To what sustainable design standard(s) do your projects typically adhere?


The LEED Green Building Rating System™ designed by the U.S. Green Building Council advances energy and material efficiency and sustainability for New Construction (LEED-NC) and for Existing Buildings (LEED-EB).

**The Leadership in Energy and Environmental Design (LEED) Green Building Rating System**, developed by the U.S. Green Building Council (USGBC), provides a suite of standards for environmentally sustainable construction. Since its inception in 1998, LEED has grown to encompass over 6,000 projects in 28 countries covering 1 billion square feet of development area. The hallmark of LEED is that it is an open and transparent process where the technical criteria proposed by the LEED committees are publicly reviewed for approval by the more than 8,500 membership organizations that currently comprise the USGBC.


The BREEAM family of assessment methods and tools are all designed to help construction professionals understand and mitigate the environmental impacts of the developments they design and build.

**Comprehensive Assessment System for Building Environmental Efficiency (CASBEE) World Green Building Council (WGBC)** - [http://www.ibec.or.jp/CASBEE/english/index.htm](http://www.ibec.or.jp/CASBEE/english/index.htm)

Promoting sustainability is a major social challenge.

As the building industry consumes large amounts of material resources and energy, specific technological and political means should be developed in order to promote sustainable buildings.

To be nationally authorized in Japan, a cooperative academic, industrial and governmental project has been to establish a new system called the Comprehensive Assessment System for Building Environmental Efficiency (CASBEE).

As the trend towards sustainable buildings became widespread in the 1980s and 1990s, many environmental assessment systems for buildings have captured considerable attention worldwide.

These assessment systems include BREEAM(Building Research Establishment Environmental Assessment Method), LEED (Leadership in Energy and Environment Design), and GB (Green Building) Tool etc.

These systems were developed to promote sustainable building through the market mechanism.
Along with disclosure of the assessment result, implementation of environmental assessments focusing on sustainability of buildings is needed to promote incentives for building owners, designers and users to develop high-quality sustainable buildings.

From this point of view, CASBEE is intended for implementation of the environmental assessment based on new concepts including BEE (Building Environmental Efficiency).

**Energy Passport**

http://www.eere.energy.gov/buildings/tools_directory/software.cfm/ID=253/pagename=alpha_list

Correlation-based evaluation tool that enables heating needs in residential buildings to be assessed. It has been developed in the framework of the PASSYS project of the European Commission DG XII. The PASSPORT tool has close links to a preliminary European Standard for calculating energy requirements for heating in residential buildings, because the PASSYS project and a working group of the European Standardisation Committee (CEN TC 89 WG4), having similar concerns, have worked in close collaboration. A choice is offered to the user of PASSPORT: either to follow strictly the CEN Standard or to call upon some features, intended to improve the accuracy of the results (especially in the case of passive solar buildings), but not retained by CEN for implication reasons.

The method is based on a steady-state energy balance for the building zone, with an allowance for external temperature variations and a utilisation factor taking account of the dynamic effect of internal and solar gains. The main improvements in comparison with previous simplified methods are listed below. The gain utilisation factor is given as a function of the gain to load ratio (GLR) and an inertia parameter t (time constant of the building or of the zone). The method treats separately two phenomena associated with intermittent heating: decreased losses due to lower inside temperatures and reduction in of the utilised gains to take account of periods when the building is not heated. Two intermittency factors are obtained from formulae taking account of the heating pattern and the time constant of the building. To deal with multi-zone passive solar buildings, uniform temperature zones are defined; then the calculation method is applied to each zone. To take account of the interaction between the zones, an interactive procedure is used to solve the heat balance for all zones.
Green Building Evaluation Standard -

This list contains links to Internet resource sites collected by USGBC staff and members to facilitate green building research. This list is not exhaustive and will remain a work in progress. The USGBC would like to express special thanks to Elizabeth Cordero, green design consultant, for her contributions to this directory.

Please note that the USGBC may not be held liable for the contents of the referenced Web sites nor the inclusion and/or omission of Web sites in this list.

Table of Contents

Associations and Non-Profit Organizations
Building Codes and Standards
Building Materials, Guides and Certification
Case Studies
Campus Initiatives
Commissioning and Post-Occupancy Evaluation
Design and Simulation Tools
Design Resources
Economics
Energy
Funding
Government Initiatives & Guidelines
Life Cycle Analysis and Costing
Media
Rating Systems
Research Centers
Sustainability/Miscellaneous
Categories

Associations and Non-Profit Organizations

American Indoor Air Quality Council
American Institute of Architecture Committee on the Environment (COTE)
American Solar Energy Society
Architects, Designers and Planners for Social Responsibility (ADPSR)
Better Bricks (productivity)
Boston Area Solar Energy Association
Boston Building Materials Co-op (BBMC)
Boston Building Materials Resource Center (BMRC)
Building Concerns
Business for Social Responsibility (BSR)
Canada Green Building Council
Climate Action Network (CAN)
Community Greenhouse Foundation
Congress for the New Urbanism
Construction Materials Recycling Association
Development Center for Appropriate Technology
Education Design Showcase
Ecological Design Institute (EDI)
Environmental Defense
Florida Green Building Coalition
Global Environmental Options (GEO)
Global Green USA
Green Building Alliance (Pittsburgh)
Green Building Council Australia
Green Building Council Korea
Green Building Information Council (GBIC), Canada
Green Round Table: Sustainable Architecture and Design
Green Pages (Canada)
Healthy House Institute (HHI)
Hong Kong Professional Green Building Council
Institute of Brownfield Professionals
Japan Green Building Council
Metropolitan Partnership for Energy
Mexico Green Building Council
National Association of State Energy Officials (NASEO)
National Environmental Trust
National Pollution Prevention Center for Higher Education (NPPC)
Natural Resources Defense Council
Natural Step (US)
New Urban Guild
North East Sustainable Energy Association- NESEA
NW Energy Efficiency Alliance
Second Nature
Society of Building Science Educators
Soil and Water Conservation Society (SWCS)
Solar Living Institute
Sustainable Buildings Industry Council (SBIC)
Sustainable Energy Coalition
Urban Ecology
Used Building Materials Association (UBMA)
Wisconsin Green Building Alliance (WGBA)
World Green Building Council

Codes and Standards

American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)
American Society for Testing and Materials (ASTM)
Building Codes Assistance Project
Center of Excellence for Sustainable Development - codes compilation
Development Center for Appropriate Technology - codes
GreenSpec
International Code Council
International Organization for Standardization
U.S. DOE BTS - Codes and Standards program

Materials, Guides and Certification

Advanced Buildings
Building Materials Resource Center
Building for Environmental and Economic Sustainability (BEES 2.0)
Certified Forest Products Council
Center for Resourceful Building Technology
CIWMB Recycled Content Product Database
Concrete Network
Construction Materials Recycling Association
EnCompass - Map of Recycled Content Buildings
Environmental Design + Construction magazine
Environmental Resource Guide - American Institute of Architects
Find Green
Forest World - Sustainable Forest Products Resource
Good to be Green
GreenGuard (interior products emissions testing)
Green Building Databases & Design Resources
Green Building Pages, Inc.
Greenroofs.com
Green Sage
Green Seal
GreenSpec, from Environmental Building News
NY Wa$teMatch Materials Exchange: Building Materials Reuse Calculator
oikos - Green Building Source
Partnership for Advancing Technology in Housing
Sustainable Design Resource Guid
Sustainable Products Corporation
Used Building Materials Association (UBMA)
U.S. EPA Environmentally Preferable Purchasing

Product Certification and Testing
American Society for Testing and Materials (ASTM)
Certified Forest Products Council
Forest Stewardship Council (in U.S., with international links)
GreenGuard
Green Seal
Scientific Certification Systems

Case Studies
901 Cherry in San Bruno, California
Adam J. Lewis Center for Environmental Studies
AIA COTE 2001 Top Ten Green Projects
Audubon House: Building for an environmental future
Bachelor Enlisted Quarters, Great Lakes Naval Training Center
Barney-Davis Green Renovation - Denison University
Beddington Zero Energy Development (BedZED)
Better Bricks (productivity)
Big Horn Home Improvement Center - Silverthorne, CO
BRE Environmental Building at Garston
BTS House of Straw
Civano - Tucson, AZ
CIWMB case studies
C. K. Choi Building, Institute of Asian Research, University of British Columbia, Canada
Cobb Hill Cohousing - Vermont
Daylighting and Productivity Study by Heschong Mahone Group
Desert House, Phoenix, Arizona
Earth General
Earthship
Ecology House - evaluation report
Ecovillage
Energy & Environmental Building Association - success stories
enCompass - map of recycled-content buildings
GreenHOME
Green Building Alliance - Pittsburgh case studies
The Greening of the White House
Innovative Design Inc. - daylighting in schools
International Case Study compilation - Hong Kong University Architecture
King County, WA - Sustainable Building program case studies
MIT Building Technology - Sustainable Urban Housing in China
NESEA - Northeast Green Building Awards
NEXT 21 (Osaka Gas Experimental Housing)
Northland College - McLean Environmental Living and Learning Center
NREL High Performance Buildings Research Projects
OIKOS case study compilation
Pennsylvania Cable and Telecommunications Association
Pennsylvania Cambria Office - Department of Environmental Protection
Pennsylvania’s First Green Building: DEP’s Southcentral Regional Office Building
Property2us article: High Rise Apartment Building in Battery Park City
Research Institute of Innovative Technology for the Earth (RITE) office
Rocky Mountain Institute - Green Development Case Studies
San Diego Environmental Services' Ridgehaven building
Smart Growth Network - eco-industrial parks and other case studies
Takenaka Corporation - Environmentally Responsible Projects
Takenaka Corporation - University buildings
Ten Shades of Green
Thoreau Center for Sustainability, San Francisco
UNEP International Environmental Center
The Universal Design Living Laboratory
U.S. DOE - CESD’s Green Building Success Stories (compilation)
U.S. EPA - Leading by Example (EPA buildings)
Village Homes - a green-built community in Davis, CA
Vital Signs Case Studies
William McDonough + Partners Projects
Zion Canyon Visitor and Transportation Center, NREL

Campus Initiatives
Arizona State University
Ball State University
Blueprint for a Green Campus
Bowdoin College
Brown is Green
California Polytechnic State University
Carnegie Mellon University
Clemson University
Connecticut College
CSU, Monterey Bay – Greening of the Campus
Dartmouth College
Duke University
Emory University
Environmental Education and Campus Greening
FGCU Green Building Project
Community Design
Georgia Institute of Technology
Harvard Green Campus Issues
Lewis and Clark College
Massachusetts Institute of Technology
Michigan Technological University’s Sustainable Futures Institute
Middlebury College – Guiding Principles
Northwestern University
Omaha Metropolitan Community College
Pitzer College
Pomona College
Princeton University
Santa Clara University
State University of New York (SUNY)
Sustainable Development on Campus [IISD]
University at Buffalo - Green Office
University of California - Berkeley, Green Design/Sustainable Architecture
Information Sources
University of Cincinnati
University of Florida
University of Oregon
University of Michigan, Sustainable Architecture
University of South Carolina
University of Vermont - Building a Green Campus
University of Washington – Facility Design Information Manual

Commissioning and Post-Occupancy Evaluation
Portland Energy Conservation Inc. - Commissioning Resources
Post Occupancy Evaluation
Methodological Approach

Design and Simulation Tools
Building Design Advisor
Building Energy Simulation Tools
Energy Design Tools
Environmental Support Solutions
EQUER (France)
Green Building Advisor
Green Buildings [Center of Excellence for Sustainable Development]
Interactive Tools Survey [University of Weimar, Germany]
International Association for Impact Assessments (IAIA)
Introduction to OTTV and Simulation Tools
Whole Building Design Guide

Design Resources
Architectural Resource Collaborative (ARC)
Architecture and Building
Earthship Architecture
EBN
Environmental Resource Guide - American Institute of Architects
Environmental Sustainable Architecture
Field Guide to Sustainable Construction
Green Building Pages, Inc.
Green Building Primer
greendesign.net - Green Building Resource Center
Green Design Sustainable Architecture
The Hannover Principles
LISA (LCA in Sustainable Architecture)
Natural Ventilation - A strategy for sustainability [MIT]
Sustainable Architecture
Sustainable Architecture Building and Culture
Sustainable Architecture Resource
Sustainable Building Resource
Sustainable Building Sourcebook
Sustainable Design Resource Guide - Denver AIA COTE

Economics
Green Economics Website
Natural Capitalism

**Energy**

- Alliance to Save Energy
- Better Bricks (productivity)
- Center for Renewable Energy & Sustainable Technology (CREST)
- The Energy Foundation
- Renewable Energy Policy Project
- State Energy Offices (U.S.)
- Sustainable Energy Coalition
- U.S. DOE Energy Efficiency and Renewable Energy Network (EREN)
- U.S. DOE and U.S. EPA -- Energy Star program
- U.S. Department of Energy Library
- U.S. Department of Energy - EnergyFiles
- U.S. National Energy Policy
- U.S. National Renewable Energy Laboratory
- World Bank energy projects

**Funding**

- Bridgemer: Funding and Investing in Green Buildings
- Center of Excellence for Sustainable Development - funding sources
  - Funding Green Buildings
  - Kresge Foundation
  - State Energy Offices (U.S.)
  - Tax Incentives Assistance Project (TIAP)

**Government Initiatives & Guidelines**

**National/International Government**

- Federal Energy Management Program - Greening Initiatives/Tools
- Federal Greening Toolkit
- Field Guide to Sustainable Construction
- Greening Federal Facilities
- National Renewable Energy Laboratory
- OECD Project on Sustainable Buildings
- U.S. Air Force Environmentally Responsible Facilities Guide
U.S. Air Force – Green Base of the Future
U.S. DOE Center of Excellence for Sustainable Development
U.S. DOE Energy Efficiency and Renewable Energy Network (EREN)
U.S. DOE and U.S. EPA -- Energy Star program
U.S. DOE High Performance Commercial Buildings: A Technology Roadmap
U.S. DOE Low Life-Cycle-Cost Air Conditioner Program
U.S. DOE Office of Building Technology, State and Community Programs
U.S. DOE Rebuild America - Schools and Commercial Buildings
U.S. EPA’s Environmentally Preferable Purchasing (EPP)
U.S. GSA Sustainable Design and LEED
U.S. GSA - Great Lakes Region - Build Green
U.S. National Park Service - Guiding Principles of Sustainable Design
U.S. Naval Facilities Engineering Command - design policy
Whole Building Design Guide

**State/Provincial Government**

British Columbia Buildings Corporation-Green Buildings BC
California Integrated Waste Management Board - Green Building Program
California High Performance Schools (CHPS)
Florida Sustainable Communities and e-design
Maryland Green Building Program
Minnesota Sustainable Design Guide
New Jersey Clean Energy Program - design support incentive
New York State Energy Research & Development Authority (NYSERDA)
New York State Green Building Tax Incentive Initiative
Oregon Office of Energy
Oregon Housing and Community Services
Pennsylvania Buildings - Governor's Green Government Council

**Local Government**

Alameda County, CA, Waste Authority - Green Building programs
Arlington County, VA - Green Building Incentive
Austin, TX, Green Building Program
Battery Park City Authority, NYC - High-Rise Residential Green Guidelines
Boulder, Colorado - Green Points Program
Cambridge Sustainable City
Coconino County, Arizona - Sustainable Economic Development Initiative
Hennepin County, MN - Sustainable Design Guide and Rating System
ICMA - Green Building Goes Local (article)
Issaquah, WA - Sustainable Building
King County, WA - Green Building Program
Kitsap County, WA - Build a Better Kitsap
Los Angeles, CA - Green Building Guidelines
Miami-Dade County, FL - Green Coalition
New York City High Performance Building Guidelines
Oakland, CA - Green Building Resource Center
Philadelphia, PA – Schools: Save Energy Campaign
Portland, OR - Green Rated
Portland, OR - Office of Sustainable Development
San Francisco, CA - Green Building Program
San Jose, CA - Green Building Program
Santa Barbara, CA - Innovative Building Design initiative
Santa Monica Green Building Guidelines & Ordinances
Scottsdale, AZ, Green Building Program
Seattle City Light - Built Smart program
Seattle Sustainable Building
Triangle J Council of Governments - High Performance Building Guidelines
Washington, DC - Metropolitan DC Council of Governments

Life Cycle Analysis and Costing
Activity-Based Management
ATHENA Sustainable Materials Institute
BEES (Building for Environmental and Economic Sustainability) [NIST]
BuildingGreen.com
Buildings and Life-Cycle Costing [Canadian Building Digest]
Carnegie Mellon – Green Design Initiative (GDI)
Comparing the Environmental Effects of Building Systems [Canadian Wood Council]
Eco-Quantum (Netherlands)
ENVEST (environmental impact estimating design software) [UK BRE]
LCAid (Australia)
Life Cycle Analysis for Residential Buildings [Canadian Wood Council]
Life Cycle Costing and Stainless Steel - ASSDA
LISA (LCA in Sustainable Architecture)

Media
Colorado Green Business
Environmental Building News
Environmental Design + Construction Magazine
Environmental News Network
HGTV
http://www.greenatworkmag.com/

Rating Systems
Alameda County, CA, Multifamily Green Building Guidelines
Austin, Texas, Green Building Program
Bepac – British Columbia
Breeam – UK
Breeam Office 1998 – Canada
British Columbia University – Facilities Branch Environmental Guidelines
Built Green Colorado
EarthCraft HouseTM
Scottsdale, Arizona, Green Building Program
U.S. Green Building Council – LEEDTM

Research Centers
Carnegie Mellon University Center for Building Performance and Diagnostics
Center for Energy Efficiency & Renewable Technologies (CEERT)
Center of Excellence for Sustainable Development (CESD), USDOE
Center for Maximum Potential Building Systems (CMPBS)
Center for Resourceful Building Technology (CRBT)
Center for Sustainable Systems - Environmental Energy Technologies Division
Centre for Sustainable Design
FICUS-Florida Internet Center for Understanding Sustainability
Green Resource Center, Berkeley
Hong Kong University - Building Energy Efficiency Research
Lawrence Berkeley National Laboratory-Building Technologies Dept.
Michigan Technological University’s Sustainable Futures Institute
MIT Building Technology Group
National Renewable Energy Laboratory
Oak Ridge National Laboratory-Buildings Technology Center
Pacific Energy Center
Renewable Resource Data Center
Rocky Mountain Institute (RMI)
Sandia National Laboratories Renewable Energy Office
Simulation Research Group
Sustainability Research Profiles [Second Nature]
The Vital Signs Project

**Sustainability/Miscellaneous**

**Agenda 21**
- Agenda 21 and other UNCED agreements
- Agenda 21 and Sustainable Development
- Agenda 21 - National Information

**Ecosystem**
- Complexity and Connectivity in Ecosystems
- Ecosystem Valuation
- Revisiting Carrying Capacity: Area-Based Indicators of Sustainability
- What is an Ecological Footprint?

**Sustainability**
- Applying Sustainable Development
- Center for Renewable Energy and Sustainable Technology
- Consulting the Public Interest
- Ecosustainable - Sustainable Environment
- Environment & Sustainable Living
- The Florida Center for Understanding Sustainability
- Global Warming Articles
- Indicators of Sustainability Training Course
- Institute of Energy and Sustainable Design
Interagency Working Group on Sustainable Development Indicators
Intergovernmental Panel on Climate Change (IPCC)
National Centre for Sustainability (NCFS)
Organisation for Economic Co-Operation and Development
President's Council on Sustainable Development (U.S.) - publications
Sources of Sustainability
Sustainable Development Gateway
Sustainable Energy Authority of Victoria, Australia
Sustainable Measures
Sustainable USA
The Natural Step
The Sustainability Report
Towards Sustainability
United Nations Environment Programme
United Nations Sustainable Development Programme
U.S. House of Representatives' Livable Community Task Force
U.S. House of Representatives' Sustainable Development Caucus
World Bank
Wuppertal Institute for Climate, Environment and Energy

**Urban Sustainability**

Congress for the New Urbanism
European Union's Database on Good Practice in Urban Management and Sustainability
Florida Internet Center for Understanding Sustainability (FICUS)
Global Development Research Center - Virtual Library on Urban Environmental Management
Green Communities Assistance Kit
Livable Communities
New Urbanism
Smart Growth Network
SURBAN (database on sustainable urban development in Europe)
Sustainable Communities Resource Package (SCRP)
Sustainable Urban Design and Climate
Green Globes - http://www.thegbi.org/greenglobes/history.asp

The Green Globes™ system

It's like having a 24-hour sustainability design consultant online.

The Green Globes system is a revolutionary green management tool that includes an assessment protocol, rating system and guide for integrating environmentally friendly design into commercial buildings. Once complete, it also facilitates recognition of the project through third-party verification. It's an interactive, flexible and affordable approach to environmental design.

The Green Globes environmental assessment and rating system represents more than nine years of research and refinement by a wide range of prominent international organizations and experts.

The genesis of the system was the Building Research Establishment's Environmental Assessment Method (BREEAM), which was brought to Canada in 1996 in cooperation with ECD Energy and Environment. Pioneers of this project included Jiri Skopek, John Doggart and Roger Baldwin, who were the principal authors of the BREEAM Canada document.

Green Star - http://www.greenstarinc.org/

Green Star® is a non-profit organization that encourages businesses to practice waste reduction, energy conservation and pollution prevention. After meeting specific standards, organizations are eligible for the Green Star Award, for general waste reduction, or the Air Quality Award, for reduced air pollution.

The Green Star Award is the original award on which the Green Star program was based. It is given to businesses, organizations, schools, and agencies that demonstrate a strong environmental and business ethic by implementing the eight Green Star Standards. These Standards encourage waste reduction within several media, as well as education and outreach. Examples of Standards topics include recycling, waste prevention, improved purchasing, outreach to other organizations, education of employees, reduction of toxic materials, water conservation, and energy efficiency.

National Association of Home Builders (NAHB) - http://www.nahb.org/

NAHB is a Washington, D.C.-based trade association whose mission is to enhance the climate for housing and the building industry. Chief among NAHB’s goals is providing and expanding opportunities for all consumers to have safe, decent and affordable housing. As “the voice of America’s housing industry,” NAHB helps promote policies that will keep housing a national priority.
**United Nations Environment Programme (UNEP)** -
http://www.unep.ch/

To provide leadership and encourage partnership in caring for the environment by inspiring, informing, and enabling nations and peoples to improve their quality of life without compromising that of future generations.

**The Energy Programme**
Addresses the environmental consequences of energy production and use, such as global climate change and local air pollution. UNEP Energy is concerned with renewable energy, energy efficiency, transport, energy finance, and policy issues.

**World Green Building Council (WGBC)**

**Vision**
The World Green Building Council (WorldGBC) will be the peak global not-for-profit organisation working to transform the property industry towards sustainability through its members - national Green Building Councils.

**Mission**
The WorldGBC provides a federation "union" of national Green Building Councils whose common goal is the sustainable transformation of the global property industry. The WorldGBC shall:

- establish common principals for Green Building Councils;
- serve as a global voice on behalf of Green Building councils;
- support and promote individual Green Building Councils;
- establish a clearing for "knowledge" transfer between Green Building Councils;
- encourage development of market based environmental rating systems;
- recognise global green building leadership.

**Objectives**
The longer term objectives of the WorldGBC is to:

- create a global market for green building through the creation of successful national Green Building Councils;
- be the peak global voice for global green building issues;
- represent no less than 60% of the global property industry through countries with Green Building Councils;
- have a dynamic web presence that serves as the preeminent portal for global green building news;
- have collaborative relationships with all other complimentary global organisations.
What is your familiarity with the following analysis software?
IES - VE
Green Building Studio
EnergyPlus
Design Builder
Archipysik
EQuestTas
Tas
TRACE
TRNSYS Carmelsoft