ENERGY SOLUTIONS CENTER

Track: Commercial Natural Gas I
Unit #13: Green Certification Programs

An overview of Certification Programs for Commercial Facilities

Eric Burgis, Energy Solutions Center

Presentation Outline

- Green Building Initiative (GBI)
  - Green Globes Program
- U.S. Green Building Council (USGBC)
  - Leadership in Energy and Environmental Design (LEED) Program
- ENERGY STAR
- Canada Green Building Council
- ASHRAE
  - Building Energy Quotient
- Other Certifications
- Association and Resources

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Green Buildings Initiative (GBI)

GBI GREEN GLOBES BUILDING CERTIFICATION

https://www.thegbi.org/green-globes-certification/

The Green Building Initiative

- Non-profit organization in Portland, Oregon
- Green Building Initiative Mission
  - **To improve the built environment's impact on climate and society.**
- Exclusive global provider of the Green Globes assessment and rating system.

GBI GREEN BUILDING INITIATIVE

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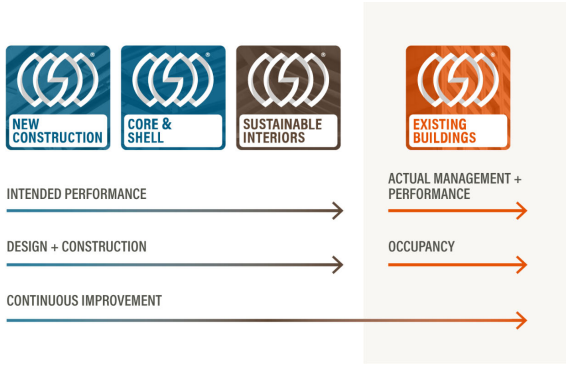
Green Globes: Tools

Green Globes for New Construction
Guides the integrated design process at each stage of project through delivery.

Green Globes for Continual Improvement of Existing Buildings
Establishes the baseline, gives a current performance report, guides improvement.

Green Globes for Sustainable Interiors
Designed for tenant improvement projects, fit-outs, and remodels.



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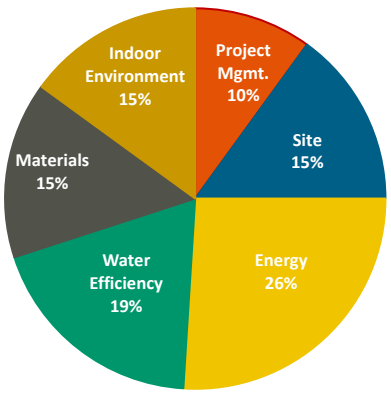
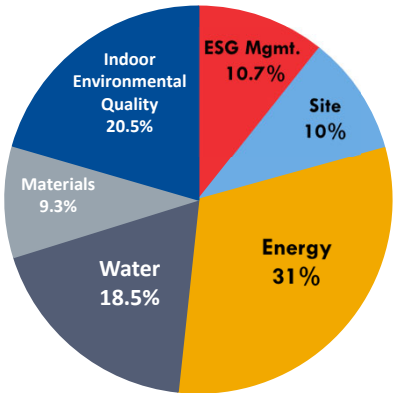
The Green Globes® System Assessment Areas & Points Distribution

Criteria: 1000 Point Scale

NC (New Construction)



Continual Improvement of Existing Buildings (CIEB)



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Assessment Areas and Points

New Construction

Environmental Assessment Area	New Construction Points
Project Management	100
Site	150
Energy	260
Water	190
Materials	150
Indoor Environment	150
Total Points	**1000**

Existing Buildings

Environmental Assessment Area	Existing Buildings Points
ESG Mgmt	107
Site	100
Energy	310
Water	185
Materials	93
IEQ	205
Total Points	**1000**

Green Globes Rating System

- Those buildings that achieve 35% or more of the 1,000 points possible in the Green Globes rating system are eligible candidates for a certification of one, two, three or four Green Globes
- The Green Globes system provides higher levels of achievement based on the percentage of points a building achieves

Green Globes Rating System

Green Globes Rating Scale	
85 - 100%	Demonstrates national leadership and excellence in the practice of energy, water and environmental efficiency to reduce environmental impacts
70 – 84%	Demonstrates leadership in applying best practices regarding energy water and environmental efficiency
55 – 69%	Demonstrates excellent progress in the reduction of environmental impacts and use of environmental efficiency practices
35 – 54%	Demonstrates a commitment to environmental efficiency practices

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Building Certification

- After achieving a minimum threshold of 35% of the total applicable points in the third-party assessment, and meeting the minimum requirements, new and existing buildings are eligible for a Green Globes certification for their environmental sustainability and achievements.

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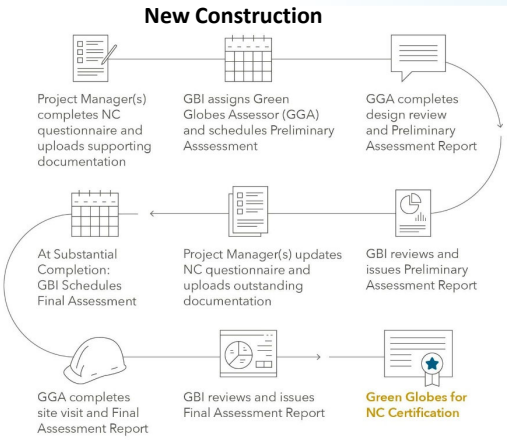
Building Certification



The process utilizes third-party assessors with expertise in green building design, engineering, construction and facility operations

Existing Buildings

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Building Certification

- Professionals interface with project teams and building owners to review documentation and conduct onsite and or virtual building tours
- Green Globes rating and certification is attainable for a wide range of commercial and government buildings, and enables building owners to credibly market their environmental responsibility to shareholders, tenants, and their community

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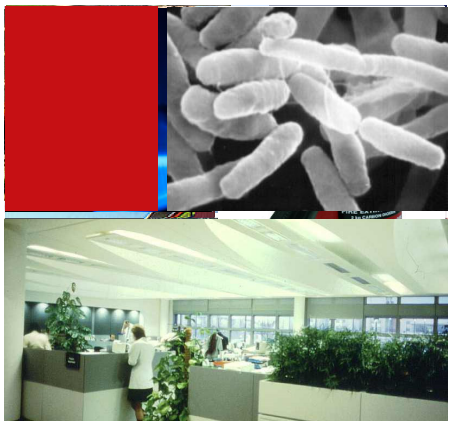
Green Globes®
Environmental Assessment Areas

1 Management
2 Site
3 **Energy**
4 Water
5 Materials
6 **Indoor Environment**



New Construction = 1000 points available
Continual Improvement of Existing Blds = 1000 points

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Section 3 Energy (25-26% of Points)

GBI GREEN GLOBES BUILDING CERTIFICATION

Energy Performance – 6 paths … ASHRAE 90.1, ENERGY STAR, IECC, ASHRAE Building EQ, Net Zero Carbon/Energy Certifications, Prescriptive Path

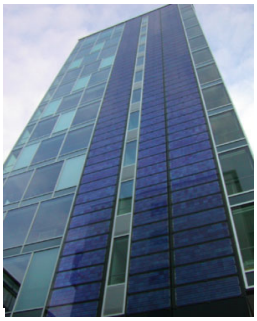
Reduced Demand (space optimization, microclimatic design, day-lighting, envelope design, metering, peak demand response)

Energy Efficiency Features (lighting, heating & cooling equipment)

Metering and sub metering

Renewable Energy (including ground source)

Transportation



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Energy

Six pathways for Energy Performance:

A. ANIS/ASHRAE/IES Standard 90.1 Appendix G
B. International Energy Conservation Code (IECC)
C. ENERGY STAR Benchmarking in Target Finder
D. ASHRAE Building Energy Quotient (Building EQ) 'As Designed' assessment
E. Net Zero Carbon or Energy Certification
F. Prescriptive

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Source Energy - Path

- ENERGY STAR® methodology includes Source Energy in determining efficiency
- Green Globes awards Energy Performance credits for Path C based on ENERGY STAR score
- From 0 to 180 points available over the ENERGY STAR award scale of 80 to 100 percentile
- Although there are several building, equipment, location, and other normalization factors taken into account, natural gas consistency scores substantially higher than other forms of fossil fuel energy

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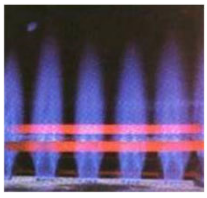
Section 6 Indoor Environment

GBI GREEN GLOBES BUILDING CERTIFICATION

New Construction	Existing Building
Air emissions (boilers)	**Air emissions** (boilers)
Ozone depletion	**Water effluents** (floor drains, roof drains, landscaping practices, glycol discharges)
Sewer & waterway protection	**Hazardous materials** (asbestos, radon, PCBs, refrigerants, storage tanks, drinking water)
Pollution control (procedures, compliance with standards)	**Hazardous products, HCS, health & safety** (MSDS, health and safety, management, pesticides)


Low-NOx burners


Pest prevention


Storage Tank


Smog


MSDSs, equipment manuals, etc.

Emissions Evaluation / Points / Potential Gas Technologies

- Air ventilation & Quality
  - Low-NOx/low-CO **boilers and furnaces** whose NOx emissions do not exceed 30 ppm corrected to 3% O_2, and whose CO emissions do not exceed 400 ppm corrected to 3% O_2
- Ozone depletion and global warming
  - The building avoid ozone depletion and global warming caused by refrigerants (i.e. There are no refrigerants or only **absorption cooling** is used.)

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Environmental Assessment Areas

- The Green Globes software tools and ratings/certification system uses a recognized and proven assessment protocol to comprehensively assess environmental impacts on a 1,000 point scale in multiple categories

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Green Globes Strengths

- Online tool
- Emphasizes energy
- Benchmarks against ENERGY STAR – takes into account the whole life cycle of energy production
- Requires third party virtual or in-person site visits for certification
- First American National Standards Institute (ANSI) – recognized green rating and assessment tool in the US
- Cost-effective and scalable

GBI GREEN GLOBES BUILDING CERTIFICATION

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Approx. Green Globes Costs

GREEN GLOBES FOR NC

Project Registration - $1,500
(preferred pricing available for GBI members)

Preliminary Assessment- $4,635 - $15,500
(dependent on GSF)

Final Assessment - $4,120 - $15,500
(dependent on GSF)

Assessor Travel - $2,000*

Recognition Items (optional) - $175 - $1,500

Average: $14,000 (virtual onsite assessment)

GREEN GLOBES FOR EB

Project Registration - $1,500
(preferred pricing available for GBI members)

Final Assessment - $4,120 - $15,500
(dependent on GSF)

Assessor Travel - $2,000*

Recognition Items (optional) - $175 - $1,500

Average: $9,500 (virtual onsite assessment)

**not required for virtual onsite assessments*

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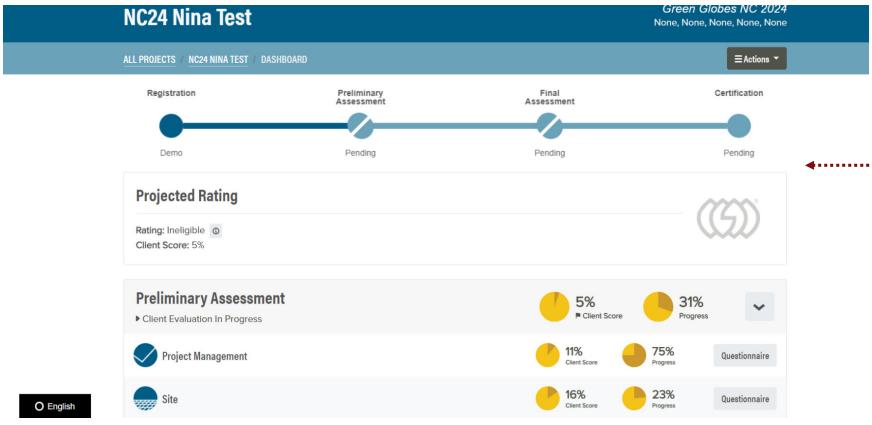
Every Project Has a Dashboard: New Construction (NC) Dashboard



Automatically calculates predicted rating based on points out of 1000

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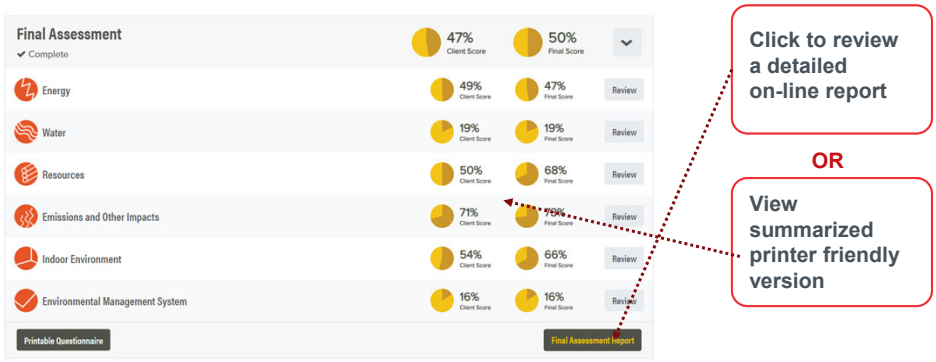
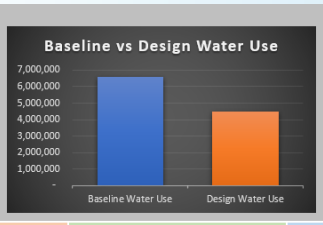
Immediately View Your Report



Actual Performance Data is Required for EB

Green Globes Water Reduction Calculator v3.0

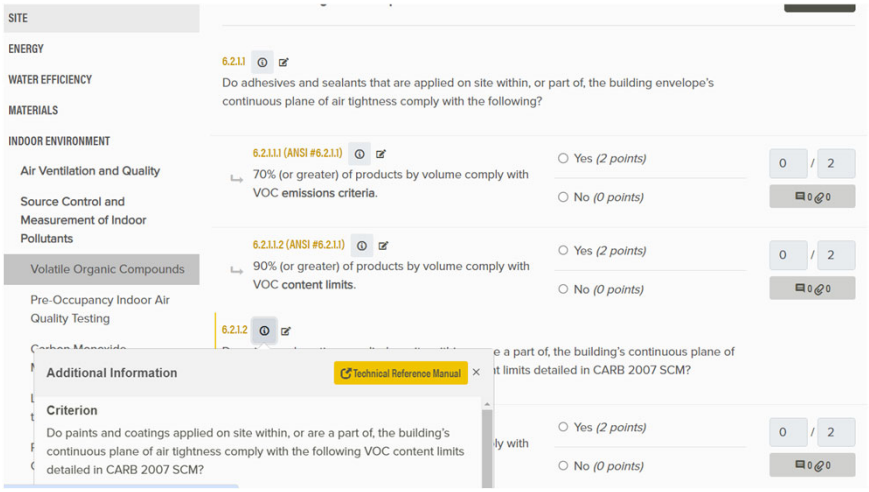
Baseline Water Use	6,582,163	Gallons
Design Water Use	4,462,167	Gallons
Percent Reduction	32%	



GBI GREEN GLOBES BUILDING CERTIFICATION

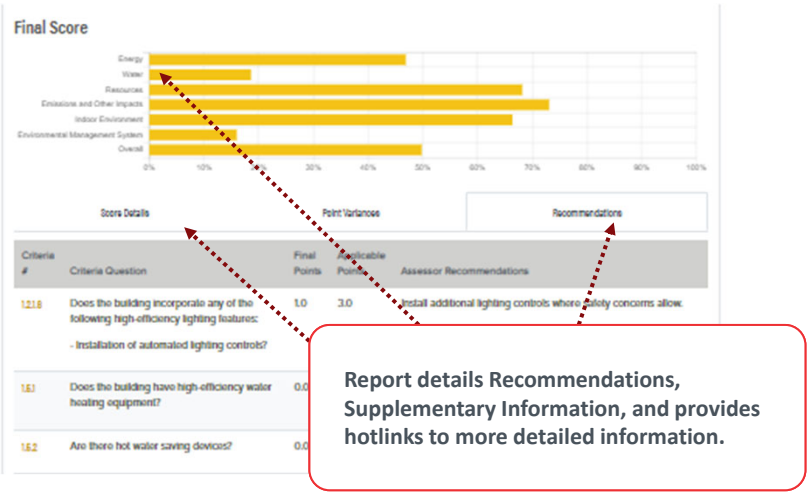
	Total				Residential			Commercial					
					Apartment			Occupancy 1 - Health			Occupancy 2 - Occupancy Type		
	Baseline	Design	Reduction	% Reduction	Baseline	Design	Reduction	Baseline	Design	Reduction	Baseline	Design	Reduction
Lavatory faucets - private	669,167	608,333	60,833	9%	669,167	608,333	60,833	-	-	-	-	-	-
Lavatory faucets - public	3,042	-	3,042	100%	3,042	-	3,042	-	-	-	-	-	-
Kitchen faucets	682,550	620,500	62,050	9%	682,550	620,500	62,050						
Showers	2,926,950	2,048,865	878,085	30%	2,419,950	1,693,965	725,985	507,000	354,900	152,100	-	-	-
Toilet - flush valve	-	-	-		-	-	-	-	-	-	-	-	-
Toilet - tank (single flush)	992,800	372,300	620,500	63%	992,800	372,300	620,500	-	-	-	-	-	-
Toilet - dual flush	-	-	-		-	-	-	-	-	-	-	-	-
Urinal	-	-	-		-	-	-	-	-	-	-	-	-
Dishwashers - In-suite	236,457	231,894	4,563	2%	145,197	145,197	-	30,420	28,899	1,521	60,840	57,798	3,042
Clothes washers - In-suite	618,018	353,685	264,333	43%	618,018	353,685	264,333						
Clothes washers - Common	453,180	226,590	226,590	50%	-	-	-	129,480	64,740	64,740	323,700	161,850	161,850
Total	**6,582,163**	**4,462,167**	**2,119,996**	**32%**	**5,530,723**	**3,793,980**	**1,736,743**	**666,900**	**448,539**	**218,361**	**384,540**	**219,648**	**164,892**

Survey Tool Uses Plain Language and Tooltips



Green Globes Report

Recommendations, Supplemental Information & Hotlinks



Report details Recommendations, Supplementary Information, and provides hotlinks to more detailed information.

Sample Green Globes Projects

GSA
Rubbermaid
Pfizer
WHOLE FOODS MARKET
Drexel UNIVERSITY
JPMorganChase
Bristol-Myers Squibb
Poudre School District
UNIVERSITY OF ARKANSAS
ASU ARIZONA STATE UNIVERSITY

Green Globes Building Analysis

- All electric building was evaluated with ENERGY STAR and had a score of 86
- Re-ran the scenario replacing the heating with gas obtaining new ENERGY STAR score of 93

Green Globe Building Evaluated

	All Electric Building 86 ENERGY STAR Score	Gas Heating Building 93 ENERGY STAR Score
Purchased Electric	8,553,884 kBtu	6,380,440 kBtu
Natural Gas	0 kBtu	2,154,726 kBtu
Site Energy Intensity	55 kBtu/ft^2/yr	54 kBtu/ft^2/yr
Source Energy Intensity	182 kBtu/ft^2/yr	150 kBtu/ft^2/yr
Emissions	1,279 MtCO_2e/yr	1,069 MtCO_2e/yr

Green Globes Point Summary

ENERGY STAR Score	GG – New Construction	GG – Existing Building
86	40 Points	34 Points
93	72 Points	59 Points
Point Differential	32 Points	25 Points
Total Point base ranges from 900 to 1000 depending on the value of non-applicable criteria accepted		

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U.S. Green Building Council (USGBC)

Leadership in Energy and Environmental Design (LEED) Program

https://www.usgbc.org/leed

Leadership in Energy and Environmental Design (LEED)

- LEED (Leadership in Energy and Environmental Design) is a widely used green building rating system.
- LEED certification provides a framework for healthy, highly efficient, and cost-saving green buildings, which offer environmental, social and governance benefits.
- LEED certification is a globally recognized symbol of sustainability achievement, and it is backed by an entire industry of committed organizations and individuals paving the way for market transformation.

US Green Building Council

- The USGBC is a non-profit organization committed to expanding sustainable building practices
- 197,000 LEED Certified Projects Worldwide
- 186 Countries and territories
- > 29 Billion Square Feet
- Numbers are steadily increasing

https://www.usgbc.org/leed

What is LEED

- LEED is an internationally recognized green building program
  - Provides building owners and operators a framework for identifying and implementing practical and measurable green building design, construction, operations and maintenance solutions
  - 186 Countries and territories have LEED projects
- A voluntary, consensus-based, market-driven program that provides third-party verification of green buildings
- To earn LEED certification, a project must satisfy all LEED prerequisites and earn a minimum 40 points on a 110-point LEED rating system scale

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LEED Rating System

- Sustainable sites
- Water efficiency
- **Energy and Atmosphere**
- Materials and Resources
- **Indoor Environmental Quality**
- Innovation and Design Process

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LEED Ratings (4 levels)

LEED Certified	LEED Silver	LEED Gold	LEED Platinum
40-49 Points	50-59 Points	60-79 Points	80+ Points

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Project Types

- New Construction
  - New construction and major renovations
- Existing Buildings
- Commercial Interiors
- Core & Shell
- Homes
- Neighborhoods
- Schools
- Retail

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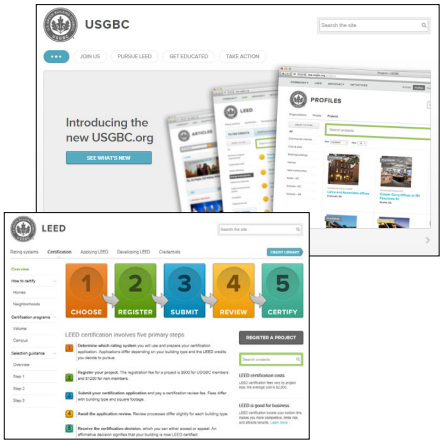
Tools Available from USGBC

- LEED Credit Library
- Reference Guides
- Sample forms
- LEED Scorecard
- Education
- Project Case Studies



LEED Rating Systems

BD+C | ID+C | HOMES | O+M | ND

LEED for Building Design and Construction (BD+C)
- New Construction and Major Renovation
- Core and Shell Development
- Schools
- Retail
- Data Centers
- Warehouses and Distribution Centers
- Hospitality
- Healthcare

LEED for Interior Design and Construction (ID+C)
- Commercial interiors
- Retail
- Hospitality

LEED for Residential Design and Construction
- Single Family Homes
- Multifamily Homes
- Multifamily Homes Core and Shell

LEED for Building Operations and Maintenance (O+M)
- Existing Buildings
- Existing Interiors

LEED for Neighborhood Development

LEED for Cities and Communities
- Plan and Design
- Existing

LEED Steps

Path to LEED Certification

Step 1: Register your project in Arc

Step 2: Pre-certify

Step 3: Share data to receive a score

Step 4: GBCI review of data

Step 5: Certify to LEED

U.S. Green Building Council

usgbc.org

LEED Rating System

- Each rating system is made up of a combination of credit categories
- Within each of the credit categories, there are specific prerequisites projects must satisfy and a variety of credits projects can pursue to earn points. The number of points the project earns determines its level of LEED certification

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Building Design & Construction

- Applies to buildings that are being newly constructed or going through a major renovation
  - New construction
  - Core & shell
  - Schools
  - Hospitality
  - Data Centers
  - Warehouse & Distribution Centers
  - Retail
  - Healthcare Facilities

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Interior Design & Construction

This rating system is for interior spaces that are a complete interior fit-out. In addition, at least 60% of the project's gross floor area must be complete by the time of certification.

- Commercial Interiors
- Hospitality
- Retail

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Building Operations & Maintenance

- This rating system is for buildings that are fully operational and occupied for at least one year. The project may be undergoing improvement work or little to no construction. Must include the entire building's gross floor area in the project.
  - Existing Whole Buildings
  - Existing Interiors

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Neighborhood & Homes

- Cities & Communities (Neighborhood Development)
  - Applies to new land development projects or redevelopment projects containing residential uses, nonresidential uses, or a mix.
- Residential BD+C (Homes)
  - Applies to single family homes, low-rise multi-family (one to three stories), or mid-rise multi-family (four to six stories); includes Homes and Multifamily Lowrise and Multifamily Midrise.

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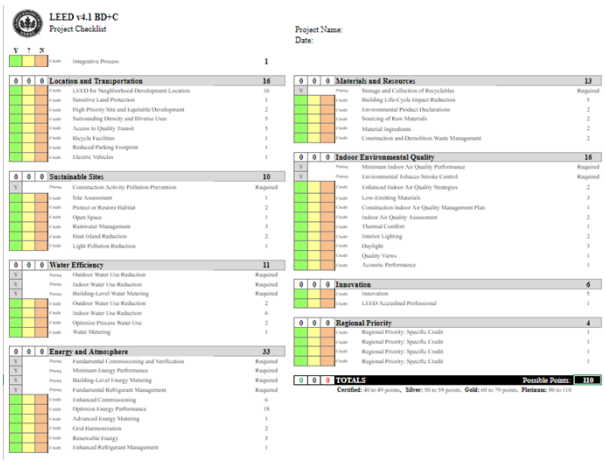
Credit Categories

- Each rating system is made up of a combination of credit categories
- Within each of the credit categories, there are specific prerequisites projects must satisfy and a variety of credits projects can pursue to earn points
- The number of points the project earns determines its level of LEED certification


LEED v4.1 BD+C
Project Checklist

Project Name:
Date:

Integrative Process		1
Location and Transportation		16
LEED for Neighborhood Development Location		16
Sensitive Land Protection		1
High Priority Site and Equitable Development		2
Surrounding Density and Diverse Uses		5
Access to Quality Transit		5
Bicycle Facilities		1
Reduced Parking Footprint		1
Electric Vehicles		1
Sustainable Sites		10
Construction Activity Pollution Prevention		Required
Site Assessment		1
Protect or Restore Habitat		2
Open Space		1
Rainwater Management		3
Heat Island Reduction		2
Light Pollution Reduction		1
Water Efficiency		11
Outdoor Water Use Reduction		Required
Indoor Water Use Reduction		Required
Building-Level Water Metering		Required
Outdoor Water Use Reduction		2
Indoor Water Use Reduction		6
Optimize Process Water Use		2
Water Metering		1
Energy and Atmosphere		33
Fundamental Commissioning and Verification		Required
Minimum Energy Performance		Required
Building-Level Energy Metering		Required
Fundamental Refrigerant Management		Required
Enhanced Commissioning		6
Optimize Energy Performance		18
Advanced Energy Metering		1
Grid Harmonization		2
Renewable Energy		5
Enhanced Refrigerant Management		1
Materials and Resources		13
Storage and Collection of Recyclables		Required
Building Life-Cycle Impact Reduction		5
Environmental Product Declarations		2
Sourcing of Raw Materials		2
Material Ingredients		2
Construction and Demolition Waste Management		2
Indoor Environmental Quality		16
Minimum Indoor Air Quality Performance		Required
Environmental Tobacco Smoke Control		Required
Enhanced Indoor Air Quality Strategies		2
Low-Emitting Materials		3
Construction Indoor Air Quality Management Plan		1
Indoor Air Quality Assessment		2
Thermal Comfort		1
Interior Lighting		2
Daylight		3
Quality Views		1
Acoustic Performance		1
Innovation		6
Innovation		5
LEED Accredited Professional		1
Regional Priority		4
Regional Priority: Specific Credit		1
Regional Priority: Specific Credit		1
Regional Priority: Specific Credit		1
Regional Priority: Specific Credit		1
TOTALS	Possible Points:	110

Certified: 40 to 49 points, Silver: 50 to 59 points, Gold: 60 to 79 points, Platinum: 80 to 110

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https://build.usgbc.org/bdc41scorecard

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Sample Credit Category
Building Design and Construction – New Construction (V4.1 LEED)

16 Points	Location & transportation
13 Points	Materials & Resources
10 Points	Sustainable sites
11 Points	Water efficiency
6 Points	Innovation
4 Points	Regional priority credits

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CONTINUED

Sample Credit Category
Building Design and Construction – New Construction (V4.1 LEED)

1 Point	Integrative process
33 Points	**Energy and atmosphere**
16 Points	**Indoor environmental quality**

110 Points Possible under V4.1 LEED Credit Library

for BD&C – New Construction

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Sample Credit Category

Building Design and Construction – New Construction (V4.1 LEED)

Energy and Atmosphere		33
Prereq	Fundamental Commissioning and Verification	Required
Prereq	Minimum Energy Performance	Required
Prereq	Building-Level Energy Metering	Required
Prereq	Fundamental Refrigerant Management	Required
Credit	Enhanced Commissioning	6
Credit	Optimize Energy Performance	18
Credit	Advanced Energy Metering	1
Credit	Grid Harmonization	2
Credit	Renewable Energy	5
Credit	Enhanced Refrigerant Management	1

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Energy & Atmosphere Category

Building Design and Construction – New Construction (V4.1 LEED)

Energy and atmosphere

- Required: Fundamental commissioning and verification, Minimum energy performance, Building-level energy metering, Fundamental refrigerant management
- 6 Points: Enhanced commissioning
- 18 Points: **Optimize energy performance**
- 1 Point: **Advanced energy metering**
- 2 Points: Grid Harmonization (Demand response)
- 5 Points: Renewable energy production
- 1 Point: Enhanced refrigerant management
- 33 points possible

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Indoor Environmental Quality

Building Design and Construction – New Construction (V4 LEED)

Indoor Environmental quality

- Required: Minimum indoor air quality performance and Environmental tobacco smoke control
- 2 Points: Enhanced indoor air quality strategies
- 3 Points: Low-emitting materials
- 1 Point: Construction indoor air quality management plan
- 2 Points: **Indoor air quality assessment**
- 1 Point: **Thermal comfort**
- 2 Points: Interior lighting
- 3 Points: Daylight
- 1 Point: Quality views
- 1 Point: Acoustic performance

16 points possible

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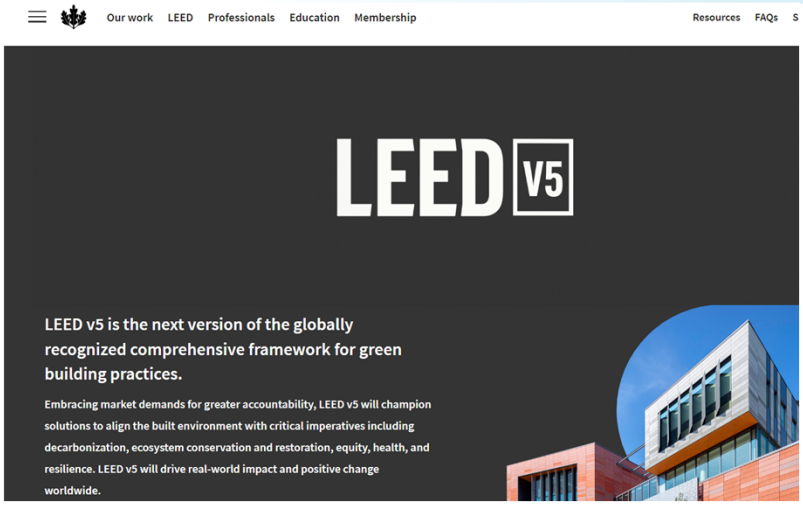
LEED V5



- Minimum pre-requisite efficiencies are increasing so energy efficiency measures will result in fewer LEED points.
- Electrification Achievement earns LEED points

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https://www.usgbc.org/leed/v5

LEED V5 Electrification Achievement (EA)

- No On-Site Combustion (5 points). Design and operate the project from start-up with no on-site combustion except for emergency support systems.
- No On-Site Combustion Except at Low Temperatures (1 – 4 points). Design space heating to be capable of operating without on-site combustion at outside air (OSA) temperatures above 20°F (-6.5 °C).
- Service Water Heating (1 point) Design service water heating systems to be capable of operating without on-site combustion at outside air temperatures above 20°F (-6.5 °C).
- Cooking and Other Process Loads (1 point) Design cooking, laundry, process equipment, and on-site power generation except emergency support systems to be capable of operating without on-site combustion.
- Fuel cells. Fuel cells using fossil fuel are ineligible for credit.

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https://www.usgbc.org/leed/v5

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LEED V5 - EA Credit: Reduce Peak Thermal Loads

Intent: To minimize demand on grid resources and improve the resiliency of buildings.

Requirements

EAc: Reduce Peak Thermal Loads Achievement Pathways	Points
New Construction	1-5
Option 1. Infiltration and Balanced Ventilation	1-2
AND/OR	
Option 2. Ventilation Energy Recovery	1
AND/OR	
Option 3. Thermal Bridging	1
AND/OR	
Option 4. Peak Thermal Load Reductions	1-3
Path 1. Peak Load Intensity	1-3
OR	
Path 2. ASHRAE 90.1 Trade-Off Methods	1-3
OR	
Path 3. Energy Simulation	1-3

ESC

https://www.usgbc.org/leed/v5

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LEED V5 - EA Credit: Enhanced Energy Efficiency

Intent: To design buildings that minimize energy use to reduce the environmental damage caused by resource extraction, air pollution, and greenhouse gas emissions and facilitate the transition to a clean energy future.

EAc: Enhanced Energy Efficiency Achievement Pathways	Points
New Construction	1-10
Option 1. Prescriptive Path	1-10
Path 1. Regulated Loads	1-7
Case 1. ASHRAE 90.1-2019	1-5
OR	
Case 2. ASHRAE 90.1-2022	4-7
AND/OR	
Path 2. Plug and Process Loads (PPL)	1-4
Case 1. Plug Load Management	1-4
OR	
Case 2. Efficient Plug and Process Load Equipment	1-4
OR	
Case 3. Plug and Process Load Exceptional Calculation	1-4
OR	
Option 2. Energy Simulation	1-10
Path 1. Percentage Reduction Excluding On-Site Renewable Contribution	1-10
OR	
Path 2. Percentage Reduction Including On-Site Renewable Contribution	1-10

Points for Percent Improvement in Plug & Process Loads

Percent improvement	Points
10%	1
20%	2
30%	3
40%	4

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https://www.usgbc.org/leed/v5

LEED V5 - EA Credit: Renewable Energy

1 – 5 points: 100% of site energy use from any combination of Tier 1, Tier 2, and Tier 3 renewable energy is required for LEED Platinum projects.

Intent: To encourage and recognize the use of renewable energy to reduce environmental and economic impacts associated with fossil fuel energy use and increase the supply of new renewable energy within the electrical grid, fostering a just transition to a green economy.

EAc: Renewable Energy Achievement Pathways	Points
New Construction	1-5
Renewable Energy Supply or Procurement	1-5

ESC

https://www.usgbc.org/leed/v5

LEED V5 - EA Credit: Grid-Interactive

Intent: To enhance power resiliency and position buildings as active partners contributing to grid decarbonization, reliability, and power affordability through integrated management of building loads in response to variable grid conditions.

Requirements

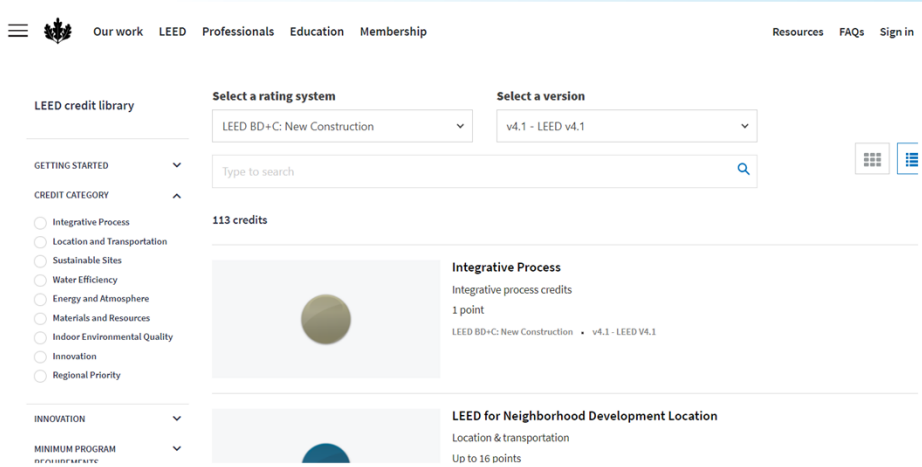
EAc: Grid-Interactive Achievement Pathways	Points
New Construction	1-2
Option 1. Energy Storage	1-2
AND/OR	
Option 2. Demand Response Program	1
AND/OR	
Option 3. Automated Demand Side Management	1
Path 1. System Level Controls	1
OR	
Path 2. Building Automation System	1
Option 4. Power Resiliency	1

Table 1. Peak Storage Capacity Relative to Peak Demand

Storage	1 point	2 points
Electric Storage Capacity Relative to peak electric demand	0.2 kWh / kW	0.4 kWh / kW
Thermal Storage Capacity Relative to peak coincident thermal demand (heating + cooling + service water heating + process heat)	1.0 kWh / kW or Btu / Btu/h or ton-hrs / ton	2.0 kWh / kWor Btu / Btu/h or ton-hrs / ton

https://www.usgbc.org/leed/v5

LEED Credit Library



Review the various requirements based on the project type and credit category.

https://www.usgbc.org/credits

LEED Fees

- Registration and Certification Fees
  - Registration is a flat fee paid up front at the time of registration
  - The certification fee is based your project's rating system and size; it is calculated and paid when the project team submits documentation for review in LEED Online
  - The fees for either the standard and split review cover both the preliminary and final reviews
- Vary by type of Certification project requested

Sample

Building Design and Construction fees

Building Design and Construction fees per building	Silver, Gold and Platinum level members		Organizational level members or nonmembers	
Registration	$1,350		$1,700	
Precertification				
Flat fee (per building)	$4,500		$5,600	
Expedited review (reduce from 20-25 business days to 10-12, available based on GBCI review capacity)	$6,000		$6,000	
Combined Certification Review: Design and Construction	**Rate**	**Minimum**	**Rate**	**Minimum**
Project gross floor area (excluding parking): less than 250,000 sq ft	$0.064/sf	$3,200	$0.076/sf	$3,825
Project gross floor area (excluding parking): 250,000 - 499,999 sq ft	$0.062/sf	$16,000	$0.074/sf	$19,000
Project gross floor area excluding parking): 500,000 - 749,999 sq ft	$0.056/sf	$31,000	$0.067/sf	$37,000
Project gross floor area (excluding parking): 750,000	Calculate pricing		Calculate pricing	

https://www.usgbc.org/tools/leed-certification/fees

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ENERGY STAR

https://www.energystar.gov/buildings/about-us

ENERGY STAR

- ENERGY STAR is a U.S. Environmental Protection Agency (EPA) voluntary program that helps businesses and individuals save money and protect our climate through superior energy efficiency.
- Through ENERGY STAR, EPA partners with businesses and public-sector organizations to transform the way that commercial buildings use energy.
- Through ENERGY STAR, EPA works with owners and managers of our nation's commercial buildings to help them strategically manage their facilities' energy performance, cut energy use, lower utility bills, and reduce greenhouse gas emissions.

https://www.energystar.gov/buildings/about-us

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Energy Star - Portfolio Manager

- The first step to saving energy at your building is to benchmark — that is, to measure and compare your building's energy to similar buildings, past consumption, or a reference performance level.
- Portfolio Manager is an interactive resource management tool that enables you to benchmark the energy use of any type of building, all in a secure online environment.
- Nearly 25% of U.S. commercial building space is already actively benchmarking in Portfolio Manager, making it the industry-leading benchmarking tool.
- It also serves as the national benchmarking tool in Canada.

ESC

https://www.energystar.gov/buildings/benchmark

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Energy Star Certification for Buildings

- On average, ENERGY STAR certified buildings use 35 percent less energy and generate 35 percent fewer greenhouse gas emissions than their peers.
- Building must earn an ENERGY STAR score of 75 or higher – indicating that it performs better than at least 75 percent of similar buildings nationwide.
- Using Portfolio Manager, EPA delivers 1 – 100 ENERGY STAR scores for many types of buildings.
- The ENERGY STAR score accounts for differences in operating conditions, regional weather data, and other important considerations.

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https://www.energystar.gov/buildings/building-recognition/building-certification

ENERGY STAR Score

- The 1 – 100 ENERGY STAR score compares buildings to other buildings like it across the country.
- Based on the information you enter about your building, such as its size, location, number of occupants, number of PCs, etc., the score's algorithm estimates how much energy the building would use if it were the best performing, the worst performing, and every level in between. It then compares the actual energy data you entered to the estimate to determine where your building ranks relative to its peers.
- All of the calculations are based on source energy and account for the impact of weather variations, as well as changes in key property use details.

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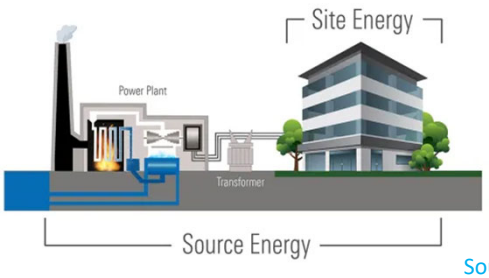
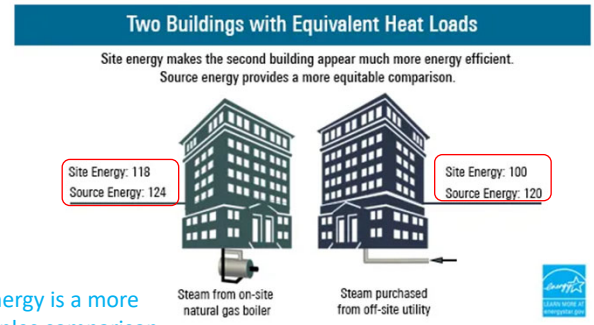
https://www.energystar.gov/buildings/benchmark/understand-metrics/how-score-calculated

Source Energy

EPA Recommends Using Source Energy

EPA has determined that *source energy* is the most equitable unit of evaluation for comparing different buildings to each other. Source energy represents the total amount of raw fuel that is required to operate the building. It incorporates all transmission, delivery, and production losses. By taking *all* energy use into account, the score provides a complete assessment of energy efficiency in a building.





Source energy is a more apples to apples comparison.

https://www.energystar.gov/buildings/benchmark/understand-metrics/source-site-difference

Property Types Eligible in the U.S.

- Bank Branch
- Barracks*
- Convenience store
- Courthouse
- Data center
- Distribution Center
- Financial office
- Hospital
- K-12 School
- Medical Office
- Multifamily housing
- Non-refrigerated warehouses
- Office
- Refrigerated warehouse
- Residence hall/ dormitory
- Retail store
- Single-family home*
- Senior living community
- Supermarket / grocery store
- Vehicle dealership
- Wastewater treatment plant*
- Wholesale club / supercenter
- Worship facility

*These property types are not eligible for ENERGY STAR certification, but they can still receive a 1-100 score

https://www.energystar.gov/buildings/benchmark/understand-metrics/property-types/eligible-score

Property Types Eligible in Canada

- Distribution Center
- Financial office
- Hospital
- Ice/Curling rink
- K-12 School
- Library
- Medical Office
- Museum
- Non-refrigerated warehouses
- Office
- Refrigerated warehouse
- Residence care facility
- Retail store
- Self storage facility
- Senior living community
- Supermarket / grocery store
- Wholesale club / supercenter

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https://www.energystar.gov/buildings/benchmark/understand-metrics/property-types/eligible-score

Property Use Details for all Buildings

Building must meet the thresholds listed:

- Be at least 5,000 square feet
  - There are four exceptions to this rule:
    - Convenience stores, K-12 schools, offices, banks, religious worship facilities, and warehouses may be <=1,000 sq ft
    - Religious worship facilities may be as small as 1,000 square feet
    - Hospitals must be at least 20,000 square feet
    - Data centers do not have a square-foot minimum
- Be in operation at least 30 hours per week.
  - There are a couple exceptions to this rule:
    - This doesn't apply to buildings that are not asked for hours of operation, such as hotels and hospitals
    - This doesn't apply to religious worship facilities
- Have at least 1 worker during the main shift

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https://www.energystar.gov/buildings/benchmark/understand-metrics/score-criteria#Property%20use

Additional Property Use Details

- Hospitals must have at least 1 bed set up and staffed for use
- Multifamily must have at least 20 units.
- Offices, bank branches, financial offices, and courthouses have at least 1 Personal Computer (PC)
- Residence halls/ dormitories and barracks have at least 5 rooms
- Retail stores have an exterior entrance to the public & be a single store only.
- Senior care facilities should not have an average number of residents > resident capacity
- Religious worship facilities have at least 25 seats and no more than 4,000 seats
- Vehicle dealerships maintain an inventory of at least one vehicle
- Wastewater Treatment have an ave. daily wastewater flow greater than 0.6 million gallons per day

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https://www.energystar.gov/buildings/benchmark/understand-metrics/score-criteria#Property%20use

Energy Data

To receive a 1–100 ENERGY STAR score, you must enter energy meters that account for all energy use for all fuel types in the *whole* building, regardless of who receives or pays the utility bills. To ensure accurate analysis, EPA applies limitations on this data as follows:

- You must include all energy used by the property (e.g., electricity, gas, oil, steam, onsite renewable energy, etc.).
- There must be at least 12 full consecutive calendar months of energy data for all active meters and all fuel types.

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https://www.energystar.gov/buildings/benchmark/understand-metrics/score-criteria#Property%20use

How Buildings Score

- The ENERGY STAR score compares the building to its peer group of buildings in the national population
- The U.S peer group is identified through nationally representative survey data, such as the Commercial Building Energy Consumption Survey (CBECS); conducted every four years by the U.S. Department of Energy
- In Canada, the building's peer group is based on a similar data source of Canadian buildings, the Survey on Commercial and Institutional Energy Use (SCIEU), which is commissioned by Natural Resources Canada (NRCan) and implemented by Statistics Canada.

https://www.energystar.gov/buildings/benchmark/understand-metrics/how-score-calculated

Certification Similarities and Differences

Operated by:	USGBC	EPA	GBI
Number of points	110	100	1000 or 0-100%
Submittals require additional documentation	✓		
New Buildings	✓		✓
Existing Buildings	✓	✓	✓
Score relative to other buildings		✓	
Online interactive questionnaire. Automated report		✓	✓
Useful to compare multiple buildings		✓	✓
Criteria weighted. Partial scores possible			✓

Canada Green Building Council

CAGBC | Canada Green Building Council

https://www.cagbc.org/

Canada Green Building Council (CaGBC)

- Created in 2002/03 to further the expansion of green building in Canada
- CAGBC offers high-quality, trusted, and rigorous third-party certifications designed to help guide and verify your investments in sustainability.
- CAGBC acts as a certification and credentialing body, exclusively administering project certifications for Zero Carbon Building Standards, LEED, Investor Ready Energy Efficiency (IREE) and TRUE.
- CaGBC is the license holder for the LEED green building rating system in Canada

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https://www.cagbc.org/CAGBC/LEED/CAGBC/Programs/LEED/_LEED.aspx?hkey=54c44792-442b-450a-a286-4aa710bf5c64

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CaGBC

- Mission: Lead and accelerate the transformation to high-performing, healthy green buildings, homes and communities throughout Canada
- Council works to:
  - change industry standards
  - develop best design practices and guidelines
  - advocate for green buildings
  - develop educational tools to support its members in implementing sustainable design and construction practices.

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https://www.cagbc.org/

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ASHRAE

Building Energy Quotient

ASHRAE®

Building eQ®

https://www.ashrae.org/technical-resources/building-eq

ASHRAE Building Energy Quotient

- Building Energy Quotient (Building EQ) is a building energy rating program that provides information on a building's energy use
- Two separate workbooks, one evaluating “As Designed” potential and the other assessing “In Operation” performance, from the foundation
  - As Designed compares potential energy use based on the building's physical characteristics and systems with standardized energy use simulation.
  - In Operation compares actual building energy use based on metered energy information.
- Building EQ rests on ASHRAE methodologies and standards and the experience of qualified practitioners

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https://www.ashrae.org/technical-resources/building-eq

What is Building EQ

- Building EQ was developed by ASHRAE
- The Building EQ Portal provides a quick energy analysis that benchmarks a building's energy performance.
- Building EQ assists in the preparation of an ASHRAE Level 1 Energy Audit to identify means to improve a building's energy performance including low-cost, no-cost energy efficiency measures and an Indoor Environmental Quality survey with recorded measurements to provide additional information to assess a building's performance.

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https://www.ashrae.org/technical-resources/building-eq

Benefits of Building EQ

- Consistent analysis of a building's potential energy efficiency & actual energy performance
- Compares a building's performance with similar buildings in similar climates
- Provides information to make informed decisions for managing a building's energy use
- Provides recommendations for reducing energy use while screening for indoor environmental quality
- Provides potential for continuous improvement in energy efficiency
- Illustrates benefit of making building equipment and system investments
- Can demonstrate corporate responsibility to employees, tenants, investors, and the public via a building label
- Provides ability to track and show the effectiveness of your improvements

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https://www.ashrae.org/technical-resources/building-eq

Building EQ Certified Providers

- The Building EQ Certified Provider badge can only be used by individuals certified by ASHRAE as Building Energy Modeling Professionals or Building Energy Assessment Professionals
- Earning and maintaining an ASHRAE Certification shows an individual has met rigorous eligibility requirements, passed an examination measuring their understanding of the respective body of knowledge, and for those who have already passed the examination, kept the understanding current through professional development.

Building eQ POWERED BY ASHRAE Certified Provider

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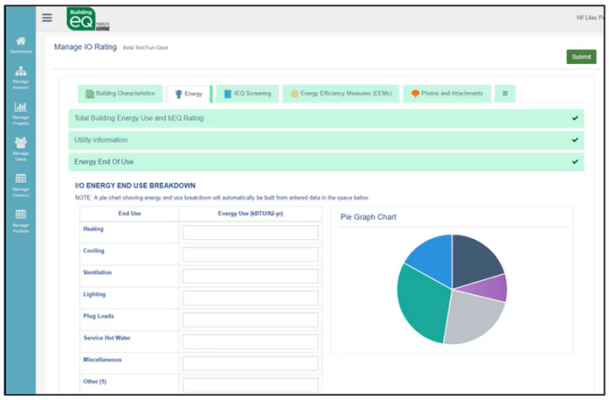
https://www.ashrae.org/technical-resources/building-eq

Building EQ Portal

- Web based portal
- Benchmarks energy performance to similar buildings in same climate zone
- Calculates building Energy Usage Intensity (EUI)
- Not a modeling tool



https://www.ashrae.org/technical-resources/building-eq/building-eq-resources

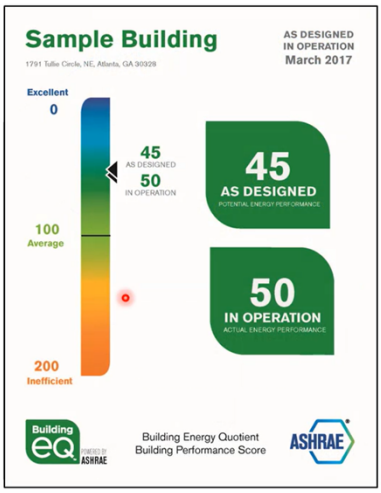
In Operation Assessment

- Uses metered bills for energy usage
- Aligns closely with Energy Star Portfolio Manager
- Reflects how a building is designed, used and operated
- Rating from 0 (Net Zero) to 200 (energy inefficient)

https://www.ashrae.org/technical-resources/building-eq/building-eq-resources

As Designed Assessment

- Evaluates potential energy use
- Aligns closely with DOE Building Asset Score
- Uses standardized energy model
- Independent of occupancy and operating conditions
- Rating from 0 (Net Zero) to 200 (energy inefficient)



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https://www.ashrae.org/technical-resources/building-eq/building-eq-resources

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Other Building Certifications

- Living Building Challenge
- Living Future Zero Carbon Certification
- SITES
- WELL Building Standard
- DOE Building Asset Score
- BOMA 360

Living Building Challenge

The Living Building Challenge is a philosophy, advocacy tool, and certification program defining today's most advanced measure of sustainability in the built environment. It addresses all buildings at all scales and is an inclusive tool for transformative design.

- Performance-based standard, and certification program for:
  - Landscape and infrastructure projects
  - Partial renovations and complete building renewals
  - New building construction
  - Neighborhood, campus and community design

https://living-future.org/lbc/

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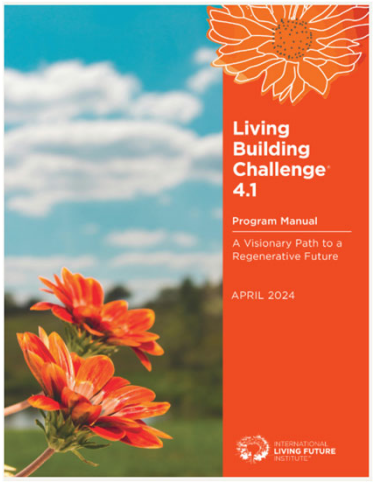
Living Building Challenge

- Performance areas include:
  - Site
  - Water
  - Energy
  - Materials
  - Health
  - Equity
  - Beauty



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https://living-future.org/lbc/

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Zero Energy Certification

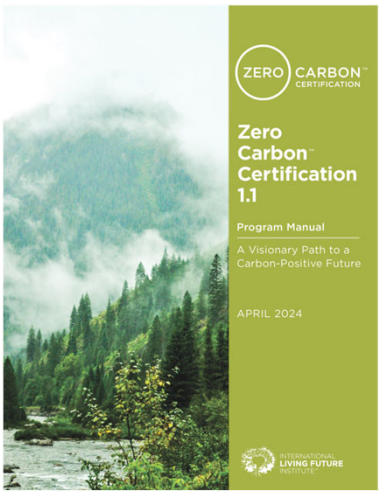
International Living Future Institute (ILFI)

LIVING FUTURE℠

https://living-future.org/zero-carbon/

Zero Energy Certification

- Zero Carbon Certification™ was developed by the International Living Future Institute to directly address the building sector's role in the global climate crisis.
- Zero Carbon Certification is a 3rd party verified, industry-recognized standard verifying that operational and embodied carbon emissions of a built project have been neutralized.
- All projects must disclose and offset 100% of the embodied carbon emissions (tCO2e).



https://living-future.org/zero-carbon/basics/

Certification Requirements

- New Building and Building Renovation projects must demonstrate a 20% reduction in the embodied carbon emissions of primary materials and exterior materials compared to a baseline building of equivalent size, function, and energy performance.
- Building Renovation projects may count the reuse of in-situ primary and exterior materials against the required 20%.
- All projects must set a goal to achieve below the ILFI-approved embodied carbon threshold for the upfront embodied carbon of the project

https://living-future.org/zero-carbon/basics/

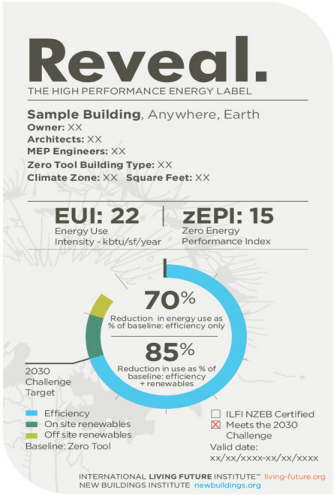
Certification Process

- Registration
- Project Development/Coaching Phase
- Audit
- Certification Rulings
  - Ready audit
  - Final audit
  - Appeal process

https://support.living-future.org/article/1322-ilfi-building-certification-process

Zero Energy Label

- The Reveal label communicates your building's energy efficiency and renewable production and procurement (if any) in one beautiful, easy-to-understand package.
- It provides a verification of energy performance, including three separate metrics: energy use intensity, the zero energy performance index, and reduction in energy use from baseline.



SITES Initiative

THE Sustainable SITES Initiative®

GBCI®

SITES is a rating system that guides, evaluates and certifies a project's sustainability in the planning, design, construction and management of landscapes and other outdoor spaces.

http://www.sustainablesites.org/

SITES Rating System

- SITES provides a comprehensive framework for designing, developing and managing sustainable and resilient landscapes and other outdoor spaces. SITES is the ideal tool to support nature positive design.
- SITES applies to:
  - Open spaces
  - Streetscapes & plazas
  - Commercial: Retail, Office, & corporate campuses
  - Educational & institutional
  - Residential: Neighborhoods or community areas

ESC

https://www.sustainablesites.org/certification-guide

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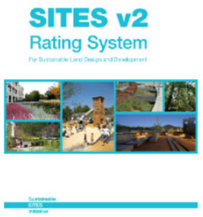
SITES

- Third party verified rating system for development projects located on sites with or without buildings.
- Administered by GBCI (Green Business Certification, Inc.)
- Performance criteria in the areas of:
  - Water
  - Wildlife Habitat
  - Energy
  - Air Quality
  - Human Health
  - Outdoor recreation opportunities



https://www.usgbc.org/resources/sites-rating-system-and-scorecard

How SITES Works

- SITES-certified projects help reduce water demand, filter and reduce stormwater runoff, enhance biodiversity, provide pollinator and wildlife habitat, reduce energy consumption, improve air quality, improve human health, increase outdoor recreation opportunities and much more.
- The SITES v2 Rating System is a 200-point system with four certification levels of achievement.

Certified	Silver	Gold	Platinum
70-84 points	85-99 points	100-134 points	135+ points

- The SITES and LEED rating systems are complementary and can be used independently or in tandem. LEED applies to your project building and the site it is located on, and SITES applies to everything on your site, except your building.

https://www.sustainablesites.org/certification-guide

SITES Costs

	USGBC and ASLA Members	Non-Members
Registration	$2,500	$3,000
Certification	$6,500	$9,000
Combined (Registration + Certification)	$8,000	$9,500

https://www.sustainablesites.org/certification-guide

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WELL Building Standard

Measures attributes of buildings that impact occupant health by looking at seven factors: Air, Water, Nourishment, Light, Fitness, Comfort, Mind

https://www.wellcertified.com/en/start-a-project

WELL v2

- The WELL Building Standard™ version 2 (WELL v2™) is a vehicle for buildings and organizations to deliver more thoughtful and intentional spaces that enhance human health and well-being.
- WELL v2 includes a set of strategies—backed by the latest scientific research—that aim to advance human health through design interventions and operational protocols and policies and foster a culture of health and well-being.

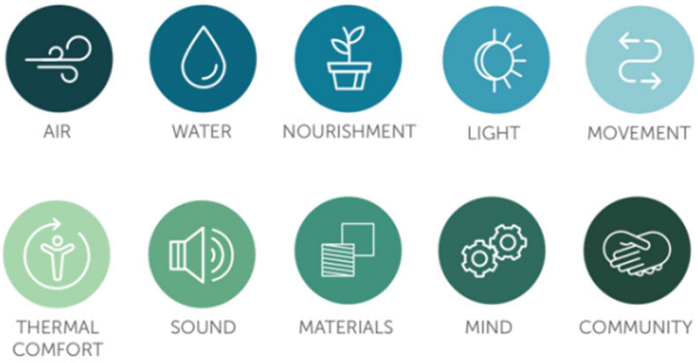
ESC https://v2.wellcertified.com/en/wellv2/overview 101

WELL v2 Principles

- **Equitable:** Aims to benefit a variety of people, including and especially disadvantaged or vulnerable populations.
- **Global:** Proposes interventions that are feasible, achievable and relevant across many applications throughout the world.
- **Evidence-based:** Draws upon a diverse and rigorous body of research across varying disciplines, validated by a collaborative body of experts, including IWBI advisors.
- **Technically robust:** Defines industry best practice and validates strategies through performance verification and a rigorous third-party verification process.
- **Customer-focused:** Sponsors the success of WELL users through dedicated coaching services, dynamic resources and an intuitive platform for navigating the journey.
- **Resilient:** Keeps pace with advances in research, science, technology and society, continuously improving by integrating new findings.

ESC https://v2.wellcertified.com/en/wellv2/overview 102

WELL Concepts



WELL Building Standard

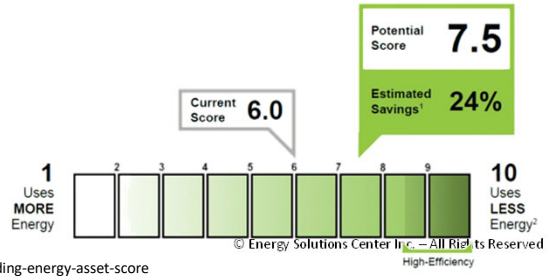
- Performance based standard and certification program for:
  - New and Existing Buildings
  - New and Existing Interiors
  - Core and Shell Retail
  - Education Facilities
  - Restaurant
  - Commercial Kitchen
  - Multifamily Residential
- Administered by the International WELL Building Institute™ (IWBI)

DOE Building Asset Score

https://www.energy.gov/eere/buildings/building-energy-asset-score

DOE Building Asset Score

- The U.S. Department of Energy's Building Energy Asset Score (Asset Score) is a national standardized tool for assessing the physical and structural energy efficiency of commercial and multifamily residential buildings.
- The Asset Score generates a simple energy efficiency rating that enables comparison among buildings and identifies opportunities to invest in energy efficiency upgrades. It is available for voluntary use and is 100% free to use.



https://www.energy.gov/eere/buildings/building-energy-asset-score

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DOE Building Asset Score

Whole-building energy simulation and generates an Energy Asset Score Report that includes the following actionable information:

- A score ranging from 1 to 10 based on the energy efficiency of the building envelope and the mechanical, electrical, and service hot water systems
- An energy efficiency assessment of the building's individual systems
- Total estimated building energy usage and energy use by end use (lighting, heating, cooling, service hot water) under standard operating conditions
- Opportunities to upgrade building efficiency, and a "potential" energy efficiency score based on identified upgrades

ESC

https://www.energy.gov/eere/buildings/building-energy-asset-score

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BOMA 360

https://boma.org/360/

BOMA 360

- BOMA 360 Performance Program has set the standard worldwide for holistic operational best practices in commercial real estate.
- Only occupied commercial office buildings/facilities are eligible for the BOMA 360 Performance Program designation for office buildings.
- The building must be occupied for at least one full year from the date of occupancy of the first tenant, with a minimum of 12 months of building operations.
- Cost $995 BOMA member and $1500 non-member

ESC

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BOMA 360 points

Section	Maximum Points	Required Points
Building Operations and Management	18	14
Life Safety/Security/Risk Management	27	17
Training/Education	19	10
Energy	23	13
Environmental/Sustainability/Health &Wellness	29	14
Tenant/Occupant Relations/Community Involvement	13	7

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https://recognition.boma.org/ShowContent?i=50

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Associations & Resources

Associations & Resources

- Green Building Initiative
  - Located in Portland, OR
  - Mission is to accelerate the adoption of building practices that result in energy-efficient, healthier and environmentally sustainable buildings
  - Provides sustainability assessment and certification services
  - www.thegbi.org

GREEN BUILDING INITIATIVE

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Associations & Resources

- USGBC – U.S. Green Building Council
- Located in Washington, DC
- Oversees the LEED Program
- Offers training workshops
- Provides education and certification
  - www.usgbc.org

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Associations & Resources

- EPA – U.S. Environmental Protection Agency
  - Located in Washington, DC
  - ENERGY STAR Program is a voluntary program that helps businesses and individuals save money and protect our climate
  - www.energystar.gov

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Associations & Resources

- Canada Green Building Council (CaGBC)
- Located in Ottawa, Ontario
- Mission is to lead and accelerate the adoption of green buildings, homes and communities throughout Canada
- https://www.cagbc.org/

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Associations & Resources

- ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers – Atlanta, GA
  - Advances heating, ventilation, air conditioning and refrigeration through research, standards writing, publishing and continuing education
  - www.ashrae.org

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