DEPARTMENT OF ENERGY
FY 2002 CONGRESSIONAL BUDGET REQUEST
ENERGY EFFICIENCY AND RENEWABLE ENERGY
ENERGY CONSERVATION
(Tabular Dollars in Thousands, Narrative in Whole Dollars)

BUILDING TECHNOLOGY, STATE, AND COMMUNITY SECTOR

PROGRAM MISSION

Mission

In partnership with industry and government, the Office of Building Technology, State, and Community Programs (BTS) develops, promotes, and integrates energy technologies and practices that make buildings more efficient, productive, and affordable.

Strategic Context

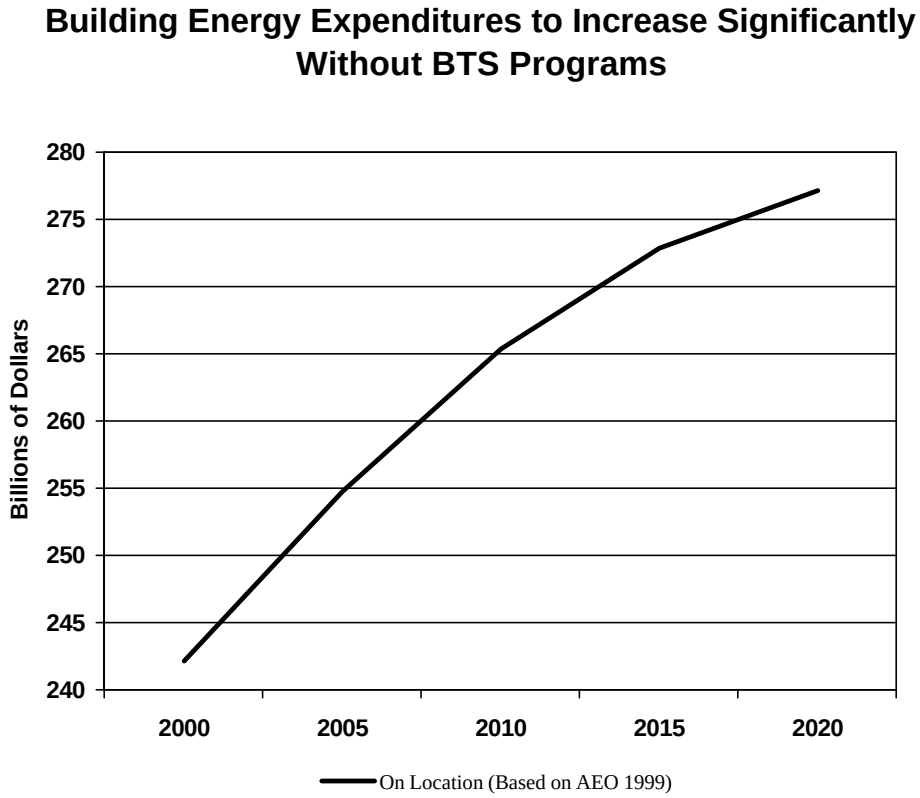
As living standards continue to increase, Americans demand more energy to power an ever increasing array of products and labor saving devices in our homes, schools, and workplaces.

- In the U.S., buildings account for more than 1/3 of the annual energy consumption, including 2/3 of all electricity generated.
- Americans spend approximately $240 billion per year to heat, cool, light, and run equipment and appliances in residential and commercial buildings. Adoption of energy-efficient buildings technologies and practices resulting from EERE's buildings programs will save approximately 2 quadrillion Btus annually by 2010. The investment in these energy efficiency improvements will save approximately $6 billion annually by 2010.
- Building energy efficiency programs address our Nation's escalating building energy consumption, while improving the office building environment and worker productivity, as well as the affordability of homes.

Strategic Approach

BTS has identified three strategies to achieve its mission:

1) Accelerate the introduction of highly-efficient technologies and practices through research and development.
2) Increase minimum efficiency levels of buildings and equipment through codes, standards, and guidelines.
3) Encourage the use of energy efficiency and renewable energy technologies and practices through technology transfer and financial assistance.



Partnerships and cost share arrangements with industry, academia, and government entities underlie most of the programs' successes. By bringing together relevant stakeholders, BTS is able to build the critical mass necessary to overcome many of the barriers to building advances. Chief among these barriers is the fragmentation of the design, construction, materials, and equipment manufacturers and building operation and maintenance industries making it difficult to reach a consensus on new technologies or coordinate efforts on concepts like whole building design. Integral to implementing BTS' strategic plan are four new ways of doing business: a customer-focused, team-based organization for greater accountability and improved results; collaboratively developed technology roadmaps to provide for a more integrated, customer driven R&D portfolio; greater competition to increase the innovation and broaden research participation; and increased peer review to assure our science is sound.

The programs use an integrated approach to energy efficiency, one that takes into account the complex and dynamic interactions between a building and its environment, among a building's energy systems, and between a building and its occupants. This "whole buildings" approach has achieved energy savings of 20 to 30 percent beyond those obtainable by focusing solely on individual building components, such as energy-efficient windows, lighting, and water heaters.

Goals and Benefits

Goals and Performance Measures:

- By 2010, save families and businesses $6 billion in energy bills by displacing about 1 quad of energy use per year, equal to the current amount of energy used in buildings in North Carolina per year.
- Develop market-ready building design strategies to reduce new building energy use by 50 percent compared to current levels.
- Develop market-ready building retrofit strategies to reduce energy use in existing buildings by 20 percent compared to current levels.

Benefits:

BTS Programs improve building quality (energy efficient buildings are usually more comfortable and have lower indoor air pollution), reduce construction wastes, and help revitalize the communities they serve. These results strongly support the EERE goal of increasing the efficiency of the energy system and help put U.S. building industry firms in a stronger position to compete in rapidly growing international buildings-technology markets.

DEPARTMENT OF ENERGY
FY 2002 CONGRESSIONAL BUDGET REQUEST
ENERGY CONSERVATION
(Dollars in Thousands)

BUILDING TECHNOLOGY, STATE, AND COMMUNITY SECTOR

PROGRAM FUNDING PROFILE

Program Activity	FY 2000 Comparable	FY 2001 Comparable	FY 2002 Request	Program Change Request vs. FY 2001 Dollar	Program Change Request vs. FY 2001 Percent
Building Research and Standards					
Technology Road Maps and Competitive R&D	$ 6,790	$ 6,870	$ 857	$ -6,013	-87.5%
Residential Buildings Integration	$ 11,212	$ 12,120	$ 7,478	$ -4,642	-38.3%
Commercial Buildings Integration	$ 3,885	$ 4,583	$ 2,510	$ -2,073	-45.2%
Equipment, Materials, and Tools	$ 36,990	$ 40,670	$ 19,718	$ -20,952	-51.5%
Subtotal, Building Research and Standards	$ 58,877	$ 64,243	$ 30,563	$ -33,680	-52.4%
Building Technology Assistance					
Weatherization Assistance Program	$ 135,000	$ 152,664	$ 273,000	$ 120,336	78.8%
State Energy Program	$ 33,500	$ 37,916	$ 38,000	$ 84	0.2%
Community Energy Program	$ 17,915	$ 18,095	$ 8,488	$ -9,607	-53.1%
Energy Star Program	$ 2,676	$ 2,204	$ 2,000	$ -204	-9.3%
Subtotal, Building Technology Assistance	$ 189,091	$ 210,879	$ 321,488	$ 110,609	52.5%

Program Activity	FY 2000 Comparable	FY 2001 Comparable	FY 2002 Request	Program Change Request vs. FY 2001 Dollar	Program Change Request vs. FY 2001 Percent
Cooperative Programs with the States	$ 1,930	$ 1,996	$ 0	$ -1,996	-100.0%
Energy Efficiency Science Initiative	$ 3,864	$ 3,891	$ 0	$ -3,891	-100.0%
Management and Planning	$ 13,928	$ 14,133	$ 15,090	$ 957	6.8%
TOTAL	$ 267,690	$ 295,142	$ 367,141	$ 71,999	24.4%
Summary					
Operating Expenses	$ 267,690	$ 295,142	$ 367,141	$ 71,999	24.4%
Total Program	$267,690[a]	$295,142[b]	$ 367,141	$ 71,999	24.4%
Staffing (FTEs)					
HQ FTEs	71	81	76		
Total FTEs	71	81	76		

Authorizations:
P.L. 94-163, “Energy Policy and Conservation Act” (EPCA) (1975)
P.L. 94-385, “Energy Conservation and Production Act” (ECPA) (1976)
P.L. 95-91, “Department of Energy Organization Act” (1977)
P.L. 95-618, “Energy Tax Act of 1978”
P.L. 95-619, “National Energy Conservation Policy Act” (NECPA) (1978)
P.L. 95-620, “Power plant and Industrial Fuel Use Act of 1978”
P.L. 96-294, “Energy Security Act” (1980)

P.L. 100-12, “National Appliance Energy Conservation Act of 1987”
P.L. 100-615, “Federal Energy Management Improvement Act of 1988”
P.L. 101-218, “Renewable Energy and Energy Efficiency Technology Competitiveness Act of 1989”
P.L. 102-486, “Energy Policy Act of 1992”
P.L. 106-469, “Energy Act of 2000"

---

[a]/ Reflects adjustment for approved reprogramming 00-R-3 of $-1,371,000 for the Small Business Innovative Research (SBIR) program and $-82,000 for the Small Business Technology Transfer Pilot Program (STTR). Also reflects comparability adjustment of $-14,855,000 for the new Power Technologies Program.

[b]/ Reflects adjustment of $-651,000 for Omnibus Rescission, P.L. 106-554. Also reflects comparability adjustment of $-21,450,000 for the new Power Technologies Program.

DEPARTMENT OF ENERGY
FY 2002 CONGRESSIONAL BUDGET REQUEST
ENERGY CONSERVATION
(Dollars in Thousands)

SUMMARY OF CHANGES

BUILDING TECHNOLOGY, STATE, AND COMMUNITY SECTOR

	FY 2002 Request
FY 2001 Comparable	$ 295,142
Non-Discretionary	
- Increase for Federal Pay Raise and Locality Pay	493
- Increase for Federal Personnel Transit Subsidy	19
FY 2002 Base	295,654
Building Research and Standards:	
- Technology Road Maps and Competitive R & D - No funding of competitive research or initiation of new road maps.	-6,013
- Residential Buildings Integration - Reduces the number of new highly resource-efficient homes constructed in 2002 from 1,500 to 850, and reduces or delays efforts to address existing homes.	-4,642
- Commercial Buildings Integration - Delays implementation of emulation of the public/private partnership successes of the residential Building America program for commercial buildings, and reduces extent of research identified in the Commercial Buildings Road Map	-2,073
- Equipment , Materials, and Tools - reduces level of research activity for solid state lighting, refrigeration systems, software design tools, and high performance windows and delays medium priority appliance standards rulemaking activities.	-20,952
Building Technology Assistance:	
- Weatherization Assistance Program - Increase will weatherize 48,000 additional homes.	+120,336

- State Energy Program.	+84
- Community Energy Program - Reduce training for building codes, and technical assistance to States. Reduce grants to States for Rebuild America and Codes by $4.2 million.	-9,607
- Energy Star Program - Reduce support to commercial partners.	-204
Cooperative Programs with States:	
- No funding request in FY 2002	-1,996
Energy Efficiency Science Initiative:	
- No funding request in FY 2002.	-3,891
Management and Planning:	
- Decrease in evaluation and planning offset by a reduction of 5 FTEs as adjusted for discretionary payroll activities.	+445
FY 2002 Congressional Budget Request.	$ 367,141

BUILDING TECHNOLOGIES
BUILDING TECHNOLOGY, STATE AND COMMUNITY SECTOR
(dollars in thousands)

BUILDING RESEARCH AND STANDARDS

I. Mission Supporting Goals and Objectives

Mission

Building Research and Standards (BRS) develops, implements, and coordinates R&D that improves the energy efficiency of building components and then uses system design and regulatory activities to integrate these components into building energy systems.

Program Goals and Benefits

Buildings Research and Standards is comprised of three EERE programs: the Residential Buildings Integration Program, the Commercial Buildings Integration Program, and Equipment, Materials, and Tools Program. In addition, the Technology Road Maps & Competitive R&D activities are used to inform and guide the three referenced programs. The Building Research and Standards programs address components and equipment technology development and building design strategies to reduce overall energy needs and improve the quality of building services. This "whole buildings" approach allows researchers to simultaneously reduce construction and energy costs and helps build energy systems that deliver the proper amount of service (e.g., heating, cooling, lighting, etc.) where needed. The approach also identifies ways that systems can work harmoniously to provide increased energy and construction savings.

Technology Road Maps and Competitive R&D

The road mapping process is a fundamental component of the BTS Strategic Plan and will help align government resources with the high-priority needs identified by industry. The road maps will guide cooperation among public and private researchers, State and Federal programs, and others involved in helping to achieve the technology goals.

Residential Buildings Integration Program

In partnership with homebuilders, industry, States, and communities, the Residential Buildings Integration Program improves the energy efficiency in new and existing homes through R&D, demonstrations, and regulatory strategies. A significant element of the BTS R&D program is making homes more energy efficient and environmentally sound at little or no additional cost. Increased energy efficiency is achieved through Building America, BTS' partnership with industry to jointly fund, develop, demonstrate, and deploy housing that integrates energy-efficient technologies and practices. Building America employs such strategies as improved design techniques that greatly reduce thermal leakage through the building envelope, or improved insulation and windows whose costs are offset by resulting reductions in the size of required space-conditioning equipment. These new homes save consumers money, are more environmentally benign, and provide more comfortable living space. Building America will begin developing and testing system integration and whole-house design that can be applied to the 80 million existing homes in the country. In addition, BTS will coordinate with the Office of Power Technologies to develop residential whole buildings approaches that will enable the cost-effective design, construction, and operation of zero energy buildings. Regulatory activities will focus on the FY 2002 update of the International Energy Code Council's residential building code.

Goals and Performance Measures:

- By 2005, build 20,000 new homes using Building America techniques.
- Develop market ready whole house energy performance strategies which reduce home energy use in newly built homes by 50 percent compared to 1996.
- Develop and promote techniques that enable average energy savings of 30 percent in existing homes.

Benefits:

In addition to the energy savings and associated environmental benefits, the Residential Buildings Integration Program will improve the indoor environmental quality, durability, and affordability of homes.

Commercial Buildings Integration Program

Late in FY 2002, Commercial Buildings Integration will begin emulation of the public/private partnership successes of the residential buildings-oriented Building America Program. Accordingly, the Commercial Buildings Integration Program works with competitively solicited industry groups on cost-shared projects that accelerate the development and adoption of new building technologies and practices. Regulatory activity will focus on the FY 2003 update of the International Energy Code Council's commercial building code.

Goals and Performance Measures:

- Develop market ready design strategies for new commercial buildings which will reduce energy consumption by 30 percent compared to 1996.

Benefits:

In addition to the energy savings and associated environmental benefits, the Commercial Buildings Integration Program will improve indoor environmental quality, durability, and productivity of workers.

Equipment, Materials, and Tools

In collaboration with industry and other stakeholders, the Equipment, Materials, and Tools Program promotes the widespread adoption of energy-efficient products and technologies in both residential and commercial buildings through a balanced program of R&D and regulatory activities.

The Program collaborates with industry to conduct R&D on building components such as innovative lighting, building envelope technologies such as advanced windows, and new designs for appliances, that will increase the energy efficiency of buildings and improve building performance. The Program works with other EERE sectors on crosscutting R&D initiatives in the area of combined cooling heat and power systems for buildings.

The Equipment, Materials, and Tools Program also develops, promulgates, and enforces test procedures and energy conservation standards for residential appliances and certain commercial equipment, under the Energy Policy and Conservation Act, as amended (EPCA). In 1996, DOE initiated a more transparent and collaborative process for setting energy conservation standards for appliances, which has been successful in reaching consensus agreements on standards for fluorescent lamp ballasts and clothes washers. Based on this process, DOE has been able to accelerate the rulemakings for these products and include provisions to reduce manufacturers' burdens and provide further benefits to consumers.

Goals and Performance Measurements:

- Annually review the list of products covered by EPCA, as amended, to determine if a higher standard is warranted due to new technological developments.
- In accordance with approaches identified in technology road maps, bring five new technology products to the commercial market by 2010.

Benefits:

To date, the 12 appliance standards developed by DOE have saved consumers over $25 billion in electricity costs.

Building Research and Standards Accomplishments

FY 2000 Accomplishments:

- In partnership with Building America, developed more than 2,000 highly energy-efficient, environmentally sound, and cost-effective houses and disseminate results to builders of 15,000 other houses through Partnership for Advanced Technology in Housing (PATH).
- Issued final or proposed energy efficiency standards rules for flourescent lamp ballasts and water heaters, clothes washers and central air conditioners.

FY 2001 Ongoing Accomplishments:

- With Building America Partners, complete 3,000 energy-efficient, environmentally-sound high performance homes.
- Publish a Notice of Proposed Rulemaking concerning standards for commercial HVAC and water heaters, and distribution transformers.

FY 2002 Planned Accomplishments:

- Complete at least 850 highly resource-efficient, cost-effective homes through the Building America consortia, bringing the total number of homes built through the program to more than 4,500.
- Establish a High Performance Buildings Roadmap implementation framework leading to the goal of 30 percent more energy efficient new commercial construction compared to 1996 standard practice.
- Publish proposed rules regarding energy conservation standards for electric distribution transformers, commercial air-source central air conditioners and heat pumps, and packaged terminal air conditioners and heat pumps, which promise high levels of energy savings.

II. A. Funding Table: BUILDING RESEARCH AND STANDARDS

Program Activity	FY 2000 Comparable	FY 2001 Comparable	FY 2002 Request	$ Change	% Change
Technology Road Maps and Competitive R&D					
Road Maps	$ 1,567	$ 1,658	$ 797	$ -861	-51.9%
Competitive R&D	$ 4,740	$ 4,862	$ 0	$ -4,862	-100.0%
Tech/Program Management Support	$ 483	$ 350	$ 60	$ -290	-82.9%
Subtotal, Technology Road Maps and Competitive R&D	$ 6,790	$ 6,870	$ 857	$ -6,013	-87.5%
Residential Buildings Integration					
Research and Development (Building America)	$ 9,674	$ 11,463	$ 6,843	$ -4,620	-40.3%
Energy Efficiency in Industrialized Housing	$ 985	$ 0[a]	$ 0[a]	$ 0	0.0%
Residential Building Energy Codes	$ 478	$ 584	$ 590	$ 6	1.0%
Tech/Program Management Support	$ 75	$ 73	$ 45	$ -28	-38.4%
Subtotal, Residential Buildings Integration	$ 11,212	$ 12,120	$ 7,478	$ -4,642	-38.3%
Commercial Buildings Integration					
Research and Development	$ 3,274	$ 3,866	$ 1,954	$ -1,912	-49.5%
Commercial Building Energy Codes	$ 586	$ 692	$ 541	$ -151	-21.8%
Tech/Program Management Support	$ 25	$ 25	$ 15	$ -10	-40.0%
Subtotal, Commercial Buildings Integration	$ 3,885	$ 4,583	$ 2,510	$ -2,073	-45.2%

[a]/Activities formerly identified as “energy efficiency in industrialized housing” are now conducted and funded within the Building America initiative.

Program Activity	FY 2000 Comparable	FY 2001 Comparable	FY 2002 Request	$ Change	% Change
Equipment, Materials, and Tools					
Lighting Research and Development	$ 5,751	$ 6,144	$ 3,394	$ -2,750	-44.8%
Space Conditioning and Refrigeration R&D	$ 4,058	$ 5,140	$ 2,425	$ -2,715	-52.8%
Appliances and Emerging Technologies	$ 1,404	$ 1,924	$ 1,455	$ -469	-24.4%
Building Envelope Research and Development	$ 11,294	$ 11,796	$ 4,392	$ -7,404	-62.8%
Analysis Tools and Design Strategies	$ 3,861	$ 3,950	$ 2,426	$ -1,524	-38.6%
Lighting and Appliance Standards.	$ 8,391	$ 9,394	$ 4,426	$ -4,968	-52.9%
Tech/Program Management Support	$ 2,231	$ 2,322	$ 1,200	$ -1,122	-48.3%
Subtotal, Equipment, Materials, and Tools.	$ 36,990	$ 40,670	$ 19,718	$ -20,952	-51.5%
Total, Building Research and Standards.	$ 58,877	$ 64,243	$ 30,563	$ -33,680	-52.4%

II. B. Laboratory and Facility Funding Table: BUILDING RESEARCH AND STANDARDS

	FY 2000 Comparable	FY 2001 Comparable	FY 2002 Request	$ Change	% Change
Argonne National Lab (East)	$ 375	$ 0	$ 0	$ 0	0.0%
Brookhaven National Lab	$ 414	$ 300	$ 150	$ -150	-50.0%
Lawrence Berkeley National Lab	$ 12,522	$ 11,411	$ 5,700	$ -5,711	-50.0%
National Renewable Energy Lab	$ 11,348	$ 10,363	$ 6,848	$ -3,515	-33.9%
Oak Ridge National Lab	$ 7,312	$ 7,427	$ 3,650	$ -3,777	-50.9%
Pacific Northwest National Lab	$ 4,004	$ 4,018	$ 1,850	$ -2,168	-54.0%
All Others	$ 22,902	$ 30,724	$ 12,365	$ -18,359	-59.8%
Total, Building Research and Standards	$ 58,877	$ 64,243	$ 30,563	$ -33,680	-52.4%

III. Performance Summary: BUILDING RESEARCH AND STANDARDS

Program Activity	FY 2000	FY 2001	FY 2002
Technology Road Maps and Competitive R&D	**Technology Road Maps and Competitive R&D** In collaboration with industry partners, academia, States, and National Laboratories, BTS completed the strategic road maps for lighting, windows, and commercial buildings; continued developing the building envelope technologies road map; and began developing long-term strategic road maps for residential buildings, appliances, and buildings cooling, heating, and power in collaboration with OIT. Continued 12 research projects initiated with industry and academia under a BTS FY 1999 competitive solicitation in lighting, space conditioning, appliances and co-generation. Initiated 9 new projects with industry and academia under a BTS FY 2000 competitive solicitation for R&D related to the completed road maps and for new and innovative technologies and other research topics not covered by the road maps. Selection criteria included technical relevance to the vision, potential energy savings, industry participation, cost realism and sharing, and prior performance	**Technology Road Maps and Competitive R&D** In collaboration with industry partners, academia, States, and National Laboratories, complete the strategic road maps for residential buildings, appliances, and building envelope technologies. Continue on-going research projects from FY 1999 and FY 2000 competitive solicitations. Initiate 10 to 12 new projects for R&D related to completed road maps and for new and innovative technologies and other research topics not covered by the road maps. The funding for road-mapped activities will be used to bridge the gap between ongoing R&D activities and newly identified high-priority areas. Selection criteria include relevance to the vision, technical feasibility, potential energy savings, and a minimum 20 percent cost share. Facilitate development of international R&D partnerships to adapt and implement key areas of the road maps leading to adoption of DOE-developed technology in international markets. ($6,520)	**Technology Road Maps and Competitive R&D** Coordinate the implementation phase of technology road maps with industry partners and disseminate completed road maps for all areas to participants, stakeholder, and the public. No funds are requested in FY 2002 for the Competitive R&D process. Selected projects from earlier cycles may be discontinued at Phase I or supported within an appropriate line program depending upon the availability of resources. National Renewable Energy Lab (NREL), Oak Ridge National Lab (ORNL), Pacific Northwest National Lab (PNNL)) ($797)

III. Performance Summary: BUILDING RESEARCH AND STANDARDS (Cont'd)

Program Activity	FY 2000	FY 2001	FY 2002
Technology Road Maps and Competitive R&D (Cont'd)	of the researcher. ($6,307) Participants included: GE, JRS, A.D. Little, Univ. of Central FL, Foster Miller, Synergetics, Energy Concepts, IGT, Lighting Research Center, Rocky Research, Davis Energy Group, NRG Technologies (Road Maps $1,567, Competitive R&D $4,740) Provide critical technical and program management support services. ($483)	Participants include: GE, A.D.Little, Davis Energy Group, TBD (Road Maps $1,658, Competitive R&D $4,862) Provide critical technical and program management support services. ($350)	Provide critical technical and program management support services. ($60)
Total, Technology Road Maps and Competitive R&D	**$6,790**	**$6,870**	**$857**

Program Activity	FY 2000	FY 2001	FY 2002
Residential Buildings Integration	**Research and Development (*Building America*)** Expanded the number of *Building America* partners from 100 to 200 and increased industry participation. The *Building America* consortia developed more than 2,000 highly energy-efficient, environmentally sound, and cost-effective houses. Disseminated innovations and results to builders of 15,000 other houses and PATH, a comprehensive Presidential initiative that brings Government (DOE, HUD, Commerce, DOD, EPA, FEMA, HHS, Labor, USDA, VA) and industry together to accelerate the widespread use of advanced, energy-efficient technologies to radically improve the affordability, durability, and environmental quality of homes. Began developing a subdivision or community using tested, advanced design strategies with one *Building America* consortium member.	**Research and Development (*Building America)*** Increase industry participation by signing up 25 new partners, including lead builders, equipment manufacturers, material suppliers, contractors, mortgage lenders, and utilities, bringing the total number of partners to 225. The *Building America* consortia will develop more than 3,000 highly energy-efficient, environmentally sound, and cost-effective houses. In addition to a 50 percent cost share, the new partners will contribute significant efficiency improvements to the new housing stock by broadening the participation of production builders, their suppliers and contractors, and local planning officials. The FY 2001 *Building America* program has targeted an overall 50 percent improvement in total energy efficiency. Add 5 additional communities with high performance building systems to serve as models of resource-efficient residential neighborhoods, bringing the total number of	**Research and Development (*Building America)*** Develop over 850 highly resource-efficient, cost-effective private sector and Federally-owned homes through the *Building America* consortia, bringing the total number of homes to 3,850. Develop and demonstrate technologies and strategies for implementing energy efficiency upgrades (appliances, equipment, building envelope and/or windows, etc.) in existing homes. Disseminate innovations to other builders. Coordinate with the Office of Power Technologies to develop residential whole buildings approaches that will enable the cost-effective design, construction, and operation of zero energy buildings. No funding is planned for the Special Project State Grant Solicitation. ($6,843) Participants will include: Building Science Consortium, Consortium for Advanced Residential Buildings (CARB), Industrialized Housing Partnership, The Integrated Building and Construction Solutions of Pittsburgh (IBACOS), LBNL,

III. Performance Summary: BUILDING RESEARCH AND STANDARDS (Cont'd)

Program Activity	FY 2000	FY 2001	FY 2002
Residential Buildings Integration (Cont'd)	Conducted field tests and applied results to modify and improve building systems using a systems engineering approach. Using data from completed and monitored buildings, tested re-engineered, advanced design strategies and verify their improved performance and appropriateness. Worked with industry to develop reliable control systems. Expanded testing of integrated appliances and building systems in cold, mixed, and hot/dry climates to include low-energy designs in hot/humid climates. Other activities to develop and demonstrate retrofit technologies included working with the private sector and other agencies through PATH's existing buildings programs. Continued development and testing of more effective natural and hybrid cooling technologies. Directed work towards integrating auxiliary heating and cooling systems which incorporated renewable energy technologies and other advanced technologies with potential application to residential buildings. Improved affordable housing design	communities to 12. The 7 communities will add 1,000 new homes, bringing the total to 3,000. Apply strategies in these communities that in addition to saving energy, reduce construction waste, conserve water, and use best land practices. Use a systems engineering approach to evaluate cost and performance tradeoffs associated with advanced equipment and systems to meet building heating, cooling, ventilation, hot water, and lighting loads. Expand use of high performance envelope designs, gas-fired cooling systems, renewable energy technologies, distributed power generation systems, and Energy Star appliances. Monitor and report on performance of the initial, community-scale *Building America* projects to determine the impact of occupant behavior on overall building energy use. Through continued systems engineering research and demonstration, expand the technology base for retrofit technologies in response to the needs of PATH, DOE's Weatherization Assistance Program, and DOE's	National Association of Homebuilders' Research Center (NAHBRC), NREL, ORNL, others TBD

Program Activity	FY 2000	FY 2001	FY 2002
Residential Buildings Integration (Cont'd)	and ensured that the homes incorporated a whole buildings approach to energy efficiency. As part of *Building America*, began cooperative work with the manufactured housing industry on incorporating component efficiency improvements into a systems integrated approach. New implementation mechanism for the *Building America* program effected in the Special Project State Grants. Grants were provided to States on a competitive basis. Participants included: IBACOS, CARB, the Hickory Consortium, NREL, National Association of Homebuilders' Research Center (NAHBRC), LBNL, Bechtel/Battelle/MRI, others TBD (Special Project State Grants included $300 from *Building America*) (*Building America* $9,674, Industrialized Housing $985). ($10,659)	*Building America* factory-constructed infill and brownfield projects. Apply promising natural and hybrid cooling strategies in one or two advanced, very low energy buildings. Develop and demonstrate residential ventilation strategies and designs that meet the proposed new ASHRAE Residential Ventilation Standard 62.2 issued in FY 2000. Working with *Building America* industry teams, continue to develop cost-effective strategies for downsizing space conditioning equipment for very low or zero energy/net energy buildings without compromising comfort or energy performance on peak heating and cooling periods. Continue work with factory-constructed housing industry on developing an integrated approach to building design and component efficiency that was initiated by the FY 1999 competitive solicitation. Participate in the Special Project State Grants that are provided to states on a competitive basis.	

III. Performance Summary: BUILDING RESEARCH AND STANDARDS (Cont'd)

Program Activity	FY 2000	FY 2001	FY 2002
Residential Buildings Integration (Cont'd)		Participants include: IBACOS, Building Science Consortium, CARB, Industrialized Housing Partnership, NREL, NAHBRC, LBNL, ORNL, others TBD (Special Project State Grants include $300 from *Building America*.). ($11,463)	
	Residential Building Energy Codes Support upgrading voluntary residential building energy codes to help deploy the best technologies and practices, increase efficiency, and reduce carbon emissions. Begin developing an improved residential compliance tool. Conduct an evaluation to determine if the upgraded voluntary residential code, 2000 IECC, will save energy and quantify the savings. This Determination will be used by States in evaluating whether to update their residential codes to meet the new voluntary codes. Proposed upgraded Federal residential building standards that includes improvements based on the 2000 International Energy Conservation Code (IECC), other	**Residential Building Energy Codes** Promote specific revisions to the residential building codes that will support the deployment of new EE technologies, such as fuel cells and microturbine generator sets, that are completing research and development. Complete development of new code compliance tools, MEC*check* and FED*check*, for private sector and Federal residential construction. Publish a determination in the *Federal Register* regarding the 1998 and 2000 International Energy Conservation Code (IECC). Issue updated final Energy Code for Federal residential building standards based on improvements to the 2000 IECC. (PNNL, NREL) ($584)	**Residential Building Energy Codes** Promote and support revisions to the residential building codes that will support new energy efficiency technologies and practices. Develop new code compliance tools for use in residential construction to foster a "whole buildings" approach. Participants will include: NREL, PNNL, Others TBD ($590)

Program Activity	FY 2000	FY 2001	FY 2002
Residential Buildings Integration (Cont'd)	residential codes, and the use of solar space cooling and heating technologies. (PNNL, NREL) ($478)		
	Provide critical technical and program management support services. ($75)	Provide critical technical and program management support services. ($73)	Provide critical technical and program management support services. ($45)
Total, Residential Buildings Integration	**$11,212**	**$12,120**	**$7,478**
Commercial Buildings Integration	**Research & Development**	**Research & Development**	**Research & Development**
	Issued and awarded a competitive solicitation to implement whole-building activities based on the commercial buildings road map.	Issue and award a second competitive solicitation to implement whole-building activities based on the commercial buildings road map.	Implement the Commercial Buildings Roadmap by working with industry groups on cost-shared projects that accelerate the development and adoption of new building technologies and practices.
Commercial Buildings	Accelerated R&D on advanced technologies in collaboration with the design and construction community, controls and equipment companies, developers, and building owners and operators by funding cost-shared R&D projects identified in the commercial buildings road map. As supported by the industry-developed road map, continued work on several projects, such as the building commissioning	Conduct cost-shared R&D on advanced technologies identified in the commercial buildings road map in collaboration with the design and construction community, controls and equipment companies, developers, and building owners and operators. New areas may include energy management practices, whole building design concepts, low-cost sensor technology, and information management systems. In	Develop metrics for energy performance, indoor environment quality, and other significant areas of building performance. Begin emulation of the public/private partnership successes of the residential Building America program. Participants will include: Carnegie Mellon University, LBNL, National Institute of Standards and Technology (NIST), NREL, PNNL, University of California, Others

Program Activity	FY 2000	FY 2001	FY 2002
Integration (Cont'd)	study of GSA's Adaptable Workplace Lab; the transfer of the Whole Building Diagnostician, a performance monitoring tool, to the private sector for commercialization; research on techniques for diagnosing problems in building systems; and the analysis of advanced system design and control strategies for high-performance buildings. Supported National Science Foundation grants to university "centers of excellence", such as the Center for the Built Environment in Berkeley, California, that tests and assesses advances and innovations in materials, components, and assemblies for thermal, visual, acoustic, and air quality performance. In addition to projects stemming from the road map, identified two major commercial real estate developments with private sector partners to test and evaluate BTS-developed technologies.	coordination with the *Rebuild America* program and its most progressive community partnerships, expands research on innovative techniques and strategies for energy-efficient building renovations. Work with 5 to 10 *Rebuild America* community partnerships to test the viability of new energy-efficient commercial equipment and systems in practical applications. Research and demonstrate energy efficiency techniques and strategies, including whole-building design techniques, Internet-based building controls combined with real time utility pricing strategies, innovative lighting design and technologies, new information management techniques for the design and construction process, and new heating and cooling technologies, such as compressorless cooling, fuel cells, and cogeneration. This effort directly links together BTS research and deployment activities for commercial buildings.	TBD) ($1,954)
Commercial	Documented the worker productivity gains from improved indoor environments in commercial	Support National Science Foundation grants to university "centers of excellence", such as the Center for the Built Environment in	

III. Performance Summary: BUILDING RESEARCH AND STANDARDS (Cont'd)

Program Activity	FY 2000	FY 2001	FY 2002
Buildings Integration (Cont'd)	buildings through on-site measurement and analysis of data. Scientifically validate techniques and technologies for indoor environment assessment in collaboration with industry, NIOSH, and other Federal agencies. Participants included: PNNL, NREL, Massachusetts Institute of Technology, LBNL, Purdue University, Portland Energy Conservation, Inc. (PECI), NIST ($3,274)	Berkeley, California, that tests and assesses advances and innovations in materials, components, and assemblies for thermal, visual, acoustic, and air quality performance. These partners have historically cost shared, providing in FY 1999 more than 6 times the BTS funding of $230,000. Publish findings from the testing and evaluation of BTS-developed technologies by two major commercial real estate developments. Conduct research to offset the increase in energy use that will result from the expected increase in the recommended ventilation rate for commercial buildings in the industry consensus standards. Explore natural ventilation solutions for commercial buildings. Continue interagency work on productivity effects from improved indoor environments to include widespread dissemination of findings. Participants include: PNNL, NREL, UC, Carnegie Mellon University, LBNL, NIST ($3,866)	

III. Performance Summary: BUILDING RESEARCH AND STANDARDS (Cont'd)

Program Activity	FY 2000	FY 2001	FY 2002
Commercial Buildings Integration (Cont'd)	**Commercial Building Energy Codes** Promulgated the final Energy Code for Federal Commercial Buildings (10 CFR 434, based on Standard 90.1-1999). Determined that the 1999 voluntary commercial energy code proposed by ASHRAE/IESNA saves energy compared with the current version. A positive determination requires States to update their commercial codes to meet the new voluntary codes. Developed and proposed a simplified compliance approach similar to the IECC for inclusion in ASHRAE/IESNA Standard 90.1 to assist States in implementing the standard as a code. Initiated revisions to COM*check-EZ* and COM*check-PLUS* to include compliance with ASHRAE/IESNA Standard 90.1-1999. Revised core materials, train-the-trainer program, and training curriculum to reflect the	**Commercial Building Energy Codes** Issue DOE determination whether Standard 90.1-1999 will improve the energy efficiency of commercial buildings, compared to previous version of 90.1. Develop supporting materials and propose lighting controls, transformer, and fenestration (windows and doors) amendments to the model commercial energy code, Standard 90.1-1999. Develop and propose upgrades to ASHRAE/IESNA Guideline 18, Energy Guideline for Buildings Except Low-Rise Residential Buildings, to assist those wanting to improve energy efficiency greater than Standard 90.1-1999. Propose the International Energy Code Council in the 2003 IECC, upgrade their simplified compliance path to be consistent with Standard 90.1-1999. Complete revisions to COM*check-EZ*, and COM*check-PLUS*, including compliance checking for the upgraded Federal commercial	**Commercial Building Energy Codes** Issue final rulemaking on the next generation of Energy Codes for Federal Commercial and High-Rise Residential Buildings. Support technical improvement of private sector codes, such as the International Energy Code Council's adoption of a simple method to demonstrate code compliance. Participants will include: PNNL, and Others TBD ($541)

Program Activity	FY 2000	FY 2001	FY 2002
Commercial Buildings Integration (Cont'd)	new requirements of ASHRAE/IESNA Standard 90.1. (EPAct Section 101) Participants included PNNL. ($586) Provide critical technical and program management support services. ($25)	code, 10 CFR 434. (EPAct Section 101) Participants include PNNL. ($692) Provide critical technical and program management support services. ($25)	 Provide critical technical and program management support services. ($15)
Total, Commercial Buildings Integration	**$3,885**	**$4,583**	**$2,510**
Equipment, Materials and Tools Equipment,	**Lighting R&D** Issued a competitive solicitation to fund new cost-shared R&D activities identified in the lighting road map. Under the light sources research element, started research on a luminaire-integrated ballast for CFLs, cost-shared with a major lamp manufacturer, so that a laboratory breadboard prototype can be constructed and tested. Continued to develop the sulfur lamp, focusing on technologies critical to achieving a low-power lamp with wide application: new lamp designs and highly efficient solid-state power sources.	**Lighting R&D** Further align R&D priorities with the lighting technology road map and accelerate the development of energy-efficient lighting technology with lighting industry partners, small business firms, National Laboratories and universities, using the competitive solicitation approach begun in FY99. In the new light sources area, continue research on two paths: seeking technology breakthroughs for conventional types of lamps (incandescent, fluorescent, and gas discharge) to improve efficiency 20	**Lighting R&D** Conduct basic and applied research on advanced light sources with an increased focus on the science and enabling technology for solid state lighting. Develop new approaches to the effective distribution and control of lighting in buildings and determine the impact of lighting on performance and comfort of building occupants. Conduct this work through an integrated program consisting of cost-shared contracts with manufacturers, utilities, and small businesses R&D firms with scientific support from National Laboratories and universities.

III. Performance Summary: BUILDING RESEARCH AND STANDARDS (Cont'd)

Program Activity	FY 2000	FY 2001	FY 2002
Materials and Tools (Cont'd)	Continued evaluation of the promise of solid-state light sources for building lighting through industry interaction and initiated a competitively-awarded project to develop basic technology for a new type of solid-state light source with a small business firm by evaluating advanced light-emitting materials. Initiated exploratory studies of approaches for increasing the efficiency of solid-state light-emitting materials. Started a comprehensive nationwide study of lighting energy use and savings potential. Under the lighting controls and distribution research element, initiated two competitively-awarded hybrid lighting projects with small business firms to develop technology for new optical fibers and hollow light guides which distribute light from highly-efficient, centralized electric or solar light sources. Evaluated candidate materials and completed the optical designs for these two distribution technologies.	to 50 percent and developing revolutionary lighting technologies which can potentially double efficiency. Continue research on a luminaire-integrated ballast for CFLs, cost-shared with a major lamp manufacturer, by testing a fully integrated laboratory test unit and evaluating marketing strategies. Continue to develop the low-power sulfur lamp by testing a breadboard prototype lamp system using the lamp designs and power supply technologies developed in the prior two years. Initiate fundamental studies to better understand physical mechanisms thought to limit efficacy and lifetime of solid state devices and initiate research to better understand the application of these novel lighting technologies to general purpose lighting. Initiate research on new phosphors which can potentially double the efficiency of fluorescent lamps and on new solid state power supplies for electrodeless lamps of either gas discharge or molecular radiator design. With industry input, continue study of lighting energy use and savings potential.	In the light sources area, continue research on two paths: seek technology breakthroughs for conventional types of lamps to improve efficiency by 20 to 50 percent, and develop revolutionary lighting technologies that can potentially double efficiency. In the lighting impacts area, achieve two major milestones by completing two preliminary field tests of the most promising concepts for saving energy through improved vision, with a potential savings up to 30 percent in office and/or highway lighting systems. ($3,394) Participants will include: LBNL, Lighting Research Center, Others TBD.

III. Performance Summary: BUILDING RESEARCH AND STANDARDS (Cont'd)

Program Activity	FY 2000	FY 2001	FY 2002
Equipment, Materials and Tools (Cont'd)	Under the lighting impacts research element, began industry-recommended field tests of the impact of mesopic street lighting on vision with technical assistance and cofunding from four large manufacturers of lighting. To increase effort on lighting impacts as suggested in the lighting road map, initiated the first field test of the scotopic lighting concept in an office building. ($5,751) Participants included: GE, Fusion Lighting, LBNL, Meadow River, ADL, Translight, Lighting Research Center, Abratech, TBD.	Under the lighting controls and distribution research element, continue two competitively-awarded hybrid lighting projects with small business firms to develop technology for new optical fibers and hollow light guides which distribute light from centralized electric/solar light sources. Evaluate candidate materials and test prototype systems for these two distribution technologies. In the lighting impacts area, continue two preliminary field tests of the most promising concepts for saving energy through improved vision, with a potential energy savings of 30 percent in office and/or highway lighting systems. ($6,144) Participants include: GE, Fusion Lighting, LANL, LBNL, Meadow River, ADL, Translight, Lighting Research Center, Abratech, TBD.	
	Space Conditioning and Refrigeration R&D	**Space Conditioning and Refrigeration R&D**	**Space Conditioning and Refrigeration R&D**

III. Performance Summary: BUILDING RESEARCH AND STANDARDS (Cont'd)

Program Activity	FY 2000	FY 2001	FY 2002
Equipment, Materials and Tools (Cont'd)	In FY 2002, research in residential absorption heat pumps, desiccants and chillers, and oil heat will be transferred to the power technologies program. Continued cost-shared, industry-driven refrigeration research in five high-priority areas including new refrigerants, improved equipment efficiency, integrating equipment and distribution systems improving quality of conditioned air, and alternative refrigeration cycles. Continued field tests to demonstrate a new, highly efficient supermarket refrigeration/HVAC systems with industry partners. Participants included: National Institute of Standards and Technology (NIST), LBNL, BNL, University of Maryland, Arthur D. Little, Foster Miller, ARTI, EPA Research, EPRI. ($4,058)	In FY 2002, research in residential absorption heat pumps, desiccants and chillers, and oil heat will be transferred to the power technologies program. Complete development of a supermarket system energy evaluation guide and work with commercial equipment manufacturers and supermarket operators to implement the guide. Initiate development of an improved defrost system for refrigeration display cases. Initiate development of diagnostic tools to maintain installed efficiency of air conditioners. Complete development of test procedures for determining air distribution system losses of installed space conditioning equipment and transfer for publication as an ASHRAE standard. Following on development of a new high efficiency heat pump water heater design, initiate and complete accelerated laboratory durability testing of ten water heaters to achieve the equivalent of ten years of cyclic operation. Continue support of the Air-Conditioning and Refrigeration	Collaborate with manufacturers to investigate alternatives for affordable efficiency advancements and development of design tools for the optimum selection of equipment components for air conditioners and heat pumps. Continue to develop refrigeration systems that reduce defrost energy needed for heat pumps and commercial food storage equipment. Continue to develop field test diagnostic tools and test methods to maintain the installed system efficiency of air conditioners and heat pumps. ($2,425) Participants will include: BNL, LBNL, NIST, ORNL, Univ of Ill, Univ MD.

III. Performance Summary: BUILDING RESEARCH AND STANDARDS (Cont'd)

Program Activity	FY 2000	FY 2001	FY 2002
Equipment, Materials and Tools (Cont'd)		Technology Institute (ARTI) Research for the 21st Century R&D projects. Participants include: National Institute of Standards and Technology (NIST), LBNL, ORNL, University of Illinois, University of Maryland, ARTI ($5,140)	
	Fuel Cells/Cogeneration: In FY 2002, this research was transferred to the Power Technologies.	Fuel Cells/Cogeneration: In FY 2002, this research was transferred to the Power Technologies	
	Appliances and Emerging Technologies R&D	**Appliances and Emerging Technologies R&D**	**Appliances and Emerging Technologies R&D**
	Initiated large-scale demonstration of innovative heat pump water heater with utilities in every region of the country.	Conduct R&D on emerging technologies and develop and monitor the performance of the next generation of appliances. Continue demonstrations of heat pump water heaters, with utility partners.	Recruit additional manufacturing partners to introduce heat pump water heaters (HPWH) to market and provide infrastructure support, such as field testing, case study dissemination and fact sheets. Coordinate with utility and end-user partners to enhance marketability and demand for HPWH. Continue to establish rooftop A/C and emerging lighting products on the market with manufacturers and end-user-groups. Work with end-user groups, utilities, and the research establishment to commercialize the next-generation of
	Developed prototypes of high-efficiency water heating equipment that are very cost effective and just as easy to install as conventional technology. Established emerging sub-CFL lamp technology on the market with manufacturers and end-user groups.	With industry, develop high-efficiency dryers that are at least 20 percent more efficient than conventional products. Establish very high-efficiency packaged, roof-top air conditioners on the market with manufacturers and end-use groups.	

III. Performance Summary: BUILDING RESEARCH AND STANDARDS (Cont'd)

Program Activity	FY 2000	FY 2001	FY 2002
Equipment, Materials and Tools (Cont'd)			smarter, more efficient appliances.
	Participants included: ORNL, PNNL. ($1,404)	Participants include: ORNL, PNNL, SE HPWH Council. ($1,924)	Participants will include: ORNL, PNNL, SE HPWH Council, Others TBD. ($1,455)
	Building Envelope R&D Competitive Solicitation: Developed and awarded a competitive solicitation for activities identified in the windows road map. ($2,158)	**Building Envelope R&D** Competitive Solicitation: Award approximately 2 additional, second-phase competitive solicitations and/or award new competitively-selected projects to accelerate implementation of the windows and building envelope road map. Continue to develop an integrated window/wall system including integrated HVAC functions in a competitively-selected, cost-shared project with industry. ($2,195)	**Building Envelope R&D** Competitive Solicitation: No funding requested. ($0)
	Thermal Insulation and Building Materials: Completed the development of the Whole Wall Rating System, which analytically measures the thermal performance of wall systems. Completed the development of metrics that define	Thermal Insulation and Building Materials: Complete development and demonstrate superinsulating materials that exhibit R-25 insulating value per inch, have a 20-year life, and are cost-effective in building and appliance applications. Continue cooperative	Thermal Insulation and Building Materials: Implementing the building envelope road map completed in FY 2001, conduct research to improve the thermal performance of the building envelope through the evaluation of

III. Performance Summary: BUILDING RESEARCH AND STANDARDS (Cont'd)

Program Activity	FY 2000	FY 2001	FY 2002
Equipment, Materials and Tools (Cont'd)	an energy-efficient roofing system. Deployed an Internet calculator to allow roofing professionals to design these systems. ($3,035)	research with industry on improving insulations using environmentally benign materials. Initiate development of two new advanced building insulation application technology concepts for retrofit and new construction. Perform industry-supported testing and evaluation of envelope materials and structures to identify opportunities for improving energy efficiency and wind resistance. Complete characterization and development of models to predict the performance of third-generation blowing agents in closed-cell foams. Complete development of an advanced multidimensional heat, air, and mass transfer model to predict the moisture tolerance durability of envelope systems. Develop air barrier and vapor barrier alternatives to existing products that eliminate liquid and vapor traps within building envelopes. Complete the Attic Handbook, a consumer-oriented compilation of information regarding attic systems and design. ($3,057) Window Technologies: Coordinate	materials and construction practices. Florida Solar Energy Center, Minority Education Institutions, NREL, ORNL. ($1,464)

III. Performance Summary: BUILDING RESEARCH AND STANDARDS (Cont'd)

Program Activity	FY 2000	FY 2001	FY 2002
Equipment, Materials and Tools (Cont'd)	Window Technologies: In partnership with industry, conducted R&D on advanced windows, including prototype commercial electrochromic windows for niche architectural applications markets, very high R-value "Super-Window" technology, and spectrally-selective "cool" windows for hot climates. Continued to develop advanced thin film technology to improve manufacturing processes for advanced windows in a competitively-selected, cost-shared project with industry. ($5,905)	advanced window research, e.g., complex fenestration systems, with International Energy Agency partners. Fabricate and test full size, prototype commercial electrochromic windows developed through a 50 percent cost share by industry and establish design criteria for a full-size production line. Support industry development of durable, spectrally-selective and low-E glazing for sunbelt and retrofit applications. ($6,544)	Window Technologies: Continue the evaluation of high performance windows. Publish Commercial Glazing handbook; and initiate companion web-based engineering design and specification tools. Implement through NFRC new WINDOW 5 rating and design software suite based on International Standards Organization procedures. Continue training of builders, architects and manufacturers through Efficient Window Collaborative. Participants will include: Florida Solar Energy Center, LBNL, NREL, ORNL, UN. MA, UN. MN, CA Energy Commission, Alliance to Save Energy. ($2,928)
	Urban Heat Island Research: Completed research on highly reflective surfaces and other mitigation techniques. (LBNL, ORNL) ($196)	Urban Heat Island Research: The program is complete. ($0)	Urban Heat Island Research: The program is complete. ($0)
	Analysis Tools and Design Strategies Continued development of new	**Analysis Tools and Design Strategies** Complete development, testing, and release Version 1.1 of new building simulation software for EnergyPlus.	**Analysis Tools and Design Strategies** Continue working with building industry groups to support early

III. Performance Summary: BUILDING RESEARCH AND STANDARDS (Cont'd)

Program Activity	FY 2000	FY 2001	FY 2002
Equipment, Materials and Tools (Cont'd)	generation of building simulation software, releasing 3 beta versions for testing. Based on the commercial buildings road map and industry partner feedback, planned new features for Version 1.1 of EnergyPlus to include new modules that simulate performance of complex, innovative building systems and components. Completed development of Version 1.0 of SPARK to allow evaluation of complex building envelopes, lighting, and HVAC systems. Completed development, tested, and released Version 2.0 of the Building Design Advisor with links to DOE-2. Completed development, tested, and released Version 1.3 of the ENERGY-10 software that incorporates advanced concepts learned in buildings studies. Continued participation in the Industry Alliance for Interoperability to ensure that energy efficiency can be considered and incorporated in	Continued working with and supporting private sector developers of interfaces and simulation modules for EnergyPlus. Based on recommendations from the Commercial Buildings Road Map, plan and begin development of EnergyPlus Version 1.1. Plan, develop, and test new simulation capabilities within SPARK Version 2.0. Make the Building Design Advisor Version 2.0, available to the private sector for commercialization. Continue development and testing of Energy-10 Version 2.0 for release in FY 2002. Continue working with the International Alliance for Interoperability through release 3.0 of their Industry Foundation Classes (IFCs). Create a utility for using IFCs with EnergyPlus and the Building Design Advisor. Continue performance measurement research with ASHRAE, ASTM, and others to advance the calculation	design decision-making and associated software tools, for renewable energy and energy efficiency within residential and small commercial buildings. Focus efforts on EnergyPlus development; conclude support for SPARK and Energy 10. Develop and demonstrate successful energy-efficient design solutions. Participants include: ASHRAE, Athena Sustainable Materials Institute, California State University, GARD Analytics, LBNL, J. Neymark Associates, NREL, Oklahoma State University, Fullerton/Chapman University, Sustainable Building Industries Council, University of Illinois/U.S. Army Construction Engineering Research Laboratories, University of Wisconsin. ($2,426)

III. Performance Summary: BUILDING RESEARCH AND STANDARDS (Cont'd)

Program Activity	FY 2000	FY 2001	FY 2002
Equipment, Materials and Tools (Cont'd)	building-related software. Incorporated ventilation and air flow calculations into energy simulation software tools. Investigated the interrelationships of energy systems on commercial and residential buildings energy performance. Developed test procedures, measurement techniques, and standards related to thermal distribution, air quality, and air leakage with ASHRAE and ASTM. Assessed advanced ventilation designs and strategies and report results that will contribute to achieving energy efficiency and improved indoor environmental quality through design excellence. ($3,861) Participants included: NREL, LBNL, ORNL, Athena Sustainable Materials Institute, ASHRAE, Passive Solar Industries Council, GARD Analytics, J. Neymark Associates, California State University, Fullerton/Chapman University, University of Illinois/U.S. Army Construction Engineering Research Laboratories.	basis of all energy analysis tools. Highlights include issuance of thermal distribution and ventilation standards by ASHRAE. Participants include: NREL, LBNL, Athena Sustainable Materials Institute, ASHRAE, Sustainable Building Industries Council, GARD Analytics, J. Neymark Associates, California State University, Fullerton/ Chapman University, University of Illinois/U.S. Army Construction Engineering Research Laboratories, Oklahoma State University, University of Wisconsin. ($3,950)	

III. Performance Summary: BUILDING RESEARCH AND STANDARDS (Cont'd)

Program Activity	FY 2000	FY 2001	FY 2002
Equipment, Materials and Tools (Cont'd)	**Lighting and Appliance Standards** Promulgated amended energy conservation standards designed to achieve the maximum improvement in energy efficiency that is technically feasible and economically justified. Issued Notice of Proposed Rulemaking (NOPR) and Final Rules concerning standards for fluorescent lamp ballasts. Issued NOPR for residential water heaters. Published the screening analysis for certain ASHRAE 90.1 - 1999 covered product types (such as commercial HVAC and water heaters) for which the Department has determined that the adoption of standards higher than specified in ASHRAE 90.1 - 1999 are not economically justified. Initiated energy conservation standards rulemaking for distribution transformers. Conducted research to develop, maintain, simplify, and improve test procedures for appliances. Revised the test procedures to ensure innovative designs can be fairly tested and process manufacturer requests for test procedure waivers.	**Lighting and Appliance Standards** Promulgate amended energy conservation standards designed to achieve the maximum improvement in energy efficiency that is technically feasible and economically justified. Issue Final Rule concerning standards for clothes washers, water heaters, and residential central air conditioners/heat pumps and for certain commercial heating, air conditioning and water heating products. Issue ANOPR for standards for distribution transformers, commercial air source central air conditioners and heat pumps and certain size constrained residential air conditioners. Conduct research to develop, maintain, simplify, and improve test procedures for appliances. Revise the test procedures to ensure innovative designs can be fairly tested and process manufacturer requests for test procedure waivers.	**Lighting and Appliance Standards** Continue to develop proposed rules regarding energy conservation standards for electric distribution transformers, commercial air-source central air conditioners and heat pumps, packaged terminal air conditioners and heat pumps, and residential furnaces and boilers, which promise high levels of energy savings. Review existing test procedures to ensure that they remain current with advancing technology. Issue final test procedure for residential central air conditioners and heat pumps. Ensure compliance to standards through follow-up inquiries, random audits, and investigations of noncompliance allegations. ($4,426)

III. Performance Summary: BUILDING RESEARCH AND STANDARDS (Cont'd)

Program Activity	FY 2000	FY 2001	FY 2002
Equipment, Materials and Tools (Cont'd)	Published NOPR incorporating legislated standards and test procedures for commercial furnaces, commercial water heaters, air conditioners, and boilers. Worked with equipment manufacturers to ensure products are properly certified and meet the standards. Worked with the Federal Trade Commission (FTC) to support mandatory energy rating and labeling programs for residential appliances and to develop a labeling program for commercial equipment and support voluntary, industry-sponsored rating programs for commercial office equipment and luminaires. ($8,391)	Issue NOPR for test procedures for residential central air conditioner/heat pumps and commercial furnaces and Final Rule for test procedures for distribution transformers, dishwashers, commercial furnaces, water heaters, air conditioners and boilers. Continue to work with equipment manufacturers to insure products are properly certified and that they meet the standards. Continue to work with the Federal Trade Commission (FTC) to support mandatory energy rating and labeling programs for residential appliances. Develop a labeling program for commercial equipment and support voluntary, industry-sponsored rating programs for commercial office equipment and luminaires. ($9,394)	
	Participants included: NIST, LBNL, PNNL, NREL, ORNL, ADL.	Participants include: NIST, LBNL, PNNL, NREL.	Participants will include: LBNL, NIST, NREL, PNNL, Others TBD.
	Provide critical technical and program management support services. ($2,231)	Provide critical technical and program management support services. ($2,322)	Provide critical technical and program management support services. ($1,200)

III. Performance Summary: BUILDING RESEARCH AND STANDARDS (Cont'd)

Program Activity	FY 2000	FY 2001	FY 2002
Equipment, Materials and Tools (Cont'd)			
Total, Equipment, Materials, and Tools	**$36,990**	**$40,670**	**$19,718**
TOTAL, BUILDING RESEARCH & STANDARDS	**$58,877**	**$64,243**	**$30,563**

BUILDING TECHNOLOGIES
BUILDING TECHNOLOGY, STATE AND COMMUNITY SECTOR
(Dollars in Thousands)

BUILDING TECHNOLOGY ASSISTANCE

I. Mission Supporting Goals and Objectives

Mission

The Office of Building Technology Assistance (BTA) accelerates the adoption of energy efficiency and renewable building technologies through technical and financial assistance to states and local communities.

Goals and Benefits

Buildings Technology Assistance is comprised of four EERE programs: The Weatherization Assistance Program, the State Energy Program, the Community Energy Program, and the Energy Star Program.

The Weatherization Assistance Program

The Weatherization Assistance Program works to maximize the number of low-income households receiving cost-effective, energy efficient improvements while ensuring the health and safety of people served.

DOE implements the Program by providing technical assistance and formula grant monies to State and local weatherization agencies throughout the U.S. The network of approximately 970 local agencies provide the trained crews who perform the weatherization services for eligible low-income households, in single-family homes, multifamily dwellings, and mobile homes. Priority is given to the elderly, persons with disabilities, families with children, and households with high energy burden. Homes receive a comprehensive energy audit and a cost-effective combination of energy-saving measures.

Goals and Performance Measures:

- By 2002, weatherize approximately 123,000 homes of low-income families saving an average of about $300 per household annually (in 2000 dollars).

Benefits:

The Weatherization Assistance Program will (1) reduce energy costs for low income households, which are disproportionately burdened by utility bills (14.5 percent of these households' income, vs. 3.5 percent of other households' income); (2) benefit local economies by reducing the local impacts of energy price volatility; (3) reduce the need for other public services such as fuel assistance, housing, and health care; (4) improve housing and community conditions. The estimated benefits of the Weatherization Assistance Program are shown in the table below.

	2005	2010	2020
Total Primary Energy Displaced (Trillion Btu)	51.38	100.40	146.56
Energy Costs or Savings (Millions of $)	360	707	1,011
Carbon Equivalent Emissions Displaced (MMTCe)	0.86	1.65	2.40

Source: Estimates based on the GPRA 2001 EERE Database. Numbers in the above table represent the estimated annual benefits in 2005, 2010, and 2020 based on the FY2002 funding request, assuming all program goals are met.

The State Energy Program

The State Energy Program (SEP) supports Federal/State partnerships that transfer energy efficiency technologies to the State and local level through formula grants which allow States to tailor energy efficiency programs to local needs and leverage non-Federal resources. To date, State Energy Offices have been able to leverage their Federal formula grant funding at the rate of $4 in non-Federal funding for each Federal dollar and, for some activities, as much as $13 to $14 in non-Federal funding for each Federal dollar. The SEP also has a component that engages States in helping achieve EERE sector goals, through competitive grants using sector-directed funds.

Goals and Performance Measures:

- By 2010, the State Energy Program will displace 51 trillion Btu of energy use per year, saving $374 million annually.
- Award 280 grants to states from 2000 to 2005.

Benefits:
The State Energy Program (1) promotes the use of new energy-efficient technologies and practices; (2) leverages Federal, local, and private funds for maximum effectiveness; (3) focuses services to meet local needs; (4) educates individuals and organizations about energy saving opportunities; and (5) provides communities with technical support and assistance. The projected benefits of the State Energy Program are shown in the table below.

	2005	2010	2020
Total Primary Energy Displaced (Trillion Btu)	26.71	51.14	96.62
Energy Costs or Savings (Millions of $)	190	374	703
Carbon Equivalent Emissions Displaced (MMTCe)	0.48	0.88	1.64

Source: GPRA 2001 EERE Database. Numbers in the above table represent the projected annual benefits in 2005, 2010, and 2020 based on the FY2002 funding request, assuming all program goals are met.

The Community Energy Program

The Community Energy Program provides technical assistance, demonstrations, training, and education to communities to accelerate the use of innovative and cost-effective energy technologies, strategies, and methods. The program helps communities, towns, and cities save energy, create jobs, promote economic growth, and protect the environment through improved energy efficiency and less energy intensive building design and operation.

BTS' Rebuild America partnerships are wide-ranging, with partners encompassing mayors' and governors' offices, community and economic development agencies, school boards, citizen conservation groups, building owners/ operators/ financiers, and energy specialists. As illustration, Rebuild America provides schools with a comprehensive portfolio of EERE technologies and works directly with national, state, and local organizations that influence school construction and modernization. The program also assists States and communities in updating and implementing building energy codes to raise minimum energy performance levels for new construction and major renovations. BTS utilizes technical resources and DOE Regional Offices to work with States, local partners, and industry and leverages $10 for each Federal dollar invested. The Community Energy Program allows local citizens to become active participants in improving their communities. BTS continues to evaluate how best to deliver services to America's communities.

Goals and Performance Measures:
- By 2005, reduce energy use in commercial buildings by an average of 25 percent in 750 million cumulative square feet of floorspace, including K-12 schools, an increase of 400 million square feet over 2000.
- By 2010, Rebuild America partners will retrofit 4 billion square feet of floorspace.

Benefits:
The Community Energy Program helps communities improve schools, provide affordable housing reduce government operating costs, revitalize downtown buildings, implement building codes, and provide consumers and businesses with information to help them reduce energy costs.

The Energy Star Program

The Energy Star Program is a collaborative effort with the Environmental Protection Agency and industry that provides its trademark name to commercial buildings and equipment, windows and home designs, and appliances that are highly efficient and cost-effective. By identifying and promoting products, equipment and buildings that are typically 20 percent more efficient than the minimum mandated energy efficiency standards or guidelines, the Energy Star Program raises the public's awareness of equipment and appliance energy use and provides easy-to-use information for consumers to make their own energy choices.

The program is a collaborative effort with the Environmental Protection Agency and industry to raise awareness of some of the products that are developed through technology research in BTS. The Energy Star Program helps increase the market penetration of high efficiency appliances, office equipment, homes, and commercial buildings through consumer education and voluntary industry partnerships. The Program collaborates with manufacturers, retailers, and utilities to identify, label, and promote products, equipment, and buildings that are typically 20 percent more efficient than the minimum mandated energy efficiency standards or guidelines. The strategy is to work with additional manufacturers, utilities, and retailers to expand the joint EPA-DOE Energy Star Program and aggressively raise the public's awareness of equipment and appliance energy use, including results from BRS' R&D projects, such as high-efficiency windows. States are have an important role in the Energy Star promotion strategy, and incorporation of Energy Star purchasing is an evolving feature of the State Energy Program as well as the Community Energy Program and the Weatherization Assistance Program.

Goals and Performance Measures:
- By 2004, achieve a 65 percent market share for ENERGY STAR windows, compared with approximately 40 percent in 1999.
- By 2004, achieve a 20 percent market share for ENERGY STAR appliances, compared with approximately 13 percent in 1999.

Benefits:
The projected benefits of the Energy Star Program are shown in the table below.

	2005	2010	2020

Total Primary Energy Displaced (Trillion Btu)	91.75	218.77	278.50
Energy Costs or Savings (Millions of $)	769	1,927	2,389
Carbon Equivalent Emissions Displaced (MMTCe)	1.78	3.99	4.90

Source: GPRA 2001 EERE Database. Numbers in the above table represent the projected annual benefits in 2005, 2010, and 2020 based on the FY2002 funding request, assuming all program goals are met.

Building Technology Assistance Accomplishments

FY 2000 Accomplishments:

- Weatherized more than 68,000 homes, bringing the total number of homes weatherized to 4.8 million.
- Recruited 50 new Rebuild America Partners, increasing the total number of Rebuild America communities to 290. New partners began action plans that will result in over 100 million square feet of floor space renovated, reducing annual energy costs by $28 million and reducing CO_2 emissions by 100 thousand metric tons when local actions are completed in 2003.
- Recruited 5 utility partners to promote ENERGY STAR products; an additional 500 retail stores to promote Energy Star products; and 40 window partners to promote Energy Star Windows.

FY 2001 Ongoing Accomplishments:

- Weatherize 75,350 homes, bringing the total number of homes weatherized to 4.9 million.
- Recruit 500 new ENERGY STAR partners, bringing the total number of stores marketing ENERGY STAR appliances up to 7,000.
- Assist community and business partnerships to incorporate high performance energy-efficient technologies and practices, including the "whole building systems approach," in projects encompassing 80 million square feet of floor space, bringing the total square footage renovated through the Rebuild America program to 550 million square feet.

FY 2002 Planned Accomplishments:

- Weatherize 123,000 homes, bringing the total number of homes weatherized to over 5 million. Provide State Energy Program grants to 50 States, the District of Columbia, and 5 Territories to conduct state and local energy programs.
- Provide educational materials to 7,000 Energy Star participating retail stores.
- Assist over 330 existing community and business partnerships to incorporate high performance energy-efficient technologies and practices, including the "whole building systems approach," in projects encompassing 60 million square feet of floor space, bringing the total square footage renovated through the Rebuild America program to over 600 million square feet.

II. A. Funding Table: BUILDING TECHNOLOGY ASSISTANCE

Program Activity	FY 2000 Comparable	FY 2001 Comparable	FY 2002 Request	$ Change	% Change
Weatherization Assistance Program					
Weatherization Assistance	$ 134,555	$ 152,364	$ 273,000	$ 120,636	79.2%
Technical/Program Management Support	$ 445	$ 300	$ 0	$ -300	0.0%
Subtotal, Weatherization Assistance Program	$ 135,000	$ 152,664	$ 273,000	$ 120,336	78.8%
State Energy Program					
State Energy Program	$ 33,450	$ 37,866	$ 38,000	$ 134	0.4%
Technical/Program Management Support	$ 50	$ 50	$ 0	$ -50	-100.0%
Subtotal, State Energy Program	$ 33,500	$ 37,916	$ 38,000	$ 84	0.2%
Community Energy Program					
Community Energy Program	$ 17,865	$ 18,045	$ 8,438	$ -9,607	-53.2%
Technical/Program Management Support	$ 50	$ 50	$ 50	$ 0	0.0%
Subtotal, Community Energy Program	$ 17,915	$ 18,095	$ 8,488	$ -9,607	-53.1%
Energy Star Program					
Energy Star Program	$ 2,676	$ 2,204	$ 2,000	$ -204	-9.3%
Subtotal, Energy Star Program.	$ 2,676	$ 2,204	$ 2,000	$ -204	-9.3%
Total, Building Technology Assistance	$ 189,091	$ 210,879	$ 321,488	$ 110,609	52.5%

II. B. Laboratory and Facility Funding Table: BUILDING TECHNOLOGY ASSISTANCE

	FY 2000 Comparable	FY 2001 Comparable	FY 2002 Request	$ Change	% Change
Argonne National Lab (East)	$ 100	$ 30	$ 0	$ -30	-100.0%
Brookhaven National Lab	$ 0	$ 0	$ 0	$ 0	0.0%
Lawrence Berkeley National Lab	$ 454	$ 585	$ 500	$ -85	-14.5%
National Renewable Energy Lab	$ 1,544	$ 660	$ 400	$ -260	-39.4%
Oak Ridge National Lab	$ 3,377	$ 2,303	$ 1,700	$ -603	-26.2%
Pacific Northwest National Lab	$ 3,126	$ 3,702	$ 1,700	$ -2,002	-54.1%
All Others	$ 180,490	$ 203,599	$ 317,188	$ 113,589	-0.9%
Total, Building Technology Assistance.	$ 189,091	$ 210,879	$ 321,488	$ 110,609	52.5%

III. Performance Summary: BUILDING TECHNOLOGY ASSISTANCE

Program Activity	FY 2000	FY 2001	FY 2002
Weatherization Assistance Program	**Weatherization Assistance** Provided State grants to weatherize homes of 67,340 low-income families, saving $1.80 (at 1997 prices) for every dollar invested over the life of the measures. Legislative and regulatory changes were proposed to increase flexibility to incorporate whole house and advanced technologies. Emphasized investment in rebuilding State technical capacity to lay the foundation for implementation of the Weatherization *Plus* strategy jointly developed and endorsed by DOE and the network. (All 50 States) ($132,700)	**Weatherization Assistance** Provide State grants to weatherize approximately 75,000 low-income homes, less than 1 percent of the eligible homes. Continue to lay the groundwork for implementing Weatherization *Plus* strategies: implement recently completed legislative and regulatory changes for increased program flexibility; collaborate on development of technical capacity; and expand access to leveraged resources. As a result, State and local agencies will be in a better position to strategically improve their programs' results by incorporating new technologies and a whole-house approach, thus connecting with broader community priorities. (All 50 States) ($150,700)	**Weatherization Assistance** Provide funding to weatherize 123,000 low-income homes and 108,000 additional homes with other leveraged resources, saving $2.10 in energy costs for every dollar invested over the life of the measures (based on current EIA data). In order to ensure the necessary expansion of the Weatherization network's production capacity, enabling it to deliver services many more low-income households over the ten-year period beginning in FY 2002, the program will work with stakeholders to ensure investment in such essential elements as equipment and training for additional crews. This investment will be especially critical in rapid-growth states and warm climate states, for whom the expansion will be proportionately the greatest (due to funding allocation formula). (All 50 States and D.C.) ($271,336)

Program Activity	FY 2000	FY 2001	FY 2002
Weatherization Assistance Program (Cont'd)	**Training And Technical Assistance** Provided technical assistance and training to promote the application of advanced technologies and collaborative strategies to further improve program effectiveness and document program performance. ($1,855) Participants include: Atlanta Regional Office (RO), Boston RO, Chicago RO, Denver RO, Philadelphia RO, San Francisco RO, ORNL, NREL, Data Tree, National Association for State Community Services Programs.	**Training And Technical Assistance** Provide technical assistance and training to promote the application of advanced technologies and collaborative strategies to further improve program effectiveness and document program performance. Increase the scope of the audits and the use of advanced energy efficiency technologies to promote the whole-house approach. ($1,664) Participants include: Atlanta Regional Office (RO), Boston RO, Chicago RO, Denver RO, Philadelphia RO, San Francisco RO, ORNL, NREL, Data Tree.	**Training And Technical Assistance** Monitor and support effective program operations by the network of State and local Weatherization agencies. Conduct limited analysis, measure and document program performance, and promote (e.g. through regular publications, workshops and peer exchange) the application of advanced techniques and collaborative strategies to further improve program effectiveness. ($1,664) Participants include: ORNL, D&R, TBD.
	Provide critical technical and program management support services. ($445)	Provide critical technical and program management support services. ($300)	Separate technical and management support services are not planned for this program in FY 2002. ($0)
Total, Weatherization Assistance Program	**$135,000**	**$152,664**	**$273,000**

Program Activity	FY 2000	FY 2001	FY 2002
State Energy Program	**State Energy Program** Provided grants to 50 States, D.C., and 5 Territories for energy efficiency programs. Continued to promote broad-based programs to support innovative approaches, such as incentive funding, revolving loan funds, and energy technology commercialization services. Focused technical assistance/training on developing State-level capabilities to use collaborative partnerships. ($33,450) Participants include: States, ORNL, NREL, Data Tree.	**State Energy Program** Provide grants to 50 States, D.C., and 5 Territories for energy efficiency programs. Support implementation of SEP Strategic Plan for the 21st Century, addressing key goals of market transformation and collaboration with environmental and economic development interests. Focus technical assistance/training on developing State-level capabilities to use collaborative partnerships. Work with States, EPA and other appropriate parties to formalize the State Energy Offices' ongoing involvement in meeting EPA Clean Air Act requirements. ($37,866) Participants include: States, ORNL, NREL, Data Tree.	**State Energy Program** Provide grants to 50 States, D.C., and 5 Territories for energy efficiency programs. Support implementation of SEP Strategic Plan for the 21st Century, addressing key goals of market transformation and collaboration with environmental and economic development interests. Provide technical assistance and training to develop State-level capabilities to form collaborative partnerships and conduct evaluation of the impact of State energy efficiency and renewable energy programs nationwide. ($38,000) Participants include: States, Data Tree, NREL, ORNL.
	Special Project State Grants Awarded over 100 Special Project State Grants to states on a competitive basis to help deploy end-use sector technologies in the following EERE programs:	**Special Project State Grants** Award at least 100 Special Project State Grants to states on a competitive basis to help deploy end-use sector technologies in the following EERE programs:	**Special Project State Grants** Award Special Project State Grants to states on a competitive, cost-shared basis to help deploy end-use sector technologies and to train and assist in the updating and implementation of state building

Program Activity	FY 2000	FY 2001	FY 2002
State Energy Program (Cont'd)	Office of Building Technology, State and Community Programs: *Building America* $300, *Rebuild America* $1,200, and Updating and implementing State Building Energy Codes $4,200; Federal Energy Management Program: $950; Office of Industrial Technologies: Industries of the Future - Specific $1,200, Industries of the Future - Crosscutting including Industrial Assessment Centers (IACs), NICE3 grants, Motor and Steam Challenge, Inventions and Innovation grants, and Technical Assistance $1,600; Office of Transportation Technologies: Clean Cities $2,700; Office of Power Technologies: Included efforts from Wind, Solar Thermal, Biomass Power, Geothermal Heat Pumps, Solar Roofs, and Remote Renewable Energy Applications $1,750. Subtotal, Energy Conservation ($12,150)	Office of Building Technology, State and Community Programs: *Building America* $300, *Rebuild America* $1,200, Updating and implementing State Building Energy Codes $4,200; Federal Energy Management Program: $400; Office of Industrial Technologies: Industries of the Future - Specific $1,340, Industries of the Future - Crosscutting $1,460; Office of Transportation Technologies: Clean Cities $3,800 Office of Power Technologies: Renewable Energy Resources $1,750. Subtotal, Energy Conservation ($12,150)	energy codes. Planned participation by program: Rebuild America $800 State Energy Codes $400 Industries of the Future: Specific $800 Crosscutting $800 Clean Cities $2,100 Subtotal, Energy Conservation ($4,900)

Program Activity	FY 2000	FY 2001	FY 2002
State Energy Program (Cont'd)	Subtotal, Renewable Energy Resources. ($1,750) Total, SEP Special Projects State Grants $13,900. Provide critical technical and program management support services. ($50)	Subtotal, Renewable Energy Resources. ($1,750) Total, SEP Special Projects State Grants $13,900. Provide critical technical and program management support services. ($50)	Subtotal, Renewable Energy Resources. ($250) Total, SEP Special Projects State Grants $5,150. Technical and program management support services are not planned for this program in FY 2002. ($0)
Total, State Energy Program	**$33,500**	**$37,916**	**$38,000**
Community Energy Program	**Rebuild America** Increased *Rebuild America* partnerships by 50 to 290, providing assistance to more communities and helping them develop and implement community action plans. New partners in FY 2000 started projects to renovate more than 100 million square feet of floor space over 4 years, reducing annual costs by $28 million when local actions are completed. DOE assistance included outreach materials; workshops; tools and training on advanced technologies, financing options, affordable housing, volume purchasing, highly reflective surfaces, and the construction and retrofit process; and design	**Rebuild America** Establish 40 new *Rebuild America* community partnerships and assist these communities to retrofit 80 million square feet of floor space in K-12 schools, colleges, public housing, state and local governments, and commercial buildings. Assist these communities to increase use of innovative and cost-effective building technologies, strategies, and practices through energy-saving programs that respond to their own circumstances and goals. Assistance includes outreach materials; workshops; tools and training on advanced technologies, financing options, affordable housing, volume	**Rebuild America** Help over 330 existing partnerships upgrade 60 million square feet of floor space in schools and commercial buildings and state and local government-owned facilities. Overcome information barriers by providing web-based training, decision tools, and case studies that increase the market demand for energy efficient products, and project development and financing services while making building owners better informed buyers. Apply BTS whole-buildings research to Rebuild America building energy projects. Partner with national organizations, manufacturers, utilities, and the

Program Activity	FY 2000	FY 2001	FY 2002
Community Energy Program (Cont'd)	assistance to increase adoption of whole-building approaches. Assisted partners in evaluating and increasing investment in energy efficiency, and promote the use of new, advanced commercial equipment and appliances, including products with the Energy Star label. Expanded training programs to optimize energy savings in *Rebuild America* communities and ensure that the latest technologies and practices are incorporated into designs and retrofits. ($10,660) Participants included: LBNL, ORNL, PNNL, ANL, NREL, American Public Power Association, U.S. Conference of Mayors) (Includes $1,200 for the State Energy Program Special Project State Grants. (*Rebuild America* $9,424)	purchasing, highly reflective surfaces, and the construction and retrofit process; and design assistance. Document the success of 80 community energy projects for dissemination to other communities. Establish a national network of *Rebuild America* partnerships to accelerate the transfer of best practices, lessons learned, and resources among partnerships. Promote the Energy Star building label for completed retrofit projects through *Rebuild America* partners. Increase education and outreach activities with *Rebuild America* industry partners, e.g. utilities, energy service companies, and major equipment manufacturers. Using *Rebuild America* partnerships, continue to support K-12 schools. Discontinue the separate EnergySmart Schools initiative. Activities include: targeting the school sector within existing and new *Rebuild America* community partnerships; developing strategic partnerships with national organizations representing policy,	energy service industry to leverage resources. ($5,938) (Includes $800 for the State Energy Program Special Project State Grants) Participants include: ORNL, PNNL, LBNL, Association of State Energy Officials, National Association of Energy Service Companies.

Program Activity	FY 2000	FY 2001	FY 2002
Community Energy Program (Cont'd)		facility, and business officials; identifying best practices in school renovation and new school design; demonstrating advanced technologies; and developing energy specifications for school design and construction. (Includes $1,200 for the State Energy Program Special Project State Grants) (includes *Rebuild America* $10,934) Participants include: LBNL, ORNL, PNNL, ANL, NREL, American Public Power Association, US Conference of Mayors.	
	Information Outreach Provided outreach and educational materials to promote energy-efficient technologies and practices that were essential to influencing consumer demand for new, high-efficiency buildings, equipment, and appliances and the energy retrofit of existing buildings. ($819) Participants included: ORNL,	**Information Outreach** Increase efforts that target builders, homeowners, and building owners by providing information and education materials on energy efficiency through a variety of media outlets to help them make the best decisions related to new construction, renovations, and purchasing of products. ($806) Participants included: NREL,	**Information Outreach** Focus outreach efforts to homeowners and homebuilders by providing information and education materials on energy efficiency to media outlets and other business communication channels. The effort is designed to help the target audiences make the best decisions related to new construction, renovations and purchasing of

Program Activity	FY 2000	FY 2001	FY 2002
Community Energy Program (Cont'd)	NREL. **Training and Assistance for State and Federal Building Energy Codes** Provided technical and financial assistance to accelerate the availability of building code information, and core materials. Trained approximately 4,000 code officials, designers, and builders on 1998 and 2000 International Energy Conservation Code (IECC) via Train-the-Trainer and distance learning. ($6,386) (Includes $4,200 for the State Energy Program Special Project State Grants) Participants include: PNNL, International Council of Building Officials (ICBO), ASHRAE.	ORNL **Training and Assistance for State and Federal Building Energy Codes** Provide technical and financial assistance to support the availability of building energy code compliance trainers, information, and materials. Train approximately 4,000 code officials, designers, and builders on 2000 International Energy Conservation Code (IECC) via Train-the-Trainer and distance learning. Evaluate differences between the Federal code and the 2000 IECC to assist Federal agencies to increase the use of the Federal code. Develop core materials for the implementation of advanced building construction practices and new energy-efficient technologies for private sector and Federal buildings. (Includes $4,200 for the State Energy Program Special Project State Grants) ($6,305) Participants include: PNNL, International Council of Building Officials (ICBO), ASHRAE.	products. ($500) Participants included: NREL, ORNL, Others TBD **Training and Assistance for State and Federal Building Energy Codes** Train approximately 1,000 code officials, designers and builders on 2000 International Energy Conservation Code (IECC). (Includes $400 for the State Energy Program Special Project State Grants) ($2,000)

Program Activity	FY 2000	FY 2001	FY 2002
Community Energy Program (Cont'd)	Provide critical technical and program management support services. ($50)	Provide critical technical and program management support services. ($50)	Provide critical technical and program management support services. ($50)
Total, Community Energy Program	**$17,915**	**$18,095**	**$8,488**
Energy Star Program	**Energy Star Program** Collaborated with EPA to expand the Energy Star program. The program increased consumers' awareness of the benefits and cost savings of energy-efficient appliances and products. Established higher energy efficiency qualifying levels for Energy Star refrigerators. Added new residential and commercial appliances and products, such as water heaters and motors, to the Energy Star product portfolio.	**Energy Star Program** Expand the Energy Star product portfolio by developing a commercial Energy Star window specification with industry and converting three Federal product recommendations into Energy Star products. Converting the FEMP-produced product recommendations will help increase the purchase of energy-efficient products, extending the benefits beyond the Federal market. Phase in the new qualifying levels for Energy Star refrigerators and establish higher energy efficiency qualifying levels for Energy Star room air conditioners. Based on the sales data developed in FY 1999, increase market share of Energy Star appliances by 5	**Energy Star Program** Continue targeted promotional and consumer education activities with over 500 existing and emerging utility, manufacturing, and retail partners. Continue to work with established state and regional groups to integrate ENERGY STAR into their energy efficiency programs. Continue to support manufacturers meeting ENERGY STAR in meeting performance specifications and logo usage requirements. ($2,000)

III. Performance Summary: BUILDING TECHNOLOGY ASSISTANCE (Cont'd)

Program Activity	FY 2000	FY 2001	FY 2002
Energy Star Program (Cont'd)		percent over the FY 2000 level.	
	Recruited 5 utility partners to promote ENERGY STAR products and 40 partners to promote ENERGY STAR windows that were developed in BTS' Building Envelope R&D program. New windows, such as high-performance, spectrally- selective windows that use advanced glazing to reduce the cooling load in Sun Belt homes by 40 to 70 percent, provide first-cost savings to the builder by allowing for smaller, less expensive air conditioning equipment, as well as energy savings to the owners.	Recruit 5 additional utility partners, particularly in the Southeast and Southwest U.S., to promote ENERGY STAR products and an additional 160 partners to promote ENERGY STAR windows. Recruit an additional 500 retail stores to label ENERGY STARr appliances. Work with two manufacturers to incorporate the ENERGY STAR logo into the FTC label. Collaborate with EPA to increase consumers' awareness of the benefits and cost savings of energy-efficient appliances and products by promoting the ENERGY STAR building label, educating consumers about the benefits of replacing inefficient residential appliances, and providing technical assistance and software tools to manufacturers.	There is no recruitment planned for FY 2002 at the $2,000,000 request level. This is because in FY 2001, the program recruited more than 500 additional retail stores to promote ENERGY STAR products, and the current number of retail storefronts exceeds 7,000. The total number of retail (with single or multiple stores), manufacturer, and utility partners exceeds 500. Funding at $2,000,000 will enable the program to service these partnerships and related promotion and maintenance of the ENERGY STAR brand and products, but not support the expansion of additional partnerships and other areas of the country.
	Worked with the Efficient Windows Collaborative to increase the awareness and demand for the latest window technologies through demonstrations and training for	Continue support of the Efficient Windows Collaborative regional initiatives, including the Sunbelt Project, providing technical assistance to architects, builders, and manufacturers in their application and development of	The Efficient Windows Collaborative has been moved to the Windows research area and is no longer supported by the ENERGY STAR program under the $2,000,000 request.

Program Activity	FY 2000	FY 2001	FY 2002
Energy Star Program (Cont'd)	builders. Extended the use of the ENERGY STAR appliance program from manufactured homes to other home builders throughout the U.S. Recruited an additional 500 retail stores to label ENERGY STAR appliances. Extended the ENERGY STAR label to buildings that meet the DOE/EPA performance level and the requirements of ASHRAE 90.1-1989. Provided new buildings in the design phase with a provisional ENERGY STAR label when they can demonstrate through simulations that they meet these criteria. The label can help building owners market the features of the buildings to attract tenants. Continued campaign to educate consumers about the benefits of early retirement of inefficient residential appliances. Monitored sales of ENERGY STAR products to measure success of the program. Expanded technical assistance to manufacturers through the development and adaptation of DOE/LBNL computer tools (WINDOW 5 and RESFEN) and provide information products and industry-based training tools. ($2,676)	advanced window products. The Collaborative promotes wider participation in the ENERGY STAR windows program. ($2,204) Participants include: ASE, ORNL, D&R, ADL, Gallup	

III. Performance Summary: BUILDING TECHNOLOGY ASSISTANCE (Cont'd)

Program Activity	FY 2000	FY 2001	FY 2002
Energy Star Program (Cont'd)	Participants included: ASE, ORNL, D&R, ADL, Gallup		
Total, Energy Star Program	**$2,676**	**$2,204**	**$2,000**
TOTAL, BUILDING TECHNOLOGY ASSISTANCE	**$189,091**	**$210,879**	**$321,488**

BUILDING TECHNOLOGIES
BUILDING TECHNOLOGY, STATE, AND COMMUNITY SECTOR
(Dollars in Thousands)

COOPERATIVE PROGRAMS WITH STATES

I. Mission Supporting Goals and Objectives

The Cooperative Programs with States pursues collaborative applied research, development, and demonstration (RD&D) that accelerates the use of clean energy technologies. Collaborating with states provides opportunities to leverage funding for important RD&D that might not otherwise receive adequate support at either the Federal or the State level. These joint efforts, both in applied research and technology field tests, maximize the benefits of clean and efficient building technologies.

In the buildings sector, competitive grants are continuing to be awarded in FY 2001 to accelerate the feasibility of new technologies that improve the energy efficiency of school facilities. The need for advanced technologies and design strategies in both new and existing schools is great. By 2003, more than 2,400 new schools will be built to relieve overcrowding. Furthermore, the average existing public school in America is 42 years old and the GAO estimates that more than $100 billion is needed to repair or upgrade tens of thousands of school facilities. The grants will focus on applied research and field test projects in building technologies and/or distributed generation. The results of the projects will be part of technical design guidelines developed for new school construction and used by architects, engineers, and product manufacturers.

In FY 2001, this program will complete its second year. Projects funded to date are being performed in collaboration with States and State energy offices. As a result of a slow start for this new program in FY 2000, the project performers funded in FY 2000 and FY 2001 will continue work into FY 2001 and FY 2002, respectively. As a part of EERE's ongoing program evaluation activities, this program will be rebaselined in FY 2002 based on the results of projects completed during FY 2001and FY 2002. For this reason, no additional funds are requested in FY 2002. Upon completion of the new baseline, funds will be requested in FY 2003.

II. A. Funding Table: COOPERATIVE PROGRAMS WITH STATES

Program Activity	FY 2000 Comparable	FY 2001 Comparable	FY 2002 Request	$ Change	% Change
Cooperative Program with States	$ 1,930	$ 1,996	$ 0	$ -1,996	-100.0%
Total, Cooperative Program with States	$ 1,930	$ 1,996	$ 0	$ -1,996	-100.0%

II. B. Laboratory and Facility Funding Table: COOPERATIVE PROGRAMS WITH STATES

	FY 2000 Comparable	FY 2001 Comparable	FY 2002 Request	$ Change	% Change
All Other	$ 1,930	$ 1,996	$ 0	$ -1,996	-100.0%
Total, Cooperative Program with States	$ 1,930	$ 1,996	$ 0	$ -1,996	-100.0%

III. Performance Summary: COOPERATIVE PROGRAMS WITH STATES

Program Activity	FY 2000	FY 2001	FY 2002
Cooperative Programs with States	**Cooperative Programs With States** Awarded one cooperative agreement with a consortium of five states under a competitive solicitation. The objective of the project is to accelerate the adoption of new technologies to improve the energy efficiency of school facilities through applied research and field test. Technical tasks include research on portable classrooms, advanced daylighting and indoor air quality. Technology integration tasks include development of design protocols, training, design assistance and demonstrations. ($1,930) Participants included: National Association of State Energy Officials, Energy Center of WI, Florida Solar Energy Center, NY State ERDA, CA Energy Commission.	**Cooperative Programs With States** Award 1 to 4 cooperative agreements with state organizations under a competitive solicitation to accelerate the adoption of new energy-efficient technologies. These projects will conduct applied research and field test projects through an integrated buildings approach in a range of technology areas, such as daylighting, indoor air quality, and thermal distribution. The results of these efforts will be communicated to researchers, engineers, facility managers, and others to promote continued technology improvement, and commercial application. ($1,996) (TBD)	**Cooperative Programs With States** As a part of EERE's ongoing program evaluation activities, this program will be rebaselined in FY 2002 based on the results of projects completed during FY 2001 and FY 2002. For this reason, no additional funds are requested in FY 2002. Upon completion of the new baseline, funds will be requested in FY 2003. ($0)
TOTAL, COOPERATIVE PROGRAMS WITH STATES	**$1,930**	**$1,996**	**$0**

BUILDING TECHNOLOGIES
BUILDING TECHNOLOGY, STATE, AND COMMUNITY SECTOR
(Dollars in Thousands)

ENERGY EFFICIENCY SCIENCE INITIATIVE

I. Mission Supporting Goals and Objective

The Energy Efficiency Science Initiative seeks to identify and fund "bridging" research and development (R&D) that falls between fundamental exploratory science and pre-commercial applied R&D. By stimulating R&D that maximizes synergies among different research fields, technologies, investigator communities, and end-use applications, this initiative expands EERE's R&D activities among energy efficiency technologies. It also cuts across traditional energy end-use sectors by emphasizing distributed power generation applications for industrial and buildings systems, transportation, and stationary power.

This initiative expands on existing cooperative efforts with the Office of Fossil Energy in areas such as natural gas-fueled turbine and fuel cell technologies, combined heat, power and cooling applications, hydrogen production, and carbon emission sequestration. This effort also involves extensive coordination with the Office of Science in pursuing follow-on research in areas critical to energy efficiency and clean energy development, such as basic biosciences, plant genetics, photo emission, heat transfer, new materials, catalysts, and computational science.

In FY 2001, this program will complete its second year. Projects funded to date are being performed in collaboration with academia in partnership with the National Laboratories. As a result of a slow start for this new program in FY 2000, the project performers funded in FY 2000 and FY 2001 will continue work into FY 2001 and FY 2002, respectively. As a part of EERE's ongoing program evaluation activities, this program will be rebaselined in FY 2002 based on the results of projects completed during FY 2001and FY 2002. For this reason, no additional funds are requested in FY 2002. Upon completion of the new baseline, funds will be requested in FY 2003.

II. A. Funding Table: ENERGY EFFICIENCY SCIENCE INITIATIVE

Program Activity	FY 2000 Comparable	FY 2001 Comparable	FY 2002 Request	$ Change	% Change
Energy Efficiency Science Initiative	$ 3,864	$ 3,891	$ 0	$ -3,891	-100.0%
Total, Energy Efficiency Science Initiative	$ 3,864	$ 3,891	$ 0	$ -3,891	-100.0%

II. B. Laboratory and Facility Funding Table: ENERGY EFFICIENCY SCIENCE INITIATIVE

	FY 2000 Comparable	FY 2001 Comparable	FY 2002 Request	$ Change	% Change
All Other	$ 3,864	$ 3,891	$ 0	$ -3,891	-100.0%
Total, Energy Efficiency Science Initiative	$ 3,864	$ 3,891	$ 0	$ -3,891	-100.0%

III. Performance Summary: ENERGY EFFICIENCY SCIENCE INITIATIVE

Program Activity	FY 2000	FY 2001	FY 2002
Energy Efficiency Science Initiative	**Energy Efficiency Science Initiative** This new initiative supported R&D to bridge the gap between fundamental exploratory science and pre-commercial applied R&D. Conducted a first-of-a-kind strategic visioning workshop (e-vision 2000) involving forefront building designers, industrial and transportation experts as well as academics whose energy efficiency ideas expand the possibilities of technology options for our Nation's future. This workshop influenced development of the FY 2002 Budget Request and defined specific R&D projects for FY 2001 implementation. Awarded 4 cooperative agreements under a competitive solicitation. One project is to develop and demonstrate a hybrid solar lighting system for daylighting commercial buildings. One project is to advance micro-technology based gas-fired heat pumps. Two other projects will develop new materials with enhanced properties. (U of NV, Battelle, U. of WI, Holyoke Center) ($3,864)	**Energy Efficiency Science Initiative** As part of the continuing initiative to support R&D to bridge the gap between fundamental exploratory science and pre-commercial applied R&D, EERE will conduct a follow-on strategic visioning workshop (e-vision 2001). This workshop will build on the tremendous technology possibilities identified during e-vision 2000, and will broaden the understanding of the proposed options for the Nation's energy future. In succeeding years, it is expected that the e-vision workshops will be conducted biennially. Up to 5 research projects will be awarded as a follow-on to recommendations from e-vision 2000. Additionally, provide for continuation of the hybrid solar lighting project. Award 4 to 8 new cooperative agreements to support R&D that bridges the gap between fundamental exploratory science and pre-commercial applied R&D. The goal is to stimulate R&D in the private and public sectors that maximizes funding and investment opportunities	**Energy Efficiency Science Initiative** As a part of EERE's ongoing program evaluation activities, this program will be rebaselined in FY 2002 based on the results of projects completed during FY 2001 and FY 2002. For this reason, no additional funds are requested in FY 2002. Upon completion of the new baseline, funds will be requested in FY 2003. ($0)

III. Performance Summary: ENERGY EFFICIENCY SCIENCE INITIATIVE (Cont'd)

Program Activity	FY 2000	FY 2001	FY 2002
Energy Efficiency Science Initiative (Cont'd)		by exploring and exploiting synergies among different research fields, technologies, investigator communities, and end-use applications. (TBD) ($3,891)	
TOTAL, ENERGY EFFICIENCY SCIENCE INITIATIVE	**$3,864**	**$3,891**	**$0**

BUILDING TECHNOLOGIES
BUILDING TECHNOLOGY, STATE, AND COMMUNITY SECTOR
(Dollars in Thousands)

MANAGEMENT AND PLANNING

I. Mission Supporting Goals and Objectives

The BTS Office of Management and Planning provides the information, analyses, and personnel necessary to skillfully conduct the Building Sector program.

Management and Planning provides a well-planned and efficiently-managed program that will lead to the achievement of the BTS Strategic Plan and building sector goals in the most cost-effective manner possible. Effective management requires efficient organizational design, adequate human resources, sufficient and high quality information, and good communication, both within the organization and with outside parties. A solid analytical foundation is basic to understanding the potential for increasing the penetration of energy-efficient and renewable technologies in the building sector, and for achieving the correct balance and direction of programmatic activities. The Management and Planning Program will provide this foundation by carrying out its mission through Evaluation, Planning, and Analysis and Program Direction functions necessary to effectively guide and support all BTS programs.

Management and Planning will collect data, develop analytical tools and models, and conduct analyses required for program planning, prioritization, and management. In addition, customer-focused services are provided for State and local grants programs and regional planning, as well as services to in-state customers. The organization maintains strong capabilities in data analysis and model development to ensure that decisions regarding program direction and resource allocation are guided by the best possible information. Analytical capabilities and the supporting database are continually refined and strengthened to improve the information available for program guidance decisions and to better evaluate the energy, economic, and environmental impacts of programmatic alternatives.

Program Direction provides BTS' personnel to manage the sector programs. It includes salaries, benefits, travel, and support for 76 FTEs located at DOE headquarters in Washington; additionally it provides critical infrastructure support such as LAN hardware, software, operation, and maintenance. These efforts support EERE's goal of continuously demonstrating managerial and operation excellence.

II. A. Funding Table: MANAGEMENT AND PLANNING

Program Activity	FY 2000 Comparable	FY 2001 Comparable	FY 2002 Request	$ Change	% Change
Evaluation, Planning, and Analysis	$4,921	$4,910	$4,528	$-382	-7.8%
Program Direction	$9,007	$9,223	$10,562	$1,339	14.5%
Total, Management and Planning	$13,928	$14,133	$15,090	$957	6.8%

II. B. Laboratory and Facility Funding Table: MANAGEMENT AND PLANNING

	FY 2000 Comparable	FY 2001 Comparable	FY 2002 Request	$ Change	% Change
Brookhaven National Lab	$ 0	$ 0	$ 0	$ 0	0.0%
Lawrence Berkeley Lab	$ 85	$ 50	$ 50	$ 0	0.0%
National Renewable Energy Lab	$ 250	$ 150	$ 150	$ 0	0.0%
Oak Ridge National Lab	$ 950	$ 350	$ 350	$ 0	0.0%
Pacific Northwest Lab	$ 1,557	$ 1,605	$ 1,605	$ 0	0.0%
All Other	$ 11,086	$ 11,978	$ 12,935	$ 957	8.0%
Total, Management and Planning	$ 13,928	$ 14,133	$ 15,090	$ 957	6.8%

III. Performance Summary: MANAGEMENT AND PLANNING

Program Activity	FY 2000	FY 2001	FY 2002
Evaluation, Planning and Analysis	**Evaluation, Planning and Analysis**	**Evaluation, Planning and Analysis**	**Evaluation, Planning and Analysis**
	Developed, organized, interpreted, and disseminated the basic data required to implement energy policy for buildings and planned, managed, and evaluated the BTS program. Provided guidance and direction to implement BTS' Strategic Plan.	Develop, organize, interpret, and disseminate the basic data required to implement energy policy for buildings and to plan, manage, and evaluate the BTS program. Activities supported include portfolio analysis, GPRA evaluation of benefits and accomplishments, and analysis of emerging trends in buildings energy use. Provide guidance and direction to implement BTS' Strategic Plan.	Conduct program evaluation and planning by developing, interpreting and disseminating the basic data required to implement energy policy for buildings and to plan, manage and evaluate BTS programs, including the continued collaboration with EIA on buildings energy use data. Responsible for the execution of NAPA Implementation Plan. ($1,925)
Evaluation, Plan-	Collaborated with EIA to refine and update buildings energy use data. Conducted topical analyses on research needs and opportunities, international technology development, potential carbon and pollution savings and associated costs, impacts of utility restructuring on the building sector, and other subjects as appropriate. Activities supported included portfolio analysis, GPRA evaluation and benefits analysis, and analysis of emerging trends in buildings energy use. Continued the evaluation of all BTS programs. ($1,530)	Collaborate with EIA to refine and update buildings energy use data. Conduct topical analyses on research needs and opportunities, regulatory and technology deployment opportunities, international technology and program opportunities. Evaluate the potential carbon and pollution savings and associated costs and employment impacts of BTS programs and the impacts of utility restructuring on the building sector, and other subjects as appropriate. Continue the evaluation of all BTS programs. ($1,527)	

III. Performance Summary: MANAGEMENT AND PLANNING (Cont'd)

Program Activity	FY 2000	FY 2001	FY 2002
ning and Analysis (Cont'd)	Participants included: PNNL, LBNL, BNL.	Participants include: PNNL, LBNL, BNL.	
	Support for State and Local Grant Programs Used the State Grants structure to efficiently and effectively provide technical assistance to State partners in areas such as utility restructuring, newly developed energy efficiency technologies, and urban/regional planning for sustainability. Fostered strengthened partnerships between EERE end-use sector offices and the States through activities that support the successful implementation of the Special Project State Grants. Prepared report for the end-use sector offices on the accomplishments of Special Project State Grant activities. Implemented methodologies for assessing the impacts of the State Energy Program at the State level and nationwide. Supported program oversight, provide State Energy Advisory Board support,	**Support for State and Local Grant Programs** Provide technical assistance to State partners in areas such as utility restructuring, newly developed energy efficiency technologies, and urban/regional planning for sustainability. Continue to foster strengthened partnerships between EERE end-use sector offices and the States through activities that support the successful implementation of the Special Project State Grants. Support evaluation study to assess impacts of the State Energy Program at the State level and nationwide. Support program oversight, provide State Energy Advisory Board support, and respond to Congressionally mandated reporting requirements. ($2,933) Participants include: Atlanta Regional Office (RO), Boston RO,	**Support for State and Local Grant Programs** Provide technical assistance to State partners in areas such as utility restructuring, newly developed energy efficiency technologies, and urban/regional planning for sustainability. Continue to foster strengthened partnerships between EERE end-use sector offices and the States through activities that support the successful implementation of the Special Project State Grants. Support evaluation study to assess impacts of the State Energy Program at the State level and nationwide. Support program oversight, provide State Energy Advisory Board support, and respond to Congressionally mandated reporting requirements. ($2,353) Participants include: Atlanta Regional Office (RO), Boston RO,
Evaluation, Plan-			

Program Activity	FY 2000	FY 2001	FY 2002
ning and Analysis (Cont'd)	and responded to Congressionally mandated reporting requirements. ($2,946) Participants included: Atlanta Regional Office (RO), Boston RO, Chicago RO, Denver RO, Philadelphia RO, San Francisco RO, ORNL, NREL, Data Tree.	Chicago RO, Denver RO, Philadelphia RO, San Francisco RO, ORNL, NREL, Data Tree.	Chicago RO, Denver RO, Philadelphia RO, San Francisco RO, ORNL, NREL, Data Tree.
	Provided critical technical and program management support services. ($445)	Provided critical technical and program management support services. ($450)	Provided critical technical and program management support services. ($250)
Total, Evaluation, Planning, and Analysis	**$4,921**	**$4,910**	**$4,528**
Program Direction			
	The following is a breakdown of the funding by Object Class: 11.9 Personnel compensation $ 6,105 12.1 Civilian personnel benefits $ 1,364 21.0 Travel and transportation of persons $ 427 25.0 Other contractual services $ 42	The following is a breakdown of the funding by Object Class: 11.9 Personnel compensation $ 7,407 12.1 Civilian personnel benefits $ 1,625 21.0 Travel and transportation of persons $ 490 25.0 Other contractual services $ 50	The following is a breakdown of the funding by Object Class: 11.9 Personnel compensation $ 7,363 12.1 Civilian personnel benefits $ 1,620 21.0 Travel and transportation of persons $ 460 25.0 Other contractual services $1,119
Program Direction	Provided salaries with cost of living increase, benefits, travel, and support for 71 FTEs to manage Building Technology, State and Community programs, including	Provide salaries with cost of living increase, benefits, travel, and support for 81 FTEs to manage Building Technology, State and Community programs, including	The request provides salaries with cost of living increase, benefits, travel for 76 FTEs to manage Building Technology, State, and Community programs, including responsibilities under the Energy Policy Act of 1992.

III. Performance Summary: MANAGEMENT AND PLANNING (Cont'd)

Program Activity	FY 2000	FY 2001	FY 2002
(Cont'd)	responsibilities under the Energy Policy Act of 1992. Total obligational authority of $7,938,000 for Program Direction included an estimated $178,000 of FY 1999 unobligated carryover in Program Direction to cover FY 2000 requirements. ($7,760)	responsibilities under the Energy Policy Act of 1992. Total obligational authority of $9,572,000 includes an estimated $1,829,000 of FY 2000 unobligated carryover in Program Direction to cover FY 2001 requirements. Also, activities include systematic analysis of critical staffing needs within the context of current and projected R&D program missions and the development of a comprehensive plan that will focus on building and sustaining a talented and diverse workforce of R&D Technical Managers. ($7,743)	Additionally, training in areas crucial for effective job performance will be a key element. ($9,643)
	Management Support Services Consistent with other DOE programs under the jurisdiction of the Interior and Related Agencies Appropriations Committees, the Energy Conservation programs provided funding for Management Support Services, which includes activities such as improving the effectiveness, efficiency, and economy of management and general administrative services.	**Management Support Services** Consistent with other DOE programs under the jurisdiction of the Interior and Related Agencies Appropriations Committees, the Energy Conservation programs provided funding for Management Support Services, which includes activities such as improving the effectiveness, efficiency, and economy of management and general administrative services. These	**Management Support Services** Consistent with other DOE programs under the jurisdiction of the Interior and Related Agencies Appropriations Committees, the Energy Conservation programs provided funding for Management Support Services, which includes activities such as improving the effectiveness, efficiency, and economy of management and general administrative services.

III. Performance Summary: MANAGEMENT AND PLANNING (Cont'd)

Program Activity	FY 2000	FY 2001	FY 2002
Program Direction (Cont'd)	These activities were critical to the planning, formulation, and execution of the Energy Conservation programs. ($1,247)	activities were critical to the planning, formulation, and execution of the Energy Conservation programs. ($1,480)	These activities were critical to the planning, formulation, and execution of the Energy Conservation programs. ($919)
Total, Program Direction	**$9,007**	**$9,223**	**$10,562**
TOTAL, MANAGEMENT AND PLANNING	**$13,928**	**$14,133**	**$15,090**

DEPARTMENT OF ENERGY
FY 2002 CONGRESSIONAL BUDGET REQUEST
ENERGY EFFICIENCY AND RENEWABLE ENERGY
ENERGY CONSERVATION
(Dollars in Thousands)

FY 2002 Power Technologies Comparability Matrix

	New Structure	Power Technologies			
		Distributed Energy Resources	Management and Planning		
	FY 2000 Structure	Distributed Generation Tech. Development	Evaluation and Planning	Program Direction	Total
FY 2000	Buildings Technology, State and Community Sector				
	Building Research and Standards				
	Equipment, Materials and Tools				
	Space Conditioned & Refrigeration R&D	10,755			10,755
	Cogeneration/Fuel Cells	3,550			3,550
	Management and Planning				
	Evaluation and Planning		440		440
	Program Direction			110	110
	Total	14,305	440	110	14,855

DEPARTMENT OF ENERGY
FY 2002 CONGRESSIONAL BUDGET REQUEST
ENERGY EFFICIENCY AND RENEWABLE ENERGY
ENERGY CONSERVATION
(Dollars in Thousands)

FY 2002 Power Technologies Comparability Matrix

	New Structure	Power Technologies			
		Distributed Energy Resources	Management and Planning		
	FY 2001 Structure	Distributed Generation Tech. Development	Evaluation and Planning	Program Direction	Total
FY 2001	Buildings Technology, State and Community Sector				
	Building Research and Standards				
	Equipment, Materials and Tools				
	Space Conditioned & Refrigeration R&D	15,667			15,667
	Cogeneration/Fuel Cells	5,487			5,487
	Management and Planning				
	Evaluation and Planning		399		399
	Program Direction			150	150
	Total	21,154	399	150	21,703

DEPARTMENT OF ENERGY
FY 2002 CONGRESSIONAL BUDGET REQUEST
ENERGY EFFICIENCY AND RENEWABLE ENERGY
ENERGY CONSERVATION
(Dollars in Thousands)

FY 2002 Management Support Services Comparability Matrix

	New Structure	Management and Planning	
		Program Direction	
	FY 2000 Structure	Management Support Services	Total
FY 2000	Buildings Technology, State and Community Sector		
	Buildings Research and Standards		
	Residential Buildings Integration	560	560
	Commercial Buildings Integration	300	300
	Equipment, Materials and Tools	315	315
	Building Technology Assistance		
	Community Partnerships	62	62
	Energy Star Program	10	10
	Total	1,247	1,247

	New Structure	Management and Planning	
		Program Direction	
	FY 2001 Structure	Management Support Services	Total
FY 2001	Buildings Technology, State and Community Sector		
	Buildings Research and Standards		
	Residential Buildings Integration	650	650
	Commercial Buildings Integration	350	350
	Equipment, Materials and Tools	365	365
	Building Technology Assistance		
	Community Partnerships	100	100
	Energy Star Program	15	15
	Total	1,480	1,480