

Greening Existing Buildings

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In the "green" arena, the big story is no longer that another newly constructed building has been rated gold or platinum - that's old news. Today, we *expect* new buildings to be designed and constructed to achieve a "green" designation. With fewer buildings being built, the focus has shifted to "greening" the nation's huge portfolio of existing buildings. In the Chicago Central Business District alone, this portfolio consists of more than 120 million square feet. So the real news today is that older, existing buildings - buildings like Chicago's FBI Building, the Merchandise Mart, and just recently, the Hyatt Center - are going green.

Existing buildings present many retrofit opportunities which will save energy and improve occupant comfort. Thus, building owners and operators are asking: 'What can be done to "green" existing buildings and just what do we mean when we say that our buildings are "green"?'

There are many definitions of what we mean when a building is described as being "green." The term "green" can refer to buildings which have received the U.S. EPA's ENERGY STAR label or have been certified under the Building Research Establishment Environmental Assessment Method (BREEAM). Most typically, however, people associate the term "green" with a building which has received LEED® (Leadership in Energy & Environmental Design) certification. While LEED is not the only way to designate that a building is "green," it is the most well-known building rating system.

LEED is the building rating system created by the U.S. Green Building Council (USGBC). USGBC is a Washington, DC, based, non-profit organization with a mission to transform the way buildings and communities are designed, built and operated. It seeks to assist in the creation of high-performance built environments which are more sustainable.

USGBC developed the LEED rating system, which the Green Building Certification Institute uses to verify that projects are designed and built using strategies intended to improve performance in areas such as energy savings, water efficiency, CO2 emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts. The LEED certification system is used throughout the nation and is now being used overseas as well.

Owners of existing buildings need to consider the requirements of LEED for Existing Buildings: Operations and Management Rating System (LEED EBOM).

LEED EBOM applies to existing commercial buildings, including offices, retail and service establishments; institutional buildings, including churches, schools, libraries and museums; hotels, and residential buildings

having four or more habitable stories. Consistent with its name, the focus of EBOM is on building Operations and Management.

In order to achieve LEED certification for an existing building, the owner must incorporate into that building environmentally sustainable operations. Under the USGBC's LEED EBOM program, building owners attain points for doing so. The points are totaled to provide the desired level of certification.

A building owner can garner points in seven different areas to total the amount necessary to achieve LEED Certified (at least 40 points), Silver (at least 50 points), Gold (at least 60 points) or Platinum (at least 80 points) status. Those areas are: Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources, Indoor Environmental Quality, Innovation in Operations and Regional Priority. Not surprisingly, the most recent revisions to LEED EBOM focus more intensively on energy, water efficiency and indoor environmental quality.

To achieve the lowest level LEED certification, or "LEED Certified," a building must obtain at least 40 points from these areas. To achieve "LEED Silver" "LEED Gold" and "LEED Platinum" a correspondingly higher number of points is required. Platinum status was just obtained by the Hyatt Center in Chicago.

The program provides numerous ways to achieve these points, many of which are described below:

Sustainable Sites:

In this area, an existing building can achieve points by arranging for alternative commuting to reduce the use of single occupant, conventionally powered and fueled vehicles. Ways to do this include installing bike racks or reserving parking spaces closer to the building for carpoolers and/or alternative fuel vehicles.

Other credits in the Sustainable Sites area can be achieved by controlling stormwater quantity (e.g. reusing runoff, using vegetated roofs or permeable pavements, etc.), by reducing the heat island effect on roofs by using solar reflective roofing material, by reducing light pollution (e.g. shielding exterior fixtures so that they do not directly emit light to the night sky).

Water Quality:

In the area of water quality, a building can achieve points by reducing the use of potable water: reduction of 10% gets a point, 15% gets 2 points, etc. Reduction can be achieved by using automatic controls, water-conserving indoor plumbing fixtures (e.g., dual flush toilets), and the like. Reduction is measured from a baseline established under LEED 2009 standards as fully explained in the LEED Reference Guide to Existing Buildings.

Energy and Atmosphere:

It is in this area that an existing building can obtain the most points and realize the most significant cost

savings. The primary method for achieving points is to comply with the U.S. EPA's ENERGY STAR program, if eligible, or with a similar standard established under USGBC's program.

In either scenario, a building must compare its energy use with those of its peers, by providing information about the size, location, number of occupants, number of PCs, etc. An estimate is made about how much energy the building would use if it were the best performing, the worst performing, and every level in between.

Under LEED, a building achieves a base point for scoring 71 on ENERGY STAR (demonstrating that its energy efficiency is better than 71% of similar buildings) and more points for higher scores. Ways to increase energy efficiency include retrofitting existing boilers and chillers, improving furnace efficiency, using energy efficient equipment such as office equipment, maintenance equipment and appliances.

Buildings can obtain points by using renewable energy options such as solar and wind. Developing an ongoing building commissioning program to address changes in facility occupancy, use, maintenance and repair, garners additional points.

Of course, the reductions in energy and water use must be demonstrated over performance periods, which generally must encompass at least the three months prior to certification. Moreover, LEED EBOM certified building owners must monitor and report energy use to the USGBC over the 5-year period during which their buildings are certified.

Materials and Resources:

It is a prerequisite in the area of Materials and Resources that a building develop a policy to reduce the generation of solid waste that is disposed of in landfills or incinerated – reuse and recycling of items, where possible, should be mandated. Sustainable purchasing (i.e., purchasing materials from renewable sources, from sources near the building site, containing recycled content, etc.) garners points for ongoing consumables, for O&M materials, for facility alterations and additions – for almost any material use conceivable.

Indoor Environmental Quality:

In this area, which is fundamental for occupant satisfaction, credits can be achieved in such ways as ensuring that ventilation systems maintain minimum outdoor airflow rates under all operating conditions, reducing particulates through air filtration, providing a high level of lighting system control by individual occupants or groups to promote their productivity, comfort and well-being, providing daylight and views to occupants, and monitoring occupants' thermal comfort.

Prerequisites in this category include, naturally, tobacco smoke control and establishing a written green cleaning policy.

Innovation in Operations and Regional Priority:

These last two categories provide opportunities for a building owner to garner a few additional points by creating an environmental benefit not addressed in LEED EBOM; for example, publicizing the "green" building features through an on-site education series or by exemplary performance in one of the existing categories. Regional priority credits, introduced by USGBC in 2009, are given if a building owner addresses a geographically meaningful environmental priority (e.g., water efficient landscaping is a priority in the West, while alternative commuting is a priority in urban settings). The USGBC maintains a database of regional priority credits.

The above examples are certainly not exhaustive, but they do provide some insight into the many different ways in which a building owner can "green" an existing building. Even if LEED status is not the desired result, implementing some of these strategies can lead to a more sustainable and more profitable building by reducing carbon emissions and lowering operating costs while enhancing property value.

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