

# Evaluation of the smartengine Technology for LEED Certifications

## Positive Influence on LEED Scoring with smartengine

LEED is the world's leading standard for the certification of sustainable buildings. In addition to energy efficiency and resource conservation, health and comfort play an important role in today's building and are a key factor for LEED.

LEED is a benchmark and incentive to plan, build and operate buildings in a more sustainable way. A total of 110 credits can be achieved in a total of 9 main categories (LEED v4 New Construction).

Depending on the number of credits achieved, four distinction levels are awarded: Certified, Silver, Gold and Platinum.

- Certified > 40 Credits
- Silver > 50 Credits
- Gold > 60 Credits
- Platinum > 80 Credits



The **smartengine technology** from wtec scores particularly well in the two main LEED categories: "Energy and Atmosphere" and "Indoor Environmental Quality" as well as additional areas including "Innovation in Design".

The smartengine technology contributes directly or in combination with the implementation of other technologies to the achievement of the following credits:

- Fundamental and Enhanced Commissioning up to **4 Credits**
- Minimum and Optimize Energy Performance up to **18 Credits**
- Advanced Energy Metering **1 Credit**
- Interior Lighting **1 Credit**
- Innovation in Design up to **5 Credits**

The specific number of credits is to be determined by the respective LEED AP (LEED specialist). The exact number of points which can be achieved by wtec will be determined on a project-specific basis.

### Summary of the advantages of smartengine technology for LEED certification:

energy savings, material savings due to the elimination of distributed drivers or ballasts, checking and securing thermal comfort, support for the commissioning and monitoring process, user influence and future increases or monitoring of air quality.

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## Detailed Explanation

### **Fundamental and Enhanced Commissioning**

The commissioning process must be managed by an independent third party (not a planner, or the executing company) as part of a LEED certification. The lighting is also tested for functionality as part of this commissioning process (fundamental commissioning) according to LEED.

In order to achieve 4 credits in the "Enhanced Commissioning" category, commissioning including seasonal tests of all HVAC and electrical trades is required (including instructions, training, operational optimization after 10 months). Trend data recording of all systems is necessary for monitoring in the operating phase. Counters, measuring points, evaluation systems and data access must be available or possible. Processes for evaluating the systems and for detecting faults must be implemented. An action plan is needed to identify and correct operating errors and shortcomings. Test intervals are specified.

With the smartengine technology, the commissioning of the lighting system is accompanied by a wtec expert. The networking and smart control of the system make self-monitoring possible. The energy consumption of the lighting can be recorded transparently. The user is able to optimize the energy consumption for the lighting without the need for a 3rd party. Complex programming is not necessary. The software dashboard analyzes energy consumption over time. For example, data can be saved by room or zone and optimized. For lighting, the smartengine technology makes it easier to achieve the LEED points for "Enhanced Commissioning". The total of 4 credits will only be achieved if the other trades are also commissioned in accordance with LEED and monitoring with operational optimization takes place.

### **Minimum Energy Performance and Optimize Energy Performance**

Requirements in general: at least 5 % better than the ASHRAE90.1-2010 baseline. LED lighting must be provided (minimum requirement). If the energy costs fall below 47 % compared to the ASHRAE reference, 18 LEED credits are achieved. For half the number of credits (9 points), the reference value must be undercut by 19 %. This LEED category has the highest weighting in the LEED system.

Lighting power ratings are an important part of meeting energy efficiency requirements. The greater the contribution of the respective energy consumer to the total energy requirement of a building and the lower the consumption of this energy consumer, the more credits can be achieved. An energy building simulation is required to determine the project-specific points.

Smartengine achieves a Lighting Power Density of 0.1 to 0.3 watt per square foot.

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### **Building-Level Energy Metering and Advanced Energy Metering**

Installation of sub-meters for consumers that account for more than 10% of the total energy consumption. The meters must be able to display the consumption by the hour. In the area of electricity consumption, the following areas are to be recorded separately: server rooms, Hot water heaters, kitchen, HVAC, lighting and elevators.

With the smartengine technology, the power consumption of the lighting is recorded separately for each sensor. The software makes it very easy to define which sensors make up an area without physical rewiring.

### **Interior Lighting**

The lighting should be controllable by the user.

Fixtures with smartengine technology can be controlled via switches, operating devices, voice control or an app. The technology enables each individual fixture to be controlled as a single device. Even if the room configuration is changed, the grouping of the lights can be easily changed using the software / app. With appropriate access authorization, building users can configure the grouping of fixtures themselves without having to modify the cabling or relying on 3rd parties to recommission.

### **Innovation in Design**

Up to 5 innovation points can be achieved for innovative, sustainable buildings components, procedures, processes etc. The innovation points are not specifically defined and are applied by the LEED AP on a project-specific basis.

The smartengine technology offers potential points here, via increased user comfort, flexibility of the building and material savings through the elimination of drivers or ballasts and also through the reduction of overall copper by replacing MC conduit with structured cabling. Other innovative approaches include easier maintenance, the robustness of the system, the possibility of user awareness through visualization tools, including real time energy consumption.

A maximum of one credit can be achieved for each aspect. A total of up to five credits are possible here.

### **Future LEED potential**

Additional LEED credits can be achieved by recording air quality and integrating noise sensors.

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