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Energy Code Compliance & LEED: A Foundation for Sustainable Building Practice

For many building professionals, energy code compliance is a starting point toward a more comprehensive objective – sustainable building practice. Like energy codes, sustainability principles are being adopted on international, national, regional, and local levels. These principles may be embodied in voluntary certification programs, such as LEED, or incentivized via tax credit provisions. In most cases, energy code compliance provides the foundation on which sustainable building practices rest.

Voluntary Certification Programs: An Overview of LEED

The LEED rating and certification system is a voluntary program through which commercial buildings obtain certification as a sustainable project. This program is the culmination of seven years of development by the U.S. Green Buildings Council (USGBC). The current version, LEED 2.0, applies to commercial new construction and high-rise residential buildings. Two additional pilot programs focus on existing buildings and commercial interiors. LEED for Existing Buildings (LEED-EB) provides guidelines for ongoing sustainable operations and maintenance practices. LEED for Commercial Interiors (LEED-CI) addresses tenant improvement projects primarily in office and institutional buildings.

LEED defines four levels of certification that include Certified, Silver, Gold, and Platinum. To minimally qualify, a building must satisfy a list of standard prerequisites and accrue at least 26 points. Higher levels of certification are achieved by earning points through implementing energy saving measures or by implementing other specified sustainable practices. These points are represented by credits within any combination of five environmental categories and one design category. As of late

Table 1. LEED Certification Categories

• LEED Certified	26 - 32 points
• Silver Level	33 - 38 points
• Gold Level	39 - 51 points
• Platinum Level	52 - 69 points

September 2003, 62 projects have achieved LEED certification, and 900 projects are registered as ongoing LEED projects.

Role of Lighting Control

Lighting control systems play three primary roles in the LEED program. First, they are required for enabling code compliance, which is a major LEED prerequisite. Second, LEED strongly encourages designing buildings using daylight as a primary light source. Consequently, from an environmental perspective, the time and dollars spent designing and building a daylit building are wasted if lighting controls aren't utilized for dimming or turning off electric lights when they're not needed. Third, lighting controls can be used for further reductions of lighting energy through personal controls, and integrating the operation of lighting and mechanical systems, which are key strategies for optimizing building energy performance. For instance, using lighting control devices to send status signals to mechanical systems, control portions of the lighting load during off-hours, and provide high/low control of HID lighting systems are all examples of strategies that will help to increase energy savings beyond code requirements such as those set forth in ASHRAE 90.1-1999. Using occupancy-based controls to manage plug loads is another strategy for boosting energy savings beyond the thresholds established in energy codes such as ASHRAE 90.1-1999.

Specifically, lighting controls fit within the following LEED categories: Energy & Atmosphere (E&A) and Indoor Environmental Quality (IEQ). As part of the E&A category, the project must satisfy a minimum level of energy efficiency for a project by complying with ASHRAE 90.1-1999, or local energy codes, whichever is more stringent. (See TB#156 for a summary of 90.1 provisions.) Beyond this prerequisite, a designer may obtain points toward a LEED rating by earning points in the relevant categories. For instance, between two and ten points can be earned by optimizing energy performance in the E&A category. In the IEQ category, a designer may earn up to two points by providing a high level of individual occupant control for thermal, ventilation, and lighting systems. An additional LEED category, Innovation in Design Process, offers an opportunity to add points by implementing innovative energy controls within the commercial environment, such as Isolé plug load controls. Projects can earn between one to four points in this area.

The greatest opportunity for gaining points through implementing controls is in the E&A category. In this area, the designer must implement efficient technologies that improve building energy performance, and must model the proposed measure, showing the incremental energy sav-

ings that are obtained above the ASHRAE 90.1-1999 baseline model. Over half of the available points in the E&A category can be earned this way. Two points can be obtained for each 10 percent increase in energy savings beyond the baseline ASHRAE 90.1-1999 model.

Tax Credit Programs for Sustainable Building Practices

In addition to voluntary programs such as LEED, some states are beginning to offer tax incentives for using sustainable building practices. For instance, in 2000, New York State passed a Green Building Tax Credit (an income tax credit) that applies to building owners and tenants of eligible buildings that meet "green" standards. In 2001, Maryland passed its Green Building legislation, based on LEED Silver certification. In addition, Oregon included Sustainable Buildings as part of its existing Building Energy Tax Credit program (BETC). This program uses the LEED rating system to determine the level of tax credit for both new and renovation projects, offering tax credits for LEED Silver, Gold, and Platinum levels.

Lighting Controls and Sustainable Building Practices

Lghting controls are an integral component of sustainable building practices. Essential for energy code compliance, lighting controls can also boost a project's ability to qualify for LEED certification, or become eligible for tax credits. And implementing lighting controls as part of sustainable building practices offers benefits beyond simply code compliance or energy savings. A development in British Columbia illustrates how implementing such design measures can benefit an owner. The Vancouver Island Technology Park project embraced a sustainable design philosophy for converting a former hospital site to a technology park, and obtained a LEED Gold certification. The project was completed on-time and on-budget and by implementing sustainable design strategies, reduced capital and operating costs. Tenants were willing to pay slightly higher rents to have offices in a "green" building, and despite economic downturns, the developer continues to lease space, and keeps rates intact (Van Belleghem, J., Green Buildings Pay, or The Education of a Developer, The Austin Papers, 2002, p 102-109).