Net-Zero Energy Commercial Building Initiative

Commercial Building Initiative

The Net-Zero Energy Commercial Building Initiative (CBI) aims to achieve marketable net-zero energy buildings by 2025 through an array of public and private partnerships to advance the development and adoption of high-performance buildings.

The Net-Zero Energy Commercial Building Initiative (CBI), launched in August 2008 to meet the charge of the Energy Independence and Security Act of 2007 (EISA), is the overarching effort of the Department of Energy's Commercial Buildings Program which aims to achieve marketable net-zero energy commercial buildings (NZEBs) by 2025.

NZEBs are grid-integrated buildings capable of generating as much energy as they consume through advanced efficiency technologies and on-site generation systems, such as solar power and geothermal energy. Meeting this aggressive goal will require significant advancements in breakthrough technologies as well as rapid adoption of these technologies by the commercial building sectors.

EISA 2007 authorizes DOE to collaborate with its national laboratories, the private sector, other federal agencies, and non-governmental organizations to speed development and adoption of energy-efficient, green building technologies.

DOE's Building Technologies Program has outlined and instituted a plan to achieve CBI's goal through a system of interrelated partnerships and alliances working together to help DOE and the nation achieve net-zero energy commercial buildings.

Key CBI partnerships and alliances:

National Laboratory Collaborative on Building Technologies (NLCBT)
This group of five national laboratories will work with DOE to research and accelerate the use of clean, efficient building technologies critical to the CBI goal. The national laboratories will team with National Accounts to assist in cost-shared RD&D. The collaborative enables DOE to coordinate application of its national laboratories' strengths to serve the goals and priorities of the DOE and its partners. NLCBT laboratories include: 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. The CBEAs, with close technical support of National Accounts, are the vehicles for evaluating, testing, and ultimately implementing replicable approaches to achieving energy-efficient commercial buildings for a variety of building types in a variety of climate zones. The Retailer Energy Alliance was launched in February 2008. Alliances also are planned for the Commercial Real Estate, Institutional, and Commercial Building Industry sectors.

Commercial Building National Accounts (NAs)
DOE has selected 23 companies and organizations that will conduct cost-shared RD&D and construct buildings that achieve savings of 50 percent above ASHRAE/IESNA Standard 90.1-2004 and retrofit buildings for 30 percent savings. The National Account companies and organizations were selected from the same target markets as the CBEAs and will share all results with CBEA members to speed market adoption of energy-saving technologies and building solutions.

High-Performance Green Building Consortium

These DOE-selected building sector groups and associations will work with DOE to accelerate the commercialization of high-performance building technologies by disseminating new technologies within the commercial building community.

High-Performance Green Building Partnership Consortia

Groups from the public and private sector that promote high-performance green buildings and net-zero energy commercial buildings will be formally recognized by DOE as members of the High-Performance Green Building Partnership Consortia. DOE will post the name, contact information, and membership of each formally recognized Partnership Consortia member on its web site and use information provided by each consortia to develop a report to Congress on the status of CBI.

DOE Creates First Database of Zero Energy Buildings

buildings.energy.gov/highperformance/ zero_energy_buildings.html

As DOE works to ultimately speed adoption of clean, energy-efficient building technologies by the public and private sectors, net-zero energy buildings that exist today 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.

The Adam Joseph Lewis Center for Environmental Studies at Oberlin College is a 13,600 sq. ft. all-electric building that produces at least as much energy as it uses in a year through a roof-mounted 60 kW photovoltaic (PV) system and a 100 kW PV system located over the parking lot.

Ongoing R&D activities in support of CBI:

Emerging Technology Projects

A critical component of CBI are emerging technology projects through which CBEA members identify promising energy-saving technologies for testing and evaluation to accelerate their application in commercial buildings. These emerging technologies may be new to the commercial marketplace, available for several years but under-utilized, or scheduled for introduction within the next two years. CBEA members choose emerging technologies that show the most 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. CBEAs can promote the technology's application in commercial buildings through technology procurements or development and sharing of best practices.

Commercial Lighting Solutions

DOE, in partnership with top lighting designers, architects, and commercial end-users, is developing Commercial Lighting Solutions that focus on systems design for different building and lighting-use scenarios. Each solution includes a series of "design vignettes," complete with lighting layouts and component specifications, as well as daylighting design where appropriate. The solutions are then entered into a free, interactive Commercial Lighting Solutions web site. Commercial Lighting Solutions have been developed and analyzed for five types of retail stores (big box, small box, grocery, specialty market, and pharmacy), and solutions for other sectors are planned.

Building Design Package R&D

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.

Commercial Lighting Solutions will be delivered through a web tool that provides energy savings projections to users based on their choices. The tool gathers information from users on building type and space description, and then allows users to select their preferred lighting solution. Solutions include performance specifications for lighting equipment and controls, design layouts, and supporting documentation. The tool will also link users to participating utilities (where applicable) to access rebates and incentives.

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