

**DEPARTMENT OF ENERGY
FY 1998 CONGRESSIONAL BUDGET REQUEST
OFFICE OF ENERGY RESEARCH
ENERGY SUPPLY, RESEARCH AND DEVELOPMENT
(Tabular dollars in thousands, Narrative in whole dollars)**

COMPUTATIONAL AND TECHNOLOGY RESEARCH

PROGRAM MISSION

The mission of the Computational and Technology Research (CTR) program is to perform long-term computational, technology, and advanced energy projects research in support of the goals of the Office of Energy Research strategic plan, and the mission of the Department of Energy (DOE).

The GOAL of the CTR program is:

To address complex problems important to the mission of the Department of Energy and to the nation, through an integrated program in applied mathematical sciences, high performance computing and communications, information infrastructure, advanced energy projects research, and technology research. Research at the forefront of scientific research is becoming more multidisciplinary and fast-paced, calling for new approaches. The CTR program emphasizes multidisciplinary research, often with federal and private sector partners. The program exploits the capabilities and research skills at universities, national laboratories, and industrial research laboratories. The CTR program funds research that extends from fundamental investigations to technology development. This includes activities such as High Performance Computing and Communications, the National Information Infrastructure, inter-agency development of the Next Generation Internet, and the joint Energy Research-Defense Programs DOE 2000 initiative. The program also explores advanced energy concepts to establish their scientific feasibility. Technology research activities include multi-year collaborations, technical assistance to small business and the Environmental Technology Partnerships. The program works closely with other Energy Research, Departmental, and other agency programs.

PROGRAM MISSION - COMPUTATIONAL AND TECHNOLOGY RESEARCH (Cont'd)

The OBJECTIVES related to these goals are:

1. To CONTRIBUTE TO SUSTAINABLE ENERGY PRODUCTION AND USE - Conduct research that creates scientific and engineering knowledge in support of Department of Energy mission thrusts to accelerate the utilization and development of energy technologies in a safe and environmentally compatible manner.
2. To PROVIDE WORLD CLASS COMPUTING FACILITIES - Provide and operate major user supercomputer facilities needed for DOE research and foster research partnerships with industry and the entire scientific community. These facilities include the National Energy Research Scientific Computing (NERSC) Center at Lawrence Berkeley National Laboratory, the Energy Sciences Network (ESnet), and specialized high-end computing research facilities at Los Alamos National Laboratory, Oak Ridge National Laboratory, Lawrence Berkeley National Laboratory, and Argonne National Laboratory. Thousands of scientists and engineers use these facilities to advance knowledge and develop new products, materials, and manufacturing processes.
3. To ENSURE THAT RESEARCH RESULTS ARE WIDELY KNOWN, VALUED AND USED - Promote open communications and the transfer of information and technology among universities, government, and the private sector. Activities include peer-review of research activities, presentation of results at meetings and in peer-reviewed scientific journals, strong coordination and planning with the energy technology offices of the Department, co-location of researchers with partner programs, input from stakeholders, and in-depth workshops and conferences among scientists and engineers with management sponsorship and participation. The national laboratories and universities are unique resources to bring about many of these important interactions.

MAJOR ACTIVITIES:

1. Mathematical, Information, and Computational Sciences:
Supports forefront, diverse applied mathematical sciences, high performance computing, communications and information infrastructure research that spans the spectrum of activities from strategic fundamental research to technology development and demonstration.
2. Laboratory Technology Research:
Supports high risk, long-term technology research that advances basic research results to a stage where industry and DOE technology programs can exploit the technologies for improved energy utilization and efficiency.

PROGRAM MISSION - COMPUTATIONAL AND TECHNOLOGY RESEARCH (Cont'd)

3. Advanced Energy Projects:

Supports research to establish the feasibility of novel, high risk/high payoff energy-related concepts that span the Department's energy mission and goals.

SCIENTIFIC FACILITIES UTILIZATION:

The Computational and Technology Research program request includes \$26,500,000 in FY 1998 to support the NERSC. This investment will provide research time for about 5,000 scientists in universities, Federal agencies, and U.S. companies. It will also leverage both Federally and privately sponsored research, consistent with the Administration's strategy for enhancing the U.S. National science investment. The proposed funding supports the number of users served in FY 1996, which was an increase over FY 1995 levels, and will maintain the quality of service and availability of facility resources to users, including university and government scientists, as well as private companies who rely on unique DOE facilities for their basic research needs. The proposed funding level will also provide for efficient utilization of high technology facilities, which are generally oversubscribed by factors of two to three. Research communities that will benefit from this initiative include structural biology, superconductor technology, medical research and technology development, materials, chemical and plasma sciences, high energy and nuclear physics, and environmental and atmospheric research.

PERFORMANCE MEASURES:

The Computational and Technology Research program performs three different types of activities: operate facilities that provide service for ER and DOE; conduct basic research in areas such as computational science, mathematics, and advanced energy principles; and perform technology research to bridge the gap between basic research and industrial needs.

Facilities Operations: Facilities and infrastructure including NERSC and ESnet are operated to meet user and overall ER program requirements, as indicated by achieving performance specifications while protecting the safety of the workers and the environment; operating facilities reliably and according to planned schedules; and maintaining and improving facilities at reasonable costs. Facility performance measures include achievement of performance specifications, operating time, throughput, user satisfaction and effective utilization of resources as determined by external reviews, user steering committees, and internal ER program manager committees.

PROGRAM MISSION - COMPUTATIONAL AND TECHNOLOGY RESEARCH (Cont'd)

Basic Research: The scientific and technical merit, appropriateness, and quality of the Computational and Technology Research programs are judged by rigorous peer reviews conducted by internationally recognized scientific experts. Highest quality research is maintained by taking appropriate management actions based on the results of the peer reviews. Other measures of the quality of the research are sustained achievements in advancing knowledge, as indicated by publication of research results in refereed scientific journals and by invited participation at national and international conferences and workshops; and by awards received by CTR supported researchers.

Bridging Technology Gap: The purpose of the Laboratory Technology Research (LTR) subprogram is to bridge from basic research to the point where industry and DOE's technology programs can exploit the innovations for energy applications. Accordingly, performance is judged by the number of technology projects and ideas that are subsequently supported or implemented by either industry or DOE's technology programs, and the economic and commercial impact of products and processes resulting from the projects, as indicated, for example by R&D 100 awards.

SIGNIFICANT ACCOMPLISHMENTS AND PROGRAM SHIFTS:

- o The NERSC was recompeted to optimize program effectiveness and was moved from Lawrence Livermore National Laboratory to Lawrence Berkeley National Laboratory in FY 1996. NERSC operating costs were reduced by \$8,149,000 from FY 1996 to FY 1997 reflecting efficiencies committed to by the CTR program.
- o The first phase of DOE's computational Grand Challenge program, begun in FY 1992, was completed in early FY 1997. The program had two beneficial results: (1) significant improvement in the ability to use high-end computers in scientific research, including software advances and improved high-end computers, (2) scientific advances, based on high performance computing, in materials science, environmental chemistry, climate and ocean modeling, plasma physics, elementary particle physics, and oil reservoir modeling. The second phase of the Grand Challenge program was competed and initiated in FY 1997 in partnership with all other ER program offices and other DOE program offices.
- o The LTR subprogram won an impressively large share of the 1996 R&D 100 Awards received by DOE programs (8 out of 32), as well as two Popular Science "What's New" awards. An external peer review of all current LTR projects also showed that this program has high scientific quality.

COMPUTATIONAL AND TECHNOLOGY RESEARCH
PROGRAM FUNDING PROFILE
(dollars in thousands)

<u>Subprogram</u>	FY 1996 Enacted <u>Appropriation</u>	FY 1997 Original <u>Appropriation</u>	FY 1997 <u>Adjustments</u>	FY 1997 Current <u>Appropriation</u>	FY 1998 Budget <u>Request</u>
Mathematical, Information, and Computational Sciences.	\$ 0	a/ \$ 117,490	\$ 0	\$ 117,490	\$ 152,490
Laboratory Technology Research.....	0	b/ 24,310	0	24,310	15,829
Advanced Energy Projects.....	0	a/ 11,700	0	11,700	7,588
Subtotal, Computational and Technology Research.....	<u>\$ 0</u>	<u>\$ 153,500</u>	<u>\$ 0</u>	<u>\$ 153,500</u>	<u>\$ 175,907</u>
Adjustment.....	<u>0</u>	<u>-2,522</u>	c/ <u>0</u>	<u>-2,522</u>	c/ <u>0</u>
TOTAL, CTR.....	<u><u>\$ 0</u></u>	<u><u>\$ 150,978</u></u>	<u><u>\$ 0</u></u>	<u><u>\$ 150,978</u></u>	<u><u>\$ 175,907</u></u>

a/ Previously budgeted in the Basic Energy Sciences program.

b/ Previously budgeted in the ER Laboratory Technology Transfer program.

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

The total general reduction was applied at the appropriation level.

Public Law Authorization:

Pub. Law: 95-91, DOE Organization Act

COMPUTATIONAL AND TECHNOLOGY RESEARCH

(Dollars in thousands)

PROGRAM FUNDING BY SITE

	FY 1996 Enacted Appropriation	FY 1997 Original Appropriation	FY 1997 Adjustments	FY 1997 Current Appropriation	FY 1998 Budget Request
Field Offices/Sites					
Albuquerque Operations Office					
Los Alamos National Laboratory	\$0	\$14,858	\$0	\$14,858	\$12,648
National Renewable Energy Laboratory	0	150	0	150	147
Sandia National Laboratories	0	4,428	0	4,428	3,569
Chicago Operations Office					
Ames Laboratory	0	2,034	0	2,034	1,942
Argonne National Laboratory	0	13,272	0	13,272	14,243
Fermi National Accelerator Laboratory	0	0	0	0	0
Brookhaven National Laboratory	0	2,863	0	2,863	3,359
Princeton Plasma Physics Laboratory	0	0	0	0	0
Idaho Operations Office					
Idaho National Engineering Laboratory	0	0	0	0	0
Oakland Operations Office					
Lawrence Berkeley National Laboratory	0	42,932	0	42,932	49,520
Lawrence Livermore National Laboratory	0	665	0	665	660
Stanford Linear Accelerator Center	0	0	0	0	0
Oak Ridge Operations Office					
Oak Ridge National Laboratory	0	11,540	0	11,540	9,069
Thomas Jefferson National Accelerator Facility	0	180	0	180	180
Richland Operations Office					
Pacific Northwest National Laboratory	0	2,275	0	2,275	2,960
All Other Sites a/	0	58,303	0	58,303	77,610
Subtotal	0	153,500	0	153,500	175,907
Adjustment	0	-2,522 b/	0	-2,522 b/	0
TOTAL	\$0	\$150,978	\$0	\$150,978	\$175,907

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 on a comparable basis. The total general reduction was applied at the appropriation level.

COMPUTATIONAL AND TECHNOLOGY RESEARCH

MATHEMATICAL, INFORMATION, AND COMPUTATIONAL SCIENCES

- I. **Mission Supporting Goals and Objectives:** The Mathematical, Information, and Computational Sciences (MICS) subprogram is a forefront, diverse program in applied mathematical sciences, high performance computing, communications and information infrastructure that spans the spectrum of activities from strategic fundamental research to technology development and demonstration. The diverse activities supported by this program are integrated to support two major strategic thrusts: (1) the National Collaboratories (NC) thrust that develops tools and capabilities to permit scientists and engineers working at different DOE and other facilities to collaborate on research as easily as if they were in the same building; (2) the Advanced Computational Testing and Simulation (ACTS) thrust that develops an integrated set of algorithms, software tools and infrastructure to enable computer simulation to better complement experiment and theory or to be used in place of experiments when real experiments are too dangerous, expensive, or inaccessible. These two strategic thrusts support the mathematics, computational science, and information technology needs of all DOE technical mission areas (e.g., Fundamental Research, Defense, Energy Efficiency, Fossil Energy, and Environmental programs). The efforts in these areas are closely coordinated with related activities supported by Defense Programs.

The FY 1998 request includes funding for the DOE 2000 initiative, a joint Energy Research - Defense Programs effort to develop and test a common technology base that will permit scientists and engineers at various remote sites to simultaneously participate in research at large science facilities. It will also foster advanced computational testing and simulation tools to attack complex technical problems and accelerate applications critical to DOE missions. The DOE 2000 initiative is coordinated with parallel research in other agencies through the Committee on Computing, Information, and Communication (CCIC) of the National Science and Technology Council; it extends throughout DOE through partnerships with other DOE programs.

The FY 1998 request also includes funding for the Department's participation in the President's Next Generation Internet Initiative. This initiative, which involves a number of Federal agencies, has three goals: (1) connect universities and national laboratories with high speed networks that are 100-1000 times faster than today's Internet; (2) promote experimentation with the next generation of networking technologies; and (3) demonstrate new applications that meet important national goals and missions. This initiative will leverage previous MICS investments in ESnet and other advanced networking technologies. In addition, a number of the DOE 2000 National Collaboratory applications are important for the third goal.

The MICS subprogram also supports and responds to the Energy Policy Act (EPACT) and to the High Performance Computing Act of 1991 and provides supercomputer access and advanced communication capabilities, through the National Energy Research Scientific Computing (NERSC) Center and the Energy Sciences Network (ESnet), to scientific researchers.

**COMPUTATIONAL AND TECHNOLOGY RESEARCH
MATHEMATICAL, INFORMATION, AND COMPUTATIONAL SCIENCES**

II. Funding Schedule:

<u>Activity</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>\$ Change</u>	<u>% Change</u>
Mathematical, Computational, and Computer Sciences Research...	\$ 0	\$ 48,997	\$ 47,026	\$- 1,971	- 4.0%
Advanced Computation, Communications, and Associated Activities.	0	65,534	101,784	+36,250	+55.3%
SBIR/STTR	<u>0</u>	<u>2,959</u>	<u>3,680</u>	<u>+ 721</u>	<u>+24.4%</u>
Total	<u>\$ 0</u>	<u>\$117,490</u>	<u>\$ 152,490</u>	<u>\$+35,000</u>	<u>+29.8%</u>

III. Performance Summary - Accomplishments:

	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>
<u>Mathematical, Computational, and Computer Sciences Research</u>			
- Research supporting advanced computational testing and simulation including applied mathematics research, computer science and software tools research, grand challenge applications, and computational science education programs. Capital equipment supporting research in advanced computational testing and simulation including computers, storage devices and other peripheral equipment.	\$0	\$46,497	\$42,026
- Support of the joint Energy Research/Defense Programs Research program started in FY 1997 under the DOE 2000 initiative to develop and begin deployment of integrated sets of advanced computational tools including software frameworks, tools for complex geometries and advanced parallel software to accelerate the accomplishment of DOE missions.	0	2,500	5,000
 SUBTOTAL Mathematical, Computational, and Computer Sciences Research	 <u>\$0</u>	 <u>\$48,997</u>	 <u>\$47,026</u>

**COMPUTATIONAL AND TECHNOLOGY RESEARCH
MATHEMATICAL, INFORMATION, AND COMPUTATIONAL SCIENCES**

III. Performance Summary- Accomplishments:	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>
<u>Advanced Computation, Communications, and Associated Activities</u>			
- Research in support of National Collaboratories: high capability networks, information surety, underlying technologies to support national collaboratories, and underlying technologies to support electricity supply and demand management.	\$ 0	\$ 9,012	\$ 3,936
- Research under the DOE 2000 initiative to develop and begin deployment of integrated sets of advanced electronic collaboration tools to accelerate the accomplishment of DOE missions by making it as easy for scientists and engineers to work together across the country as if they were in the same building. This will include remote operation of experiments at national user facilities.	0	6,000	6,000
- Research in support of the President's Next Generation Internet Initiative to: (1) connect universities and national laboratories with high speed networks that are 100-1000 times faster than today's Internet; (2) promote experimentation with the next generation of networking technologies; and (3) demonstrate new applications that meet important national goals and missions. The funding is part of a coordinated multi-agency program.	0	0	35,000

**COMPUTATIONAL AND TECHNOLOGY RESEARCH
MATHEMATICAL, INFORMATION, AND COMPUTATIONAL SCIENCES**

III. Performance Summary- Accomplishments:	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>
<p>- Support for the NERSC Center, which provides high performance computing for investigators supported by the Office of Energy Research. The Center serves more than 5,000 users working on about 700 projects, of which about 35% are university based, 60% are in National Laboratories, and 5% are in industry. NERSC provides a spectrum of supercomputers that offers a range of high performance computing resources and associated software support that is a critical element in the success of many ER research programs. These computational resources are integrated together by a common high performance file storage system which facilitates interdisciplinary collaborations. Related capital equipment needs are also supported.</p>	0 ^{a/}	19,130 ^{b/}	26,500
<p>-Support for ESnet operations which provide worldwide access to Energy Research facilities, including: advanced light sources; neutron sources; particle accelerators; fusion reactors; spectrometers; High Performance Computing Resource Providers (HPCRP); and other leading-edge science instruments and facilities. Future upgrades will allow for remote experimentation and remote access to these facilities, as National Collaboratory technologies are developed and deployed. Related capital equipment needs are also supported.</p>	0	14,787	13,787

a/ In FY 1996, funding for NERSC was provided in the Basic Energy Sciences and Fusion Energy Sciences programs at \$34,649,000.

b/ In FY 1997, an additional \$7,370,000 of Fusion Energy Sciences funds were provided for total NERSC funding of \$26,500,000.

**COMPUTATIONAL AND TECHNOLOGY RESEARCH
MATHEMATICAL, INFORMATION, AND COMPUTATIONAL SCIENCES**

III. Performance Summary- Accomplishments:	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>
<p>-HPCRP's at Oak Ridge National Laboratory, Los Alamos National Laboratory, and Argonne National Laboratory which provide the needed leading edge computational hardware testbeds to support grand challenge and advanced computational testing and simulation research. Related capital equipment needs are also supported.</p>	0	16,605	16,561
<p>SUBTOTAL Advanced Computation, Communications, & Associated Activities</p>	<hr style="width: 100%;"/> 0	<hr style="width: 100%;"/> 65,534	<hr style="width: 100%;"/> 101,784
<p><u>SBIR/STTR Funding</u></p> <p>The FY 1997 estimate is for both SBIR and STTR. The FY 1998 estimate is for SBIR only since Part D, Section 110 of P.L. 104-208, making Omnibus Consolidated Appropriations for FY 1997 reauthorized STTR for FY 1997 only.</p>	0	2,959	3,680
<p>TOTAL Mathematical, Information, and Computation Sciences</p>	<hr style="width: 100%;"/> <u>\$ 0</u>	<hr style="width: 100%;"/> <u>\$117,490</u>	<hr style="width: 100%;"/> <u>\$152,490</u>

**COMPUTATIONAL AND TECHNOLOGY RESEARCH
MATHEMATICAL, INFORMATION, AND COMPUTATIONAL SCIENCES**

EXPLANATION OF FUNDING CHANGES FROM FY 1997 TO FY 1998:

Reduce funding for: Adventures in Supercomputing Program with transfer of responsibilities to the States in which it is operated, grand challenges by conducting early progress review and termination of efforts which are less productive, and Advanced Computational Testing and Simulation (ACTS) and capital equipment related to ACTS research.	\$-4,471,000
Provide full funding for operations of NERSC.	+7,370,000
Reduce funding for National Collaboratory Research based on review of projects and alignment of funding with MICS missions.	-5,076,000
Reduce ESnet operations to respond to changes in priorities for network services.	-1,000,000
Increase funding to initiate the Next Generation Internet Initiative.	+35,000,000
Increase funding for DOE 2000 ACTS Toolkit efforts to provide expanded sets of tools and capabilities.	+2,500,000
Reduce support for HPCRP.	-44,000
Increase SBIR funding due to increase in operating expenses. No STTR funding requested in FY 1998.	<u>+721,000</u>
Total Funding Change, Mathematical, Information, and Computational Sciences	<u>\$+35,000,000</u>

COMPUTATIONAL AND TECHNOLOGY RESEARCH

LABORATORY TECHNOLOGY RESEARCH

- I. **Mission Supporting Goals and Objectives:** The Laboratory Technology Research (LTR) subprogram conducts technology research projects in support of Office of Energy Research (ER) goals, as defined by the strategic plan, to reduce technical risk associated with technology or process development. The program links the basic research advances at ER national laboratories to applied energy technologies through leveraged collaborations with industry. The program contributes to technological innovations in three critical technology research areas: tailored materials, intelligent manufacturing, and sustainable environments. This research will contribute to national economic growth and increase the return on the government investment in basic research. For example, research on intelligent manufacturing, such as sensor-computer-machine control systems, will focus on high risk technological problems for ultimate commercial applications with high payoff. The potential for large payoff is based on the explosive growth in inexpensive computer technologies and the ability to incorporate them into control systems.

Research is conducted through collaborations with industrial partners, including multi-year projects, personnel exchanges, and technology research and maturation projects. Peer review is used to evaluate proposed collaborations on the basis of scientific merit, program relevance, and commercial potential. The subprogram allows small business quick and easy access to research and development at the energy laboratories, such as through personnel exchanges between the laboratories and industry.

The LTR subprogram supports and responds to the National Competitiveness Technology Transfer Act (NCTTA) of 1989 and provides a mechanism for Federal investment in public-private R&D partnerships necessary to keep America competitive. LTR does not provide Federal funds directly to the private sector. Private sector research partners bear all of their own expenses. Rather, Federal investments at the National Laboratories support laboratory researchers engaged in research partnerships that benefit all major stakeholders - the DOE, the industrial partners, and the general public. The investments capitalize on two great strengths of this country: 1) the world class basic research of the National Laboratories, and 2) the unparalleled entrepreneurial spirit of American industry.

**COMPUTATIONAL AND TECHNOLOGY RESEARCH
LABORATORY TECHNOLOGY RESEARCH**

II. Funding Schedule:

<u>Activity</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>\$ Change</u>	<u>% Change</u>
Laboratory Technology Research	\$ 0	\$ 13,931	\$ 15,433	\$+ 1,502	+ 10.8%
SBIR/STTR	0	644	396	- 248	- 38.5%
Congressional Direction	0	9,735	0	- 9,735	-100.0%
Total	<u>\$ 0</u>	<u>\$ 24,310</u>	<u>\$ 15,829</u>	<u>\$- 8,481</u>	<u>- 34.9%</u>

III. Performance Summary - Accomplishments:

-About 10 technology research projects will be initiated in FY 1998 that link the basic research advances of Office of Energy Research national laboratories to applied technologies through leveraged collaborations with industry. The program focuses on key administration initiatives, including tailored materials, intelligent manufacturing, and sustainable environments. For example, research on intelligent manufacturing, such as sensor-computer-machine control systems, will focus on high risk technological problems for ultimate commercial applications with high payoff. Approximately 65 current technology research projects will be continued. A minimal level of quick and easy access by small business to the research and development at the national laboratories will be provided through, for example, personnel exchanges.

	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>
	\$ 0	\$ 13,931	\$ 15,433
<u>SBIR/STTR Funding</u>	0	644	396

The FY 1997 estimate is for both SBIR and STTR. The FY 1998 estimate is for SBIR only since Part D, Section 110 of P.L. 104-208, making Omnibus Consolidated Appropriations for FY 1997, reauthorized STTR for FY 1997 only.

**COMPUTATIONAL AND TECHNOLOGY RESEARCH
LABORATORY TECHNOLOGY RESEARCH**

III. <u>Performance Summary - Accomplishments:</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>
<u>Congressional Direction</u>	<u>0</u>	<u>9,735</u>	<u>0</u>
-Funds the University of Southwestern Louisiana (per Congressional direction). No additional funds were provided for this project by the Congress in FY 1997.			
TOTAL Laboratory Technology Research	<u>\$ 0</u>	<u>\$ 24,310</u>	<u>\$ 15,829</u>

EXPLANATION OF FUNDING CHANGES FROM FY 1997 to FY 1998:

Initiate about 10 technology research projects while continuing about 10 projects begun in FY 1997. These projects are multi-year collaborations between ER national laboratories and industry on key administration initiatives.	\$ +1,502,000
Funding not needed in FY 1998 for FY 1997 projects included by Congress without funds.	-9,735,000
Reduce SBIR funding due to decrease in operating expenses. No STTR funding requested in FY 1998.	<u>-248,000</u>
Total Funding Change, Laboratory Technology Research	<u>\$ -8,481,000</u>

COMPUTATIONAL AND TECHNOLOGY RESEARCH

ADVANCED ENERGY PROJECTS

I. Mission Supporting Goals and Objectives: This activity funds research to establish the feasibility of novel, energy-related concepts that span the Department's energy mission and goals. These concepts are usually derived from recent advances in basic research, but require additional research to establish their feasibility. A common theme for each concept is the initial linkage of new, or previously neglected, research results to a practical energy payoff for the Nation. Efforts are typically supported up to a level of about \$300,000 per year for a period of 3 years. Projects are selected from proposals submitted by universities, industrial organizations, non-profit research institutions, and national laboratories. Equal consideration is given to each submission. Funding criteria emphasize scientific merit as judged by peer review.

II. Funding Schedule:

<u>Activity</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>\$ Change</u>	<u>% Change</u>
Advanced Energy Projects	\$ 0	\$ 11,398	\$ 7,406	\$- 3,992	-35.0%
SBIR/STTR	<u>0</u>	<u>302</u>	<u>182</u>	<u>- 120</u>	<u>- 39.7%</u>
Total	<u>\$ 0</u>	<u>\$ 11,700</u>	<u>\$ 7,588</u>	<u>\$- 4,112</u>	<u>-35.1%</u>

III. Performance Summary - Accomplishments:

	<u>FY 1996</u>	<u>FY1997</u>	<u>FY 1998</u>
Support of AEP projects will be reduced. All of the 30 on-going projects will be closely examined. About five of these projects will be terminated before completion. No new projects will be initiated. Capital equipment related to the remaining AEP projects will be supported.	\$0	\$11,389	\$7,406
<u>SBIR/STTR Funding</u>	0	311	182

The FY 1997 estimate is for both SBIR and STTR. The FY 1998 estimate is for SBIR only since Part D, Section 110 of P.L. 104-208, making Omnibus Consolidated Appropriations for FY 1997, reauthorized STTR for FY 1997 only.

TOTAL Advanced Energy Projects	<u>\$ 0</u>	<u>\$ 11,700</u>	<u>\$ 7,588</u>
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**COMPUTATIONAL AND TECHNOLOGY RESEARCH
ADVANCED ENERGY PROJECTS**

EXPLANATION OF FUNDING CHANGES FROM FY 1997 to FY 1998:

Reduce the number of projects in emerging scientific and technical areas consistent with the highest priorities of the Office of Energy Research and the Department of Energy mission.	\$ -3,992,000
Reduce SBIR funding due to decrease in operating expenses. No STTR funds requested in FY 1998.	<u>- 120,000</u>
Total Funding Change, Advanced Energy Projects	<u>\$-4,112,000</u>

COMPUTATIONAL AND TECHNOLOGY RESEARCH
 CAPITAL OPERATING EXPENSES AND CONSTRUCTION SUMMARY
 (Dollars in thousands)

	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>\$ Change</u>	<u>% Change</u>	
Capital Operating Expenses						
Capital Equipment (total).....	\$0	\$6,115	\$5,575	-\$540	-8.8%	
	<u>TEC</u>	<u>Previous Appropriated</u>	<u>FY 1996 Appropriated</u>	<u>FY 1997 Appropriated</u>	<u>FY 1998 Request</u>	<u>Acceptance Date</u>
Major Items of Equipment (CE \$2 million and Above)						
1. Archival Systems Upgrade - LBNL	\$2,000	0	0	\$2,000	0	4/97