

**DEPARTMENT OF ENERGY  
FY 1997 CONGRESSIONAL BUDGET REQUEST  
ENERGY SUPPLY, RESEARCH AND DEVELOPMENT  
(Tabular dollars in thousands, Narrative in whole dollars)**

**UNIVERSITY AND SCIENCE EDUCATION**

**PROGRAM MISSION**

The University and Science Education Program (USE) supports activities that utilize the scientific and technical resources of the Department of Energy's laboratories to enhance the development of a diverse, well-educated and scientifically literate workforce. USE's centralized institutional support for the Department's education efforts enables all DOE research and technical program areas to provide hands-on research experiences for students and faculty at the Department's laboratories and minimizes department-wide administrative cost. USE is the lead program for the Department's role in providing support to the national effort to improve science education for all students.

The Office of Laboratory Policy and Infrastructure Management, which reports to the Director of the Office of Energy Research, manages the USE program. The office is responsible for providing leadership and program support necessary to use and leverage the resources of the Department's laboratories to help replenish the pool of scientists and engineers, and to achieve significant, long-term improvements in their science and technology skills, primarily through hands-on experiences at the laboratories.

The **GOAL** of the University and Science Education Program is to:

Ensure that the Department effectively utilizes and leverages the resources of the DOE laboratory system to support the Department's university and science education mission.

The **OBJECTIVES** related to this goal are to:

1. Provide opportunities and effective mechanisms for students and faculty to utilize the Department's laboratories for hands-on research experiences.
2. Support increased participation of under-represented populations in science and engineering.
3. Utilize DOE laboratory resources to contribute to systemic science education reform.

## **PROGRAM MISSION - UNIVERSITY AND SCIENCE EDUCATION (Cont'd)**

4. Provide the infrastructure for the Department's laboratory science education programs.

### **PERFORMANCE MEASURES:**

Performance measures for the University and Science Education Program are both qualitative and quantitative. The quality of the program will be measured by improvement in performance of the DOE Laboratory Science Education Programs.

1. Enhanced opportunities at DOE laboratories to improve students/teachers' understanding of science and mathematics.
2. Improved flow of underrepresented students into science and math programs/careers achieved.
3. Cost sharing for program initiatives.

### **SIGNIFICANT ACCOMPLISHMENTS AND PROGRAM SHIFTS:**

- o Through the Science and Engineering Research Semester (SERS) nearly 400 undergraduates had the opportunity to spend an academic term working side-by-side with scientists at DOE's national laboratories. In addition to gaining valuable personal experience, these students helped DOE scientists advance their ongoing research.
- o The infrastructure supported by the Laboratory Cooperative Program enabled nearly 2000 college and university faculty and students to participate in collaborative hands-on research with the scientists from DOE's national laboratories. Participants in these programs brought fresh ideas to the Department's research endeavors, and carried "state-of-the-art" knowledge and experience from our laboratories back to their universities to infuse into their institutions academic programs. Training provided by the laboratories through Laboratory Cooperative Program workshops and conferences provided an additional 1500 college-level participants with new skills in developing areas of science like parallel computation, an area of computer science in which the laboratories have played a leading role.
- o Over 100 undergraduate students and 50 faculty involved in DOE-laboratory partnership efforts with Historically Black Colleges and Universities (HBCU) and other minority institutions participated in hands-on research with DOE laboratory scientists.

## **PROGRAM MISSION - UNIVERSITY AND SCIENCE EDUCATION (Cont'd)**

- o Nearly 3000 precollege teachers participated in 52 laboratory-based research participation experiences and over 3500 teachers participated in workshops or institutes at DOE laboratories. DOE's work with teachers and their school systems is clearly beginning to pay dividends. With support of DOE's Princeton Plasma Physics Laboratory's science education reform efforts, the Trenton, New Jersey, public school system reports significantly improved standardized test scores systemwide.**
- o Recently transferred to the Basic Energy Sciences program in the Office of Energy Research, several significant accomplishments were realized in the Experimental Program to Stimulate Competitive Research (EPSCoR) in FY 1995. DOE/EPSCoR increased the number of state Implementation Awards from seven to nine. Additionally, the integration of DOE/EPSCoR faculty into the larger science community is essential if EPSCoR states are to enhance their funding competitiveness. Over 100 new interactions between DOE scientists and EPSCoR faculty were established over the past year.**
- o The University Research Instrumentation Program awarded 21 grants in FY 1995. These awards allowed DOE-supported university researchers to purchase unique, state-of-the-art equipment to continue, expand or accelerate existing energy-related research.**
- o Forty-six grants to colleges and community colleges were awarded for the Pre-Freshman Enrichment Program. The purpose of this program is to introduce science and math-based activities to students in grades 6-10. These students represent populations historically underutilized in science-based careers. Cost-sharing with local businesses and industry is typical.**
- o As a result of a budget reduction of approximately \$42 million and Congressional report guidance, a considerable shift in emphasis has occurred between FY 1995 and FY 1996. In restructuring the program to maximize the resources available to summer and academic-term, laboratory-based research participation activities, precollege science education outreach projects have been reduced from several hundred to fewer than twenty.**
- o Precollege activities that capitalize on leveraged previous investments and partnerships, and summer and academic laboratory-based research assignments have been continued. While laboratory-based programs are our highest priority, the severity of the FY 1996 budget reductions have also required cutbacks in college level faculty and student intern and collaborative research appointments. No new postdoctoral research fellows are being appointed and substantial reductions were required in support for minority and outreach efforts.**

**UNIVERSITY AND SCIENCE EDUCATION**

**PROGRAM FUNDING PROFILE**

(Dollars in thousands)

	<u>FY 1995 Comparable Appropriation</u>	<u>FY 1996 Original Appropriation</u>	<u>FY 1996 Real &amp; Comp Adjustments</u>	<u>FY 1996 Comparable Adjusted</u>	<u>FY 1997 Budget Request</u>
<b><u>Research</u></b>					
Laboratory Cooperative Program.....	\$29,607	\$13,000	\$0	\$13,000	\$13,900
University Programs Operating Expenses.....	26,423	5,900	0	5,900	6,000
University Research Instrumentation Program.....	5,431	0	0	0	0
Program Direction.....	0	1,100 a/	-1,100 b/	0	0
Subtotal University and Science Education...	<u>61,461</u>	<u>20,000</u>	<u>-1,100</u>	<u>18,900</u>	<u>19,900</u>
Adjustment.....	<u>-730 c/</u>	<u>-500 c/</u>	<u>0</u>	<u>-500 c/</u>	<u>0</u>
<b>Total, University and Science Education.....</b>	<b><u>\$60,731</u></b>	<b><u>\$19,500</u></b>	<b><u>-\$1,100</u></b>	<b><u>\$18,400</u></b>	<b><u>\$19,900</u></b>

a/ Up to \$1,100,000 was made available for University and Science Education staff severance costs.

b/ Comparability transfer to Energy Research Energy Supply, Research and Development Program Direction.

c/ Share of Energy Supply, Research and Development general reduction for use of prior year balances assigned to this program. The total general reduction is applied at the appropriation level.

Public Law Authorization:

Pub. Law 95-91, DOE Organization Act (1977)

**UNIVERSITY AND SCIENCE EDUCATION**  
(Dollars in thousands)

**PROGRAM FUNDING BY SITE**

<b>Field Offices/Sites</b>	<b>FY 1995 Comparable Appropriation</b>	<b>FY 1996 Original Appropriation</b>	<b>FY 1996 Real &amp; Comp Adjustments</b>	<b>FY 1996 Comparable Appropriation</b>	<b>FY 1997 Budget Request</b>
<b>Albuquerque Operations Office</b>					
Inhalation Toxicology Research Institute	\$90	\$20	\$0	\$20	\$0
Los Alamos National Laboratory	1,474	440	0	440	500
Sandia National Laboratory	1,487	1,275	0	1,275	1,300
<b>Chicago Operations Office</b>					
Ames Laboratory	428	95	0	95	100
Argonne National Laboratory	5,288	2,255	0	2,255	2,700
Brookhaven National Laboratory	2,063	695	0	695	900
Fermi National Accelerator Laboratory	1,257	355	0	355	350
Princeton Plasma Physics Laboratory	381	300	0	300	300
<b>Golden Field Office</b>					
National Renewable Energy Laboratory	261	50	0	50	50
<b>Idaha Operations Office</b>					
Associated Western Universities	5,194	2,170	0	2,170	2,000
Idaho National Engineering Laboratory	375	120	0	120	150
<b>Oakland Operations Office</b>					
Lawrence Berkeley National Laboratory	2,969	825	0	825	1,050
Lawrence Livermore National Laboratory	1,548	395	0	395	500
Stanford Linear Accelerator Center	183	80	0	80	100
<b>Oak Ridge Operations Office</b>					
Continuous Electron Beam Acc. Facility	593	100	0	100	150
Oak Ridge Institute for Science and Educatio	6,504	3,957	0	3,957	3,700
Oak Ridge National Laboratory	1,420	737	0	737	800
<b>Ohio Field Office</b>					
EG&G Mound App. Technology	100	25	0	25	0
Fernald Env. Res. Mgmt. Corp.	53	0	0	0	0
<b>Richland Operations Office</b>					
Pacific Northwest National Lab	1,411	380	0	380	450
<b>Savannah River Operations Office</b>					
Savannah River Ecology Lab	149	100	0	100	100
Savannah River Tech. Center	95	5	0	5	0
<b>All other sites a/</b>	<b>28,138</b>	<b>5,621</b>	<b>-1,100</b>	<b>4,521</b>	<b>4,700</b>
<b>Subtotal</b>	<b>61,461</b>	<b>20,000</b>	<b>-1,100</b>	<b>18,900</b>	<b>19,900</b>
<b>Adjustment</b>	<b>-730 b/</b>	<b>-500</b>	<b>0</b>	<b>-500</b>	<b>0</b>
<b>TOTAL</b>	<b>\$60,731</b>	<b>\$19,500</b>	<b>-\$1,100</b>	<b>\$18,400</b>	<b>\$19,900</b>

a/ Funding provided to universities, industry, other federal agencies and other miscellaneous contractors.

b/ Share of Energy Supply, Research and Development general reduction for use of prior year balances assigned to this program.

**UNIVERSITY AND SCIENCE EDUCATION  
PROGRAM OBJECT CLASS SUMMARY  
(Dollars in thousands)**

	FY 1995		FY 1996		FY 1997
	Comparable	Non.-Comp.	Comparable	Non-Comp.	
<b>Direct Funding:</b>					
<b>Personnel compensation:</b>					
11.1 Full-time permanent.....		\$1,509			
11.3 Other than full-time permanent.....		430			
11.5 Other personnel compensation.....		23			
11.8 Special personal services payments.....		0			
11.9 Total personnel compensation.....	0	1,962	0	0	0
12.1 Civilian personnel benefits		333			
13.0 Benefits for former personnel.....		0		1,100	
21.0 Travel and transportation of persons.....		107			
22.0 Transportation of things.....					
23.1 Rental payments to GSA.....					
23.2 Rental payments to others.....					
23.3 Communications, utilities, and miscellaneous charges.....					
24.0 Printing and reproduction.....					
25.1 Advisory and assistance services.....	0	531	0	0	0
25.2 Other services.....	0	235	0	0	0
25.3 Purchases of goods and services from Government accounts.....					
25.4 Operation and maintenance of facilities .....	21,742	21,742	8,252	8,252	9,500
25.5 Research and development contracts.....	13,620	13,620	12,020	12,091	8,550
25.7 Operation and maintenance of equipment.....					
26.0 Supplies and materials.....					
31.0 Equipment.....	0	0	0	0	0
32.0 Land and structures.....	0	0	0	0	0
41.0 Grants, subsidies and contributions.....	23,347	23,347	250	250	1,850
99.0 Subtotal, obligations.....	58,709	61,877	20,522	21,693	19,900
Reimbursable Obligations.....		-	-		
99.9 Total Obligations.....	58,709	61,877	20,522	21,693	19,900
Recovery of prior year obligations.....	0	0	-25	-25	
Unobligated balance avail, start of year.....	-172	-172	-2,097	-2,168	
Unobligated balance avail, end of year.....	2,194	2,264			
Budget Authority.....	\$60,731	\$63,969	\$18,400	\$19,500	\$19,900

**UNIVERSITY AND SCIENCE EDUCATION**  
**PROGRAM PERFORMANCE SUMMARY**  
**(Tabular dollars in thousands, Narrative in whole dollars)**

**I. Mission Supporting Goals and Objectives**

Activities supported by University and Science Education programs ensure the effective utilization of DOE's laboratory system to support the Department's university and science education mission by enhancing the capabilities of faculty and students through hands-on research experiences at DOE national laboratories, by increasing the diversity of the scientific workforce, by utilizing laboratory resources to contribute to systemic science education reform, and by providing the infrastructure for the Department's laboratory-based science education programs.

**Laboratory Cooperative Program**

The Laboratory Cooperative Program is the Department's primary vehicle for providing faculty and students with access to its national laboratories. The program provides participants with access to state-of-the-art scientific equipment, techniques and ideas and enables them to further develop their critical thinking and analytical skills. The laboratory-based institutional support provided by the Laboratory Coop Program ensures accurate participant placement across all of DOE's research and technical program areas and monitors the quality of their research experiences. Minority students and faculty are particularly sought out and encouraged to participate in the Laboratory Cooperative Program. From the many thousands of applications the Laboratory Cooperative Program receives annually, it is clear that DOE's research participation appointments are highly regarded and that these opportunities play an important role in the science education program of the country.

**University Programs**

The University Programs subcategory includes support for university-based efforts directed at encouraging more young people, including minorities and women, to pursue energy-related scientific and technical careers. Support is being requested to sustain DOE laboratory minority university alliances as well as other Administration and Congressionally recommended efforts. In addition, funds are being requested to continue the Department's Prefreshman Enrichment Program (PREP) with emphasis on HBCU and minority institutions supporting summer workshops in mathematics, science and engineering on their campuses.

## PROGRAM PERFORMANCE SUMMARY (Cont'd)

### II. Funding Schedule:

<u>Program Activity</u>	<u>FY 1995</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>\$ Change</u>	<u>% Change</u>
Laboratory Cooperative Programs...	\$29,607	\$13,000	\$13,900	\$+ 900	+ 6.9%
University Programs.....	26,423	5,900	6,000	+ 100	+ 1.7%
University Research Instr. Program.	<u>5,431</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0.0%</u>
Total, USE.....	<u>\$61,461</u>	<u>\$18,900</u>	<u>\$19,900</u>	<u>\$+ 1,000</u>	<u>+ 5.3%</u>

### III. Performance Summary:

#### FY 1995 Accomplishments

- o Nearly 400 undergraduates gained valuable research experience and helped DOE scientists advance the national laboratories ongoing research programs through participation in the academic-year Science and Engineering Research Semester (SERS). An additional 2000 faculty and students participated in collaborative hands-on research during the summer through the Laboratory Cooperative Program. Participants in both programs brought new perspectives to the Department's research endeavors and carried away new skills and ideas to their college and university campuses.
- o Laboratory Cooperative Program workshops and conferences provided an additional 1500 college-level participants with new skills in developing areas of science like parallel computation, an area of computer science in which the laboratories have played a leading role.
- o Over 100 undergraduate students and 50 faculty from Historically Black Colleges and Universities (HBCU) and other minority institutions participated in hands-on research with DOE laboratory scientists.
- o Nearly 3000 precollege teachers participated in 52 laboratory-based research participation experiences and over 3500 teachers participated in laboratory-sponsored education workshops or institutions. Such efforts, like that supported by DOE's Princeton Plasma Physics Laboratory's in Trenton, New Jersey's public school system, has contributed to significantly improved standardized student test scores systemwide.



### **III. PERFORMANCE SUMMARY (Cont'd)**

- o The Department of Energy's Experimental Program to Stimulate Competitive Research (EPSCoR) increased the number of state Implementation Awards from seven to nine in FY 1995. Additionally, over 100 new interactions between DOE scientists and EPSCoR faculty were established over the past year thereby helping integrate faculty and students from EPSCoR states into the larger science community.
- o Twenty-one University Research Instrumentation awards allowed DOE-supported university researchers to purchase unique, state-of-the-art equipment to further enhance their existing energy-related research projects.
- o Through Pre-Freshman Enrichment Program (PREP) grants that are cost shared with local businesses and industry, 46 colleges and community colleges were able to introduce science and math-based activities to grade 6-10 students from minority communities.
- o Funding in the amount of \$1,078,000 and \$54,000 has been transferred to the SBIR and STTR programs, respectively.

#### FY 1996 Accomplishments (to date and planned):

- o In restructuring the program to maximize the resources available to laboratory-based research participation activities, the number of precollege science education outreach projects has been reduced from several hundred to less than twenty. Those precollege activities that remain capitalize on previous investments and partnerships, including education efforts with the National Science Foundation. Despite the positive accomplishments of these precollege activities, these programs are being funded at a significantly reduced levels.
- o Due to the severity of the FY 1996 appropriation, support for faculty and student intern and collaborative research appointments, while our highest priority, is being reduced to early 1990 funding levels. No new postdoctoral research fellows are being appointed and significant reductions are necessary in support for congressionally recommended minority and outreach efforts. Cost sharing with other DOE programs is being sought to maintain as many excellent activities as possible at a viable level.
- o Funding in the amount of \$368,000 and \$28,000 has been budgeted for the SBIR and STTR programs, respectively.

### **III. PERFORMANCE SUMMARY (Cont'd)**

#### **FY 1997 Planned Accomplishments:**

- o Increase the number of undergraduate and graduate participants in the Laboratory Cooperative Education Program by 5%.
- o Increase coordination with other DOE programs and improve integration of science education activities.
- o Sustain support for high priority Administration and Congressional programs.
- o Establish a developmental award program for faculty and students from primarily undergraduate institutions and minority institutions that stimulates collaborations with DOE national laboratory scientific staff and enhances faculty grant competitiveness.
- o Increase coordination with other agencies.
- o Partner with NSF in support of its Minority Institutes of Excellence program to enhance coordination and effectiveness of support for undergraduate programs at HBCUs.
- o Funding in the amount of \$498,000 has been budgeted for the SBIR program.

#### **Explanation of Funding Changes FY 1996 to FY 1997:**

- o The increase of \$1,000,000 in FY 1997 University and Science Education funding will enable the Department to provide an adequate base program focused on longer term research assignments of undergraduates, graduate students and faculty at DOE laboratories. It also provides a level of science education institutional support that allows DOE's research groups and technical program offices to optimize student and faculty internships and collaborative involvement in ongoing DOE research. This approach is consistent with Congressional guidance, supports the Administration's science education goals, and will result in increased efficiency and effectiveness in carrying out the restructured programmatic initiatives in close collaboration with DOE programs and other agencies, such as NSF.