Siemens electrical products and solutions contributing toward satisfying credits under LEED®

Prepared by:
Steven T. Six - National Power Solutions Business Development Manager
Tim Grigg, PE, CEM - Power Solutions Business Developer
Mike Ubanoski - Consulting Business Developer

Challenge

Today, an increasing number of building owners are striving to be more environmentally responsible with the structures that they manage. There are many areas in which one can design or improve a building to be more "green". These areas of design include building envelope, HVAC system equipment efficiencies, construction waste management, lighting controls, electrical system efficiencies, and many others.

The primary certification for green buildings is the U.S. Green Building Council® (USGBC) and its LEED (Leadership in Energy and Environmental Design) green building certification program. Building designers / owners wishing to apply for LEED Certification must document steps during the design and construction of the building through which they are awarded points towards LEED certification. By developing design solutions, utilizing efficient products and implementing environmentally sound construction practices and solutions they can earn LEED points which are summed to earn LEED Certifications below:

Certified 40-49 points
Silver 50-59 points
Gold 60-79 points
Platinum 80 points and above
Point solution ideas from Siemens

As a member of the USGBC, Siemens actively supports the LEED Green Building Rating System™. Siemens offers products that improve the overall efficiency of the electrical system and provide tools for measurement and verification of reduced energy use that help contribute to the overall LEED points value.

EA credit 1: optimize energy performance
(possible 1-19 points)

There are a number of products that Siemens has to offer that apply to this credit, which is given for installing systems and technology that reduce the energy use of a building.

Lighting:
Lighting is another area in which we can help save energy. Lighting typically consumes 20 to 25 percent of a building’s energy usage. Energy efficient light fixtures and lamps from Osram Sylvania, a Siemens company, can be used to achieve energy reduction.

Lighting controls:
Using energy efficient lighting is a necessary first step, but what about turning those lights off when a space is unoccupied? Siemens’ i-3 lighting control system is an innovative solution to ensure that the lights turn off and on when needed inside and outside the building. The i-3 system is very flexible in its control applications. It can operate as an independent lighting control package using its own EIB control platform, or it can be easily integrated with a Siemens building automation and power monitoring system or any other third party system using open communications protocols. Whichever way you prefer you can rest assured your lighting system will be as efficient as possible. Siemens is sensitive to how important leasable square footage is today, so we designed a lighting control system that is embedded into the lighting class panelboards. There is no need for extra wall space with the i-3 solution. The control modules are an easy plug-in addition to the panelboard’s circuit breakers!

Energy efficient motors and drives:
Optimizing motors and drives in a facility can reduce energy consumption in this area by up to fifty percent. Siemens has developed advanced technology throughout this product area. Our innovative motor lines are designed and manufactured to provide maximum value and efficiency – in fact our die-cast copper-rotor line is the most efficient line of motors in the market today! Siemens efficiencies surpass NEMA Premium requirements by an average of 10 percent.

All Siemens drive systems are designed to save energy or recover wasted energy. Energy-efficiency drive systems from Siemens assist with reducing energy use and costs, and lower CO₂ emissions, over the life of the system. Siemens offers a broad spectrum of variable frequency drive products. The SINAMICS drive family includes efficient infeed technology to return energy to the system. This technology produces lower harmonics and supports regenerative feedback in a smaller and cost-effective package.

Transformers:
Siemens provides Super High Efficiency Transformers which lower energy losses where transformers are required to reduce electrical voltages in a building. Our TP1S electrical transformers are 25 to 30 percent more efficient than the baseline TP1 standard for transformers. By employing these transformers in your design the overall energy usage of the building is less, enabling the building to operate more efficiently.

EA credit 2: on-site renewable energy
(possible 1-7 points)

On-site renewable energy opportunities are a growing feature to pursue in LEED design projects. To support renewable designs, Siemens offers a comprehensive portfolio of specialized solutions for virtually all solar inverter system-related demands. Siemens’ SINEVERT inverters are available as single components, but can also be packaged as a complete electrical system from Siemens which includes housing, combiner boxes, medium voltage-components and monitoring system.

Net metering is also a requirement for this credit. Siemens’ family of power meters provides net metering capability to verify on-site generation quantities.
EA credit 3: enhanced commissioning  
(2 points)

Siemens Power Monitoring and Building Automation reporting tools can be used to support enhanced commissioning work tasks both at the initial commissioning phase as well as the required follow-up review after substantial completion. This software is designed to integrate data from all utility services, not just electricity. By importing data from other recording meters, including water, gas, chilled water or steam, etc., it is able to easily produce custom reports on energy and utility usage. These reports can be automatically generated and stored until needed by the commissioning authority. They can also be continuously used by the building operating staff for continuous commissioning activities.

EA credit 5: measurement and verification  
(3 points)

Now that we have implemented some energy saving products, let’s look at some products that can help to verify the energy savings. Siemens’ Access power monitoring product line is another powerful tool to measure and verify the power usage of a building. It offers a full line of high quality highly accurate meters and power management software.

Meters:  
The PAC 3100, 3200, and 4200 are the newest additions to the Siemens’ family of electrical meters. They offer a basic power metering in the form of the 3100 to the more advanced 4200 when on board data logging and Ethernet gateway features are desired.

The Access 9340/9360 and 9510/9610 meters offer the most advanced capabilities in metering, data logging, PQ analysis, and trending available on the market today. The meters can also act as an Ethernet gateway for Siemens or other third party serial devices and provide preconfigured or custom web pages for accessing the data remotely.

Intelligent breakers:  
Circuit breakers are no longer just an overcurrent protective device, they now include internal intelligence that provides for collecting, storing and alarming of power and energy data. This information can be internally sent to a central collection system, like Siemens Power Monitoring or Building Automation systems.

The Siemens line of WL breakers contains these advanced solid state trip units with industry standard communications protocols. The WL is Siemens’ solid state insulated case power circuit breaker ranging from 800A frame to 5000A frame and is offered in both draw-out or fixed mount configurations. The WL breaker comes with a metering module option, which can be utilized in those areas of the power distribution system where the collection of power usage data is desired. No additional metering device is required. The kWh is measured by the circuit breaker trip unit and transmitted to the power monitoring software package for collection, charting, and trending to allow for power usage verification and systems optimization.

In addition, the VL family of circuit breakers by Siemens utilizes a compact and modular design which can be configured to suit a wide range of ratings and applications. The range of frames includes 150A to 1600A and each rating is available with interchangeable trip units. These trip units offer communications features which enable collection of breaker data into the power monitoring software package.

Siemens full line of electrical meters and intelligent solid state breakers can provide power usage information from the service entrance to individual branch circuit locations. Together, these products act as a power monitoring system that the building owner can utilize to monitor and optimize the energy usage of the building over time.

Submetering:  
If metering of the smallest branch circuits is what you are looking for, Siemens has that too. Siemens can provide embedded metering products that fit into the side gutters of a standard lighting panelboard or distribution panelboard without the need for additional unit space.

All of the embedded metering products provide built-in metering, communications and non-volatile memory. This data can also be communicated back to the power monitoring or building automation software packages.

Siemens Embedded Submetering solution is a product that integrates the submetering hardware into a standard distribution panel. By combining what typically requires two
separate electrical enclosures (one for distribution, one for metering) into one enclosure, this innovative design reduces the materials required for construction and decreases the square footage required for electrical rooms. Installation of the meters is done at the Siemens factory prior to shipment, thus eliminating any on-site labor when compared to traditional external metering methods.

Software:
We have covered products that will reduce the energy consumption of a building and we have covered products that measure the energy savings, so how do we tie it all together?

The answer:
Siemens can provide advanced Power Monitoring and Building Automation software, like WinPM/PowerManager or Apogee solutions that will help the building owner monitor and manage the energy usage of the building.

Not only will the Siemens software bring in usage data from your Siemens electrical equipment, it can also bring in usage data from third-party devices such as electrical, water, air, gas, and steam flow meters. They also interface with third-party equipment such as generator control panels, automatic transfer switches, and backup power supplies. This allows the owner to view, trend and log their entire facility’s usage and efficiency data with one powerful software package.

ID credit 1: innovation in design (possible 1-5 points)

Educating the occupants and visitors of a LEED Certified building is an important part of being green. Educating personnel on the environmental impact of owning a more efficient building and showing the real time data is a part of the education process.

What better way to show this real time data than on a Siemens SIMATIC PC-based touch screen panel located in the main lobby to display the building’s energy performance. The touch screen can be custom configured to show data the owner wants the public to see. The touch screen can be interactive with the public, allowing them to see real-time usage information which they can compare to similar buildings that are not LEED Certified.

Interactive tools may include allowing the user to select different pages that show the total or individual electrical, HVAC, lighting, or mechanical efficiencies. The Siemens SIMATIC touch screens can be integrated with the electrical system, power monitoring software, a building automation system, or any other system the owner wishes to show. The possibilities are endless.

Summary
Siemens is dedicated to providing you with new and innovative products and solutions that enable owners to build a more environmentally responsible, energy efficient building and empower the owner with tools to measure and verify their efforts. Let us help you contribute to the overall LEED point value.

To find out more information on these products and more please contact your local Siemens representative or visit the websites below.

Siemens Product Link for Consulting Engineers: www.usa.siemens.com/ce
Power Monitoring and Meters: www.usa.siemens.com/access
Intelligent Breakers: www.usa.siemens.com/wlbreaker
Lighting Controls: www.usa.siemens.com/i-3
Motors: www.usa.siemens.com/motors
Motor Controls and Drives: www.usa.siemens.com/drives
Touchscreens: www.usa.siemens.com/hmi

Products are not reviewed or certified under LEED. LEED credit requirements cover the performance of materials in aggregate, not the performance of individual products or brands. For more information on LEED, visit www.usgbc.org/leed.

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