AWeber Communications; Chalfont, PA
LEED rating: Gold

LEED® v4 buildings | Lutron commercial solutions

LUTRON

LEED® overview

What is LEED?

LEED – Leadership in Energy and Environmental Design, is a rating system started in 1998 and administered by the United States Green Building Council (USGBC). It provides an objective, national standard for what constitutes a green building, and it offers a set of scientifically based performance criteria for LEED project certification.

The LEED Green Building Rating Systems address eight energy and environmental topics (Lutron solutions can help achieve points in the categories highlighted in **BOLD** below):

- Location and Transportation
- Sustainable Sites
- Water Efficiency
- **Energy and Atmosphere**
- **Materials and Resources**
- **Indoor Environmental Quality**
- **Innovation**
- **Regional Priority**

All LEED v4 rating systems have four certification levels.
Each is awarded by achieving a minimum number of points:
Certified – 40-49 points
Silver – 50-59 points
Gold – 60-79 points
Platinum – 80 points and above

Genzyme Center, Cambridge, MA
LEED rating: Platinum

What's NEW in LEED v4?

- **New market sectors**
  Twenty-one new market specific adaptations of LEED for projects such as data centers, warehouses, hospitality, and retail
- **New credits**
  Integrative Process, Demand Response, and Location and Transportation are new credits
- **Increased stringency**
  ASHRAE 90.1-2010 is the new energy baseline, instead of 90.1-2007
- **Streamlined services**
  The number of LEED online forms has been reduced to 186 from 2,900

Market Specific LEED Rating Systems

LEED v4 covers a wider swath of the market than ever before and seeks to meet the unique needs of users by providing technical solutions for all project types. Under each general LEED rating system there are additional, market-specific rating systems for the following building types:

- Schools
- Data centers
- Warehouses and distribution centers
- Hotels
- Retail
- Healthcare

Market-specific rating systems should be used when more than 60% of the floor area on a project is one of the building types listed above. If less than 40% of the floor area is one of these building types, the project should use one of the general LEED rating systems (New Construction, Existing Building, or Commercial Interiors). If the floor area falls between 40% and 60% in one of these building types, the design team can choose to use the more applicable LEED rating system.

Lutron strategies for LEED projects include:

- Astronomical timeclock scheduling
- Occupancy/vacancy sensing
- Dimming and switching systems (including fluorescent and LED dimming)
- Light level tuning or high-end trim
- Daylight harvesting
- Automated window shades
- Glare control
- Personal light control
- Real-time monitoring
- Load shedding and demand response
- Building Management Systems (BMS) integration
- Commissioning

Lutron solutions contribute to LEED® v4 certification[1]

Energy and Atmosphere

Fundamental Commissioning and Verification[2]

Intent:

Support the design, construction, and operation of a project that meets owner requirements

Key requirement:

- Develop and implement a commissioning plan for all building systems, including lighting

Lutron solution:

Lutron field service team will help the Commissioning Authority (CxA) verify the Lutron system installation and performance

Enhanced Commissioning

Intent:

To further support the design, construction, and operation of a project that meets owner requirements

Key requirements:

- Train operating personnel and provide systems manuals
- Review building operations after 10 months of completion

Lutron Solution:

- Lutron field service team can train and provide necessary manuals to operating personnel
- Lutron field service system optimization or customer site solutions training[3]

Energy Efficiency Best Management Practices[2]

Intent:

Promote continuity of information to ensure that energy-efficient operating strategies are maintained and provide a foundation for training and system analysis

Key requirement:

- Conduct energy audit

Lutron Solution:

- Lutron field service system optimization or customer site solutions training[3]

Advanced Energy Metering

Intent:

Track system-level energy use

Key requirement:

- Lighting, HVAC, and plug load energy monitoring

Lutron Solution:

- Quantum monitors, calculates, records, and reports on the lighting energy use in real-time

Demand Response

Intent:

Increase participation in demand response technologies

Key requirement:

- Participate in a demand response program

Lutron Solution:

- Quantum and Vive demand responsive lighting can automatically shed lighting loads during a demand response event and automatically return lighting to pre-demand response levels at the end of the demand response event

Minimum Energy Performance[2]

Intent:

Establish a minimum level of energy efficiency for the building

Key requirement:

- Comply with ASHRAE 90.1-2010 Energy Efficiency Standard

Lutron Solution:

- Lutron solutions can help achieve many mandatory lighting control requirements in ASHRAE 90.1-2010 (see sidebar)

Optimize Energy Performance

Intent:

Achieve energy performance beyond the prerequisite standard

Key requirement:

- Achieve energy performance at least 6% better than an ASHRAE 90.1-2010 compliant building

Lutron Solution:

- Using a combination of energy-saving lighting control strategies that go beyond what's mandated in 90.1-2010 can reduce lighting loads by 30% or more beyond a 90.1-2010 compliant building. These solutions include: automatic partial-off lighting in corridors, continuous daylight dimming in primary and secondary daylight zones, high-end trim, and occupancy sensing timeouts set to 20 minutes or less. In addition, these advanced lighting control strategies also help to reduce HVAC loads.

Material and Resources

Building Product Disclosure and Optimization

Intent:

Encourage use of products and materials that have life cycle information and that are environmentally friendly

Key requirement:

- Use products with recycled content or that are Cradle-to-Cradle certified, for at least 25% of the total value of all installed building products

Lutron Solution:

- 100% Recycled fabrics for Lutron automated window shades
- Cradle-to-Cradle certified Lutron shade fabrics

[1] This brochure summarizes the LEED credits and prerequisites that Lutron solutions can contribute to. It is for information purposes only. Please refer to the USGBC LEED Reference Guides on usgbc.org/credits for precise requirements.

[2] Prerequisite

[3] lutron.com/service

Lutron ASHRAE 90.1-2010 Solutions

All LEED v4 projects must comply with the ASHRAE 90.1-2010 energy standard. Below are some of the mandatory requirements in 90.1 that Lutron solutions can help meet:

- **Automatic shut-off**
  Occupancy sensors or astronomical timeclocks
- **Space control**
  Dimmers, switches, keypads, and scene controls
- **Exterior lighting control**
  Astronomical timeclocks
- **Stairwell lighting control**
  Stairwell fixtures
- **Automatic daylight zone control**
  Daylight sensors with dimming ballasts or drivers
- **Light reduction controls**
  Dimming ballasts and drivers
- **Functional control testing**
  Lutron Services Company
- **Receptacle control**
  20A PowPak relay module, 20A Energi Savr Node with SoftSwitch, or XP switching module
- **Energy monitoring**
  Quantum lighting energy monitoring

Lutron solutions contribute to LEED® v4 certification

Indoor Environmental Quality

Indoor Air Quality Assessment

Intent:

Establish better quality indoor air after construction and during occupancy

Key requirement:

- Air testing to show that contaminants (e.g. volatile organic compounds or VOCs) are below the thresholds

Lutron Solution:

- GREENGUARD® Certified fabrics for Lutron automated window shades

Low-emitting materials

Intent:

To reduce concentrations of chemical contaminants that can damage air quality, human health, productivity, and the environment.

Key requirement:

- Building products must be tested and determined compliant with California Department of Public Health (CDPH) Standard Method v1.1–2010

Lutron Solution:

- GREENGUARD® GOLD fabrics for Lutron automated window shades

Interior Lighting

Intent:

Provide high-level lighting system control for individual occupants or groups in multi-occupant spaces (i.e. classrooms, conference rooms) and occupants' promote productivity, comfort, and well-being

Key requirement:

- Use of multi-level lighting or continuous dimming

Interior Lighting

Lutron Solution:

- All Lutron lighting controls from wallbox dimmers to preset scene controls, such as GRAFIK Eye QS, help achieve this credit

Daylight and Quality Views

Intent:

Provide occupants a connection to outdoors through daylight and views into regularly occupied spaces

Key requirement:

- Glare control

Lutron Solution:

- Lutron automated window shades help control glare while still providing daylight and access to views

Innovation

Innovation

Intent:

Additional points for exceptional performance above LEED requirements and/or innovative performance in green building categories not addressed by LEED

Lutron Solution:

- Using the Quantum GreenGlance energy savings display in conjunction with a distributed case study or building tours helps achieve innovation points for green education

LEED AP

Intent:

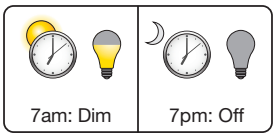
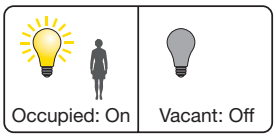
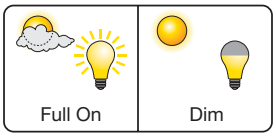
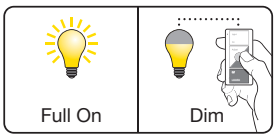
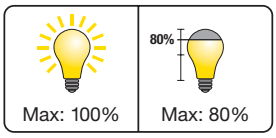
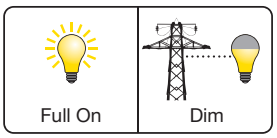
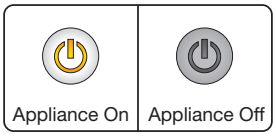
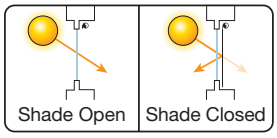
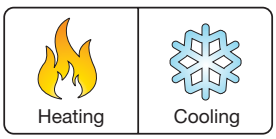
Support and encourage the design and integration required by LEED to streamline the application and certification process

Lutron Solution:

- Lutron has several LEED APs on staff who can assist the project team with the LEED rating system

What is the savings opportunity?

Lutron solutions enhance comfort and productivity while saving up to 60% of a commercial building's lighting energy plus additional savings in HVAC and plug load energy.

		Potential savings
	**Scheduling** provides pre-programmed changes in light levels based on time of day.	10–20% Lighting
	**Occupancy/vacancy sensing** turns lights on when occupants are in a space and off when they vacate the space.	20–60% Lighting
	**Daylight harvesting** dims electric lights when daylight is available to light the space.	25–60% Lighting
	**Personal dimming control** gives occupants the ability to adjust the light level for their tasks at hand, improving their productivity while saving energy.	10–20% Lighting
	**High-end trim** sets the maximum light level based on customer requirements in each space.	10–30% Lighting
	**Demand response** automatically reduces lighting loads during peak electricity usage times.	30–50% Lighting
	**Plug load control** automatically turns off loads after occupants leave a space.	15–50% Plug load
	**Controllable window shading** can save 10-20% in cooling energy while eliminating glare from windows and increasing productivity by up to 25%	10–20% HVAC
	**HVAC integration** controls heating, ventilation, and air conditioning systems through contact closure, or BACnet protocol.	5–15% HVAC

For a list of sources please visit lutron.com/references.

LEED® v4 building design and construction

NC **New Construction and Major Renovations**
CS **Core and Shell Development**
S **Schools**

Lutron solutions help with the following credits and prerequisites.

		NC Points	CS Points	S Points
CREDIT 1	Integrative Process	1	1	1
Energy and Atmosphere	**Possible Points**	**27**	**27**	**25**
PREREQUISITE 1	Fundamental Commissioning and Verification	Req.	Req.	Req.
PREREQUISITE 2	Minimum Energy Performance	Req.	Req.	Req.
CREDIT 1	Enhanced Commissioning	6	6	6
CREDIT 2	Optimize Energy Performance	18	18	16
CREDIT 3	Advanced Energy Metering	1	1	1
CREDIT 4	Demand Response	2	2	2
Materials and Resources	**Possible Points**	**4**	**4**	**4**
CREDIT 3	Building Product Disclosure and Optimization - Raw Materials	2	2	2
CREDIT 4	Building Product Disclosure and Optimization - Material Ingredients	2	2	2
Indoor Environmental Quality	**Possible Points**	**11**	**7**	**11**
CREDIT 2	Low Emitting Materials	3	3	3
CREDIT 4	Indoor Air Quality Assessment	2	–	2
CREDIT 6	Interior Lighting	2	–	2
CREDIT 7	Daylight	3	3	3
CREDIT 8	Quality Views	1	1	1
Innovation in Design	**Possible Points**	**6**	**6**	**6**
CREDIT 1	Innovation	5	5	5
CREDIT 2	LEED Accredited Professional	1	1	1
Regional Priority	**Possible Points**	**4**	**4**	**4**
CREDIT 1	Regional Priority: Specific Credit	1	1	1
CREDIT 2	Regional Priority: Specific Credit	1	1	1
CREDIT 3	Regional Priority: Specific Credit	1	1	1
CREDIT 4	Regional Priority: Specific Credit	1	1	1
	Maximum Points Lutron Solutions Can Help Achieve	**53**	**49**	**51**

Lutron solutions can help achieve up to 53 of the 110 possible points in LEED NC.*

* Lutron cannot guarantee that points will be awarded for using any particular solution. USGBC does not award points based on products, rather they award points based upon the project meeting all the requirements for a given LEED credit or prerequisite. Lutron solutions may help meet one or more of the requirements for the identified credits or prerequisites in the chart above.

CI Commercial Interiors

Lutron solutions help with the following credits and prerequisites.

		CI Points
CREDIT 1	Integrative Process	2
Energy and Atmosphere	**Possible Points**	**32**
PREREQUISITE 1	Fundamental Commissioning and Verification	Req.
PREREQUISITE 2	Minimum Energy Performance	Req.
CREDIT 1	Enhanced Commissioning	5
CREDIT 2	Optimize Energy Performance	25
CREDIT 3	Advanced Energy Metering	2
Materials and Resources	**Possible Points**	**4**
CREDIT 4	Building Product Disclosure and Optimization - Raw Materials Extraction	2
CREDIT 5	Building Product Disclosure and Optimization - Material Ingredients	2
Indoor Environmental Quality	**Possible Points**	**11**
CREDIT 2	Low-Emitting Materials	3
CREDIT 4	Indoor Air Quality Assessment	2
CREDIT 6	Interior Lighting	2
CREDIT 7	Daylight	3
CREDIT 8	Quality Views	1
Innovation	**Possible Points**	**6**
CREDIT 1	Innovation	5
CREDIT 2	LEED Accredited Professional	1
Regional Priority	**Possible Points**	**4**
CREDIT 1	Regional Priority: Specific Credit	1
CREDIT 2	Regional Priority: Specific Credit	1
CREDIT 3	Regional Priority: Specific Credit	1
CREDIT 4	Regional Priority: Specific Credit	1
	Maximum Points Lutron Solutions Can Help Achieve	**59**

Lutron solutions can help achieve up to 59 of the 110 possible points in LEED CI.*

* Lutron cannot guarantee that points will be awarded for using any particular solution. USGBC does not award points based on products, rather they award points based upon the project meeting all the requirements for a given LEED credit or prerequisite. Lutron solutions may help meet one or more of the requirements for the identified credits or prerequisites in the chart above.

LEED® v4 building design and construction checklist

EB Existing Buildings

Lutron solutions help with the following credits and prerequisites.

		EB Points
Energy and Atmosphere	**Possible Points**	**32**
PREREQUISITE 1	Energy Efficiency Best Management Practices	Req.
PREREQUISITE 2	Minimum Energy Performance	Req.
CREDIT 1	Existing Building Commissioning—Analysis	2
CREDIT 2	Existing Building Commissioning—Implementation	2
CREDIT 3	Ongoing Commissioning	3
CREDIT 4	Optimize Energy Performance	20
CREDIT 5	Advanced Energy Metering	2
CREDIT 6	Demand Response	3
Indoor Environmental Quality	**Possible Points**	**6**
CREDIT 4	Interior Lighting	2
CREDIT 5	Daylight and Quality Views	4
Innovation	**Possible Points**	**6**
CREDIT 1	Innovation	5
CREDIT 2	LEED Accredited Professional	1
Regional Priority	**Possible Points**	**4**
CREDIT 1	Regional Priority: Specific Credit	1
CREDIT 2	Regional Priority: Specific Credit	1
CREDIT 3	Regional Priority: Specific Credit	1
CREDIT 4	Regional Priority: Specific Credit	1
	Maximum Points Lutron Solutions Can Help Achieve	**48**

Lutron solutions can help achieve up to 48 of the 110 possible points in LEED EB.*

* Lutron cannot guarantee that points will be awarded for using any particular solution. USGBC does not award points based on products, rather they award points based upon the project meeting all the requirements for a given LEED credit or prerequisite. Lutron solutions may help meet one or more of the requirements for the identified credits or prerequisites in the chart above.

Lutron project profile

AWeber Communications

Chalfont, PA

AWeber Communications thrives on creative energy. From free-form office space, to tube slide transports, to a dynamic lighting control system that automatically responds to the outdoor environment, AWeber offices combine playfulness with productivity and energy efficiency.

These values are built into the office design and evaluated regularly. A recent lighting retrofit at their new headquarters resulted in a total lighting energy savings of 32% below baseline. The company attributes 70% of that reduction to dynamic lighting control strategies, including high-end-trim, wireless daylight and occupancy sensors, and automated shade control.

Prior to the renovation, baseline lighting electricity use was 242,830 kWh. Subsequent analysis shows that AWeber has reduced lighting electricity use to 166,489 kWh. Further analysis by Rafael Carrero of Bala Engineering shows that 70% of the savings can be attributed to the lighting control strategies.

AWeber Communications. Photo © Halkin Mason Photography

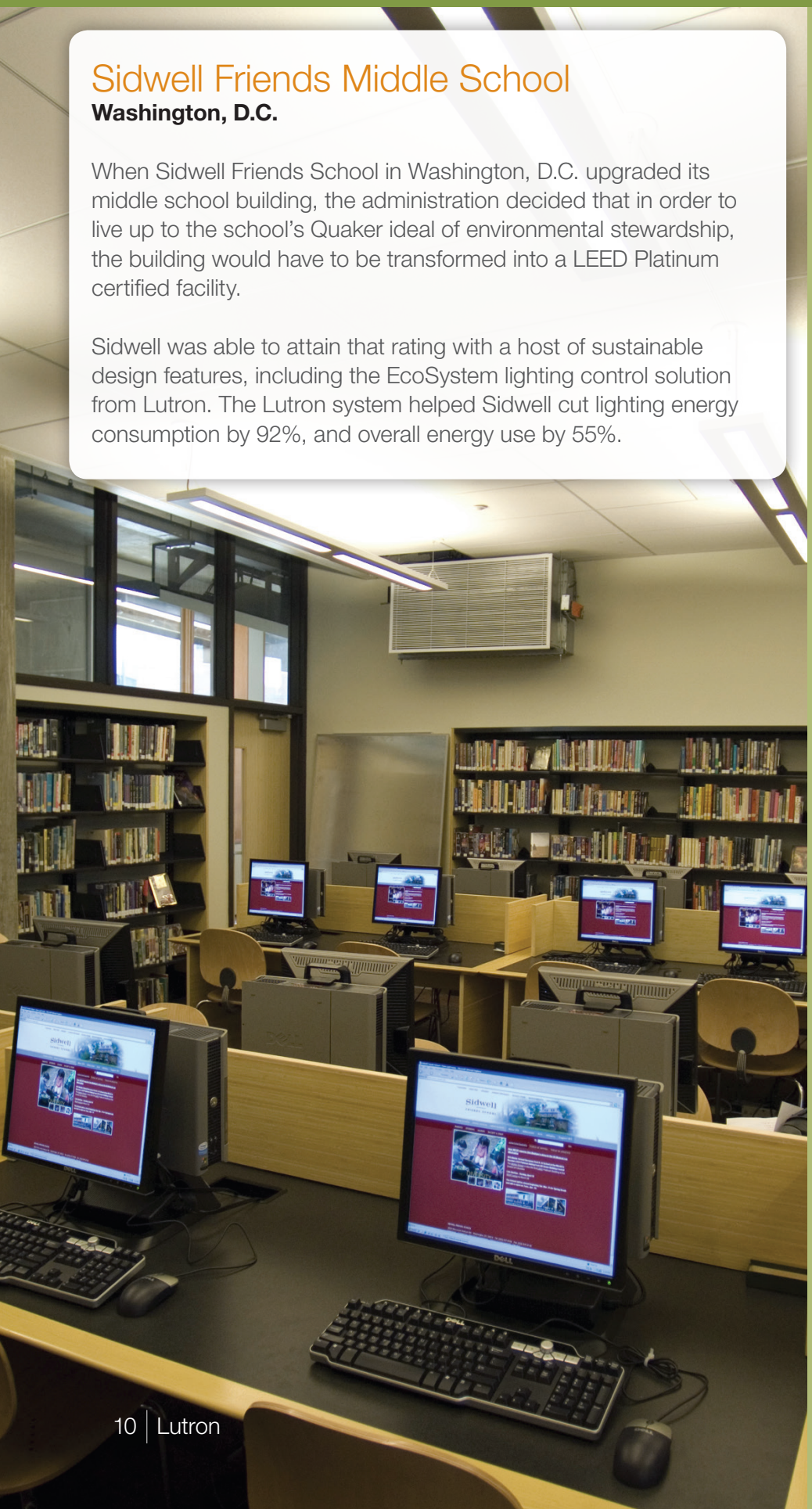
LEED® Facts

Gold	**61**
Sustainable Sites	9/21
Water Efficiency	8/11
Energy & Atmosphere	23/37
Materials & Resources	9/14
Indoor Environmental Quality	5/17
Innovation in Design	6/65
Regional Priority	1/4

LEED for Commercial Interiors (v 2009)
awarded July 2013

"Our offices are built to encourage collaboration… freedom and fun are core values that translate into tremendous return on investment."

Sean Cohen
Chief Operation Officer, AWeber



Sidwell Friends Middle School

Washington, D.C.

When Sidwell Friends School in Washington, D.C. upgraded its middle school building, the administration decided that in order to live up to the school's Quaker ideal of environmental stewardship, the building would have to be transformed into a LEED Platinum certified facility.

Sidwell was able to attain that rating with a host of sustainable design features, including the EcoSystem lighting control solution from Lutron. The Lutron system helped Sidwell cut lighting energy consumption by 92%, and overall energy use by 55%.

LEED® Facts

Platinum	**57**
Sustainable Sites	11/14
Water Efficiency	5/5
Energy & Atmosphere	13/17
Materials & Resources	8/13
Indoor Environmental Quality	15/15
Innovation in Design	5/5

LEED for New Construction Certification awarded March 14, 2007

"Sidwell Friends School wanted a building that set a new standard for environmental responsibility and, in order to give them that, we needed the most advanced lighting system available that can integrate daylight sensing and other technologies."

Stephen Kieran, FAIA
Partner
KieranTimberlake Associates LLP

More Lutron LEED projects

Project	Building Type	Rating System	Certification Level	Location
Access Living	Office	NC 2.1	Gold	Chicago, IL
AIA Headquarters	Office	CI 2.0	Gold	San Francisco, CA
Allsteel Showroom	Retail	CI 2.0	Silver	San Francisco, CA
ASID Headquarters	Office	CI 4.0	Platinum	Washington, DC
AWeber Communications	Office	CI V2009	Gold	Chalfont, PA
Ben Franklin Technology Partners	Office	NC 2.2	Gold	Bethlehem, PA
Bank of America	Office	CI 2.0	Silver	New York, NY
Bently Reserve	Office	CS 2.0	Silver	San Francisco, CA
David L. Lawrence Convention Center	Exhibit Hall	NC 2.0	Gold	Pittsburgh, PA
eBay	Office	NC 2.1	Gold	San Jose, CA
Exelon Headquarters	Office	CI 2.0	Platinum	Chicago, IL
Genzyme Center	Office	NC 2.0	Platinum	Cambridge, MA
Glumac	Office	CI V2009	Platinum	Portland, OR
Hotel Arista	Hotel	NC 2.2	Certified	Naperville, IL
HSBC	Office	NC 2.1	Gold	Chicago, IL
ITC Gardenia Hotel	Hotel	India NC	Platinum	Bangalore, India
Montage Hotel Beverly Hills	Hotel	NC 2.2	Gold	Beverly Hills, CA
NASA Propellants North Facility	Office	NC 2.2	Platinum	Cape Canaveral, FL
Orchard Garden Hotel	Hotel	NC 2.1	Certified	San Francisco, CA
Panduit Headquarters	Office	NC 2.2	Gold	Tinley Park, IL
Phipps Center for Sustainable Landscapes	Education	NC 2.2	Platinum	Pittsburg, PA
Salmon Creek Eco-Resource Building	Education	NC 2.2	Platinum	Occidental, CA
SCA Americas	Office	CI 2.0	Gold	Philadelphia, PA
Sidwell Friends School	School	NC 2.1	Platinum	Washington, D.C.
Starwood Element	Hotel	NC 2.2	Gold	Lexington, MA
The Energy Foundation	Office	CI 2.0	Platinum	San Francisco, CA
The Plaza Center at PPL	Office	NC 2.1	Gold	Allentown, PA
WB Moore Company	Office	NC 2.2	Platinum	Charlotte, NC
Yale Sculpture Building	Education	NC 2.1	Platinum	New Haven, CT

Lutron case study available; visit lutron.com/casestudies to download.

Key lighting related changes in LEED® v4

Prerequisite/Credit		Intent	LEED 2009	LEED v4
IP c1	Integrative process	Encourages early analysis of energy and water systems to inform design.	• Not present.	• Includes lighting level assessment and shading.
SS c6	Light pollution reduction	Increase night sky access and reduce light trespass.	• Interior and exterior lighting requirements. • Interior lighting control requirements.	• No interior lighting requirements, only exterior luminaire requirements. • No lighting control requirements.
EA p1	Fundamental commissioning	Support the design, construction, and operation of a project that meets owner project requirements.	• Limited to energy systems. • No requirement for operations and maintenance (O&M) plan.	• Includes envelope, indoor environmental quality, and durability. • O&M plan required that includes lighting level settings and systems narrative.
EA p2	Minimum energy performance	Achieve a minimal level of energy efficiency.	• Meet ASHRAE 90.1-2007 lighting and control requirements. • 10% improvement required.	• Meet ASHRAE 90.1-2010 lighting and control requirements. • 5% improvement required.
EA p3	Building energy metering	Track whole-building energy usage.	• Was optional credit called Measurement and Verification.	• Install permanent energy meters. • Share energy usage and electrical demand data with USGBC.
EA c1	Enhanced commissioning	To further support the design, construction, and operation of a project that meets owner project requirements.	• Limited to energy systems.	• Includes envelope, indoor environmental quality, and durability. • Seasonal testing and on-going commissioning plan. • Extra points for envelope commissioning and monitoring-based commissioning.

Prerequisite/Credit		Intent	LEED 2009	LEED v4
EA c2	Optimize energy performance	Achieve increasing levels of energy performance.	• Beat ASHRAE 90.1-2007 by at least 11%.	• Beat ASHRAE 90.1-2010 by at least 6%.
EA c3	Advanced energy metering	Tracking system-level energy use.	• Not present.	• Requires sub-metering of energy end-uses including lighting. • Meters must be connected to the building automation system and log data at appropriate intervals.
EA c4	Demand response	Increase participation in demand response technologies.	• Not present.	• Design building and equipment for participation in demand response programs through load shedding or shifting.
MR p1	Storage and collection of recyclables	Reduce waste in landfills.	• Recycle paper, glass, plastic, cardboard, and metal.	• Added batteries, mercury—containing lamps, and electronic waste.
EQ p6	Interior lighting	Improve occupant comfort and productivity through lighting control and quality.	• Was called Controllability of Systems—Lighting. • Required lighting controls in individual and shared spaces.	• Added lighting quality requirements. • Kept the multi-level lighting control requirements in individual and shared spaces (at least On, Off, Mid-level)
EQ c7	Daylight	Provide a connection to outdoors and reduce electric lighting by introducing daylight into building.	• Provide minimum of 25 fc of daylight in regularly occupied spaces. • Control glare.	• Glare control devices still required. • Added spatial daylight autonomy option.
EQ c8	Quality views	Provide a connection to outdoors through quality views.	• Provide a direct line of sight to outdoors for 90% of regularly occupied spaces.	• Provide direct line of sight to vision glazing for 75% of regularly occupied floor area. • Requires 2 of 4 defined types of views.

A history of sustainability

At Lutron, sustainability is not a new concept. Since 1961, we have been designing industry-leading technology that saves energy and reduces greenhouse gas emissions.

Each year, Lutron solutions save nearly 10 billion kWh of energy.*

Global service and support

You can count on a level of support unequaled anywhere in the industry and anywhere in the world. Lutron provides 24/7 technical phone support. Lutron Field Service, made up of a global network of customer-focused field service engineers, provides world-class services that begin before your building is commissioned and continue throughout the life of your building.

For more information about LEED®

For more detailed information on all the LEED rating systems, visit **lutron.com/LEED**.
Additional information is available at usgbc.org/LEED or leedinfo@usgbc.org.

* Visit lutron.com/references for more information

Cover photo: AWeber Communications. Photo © Halkin-Mason Photography

Lutron has been a member of the USGBC continually since 2002.

printed using SOLAR ENERGY

lutron.com/LEED
World Headquarters 1.610.282.3800
Technical Support Center 1.800.523.9466 (Available 24/7)
Customer Service 1.888.LUTRON1

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