The Leadership in Energy and Environmental Design (LEED®) Green Building Rating System™ encourages and accelerates global adoption of sustainable green building and development practices through the creation and implementation of universally understood and accepted tools and performance criteria.1

According to the U.S. Green Building Council,

The LEED Rating Systems are as follows:

- Homes
- Neighborhood Development (in pilot)
- Commercial Interiors
- Core and Shell
- New Construction
- Schools, Retail, Healthcare
- Existing Buildings

LEED® is a voluntary, consensus-based national program for supporting and validating high-performance, sustainable buildings.¹

What is LEED for Existing Buildings and how does it differ from LEED?²

“LEED is a voluntary performance standard for sustainable operations and maintenance of buildings and provides guidelines for sustainable upgrade over time.”³ LEED can be used to certify the following buildings:

- Non-LEED buildings seeking initial certification and ongoing certification
- LEED for New Construction, certified buildings seeking ongoing certification
- LEED for Core and Shell, certified buildings ongoing certification
- LEED for Existing Buildings, certified buildings seeking ongoing certification

Lighting accounts for a significant amount of the energy used in commercial buildings, therefore, now more than ever, the lighting industry recognizes the need for providing sustainable lighting solutions. All LEED programs encourage high-performance lighting, which may entail using more energy-efficient lamps, employing task lighting whenever possible, and using sensors and controls to reduce the use of unnecessary lighting. These practices can significantly reduce the energy and power demand in the building.

Lamp manufacturers and control companies are continually assessing their product portfolios and aim to make improvements for their customers, many of whom may consider applying for LEED certification. The biggest concern among facility managers considering green design—for new construction or for existing buildings—is cost.

In fact, constructing or maintaining a sustainable building site through purchases of lamps. The October 2003 report developed by California’s Sustainable Building Task Force entitled, “The Cost and Financial Benefits of Green Buildings,” finds that a minimal upfront investment of about two percent of construction costs typically yields life cycle savings of over 10 times the initial investment.⁴

In LEED, specific lamps may contribute towards the achievement of various LEED credits. This score is known as the picogram per lumen-hour score. To determine the picogram per lumen-hour score you need the following information: the amount of mercury in the lamps, the life rating of the lamps based on 3 hour starts and the design lumen of the lamps. A calculation can be performed to determine the picogram per lumen-hour score using this data. There is a possibility of being awarded 2 points if your purchasing specifications include lamps with the average picogram score below 70 picograms per lumen-hour.

As stated by the U.S. Green Building Council in discussing material and resource credits with respect to lamps:

**Intent**

“To establish and maintain a toxic material source reduction program to reduce the amount of mercury brought onto the building site through purchases of lamps.

**Requirements**

Develop a lighting purchasing plan that specifies maximum levels of mercury permitted in mercury-containing lamps purchased for the building and associated grounds. The purchasing plan must specify a target for the overall average of mercury content in lamps of 90 picograms per lumen-hour or less. The plan must include lamps for both indoor and outdoor fixtures, as well as both hard-wired or portable fixtures. The plan must require that at least 90% of purchased lamps comply (as measured by the number of lamps) with the NEMA guidelines, as described in the LEED for Existing Buildings: Operation & Maintenance Reference Guide.

Lamps containing no mercury may be counted toward plan compliance only if they have energy efficiency at least as good as their mercury-containing counterparts.

Implement the lighting purchasing plan during the performance period. One or two points are awarded to the projects for which at least 90% of all mercury-containing lamps purchased during the performance period (as measured by the number of lamps) comply with the purchasing plan and meet the following overall targets for mercury content:

- MR Credit 4.1 (1 point): 90 picograms per lumen-hour
- MR Credit 4.2 (2 points): 70 picograms per lumen-hour

A template calculator to aid in documenting performance for the MR Credits 4.1 and 4.2 is available in the LEED for Existing Buildings: Operations & Maintenance Reference Guide. Exception: Screw-based, integral compact fluorescent lamps (CFLs) may be excluded from both the plan and the performance calculation if they comply with the voluntary industry guidelines for a maximum mercury content specified in the LEED for Existing Buildings: Operation & Maintenance Reference Guide. Screw-based, integral CFLs that do not comply with the NEMA guidelines must be included in the purchasing plan and the performance calculation.

Performance metrics for lamps— including mercury content (mg/lamp), mean light output (lumens) and rated life (hours) — must be derived according to the industry standards, as described in the LEED for Existing Buildings: Operation & Maintenance Reference Guide. Mercury values generated by toxicity characteristic leaching procedure (TCLP) tests do not provide the required mercury information for LEED for Existing Buildings: O&M and cannot be used in the calculation.

LEED credits under LEED for Existing Buildings: O&M can be achieved for lighting performance during the performance period of the building.

Mercury-containing lamps (or their high-efficiency counterparts) must be purchased during the performance period to earn points in this credit.

**Potential Technologies & Strategies**

Establish and follow a lamp-purchasing program that sets a minimum level of mercury content and life for all mercury-containing lamp types. Work with suppliers to specify these requirements for all future purchases.⁵

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³ Green Building Rating System for Existing Buildings — Upgrades, Operations & Maintenance

