

What is Green Building?

Green Building is the design and construction of buildings giving careful consideration to three main elements: healthy indoor environment, maximum energy efficiency and conservative, thoughtful use of natural resources.

Who says it's a green building? Is there a certification process?

There are several ways to denote a building's "greenness." In the US, and now world wide, green buildings are certified through an independent third party, the US Green Building Council's program, Leadership in Energy and Environmental Design (LEED®). For more information on LEED® and the USGBC visit <http://www.usgbc.org>

Under the LEED® certification program green building design focuses on five main categories

- 1) Sustainable Sites - The Sustainable Sites category encourages good stewardship of the land, taking care to minimize adverse project impacts on surrounding areas during and after construction. This category requires the building owner to consider appropriate site selection, urban redevelopment, and brownfield development. It also encourages the use of alternative transportation to the facility, reducing site disturbance, and storm water management. Credit is also given to projects that achieve a reduced heat island effect and reduce light pollution.
- 2) Water Efficiency - The Water Efficiency category encourages the thoughtful use of water. Credit is given to building and landscape designs that reduce the use of potable water for irrigation and waste water. Credit is given for a total reduction in potable water use through various water conservation strategies in the building.
- 3) Energy and Atmosphere - The Energy and Atmosphere category requires that the building undergo fundamental commissioning to insure that the building systems are operating in the way they were designed to operate. This category also requires that the building achieve a minimum energy performance, and that it eliminate the use of CFC-based (Chlorinated Fluorocarbon) refrigerants in new building heating, ventilating, air conditioning and refrigerating. Credit is given for projects that further optimize energy performance, use renewable energy generated onsite, and purchase green power from a utility company. Additional credits are given for more extensive commissioning and long term continuous measurement and verification of building performance.
- 4) Materials and Resources - The Materials and Resources category requires that collection and storage of recyclables is provided for in building design and operations. This category also encourages the use of recycled materials, locally manufactured environmentally responsible materials and certified wood. Credit is given to projects that can re-use a portion of the existing building on the site and to projects that implement a construction waste management plan.
- 5) Indoor Environmental Quality - The Indoor Environmental Quality category seeks to ensure that green buildings have optimal lighting, thermal comfort and healthy indoor air quality for their occupants. The category requires that the building meets a minimum IAQ performance standard, and controls environmental tobacco smoke. Credits are given for carbon dioxide monitoring, increased ventilation effectiveness, indoor air quality management during and after construction, the use of low emitting materials, coatings, paints and finishes and allowing occupants to control the systems in their personal workspace.

Why Build Green?

It makes sense.

Green Buildings increase the efficient use of energy, environmental, and human resources. Increases in efficiency directly translate into economic benefit and. Green Buildings incorporate practices that significantly reduce or eliminate adverse environmental impacts.

Making improvements to design when renovating or building new is most cost effective. A one-time investment premium of less than 1% of first costs can increase energy efficiency over standard building code practices by 20-30%.

Green Building – Surprising Facts:

- The US Department of Energy states that today's buildings consume more energy than any other sector of the U.S. economy, including transportation and industry.
- The EPA estimates that building-related illnesses account for \$60 billion of annual productivity lost nationwide.
- Green or High Performance Buildings typically lease or sell faster, and retain and attract tenants better because they combine superior amenity and comfort with lower occupancy costs and more competitive terms.*
- Energy and water efficient buildings reduce operating costs to less than half those of a traditional building by employing green design concepts.*
- Improved indoor environments can increase employee productivity by up to 16 percent.*
- Well integrated and comprehensive green building projects can result in lower or neutral incremental project development costs.*
- Studies indicate that Americans spend up to 90% of their day indoors. According to the US Environmental Protection Agency, air quality inside buildings is sometimes two to five times worse than outside air**

*LEED: *Good for Business, Good for the Environment* July 2000, *The Construction Specifier*

**US Environmental Protection Agency

More on the Economic Benefits of Energy Efficiency, Environmental Efficiency, and Human Efficiency

- Energy Efficiency
Using energy more efficiently
 - Saves operating costs on utility bills over the life of the building (30 Years)
 - Reduces the cost per unit on manufactured goods and services
 - Enhances resale and lease value of real estate
- Environmental Efficiency
Reducing environmental impact
 - Reduces waste materials and disposal costs,
 - Reduces water usage,
 - Reduces chemical use and disposal costs
 - Encourages recycling and reuse of materials
 - Develops local markets for locally produced materials- saves on transportation costs and develops economy-of-scale price reductions.

- Human Efficiency
 - Improving indoor environment, producing healthier places to work
 - increases productivity
 - reduces absenteeism
 - boosts morale and corporate loyalty
 - reduces employee turnover

- Green Buildings enjoy high profile notoriety and their developers enjoy the well-deserved public perception of goodwill toward employees and the community.

Costs of Going Green

Green buildings or buildings that meet the US Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED®) third party certification process, may be built with little increase in first costs. If green concepts are incorporated early in the design process, a certified green building may cost no more to build than a code compliant building.

Online reports available:

[Green Building Costs and Financial Benefits](#), by Gregory H. Kats

[Costing Green: A Comprehensive Cost Database and Budgeting Methodology](#), by Davis Langdon Adamson, Lisa Fay Matthiessen, and Peter Morris

Shades of Green

FSI provides green building services through the New Construction Program. Any level of green design is recognized and supported, therefore various “shades of green” can be considered for technical and green design assistance. Applicants can request assistance for new building or renovation projects when considering green building measures.

Incentives under the New Construction Program are energy performance based, therefore, some green measures may not qualify for incentives. However, green building assistance provided for green measures can be used to analyze energy savings, indoor air quality effects, appropriateness of the technology for LEED® certification, life cycle costs and other impacts.

Energy Efficiency

Technical assistance is provided through the New Construction Program to projects at the pre-design and design phase to determine energy efficiency measures that maximize operations savings.

A technical assistance report outlines energy efficiency measures that work best to reduce energy consumption and increase energy efficiency. The report also provides estimated energy savings as a basis for calculating New Construction Program incentives.

Results to date indicate that the energy efficiency of buildings studied can exceed the requirements of the New York State Energy Code by an average of 32%. In addition, peak demand reductions in these buildings have averaged 40%. With good planning and design this can be accomplished at an increase of less than 1% in construction cost, with a simple payback of 4.5 years.

Energy Modeling

Green buildings services include technical assistance to provide whole building energy modeling using appropriate modeling programs. Energy modeling provides a basis for energy efficiency claims when achieving compliance, and applying for LEED® certification or your building if available Green Building Tax Credit.

Links to Related topics

[Whole Building Design Guide](#)

[Energy Efficiency and Renewable Energy Network, Green Buildings](#)

Green Materials

The primary focus of the material analysis component of the Green Building Program is improved indoor air quality through the use of low-emitting materials. Clients may select products to be evaluated for their performance; installation and maintenance requirements; durability; reusability; and cost. Suggestions for alternative materials, as well as lists of suppliers and costs are also provided through green building technical assistance.

The US Green Building Council's rating program, LEED® (Leadership in Energy and Environmental Design), is used to assess the overall performance of the building.

Links to information:

Materials and Resources

<http://www.cdrecycling.org/>
<http://www.crbt.org>

Materials for Indoor Environmental Quality

<http://www.green seal.org>
<http://www.daylighting.org/>

Green Materials referenced in the NYS Green Building Tax Credit

<http://www.dec.ny.gov/energy/1540.html>

Green building Tips

<http://www.dec.ny.gov/energy/1538.html>

LEED® Certification

Leadership in Energy and Environmental Design program, LEED®, is the United States Green Building Council's (USGBC) third party green building certification program. FSI's green building services offer technical assistance in attaining the United States Green Building Council's LEED® green building certification.

A national non-profit organization, with funding from various organizations including the U.S. Department of Energy, the USGBC's purpose is to accelerate the implementation of green building policies, programs, technologies, standards and design practices.

Cost shared assistance is offered in meeting the requirements of LEED® on a point - by-point basis, and guidance is provided on credit achievement and USGBC submittal requirements.

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