BUDGET IN BRIEF
1981

U.S. Department of Energy

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DEPARTMENT OF ENERGY
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Overview

The Department of Energy has now completed its second full year of operation. Since its establishment on October 1, 1977, the reality of the energy problem the Nation faces has become more evident. The concept underlying the establishment of the Department was to bring together under unified leadership the primary federal government mechanisms available to deal with this increasingly serious issue. With the organization and managment changes made during the past summer, that foundation has been strengthened and the Department's energy programs are now more effectively integrated. In addition, the experience gained over the past two years working with the Congress, other government agencies, industry and the public has enabled the Department to formulate a more comprehensive and balanced approach to meet the Nation's energy needs. It is within this context that the FY 1981 Budget request was developed and is presented.

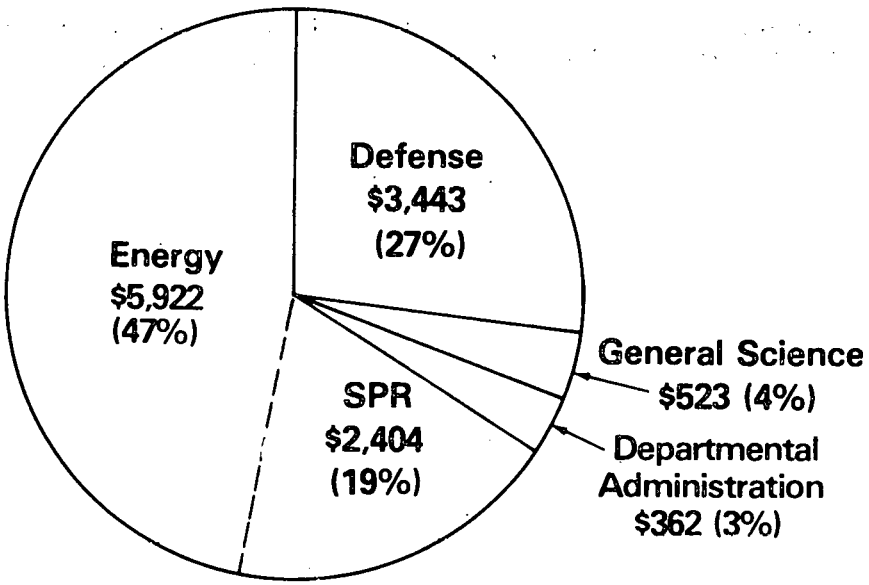
The FY 1981 Department of Energy budget totals $12.6 billion in budget authority and $11.1 billion in budget outlays. The budget authority being requested consists of $10.3 billion in new authority and a $2.3 billion reappropriation of expiring funds for the Strategic Petroleum Reserve. A breakdown of the Department's request by primary mission is presented below:

	Budget Authority (In Millions)	
	FY 1980	FY 1981
ENERGY:		
Energy Conservation	$ 815	$ 1,067
Research, Development & Applications	3,730	4,092
Regulation & Information	379	355
Direct Energy Production	488	408
Subtotal	$ 5,412	$ 5,922
Strategic Petroleum Reserve	0	2,404
Energy Security Reserve	2,208	0
ENERGY TOTAL	$ 7,620	$ 8,326
GENERAL SCIENCE	472	523
DEFENSE ACTIVITIES	3,008	3,443
DEPARTMENTAL ADMINISTRATION	275	362
LEGISLATIVE PROPOSAL - SPENT FUEL	300	0
TOTAL DOE	$11,675[1/]	$12,654

1/ 1980 column includes enacted appropriations and proposed supplementals of $517 million.

When compared in total to FY 1980, Departmental programs show a growth of $1.0 billion or 8 percent in budget authority. Adjustment for the Energy Security Reserve appropriation in FY 1980 and the Strategic Petroleum Reserve reappropriation in FY 1981 have virtually no effect on these statistics. Real growth is seen in all three primary mission areas for which the Department is responsible: Energy, General Science and Defense Activities. While the Energy mission of the Department is well known, its General Science and Defense responsibilities also constitute a sizeable share of the resource request.

As can be seen in the figure below, Energy programs, including the Strategic Petroleum Reserve, account for approximately two-thirds of the total resource request in FY 1981.



These energy activities include:

- o research and development and grant programs to encourage the conservation of energy;
- o programs to expand future energy supplies through research and development, financial incentives and direct production;
- o regulatory activities and the collection, analysis and dissemination of energy information; and
- o establishment of a Strategic Petroleum Reserve to protect the Nation from the effects of an interruption in the supply of petroleum.

Another 4 percent of the Department's resources are directed toward meeting its General Science responsibility, as established over 25 years ago by the Atomic Energy Act of 1954. In fulfilling this public trust, the Department undertakes basic research to expand our knowledge of the fundamental structure and behavior of matter. It is through such understanding that technological progress will continue for future generations.

Finally, 27 percent of the FY 1981 budget will provide support to the national security mission of the Department of Defense through the development, testing and production of nuclear weapons and related activities. Like the General Science responsibility, the Defense role of the Department of Energy was established by the Atomic Energy Act and transferred to it upon its establishment on October 1, 1977.

A detailed discussion of the FY 1981 activities to be undertaken to carry out these primary responsibilities is provided in the sections that follow.

ENERGY PROGRAMS

The FY 1981 budget request for energy programs totals $5.922 billion in budget authority for FY 1981, an increase of $510 million over FY 1980. The total including the Strategic Petroleum Reserve and the Energy Security Reserve is $8.326 billion for FY 1981, an increase of 9% over FY 1980.

	Budget Authority (In Millions)	
	FY 1980	FY 1981
ENERGY		
Conservation	$ 815	$ 1,067
Research, Development & Applications	3,730	4,092
Regulation and Information	379	355
Direct Production	488	408
SUBTOTAL	$ 5,412	$ 5,922
Strategic Petroleum Reserve		$ 2,404
Energy Security Reserve	$ 2,208	
TOTAL ENERGY	$ 7,620	$ 8,326

The funding requested in FY 1981 will:

- o continue grants to schools and hospitals, weatherization assistance to low-income homeowners and efforts to enhance public conservation awareness;
- o increase funding to help achieve the President's goal of meeting 20 percent of the Nation's energy needs through solar and hydropower applications by the year 2000;
- o pursue an aggressive fossil energy program, including $420 million in FY 1981 to construct two solvent refined coal demonstration facilities and the High-Btu Pipeline Gas demonstration plant;
- o expand efforts to deal with the long-term disposal of nuclear waste and interim handling of spent fuel;
- o strengthen the Department's regulatory and information programs;
- o operate the Department's business enterprises which will generate a total of $3.8 billion in revenues in FY 1981; and
- o move forward with the Strategic Petroleum Reserve in order to place 750 million barrels of oil in storage by 1989.

CONSERVATION

The Department's highest priority programs are designed to reduce the growth of energy demand by encouraging and providing the means for more efficient use of energy. The Department uses technology development, grants and public education programs which are complemented by tax credits and the regulatory provisions of recent legislation to provide a comprehensive approach to reducing energy consumption. In each case, the programs have been chosen for their potential energy benefits which consistently prove to be among the highest in the Department, especially in the near-term.

The FY 1981 budget provides $1.067 billion for conservation programs, which are complemented by an additional $739 million in conservation tax credits. This represents a significant federal investment in conservation.

	Budget Authority (In millions)	
	FY 1980	FY 1981
Research and Development		
Buildings and Community Systems	$106	$ 97
Industrial	60	59
Transportation	118	113
Conservation Multi-Sector	17	29
SUBTOTAL	$301	$298
Grant Programs		
State and Local	$457	$569
Energy Impact Assistance	50	150 1/
SUBTOTAL	$507	$719
Public Education		
Energy Information Campaign	$ 7	$ 50
TOTAL CONSERVATION	$815	$1,067

Research and Development

Conservation research and development activities are designed to augment private sector conservation efforts and accelerate the development of innovative equipment and processes. Energy savings of up to 50 percent are possible over the next 30 years by changing existing methods of energy use. This high potential for energy savings is accompanied by significant technical risks and long-lead time for implementation. The FY 1981 budget includes $298 million for Conservation research and development activities in the buildings and community systems, industrial and transportation sectors. In addition to these funds, the President is proposing legislation which would be supported by revenues from a "windfall" profits tax on the petroleum industry. A residential/commercial retrofit program would have budget authority of $10 million and $90 million for years FY 1980 and FY 1981, respectively.

1/ Energy Impact Assistance, shown with the Grant programs, is pass-through funding to the Farmer's Home Administration to assist communities in meeting their needs resulting from actions to increase energy supply.

The FY 1981 budget provides $97 million in budget authority for the Buildings and Community Systems program. The purpose of this program is to increase energy efficiency by developing the means to use fuel substitutes, as well as technologies which decrease residential and commercial energy requirements. Activities planned in FY 1981 include:

- o completion of minimum efficiency standards for major home appliances by November 1981;
- o completion of technical and training materials to refine the Building Energy Performance Standards program;
- o continued technical assistance to electric and gas utilities to provide insulation services to residential customers; and
- o development of the means to convert urban waste to usable energy.

FY 1981 funding for Conservation activities in the Industrial sector totals $59 million. This program will develop and introduce into industry high-risk, high-potential energy saving measures through DOE/industry cost-sharing projects. FY 1981 activities include:

- o installation of high temperature recuperators to recycle waste heat;
- o waste lubricating oil re-refining;
- o cogeneration projects for electrical power and process heat; and
- o a joint project with TVA to develop a pipe cross reactor for fertilizer production.

Transportation programs have the long-range objective of significantly reducing the Nation's almost complete dependence on petroleum to meet its transportation needs. Improvements in internal combustion efficiency, propulsion systems and eletric vehicles are the principal near-term goals. Transportation programs will be funded at a level of $113 million in FY 1981. These activities include:

- o the Electric and Hybrid Vehicle program which purchases several hundred electric vehicles each year to encourage the establishment of an electric vehicles industry;
- o vehicle propulsion to develop multi-fuel capacity and gas turbine fuel economy; and
- o alternate fuels studies to investigate methanol, ethanol and synthetic fuels use in the transportation sector.

Within the Conservation Multi-Sector program, funding is provided for small-scale technology to complement long-term centralized approaches to energy supply and conservation through incentives that make use of resources abundant in a localized area. Based on the dollar value of fuels saved over the next 5 years, many of these projects show a return on investment of as much as 500 percent. One example from last year is the effort by one of the Pacific Trust Territories to turn 10,000 gallons per day of tuna sludge into methane gas, feedstock, and fertilizer.

Grant Programs

State and Local programs provide federal funds to the state and local governments to improve energy conservation. These programs are funded at $569 million in FY 1981 in budget authority, up 25 percent from FY 1980.

Major FY 1981 grant activities include:

- $203 million for energy audits and energy conservation measures in schools and hospitals throughout the Nation;
- weatherization asssistance for low income, elderly and handicapped persons who live in older, less energy efficient housing ($199 million); and
- the Energy Management Partnership Act (EMPA) now before Congress, which will allow states and local governments to forecast energy consumption, identify projected energy supplies and develop management, facility siting and emergency plans. This act will consolidate the Energy Extension Service and the State Energy Conservation Programs into a "core" program for conservation activities. The legislation will also provide $50 million in grants to support local government energy activities. A total of $152 million is proposed for these activities.

Public Education

The Energy Information Campaign is a national advertising campaign using television, magazines, radio, and newspapers. The campaign is designed to be similar to a recent highly successful Canadian program. A test program for which $7 million in FY 1980 Supplemental funding is requested, will provide the data for a full scale campaign in FY 1981. Budget authority for FY 1981 is requested at a level of $50 million.

RESEARCH, DEVELOPMENT AND APPLICATIONS

Research, development and applications programs facilitate technology development to expand future energy supply. The Nation must obtain substitutes for its use of oil, substitutes which will be economically and environmentally acceptable. Economic survival will depend on competitive energy supplies. Each area of the world has a different set of resources available to it, but the United States has the most advanced technical capabilities of any nation in the world. We must convert these capabilities into capacity, before actual oil shortages constrain our productive abilities.

The FY 1981 Budget provides $4.092 billion for research, development and applications as shown below:

	Budget Authority (In Millions)	
	FY 1980	FY 1981
Fossil Energy	$ 897	$ 1,165
Solar and Other Renewables	771	868
Energy Systems & Storage	104	112
Magnetic Fusion	356	404
Nuclear Fission	1,186	925
Environment	235	261
Supporting Research	252	297
General Purpose Facilities	-	60
General Reduction	-71	
TOTAL RESEARCH, DEVELOPMENT AND APPLICATIONS	$ 3,730	$ 4,092

Fossil Energy

The Department's Fossil Energy programs are directed toward the research, development and commercialization of technologies which will permit greater reliance on domestic fossil resources of coal, oil and unconventional natural gas. These programs total $1.165 billion in FY 1981.

	Budget Authority (In Millions)	
	FY 1980	FY 1981
Coal	$ 779	$ 1,047
Petroleum	61	64
Gas	36	31
Fossil Energy Applications	21	23
TOTAL FOSSIL ENERGY	$ 897	$ 1,165

Coal

The Coal program directly supports the President's National Energy Plan to reduce our dependence on imported oil through the development of a commercially viable synthetic fuels industry at the earliest possible time. The program also supports required and voluntary conversion to coal through the demonstration of environmentally acceptable coal combustion technology.

Selected coal liquefaction and gasification technologies continue to be developed through pilot and demonstration facilities jointly cost-shared with private industry. Construction funds for three major demonstration facilities are included in the FY 1981 budget and constitute 40 percent of the FY 1981 resource request for coal research and development. They are:

- the Solvent Refined Coal (SRC-I) plant at Newman, Kentucky ($175 million);
- the SRC II plant at Morgantown, West Virginia ($190 million); and
- the High Btu Synthetic Pipeline Gas plant ($55 million).

In addition to these large demonstration plants, the H-Coal and Exxon Donor Solvent liquefaction pilot plants will be in operation in FY 1981.

The FY 1981 budget also provides $23 million to continue the development of Atmospheric Fluidized Bed combustion systems capable of burning high-sulfur coals in an environmentally acceptable manner. A total of $97 million is provided to continue research and development on technologies to increase energy conversion efficiency in fuel cells and magnetohydrodynamics. The coal-oil mixture program, for which $22 million is provided, will be continued. Finally, $65 million will be provided to support basic research and development of advanced coal conversion and combustion technologies.

In addition, $50 million in FY 1980 and $50 million in FY 1981 is being proposed for the Coal R&D program in separate legislation to be supported by the Windfall Profits Tax. These amounts will be used to fund both direct and indirect liquefaction, coal liquids refining, in-situ gasification, and coal preparation.

Petroleum

The Department's emphasis on the Petroleum program is in long-range technology development. The funding level of $64 million will provide for the continued development of new and improved technologies for recovering oil from existing and potential oil reserves as well as non-conventional sources such as shale rock. These activities include advanced process technology, oil shale, drilling and off-shore technology, and enhanced oil recovery.

Enhanced oil recovery activities will focus on in situ and surface conversion of oil shale, steam drive pilot tests on tar sands and field tests on light and heavy oils.

Gas

The FY 1981 budget for the Gas program includes $31 million to continue definition and characterization of the Nation's unconventional gas resources, including Eastern gas shales and Western gas sands to ascertain the true potential of these unconventional resources and provide technological support for tapping them.

Fossil Energy Applications

The Department's fossil energy applications include efforts related to fluidized bed combustion, coal-oil mixtures and gasification. The industrial commercialization program will provide information needed to encourage the use of the technologies noted above. Other benefits include a basis for industrial boiler fuel users to decide the viability of coal, and for the Economic Regulatory Administration to judge the merits of exemption petitions.

In addition, these requested funds will:

- o continue shale commercialization studies concerning mitigation of environmental, financial and technological barriers to oil shale development;
- o continue unconventional gas recovery in commercial demonstrations of coal bed methane and devonian shale, and provide grants for site specific assessments of production potential; and
- o continue supply initiative efforts to increase production of domestic oil and gas from marginal sources by mitigating commercial constraints and conduct development and demonstration studies of "heavy oil" and tar sands production.

Solar and Other Renewables

The FY 1981 funding for programs to develop solar and other renewable forms of energy totals $868 million. This is coupled with other Federal solar programs of $436 million and tax credits of approximately $355 million. Department of Energy funding is as follows:

	Budget Authority (In Millions)	
	FY 1980	FY 1981
Solar Energy		
Solar Technology	$ 447	$ 466
Solar Applications	155	186
Subtotal Solar	$ 602	$ 652
Geothermal	$ 145	$ 155
Hydropower	24	19
Subtotal Other Renewables	$ 169	$ 174
Geothermal Resource Development Fund Extension	0	42
TOTAL SOLAR & OTHER RENEWABLES	$ 771	$ 868

Solar Energy

The Department is responsible for solar technology development and applications programs aimed toward increasing the contributions made by solar energy in meeting the Nation's total energy requirements. In recognizing the potential economic, environmental and national security benefits of solar energy and the need to begin a transition to long-term reliance on solar and renewables, the President has committed the Nation to supplying 20 percent of its needs from solar energy, including hydropower, by the turn of the century.

Solar technology programs are designed to establish the technical and market readiness of a broad range of renewable energy resources with the objective of supplying significant portions of residential, commercial, industrial, agricultural, transportation and utility demands for energy in an environmentally acceptable manner. Specific solar technology development activities funded in FY 1981 include:

- o continued R&D in photovoltaic thin films, novel concentrators and advanced materials and the grant program for high risk innovative concepts;
- o development and testing of small scale wind systems and fabrication of advanced intermediate and large scale experimental system;

- solar thermal repowering/industrial retrofit experiments, evaluation of concentrators and receivers for large and small systems and continued development and testing of collector designs and materials; construction of
- construction of the Shenandoah total energy project, the Small Community Solar Thermal Power Experiment, the Solar Energy Research Institute and the 10 MWe Central Receiver Power Plant at Barstow, California;
- biomass technology and engineering development combustion, fermentation, gasification and liquefaction systems;
- operational testing of the Ocean Thermal Energy Conversion demonstration (OTEC-1) and initiation of the second generation OTEC design; and
- establishment of the Solar Energy Information Data Bank to collect, review and disseminate information for all solar technologies.

Solar Applications programs are intended to eliminate the economic and institutional barriers to near-term use of solar energy technologies and systems. Major program elements in FY 1981 include:

- systems development and engineering for passive solar applications, agricultural and industrial process heat, and active heating and cooling systems;
- demonstration activities in residential, commercial and federal buildings; and
- solar commercialization activities including market analysis, barrier assessment, market development, information, training, and consumer assurance activities.

In addition to these activities solar-related work is underway in energy systems and storage, environment and supporting research areas. With these additions, DOE solar and related funding totals $707 million. For a description of solar energy related funding in the Federal Government, see the Special Analyses section.

Geothermal

The main objectives of the Geothermal program are: to support the commercialization of hydrothermal energy; evaluate the economic recoverability of methane, thermal and hydraulic energy from geopressured resources; develop the technologies to reduce the cost of energy recovery from all geothermal resources; and to economically extract the energy in hot dry rock.

Activities to be pursued in FY 1981 include the following:

- o design will be completed and construction will begin on the cost-shared 50 MWe Geothermal Demonstration Plant at Valles Caldera, New Mexico;
- o the 5 MWe Raft River Pilot Plant will begin operation;
- o the number of direct heat demonstrations will be expanded;
- o construction will continue on the hot dry rock 50 megawatt thermal loop at Fenton Hill, New Mexico; and
- o preliminary determination of the distribution and character of hot dry rock formations in the U.S. will be completed.

Technology has been proven for both direct heat and electrical generation applications from high temperature hydrothermal resources. Efforts to stimulate commercial development of the resources include work with other federal agencies to streamline the federal leasing process, promote private sector development, and conduct planning and analysis tasks in support of prospective hydrothermal resource users.

With regard to the Geothermal Resources Development Fund, the Department is requesting new annual loan guarantee authority of $206 million to cover loans for additional electric power generating plants and direct heat applications. This is in addition to anticipated commitments of $350 million through FY 1980. Finally, a reappropriation of $42 million is requested to extend the availabiliity of the reserve to cover potential defaults after 1984.

Hydropower

The FY 1981 budget requests $19 million for further commercial development of low-head hydroelectric power resources at existing dam sites and for new initiatives involving power production from river current. This will continue the mix of program activities conducted in FY 1980 including feasibility loan studies, commercial demonstrations, barrier mitigation and information dissemination.

Electric Energy Systems & Storage

FY 1981 funding for Electric Energy Systems & Storage totals $112 million. These programs will provide better methods of transmitting and storing electric energy which are critical to the development of new and improved energy technologies.

The objectives pursued under electric energy systems are to develop the means for effective integration of new electric energy technologies into the existing electric utility systems and to provide technical options for increased power tranmission and storage. The $40 million request for FY 1981 will enable the Department to continue to:

- o promote the integration of dispersed (e.g., photovoltaic, wind and solar thermal) electric generation systems;
- o develop a/c superconducting cables and d/c cable prototypes for electricity transmission; and
- o determine electric field effects on the environment and living organisms.

The goal of the energy storage program is to develop reliable, low cost, safe and environmentally acceptable energy storage systems and components for use in transportation systems, building heating and cooling systems, industrial processes, solar systems and utilities. FY 1981 funding of $72 million will continue research and development efforts to:

- o improve propulsion batteries and flywheel regenerative braking systems to upgrade electric and hybrid vehicle performance to the level required for significant market penetration;
- o utilize aquifer storage of hot and cold water for heating and cooling buildings;
- o improve battery, thermal, mechanical, magnetic and underground storage for utility load leveling to substitute for natural gas and oil-fired peaking turbines and for use in solar electric systems;
- o develop energy saving electrochemical processes and retrofit thermal storage for industrial heat recovery.

Magnetic Fusion

Funding of $404 million is provided in FY 1981 to continue development of fusion technology for the generation of electricity in a safe, economic and environmentally acceptable manner. The program strategy is to proceed systematically toward the development of a sound physics, engineering and technological foundation needed for the design, construction and operation of increasingly complex experiments and facilities. Progress, as measured by improvements in plasma density, temperature and confinement time, has been most encouraging.

Activities in FY 1981 include continued construction of:

- o major physics scaling experiments, including the Tokamak Fusion Test Reactor and the Mirror Fusion Test Facility, both of which should be completed in 1982; and
- o the Fusion Materials Irradiation Test Facility which will provide the necessary testing capability for materials development and generation of engineering data upon completion expected in 1984.

In addition, other tokamak and mirror experimental devices will be operated to continue development of a strong scientific base for the eventual design of a fusion engineering test facility. The FY 1981 funding level as in the past provides for the assessment and development of alternate fusion concepts.

Nuclear Fission

The nuclear fission programs undertaken by the Department provide the technological base for nuclear power as an economic and environmentally acceptable source of electric power generation and underpin the Nation's non-proliferation policy. FY 1981 funding for nuclear fission activities totals $925 million, in seven distinct, yet interrelated programs as described below.

	Budget Authority (In millions)	
	FY 1980	FY 1981
Commercial Nuclear Waste	$ 220	$ 299
Spent Nuclear Fuel	18	20
Advanced Isotope Separation Technology	56	87
Converter Reactor Systems	66	55
Breeder Reactor Systems	762	384
Advanced Nuclear Systems	39	44
Uranium Resource Assessment	65	36
Less Unobligated Balance	-40	-
TOTAL NUCLEAR FISSION	$1,186	$ 925

The FY 1981 Commercial Nuclear Waste budget of $299 million provides for further expansion of investigations begun in FY 1980 of non-salt geologic media for potential terminal isolation of nuclear waste. Repository site investigations also continue in salt, including construction of the Salt Test Facility. The Commercial Nuclear Waste Program also includes funding for further characterization and protection of the site near Carlsbad, New Mexico, in bedded salt which had previously been under Defense Waste Management. Funding of $49 million is included for decontamination and decommissioning of inactive uranium mill tailings sites and former Atomic Energy Commission/ Manhattan Engineering District sites, and other surplus DOE facilities. Finally, work initiated in FY 1980 will continue at the West Valley, New York site, at a level of $5 million.

The Spent Nuclear Fuel program, funded at $20 million in FY 1981, continues to provide technical and operational support for the President's commitment to provide interim storage for commercially generated spent nuclear fuel. Separate legislation was proposed in 1979 to provide borrowing authority of $300 million necessary for acquisition of the required storage capacity by 1983. The Department continues to support that legislative proposal.

Increased funding to $87 million for the Advanced Isotope Separation Technology program will permit the continued investigation of three processes -- two laser processes and a plasma process. Fabrication of the preprototype test beds will be completed with startup in FY 1982. Conceptual design studies for a development module, planned to be operational in the mid-1980's will be completed.

In FY 1981, research and development on converter reactors totals $55 million. The program is focused on:

- o increasing the safety and efficiency of light water reactors (LWR's) through improved fuel utilization concepts, reduced occupational exposure to radiation, increased plant productivity and developing technology to improve LWR safety;

- o obtaining data from the examination and evaluation of the Three Mile Island plant and equipment which will be of value in improving the safety of LWR plants; and

- o developing and demonstrating new technology for reducing the percentage of uranium enrichment in research and test reactor fuels so as to reduce the associated proliferation risks.

In FY 1981, $384 million is provided for the Breeder Reactor Program. This funding will maintain the breeder technology base for future use when required, consistent with U.S. nonproliferation objectives and anticipated electric power requirements. Funding for the LMFBR is reduced consistent with current expectations that the LMFBR will not be needed in this country until after the year 2000. Activities are being focused on the development of breeder fuels by using the Fast Flux Test Facility at Richland, Washington, its supporting facilities and associated test program. The fuel cycle R&D program will concentrate on maintaining a base reprocessing technology effort. Work will continue in the Water Cooled Breeder program, including advanced water breeder applications.

The $44 million requested for advanced nuclear systems will continue funding for space and terrestrial applications and advanced systems evaluation activities. Key FY 1981 activities include the isotopic power system development efforts in support of the NASA Galileo and International Solar Power spacecraft, fuel and aerospace nuclear safety work, support of advanced thermoelectrical materials, component materials and technology of an advanced space reactor for the DOD.

To reduce uncertainties as to the extent, availability and economics of both domestic and foreign nuclear fuel resources, the National Uranium Resource Evaluation (NURE) program was established. Work will continue at a level of $36 million to identify new areas that appear favorable to further geological exploration and to apply improved technology to uranium resource assessment, exploration and production.

Environment

The Department's environmental activities related to energy supply are designed to ensure that environmental impacts are incorporated in energy technology development and deployment activities. Potential environmental health and safety concerns must be identified early in the development phase and adequate mitigation processes or controls determined through research.

The FY 1981 request for environmental programs is $261 million, an increase of $26 million over FY 1980. Included are efforts to:

- o expand research to predict and determine the effects of increased levels of carbon dioxide in the atmosphere;
- o increase the level of health effects research in the fossil energy technologies, especially coal combustion, liquefaction, and gasification;
- o support human health studies to determine late effects of low-level radiation exposure;
- o conduct research on selected projects, such as SRC I and II and geothermal demonstrations;
- o continue generic studies into health and environmental effects related to energy technologies.

Supporting Research

The Department's Supporting Research program (formerly Basic Energy Research) provides the strong technology base which must underpin energy technology development. The FY 1981 budget includes $297 million for these programs.

	Budget Authority (In Millions)	
	FY 1980	FY 1981
Basic Energy Sciences	$ 229	$ 260
Technical Assessment Projects	14	21
University Research Support	7	14
Technical Program & Policy Anslysis	2	2
TOTAL SUPPORTING RESEARCH	$ 252	$ 297

These programs seek fundamental knowledge of the physical and biological sciences, and engineering and mathematics as they relate to energy production, conversion and conservation. Specifically, in FY 1981 the Department will:

- maintain ongoing investigations into the chemistry of coal, the processes of combustion and catalysis, and novel approaches to the use of solar energy and the isolation of nuclear waste;
- increase engineering, geosciences and biological energy research efforts;
- begin to use the Intense Pulsed Neutron Source I at Argonne National Laboratory, the Combustion Research Facility at Sandia Livermore Laboratory, and the National Synchrotron Light Source at Brookhaven National Laboratory;
- complete the Chemical and Materials Sciences Laboratory at Lawrence Berkeley Laboratory; and
- support cooperative research in universities, industry and the national laboratories to expedite technology transfer.

General Purpose Facilities

The Department requests funding of $60 million in budget authority to begin construction of seventeen General Purpose Facilities (GPF) projects to overcome deficiencies at multiprogram laboratories. The deficiencies include overcrowded office and laboratory space, aging utility systems and roads, and unacceptable fire prevention conditions. A program to continue to monitor and provide support for the multiprogram GPF will be established.

REGULATION AND ENERGY INFORMATION

The third category of DOE energy programs deals with regulation and energy information activities. The regulatory activities assigned to the Department are the responsibility of the Economic Regulatory Administration, the Office of Hearings and Appeals and the Federal Energy Regulatory Commission. Energy information programs are the responsibility of the Energy Information Administration. Funding for these activities totals $355 million in FY 1981.

Economic Regulatory Administration (ERA)

In keeping with national energy objectives, ERA has the responsibility for programs to diminish the use of oil and natural gas by utilities and industry; to promote conservation, equity and efficiency of utilities; and to enforce DOE's petroleum pricing and allocation regulations. ERA also controls imports and exports of oil, gas and electricity and seeks to achieve equitable pricing and distribution of available supplies of crude oil and petroleum products. ERA seeks to guide rather then regulate the behavior of the petroleum industry.

	Budget Authority (In millions)	
	FY 1980	FY 1981
Fuels Conversion (Coal Utilization)	$ 27	$ 31
Utility Programs and Regulation Intervention	29	33
Compliance	72	67
Regulation Development	3	3
Fuels Regulation	11	11
Emergency Preparedness	47	5
Program Administration	3	4
TOTAL ERA	$192	$154

The level of funding for ERA is $154 million in FY 1981 and will support actions to:

- o implement legislation which prohibits the use of scarce fuel, especially oil, in new power plants and large industrial installations, and encourage utilization of coal in existing facilities;
- o support adoption of utility rate structures which foster conservation and seek improvements in electric power supply and reliability;
- o complete compliance actions for embargo periods and enforce present pricing and allocation regulations;
- o develop as necessary regulations for the pricing and allocation of crude oil and petroleum products pricing;
- o achieve equitable pricing and allocation of crude oil and petroleum products; and
- o develop and maintain contingency plans for a severe energy supply interruption and a standby motor fuels rationing plan.

Office of Hearings and Appeals (OHA)

Budget authority of $9 million is provided for OHA in FY 1981. The Office has responsibility for reviewing and issuing final DOE orders of an adjudicatory nature and deciding on appeals, exemptions and exceptions.

Federal Energy Regulatory Commission (FERC)

FERC is charged with regulating certain interstate aspects of the electric power, natural gas and oil industries to assure adequate energy supplies at just and reasonable rates, and allowing fair rates of return to provide incentives for increased production of energy supplies.

	Budget Authority (In millions)	
	FY 1980	FY 1981
Gas Regulation	$ 39	$ 41
Hydro-power Regulation	13	13
Oil Regulation	5	6
Multi-resource Regulation	16	16
TOTAL FERC	$ 73	$ 76

The FY 1981 funding will enable FERC to continue to:

- o carry out the provisions of the National Energy Act, particularly the Natural Gas Policy Act and the Public Utility Regulatory Policies Act;
- o issue permits and licenses for hydro-electric projects, inspect all licensed and license-pending dams, and encourage development of small scale hydro sites;
- o develop regulations to enforce policies for natural gas and electric power pricing, production, transmission, and distribution and for interstate oil pipelines; and
- o perform regulatory responsibilities with respect to the Alaska Natural Gas Transportation System and the Trans Alaska Pipeline System.

Energy Information Administration (EIA)

The Department has the responsibility to develop and maintain a comprehensive and reliable base of energy information and analytical capability to assist legislative, executive and private decision-makers with informed judgements on present and future energy policy and use.

	Budget Authority (In Millions)	
	FY 1980	FY 1981
Energy Applied Analysis	$ 13	$ 14
Collection, Production and Dissemination	37	37
Information Validation	13	15
Data Information Services	45	50
TOTAL EIA	$108	$116

The FY 1981 funding request of $116 million provides for:

- o development of econometric, statistical and structural process models of energy supply, demand, price, transportation, and fuel conversion;
- o substantive information on electric and natural gas supply and consumption patterns, problems, trends, technology, and long-range industry plans and outlook;
- o the analysis of the impacts of national and international energy policies, actions, and developments on the national economy, major economic sectors, and sepcific socioeconomic groups;
- o development and implementation of a detailed financial information reporting system to assess industry performance in the area of energy resource production and distribution;
- o collection of oil and gas production and reserve data;
- o development and implementation of the Emergency Management Information System;
- o a national energy information system to collect and provide energy information to all users; and
- o making available the Department's energy information resources to other Federal agencies, the Congress and the public.

DIRECT ENERGY PRODUCTION

The Department of Energy is responsible for three major Direct Energy Production programs, namely:

- o the production and sale of enriched uranium services for use in nuclear powered electrical generating plants;
- o the development, production and sale of oil from the Naval Petroleum Reserves; and
- o the distribution and sale of electric power in five power marketing areas.

As can be seen from the table below, production and distribution costs for these activities total $1.697 billion while revenues are estimated at $3.771 billion in FY 1981.

	FY 1980	FY 1981
	(BA in millions)	
Production and Distribution Costs		
Uranium Enrichment	$1,308	$1,377
Naval Petroleum Reserve	73	145
Power Marketing	165	175
TOTAL	$1,546	$1,697
	(Revenues in millions)	
Revenues		
Uranium Enrichment	$1,057	$1,289
Naval Petroleum Reserve	1,621	2,092
Power Marketing	382	390
TOTAL	$3,060	$3,771

The revenues obtained from the sale of enriched uranium directly offset the cost incurred by the Department in providing that service. Revenues generated from the sale of oil from the Naval Petroleum Reserves and the marketing of power from four of the five power marketing administrations revert directly to the U.S. Treasury. Thus, the net appropriations required for these activities is $408 million in FY 1981.

Uranium Enrichment

The Department enriches uranium in three gaseous diffusion plants located at Oak Ridge, Tennesse, Portsmouth, Ohio and Paducah, Kentucky for domestic and foreign nuclear power reactor customers and to meet government requirements. The FY 1981 request is based on plans to produce 9.5 million separative work units (SWU). Anticipated sales of 10.8 million SWU in FY 1981 will result in revenues totalling $1.179 billion. An additional $110 million in revenues will be realized from the sale of depleted uranium to the Italian government.

The Department is working on a means to reduce the amount of electric power required for future enrichment activities through the use of gas centrifuge technology. The major component of this effort is construction of the Portsmouth Gas Centrifuge Enrichment Plant. Scheduled to provide 2.2 million SWU of capacity by the end of 1988, this project is funded in FY 1981 at $319 million. The plant will have the potential to expand in 1.1 million SWU increments, up to a total of 8.8 million SWU, should demand for enrichment services warrant the additional capacity.

Naval Petroleum Reserves

The Naval Petroleum Reserves contain the ninth largest known reserve in the U.S., at Elk Hills, California. The FY 1981 BA request provides for continued operation and development of the reserves (in California and Utah) and the resumption of exploratory drilling at NPR #1 after a temporary halt in FY 1980. The request anticipates that the federal share of NPR production will be 160,000 barrels per day, dependent on settlement of litigation with Chevron U.S.A.

Other activities funded in FY 1981 include:

- operation and maintenance of existing facilities;
- drilling 89 developmental and 10 exploratory wells;
- continuation of the facilities construction program; and
- purchase of hardware and software for the NPR #1 automated accounting system.

Power Marketing Administrations

The Power Marketing Administrations operate high voltage transmission systems to market electric power produced at federal hydroelectric generating projects in five geographic regions of the United States. They are the Alaska, Bonneville, Southeastern, Southwestern, and Western Area Power Administrations. The FY 1981 budget request for four of the five administration is $175 million. There is no budget authority requested for the Bonneville Power Administration since it operates as a self-financed revolving fund. The budget request for the Western Area Power Administration increases from $128 million in FY 1980 to $142 million in FY 1981 primarily due to transmission line improvement and system construction. Southwestern Power Administration has a $4.0 million decrease from $32 million in FY 1980 to $28 million in FY 1981 primarily due to completion of construction projects. The other Power Marketing Administrations are essentially no-growth requests.

STRATEGIC PETROLEUM RESERVE

In December 1975, legislation was enacted to establish a Strategic Petroleum Reserve (SPR) of up to one billion barrels of oil in order to reduce the Nation's vulnerability to the effects of a severe petroleum supply interruption. Preparation of storage facilities is proceeding on a schedule which calls for completion of Phase I with 248 million barrels in storage by 1983 and 750 million barrels in storage by the end of 1989. The latter figure includes 24 million barrels of regional petroleum storage. New budget authority of $104 million is requested in FY 1981 for facilities development.

Oil acquisition for SPR, which has been halted since the beginning of the Iranian crisis in early 1979, could resume again in 1980, depending upon international market conditions. The budget request assumes an average fill rate of 100,000 barrels per day during calendar years 1980 and 1981. The fill rate is planned to increase to approximately 250,000 barrels per day in 1982 and thereafter.

The Department is seeking a provision in the appropriation language for the SPR in FY 1981 which will extend indefinitely the life of the FY 1979 SPR appropriation which is scheduled to expire on December 31, 1980. As a result, an estimated $2.3 billion is requested for reappropriation in FY 1981. This is not a request for new budget authority but rather an extension of existing budget authority.

In addition, the Administration is proposing legislation which will support Regional Strategic Petroleum Reserve objectives with $9 million in FY 1980 and $15 million in FY 1981. These funds will be made available upon enactment of the Windfall Profits Tax.

ENERGY SECURITY RESERVE (ESR)

To stimulate the production of alternative fuels, the Congress appropriated $19.0 billion to be available as a reserve for accelerating development of alternative fuels as substitutes for imported oil. Of that amount, $1.5 billion was designated for purchase commitments or price guarantees to stimulate domestic production of alternative fuels. The Department is developing the procedure for using this "market pull" incentive to the production of fuel derived from various sources such as coal, shale, tar sands, lignite, peat, biomass and unconventional gas under purchase agreement within the next few years.

Another $708 million of the $19.0 billion ESR has been appropriated by Congress to support preliminary alternative fuels commercialization activities as follows:

	Budget Authority ($ in millions)
Project Feasibility Studies	$ 100
Cooperative Agreements	$ 100
Loan Guarantee Reserve	$ 500
Program Support	$ 8
SUBTOTAL	$ 708
Alternative Fuels Purchase/Agreements	$1,500
TOTAL ESR (Currently Available for Obligation)	$2,208

In addition, the Congress established a $1.0 billion reserve for stimulation of conservation and solar alternatives. This Solar and Conservation Reserve is not available for obligation until the passage of authorizing legislation and subsequent appropriation acts.

In summary, the Congress established reserves totalling $20.0 billion for Energy Security and Conservation and Solar, and appropriated $2.208 billion of the ESR for availability in FY 1980.

GENERAL SCIENCE

The purpose of the General Science programs is to pursue fundamental knowledge in the physical and life sciences in order to gain a deeper understanding of the structure and behavior of matter through an integrated theoretical and experimental program. General Science is not directed toward any particular technology. Rather through investigations into areas at the existing frontiers of knowledge they are expected to yield long-term benefits in terms of scientific and technological breakthroughs.

The FY 1981 request for General Science programs totals $523 million distributed as follows:

	Budget Authority (In Millions)	
	FY 1980	FY 1981
High Energy Physics	$ 325	$ 359
Nuclear Physics	105	115
Life Sciences Research and Nuclear Medicine Applications	42	49
TOTAL GENERAL SCIENCES	$ 472	$ 523

HIGH ENERGY PHYSICS

In this program, studies are conducted of the fundamental building blocks of matter and the fundamental forces of nature in an attempt to understand more fully the relationships and transformations between energy and matter. The method of achieving the program objective involves the use of large accelerator facilities to provide various types of high-energy particle beams and the use of sophisticated detection and analysis apparatus to study the particle interactions. In 1981, these facilities will be used to search for new physical phenomenon using subnuclear particle interaction.

The FY 1981 request for High Energy Physics reflects the final year of funding for the Energy Saver project at FERMILAB and the initiation of the Tevatron colliding beam project at that site. It also includes $45 million for the continuation of construction of the Intersecting Storage Accelerator (ISABELLE) at Brookhaven National Laboratory.

NUCLEAR PHYSICS

The Nuclear Physics program is concerned with attaining a deeper understanding of the interactions, structure and properties of nuclei through experimental medium energy and heavy ion nuclear research and theoretical investigations. Plans for FY 1981 include exploitation of research opportunities at nuclear physics facilities and conduct of research and development related to high duty, high current electron linear accelerators. Budget authority of $115 million is being requested for FY 1981.

Construction continues for the National Superconducting Cyclotron Laboratory at Michigan State University which will provide a major expansion of heavy ion research capabilities. Construction of the Argonne Tandem Accelerator System will be initiated. This system is designed to provide heavy ion beams in a higher range than now possible.

LIFE SCIENCES AND NUCLEAR MEDICINE APPLICATIONS

Life sciences research and nuclear medicine applications funding supports long-term basic biological research which provides fundamental information on the normal structure and function of living organisms at all levels of organization for an understanding of the health and environmental effects of energy-related pollutants. Research on the applications and clinical feasibility of radiation, radionuclides and stable isotopes for use in diagnosis and treatment of human diseases in clinical medicine is also pursued.

The FY 1981 funding request is $49 million for Life Sciences and Nuclear Medicine Applications, an increase of 15 percent over FY 1980. Increased efforts will be provided for basic biological research to determine the structure of genetic material and comparison of differences between portions of the chromosome which control different functions. In the nuclear medicine applications program, an effort will be initiated to develop new computer automated tomographic techniques for tests of feasibility in clinical diagnosis of human diseases.

DEFENSE ACTIVITIES

The Department's third major mission is to meet the Department of Defense requirements for nuclear weapons, nuclear materials, improved naval reactor design, and management of nuclear waste generated by defense activities. The Department also is charged with the responsibility for verification of nuclear test treaty compliance and the development of nuclear materials safeguards and security procedures including classification of sensitive information. Inertial Confinement Fusion technology is part of this mission area because of its relevance to nuclear weapons development. Total FY 1981 funding for DOE defense activities is $3.443 billion, up from $3.008 billion in FY 1980. The requests for FY 1980 and FY 1981 are shown by major program below:

	FY 1980	FY 1981
	(BA in millions)	
Inertial Confinement Fusion	$ 195	$ 202
Weapons Activities	1,654	1,972
Materials Production	513	523
Verification and Control Technology	38	41
Nuclear Materials Security and Safeguards Development	47	50
Defense Waste Management	283	350
Naval Reactors Development	278	305
TOTAL	$3,008	$3,443

INERTIAL CONFINEMENT FUSION

The Inertial Confinement Fusion program is an outgrowth of nuclear weapons development that has the potential to produce energy from a virtually unlimited fuel source. The technique used is to irradiate small pellets containing hydrogen heavy isotopes, deuterium and tritium with beams of laser light or particles, driving the fuel to the high density and temperature required for fusion to occur.

In FY 1981, the program will:

- Continue development of increasingly powerful drivers to meet both the nuclear weapons and the civilian energy program goals; and
- Continue research and development which will address the objective of developing practical reactor designs and reactor-scale fuel pellet technology.

WEAPONS ACTIVITIES

Weapons activities include research and development, testing, manufacture, and retirement of all U.S. nuclear weapons. The Department is also responsible for the maintenance of reliable weapons through their stockpile life.

Funding authority for weapons activities will increase by 19 percent from $1.654 billion in FY 1980 to $1.972 billion in FY 1981. Most of this increase can be attributed to escalation in the price of materials and wages. The major components of the request for weapons activities are shown as follows:

	Budget Authority (In millions)	
	FY 1980	FY 1981
Research, Development and Testing	$ 752	$ 839
Production and Surveillance	865	1,095
Program Direction	37	38
TOTAL WEAPONS ACTIVITIES	$ 1,654	$ 1,972

In FY 1981, weapons activities will continue to provide new technology to maintain a modern nuclear force, along with the design and development of new weapon systems and surveillance of the existing stockpile. Increases are provided for continued production of weapon systems as well as initiation of production on several new systems. The FY 1981 program also includes $94 million for the continuation of a multi-year restoration effort to correct deteriorating plant and equipment throughout the weapons complex.

MATERIALS PRODUCTION

Materials Production program provides special nuclear materials to meet weapons and other DOE nuclear program requirements. The FY 1981 request of $523 million provides for the continued operation of the N-Reactor at Richland, three production reactors at Savannah River and chemical processing operations and supporting services.

VERIFICATION AND CONTROL TECHNOLOGY

This program provides for the advancement of verification and control technology for the monitoring of nuclear treaties. The FY 1981 program provides for continued verification efforts on the limited test ban and proposed comprehensive test ban treaties. The program will continue to process export license applications related to arms control and non-proliferation. Funding of $41 million is provided for this purpose.

NUCLEAR MATERIALS SECURITY AND SAFEGUARDS DEVELOPMENT

The goal of the Nuclear Materials Security and Safeguards Development program is to deter and prevent malevolent acts involving domestic nuclear materials and facilities and to support U.S. nonproliferation initiatives and International Atomic Energy Agency safeguards efforts. The FY 1981 funding of $50 million will allow continued support of safeguards responsibilities and nonproliferation policy.

DEFENSE WASTE MANAGEMENT

This program provides for the interim storage of defense generated nuclear waste while continuing to develop technologies to implement long-term waste disposal options. Budget authority in FY 1981 of $350 million is requested, 24 percent above the $283 million available in FY 1980. Funding for specific elements of the Defense Waste Management program is shown below:

	Budget Authority (In millions)	
	FY 1980	FY 1981
Interim Waste Operations	$ 163	$ 219
Long-Term Waste Management Technology	83	116
Terminal Storage	28	0
Decontamination and Decommissioning	2	6
Transportation R&D	5	7
Program Direction	2	2
TOTAL WASTE MANAGEMENT	$ 283	$ 350

In FY 1981, efforts will continue to upgrade waste handling storage and disposal operations, transfer high level waste to new double-shell tanks at the Hanford and Savannah River sites and construct improved facilities and improved burial operations. Long-term waste management technology efforts will emphasize alternate final waste forms other than glass. Efforts will increase in FY 1981 in decontaminating and decommissioning various DOE facilities.

The Administration has decided that the Waste Isolation Pilot Plant (WIPP) Project near Carlsbad, New Mexico, should be cancelled, and that defense waste previously intended for disposal in the WIPP facility should be placed instead in the first commercial waste disposal facility. The characterization and protection of the Carlsbad site is included in the Commercial Waste Management budget in FY 1981. The commercial waste program will investigate regions of the country for candidate sites for disposal of spent fuel and high level waste from both defense and commercial sources.

NAVAL REACTORS DEVELOPMENT

This program provides for the design, development and testing of improved naval nuclear propulsion plants and reactor cores having longer fuel life, increased reliability, improved performance, and simplified operating and maintenance requirements. These reactors are necessary to meet a variety of military requirements. Funding of $305 million is provided in FY 1981. Efforts will continue to improve existing submarine and surface ship reactor cores and plant technology, and to develop new advanced reactor concepts and propulsion plants including the completion of propulsion plant testing in the first Trident strategic ballistic missile submarine.

DEPARTMENTAL ADMINISTRATION

Activities included in the Departmental Administration portion of the budget include general management and administration of the Department, as well as policy studies and analyses, institutional and intergovernmental relations and efforts to conserve energy in DOE facilities. FY 1981 funding requested for these activities totals $362 million, an increase of $87 million over the FY 1980 level. A distribution of the request is provided below:

Budget Authority
(In millions)

	FY 1980	FY 1981
Policy Analysis and Systems Studies	$ 16	$ 20
International Affairs	4	5
Management and Support	264	292
Intergovernmental and Institutional Relations	31	37
In-House Energy Management	37	57
Security Investigations	16	17
Other Supporting Activities	3	9
Cost of Work for Others	25	44
Miscellaneous Revenues	-122	-131
Changes in Inventories	16	12
Unobligated Balance	-15	-
TOTAL DEPARTMENTAL ADMINISTRATION	$275	$362

POLICY ANALYSIS AND SYSTEMS STUDIES

The FY 1981 request of $20 million will furnish resources for:

- development of the third National Energy Plan (NEP III);
- analyses that underpin formulation of basic energy policies and program strategies;
- energy supply contingency planning activities;
- improved Departmental planning and management through the Planning, Programming, and Budgeting System (PPBS); and
- analyses surrounding the promotion of competition in energy industries and critical topics of Congressional and Presidential concern.

INTERNATIONAL AFFAIRS

The FY 1981 request of $5 million will expand efforts by International Affairs in conducting comprehensive energy assessments in cooperation with the governments of participating developing countries and will provide for the continuation of international energy policy studies.

MANAGEMENT AND SUPPORT

This activity provides the salaries, travel and related personnel expenses associated with Headquarters staff functions, regional representation and multi-program field office support for the Department's programs. The FY 1981 request is $292 million, a 10 percent increase over FY 1980 primarily accounted for by inflationary increases in support services.

INTERGOVERNMENTAL AND INSTITUTIONAL RELATIONS

The FY 1981 funding level for the Intergovernmental and Institutional Relations program is $37 million. Efforts are directed toward increasing the public and private sector's understanding of the Nation's energy situation. Program initiatives are:

- o the dissemination of technical energy-related information to business, state, local and tribal governments, academia, and individual citizens;
- o outreach efforts that encourage public participation in the development and implementation of Federal energy policies and programs; and
- o informing interested and concerned citizens of energy programs and activities through the mass media, operation of DOE science museums, traveling exhibits, and other public communications channels.

IN-HOUSE ENERGY MANAGEMENT

The FY 1981 request of $57 million reflects a continuing emphasis on energy conservation and use of alternative energy sources through expanded construction retrofit and fuels conversion projects. Major program goals are to: reduce energy consumption by 20 percent in all DOE buildings and facilities by 1985 from a 1975 baseline; retrofit all DOE buildings with cost effective energy conservation retrofits by 1990; and eliminate the use of natural gas and fuel oil in all DOE major fuel burning installations.

Specific program elements consist of:

- o studies of existing buildings to identify cost effective energy retrofit projects and surveys of central plants to develop fuel conversion requirements;
- o retrofit construction projects that employ selected energy management concepts and systems at various field sites to reduce energy consumption; and
- o fuels conversion projects to switch central heating plants from fuel oil or natural gas to alternative sources of energy.

OTHER DEPARTMENTAL ACTIVITIES

The remaining portion of Departmental Administration consists of small, level of effort programs such as Security Investigations, Plant Engineering and Design, cost of work for others, and changes in inventories. The aggregate FY 1981 funding request for these items is $82 million.

MISCELLANEOUS REVENUES

The FY 1981 estimate includes $131 million in miscellaneous revenues as compared to $122 million in FY 1980. Revenues come from sale and lease of products, materials, and services to eligible purchasers (e.g., sale of isotopes). These revenues are applied against the Department's funding requirements. Specifically excluded are receipts from Naval Petroleum Reserves and Power Market Administrations.

LEGISLATIVE PROPOSALS

NUCLEAR WASTE MANAGEMENT INITIATIVES

In 1980 the Administration will submit three proposals implementing recommendations of an Interagency Review Group on Nuclear Waste Management, which prepared a detailed waste management strategy. One of the proposals, the "Spent Nuclear Fuel Act," was introduced in 1979. The other two are new legislative initiatives:

The three proposals are:

- Spent Nuclear Fuel Act

  S. 797 and H.R. 2586 authorize the Secretary of Energy to enter into contracts for spent fuel storage and disposal. S. 758 and H.R. 2611 provide for licensing of high-level radioactive waste and spent fuel storage facilities. Funding of $300 million is being requested separately.

- Federal Ownership and Operation of Disposal Sites for Commmercial Low-Level Radioactive Waste

  This legislation will authorize the Department of Energy to accept ownership, operation and management control over existing commercial low-level waste burial grounds at the option of the states. Funding will be requested separately for this proposal.

- Remedial Action at Former Manhattan Engineer District and Atomic Energy Commission Sites

  This legislation will authorize the Secretary of Energy to conduct remedial action at approximately 30 formerly utilized sites that pose a potential threat to the public or the environment due to their radiological contamination. This proposal complements authority provided by the Uranium Mill Tailings Radiation Control Act of 1978 and will be proposed separately.

In addition to the legislative proposals, the President will sign an Executive Order establishing a State Planning Council to provide for state and local participation in planning the management of nuclear waste, and to establish a consultation and concurrence process between the federal government and the states.

POWERPLANT CONVERSION

Proposed legislation entitled the "Powerplant Petroleum and Natural Gas Conservation Act of 1980" would authorize $12 billion over several years in grant assistance for conversion of electrical generating plants from petroleum and natural gas to alternate fuels. It sets a 1990 deadline for achieving a 50 percent reduction in petroleum and natural gas usage by utilities. If enacted, this proposal will result in estimated savings of 750,000 barrels of oil per day by 1990.

STATE ENERGY CONSERVATION

The proposed Energy Management and Partnership Act (EMPA) would provide financial and technical assistance to States to develop and broaden their energy planning and management capabilities and to develop a State energy strategy as well as plan and implement energy conservation programs. It will restructure several existing grant programs and consolidate grant administration procedures for other State energy conservation programs administered by DOE. The program as introduced (H.R. 4382, S. 1280) would authorize $110 million annually for five years. The Administration now supports increasing the authorization level to $155 million per year. The additional funding would be used primarily to assist energy activities conducted by local governments.

ADDITIONAL ENERGY LEGISLATION

In his April 5, 1979 Energy Address to the Nation, the President proposed to capture a portion of the unearned revenues which will accrue to the oil companies as a result of price decontrol. This leads to the creation of certain programs which will be supported by revenues from a "windfall" profits tax on the petroleum industry. For the use of these funds, the President proposed a series of measures to reduce the U.S. dependence upon foreign oil. These programs include increased support for mass transit, assistance to low income families to enable them to pay higher energy bills, and an Energy Security Corporation to stimulate the production of synthetic fuels. In addition, the President proposed establishment of an Energy Mobilization Board to expedite the regulatory procedures for new energy projects.

Among the initial uses, these funds would provide increased funding for the following programs:

	Budget Authority (In millions)	
	FY 1980	FY 1981
Coal R&D	$ 50	$ 50
Residential/Commercial Retrofit	10	90
Utility Oil Backout	1	25
Regional Strategic Petroleum Reserve	9	15
TOTAL	$ 70	$ 180

FY 1980 SUPPLEMENTAL REQUESTS

In conjunction with the FY 1981 Budget, DOE is requesting the FY 1980 supplementals, totaling $517 million, which are highlighted below.

EMERGENCY ENERGY CONSERVATION ACT OF 1979

This legislation, signed into law on November 5, 1979, establishes an emergency program for the conservation of energy and provides for a standby rationing plan for motor fuel. This Act places new requirements on the Economic Regulatory Administration ($43 million for Emergency Preparedness), Energy Information Administration ($20 million), and Conservation ($15 million) for a total supplemental request of $78 million.

DEFENSE ACTIVITIES

A supplemental request totalling $44 million is being submitted for Defense activities. It includes $30 million for weapons production, $6 million for security at materials production facilities, $3 million for Inertial Confinement Fusion for advanced driver system research, and $5 million for construction funds for the New Waste Calcining Facility at INEL.

URANIUM ENRICHMENT

A supplemental request of $308 million is being requested in order to make up for reduced revenues resulting from lower demand for enriched uranium in the private sector ($253 million) and a $55 million power cost overrun.

OTHER SUPPLEMENTALS

In addition to the supplementals discussed above, the Department is requesting $87 million of funding for small supplementals for Magnetohydrodynamics and coal-oil mixtures, small hydro demonstration projects, fuels conversion projects, the Federal Energy Management Program, the October 1979 pay raise, a number of conservation and solar programs including a paid advertising program, and for Converter Reactor work on advanced non-proliferation reprocessing technologies and examination and evaluation of Three Mile Island data.

SPECIAL ANALYSES

DEPARTMENT OF ENERGY

FY 1981 BUDGET

FEDERAL FOSSIL PROGRAM
(In millions)

	FY 1980		FY 1981	
	BA	BO	BA	BO
Technology				
Coal				
Advanced Environmental Control	$ 38	$ 24	$ 42	$ 50
Advanced R&D	51	61	59	50
Coal Liquefaction	250	214	524	330
Combustion Systems	57	75	69	61
Fuel Cells	27	18	25	29
Heat Engines & Heat Recovery	51	63	43	45
In-Situ Coal Gasification	10	10	10	10
Magnetohydrodynamics	93	81	72	80
Mining R&D	69	66	47	43
Surface Coal Gasification	116	170	139	108
University Coal Research Labs	5	5	5	5
Program Direction	12	12	12	12
Total	$ 779	$ 799	$1,047	$ 823
Petroleum				
Advanced Process Technology	6	3	5	7
Drilling & Off-shore Technology	3	2	2	2
Enhanced Oil Recovery	23	35	20	27
Oil Shale	28	29	36	24
Program Direction	1	1	1	1
Total	$ 61	$ 70	$ 64	$ 61
Gas				
Enhanced Gas Recovery	$ 36	$ 40	$ 31	$ 32
Supplemental Request	$ -26	-18		-8
Total Technology	$ 850	$ 891	$1,142	$ 908
Applications				
Fossil Energy Applications	$ 21	$ 22	$ 23	$ 23
Direct Production				
Naval Petroleum Reserves (NPR)[1/]	$ 72	$ 81	$ 145	$ 173
TOTAL DIRECT FOSSIL	$ 943	$ 994	$1,310	$1,104

1/ NPR generates revenues shown on page 23.

DEPARTMENT OF ENERGY

FY 1981 BUDGET

FEDERAL FOSSIL PROGRAM
(In millions)

	FY 1980		FY 1981	
	BA	BO	BA	BO
Other DOE Fossil Related (Basic Energy Science, Environment and Technical Assessment Projects	$ 89	$ 87	$ 108	$ 107
TOTAL DOE FOSSIL[1/]	$1,032	$1,081	$1,418	$1,211
Other Federal Funding				
Department of Interior				
Bureau of Land Management	$ 87	$ 84	$ 97	$ 93
US Geological Survey	160	152	168	168
Fish & Wildlife Service	4	3	6	6
Surface Mining Reclamation & Enforcement	170	116	172	151
Bureau of Mines	56	52	58	60
TOTAL DOI	$ 477	$ 407	$ 501	$ 478
TOTAL FEDERAL FOSSIL FUNDING	$1,472	$1,457	$1,916	$1,666
Tax Expenditures (Revenue Loss)	$ 111		$ 238	

1/ Does not include Coal R&D funds provided by windfall profits tax or the Alternative Fuels Program.

DEPARTMENT OF ENERGY

FY 1981 BUDGET

FEDERAL SOLAR PROGRAMS
(In millions)

	FY 1980		FY 1981	
	BA	BO	BA	BO
SOLAR TECHNOLOGY				
Solar Thermal Electric	$ 121	$136	$118	$141
Photovoltaic Energy Development	147	131	140	119
Wind Energy Conservation	63	63	80	75
Ocean Systems	46	47	39	39
Solar Energy Research Institute Building	7	7	10	10
Solar Information Systems	0	0	1	1
Solar International	0	0	11	11
Biomass	56	56	63	60
Program Direction and Support	7	7	4	4
TOTAL	$ 447	$447	$466	$460
SOLAR APPLICATIONS				
Systems Development	$ 53	$ 48	$ 56	$ 44
Market Test and Applications	61	74	74	86
Federal Buildings	12	20	2	21
Commercial/Market Analysis	6	4	7	7
Market Development and Training	20	21	40	31
Solar International Applications	0	0	4	4
Program Direction and Support	3	3	3	3
TOTAL	$ 155	$170	$186	$196
OTHER DOE SOLAR FUNDING (Support from Basic Energy Sciences, Environment, Electric Energy Systems, Energy Storage Systems and the Satellite Power System)[1/]	$ 41	$ 38	$ 55	$ 54
TOTAL DOE SOLAR FUNDING	$ 643	$655	$707	$710

1/ Does not include Hydropower.

DEPARTMENT OF ENERGY

FY 1981 BUDGET

FEDERAL SOLAR PROGRAMS
(In millions)

	FY 1980		FY 1981	
	BA	BO	BA	BO
OTHER FEDERAL SOLAR FUNDING				
Agency for International Development ..	$ 38	$ 25	$ 53	$ 36
Solar Bank (HUD)	35	29	150	130
Small Business Administration	20	20	12	12
Economic Development Administration ...	75	28	74	64
Power Marketing Agencies (TVA, etc.) ..	24	22	41	38
Biomass Loan Program (USDA)	50	50	41	41
Other Federal Activities	39	33	65	57
TOTAL	$ 281	$ 207	$ 436	$ 378
TOTAL FEDERAL SOLAR PROGRAMS	$ 924	$ 862	$1,141	$1,088
Tax Expenditures	$ 239		$ 355	

DEPARTMENT OF ENERGY
FY 1981 BUDGET

FEDERAL CONSERVATION PROGRAMS

	Budget Authority (In Millions)	
	FY 1980	FY 1981
Department of Energy		
Technology Programs	$ 301	$ 298
Grants*	457	569
Energy Information Campaign	7	50
	$ 765	$ 917
Other Energy Conservation Programs	$ 111	$ 265
Mass Transit & Auto Efficiency	1,276	1,500
Conservation Investments In Federal Buildings	246	308
	$ 1,633	$ 2,073
TOTAL FEDERAL FUNDING	$ 2,398	$ 2,990
Tax Expenditures (Revenue Loss)	702	739

* Excludes Energy Impact Assistance funding of $50 million in FY 1980 and $150 million in FY 1981 which is managed in the DOE Conservation program but is not a conservation effort.

DOE NUCLEAR WASTE
NUCLEAR WASTE MANAGEMENT

The Department's Nuclear Waste Management programs are responsible for long-term solutions to the Nation's nuclear waste disposal for both commercial and defense wastes. Both the Defense and Commercial Waste Management programs are focused on deep geologic isolation of wastes, but include additional efforts such as transportation R&D and intermediate storage.

The former Decontamination and Decommissioning program is now a part of the Commercial Nuclear Waste Management program and accounts for $19 million of the increase for FY 1981. The remainder of the increase, $60 million: 1) reflects site protection of the Carlsbad, N.M. site by lease acquisition so as not to preclude its future use as a repository; 2) initiation of construction of Salt Test facility, and 3) expanded work in non-salt geologic studies.

The Defense Waste Management program increases are primarily due to high level waste tank transfer operations, equipment upgrades and replacements, construction of new facilities and the development of alternative high level waste forms.

	Budget Authority (In millions)	
	FY 1980	FY 1981
Commercial Nuclear Waste	$ 220	$ 299
Spent Nuclear Fuel	18	20
Defense Waste Management	283	350
	$ 521	$ 669

In addition to these programs, there are three nuclear waste management initiatives being proposed: 1) the Spent Nuclear Fuel Act, 2) Federal Ownership and Operation of Disposal Sites for Commercial Low-Level Radioactive Waste, and 3) the Remedial Action at Former MED and AEC Sites. These proposals are discussed under the Legislative Proposals Section.

DEPARTMENT OF ENERGY
FY 1981 BUDGET
Budget Authority by Organization
(In millions)

	FY 1979	FY 1980	FY 1981
Defense Programs	$ 2,128	$ 2,463	$ 2,805
Energy Research	958	1,037	1,236
Environment	269	278	310
Nuclear Energy	1,692	1,723	1,544
Resource Applications	3,570	2,992	3,127
Conservation and Solar Energy	1,211	1,486	1,794
Fossil Energy	760	888	1,141
Federal Energy Regulatory Commission	54	73	76
Economic Regulatory Administraton	99	198	162
Energy Information Administration	65	108	116
Intergovernmental Affiars	25	25	31
International Affairs	6	3	5
Policy and Evaluation	12	16	20
Administration	26	37	57
Consumer Affairs	1	1	1
Controller & Other	-75	-77	-66
Program Administration	219	264	292
Public Affairs	3	2	3
Subtotal	$11,023	$11,517	$12,654
Legislative Proposals	---	300	---
Use of Prior Year Balances	$ -155	$ -142	$ ---
Total DOE	$10,868	$11,675[1/]	$12,654

1/ Includes proposed supplementals of $517 million.

DEPARTMENT OF ENERGY
FY 1981 BUDGET

STATISTICAL APPENDIX

DEPARTMENT OF ENERGY
FY 1981 Budget
(In millions of dollars)

SUMMARY BY APPROPRIATION

APPROPRIATIONS BEFORE THE ENERGY AND WATER DEVELOPMENT SUBCOMMITTEES:	FY 1980 ESTIMATE BA	FY 1980 ESTIMATE BO	FY 1981 ESTIMATE BA	FY 1981 ESTIMATE BO
ATOMIC ENERGY DEFENSE ACTIVITIES - OPERATING EXPENSES.....	2,410	2,363	2,795	2,742
ATOMIC ENERGY DEFENSE ACTIVITIES - PLANT AND CAPITAL EQUIPMENT.....	598	619	649	644
GENERAL SCIENCE AND RESEARCH - OPERATING EXPENSES.....	342	336	377	371
GENERAL SCIENCE AND RESEARCH - PLANT AND CAPITAL EQUIPMENT.....	130	126	146	137
ENERGY SUPPLY RESEARCH AND DEVELOPMENT - OPERATING EXPENSES.....	2,248	2,287	2,350	2,254
ENERGY SUPPLY RESEARCH AND DEVELOPMENT - PLANT AND CAPITAL EQUIPMENT.....	447	462	401	435
URANIUM ENRICHMENT - OPERATING EXPENSES.....	367	307	209	214
URANIUM ENRICHMENT - PLANT AND CAPITAL EQUIPMENT.....	4	57	1	23
FEDERAL ENERGY REGULATORY COMMISSION.....	73	70	76	76
GEOTHERMAL RESOURCES DEVELOPMENT FUND.....	--	1	43	1
ALASKA POWER ADMINISTRATION - OPERATION AND MAINTENANCE.....	3	3	3	3
BONNEVILLE POWER ADMINISTRATION.....	--	-128	--	-85

DEPARTMENT OF ENERGY
FY 1981 Budget
(In millions of dollars)

SUMMARY BY APPROPRIATION - continued

APPROPRIATIONS BEFORE THE ENERGY AND WATER DEVELOPMENT SUBCOMMITTEE	FY 1980 ESTIMATE BA	FY 1980 ESTIMATE BO	FY 1981 ESTIMATE BA	FY 1981 ESTIMATE BO
SOUTHEASTERN POWER ADMINISTRATION - OPERATION AND MAINTENANCE.....	1	1	1	2
SOUTHWESTERN POWER ADMINISTRATION - OPERATION AND MAINTENANCE.....	32	32	28	37
WESTERN AREA POWER ADMINISTRATION - CONSTRUCTION, REHABILITATION OPERATION AND MAINTENANCE.....	123	123	138	138
WESTERN AREA POWER ADMINISTRATION - COLORADO RIVER BASIN.....	5	5	4	4
DEPARTMENTAL ADMINISTRATION.....	275	283	362	342
SPECIAL FOREIGN CURRENCY.....	--	.1	--	.1
SPENT FUEL STORAGE FUND.....	300	-100	--	200
SUBTOTAL, APPROPRIATIONS BEFORE THE ENERGY AND WATER DEVELOPMENT SUBCOMMITTEES:.....	7,358	6,847	7,583	7,538
APPROPRIATIONS BEFORE THE INTERIOR AND RELATED AGENCIES SUBCOMMITTEES				
FOSSIL ENERGY RESEARCH AND DEVELOPMENT.....	773	770	692	706
FOSSIL ENERGY CONSTRUCTION.....	103	139	450	210

DEPARTMENT OF ENERGY
FY 1981 Budget
(In millions of dollars)

SUMMARY BY APPROPRIATION - continued

APPROPRIATIONS BEFORE THE INTERIOR AND RELATED SUBCOMMITTEES:	FY 1980 ESTIMATE BA	FY 1980 ESTIMATE BO	FY 1981 ESTIMATE BA	FY 1981 ESTIMATE BO
ENERGY PRODUCTION, DEMONSTRATION AND DISTRIBUTION.....	112	129	179	224
ENERGY CONSERVATION.....	815	603	1,067	856
ALTERNATIVE FUELS PRODUCTION.....	2,208	155	—	53
STRATEGIC PETROLEUM RESERVE.....	—	767	2,404	1,294
ENERGY INFORMATION ADMINISTRATION....	108	106	116	116
ECONOMIC REGULATORY ADMINISTRATION...	198	173	163	176
SUBTOTAL, APPROPRIATIONS BEFORE THE INTERIOR AND RELATED SUBCOMMITTEES:.	4,317	2,842	5,071	3,635
TOTAL, DEPARTMENT OF ENERGY FEDERAL FUNDS:.....	11,675	9,689	12,654	11,173
RECAP OF FEDERAL FUNDS:				
NEW AUTHORITY.....	11,158	9,238	10,312	11,111
REAPPROPRIATION.....	—	—	2,342	—
SUPPLEMENTALS.....	517	451	—	62
TOTAL, DEPARTMENT OF ENERGY:.....	11,675	9,689	12,654	11,173
OTHER FUNDS:				
ADVANCES FOR COOPERATIVE WORK.....	13	13	15	15
ACTIVITIES FINANCED FROM THE WINDFALL PROFITS TAX.....	70	56	180	85

DEPARTMENT OF ENERGY
FY 1981 Budget
(In millions of dollars)

ATOMIC ENERGY DEFENSE ACTIVITIES

	FY 1980 ESTIMATE		FY 1981 ESTIMATE	
	BA	BO	BA	BO
INERTIAL CONFINEMENT FUSION.....	194.9	171.2	202.0	212.0
NAVAL REACTOR DEVELOPMENT				
Submarine Propulsion Reactors.....	197.1	177.4	218.0	210.0
Surface Ship Propulsion Reactors....	55.6	68.5	57.0	74.0
Supporting Research & Development...	16.9	16.9	20.0	20.0
Program Direction.....	8.8	8.8	10.3	10.3
TOTAL, NAVAL REACTOR DEVELOPMENT.....	278.4	271.6	305.3	314.3
WEAPONS ACTIVITIES				
Research, Development & Testing.....	762.2	766.6	851.3	843.9
Production & Surveillance.....	855.4	851.5	1,082.8	987.7
Program Direction.....	37.2	37.2	37.8	37.8
TOTAL, WEAPONS ACTIVITY.....	1,653.8	1,655.3	1,971.9	1,869.4
VERIFICATION AND CONTROL TECHNOLOGY.....	37.9	36.7	41.4	40.3
MATERIALS PRODUCTION.....	512.7	482.8	522.5	527.2
DEFENSE WASTE MANAGEMENT				
Interim Waste Operations.....	163.0	212.6	219.2	221.7
Long Term Waste Management.....	83.4	78.8	115.7	128.0
Terminal Storage.....	28.4	26.4	--	10.4
Decontamination & Decommissioning...	2.0	2.0	6.1	6.9
Transportation Research.....	5.0	4.3	7.0	7.0
Program Direction.....	1.5	1.5	1.7	1.7
TOTAL, DEFENSE WASTE MANAGEMENT...	283.3	325.6	349.7	375.7
NUCLEAR MATERIALS SECURITY AND SAFEGUARDS.....	46.8	43.0	50.4	46.8
COST OUTLAY ADJUSTMENT.....	--	-4.3	--	--
TOTAL, ATOMIC ENERGY DEFENSE ACTIVITIES.....	3,007.8	2,981.9	3,443.2	3,385.7

DEPARTMENT OF ENERGY
FY 1981 Budget
(In millions of dollars)

ATOMIC ENERGY DEFENSE ACTIVITIES - continued

	FY 1980 ESTIMATE		FY 1981 ESTIMATE	
	BA	BO	BA	BO
RECAP:				
New Authority.....	2,961.5	2,943.5	3,443.2	3,377.8
Supplementals.....	46.3	38.4	--	7.9
TOTAL, ENERGY SUPPLY RESEARCH AND DEVELOPMENT.....	3,007.8	2,981.9	3,443.2	3,385.7
APPROPRIATIONS SUMMARY				
OPERATING EXPENSES.....	2,410.3	2,362.5	2,794.7	2,741.6
PLANT & CAPITAL EQUIPMENT.....	597.5	619.4	648.5	644.1
TOTAL, ENERGY SUPPLY RESEARCH AND DEVELOPMENT.....	3,007.8	2,981.9	3,443.2	3,385.7

DEPARTMENT OF ENERGY
FY 1981 Budget
(In millions of dollars)

GENERAL SCIENCE AND RESEARCH APPROPRIATIONS

	FY 1980 ESTIMATE		FY 1981 ESTIMATE	
	BA	BO	BA	BO
BASIC SCIENCES				
LIFE SCIENCES RESEARCH AND NUCLEAR APPLICATIONS:				
General Life Sciences	24.4	22.8	28.6	26.9
Nuclear Medicene Applications	17.6	17.0	20.0	19.0
Program Direction	.2	.2	--	--
TOTAL, LIFE SCIENCES RESEARCH	42.2	40.0	48.6	45.9
HIGH ENERGY PHYSICS:				
Physics Research	71.9	70.8	76.5	76.1
Facility Operations	207.3	200.8	228.1	221.0
High Energy Technology	42.0	42.0	50.6	50.2
Other Capital Equipment	3.3	2.0	2.8	2.0
Program Direction	.6	.6	.8	.8
TOTAL, HIGH ENERGY PHYSICS	325.1	316.2	358.8	350.1
NUCLEAR PHYSICS:				
Medium Energy Physics	57.7	50.2	58.0	54.0
Heavy Ion Physics	33.6	43.3	40.0	42.0
Nuclear Theory	6.1	6.5	7.0	7.0
MSU Cyclotron	6.0	4.7	8.9	7.5
Other Capital Equipment	1.0	1.0	1.3	1.2
Program Direction	.2	.2	.3	.3
TOTAL, NUCLEAR PHYSICS	104.6	105.9	115.5	112.0
TOTAL, GENERAL SCIENCE AND RESEARCH	471.9	462.1	522.9	508.0
APPROPRIATIONS SUMMARY				
OPERATING EXPENSES	341.9	336.4	376.7	371.1
PLANT & CAPITAL EQUIPMENT	130.0	125.7	146.2	136.9
TOTAL GENERAL SCIENCE & RESEARCH APPROPRIATIONS	471.9	462.1	522.9	508.0

DEPARTMENT OF ENERGY
FY 1981 Budget
(In millions of dollars)

ENERGY SUPPLY RESEARCH AND DEVELOPMENT APPROPRIATIONS

	FY 1980 ESTIMATE		FY 1981 ESTIMATE	
	BA	BO	BA	BO
SOLAR APPLICATIONS				
Systems Development	53.0	48.0	56.0	44.0
Market Test & Applications	60.7	73.9	74.0	86.0
Market Development & Training	20.5	20.5	39.5	31.0
Solar International Applications	--	--	4.0	3.8
Program Direction -- ES R&D	2.6	2.6	2.8	2.8
TOTAL, SOLAR APPLICATIONS	136.8	145.0	176.3	167.6
SOLAR TECHNOLOGY				
Technology Support and Utilization	3.1	3.1	--	--
Biomass	56.0	55.5	63.0	60.1
Solar Thermal Electric Power Systems	121.0	135.7	117.5	141.4
Photovoltaics Energy Development	147.0	131.5	140.0	118.5
Wind Energy Conversion System	63.4	63.4	80.0	74.7
Ocean Systems	46.0	47.0	39.0	39.3
Solar International	--	--	11.0	11.0
Solar Energy Research Institute	6.9	6.9	10.0	10.0
Solar Information Systems	--	--	1.4	1.0
Program Direction	3.9	3.9	4.0	4.0
TOTAL, SOLAR TECHNOLOGY	447.3	447.0	465.9	460.0
GEOTHERMAL				
Hydrothermal Resources	61.4	61.7	53.0	58.7
Geopressured Resources	36.0	34.1	36.0	34.1
Geothermal Technology Development	41.0	38.4	53.0	49.8
Program Direction	1.1	1.1	1.4	1.4
TOTAL, GEOTHERMAL	139.5	135.3	143.4	144.0
HYDROTHERMAL COMMERCIALIZATION				
Planning and Analysis	5.0	3.7	5.0	4.8
Private Sector Development	4.9	4.0	5.0	5.2
TOTAL, HYDROTHERMAL COMMERCIALIZATION	9.9	7.7	10.0	10.0

DEPARTMENT OF ENERGY
FY 1981 Budget
(In millions of dollars)

ENERGY SUPPLY RESEARCH AND DEVELOPMENT APPROPRIATIONS - continued

	FY 1980 ESTIMATE		FY 1981 ESTIMATE	
	BA	BO	BA	BO
HYDROPOWER				
Low Head Hydroelectric Development..	13.0	7.1	8.2	15.2
Feasibilities Studies Loan Program..	10.0	10.0	10.0	10.0
Program Direction.....	0.7	0.7	0.8	0.8
TOTAL, HYDROPOWER.....	23.7	17.8	19.0	26.0
NUCLEAR				
Converter Reactor Systems				
Thermal Reactor Systems.....	57.0	51.1	48.5	53.0
Advanced Reactor Systems.....	7.5	6.2	5.0	7.7
Gas Cooled Thermal Reactors.....	—	13.0	--	4.3
Program Direction.....	1.4	1.4	1.4	1.5
TOTAL, CONVERTER REACTOR SYSTEM	65.9	71.7	54.9	66.5
COMMERCIAL NUCLEAR WASTE.....	220.1	216.9	298.9	295.6
SPENT NUCLEAR FUEL				
Domestic.....	15.0	17.0	15.8	17.3
International.....	3.0	3.0	4.2	4.2
Program Direction.....	0.5	0.5	0.5	0.5
TOTAL, SPENT NUCLEAR FUEL.....	18.5	20.5	20.5	22.0
ADVANCED NUCLEAR SYSTEMS				
Space & Terrestrial Applications....	36.4	41.0	40.0	40.7
Advanced Systems Evaluation.....	2.0	4.3	3.0	3.0
Program Direction.....	1.2	1.2	1.0	1.0
TOTAL, ADVANCED NUCLEAR SYSTEMS.....	39.6	46.5	44.0	44.7

DEPARTMENT OF ENERGY
FY 1981 Budget
(In millions of dollars)

ENERGY SUPPLY RESEARCH AND DEVELOPMENT APPROPRIATIONS - continued

	FY 1980 ESTIMATE		FY 1981 ESTIMATE	
	BA	BO	BA	BO
BREEDER REACTOR SYSTEMS				
Liquid Metal Fast Breeder Reactor...	614.9	621.3	299.8	375.7
Water Cooled Breeder Reactor.....	60.0	69.0	61.0	68.0
Gas Cooled Breeder Reactor.....	26.0	26.0	--	9.0
Fuel Cycle Research and Development.	30.0	33.1	12.0	23.0
Thermal Reactor Fuel Cycle.....	19.5	29.1	--	--
Program Direction.....	11.4	11.4	11.2	11.2
TOTAL, BREEDER REACTOR SYSTEMS.	761.8	789.9	384.0	486.9
LIGHT WATER REACTOR FACILITIES	--	2.8	--	0.3
TOTAL, NUCLEAR.....	1,105.9	1,148.3	802.3	916.0
MAGNETIC FUSION				
Confinement Systems.....	124.1	124.6	131.3	131.9
Development and Technology.....	56.0	62.0	78.8	77.5
Applied Plasma Physics.....	53.4	55.4	72.5	72.3
Planning and Projects.....	119.0	130.3	117.9	179.1
Program Direction.....	3.1	3.1	3.1	3.1
TOTAL, MAGNETIC FUSION.....	355.6	375.4	403.6	463.9
ELECTRIC ENERGY SYSTEMS & STORAGE				
ELECTRIC ENERGY SYSTEMS				
Power Supply and Integration.....	17.0	12.5	19.0	20.5
Power Delivery.....	19.0	21.3	20.0	21.2
Program Direction.....	1.4	1.4	0.9	0.9
SUBTOTAL, ELECTRIC ENERGY SYSTEMS.	37.4	35.2	39.9	42.6
ENERGY STORAGE SYSTEMS				
Battery Storage.....	33.1	29.7	38.5	40.0
Thermal and Mechanical Storage.....	31.9	32.3	32.3	33.2
Program Direction.....	1.4	1.3	1.0	1.1
SUBTOTAL, ENERGY STORAGE SYSTEMS	66.4	63.3	71.8	74.3
TOTAL, ELECTRIC ENERGY SYSTEMS & STORAGE.....	103.8	98.5	111.7	116.9

DEPARTMENT OF ENERGY
FY 1981 Budget
(In millions of dollars)

ENERGY SUPPLY RESEARCH AND DEVELOPMENT APPROPRIATIONS - continued

	FY 1980 ESTIMATE		FY 1981 ESTIMATE	
	BA	BO	BA	BO
ENVIRONMENT				
ENVIRONMENTAL RESEARCH & DEVELOPMENT				
Overview and Assessment	56.4	52.3	62.8	60.1
Biological and Environmental	168.9	167.5	187.2	182.1
Program Direction	10.1	10.1	11.1	11.1
TOTAL, ENVIRONMENT	235.4	229.9	261.1	253.3
SUPPORTING RESEARCH				
BASIC ENERGY SCIENCES				
Nuclear Sciences	32.0	32.7	34.8	33.8
Materials Sciences	97.0	108.2	99.9	106.9
Chemical Sciences	65.0	68.0	74.4	75.2
Engineering, Mathematical	21.3	21.8	30.7	29.3
Advanced Energy Projects	5.2	5.3	8.3	8.0
Biological Energy Research	6.3	6.4	9.2	8.8
Program Direction	2.3	2.3	2.4	2.4
Other Capital Equipment	0.1	0.1	0.1	0.1
TOTAL, BASIC ENERGY SCIENCES	229.2	244.8	259.8	264.5
TECHNICAL ASSESSMENT PROJECTS	13.5	14.1	21.3	20.6
UNIVERSITY RESEARCH SUPPORT	7.1	7.1	14.3	14.3
TECHNICAL PROGRAM & POLICY ANALYSIS	2.0	2.0	2.0	2.0
TOTAL, SUPPORTING RESEARCH	251.8	268.0	297.4	301.4
GENERAL PURPOSE FACILITIES	--	--	60.3	25.0
COST OUTLAY ADJUSTMENT	--	-124.3	--	-195.4
USE OF PRIOR YEAR BALANCE	-115.3	--	--	--
TOTAL, ENERGY SUPPLY AND DEVELOPMENT	2,694.4	2,748.6	2,751.0	2,688.7

DEPARTMENT OF ENERGY
FY 1981 Budget
(In millions of dollars)

ENERGY SUPPLY RESEARCH AND DEVELOPMENT APPROPRIATIONS - continued

	FY 1980 ESTIMATE		FY 1981 ESTIMATE	
	BA	BO	BA	BO
RECAP:				
New Authority	2,672.1	2,738.6	2,751.0	2,676.4
Supplementals	22.3	10.0	--	12.3
TOTAL, ENERGY SUPPLY RESEARCH AND DEVELOPMENT	2,694.4	2,748.6	2,751.0	2,688.7
APPROPRIATIONS SUMMARY				
OPERATING EXPENSES	2,247.4	2,286.5	2,349.9	2,253.4
PLANT & CAPITAL EQUIPMENT	447.0	462.1	401.1	435.3
TOTAL, ENERGY SUPPLY RESEARCH AND DEVELOPMENT	2,694.4	2,748.6	2,751.0	2,688.7

DEPARTMENT OF ENERGY
FY 1981 Budget
(In millions of dollars)

URANIUM ENRICHMENT APPROPRIATIONS

	FY 1980 ESTIMATE		FY 1981 ESTIMATE	
	BA	BO	BA	BO
URANIUM ENRICHMENT ACTIVITIES				
Gaseous Diffusion Program	899.8	987.3	986.4	1,021.4
Gas Centrifuge Program	405.3	298.9	387.1	417.2
Program Direction	2.4	2.4	3.1	3.1
SUBTOTAL, URANIUM ENRICHMENT ACTIVITIES	1,307.5	1,288.6	1,376.6	1,441.7
URANIUM RESOURCE ASSESSMENT	64.7	65.3	35.7	53.7
ADVANCED ISOTOPE SEPARATION TECHNOLOGY	55.7	55.6	86.9	77.5
SUBTOTAL, URANIUM ENRICHMENT	1,427.9	1,409.5	1,499.2	1,572.9
OFFSETTING REVENUES	-1,057.0	-1,057.0	-1,289.0	-1,289.0
COST OUTLAY ADJUSTMENT	--	11.7	--	-47.1
TOTAL, URANIUM ENRICHMENT	370.9	364.2	210.2	236.8
RECAP:				
New Authority	63.1	56.4	210.2	236.8
Supplementals	307.8	307.8	--	--
TOTAL, URANIUM ENRICHMENT APPROPRIATIONS	370.9	364.2	210.2	236.8
APPROPRIATIONS SUMMARY				
OPERATING EXPENSES	366.9	307.2	208.9	213.4
PLANT & CAPITAL EQUIPMENT	4.0	57.0	1.3	23.4
TOTAL, URANIUM ENRICHMENT APPROPRIATIONS	370.9	364.2	210.2	236.8

DEPARTMENT OF ENERGY
FY 1981 Budget
(In millions of dollars)

FEDERAL ENERGY REGULATORY COMMISSION APPROPRIATION

	FY 1980 ESTIMATE		FY 1981 ESTIMATE	
	BA	BO	BA	BO
REGULATION				
Oil Regulation	5.5	5.3	6.0	5.8
Gas Regulation	38.9	37.7	41.1	40.8
Hydro Regulation	12.5	12.1	12.8	12.8
Multi-Resource Regulation	15.6	15.1	16.5	16.2
TOTAL, FEDERAL ENERGY REGULATORY COMMISSION	72.5	70.2	76.4	75.6
RECAP:				
New Authority	67.8	65.5	76.4	75.5
Supplementals	4.7	4.7	--	0.1
TOTAL, FEDERAL ENERGY REGULATORY COMMISSION	72.5	70.2	76.4	75.6

DEPARTMENT OF ENERGY
FY 1981 Budget
(In millions of dollars)

GEOTHERMAL RESOURCES DEVELOPMENT FUND APPROPRIATION

	FY 1980 ESTIMATE		FY 1981 ESTIMATE	
	BA	BO	BA	BO
GEOTHERMAL RESOURCES DEVELOPMENT FUND	0.2	1.4	1.3	1.2
REAPPROPRIATION	--	--	42.0	--
TOTAL, GEOTHERMAL RESOURCES DEVELOPMENT FUND	0.2	1.4	43.3	1.2

DEPARTMENT OF ENERGY
FY 1981 Budget
(In millions of dollars)

POWER MARKETING ADMINISTRATION APPROPRIATION

	FY 1980 ESTIMATE		FY 1981 ESTIMATE	
	BA	BO	BA	BO
TOTAL, ALASKA POWER ADMINISTRATION	2.7	2.7	3.1	3.1
TOTAL, BONNEVILLE POWER ADMINISTRATION	--	-128.1	--	-84.5
TOTAL, SOUTHEASTERN POWER ADMINISTRATION	1.4	1.5	1.6	1.5
TOTAL, SOUTHWESTERN POWER ADMINISTRATION	32.4	32.5	28.2	37.2
TOTAL, WESTERN AREA POWER ADMINISTRATION	128.2	128.2	142.3	142.3
TOTAL POWER MARKETING ADMINISTRATION	164.4	36.4	175.1	99.6

DEPARTMENT OF ENERGY
FY 1981 Budget
(In millions of dollars)

DEPARTMENTAL ADMINISTRATION APPROPRIATION

	FY 1980 ESTIMATE		FY 1981 ESTIMATE	
	BA	BO	BA	BO
POLICY AND MANAGEMENT				
Policy Analysis and System Studies..	16.5	16.5	19.6	19.6
International Affairs.....	3.5	3.5	5.1	5.1
Management and Suport.....	263.5	263.6	292.3	292.2
Intergovernmental and Institutional Relations.....	30.6	30.4	37.3	37.3
In-house Energy Management.....	36.7	19.3	56.9	36.6
Security Investigations.....	16.4	16.4	17.0	17.0
Other Supporting Activities.....	3.0	13.2	9.0	13.7
Miscellaneous.....	-80.4	-80.4	-75.5	-75.5
Cost Outlay Adjustment	--	--	--	-3.7
Use of prior year balance	-15.0	--	--	--
TOTAL DEPARTMENTAL ADMINISTRATION.....	274.8	282.5	361.7	342.3
RECAP:				
New Authority.....	260.2	271.9	361.7	339.2
Supplemental.....	14.6	10.6	--	3.1
TOTAL, DEPARTMENTAL ADMINISTRATION.....	274.8	282.5	361.7	342.3

DEPARTMENT OF ENERGY
FY 1981 Budget
(In millions of dollars)

	FY 1980 ESTIMATE		FY 1981 ESTIMATE	
	BA	BO	BA	BO
TOTAL, SPECIAL FOREIGN CURRENCY	--	0.1	--	0.1
TOTAL, PAYMENTS TO STATES	0.1	0.1	0.1	0.1
TOTAL, SPENT FUEL STORAGE FUND	300.0	-100.0	--	200.0

DEPARTMENT OF ENERGY
FY 1981 Budget
(In millions of dollars)

FOSSIL ENERGY RESEARCH AND DEVELOPMENT APPROPRIATIONS

	FY 1980 ESTIMATE		FY 1981 ESTIMATE	
	BA	BO	BA	BO
COAL				
Mining Research and Development.....	68.9	66.5	46.5	43.4
Coal Liquefaction.....	250.5	214.0	523.9	329.7
Surface Coal Gasification.....	116.0	170.4	138.5	107.7
In-Situ Coal Gasification.....	10.0	9.8	10.0	10.3
Advanced Research and Technology Development.....	51.4	60.8	59.5	49.6
Advanced Environmental Control Technology.....	38.3	24.1	42.5	49.7
Heat Engines and Heat Recovery.....	50.5	63.0	43.4	45.1
Combustion Systems.....	57.5	74.8	68.5	61.0
Fuel Cells.....	26.5	17.7	25.0	29.5
Magnetohydrodynamics.	92.6	80.7	72.0	79.8
University Coal Research Laboratories.....	5.0	5.0	5.0	5.0
Program Direction	11.9	11.9	12.1	12.1
TOTAL, COAL.....	779.1	798.7	1,046.9	822.9
PETROLEUM				
Enhanced Oil Recovery.....	23.2	34.5	19.4	27.1
Oil Shale.....	28.3	29.2	36.1	24.1
Drilling and Offshore Technology....	3.0	2.0	2.4	1.9
Advanced Process Technology.....	6.1	3.1	5.0	7.1
Program Direction.....	0.8	0.8	0.9	0.9
TOTAL, PETROLEUM.....	61.4	69.6	63.8	61.1
GAS				
Enhanced Gas Recovery.....	35.6	40.4	30.8	31.7
TOTAL, FOSSIL ENERGY RESEARCH AND DEVELOPMENT	876.1	908.7	1,141.5	915.7

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FOSSIL ENERGY RESEARCH AND DEVELOPMENT APPROPRIATIONS - continued

	FY 1980 ESTIMATE		FY 1981 ESTIMATE	
	BA	BO	BA	BO
RECAP:				
New Authority	850.3	890.9	1,141.5	907.7
Supplemental	25.8	17.8	--	8.0
TOTAL, FOSSIL ENERGY RESEARCH AND DEVELOPMENT	876.1	908.7	1,141.5	915.7
APPROPRIATIONS SUMMARY				
OPERATING EXPENSES AND CAPITAL EQUIPMENT	772.8	769.4	691.7	706.0
PLANT	103.3	139.3	449.8	209.7
TOTAL, FOSSIL ENERGY RESEARCH & DEVELOPMENT APPROPRIATIONS	876.1	908.7	1,141.5	915.7

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ENERGY PRODUCTION, DEMONSTRATION AND DISTRIBUTION APPROPRIATION

	FY 1980 ESTIMATE		FY 1981 ESTIMATE	
	BA	BO	BA	BO
COAL				
Loan Guarantee Program	0.3	0.3	0.2	0.2
Coal Supply Development Program	1.5	1.2	0.8	0.8
Coal Resource Management	2.5	2.5	5.2	5.0
TOTAL, COAL	4.3	4.0	6.2	6.0
OIL				
Naval Petroleum Reserves	72.6	81.2	145.4	173.5
Shale Oil Development	7.5	6.4	5.9	5.8
Oil and Gas Development Projects	5.1	4.0	6.3	6.0
TOTAL, OIL	852	91.6	157.6	185.3
SOLAR				
Federal Buildings	11.8	20.0	2.0	21.0
Market Analysis	6.0	4.2	7.3	6.5
Program Direction	0.8	0.8	0.7	0.7
TOTAL, SOLAR	18.6	25.0	10.0	28.2
FEDERAL LEASING	2.2	2.8	3.3	3.2
MULTI-RESOURCE	1.0	4.1	1.0	1.0
EXECUTIVE DIRECTION	1.0	1.0	0.6	0.6
TOTAL, ENERGY PRODUCTION DEMONSTRATION & DISTRIBUTION	112.3	128.5	178.7	224.3

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ENERGY PRODUCTION, DEMONSTRATION AND DISTRIBUTION APPROPRIATION

	FY 1980 ESTIMATE		FY 1981 ESTIMATE	
	BA	BO	BA	BO
RECAP:				
New Authority.....	111.7	128.0	178.7	224.2
Supplemental.....	0.6	0.5	--	0.1
TOTAL, ENERGY PRODUCTION DEMONSTRATION & DISTRIBUTION.....	112.3	128.5	178.7	224.3

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ENERGY CONSERVATION APPROPRIATIONS

	FY 1980 ESTIMATE		FY 1981 ESTIMATE	
	BA	BO	BA	BO
CONSERVATION				
Buildings and Community Systems.....	106.1	87.4	97.6	93.1
Industrial.....	60.3	49.9	58.9	51.3
Transportation.....	117.5	100.0	113.0	111.6
State and Local.....	456.8	335.4	568.6	480.7
Multi-Sector.....	16.9	15.8	29.2	23.7
Energy Information Campaign.....	7.0	4.0	50.0	33.0
Energy Impact Assistance.....	50.0	10.5	150.0	62.1
TOTAL, ENERGY CONSERVATION.....	814.6	603.0	1,067.3	855.5
RECAP:				
New Authority.....	786.5	588.5	1,067.3	845.4
Supplemental.....	28.1	14.5	--	10.1
TOTAL, ENERGY CONSERVATION.....	814.6	603.0	1,067.3	855.5

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ALTERNATIVE FUELS PRODUCTION

ENERGY SECURITY RESERVE	FY 1980 ESTIMATE BA	FY 1980 ESTIMATE BO	FY 1981 ESTIMATE BA	FY 1981 ESTIMATE BO
Project Development Feasibility Study	100.0	100.0	--	--
Cooperative Agreements	100.0	52.0	--	48.0
Reserve for Loan Guarantees	500.0	0	--	--
Purchase Commitments	1,500.0	0	--	--
Program Administration	8.0	3.0	--	5.0
TOTAL, ALTERNATIVE FUELS PRODUCTION.....	2,208.0	155.0	--	53.0

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STRATEGIC PETROLEUM RESERVE

	FY 1980 ESTIMATE		FY 1981 ESTIMATE	
	BA	BO	BA	BO
EMERGENCY PREPAREDNESS				
Planning	--	23.0	10.0	12.0
Petroleum Acquisition and Transportation	--	255.6	--	1,111.4
Storage Facilities Development	--	476.5	82.8	159.9
Program Direction	0.2	12.0	11.2	11.1
Reappropriation	--	--	2,300.0	--
TOTAL, STRATEGIC PETROLUM RESERVE	0.2	767.1	2,404.0	1,294.4
RECAP:				
New Authority	0.2	767.1	104.0	1,294.4
Reappropriation	--	--	2,300.0	--
TOTAL, STRATEGIC PETROLEUM RESERVE	0.2	767.1	2,404.0	1,294.4

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ENERGY INFORMATION ADMINISTRATION APPROPRIATION

	FY 1980 ESTIMATE		FY 1981 ESTIMATE	
	BA	BO	BA	BO
ENERGY INFORMATION				
Energy Applied Analysis.....	12.6	12.1	13.6	13.6
Collection, Production and Dissemination.....	36.9	36.4	37.4	37.4
Information Validation.....	13.3	12.3	15.2	15.2
Data Information Services.....	45.6	45.6	50.0	50.0
TOTAL, ENERGY INFORMATION ADMINISTRATION.....	108.4	106.4	116.2	116.2
RECAP:				
New Authority.....	87.3	85.3	116.2	116.1
Supplemental.....	21.1	21.1	--	0.1
TOTAL, ENERGY INFORMATION ADMINISTRATION.....	108.4	106.4	116.2	116.2

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ECONOMIC REGULATION APPROPRIATION

	FY 1980 ESTIMATE		FY 1981 ESTIMATE	
	BA	BO	BA	BO
REGULATION				
Coal Utilization	27.5	21.7	30.6	24.2
Utility Programs and Regulatory Intervention	29.0	33.7	33.1	32.2
Compliance	72.3	69.4	67.3	68.2
Regulation Development	2.9	2.8	2.8	3.5
Fuels Regulation	10.7	9.3	11.4	11.2
Emergency Preparedness	46.7	26.3	4.9	24.9
Program Administration	3.1	3.0	3.5	3.5
Office of Hearings and Appeals	6.2	6.2	8.9	8.5
TOTAL, ECONOMIC REGULATION APPROPRIATION	198.4	172.4	162.5	176.2