DEPT. OF HEALTH AND HUMAN SERVICES: CENTERS FOR DISEASE CONTROL

CDC reduces the private share of energy-related externalities borne by the energy industry by researching diseases associated with energy production and consumption. *Quantitative estimates for this agency were not done.*

Chronic and Environmental Diseases. Heede allocated based on the energy fraction of GNP (Heede, 57).

Occupational Safety and Health. Allocated based on economic activity also. Actual figures should be lagged by 20-30 years, since current problems may have earlier roots.

Sources

Heede, Rick. Federal Energy Subsidies: Agency Obligations, Draft. Rocky Mountain Institute, 1986.

U.S. OMB, Budget of the United States Government, FY 1992, p. 4-639)

DEPT. OF HEALTH AND HUMAN SERVICES: NATIONAL INSTITUTES OF HEALTH

Quantitative estimates for this agency were not done.

National Cancer Institute. Heede allocated 1% based on linkages between ionizing radiation from the nuclear power cycle, and other occupational exposure to carcinogens (e.g., benzene in motor fuels, etc.) in the energy sector. This may be low since energy-related pollutants are so prevalent.

Chemical and Physical Carcinogenesis. Current efforts related to the energy sector include: studies to evaluate cancer risk due to radiation exposure, studies of electromagnetic radiation and childhood leukemia, and a long-term study of cancer deaths in the vicinity of nuclear facilities. This last effort is being undertaken since "a survey of cancer mortality around nuclear installations in the United Kingdom showed an excess of childhood leukemia." (NIH, vol. III, p. 94).

Epidemiology. Occupational studies in the detection of cancer risk, which focus on high-risk occupations. Current focus is on pesticide exposures. Also have done studies of mining, although the current efforts are in the iron ore mining area. Also studying the role of environmental exposures and cancer risk, primarily through air pollution. Current studies include exposure to emissions from coal-burning stoves. (NIH, vol. III, p. 101).

National Heart, Lung, and Blood Institute. Some benefits to the energy sector assuming that some portion of lung research is on black lung disease, or on lung conditions due to pollutants from fossil fuel combustion, such as ozone, SOx, NOx, etc.

Lung Programs Related to Energy. Program area: occupational and immunologic lung diseases. (NIH, vol. III, 223).

National Institute of Allergy and Infectious Diseases. Some portion of the spending on allergies may relate to multiple chemical sensitivities, a disorder which is related primarily to indoor air pollution which is often a byproduct of increased building energy efficiency.

Occupational Lung Disease. Occupational immunologic lung diseases include "the syndromes of allergic asthma and hypersensitivity pneumonitis or allergic pneumonia. The exact magnitude of these

problems is unknown, but as many as 15 percent of workers in some industries are affected." (NIH, vol. IV, 158). Focus is on mold exposures to hay. However, a significant portion of lung disorders also result from mining (such as black lung) and asthma from ground-level ozone and acidic aerosols, both of which are generated in large part through fossil fuel combustion.[51]

National Institute of Environmental Health Sciences. Provides support for biomedical research and research training related to environmental health hazards and toxicology research.

Biological Response to Environmental Agents. "NIEHS research has provided much of the information available today on air pollutants." NIEHS does research on synergistic reactions of multiple pollutants, and is paying increasing attention to issues such as stratospheric ozone depletion, lead and mercury, and biological markers of environmental degradation.

Applied Toxicological Research and Testing. Characterizes toxicity of chemical agents. Energy-related agents: ozone exposure.

Biometry and Risk Assessment. Includes planning and conducting basic and applied research in quantitative and biochemical risk assessment, statistics, biomathematics, epidemiology, molecular modeling, and evaluation of basic concepts in toxicology. Studies: 24 cities study of air pollutants. Now focusing on the effect of acid aerosols on school-age children. "Already, evidence is growing for a major role of acid aerosols, the mists and fogs made acidic by oxides of nitrogen and sulfur, in damaging normal lungs (bronchitis). In a separate study, investigators are looking at the link between levels of acid aerosols in ambient air and hospital admissions for respiratory problems." (NIH, v. 5, 136).

Sources

Heede, Rick. Federal Energy Subsidies: Agency Obligations, Draft Report. Rocky Mountain Institute, 1986.

U.S. OMB, Budget of the United States Government, FY 1992, p. 4-639)

National Institute of Health Justification of Appropriation Estimates for Committee on Appropriations, Fiscal Year 1991. Washington, DC: US GPO, Volumes III, IV, V and VI.

[51]One possible source of detailed information is Chan-Yeung M., Lam S. "Occupational Asthma," Am Rev. Respir. Dis., 1986, 133:686-703.

DEPT. OF HEALTH AND HUMAN SERVICES: SOCIAL SECURITY ADMINISTRATION

Special Benefits for Disabled Coal Miners. Responsibility for support for miners and their survivors afflicted by black lung (pneumoconiosis) is divided among a number of federal agencies. While the Department of Labor will eventually take over all black lung-related programs, SSA (under the Federal Mine Safety and Health Act) currently oversees what are referred to as "Black Lung Part B" cases. This includes all claims filed prior to July 1, 1973 as well as survivor claims filed between July and December 1973, or, if later, within 6 months of the miners death.

The SSA Black Lung program is funded on an annual basis by Congressional appropriation. It is not supported by the Black Lung Trust Fund. As of September 1989, the SSA program benefitted 229,508 miners, dependents, and survivors. This number is decreasing over time as beneficiaries die.

Black Lung Part B benefits were $892 million in FY 1989. The estimated present value of future benefits to be paid by taxpayers is $7.9 billion.

Source

U.S. Department of Health and Human Services, Social Security Administration. SSA 90: Annual Report to Congress, pp. 17, 54.

Social Security Administration
Black Lung Part B Benefits

Part 1: Estimate of Subsidy

Year	Benefits ($Mil.)
1988	915
1989	892
1990	871
1991	748
1992	672
1993	607
1994	550
Thereafter	7,948

Part 2: Allocation to Fuel Type

All expenditures benefit coal.

Sources and Notes:

(1) The 1990 figure represents actual expenditures and is from OMB's FY 1992 Budget, p. 4-98.

(2) All other data are from U.S. Dept. of Health and Human Services, Social Security, "SSA '90 Annual Report to Congress," p. 54.

(3) 1988-90 are actual figures. Data after 1990 are estimates, with the value after 1994 representing the present value of future estimates using assumptions by the SSA about benefit increases and discount rates.

DEPT. OF HEALTH AND HUMAN SERVICES: FAMILY SUPPORT ADMINISTRATION
LOW INCOME HOME ENERGY ASSISTANCE PROGRAM

The Low Income Home Energy Assistance Program (LIHEAP) provides grants to States and Indian tribes to aid low-income households with high energy costs through direct payments or payments to qualified contractors.

This money comes primarily from federal block grants, although some funds are also derived from legal suits regarding oil pricing irregularities (oil overcharge funds). Oil overcharge funds are not counted as a subsidy in this report and are excluded from the associated table (see Chapter B5 for an explanation of, and additional information on, overcharge funds). There are six major categories of spending under LIHEAP. Heating benefits support the purchase of energy for heating; cooling benefits do the same for cooling. Crisis benefits pay for energy in emergency situations where energy would not otherwise be available. Weatherization benefits, currently capped at 15 percent of LIHEAP spending, support infrastructure improvements in the homes of low income residents to reduce the need for future energy expenditures. Program administration funds government oversight and management of the program.

The final category of spending involves block grant transfers. A maximum of 10 percent of available LIHEAP funds may be transferred from fuel support into other social support services. Although these other programs may also transfer up to 5 percent of their spending into the LIHEAP program, none did so in 1989.

Spending is allocated to fuel types based on surveys of the fuels used by LIHEAP recipients. Spending on electricity is allocated to source fuels based on data gathered by the Energy Information Administration. The category of fuel use classified as "other" includes home coal and wood burning, as well as other minor sources. This category is arbitrarily split between coal and renewables.

Sources

U.S. Department of Energy, Energy Information Administration. Monthly Energy Review, February 1990, p. 29.

U.S. GAO. Low-Income Energy Assistance: A Program Overview, October 1990, GAO/HRD-91-1BR.

U.S. Department of Health and Human Services, Family Support Administration. Low Income Home Energy Assistance Program Report to Congress, FY 1989. October 20, 1990.

U.S. Department of Health and Human Services, Family Support Administration. "Summary Statistics on HHS Energy Assistance Programs, FY1981-1992," spreadsheet. January 23, 1992.

Low Income Home Energy Assistance Program (LIHEAP)

Part 1: Federal Program Support, Historical Data ($Millions)

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
LIHEAP Funds Used for Energy Support											
Heating benefits	1,470.0	1,120.0	1,340.0	1,370.0	1,470.0	1,350.0	1,280.0	1,150.0	1,020.0	1,030.0	1,140.0
Cooling benefits	48.0	51.0	33.0	32.0	29.0	36.0	30.0	21.0	12.0	25.0	27.0
Crisis benefits	46.0	139.0	192.0	226.0	191.0	199.0	198.0	190.0	187.0	189.0	219.0
Weatherization Benefits	NA	136.0	195.0	187.0	227.0	193.0	220.0	170.0	148.0	133.0	130.0
Program Admin.	119.0	NA	150.0	157.0	164.0	169.0	173.0	153.0	146.0	143.0	155.0
Total	1,683.0	1,446.0	1,910.0	1,972.0	2,081.0	1,947.0	1,901.0	1,684.0	1,513.0	1,520.0	1,671.0
LIHEAP Funds Not Used For Energy Purposes (not counted in totals)											
HHS Block Grant Transfers	NA	98.0	115.0	94.0	98.0	87.0	92.0	66.0	53.0	52.0	62.0

Notes:

(1) The LIHEAP Statutes authorizes grantees to transfer up to a total of 10 percent of the LIHEAP funds payable to them to one or more of five other HHS social and community service block grants.

(2) States are also allowed to transfer in a maximum of 5% of other HHS block grants into LIHEAP; none did so in FY89 ('89 Rept. to Congress, p. 8).

(3) Weatherization assistance is limited to a maximum of 15 percent of the LIHEAP funds available to a grantee.

Source: U.S. Department of Health and Human Services, Family Support Administration. "Summary Statistics on HHS Energy Assitance Programs, FY 1981-1992," January 23, 1992. Spreadsheet.

Part 2: Energy Mix of Particular Uses

	Shares	Heating Benefits	Cooling Benefits	Weather-ization
Natural Gas		56.28%		
Electricity		11.06%	100.00%	
Coal	55.82%	6.17%	55.82%	
Natural Gas	9.59%	1.06%	9.59%	
Petroleum	5.68%	0.63%	5.68%	
Hydroelectric	9.52%	1.05%	9.52%	
Fission	19.00%	2.10%	19.00%	
Renewables (See Note 5)				
Geothermal	0.34%	0.04%	0.34%	
Biomass	0.04%	0.00%	0.04%	
Waste-to-Energy	0.03%	0.00%	0.03%	
Solar	0.00%	0.00%	0.00%	
Oil		26.03%		
Fuel Oil		12.68%		
Kerosene		3.62%		
LPG		9.75%		
Efficiency				100.00%
Other (Note 3)		6.63%		
Total		100.0%	100.0%	100.0%

Notes:

(1) Energy mix data is based on LIHEAP recipient households only. Electricity is allocated to base fuels using the national electricity mix in 1989 (from ALLOCATION.WK1).

(2) Energy crisis intervention provides relief for household-level energy emergencies, and is allocated on the same basis as heating benefits.

(3) "Other" fuels refer to wood, coal, and other minor fuels. This category is arbitrarily split between coal and non-grid wood heat.

(4) Heating benefits include .05% rounding error allocated to constituent fuels in proportion to LIHEAP-supported consumption.

(5) Electricity from renewables in 1989 was 9.0% biomass, 8.4% waste-to-energy, 82.6% geothermal; and 0.02% solar. (EIA, Powerplant). Share of overall electric mix (shown above) is much smaller.

Sources:

U.S. Department of Health and Human Services, Family Support Administration. "Low Income Home Energy Assistance Program Report to Congress, FY 1989." Oct. 20, 1990, pp. 51,54.

U.S. Department of Health and Human Services, Family Support Administration. "Summary Statistics on HHS Energy Assistance Programs, FY 1981-1992," January 23, 1992. Spreadsheet.

U.S. Department of Energy, Energy Information Administration. "Annual Energy Review," February 1991, p. 211.

U.S. Department of Energy, Energy Information Administration. "Monthly Powerplant Report." Data provided by Melvin Johnson, EIA, 6/91.

Part 3: Allocation of Benefits to Fuel Types, FY 1989

		Heating Benefits	Cooling Benefits	Weather-ization	Crisis	Direct Total	Percent Share	Program Admin.	Net Total
Total Funding		1,020.0	12.0	148.0	187.0	1,367.0		146.0	1,513.0
Natural Gas		574.1	0.0	0.0	105.2	679.3	49.69%	72.6	751.9
Electricity									
Coal		62.9	6.7	0.0	11.5	81.2	5.94%	8.7	89.8
Natural Gas		10.8	1.2	0.0	2.0	13.9	1.02%	1.5	15.4
Petroleum		6.4	0.7	0.0	1.2	8.3	0.60%	0.9	9.1
Hydroelectric		10.7	1.1	0.0	2.0	13.8	1.01%	1.5	15.3
Fission		21.4	2.3	0.0	3.9	27.6	2.02%	3.0	30.6
Renewables									
Geothermal		0.4	0.0		0.1	0.5	0.04%	0.1	0.5
Biomass		0.04	0.00		0.01	0.05	0.004%	0.01	0.06
Waste-to-Energy		0.04	0.00		0.01	0.05	0.004%	0.01	0.05
Oil		265.5	0.0	0.0	48.7	314.2	22.98%	33.6	347.7
End-Use Efficiency		0.0	0.0	148.0	0.0	148.0	10.83%	15.8	163.8
Other									
Coal		33.8	0.0	0.0	6.2	40.0	2.93%	4.3	44.3
Renewables (Wood)		33.8	0.0	0.0	6.2	40.0	2.93%	4.3	44.3
	Total	1,020.0	12.0	148.0	187.0	1,367.0	100.00%	146.0	1,513.0

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Quantitative estimates for HUD are not included in this report. However, HUD housing efforts have retrofitted a great deal of public housing stock. While some portion of this spending is likely to be associated with improvements in energy efficiency, a primary focus on construction cost (as opposed to operating costs such as heating) in HUD programs suggests that the historic contribution of HUD retrofits to energy efficiency might not be as great as would be expected. Housing loans and loan guarantees through HUD may also be used to improve efficiency.

Assistance for Solar and Conservation Improvements. Subsidized loans and grants for the installation of energy conservation and solar energy improvements in single and multifamily residences, and agricultural and commercial buildings were authorized through the Energy Security Act of 1980 which created the Solar Energy and Energy Conservation Bank. The Solar Bank was eliminated March 15, 1988. (OMB '92, 4-712).

Source

U.S. Department of Housing and Urban Development, FY 1991 Budget Summary, January 29, 1990.

DEPARTMENT OF THE INTERIOR: BUREAU OF INDIAN AFFAIRS

Indian lands contain vast amounts of fuel minerals which are tribally-owned. A number of BIA activities are associated with managing and developing these resources, *although specific quantitative estimates are not included in this report.*

BIA "manages over 5.7m acres of commercial Indian timberland primarily located on 107 reservations. The sale of timber form these lands is a significant source of income to the tribes - averaging about $77.1 million annually for fiscal years 1988 and 1989." (GAO/RCED-91-53, 2).

Natural Resources Development

Natural Resources, General. Direction and support in the planning and management of the 53 million acres of Indian renewable natural resources under BIA.

Forestry. 1989 figures high due to fire suppression expenditures of about $58m. Forest-related spending includes forest development, product marketing assistance, forest planning and management, and fire suppression.

Minerals and Mining. Includes mineral assessments, and special mining-related projects.

Tribe/Agency Operations. Funds natural resource development at the tribal level.

Trust Responsibilities

Indian Rights Protection

Environmental Quality. Pays for environmental reviews and compliance with federal environmental laws for facilities under the jurisdiction of BIA. Includes assessments of four high risk sites: Masonite Mill Creek (Hoopa Valley Reservation, CA); Kenwood Dump (Cherokee Nation, OK); Tulalip Landfill (Tulalip Reservation, WA); Copper Bluff Mine (Hoopa Valley Reservation, CA). (BIA, 193). Requested increases are for study and mitigation of Midnite Mine (Dawn Mine) on the Spokane Indian Reservation in WA). Since cleanup involves the NRC, this appears to be a radioactive waste site. (BIA, 194).

"Exploitation of mineral wealth beneath the vast lands of the Navajo Nation, for example, has created environmental problems such as abandoned uranium mines and mine tailings and has contaminated ground and surface waters." (Breslin, 1920).

Indian Rights Protection. Legal support for Indian tribes to fight encroachments on claims and treaty agreements from government and commercial interests. Includes land allotments to Alaska natives.

Real Estate/Financial Trust Services. Manage and direct the implementation of the Trust, Economic Development, and Natural Resource programs. Includes lease compliance, records keeping, ownership resolution.

Tribe/Agency Operations. Funding on the tribal level for similar activities as those presented above.

General Administration. Includes management and administration, automated data processing, personnel compensation and training, and management at the program and tribal levels.

Construction

Buildings and Utilities. Portions of this funding are used to improve utility infrastructure, alleviate environmental deficiencies, and upgrade the energy efficiency of the buildings. Since the projects change every year, estimating proportions accruing to different energy sources is difficult. (BIA, 273-283).

Irrigation and Power Systems. Construction and monitoring of water systems used for irrigation and power generation.

Economic Development Programs.

Business Enterprise Development.

Credit and Financing. Assists qualified tribes to develop their economies through the use of their local resources by providing them with access to technical assistance, credit, and financing.

Indian Business Development Grant Program. Grants to tribes and individuals to start promising businesses.

Tribe/Agency Operations. Support for salaries, travel, and operational expenses for bureau employees who monitor and collect the loans made under the direct loan program and the guaranteed loan program and who administer the grant program.

Loan and Loan Guarantee Revolving Fund. This fund was created to encourage economic development among Indian populations though the use of subsidized direct loans and loan guarantees. Subsidy includes interest rate subsidies, default rates, and costs of administering the program.

Interest Rate Subsidies. Between 1976 and 1989, BIA estimates that they have paid $15.1 m in interest rate subsidies to support loans made during that period. (BIA, 321). The estimated subsidy in 1991 is $6.9m.

Losses on Defaulted Loans. Between 1975 and September 30, 1989, $37.0 million paid for loan defaults. (BIA, 321).

Sources

Breslin, Karen. "Addressing Environmental Problems on Indian Lands: Issues of Tribal Sovereignty versus State and EPA Regulatory Authority," Environment Reporter, 1/27/89, pp. 1920-1926.

United States Department of the Interior, Bureau of Indian Affairs. Budget Justifications, FY 1991: Bureau of Indian Affairs.

U.S. General Accounting Office. Indian Programs: Use of Forest Development Funds Should be Based on Current Priorities, March 1991, p. 2. GAO/RCED-91-53).

DEPARTMENT OF THE INTERIOR: BUREAU OF LAND MANAGEMENT

BLM manages large tracts of government land, including management of some fuel mineral extraction. Royalty collection from mineral sales falls under the auspices of the Minerals Management Service, not BLM. *A quantitative estimate for BLM was not done.*

Budget Receipts

Sales of Public Lands and Materials. Includes sales of timber from public lands and the sale of land and materials from selected BLM areas (BLM, 12).

Noncompetitive Filing Fees. Charges for noncompetitive filing fees charged on oil and gas leases per the Onshore Oil and Gas Leasing Reform Act of 1987. 1.5m in '91.

Registration and Filing Fees. Primarily collections for processing mining claims.

Mineral Leasing. Receipts in the form of bonuses, royalties, and rents from leasing oil, gas, coal, oil shale, geothermal, and other minerals on public lands. Most responsibility for this function was transferred to the Mineral Management Service in 1984. BLM continues to collect rental fees for oil and gas pipeline rights-of-ways associated with lands leased under the Minerals Leasing Act.

Timber Sales. Receipts on the sale of timber from Federal lands.

Energy and Minerals Management

Oil and Gas. Responsibilities include managing active and inactive leases, resource evaluation, post-lease supervision and inspection; enforcement; lease adjustments; drainage detection; diligent development reviews of Indian mineral leases; and environmental assessment of oil and gas activities. The separate tar sands program was ended in 1987 and oversight of existing tar sands leases is now part of the oil and gas program.

"At the end of 1989, there were about 80,000 leases in force on Federal lands covering about 70 million acres, of which about 19,000 leases are in producing status." BLM also oversaw 9,000 leases on Indian lands, of which 3,800 were producing. (BLM, 36).

Coal Management. Oversees the leasing and management of about 1/3 of all the coal resources in the United States. Responsibilities include lease supervision; lease adjustments; diligent development reviews; inspection and enforcement; and production verification (for royalty payments).

Mining Law Administration. Oversight of hardrock mining laws. A small portion of this item oversees uranium extraction.

Other Minerals Resources Management. Activities include the leasing and supervision of energy minerals such as uranium and oil shale, as well as geothermal resources.

- Geothermal: 60 percent of the known or prospective geothermal resource areas in the U.S. are located on Federal land. As of 1989 there were 691 geothermal leases in effect over about 1.1 million acres. The leases generated approximately $16 million in bonus, rental, and royalty payments.

- Uranium: Less than 31 uranium leases were in effect as of 9/30/89. Most uranium leasing operations managed by BLM are located on Indian lands in NM and WA. "BLM's emphasis in 1991 will focus on reclamation of abandoned and existing sites." (BLM, 58).

- No new oil shale leases were planned for 1991. "In 1974 four prototype oil shale leases, two in CO and two in UT were issued. The two leases in Utah were relinquished in 1986. The inactive mine, the remaining mine-related structures and the land surface within the Utah leases are now managed by the BLM. One of the leases in Colorado remains in suspension; the other has been reactivated and annual rental is required. These two Colorado leases are being monitored for the potential impact on the ground water in the area. Advance royalty payments are not required for either lease." (BLM, 61).

- Total outstanding leases: 679 geothermal; 1,000 gravel, etc.; 522 mineral leases (including uranium).

Lands and Realty Management

Lands, Realty and Right-of-Way Management. "The lands programs include processing of right-of-way applications for energy development (the costs of which are generally recovered), review of land withdrawals (in part to ensure that withdrawals do not impede minerals development), [and] the acquisition of easements." (Heede, 63).

Rights-of-ways are mostly paid for by levies and rental fees assessed on the parties. However, some applicants receive partial or full waivers. (p. 72). With the exception of water pipelines and roads, most rights-of-ways activities are energy-related.

Activities also include waterpower management to identify and evaluate all Federal lands with significant water and power potential. "This review will provide land managers with information to ensure that potential water and power site information is included in land use plans. " (BLM, 74).

Alaska Lands. Responsibilities in this area are primarily transferring Federal land to Alaskan natives under the Alaska Natives Claim Settlement Act and to Alaska under the Alaska Statehood Act, as well as activities such as wilderness reviews. While many of the claims processed by BLM have been requested by the State or the Native Corporations on the basis of energy minerals, this is not the primary purpose of the transfer of title.

"In proposed land exchanges between Interior and six groups of Alaska Native corporations, the Native groups would receive potentially lucrative oil an gas rights in the Arctic National Wildlife Refuge in exchange for lands they now own within the boundaries of other wildlife refuges in Alaska." However, the government is paying six times the appraised fair market value of the native lands. In addition, DOI did not create a bidding situation, despite its trading away oil and gas rights with no continuing royalty interests. (GAO/OCG-89-24TR, 14-16).

Renewables Resources Management

Forest Management. 6.7m in '89; 6.6m in '90. Management, development, and protection of "approximately 1.8 million acres of public domain commercial forest land outside of western Oregon and about 20.5 million acres of woodlands." (BLM, 18). Output objectives: 60 m board feet of timber, 42,000 minor forest product permits, and reforestation of 2,300 acres. 10,000 acres of reforestation backlog (down

from 20,700 in '85). (BLM, 90). At current work levels, this is a 4 year backlog. Part of the timber management expenditures accrues to fuelwood. For example,

> Typical woodland products such as fuelwood, Christmas trees, posts and poles are generally purchased by individuals for their own use. In some areas where demand for these products is high, they are occasionally sold to small businesses that resell to individuals. Free-use permits are available for nonprofit groups or organizations. The large quantity of permits to be issue in 1991 represents a considerable degree of public service in that many individuals are gaining a tangible benefit from the Government. Additionally, the selling of permits is also a form of unauthorized use abatement by making is as easy as possible for individuals to obtain forest products legally. (BLM, 91).

BLM reduced outlays (as required by Gramm-Rudman) by reducing the timber volume offered for sale by 3 million board feet, suggesting that they are selling the timber at a loss.

Soil, Water, and Air Management. "This program provides basic data and technical information for soil, water, and air resources. The program includes monitoring efforts to determine the effectiveness of BLM management programs on the Public Land watersheds, including riparian areas and airshed, and to determine if management actions and investments are achieving the intended objectives while meeting required water and air quality standards. Climate monitoring and data are coordinated to support various BLM programs." Monitoring of soil productivity and consumptive and instream flow water uses associated with activities are also undertaken. Energy-related activities include:

- $100,000 to support the operation of 15 acid rain monitoring stations in the Western United States (BLM, 109).
- Dam inspection.
- "Interpretation of climate and air data is used to support operational activities such as grazing, prescribed burning, smoke management, fire rehabilitation, wilderness baseline monitoring, and energy and minerals development." (BLM, 110).
- Global Climate Change Research: planned funding in 1991 of $300,000, with a requested increase of 2.1m (BLM, 111).

Heede allocated spending for soil, water, and air management expenses to energy in proportion to the overall energy fraction of BLM obligations. (Heede, 63).

Wildlife Habitat Management. 22.9m requested for 1990. Program goals include reclaiming of habitat; monitoring wildlife populations, especially those of endangered species; and taking steps to improve threatened populations and ecosystems. Habitat is threatened to some degree by natural disasters such as fire. However, much of the damage to ecosystems result from other BLM-sponsored activities such as mining, grazing, drilling, and road building.

- Allocating based on energy share of total other spending would probably be fairly accurate.

Resource Management Planning. BLM studies areas under their management and prepares resource management plans to balance competing uses; coordinate federal, state, and local roles; and to ensure compliance with the National Environmental Policy Act.

Information and Resource Data Management

Information Systems Operation and Management. BLM is automating its information systems and maps to improve its handling of resource leasing, collection of user fees, and coordination of competing uses for the land. Many of these information systems are energy-related (e.g., the Solid Leasable Minerals System, Lease Management System, Automated Inspection and Reporting System). They help to ensure that BLM properly manages the resources for which it is responsible, such as not issuing new mining leases to corporations that have outstanding violations for reclamation.

Resource Data Acquisition and Management. Goal is to automate repetitive functions, develop standards of data interchange, and utilize geographic information technology in support of BLM energy, minerals, lands, and renewables resource programs.

Automated Land and Mineral Records System Project. 22.9m requested in '91. Project automates BLM's paper land and mineral records holdings so they can be retained, used, and shared among current decision makers. Resulting system will help resolve land disputes and improve agency coordination. It does benefit energy producers by accelerating approval for exploration, and tracking ownership, leasing arrangements, easements, and mining claims -- though this is not the major driver of the initiative.

Support Services

Resource Protection and Law Enforcement. The only energy-related functions of this activity is BLM enforcement for solid and fluid mineral theft and fraud (primarily oil and gas theft) (102k in '89). (BLM, 189).

Engineering Services. Provide engineering expertise used for such things as survey and design for roads for timber access, rehabilitation of BLM areas, etc. 19.2m requested for 1991. (BLM, 195).

Emergency Operations. Includes funding to prevent pest outbreaks on public lands. Indirect subsidy to wood. (OMB '92, 4-725). Also funds facility reconstruction following a fire or natural disaster.

General Administration. 87.6m in '89; 88.7 approp. in '90.

Payments in Lieu of Taxes. These payments are made by federal agencies, including BLM, to state and local government entities as compensation for lost tax revenue due to federal, rather than private, ownership of land within their borders. (BLM, 323). "Since energy industries benefit from BLM ownership of the lands, and would have to pay property taxes on the land on which they operate mineral leases if these lands were privately owned, a commensurate fraction of PILT should be charged as a subsidy." (Heede, agencies, 63). 103.9m paid out in '89; 105m requested in '90.

Miscellaneous Permanent Appropriations. (Begins BLM, 529)

Payment of Royalties, Etc. to State and Local Governments. These payments reduce the offset provided by mineral revenues.

Payments to Alaska for the National Petroleum Reserve: 596k in '89; 600k est. in '90. Benefits to oil and gas. Reimbursement for State provision of essential public facilities.

Road Maintenance Deposits. User fees by timber companies to pay for BLM maintenance of timber roads. Appears to break even.

Emergency Operations

Firefighting. 158.3m in '89 (BLM, 257); 193.8m approp. in '90. Pre-suppression and post-fire activities. Benefits timber companies, although recreational use as well.

Sources

Heede, Rick. Federal Energy Subsidies: Agency Obligations, Draft Report. Rocky Mountain Institute, 1986.

United States Department of the Interior, Budget Justifications, F.Y., 1991: Bureau of Land Management, 1990.

U.S. General Accounting Office. Transition Series: Interior Issues, 11/88, pp. 14-16. GAO/OCG-89-24TR.

United States Office of Management and Budget. Budget of the United States Government, Fiscal Year 1992.

DEPARTMENT OF INTERIOR: BUREAU OF MINES

The Bureau of Mines was created in 1910 to ensure that the U.S. has an adequate and dependable supply of minerals to meet defense and economic needs "at acceptable environmental, energy, and economic costs." (BOM, 2). *A quantitative estimate for BOM was not done.*

Information and Analysis. Collects, interprets, and disseminates worldwide information relating to the production, consumption, and availability of minerals.

Energy-related initiatives include:

- Studies of domestic mining competitiveness, including coal; technology transfer of clean coal technologies; developing geographic information systems; and mapping of coal regions in KY, WV and VA (BOM, 42).
- Land assessments of mineral availability on BLM and Forest Service Lands, mining district studies in Alaska (BOM, 52-61). Also includes reviews of Environmental Impact Assessments.
- Data collection on mineral commodities, and provision of statistics.

Health, Safety, and Mining Technology Research. Program focused on long-term, high-risk research aimed at improving all aspects of mining, both from a safety and a competitive viewpoint. Heede attributed 90% of these costs to coal. (Heede, agencies, 75). This may be high. Feasible alternative allocation bases may be number of mines (especially of underground mines), or the number of miners (total, or underground).

Areas of study include:

Occupational health. Ways to reduce dangers of the mine environment by reducing exposures to airborne contaminants, diesel fumes, noise, radon, and other factors contributing to long-term illnesses and deafness.[52]

Ground Control. Study and prevention of groundfall hazards such as roof collapse. Benefits underground mines and surface mines with pitwalls.

Human Factors. Study of how people and technology interact and work together. Focus on safety training, skill retention, and incorporation of human behavior in the design of future automation systems. (BOM, 94).

Mine Safety Systems. Goal of this research is "to provide technological improvements that will enable the mining industry to reduce accidents and maintain safety in haulage, materials handling, equipment, and electrical areas of mining." (BOM-96). Primarily seems to benefit underground mines.

Mine Disaster Prevention. Study of causes of mine disasters to determine ways to prevent them in the future through training, monitoring, and provision of safety equipment and escape option. "Preventing one mine disaster every 4 years will save the industry an average of $25 million every year." (BOM, 100).

[52]As of 1985, 80% of miners over 50 years of age had developed moderate to severe loss of hearing. (Heede, agencies, 75).

Experimental Facilities. (BOM, 102). Covers the operation and maintenance of BOM's full-scale underground and surface mining test facilities (at Bruceton, PA and Fairchance, PA).

Advanced Mining Systems. (BOM, 104). Development of new mining technologies to improve the competitiveness of U.S. mines. Focus of their research is on strategic minerals which cannot currently be economically mined from U.S. sources (e.g., chromium , manganese, platinum-group metals, cobalt, and vanadium), as well as research on coal. Research focuses on robot-assisted mining, on-site leach mining, etc.

Minerals and Materials Science Research. Basic research on fundamental scientific and engineering principles of minerals processing. The goal is to increase the production of strategic, critical, and other essential minerals, (BOM, 9) to develop new uses for domestically-produced minerals, and to develop substitutes for strategic minerals which must be imported.

Minerals Research. Focuses on improved recovery from existing sources, recovery from mining scrap and wastes, and the development of advanced extraction technologies. May not be very applicable to energy minerals.

Materials Research. (BOM, 124). Reducing minerals consumption by improving the service life of materials. This activity benefits the energy sector by providing R&D into equipment improvements and corrosion and fracture resistance. May also benefit the utility industry (especially reactor technologies). Conducted studies on the corrosive effects of acidic deposition.

This function also conducts research into viable substitutes to strategic minerals. Does some joint research with DOE.

Environmental Technology. Research aimed at reducing the environmental impacts of mining and minerals processing. Focus is on acid mine drainage, subsidence, and neutralization of toxic waste materials.

Control of Mine Drainage and Liquid Wastes. Research aimed at studying the effects of acid mine drainage and determining ways to ameliorate such leaching, as well as the proliferation of cyanide liquid wastes from leach mining techniques. (BOM, 139).

Solid Waste Management and Subsidence. Managing the environmental hazards and aesthetic eyesores resulting from the 1-3 billion tons/year of mining wastes; and for researching ways to control subsidence resulting from underground mines. "More than 7 million acres of the Nation are underlain by abandoned coal mines; 2 million of these acres are estimated to be susceptible to subsidence. Some 500,000 acres are under urban areas." (BOM, 143). Primary problem is coal.

Abandoned Mined Land Reclamation Research. Researches ways to reclaim abandoned coal mined land.

National Mine Land Reclamation Center. To do research in reclamation of abandoned coal mine lands, and to provide support to federal and state reclamation efforts.

Mineral Institutes. Minerals research and engineering programs conducted at 32 colleges and universities nationwide. BOM supports research through allotment grants (for fellowships, professors, etc.) and

research grants (funding for specific projects). Allotment grants were discontinued in the 1991 budget year.

Research grants through 1989 were $15.9m in respirable dust and $29.6m in 5 other categories (mine systems design, communication, mineral industry waste treatment and recovery, pyrometallurgy, marine minerals technology). (BOM, 156).

General Administration and Facilities.

Sources

Heede, Rick. Federal Energy Subsidies: Agency Obligations, Draft Report. Rocky Mountain Institute, 1986.

United States Department of the Interior, Budget Justifications, FY 1991: Bureau of Mines, 1990.

U.S. OMB, Budget of the United States Government, FY 1991, pp. A-801 - A-802.

DEPARTMENT OF THE INTERIOR: BUREAU OF RECLAMATION

The Bureau of Reclamation assists government and private entities in "developing and conserving the Nation's water resources for municipal and industrial, agricultural, hydroelectric power, and recreational uses by means of environmentally and economically sound water projects..." (BuRec, 1). *A quantitative estimate of energy subsidies through the Bureau of Reclamation was not done.*

General Investigations. Investigations into water system optimization and dam modifications. While most of the current projects focus on water delivery for consumptive uses and on water quality, some of the investigations do focus on problems and planning associated with hydropower.

Some projects are allocated to fish and wildlife, and therefore not subject to repayment. However, the root cause of the problem is often flow modifications from hydroelectric power generation.

Construction. New construction and expansion of BuRec dam facilities. Costs are allocated to particular uses which must then repay that portion of the costs (unless the particular use is considered a non-reimbursable expense). Some fish and wildlife expenditures are considered non-reimbursable even though they were incurred due to power production or irrigation uses.

Operation and Maintenance. BuRec ensures the continued working condition of the multi-billion dollar investment in facilities to ensure "repayment of reimbursable project costs," (BuRec, 412) such as power and irrigation.

Source

U.S. Department of the Interior. Budget Justifications, FY 1991: Bureau of Reclamation.

DEPARTMENT OF THE INTERIOR: FISH AND WILDLIFE SERVICE

The Fish and Wildlife Service often comes into contact with energy development when endangered species are threatened or when energy interests wish to search for fuel minerals in F&WS-overseen land. *Quantitative estimates of energy subsidies through F&WS were not done.*

Resource Management

Fish and Wildlife Enhancement

Ecological Services

- Advanced Project Planning activities, in which the Fish and Wildlife Service provides expert consultation to other Federal agencies, States, industry, or other private interests with respect to research use. These activities include energy-related efforts such as resource development and leasing.

- Project Investigations include assessments of in-stream activities, such as maintenance dredging, on the fish and wildlife.

- Permits and Licenses. F&WS prepares recommendations for the Federal Energy Regulatory Commission with regard to hydropower licensing impacts on fish passage, instream flows, water quality and fluctuations, and other ecosystem changes that result from the dams. "In FY 1989, the Service's hydropower workload continued to increase in responses to increased relicensing activities." (F&WS, 72). Other energy-related licensing activities include review and comment on NRC permits for construction of nuclear facilities and licensing of such facilities, and BLM right-of-way permits allowing multiple uses of public lands (of which energy extraction is a major one).

- In 1989, the F&WS "provided detailed assistance to protect pelagic fisheries, migratory birds and endangered species to the Mineral Management Service on the proposed 5-year Outer Continental Shelf Oil and Gas Leasing Program for areas off the coasts of Alaska, Washington, Oregon, and California. (F&WS, 73).

- Staffing for Elkins, West Virginia Field Office. This office expends significant resources on FERC licensing/relicensing issues.

Environmental Contaminants. Initiation of a program to ensure underground storage tanks comply with EPA and State regulations (1m in '90).

- Staff review permit applications submitted under the Federal Power Act to review potential impact of these activities on wildlife. (F&WS, 83).

- Review of ocean disposal sites for dredge spoil (resulting from harbor and channel dredging) for impact on ecosystem. (F&WS, 83).

- Remove, replace, and clean up old underground storage tanks at all Service facilities and at: Aransas, Anahuac, Bosque de Apache, Hagerman, Salt Plains, Washita. (F&WS, 84).

- Other energy-related cleanups: Oil drums at Kenai and Nowitna, and removal of mining wastes at Yukon. (F&WS, 84).

- Oil spill response in which F&WS contaminants biologists "coordinated efforts to protect trust resources, rehabilitate injured wildlife, and assess the adverse impacts of the spill." (F&WS, 90).

National Wetlands Inventory. Although many activities threaten wetlands, according to the Fish and Wildlife Service, energy development is a major reason that the inventory must be developed now. For example, "In Alaska, the priority areas were defined as those being affected by oil and gas exploration and agricultural and population expansion." (F&WS, 102).

Refuges and Wildlife

Refuge Operations. Alaskan ecosystem studies to "provide data essential for making decisions related to potential oil and gas activities in the Arctic NWR [National Wildlife Refuge]." Increased by 250k in '90. (FY '91 F&WS, p. 17).

Fisheries

Fish and Wildlife Management Assistance. Energy-related activities include:

- "Ensuring effective and efficient implementation of measures required to mitigate impairment of interjurisdictional fishery resources affected by Federal water development projects." (F&WS, 203).

- Technical assistance for fishery management on national wildlife refuges. "Major projects addressing the management issues will be continued, including the Yukon River and oil and gas development projects on the Arctic National Wildlife Refuge." (F&WS, 208).

Research and Development

Contaminants Research

- Acid Rain Effects and Mitigation Studies. Cooperative studies investigating the acidification and neutralization of watershed and the effect of acidic environmental on the ability of organisms to survive. (F&WS, 19, 219).

- Impacts of energy development on ecosystems. Proposed study for FY '91 on the effects of oilfield brines and petroleum waste discharges into estuarine habitats. (F&WS, 220).

Wildlife Research

- Satellite tracking study of caribou to study impact of drilling in the Arctic National Wildlife Refuge and oil operations on population success. (F&WS, 231). Similar studies done on logging in the Northwest.

Fisheries Research. Determination of methodologies to determine the appropriate water regulation schedules in reservoirs and below dams. (F&WS, 20). Studies on habitat suitability potential for anadromous fish in the Middle Snake River above Brownlee Dam (discontinued in '91, F&WS, 20). Studies of salmon runs in the Yukon river; assessment of the effects of the Swan Falls Agreement on fish and wildlife.

Technical Development. 2.9m in '91 proposed for studying the impact of global climate change on fish and wildlife resources. (F&WS, 258).

General Administration. Allocated based on proportion of total funding for the Fish and Wildlife Enhancement function.

Construction and Rehabilitation

Dam Safety. Repair any of a range of dam safety problems.

Energy Conservation Improvements. As of 1991, "most of the energy conservation projects with the highest potential life cycle savings have already been implemented." Therefore, no funding was requested for '91. (F&WS, 306).

National Wildlife Refuge Fund. Allows revenue through the sale of products from Service lands, less expenses for producing that revenue to be allocated to the counties in which the reserves are located as payments in lieu of taxes. Shortfalls are made up through direct disbursements.

ANILCA Oil and Gas Permits. Money collected from oil and gas permittees is used only to meet F&WS expenditures incurred in administering the permit program and monitoring the impact of exploration for gas and oil in the Arctic National Wildlife Refuge and Non-North Slope Federal lands.

Sport Fish Restoration. (F&WS, 452). Flow modification for hydroelectric facilities may be a significant source of sport fish depletion (e.g., salmon).

Sources

DOI, Fish and Wildlife Service, Budget Justifications, FY 1991.

Heede, Rick. Federal Energy Subsidies: Agency Obligations, Draft Report. Rocky Mountain Institute, 1986.

DEPARTMENT OF INTERIOR: MINERALS MANAGEMENT SERVICE

The Minerals Management Service oversees exploration, development, and production of minerals development on the U.S. outer continental shelf. In addition, MMS collects rents and royalties from mineral production on federal[53] and Indian lands, and distributes them to states, Indian tribes, and the federal government. (OMB '91, A-786). Although DOI once proposed paying the costs of MMS management from leasing revenues (Heede, 65) current 1989 budget figures show no such payment. Of the bonuses, royalties, and rentals from minerals development, Alaska receives 90% and other states 50% of the funds collected within their respective states, with the remainder going to the U.S. Treasury. (OMB '91, A-787). Revenues from off-shore leases accrue entirely to the U.S. Treasury. (GAO/RCED-91-153, 2). Since 1981, revenues from mineral sales on Department of Defense-owned lands are distributed in the same manner; prior to that time revenues were wholly retained by the federal government. (GAO/RCED-90-7, 18). Main program areas are as follow:

OCS Lands. Performs environmental assessments of leasing options on the Outer Continental Shelf to ensure compliance with the National Environmental Policy Act, conducts lease offerings, evaluates competitive bids and awards tracts. In addition, MMS ensures that the federal government receives fair market value on the leases and regulates and monitors the process of mineral extraction. We were not able to assess whether there is a problem with below-market sales of leases.

Royalty Management. Accounting, auditing, and contract compliance regarding the collection of minerals revenues.

Royalties. Royalties returned to the Treasury, like income earned on petroleum sales from DOE's Naval Petroleum Reserves, are a return on the sale of government assets. Since these royalties are not above market rates, they do not constitute a tax. There may be some issue with whether the government realizes market royalties. Lease holders are allowed to deduct transportation and processing costs from minerals sale price to derive the "value of production" on which royalties are assessed. The regulations on how to calculate the payments were not standardized until March 1988. (GAO/RCED-91-153, 2). In addition, until April 1988, MMS did not have a strategy for auditing the royalty payments it collected. (GAO/RCED-89-167, 2). We assume that royalty payments are what are owed, and that initial bids are done competitively in our subsidy estimates.

Sources

Heede, Rick. Federal Energy Subsidies: Agency Obligations. Rocky Mountain Institute, 1989, pp. 65-66.

U.S. GAO. Mineral Revenues: Collection and Distribution of Revenues from Acquired Lands, August 1990. GAO/RCED-90-7.

U.S. GAO. Mineral Revenues: Interior Used Reasonable Approach to Assess Effect of 1988 Regulations, May 1991. GAO/RCED-91-153.

U.S. GAO. Mineral Revenues: Options to Accelerate Royalty Payments Audits Need Further Consideration, June 1989. GAO/RCED-89-167.

U.S. OMB. Budget of the United States Government, FY 1991, pp. A-786 - A-787.

[53]This includes lands managed by the Forest Service, the Bureau of Land Management, the Army Corps of Engineers, the Bureau of Reclamation, the Fish and Wildlife Service, the Department of Defense, and much smaller holdings by agencies such as NASA, GSA, the Veterans Administration, and the Departments of State, Commerce, Energy, Transportation, and Health and Human Services. (GAO/RCED-90-7).

DOI: Minerals Management Service

Part 1: Program Obligations, FY89 ($Millions)

	Amount	Energy Share	Of Which: Oil	Gas	Net Subsidy Oil	Gas	Allocation Basis	Spending Type	Carbon Increasing?
OCS Lands	90.7	98.65%	55.51%	44.49%	49.7	39.8	Part 2A	Ownership	Yes
Royalty Management	52.2	98.26%	55.51%	44.49%	28.5	22.8	Part 2B	Ownership	Yes
General Administration	27.3	98.51%	55.51%	44.49%	14.9	12.0	Oil & Gas Shares of above items	Ownership (only function is to support sales)	Yes
Total	170.2	167.7			93.1	74.6			

Source: U.S. OMB, "Budget of the United States Government, FY91," A-786 - A-787.

Part 2: Allocation of Subsidy to Fuels

A. OCS Program, 1988 Data

	Value of Bonuses	Percent Shares	
Oil and Gas Lease Sales	1,106.7	98.65%	
Other - sulpher and salt	15.1	1.35%	
Number of Wells in OCS Program, 1988	Oil	Gas	
Pacific Region	362.0	24.0	OCS, pp. 16, 17
Gulf of Mexico Region	3,579.0	3,135.0	OCS, pp. 16, 17
Atlantic Region	No Production in '88		OCS, pp. 16, 17
Alaska Region	No Production in '88		OCS, pp. 16, 17
Total	3,941.0	3,159.0	
Percent of Wells Managed by OCS	55.51%	44.49%	

Source: Minerals Management Service, "Oil & Gas Leasing/Production Program: Annual Report/FY 1988."

B. Shares of All MMS Royalties, 1987 data

Agency	Mineral Revenues	Percent Shares
Corps of Engineers	1.3	0.04%
Forest Service	37.7	1.28%
Bureau of Land Management	1.5	0.05%
Bureau of Reclamation	0.6	0.02%
Fish and Wildlife Service	2.1	0.07%
Department of Defense	0.5	0.02%
Other Agencies	7.8	0.26%
Outer Continental Shelf Program	2,900.0	98.26%
Total	2,951.5	

Net Share of Revenues from Oil & Gas: 98.26% Assumes none of the other agency sales were of oil or gas

Sources: U.S. GAO, "Mineral Revenues: Collection and Distribution of Revenues from Acquired Lands," August, 1990. GAO/RCED-90-7
U.S. Department of Commerce, "Statistical Abstract of the United States, 1990," Table 1223

DEPARTMENT OF INTERIOR:
OFFICE OF SURFACE MINING RECLAMATION AND ENFORCEMENT

OSMRE's mission is to ensure proper regulation of new coal mines and the reclamation of old mines. The Agency has two main functions: regulation and technology. In addition, OSMRE manages the Abandoned Mine Land (AML) Reclamation Fund, which finances federal and state grants to reclaim abandoned coal mine sites. The AML fund is financed via an excise tax on coal, although this funding is not sufficient to reclaim the abandoned sites.

State Regulatory Program Grants. Provides grants to the states to regulate coal mines. As of September 1989, 24 states had approved state enforcement programs and could therefore receive the grants.

Federal Regulatory Program Grants. Activities include oversight of state programs, provision of oversight in states without approved programs, and reclamation funding where performance bonds have been forfeited, and legal action and technical assistance related to the Surface Mining Control and Reclamation Act.

Abandoned Mine Reclamation Fund

The AML Reclamation Fund was authorized in title IV of the Surface Mining Control and Reclamation Act of 1977. This law created an excise tax of 35 cents/ton on surface mined coal and 15 cents per ton on underground coal, and 10 cents/ton of lignite to finance the cleanup of thousands of abandoned sites around the country. The charge was based on a congressional consensus

> that the industry which had inflicted the environmental damage should finance its repair. To achieve this, Congress included title IV (the Abandoned Mine Land Reclamation or AML program) in SMCRA. The purpose of this program is to impose a unit excise tax on coal production and use the proceeds to restore land and water resources adversely affected by past coal mining, beginning with high priority public hazard areas and eventually repairing less hazardous but environmentally damaged minesites. (Thompson, 1,2).

Collections were to be spent according to a general formula: 50% of collections from a state or tribal area must be spent in that same geographic area; 20% funds a DOI discretionary cleanup fund; up to 20% supports reclamation of rural abandoned mines, and 10% supports pre-mining planning for small mine operators. Recently, funds have also been authorized to reclaim non-coal mine sites. Such spending is allowed only if all coal sites within the state have been recovered or the non-coal site is deemed an imminent hazard by the state governor. Although funds are earmarked for mine cleanup, money from the fund may not be spent until appropriated by Congress. We treat funds collected from coal producers but used to reclaim non-coal sites as a tax on coal, and have credited them to the AML fund in our calculation of the net fund deficit.

Most federal funds are funneled through state reclamation programs which have been approved by OSMRE. Although the excise tax was originally slated to expire in 1992, it has been extended by Congress through 2004. In addition, since 1991, unused trust fund balances have earned interest. Since not paying interest on surplus balances in earlier years enabled Treasury to reduce federal borrowing, the imputed interest not paid counts as a tax on coal. We have compounded this interest and credited the Trust Fund for the entire amount.

The subsidies to coal provided via OSMRE include two major parts: the regulatory program and the AML fund. The general regulatory program of OSMRE is funded by Congressional appropriations and all benefits coal.

The AML fund is financed through excise taxes on coal production. We measure the subsidy by comparing the total funds collected from industry to the total funds needed to correct the problem for which the AML fund was created, and annualizing the shortfall over a 30 year cleanup period. Total funds collected are equal to historical plus projected excise tax receipts, plus imputed interest on positive trust fund balances which historically were not credited to the fund. We include in fund collections money from coal excise taxes that has been used to clean up non-coal mines, since these payments were from the coal industry and should reduce the coal industry's liability for cleaning up coal mines whether or not OSMRE and the states actually spent the funds in that manner.

The approximately $38 billion estimate for the total cost to reclaim all U.S. abandoned coal mine sites is based on Congressional testimony from a prior OSMRE acting director in 1985, scaled to 1989 dollars. (Thompson, 7). This estimate has been validated recently by OSMRE (McEntegart, 1/21/93) as representative of the cost to reclaim priority 1, 2, and 3 sites. Current collections are expected to be sufficient to cover the cost of priority 1 and 2 (health and safety) sites only; priority 3 sites, with environmental damage at abandoned coal mine sites, remain unfunded. According to McEntegart, the $38 billion figure originated from a comprehensive Bureau of Mines survey of abandoned mine lands in the late 1970s. We were unable to obtain a copy of this original study, however.

Sources

McEntegart, Steve. OSMRE, personal communication, 5/14/92; 1/21/93.

Thompson, Duane. The Abandoned Mine Land Reclamation Program: Too Little, Too Late, To Complete. Washington, DC: Congressional Research Service, March 5, 1986. 86-730 ENR.

United States Department of the Interior, Budget Justifications, FY 1991: Office of Surface Mining and Reclamation, 1990.

United States Department of the Interior, Office of Surface Mining. Annual Report, Fiscal Years 1988 and 1989, January 1990.

U.S. GAO. Abandoned Mine Reclamation: Interior May Have Approved Shifts to Noncoal Projects Prematurely, June 1991. GAO/RCED-91-162.

U.S. GAO. Surface Mining: Management of the Abandoned Mine Land Fund, July 1991. GAO/RCED-91-192.

DOI: Office of Surface Mining Reclamation and Enforcement

Part 1: Regulatory Activities: Historic Appropriations

Year	Appropriation ($Mil)
1978	30.9
1979	53.9
1980	64.7
1981	89.7
1982	58.5
1983	60.9
1984	70.7
1985	80.3
1986	80.8
1987	100
1988	102.1
1989	101.1
1990	102.1
1991	110.8
1992	114.0

Sources: OSMRE Annual Report, FY 1988 and 1989, p. 7; 1990-1992 data from OMB '92 Federal Budget, 4-736. 1991 and 1992 are estimates.

Part 2A: Abandoned Mineland Trust Fund, Fee Collections including Imputed Interest On Unused Balances

Year	Start of Year Balance (1)	Plus New Receipts (2)	Minus Approp. (3)	Plus Int. Not Credited (4)=(1+2-3)*(5)	Int. Rate (1-yr T-Bill) (5)	End of Year Balance (1+2-3+4)	Cum. Balance W/Out Imputed Interest*	Trends Data: Receipts in 1989$	Trends Data: Approp. in 1989$	Trends Data: Approp. as % of Receipts	Currency Conversion Data: GNP Implicit Price Deflator	Currency Conversion Data: Conversion Factor to 1989$
1978	0.0	105.4	36.6	5.7	8.34%	74.5	68.8	184.4	64.0	34.72%	72.2	1.75
1979	74.5	184.4	61.5	21.0	10.65%	218.5	191.7	296.3	98.8	33.35%	78.6	1.61
1980	218.5	199.0	94.8	38.7	12.00%	361.4	295.9	293.3	139.7	47.64%	85.7	1.47
1981	361.4	192.7	82.5	69.8	14.80%	541.4	406.1	258.9	110.8	42.81%	94	1.34
1982	541.4	222.6	115.3	79.6	12.27%	728.3	513.4	281.1	145.6	51.80%	100	1.26
1983	728.3	197.2	213.1	68.2	9.58%	780.6	497.5	239.7	259.0	108.06%	103.9	1.22
1984	780.6	216.6	271.2	79.2	10.91%	805.2	442.9	254.0	318.0	125.21%	107.7	1.17
1985	805.2	225.0	296.9	61.7	8.42%	795.1	371	256.2	338.1	131.96%	110.9	1.14
1986	795.1	219.2	197.3	52.7	6.45%	869.7	392.9	243.3	219.0	90.01%	113.8	1.11
1987	869.7	215.3	203.7	59.7	6.77%	940.9	404.5	231.6	219.1	94.61%	117.4	1.08
1988	940.9	228.3	199.4	74.2	7.65%	1,044.0	433.4	237.7	207.6	87.34%	121.3	1.04
1989	1,044.0	234.5	193.2	92.6	8.53%	1,177.9	474.7	234.5	193.2	82.39%	126.3	1.00
1990**	1,177.9	243.9	192.8	97.0	7.89%	1,320.1	525.8	234.3	185.2	79.05%	131.5	0.96
			Net fund increase in 1990		148.1							
			Increase in 1989$		142.2		Total	3,245.3	2,498.3			
							Average	249.6	192.2	77.61%		

*The cumulative fund balance without interest credited for 1990 is from OMB '92 Budget, p. 4-736. The similar OMB figure for 1989 is $3m higher than the figure given by OSMRE. The OSMRE information is shown here.

**Final fund balance in 1990 shown in 1989$.

Part 2B: Expected Growth In Future Fund Receipts

	1970	1988	Cumulative Average Growth Rate	Source
Coal Mining Production Index	88.7	137.9	2.35%	Statistical Abstract of the U.S., 1990, Table 1206.
	1980	1988		
Coal Production (Mil. sh. tons)	830	951	1.52%	Statistical Abstract of the U.S., 1991, Table 1216.
Actual Historic Fund Receipts	Fluctuated up and down over time.			
Maximum Plausible Real Growth Rate of Fund Receipts			2.35%	

Part 2C: Funds Not Used for Coal Mines, But Credited Here Against Coal Reclamation (Note 4)

Total funds spent, 1978-1990:	2,158.3	
Funds used for non-coal reclamation:	138.0	(GAO/RCED-91-192, 4)
Percent used for non-coal	6.39%	

Notes to Parts 2A, 2B, and 2C

(1) Our starting balance includes interest not credited in OSMRE accounts.

(2) The Abandoned Mine Reclamation Act of 1990 began to pay interest on the unappropriated balance of the AML fund, effective October 1, 1991. Prior to that time, no interest was paid. Current yields depend on the mix of Treasury securities purchased; the 1-year rate is an estimate.

(3) AML funds may be used for non-coal reclamation so long as the governor of a state certifies that all coal-related reclamation problems in the state have been addressed, or the non-coal mine represents a hazard to health and safety (GAO, p. 3). Although these funds were actually not spent on coal mines, we treat them as though they were in order to calculate the portion of coal reclamation costs not paid by the coal industry.

(4) Imputed interest column includes interest payments on uncredited interest from earlier years.

Sources:

U.S. DOI, "Budget Justifications for FY 1991: Office of Surface Mining and Reclamation," p. 105.

Steve McEntegart, Abandoned Mine Land Reclamation Division of OSMRE, personal communication, 5/13/92; 1/21/93.

U.S. GAO. "Surface Mining: Management of the Abandoned Mine Land Fund," July 1991. GAO/RCED-91-192.

Part 3: Estimated Fund Needs for Cleanup

Estimated need for total AML Cleanup	33,000	1985$; Thompson, p. 7. See Note 2.
Converted to 1989$	37,672	1989$
Less Funds Already Spent	2,498	Through 1990, in 1989$
Less Funds Collected But Not Yet Spent	1,320	Through 1990. Includes compounded interest not properly paid to the Trust Fund (Note 1).
Less Expected Future Collections	10,526	From Part 4. Assumes a 30-year period to collect funds and clean up the sites.
Tot. Industry-Supported Funding	14,345	
Projected Shortfall	23,327	Estimated need, less industry funding past and future.
Calculation of Annual Payment to Eliminate Shortfall		
Years to Clean up Sites	30	Estimated reasonable clean-up period
Real Interest Rate	0.00%	Funds will be used as collected in order to clean sites up in alloted time, and therefore will not be available to earn interest
Annual shortfall	777.6	

Notes to Part 3:

(1) Funds collected but not yet spent are based on the calculations shown in Part 2A. Since the imputed interest rate is a nominal one, which incorporates expected inflation rates, the GNP price deflator was used only to scale 1990 fund increases to 1989$.

(2) Estimate is from testimony from Jed Christensen, then acting director of OSMRE; cited in Duane Thompson, "The Abandoned Mine Land Reclamation Program: Too Little, Too Late, To Complete," (Congressional Research Service, March 5, 1986). The validity of this estimate was reaffirmed by Steve McEntegart, OSMRE AML Reclamation Division, Jan. 21, 1993. The original estimate is based on a comprehensive study conducted by the Bureau of Mines in 1979 that surveyed abandoned coal mine lands and estimated the cost to reclaim them at $31.7 billion. Simply scaling this figure to 1989$ yields an aggregate estimate of reclamation cost of almost $51 billion. We therefore view our $37 billion estimate as conservative.

Part 4: Expected Future Collections

Year	Start of Year Balance (1)	Plus New Receipts (2)	Amort. Of Begin. Surplus (3)	Interest on Unused Balances (4)=(1-3)*(5)	Interest Rate (5)	Annual Spending (2+3+4)	End of Year Balance (6)=(1-3)
1991	1,320.1	239.8	44.0	16.6	1.30%	300.4	1,276.1
1992	1,276.1	245.4	44.0	16.0	1.30%	305.4	1,232.1
1993	1,232.1	251.2	44.0	15.4	1.30%	310.6	1,188.1
1994	1,188.1	257.1	44.0	14.9	1.30%	315.9	1,144.1
1995	1,144.1	263.1	44.0	14.3	1.30%	321.4	1,100.1
1996	1,100.1	269.3	44.0	13.7	1.30%	327.0	1,056.1
1997	1,056.1	275.6	44.0	13.2	1.30%	332.8	1,012.1
1998	1,012.1	282.1	44.0	12.6	1.30%	338.7	968.1
1999	968.1	288.7	44.0	12.0	1.30%	344.7	924.1
2000	924.1	295.5	44.0	11.4	1.30%	350.9	880.1
2001	880.1	302.4	44.0	10.9	1.30%	357.3	836.1
2002	836.1	309.5	44.0	10.3	1.30%	363.8	792.1
2003	792.1	316.8	44.0	9.7	1.30%	370.5	748.1
2004	748.1	324.3	44.0	9.2	1.30%	377.4	704.1
2005	704.1	331.9	44.0	8.6	1.30%	384.5	660.1
2006	660.1	339.7	44.0	8.0	1.30%	391.7	616.1
2007	616.1	347.7	44.0	7.4	1.30%	399.1	572.0
2008	572.0	355.8	44.0	6.9	1.30%	406.7	528.0
2009	528.0	364.2	44.0	6.3	1.30%	414.5	484.0
2010	484.0	372.7	44.0	5.7	1.30%	422.5	440.0
2011	440.0	381.5	44.0	5.1	1.30%	430.7	396.0
2012	396.0	390.5	44.0	4.6	1.30%	439.1	352.0
2013	352.0	399.6	44.0	4.0	1.30%	447.7	308.0
2014	308.0	409.0	44.0	3.4	1.30%	456.5	264.0
2015	264.0	418.6	44.0	2.9	1.30%	465.5	220.0
2016	220.0	428.5	44.0	2.3	1.30%	474.8	176.0
2017	176.0	438.6	44.0	1.7	1.30%	484.3	132.0
2018	132.0	448.9	44.0	1.1	1.30%	494.0	88.0
2019	88.0	459.4	44.0	0.6	1.30%	504.0	44.0
2020	44.0	470.2	44.0	0.0	1.30%	514.2	0.0
Total		10,277.5	1,320.1	248.8			

Inputs		
Years to amortize surplus	30	Estimated reasonable clean-up period.
Real Interest Rate	0.013	See Part 4, note 5.

Total New Funds Collected and Used During 1991-2020

New Receipts Expected	10,277.5	See Notes 1 and 2.
Interest on Unused Balances	248.8	
Total New Funds	10,526.4	

Amortization of Surplus 1,320.1 This figure is already included in Part 3, and is therefore excluded from the total future collections.

Notes to Part 4:

(1) The starting balance in 1991 reflects the accumulated surplus from the earlier years of fund operation, shown in 1989$. New receipts for 1991 reflect escalated 1990 (in 1989$) receipts. The balance in later years declines because we assume that new appropriations, interest on the unused balance, and a portion of the unused principal is spent to clean up abandoned coal mine sites each year. This calculation is in line with the assumption made at the outset that all abandoned mine sites would be cleaned up in 30 years.

(2) New receipts increase at the maximum rate calculated in Part 2B. The rate of growth measures real changes in production, as a result the growth rate is the real rate needed to keep funds in 1989$. Growth projections assume that Congress reauthorizes the levy on coal that funds cleanup when the current authorization expires in 2004, and that coal use (or the levy per ton of coal mined) continue to grow in a manner consistent with increased collections despite impediments to increased coal use such as the Clean Air Act requirments and concerns over global climate change.

(3) Since current appropriation rates are insufficient to clean up environmentally-damaged coal mine sites, we assume that the current surplus must be used up in order to do so. Therefore, surplus funds are used evenly over the 30 year period of cleanup.

(4) This section computes imputed interest differently that section 2 because new receipts and prior interest are assumed spent in the year of receipt, whereas previously they were accrued. Beginning in Fiscal 1992, the AML Trust Fund is credited with interest on unused fund balances. However, the principal on which this interest is calculated does not include compounding of earlier interest not paid, as we do here. For the purposes of calculating the net fund shortfall, the portion of interest that will actually be recognized by Treasury, versus the entire interest amount that we credit to the fund is irrelevant. Therefore, we impute interest on the entire surplus balance, including compounded interest. Since real interest rates are used, interest payments are in 1989 dollars.

(5) The interest rate chosen reflects the average real yield on Treasury bills between 1966 and 1990. This time frame was used to approximate the cleanup period; real yields from 1926-1991 were much lower. Since the surplus funds are used by other parts of the federal government, government borrowing rates were used. Short-term rates were chosen to reflect the flexibility with which the magnitude of cleanup efforts can be changed, and to match the rates used in Part 2. Real interest rate figures are from Jeremy Siegel, "The Equity Premium: Stock and Bond Returns Since 1802," in Financial Analysts Journal, Jan./Feb. 1992; based on Ibbotson Associates, "Stocks, Bills, Bonds and Inflation," 1991 Yearbook.

(6) The decline in the end-of-year balance reflects the use of surplus funds, and the expenditure of current receipts and interest each year.

Part 5: Summary of OSMRE Expenditures in FY 1989 and Allocation to Fuel Types

Regulatory Program	101.1	
1989 Share of AML Fund Shortfall	777.6	Low estimate assumes no fund shortfall.
Total	878.7	

DEPARTMENT OF THE INTERIOR: U.S. GEOLOGICAL SURVEY

USGS surveys, investigates, and researches topography, geology, hydrology, and the mineral and water resources of the United States. *Quantitative estimates of USGS energy subsidies were not done.*

National Mapping, Geography, and Surveys. Produces and sells maps in printed and digital form.

National Map and Digital Data Production. To update and improve the mapping of the country. Energy would be allocated a portion of this equal to its portion of total USGS spending.

Information and Data Systems

National Data Base Management. Archive, manage, and make available cartographic, remotely sensed, and other earth science data in digital and graphic data bases that are readily available to all users. Includes the National Uranium Resource Evaluation, a national mapping of uranium deposits. (USGS, 43).

Information Dissemination Services. Collect, analyze, and disseminate information about domestic cartographic, geographic, and earth science related data and information.

Global Change Data Systems. Manage and facilitate access to global land data sets required to support global change investigations.

Research and Technology. Research into cartographic sciences, coordination and standardization of data protocols, and pilot projects demonstrating new capabilities. Efforts specifically related to energy include GIS mapping of complex geologic terrain in western Montana to assess its mineral land energy potential, and forest vegetation mapping for the Forest Service. (USGS, 57, 58).

Advanced Cartographic Systems. Development of state-of-the-art mapping systems, including automated data conversion from graphic to digital formats, remote sensing linkages to mapping, and conversion methods of digital data into finished products.

Geologic and Mineral Resource Surveys and Mapping. "The national program of onshore and offshore geologic research and investigations produces: (1) improved methods and instruments for mineral and energy assessments; (2) geologic, geophysical, and geochemical maps and analyses; (3) information on the chemistry and physics of the Earth, the climates, and the geologic processes by which it was formed and is being modified; (4) information on geologic hazards; and (5) information for use by other Federal and Stated agencies in the management of public lands and in national policy determination." (OMB '91, A-800).

Geologic Hazards Surveys

Earthquake Hazards Reduction. Heede allocated 15 percent to account for the safe construction and operation of energy facilities, nuclear reactors and hydropower dams in particular. (Heede, 72). For example, the Reclamation Safety of Dams Act of 1978 requires that USGS participate in exchange of science information with other agencies and use data from the hazards surveys in dam safety analyses. (USGS, 71).

Geologic Framework and Processes. Basic geologic research to investigate environmental and dynamic earth processes. Energy activities include understanding of natural and human-induced climate processes, support for nuclear reactor siting and monitoring and siting internationally through the State Department and the Agency for International Development. USGS also reviews environmental impact statements for nuclear power plant and other critical facilities sites. (USGS, 97,98).

National Geologic Mapping Program. Provides basic geologic data. Specialized applications are produced by combining the basic map with more specialized derivative maps that, among other things, locate energy resources, and are used for critical facilities siting. (USGS, 102). Heede allocated 50% of this to energy due to support of fission reactor siting and general research on oil and gas formation and entrapment, geologic and geophysical map production and distribution, and Federal and State cooperative research efforts. (Heede, 73).

Deep Continental Studies. Conducts fundamental research into the earth's core which sheds light onto the evolution of continents as well as the processes that produce mineral and energy resources. (USGS, 118).

Geomagnetism. USGS' detailed studies of the Earth's geomagnetic fields "provide the basis for interpretation of aeromagnetic anomaly maps used in exploration for fossil fuels, geothermal energy and mineral, and in studies of geologic structures associated with earthquake and volcano hazards." (USGS, 125).

Climate Change. In depth research on climate change forces and history. USGS global change efforts are an integral part of the U.S. Global Change Research Program.

Offshore Geologic Framework. "Regional investigations aimed at the systematic understanding and description of the geologic framework, energy and mineral resources, and geohazards of the offshore areas of the United States and other areas of interest to the Nation's needs for a continued supply of resources." (USGS, 143). Regional geologic framework investigations are precursors to investigations of energy and mineral resources. Formation of marine energy and mineral deposits studies seek to understand the formation of petroleum and metallic and non-metallic commodities.

Mineral Resource Surveys

National Mineral Resource Assessment Program. This is the USGS program most responsible for providing comprehensive assessments of the mineral resources of public and other lands in the U.S. and U.S.-affiliated insular areas.

Strategic and Critical Minerals. Focus on rare metals and minerals that are of strategic importance to the United States. Some of these minerals may be critical for fission power.

Devel. of Assessment Techniques. Improvement of resource location and evaluation techniques.

Energy Geologic Surveys

Evolution of Sedimentary Basins. Multidisciplinary study of entire sedimentary basins "to provide the integrated framework within which subsequent exploration for and evaluation of the Nation's mineral and energy resources can be more successfully completed." (USGS, 175). Studies benefit a variety of resources including coal, petroleum, oil shale, and uranium.

Fuel-Specific Investigations. USGS conducts geological, geophysical and geochemical investigations of deposits of coal, oil, gas, oil shale, uranium and radon, and geothermal resources of the United States.

World Energy Resource Assessment. Provision of geologic information and assessments of world energy resources, with a focus on oil and gas, to help with domestic policy formulation.

Water Resources Investigations

National Water Resources Research and Information System - Federal Program

Toxic Substances Hydrology. Energy-related work includes a long term study in Bemidji, MN of how crude oil and its derivatives are being transported through the subsurface (USGS, 239).

Nuclear Waste Hydrology. "The purpose of this activity is to select and characterize sites where high-level radioactive wastes can be effectively isolated in deep geologic environments, and to determine the hydrologic and geologic conditions important for the shallow burial and containment of low-level radioactive wastes." (USGS, 245).

Acid Rain. Measurement of quantity and dispersion of acidic deposition nationwide and to monitor water quality at susceptible lakes and streams. Work is being carried out as part of the National Acid Precipitation Assessment Program.

Global Change Hydrology. Understanding the role of water in large-scale environmental conditions, especially those associated with climate.

National Water Resources Research and Information System - Federal/State Cooperative Program. USGS cooperative hydrology studies support a variety of energy activities, including coal hydrology, hydrologic consequences of mining and reclamation operations, acid precipitation, and water flow studies used in hydropower planning. (USGS, 263-266).

Data Collection and Analysis, Areal Appraisals, and Special Studies. Tracks quantity and quality of the Nation's surface and ground water resources. Data is used in planning for hydroelectric power generation, waste disposal standards, coal mine permits and land reclamation. Includes research into hydrology and changing climate, and the hydrologic effects of fossil fuel and mineral extraction. (USGS, 265).

National Water Resources Research and Information Systems - State Research Institutes and Research Grants Program. Funding for research into water quality problems, some of which are energy-related.

Exploration of National Petroleum Reserve in Alaska. Initiated in 1974, and closed out in 1989. Some remaining activities in FY '90 and '91. Total expenditures through 1989: $914.5 million. (USGS, 316).

Sources

Heede, Rick. Federal Energy Subsidies: Agency Obligations, Draft Report. Rocky Mountain Institute, 1986.

United States Department of the Interior, Budget Justifications, F.Y. 1991: Geological Survey.

DEPARTMENT OF LABOR: BLACK LUNG PROGRAM

The Black Lung Trust Fund was established by the Black Lung Benefits Revenue Act (BLBRA) of 1977. The purpose of the fund was to shift the burden of financing black lung cases from the general tax payer to coal producers and coal insurers. Currently, black lung cases under Part B of the BLBRA continue to be paid out of general tax revenues and managed by the Social Security Administration (see the Social Security Administration section for more detail on SSA coverage). All other cases are managed by the Department of Labor, and subject to payment through the Trust Fund. If the Trust Fund has not generated enough revenue through its excise taxes to cover current payouts to victims in a given year, the short fall will be advanced, at interest, from the Treasury.

Source of Funds

The Trust Fund is financed primarily through an excise tax on newly mined coal. These taxes were originally set at $1.00/ton for underground coal and $0.50/ton for surface-mined coal (capped at 4% of sales price). The Consolidated Omnibus Budget Act (COBRA) of 1985 temporarily increased fees to $1.10/ton and $0.55/ton respectively, with a cap of 4.4% of sales. In 1987, this "temporary" increase was extended through the end of 2031.

Other sources of funds include recoveries from Responsible Mine Operators (i.e., mines directly responsible for specific black lung cases and still in operation), refunds for past overpayment, and advances from the U.S. Treasury.

Subsidies

In addition to increasing the excise tax on coal, COBRA set a five year moratorium on interest payments for Trust Fund advances from the U.S. Treasury. Since the Trust Fund had a cumulative debt of over $3 billion in 1989, the interest forgiveness creates a large subsidy to coal. Our estimates use the 1-year Treasury bill rate as a proxy for the government's cost of funds, reflecting the that fact that the government can set the interest rate to charge the fund at least on an annual basis. Had we used a longer-term bond rate, the overall subsidy level would have been higher.

For some years, including 1989, the actual interest payment forgiven is reported in the Black Lung Benefits Act Annual Report (see Calendar Year 1989 Report, p. 6, for 1989 interest forgiven). This payment is substantially higher than our estimate for the direct cost to the government of lending the Fund money, perhaps because the interest forgiven includes some premium for risk or management costs. We conservatively use our estimate of the direct cost to Treasury as our low estimate in 1989. Our high estimate compounds the unpaid interest over the years, so that interest is charged on unpaid interest from prior years.

Sources

U.S. Department of Labor, Employment Standards Administration. Benefits Act Annual Report on Administration of the Act During Calendar Year 1987, submitted to Congress 1989.

U.S. Department of Labor, Employment Standards Administration. Benefits Act Annual Report on Administration of the Act During Calendar Year 1989, submitted to Congress 1991.

DEPARTMENT OF LABOR: BLACK LUNG TRUST FUND

Part 1: Interest Rate Subsidies to the Black Lung Trust Fund (Dollars in Thousands)

	Subsidy Magnitude Without Compounded Interest							Actual Subsidy	Subsidy Magnitude Using Compounded Interest			
Year	Incremental Debt to Treas.	Cum. End-of-Year Debt to Treas.	Interest Charge	Effective Interest Rate	1-Yr. T-bond Rate	Est. Interest Subsidy	Subsidy With No Compounding	Recorded By DOL	Imputed Old Debt	New Debt	Actual Interest Cost to Gov't	End of Yr. Cum.
	(1)	(1a)	(2)	(3)=2/(1a-2)	(4)	(4a)=(4-3)	(5)=(4a*1a)	(6)	(7)	(8)=(1-2)	(9)=(4*(7+8))	(10)=(7+8+9)
1977	0	0	0	N/A					0	0	0	0
1978	18,925	18,925	0	0.00%	8.34%	8.34%	1,578		0	18,925	1,578	20,503
1979	400,809	419,734	7,740	1.88%	10.65%	8.77%	36,816		20,503	393,069	44,045	457,618
1980	535,837	955,571	52,497	5.81%	12.00%	6.19%	59,120		457,618	483,340	112,915	1,053,873
1981	554,865	1,510,436	109,488	7.82%	14.80%	6.98%	105,500		1,053,873	445,377	221,889	1,721,139
1982	283,002	1,793,438	160,597	9.84%	12.27%	2.43%	43,662		1,721,139	122,405	226,203	2,069,747
1983	357,773	2,151,211	193,273	9.87%	9.58%	-0.29%	(6,265)		2,069,747	164,500	214,041	2,448,287
1984	345,976	2,497,187	234,503	10.36%	10.91%	0.55%	13,636		2,448,287	111,473	279,270	2,839,030
1985	335,546	2,832,733	274,751	10.74%	8.42%	-2.32%	(65,746)		2,839,030	60,795	244,165	3,143,990
1986	51,271	2,884,004	0	0.00%	6.45%	6.45%	186,018		3,143,990	51,271	206,094	3,401,356
1987	67,776	2,951,780	0	0.00%	6.77%	6.77%	199,836	311,400	3,401,356	67,776	234,860	3,703,992
1988	41,274	2,993,054	0	0.00%	7.65%	7.65%	228,969		3,703,992	41,274	286,513	4,031,779
1989	55,852	3,048,906	0	0.00%	8.53%	8.53%	260,072	320,100	4,031,779	55,852	348,675	4,436,306

NOTES:

(1) Incremental debt to the Treasury includes new operational deficits plus interest charged on outstanding debt, and is net of all incremental Trust Fund receipts through coal excise taxes.

(2) The Consolidated Omnibus Budget Reconciliation Act (COBRA) of 1985 imposed a 5-year moratorium on the accrual of interest on all Black Lung Trust Fund repayable advances from October 1, 1985 through September 30, 1990.

(3) Interest rates were back calculated from data on cumulative debt and interest payments. Actual rates paid are determined by the Treasury Department based on the size and duration of the loan.

(4) The 1-year Treasury Bond Rate is used as a proxy for the cost of funds to the government, and reflects the frequency with which the government could decide what interest rate to charge the fund. Using a longer-term bond rate would have increased the calculated subsidy magnitude.

(5) The annual subsidy here represents the avoided interest payments through below-cost lending to the Trust Fund, assuming that unpaid interest is not compounded. We conservatively use this as our low estimate of the cost to the federal government of the interest holiday -- even though DOL recorded the foregone interest as that shown in column 6.

(6) Actual figures for interest accrued but not paid for 1987 (CY 1989 Annual Report, p. 5) and 1989 (CY89 Annual Report, p. 6). The difference between this figure and the prior column reflects either the interest rate premium (above borrowing cost) charged to the Trust Fund, or some compounding of interest owed.

(7) Includes imputed interest.

(8) New borrowing, excluding the interest actually charged to the Trust Fund. This base is a necessary input to calculated the principal on which interest should be levied (column 9).

(9) The interest charge is calculated by multiplying the government's cost of funds by the sum of the start-of-year deficit plus new borrowing.

(10) The cumulative end-of-year deficit is the sum of debt plus compounded interest. The inclusion of compounded interest is the reason that column 10 exceeds the end-of-year debt level shown in column 1a.

(11) Claims approved by the the Social Security Administration under Part B of the Black Lung Benefits Acts continue to be paid from general tax revenues.

SOURCES:

U.S. Department of Labor, Empolyment Standards Administration, Black Lung Benefits Act Annual Report on Administration of the Act During Calendar Year 1987, submitted to Congress, 1989, p. 25

U.S. Department of Labor, Empolyment Standards Administration, Black Lung Benefits Act Annual Report on Administration of the Act During Calendar Year 1989, submitted to Congress 1991, p. 24

Part 2: Allocation to Fuel Types ($Millions)

	Low Est.	High Est.
Total Interest Subsidies in FY1989	260.1	348.7
Percent Allocated to Coal	100.00%	100.00%
Net Subsidy to Coal	**260.1**	**348.7**

Doug Koplow - 29-Jan-93 - BLUNGDAT.WK1

DEPARTMENT OF LABOR: MINE SAFETY AND HEALTH ADMINISTRATION

The Mine Safety and Health Administration was created by the Federal Mine Safety and Health Act which stipulated that every underground mine be inspected four times per year; that every surface mine be inspected twice per year; and that all miners be trained. The Act also included stipulations aimed at protecting workers' health.

The Administration inspects the mines, investigates accidents, develops safety training programs with industry and labor, tests new mining equipment, develops mining standards, and analyzes data relating to its mission.

Enforcement

Tasks include mine inspections, development and promulgation of health and safety standards, assisting in mine emergencies, and efforts to reduce working hazards. Budget categories include coal mine enforcement; metal/non-metal mine enforcement; and standards development.

Assessments

Levying of civil monetary penalties for violations of health and safety standards. MSHA assessed 156,729 violations in 1989. (OMB '91, A-886).

Educational Policy and Development

Develops and conducts educational programs for MSHA personnel, other government personnel, and the mining industry.

Technical Support

MSHA provides technical services and advice to field managers, mine inspectors, State program employees, and industry management to assist enforcement or improve mining practices. It also collects and analyzes data relative to the cause, frequency, and circumstances of accidents. (OMB A-886).

Program Administration

Administers all functions presented above.

Allocation Information

MSHA deals with only two energy-related mines: coal and uranium. The uranium share of the total metal/non-metal enforcement budget was allocated in proportion to the number of uranium mines operating in 1989 to the total metal/non-metal mines in operation. Since over half of the metal/non-metal mines are sand and gravel,[54] this allocation mechanism probably understates the share of costs attributable to uranium.

All other activities are assumed to follow the same patterns as the enforcement budget and are allocated in proportion.

---

[54]For example, in FY88, 9,424 of 11,455 (82%) metal/non-metal operations were stone quarries and sand and gravel operations. (MSHA Annual Report, 100).

Sources

U.S. Department of Energy, Energy Information Administration. Domestic Uranium Mining and Milling Industry 1988, Viability Assessment, December 1989.

U.S. Department of Labor, Mine Safety and Health Administration. Annual Report of the Secretary of Labor Under the Federal Mines Safety and Health Act of 1977: Fiscal Year 1988.

U.S. Office of Management and Budget. Budget of the United States Government, FY91, pp. A-886 - A-887.

DOL: Mine Safety and Health Administration

Policy Area	Spending	Coal Share	Uranium Share	Allocation Method	Spending Type
Enforcement					
Coal Enforcement	82.8	82.80		All to coal	Admin./Reg
Metal/non-Metal Enforcement	32.5		0.09	Uranium fraction of total metal/non-metal mines	Admin./Reg
Standards Development	1.1	0.79	0.00	Shares of Enforcement Budget	Admin./Reg.
Assessments	2.2	1.58	0.00	Shares of Enforcement Budget	Admin./Reg
Educational Policy and Assessment	12	8.62	0.01	Shares of Enforcement Budget	Fed. Ownshp.
Technical Support	20.5	14.72	0.02	Shares of Enforcement Budget	Fed. Ownshp.
Program Administration	11.2	8.04	0.01	Shares of Enforcement Budget	Admin./Reg.
Total	162.3	116.6	0.1		

Mix of Mine and Mine Employment, 1989 Data

	Total Operating Mines
Coal	4,766
Total metal/non-metal mining	11,569
Uranium (FY88)	33.0
Uranium share of met./non-met.	0.29%

Notes and Sources:

(1) Data for number of operating mines other than uranium from OMB '91, p. A-886. Includes both surface and underground mines.

(2) Uranium data from DOE, Energy Information Administration, "Domestic Uranium Mining and Milling Industry 1988, Viability Assessment," December 1989 Number of establishments exclude by-product processing.

DEPARTMENT OF LABOR: OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

Energy subsidies through OSHA were not quantified.

Safety and Health Standards. Promulgation of new and revised worker health and safety standards.

Enforcement. Enforcement of regulations through physical inspection of facilities. "Programs are targeted to the investigation of claims of imminent danger and employee complaints, the investigation of fatal and catastrophic accidents, programmed inspection of firms with injury-illness rates that are above the national average, and special emphasis inspections for serious health and safety hazards. OSHA's enforcement strategy will include a selective targeting of inspection and related compliance activities to specific high hazard industries."

Technical Support. Analysis of the economic and environmental impacts of proposed standards. Provision of laboratory support to OSHA inspectors and expertise is provided to the regulated community.

Compliance Assistance. Reimburses states for providing free onsite consultations with the regulated community. Training of compliance personnel.

Safety and Health Statistics. Collection of occupational fatalities, injuries, and illnesses through grants to the States.

Executive Direction and Administration. Oversight and management of OSHA activities.

Source

U.S. Office of Management and Budget. Budget of the United States Government, Fiscal Year 1992.

DEPARTMENT OF LABOR: ADJUDICATION SERVICES

Conducts formal hearings and renders "timely decisions" on claims filed under the Benefits Reform Act of 1977, among others. Also adjudicates complaints regarding health and safety regulations. (OMB '92, 4-839). *Energy subsidies through this branch of DOL were not quantified.*

Source

U.S. Office of Management and Budget. Budget of the United States Government, Fiscal Year 1992.

DEPARTMENT OF TRANSPORTATION: U.S. COAST GUARD

The Coast Guard plays a strong supporting role in regulating coastal shipping in the United States. This includes patrolling the region, improving shipping lanes, and protecting the coastal resources from degradation. The Coast Guard also plays a large role in oil spill prevention and response, a role which increased significantly following the Exxon Valdez spill.[55] Since the Valdez spill and the passage of the Oil Pollution Act of 1990, the Coast Guard is responsible for examining and approving oil shippers oil spill prevention plans. Without Coast Guard approval of this plan, shippers can not operate in U.S. waters.[56]

In addition to regulating waterborne shipping, the Coast Guard is also responsible for inspecting waterfront facilities, including intrafacility pipelines such as those that transport oil between the docks and storage facilities further onshore. Inspections of waterfront facilities to ensure compliance with oil spill prevention guidelines used 3,350 staff days in 1990. (GAO/RCED-91-161, 2-3). Most oil spills at waterfront facilities occur during transfer operations.

Direct Program

Search and Rescue. The Coast Guard maintains "a comprehensive system of resources to save lives and prevent personal injury and property damage in the maritime regions of the United States SAR answered over 58,000 calls for help in 1987, saving over 6,800 lives and helping more than 135,600 persons in the process, while preventing over one billion dollars in property loss." (DOT '87 ann. rept., 14).

Aids to Navigation. Lighthouse automation and buoys to help ocean shipping.

Maritime Safety. Vessel inspections, review of plans and specifications for construction or alteration of merchant vessels, and standard and practice setting for merchant mariner licensing. Following the methodology in the Heede report, we exclude 40% of the allocation for the boating safety program, aimed at recreational boaters and funded through the Highway Trust Fund from taxes levied on boat fuel. (Heede, agencies, 96).

Although we allocate this item on the basis of share of waterborne commerce, this may be a conservative assumption. For example,

> Responding to and investigating reports of oil and other hazardous materials discharges resulted in a considerable expenditure of USCG resources in 1988. Many of these investigations resulted in civil penalty action for violations of the hazardous materials and/or pollution prevention regulations. In 1988, the USCG received 8,974 reports of discharges of oil and other hazardous materials. The USCG subsequently conducted 8,562 investigations. These investigations resulted in 2,898 reports of violations being initiated, and the expenditure of approximately 50 work years. (DOT, Research and Special Progrs. Admin., Ann. Rept. on Haz. Mat. Transport., Calendar Year 1988, p. A-6).

---

[55]More than 1/2 billion gallons of oil are transported in the U.S. daily. Each year since 1981 there have been an average of 9,000 spills. (GAO/RCED-91-212, 12).

[56]In response to this new law, industry formed a joint venture called the Marine Spill Response Corporation which will ensure that spill plans are met without duplication of cleanup equipment among the various firms. This corporation is spending $900 million over a three year period to purchase spill cleanup equipment, and expects that more will be needed later. (GAO/RCED-91-212, 7). This expenditure is one crude measure of the oil spill externality that existed at the time of the Valdez spill.

Marine Environmental Protection. The Coast Guard is charged with the prevention of marine environmental degradation, enhancing environmental quality, approving oil spill response plans, and responding to pollution incidents, including oil spills.

One aspect of this protection is the Coast Guard Strike Teams. Established in 1973, the teams provide rapid oil spill response on open waters through specialized equipment, expertise, guidance, communications support, monitoring, and documentation of clean up costs. (GAO/RCED-91-212, 21). The teams have a staff of 65, plus 48 local marine safety officers. Between 1988 and 1990, the strike teams responded to 106 spills and used equipment in 23 of incidents. In FY89, strike teams spent 17,800 work days, of which only 2,600 were responses to hazardous substance spills rather than oil. (GAO/RCED-91-212, 23).

Enforcement of Laws and Treaties. These are not energy-related.

Ice Operations. Ice clearing activities are primarily performed in the Arctic regions, where much of the shipping is oil-related. Better data on the shipping mix in the ice-affected corridors would improve this estimate.

Headquarters Administration. Allocated by the energy share of total spending.

Acquisition, Construction, and Improvements. Funds acquisition, construction, rebuilding, and improvement of aids to navigation, shore facilities, vessels, and aircraft. Sub-categories of spending are the same as above.

Environmental Compliance and Restoration Account. Funds environmental cleanup at Coast Guard sites.

Alteration of Bridges. Funds the government's share to remove bridges determined to be obstructions to navigation, generally due to insufficient vertical or horizontal clearances. This is a subsidy to waterborne navigation.

Research, Development, Test, and Evaluation. Technological development and testing to improve the Coast Guard's ability to carry out its mission, including the development of oil spill response technology. Subcategories of spending are the same as under the direct program.

Pollution Fund. Finances immediate cleanup of spills of oil or other hazardous substances. Outlays are later reimbursed by responsible parties. Fund was discontinued in 1990 and the unused balance was transferred to the Oil Spill Liability Trust Fund.

Offshore Oil Pollution Compensation Fund. The fund pays compensation for damages, including cleanup, resulting from oil spills associated with oil production on the Outer Continental Shelf. (OMB '91, A-945). Fund was discontinued in 1990 and the balance transferred to the Oil Spill Liability Trust Fund.

Deepwater Port Liability Fund. Funds cleanup costs and damages incurred as a result of discharges of oil into the marine environment from deepwater port activities. Originally funded through a 2 cents/barrel levy on all oil delivered to the facilities, the fee was suspended in 1984 due to a growing positive balance. (OMB '91, A-945). The fund was discontinued in 1990 and the unused balance was placed into the Oil Spill Liability Trust Fund.

Oil Spill Liability Trust Fund. The fund was created in the Omnibus Budget Reconciliation Act of 1986, although no money could be spent until Congress enacted comprehensive oil spill legislation. This condition was met by the passage of the Oil Pollution Act of 1990. Through March 1991, deposits into the fund totaled $526.6 million, and disbursements only $14.3 million. Although the fund may statutorily be used for spill cleanup, damage assessment studies, and third-party damage claims, the President has thus far authorized only payouts for spill cleanup. (GAO/RCED-91-204, 2). The Fund may also be used to reimburse other federal agencies for costs they incur in a cleanup, although the determination of eligible and ineligible costs remains to be worked out.

The Oil Spill Fund was capitalized by balances from the above three funds discontinued in 1990. It receives additional money through a 5 cent tax on oil produced in the U.S. (or imported oil refined in the U.S.), penalties levied by the Coast Guard for spill prevention regulation violations, cost recoveries following a spill, and interest earned on unspent balances. Collection of the tax ceases if the unobligated balance exceeds $1 billion. (GAO/RCED-91-204, 4).

Sources

Heede, Rick. Federal Energy Subsidies: Agency Obligations, Draft Report. Rocky Mountain Institute, 1986.

U.S. DOT. 1987 Annual Report.

U.S. DOT, Research and Special Programs Administration. Annual Report on Hazardous Material Transport, Calendar Year 1988.

U.S. GAO. Coast Guard: Coordination and Planning for National Oil Spill Response, Sept. 1991. GAO/RCED-91-212.

U.S. GAO. Coast Guard: Inspection Program Improvements are Under Way to Help Detect Unsafe Tankers, June 1991. GAO/RCED-91-161.

U.S. GAO. Coast Guard: Oil Spills Continue Despite Waterfront Facility Inspection Program, June 1991. GAO/RCED-91-161.

U.S. GAO. Coast Guard: Oil Spill Liability Trust Fund Not Being Used to Pay Allowable Costs, August 1991. GAO/RCED-91-204.

DOT: Coast Guard

Item	Total	Est. Merchant Marine Share	Energy Share of Merchant Shipping	Net Share to Energy	Subsidy to Energy	Oil Share	Coal Share	Notes and Spending Type
Direct Program	(a)	(1)	(2)	(3)=(1*2)	(a*3)			
Search and Rescue	405.3	40%	57%	23%	93.1	78.0	15.0	Grant
Aids to Navigation	392	60%	57%	34%	135.0	113.2	21.8	Grant
Marine Safety	113.3	60%	57%	34%	39.0	32.7	6.3	Grant
Marine Environmental Protection	127.3	80%	57%	46%	58.5	49.0	9.4	Grant
Enforcement of Laws and Treaties	625.3	NA	0%	NA	0.0	0.0	0.0	Planning
Ice Operations	73.7	80%	57%	46%	33.8	28.4	5.5	Grant
Headquarters Administration	127.4	NA	NA	15%	19.5	16.4	3.2	Fuel shares of total Coast Guard spending
								Admin./Regulatory
Acquisition, Construction and Improvements								
Search and Rescue	41.8	40%	57%	23%	9.6	8.0	1.6	Grant
Aids to Navigation	40.5	60%	57%	34%	13.9	11.7	2.3	Grant
Marine Safety	9	60%	57%	34%	3.1	2.6	0.5	Grant
Marine Environmental Protection	22.5	80%	57%	46%	10.3	8.7	1.7	Grant
Enforcement of Laws and Treaties	189	NA	57%	NA	0.0	0.0	0.0	Planning
Ice Operations	130.5	80%	57%	46%	59.9	50.2	9.7	Grant
Envir. Compliance and Restoration Acct		Begins 1991						
Alteration of Bridges	13.5	60%	57%	34%	4.6	3.9	0.8	Grant
Research, Development, Test, and Evaluation								
Search and Rescue	3.6	40%	57%	23%	0.8	0.7	0.1	R&D
Aids to Navigation	4.3	60%	57%	34%	1.5	1.2	0.2	R&D
Marine Safety	2.1	60%	57%	34%	0.7	0.6	0.1	R&D
Marine Environmental Protection	1.5	80%	57%	46%	0.7	0.6	0.1	R&D
Enforcement of Laws and Treaties	4.4	NA	57%	NA	0.0	0.0	0.0	R&D
Ice Operations	0.7	80%	57%	46%	0.3	0.3	0.1	R&D
Pollution Control Revolving Funds								
Pollution Fund	N/A	Assumed to be self-financing; positive balances receive interest through Treasury securities						
Offshore Oil Pollution Comp. Fund	N/A	Assumed to be self-financing; positive balances receive interest through Treasury securities						
Deepwater Port Liability Fund	N/A	Assumed to be self-financing; positive balances receive interest through Treasury securities						
Oil Spill Liability Trust Fund	N/A	Assumed to be self-financing; positive balances receive interest through Treasury securities						
Total, Partially Energy-Related	2,327.7		Total to Energy		484.5	406.2	78.3	
Total, All Coast Guard	3,037.3							

Notes:

(1) These fractions follow the methodology used by Rick Heede in his 1986 study. A better allocation would be based on the share of port calls by coastal ships. In 1989, approximately 18,700 port calls were made by U.S. and foreign oil tankers. Data on other ship traffic were not available in time for this study. (GAO/RCED-92-23, 22). Lower shares for search and rescue reflect the likelihood of larger merchant ships having better navigational equipment and more skilled captains. The higher share for marine environmental protection reflects the magnitude of oil spill problems. 20% is assumed to account for other hazardous substances. Similarly, a higher allocation for ice operations accounts for the heavy use of Arctic shipping lanes for oil movements.

(2) Reflects energy shares of energy shipments in waters overseen by the Coast Guard, including ocean shipping (imports plus exports) and coastwise shipping. Shipments by tonnage rather than value are used since value is not a strong indicator of the need for marine support services. See Part 2 for more detail.

Sources:

Heede, Rick. "Federal Energy Subsidies, Agency Obligations," 1986, pp. 96-99. Rocky Mountain Institute.

U.S. GAO. "Coast Guard: Inspection Improvements are Under Way to Help Detect Unsafe Tankers," October 1991. GAO/RCED-92-23.

U.S. OMB. "Budget of the U.S. Government, FY 1991," A-939 - A-947.

Part 2: Energy Shares of Coastal Shipping, 1989

Coast Guard programs benefit oceanborne and coastwise shipping only.

		Oceanborne	Coastwise	Total	Percent of Total	Percent Of Energy Shipments
Oil fuel related products		408.8	236.0	644.8	48.1%	83.8%
Coal fuel related products		111.4	12.9	124.3	9.3%	16.2%
	All Energy	520.2	248.9	769.1	57.4%	
All products		1,037.9	302.0	1,339.9		

Notes:

(1) Oceanborne commerce includes imports plus exports.

(2) Since the much of the voyage of oceanborne freight is out of the jurisdiction of the U.S. Coast Guard, total tons provides a better measure of benefits than would ton-miles

(3) Excludes oil- or coal-derived products such as asphalt which are not themselves used as fuels.

(4) More detail on energy shipments can be found in TRANSPORT.WK1

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

DEPARTMENT OF TRANSPORTATION: MARITIME ADMINISTRATION

The Maritime Administration is responsible for increasing the competitiveness and productivity of the U.S. Merchant Marine and for ensuring an adequate shipping fleet during war by subsidizing that fleet during peace time. Much of MARAD's efforts go towards maintaining domestic shipbuilding capability.

Ship Construction. Subsidizes certain construction cost differentials when U.S. construction costs exceed that of foreign vessels. No funding in 1989.

Operating Differential Subsidies. Pays operating subsidies to qualified operators of U.S.-flag vessels to promote a domestic fleet capable of providing essential ocean-shipping services. (Heede, 100). The provision provides a payment of "the differential between certain of [the U.S. operator's] operating costs and those of foreign competitors in order to permit operation on a comparable cost basis." (MARAD Budget Request, 5). Although the no new operating subsidy contracts have been signed (OMB '91, A-948) payments under old contracts remain high.

Ocean Freight Differential. Subsidizes transport of agricultural commodities; no energy component.

Research and Development Expenditures. Small funding for research into improving the maritime transport system. Allocated on the same basis as operating differentials.

Operations and Training. Administration of Maritime programs, training of personnel through the US Merchant Marine Academy and six State maritime academies, and national security capability support. With the exceptions of the sub-items listed below, this line item supports national security and is not included as an energy subsidy. (OMB '91, A-948).

Development of Waterborne Transportation Systems. Researches and fund programs to improve U.S. shipbuilding skills, develop more efficient ship designs, and facilitate raising ship construction capital.

Use of Waterborne Transportation Systems. Technical studies to improve the cost-position of domestic merchant shipping relative to foreign competition.

Both sub-items are allocated on the energy share of ocean shipping.

Federal Ship Financing Fund. Authorized under Title XI of the Merchant Marine Act of 1936 amended, the Fund provides loan and mortgage guarantees on U.S.-flag vessels built in the United States. The goal is to improve the merchant fleet and retain shipbuilding capabilities domestically. The fund receives income from insurance premiums on construction loans and mortgages, fees, and interest on mortgages held directly. Given available data, the fund appears to be self-financing in recent years. Historically, however, there have been large defaults.

- In 1987, the fund operated at a deficit of $233.5m. Borrowing from the U.S. Treasury was $420 million in '87 and $1.375 billion in '86. (DOT '87 ann. rept., 36).
- MARAD received a supplemental appropriation on 7/28/89 to cover defaults for FY '86 and '87.

War Risk Insurance Revolving Fund. MARAD provides insurance for "uninsurable" war risks to protect shipping in war torn regions of the world until commercial insurance becomes available. Crude oil is probably a main beneficiary of this program, although the program appears to be self-financing.

Vessels Operations Revolving Fund. The item finances MARAD reactivation, operation, deactivation, and charter of merchant vessels; or to finance vessels involved in mortgage foreclosures. Funded primarily from reimbursements from other federal agencies, and appears to be self-financing.

Capital Construction Fund. Established under the Merchant Marine Act of 1970. Allows operators to deposit money deferred from income taxes to build, buy, or reconstruct ships used in the U.S. foreign trade, Great Lakes, and trade between the West Coast and Hawaii. Since 1971, $5.1 billion has been deposited and $3.8b withdrawn (MARAD '89, 3), suggesting that the fund is essentially self-financing. Tax subsidies associated with this provision are incorporated in the Deferral of Tax on Shipping description in the Tax Expenditure chapter.

Emergency Operations. "Attacks on merchant shipping in the Persian Gulf continued to disturb the global shipping community in 1987. MARAD assisted the U.S. Navy by providing operating and communications instructions for U.S.-flag merchant vessels in this area of the world. Also, as a result of hostile acts by Iran,the agency briefed the masters of reflagged Kuwaiti tankers and naval escort liaison officers on operations in this area..." (DOT ann. rept. 1987, 35). We have no data on the magnitude of this support or its current form.

Required Shipping Provisions - Preference Cargo Provisions. A number of laws require that shippers use domestic vessels, or nothing at all.

Cargo Preference Act of 1904. All items procured for, or owned by, the military must be carried on U.S.-flag vessels. Since the Merchant Marine Act of 1970, at least 50 percent of this amount must be carried by privately owned U.S.-flag vessels. This includes oil destined for the Strategic Petroleum Reserve.

Public Resolution 17. Requires all Eximbank-financed cargoes be shipped on U.S.-flag vessels, or be granted a waiver.

Cargo Preference Act of 1954. Requires that half of all Government-generated cargo move on U.S.-flag commercial vessels. The Merchant Marine Act of 1986 increased the requirement of certain agricultural commodities from 50 to 75 percent. (MARAD '89, 27).

Sources

Heede, Rick. "Maritime Administration," Federal Energy Subsidies: Agency Obligations. Rocky Mountain Institute, 1986.

U.S. DOT, Maritime Administration. Budget Estimates Fiscal 1991: Maritime Administration.

U.S. DOT, Maritime Administration. MARAD '89, Annual Report of MARAD, FY89. Published April 1990.

U.S. DOT, Maritime Administration. Merchant Fleets of the World as of January 1, 1990, 1991.

U.S. Department of Transportation, Twenty-First Annual Report, Fiscal Year 1987.

DOT: Maritime Administration

Part 1: Subsidies to U.S. Operators of Vessels Engaged in Foreign Trade

A. Program Spending

	Total ($Mil)	Potential Energy Share		Spending Type
Operating Differential Expenditures	220.4	166.2	75.4%, based on fleet mix below	Grant
Construction Differential	0	0		Grant
Ocean Freight Differential	43.8	0	Funds agricultural commodities only	Grant
Research and Development	2.3	1.7		R&D
Development of Waterborne Transport	0.9	0.7		R&D
Use of Waterborne Transport	7.7	5.8		R&D
Total		174.4		

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

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

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

C. Oceanborne Shipping of Commodities, 1989

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

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

D. Allocation of Energy Share of Program Expense to Fuels

	Amount	
Operating Differential Expenditures		
Benefitting Fuel-Carrying Vessels	174.4	From sections A and B
Coal Share	32.9	From section C, scaled percentages
Oil Share	120.7	From section C, scaled percentages
Benefitting Other Commodities	20.8	

Part 2: MARAD Revolving Funds

A. Federal Ship Financing Fund

Federal Loan Guarantees Under Title XI of the Merchant Marine Act
(As of September 30, 1991)

Guarantees Outstanding	3,600
Of which:	
Drill Rigs and Supply Ships	221.8

The rest includes classes of vessels that could be fuel carriers

Borrowing Authority, MARAD	9,500

Financing through charges for MARAD guarantees and insurance, appears to be self-financing

B. War Risk Insurance Fund

Probably benefits oil transport. Seems to operate on breakeven basis.

C. Vessels Operations Revolving Fund - Primarily Military

Part 3: Value of Cargo Preference Provisions

Operating Differential Subsidy, FY89 ($Mil)	220.4	From Part 1A
Contracted Deadweight tons, FY 1989	17,720.0	From Part 1B
Est. subsidy/deadweight ton ($)	12,437.9	
Total Deadweight ton conversion:		
Deadweight ton = carrying capacity of vessel in long tons		
1 long ton = 2,240 pounds = 1.016 metric tons		
Est. subsidy/metric ton ($)	12,242.1	Contracted capacity/ton-year

Subsidy/Ton Cargo Carried		
Oceanborne tonnage carried by US Flag Vessels, 1988 (Mil)	30.8	
Operating Differential Subsidy, 1988 ($Mil)	221.2	MARAD '89, p. 15
Subsidy/Ton Carried ($)	7.2	
Subsidy/Metric ton ($)	7.1	

Government "Sponsored" Cargoes Related to Energy (FY88 Data)

	U.S. Flag Vessel Shipments, Metric tons	Estimated Extra Cost To Shippers ($Mil)	Fuel Affected
Bonneville Power Administration	240	0.0	?
Strategic Petroleum Reserve	1,331,244	9.4	Oil
Other DOE Agencies	873	0.0	?
Export-Import Bank	63,527	0.4	Probably fossil electric
Est. Energy Share	0.29	Energy share of loan Eximbank loan authorizations in FY88	

Some Department of Defense Cargoes May Also be Energy-Related

Source: MARAD 1989 Annual Report, pp. 14, 15, 31-33

Part 4: Summary of MARAD Subsidies to Energy

Item	Oil	Coal	Fossil Electric	Total
Program Areas	120.7	32.9		153.6
Extra Cost of Required Use of U.S. Vessels	(9.4)		(0.4)	(9.9)
Total	111.3	32.9	(0.4)	143.7

DEPARTMENT OF TRANSPORTATION: SAINT LAWRENCE SEAWAY DEVELOPMENT CORP.

The Corporation is responsible for the operation, maintenance, and development of the U.S. portion of the Seaway between Lake Erie and Montreal. It is funded through the Harbor Maintenance Trust Fund and, prior to 1986, by levies on the users of the Seaway as well. The Corporation is a wholly owned subsidiary of the Department of Transportation and was created by the Wiley-Dondero Act of 1954. Subsidies may come in through repayment of Federal capital, or interest rate subsidies on loans.

Tolls paid to the SLSDC now go to the U.S. Treasury Harbor Maintenance Trust Fund, and back to the shippers as a rebate. As a result, SLSDC must depend on Congressional appropriations to function. (DOT '87 ann. report, 37).

The total federal capital investment in SLSDC through 1988 was 140.8m ('88 ann. rept., 15). Unlike inland waterway shipping overall, energy shipments (shown below) through the St. Lawrence Seaway are fairly small. *Thus, although quantitative estimates of energy subsidies from SLSDC were not done for this report, they are not likely to be significant.*

Cargo	1987 Shipments (metric tons)	Percent of Total	1988 Shipments (metric tons)	Percent of Total
Coal	233	0.01	756	0.02
Coke	654	0.02	1,466	0.04
Gasoline	167	0.00	248	0.01
Fuel Oil	481	0.01	876	0.02
Petroleum Prod.	241	0.01	169	0.00
Total - All Cargo	39,962	N/A	40,523	N/A

Source: U.S. Department of Transportation, Saint Lawrence Seaway Development Corporation, 1988 Annual Report.

Source: U.S. Department of Transportation, Saint Lawrence Seaway Development Corporation, 1988 Annual Report.

DOT: OFFICE OF THE INSPECTOR GENERAL

Office audits and investigations relating to DOT program areas. *Not quantified.*

DOT: RESEARCH AND SPECIAL PROGRAMS ADMINISTRATION

Research, analytical, and technical development arm of DOT for multimodal research and development. Particular emphasis is given to transportation of hazardous cargo by all modes of transportation. *Program was not quantified in this report.*

Research and Special Programs. General research usually related to shipment of hazardous materials. In 1988, 55.7% of the total damages in transport of hazardous materials involved flammable liquids. Only 2.4% involved flammable compressed gas, and less than 0.1% from radioactive materials. (DOT, RSPA '88 Ann. rept., p. 12). Propane gas was responsible for the most deaths (8), with gasoline next (4). Fuel oil and crude petroleum accidents resulted in 1 death each. The only non-fossil fuel related death resulted from sulfur dioxide. The bulk of all accidents that year occurred on the highway (78.9%) and rail (16.7%). (DOT, RSPA '88 ann. rept., p. 14).

Pipeline Safety. Oversight of pipeline safety, grants to State pipeline safety programs, and enforcement of pipeline regulations.

Transportation Systems Center. Funds multidisciplinary research financed through agreements negotiated with the Secretary of Transportation. Heede allocated 20% to efficiency for presumed work on energy efficiency by the Transportation Systems Center in Cambridge, MA. (Heede, agencies, 93; OMB '91, A-955).

- 1987 Annual report provides more information on TSC's activities. Categories include safety, security, infrastructure, information systems, and policy development, with a heavy emphasis on air programs. (RSPA '87, pp. 41, 42).

Sources

Heede, Rick. Federal Energy Subsidies: Agency Obligations, Draft Report. Rocky Mountain Institute, 1986.

U.S. DOT, Research and Special Programs Administration. Annual Report, for 1987 and 1988.

DEPARTMENT OF TRANSPORTATION: ADMINISTRATIVE OFFICES

This item was not quantified.

Motor Carrier Safety. Aims to reduce the risk of accidents in truck and bus highway transportation through safety reviews and roadside examinations. Proposed legislation would finance this program through the Highway Trust Fund. (OMB '92, 4-863). Allocate based on vehicle miles, trucks vs. buses.

DEPARTMENT OF TRANSPORTATION: FEDERAL HIGHWAY ADMINISTRATION

To the extent that the full costs of highway construction, operation, and maintenance are not borne by truck freight companies in proportion to their share of use and damages, some subsidies will accrue to the energy sector (primarily refined petroleum fuels). *Subsidies to energy through FHA were not quantified.*

Motor Carrier Safety. Upgrade of highway safety through road improvements and truck and bus inspections.

Railroad-Highway Crossings Demonstration Projects. Capital upgrades in rail crossings of highways for projects not paid for out of the highway trust fund. (OMB '91, A-910).

Waste Isolation Pilot Project. Funds road improvements for the nuclear repository test site. Since only weapons-waste will be disposed here, we make no allocation to the commercial sector.

Highway Trust Fund. In surplus by 10.6 billion in '89. (OMB '91, p. A-913).

However, in 1989 "DOT reported that 40 percent (about 238,00) of the nation's approximately 578,000 bridges were structurally deficient or functionally obsolete and that over $50 billion wold be needed to bring them up to current standards." [57] Depending on the assumptions that one makes, the Trust Fund may either have a large surplus, or be unable to meet projected needs.

See Chapter B3 for additional discussion of the Highway Trust Fund.

Motor Carrier Safety Grants. Provide grants to States to enforce Federal and compatible State standards applicable to commercial motor vehicle safety. "The purpose of the grant program is to raise the level of enforcement, not to substitute Federal funds for State and local dollars." (OMB '91, A-918).

Miscellaneous Highway Trust Funds. A couple of special-use trust funds may generate additional subsidies to the energy sector. These include the intermodal urban demonstration project (which may be a subsidy to rail and truck shipping) and the nuclear waste transportation safety demonstration project (which probably benefits the defense as well as the commercial sector). (OMB '91, A-919).

Source: U.S. OMB. Budget of the United States Government, Fiscal Year 1991.

[57] US GAO, "Transportation Infrastructure: Federal Highway Administration FY 1992 Budget Request and Highway Program Reauthorization Proposal." Testimony of Kenneth Mead, Director of Transportation Issues, before the Committee on Environment and Public Works, US Senate, March 5, 1991, p. 11. GAO/T-RCED-91-12.

DEPT. OF TRANSPORTATION: NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

Energy subsidies through NHTSA were not quantified.

Rulemaking Programs. Rulemaking related to a variety of transport standards, including fuel efficiency standards. Heede allocated 20% to end-use efficiency. (Heede, agencies, 88).

Enforcement Programs. Enforcement of rules made, including fuel efficiency.

Highway Safety Programs.

Research and Analysis. Safety analyses for cars and trucks.

Office of the Administration and General Administration. Oversight and management of program areas.

DEPARTMENT OF TRANSPORTATION: FEDERAL RAILROAD ADMINISTRATION

Since coal and, to a lesser extent, oil, constitute such a large portion of total rail transport, federal support for freight rails subsidizes oil and coal.

Office of the Administrator.

Salaries and Expenses. Cost of administration.

Local Rail Service Assistance. Provides funds to states for rail planning, track rehabilitation, rail facility construction, and substitute service projects. (OMB '91, A-924).

Alaska Railroad Workers' Compensation. Reimburses Department of Labor for annual and lump-sum compensation payments to former Federal employees of the Alaska Railroad, which was purchased by the State of Alaska in 1985.

Railroad Safety. Includes enforcement of Federal rail regulations, track inspection, and program administration.

Railroad Research and Development. Railroad research on issues related to current infrastructure and advanced technology, such as track safety, and hazardous materials safety. Includes magnetic levitation and high speed rail research.

Regional Rail Reorganization Program. Covers default of promissory notes guaranteed by the Department of Transportation. Liquidation of $95m in principal and $9.6m in interest.

Subsidies for passenger transport are excluded from our estimates.

Sources for NHTSA and FRA

Heede, Rick. Federal Energy Subsidies: Agency Obligations, Draft Report. Rocky Mountain Institute, 1986.

U.S. OMB. Budget of the United States Government, Fiscal Year 1991.

DOT: Federal Railroad Administration

Part 1: Program Spending Related to Freight Rails

	Total Program	Energy Share Low Est.	High Est.	Comment	Spending Type
Office of the Administrator					
Salaries and Expenses	12.1	3.2	3.7		Admin/Reg
Local Rail Service Assistance	3.0	0.8	0.9		Grant
Alaska RR Workers Comp. Pymts.				Begins in '91	
Railroad Safety					
Federal Enforcement	21.1	5.6	6.5		Admin./Reg.
Automated Track Inspection Program	1.4	0.4	0.4		Admin/Reg.
Safety Regulation and Prog. Admin	5.5	1.5	1.7		Admin/Reg.
Railroad R&D					
Equipment, operations, and haz. materials	2.7	0.7	0.8		R&D
Track safety	5.1	1.3	1.6		R&D
Magnetic levitation high speed rail	6.2	0.0	1.9	Primarily benefits human	R&D
Regional Rail Reorganization Program	0.0	0.0	0.0	95m in FY 1990	
Total		13.5	17.6		

Part 2: Allocation to Fuel Types

Energy Commodity Share of Total Rail Shipments, 1989

Energy Type	Shares Low Est. (% Value)	Shares High Est. (% Volume)	Scaled Energy Low (% Value)	Share of Transport High (% Volume)	Subsidy Shares by Fuel Low Est.	Subsidy Shares by Fuel High Est.
Coal	24.65%	26.15%	93.27%	91.40%	12.5	16.1
Oil	1.65%	2.55%	6.24%	8.28%	0.8	1.5
Natural Gas	0.06%	0.06%	0.23%	0.19%	0.0	0.0
Electricity - General	0.07%	0.04%	0.26%	0.13%	0.0	0.0
Total Energy	26.43%	30.80%	100.00%	100.00%	13.5	17.6

See TRANSPORT.WK1 for more detail on derivation of rail shares

Notes.

(1) The Federal Railroad Administration benefits the main users of rail services in the same way that the Coast Guard helps merchant shipping.

(2) Scaled shares simply adjust energy shares of overall rail freight to relative shares of energy carried via rail.

ENVIRONMENTAL PROTECTION AGENCY

Many environmental problems are the direct result of energy extraction, transportation, storage, or use. *Energy subsidies through EPA are not quantified, though they could be large.*

Air. Standards development for hazardous and mobile source pollutants. Research also in the areas of indoor air, global changes, and stratospheric ozone depletion.

Research and Development

Scientific Assessment. Scientific study of movement and health effects of particular air pollutants or activities generating air pollutants.

1989 activities: Work on Air Quality Criteria Documents for CO and NOx; prepared issue paper on the health effects of acid aerosols; work on ground level ozone and other photochemical oxidants; assessments on hazardous air pollutants (ammonia, hydrogen fluoride, inorganic phosphorous, hospital waste incineration, mercuric chloride; development of data bases on hazardous air pollutants and indoor air pollution research. (EPA Budg. Just., 2-17).

Monitoring Systems and Quality Assurance. Data gathering to support air-efforts; and quality assurance associated with data gathering already in place.

1989 activities: workshop on characterization of acid aerosols; evaluation of methods to measure ambient levels of PM10 (particulate matter); report characterizing populations exposures to mobile source pollutants. (EPA Budg. Just., 2-20).

Health Effects. Study and evaluation of health effects associated with air pollutants.

1989 activities: areas of research and support included ground level ozone, mobile source emissions, indoor air pollutants, and an assessment of the comparative mutagenicity and carcinogenic of combustion source emissions. (EPA Budg. Just., 2-22).

Environmental Engineering and Technology. Applied research into problem evaluation and control technologies.

1989 activities: indoor air pollutant measurement; SO2 and NOx control technologies; control of acid gases from combustion; performance standards for controls in key air toxics sources.

Environmental Processes and Effects. Modeling of pollution dispersion and environmental impact of air pollutants. Study is centered on the impact of ozone on forest species.

Characterization, Transport, and Fate. Detailed work on airshed modelling for use in support of EPA regulatory activities.

1989 Activities: Study of regional VOC and NOx control strategies and their impact on ozone air quality; role of biogenic sources of ozone in air quality problems; emissions characterization of gasoline and gasoline/methanol blends; diesel emissions control technology; modelling of dispersion in complex terrain; and hazardous air pollutants resulting from reactions of innocuous emissions in the atmosphere. (EPA Budg. Just., 2-28).

Stratospheric Modification. Study of stratospheric ozone depletion and global warming.

1989 Activities: Participated in conference of global climate change and rice; participated in a number of activities associated with the impacts of increased UV-B radiation (from depleted ozone); conducted review of alternative refrigerants; conducted research on the sensitivity of ecosystems to climate change; extensive support for the Report to Congress on global climate change.

Abatement and Control. Development and implementation of standards and programs to reduce and eliminate air pollutants.

Air Quality and Stationary Source Planning and Standards

Emission Standards and Technology Assessment

1989 Activities: Promulgated 3 new source performance standards; proposed rules from chromium (comfort cooling towers); proposed response to benzene litigation, along with some benzene emission standards. (EPA Budg. Just., 2-36).

National Pollutant Policies, Strategies and Rules

1989 Activities: Activities in four main areas: acid rain, support for DOE's clean coal technology, CFCs and halons, and indoor air. Indoor air work centered on mitigation of environmental tobacco smoke, and on prevention of building-related problems ("sick building syndrome"). (EPA Budg. Just., 2-39).

State Program Guidelines and Air Standards Development. Air quality standards review lead, ozone, SO2, fine particles, and acid aerosols. Other work on CO and NO2, and visibility impairments.

Mobile Source Air Pollution Control and Fuel Economy

Emission Standards, Technical Assessment and Characterization

1989 Activities: Implementation assistance and review of State Implementation Plans, particularly vehicle inspection and maintenance programs. Additional work on control of formaldehyde (alcohol fuels) and particulate matter (diesel), as well as other alternative fuels; promulgation of rule on methanol-fuel vehicles; research on alternatives to lead as octane enhancers; review of heavy duty vehicle standards for hydrocarbons, CO, and particulate matter. (EPA Budg. Just., 2-45).

Testing, Technical and Administrative Support

1989 Activities: Technical oversight for emissions compliance and fuel switching prevention; field studies of new emission control technologies. (EPA Budg. Just., 2-47).

Emission and Fuel Economy Compliance

1989 Activities: Issuance of certificates of compliance to vehicle and engine manufacturers with respect to emissions and fuel economy. (EPA Budg. Just., 2-48).

State Program Resource Assistance

Control Agency Resource Supplementation

1989 Activities: Most of the work centered on ozone/CO standards; support for VOC source inspection, particulate matter evaluations, SO2 monitoring networks, and large stationary sources. States also received support for enforcement of asbestos regulations, and air quality monitoring. Four special projects were undertaken involving automobile emissions, ozone nonattainment, and two airshed studies, one focused on ozone/CO and PM-10. (EPA Budg. Just., 2-54).

Air Quality Management Implementation

1989 Activities: Ozone and CO problems; evaluation of state air quality implementation plans on PM-10 and SO2. Considerable effort expended on court-mandated Federal Implementation Plans in IL and Utah for ozone and CO. (EPA Budg. Just., 2-59).

Trends Monitoring and Progress Assessment

Ambient Air Quality Monitoring

1989 Activities: Work centered on ozone, CO and PM-10; additional efforts on emission inventories. (EPA Budg. Just., 2-63).

Air Quality and Emission Data Management and Analysis

1989 Activities: Support for emissions modelling and tracking software; analysis of emission test methods; pollutant work on ozone, CO and PM-10.

Enforcement

Stationary Source Enforcement

1989 Activities: Program evaluation and guidance documents to improve compliance efforts; asbestos; technical projects on VOCs.

Mobile Source Enforcement

1989 Activities: Issued recalls for failure of emissions; inspection of points in the petroleum distribution chain for fuel tampering and compliance with volatility regulations. (EPA Budg. Just., 2-73).

WATER QUALITY

Research and Development

Environmental Processes and Effects. 1991 budget request contained data development to support oil spill programs.

Great Lakes Program. 1991 budget request includes data development to support oil spill programs. (EPA Budg. Just., 3-20).

Oil Spills. Research into oil spill cleanup technologies, such as bioremediation. 1989 funds do not include $1.6m provided by Exxon for efforts on the Exxon Valdez spill.

Abatement and Control

Water Quality and Grants Program Management. Benefits energy to the extent that energy-related emissions are a major source of water pollution in general, in the Great Lakes, or in the Chesapeake Bay. (EPA Budg. Just., 3-23).

Effluent Standards and Guidelines

1989 Activities: Energy-related expenditures on the off-shore and on-shore oil and gas industries.

Water Quality Strategies Implementation

Ocean Disposal Permits. This activity, among other things, regulates the ocean disposal of dredged material such as that generated through waterway and port dredging.

Environmental Emergency Response and Prevention. EPA provides guidance, emergency support, and spill prevention training for oil spills.

Spill Restoration Program. EPA environmental restoration efforts following the Exxon Valdez spill. Funded in 1990 only; not a regular budget item.

Enforcement

Water Quality Enforcement. Includes enforcement of oil and hazardous substance spill requirements. This seems to be a small portion of the program. (EPA Budg. Just., 3-72).

DRINKING WATER

Research and Development

Monitoring Systems and Quality Assurance. FY '91 groundwater work includes the identification and assessment of technologies to improve injection well practices, a main disposal method for oil and gas drilling wastes. (EPA Budg. Just., 4-13).

Environmental Processes and Effects. Includes in-situ treatment technologies for contaminated aquifers and study of movement and transformation of wastes from underground injection wells. Aquifer technologies are relevant only to the extent that petroleum products are a main source of aquifer contamination. (EPA Budg. Just., 4-16).

Abatement and Control

Drinking Water Implementation. Energy-related efforts involve the underground injection control of injected hazardous wastes, including oil and gas drilling wastes, as well as the implementation of a shallow injection well strategy. (EPA Budg. Just., 4-23).

Underground Injection Control Program Grants. Grants support programs to protect underground sources of drinking water from contamination through underground injection of wastes. (EPA Budg. Just., 4-28). Class I and II wells are for oil and gas wastes.

Underground Injection Control Program. Federal oversight of underground injection well regulations, safety inspection of wells, etc. Includes well permitting.

Drinking Water Enforcement. A small portion of the enforcement budget goes for enforcement of Class I and II (oil and gas wastes) underground injection wells.

HAZARDOUS WASTE

Research and Development

Scientific Assessment. FY90 and '91 programs include comprehensive studies of the hazards of municipal waste combustion.

Monitoring Systems and Quality Assurance. Energy-related activities include remote sensing for monitoring spills and spill threats; and leak monitoring methods with respect to underground storage tanks; subsurface monitoring for detecting waste plume migration.

Health Effects. Research is focused on the health effects of municipal and hazardous waste combustion. (EPA Budg. Just., 5-17).

Environmental Engineering and Technology. Activities include underground chemical and petroleum storage tank research on reliable leak detection methods. 1991 program includes research on municipal solid waste incinerators.

Environmental Processes and Effects. 1989 efforts include, in small part, study of the damage caused by spills. 1990 efforts include field tests of cleanup techniques developed at hazardous waste sites on cleanups from underground storage tanks.

Abatement and Control

Regulations, Guidelines, and Policies - Hazardous Wastes. 1989 activities included the clarification of mineral processing wastes (as well as wood preserving wastes and methyl bromide). (EPA Budg. Just., 5-27).

Regulations, Guidelines, and Policies - Water. 1989: Includes underground injection well corrective action investigations for Class 1 hazardous waste wells. (EPA Budg. Just., 5-30).

Regulations, Guidelines, and Policies - Underground Storage Tanks. Regulatory development, communication, eduction, and support for chemical and petroleum USTs. (EPA Budg. Just., 5-30 - 5-32).

Underground Storage Tanks State Grants. Grants support the development and continuation of state UST programs.

Emergency Planning and Community Right-to-Know - SARA Title III. Support for compiling and publishing hazardous waste emission data, and enforcing the reporting requirements. Allocate based on energy share of total emissions.

RADIATION

Research and Development

Monitoring Systems and Quality Assurance. In addition to monitoring nuclear weapons tests, EPA monitors radiation exposure in the general population and supports site characterization studies of Yucca Mountain. FY1989 activities related only to weapons testing. (EPA Budg. Just., 7-9).

Environmental Engineering and Technology. Work involves research into radon tracking, mitigation, and education.

Abatement and Control

Radiation Criteria, Standards, and Guidelines. Rulemakings and standards related to both high- and low-level radioactive wastes, uranium mill tailings. Development of protective action guidelines for exposure to radionuclides in the event of an accident. Some study of electromagnetic fields. (EPA Budg. Just., 7-13)

Radiation Program Implementation. Main task is technical assistance to the states and EPA regional programs to handle exemptions and construction requests for facilities generating radionuclides. Other tasks include the review of environmental impact statements for radiation facilities such as uranium mills, mines, waste disposal sites; and the characterization of wastes at Superfund sites. (EPA Budg. Just., 7-17).

Radiation Environmental Impact Assessment. Risk assessment methodology in support of residual radioactivity at decommissioned nuclear facilities; assessments of harbors serving nuclear vessels; emergency response teams for releases of radiological contamination (both commercial and defense). (EPA Budg. Just., 7-20).

Radon Action Program.

1989 Activities: National survey of radon in residences; developed methodology for measuring and mitigating radon in schools; evaluated radon mitigation firms; established training centers for radon contractors; developed and disseminated information on radon hazards and mitigation. (EPA Budg. Just., 7-24).

Radon Action Program Implementation. Support for state programs and federal radon initiatives.

Radon State Grant Program. State grants for development of state radon evaluation and control efforts. Grants initiated in 1990.

TOXIC SUBSTANCES.

The program's four major goals are to "1) prevent or eliminate unreasonable risk from new or existing chemicals, 2) reduce unnecessary exposure through voluntary reduction of toxic emissions, 3) encourage the development of safer substitutes for high risk chemicals, and 4) maximize productivity through

improved management and through the strengthening of state and local programs." ('91 Budget Summary, 27).

Toxic Substance Research. Spending categories include Scientific Assessment, Monitoring Systems and Quality Assurance, Health Effects, Environmental Engineering and Technology, and Environmental Processes and Effects. EPA research involves toxic chemicals and asbestos. Energy-related releases as a percentage of the Toxic Release Inventory could be used to allocate spending to the energy sector.

Abatement and Control. Spending other than on asbestos should be allocated to energy on the basis of the energy fraction of the Toxic Release Inventory. The Regional Toxics Program, new in 1990, focuses mainly on asbestos and PCBs. Retain PCBs only since utilities are a large source of them.

ENERGY

Research and Development

Acid Deposition. Monitoring and evaluation emissions sources and impacts.

Environmental Engineering and Technology. Research on the Limestone Injection Multistage Burner (LIMB) research program to remove acid-rain precursors from coal-fired boiler emissions. LIMB funding was 3.4 m in '90. (EPA Budg. Just., 10-8).

MANAGEMENT AND SUPPORT

Executive direction and policy oversight for EPA program offices as well as general overhead. The overhead for each program office should be allocated to each energy source on the same percentage basis as spending for that particular office. General overhead should be allocated on the basis of percent of spending on a particular energy source for the agency as a whole.

BUILDINGS AND FACILITIES

Salaries and Expenses. Costs associated with the above program areas.

Abatement, Control, and Compliance. Funds for contracts, grants, and cooperative agreements for pollution abatement, control, and compliance activities.

- EPA "plays a major role in the Federal response to nuclear accidents...EPA is responsible for coordinating all Federal monitoring efforts. For nuclear accidents outside the U.S., EPA assumes this role immediately. For accidents in the U.S., EPA is responsible for a nation wide monitoring and assumes monitoring around the site for the accident from DOE as soon as the emergency phase of the accident is over." EPA also provides information on what levels of radiation are dangerous. (EPA, Office of Air and Radiation, Radiological Emergency Response, FY 1992-1995 Program Strategy, November 30, 1989, p. 2).

- Radioactive Waste. "Well over 100 million cubic meters of all kinds of radioactive waste have accumulated to date and approximately one million cubic meters are generated annually...The mining and extraction and mineral processing industries generate hundreds of millions of metric tons of waste containing natural radioactivity every year...There are over 20 sites on the National

Priority List that are radioactively contaminated...In addition, there are about another 1,000 hazardous waste sites containing nuclear materials. At present, except for uranium mill tailings, no clean up or disposal standards exist in this area to ensure the protection of public health and safety." (EPA Radioactive Waste Strategy, 1).

EPA is responsible for issuing generally applicable environmental standards for high level radioactive waste, LLRW, and mixed waste (which is both hazardous and radioactive), as well as assessing the risks from naturally-occurring radioactive materials. Wastes containing natural radioactivity are generated through mining, beneficiation of mineral, pipe scale from oil and gas drilling, and sludge from treating drinking water. (EPA Radioactive Waste Strategy, 8). EPA also monitors residual radioactivity from decommissioning of defunct production facilities.

Office of the Inspector General. Internal investigative audit arm of EPA. Three distinct parts: Management, Superfund, and LUST. Superfund and LUST expenditures are derived from the two Trust Funds and are therefore paid by users.

BUILDINGS AND FACILITIES. Costs associated with EPA physical plant should be allocated on the basis of the mix of R&D and compliance expenditures.

PAYMENT TO THE HAZARDOUS SUBSTANCE SUPERFUND. Congressional appropriations to Superfund for the cleanup of abandoned hazardous waste sites.

HAZARDOUS SUBSTANCE SUPERFUND TRUST FUND. Funds the implementation of CERCLA. (OMB '89, A-1040).

LEAKING UNDERGROUND STORAGE TANK TRUST FUND. Provides funds for responding to releases from leaking underground petroleum tanks. Financed through a 0.1 cent/gallon tax on motor fuels.

Sources

United States Environmental Protection Agency, FY 1991 Budget Justification.

United States Environmental Protection Agency, Summary of the 1991 Budget, January 1990.

U.S. EPA, Office of Air and Radiation, Radioactive Waste, FY 1992-1995 Program Strategy, November 30, 1989.

U.S. EPA, Office of Air and Radiation, Radiological Emergency Response, FY 1992-1995 Program Strategy, November 30, 1989.

U.S. Office of Management and Budget. Budget of the United States Government, Fiscal Year 1991.

LEGISLATIVE BRANCH: VARIOUS FUNCTIONS

None of these items are quantified in this report.

General Accounting Office. "The GAO is responsible directly to the Congress for conducting independent reviews, audits, and investigations of programs, activities, and financial transactions of Federal agencies. The GAO is also responsible for rendering legal decisions relating to Government fiscal matters; for developing principles and requirements for Federal agency accounting systems; for the settlement of certain claims for and against the Government; and for advising and assisting the Congress and Government agencies on matters related to public funds." (Heede, 129).

As can be seen from the citations throughout this report, GAO is closely involved with energy issues.

Congressional Budget Office. CBO researches many energy-policy related topics, as well as an annual estimate of potential budget savings through budget cuts. Many of these provisions involve subsidies to the energy sector.

Environmental and Energy Study Conference. EESC is a legislative service organization sponsored by a group of congress people. The Conference provides its congressional sponsors with information concerning environmental and energy issues affecting federal legislation. (GAO/AFMD-91-4, 11). Although EESC is funded from Congressional office budgets, the funds were initially paid to the government by the U.S. taxpayer. Total funding in 1989 was $437,000. (GAO/AFMD-91-4, 9).

Joint Committee on Taxation. JCT assesses new tax bills and generates annual estimates of the magnitude of federal tax expenditures. Many of these provisions are directly or indirectly related to energy. (OMB '92, 4-230).

Installation of Solar Collectors in House Office Buildings. 38k in '90; apparently lapsed. (OMB '92, 4-235).

Congressional Research Service. CRS conducts extensive research on issues of interest and importance to Congress people and their staff, and maintains up-to-date information on the status of legislation. As with GAO, a significant portion of CRS' effort is on energy issues.

Office of Technology Assessment. OTA conducts studies to assess technological opportunities or constraints related to certain issues. The agency has done a number of studies on the energy sector, including two on electricity and one on radioactive waste.

Sources

U.S. GAO, Financial Audit: Environmental and Energy Study Conference Financial Statements for 1989 and 1988. GAO/AFMD-91-4, Feb. 1991.

U.S. Office of Management and Budget. Budget of the United States Government, Fiscal Year 1991.

NUCLEAR REGULATORY COMMISSION

The Nuclear Regulatory Commission was created in the Energy Reorganization Act of 1974 with the mission of assuring that civilian uses of nuclear materials in the United States are carried out to ensure proper protection of health, safety, environmental quality, and national security. The commission regulates nuclear materials in medical, industrial, and research applications as well as in power plants.

The NRC regulates reactor design, siting, and operations of nuclear power plants, including the licensing of transporters and disposers of radioactive materials. The Agency was also responsible for overseeing the clean-up at Three Mile Island.

Data on NRC spending by category was taken from the OMB Federal Budget. Detailed data on offsetting revenues is from the two page financial statements presented in the NRC 1990 Annual Report. Due to a range of values concerning the commercial utility share of radioactive waste, we generate high and low estimates for NRC.

The Omnibus Budget Reconciliation Act of 1990 required NRC to recover all costs from licensees for fiscal years 1991-1995. Renewal of the legislation in 1995 will be necessary to continue full cost recovery past that date. (Ingram, 3/1/93). For all years prior to 1991, the NRC provided hundreds of millions of dollars in uncompensated oversight to the commercial nuclear industry.

Reactor Safety and Safeguards Regulation

Tasks include all NRC licensing and inspection of civilian reactor facilities and designs. The NRC conducts reviews in the following areas: reactor operations reviews; human performance in reactor safety; reactor operations inspections; operating reactor license maintenance and regulatory improvements; reactor accident management; and reactor safeguards. (OMB, '91, A-1162).

Nuclear Safety Research

This area includes three main tasks: the provision of expertise and independent research (i.e., not from the licensees) on short-term problems; long-term research (5-10 years) in support NRC decisions and regulatory approaches; and the development of the regulations and guides necessary to implement policy or technical requirements of NRC programs.

Nuclear Material Safety, safeguards, and low-level waste regulation

This area of responsibility seeks to ensure that nuclear materials and fuel cycle facilities do not pose an undue health, safety, environmental, or national security risk. Tasks include all NRC licensing and inspection of nuclear fuel-cycle facilities, users of nuclear materials, the transport of nuclear materials, the safe management and disposal of low-level radioactive wastes, and uranium recovery activities and related remedial actions.

High Level Nuclear Waste Regulation

NRC licensing and oversight efforts to ensure the safe handling, transport, and management of high level radioactive wastes, including spent fuel.

Reviews, Investigations, and Enforcement

Review, evaluation, and investigation of NRC's licensees. Included are diagnostic evaluations of plant safety, evaluation of operational events (i.e., mishaps), and provision of advice in these areas. Also included is the NRC's emergency operations center.

Office of the Inspector General

An Office of the Inspector General was established in the NRC pursuant to the Inspector General Act Amendments of 1988. The purpose of this position is to review and appraise the integrity of NRC programs and operations. (OMB, '91, A-1164).

Sources:

Heede, Rick. Federal Energy Subsidies: Agency Obligations, Draft Report. Rocky Mountain Institute, 1986.

Ingram, Frank. Nuclear Regulatory Commission. Personal communication, March 1, 1993.

Office of Management and Budget. Budget of the U.S. Government, FY 1991, A-1161 - A-1164.

United States Nuclear Regulatory Commission. Annual Report 1988, June 12, 1989.

United States Nuclear Regulatory Commission. Annual Report 1990, 1990, pp. 199, 200.

NUCLEAR WASTE TECHNICAL REVIEW BOARD

The Board is directed to evaluate the technical and scientific validity of DOE's nuclear waste disposal program undertaken after the Nuclear Waste Policy Amendments Act of 1987. (OMB '91, A-1164). The Board is funded through the Nuclear Waste Fund, and is therefore not subsidized by taxpayers.

OFFICE OF THE NUCLEAR WASTE NEGOTIATOR

This position is created with the purpose and authority to attempt to find a State or Indian tribe willing to host a nuclear waste repository or monitored retrieval site at a technically qualified site. Funding began in 1990; therefore, it has no subsidy value for our 1989 snap-shot estimate.

PRESIDENT'S COMMISSION ON CATASTROPHIC NUCLEAR ACCIDENTS

The purpose of this Commission is to study the options for fully compensating victims (or their survivors) of a catastrophic nuclear accident. The study, which was to be completed by 1990, was authorized under the Price-Anderson Act Amendments of 1988. The Commission was abolished Oct. 1, 1990. (OMB '92, 4-1167). Funding was split evenly between commercial fission and the military sector.

Nuclear Regulatory Commission

Item	Amount ($mil) (a)	Commercial Fission Portion Low Est. (b)	Commercial Fission Portion High Est. (c)	Net Subsidy Low Est. (a*b)	Net Subsidy High Est. (a*c)	Notes
Reactor Safety and safeguards regulation	156.9	100.0%	100.0%	156.9	156.9	(1)
Nuclear safety research	109.9	100.0%	100.0%	109.9	109.9	(1)
Nuclear material and low-level waste safety and safeguards regulation	35.4	44.0%	88.3%	15.6	31.3	(2)
High-level nuclear waste regulation	17.7	2.5%	94.6%	0.4	16.7	(3)
Reviews, Investigations, Enforcement	33.8	100.0%	100.0%	33.8	33.8	(4)
Nuclear safety, management & support (NSMS)	63.9	44.0%	88.3%	28.1	56.4	(2)
Office of the NRC Inspector General	0.0	0.0%	0.0%	0.0	0.0	(5)
Reimburseable Program	3.6	0.0%	0.0%	0.0	0.0	
Total Program Costs	421.2			344.8	405.0	
Less Revenues (Notes 7 and 8)						
Reimburseable work for other agencies	(1.6)	0.0%	0.0%	0.0	0.0	(6)
Material Licenses	(3.7)	100.0%	100.0%	(3.7)	(3.7)	(6)
Facility Licenses	(48.0)	100.0%	100.0%	(48.0)	(48.0)	(6)
Other	(5.9)	100.0%	100.0%	(5.9)	(5.9)	(6)
Total Revenues	(59.2)			(57.6)	(57.6)	
Net Cost of Operations	362.0			287.2	347.4	

Notes:

(1) These areas of activity go almost entirely towards oversight of commercial reactors.

(2) Nuclear material and LLRW safety and safeguards and NSMS expenditures oversee nuclear fuel cycle facilities and low-level waste regulation. The low estimate is based on the volume of low-level radioactive wastes attributable to the utility sector (OTA, 84), assuming that costs are driven by the volume of LLRW. The high estimate reflects the percentage of uranium enrichment services going to the commercial sector (see section on DOE's Uranium Enrichment Enterprise), assuming that this pattern of activity is a fair proxy for the distribution of these costs. Allocating by the commercial share of radioactivity would yield a larger subsidy estimate than the one shown.

(3) The wide range here reflects the commercial share of high-level radioactive waste by volume in the low estimate and by radioactivity in the high estimate. We do not know which drives oversight costs more.

(4) Reviews and inspections of NRC licensees impacts commercial facilities.

(5) The Office of the Inspector General was not funded until FY91.

(6) Reimburseable work for other agencies is assumed to be unrelated to commercial fission. License fees are "other" fees are conservatively assumed all to be collections from commercial fission facilities. Data are from NRC 1990 Financial Statements, p. 200.

(7) Revenues are generally deposited into the U.S. Treasury, and then transferred to appropriations the following year. Revenue da 387.6 m for FY89 is used to scale

(8) In FY89 NRC fees were capped at 33% of the cost of running the Commission. Proposed legislation would have funded $19.7m in costs from the Nuclear Waste Fund, and the rest through license fees. In FY92, $19.7m did come from the Waste Fund; the status of fee collections is unknown. (OMB '91, A-1163; OMB '92, 4-1154).

Cumulative Generation of Radioactive Wastes to Jan. 1, 1989

	Vol. (000 cu yds	(%)	Radioactivity (Mil. curies)	(%)
Low Level Radioactive Wastes				
Nuclear Utility LLRW (Operating plus decommissioning)	9,335	44.03%	548	97.34%
Defense and Industrial LLRW	11,865	55.97%	15	2.66%
Total LLRW	21,200	100.00%	563	100.00%
High Level Radioactive Wastes				
Nuclear Utility HLRW	39	2.53%	20,430	94.56%
Defense and Industrial HLRW	1,500	97.47%	1,175	5.44%
Total HLRW	1,539	100.00%	21,605	100.00%

Source: Chapman p. 250, based on OTA.

Sources:

Chapman, Duane. "Decommissioning and Nuclear Waste Policy: Comprehensive or Separable?" The Energy Journal, V. 12, 1991.

Heede, Rick. "Federal Energy Subsidies: Agency Obligations." NRC section. Rocky Mountain Institute, 1986.

Nuclear Regulatory Commission. "Annual Report." For 1988, and financial statements for 1990.

Office of Management and Budget. "Budget of the U.S. Government, FY 1991," pp. A-1161 - A-1164.

Office of Management and Budget. "Budget of the U.S. Government, FY 1992," pp. 4-1154 - 4-1157.

Office of Technology Assessment "Partnerships Under Pressure: Managing Commercial Low-Level Radioactive Waste." November 1985

DEPARTMENT OF STATE: INTERNATIONAL ATOMIC ENERGY AGENCY

The International Atomic Energy Agency is the primary organization working to oversee the international movement of fissionable materials (such as enriched uranium), and to ensure compliance with the Nuclear Non-Proliferation Treaty. According to DOE:

> To the United States, the most important IAEA activity is its safeguards program for verifying that civil nuclear materials and facilities are not used to further any military purpose. (DOE ann. rept., 263).

The United States is a primary contributor to the IAEA. In recent years, the U.S. has been assessed approximately 25.4% of the Agency's regular budget (Weston, 8/28/91). This is up from the 20% the U.S. paid in 1985 (Heede, 86). In addition to the assessed contributions, the U.S. has traditionally also made voluntary contributions of cash, fissionable materials, manpower, or expertise, or through research contracts. Most funding goes through the Department of State's Contribution's to International Organizations budget. Some small additional funds are provided through the Department of Energy. DOE contributions are not included on the attached spreadsheet.

According to Heede, IAEA is involved in many energy-related activities, including IAEA laboratories, commercial nuclear power promotion and statistics gathering, nuclear safety programs and inspections, nuclear fuel cycle and uranium supply assurance programs, waste management and environmental support, and technical cooperation. In addition, Heede ascribed part of the non-proliferation budget to nuclear electric since "peaceful nuclear power serves as the primary conduit and concern regarding proliferation." (Heede, 86). Heede's estimate that 80 percent of IAEA's budget benefits nuclear electric power is used here.

Recent specific energy-related projects cited by DOE include increased study on handling of nuclear accidents and radiological releases, following the accident at Chernobyl; sponsoring an international symposium on managing commercial radioactive wastes and efforts on advanced light water reactors; and safeguards at nuclear facilities, reprocessing, enrichment, and plutonium fuel sites. The IAEA has also run training courses on proper handling for, and protection of, nuclear material. (DOE Annual Report, 261, 262).

Sources

Black, Barbara and Warren Donnelly. The U.S. Uranium Industry: What Assistance Does it Need? US Congressional Research Service, December 15, 1988. CRS 88-760 ENR.

Heede, Rick. Federal Energy Subsidies: Agency Obligations, Draft Report. Rocky Mountain Institute, 1986.

U.S. DOE. The Secretary's Annual Report to Congress, 1988-1989. DOE/S 0010(89). [Cited as "DOE annual rept."]

U.S. General Accounting Office. U.S. Financial Assistance in the Development of Foreign Nuclear Energy Programs, May 1975, pp. 24-29. GAO/ID-75-63.

Weston, Kay, U.S. Department of State. Personal communication, "U.S. Contributions to the IAEA," August 28, 1991.

U.S. Department of State

International Atomic Energy Agency

Part 1: Historical Data on Contributions

Year	Assessment	Voluntary Contribution	Other Contribution	Total
		(All dollars in Millions)		
1958	1.4	0.1		1.5
1959	1.7	1.7		3.4
1960	1.9	1.1		3.0
1961	2.0	1.0		3.0
1962	2.1	1.2		3.3
1963	2.3	1.1		3.4
1964	2.3	1.1		3.4
1965	2.5	1.0		3.5
1966	2.8	0.9		3.7
1967	2.9	0.9		3.8
1968	3.2	0.9		4.1
1969	3.4	0.9	0.8	5.1
1970	3.7	1.4	0.5	5.6
1971	4.0	1.6	0.6	6.2
1972	4.9	1.6	0.6	7.1
1973	5.7	1.8	0.7	8.2
1974	7.4	2.0	0.1	9.5
Tot. '58-74	54.2	20.0		74.2
Research Contracts		1.1		1.1
Donated fissionable materials		0.7		0.7
	Total Contributions, 1958-1974			76.0
1980	19.4	12.0		31.4
1981	21.0	12.4		33.4
1982	20.0	12.8		32.8
1983	21.0	14.5		35.5
1984	23.0	15.8		38.8
1985	22.6	18.4		41.0
1986	23.5	17.0		40.5
1987	31.7	20.5		52.2
1988	36.8	21.9		58.7
1989	38.0	22.0		60.0
1990	37.8	21.6		59.4
1991	49.4	23.6		73.0
	Total, 1958-1974, 1980-1991			632.71

Notes:

(1) Assessments for the IAEA from FY 1986-on include portions which were paid in Austrian Schillings. The dollar value of these contributions is dependent on the exchange rate in effect at the time of payment.

(2) Data on voluntary assessments reflect amounts appropriated by Congress through the International Organizations and Programs Account. Some funds may be obligated but not yet spent.

(3) "Other" contributions include cash and in-kind support from DOE and for contracts on nuclear proliferation safeguards through the Arms Control and Disarmament Agency. Data between 1969 and 1974 represents safeguards research. 1968 data is commingled with 1969 data here and in original source.

(4) Some minor additional contributions from DOE in 1989 are not included in this table.

Part 2: Allocation of FY89 Expenditures to Commercial vs. Military Sector

Total Funding in FY89	60.0
Estimated Share to Nuclear Electric	80% *
Net Estimated Subsidy to Nuclear Electric	48.0

*This fraction is based on estimates made by Rick Heede in his estimates of energy subsidies in 1986. No additional information was used.

Sources:

Heede, Rick. "Federal Energy Subsidies, Agency Obligations," Draft Report. IAEA Section. Rocky Mountain Institute, 1986.

U.S. GAO. U.S. Financial Assistance in the Development of Foreign Nuclear Energy Programs, May 1975, pp. 24-29. GAO/ID-75-63. (For data through 1974).

Weston, Kay, U.S. Department of State. "U.S. Contributions to the IAEA," Personal memorandum, August 28, 1991.

EXPORT-IMPORT BANK

The Export-Import Bank provides aid in financing U.S. exports. Although called a Bank, Eximbank's mission is to "facilitate export financing of U.S. goods and services by neutralizing the effect of export credit subsidies from other governments and by absorbing reasonable credit risks that are beyond the current reach of the private sector." (FY 1990 Annual Report, 2). Private sector banking performance measures of interest rate spread and loan performance do not appear to be relevant to Eximbank's ongoing operations. Much of the financing is subsidized and a large portion of the Bank's loans are in default. Information on the existing loan portfolio, including payment schedules, defaults, restructurings, and exposure on loan guarantees or export insurance is difficult to obtain. While Eximbank does not choose the sectors for which is provides loans or guarantees, the energy sector has historically comprised as significant portion of its loan and guarantee portfolio, and between 1980 and 1989 comprised almost 1/3 of all new loans authorized (see data sheets). Similarly, while all sectors have received financing support, energy has been a main beneficiary because of its share of total Bank activity.

Our estimates are subject to the assumption that energy loans are defaulted on at the same rate as the general loan portfolio. To the extent that energy exports benefit from the Bank's lending, guarantee, and insurance programs, a government subsidy accrues to domestic providers of energy goods and services. Historically, Eximbank's energy lending activities have centered around oil and gas development and electric power plant construction. Although lending to alternative fuels has grown somewhat, such activity still represents a tiny portion of total financing.

Subsidies to the energy sector arise in a number of ways, including subsidized loans, free loan guarantees, grants, export insurance, and free lines of credit. In addition, the costs of poor risk management also provide added subsidies through delayed loan repayment allowances, and defaulted direct and guaranteed loans. Lending-related losses are converted to annual payments by imputing the annual payment necessary over the period of loss to have accrued the current provision. Each area of subsidization is covered in more detail below.

Subsidized Loans and Loan Defaults

Interest Rate Subsidies. Eximbank loans have often been made below the Bank's cost of borrowing. According to one Eximbank official, interest rate subsidies have historically occurred when high U.S. dollar interest rates exceeded the minimum allowable interest rates set by the OECD. (Gonter, 8/6/92). Additional disparity may be the result of long time lags between approving loans and actually providing cash create significant interest rate risks. The subsidy calculation is based on the actual difference between the Bank's lending rate and borrowing rate on individual loans. Eximbank's cost of borrowing is calculated from annual debt information in the annual reports. This estimate does not incorporate interest rate risk from the lags between authorization and actual funding. The interest rate subsidy is counted as zero as soon as the bank lending rate exceeds its borrowing rate. Any premium charged is assumed to be a charge for perceived loan risk. Similarly, interest rate subsidies do not have a risk premium attached to them. The effects of both of these circumstances is reflected in the accrual for loan defaults. To the extent that economies of scale in federal borrowing reduce the cost of funds to Eximbank (net of any default premium), our estimates do not capture the value of this intermediation.

Duration of Impact. Although loan repayment may last only 5-10 years, the initial payment is, in some cases, deferred for as long as 9 years. As a result, loan decisions made almost 20 years ago may still be conferring an annual benefit to the loan recipient. For example, of the energy loans authorized

in 1980, over 96 percent were still outstanding in FY89 (see attached tables).[58] Data on the initial payment date was published in the Bank's Annual Reports only until 1982. Estimates for years since 1982 are based either on the earliest year of debt retirement assuming amortization begins immediately, or on the overall lending portfolio maturity data provided in the notes of the Bank's annual reports.

Loan Defaults. Eximbank has accrued funds to cover its expected losses on loans receivable. This provision is allocated to the energy sector based on the energy share of total loans authorized between 1980 and 1989, prorated by the share of loans made in a particular year that remain outstanding in 1989. The energy share is then allocated to particular fuels using actual loan authorization data from this period.

Loan Guarantees

Eximbank provided billions of dollars in loan guarantees, many of which have since defaulted, requiring the bank to make good on its pledge. The provision for losses on loan defaults is allocated to particular fuels based on the share of total guarantees authorized between 1980 and 1989, prorated by the share of guarantees made in a particular year still outstanding in 1989. Since available sources for some years did not contain data on the provision of loan guarantees only (i.e., guarantees made without a direct loan), this estimate is likely to be too low.

Export Insurance

Eximbank provides insurance to exporters through the Foreign Credit Insurance Association (FCIA). Under the existing arrangement, FCIA acts as Eximbank's agent, selling and servicing export credit insurance policies. Eximbank, however, assumes all political and commercial non-payment risks associated with the policy. Estimates for insurance-related losses are included in Eximbank provisions for claims losses (which includes losses on both insurance and loan guarantee programs). However, no data were available on insurance of energy exports. As a result, the estimate of the energy portion of claims loss is likely to be too low.

Lines of Credit and Value of Intermediation

Eximbank has a $6 billion line of credit with the U.S. Treasury, an unlimited line of credit with the Federal Financing Bank (also funded by taxpayers), and a $40 billion cap on obligations outstanding. There are no charges for any of these. In addition, the bank benefits from borrowing rates available only to government borrowers.

[58]The length of repayment is often longer for larger loans, and larger loans are generally associated with electric power plants, especially fission-electric. For example, an $80m loan to Taiwan for a nuclear power plant was authorized in FY 1970. Payments didn't begin until 1976, and loan repayment, assuming no restructuring, continued until 1991. (Eximbank 1970 Annual Report, 54).

Summary of Estimating Errors

Estimates involve a number of approximations which influence the results. These are presented briefly below.

Bias	Impact
Long lag times between authorization and disbursement.	Interest rate risk which could yield windfall losses or gains depending on rate movements.
Data only back to 1980.	Implicitly assumes that earlier activity followed same energy mix and share of total lending patterns as later years. This is not the case.[59]
Lack of data on loan guarantee activity for every year.	Underestimates share of energy-related guarantee losses.
Lack of data on export insurance activity.	Underestimates share of energy-related claims losses.
Choice of period of loss	Longer period of loss will reduce annualized losses; shorter period of losses will increase annualized losses.

Sources

Bowring, Joseph. Federal Subsidies to Nuclear Power: Reactor Design and the Fuel Cycle, Unpublished Draft. Washington, DC: US DOE: EIA, March 1980.

Export-Import Bank of the United States. Annual Report, for the years 1970, 1980-1990.

Export-Import Bank of the United States. "Authorizations for Nuclear Power Plants and Training Centers from Inception Thru [sic] September 30, 1981.

Export-Import Bank of the United States. "Borrowings from Federal Financing Bank FY 1989 through FY 1991." Provided by Ken Buschow, Eximbank, January 1992.

Export-Import Bank of the United States. "Exim Loan and Guarantee Energy Authorizations," for FY 88, 89, 90, and 91 (through 9/30/91).

Gonter, Michael, Export Import Bank, personal communication, 11/25/91 and 8/6/92.

[59]For example, between 1980 and 1989, Eximbank authorized $8.5 billion in loans and guarantees, of which only $994 million was for nuclear power. However, Eximbank loans through September 1979 to nuclear alone were $4.7 billion, plus an additional $1.9 billion in guarantees. (Eximbank, Authorizations for Nuclear Power, 1981).

EXPORT-IMPORT BANK: SUMMARY TABLE ON ENERGY LOAN PORTFOLIO

(Millions of Nominal Dollars)

	Total (FY80-89)	FY1980	FY1981	FY1982	FY1983	FY1984	FY1985	FY1986	FY1987	FY1988	FY1989	FY1990	FY1991
NEW AUTHORIZATIONS													
Direct Loans	19,074.7	4,577.8	5,430.9	3,516.3	844.9	1,465.0	659.4	577.4	598.9	685.3	718.8	614.1	0
Loan Guarantees	13,684.6	2,509.7	1,513.2	741.2	1,740.6	1,333.2	1,320.1	1,127.9	1,505.5	601.0	1,292.2	3332.7	
Insurance	47,518.5	521.7	2,459.0	5,104.7	6,783.7	5,817.6	6,529.5	4,379.9	6,444.0	5,133.6	4,344.8	4841.1	
ENERGY AUTHORIZATIONS													
New Energy Loan Auth.	5,985.7	1,715.4	1,041.2	2,052.2	189.8	188.0	171.0	163.2	175.3	193.7	96.1	221.7	155.7
Egy. Lns./Tot. Lns. Auth.		37.47%	19.17%	58.36%	22.46%	12.83%	25.93%	28.26%	29.27%	28.26%	13.38%	279.7	347.3
New Energy Guar. Auth.	2,425.6	178.5	473.0	536.3	294.4	313.2	341.8	88.0	0.0	56.0	144.5		
Egy. Guar./Tot. Guar. Auth.		7.11%	31.25%	72.35%	16.91%	23.49%	25.89%	7.80%	0.00%	9.32%	11.18%	8.39%	0.00%
Estimated Pct. of Portfolio Outstanding in FY1989		96.4%	96.3%	100.0%	54.2%	61.1%	65.3%	74.7%	85.4%	93.9%	100.0%	N/A	N/A
WEIGHTED BY PERCENT OF PORTFOLIO OUTSTANDING IN 1989													
Total Loans	17,250.0	4,415.1	5,229.0	3,516.3	458.3	895.4	430.7	431.1	511.6	643.8	718.8		
Energy Loans	5,568.2	1,654.4	1,002.4	2,052.2	103.0	114.9	111.7	121.8	149.7	182.0	96.1		
Egy. Lns./Tot. Lns. Auth.	32.40%												
Total Guarantees	11,224.8	2,420.5	1,456.9	741.2	944.2	814.8	862.2	842.0	1,286.1	564.6	1,292.2		
Energy Guarantees	2,000.9	172.2	455.4	536.3	159.7	191.4	223.3	65.7	0.0	52.6	144.5		
Egy. Guar./Tot. Guar. Auth.	17.83%												
Ex-Im Ave. Cost of Debt		10.49%	13.86%	13.35%	12.51%	12.42%	11.06%	9.26%	7.57%	9.28%	9.01%	8.19%	6.48%

ACCRUED PROVISION FOR LOSSES, AS OF THE END OF FY89			Accumulated Deficit	Energy Share	Source
Loan Losses			2,519.3		FY 1990 Ann. Rept., 32.
Provision for Loan Losses as % of Outstanding Loans			30.0%		FY 1990 AR, 32. Informational only; not used in calculations.
Energy Share	32.40%	of deficit =		816.1	Historic Average, from above table.
Claims Losses (Guar. and Insurance)			1,425.5		FY90 AR, p. 33
Provision for Losses as % of Guar. & Insur.			59.6%		FY90 AR, p. 33. Informational only; not used in calculations.
Energy Share	17.83%	of deficit =		254.1	Historic Average, from above table.
Write-off of accrued interest on non-performing loans					
Low Estimate			214.0	69.3	FY90 AR, p.34; Unlike above losses, this loss represents losses for 1989 only.
High Estimate			271	87.8	FY89 AR, p.39; Unlike above losses, this loss represents losses for 1989 only.
Energy Share	32.40%	of deficit =			

Period of Loss: 1980-1989	10 years	
Wghtd. Ave. Lending Rate, FY 1989	8.92% (Ex-Im 1989 Ann. Rept., p. 34)	
Wghtd. Ave. Lending Rate, FY 1990	6.80% (Performing Assets only; FY90 AR, p. 32)	
Annualized Accrual for Loan Losses		
Low Est. (Higher Discount Rate)		53.9
High Est. (Lower Discount Rate)		59.6
Annualized Accrual for Guarantee Defaults		
Low Est. (Higher Discount Rate)		16.8
High Est. (Lower Discount Rate)		18.6

Total Estimated Capital Deficiency	5,300.0	FY89 AR, p. 39
Negative Interest Spread On Energy Loans Estimate		FY89 AR, p. 34
Assuming Loan Disbursement In Year of Loan Approval	140.4	Calculated below from Eximbank loan data.

LINES OF CREDIT		
Statutory Limit on Outstanding Obligations	40,000	FY90 AR, 37
Borrowing Authority from the FFB	Unlimited	FY90 AR, 34
Borrowing Authority from Treasury	6,000	FY89 AR, 40
Statutory Authority Used through end of FY89	16,642	FY89 AR, 37
Net Available	23,358	
Value of Energy Portion, at 1/8% commitment fee	9	

Allocation Table: Subsidies by Energy Type

LOANS

	Total	Coal	Oil	Gas	Oil&Gas Mixed	Electric Fossil	Electric Fission	Electric Oil	Electric Coal	Electric Gas	Electric Hydro	Effic - Supply	Biomass	Wind	Solar	Geotherm.	Effic.- End-Use	Other Renew.	Fusion
ACTUAL LENDING DATA BY ENERGY TYPE ($Millions)																			
DIRECT LOANS																			
1989	96.1	3.4	2.7	0.0	39.7	30.1	0.0	0.2	9.6	8.8	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1988	193.7	1.0	0.0	0.0	28.3	153.0	0.0	0.0	0.0	10.9	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0
1987	304.8	28.2	5.4	30.8	36.2	102.7	0.0	0.0	0.0	93.3	8.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1986	163.2	0.0	29.1	34.0	0.0	7.7	0.0	0.0	65.4	27.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1985	171.0	130.0	35.8	0.0	0.0	0.0	5.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1984	188.0	14.1	90.8	49.3	0.0	33.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1983	189.8	0.0	105.1	0.0	0.0	23.7	61.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1982	2,052.2	549.6	525.8	0.0	0.0	313.5	13.1	4.9	43.6	37.0	556.6	7.8	0.0	0.0	0.4	0.0	0.0	0.0	0.0
1981	1,041.2	46.9	185.5	67.1	0.0	451.6	0.0	0.0	80.0	104.4	105.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1980	1,715.4	16.4	174.0	113.5	50.0	508.8	611.1	32.0	29.2	142.9	37.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	6,115.2	789.6	1,154.1	294.7	154.2	1,624.8	690.4	37.1	227.8	424.3	709.6	7.8	0.0	0.0	0.9	0.0	0.0	0.0	0.0
Percentage Shares	100.00%	12.9%	18.9%	4.8%	2.5%	26.6%	11.3%	0.6%	3.7%	6.9%	11.6%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
LOAN GUARANTEES - Actual Loan Guarantee Data by Energy Type ($Millions)																			
1989	144.5	9.5	4.8	0.0	8.9	11.3	0.0	0.0	0.0	0.9	109.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1988	56.0	1.0	0.0	0.0	18.5	8.4	0.0	0.0	0.0	0.0	28.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1987	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1986	88.0	0.0	9.0	54.6	0.0	0.0	0.0	0.0	0.0	24.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0
1985	429.8	40.0	115.0	0.0	0.0	119.0	59.3	0.0	0.0	0.0	8.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1984	655.0	1.9	13.2	10.2	0.0	8.8	0.0	0.0	0.0	0.0	279.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1983	607.6	0	38.5	17.9	0	33	205	0	0	0	0	0	0	0	0	0	0	0	0
1982	536.3	0.0	413.9	0.0	0.0	33.5	13.1	0.0	43.6	25.2	6.6	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0
1981	473.0	1.7	111.6	0.0	0.0	255.3	0.0	0.0	0.0	104.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1980	178.5	0.0	29.3	0.0	0.0	61.2	26.7	9.5	6.7	45.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	2,425.6	54.1	735.3	82.7	27.4	530.5	304.1	9.5	50.3	199.6	431.4	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0
Percentage Shares	100.00%	2.2%	30.3%	3.4%	1.1%	21.9%	12.5%	0.4%	2.1%	8.2%	17.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
SHARES OF ACCUMULATED DEFICITS, ANNUALIZED VALUE, FY 1989																			
LOW ESTIMATE																			
Energy Portion of:																			
Loan Defaults	53.9	7.0	10.2	2.6	1.4	14.3	6.1	0.3	2.0	3.7	6.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Interest Write-off	214.0	27.6	40.4	10.3	5.4	56.9	24.2	1.3	8.0	14.8	24.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Loan Weight Factor	100.00%	12.91%	18.87%	4.82%	2.52%	26.57%	11.29%	0.61%	3.73%	6.94%	11.60%	0.13%	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%
Guar.& Insurance																			
Defaults	16.8	0.4	5.1	0.6	0.2	3.7	2.1	0.1	0.3	1.4	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Guar. Wght. Fctr.	100.00%	2.23%	30.31%	3.41%	1.13%	21.87%	12.54%	0.39%	2.07%	8.23%	17.79%	0.00%	0.00%	0.00%	0.03%	0.00%	0.00%	0.00%	0.00%
Net. Int. Spread	140.3	7.6	20.7	5.8	1.5	40.5	14.4	0.6	5.0	8.8	35.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lines of Credit	9.5	1.2	1.8	0.5	0.2	2.5	1.1	0.1	0.4	0.7	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Low Est.	434.4	43.8	85.1	21.5	(0.0)	0.0	47.8	8.1	54.7	102.6	70.5	0.4	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Allocation of Mixed Categories					8.6	117.9													
HIGH ESTIMATE																			
Energy Portion of:																			
Loan Defaults	59.6	7.7	11.3	2.9	1.5	15.8	6.7	0.4	2.2	4.1	6.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Interest Write-off	271.0	35.0	51.1	13.1	6.8	72.0	30.6	1.6	10.1	18.8	31.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Loan Weight Factor	100.00%	12.91%	18.87%	4.82%	2.52%	26.57%	11.29%	0.61%	3.73%	6.94%	11.60%	0.13%	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%
Guar.& Insurance																			
Defaults	18.6	0.4	5.6	0.6	0.2	4.1	2.3	0.1	0.4	1.5	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Guar. Wght. Fctr.	100.00%	2.23%	30.31%	3.41%	1.13%	21.87%	12.54%	0.39%	2.07%	8.23%	17.79%	0.00%	0.00%	0.00%	0.03%	0.00%	0.00%	0.00%	0.00%
Net. Int. Spread	140.3	7.6	20.7	5.8	1.5	40.5	14.4	0.6	5.0	8.8	35.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lines of Credit	9.5	1.2	1.8	0.5	0.2	2.5	1.1	0.1	0.4	0.7	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Loan Weight Factor	100.00%	12.91%	18.87%	4.82%	2.52%	26.57%	11.29%	0.61%	3.73%	6.94%	11.60%	0.13%	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%
Total High Est.	498.9	51.9	98.7	24.9	(0.0)	(0.0)	55.1	9.4	62.7	117.6	78.1	0.5	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Allocation of Mixed Categories					10.2	134.9													

EXPORT-IMPORT BANK: ENERGY LOANS AND GUARANTEES

LOAN MIX (Actual Loans & Guarantees Approved, in $Millions)

Country	Amount (Millions) (1)	Type (2)	Rate (3)	Effect. Ann. Rt (4)	Semi-Ann. Payments (5)	Start Year (6)	Earliest End Year (7)	Ex-Im Spread (8)	Ann. Int. Subsid. ($Mils) (9)	Coal	Oil	Gas	Oil&Gas Mixed	Electric. Fossil	Electric. Fission	Electric. Oil	Electric. Coal	Electric. Gas	Electric. Hydro	Effic.- Supply	Biomass	Wind	Solar	Geotherm.	Effic.- End-Use	Other Renew.	Fusion
1991 FISCAL YEAR SUMMARY																											
TOTAL ACTIVITY					ENERGY ACTIVITY																						
Tot. New Loans					Tot. Direct Loans		155.7	(DL+IG+IO+LG)																			
Tot. Guar.					Total Loan Guar.		347.3	(GO+IG+LG)																			
Tot. Insur. Auth.					Total Energy		503																				
TOTAL AUTHOR			N/A		Egy Lns/Tot. Lns																						
WACC in FY91			6.48%		Egy Guar/Tot. Guar.																						
Algeria	13.2	DL	9.15%	9.36%	10		1996	2.88%	0.00					13.2													
China (Mainland)	6.2	DL	8.30%	8.47%	20		2001	1.99%	0.00					6.2													
Algeria	5.1	DL	10.05%	10.30%	10		1996	3.82%	0.00		5.1																
Algeria	2.5	DL	9.15%	9.36%	10		1996	2.88%	0.00		2.5																
Philippines	1.6	DL	9.20%	9.41%	14		1998	2.93%	0.00										1.6								
Total 'DL'	28.6	28.6								0	7.6	0	0	19.4	0	0	0	0	1.6	0	0	0	0	0	0	0	0
Algeria	95.6	GO	LIB+.5	0.00%	10		1996	0.00%	0.00		95.6																
Algeria	45	GO	7.65%	7.80%	10		1996	0.00%	0.00		45																
Colombia	25	GO	LIB+.75	0.00%	10		1996	0.00%	0.00		25																
Mexico	17.9	GO	?	0.00%	20		2001	0.00%	0.00	17.9																	
Mexico	11.3	GO	LIB+.375	0.00%	10		1996	0.00%	0.00															11.3			
Turkey	8.4	GO	?	0.00%	12		1997	0.00%	0.00	8.4																	
Algeria	5	GO	9.24%	9.45%	10		1996	0.00%	0.00		5																
Poland	3.1	GO	?	0.00%	10		1996	0.00%	0.00					3.1													
Algeria	3	GO	10.50%	10.78%	10		1996	0.00%	0.00		3																
Poland	2.6	GO	?	0.00%	10		1996	0.00%	0.00					2.6													
Algeria	2.6	GO	9.24%	9.45%	10		1996	0.00%	0.00		2.6																
Mexico	1.9	GO	9.15%	9.36%	10		1996	0.00%	0.00					1.9													
Canada	1.6	GO	LIB+1.25	0.00%	6		1994	0.00%	0.00		1.6																
Colombia	1.6	GO	LIB+.75	0.00%	10		1996	0.00%	0.00		1.6																
Brazil	1.3	GO	LIB+.88%	0.00%	10		1996	0.00%	0.00					1.3													
Mexico	1.1	GO	10.05%	10.30%	10		1996	0.00%	0.00					1.1													
Mexico	0.7	GO	?	0.00%	10		1996	0.00%	0.00										0.7								
Algeria	0.6	GO	LIB+1.5	0.00%	10		1996	0.00%	0.00		0.6																
Total 'GO'	228.3	228.3					1991			26.3	180	0	0	10	0	0	0	0	0.7	0	0	0	0	11.3	0	0	0
Algeria	8.3	IG	9.55%	9.78%	10		1996	3.29%	0.00		8.3																
Algeria	7.7	IG	9.55%	9.78%	10		1996	3.29%	0.00		7.7																
Algeria	7.6	IG	9.55%	9.78%	10		1996	3.29%	0.00		7.6																
Algeria	7	IG	9.55%	9.78%	10		1996	3.29%	0.00		7																
Algeria	7	IG	9.55%	9.78%	10		1996	3.29%	0.00		7																
Algeria	6.8	IG	9.55%	9.78%	10		1996	3.29%	0.00		6.8																
Algeria	5.9	IG	9.55%	9.78%	10		1996	3.29%	0.00		5.9																
Algeria	5.7	IG	9.55%	9.78%	10		1996	3.29%	0.00		5.7																
Algeria	5.4	IG	9.55%	9.78%	10		1996	3.29%	0.00		5.4																
Algeria	4.9	IG	9.05%	9.25%	10		1996	2.77%	0.00		4.9																
Algeria	4.1	IG	9.05%	9.25%	10		1996	2.77%	0.00		4.1																
Algeria	3.3	IG	8.15%	8.32%	10		1996	1.83%	0.00									3.3									
Algeria	3.1	IG	8.15%	8.32%	10		1996	1.83%	0.00									3.1									
Algeria	3	IG	9.05%	9.25%	10		1996	2.77%	0.00		3																
Venezuela	2.5	IG	8.15%	8.32%	10		1996	1.83%	0.00										2.5								

EXPORT-IMPORT BANK: ENERGY LOANS AND GUARANTEES

LOAN MIX (Actual Loans & Guarantees Approved, in $Millions)

Country	Amount (Millions) (1)	Type (2)	Rate (3)	Effect. Ann. Rt. (4)	Semi-Ann. Payments (5)	Start Year (6)	Earliest End Year (7)	Ex-Im Spread (8)	Ann. Int. Subsid. ($Mils) (9)	Coal	Oil	Gas	Oil&Gas Mixed	Electric Fossil	Electric Fission	Electric Oil	Electric Coal	Electric Gas	Electric Hydro	Effic.- Supply	Biomass	Wind	Solar	Geotherm.	Effic.- End-Use	Other Renew.	Fusion
Algeria	2.6	IG	9.05%	9.25%	10		1996	2.77%	0.00		2.6																
Algeria	2.4	IG	8.15%	8.32%	10		1996	1.83%	0.00		2.4																
Algeria	1.9	IG	9.05%	9.25%	10		1996	2.77%	0.00		1.9																
Algeria	1.8	IG	8.15%	8.32%	10		1996	1.83%	0.00		1.8																
Algeria	1.8	IG	9.05%	9.25%	10		1996	2.77%	0.00					1.8													
Algeria	1.7	IG	8.15%	8.32%	10		1996	1.83%	0.00		1.7																
Algeria	1.5	IG	8.15%	8.32%	10		1996	1.83%	0.00		1.5																
Algeria	1.5	IG	9.05%	9.25%	10		1996	2.77%	0.00		1.5																
Algeria	1.5	IG	9.05%	9.25%	10		1996	2.77%	0.00		1.5																
Algeria	1.5	IG	9.05%	9.25%	10		1996	2.77%	0.00		1.5																
Algeria	1.5	IG	8.15%	8.32%	10		1996	1.83%	0.00		1.5																
Algeria	1.4	IG	8.15%	8.32%	10		1996	1.83%	0.00		1.4																
Algeria	1.3	IG	8.15%	8.32%	10		1996	1.83%	0.00		1.3																
Algeria	1.2	IG	8.15%	8.32%	10		1996	1.83%	0.00		1.2																
Algeria	1	IG	9.05%	9.25%	10		1996	2.77%	0.00		1																
Algeria	0.9	IG	8.55%	8.73%	10		1996	2.25%	0.00		0.9																
Algeria	0.8	IG	8.55%	8.73%	10		1996	2.25%	0.00		0.8																
Algeria	0.8	IG	8.55%	8.73%	10		1996	2.25%	0.00		0.8																
Algeria	0.7	IG	8.55%	8.73%	10		1996	2.25%	0.00		0.7																
Algeria	0.7	IG	7.65%	7.80%	10		1996	1.31%	0.00		0.7																
Algeria	0.6	IG	7.65%	7.80%	10		1996	1.31%	0.00										0.6								
Algeria	0.6	IG	7.65%	7.80%	10		1996	1.31%	0.00		0.6																
Algeria	0.6	IG	7.65%	7.80%	10		1996	1.31%	0.00		0.6																
Algeria	0.6	IG	8.55%	8.73%	10		1996	2.25%	0.00		0.6																
Algeria	0.5	IG	7.65%	7.80%	10		1996	1.31%	0.00										0.5								
Algeria	0.5	IG	7.65%	7.80%	10		1996	1.31%	0.00		0.5																
Algeria	0.4	IG	7.65%	7.80%	10		1996	1.31%	0.00		0.4																
Algeria	0.4	IG	8.55%	8.73%	10		1996	2.25%	0.00		0.4																
Algeria	0.3	IG	7.65%	7.80%	10		1996	1.31%	0.00		0.3																
Algeria	0.3	IG	8.55%	8.73%	10		1996	2.25%	0.00		0.3																
Algeria	0.3	IG	8.55%	8.73%	10		1996	2.25%	0.00		0.3																
Algeria	0.3	IG	7.65%	7.80%	10		1996	1.31%	0.00		0.3																
Algeria	0.3	IG	8.55%	8.73%	10		1996	2.25%	0.00		0.3																
Total IG	116.5		116.5				1991 -			0	104.7	0	0	1.8	0	0	0	7.5	2.5	0	0	0	0	0	0	0	0
Mexico	1.6	IO	9.05%	9.25%	10		1996	2.77%	0.00					1.6													
Mexico	1	IO	7.65%	7.80%	10		1996	1.31%	0.00										1								
Mexico	0.9	IO	7.65%	7.80%	10		1996	1.31%	0.00										0.9								
Mexico	0.9	IO	8.55%	8.73%	10		1996	2.25%	0.00					0.9													
Mexico	0.8	IO	7.65%	7.80%	10		1996	1.31%	0.00										0.8								
Mexico	0.7	IO	7.65%	7.80%	10		1996	1.31%	0.00					0.7													
Mexico	0.7	IO	7.65%	7.80%	10		1996	1.31%	0.00					0.7													
Mexico	0.6	IO	8.55%	8.73%	10		1996	2.25%	0.00										0.6								
Mexico	0.4	IO	8.55%	8.73%	10		1996	2.25%	0.00										0.4								
Mexico	0.3	IO	7.65%	7.80%	10		1996	1.31%	0.00										0.3								
Mexico	0.3	IO	7.65%	7.80%	10		1996	1.31%	0.00										0.3								
Mexico	0.3	IO	8.55%	8.73%	10		1996	2.25%	0.00					0.3													
Mexico	0.3	IO	7.65%	7.80%	10		1996	1.31%	0.00					0.3													
Mexico	0.2	IO	7.65%	7.80%	10		1996	1.31%	0.00					0.2													

EXPORT-IMPORT BANK: ENERGY LOANS AND GUARANTEES

LOAN MIX (Actual Loans & Guarantees Approved, in $Millions)

Country	Amount (Millions) (1)	Type (2)	Rate (3)	Effect. Ann. Rt. (4)	Semi-Ann. Payments (5)	Start Year (6)	Earliest End Year (7)	Ex-Im Spread (8)	Ann. Int. Subsid. ($Mils) (9)	Coal	Oil	Gas	Oil&Gas Mixed	Electric. Fossil	Electric. Fission	Electric. Oil	Electric. Coal	Electric. Gas	Electric. Hydro	Effic.- Supply	Biomass	Wind	Solar	Geotherm.	Effic.- End-Use	Other Renew.	Fusion
Mexico	0.2	IO	7.65%	7.80%	10		1996	1.31%	0.00					0.2													
Total 'IO'	9.2	9.2					1991	-		0.0	0.0	0.0	0.0	4.9	0.0	0.0	0.0	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Algeria	1	LG	8.55%	8.73%	10		1996	2.25%	0.00				1														
Algeria	0.4	LG	7.65%	7.80%	10		1996	1.31%	0.00				0.4														
Total 'LG'	1.4	1.4								0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1991 Energy Mix Summary	Check																										
Direct Loans	155.7	155.7								0	112.3	0	1.4	26.1	0	0	0	11.8	4.1	0	0	0	0	0	0	0	0
Loan Guarantees	348.7	348.7								26.3	287.2	0	1.4	11.8	0	0	0	7.5	3.2	0	0	0	0	11.3	0	0	0

1990 FISCAL YEAR SUMMARY

TOTAL ACTIVITY		ENERGY ACTIVITY		
Tot. new loans	614.1	Tot. Energy Loans	221.7	(DL+IG+IO+LG+MC)
Tot. Guar. .	3,332.7	Tot. Energy Guar.	279.7	(GO+IG+LG+MC)
Tot. Insur. Auth.	4,841.1	Tot. Energy	501.4	
TOTAL AUTHOR.	8,787.9	Egy Lns/Tot Lns	36.10%	
WACC in FY 90	8.19%	Egy Guar/Tot. Guar	8.39%	

Indonesia	98.6	DL	8.30%	8.47%	20		2000	0.28%	0.00				9.8				98.6										
China (Mainland)	9.8	DL	8.30%	8.47%	20		2000	0.28%	0.00																		
Total 'DL'	108.4	108.4								0.0	0.0	0.0	9.8		0.0	0.0	98.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mexico	85	GO	LIB+.375	0.00%	10		1995	0.00%	0.00					85													
Israel	35.8	GO	?	0.00%	17		1999	0.00%	0.00									35.8									
Venezuala	32.1	GO	LIB+.5	0.00%	14		1997	0.00%	0.00										32.1								
Colombia	24.2	GO	9.65%	9.88%	20		2000	0.00%	0.00				24.2														
Venezuala	9.5	GO	9.40%	9.62%	17		1999	0.00%	0.00		9.5																
Algeria	7.3	GO	9.15%	9.36%	10		1995	0.00%	0.00					7.3													
Mexico	3.6	GO	LIB+.38	0.00%	10		1995	0.00%	0.00										3.6								
Algeria	0.2	GO	LIB+.375	0.00%	6		1993	0.00%	0.00		0.2																
Total 'GO'	197.7	197.7								0.0	9.7	0.0	24.2	92.3	0.0	0.0	0.0	35.8	35.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Algeria	6.5	IG	8.65%	8.84%	10		1995	0.64%	0.00									6.5									
Algeria	6	IG	8.65%	8.84%	10		1995	0.64%	0.00									6									
Algeria	4.4	IG	8.15%	8.32%	10		1995	0.12%	0.00				4.4														
Algeria	3.3	IG	8.15%	8.32%	10		1995	0.12%	0.00				3.3														
Algeria	2.1	IG	9.05%	9.25%	10		1995	1.06%	0.00				2.1														
Algeria	1.8	IG	9.15%	9.36%	10		1995	1.17%	0.00					1.8													
Algeria	1.1	IG	8.15%	8.32%	10		1995	0.12%	0.00				1.1														
Algeria	1.3	IG	8.15%	8.32%	10		1995	0.12%	0.00				1.3														
Algeria	0.9	IG	7.65%	7.80%	10		1995	-0.40%	(0.00)		0.9																
Algeria	0.9	IG	7.65%	7.80%	10		1995	-0.40%	(0.00)				0.9														
Algeria	0.8	IG	7.65%	7.80%	10		1995	-0.40%	(0.00)				0.8														
Algeria	0.7	IG	7.65%	7.80%	10		1995	-0.40%	(0.00)				0.7														
Algeria	0.6	IG	7.65%	7.80%	10		1995	-0.40%	(0.00)		0.6																
Algeria	0.6	IG	7.65%	7.80%	10		1995	-0.40%	(0.00)																		
Algeria	0.6	IG	7.65%	7.80%	10		1995	-0.40%	(0.00)		0.6												0.6				
Algeria	0.5	IG	7.65%	7.80%	10		1995	-0.40%	(0.00)				0.5														
Algeria	0.5	IG	7.65%	7.80%	10		1995	-0.40%	(0.00)									0.5									

EXPORT-IMPORT BANK: ENERGY LOANS AND GUARANTEES

LOAN MIX (Actual Loans & Guarantees Approved, In $Millions)

Country	Amount (Millions) (1)	Type (2)	Rate (3)	Effect. Ann. Rt. (4)	Semi-Ann. Payments (5)	Start Year (6)	Earliest End Year (7)	Ex-Im Spread (8)	Ann. Int. Subsid. ($Mils) (9)	Coal	Oil	Gas	Oil&Gas Mixed	Electric. Fossil	Electric. Fission	Electric. Oil	Electric. Coal	Electric. Gas	Electric. Hydro	Effic.- Supply	Biomass	Wind	Solar	Geotherm.	Effic.- End-Use	Other Renew.	Fusion
Algeria	0.5	IG	7.65%	7.80%	10		1995	-0.40%	(0.00)				0.5														
Algeria	0.5	IG	7.65%	7.80%	10		1995	-0.40%	(0.00)					0.5													
Algeria	0.4	IG	7.65%	7.80%	10		1995	-0.40%	(0.00)				0.4														
Algeria	0.3	IG	7.65%	7.80%	10		1995	-0.40%	(0.00)				0.3														
Algeria	0.3	IG	7.65%	7.80%	10		1995	-0.40%	(0.00)				0.3														
Algeria	0.2	IG	7.65%	7.80%	6		1993	-0.40%	(0.00)		0.2																
Total 'IG'	34.8	34.8						-	-	0.0	2.3	0.0	16.6	2.3	0.0	0.0	0.0	13.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0
Mexico	5.7	IO	8.65%	8.84%	10		1995	0.64%	0.00									5.7									
Mexico	4.7	IO	8.15%	8.32%	10		1995	0.12%	0.00					4.7													
Mexico	3.1	IO	7.85%	8.00%	10		1995	-0.19%	(0.01)									3.1									
Mexico	2.3	IO	8.15%	8.32%	10		1995	0.12%	0.00									2.3									
Mexico	2.1	IO	9.05%	9.25%	10		1995	1.06%	0.00					2.1													
Mexico	1.7	IO	8.15%	8.32%	10		1995	0.12%	0.00					1.7													
Mexico	1.4	IO	8.15%	8.32%	10		1995	0.12%	0.00					1.4													
Mexico	1	IO	7.65%	7.80%	10		1995	-0.40%	(0.00)					1													
Mexico	1	IO	8.15%	8.32%	10		1995	0.12%	0.00					1													
Mexico	0.7	IO	7.65%	7.80%	10		1995	-0.40%	(0.00)					0.7													
Israel	0.6	IO	7.21%	7.34%	10		1995	-0.85%	(0.01)					0.6													
Mexico	0.6	IO	7.65%	7.80%	10		1995	-0.40%	(0.00)					0.6													
Mexico	0.5	IO	7.65%	7.80%	10		1995	-0.40%	(0.00)									0.5									
Mexico	0.5	IO	7.65%	7.80%	10		1995	-0.40%	(0.00)					0.5													
Mexico	0.4	IO	7.65%	7.80%	10		1995	-0.40%	(0.00)									0.4									
Mexico	0.4	IO	7.65%	7.80%	10		1995	-0.40%	(0.00)					0.4													
Mexico	0.4	IO	7.65%	7.80%	10		1995	-0.40%	(0.00)					0.4													
Mexico	0.4	IO	7.65%	7.80%	10		1995	-0.40%	(0.00)					0.4													
Mexico	0.3	IO	7.65%	7.80%	10		1995	-0.40%	(0.00)									0.3									
Mexico	0.3	IO	7.65%	7.80%	10		1995	-0.40%	(0.00)					0.3													
Mexico	0.3	IO	7.65%	7.80%	10		1995	-0.40%	(0.00)					0.3													
Mexico	0.3	IO	7.65%	7.80%	10		1995	-0.40%	(0.00)					0.3													
Israel	0.3	IO	7.37%	7.51%	10		1995	-0.69%	(0.00)					0.3													
Mexico	0.2	IO	7.65%	7.80%	10		1995	-0.40%	(0.00)									0.2									
Mexico	0.2	IO	7.65%	7.80%	4		1992	-0.40%	(0.00)		0.2																
Mexico	0.2	IO	7.65%	7.80%	10		1995	-0.40%	(0.00)					0.2													
Mexico	0.2	IO	7.65%	7.80%	10		1995	-0.40%	(0.00)					0.2													
Mexico	0.2	IO	7.65%	7.80%	10		1995	-0.40%	(0.00)					0.2													
Mexico	0.2	IO	7.65%	7.80%	10		1995	-0.40%	(0.00)					0.2													
Mexico	0.2	IO	7.65%	7.80%	10		1995	-0.40%	(0.00)				0.2														
Mexico	0.2	IO	7.65%	7.80%	10		1995	-0.40%	(0.00)					0.2													
Total 'IO'	31.3	31.3						-	-	0.0	0.2	0.0	0.2	18.4	0.0	0.0	0.0	12.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Uruguay	35.9	MC	0.0967 PE	0.00%	20		2000	-	0.00					35.9													
Sudan	11.3	MC	0.25%	0.25%	20		2000	-7.94%	(0.90)					11.3													
Total 'MC'	47.2									0.0	0.0	0.0	0.0	47.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1990 Energy Mix Summary		Check																									
Direct Loans	221.7	221.7								0	2.5	0	26.6	67.9	0	0	98.6	25.5	0	0	0	0	0.6	0	0	0	0
Loan Guarantees	279.7	279.7								0	12	0	40.8	141.8	0	0	0	48.8	35.7	0	0	0	0.6	0	0	0	0

EXPORT-IMPORT BANK: ENERGY LOANS AND GUARANTEES

LOAN MIX (Actual Loans & Guarantees Approved, in $Millions)

Country	Amount (Millions) (1)	Type (2)	Rate (3)	Effect. Ann. Rt. (4)	Semi-Ann. Payments (5)	Start Year (6)	Earliest End Year (7)	Ex-Im Spread (8)	Ann. Int. Subsid. ($Mils) (9)	Coal	Oil	Gas	Oil&Gas Mixed	Electric. Fossil	Electric. Fission	Electric. Oil	Electric. Coal	Electric. Gas	Electric. Hydro	Effic.- Supply	Biomass	Wind	Solar	Geotherm.	Effic.- End-Use	Other Renew.	Fusion
1989 FISCAL YEAR SUMMARY																											
TOTAL ACTIVITY				**ENERGY ACTIVITY**																							
Tot. new loans	718.8			Tot. Energy Loans	96.1	(DL+IG+IO																					
Tot. Guar.	1,292.2			Tot. Energy Guar.	144.5	(GO+IG)																					
Tot. Insur. Auth.	4,344.8			Tot. Energy	240.6																						
TOTAL AUTH.	6,355.8			Energy as % Tot. Lns	13.38%																						
WACC IN FY89	9.01%			Egy. Guar/Tot. Ins.+Guar.	11.18%																						
LOAN DURATION PORTFOLIO																											
Total Loans Receivable ($billion)																											
% Due Through End of FY88	0.0%																										
Authorized Loans Not Yet Disbursed																											
% of Rec.+Author. Due through End of FY88	0.0%																										
Algeria	33.9	DL	9.15%	9.36%	10		1994	0.35%	0.00				33.9														
Thailand	10.4	DL	8.00%	8.16%	24		2001	-0.85%	(0.09)					10.4													
Israel	0.2	DL	8.67%	8.86%	10		1994	-0.15%	(0.00)					0.2													
Total 'DL'	44.5									0.0	0.0	0.0	33.9	10.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Venezuala	103.7	GO	9.89%	10.13%	17		1998	0.00%	0.00										103.7								
Brazil	5.4	GO	9.00%	9.20%	10		1994	0.00%	0.00										5.4								
Brazil	3.1	GO	LIB+.625	0.00%	10		1994	0.00%	0.00				3.1														
Yugoslavia	3.1	GO	LIB+1	0.00%	10		1994	0.00%	0.00	3.1																	
Yugoslavia	3	GO	LIB+1	0.00%	10		1994	0.00%	0.00	3																	
Brazil	2.6	GO	7.50%	7.64%	10		1994	0.00%	0.00					2.6													
Venezuala	2.5	GO	LIB+1	0.00%	10		1994	0.00%	0.00					2.5													
Brazil	2.1	GO	LIB+1.25	0.00%	10		1994	0.00%	0.00		2.1																
Colombia	0.9	GO	LIB+.5	0.00%	10		1994	0.00%	0.00									0.9									
Total 'GO'	126.4									6.1	2.1	0.0	3.1	5.1	0.0	0.0	0.0	0.9	109.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Venezuala	3.1	IG	8.15%	8.32%	10		1994	-0.70%	(0.02)					3.1													
Yugoslavia	2.3	IG	8.15%	8.32%	10		1994	-0.70%	(0.02)	2.3																	
Algeria	2.2	IG	8.15%	8.32%	10		1994	-0.70%	(0.02)					2.2													
Algeria	2	IG	8.15%	8.32%	10		1994	-0.70%	(0.01)		2																
Algeria	1.6	IG	8.15%	8.32%	10		1994	-0.70%	(0.01)				1.6														
Yugoslavia	1.1	IG	7.25%	7.38%	10		1994	-1.63%	(0.02)	1.1																	
Algeria	1.1	IG	8.15%	8.32%	10		1994	-0.70%	(0.01)				1.1														
Israel	0.9	IG	8.19%	8.36%	10		1994	-0.65%	(0.01)					0.9													
Brazil	0.7	IG	7.65%	7.80%	10		1994	-1.22%	(0.01)		0.7																
Algeria	0.7	IG	7.65%	7.80%	6		1992	-1.22%	(0.01)				0.7														
Algeria	0.5	IG	7.65%	7.80%	10		1994	-1.22%	(0.01)				0.5														
Algeria	0.5	IG	7.65%	7.80%	10		1994	-1.22%	(0.01)				0.5														
Algeria	0.4	IG	7.35%	7.49%	6		1992	-1.53%	(0.01)				0.4														
Algeria	0.4	IG	7.65%	7.80%	10		1994	-1.22%	(0.00)				0.4														
Algeria	0.4	IG	7.35%	7.49%	6		1992	-1.53%	(0.01)				0.4														
Algeria	0.2	IG	7.65%	7.80%	10		1994	-1.22%	(0.00)				0.2														
Total 'IG'	18.1									3.4	2.7	0.0	5.8	6.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hong Kong	9.6	IO	8.65%	8.84%	10		1994	-0.17%	(0.02)								9.6										
Mexico	4.1	IO	8.15%	8.32%	10		1994	-0.70%	(0.03)									4.1									
Mexico	3.2	IO	8.15%	8.32%	10		1994	-0.70%	(0.02)					3.2													
Mexico	2.4	IO	7.85%	8.00%	10		1994	-1.01%	(0.02)									2.4									
Israel	2.3	IO	7.85%	8.00%	10		1994	-1.01%	(0.02)									2.3									
Mexico	1.6	IO	8.41%	8.59%	10		1994	-0.42%	(0.01)										1.6								
Mexico	1.3	IO	7.85%	8.00%	10		1994	-1.01%	(0.01)					1.3													
Mexico	1.1	IO	8.15%	8.32%	10		1994	-0.70%	(0.01)					1.1													

EXPORT-IMPORT BANK: ENERGY LOANS AND GUARANTEES

Country	Amount (Millions) (1)	Type (2)	Rate (3)	Effect Am. Rt. (4)	Semi-Ann. Payments (5)	Start Year (6)	Earliest End Year (7)	Ex-Im Spread (8)	Ann. Int. Subsid. ($Mils) (9)
Mexico	0.9	IO	7.65%	7.80%	10		1994	-1.22%	(0.01)
Mexico	0.7	IO	7.65%	7.80%	10		1994	-1.22%	(0.01)
Israel	0.7	IO	7.69%	7.84%	10		1994	-1.17%	(0.01)
Mexico	0.6	IO	7.65%	7.80%	10		1994	-1.22%	(0.01)
Mexico	0.5	IO	7.35%	7.49%	10		1994	-1.53%	(0.01)
Israel	0.4	IO	8.70%	8.89%	10		1994	-0.12%	(0.00)
Israel	0.4	IO	8.55%	8.73%	10		1994	-0.28%	(0.00)
Mexico	0.4	IO	7.65%	7.80%	10		1994	-1.22%	(0.00)
Mexico	0.4	IO	7.65%	7.80%	10		1994	-1.22%	(0.00)
Mexico	0.3	IO	7.65%	7.80%	10		1994	-1.22%	(0.00)
Mexico	0.3	IO	7.65%	7.80%	10		1994	-1.22%	(0.00)
Mexico	0.3	IO	7.65%	7.80%	10		1994	-1.22%	(0.00)
Mexico	0.3	IO	7.65%	7.80%	10		1994	-1.22%	(0.00)
Mexico	0.3	IO	7.65%	7.80%	10		1994	-1.22%	(0.00)
Mexico	0.3	IO	7.65%	7.80%	10		1994	-1.22%	(0.00)
Mexico	0.3	IO	7.65%	7.80%	10		1994	-1.22%	(0.00)
Israel	0.2	IO	8.09%	8.25%	10		1994	-0.76%	(0.00)
Israel	0.2	IO	7.91%	8.07%	10		1994	-0.94%	(0.00)
Mexico	0.2	IO	7.65%	7.80%	10		1994	-1.22%	(0.00)
Mexico	0.2	IO	7.65%	7.80%	8		1993	-1.22%	(0.00)
Mexico	0.05	IO	7.65%	7.80%	10		1994	-1.22%	(0.00)
Total 'IO'	33.5								
1989 Energy Mix Summary		Check							
Loans	96.1	96.1							
Guarantees	144.5	144.5							
Algeria	8.7	DL	8.25%	8.42%	10		1993	-0.86%	(0.07)
Algeria	7.4	DL	8.75%	8.94%	20		1998	-0.33%	(0.02)
Cote d'Ivoire	2.1	DL	8.25%	8.42%	10		1993	-0.86%	(0.02)
Algeria	1.1	DL	9.15%	9.36%	10		1993	0.08%	0.00
Total 'DL'	19.3							-	
Venezuela	28.1	GO	PR.+1.12	0.00%	14		1995	-	0.00
Yugoslavia	6.3	GO	LIB+.63	0.00%	10		1993	-	0.00
Total 'GO'	34.4							-	
Algeria	3.4	IG	7.25%	7.38%	10		1993	-1.89%	(0.06)
Algeria	2.8	IG	7.25%	7.38%	10		1993	-1.89%	(0.05)
Algeria	2.7	IG	7.25%	7.38%	10		1993	-1.89%	(0.05)
Algeria	2.3	IG	7.25%	7.38%	10		1993	-1.89%	(0.04)

LOAN MIX (Actual Loans & Guarantees Approved, in $Millions)

Country	Coal	Oil	Gas	Oil&Gas Mixed	Electric Fossil	Electric Fission	Electric Oil	Electric Coal	Electric Gas	Electric Hydro	Effic.-Supply	Biomass	Wind	Solar	Geotherm.	Effic.-End-Use	Other Renew.	Fusion
Mexico					0.9													
Mexico					0.7													
Israel					0.7													
Mexico					0.6													
Mexico					0.5													
Israel					0.4													
Israel					0.4													
Mexico					0.4													
Mexico					0.4													
Mexico					0.3													
Mexico					0.3													
Mexico					0.3													
Mexico					0.3													
Mexico					0.3													
Mexico					0.3													
Mexico					0.3													
Israel							0.2											
Israel					0.2													
Mexico					0.2													
Mexico					0.2													
Mexico					0.049													
Total 'IO'	0.0	0.0	0.0	0.0	13.3	0.0	0.2	9.6	8.8	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Loans	3.4	2.7	0.0	39.7	30.1	0.0	0.2	9.6	8.8	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Guarantees	9.5	4.8	0.0	8.9	11.3	0.0	0.0	0.0	0.9	109.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Algeria				8.7														
Algeria									7.4									
Cote d'Ivoire					2.1													
Algeria				1.1														
Total 'DL'	0.0	0.0	0.0	9.8	2.1	0.0	0.0	0.0	7.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Venezuela										28.1								
Yugoslavia					6.3													
Total 'GO'	0.0	0.0	0.0	0.0	6.3	0.0	0.0	0.0	0.0	28.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Algeria				3.4														
Algeria				2.8														
Algeria				2.7														
Algeria				2.3														

1988 FISCAL YEAR SUMMARY

TOTAL ACTIVITY		ENERGY ACTIVITY			LOAN DURATION PORTFOLIO	
Tot. new loans	685.3	Tot. Energy Loans	193.7	(DL+IG+IO+MC)	Total Loans Receivable ($billion)	9.9
Tot. Guar.	801.0	Tot. Energy Guar.	56.0	(GO+IG)	% Due Through End of FY88	7.2%
Tot. Insur. Auth.	5,133.6	Tot. Energy	249.7		Authorized Loans Not Yet Disbursed	1.9
TOTAL AUTH.	6,419.9	Egy Loans/Tot. Loans	28.26%		% of Rec.+ Author. Due through End of FY88	6.1%
WACC IN FY88	9.28%	Egy Guar/Tot. Guar	9.32%		(1988 Ann. Rept., p. 30)	
					Pct. Portfolio Remaining in FY89	93.9%

EXPORT-IMPORT BANK: ENERGY LOANS AND GUARANTEES

LOAN MIX (Actual Loans & Guarantees Approved, in $Millions)

Country	Amount (Millions) (1)	Type (2)	Rate (3)	Effect. Ann. Rt (4)	Semi-Ann. Payments (5)	Start Year (6)	Earliest End Year (7)	Ex-Im Spread (8)	Ann. Int. Subsid. ($Mils) (9)	Coal	Oil	Gas	Oil&Gas Mixed	Electric. Fossil	Electric. Fission	Electric. Oil	Electric. Coal	Electric. Gas	Electric. Hydro	Elec.- Supply	Biomass	Wind	Solar	Geotherm.	Elec.- End-Use	Other Renew.	Fusion
Argentina	2.2	IG	7.25%	7.38%	10		1993	-1.89%	(0.04)				2.2														
Jamaica	2.1	IG	7.25%	7.38%	10		1993	-1.89%	(0.04)					2.1														
Algeria	1.7	IG	7.25%	7.38%	10		1993	-1.89%	(0.03)				1.7														
Algeria	1.1	IG	7.25%	7.38%	10		1993	-1.89%	(0.02)				1.1														
Yugoslavia	1	IG	8.85%	9.05%	6		1991	-0.23%	(0.00)	1																	
Algeria	1	IG	7.85%	8.00%	10		1993	-1.27%	(0.01)				1														
Algeria	0.9	IG	6.75%	6.86%	10		1993	-2.41%	(0.02)				0.9														
Argentina	0.2	IG	7.35%	7.49%	6		1991	-1.79%	(0.00)				0.2														
Algeria	0.2	IG	7.35%	7.49%	8		1992	-1.79%	(0.00)				0.2														
Total 1G	21.6									1	0	0	18.5	2.1	0	0	0	0	0	0	0	0	0	0	0	0	0
Israel	2.1	IO	9.15%	9.36%	10		1993	0.06%	0.00									2.1									
Mexico	1.5	IO	8.15%	8.32%	10		1993	-0.96%	(0.01)					1.5													
Mexico	1.4	IO	7.85%	8.00%	10		1993	-1.27%	(0.02)									1.4									
Israel	1.2	IO	9.15%	9.36%	10		1993	0.06%	0.00					1.2													
Mexico	1	IO	7.25%	7.38%	10		1993	-1.89%	(0.02)					1													
Mexico	0.9	IO	7.65%	7.80%	10		1993	-1.48%	(0.01)					0.9													
Mexico	0.7	IO	6.75%	6.86%	10		1993	-2.41%	(0.02)					0.7													
Israel	0.5	IO	8.65%	8.84%	10		1993	-0.44%	(0.00)					0.5													
Mexico	0.5	IO	7.65%	7.80%	10		1993	-1.48%	(0.01)															0.5			
Mexico	0.4	IO	7.35%	7.49%	10		1993	-1.79%	(0.01)					0.4													
Mexico	0.4	IO	7.35%	7.49%	10		1993	-1.79%	(0.01)					0.4													
Mexico	0.4	IO	7.65%	7.80%	10		1993	-1.48%	(0.01)					0.4													
Israel	0.3	IO	8.05%	8.21%	10		1993	-1.06%	(0.00)					0.3													
Mexico	0.3	IO	6.75%	6.86%	10		1993	-2.41%	(0.01)					0.3													
Israel	0.3	IO	8.05%	8.21%	10		1993	-1.06%	(0.00)					0.3													
Israel	0.2	IO	8.65%	8.84%	10		1993	-0.44%	(0.00)					0.2													
Mexico	0.2	IO	7.65%	7.80%	10		1993	-1.48%	(0.00)					0.2													
Israel	0.2	IO	8.05%	8.21%	10		1993	-1.06%	(0.00)					0.2													
Israel	0.2	IO	8.05%	8.21%	10		1993	-1.06%	(0.00)					0.2													
Israel	0.2	IO	8.05%	8.21%	10		1993	-1.06%	(0.00)					0.2													
Mexico	0.1	IO	6.75%	6.86%	8		1992	-2.41%	(0.00)					0.1													
Total 1O	13.0									0.0	0.0	0.0	0.0	9.0	0.0	0.0	0.0	3.5	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0
China (Mainland)	128.4	OT	7.40%	7.54%	20		1998	-1.74%	(2.23)					128.4													
Mexico	1.4	OT	7.25%	7.38%	10		1993	-1.89%	(0.03)					1.4													
Mexico	1.4	OT	7.25%	7.38%	10		1993	-1.89%	(0.03)					1.4													
Mexico	0.7	OT	7.35%	7.49%	10		1993	-1.79%	(0.01)					0.7													
Mexico	0.7	OT	7.35%	7.49%	10		1993	-1.79%	(0.01)					0.7													
Mexico	0.7	OT	7.35%	7.49%	10		1993	-1.79%	(0.01)					0.7													
Mexico	0.7	OT	7.35%	7.49%	10		1993	-1.79%	(0.01)					0.7													
Mexico	0.6	OT	7.35%	7.49%	10		1993	-1.79%	(0.01)					0.6													
Mexico	0.5	OT	6.75%	6.86%	10		1993	-2.41%	(0.01)					0.5													
Mexico	0.5	OT	6.75%	6.86%	10		1993	-2.41%	(0.01)					0.5													
Mexico	0.5	OT	6.75%	6.86%	10		1993	-2.41%	(0.01)					0.5													
Mexico	0.4	OT	7.25%	7.38%	10		1993	-1.89%	(0.01)					0.4													
Mexico	0.4	OT	7.35%	7.49%	10		1993	-1.79%	(0.01)					0.4													
Mexico	0.4	OT	6.75%	6.86%	10		1993	-2.41%	(0.01)					0.4													
Mexico	0.4	OT	6.75%	6.86%	10		1993	-2.41%	(0.01)					0.4													
Mexico	0.3	OT	7.35%	7.49%	10		1993	-1.79%	(0.01)					0.3													

EXPORT-IMPORT BANK: ENERGY LOANS AND GUARANTEES

LOAN MIX (Actual Loans & Guarantees Approved, in $Millions)

Country	Amount (Millions) (1)	Type (2)	Rate (3)	Effect. Ann. Rt. (4)	Semi-Ann. Payments (5)	Start Year (6)	Earliest End Year (7)	Ex-Im Spread (8)	Ann. Int. Subsid. ($Mils) (9)	Coal	Oil	Gas	Oil&Gas Mixed	Electric. Fossil	Electric. Fission	Electric. Oil	Electric. Coal	Electric. Gas	Electric. Hydro	Effic.-Supply	Biomass	Wind	Solar	Geotherm.	Effic.-End-Use	Other Renew.	Fusion
Mexico	0.3	OT	7.35%	7.49%	10		1993	-1.79%	(0.01)					0.3													
Mexico	0.3	OT	7.35%	7.49%	10		1993	-1.79%	(0.01)					0.3													
Mexico	0.3	OT	7.25%	7.38%	10		1993	-1.89%	(0.01)					0.3													
Mexico	0.3	OT	7.65%	7.80%	10		1993	-1.48%	(0.00)					0.3													
Mexico	0.2	OT	7.35%	7.49%	10		1993	-1.79%	(0.00)					0.2													
Mexico	0.2	OT	6.75%	6.86%	11		1994	-2.41%	(0.00)					0.2													
Mexico	0.2	OT	7.65%	7.80%	10		1993	-1.48%	(0.00)					0.2													
Total 'OT'	139.8									0	0	0	0	139.8	0	0	0	0	0	0	0	0	0	0	0	0	0
1988 Energy Mix Summary		Check																									
Loans	193.7	193.7								1.0	0.0	0.0	28.3	153.0	0.0	0.0	0.0	10.9	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0
Guarantees	56.0	56								1.0	0.0	0.0	18.5	8.4	0.0	0.0	0.0	0.0	28.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

1987 FISCAL YEAR SUMMARY

TOTAL ACTIVITY		ENERGY ACTIVITY		LOAN DURATION PORTFOLIO	
Tot. new loans	598.9	Total Energy Loans	175.3 (DL)	Total Loans Receivable ($billion)	11.2
Tot. Guar.	1,505.5	Tot. Energy Guar.	0	% Due Through End of FY88	17.7%
Tot. Insur. Auth.	6,444.0	Egy Loans/Tot. Lns	29.27%	Authorized Loans Not Yet Disbursed	2.4
Tot. Auth.	8,549.4	Egy Guar/Tot Guar	0.00%	% of Rec.+Author. Due through End of FY88	14.6%
WACC in FY87	7.57%			(1987 Ann. Rept., p. 36)	
				Pct. Outstanding in FY89	85.4%

Country	Amount (Millions) (1)	Type (2)	Rate (3)	Effect. Ann. Rt. (4)	Semi-Ann. Payments (5)	Start Year (6)	Earliest End Year (7)	Ex-Im Spread (8)	Ann. Int. Subsid. ($Mils) (9)	Coal	Oil	Gas	Oil&Gas Mixed	Electric. Fossil	Electric. Fission	Electric. Oil	Electric. Coal	Electric. Gas	Electric. Hydro	Effic.-Supply	Biomass	Wind	Solar	Geotherm.	Effic.-End-Use	Other Renew.	Fusion
Nigeria	93.3	DL	8.75%	8.94%				1.37%	0.00									93.3									
India	30.8	DL	7.40%	7.54%				-0.03%	(0.01)			30.8		0													
China (Mainland)	28.2	DL	7.40%	7.54%				-0.03%	(0.01)	28.2				0													
Yugoslavia	9.4	DL	8.75%	8.94%				1.37%	0.00					9.4													
USA, Sally Mae	8.2	DL	5.00%	5.06%				-2.50%	(0.21)										8.2								
Latin America	5.4	DL	8.75%	8.94%				1.37%	0.00		5.4																
Totals	175.3	304.8								28.2	5.4	30.8	36.2	102.7	0	0	0	93.3	8.2	0	0	0	0	0	0	0	0

1986 FISCAL YEAR SUMMARY

TOTAL ACTIVITY		ENERGY ACTIVITY		LOAN DURATION PORTFOLIO	
Tot. new loans	577.4	Tot. Energy Loans	163.2 (DC)	Total Loans Receivable ($billion)	14.3
Tot. Guar.	1,127.9	Tot. Energy Guar.	88.0 (GO+Insur)	% Due Through End of FY88	29.8%
Tot. Insur. Auth.	4,379.9	Tot. Energy	251.2	Authorized Loans Not Yet Disbursed	2.4
Tot. Auth.	6,085.2	Egy Lns/Tot Lns	28.26%	% of Rec.+Author. Due through End of FY88	25.3%
WACC in FY 86	9.26%	Egy Guar/Tot Guar	7.80%	(1986 Ann. Rept., p. 35)	
				Pct. outstanding in FY89	74.7%

Country	Amount (Millions) (1)	Type (2)	Rate (3)	Effect. Ann. Rt. (4)	Semi-Ann. Payments (5)	Start Year (6)	Earliest End Year (7)	Ex-Im Spread (8)	Ann. Int. Subsid. ($Mils) (9)	Coal	Oil	Gas	Oil&Gas Mixed	Electric. Fossil	Electric. Fission	Electric. Oil	Electric. Coal	Electric. Gas	Electric. Hydro	Effic.-Supply	Biomass	Wind	Solar	Geotherm.	Effic.-End-Use	Other Renew.	Fusion
China (Mainland)	65.4	DC	8.80%	8.99%				-0.26%	(0.17)								65.4										
[illegible]rkey	34	DC	8.75%	8.94%				-0.32%	(0.11)			34															
[illegible]zil	23.6	DC	11.20%	11.51%				2.26%	0.00		23.6																
[illegible]ia	13.7	DC	7.40%	7.54%				-1.72%	(0.24)									13.7									
[illegible]ia	13.3	DC	2.00%	2.01%				-7.25%	(0.96)									13.3									
[illegible]zil	7.7	DC	10.15%	10.41%				1.15%	0.00					7.7													
[illegible]zil	5.5	DC	11.20%	11.51%				2.26%	0.00		5.5																
Total 'DC'	163.2	163.2								0	29.1	34	0	7.7	0	0	65.4	27	0	0	0	0	0	0	0	0	0
[illegible]goslavia	54.6	GO	?	0.00%				0.00%	0.00			54.6															

EXPORT-IMPORT BANK: ENERGY LOANS AND GUARANTEES

LOAN MIX (Actual Loans & Guarantees Approved, in $Millions)

Country	Amount (Millions) (1)	Type (2)	Rate (3)	Effect. Ann. Rt. (4)	Semi-Ann. Payments (5)	Start Year (6)	EarBest End Year (7)	Ex-Im Spread (8)	Ann. Int. Subsid. ($Mils) (9)	Coal	Oil	Gas	Oil&Gas Mixed	Electric. Fossil	Electric. Fission	Electric. Oil	Electric. Coal	Electric. Gas	Electric. Hydro	Effic.- Supply	Biomass	Wind	Solar	Geotherm.	Effic.- End-Use	Other Renew.	Fusion
Oman	24	GO	?	0.00%				0.00%	0.00																		
Brazil	7.3	GO	11.20%	11.51%				0.00%	0.00		7.3								24								
Brazil	1.7	GO	11.20%	11.51%				0.00%	0.00		1.7																
Chile	0.4	Mt Insur		0.00%				0.00%	0.00														0.4				
Tot 'GO' & Insur.	88.0	88								0.0	9.0	54.6	0.0	0.0	0.0	0.0	0.0	24.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0

1985 FISCAL YEAR SUMMARY

TOTAL ACTIVITY		ENERGY ACTIVITY			LOAN DURATION PORTFOLIO	
Tot. new loans	659.4	Tot. Energy Loans	171.0	(DC)	Total Loans Receivable ($billion)	15.9
Tot. Guar.	1,320.1	Tot. Energy Guar.	341.8	(GO)	% Due Through End of FY88	42.1%
Tot. Insur. Auth.	6,529.5	Tot. Energy	512.8		Authorized Loans Not Yet Disbursed	3.6
Tot. Auth.	8,509.0	Egy Lns/Tot Lns	25.93%		% of Rec.+ Author. Due through End of FY88	34.7%
WACC in FY 85	11.06%	Egy Guar/Tot Guar	25.89%		(1985 Ann. Rept., p. 35)	
					Pct. outstanding in FY89	86.3%

Colombia	130	DC	11.20%	11.51%				0.45%	0.00	130																	
Korea (South)	35.75	DC	10.70%	10.99%				-0.08%	(0.03)		35.75																
Indonesia	5.2	DC	9.50%	9.73%				-1.34%	(0.07)						5.2												
Total 'DC'	170.95	170.95								130	35.75	0	0		5.2	0	0	0	0	0	0	0	0	0	0	0	0
Colombia	115	GO	?	0.00%				0.00%	0.00		115																
Nigeria	93.5	GO	?	0.00%				0.00%	0.00					93.5													
Brazil	59.3	GO	?	0.00%				0.00%	0.00						59.3												
Colombia	40	GO	11.20%	11.51%				0.00%	0.00	40																	
Turkey	25.5	GO	?	0.00%				0.00%	0.00					25.5													
Brazil	8.5	GO	?	0.00%				0.00%	0.00										8.5								
Total 'GO'	341.8	341.8								40	115	0	0	119	59.3	0	0	0	8.5	0	0	0	0	0	0	0	0

1984 FISCAL YEAR SUMMARY

TOTAL ACTIVITY		ENERGY ACTIVITY			LOAN DURATION PORTFOLIO	
Tot. new loans	1,465.0	Tot. Energy Loans	184.6	(DL+DC)	Total Loans Receivable ($billion)	17.5
Tot. Guar.	1,333.2	Tot. Energy Guar.	313.2	(GO)	% Due Through End of FY88	51.1%
Tot. Insur. Auth.	5,817.6	Total Energy	501.2		Authorized Loans Not Yet Disbursed	5.5
Tot. Auth.	8,615.8	Egy Lns/Tot Lns	12.83%		% of Rec.+ Author. Due through End of FY88	38.9%
WACC in FY 84	12.42%	Egy Guar/Tot Guar	23.49%		(1984 Ann. Rept., p. 42)	
					Pct. Outstanding in FY89	61.1%

Angola	84.5	DC	9.50%	9.73%				-2.69%	(2.28)		84.5																
Congo	33.75	DC	10.70%	10.99%				-1.43%	(0.48)					33.75													
Thailand	16.3	DC	9.50%	9.73%				-2.69%	(0.44)			16.3															
Brazil	6.3	DC	11.90%	12.25%				-0.17%	(0.01)		6.3																
Total 'DC'	140.85									0	90.8	16.3	0	33.75	0	0	0	0	0	0	0	0	0	0	0	0	0
Yugoslavia	33	DL	10.35%	10.62%				-1.80%	(0.59)			33															
Yugoslavia	14.1	DL	10.35%	10.62%				-1.80%	(0.25)	14.1																	
Total 'DL'	47.1									14.1	0	33	0		0	0	0	0	0	0	0	0	0	0	0	0	0
Venezuala	173.2	GO	?	0.00%				0.00%	0.00										173.2								
Turkey	94.4	GO	?	0.00%				0.00%	0.00										94.4								
Chile	11.5	GO	?	0.00%				0.00%	0.00										11.5								
Angola	11.3	GO	10.70%	10.99%				0.00%	0.00		11.3																
Yugoslavia	10.2	GO	10.35%	10.62%				0.00%	0.00			10.2															

EXPORT-IMPORT BANK: ENERGY LOANS AND GUARANTEES

LOAN MIX (Actual Loans & Guarantees Approved, in $Millions)

Country	Amount (Millions) (1)	Type (2)	Rate (3)	Effect. Ann. Rt. (4)	Semi-Ann. Payments (5)	Start Year (6)	Earliest End Year (7)	Ex-Im Spread (8)	Ann. Int. Subsid. ($Mlns) (9)	Coal	Oil	Gas	Oil&Gas Mixed	Electric. Fossil	Electric. Fission	Electric. Oil	Electric. Coal	Electric. Gas	Electric. Hydro	Elec.- Supply	Biomass	Wind	Solar	Geotherm.	Elec.- End-Use	Other Renew.	Fusion
Congo	4.5	GO	10.70%	10.99%				0.00%	0.00					4.5													
Venezuala	4.3	GO	?	0.00%				0.00%	0.00					4.3													
Yugoslavia	1.9	GO	10.35%	10.62%				0.00%	0.00	1.9																	
Brazil	1.9	GO	11.90%	12.25%				0.00%	0.00		1.9																
Total 'GO'	313.2									1.9	13.2	10.2	0	8.8	0	0	0	0	279.1	0	0	0	0	0	0	0	0
1984 Energy Mix Summary		Check																									
Loans	188.0	188.0								14.1	90.8	49.3	0.0	33.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Guarantees	313.2	313.2								1.9	13.2	10.2	0.0	8.8	0.0	0.0	0.0	0.0	279.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

1983 FISCAL YEAR SUMMARY

TOTAL ACTIVITY		ENERGY ACTIVITY			LOAN DURATION PORTFOLIO	
Tot. new loans	844.9	Tot. Energy Loans	189.8	(DC)	Total Loans Receivable ($billion)	16.8
Tot. Guar.	1,740.6	Tot. Energy Guar.	294.4	(GO)	% Due Through End of FY88	64.5%
Tot. Insur. Auth.	6,783.7	Tot. Energy Auth.	484.2		Authorized Loans Not Yet Disbursed	6.8
Total. Author.	9,369.2	Egy Lns/Tot Lns	22.46%		% of Rec.+ Author. Due through End of FY88	45.8%
WACC in FY 83	12.51%	Egy Guar/Tot Guar	16.91%		(1983 Ann. Rept., p. 30)	
					Pct. Outstanding in FY89	54.2%

Indonesia	57	DC	10.00%	10.25%			-2.26%	(1.29)							57												
Angola	45	DC	10.00%	10.25%			-2.26%	(1.02)		45																	
Brazil	29.3	DC	11.35%	11.67%			-0.84%	(0.25)		29.3																	
Peru	26.3	DC	12.00%	12.36%			-0.15%	(0.04)		26.3																	
Mexico	20.1	DC	11.35%	11.67%			-0.84%	(0.17)						20.1													
Cayman Islands	4.5	DC	12.00%	12.36%	14		-0.15%	(0.01)		4.5																	
Indonesia	4	DC	10.42%	10.69%			-1.82%	(0.07)							4												
Mexico	3.6	DC	11.35%	11.67%			-0.84%	(0.03)						3.6													
Total 'DC'	189.8	189.8								105.1	0	0		23.7	61	0	0	0	0	0	0	0	0	0	0	0	0
Philippines	204.5	GO	?	0.00%			N/A	0.00							204.5												
Dominican Republic	20	GO		0.00%			N/A	0.00						20													
Peru	20	GO	12.00%	12.36%			-0.15%	0.00		20																	
Trinidad & Tobago	17.9	GO	?	0.00%			0.00%	0.00			17.9																
Mexico	11	GO	11.35%	11.67%			0.00%	0.00						11													
Brazil	9	GO	11.35%	11.67%			0.00%	0.00		9																	
Angola	6	GO	10.00%	10.25%			0.00%	0.00		6																	
Peru	3.5	GO	12.00%	12.36%			0.00%	0.00		3.5																	
Mexico	2	GO	11.35%	11.67%			0.00%	0.00						2													
Indonesia	0.5	GO	10.00%	10.25%			0.00%	0.00							0.5												
Total 'GO'	294.4	294.4								38.5	17.9	0		33	205	0	0	0	0	0	0	0	0	0	0	0	0

1982 FISCAL YEAR SUMMARY

TOTAL ACTIVITY		ENERGY ACTIVITY			LOAN DURATION PORTFOLIO (FROM ACTUAL DATA BELOW)	
Tot. new loans	3,516.3	Tot. Energy Loans	2,052.2	(LG+DC)	Energy Loans Paid off prior to FY89	0.0
Tot. Guar.	741.2	Tot. Energy Guar.	536.3	(LG)	Pct. Outstanding in FY89	100.0%
Tot Insur. Auth.	5,104.7	Tot. Energy	2,588.4			
Tot. Auth.	9,362.2	Egy Lns/Tot Lns	58.36%			
WACC in FY82	13.35%	Egy Guar/Tot Guar	72.35%			

EXPORT-IMPORT BANK: ENERGY LOANS AND GUARANTEES

LOAN MIX (Actual Loans & Guarantees Approved, In $Millions)

Country	Amount (Millions) (1)	Type (2)	Rate (3)	Effect. Ann. Rt. (4)	Semi-Ann. Payments (5)	Start Year (6)	Earliest End Year (7)	Ex-Im Spread (8)	Ann. Int. Subsid. ($Mils) (9)	Coal	Oil	Gas	Oil&Gas Mixed	Electric. Fossil	Electric. Fission	Electric. Oil	Electric. Coal	Electric. Gas	Electric. Hydro	Effic.- Supply	Biomass	Wind	Solar	Geotherm.	Effic.- End-Use	Other Renew.	Fusion
Indonesia	292.5	LG	11.00%	11.30%	16	1984	1992	-2.05%	(5.98)		292.5																
Ivory Coast	55.8	LG	12.00%	12.36%	16	1985	1993	-0.99%	(0.55)		55.8																
Indonesia	31.1	LG	11.00%	11.30%	16	1986	1994	-2.05%	(0.64)		31.1																
Brazil	28.6	LG	12.00%	12.36%	16	1986	1994	-0.99%	(0.28)		28.6																
Venezuala	26	LG	12.00%	12.36%	23	1991	2003	-0.99%	(0.26)								26										
Egypt	25.2	LG	11.00%	11.30%	12	1984	1990	-2.05%	(0.52)									25.2									
Spain	17.6	LG	12.00%	12.36%	18	1986	1995	-0.99%	(0.17)								17.6										
Mexico	17	LG	12.00%	12.36%	16	1983	1991	-0.99%	(0.17)					17													
Indonesia	13.1	LG	10.42%	10.69%	18	1987	1996	-2.66%	(0.35)						13.1												
Egypt	9.9	LG	11.00%	11.30%	12	1984	1990	-2.05%	(0.20)					9.9													
Egypt	6.6	LG	8.75%	8.94%	18	1986	1995	-4.41%	(0.29)										6.6								
Mexico	6.6	LG	8.75%	8.94%	20	1984	1994	-4.41%	(0.29)					6.6													
Brazil	5.9	LG	12.00%	12.36%	16	1985	1993	-0.99%	(0.06)		5.9																
Colombia	0.35	LG	?	0.00%		1984		N/A	0.00														0.35				
Total 'LG'	536.3	536.25								0.0	413.9	0.0	0.0	33.5	13.1	0.0	43.6	25.2	6.6	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0
Argentina	550	DL	7.75%	7.90%	20	1992	2002	-5.45%	(29.96)										550								
Colombia	487.5	DL	12.00%	12.36%	27	1989	2003	-0.99%	(4.82)	487.5																	
China (Taiwan)	201	DL	12.00%	12.36%	16	1987	1995	-0.99%	(1.99)					201													
New Zealand	99.5	DL	12.00%	12.36%	9	1990	1995	-0.99%	(0.98)	49.8	49.8																
Cameroon	54	DL	11.00%	11.30%	20	1984	1994	-2.05%	(1.10)		54														0		
Trinidad & Tobago	35.8	DL	12.00%	12.36%	27	1986	2000	-0.99%	(0.35)					35.8													
Colombia	18.8	DL	10.75%	11.04%	18	1986	1995	-2.31%	(0.43)					18.8													
Spain	12.3	DL	10.75%	11.04%	5	1988	1991	-2.31%	(0.28)	12.3																	
Colombia	12.2	DL	8.75%	8.94%	16	1984	1992	-4.41%	(0.54)					12.2													
Peru	11.8	DL	10.75%	11.04%	18	1985	1994	-2.31%	(0.27)									11.8									
Cameroon	8.1	DL	11.00%	11.30%	20				0.00		8.1																
Korea (Repub.)	7.8	DL	10.75%	11.04%	10	1989	1994	-2.31%	(0.18)					7.8													
Spain	7.8	DL	12.40%	12.78%	11	1987	1993	-0.56%	(0.04)											7.8							
Peru	4.9	DL	12.00%	12.36%	14	1984	1991	-0.99%	(0.05)							4.9											
Colombia	4.4	DL	12.00%	12.36%	11	1984	1990	-0.99%	(0.04)					4.4													
Total 'DL'	1515.9	1515.9								549.55	111.85	0	0	280	0	4.9	0	11.8	550	7.8	0	0	0	0	0	0	0

1982 Energy Mix Summary		Check																			
Loans	2,052.2	2,052.2								549.6	525.8	0.0	0.0	313.5	13.1	4.9	43.6	37.0	556.6	7.8	0.0	0.0	0.4	0.0	0.0	0.0	0.0
Guarantees	536.3	536.3								0.0	413.9	0.0	0.0	33.5	13.1	0.0	43.6	25.2	6.6	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0

Assumes that loans with no external guarantor (designated as 'LG') are guaranteed by Ex-Im.

No data on guarantees made without accompanying loans.

1981 FISCAL YEAR SUMMARY

TOTAL ACTIVITY		ENERGY ACTIVITY			LOAN DURATION PORTFOLIO (FROM ACTUAL DATA BELOW)	
Tot. new loans	5,430.8	Tot. Energy Loans	1,041.2	(LG+DC)	Tot. Loans Due Prior to FY89	35.0
Tot. Guar.	1,513.2	Tot. Energy Guar.	473.0	(LG)	Tot. Guar. Due Prior to FY89	21.3
Tot. Insur. Auth.	2,459.0	Tot. Energy	1,514.1		Total Due Prior to FY89	56.3
Tot. Auth.	9,403.1	Egy Lns/Tot Lns	19.17%		Percent of New Energy Commitments	3.7%
WACC in FY 81	13.86%	Egy Guar/Tot Guar	31.25%		Pct. Outstanding in FY89	96.3%

EXPORT-IMPORT BANK: ENERGY LOANS AND GUARANTEES

LOAN MIX (Actual Loans & Guarantees Approved, in $Millions)

Country	Amount (Millions) (1)	Type (2)	Rate (3)	Effect. Ann. Rt. (4)	Semi-Ann. Payments (5)	Start Year (6)	Earliest End Year (7)	Ex-Im Spread (8)	Ann. Int. Subsid. ($Mils) (9)	Coal	Oil	Gas	Oil&Gas Mixed	Electric. Fossil	Electric. Fission	Electric. Oil	Electric. Coal	Electric. Gas	Electric. Hydro	Effic.- Supply	Biomass	Wind	Solar	Geotherm.	Effic.- End-Use	Other Renew.	Fusion
Mexico	84.5	LG	8.75%	8.94%	16	1986	1994	-4.92%	(4.16)					84.5													
Mexico	72.1	LG	10.75%	11.04%	19	1982	1992	-2.82%	(2.04)									72.1									
Venezuala	38.3	LG	8.75%	8.94%	17	1982	1991	-4.92%	(1.88)					38.3													
Brazil	30.75	LG	8.75%	8.94%	18	1984	1993	-4.92%	(1.51)		30.75																
China (Mainland)	28.7	LG	8.75%	8.94%	9	1986	1991	-4.92%	(1.41)					28.7													
China (Mainland)	28.4	LG	8.75%	8.94%	9	1986	1991	-4.92%	(1.40)					28.4													
Brazil	27.2	LG	9.25%	9.46%	7	1986	1990	-4.40%	(1.20)		27.2																
Argentina	26.9	LG	8.25%	8.42%	15	1983	1991	-5.44%	(1.46)									26.9									
Mexico	25.5	LG	8.75%	8.94%	16	1982	1990	-4.92%	(1.25)					25.5													
Brazil	23.7	LG	8.75%	8.94%	16	1985	1993	-4.92%	(1.17)		23.7																
Brazil	17.9	LG	8.75%	8.94%	8	1986	1990	-4.92%	(0.88)		17.9																
Colombia	15.7	LG	8.75%	8.94%	15	1983	1991	-4.92%	(0.77)					15.7													
Mexico	13	LG	10.75%	11.04%	20	1984	1994	-2.82%	(0.37)					13													
Venezuala	8.3	LG	8.75%	8.94%	7	1983	1987	-4.92%	(0.41)					8.3													
Venezuala	7.1	LG	8.75%	8.94%	13	1983	1990	-4.92%	(0.35)					7.1													
Sweden	5.7	LG	8.75%	8.94%	10	1981	1986	-4.92%	(0.28)		5.7																
Sweden	5.6	LG	8.00%	8.16%	10	1981	1986	-5.70%	(0.32)		5.6																
Argentina	5.4	LG	8.25%	8.42%	16	1982	1990	-5.44%	(0.29)									5.4									
Thailand	3.8	LG	8.75%	8.94%	8	1985	1989	-4.92%	(0.19)					3.8													
Brazil	2	LG	8.75%	8.94%	16	1984	1992	-4.92%	(0.10)					2													
Mexico	1.7	LG	8.75%	8.94%	10	1983	1988	-4.92%	(0.08)	1.7																	
Venezuala	0.7	LG	8.38%	8.55%	8	1986	1990	-5.31%	(0.04)		0.7																
Total 'LG'	472.95	472.95								1.7	111.55	0	0	255.3	0	0	0	104.4	0	0	0	0	0	0	0	0	0
Romania	120.7	DC	8.00%	8.16%	20	1989	1999	-5.70%	(6.88)					120.7													
Ivory Coast	95.3	DC	10.00%	10.25%	33	1991	2008	-3.61%	(3.44)										95.3								
Spain	80	DC	8.75%	8.94%	20	1985	1995	-4.92%	(3.94)								80										
Malaysia	67.1	DC	8.75%	8.94%	20	1984	1994	-4.92%	(3.30)			67.1															
Zimbabwe	33.3	DC	8.75%	8.94%	11	1985	1991	-4.92%	(1.64)	33.3																	
Mexico	30.6	DC	8.75%	8.94%	8	1986	1990	-4.92%	(1.51)		30.6																
Philipines	28.5	DC	8.75%	8.94%	22	1986	1997	-4.92%	(1.40)					28.5													
Ireland	27	DC	8.00%	8.16%	24	1988	2000	-5.70%	(1.54)					27													
India	23.4	DC	10.75%	11.04%	16	1983	1991	-2.82%	(0.66)		23.4																
Colombia	15.9	DC	8.62%	8.81%	20	1984	1994	-5.05%	(0.80)					15.9													
Australia	11.9	DC	8.75%	8.94%	10	1983	1988	-4.92%	(0.59)	11.9																	
Leitchenstein	8.4	DC	8.75%	8.94%	19	1984	1994	-4.92%	(0.41)		8.4																
Spain	7.7	DC	8.50%	8.68%	20	1984	1994	-5.18%	(0.40)										7.7								
Netherlands Antilles	6.1	DC	8.75%	8.94%	8	1986	1990	-4.92%	(0.30)		6.1																
Brazil	4.2	DC	8.75%	8.94%	28	1986	2000	-4.92%	(0.21)					4.2													
Caymen Islands	3.6	DC	8.75%	8.94%	7	1985	1989	-4.92%	(0.18)		3.6																
Argentina	2.7	DC	8.75%	8.94%	5	1986	1989	-4.92%	(0.13)										2.7								
Spain	1.8	DC	8.75%	8.94%	10	1982	1987	-4.92%	(0.09)		1.8																
Total 'DC'	568.2	568.2								45.2	73.9	67.1	0	196.3	0	0	80	0	105.7	0	0	0	0	0	0	0	0

Assumes that loans with no external guarantor (designated as 'LG') are guaranteed by Ex-Im.
No data on guarantees made without accompanying loans.

1981 Energy Mix Summary Check

EXPORT-IMPORT BANK: ENERGY LOANS AND GUARANTEES

LOAN MIX (Actual Loans & Guarantees Approved, In $Millions)

Country	Amount (Millions) (1)	Type (2)	Rate (3)	Effect. Ann. Rt (4)	Semi-Ann. Payments (5)	Start Year (6)	Earliest End Year (7)	Ex-Im Spread (8)	Ann. Int. Subsid. ($Mils) (9)	Coal	Oil	Gas	Oil&Gas Mixed	Electric. Fossil	Electric. Fission	Electric. Oil	Electric. Coal	Electric. Gas	Electric. Hydro	Effic.- Supply	Biomass	Wind	Solar	Geotherm.	Effic.- End-Use	Other Renew.	Fusion
Loans	1,041.2	1,041.2								46.9	185.5	67.1	0.0	451.6	0.0	0.0	80.0	104.4	105.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Guarantees	473.0	473.0								1.7	111.6	0.0	0.0	255.3	0.0	0.0	0.0	104.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

1980 FISCAL YEAR SUMMARY

TOTAL ACTIVITY		ENERGY ACTIVITY			LOAN DURATION PORTFOLIO (FROM ACTUAL DATA BELOW)	
Tot. new loans	4,577.8	Tot. Energy Loans	1,715.4	(LG+DL)	Tot. Loans Due Prior to FY89	57.0
Tot. Guar.	2,509.7	Tot. Energy Guar.	178.5	(LG)	Tot. Guar. Due Prior to FY89	10.3
Tot. Insur. Auth	521.7	Tot. Energy	1,893.9		Total Due Prior to FY89	67.3
Tot. Auth.	7,609.2	Egy Lns/Tot Lns	37.47%		Percent of New Energy Commitments	3.6%
WACC in FY80	10.49%	Egy Guar/Tot Guar	7.11%		Pct. Outstanding in FY89	96.4%

Venezuala	42.5	LG	8.00%	8.16%	17	1983	1992	-2.33%	(0.99)					42.5													
Mexico	35.4	LG	8.00%	8.16%	20	1981	1991	-2.33%	(0.83)									35.4									
Spain	18.7	LG	8.25%	8.42%	20	1983	1993	-2.07%	(0.39)					18.7													
Brazil	14.5	LG	8.38%	8.55%	4	1989	1991	-1.94%	(0.28)		14.5																
Spain	11.6	LG	8.75%	8.94%	5	1992	1995	-1.55%	(0.18)						11.6												
Spain	10.8	LG	8.75%	8.94%	13	1981	1988	-1.55%	(0.17)						10.8												
Trinidad & Tobogo	9.7	LG	8.75%	8.94%	8	1985	1989	-1.55%	(0.15)									9.7									
Egypt	9.5	LG	8.75%	8.94%	4	1993	1995	-1.55%	(0.15)							9.5											
Brazil	7	LG	8.75%	8.94%	4	1991	1993	-1.55%	(0.11)		7																
Spain	6.7	LG	8.75%	8.94%	5	1991	1994	-1.55%	(0.10)								6.7										
Italy	6	LG	8.00%	8.16%	8	1982	1996	-2.33%	(0.14)		6																
Spain	4.3	LG	7.88%	8.03%	6	1982	1985	-2.46%	(0.11)						4.3												
Norway	1.8	LG	8.00%	8.16%	7	1984	1988	-2.33%	(0.04)		1.8																
Total LG	178.5									0	29.3	0	0	61.2	26.7	9.5	6.7	45.1	0	0	0	0	0	0	0	0	0
Korea (South)	504	DL	8.00%	8.16%	30	1986	2001	-2.33%	(11.75)						504												
Israel	170	DL	8.75%	8.94%	24	1988	2000	-1.55%	(2.64)					170													
Angola	96.6	DL	8.25%	8.42%	14	1982	1989	-2.07%	(2.00)			96.6															
Korea (South)	71.5	DL	8.00%	8.16%	24	1984	1996	-2.33%	(1.67)					71.5													
Israel	57.4	DL	8.75%	8.94%	6	1997	2000	-1.55%	(0.89)					57.4													
Ivory Coast	51	DL	8.00%	8.16%	20	1982	1992	-2.33%	(1.19)		51																
Taiwan	50	DL	8.38%	8.55%	15	1985	1993	-1.94%	(0.97)				50														
Argentina	29.3	DL	7.83%	7.98%	24	1985	1997	-2.51%	(0.73)										29.3								
Yugoslavia	22.5	DL	8.75%	8.94%	15	1982	1990	-1.55%	(0.35)						22.5												
Thailand	16.9	DL	8.00%	8.16%	5	1989	1992	-2.33%	(0.39)			16.9															
Colombia	16.4	DL	8.50%	8.68%	10	1984	1989	-1.81%	(0.30)	16.4																	
Ireland	12.75	DL	8.38%	8.55%	16	1983	1991	-1.94%	(0.25)					12.75													
Israel	10.1	DL	8.75%	8.94%	6	1997	2000	-1.55%	(0.16)					10.1													
Australia	9.9	DL	8.75%	8.94%	6	1984	1987	-1.55%	(0.15)		9.9																
Spain	9.1	DL	8.50%	8.68%	5	1992	1995	-1.81%	(0.16)								9.1										
Australia	6.6	DL	8.00%	8.16%	6	1983	1986	-2.33%	(0.15)		6.6																
Saudi Arabia	6.1	DL	7.75%	7.90%	10	1981	1986	-2.59%	(0.16)		6.1																
Spain	6.1	DL	8.50%	8.68%	5	1992	1995	-1.81%	(0.11)										6.1								
Spain	5.1	DL	8.00%	8.16%	11	1981	1987	-2.33%	(0.12)									5.1									
Greece	4.5	DL	8.00%	8.16%	10	1982	1987	-2.33%	(0.10)						4.5												
Argentina	4	DL	9.00%	9.20%	5	1983	1986	-1.29%	(0.05)		4																
Saudi Arabia	3.7	DL	8.75%	8.94%	6	1983	1986	-1.55%	(0.06)		3.7																
Peru	3.5	DL	8.25%	8.42%	15	1983	1991	-2.07%	(0.07)							3.5											

EXPORT-IMPORT BANK: ENERGY LOANS AND GUARANTEES

LOAN MIX (Actual Loans & Guarantees Approved, in $Millions)

Country	Amount (Millions) (1)	Type (2)	Rate (3)	Effect. Ann. Rt. (4)	Semi-Ann. Payments (5)	Start Year (6)	Earliest End Year (7)	Ex-Im Spread (8)	Ann. Int. Subsid. ($Mills) (9)	Coal	Oil	Gas	Oil&Gas Mixed	Electric. Fossil	Electric. Fission	Electric. Oil	Electric. Coal	Electric. Gas	Electric. Hydro	Effic.- Supply	Biomass	Wind	Solar	Geotherm.	Effic.- End-Use	Other Renew.	Fusion
Bahamas	3.4	DL	8.75%	8.94%	8	1986	1990	-1.55%	(0.05)					3.4													
Venezuala	2.6	DL	8.38%	8.55%	8	1986	1990	-1.94%	(0.05)		2.6																
Spain	2.5	DL	8.00%	8.16%	9	1983	1988	-2.33%	(0.06)									2.5									
Australia	2.2	DL	8.75%	8.94%	10	1981	1986	-1.55%	(0.03)		2.2																
Liberia	2.1	DL	8.13%	8.29%	14	1981	1988	-2.20%	(0.05)										2.1								
Total 'DL'	1,536.9									16.4	144.7	113.5	50.0	447.6	584.4	22.5	22.5	97.8	37.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Assumes that loans with no external guarantor (designated as 'LG') are guaranteed by Ex-Im.																											
No data on guarantees made without accompanying loans.																											
1980 Energy Mix Summary																											
Loans	1,715.4	1,715.4								16.4	174.0	113.5	50.0	508.8	611.1	32.0	29.2	142.9	37.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Guarantees	178.5	178.5								0.0	29.3	0.0	0.0	61.2	26.7	9.5	6.7	45.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Total Annual Interest Rate Subsidies, Loans FY80-9/91 (141.4)
Total Annual Interest Rate Subsidies, Loans FY80-89 (140.4)

NOTES:

(1) Loan or guarantee amount authorized by Eximbank. Figures are rounded to the nearest $100,000.
(2) Type refers to the particular authorization approved. "DL" is a direct loan to the foreign purchaser; "IO" is an intermediary loan, usually going to a U.S. bank; "LG" is a direct loan and a loan guarantee; "IG" is an intermediary loan plus a guarantee; "GO" is a loan guarantee only; "DC" is a direct credit, the same as a direct loan; "MC" is a mixed credit, part grant, part loan; "OT" is other. Transactions with both loans and guarantee components are counted as both. Mixed credits and "other" are treated conservatively as loans. Loans made in the early 1980s with no external guarantor listed are assumed to be guaranteed by Eximbank.
(3) The rate listed is the rate Eximbank charges borrowers. Interest rates listed for loan guarantees refer to loans not made by Eximbank.
(4) Eximbank requires loan payments twice per year. The effective annual rate is what the interest rate would be with payments once per year, but yielding the same absolute amount as the current 2/year system.
(5) Semi-Annual payments refers to the number of semi-annual payments allowed for repaying the loan. These data were not available for all years.
(6) Start year is the year in which loan repayment begins according to the original loan agreement. The start year is often 5-10 years later than the loan autorization date.
(7) Earliest end year is an estimate of the earliest point at which the borrower will have repaid the entire loan. It is used to determine whether particular loans are still impacting government expenditures for FY89. Where start year year and number of payments data were available, the end year is easily calculated. Where only the number of payments was available, the end year calculation assumes that loan repayment begins in the year of authorization.
(8) "Ex-Im Spread" is simply Eximbank's cost of capital (shown in the summary table for each year) minus the effective annual rate charged to borrowers.
(9) The annual interest rate subsidy is calculated by multiplying the loan amount (1) by the Eximbank spread (8). The subsidy is set to zero if the Eximbank spread is greater than zero. This is because a positive interest spread is the norm for a bank, and is used to cover default and interest rate risk (as well as profit). We make no effort to assess the appropriate size of the interest rate premium since this is adequately represented through Eximbank's provisions for defaults, calculated below.
(10) WACCs refer to "Weighted Average Cost of Capital" for Eximbank and are calculated from actual annual borrowing data (see Eximwacc wk1).
(11) Loans are allocated to particular fuels using loan descriptions in the sources listed below.

SOURCES:

(1) Export Import Bank of the United States, "Annual Report," for the years 1980-1990.
(2) Export Import Bank of the United States, "Exim Loan and Guarantee Energy Auth
(3) Michael Gonter, Eximbank, personal communication, 11/25/92.
(4) Export Import Bank of the United States, "Borrowings from Federal Financing Bank, FY 1989 through FY 1991," January 1992. Provided by Ken Buschow, Eximbank.
(5) Robert Stobaugh, Harvard Business School, personal communication, 3/27/92.

EXPORT-IMPORT BANK'S COST OF CAPITAL

Summary Table

Fiscal Year	WACC (a)	Tot. Ann. Borrowings ($Mils)	Wghtd Ave.
1991	6.48%	4,033.1	1.35%
1990	8.19%	2,674.0	1.13%
1989	9.01%	867.0	0.40%
1988	9.28%	183.0	0.09%
1987	7.57%	511.0	0.20%
1986	9.26%	801.0	0.38%
1985	11.06%	1,382.0	0.79%
1984	12.42%	2,584.0	1.66%
1983	12.51%	2,225.0	1.44%
1982	13.35%	3,166.9	2.18%
1981	13.86%	3,953.0	2.83%
1980	10.49%	3,704.1	2.01%
l, 80-89		19,377.0	
WACC for 1980-1989			11.970%

NOTES:

(a) The weighted average cost of capital for the Ex-Im Bank is based on borrowing statistics from the Federal Financing Bank found in Ex-Im's annual reports through FY 1988. Data for FY89-FY91 is from Ken Buschow, Export-Import Bank, Jan. 1992.

Derivation of Annual Totals

Date	Amt.	Rate	Duration	Wghted. Ave
FY1991				
12/3/90	166.0	7.960%		0.328%
12/3/90	16.0	8.582%		0.034%
12/3/90	578.0	7.487%		1.073%
3/1/91	102.0	7.530%		0.190%
3/1/91	8.0	8.288%		0.016%
3/1/91	976.0	6.443%		1.559%
6/3/91	67.0	7.210%		0.120%
6/3/91	14.7	8.278%		0.030%
6/3/91	968.0	6.072%		1.487%
9/3/91	134.0	7.315%		0.243%
9/3/91	10.4	8.150%		0.021%
9/3/91	973.0	5.725%		1.381%
Total	4,033.1			
FY 1991 WACC:		6.483%		
FY1990				
12/1/89	98.0	7.844%		0.287%
12/1/89	8.0	8.144%		0.024%
12/1/89	137.0	7.906%		0.405%
3/1/90	89.0	8.486%		0.282%
3/1/90	14.0	8.831%		0.046%
3/1/90	517.0	8.270%		1.599%
6/1/90	338.0	8.627%		1.090%
6/1/90	24.0	8.906%		0.080%
6/1/90	321.0	8.249%		0.990%
9/1/90	256.0	8.537%		0.817%
9/1/90	8.0	9.219%		0.028%
9/1/90	864.0	7.868%		2.542%
Tot	2,674.0			
FY90 WACC:		8.192%		
FY1989		Ann. Rept., 16		
12/1/88	281.0	9.085%		2.945%
12/1/88	70.0	8.998%		0.726%
3/1/89	247.0	9.340%		2.661%
6/1/89	269.0	8.636%		2.679%
Tot	867.0			
FY89 WACC:		9.011%		
FY1988		Ann. Rept., 31		
6/1/88	164.0	9.219%	10.0	8.262%
9/1/88	19.0	9.770%	10.0	1.014%
Tot	183.0			
FY88 WACC:		9.276%		
WACC from FFB:				
FY1987		Ann. Rept., 35		
Date	Amt.	Rate	Duration	
12/1/86	354.0	7.210%	10.0	
3/2/87	36.0	7.249%	10.0	
9/1/87	121.0	8.705%	10.0	
Tot	511.0			
FY87 WACC:		7.567%		
FY1986				
12/2/85	417.0	9.600%	10.0	
12/2/85	261.0	9.261%	10.0	
3/3/86	3.0	8.172%	10.0	
6/2/86	120.0	8.093%	10.0	
Tot	801.0			
FY86 WACC:		9.258%		
FY1985		Ann. Rept., 36		
12/3/84	413.0	11.539%	10.0	
12/3/84	162.0	11.289%	10.0	
3/1/85	254.0	11.859%	10.0	
6/3/85	456.0	10.273%	10.0	
9/3/85	97.0	10.273%	10.0	
Tot	1,382.0			
FY85 WACC:		11.062%		

FY1984		Ann. Rept., 43		
12/1/83	387.0	11.539%	10.0	1.728%
12/1/83	113.0	11.303%	10.0	0.494%
3/1/84	390.0	11.985%	10.0	1.809%
3/1/84	508.0	11.720%	10.0	2.304%
6/1/84	383.0	13.797%	10.0	2.045%
6/1/84	267.0	13.592%	10.0	1.404%
9/1/84	410.0	12.713%	10.0	2.017%
9/1/84	126.0	12.680%	10.0	0.618%
Tot	2,584.0			
FY84 WACC:		12.420%		

FY1983		Ann. Rept., 31		
12/1/82	369.0	11.539%	10.0	1.914%
12/1/82	223.0	11.303%	10.0	1.133%
3/1/83	375.0	11.985%	10.0	2.020%
3/1/83	55.0	11.720%	10.0	0.290%
6/1/83	376.0	13.797%	10.0	2.332%
6/1/83	261.0	13.592%	10.0	1.594%
9/1/83	383.0	12.713%	10.0	2.168%
9/1/83	183.0	12.680%	10.0	1.043%
Tot	2,225.0			
FY83 WACC:		12.513%		

FY1982		Ann. Rept., 23		
12/1/81	317.9	13.042%	10.0	1.309%
12/1/81	460.0	12.765%	10.0	1.854%
3/1/82	83.0	13.913%	10.0	0.365%
3/1/82	691.0	14.014%	10.0	3.058%
6/1/82	347.0	13.604%	10.0	1.491%
6/1/82	652.0	13.634%	10.0	2.807%
9/1/82	363.0	12.732%	10.0	1.459%
9/1/82	253.0	12.587%	10.0	1.006%
Tot	3,166.9			
FY82 WACC:		13.348%		

FY1981		Ann. Rept., 22		
12/1/80	715.0	13.003%	10.0	2.352%
12/1/80	247.0	12.645%	10.0	0.790%
3/2/81	264.0	13.333%	10.0	0.890%
3/2/81	820.0	13.570%	10.0	2.815%
6/1/81	715.0	13.715%	10.0	2.481%
6/1/81	285.0	13.401%	10.0	0.966%
9/1/81	604.0	15.701%	10.0	2.399%
9/1/81	303.0	15.245%	10.0	1.169%
Tot	3,953.0			
FY81 WACC:		13.862%		

FY1980		Ann. Rept., 16		
12/3/79	949.8	10.559%	10.0	2.537%
3/3/80	124.0	12.694%	10.0	0.398%
3/3/80	713.6	13.233%	10.0	2.389%
6/2/80	840.2	9.988%	10.0	2.123%
6/2/80	209.3	10.293%	10.0	0.545%
9/2/80	637.0	11.352%	10.0	1.829%
9/2/80	230.2	11.509%	10.0	0.670%
Tot	3,704.1			
FY80 WACC:		10.492%		

FY81 WACC:	7.556%

FY1980		Ann. Rept., 16		
12/3/79	949.8	10.559%	10.0	2.537%
3/3/80	124.0	12.694%	10.0	0.398%
3/3/80	713.6	13.233%	10.0	2.389%
6/2/80	840.2	9.988%	10.0	2.123%
6/2/80	209.3	10.293%	10.0	0.545%
9/2/80	637.0	11.352%	10.0	1.829%
9/2/80	230.2	11.509%	10.0	0.670%
Tot	3,704.1			
FY80 WACC:		10.492%		

FEDERAL EMERGENCY MANAGEMENT AGENCY

FEMA prepares for some disasters that are likely to be associated with energy. *Quantitative estimates were not done.*

Technological Hazards

Radiological Emergency Preparedness. Emergency preparation in connection with off-site emergency planning around nuclear facilities. Heede allocated 90%, assuming 10% related to medical uses of radioisotopes.

Hazardous Materials. Improving Federal, State, and Local response to hazardous materials incidents.

Civil Defense, Comprehensive Emergency Preparedness, and Federal Preparedness. Heede allocated 6% of these programs to energy due to required preparation against attacks on domestic energy supply and delivery.

Management and Administration. Allocated in proportion to energy expenses.

Office of the Inspector General. Same as above.

Sources

Federal Emergency Management Agency. Budget in Brief: Fiscal Year 1991.

Heede, Rick. Federal Energy Subsidies: Agency Obligations, Draft Report. Rocky Mountain Institute, 1986.

FEDERAL MARITIME COMMISSION

The Federal Maritime Commission regulates the domestic offshore and international waterborne commerce of the United States. It licenses ocean freight forwarders and ensures that ocean vessels carry proper insurance. Total outlays in 1989 were $13.6 million (OMB '91, A-1127). *A quantified estimate of energy subsidies through the Maritime Commission is not included here.*

Heede allocated on the basis of total waterborne commerce: exports + imports + coastal domestic shipping. According to Heede's earlier work, the Commission emphasizes merchandise rather than commodity trade, suggesting that the energy share of federal support would be quite small.

FEDERAL MINE SAFETY AND HEALTH REVIEW COMMISSION

The Commission reviews and decides contested enforcement actions undertaken under mine safety legislation, as well as adjudicating claims by mine labor regarding miners' rights. Total outlays in 1989 were 3.8 million, a significant portion of which probably attributable to coal mining. (OMB '91, A-1128). *The energy share of this funding was not quantified.*

INTERNATIONAL TRADE COMMISSION

The Trade Commission protects U.S. industries from unfair competition, provides information to Congress and private industry on trade matters, and advises the President on trade matters. Total outlays in 1989 were $36.1 million. (OMB '91, A-1134). *ITA support for energy was not quantified.*

Public Investigations and Research Studies. Examines cases of dumping and other forms of local injury from imports. While the case mix varies annually, FY 1989 had only one energy-related endeavor: the study of ethyl alcohol imports (affecting gasohol). (ITC, 16). Energy in an indirect beneficiary of trade analyses of such studies as the impact of a Mexican-U.S. free trade agreement.

Technical Information and Assistance. Furnish technical information and assistance to the President, the Congress, other agencies, and private industries, groups, and individuals. Energy-related information provided to the legislative branch in 1989 included a study on the petroleum industry.

Recurring Reports and Services. Efforts include monitoring of trade developments, world tariffs, trade volumes, and customs laws. Statistical information on a variety of items are also prepared.

Assembling and Analyzing Economic and Technical Information. The collection, assembly, and analysis of statistical, economic, and technical information relating to imports and exports. The purpose of this effort is to "obtain data on and analyze the factors involved in each domestic industry's competitive position vis-a-vis its foreign counterparts, and to be able to relate this information to tariff structures and nontariff barriers." (ITC, 31).

Administration and Executive Direction. Executive direction includes primarily the work of the trade Commissioners and their staffs.

Source

United States International Trade Commission, Budget Justification, Fiscal Year 1991.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

NASA has recently undertaken extensive global environmental management perspectives, such as global climate change. *NASA support for energy was not quantified.* However, potential NASA areas of involvement benefitting energy are presented below, and are worthy of additional research.

Research and Development

-Global Geospace Sciences
-Earth Sciences: upper atmosphere research satellite, ocean topography experiment, scatterometer, earth science payload instrument development, airborne science and applications, geodynamics, missions operations and data analysis, research and analysis.
-Materials Processing
-Mission to Planet Earth
-U.S. Global Change Research Program

NATIONAL INSTITUTE OF BUILDING SCIENCES

May have some energy-related functions through efficiency-in-buildings. NIBS was funded less than $0.5 million in 1989, and was supposed to be self-financing by FY 1992. (OMB '91, A-1153). *A quantification of NIB's energy-related spending was not done for this report.*

NATIONAL TRANSPORTATION SAFETY BOARD

The Board promotes transportation safety through the investigation of accidents and by making recommendations on how to prevent applications. The Board is mandated by Congress to investigate all catastrophic accidents. Total outlays in 1989 were $24.5 million. (OMB '91, A-1159). Spending should be allocated based on the percentage of actions in particular transport mode, *but the energy share was not quantified in this report*. Based on the information below, the energy share is likely to be small.

Aviation. Battelle estimated 73% of spending was on this sector. Has probably changed since 1978.

Railroad. Significant portion relates to examination of passenger rail, not freight.

Marine. Monitors cruise ships, other passenger vessels, fishing vessels, military vessels, and cargo ship. Only cargo has any accrual to energy.

Highway. Regulates bus and truck safety.

Hazardous Materials and Pipeline Safety. Pipeline safety is all energy-related.

Investigations in 1988, by Type of Transit

Transport Mode	Number of Investigations[a]
Aviation	21
Highway - Freight	1
Highway - Passenger/Other	8
Railroad - Freight	13
Railroad - Passenger/Commuter	7
Marine - Tanker	3
Marine - Other Freight	2.5
Marine - Fishing Vessel/Passenger/Military/Other	6.5
Pipeline - Natural Gas	17
Pipeline - Other	1
Hazardous Materials	4

Source: "Appendix J," National Transportation Safety Board 1988 Annual Report to Congress, July 1, 1989.

[a] Collisions are counted as 1/2 an investigation for each of the two vessel types involved.

NATIONAL SCIENCE FOUNDATION

The National Science Foundation provides scientific research grants to institutions and individual throughout the country. Total outlays in 1989 were $1,498 million. (OMB '91, A-1155). This funding subsidizes R&D in a similar manner to Department of Energy R&D, except that NSF's projects are more decentralized.

To the extent that NSF grants favor particular types of energy research over others, market distortions may be introduced. This was the thinking of Heede (1986) when he allocated a portion of NSF research to the energy sector as a significant beneficiary from NSF support in the areas of nuclear, atomic, and plasma physics. (Heede, 116). Since NSF does not aggregate grants supporting particular types of energy, substantial additional research is needed to determine which NSF research is driven by particular energy needs. *No quantification of NSF spending on energy was done for this report.*

Engineering. Special research thrust on the processing of advanced materials, including polymers, superconductors, microstructures, composites, and biomaterials.

Environmental and ocean systems. Benefits energy by reducing the cost of internalizing energy-related environmental damage.

Geosciences. Seeks to understand and ultimately predict future changes in the earth's environment. Global Change support at NSF will total $103m through the NSF Biological, Behavioral, and Social Sciences, the Geosciences, and the U.S. Antarctic Program. (NSF summary, 8).

Sources

Heede, Rick. Federal Energy Subsidies: Agency Obligations, Draft Report. Rocky Mountain Institute, 1986.

National Science Foundation. Budget Summary, Fiscal Year 1991.

OCCUPATIONAL SAFETY AND HEALTH REVIEW COMMISSION

Commission adjudicates contested enforcement actions by OSHA. Total outlays in 1989 were $5.7 million. (OMB '91, A-1165). Cases heard by the Commission may, upon completing all levels of internal appeal, appeal cases to an appropriate United States Court of Appeals. While energy industries are large "users" of government health and safety oversight, *no quantification of this Commission was done.*

Sources

U.S. OMB, Budget of the United States Government, FY 1992.

"The President's Report on Occupational Safety and Health: The Occupational Safety and Health Review Commission," Fiscal Year 1988.

RAILROAD RETIREMENT BOARD

We did not have enough information to quantify the share of subsidies to the railroad pensions accruing to the bulk rail users such as the coal industry. However, subsidies to the pension appear to be large. According to OMB, "this appropriation is a Federal subsidy to the rail industry pension for costs not financed by the railroad sector. The American taxpayer subsidy annually exceeds $1,000 per rail employee." The following excerpt from the OMB Budget implies that railroad retirees are receiving benefits well in excess of the funds they paid in. If this is the case, the rail industry benefits by shifting its pension liability to the federal government. This would reduce their cost of service, with corresponding benefits to bulk energy users of rail transport such as coal and oil. Consider the following statement:

"When first authorized in 1974, the windfall subsidy appropriation was estimated as $250 million annually for 25 years, or a total subsidy of $6.25 billion. In two years, the annual windfall subsidy estimate increased by 45 percent and, within five years, the Railroad Retirement Board reported that the original 1974 estimate had doubled to $500 million and would continue to increase if there were any inflation after 1980.

"The Carter administration, faced with increasingly large projected subsidy costs, sought to limit to $350 million annually the general taxpayers' liability to subsidize this rail industry pension, a position also reflected in the March revisions to the 1982 budget. Based on their collectively-bargained agreement and assuming a $350 million subsidy appropriation, rail labor and management successfully sought congressional restructuring of the rail industry windfall in Public Law 97-35. The rail sector sought to limit windfall payments to the appropriated subsidy amounts rather than rely on the rail industry funded retirement account. This extended the subsidy well beyond the year 2000.

"The rail sector has used the windfall subsidy to shift some of the financing of non-windfall rail pensions onto American taxpayers. Under current law, the industry-financed component is reduced by 25 percent of the windfall benefit payable to a retiree. If the rail sector financed windfall benefits, the costs would therefore be only 75% of the calculated windfall benefit. American taxpayers, however, have paid for 100% of calculated windfall costs. The budget proposes (in appropriations languages and authorizing legislation) to limit the general fund subsidy to the windfall costs that the rail sector would otherwise incur (i.e., 75% of the calculated windfall benefits). Rail retirees will continue to get the same windfall benefit with a portion financed from rail sector contributions." (OMB '92, 4-1168).

TENNESSEE VALLEY AUTHORITY

TVA was created in 1933 to develop the Tennessee Valley area. TVA is a wholly-government owned power wholesaler for 160 municipal and cooperative electric systems serving millions of customers. (1990 Annual Report). Historically, TVA also provided power to the large federal uranium enrichment facilities at Oak Ridge and Paducah, although power sales in this area have declined with the reduction in U.S. enrichment activity. TVA's generating capacity began with hydroelectric, but is now more than 50 percent coal fired, and 18% nuclear. TVA continues to invest heavily in completing nuclear facilities begun in the 1980s. In addition to power development, TVA is engaged in other activities such as fertilizer research, flood control, land resource management, and navigational improvements. Some of these peripheral activities such as navigation improvements, are financed via Congressional appropriations and provide some benefits to energy. However, portions of these programs are paid from power proceeds, so we assume that all activities benefitting power generation or energy transport are paid for from power proceeds.

The Power Program is now run independently, issuing its own debt and paying operating expenses out of proceeds from the sale of electrical power.[61] However, TVA continues to benefit from both historic and present day government support which reduces the cost of power. Government support falls into the following categories:

Interest Charges on Government Appropriations for Power. Prior to 1961, TVA's entire infrastructure was built with federal money on which TVA paid no interest.[62] Beginning in 1961, TVA began paying dividends to the federal government. These dividend rates are set every year and approximate the governments cost of borrowing. They are applied to the entire principal outstanding. The dividend rate is now slightly below the government's cost of capital to build TVA, although the associated subsidy is extremely small. The high estimate uses the cost of raising the funds on the private market rather than from the government shows a higher discrepancy between TVA's actual cost of funds and payment for funds through the dividend method.

Debt repayment. TVA received self-financing authority in 1959. At that time, an amortization schedule for government investment was set at $10 million for the first 5 years, $15 million for the next 5 years, and $20 million thereafter until a total of $1 billion was repaid. This repayment cap of $1 billion is $495 million (on a nominal basis) below the funds the government put into TVA. Through approximately 2014 when the annual repayments end, TVA will continue to pay the government "dividends" which approximate the government's annual cost of funds. This rate is a nominal one and generally protects the government against the erosion of its principal through inflation. However, once the payments stop, so do the dividends. This shortfall has a real present value of over $150 million, and would require annual payments of almost $3 million per year between 1961 and 2014 in order to eliminate (see TVA spreadsheet).

Access to Low Cost Federal Borrowing. Although TVA now raises most of its funds on private capital markets, the Administration historically borrowed from the Federal Financing Bank at rates slightly above the government's cost of funds, but below that available in the private market. In addition, TVA held almost $1 billion in short-term debt from the U.S. Treasury and the Federal Financing Bank in 1989, again

---

[61] TVA's debt is exempt from state and local taxation (other than inheritance or gift taxes), but is fully taxed federally. The debt is *not* guaranteed by the federal government.

[62] Prior to this time, TVA's focus was supposedly on flood control, with power generation as a sideline. (Williams, 9/3/92). However, TVA did keep separate books on its power operation from much earlier, suggesting that electricity was at least an important sideline.

at rates below those generally available in the private market. This government intermediation is not a cash cost to the federal government, but does reduce the ability for substitutes to enter the market and is therefore included in our high estimate. The value of access to government debt for obligations outstanding in 1989 reduced interest costs by more than $100 million/year.

One interesting aspect to the FFB borrowing is that TVA received less favorable call provisions. This reduced their ability to refinance debt at lower interest rates. TVA bonds in the 1960s were generally callable after 5 or 6 years. FFB borrowing, which began in 1974, allowed only a 10 year call beginning with 1976 borrowings. In January 1985, new FFB issues were no longer callable. Privately-issued utility bonds in the 1980s generally had 5-year calls. (Williams, 9/3/92). Whether the added cost from not being able to refinance the bonds through a call provision offset the savings from reduced government interest rates is not known. However, it is another example of the cost of risk-bearing in financial arrangements.

Direct Congressional Appropriations. As stated above, we assume all non-power areas supported from appropriations do not benefit energy. However, some non-power spending seems directly related to energy. Such areas include energy and pollution control R&D, a coal gasification project in Northern Alabama ($115 million; TVA, F-12), and certain transportation improvements. This area may be worthy of additional research.

Decommissioning, Decontamination, and Nuclear Waste

Decommissioning. TVA has accrued for decommissioning costs of its nuclear plant since 1982. Given their current estimates of decommissioning costs, the fund is adequately financed. A license extension at two TVA plants led TVA to determine that their decommissioning trust was overfunded (since the money would not be needed until further into the future). As a result, they sold $204 million worth of the bonds used to accrue the decommissioning funds. (TVA, 21).

We assume that TVA's estimates are correct and that decommissioning is not subsidized by future rate payers. However, the accrual for decommissioning is held in an internal fund (TVA, 21), unlike the external trusts required of most private utilities. Therefore, there is some risk that accrued funds will not be available for decommissioning purposes due to mismanagement. We assume that the trust will be properly managed. See Chapter B5 for a detailed discussion of federal subsidies through nuclear decommissioning.

Nuclear Waste. TVA pays a tax per kWh on all nuclear-generated electricity, the same as private utilities. In return, DOE, through the Nuclear Waste Fund, takes responsibility for disposing and managing the wastes. As DOE has no disposal site yet, TVA stores the material on-site, as do private utilities. TVA will begin to run out of on-site storage in 1996. Any subsidies on nuclear waste are reflected in our estimates for the DOE Nuclear Waste Fund.

Cross-Subsidies

Write-offs of Nuclear-Related Assets. TVA invested heavily in nuclear power during the 1970s and early 1980s. Many of these projects were plagued with huge cost overruns, operational problems, and ultimately write-offs. Amortization costs for nuclear plant cancellations, deferred costs for plant corrections on pending plants, and investment losses in uranium mining property all had budgetary impact in 1989. (TVA Budget Program, FY91, 65). We assign these losses to fission power, and allocate the cross-subsidies to TVA's other power sources in proportion to their respective shares of the TVA power mix. Due to the magnitude of the nuclear write-offs, all of the other fuels show as negative

numbers. This means that these other fuels are in essence being taxed to pay for the canceled nuclear investments, and could be sold more cheaply had the nuclear investments not taken place.

Below-Cost Power Sales to Uranium Enrichment. Other researchers have hypothesized that TVA sold electrical power to the uranium enrichment facilities at artificially low prices. As can be seen in Part 4 of the spreadsheet estimates, this clearly was not an issue for the later 1980s. During this period, DOE's demand for enriched uranium plummeted and the Agency was forced to pay TVA for power it was not actually using. These take-or-pay contracts explain the huge increase in cost per kilowatt hour shown. However, during the early 1970s, the argument of below-cost sales holds more credence. Since the sales went to support the production of fissionable uranium, these subsidies should properly be ascribed to fission-electric, and treated as a tax on the more general TVA power mix.

Lack of a Rate of Return

The fact that TVA is federally-owned allows it to operate without providing a market rate of return to equity investors. A similar entity, if privately-owned, would require some adequate return on the billions of dollars of assets owned. The lack of a required rate of return enables TVA to charge lower prices for power than would be possible for a private utility.[63]

Sources

Morgan Stanley & Co., et al. Offering Circular Supplement, November 1989. Prospectus for power bond offering 1989 series F and G.

Tennessee Valley Authority. 1990 Annual Report.

Tennessee Valley Authority. Budget Program for the Fiscal Year Ending September 30, 1991, January 1990.

Tennessee Valley Authority. Financial Statements, for the fiscal years 1986 through 1989.

Tennessee Valley Authority. "Information Statement," August 12, 1991. Cited as "TVA."

U.S. DOE, Energy Information Administration. Federal Energy Subsidies: Direct and Indirect Interventions in Energy Markets, November 1992.

Williams, Ann. Senior Financial Analyst, TVA. Personal Communications, April 10, 1992 and September 3, 1992.

[63]Although we did not quantify the magnitude of this subsidy for 1989, one recent attempt found that 1990 revenues would have had to have been more than $2.2 billion (1990$) higher in order to earn a return on investment comparable to that earned by investor-owned utilities. (EIA, 65).

Tennessee Valley Authority

Part 1: Interest Subsidies Associated With TVA Repayment of Power-Related Debt to the Federal Government

A. Cost of Funds

	Net Debt (1)	Net Change (2)	Last Refin. Year (3)	Gov't L-T Bond Rate in Refin. Yr. (4)	Annual Cost to Gov't of Marginal Debt (5)	TVA Dividend Rate (6)	Utility Long-Term Bond Rate (4)	Annual Cost of Increase in Debt at Pub. Power Rates (5)
1933	20.2	20.2	1963	0.04050	0.8	0.00000	0.04400	0.9
1934	41.0	20.9	1964	0.04190	0.9	0.00000	0.04550	1.0
1935	61.6	20.6	1965	0.04270	0.9	0.00000	0.04610	0.9
1936	82.1	20.4	1966	0.04770	1.0	0.00000	0.05530	1.1
1937	102.6	20.5	1967	0.05010	1.0	0.00000	0.06070	1.2
1938	123.3	20.7	1968	0.05450	1.1	0.00000	0.06800	1.4
1939	143.7	20.4	1969	0.06320	1.3	0.00000	0.07980	1.6
1940	164.4	20.7	1970	0.06870	1.4	0.00000	0.08790	1.8
1941	185.3	20.9	1971	0.06120	1.3	0.00000	0.07700	1.6
1942	205.4	20.1	1972	0.06010	1.2	0.00000	0.07500	1.5
1943	224.9	19.5	1973	0.07120	1.4	0.00000	0.07910	1.5
1944	244.3	19.4	1974	0.08060	1.6	0.00000	0.09590	1.9
1945	263.8	19.5	1975	0.07990	1.6	0.00000	0.09970	1.9
1946	285.9	22.2	1976	0.07610	1.7	0.00000	0.08920	2.0
1947	347.3	61.4	1977	0.07750	4.8	0.00000	0.08430	5.2
1948	340.3	(7.0)	1978	0.08490	0.0	0.00000	0.09300	0.0
1949	342.6	2.3	1979	0.09280	0.2	0.00000	0.10850	0.2
1950	369.7	27.1	1980	0.11270	3.1	0.00000	0.13460	3.6
1951	467.3	97.6	1981	0.13450	13.1	0.00000	0.16310	15.9
1952	655.1	187.8	1982	0.12760	24.0	0.00000	0.14930	28.0
1953	834.5	179.4	1983	0.11180	20.1	0.00000	0.12700	22.8
1954	1,084.4	249.9	1984	0.12410	31.0	0.00000	0.14250	35.6
1955	1,231.4	147.0	1985	0.10790	15.9	0.00000	0.11830	17.4
1956	1,219.5	(11.9)	1986	0.07780	0.0	0.00000	0.09610	0.0
1957	1,200.9	(18.6)	1987	0.08590	0.0	0.00000	0.09740	0.0
1958	1,195.6	(5.3)	1988	0.08960	0.0	0.00000	0.10030	0.0
1959	1,199.0	3.4	1959	0.04130	0.1	0.00000	0.04920	0.2
1960	1,201.3	2.3	1960	0.04060	0.1	0.00000	0.04720	0.1
1961	1,193.0	(8.3)	1961	0.03920	0.0	0.03449	0.04720	0.0
1962	1,183.4	(9.6)	1962	0.03990	0.0	0.03063	0.04400	0.0
1963	1,173.9	(9.5)	1963	0.04050	0.0	0.03285	0.04400	0.0
1964	1,164.3	(9.6)	1964	0.04190	0.0	0.03425	0.04550	0.0
1965	1,154.6	(9.7)	1965	0.04270	0.0	0.03659	0.04610	0.0
1966	1,140.0	(14.6)	1966	0.04770	0.0	0.03800	0.05530	0.0
1967	1,125.1	(14.9)	1967	0.05010	0.0	0.04134	0.06070	0.0
1968	1,115.9	(9.2)	1968	0.05450	0.0	0.04165	0.06800	0.0
1969	1,101.9	(14.0)	1969	0.06320	0.0	0.04757	0.07980	0.0
1970	1,088.3	(13.6)	1970	0.06870	0.0	0.05232	0.08790	0.0
1971	1,071.2	(17.1)	1971	0.06120	0.0	0.05986	0.07700	0.0
1972	1,054.8	(16.4)	1972	0.06010	0.0	0.05210	0.07500	0.0
1973	1,034.8	(20.0)	1973	0.07120	0.0	0.05099	0.07910	0.0
1974	1,015.2	(19.6)	1974	0.08060	0.0	0.06129	0.09590	0.0
1975	995.8	(19.4)	1975	0.07990	0.0	0.07030	0.09970	0.0
1976	996.0	0.2	1976	0.07610	0.0	0.06533	0.08920	0.0
1977	952.3	(43.7)	1977	0.07750	0.0	0.06591	0.08430	0.0
1978	932.1	(20.2)	1978	0.08490	0.0	0.06481	0.09300	0.0
1979	912.6	(19.5)	1979	0.09280	0.0	0.07388	0.10850	0.0
1980	899.4	(13.2)	1980	0.11270	0.0	0.08592	0.13460	0.0
1981	880.4	(19.0)	1981	0.13450	0.0	0.09608	0.16310	0.0
1982	882.0	1.6	1982	0.12760	0.2	0.12435	0.14930	0.2
1983	863.2	(18.8)	1983	0.11180	0.0	0.12082	0.12700	0.0
1984	848.2	(15.0)	1984	0.12410	0.0	0.10850	0.14250	0.0
1985	828.1	(20.1)	1985	0.10790	0.0	0.11383	0.11830	0.0
1986	808.3	(19.8)	1986	0.07780	0.0	0.10383	0.09610	0.0
1987	788.3	(20.0)	1987	0.08590	0.0	0.09193	0.09740	0.0
1988	768.0	(20.3)	1988	0.08960	0.0	0.08695	0.10030	0.0
1989	748.0	(20.0)	1989	0.08450	0.0	0.08770	0.09920	0.0
Total Through 1989					129.6			149.8
1990	728.0	(20.0)	1990	0.08610	0.0	0.09043	0	
1991	708.0	(20.0)	1991	0.08140	0.0	0.08843	0	

B. Less TVA Repayment for Use of Federal Funds - Assuming Highest Cost Debt Repaid First (See Note 7)

Total Debt Repaid through 1989 (497.9) million Summation of all reductions in net debt.

Low Estimate: Repayment Schedule, Goverment Borrowing Cost

Debt Year	Rate on Debt	Debt Amount	Repay Amount	Reduction Annual Costs
1951	0.1345	97.6	97.6	(13.1)
1952	0.1276	187.8	187.8	(24.0)
1982	0.1276	1.6	1.6	(0.2)
1954	0.1241	249.9	210.9	(26.2)
	Total		497.9	(63.5)

High Estimate: Repayment Schedule, Utility Borrowing Cost

Debt Year	Rate on Debt	Debt Amount	Repay. Amount	Reduction Annual Costs
1951	0.1518	97.6	97.6	(14.8)
1952	0.1457	187.8	187.8	(27.4)
1982	0.1457	1.6	1.6	(0.2)
1954	0.1352	249.9	210.9	(28.5)
	Total		497.9	(70.9)

C. Summary of Subsidies Associated with Unrepaid Federal Investment, 1989

	Low Est.	High Est.
Annual Interest Cost on Increases in Debt	129.6	149.8
Less Annual Reduction From Repayments	(63.5)	(70.9)
Less TVA Dividend, 1989 (see Note 6)	(65.6)	(65.6)
Net Borrowing Subsidy, 1989	0.5	13.3

Notes to Part 1:

(1) Net debt figures from 1947 to the present are from TVA "Power Program Summary," various years. Data for 1933-1946 are from Battelle Memorial Institute, "An Analysis of Federal Incentives Used to Stimulate Energy Production," December 1978, p. E-16.

(2) The net change column measures increases or decreases in aggregate debt. We assume that any increases in aggregate debt were financed at prevailing government borrowing rates in the year of increase, and the any reductions paid off the highest cost debt to the government at the time (according to interest rates in the year of refinancing).

(3) Last refinancing year calculations assume that initial spending was financed with 30-year Treasury or Electric Power bonds, the longest-term issue generally available (most TVA debt issues are 25 years). See RATES2.WK1 and the debt appendix for more detail on this assumption. The use of longer term debt in our imputed refinancing reduces the risk and cost borne by the federal government.

(4) The long-term rates columns provide the cost of funds in the refinancing year.

(5) Interest rate in refinancing year multiplied by the net increase in debt. Decreases in debt are shown in part 1B. This is a measure of the annual cost (since debt from each year remains outstanding) of government support for TVA, and does not compound interest subsidies.

(6) Dividend Rate is the interest rate TVA pays to Treasury on outstanding power appropriations. Data provided by Anne Williams, TVA, 4/92.

(7) Reductions in aggregate debt are assumed to repay highest cost obligations first. The years shown represent the highest cost debt, and repayments are applied against successively lower cost borrowings until all repayments have been applied. The annual reduction in interest costs is the amount government debt carrying charges were reduced by the repayment.

Part 2: Estimated Value of Cap on TVA Principal Repayment of Treasury Debt

	$Millions	
Total Repayments Required	1,000	Note 1
Repayments Made through 1989		
1961-1965	50	($10/year for first 5 years)
1966-1970	75	($15/year for next 5 years)
1971-1989	380	($20/year from 1971-on - 19 years through 1989)
Total	505	Note 2
Net Repayments Due after 1989	495	
Number of Years	25	
Last Payment Year	2014	
Net TVA Debt in 1989	748.0	
Debt at end of Req. Repayment	253.0	
Since dividend payments paid on entire principal through 2014, subsidy equals present value of principal only.		
Discount rate	1.80%	Note 3
Years of discounting	25	From 1989 - 2014
Present Value, 1989	163	

Annual Payments Necessary to Eliminate Shortfall

Start of Payments	1961	
End of Payments	2014	
Total Years	53	
Shortfall in 2014	253	
Real Interest Rate	0.018	
Annual Payment	2.9	Annual payments to totally repay TVA's federal appropriations by 2014.

Notes to Part 2.

(1) Current statutes do require a total of $1 billion in repayments, according to the schedule shown above. This leaves over $200 million in federal contributions to power unrepaid at the end.

(2) This figure is slightly different from the total net decrease in debt shown above. Part 1 shows only changes in the absolute magnitude of the debt to the federal government. There may have been years where TVA both repaid original appropriations as received new funds as well.

(3) The shortfall at the end of required TVA principal payments is a nominal figure. Until principal repayment ceases, TVA's annual "dividends" approximate the real return on the outstanding debt, since the market-near-market dividend rates paid incorporate the inflation of the time. To calculate the real value of payments which are not made, the real interest rate is used to calculate the necessary payments, net of inflation. While TVA repayments require only that a nominal $1 billion in federal appropriations need be repaid, we measure the value of the inflationary risk to the government of extremely long repayment periods through the imputed refinancing shown in Part 1. We capture this same effect with the repayment cap by using real, inflation adjusted returns on Treasury bonds.

The source for data on real returns is Jeremy Siegel, "The Equity Premium: Stock and Bond Returns Since 1802," Financial Analysts Journal, Jan.-Feb. 1992, p. 31, based on data from Ibottson Associates.

Part 3: Value of Government Intermediation on Treasury and Federal Financing Bank Borrowing

Borrowing as of End of FY89	Amount	Interest Rate TVA Rate	Mkt. Rate	Int. Rate Differential	Annual Value	
L-T debt, federal financing bank	15,925			0.685%	109.1	Ave. spread btwn. Corp. Aa and 30-yr T-bond, 1975-89
S-T debt, Treasury	150	8.663%	8.800%	0.137%	0.2	Spread in 1989, based on 6-month commercial paper.
S-T debt, FFB	742	8.240%	8.800%	0.560%	4.2	Spread in 1989, based on 6-month commercial paper.
				Total	113.4	

Source: TVA Financial Statements, FY89, pp. 15-17; long-term private market cost of borrowing covers period of TVA borrowing from FFB.

See RATES2.WK1 for derivation of interest rate spreads.

Part 4: Cross Subsidies on Power Sales to Uranium Enrichment Facilities (in cents/kWh)

Year	Industry Average, Large Industrial (1)	TVA Pricing on Power Sales to: Municipalities and Coops (2)	Federal Agencies (2)	Uranium Enrichment Facilities (3)	DOE power Paid for But Not Used (MW) (4)	Ratio Analyses: Uranium Enrich/ Munis and Coops (6)	Enrichment/ Federal Agency Average (6)
1970	0.95	0.532	0.454	0.435		81.81%	95.71%
1971	1.03	0.683	0.526	0.494		72.35%	93.96%
1972	1.09	0.718	0.586	0.555		77.27%	94.66%
1973	1.17	0.746	0.603	0.581		77.85%	96.34%
1974	1.55	0.866	0.699	0.677		78.14%	96.89%
1975	1.92	1.144	0.941	0.918		80.28%	97.53%
1976	2.07	1.589	1.389	1.366		85.96%	98.36%
1977	2.33	1.619	1.449	1.423		87.92%	98.22%
1978	2.59	1.978	1.829	1.778		89.90%	97.23%
1979	2.91	2.385	2.280	2.223		93.22%	97.49%
1980	3.44	3.065		2.466		80.44%	
1981	4.03			3.115	379		
1982	4.66			3.975	1,370		
1983	4.68			4.23	1,413		
1984	4.88	3.952		5.94	2,639		
1985	5.04	3.983		12.757	4,032	(5)	
1986	4.99	4.108		55.609	4,390	(5)	
1987	4.82	4.376		68.29		(5)	
1988	4.71	4.486		70.336		(5)	
1989	4.79	4.440		63.641		(5)	
1990	4.83			44.462		(5)	
1991				25.092		(5)	

(1) Edison Electric Institute, "Statistical Yearbook of the Electric Utility Industry, 1990," p. 73.

(2) Data for 1970-79 from the TVA "Power Annual Report, 1979, pp. 34-39;" 1980 data from TVA, "Power Program Summary, Vol. 2," FY ending 6/30/80. FY84-86: FY86 TVA "Financial Statements." FY84-86 data from TVA Financial Statements, FY86, p. 4; 1987-1989 data from TVA 1989 Financial Statements, p. 4.

(3) Data provided by Anne Williams, TVA, April 1992.

(4) U.S. GAO. "Uranium Enrichment: Congressional Action Needed to Revitalize the Program," October 1987, p. 14. GAO/RCED-88-18.

(5) Beginning in 1985, minimum charge provisions applied. Payments from 1988 to 1991 reflect DOE settlement in TVA litigation.

(6) Power sales to uranium enrichment cost less than wholesale rates to the municipal and cooperative utility systems that TVA was created to serve. Although the enrichment facilities comprise most of federal demand from TVA, power rates are even below the overall federal agency average.

Part 4: Allocation of Subsidies by Fuel

A. TVA Power Mix - Nameplate Capacity as of 6/30/89

	kW	Percent	Scaled Pct	Note
Hydro	5,605,910	17.07%	20.81%	Includes pumped storage
Coal	17,647,360	53.74%	65.50%	
Nuclear	5,897,160	17.96%		
Gas Turbine	2,510,000	7.64%	9.32%	
End-Use Effic.	1,179,432	3.59%	4.38%	
Total	32,839,862		100.00%	

Sources and Notes:

(1) Power mix data from Morgan Stanley et al, "Offering Circular Supplement, Tennessee Valley Authority," Nov. 17, 1989, p. 12.

(2) TVA would not provide any recent data on their efficiency investments. This estimate is made on the basis of an article written by the former head of TVA who stated their conservation efforts were equal to a nuclear power plant. Therefore, this figure is equal to the total TVA nuclear nameplate capacity divided by 5 reactor units. Due to the crudeness of this approximation and the fact that the article is 7 years old, the actual figure is likely to be higher. (See David Freeman, "The Nine Lives of TVA," Environment, April 1985, pp. 4-11). Prior to 1988, TVA saved an average of 205 MW/year from its home weatherization program alone. (U.S. GAO, "Electricity Supply: Utility Demand-Side Management Programs Can Reduce Electricity Use," Oct. 1991, p. 36. GAO/RCED-92-13.

(3) Scaled percentage is the share of the non-nuclear power mix for allocating nuclear cross-subsidies.

B. Summary of Subsidies from Parts 1,2, and 3

	Low Estimate	High Estimate
Government Appropriation	0.5	13.3
Present Value of Cap on Repayments	2.9	2.9
Gov't Intermediation on Borrowing	N/A	113.4
Total	3.4	129.6

C. Distribution to Fuel Types and Incorporation of Nuclear Cross-Subsidies

	Low Estimate Total	Coal	Nuclear	Hydro	End-Use Efficiency	Gas	High Estimate Total	Coal	Nuclear	Hydro	End Use Efficiency	Gas
Subsidies from Part B	3.4	1.8	0.6	0.6	0.1	0.3	129.6	69.7	23.3	22.1	4.7	9.9
Write-offs of Nuclear Plant Amort. of Cancelled Nuclear Plants			273.8						273.8			
Less Allowance for Recovery on Brown's Ferry			(25.8)						(25.8)			
Deferred Costs, corrective action			38.0						38.0			
Unrecoverable investment in uranium mining			22.0						22.0			
Net Nuclear Plant-Related Losses			308.0						308.0			
Re-allocation to TVA Power Mix		(201.7)	0.0	(64.1)	(13.5)	(28.7)	0.0	(201.7)	0.0	(64.1)	(13.5)	(28.7)
Tax-Exempt Operating Status	Included in "Tax-Exempt Status, Public Power," in the Tax Expenditures chapter.											
No Required Rate of Return on Invested Assets	Not Quantified											
Total Subsidies for TVA	3.4	(199.9)	308.6	(63.5)	(13.4)	(28.4)	129.6	(132.1)	331.3	(42.0)	(8.8)	(18.8)

Sources for nuclear write-offs in FY1989: TVA, "Budget Program for FY91," p. 65; TVA "Financial Statements for FY89, p. 8.

Federal Energy Subsidies:

Energy, Environmental, and Fiscal Impacts

Technical Appendix
(Appendix B)

by Douglas N. Koplow
Lexington, Massachusetts

April 1993

The Alliance to Save Energy
Energy Price and Tax Program
Mary Beth Zimmerman, Program Manager