamination resulting from the operation of the largest government-owned industry. DOE manages thousands of contaminated areas and buildings, huge waste volumes, and nuclear materials left over from the nuclear weapons production and process and nuclear-related research efforts. In 1996, the Department began working toward a goal of completing cleanup at as many sites as possible by the end of the decade. In fiscal year 1998, Congress established the Non-Defense Environmental Management appropriation (formerly part of the Energy Supply Research and Development appropriation). The mission of the Non-Defense Environmental Management Program—to clean up as many of its contaminated sites as possible by 2006—did not change.

Revenue Loss/Outlay

The Non-Defense Environmental Management fiscal year 1999 budget request of \$466.6 million is a \$30.0 million (6 percent) decrease from the fiscal year 1998 budget request (see Appendix C, Table C2).

Rationale

Thousands of contaminated areas and buildings now exist. The goal of this program is to clean up and close as many sites as possible by 2006. After cleanup there will be no further DOE presence, with the exception of long-term surveillance and maintenance.

Major Form(s) of Energy/Fuel Cycle Stage(s) Affected

Nuclear contamination.

Impact

Fiscal year 1999 marks the first year in which the budget structure is aligned with the 2006 plan process. DOE expects sites within this account to be in compliance with applicable environmental and other requirements.

13. Fusion Energy Sciences

Description

The Fusion Energy Sciences program is a broad-based, fundamental research effort, geared to produce scientific knowledge and technical benefits in the near term and to provide the science base for a fusion energy option in the long term. Cross-cutting and interrelated objectives of the Fusion Energy Sciences program include: understanding the physics of plasmas, the fourth state of matter; identifying and exploring innovative and cost-effective development paths to fusion energy; and exploring the science and technology of energy-producing plasmas, the next frontier in fusion research, as a partner in an international effort.

The Fusion Energy Sciences budget is divided into three subprograms: Science, Facility Operations, and Enabling R&D. The Science subprogram includes research funds for plasma science and the development of improved confinement concepts. Funds for building and operating major experimental facilities are in the Facility Operations subprogram. The Enabling R&D subprogram includes funds for establishing the scientific foundation which underlies current advances in fusion technology and provides technological capabilities and innovations needed to advance plasma science and develop the knowledge base for an attractive fusion energy source.

Revenue Loss/Outlay

The fiscal year 1999 appropriation is \$223 million, allocated approximately as follows: Science, \$119 million; Facilities Operations, \$61 million; Enabling R&D, \$43 million. The appropriation was \$217 million in fiscal years 1997 and 1998. (All figures are in nominal dollars.)

Rationale

The introduction of fusion energy power plants could provide an economical and secure electricity supply while reducing the environmental impacts of increasing worldwide demands for electricity. The Fusion Energy Sciences program supports DOE's strategic goal of delivering the scientific and technological innovations critical to meeting the Nation's energy challenges.

Major Form(s) of Energy/Fuel Cycle Stage(s) Affected

Nuclear energy.

Impact

The goal of the Fusion Energy Sciences program is to "acquire the knowledge base for an economically and environmentally attractive fusion energy source." Although there is not a schedule for developing and deploying fusion energy systems the availability of fusion as an option for large central station power plants would be valuable insurance against possible environmental concerns about fossil and nuclear energy. In addition, there may be nearer term applications of fusion in transmutation of wastes and isotope production.

14. Basic Energy Research

Description

Basic Energy Research includes research in the natural sciences and engineering leading to new and improved energy technologies. It also includes understanding and mitigating the environmental impacts of energy technologies; a science base for identifying, understanding, and anticipating the long-term health and environmental consequences of energy production, development, and use; and advanced computing research, including operation of supercomputers, networks, and related facilities for analysis, modeling, simulation, and prediction of complex phenomena. Associated activities include support laboratory infrastructure management, evaluation of research programs, and construction and operation of scientific facilities. In the high energy and nuclear physics area, funds are used for construction of new facilities. The Life Sciences subprogram supports the Human Genome program. In the environmental area, funds will be used to develop advanced environmental remediation tools. Within the Climate Change Technology Initiative the focus will be on energy-efficient technologies, energy utilization, carbon sequestration, and photosynthesis. The Computational and Technology Research will support the Next Generation Internet initiative.

Revenue Loss/Outlay

Outlays for basic energy sciences excluding fusion were about \$2.0 billion in fiscal year 1998 and are expected to be \$2.5 billion in fiscal year 1999. The request for fiscal year 2000 is \$2.2 billion. In fiscal year 1998, \$0.5 billion was allocated for Environmental/Health/Safety. (All figures are in nominal dollars.)

Rationale

Government generally undertakes basic research where commercial payoffs are uncertain, long-term, or unavailable to the public. Private, for-profit organizations may invest insufficient amounts in basic research, especially in an era of increased economic competition.

Major Form(s) of Energy/Fuel Cycle Stage(s) Affected

Nuclear energy and others.

Impact

If the results of basic research follow in the pattern of previous discoveries, then benefits of the associated applied technological advances will be felt in the future. It is difficult, however, to assess such benefits against the dollars allocated to the programs in the present. Ultimately, it is hoped that increased understanding of fundamental processes will reap applications that improve the energy sources and technologies that are in use today.

15. Clean Coal Technology Program

Description

Public Law 99-190 (1985) provided funds from the Energy Security Reserve in the Department of Treasury for a Clean Coal Technology (CCT) Program in the Department of Energy (DOE). The program was authorized under the Clean Coal Technology Reserve proviso of P.L. 98-473 to subsidize the construction and operation of facilities to demonstrate the potential commercial feasibility of such technologies. Cost-shared (e.g., with the Electric Power Research Institute) innovative CCT projects demonstrate technologies appropriate for replacing, retrofitting, or modernizing existing coal-fired facilities to provide significantly reduced emissions. The provisions of cost-sharing allow the Government to recoup investments if the technologies achieve commercialization.

Revenue Loss/Outlay

Congress has appropriated \$2.3 billion for the CCT Program. As of September 30, 1998, the program consisted of 40 active or completed projects. The 40 projects have resulted in a combined commitment by the Federal Government and the private sector of \$5.7 billion. DOE has obligated \$1.9 billion to date. (All figures are in nominal dollars.)

In fiscal year 2000, only two projects are expected to have outstanding obligation commitments: the Clean Energy Demonstration Project in Southern Illinois and the CPICOR combined steelmaking and generation project planned for Geneva, Utah. DOE's current projections are that neither of these two projects will require funding allotments from previous appropriations in fiscal year 2000, and consequently \$246 million can be deferred into future years. Program outlays were \$77 million in fiscal year 1998 and are estimated to be \$183 million in fiscal year 1999. (All figures are in nominal dollars.)

Rationale

The purpose of the CCT Program is to speed up the introduction of technologies that use low-cost coal, while ensuring that progress toward meeting air quality goals is made.

Major Form(s) of Energy/Fuel Cycle Stage(s) Affected

Coal combustion.

Impact

The CCT Program has demonstrated a portfolio of technologies that have improved the economic and environmental performance of coal technologies for electricity generation and for industrial processes.

16. Coal Research and Development

Description

Coal research and development (R&D) projects are supported by funding in the Office of Fossil Energy, U.S. Department of Energy. The R&D program has three related facets—coal power systems, coal-derived fuels, and advanced research. The Clean Coal Technology (CCT) Program is discussed in the preceding fact sheet. The program includes low-emission boiler systems, coal gasification techniques, fluidized-bed combustion, direct and indirect liquefaction, and long-range research, as well as studies to provide the technological foundation for future coal-related systems. DOE's new "Vision 21" program calls for research on integrated power plants that are equipped with carbon capture and sequestration devices.

Revenue Loss/Outlay

Coal R&D appropriations for 1997 through 1999, excluding the unallocated component, were distributed to technology programs as follows (in million nominal dollars):

Program	1997	1998	1999
Advanced Clean Efficient Power Systems	69.3	72.4	87.7
Advanced Clean Fuels	16.2	15.6	15.5
Advanced Research and Technology Development	17.6	17.3	19.9
Total	103.0	105.3	123.1

Rationale

The objective of coal R&D is to provide an adequate scientific and engineering knowledge base to foster technological advances in the private sector. Also, coal-burning power plants are at the center of the controversies involving acid rain and global warming. New technology may help alleviate these problems.

Major Form(s) of Energy/Fuel Cycle Stage(s) Affected

Coal mining, combustion, liquefaction, and gasification.

Impact

If R&D is successful, improved coal technologies may benefit consumers through reduced electric power costs and improved environmental performance. The Energy Information Administration's *Annual Energy Outlook 1999* reports that coal accounted for 53 percent of total U.S. electricity generation in 1997.

17. Oil Technology Research and Development

Description

The overall approach of oil R&D is, first, to identify those types of oil deposits that have both the greatest potential for improved oil recovery and the greatest risk of abandonment within the next 5 to 10 years and, second, to apply available technologies. The technologies to be further investigated are called secondary and enhanced oil recovery. The first generally involves drilling and improved production methods based on sophisticated geological and geophysical interpretation. Enhanced oil recovery includes the injection of chemicals, gases, or heat to overcome physical barriers in the reservoir.

Revenue Loss/Outlay

Oil R&D appropriations were \$49 million in fiscal year 1998 and are expected to be \$50 million in fiscal year 1999.

U.S. Department of Energy Oil Research and Development Appropriations, 1995-2000

(Million Nominal Dollars)

Fiscal Year	Appropriation
1995	82
1996	56
1997	46
1998	45
1999	48
^a 2000	50

^aEstimate for Congressional request.

Sources: U.S. Department of Energy, *U.S. Department of Energy Fiscal Year 1999 Budget Request*, DOE/CR-0050 (Washington, DC, February 1998); and *U.S. Department of Energy Fiscal Year 2000 Budget Request*, DOE/CR-0059 (Washington, DC, May 21, 1999).

Rationale

Enhanced oil recovery research is aimed at capturing a significant portion of the estimated 300 billion barrels left in the ground from past recovery rates and methods. The goal is to preserve access to identified deposits while developing and testing technologies designed to overcome the specific problems that prevent increased oil recovery.

Major Form(s) of Energy/Fuel Cycle Stage(s) Affected

Crude oil production.

Impact

The impact of oil technology R&D is to boost domestic crude oil production from marginal wells.

18. Natural Gas Research and Development

Description

The Department of Energy's (DOE) research and development (R&D) spending focuses on enhanced natural gas production and high-efficiency, low-NO_x turbines. In order to increase domestic production, DOE has funded R&D spending directed at developing and testing new technologies such as hydraulic pulse and underbalanced drilling; improved techniques for imaging and predicting gas production in naturally fractured reservoirs; deep gas production; and revitalizing stripper wells. Secondly, DOE has also funded R&D directed at increasing gas storage capabilities. DOE is also currently funding an 8-year effort to produce working prototypes of a natural gas turbine for baseload generation that will be 10 percent more efficient and produce less than half the NO_x of current technology systems. Improved fuel cell technology has also been a focus of DOE R&D efforts.

Revenue Loss/Outlay

The 1998 gas R&D appropriation were \$103 million in fiscal year 1998. They are expected to be \$115 million in fiscal year 1999.

U.S. Department of Energy Natural Gas Research and Development Appropriation, 1995-2000 (Million Nominal Dollars)

Fiscal Year	Natural Gas Research	Fuel Cell Research	Total
1995	27	4	31
1996	59	4	62
1997	69	49	117
1998	63	39	103
1999	71	44	115
^a 2000	68	38	105

^aEstimate for Congressional request.

Sources: U.S. Department of Energy, *U.S. Department of Energy Fiscal Year 1999 Budget Request*, DOE/CR-0050 (Washington, DC, February 1998); and *U.S. Department of Energy Fiscal Year 2000 Budget Request*, DOE/CR-0059 (Washington, DC, May 21, 1999).

Rationale

Natural gas has become a more attractive fuel in light of the global warming controversy. Its combustion adds less CO₂ to the atmosphere than other fuels. Enhancing the technologically secure reserve of this fuel, while the industry is made more competitive through regulatory changes, can add large potential benefits to the U.S. economy and improve the potential for reducing greenhouse gases.

Major Form(s) of Energy/Fuel Cycle Stage(s) Affected

Natural gas exploration and production.

Impact

The goals of DOE's natural gas R&D are increased gas production, improved storage capabilities, and improved fuel cell and turbine technology.

19. Renewable Energy Technology Research and Development

Description

A mission of the Department of Energy (DOE) is to lead the national effort to support and develop clean, competitive, reliable power technologies for the 21st century. In the field of renewable energy technology, DOE's research and development (R&D) program includes the following activities:

- Encouraging electricity suppliers to choose and deploy renewable energy and energy efficiency technologies on an equitable basis with other supply technologies
- Addressing the technological and institutional constraints that impede the adoption of renewable energy and energy efficiency technologies worldwide
- Working with utility, industry, and other stakeholders to realize the full market potential for renewable energy and energy efficiency technologies, both in the United States and in other countries.

A key strategy in accomplishing the Department's mission is to establish and maintain a renewable energy technology base. The Department works with industry, State and local governments, universities, and the national laboratories to support R&D in photovoltaic, concentrating solar, wind, geothermal, hydropower, and biomass power and biofuels technologies and systems. Much of this research is cost-shared with industry, whose contribution is typically 30 to 50 percent of a total project budget, particularly for system hardware development and demonstration. Industry's willingness to share the cost of R&D indicates its belief in the market potential of these technologies and its commitment to commercialize them. In addition to R&D on renewable energy technologies, DOE supports research on electric technologies that complement and enhance the use of renewable energy. These include energy storage technologies, hydrogen, high-temperature superconductivity, and reliability in the transmission and distribution of electricity.

Revenue Loss/Outlay

The fiscal year 1999 budget for renewable energy technology R&D is approximately \$327.2 million, distributed as follows: wind, solar photovoltaic, concentrating solar power, and solar buildings, \$133.9 million; biomass and biofuels, \$95.5 million; electricity technologies, \$44.1 million; geothermal, \$28.5 million; hydroelectric, \$3.3 million; and unallocated, \$22.0 million. The fiscal year 1997 appropriation was \$269.6 million, and for fiscal year 1998 the appropriation was \$313.8 million (nominal dollars).

Rationale

Renewable energy systems are a domestic resource alternative that can help meet the Nation's increasing energy needs. Renewable energy resources (such as the sun, wind, biomass, geothermal energy, and falling water) have characteristics that make them attractive from a national policy perspective:

- Renewable resources are inexhaustible, which means that they represent a sustainable energy choice (using them today will not limit opportunities for future generations to use them).

- Renewable resources are wholly domestic, so they can be used without interference from, or manipulation by, foreign entities.
- As energy conversion systems for renewable resources can be designed and built domestically, they can create jobs and economic growth in the United States.
- Renewable energy systems create very little air pollution, so their use helps the United States meet national environmental and global climate change goals.

Major Form(s) of Energy/Fuel Cycle Stage(s) Affected

Electricity and renewable energy.

Impact

Renewable energy R&D has contributed to performance and cost improvements in several technologies over the past two decades. For example, the cost of electricity from wind energy today is about 4 to 5 cents per kilowatthour, depending on the quality of the wind resource. This is an eight- to ninefold reduction in costs from 1980 levels of 35 to 40 cents per kilowatthour. Similarly, the cost of electricity from photovoltaic systems has fallen from about \$1.00 per kilowatthour in 1980 to about 25 to 30 cents per kilowatthour today in regions with the best solar potential. DOE's goal is to reduce the costs of these technologies even further: to 2.5 to 3.5 cents per kilowatthour for electricity from wind, 12 to 20 cents per kilowatthour for electricity from photovoltaics, less than 8 cents per kilowatthour for electricity from concentrating solar power systems, 5 to 6 cents per kilowatthour for electricity from biomass, and 4.5 cents per kilowatthour for electricity from geothermal resources. Hydropower is already an abundant and relatively inexpensive source of electricity. The hydropower R&D focuses on making hydroelectric power plants more compatible with aquatic life and other uses that share water resources.

20. Advanced Turbine Systems

Description

There is a growing national need for increased electricity and reduced emissions from electric power generating plants. The objective of the Advanced Turbine Systems (ATS) program is to develop ultra-high-efficiency gas turbine systems for utilities, independent power producers, and industrial markets. The ATS program is striving for revolutionary, yet achievable advances that include: industrial turbine systems for distributed power generation that will show a 15-percent improvement over today's best gas turbine systems; and large central power plants for utility systems that will break the 60-percent barrier in net thermal efficiency.

Revenue Loss/Outlay

The fiscal year 1999 appropriation for ATS research and development is \$33 million. The appropriation was \$35 million for fiscal year 1998 and \$25 million for fiscal year 1997. (All figures are in nominal dollars.)

Rationale

There is a growing need for increased electricity and reduced emissions from electric power generating plants. The availability of affordable energy will be essential to the Nation's economic strength in the coming decades. To continue to enjoy the economic benefits of lower cost energy, ensure a reliable energy supply, and minimize the impact on the environment, advances in fossil fuel technology are needed. Although renewable energy technology is starting to penetrate the electricity generation market, fossil fuels will be the dominant energy source for the foreseeable future.

Major Form(s) of Energy/Fuel Cycle Stage(s) Affected

Natural gas combustion.¹⁰⁸

Impact

Advanced gas turbine systems have higher efficiencies and burn less fuel, resulting in lower operating costs and lower electricity prices as well as improved environmental performance. Because of their high efficiency, advanced turbine systems emit less carbon dioxide than other competing fossil-fueled technologies, thus providing an alternative for meeting future electrical demands while minimizing contributions to global warming.

¹⁰⁸Although the ATS program will demonstrate performance with natural gas fuel, advanced turbine design systems will make use of fuels other than natural gas, such as coal and renewable biomass.

21. Abandoned Mine Reclamation Fund

Description

This fund is designated for carrying out the provisions of Title IV of the Surface Mining Control and Reclamation Act (SMCRA) of 1977. The Office of Surface Mining in the Department of the Interior is responsible for carrying out the provisions of the Act. There are three major programs. The first program is for State reclamation grants. Each State and Indian Tribe with an approved reclamation program is entitled, subject to appropriation, to receive 50 percent of fund revenues derived from operating mines in that State or Tribal Land. With grants, States and Tribes assume primary responsibility for addressing problems such as subsidence, underground fires, open shafts, and acid drainage in accordance with SMCRA. States with approved reclamation plans are responsible for emergency reclamation. The second program covers Federal reclamation. This activity includes fee collection and assistance to States in developing reclamation programs, abandoned mine lands reclamation projects undertaken directly by the Office of Surface Mining Reclamation and Enforcement for States lacking approved reclamation plans, and the Rural Abandoned Mine Program administered by the Department of Agriculture's Soil Conservation Service. The third program is for small operator assistance payments. This activity provides for payments for authorized services to eligible coal mine operators in preparing applications for mining permits under a permanent State or Federal regulatory program. Services include determining the probable hydrologic consequences of the proposed mining operation and analysis of test borings and core samples. Fees of 35 cents per ton of surface coal, 15 cents per ton of coal mined underground, and 10 cents per ton of lignite are collected from mining operations. Fees are deposited in the Abandoned Mine Lands (AML) Reclamation Fund, which is used to pay the costs of abandoned mine reclamation projects. Since the inception of the fund through fiscal year 1998, Office of Surface Mining has collected \$5.1 billion.¹⁰⁹

Revenue Loss/Outlay

In fiscal year 1998, \$198 million was disbursed from the fund, including \$142.3 million for State reclamation grants. In addition, \$32.6 million was transferred to the United Mine Workers of America Combined Benefit Fund. Estimated Government receipts in fiscal year 1999 total \$305 million from reclamation fees. The estimated cash outlay during fiscal year 1999 is \$247 million. (All figures are in nominal dollars.)

Rationale

Coal mining has affected more than 1 million acres of land, resulting in health and safety problems. An adequate AML fund ensures that these problems will be abated by providing the financial resources for State, Tribal, and Federal reclamation efforts.

Major Form(s) of Energy/Fuel Cycle Stage(s) Affected

Coal mining.

¹⁰⁹U.S. Department of the Interior, Office of Surface Mining, *1998 Annual Report* (Washington, DC, 1999).

Impact

The fund is expected to have a positive balance of \$1,785 million at the end of fiscal year 1999, indicating that the industry has been paying fees in excess of claims on the fund. Because the costs of producing coal are increased by the fee, coal prices may be increased.

22. Black Lung Disability Fund

Description

The Black Lung Disability Trust Fund consists of all moneys collected from the coal mine industry under the provisions of the Black Lung Benefits Revenue Act of 1977 (P.L. 95-227), as amended, in the form of an excise tax on mined coal. In addition, the fund pays all administrative expenses incurred in the operation of Part C of the Black Lung program. The fund is administered jointly by the Secretaries of Labor, Treasury, and Health and Human Services. The Benefits Revenue Act provides for repayable advances to the fund in the event resources will not be adequate to meet program obligations.

The excise tax is \$1.10 per ton for coal from underground mines and 55 cents per ton for coal from surface mines (but no more than 4.4 percent of the coal's selling price). The tax does not apply to lignite and, pursuant to a 1998 U.S. District Court ruling, does not apply to coal sold for export.

Revenue Loss/Outlay

Tax revenues were \$636 million in fiscal year 1998 and are projected to be \$638 million in fiscal year 1999. Outlays (benefit payments) from the fund were \$452 million in fiscal year 1998 and are expected to be \$454 million in fiscal year 1999. The fund's balance was a negative \$5,837 million at the end of fiscal year 1998 and a negative \$6,218 million at the end of fiscal year 1999. The Black Lung Disability Trust Fund is in deficit because, in the past, benefit payments exceeded tax receipts credited to the fund. Under present law, the Trust Fund owes interest on past borrowing. Outlays are estimated to total \$1,021 million in fiscal year 1999, including benefit payments (\$454 million), other services (\$51 million), and interest on advances (\$516 million). (All figures are in nominal dollars.)

Rationale

These monies are expended to pay compensation and medical and survivor benefits to eligible miners and their survivors, where mine employment terminated prior to 1970 or where no mine operator can be assigned liability.

Major Form(s) of Energy/Fuel Cycle Stage(s) Affected

Coal mining.

Impact

The excise tax on coal is expected to put some upward pressure on the prices of mined coal. However, current coal prices are relatively low, and the small increase in the price does not affect demand significantly. Approximately 90 percent of domestic coal consumption in 1998 was for electricity generation.¹¹⁰

¹¹⁰Energy Information Administration, *Annual Energy Review 1998*, DOE/EIA-0384(98) (Washington, DC, August 1999).

23. Nuclear Waste Fund

Description

The Nuclear Waste Policy Act of 1982 established the Federal Government's responsibility and statutory framework to provide permanent disposal of commercially generated spent nuclear fuel and the high-level radioactive waste generated by the Nation's nuclear defense activities. The Department of Energy (DOE), as directed by the Act, initially undertook a national screening exercise to evaluate candidate repository sites. In 1986, at the conclusion of this scientific screening activity, DOE recommended three sites to the President for further study as potential repositories. Congress, however, in the Nuclear Waste Policy Amendments Act of 1987, directed DOE to investigate only one site—Yucca Mountain, Nevada—for possible development as a geologic repository.

The Conference Report to the fiscal year 1997 Energy and Water Appropriations Act directed DOE to complete a Viability Assessment for the Yucca Mountain site. This report was completed and sent to Congress in December 1998. The program continues to build on the momentum achieved over the past 4 years. DOE is planning to complete the Draft Environmental Impact Statement for Yucca Mountain in fiscal year 1999, and, in fiscal year 2000, issue the Final Environmental Impact Statement. The completion of these major program objectives will be followed by (1) a decision by the DOE Secretary whether to recommend the Yucca Mountain site to the President in 2001, if the site is found to be suitable; and (2) if recommended, submission of a license application for the construction of a repository to the Nuclear Regulatory Commission in 2002.

Revenue Loss/Outlay

The fund is paid for by the users of the disposal service. The funding for the program's activities are appropriations principally from two sources: the Nuclear Waste Disposal Appropriation and the Defense Nuclear Waste Disposal Appropriation. The budget requests a total of \$409 million in budgetary resources for the Civilian Radioactive Waste Management Program in fiscal year 2000. This sum includes a request for new budget authority totaling \$370 million, as well as a request that an additional \$39 million be provided from \$85 million in unobligated balances remaining in the 1996 Defense Nuclear Waste Disposal Appropriation (Public Law 104-46) and transferred to the Nuclear Waste Disposal account for fiscal year 2000. The fiscal year 1998 appropriation was \$346 million, and the fiscal year 1999 appropriation is \$358 million. (All figures are in nominal dollars.)

Cash outlays from the Nuclear Waste Fund total \$182 million in 1998, an estimated \$183 million in 1999, and an estimated \$256 million in 2000. Estimated receipts from electric utilities were \$600 million in fiscal year 1998 and \$642 million in fiscal year 1999. (All figures are in nominal dollars.)

Rationale

A permanent repository site will enable the Nation to continue to demonstrate leadership and advance nonproliferation goals by moving forward with its plans for the disposition of nuclear waste. The Federal Government can provide the leadership in developing and implementing strategies to accomplish this mission that assure public and worker health and safety, protect the environment, merit public confidence, and are economically viable.

Major Form(s) of Energy/Fuel Cycle Stage(s) Affected

Nuclear power waste storage.

Impact

The Nuclear Waste Policy Act of 1982 directed that activities associated with the management and disposal of civilian spent nuclear fuel conducted under the Act be funded through fees on the commercial generation of nuclear power. The fee was set initially at 1.0 mill per kilowatthour, to be deposited into the Nuclear Waste Fund. The Secretary of Energy is directed to review the fee amount annually to determine its adequacy to meet Federal Government costs of managing civilian spent nuclear fuel, and to propose adjustments as needed to ensure full cost recovery. Costs associated with the disposal of high-level radioactive waste from defense activities are to be paid by the Federal Government. As the costs of generation from nuclear power are increased by contributions to the fund, electricity prices may increase. The increase in the cost of generation spread over generation from all energy sources represents about 0.02 cents per kilowatthour.

24. Uranium Enrichment Decontamination and Decommissioning Fund

Description

The Uranium Enrichment Decontamination and Decommissioning Fund was established by the Energy Policy Act of 1992 (EPACT) to carry out environmental management responsibilities at the Nation's three gaseous diffusion plants, located in the East Tennessee Technology Park in Tennessee, at the Portsmouth site in Ohio, and at the Paducah site in Kentucky. EPACT also directs that this fund be used to reimburse licensees operating uranium or thorium processing sites for the costs of environmental cleanup at those sites, subject to a site-specific reimbursement limit.

The Uranium Enrichment Decontamination and Decommissioning Fund is an integral and necessary component of legislation to privatize uranium enrichment activities in the United States. The fund addresses the cleanup liabilities at the three gaseous diffusion plants that are attributable to past Department of Energy (DOE) operations for weapons and commercial fuel. The future operations of the enrichment facilities will be managed by the commercial United States Enrichment Corporation (USEC). Ultimate cleanup of the facilities that are leased from DOE by the USEC will commence when operations are completed and the leases are terminated. The Decontamination and Decommissioning Fund includes contributions from annual budget appropriations and contributions from commercial utilities based upon historical enrichment services, measured in "separative work units."

Revenue Loss/Outlay

Cash income during fiscal year 1999 is estimated at \$645 million (nominal dollars), with governmental receipts from assessments of \$171 million, earnings of investments at \$76 million, and transfers from the General Fund at \$398 million. Outlays are projected to be \$223 million.

Rationale

The goal of the Uranium Enrichment Decontamination and Decommissioning Fund is to clean up the surplus enrichment plants as soon as possible and reimburse licensees for their remediation activities at uranium and thorium sites. The enrichment plants include valuable facilities and equipment, and the cleanup costs will be offset to the extent that DOE is able to recover the value from these surplus assets. The Department plans to "re-industrialize" the surplus sites and infrastructure, which will reduce the Department's cleanup cost and will transfer the surplus Federal facilities to private-sector firms for productive re-use. In this way, the local socioeconomic impacts of shutting down these facilities will be offset by increased commercial job creation.

Major Form(s) of Energy/Fuel Cycle Stage(s) Affected

Nuclear power waste storage.

Impact

Licensees are subject to an annual assessment for 15 years based on their *pro rata* share of past enrichment services. The costs are recorded as a fuel cost and are recovered through electricity customer rates.

25. Leaking Underground Storage Tank Fund

Description

The Leaking Underground Storage Tank Fund, authorized by the Superfund Amendments and Reconciliation Act of 1990 and administered by the U.S. Environmental Protection Agency (EPA), provides funds for responding to releases from leaking underground petroleum tanks. It is financed by a tax of 0.1 cent per gallon on motor fuels, effective January 1, 1987.

Revenue Loss/Outlay

Outlays from this fund were \$62 million in fiscal year 1998 and are expected to be \$67 million in fiscal year 1999. The fund's balance was \$1,255 million at the end of fiscal year 1998 and is expected to be \$1,466 million at the end of fiscal year 1999. Government receipts from the excise tax are \$212 million in fiscal year 1999.

Estimated Outlay Equivalent and End-of-Year Balance, 1987-2000

(Million Nominal Dollars)

Year	Outlays	End-of-Year Balance
1987	NA	NA
1988	NA	NA
1989	NA	NA
1990	59	NA
1991	66	468
1992	87	578
1993	80	677
1994	70	799
1995	70	1,040
1996	46	1,057
1997	67	1,071
1998	62	1,255
1999	67	1,466
2000	69	1,655

NA = not available or not applicable.

Source: Office of Management and Budget, *Budget of the United States Government, Appendix 2000* (Washington, DC, 1999). Also earlier editions.

Rationale

The fund acts as insurance in the case of leakages from underground storage tanks.

Major Form(s) of Energy/Fuel Cycle Stage(s) Affected

Oil storage.

Impact

Consumers and producers of motor fuels are affected by the increased price implied by the tax.

26. Oil Spill Liability Fund

Description

Although the Oil Spill Liability Fund is administered by the Department of the Interior, monies in the fund are used to finance oil pollution prevention and cleanup responsibilities by various Federal Agencies. The Omnibus Budget Reconciliation Act of 1989 (Public Law 101-239) triggered the collection of a 5-cent tax on each barrel of oil produced domestically or imported, to be deposited in the fund. The authority to collect this tax expired on December 31, 1994.

Revenue Loss/Outlay

Outlays for this fund were \$48 million in fiscal year 1998 and are estimated to be \$52 million in fiscal year 1999. The fund's balance was \$1,076 million at the end of fiscal year 1998 and \$1,035 million at the end of fiscal year 1999.

Estimated Outlay Equivalent and End-of-Year Balance, 1987-2000

(Million Nominal Dollars)

Year	Outlays ^a	End-of-Year Balance
1990	42	366
1991	41	647
1992	66	894
1993	66	1,148
1994	49	1,074
1995	61	1,121
1996	61	1,119
1997	62	1,091
1998	48	1,076
1999	52	1,035
2000	48	1,303

^aTrust fund share of expenses.

Source: Office of Management and Budget, *Budget of the United States Government, Appendix 2000* (Washington, DC, 1999). Also earlier editions.

Rationale

The purpose of the Oil Spill Liability Fund is to aid in the prevention or remediation of potentially damaging oil spill events.

Major Form(s) of Energy/Fuel Cycle Stage(s) Affected

Oil transportation.

Impact

It is often the case that prevention is cheaper than remediation. To the extent that the fund wards off or minimizes oil-spill damages through its spending on prevention, the problem is solved in a less expensive manner. The tax tends to increase the prices of oil products and thereby reduce petroleum consumption.

27. Pipeline Safety Fund

Description

The Research and Special Programs Administration of the Department of Transportation is responsible for this fund. Monies in the fund are used to conduct the functions of the pipeline safety program and for grants-in-aid to carry out a pipeline safety program, as authorized by Section 5 of the Natural Gas Safety Act of 1968 and the Hazardous Liquid Pipeline Safety Act of 1979. Activities include enforcement programs, research and development, and grants for State pipeline safety programs.

Revenue Loss/Outlay

Outlays for this fund were \$34 million in fiscal year 1998 and are expected to be \$36 million in fiscal year 1999. The fund's balance was \$18 million at the end of fiscal year 1998 and is expected to be \$16 million at the end of fiscal year 1999. Estimated receipts from pipeline safety user fees are \$29 million.

Estimated Outlay Equivalent and End-of-Year Balance, 1987-2000

(Million Nominal Dollars)

Year	Outlays	End-of-Year Balance
1987	NA	17
1988	5	17
1989	10	18
1990	9	18
1991	12	17
1992	14	18
1993	14	17
1994	14	19
1995	22	19
1996	34	20
1997	34	20
1998	34	18
1999	36	16
2000	37	16

Source: Office of Management and Budget, *Budget of the United States Government, Appendix 2000* (Washington, DC, 1999). Also earlier editions.

Rationale

The public interest in pipeline safety calls for Government intervention.

Major Form(s) of Energy/Fuel Cycle Stage(s) Affected

Oil and natural gas transportation.

Impact

To the extent that collections do not cover all expenses, the fund underwrites pipeline safety.

28. Aquatic Resources Trust Fund

Description

This trust fund consists of two accounts: (1) the Sport Fish Restoration Account, which provides for the restoration and management of fish with material value in sport or recreation; and (2) the boating safety account, which provides for public access to marine sites, emergency search-and-rescue assistance, waterway markers, boating navigation, and boating education and law enforcement. The trust fund receives revenues from excise taxes imposed on sport fishing equipment, electric outboard motors, and sonar devices suitable for the location of fish. A 14 cent excise tax is levied on gasoline and special motor fuels used in motorboats and small engines.

Revenue Loss/Outlay

The motor boat fuel tax portion of the Aquatic Resources Trust Fund amounted to \$146 million in fiscal year 1998 and is expected to amount to \$205 million in fiscal year 1999. Receipts in fiscal year 2000 are expected to total \$172 million.

Estimated Outlay Equivalent, 1987-2000

(Million Nominal Dollars)

Year	Motor Boat Fuel Tax
1987	NA
1988	NA
1989	111
1990	112
1991	118
1992	192
1993	213
1994	238
1995	244
1996	250
1997	255
1998	146
1999	205
2000	172

NA = not available or not applicable.

Source: Office of Management and Budget, *Budget of the United States Government, Appendix 2000* (Washington, DC, 1999). Also earlier editions.

Rationale

According to the National Transportation Safety Board, "recreational boating accidents result in the highest number of transportation fatalities annually after highway accidents. Over 900 people are killed each year in boating accidents, and over 350,000 are injured, more than 40 percent of which require treatment beyond first aid. The

number of boats, especially high speed boats, is increasing each year.” This fund is used primarily to provide grants to States to help them enforce boating safety laws and expand boating education programs.

Major Form(s) of Energy/Fuel Cycle Stage(s) Affected

Motorboat gasoline consumption.

Impact

Consumers of motorboat gasoline and special motor fuels used in motorboats and small engines pay higher fuel prices that reflect the tax.

29. Price-Anderson Act

Description

The Price-Anderson Act, enacted as a section of the Atomic Energy Act of 1957, provides indemnification to U.S. Department of Energy (DOE) contractors who manage and conduct nuclear activities in the DOE complex. In addition, under the Nuclear Regulatory Commission domain, the Act limits the liability of nuclear plant operators in the event of accidents involving commercial nuclear power plants.

For commercial nuclear power plants, the Price-Anderson Act provides for a two-layer compensation system to pay public liability claims. The first layer consists of a set amount of insurance for each reactor site currently available from the private insurance market. The second is provided by funds made available through an assessment on each licensed reactor of a pro-rated share not to exceed a specified amount. In order to make a larger pool of money available to pay public liability claims, the 1988 amendments to the Act increased maximum secondary insurance assessments from the \$5 million (nominal dollars) established in 1975 to \$63 million per reactor per incident, to be adjusted for inflation at 5-year increments effective in August. The 1988 amendments also increased potential liability limits to \$7.34 billion (\$200 million primary insurance and \$7.14 billion secondary insurance coverage) per accident. The 1988 amendments extended the Price-Anderson Act for 15 years, to August 1, 2002. With the August 1998 inflation adjustment required by the Act, the maximum retrospective premium will be \$83.9 million per reactor per incident. As of September 1999, the nuclear power industry was expected to be insured per incident to a maximum of \$9.26 billion (i.e., 108 units holding an operating license for Price-Anderson purposes, multiplied by \$83.9 million plus \$200 million primary insurance).¹¹¹ The number of reactors participating in the Price-Anderson system is important, because most of the total financial coverage derives from the secondary insurance layer. The greater the number of reactors, the greater the coverage and the higher the liability limit. Thus, the Act effectively controls the individual liability and provides a form of subsidized insurance.

DOE is required by the Price-Anderson Amendments Act, a Federal law, to protect its contractors from legal claims that may arise as the result of a nuclear accident that occurs at a DOE facility. Price-Anderson also allows the DOE to establish nuclear safety rules that its contractors must follow, and gives the Department authority to fine contractors for violating those rules.

Revenue Loss/Outlay

There are no associated revenue losses or budgetary outlays at this time. However, Federal outlays could rise if the Federal Government is forced to clean up a nuclear incident in excess of individual liability limits. As the Act limits liability, it reduces the cost of insurance to the owners of nuclear power plants and nuclear activities at DOE sites and, hence, reduces the cost of nuclear power and other nuclear activities.

Rationale

The Price-Anderson Act was enacted into law on September 2, 1957, as Section 170 of the Atomic Energy Act, to meet two basic objectives: remove the deterrent to private-sector participation in atomic energy presented by the threat

¹¹¹U.S. Nuclear Regulatory Commission, *The Price-Anderson Act—Crossing the Bridge to the Next Century: A Report to Congress*, NUREG/CR-6617 (Washington, DC, August 1998).

of potentially enormous liability claims in the event of a catastrophic nuclear accident; and ensure that adequate funds are available to the public to satisfy liability claims if such an accident were to occur.

Major Form(s) of Energy/Fuel Cycle Stage(s) Affected

Nuclear power production and other nuclear activities.

Impact

There is an implied subsidy in the form of reduced insurance premiums per operating unit which reduces the operating costs of commercial nuclear power plants. The Government acts as an insurer for DOE contractors against any finding of liability arising from nuclear activities of the contractor within the scope of the contract. Price-Anderson coverage could become more critical with the significant increase in potential radioactive waste shipment numbers which can be anticipated in both the near and long term. An increase in shipments is likely to stem from a variety of sources, including the decommissioning and decontamination of nuclear reactors, DOE and Department of Defense environmental restoration activities, and shipments of spent nuclear fuel and high-level radioactive waste under the Nuclear Waste Disposal Act.

Appendix C

**Federal Energy Research
and Development
Appropriations**