

	Creator		Age of System	No. Bldgs Certified	Basis for Development	Brief Description (9)	Building Types	Outstanding Attributes	Driver Towards HPB	
<b>Major Environmental Rating Systems Based on Whole Building Analysis</b>										
US	LEED Leadership in Energy and Environmental Design usgbc.org	USGBC United States Green Building Council	GBCI Green Building Certification Institute	2001	3,855	Original	LEED is an internationally recognized green building certification system, providing third-party verification that a building or community was designed and built using strategies aimed at improving performance across all the metrics that matter most: energy savings, water efficiency, CO2 emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts.	NC, EB, O&M, CI, Schools, Retail, ND, Healthcare	Sustainable Sites, Water, Energy, Materials & Resources, Indoor Environmental Quality, Regional Design	ASHRAE 90.1-2007 Standards Minimum Req'ts - 10% improvement over baseline Add'l points to 48% improvement (19 of 100 pts)
	Green Globes greenglobes.com	GBI Green Buildings Initiative	ANSI American National Standards Institute	2000		BREEAM, Green Globes Canada	The ratings system is based on online questionnaires in seven categories: project management—policies and practices; site; energy; water; resources, building materials, and solid waste; emissions and effluents; and indoor environment. Assessments must be verified by a third party to receive a Green Globes rating, which range from one to four Globes based on the number of total points achieved. <sup>1</sup>	NC, EB All	Adds: LCA, Project Management, Space Optimization, Acoustic Control, Microclimate Analysis, Education	Energy Target Minimum performance: Achieve levels of performance better than that of a building meeting the 75% target defined by comparison with similar buildings by CBECs. 5-19% performance improvements over the 75% EPA target receive add'l points.
	LBC Living Building Challenge ilbi.org	International Living Building Institute	Cascadia Region Green Building Council	2006	None 60*	Original	The program is designed to challenge builders, owners, architects, engineers, and design professionals to build environmentally sound and self-sustaining buildings. There are requirements living buildings need in order to meet the challenge. Three of these are that the building shall: A) It generates all of its own energy with renewable resources, B) It captures and treats all of its water on site and C) It uses resources efficiently and for maximum beauty.	NC All	Adds: Biophilia, Civilized Environment, Material Red List, Embodied Carbon Footprint, Human Scale & Humane Places, Democracy & Social Justice, Rights to Nature, Beauty & Spirit, Education	Zero Impact Targets Energy, Water & Carbon *Registered have access to an approved carbon calculator.
	Earth Advantage® Commercial Program www.earthadvantage.com	EAI Earth Advantage Institute	Energy Trust of Oregon & New Buildings Institute	2010	New	LEED	Established with the vision of bringing an affordable, alternative green rating system to the market by providing a tool kit comprised of prescriptive measures that will maximize cost effectiveness and environmental benefit.	NC, EB Small Commercial (≤ 50,000 sf)	Energy, Water, Health, Land and Materials	Prescriptive approach
International	BREEAM Building Research Establishment's Environmental Assessment Method http://www.breeam.org/	UK		1990	about 4,000	Original	BREEAM was developed in 1990 by the British Research Establishment and is the benchmark for assessing building performance in the U.K. Over 900 buildings worldwide have been assessed with BREEAM, making it the most widely used international method for evaluating buildings. It assesses the environmental impacts of management; health and well-being; energy; transport; water; materials and waste; land-use and ecology; and pollution, and assigns points providing ratings of pass, good, very good, or excellent. Green Globes (see above) was adapted from BREEAM in Canada before making its way to the U.S. <sup>1</sup>	All	BREEAM International uses local guidance, regulations, climatic distinctiveness and environmental priorities. Overall standards may be slightly more stringent than those for LEED. (6)	
	CASBEE Comprehensive Assessment System for Building Environmental Efficiency www.ibec.or.jp/CASBEE/english/index.htm	Japan		2001	about 100	Original	Developed in Japan but available in English, CASBEE is a fairly new system that is not well-known in the U.S. CASBEE assesses energy efficiency; resource efficiency; local environment; and indoor environment. For each of these four target fields, the improvements to the quality of the enclosed space (the private property) and the negative aspects of the environmental impact which go beyond the enclosed space (the public property) are evaluated. <sup>1</sup>	NC, EB	Adds: LCA Calculator, Flexibility & Adaptability, and Earthquake risk management. System includes a complex weighting system.	
	SBTool Sustainable Building Challenge www.sbc.nrcan.gc.ca/software_and_tools/gbtool_e.asp	iiSBE International Initiative for a Sustainable Built Environment 20 Countries		1998		Original	SBTool is intended as a "toolbox" designed to allow countries to create their own locally relevant rating systems. The framework includes the criteria of site selection, project planning and development; energy and resource consumption; environmental loadings; indoor environmental quality; service quality; social and economic aspects; and cultural and perceptual aspects. After the local iiSBE defines the scope, context, weights, and benchmarks, the design team defines project characteristics and enters performance targets. An independent assessor reviews the self-assessment, and forwards the assessment on to the local iiSBE. The iiSBE headquarters issues final certification. Because of the system's inherent flexibility, it requires more technical expertise to implement than other rating systems, and has limited exposure in the U.S. <sup>1</sup>	Multiple, NC, EB	Adds: Environmental Loadings (Carbon Footprint, Climate Change, Acid Rain, etc...), Service Quality, Social and Economic Aspects, and Cultural and Perceptual Aspects. LCA is incorporated into system.	By weighting and benchmarking performance ratings by local climate conditions, energy operating costs, and case study models, this tool provides targets for the reduction of energy use as well as energy dollars. <sup>3</sup>
<b>Specialized Rating Systems</b>										
	Building EQ Building Energy Quotient Program www.buildingEQ.com	ASHRAE American Society of Heating, Refrigerating and Air-conditioning Engineers		2010	New	Energy Star Program	Building Energy Labeling Program Provides information on the potential and actual energy use of buildings measuring both the energy the building is designed to use and the energy actually being consumed, this program can help us to close the gaps between intention and operation	NC, EB, O&M Energy Analysis	Similar to Energy Star, but expanded analysis to include both an asset and operational ratings.	Multiple levels of recognition.
	Energy Star for Commercial Buildings www.energystar.gov	EPA US Environmental Protection Agency		10+ yrs	120,000	Original	Developed by the U.S. Environmental Protection Agency, this program focuses on energy efficiency. The Target Finder tool for new construction is designed to help set an energy use design target and evaluate the design for energy use for buildings that are not single-family homes. Projects that perform in the top 25 percent of U.S. buildings are eligible to earn an ENERGY STAR label. Once construction is completed and the building has operated long enough to accumulate one year of utility data, the owner can go online to ENERGY STAR's Portfolio Manager, submit the data and, if the energy performance meets performance requirements, apply for an ENERGY STAR label. To achieve this mark, commissioning and other consulting fees may be incurred. <sup>1</sup>	NC, EB Energy Analysis	Energy Analysis, also accounts for differences in operating conditions, regional weather data, and other important considerations	To qualify for the ENERGY STAR, a building or manufacturing plant must score in the top 25 percent based on EPA's National Energy Performance Rating System. Comparison analysis.

US	STARS Sustainability Tracking, Assessment & Rating System www.aashe.org	AASHE Association for the Advancement of Sustainability in Higher Education		2010	New	LEED & Original	STARS includes credits related to an institution's social, economic, and environmental performance - curriculum and research, campus operations, planning and institutional capacity - with the goal of aiding strategic planning, fostering cross-sector campus dialogues, and stimulating conversations and learning between institutions.	NC, EB, O&M Higher Education Facilities	Adds: Curriculum and Research Development, Dining Services, Purchasing, Transportation, Planning, Administration & Engagement.	Relies on LEED for building performance.
	GGHC Green Guide for Health Care gghc.org	ASHE American Society for Healthcare Engineering		2002	160*	LEED	Quantifiable sustainable design toolkit integrating enhanced environmental and health principles and practices into the planning, design, construction, operations and maintenance of their facilities. A voluntary, self-certifying metric toolkit of best practices that designers, owners, and operators can use to guide and evaluate their progress towards high performance healing environment.	NC, EB, O&M Healthcare	Adds: Heavy Emphasis on Operations (emissions reporting, food service, purchasing, continuous improvement, education, etc...)	To be used as a voluntary, educational guideline towards development of HPB in Healthcare. Will be integrated into LEED system.
	Labs 21 www.labs21century.gov/about/index.htm	EPA US Environmental Protection Agency	DOE US Department of Energy				The purpose of this benchmarking database tool is to allow laboratory owners to compare the performance of their laboratory facilities to similar facilities and thereby help identify potential energy cost savings opportunities. The tool will allow benchmarking with energy use metrics (e.g. BTU/sf/yr) as well as system efficiency metrics (e.g. W/cfm)	NC & EB	Energy efficiency and environmental performance, Water, Occupant Safety, LCA, Materials	This is a partnership program that requires goal setting and posting of results.
	Green Leaf Eco-Rating Program classic.auduboninternational.org	Audubon International				Original	Program based on sustainability resource management principles. Audubon International's principle form a philosophical foundation by which a community, as well as organizations, families, and individuals within it, may work toward a sustainable future.	NC, EB Hospitality	Specific information not currently available.	
	Sustainable Sites Initiative www.sustainablesites.org	ASLA American Society of Landscape Architects	Ladybird Johnson Wildflower Center United States Botanical Garden	2009	New	LEED	The Rating System contains 15 prerequisites and 51 credits that cover all stages of the site development process from site selection to landscape maintenance.	All Sustainable Sites	Hydrology, Soils, Vegetation, Materials, Human Health & Well-Being	NA

#### Challenges

Net-Zero Energy Commercial Building Initiative www1.eere.energy.gov/buildings/commercial_initiative/	DOE US Department of Energy						The Net-Zero Energy Commercial Building Initiative aims to achieve marketable net-zero energy commercial buildings by 2025.			
Lifecycle Building lifecyclebuilding.org	EPA US Environmental Protection Agency						Lifecycle building is the design of building materials, components, information systems, and management practices to create buildings that facilitate and anticipate future changes to and eventual adaptation or dismantling for recovery of all systems, components, and materials. Annual challenge.			
Carbon Neutral Design Project	SBSE Society of Building Science Educators						Goal is to produce educational and resource materials for carbon neutral design.			
2030 Challenge	AIA American Institute of Architects						An initiative by Edward Mazria and Architecture 2030 asking the global architecture and construction community to adopt a series of greenhouse gas reduction targets for new and renovated buildings.			
Energy Independence and Security Act			2007				Aims to cut energy use in federal buildings by 30 percent by 2015 and requires new and renovated federal buildings to significantly reduce their reliance on energy from fossil fuels. Compared with existing federal buildings, federal buildings built or renovated in 2010 must cut their fossil-fuel dependency by 55 percent and by 2030, new or renovated federal buildings must eliminate their use of fossil fuel energy.			

*What are the significant challenges and/or incentives for our region? (USGBC publication)*

#### Additional Commercial Rating Systems (8)

BREEAM Green Leaf	Canada					BREEAM, Green Leaf				
LEED	Canada									
	India		1990							
	Mexico									
CEPAS Comprehensive Environmental Performance Assessment Scheme						LEED, BREEAM, HK-BEAM, IBI				
Green Mark	Singapore									
German Sustainable Building Certification	Germany									
BERDE Building for Ecologically Responsive Design Excellence	Phillipines		2009							
NEW - Global Green Rating	Europe									
International Green Construction Code										
EkoProfile	Norway									
GEM Global Environmental Method	UK					Green Globes Canada				
GOBAS Green Olympic Building Assessment System						CASBEE, LEED				
Green Building Rating System	Korea					BREEAM, LEED, BEPAC				
Green Globes	Canada					BREEAM Green Leaf				
Green Star	Australia		1996			BREEAM, LEED				

HK BEAM Hong Kong Building Environmental Assessment Method	Hong Kong				BREEAM				
HEQ High Environmental Quality	France				Original	A global approach designed to improve the environmental quality of buildings, in other words to control their impact on the outdoors environment and create a healthy and comfortable indoors environment.			
iDP Integrated Design Process					Original				
NABERS National Australian Built Environment Rating System	Australia								
PromisE									
Protocol ITACA					GBTool				
SBAT Sustainable Buildings Assessment Tool					Original				
SPiRiT Sustainable Project Rating Tool  www.cecer.army.mil/sustDesign/SPiRiTinfo.cfm					LEED	SPiRiT was developed by the Army Corps of Engineers' Construction Engineering Research Laboratory and was mandated for use in all military construction in 2001. It is based on LEED, with the additional categories of Facility Delivery Process, Current Mission, and Future Mission. There are no formal requirements for documentation; the project team or an independent panel reviews the completed project to determine a rating level (Platinum, Gold, Silver or Bronze). The Army transitioned from SPiRiT to LEED in 2007. While the standards of LEED will need to be met for all military facilities, certification will not be required. <sup>1</sup>			
TERI-GRIHA TERI Green Rating for Integrated Habitat Assessment	India				Original				
TQ Building Assessment System	Germany/Europe				Original	The TQ Building Assessment Tool sets target values as standards to be met in design. Projects earn a Building Quality Certificate.			
<b>Residential Rating Systems</b>									
LEED for Homes Leadership in Energy and Environmental Design  greenhomeguide.com	USGBC United States Green Building Council				LEED	LEED for Homes is a voluntary rating system that promotes the design and construction of high-performance green homes, including affordable housing, mass-production homes, custom designs, stand-alone single-family homes, duplexes and townhouses, suburban and urban apartments and condominiums and lofts in historic buildings.	NC, EB		HERS Index
National Green Building Standards  www.nahbgreen.org	NAHB National Association of Home Builders	GBI Green Building Institute			Green Globes	This ANSI approved standard defines green building for single and multifamily homes, residential remodeling projects, and site development projects. It allows flexibility for regionally-appropriate best green practices.	NC, EB		
Enterprise Green Communities  www.greencommunitiesonline.org/	Enterprise				LEED	Enterprise's vision through Green Communities is to fundamentally transform the way we think about, design and build affordable homes.	NC, ND		HERS Index
Energy Star & Indoor airPLUS  www.energystar.gov/index.cfm?c=new_bldg_design.new_bldg_design_guidance	DOE US Department of Energy					The ENERGY STAR program requires new homes to be at least 15 percent more energy efficient than homes built to the 2006 International Residential Code, with energy-saving features that typically make them 20-30 percent more efficient than conventionally built homes.	NC, EB		HERS Index
Passive House  www.passivehouse.us	PHIUS Passive House Institute US					The Passive House Planning Package (PHPP) projects detailed heat load, heat loss, and primary energy usage for individual building parameters. The latest version of the PHPP also projects cooling, cooling loads, and latent cooling.	NC		
Environments for Living Certified Green  www.environmentsforliving.com	MASCO					The prescriptive, performance-based program structure was developed with the assistance of nationally recognized experts in the field of building science, Building Science Corp. and Advanced Energy. A national turn-key program designed to assist builders in constructing and marketing homes utilizing the principles of building science – homes that offer energy efficiency, indoor environmental quality and durability benefits.	NC		
Earth Advantage  www.earthadvantage.com	EAI Earth Advantage Institute	Energy Trust of Oregon & New Buildings Institute	2010	New	LEED	Rating System aims to provide a tool kit comprised of prescriptive measures that will maximize cost effectiveness and environmental benefit.	NC, ND	Energy, Water, Health, Land and Materials	Prescriptive approach
E-SCALE EnergySmart Home Scale  www.eere.energy.gov/buildings/challenge/energysmart.html	DOE US Department of Energy				A builder's challenge similar to Energy Star	The E-Scale is an easy-to-understand tool that helps homebuyers and homeowners make smart energy decisions when purchasing, renting, or updating a home.	NC, EB		HERS Index
<b>Residential Challenges</b>									
Builders Challenge	DOE US Department of Energy					The Builders Challenge is helping to change the face of home energy efficiency by recognizing industry leaders and promoting the technical pathways to Net-Zero Energy for all Americans.			
<i>What are the significant challenges for our region?</i>									
<b>Notes</b>									
* Registered Projects									

## Untangling the Rating Systems

Stefanie Smith, AIA, LEED AP

Date: January, 2010

<b>Overall</b>	Each of the rating systems provides an assessment tool for evaluating environmental impact through whole building analysis. Green Globes and LEED strive to provide a means to measure environmental achievement through point accumulation. The Living Building Challenge focuses on achieving zero impact buildings.				
<b>Information</b>	<b>LEED</b>	<b>Green Globes</b>	<b>Significant Differences Between LEED and Green Globes</b>	<b>LBC</b>	
	Leadership in Energy and Environmental Design			Living Building Challenge	
	USGBC	GBI		International Living Building Institute	
<b>General Information</b>	<b>Description</b>	Based on point accumulation.	Based on point accumulation.	LEED needs to continue development of LCA, renewable energy and carbon reduction targets to improve effectiveness. Green Globes needs to provide more stringent and specific requirements. <sup>3</sup>	Targets "deep-green" strategies to achieve net zero environmental impact with regenerative design being the ultimate goal. Bypasses point accumulation with 16 prerequisites and no credits.
	<b>Building Types</b>	NC, EBOM, CS, CI, Schools, Retail, ND, Healthcare, Homes	NC, EB&OM NC system may be used for all building types.		NC
	<b>Registration</b>		The online tool must be purchased for self certification. Additional fees are required for 3rd party verification.	No Some studies indicate that Green Globes may be more cost effective for smaller, basic buildings.	
	<b>Access to information</b>	Rating system is available online without a fee. Reference guides must be purchased.	Green Globes website provides quite limited access to nonmembers. Free limited trials of the program are available (30 day typical).	Yes	
	<b>Fee Structure</b>			Yes	
<b>Self Assessment</b>	Yes	For a minimal cost, the system can be used as a self-assessment tool.	No		
<b>Certification</b>	<b>Levels of Certification</b>	4 Certified, Silver, Gold, Platinum	4 1 to 4 globes	No	1 (Certified)
	<b>Certifying Body</b>	Independent 3rd Party - GBCI	For 3rd party certification, system requires on-site verification by regional reviewers. To date, this process is not transparent. <sup>2</sup>	Yes	Cascadia
<b>Point Accumulation</b>	<b>Prerequisites</b>	Yes Prerequisites establish minimum performance thresholds. Some prerequisites do incur additional cost such as commissioning.	No Although new versions will require minimum levels of achievement.	Yes But will be similar in the near future.	ALL
	<b>Points</b>	Projects are responsible for all potential points. No partial credit is available, however many credits award multiple levels of achievement.	Projects are only responsible for credits that are within their scope of work. Other items can be excluded as not applicable without penalty. Partial credit can be awarded.	Yes GG concept is worthwhile, but may make tracking targeted levels of achievement difficult as the weighting system is not transparent. Projects may have a difficult time balancing decisions with economics and environmental impact. On the positive side, this method may reduce point chasing. <sup>2</sup>	None
	<b>Tracking</b>	Online tool allows the Project Administrator to manage credits attempted and completion of documentation, but ultimately, team must keep track project point accumulation.	Points are updated online in real time. System lacks ability to track "maybe" points or points "in progress."	No	
<b>Reporting Method</b>	<b>Reporting Method</b>	Online submission using templates and uploaded documents can be completed in one or two phases: design (optional, typically submitted at the substantial completion of construction documents) and construction (submitted at project completion).	Reporting is through an online questionnaire organized by six project delivery phases which are then broken down into areas of assessment. 3rd party verification is in two phases: after completion of construction documents and post construction.	No	
	<b>Access to Online Information</b>	Multiple team members may view the scorecard. The Project Administrator may assign different individuals to complete documentation for individual credits.	Multiple team members may view the scorecard, however one member typically needs to input all of the information.	Yes	

Reporting	<b>Documentation</b>	A key complaint about LEED is the extensive documentation requirements.	Documentation is required for 3rd party verification. Reports note that lack of stringency may reduce project costs but may negatively affect quality control.	Yes GG documentation requirements are less stringent than LEED's	
	<b>Project Feedback</b>	LEED aims to provide feedback within 30 days. A clear procedure for appeals is provided, additional costs will apply.	Once the questionnaire for a phase has been completed, a report is automatically generated, which provides ratings, a list of achievements as well as recommendations. The immediate feedback provides opportunities to influence the design and planning processes of the project. Appeals are not available but project parameters may be updated up to one year after registration. Extensions are available.	Yes	
Subjects Assessed	<b>General Note</b>	Information comparing subject matter is provided based on general review of articles examining the rating systems. The most detailed articles were published in 2006 and while are no longer accurate with regard to specific credit comparisons. Approximately 85% of the credits addressed within LEED and Green Globes are similar. Weighted point accumulation does vary between the systems specifically when comparing the lower certification levels. (4)			LBC takes a stringent stance within most categories which has been prohibitive in certifying any buildings to date. Note: Project teams can choose whether to pursue all of the prerequisites and achieve full certification or pursue one or two petals and be recognized for leadership in specific areas. (5)
	<b>Project Management</b>	Most aspects are addressed within different categories. Collaborative design process is not included.	Primary focus area. Project management is a primary area of assessment. It incorporates integrated design, innovation, environmental purchasing, commissioning.	No Most elements are covered by both rating systems.	
	<b>Site</b>			No Most elements are covered by both rating systems.	LBC site restrictions are significantly more stringent than other rating systems. Additionally, construction may ONLY occur on previously developed land.
	<b>Water</b>			No Most elements are covered by both rating systems.	All water used in the project must come from captured rainwater or closed-loop water systems. All stormwater must be managed on site and integrated into the project's water-supply system.
	<b>Energy Analysis</b>	Data compared to ASHRAE 90.1 standards. Note: To a degree, hypothetical design performance can be distorted to increase perceived energy efficiencies. LEED has begun to address this issue with required reporting for 5 years after certification. EBOM certificates are based on actual performance improvements.	Data compared with EPA's Target Finder. Method to determine projected energy use for the project is discretionary.	Yes EPA's Target Finder is easier to execute and may be more economical for smaller, basic buildings. Energy modeling compared to ASHRAE 90.1 is preferred for larger and/or more complex buildings.	Onsite renewable energy systems must produce 100% of a building's needed energy on a net-annual basis. Scale-jumping is allowed.
	<b>Measurement of Actual Building Performance</b>	Recently required.	Not required.	Yes	1 year requirement for certification.
	<b>Materials and Resources</b>			No Most elements are covered by both rating systems. Some reports note GG requirements for certified wood are too lenient.	LBC: Projects may not contain any materials from the "Red List." (ref. www.redlistready.org) The project carbon footprint must be offset. All wood FSC, salvaged or from on-site. Local material requirements (most materials must come from 250 mile radius). 80 - 100% of construction waste must be diverted from landfills.
	<b>Indoor Environmental Quality</b>			No Most elements are covered by both rating systems.	Similar to LEED credits.
	<b>Regional Priorities</b>	4 points are available for credits achieved reflecting regional priorities.	Adaptation for regional or bioclimatic differences may be reflected within energy studies.	Yes Regional priorities need to be further incorporated into both rating systems.	

	<b>Emissions</b>	Emissions are addressed within several categories.	Primary focus area. Category covers air emissions (boilers), ozone depletion, water & sewer protection, pollution controls.	No Most elements are covered by both rating systems.	
	<b>LCA</b>	LCA calculations may achieve credits under Innovation & Design. Several calculation programs are now available on the internet.	The Green Globes LCA Calculator is based on the ATHENA Institute EcoCalculator, <a href="http://www.athenasmi.org/tools/ecoCalculator/">http://www.athenasmi.org/tools/ecoCalculator/</a> .	No Both rating systems are still working to effectively integrate LCA into the rating systems. Under GG, LCA is a specific credit option.	
	<b>Durability</b>	Durability is not specifically addressed in most LEED rating systems. LEED for Homes does include it as a separate credit category.	GG addresses durability within a number of available credits.	Yes Durability should be considered in every design decision.	
	<b>Acoustic Control</b>	Not specifically addressed.	Credit available.	Yes	
	<b>Space Optimization</b>	Not specifically addressed.	Credit available.	Yes	
	<b>Beauty &amp; Inspiration</b>	Not addressed.	Not addressed.	Yes	Project teams must include features intended only for "human delight and the celebration of culture, spirit, and place."
<b>Additional Notes</b>			<b>Sponsorship</b> GBI and GG are sponsored by NAHB. A majority of the initial funding came from the forest products industry. As a result, the system's integrity comes into question. <sup>2</sup>		<b>System Development:</b> LBC lacks consensus-based development. Current participants are "beta" testers.
			<b>Bias</b> Bias and advertisements are frequently located within the online tool's resources and recommendations. These need to be declared and separated from the rating system recommendations. <sup>2</sup>		<b>Biggest Challenges to Certification</b> The two areas as presenting the biggest design and approval challenges: the materials and water requirements. (5)
			<b>Format</b> Online format could provide easy access to resources and recommendations, facilitate project communication, regional priorities, local climate, etc... The system has excellent potential. However, current information provided by the system is not project specific and typically reverts to generalized information. Tool needs to be "smarter" to realize its full potential. <sup>2</sup>		<b>Cost to Implement</b> One study found that premiums for LBC construction ranged from 4%–49%. With ROI at 21 years. (5)
			<b>Technical Rigor</b> Student study felt that many questions were too vague with unclear metrics for measurement. <sup>2</sup>		

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### 9 Brief Descriptions of the Rating Systems

Descriptions are pulled from listed websites for each rating system unless otherwise noted.