

USGBC LEED Rating Systems and Energy Requirements

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US Green Building Council

- Mission
 - To transform the way buildings and communities are designed, built and operated, enabling an environmentally and socially responsible, healthy, and prosperous environment that improves the quality of life
- Leadership in Energy and Environmental Design (LEED)
 - Provides building owners and operators with a framework for identifying and implementing practical and measurable green building design, construction, operations and maintenance solutions



LEED is a set of rating systems

NEW
CONSTRUCTION
AND MAJOR RENOVATIONS

EXISTING
BUILDINGS
OPERATIONS AND
MAINTENANCE

CORE AND
SHELL
DEVELOPMENT

COMMERCIAL
INTERIORS

HOMES

NEIGHBORHOOD
DEVELOPMENT

HEALTHCARE

SCHOOLS

RETAIL



LEED 2009

Main credit categories

- **Sustainable sites**
 - Minimize the impact on ecosystems and water resources
- **Water efficiency**
 - Smarter use of water to reduce potable water consumption
- **Energy & atmosphere**
 - Better building energy performance
- **Materials & resources**
 - Using sustainable building materials and reducing waste
- **Indoor environmental quality**
 - Better indoor air quality and access to daylight and views

LEED 2009 New Construction and Major Renovations



Out of a possible 110 points:

Certified

40 - 49 points

Silver

50 - 59 points

Gold

60 - 79 points

Platinum

80 points and above



Energy and Atmosphere

Prerequisites	
EAp1	Fundamental Commissioning of Building Energy Systems
EAp2	Minimum Energy Performance
EAp3	Fundamental Refrigerant Management

EAp2

Minimum Energy Performance



Intent	To establish the minimum level of energy efficiency for the proposed building and systems to reduce environmental and economic impacts associated with excessive energy use
Requirements	
Option 1	Whole Building Energy Simulation <ul style="list-style-type: none">● Demonstrate a 10% improvement for new buildings compared with the baseline performance rating. Calculate based on ASHRAE 90.1-2007 Appendix G
Option 2	Prescriptive Compliance Path: ASHRAE <ul style="list-style-type: none">● Comply with the ASHRAE Advanced Energy Design Guide
Option 3	Prescriptive Compliance Path: Advanced Buildings Guide <ul style="list-style-type: none">● Comply with the Advanced Buildings Core Performance Guide developed by the New Buildings Institute



Energy and Atmosphere

Credit		Possible Points
EAc1	Optimize Energy Performance	1-19
EAc2	On-site Renewable Energy	1-7
EAc3	Enhanced Commissioning	2
EAc4	Enhanced Refrigerant Management	2
EAc5	Measurement and Verification	3
EAc6	Green Power	2
Total		35

EAc5

Measurement and Verification



Intent	To provide for the ongoing accountability of building energy consumption over time
Requirements	
Option 1	Develop and implement a M&V plan consistent with Option D: Calibrated Simulation
Option 2	Develop and implement a M&V plan consistent with Option B: Energy Conservation Measure Isolation
Option 3	Commit to sharing whole building energy data for at least 5 years

IPMVP . International Performance Measurement & Verification Protocol Volume III:
Concepts and Options for Determining Energy Savings in New Construction, April 2003



Measuring Performance

Site Energy Use Intensity (EUI)

This facility is currently using 51% less energy per square foot than similar facilities in the U.S. Total site EUI has decreased 2% from the baseline year.

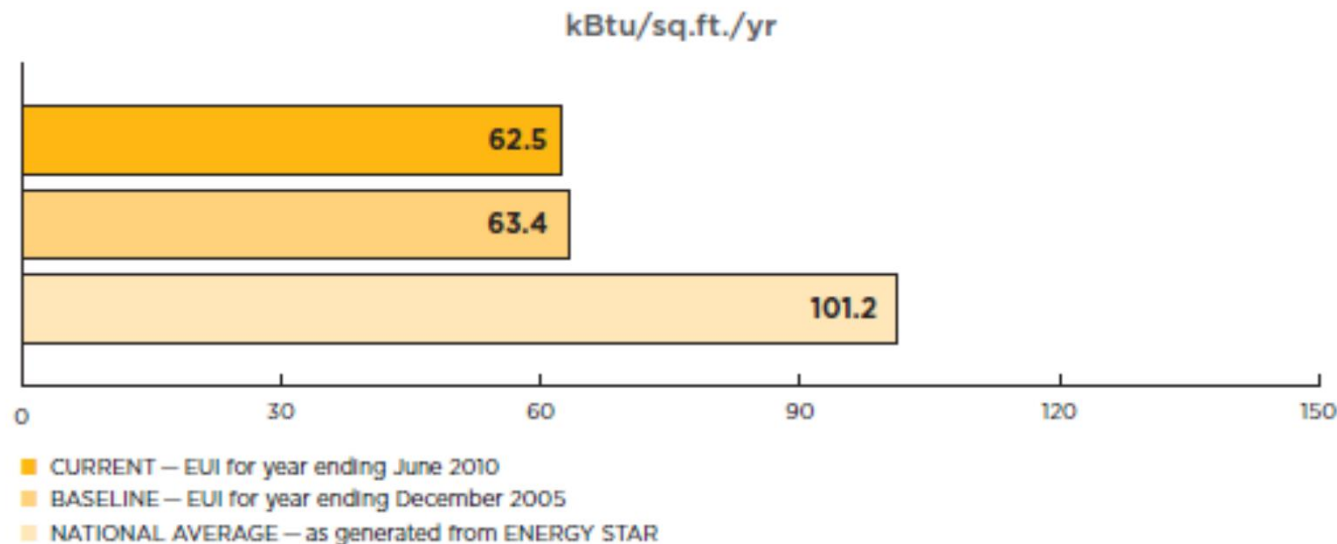
The ENERGY STAR Rating has increased indicating an improvement in energy performance relative to other similar buildings in the U.S.

Energy Use:
(Current EUI: 62.5 kBtu/sq.ft./yrs)

Current ENERGY STAR Rating:
(baseline is 87)

 **2%**

88





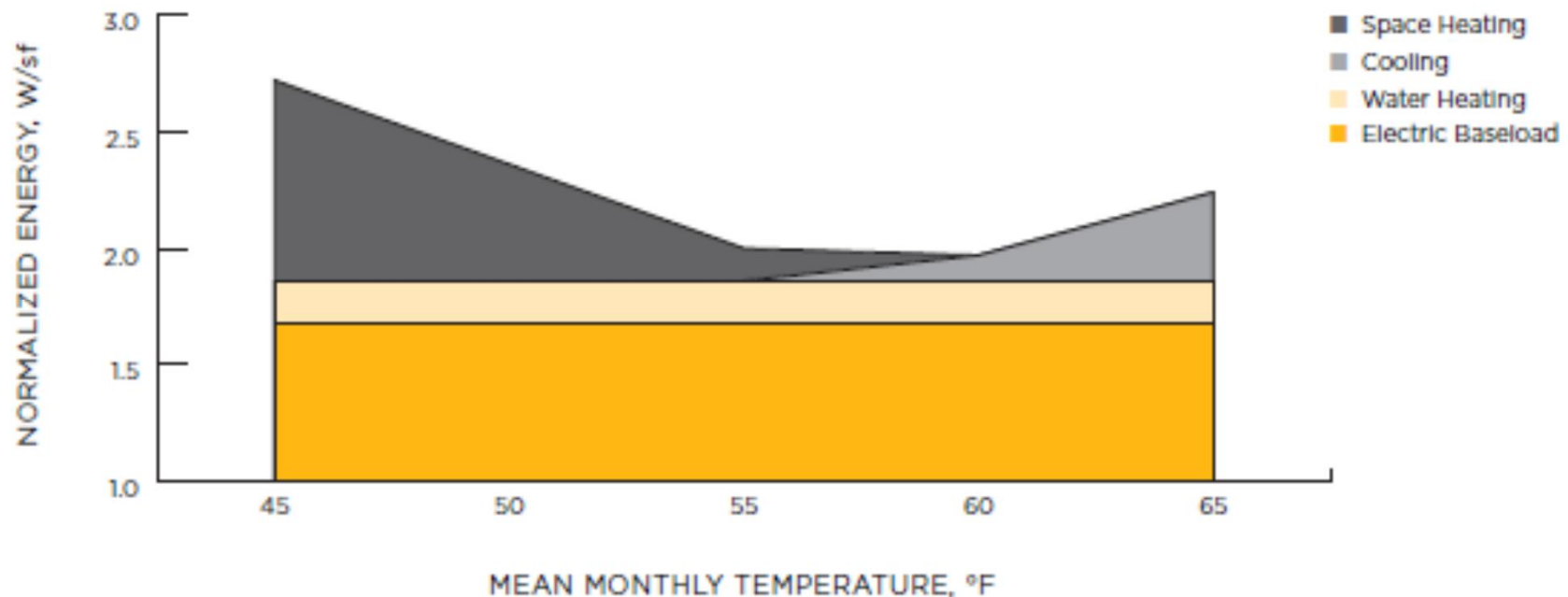
Measuring Performance

Energy Signature by End Use

Energy Signatures analyze the monthly measured energy use (vertical axis) in relation to the actual average outside temperature (horizontal axis). That perspective permits an effective first view of how energy is being used in the building and areas that may warrant further investigation.

• Energy Signature analysis performed by: New Buildings Institute in Vancouver, WA

Energy Signature by End Use (July 2009 - June 2010)





LEED v4

Coming in 2013

- **New prerequisites:**

- Energy verification and reporting
- Building-level energy metering

- **New credits:**

- Advanced energy metering
 - Hourly data logging
 - Remote access
 - Sub-metering of large energy-consuming systems
 - Alarm system to alert when demand rises >5% above expected levels
- Renewable energy production
- Green power and carbon offsets

Professional training and certificates



Credentials:

- LEED Green Associates

- Basic knowledge of green design, construction & maintenance



- LEED Accredited Professionals (AP)

- Professionals with practical knowledge and expertise in a specific area relevant to a green rating system



Certificates:

- LEED for Homes Green Rater

- Provide in-the-field verification services by performing field inspections and performance testing



More information

- USGBC LEED

<http://new.usgbc.org/leed>

- Green Building Information Gateway

<http://www.gbig.org/>

- LEED professional credentials

<http://new.usgbc.org/credentials>

- CaGBC

<http://www.cagbc.org/>