

Making America's Buildings Better

Did you know that buildings use more energy than any other sector of the U.S. economy? In fact, buildings consume more than 70% of the electricity and more than 50% of the natural gas Americans use.

That's why the U.S. Department of Energy's (DOE's) Building Technologies Program (BTP) is working to improve building energy performance through high-impact research, outreach, and regulatory efforts. These efforts will result in affordable, high-performance homes and commercial buildings. These grid-connected buildings will be more energy efficient than today's typical buildings, with renewable energy providing a portion of the power needs. They will combine energy-smart "whole building" design and construction, appliances and equipment that minimize plug loads, and cost-effective photovoltaics or other on-site energy systems.

Investing in Energy Efficient Buildings Provides:

- Savings for American homes and businesses
- Sustained reductions in greenhouse gas emissions
- Job growth
- National energy security



With new technologies and practices, energy-efficient buildings will be the new standard for residents in all U.S. climate zones. DOE and its partners are pursuing a full portfolio of various initiatives to make it happen. *Photo by Ed Hancock, NREL PIX/14832*

Integrated Approach

DOE focuses on three key strategies to make cost-effective, energy-efficient technologies and practices widely available:

Research & Development

- Advance technologies
- Develop integrated building approaches

Market Stimulation

- Increase market pull from private industry
- Support ENERGY STAR®

Codes & Standards

- Continually raise the bar for efficiency
- Expand product portfolio

Advancing Innovation

Research & Development

Goals:

- Advancing technologies, reducing costs, and increasing their availability
- Enabling buildings to integrate with smart grids and renewable energy

DOE's commercial and residential research accelerates the development and adoption of advanced technology for new and existing buildings.

Research teams across the nation work with leaders in the energy-efficiency industry to achieve significant energy savings.

Today, new energy-efficient technologies are on the verge of widespread market success and are essential to achieving dramatic improvements in whole-building energy performance. These technologies will lead to buildings that use energy as efficiently as possible.

The Building Technologies Program is leading research in many critical project areas:

- Solid-state lighting that uses a fraction of the energy used by compact fluorescents, while still providing high-quality illumination
- Water heating with solar energy and heat pumps
- Climate-specific, dynamic insulation that saves energy and reduces peak energy load
- Highly insulating windows with thermal performance that nearly equals that of walls
- Better components, materials, and working fluids for heating and cooling equipment

The program's research and development help bring to market cost-effective, energy-efficient technologies that meet industry needs.

Improving Homes, Businesses, Schools, and More

Striving for Better Buildings

Goals:

- Create a national self-sustaining energy-efficiency market
- Educate homeowners, builders, and developers about the benefits of embracing energy-efficient technologies and practices
- Improve awareness, accessible information, and a trained workforce for energy-efficient products and services

The Better Buildings Initiative will make commercial and industrial buildings more energy efficient and accelerate private sector investment in energy efficiency through a series of incentives to upgrade offices, stores, schools and other municipal buildings, universities, hospitals, and other commercial buildings. This effort is coupled with the Better Buildings Neighborhood Program, which is helping over 40 state and local governments develop sustainable programs for upgrading more than 150,000 buildings.

The Building Technologies Program provides building designers, energy-efficiency program managers, and others with easy-to-use tools like the Home Energy Score and EnergyPlus to simplify building energy performance improvement.

The Solar Decathlon is an award-winning competition that challenges 20 university teams to design, build, and operate solar-powered houses. Teams blend affordability, consumer appeal, and design excellence with

optimal energy production and maximum efficiency. The competing teams show how energy efficiency can be integrated into any home today.

By training contractors and working closely with utilities and state and local governments, the Home Performance with ENERGY STAR® program is making it easier for homeowners to improve the efficiency of their homes through comprehensive energy audits and effective improvements.

DOE is facilitating the Commercial Building Energy Alliances, which bring leading businesses together to improve the energy performance of their new and existing facilities. Sectors addressed include retail, hospitals, higher education, and commercial real estate. An industry-led steering committee sets the priorities for each alliance.

Elevating Building Codes and Appliance Standards

Regulatory Work

Goals:

- Support adoption of and compliance with building energy codes
- Pursue 50% energy savings in codes that are cost effective for residential and commercial buildings
- Maximize energy savings opportunities through appliance standards
- Enhance information quality and availability, decrease associated risks and uncertainty, and improve energy efficiency industry cohesion

Our regulatory team works with states and industry partners to improve and implement building energy codes and provide technical assistance to stakeholders. Successful code implementation saves homes and commercial buildings an estimated \$2.5 billion in energy costs per year. In 2010, DOE helped create 30% energy savings in the model residential

and commercial codes. The department is now targeting a goal of 50% energy savings through cost-effective building efficiency measures.

Collaborating with businesses and industry associations, DOE develops minimum efficiency standards for appliances and equipment. The energy saved by appliance standards issued before July 2009 will return an estimated \$300 billion to the U.S. economy by 2030.

A Brighter Future for Our Homes, Our Businesses, and Our Nation

The Building Technologies Program is speeding market adoption of today's energy-efficient technologies while researching new technologies that will further improve building performance, drive down costs, and enhance comfort. Making energy upgrades to the nation's homes and buildings will strengthen the economy, create jobs, and protect the environment. DOE's investments in innovative technologies and practices are creating better buildings today, leading to America's secure energy in the future.

Learn More



buildings.energy.gov
