



# ENERGY STAR and Green Buildings

## Using ENERGY STAR Resources for Green Building Rating Systems: LEED®, Green Globes® and CHPS

By Kudret Ütebay

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**A**re you looking to reduce your carbon footprint, use less energy and cut energy costs? The buildings in which we work, shop, play and learn offer one of the best opportunities to improve energy efficiency and fight climate change. Every building, from the smallest school to the tallest skyscraper, uses energy. This energy is most often generated by burning fossil fuels, which releases greenhouse gases into the atmosphere and contributes to climate change.

In fact, the energy used by U.S. commercial and industrial buildings is responsible for almost half of our national emissions of greenhouse gases. Yet much of the energy used by buildings is wasted. According to the U.S. Environmental Protection Agency (EPA), a third of the energy consumed in commercial buildings is used unnecessarily or inefficiently—for example, by leaving lights on or running the heating and cooling system in an unoccupied building.

Existing commercial buildings offer a significant opportunity for low-cost, immediate emissions and energy cost reductions via efficiency upgrades. Energy efficiency can also be designed and built into new buildings.

The benefits of energy-efficient buildings have not gone unnoticed by the building design, construction, and operations and maintenance professions. Multiple standards for green building, energy efficiency and sustainable construction have taken root worldwide. Whether designing and constructing a new building or renovating a decades-old facility, there is a green building certification for your project. Leadership in Energy and Environmental Design (LEED), Green Globes and the Collaborative for High Performance Schools (CHPS) are three of the larger and more widely recognized green building certification systems. Although they differ in scope and purpose, they share one important characteristic: the inclusion of EPA energy performance, measurement, and tracking tools.

### **ENERGY STAR for Buildings**

ENERGY STAR is a joint program of EPA and the U.S. Department of Energy helping us all save money and protect the environment through energy-efficient products and practices. The energy performance of more than 130,000 buildings—representing nearly 17

billion square feet or 23 percent of the total market—has been assessed using EPA's Portfolio Manager, and more than 11,000 buildings have earned the ENERGY STAR for superior energy performance. On average, ENERGY STAR labeled buildings operate 35 percent more efficiently than typical buildings and pay 50 cents less per square foot in energy costs. These savings are not a one-time payback; instead, they continue over the course of several years and improve in value as energy prices increase.

Through the ENERGY STAR program, EPA delivers tools and resources to commercial and industrial partners to help them reduce energy use and provides recognition to partners for their energy efficiency efforts. One of the most useful resources is EPA's energy performance scale, which includes two components: Target Finder, an online tool that enables architects and building owners to set energy targets and receive an EPA energy performance score for projects during the design process, and Portfolio Manager, an interactive energy management tool that allows building owners and facilities managers to track and assess energy and water

consumption across an entire portfolio of buildings in a secure online environment. Target Finder and Portfolio Manager, both accessible at no cost on [www.energystar.gov](http://www.energystar.gov), are featured prominently in the most widely used green building certification systems.

For select building types, Target Finder and Portfolio Manager compare energy use targets of building designs and the energy use of operating buildings, respectively, to the energy use of similar existing buildings. These metrics are based on data from the Energy Information Administration's (EIA's) Commercial Building Energy Consumption Survey (CBECS), which collects information on U.S. buildings' square footage, hours of operation, number of occupants and other building characteristics every 4 years. The data for some select building types are then used to create average building energy usage, normalized across space type, regional climate, size, and occupancy. Weather normalization is available for all facilities and buildings. Both Portfolio Manager and Target Finder provide scores for 13 space types, data centers, offices, K-12 schools, hotels, supermarkets, hospitals, warehouses, residence halls, courthouses, medical offices, financial centers/banks, wastewater treatment plants, and houses of worship representing 60 percent of commercial square footage. Portfolio Manager collects and manages data on both ratable and non-ratable space types, including campuses of buildings without individual energy metering capabilities.

The scores on EPA's energy performance scale range from 1-100, with 1 equal to the least efficient and 100 to the most efficient. Building designs that earn an ENERGY STAR score of 75 or higher in Target Finder can achieve Designed to Earn the ENERGY STAR, and buildings that achieve a score of 75 or higher in Portfolio can earn the ENERGY STAR label.

### **Target Finder**

Target Finder enables architects to set energy use targets for their planned projects. Targets can be set for either percentage of energy use reduction or for a desired ENERGY STAR score, both of which are compared to the energy use of average buildings.

### **Portfolio Manager**

Portfolio Manager enables facility owners and property managers to measure and track their buildings' energy performance over time. Portfolio Manager is used for measuring the actual energy performance of existing buildings, and it uses the same scale as Target Finder, ensuring a seamless means to set energy use targets in the design phase and then measure the actual performance of constructed buildings to determine whether the targeted goals were achieved. Portfolio Manager requires users to enter at least 11 months of previous energy use data. Once the data are uploaded, Portfolio Manager delivers an ENERGY STAR score for eligible building types along with other metrics such as energy use intensity and greenhouse gas emissions.

### **ENERGY STAR in Green Building Rating Systems**

EPA's ENERGY STAR tools serve as the foundation for setting energy use targets, benchmarking the energy use of operating buildings and evaluating the effectiveness of energy efficiency measures for both new and existing buildings. Target Finder and Portfolio Manager are often the default tools for certification systems looking to set and pinpoint buildings' energy use.

### **Leadership in Energy and Environmental Design (LEED)**

Developed by the U.S. Green Building Council, LEED is an internationally recognized green building certification system. LEED provides third-party verification that a building or community is designed,

built, or operated using strategies aimed at improving performance across all the metrics that matter most: energy savings, water efficiency, carbon dioxide emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts. It provides building owners and operators with a concise framework for identifying and implementing practical and measurable green building design, construction, operations and maintenance solutions.

LEED is flexible enough to apply to all building types, commercial as well as residential. It works throughout the building lifecycle – design and construction, operations and maintenance, tenant fit out and significant retrofit. LEED currently has nine rating systems: New Construction; Existing Buildings: Operations & Maintenance (O&M); Commercial Interiors; Core & Shell; Schools; Retail; Healthcare; Homes; and Neighborhood Development. Its systems cover site planning, water and energy efficiency, material use, recycling and air quality and provide the ability to earn credit for innovative sustainable techniques. Core to some of the most crucial LEED credits is the energy tracking ability of EPA's Target Finder and Portfolio Manager.

LEED for New Construction uses Target Finder to establish requirements that all its aspiring buildings must meet. Credits may be earned in the Energy & Atmosphere category for increased energy performance; the Submittal Template also uses Target Finder as one of its compliance options and links directly to the Target Finder website. LEED for Schools uses Target Finder in the same way, linking from the Energy & Atmosphere prerequisite directly to Target Finder.

Similarly, LEED for Existing Buildings: O&M offers multiple credits via Portfolio Manager. The Energy & Atmosphere credits,

including those related to building commissioning, are simple and straightforward if the building already has an ENERGY STAR score. LEED for Existing Buildings: O&M doesn't just cull ENERGY STAR's energy data – the rating system uses Portfolio Manager's water use summary report for Water Efficiency credits, as well.

For more information about LEED, visit [usgbc.org/leed](http://usgbc.org/leed).

### Green Globes

Green Globes is a revolutionary green building guidance and assessment program that offers an effective, practical and affordable way to advance the overall environmental performance and sustainability of commercial buildings. Essential elements of the Green Globes system include:

- Comprehensive environmental assessment protocol
- Software tools that speed and simplify online assessment
- Best practices guidance for green construction and operations
- Qualified assessors with green building expertise
- Rating/certification system

Green Globes is an easily-accessible online tool, emphasizing energy and the introduction of carbon dioxide emissions metrics into building performance tracking. Like LEED, it benchmarks against ENERGY STAR. Energy efficiency is a significant portion of the points available in both the New Construction (NC) and Continual Improvement of Existing Buildings (CIEB) rating systems. The NC system requires that users enter their buildings' Target Finder data, and aims for an energy performance of 20, 30, 40, or 50 percent better than that of a similar building. The CIEB system's energy consumption questions are

identical to those in Portfolio Manager, and existing Portfolio Manager energy and water use data are offered via a direct link to the ENERGY STAR website.

For more information about Green Globes, visit [thegbi.org](http://thegbi.org).

### Collaborative for High Performance Schools (CHPS)

The mission of CHPS is to facilitate the design, construction and operation of high performance schools: environments that are not only energy and resource efficient, but are also healthy, comfortable and well lit, and contain the amenities for a high-quality education. Founded in 1999 as a partnership among California's major utilities to address energy efficiency in schools around the state, the program has spread to 11 states. To date, 46 U.S. schools have completed the CHPS program and 41 school districts with more than 1.5 million students enrolled have committed to building new schools or modernizing to the CHPS high performance standard, or using CHPS resources.

CHPS provides a six-volume Best Practices Manual, training sessions, conferences, and recognition to participating schools, within which EPA's energy performance tools are often mentioned and recommended. Individual states have begun to mandate additional prerequisites. The Colorado CHPS program (CO-CHPS) has developed an energy performance prerequisite that asks for its schools to "Establish an EPA Energy Performance Score goal of at least 75 using EPA's Target Finder rating tool." CHPS has also recently developed an Operations Report Card (ORC) that focuses on performance benchmarking for existing school buildings. In Energy Efficiency, one of the Report Card's five data collection categories, Portfolio Manager is used to access a school's efficiency data and provide an energy performance score.

For more information about CHPS, visit [chps.net](http://chps.net).

### Learn More

EPA offers a proven strategy for superior energy management with tools and resources to help each step of the way. Based on the successful practices of ENERGY STAR partners, these guidelines for energy management can assist your organization in improving its energy and financial performance while distinguishing your organization as an environmental leader. Both Target Finder and Portfolio Manager are accessible at no cost from the ENERGY STAR website. Visit [energystar.gov/buildings](http://energystar.gov/buildings) for energy management guidelines, tools and resources, training sessions and other information on taking the first steps toward superior energy efficiency. ■

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Kudret Ütebay, a bilingual Senior Associate at Cadmus, has more than 18 years of experience in the education, research, science (physics) and technology, and energy fields in Turkey and the United States. He currently serves as the Project Manager for Cadmus' contract with EPA's ENERGY STAR® for Commercial Buildings in the Public Sector. For the past 9 years, Mr. Ütebay has worked closely with K-12 school districts and all other public and private sector organizations to evaluate building energy performance using EPA's Portfolio Manager. Leveraging his programming skills, Kudret Ütebay has played an exceptional role in monitoring and analyzing energy consumption data for more than 10,000 public sector buildings. In recognition of his leadership in the K-12 sector in particular, Mr. Ütebay was appointed to the Green Schools Alliance Technical Advisory Committee in 2008.