

Congressional Budget Request

Energy Supply Research and Development

Volume 3

FY 1987



U.S. Department of Energy

Assistant Secretary,
Management and Administration
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DEPARTMENT OF ENERGY
FISCAL YEAR 1987 CONGRESSIONAL BUDGET REQUEST
ENERGY SUPPLY RESEARCH AND DEVELOPMENT
VOLUME 3
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DEPARTMENT OF ENERGY
FISCAL YEAR 1987 CONGRESSIONAL BUDGET REQUEST

SUMMARY OF ESTIMATES BY APPROPRIATIONS

(in thousands of dollars)

	<u>FY 1985 Actual BA</u>	<u>FY 1986 Estimate BA</u>	<u>FY 1987 Request BA</u>
Appropriations Before The Energy and Water Development Subcommittees:			
Energy Supply Research and Development	1,967,490	1,696,298	1,254,162
Uranium Enrichment	237,956	190,512	---
General Science and Research	724,860	655,928	773,400
Atomic Energy Defense Activities ..	7,322,321	7,231,664	8,230,000
Departmental Administration	128,602	150,319	151,082
Alaska Power Administration	3,233	3,245	2,881
Bonneville Power Administration ...	284,771	330,000	276,100
Southeastern Power Administration .	35,744	---	19,647
Southwestern Power Administration .	31,208	29,191	25,337
Western Area Power Administration .	218,230	195,910	240,309
Western Area Power Emergency Fund .	---	---	---
Federal Energy Regulatory Commission	54,543	41,989	20,325
Nuclear Waste Fund	327,669	499,037	769,349
Geothermal Resources Development Fund	<u>121</u>	<u>69</u>	<u>72</u>
Subtotal, Appropriations Before the Energy and Water Development Subcommittees	<u>\$11,336,748</u>	<u>\$11,024,162</u>	<u>\$11,762,664</u>

DEPARTMENT OF ENERGY
FISCAL YEAR 1987 CONGRESSIONAL BUDGET REQUEST

SUMMARY OF ESTIMATES BY APPROPRIATIONS

(in thousands of dollars)

	<u>FY 1985</u> <u>Actual</u> <u>BA</u>	<u>FY 1986</u> <u>Estimate</u> <u>BA</u>	<u>FY 1987</u> <u>Request</u> <u>BA</u>
Appropriations Before Interior and Related Agencies Subcommittees:			
Alternative Fuels Production	\$ 1,169,895	\$ ---	\$ ---
Clean Coal Technology	---	---	---
Fossil Energy Research and Development	289,048	311,954	82,767
Naval Petroleum and Oil Shale Reserves	156,874	13,002	127,108
Energy Conservation	457,436	427,512	39,433
Energy Regulation	27,139	23,423	21,850
Emergency Preparedness	6,045	5,750	6,044
Strategic Petroleum Reserve	2,049,550	107,533	---
Energy Information Activities	<u>60,919</u>	<u>57,724</u>	<u>59,651</u>
Subtotal, Interior and Related Agencies Subcommittees	4,216,906	946,898	336,853
Subtotal, Energy and Water Development Subcommittees	<u>11,336,748</u>	<u>11,024,162</u>	<u>11,762,664</u>
Subtotal, Department of Energy	15,553,654	11,971,060	12,099,517
Permanent - Indefinite Appropriations:			
Payments to States	<u>1,052</u>	<u>570</u>	<u>570</u>
Total, Department of Energy	<u>\$15,554,706</u>	<u>\$11,971,630</u>	<u>\$12,100,087</u>

DEPARTMENT OF ENERGY
 FY 1987 CONGRESSIONAL STAFFING REQUEST
 TOTAL WORK FORCE

	FY1985 FTE USAGE	FY1986 CONGR REQ	FY1987 -FY86	FY1987 CONGR REQ
ENERGY & WATER SUBCOMMITTEE				
HEADQUARTERS	4,865	4,965	-10	4,947
FIELD	9,133	9,185	111	9,296
SUBCOMMITTEE TOTAL	13,998	14,150	93	14,243
INTERIOR SUBCOMMITTEE				
HEADQUARTERS	1,353	1,304	-166	1,138
FIELD	907	896	-226	670
SUBCOMMITTEE TOTAL	2,260	2,200	-392	1,808
GRAND TOTAL	16,258	16,350	-299	16,051
ADJUSTMENT		-132	-198	-330
ADJUSTED TOTAL	16,258	16,218	-497	15,721

DEPARTMENT OF ENERGY
 FY 1987 CONGRESSIONAL STAFFING REQUEST
 TOTAL WORK FORCE

	FY1985 FTE USAGE	FY1986 CONGR REQ	FY1987 -FY86	FY1987 CONGR REQ
10: ENERGY SUPPLY RESEARCH AND DEV	937	934	-34	900
HEADQUARTERS	811	820	-28	792
FIELD	126	114	-4	108
15: URANIUM ENRICHMENT	69	66	1	67
HEADQUARTERS	58	55	1	56
FIELD	11	11	0	11
20: GENERAL SCIENCE AND RESEARCH	37	39	0	39
HEADQUARTERS	37	39	0	39
25: ATOMIC ENERGY DEFENSE ACTIVITI	2,618	2,702	131	2,833
HEADQUARTERS	456	918	9	927
FIELD	2,122	2,184	122	2,306
30: DEPARTMENTAL ADMINISTRATION	3,307	3,352	-9	3,327
HEADQUARTERS	1,721	1,726	0	1,726
FIELD	1,586	1,604	-5	1,601
34: ALASKA POWER ADMINISTRATION	37	38	0	38
FIELD	37	38	0	38
36: BONNEVILLE POWER ADMIN	3,910	3,480	0	3,480
FIELD	3,510	3,480	0	3,480
38: SOUTHEASTERN POWER ADMIN	38	40	0	40
FIELD	38	40	0	40
42: SOUTHWESTERN POWER ADMIN	186	186	0	186
FIELD	186	186	0	186
46: WESTERN AREA POWER ADMIN	1,181	1,160	0	1,160
FIELD	1,181	1,160	0	1,160
50: WAPA - COLDRADO RIVER BASIN	219	219	0	219
FIELD	219	219	0	219
52: FEDERAL ENERGY REGULATORY COMM	1,617	1,659	0	1,659
HEADQUARTERS	1,617	1,659	0	1,659
54: NUCLEAR WASTE FUND	238	292	0	292
HEADQUARTERS	123	147	0	147
FIELD	115	145	0	145
56: GEOTHERMAL RESOURCES DEV FUND	2	1	0	1
HEADQUARTERS	2	1	0	1
65: POSSIL ENERGY RESEARCH AND DEV	714	700	-161	539
HEADQUARTERS	151	135	-26	100
FIELD	563	565	-135	430
70: NAVAL PETROL & OIL SHALE RES	104	104	-9	95
HEADQUARTERS	23	23	0	23
FIELD	81	81	-9	72
75: ENERGY CONSERVATION	333	352	-134	218
HEADQUARTERS	208	227	-79	148
FIELD	125	129	-55	70
80: EMERGENCY PREPAREDNESS	74	71	0	71
HEADQUARTERS	74	71	0	71
81: ECONOMIC REGULATION	377	340	-50	290
HEADQUARTERS	377	340	-50	290
85: STRATEGIC PETROLEUM RESERVE	178	152	-32	120
HEADQUARTERS	40	27	-5	22
FIELD	138	125	-27	98
90: ENERGY INFORMATION ACTIVITIES	480	481	-6	475
HEADQUARTERS	480	481	-6	475
94: ADVANCES FOR CO-OP WORK	2	2	0	2
FIELD	2	2	0	2
GRAND TOTAL	16,258	16,350	-299	16,051
ADJUSTMENT		-132	-198	-330
ADJUSTED TOTAL	16,258	16,218	-497	15,721

DEPARTMENT OF ENERGY
Proposed Appropriation Language
Energy Supply, Research and Development Activities
(Including Transfer of Funds)

For expenses of the Department of Energy activities including the purchase, construction and acquisition of plant and capital equipment and other expenses incidental thereto necessary for energy supply, research and development activities, and other activities in carrying out the purposes of the Department of Energy Organization Act (Public Law 95-91), including the acquisition or condemnation of any real property or any facility or for plant or facility acquisition, construction or expansion; purchase of passenger motor vehicles (not to exceed [17] 18 for replacement only), [\$1,989,671,000] \$1,254,162, to remain available until expended [of which \$200,000,000]; in addition, \$584,158,000 shall be derived by transfer from Uranium Supply and Enrichment Activities provided in prior years[, and of which \$17,400,000 shall be derived by transfer from Operation and Maintenance, Southeastern Power Administration; and of which \$25,000,000 shall be available only for construction of]: Provided, That funds available under this head in Public Law 99-141 for the Advanced Science Center, the Center for Science and Technology, the Center for Energy and Biomedical Technology, the Energy and Mineral Research Center, and the Demonstration Center for Information Technologies [as described in the report accompanying this Act; together with not to exceed \$6,000,000, to be derived from revenues from activities of the Technical Information Services, which shall be credited to this account and used for necessary expenses and shall remain available until expended], shall be available for other expenses of energy supply, research and development activities. (Public Law 99-141, making appropriations for energy and water development, 1986.)

DEPARTMENT OF ENERGY
 FISCAL YEAR 1987 CONGRESSIONAL BUDGET REQUEST
 SUMMARY OF ESTIMATES BY APPROPRIATION BY MAJOR ACTIVITY
 ENERGY SUPPLY RESEARCH AND DEVELOPMENT
 (Budget Authority in Thousands of Dollars)

	FY 1985 Actual	FY 1986 Estimate	FY 1987 Request
Solar Energy	\$ 171,587	\$ 144,624	\$ 72,292
Geothermal	29,698	26,681	17,930
Hydropower	447	481	---
Electric Energy Systems	19,717	11,548	7,619
Energy Storage Systems	18,642	17,292	8,000
Nuclear Energy R&D	432,612	374,684	330,900
Remedial Action & Waste Technology ..	170,365	230,047	294,100
Civilian Waste R&D	25,806	16,064	6,500
Environmental, Safety and Health ...	38,053	46,921	76,098
Biological and Environmental Research	187,746	179,950	196,565
Liquified Gaseous Spill Test Facility	4,289	1,732	1,200
Magnetic Fusion	429,553	365,469	333,000
Basic Energy Sciences	410,000	433,770	441,370
Energy Research Analysis	2,970	2,598	3,550
University Research Instrumentation ..	4,950	6,254	5,000
University Research Support	10,059	10,296	10,075
Advisory and Oversight Program Direction	2,900	2,674	2,900
Multi-Program Laboratories Facilities Support	33,200	39,824	60,190
Small Business Innovation Research Program	24,724	---	---
In-House Energy Management	14,821	11,709	16,500
Technical Information and Management	13,442	12,413	10,775
Policy and Management	3,380	3,497	3,887
Subtotal, Energy Supply R&D ...	2,029,690	1,939,528	1,899,951
Less Use of Prior Year Balances and Other Adjustments	-62,400	-243,230	-645,789
Total, Energy Supply R&D	<u>\$1,967,490</u>	<u>\$1,696,298</u>	<u>\$1,254,162</u>

SUPPORTING RESEARCH AND TECHNICAL ANALYSIS

DEPARTMENT OF ENERGY
FISCAL YEAR 1987 CONGRESSIONAL BUDGET REQUEST
ENERGY SUPPLY RESEARCH AND DEVELOPMENT
VOLUME 3
SUPPORTING RESEARCH AND TECHNICAL ANALYSIS
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DEPARTMENT OF ENERGY
 FY 1987 CONGRESSIONAL BUDGET REQUEST
 LEAD TABLE
 UNIVERSITY RESEARCH SUPPORT
 ENERGY SUPPLY RESEARCH AND DEVELOPMENT

(Tabular dollars in thousands. Narrative material in whole dollars.)

	<u>FY 1985</u> <u>Appropriation</u>	<u>FY 1986</u> <u>Appropriation</u>	<u>FY 1987</u> <u>Base</u>	<u>FY 1987</u> <u>Request</u>	<u>Request</u> <u>vs Base</u>
<u>University Research Support (ER)</u>					
<u>Operating Expenses:</u>					
<u>University Laboratory Research</u>					
University Laboratory Cooperative Research...	\$ 6,500	\$ 5,773	\$ 5,773	\$ 7,775	\$+ 2,002
University Reactor Fuel Assistance.....	2,848	3,753	3,753	1,900	- 1,853
Subtotal.....	<u>\$ 9,348</u>	<u>\$ 9,526</u>	<u>\$ 9,526</u>	<u>\$ 9,675</u>	<u>\$+ 149</u>
<u>Energy Manpower Development</u>					
Energy Manpower Assessment.....	450	385	385	500	+ 115
Energy Education and Training.....	300	385	385	800	+ 415
Subtotal.....	<u>\$ 750</u>	<u>\$ 770</u>	<u>\$ 770</u>	<u>\$ 1,300</u>	<u>+ 530</u>
<u>Total</u>					
Operating Expenses.....	<u>\$ 10,098</u>	<u>\$ 10,296</u>	<u>\$10,296</u>	<u>\$10,975</u>	<u>\$+ 679</u>
University Research Support.....	\$ 10,098 ^{a/b/}	\$ 10,296 ^{c/}	\$10,296	\$10,975	\$+ 679

Authorization: Section 209, P.L. 95-91, Section 31, Atomic Energy Act of 1954, Section 103 (103) P.L. 93-483.

- ^{a/} FY 1985 total does not include \$102,000 transferred to the SBIR program.
^{b/} Total reflects a reduction of \$1,000,000 in FY 1985 for management initiatives savings.
^{c/} Total reduced by \$404,000 in accordance with P.L. 99-177, the Balanced Budget and Emergency Deficit Act of 1985 (Gramm/Rudman/Hollings).

Department of Energy
 FY 1987 Congressional Budget Request
 Additions to FY 1986 Appropriations

	FY 1986 Confer. (1)	General Reduction (2)	Management Initiatives (3)	Pay Cost Restoration (4)	FTE General Reduction (5)	Gram- Rudman- Hollings (6)	ES&H Transfer/ Reprogramming (7)	Subtotal (8)	Comparability Adjustments (9)	Total (10)
<u>University Research Support (UR)</u>										
University Laboratory Cooperative Program										
Operating Expenses	5,800	-800				-227		5,773		5,773
University Reactor Fuel Assistance Program										
Operating Expenses	3,980					-247		3,733		3,733
<u>Energy Manpower Development</u>										
Energy Manpower Assessment Program										
Operating Expenses	450	-50				-45		355		355
Energy Education and Training Program										
Operating Expenses	50	-50				-15		35		35
Subtotal, University Research Support	11,700	-1,900				-487		10,296		10,296
General Reduction	-1,000	1,000								
Management Initiatives										
Pay Restoration										
Use of Prior Year Balances (UR)										
Use of Prior Year Balances (Other Energy Supply)										
Total, University Research Support	\$ 10,700	\$ 1,000				\$ -487		\$ 10,296		\$ 10,296

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DEPARTMENT OF ENERGY
1987 CONGRESSIONAL BUDGET REQUEST
SUMMARY OF CHANGES
UNIVERSITY RESEARCH SUPPORT
(In thousands of dollars)

1986 Appropriation enacted.....	\$ 10,700
1986 Gramm-Rudman reduction.....	- 404
1986 adjusted.....	<u>\$ 10,296</u>
 Program increases and decreases:	
o Increases the number of faculty and student research appointments at the DOE laboratories by 20% and increases support for laboratory/HBCU cooperative projects.....	+ 1,302
o Provides for Laboratory Technology Exchange including research support for visiting industrial scientist appointments.....	+ 700
o Provides for base reactor fuel program.....	- 1,853
o Increases support for high school science teacher/student research projects at DOE laboratories.....	+ 530
 1987 Budget Request.....	 <u>\$ 10,975</u>

The principal goal of the University Research Support (URS) program is to help maintain strong scientific/technical research capabilities in support of the Department's long range energy R&D mission. This is accomplished through supporting specialized research and manpower development efforts which complement and underpin the R&D mission of other Departmental programs. The URS program provides a special Departmental focus for several efforts which primarily involve universities both directly or in conjunction with the Department's national laboratories and major contractors. The URS supported activities may be distinguished from other Departmental university R&D programs by their multidisciplinary nature and by their focus on manpower development needs. Individual efforts carried out through the URS program relate to one or more of the following mission objectives:

- o Maintain and strengthen university-based energy research and manpower development efforts in selected high priority energy research fields.
- o Utilize the unique resources of the national laboratories (equipment, instrumentation, and personnel) for university faculty and student research and training.
- o Assist in the transfer of laboratory-developed technology and expertise to the private sector.
- o Increase the number and enhance the quality of students, including women and minorities, pursuing professional-level degrees in energy-related science or engineering.
- o Help strengthen the scientific/technical workforce in the Department's national laboratories.

There are two major subprograms within URS. The first subprogram, University Laboratory Research, is directed at strengthening the capabilities of both universities and national laboratories as major energy research performers in the conduct of long range energy research. Many of the specific activities supported within this subprogram rely on the use of facilities at the DOE Laboratories for faculty and student research training. This subprogram also includes support for implementing the Department's statutory responsibility for assessing the supply and demand of manpower for both current and projected energy R&D programs.

In order to carry out URS program objectives, a variety of approaches are used including faculty, graduate and undergraduate student research participation in national laboratory programs, joint efforts involving laboratory university scientists, and support for the operation of unique university-based nuclear research and training reactors.

In FY 1986, the following major accomplishments are planned for the URS program.

- o Support 2,000 faculty and student research and training appointments at the DOE laboratories. Support five to eight visiting industrial scientist research appointments at the DOE laboratories.
- o Refuel five to six university nuclear research reactors and support 20 university reactor sharing projects.
- o Continue in-depth analyses of the supply/demand for manpower in energy R&D programs including publication of a comprehensive survey of manpower requirements in a number of energy R&D areas of direct relevance to the Department.

- o Support one to two high school teacher/student workshops in energy-related science and mathematics at the DOE laboratories and 21 Pre-freshman Engineering Program projects reaching over 2,000 secondary school students.

The URS program also supports special research contracts in which costs are shared by the universities. The universities' contributions are provided by a number of mechanisms, e.g., salaries to investigators, summer student assignments, provision of facilities and/or equipment, etc. The URS program encourages such cost sharing policies to achieve maximum utilization of available Federal funds.

	<u>FY 1985</u>	<u>FY 1986</u>	<u>FY 1987 Request</u>
University Research Support.....	\$10,098	\$10,296	10,975

The FY 1987 request for the University Research Support Program is \$10,975,000. Specific priorities at the requested level are as follows:

- o Support 2,500 faculty/student research training appointments at the laboratories (including 1,250 undergraduates).
- o Initiate new Laboratory Technology Exchange Program including continuing cost-shared support for up to 25 visiting industrial scientists at DOE laboratories.
- o Refuel seven university research reactors and support twenty reactor sharing grants.
- o Support four laboratory-based high school science teacher/student workshops.
- o Support 2,300 junior high school minority and women participants in the Pre-freshman Engineering Program.

The following sections describe the proposed activities which will be carried out at the FY 1987 request level within each of the major URS subprograms.

<u>University Laboratory Research.....</u>	\$ 9,328	\$ 9,526	\$ 9,675
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There are two major emphases in this subprogram. The first is strengthening the capabilities of universities and the national laboratories to conduct long range energy related research and to help ensure an adequate scientific and engineering manpower base for both current and future energy R&D programs. The second emphasis is enhancing and expanding the transfer of laboratory-generated research and technology to the private sector.

	<u>FY 1985</u>	<u>FY 1986</u>	<u>FY 1987 Request</u>
<u>University Laboratory Cooperative Research.....</u>	(\$ 6,474)	(\$ 5,773)	(\$ 7,775)

This activity includes a variety of approaches designed to bring the DOE laboratories, universities and industry into a closer partnership in meeting national priorities for energy research and manpower development. One of the principal objectives is to maintain the flow of manpower for future energy research programs by involving students in ongoing laboratory research programs. Additional research capabilities are also available to the Department's Laboratories through participating faculty. Funding is provided to ten multiprogram laboratories and university consortia (who work with other DOE contractors) for the placement of faculty, graduate, and undergraduate students in summer or academic year research activities.

The FY 1987 request includes support for the following:

- o Undergraduate Student Research: Approximately 1,250 undergraduate science and engineering students will be supported in summer research assignments in the participating laboratories. Each student is assigned to an ongoing laboratory research program and is involved in energy related research significant to the Department's needs.
- o Graduate Student Research: Graduate students who have completed their academic course work and are ready to undertake their thesis research are eligible for support under this program. About 250 graduate students in the sciences and engineering will collaborate with laboratory staff in areas of fundamental and applied research that are of interest to DOE.
- o Faculty Research: About 300 faculty members from colleges and universities will participate in ongoing research at DOE laboratory and contractor sites. These appointments include both summer and academic year assignments. In a number of cases continued support is provided for on-campus research through funding provided directly by the laboratory's research programs and continued liaison with laboratory research staff.
- o Special Energy R&D Training: Over 700 university faculty and students will participate in special energy-related workshops, short courses and institutes conducted at national laboratories on selected energy R&D topics and problem areas at the forefront of energy research. A sample of the workshops and institutes conducted within this activity are: Computer-Aided Spectroscopy, X-Ray Optics, Separation of Proteins by Two-Dimensional Electrophoresis, Measurement Techniques for Radium and Actinides, Overview of Advanced Energy Conversion Systems, etc. These workshops are important means by which state-of-the-art information on research and technology topics is disseminated to the university community.
- o National Laboratory/Historically Black Colleges and Universities Programs: Continued support will be provided for cooperative research and manpower development programs between DOE laboratories and Black Colleges including ongoing efforts with Jackson State University/Lawrence Berkeley Laboratory and Atlanta University/Argonne National Laboratory.
- o Laboratory Technology Exchange:

As part of the Department's effort to expand the collaboration in research between the national laboratories and private industry, continued research support will be provided for visiting research appointments at DOE laboratories for industrial scientists. (This effort was budgeted in FY 1986 as part of the University-Laboratory Cooperative activity.) Participating laboratories identify research areas of potential interest to industries not already significantly involved in laboratory programs. Formal agreements are then developed with interested industries to bring industrial scientists to the laboratories for one year visiting research appointments. Up to 25 visiting appointments will be made in FY 1987 within the requested budget level. Cost sharing with industry will be involved in these appointments. Funds are also included in the FY 1987 request to support model methods and approaches for enhancing the transfer of laboratory based technology to U.S. industries. These approaches will identify and evaluate laboratory technologies with potential spinoff industrial applications. This effort will take fuller advantage of the scientific and technological capabilities at the DOE Laboratories with the purpose of helping to enhance the Nation's industrial competitiveness.

	<u>FY 1985</u>	<u>FY 1986</u>	<u>FY 1987 Request</u>
<u>University Reactor Fuel Assistance.....</u>	(\$ 2,854)	(\$ 3,753)	(\$ 1,900)

This program provides fuel for university research and training reactors, particularly those higher powered reactors using Material Test Reactor (MTR) type fuel. The university-based nuclear research and manpower development effort is highly dependent on these specialized facilities not only for nuclear related training but also for research in the basic sciences. Some of the current uses are neutron physics research, trace analysis and radiochemistry, primarily in the fields of human nutrition, health and geochemistry, and research in materials such as structural alloys for fusion reactors, etc. Under the Reactor Sharing Activity, funding is provided to help defray reactor operational costs when the facility is "shared" with researchers from neighboring universities.

At the FY 1987 request level, seven reactors will be provided fuel and approximately twenty reactor sharing grants will be made on a competitive basis. Continued support will also be provided to ship and store excess reactor fuel at DOE Laboratory sites and other efforts responsive to university requests related to NRC requirements.

	<u>FY 1985</u>	<u>FY 1986</u>	<u>FY 1987 Request</u>
<u>Energy Manpower Development.....</u>	\$ 770	\$ 770	\$ 1,300

This subprogram combines two manpower-oriented efforts--the Manpower Assessment effort which conducts studies and analyses of the supply and demand of manpower for both current and future energy R&D programs; and the Energy Education and Training effort which supports activities directed at encouraging secondary school students to pursue energy-related science and engineering programs at the college level.

<u>Energy Manpower Assessment.....</u>	(450)	(385)	(500)
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The FY 1987 request of \$500,000 for the Manpower Assessment activity will provide support for an in-depth analysis of the employment and utilization of engineering, scientific and related personnel over a 5 year period resulting from changing trends in public and private energy R&D funding and energy production and conservation activities. This effort will require the continued collection and analysis of base line data on the employment, utilization and supply of engineers and scientists in all types of energy-related activities and programs. Major components of this effort include a new survey of doctoral scientists and engineers involved in energy R&D and related activities and an analysis of the involvement of recent BS/MS science and engineering graduates in developing new energy technologies.

<u>Energy Education and Training.....</u>	(320)	(385)	(800)
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This program activity supports the Department's longer term R&D mission by encouraging students to pursue energy-related scientific and technical careers. There are four interrelated efforts in this activity: the Pre-Freshman Engineering Program (PREP); the DOE Special Awards Program; high school science teacher institutes; and a high school science student research competition. The Pre-Freshman Engineering Program provides initial training in and exposure to careers in engineering for minority and woman high school students through summer institutes at colleges and universities throughout the country. At the FY 1987 request, 20 PREP projects will be conducted

reaching an estimated 2,300 students. This is a competitive grant program open to university engineering schools. The DOE Special Awards Program recognizes excellence in student energy research at the annual International Science and Engineering Fair. Each year, ten high school science students, along with their science teachers, receive week-long visits to one of the Department's national laboratories. Also, three laboratories will host high school science teacher workshops during FY 1987 aimed at better preparing classroom teachers in chemistry, physics, computer science and mathematics. Additionally, a high school student research competition program will provide an opportunity for 50-100 highly qualified high school science students to collaborate on energy research projects at selected DOE laboratories during the summer.