



Understanding Energy

Energy Pyramid
Fact Sheet

Net Metering Fact Sheet

Off-Grid Living Fact Sheet

Green Building Fact Sheet

Understanding Your
Energy Consumption
Fact Sheet

Sources and Uses
Fact Sheet

Carbon and Energy
Fact Sheet

Importance Scale Survey

For more energy information, go to
<http://energy.tennessee.edu>.

Green Building Programs for High Performance & Energy Efficiency

When people look to buy or retrofit a home or other building, they consider purchase price (the first price tag), number of rooms, the floor plan, and the overall “look.” An increasing number of buyers are also considering the “second price tag” that addresses the operation and maintenance of a building. They are asking questions about energy and water bills, maintenance and durability, indoor air quality, and comfort. In other words, how will the building perform?

If you see the value of both price tags and want to build or buy a better home or building that is “above code,” review the programs listed. Their guidelines take an integrated, whole-systems approach and address the energy and natural resources required to build, operate, and maintain buildings. They recognize the impact buildings have on the environment and the pocketbook.

The U.S. Green Building Council’s Leadership in Energy and Environmental Design (LEED) Program



The LEED Program (www.usgbc.org/LEED) promotes green building design, construction, operations and maintenance strategies for homes, institutions, and commercial and industrial buildings. It also promotes sustainable building interiors and neighborhoods. The program considers performance in the following categories: Site Selection; Water Efficiency; Materials & Resources; Energy & Atmosphere; Indoor Environmental Quality; Location & Linkages; Awareness & Education; and Innovation. Points are earned in each category leading to four possible levels of certification.

Homes

- **Existing Homes:** LEED currently does not address existing homes.
- **New Homes:** LEED for Homes houses maximize fresh air, minimize airborne toxins and pollutants, and have the potential to use 20-30 percent less energy (some up to 60 percent less) than a home built to the International Energy Code Council’s (IECC) 2006 code. <http://greenhomeguide.com/program/leed-for-homes>



Farm Buildings

- **Existing Buildings:** The LEED for *Existing Buildings: Operation and Maintenance* program helps building owners/operators measure operations, improvements, and maintenance, to maximize operational efficiency and minimize environmental impacts. It addresses whole-building cleaning and maintenance issues (including chemical use), recycling programs, exterior maintenance programs, and systems upgrades.
- **New Buildings:** the *New Construction and Major Renovations* program is primarily for office buildings, but its strategies have been applied to many other building types.

The National Association of Home Builders (NAHB) National Green Building Standard

NAHB's National Green Building Standard (www.nahbgreen.org) is for single and multifamily homes, home remodels, and site development projects. The program considers performance in the following categories: Lot Design, Preparation and Development; Resource Efficiency; Energy Efficiency; Water Efficiency; Indoor Environmental Quality; and Operation, Maintenance, and Owner Education. Points are earned for four possible certification levels.



Earth Advantage Institute

The Earth Advantage Institute's program (www.earthadvantage.org) includes new and existing homes and is currently developing a program for commercial buildings. Program categories: Energy, Water, Health, Land, and Materials.



Environments for Living

ENVIRONMENTS FOR *Living*

The Environments for Living Certified Green program (www.environmentsforliving.com) addresses Energy Efficiency, Durability, Indoor Air Quality, and Water Efficiency for three possible certification levels.

U.S. Environmental Protection Agency's (EPA) Energy Star Program



The EPA's Energy Star Program (www.energystar.gov) is an energy efficiency based program for new and existing homes and commercial/industrial buildings.

Homes

- **Existing Homes:** Provides information on how you or a contractor can improve your home's energy efficiency. Addresses how to conduct an assessment, sealing and insulating, and how to heat and cool efficiently.
- **New Homes:** Provides guidelines for building a home that will be 15 percent more energy efficient than a home built to the 2004 International Residential Code (IRC), and 20-30 percent more energy efficient than a standard home. Addresses efficient insulation, high-performance windows, tight construction and ductwork, efficient heating and cooling equipment, and Energy Star-qualified lighting and appliances.

Farm Buildings

- **Existing Buildings:** The "Building and Plants" section provides a link to a "Building Upgrade Manual" (http://www.energystar.gov/ia/business/EPA_BUM_Full.pdf) that provides tips on lighting, supply load reduction, air distribution, and heating and cooling equipment upgrades.
- **New Buildings:** provides information on how to make informed decisions about energy efficiency during the design process.

The Passive House Institute, U.S. (PHIUS)



PHIUS (www.passivehouse.us) has developed one of the highest building energy standards that can be applied to new construction and retrofits of homes, institutions, and commercial buildings. The standard saves up to 90 percent of space heating costs. A PHIUS-certified building is very well-insulated, virtually air-tight, and primarily heated by passive solar gain and internal heat gain from people, appliances, equipment, etc. Energy losses are minimized through air-tight construction and few if any thermal bridges. Any remaining heat demand is provided by an extremely small source. Summer heat gain is avoided through shading and window orientation eliminating or reducing the need for air conditioning. A heat or energy recovery ventilator provides a constant and balanced fresh air supply.

Every program listed entails either a point-based rating system and/or computer verification tool. Neutral, third-party certification (on-site inspections and testing, etc.) is required to ensure quality and high performance.

State and Local Programs

The listed programs may have state or local chapters with websites that provide contact information of trained and certified individuals and companies that can help design, build, remodel and certify your high-performance building.

- Energy Star Contractors and Builders: <http://www.energystar.gov/index>
- East Tennessee U.S. Green Building Council: <http://etnugbc.org>
- Middle Tennessee U.S. Green Building Council: <http://usgbcmidtn.com>
- Memphis Regional U.S. Green Building Council: <http://usgbcmemphis.org>

Renewable Energy Design Strategies

Most of the listed programs provide certification points for renewable energy design strategies and considerations:

- Passive Solar Design: www.nrel.gov/docs/fy01osti/27954.pdf
- Solar Ready Design: www.nrel.gov/docs/fy10osti/46078.pdf
- Net Zero Energy Buildings: www.nrel.gov/sustainable_nrel/pdfs/44586.pdf; <http://zeb.buildinggreen.com/>

Incentives

- An Energy Efficient Mortgage (EEM) credits a home's energy efficiency in the mortgage itself. www.energystar.gov/index.cfm?c=mortgages.energy_efficient_mortgages
- The DSIRE website (www.dsireusa.org) provides up-to-date information on utility and government incentives available for energy efficiency projects.

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Programs in agriculture and natural resources, 4-H youth development, family and consumer sciences, and resource development. University of Tennessee Institute of Agriculture, U.S. Department of Agriculture and county governments cooperating. UT Extension provides equal opportunities in programs and employment.