

# 21st Century



OFFICE OF

**BUILDING** TECHNOLOGY,

STATE AND COMMUNITY PROGRAMS

## STRATEGIC PLAN EXECUTIVE SUMMARY

Buildings for the  
21st Century



OFFICE OF ENERGY EFFICIENCY AND RENEWABLE ENERGY  
U.S. DEPARTMENT OF ENERGY

# Strategic Plan Executive Summary

**THIS STRATEGIC PLAN POSITIONS THE OFFICE OF BUILDING TECHNOLOGY, STATE AND COMMUNITY PROGRAMS (BTS) TO BE MORE EFFECTIVE IN REDUCING ENERGY CONSUMPTION IN OUR NATION'S HOMES, OFFICES, SCHOOLS, AND OTHER BUILDINGS, AND IN REDUCING ENVIRONMENTAL IMPACTS ASSOCIATED WITH ENERGY USE. IT COMMITS BTS TO A MORE PARTICIPATORY PROCESS WITH INDUSTRY, THE RESEARCH COMMUNITY, AND KEY STAKEHOLDERS IN ALL ACTIVITIES.**

## BTS Program Benefits

Buildings consume 36% of all energy used in the United States.<sup>1</sup> More than \$220 billion is spent each year in the U.S. to provide heating, cooling, lighting, and related services for our buildings.

Energy consumption in buildings is a major cause of acid rain, smog, and global warming, accounting for 47% of U.S. sulfur dioxide emissions; 22% of nitrogen oxide emissions; and 35% of carbon dioxide emissions.

Based on program analysis conducted for the Government Performance and

Results Act (GPRA),<sup>2</sup> an annual Federal investment of \$300 million in improving the energy efficiency of buildings will:

- Save consumers a cumulative \$65 billion by 2010 and over \$320 billion by 2020 in energy expenditures.
- Reduce carbon emissions by over 45 million metric tons in 2010, and by 124 million metric tons in 2020.
- Provide comfortable and healthy indoor environments, improve worker productivity, and reduce on-site construction waste.
- Increase competitiveness for the building industry and stimulate economic activity in communities.

## BTS Energy-Saving Goals

Energy-saving goals as a direct result of BTS work are:	An amount equal to:	As an illustration, this level of savings would require reducing energy use:
2 quads per year by 2010	All the energy used annually in the State of Virginia	<ul style="list-style-type: none"> <li>• By 50% in 4.8 million of the anticipated 18.4 million <u>new homes</u>, and 5.6 billion of the anticipated 21.5 billion square feet of <u>new commercial floor space</u>.</li> <li>• By 20% in 16.4 million of the 98.7 million <u>existing homes</u>, and 7.9 billion of the 61.3 billion square feet of <u>existing commercial floor space</u>.</li> </ul>
5 quads per year by 2020	All the energy used annually in the States of New York and Colorado combined	<ul style="list-style-type: none"> <li>• By 50% in 14.6 million of the anticipated 34.3 million <u>new homes</u>, and 20.0 billion of the anticipated 35.1 billion square feet of <u>new commercial floor space</u>.</li> <li>• By 20% in 36.6 million of the 94.4 million <u>existing homes</u>, and 13.7 billion square feet of <u>existing commercial floor space</u>.</li> </ul>

## Strategies

BTS will pursue the following three strategies to achieve the targeted energy-saving goals.

### 1. Accelerate the introduction of highly efficient technologies and practices through research and development.

Research and development expenditures by the building sector as a whole are less than one half of one percent of sales, while the national average in other industries is closer to 3.5%. A recent report on energy research and development by the President's Committee of Advisors on Science and Technology, and a report on energy technologies prepared by five Federal laboratories, stressed the importance of the BTS role in building research.

In leveraging the scant public- and private-sector resources available, BTS will conduct a balanced portfolio of high-risk and applied research on individual building components (appliances; envelope technologies; cogeneration; heating, ventilation, and cooling equipment; lighting) and on systems analysis and integration methods for optimizing overall energy performance. BTS will establish its research portfolio in collaboration with stakeholders and customers in key areas of building components and system integration. To begin the collaborative process with industry, BTS will jointly develop technology roadmaps in the following

areas: lighting, heating and cooling, windows, insulation, whole buildings in the commercial sector, and whole buildings in the residential sector.

### 2. Increase the minimum efficiency of buildings and equipment through codes, standards, and guidelines.

BTS has legislative requirements to improve the minimum efficiency for buildings by implementing energy efficiency codes, standards, and guidelines for building equipment, appliances, and federally owned buildings. These codes and standards must be technologically feasible and cost-effective on a life-cycle basis. Eliminating the most inefficient technologies and building practices complements the other BTS strategies for developing and promoting advanced, highly efficient technologies and practices. National standards provide manufacturers with a single set of requirements rather than an array of potentially conflicting State and local regulations.

In implementing this strategy, BTS will use a collaborative approach in which manufacturers and other key stakeholders identify opportunities and activities that can achieve or exceed the potential results of regulatory programs. Specifically, BTS will lead a comprehensive effort to establish minimum efficiency codes, standards, and guidelines for equipment, appliances, and Federal buildings; and will assist States and building industry organizations in developing, updating, and revising building standards and codes.

## BTS' NEW WAY OF DOING BUSINESS WILL BE CHARACTERIZED BY:

- **STRONGER AND MORE EFFECTIVE PARTNERSHIPS WITH INDUSTRY AND STATES**
- **JOINTLY DEVELOPED GOVERNMENT-INDUSTRY TECHNOLOGY ROADMAPS**
- **COMPETITIVELY SELECTED AND PEER-REVIEWED PROJECTS**
- **ESTABLISHMENT OF BTS AS THE INTEGRATOR OF COST-EFFECTIVE, TECHNOLOGY-BASED, ENERGY-EFFICIENT PRODUCTS AND PRACTICES**
- **CUSTOMER-FOCUSED, HIGHLY PRODUCTIVE, AND RESULTS-DRIVEN ORIENTATION**

<sup>1</sup> According to the Energy Information Administration Annual Energy Outlook (1997), the residential (18.43) and commercial (14.33) sectors totaled 32.76 quads in 1995 out of a total 90.93 quads of primary energy use. A quad refers to a quadrillion Btu, which is the typical amount of energy consumed annually by three million Americans.

<sup>2</sup> The baseline year for energy consumption and new/existing buildings comparison is 1999.

**3. Encourage use of energy efficiency and renewable energy technologies and practices through technology transfer and financial assistance.** Many barriers slow the adoption of new energy-efficient building technologies, including a hesitancy to accept unproven new technologies, lowest first-cost procurement policies, tax disincentives, and a lack of credibility about professed benefits. To overcome these barriers, BTS will work with State governments, local entities, utilities, retailers, manufacturers, and other partners to bridge the gap between research and widespread technology utilization. BTS will exchange information with these stakeholders to ensure the feedback critical to the development of successful next-generation research and regulation, and will support public- and private-sector activities as voluntary alternatives to regulatory programs.

BTS efforts will include:

- Educating decision makers by providing unbiased, accurate information on performance, reliability, purchasing, and financing for energy-efficient products and services
- Demonstrating the performance, cost, and reliability of new technologies
- Increasing application of technology and best practices for cost-effective weatherization of homes for low-income families
- Awarding targeted grants to States and communities to support their activities to promote increased energy efficiency and the use of renewable energy resources.

**For more energy-saving information, contact:**

**Office of Building Technology,  
State and Community Programs  
U.S. Department of Energy  
1000 Independence Avenue, S.W.  
Washington, D.C. 20585-0121  
202-586-1510**

**Call the Energy Efficiency and  
Renewable Energy Clearinghouse at:  
1-800-DOE-3732**

**Or visit the BTS Web site at:  
[www.eren.doe.gov/buildings](http://www.eren.doe.gov/buildings)**

**BUILDINGS FOR THE 21ST CENTURY**

**BUILDINGS THAT ARE MORE ENERGY-EFFICIENT, COMFORTABLE, AND AFFORDABLE . . . THAT'S THE GOAL OF DOE'S OFFICE OF BUILDING TECHNOLOGY, STATE AND COMMUNITY PROGRAMS (BTS). TO ACCELERATE THE DEVELOPMENT AND WIDE APPLICATION OF ENERGY EFFICIENCY MEASURES, BTS:**

- **CONDUCTS R&D ON TECHNOLOGIES AND CONCEPTS FOR ENERGY EFFICIENCY, WORKING CLOSELY WITH THE BUILDING INDUSTRY AND WITH MANUFACTURERS OF MATERIALS, EQUIPMENT, AND APPLIANCES**
- **PROMOTES ENERGY/MONEY SAVING OPPORTUNITIES TO BOTH BUILDERS AND BUYERS OF HOMES AND COMMERCIAL BUILDINGS**
- **WORKS WITH STATE AND LOCAL REGULATORY GROUPS TO IMPROVE BUILDING CODES, APPLIANCE STANDARDS, AND GUIDELINES FOR EFFICIENT ENERGY USE**
- **PROVIDES SUPPORT AND GRANTS TO STATES AND COMMUNITIES FOR DEPLOYMENT OF ENERGY-EFFICIENT TECHNOLOGIES AND PRACTICES**

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**ADVANCED COMPONENT TECHNOLOGIES**

**New advanced component technologies could be twice as efficient as conventional components and still meet the challenging reliability and cost requirements in buildings. Used in retrofit application, these technologies provide one of the best opportunities to increase energy efficiency in existing buildings.**

