# Commercial Building Initiative

U.S. DEPARTMENT OF

Through aggressive research and development and an array of collaborations with industry-leading companies and organizations, the U.S. Department of Energy (DOE) is enabling significant improvements in the energy performance of the nation's existing and new commercial buildings.

The nation's more than 5.5 million<sup>1</sup> commercial buildings account for 19 percent of U.S. primary energy consumption and are responsible for 19 percent of energy-related carbon dioxide emissions. Raising the efficiency level of commercial buildings is critical to alleviating U.S. dependence on foreign oil and sustaining the competitiveness of U.S. businesses. It is also among the most effective and economically sound strategies for reducing carbon dioxide emissions in coming decades.

Making significant improvements to the energy performance of commercial buildings requires continued advancements in energy-efficiency technologies and strategies, as well as rapid adoption of those technologies throughout the commercial building sector.

DOE's Commercial Building Initiative (CBI) encompasses an array of programmatic and research efforts aimed at providing the cost-effective, energyefficient building technologies and practices needed to reach new levels of commercial building energy performance. The initiative also engages commercial building owners and operators from a variety of industry sectors to help



demonstrate, monitor, and move these technologies from the laboratory to the marketplace.

The initiative, which is part of DOE's Building Technologies Program, was established in August 2008 in support of requirements mandated by the Energy Independence and Security Act (EISA) of 2007.

# **Key CBI Partnerships and Alliances**

### National Laboratory Collaborative on Building Technologies (NLCBT)

This group of five national laboratories works with DOE to research and accelerate the use of clean, efficient building technologies. The collaborative enables DOE to coordinate application of its national laboratories' strengths to best serve the goals and priorities of DOE and its partners, including the Commercial Building Energy Alliances and the Commercial Building Partnerships. NLCBT laboratories are: Argonne National Laboratory, Lawrence Berkeley National Laboratory, National Renewable Energy Laboratory, Oak Ridge National Laboratory, and Pacific Northwest National Laboratory.

### Commercial Building Energy Alliances (CBEAs)

These informal associations of commercial building owners and operators organized by sector work to significantly reduce energy consumption and carbon emissions. Member companies from the commercial real estate, hospital, and retail sectors benefit from technical support and expertise of DOE's national laboratories and help to evaluate, test, and ultimately implement replicable approaches throughout their portfolio of buildings. DOE plans to launch the higher education energy alliance in 2011.

### **Commercial Building Partnerships**

DOE's national laboratories are working with more than 20 companies and organizations—including retailers, real estate management companies, and distribution facility providers—to create, test, and validate design concepts that will move the industry toward exemplary energy performance in commercial buildings. Each partner has agreed to construct one new building that uses 50 percent less energy than ASHRAE/IESNA Standard 90.1-2004 and retrofit a building that uses 30 percent less energy than the Commercial Buildings Energy Consumption Survey (CBECS) baseline or 30 percent less energy than the mean of their building portfolio. The project results are shared with the CBEAs and with others in the building industry to speed the market adoption of energy-saving technologies and building solutions.

### Zero Energy Commercial Buildings Consortium

This partnership of more than 300 commercial building organizations and stakeholders provides DOE access to their members' technical expertise, communicates

<sup>1.</sup> EIA's Annual Energy Outlook 2010. Table 5.



**Commercial Lighting Solutions Web** tool gathers information from users on building type and space description, and then allows users to select their preferred lighting solution. The tool also links users to participating utilities (where applicable) to access rebates and incentives.

the emergence of new technologies to the commercial building community, and promotes the demonstration of highperformance building technologies. DOE selected the National Association of State Energy Officials (NASEO) as convener of the consortium because it has the collective expertise to move the market toward exemplary energy performance in five target markets: commercial real estate, retail, hospital, higher education, and state and local governments.

### **High-Performance Green Building** Partnership Consortia

Public and private sector groups that promote high-performance green buildings and net-zero energy commercial buildings are formally recognized by DOE as consortia members. DOE lists consortia members on its Web site and uses information provided by members to develop a CBI status report to Congress.

# **Ongoing R&D Activities** in Support of CBI

### **Emerging Technology Projects**

Emerging technology projects allow CBEA members to identify promising energy-saving technologies for national laboratory testing and evaluation in

order to accelerate their application in commercial buildings. CBEA members choose technologies that show promise of meeting specific operational needs. Nominated technologies are evaluated and those that satisfy the screening process are presented to the CBEAs for project consideration. The CBEAs can promote the technology's application in commercial buildings through technology procurements or development and sharing of best practices.

#### **Commercial Technology Solutions**

Commercial technology solutions are interactive tools (primarily Web-based) through which commercial building designers, engineers, and operators can get guidance on how to improve the efficiency of their building systems. CBEA members work with the national laboratories to design and create a tool that gives customizable best practices and strategies on design, controls, installation, and commissioning of a particular technology. The solutions are designed to meet or exceed energy savings levels needed to qualify for tax incentives. The first interactive Web tool, the Commercial Lighting Solutions for retail spaces, was released in 2009.

### Technology Specifications

This approach is designed to bring innovative energy-saving technologies and systems at the most competitive price to the market for use in both retrofits and new construction. The intent is to communicate CBEA members' performance expectations to suppliers so members can purchase equipment that is more efficient and better suited to their facilities than currently available technologies. These projects are collaborative efforts between CBEA members and the national laboratories. CBEA members choose the technologies to specify-focusing on those for which there is the most compelling market need—and the national laboratories help

# DOE's Database of **Zero Energy Buildings:** zeb.buildinggreen.com

As DOE works to ultimately speed the adoption of clean, energyefficient building technologies by the public and private sectors, existing net-zero energy buildings serve as important examples of what can be achieved. DOE's Zero Energy Buildings Database features profiles of commercial buildings that produce as much energy as they use during the course of a year. DOE created the database, the first of its kind, to highlight these projects from across the country and provide ideas that can be applied to any new building.

identify key performance parameters and guide discussions with equipment manufacturers to come to the desired "stretch" performance specification.

DOE will continue to sponsor development of design guides and decision tools, such as Advanced Energy Design Guides and Technical Support Documents, as well as the underlying technology innovations necessary to realize 50 percent to 70 percent whole building energy savings levels across a variety of climate zones, building types, energy intensities, and sizes.

### A Strong Energy Portfolio for a Strong America

Energy efficiency and clean, renewable energy will mean a stronger economy, a cleaner environment, and greater energy independence for America, Working with a wide array of state, community, industry, and university partners, the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy invests in a diverse portfolio of energy technologies.

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# **Commercial Building** Initiative

For more information, contact: Joseph Hagerman **Commercial Buildings Team Lead** Office of Building Technologies Energy Efficiency and Renewable Energy U.S. Department of Energy commercialbuildings.energy.gov