



## USGBC In the News Details

Title: Existing Buildings: The Biggest Opportunity to Reduce Energy Consumption and CO2 Emissions  
Author: Jamie Qualk  
Source: The Tennessean  
Date Written: 8/11/2009

The biggest opportunity for greening buildings is with our existing building stock. There are a tremendous number of existing buildings, tens of millions, a far greater number than what is being designed and constructed in any given year. Additionally, the majority of this existing building stock was designed and constructed decades ago, at a time when energy use, water consumption and indoor environmental quality were neither priorities nor major considerations. As stated, most of our built environment was designed and constructed without the cost of energy or the long term operating expenses factored in to balance first cost decisions relating to energy consuming equipment. The Intergovernmental Panel on Climate Change (IPCC)'s latest report actually indicates that the number one opportunity to reduce CO2 emissions through reductions in energy consumption and therefore mitigate global warming comes from existing buildings as well. Because of all of this, the U.S. Green Building Council (USGBC) offers a rating system dedicated entirely to the existing building market, LEED for Existing Building, Operations and Maintenance (LEED-EB O&M) which promotes high performance, affordable, sustainable and environmentally sound operations in existing buildings.. LEED-EB O&M is unique from all other rating systems in that it deals primarily with operations, maintenance, policies and procedures where all other rating systems deal with the design and construction of new or renovated structures.

As in LEED-EB O&M, the federal government now recognizes the opportunity to lower energy consumption in buildings by including block grants worth \$3.2 billion in the 2009 American Recovery and Reinvestment Act passed earlier this year for "energy efficiency projects" for state, local and tribal governments. While many of these entities are still figuring out what to do with this funding, many others are hitting the ground running with very specific programs to lower utility bills in publically owned buildings. These initiatives are a good example for what everyone should be doing at a minimum in facilities in all parts of our country and around the world.

The following represent the first steps any public entity or private company that owns and/or operates facilities should take. These are very low cost options but provide valuable insight about where to spend additional effort or dollars to maximize the operation of building systems while reducing their energy consumption and carbon footprint. It should be acknowledged that these are first steps only and should not be considered as the only action to meet sustainability or energy efficiency goals.

**Energy Audits** Whether the goal is to simply reduce energy or actually pursue some level of LEED-EB O&M certification, the first step is conducting an energy audit, which can take on varying sizes, scopes and yes, price, depending on the desired outcome. A LEED EB O&M prerequisite requires a basic ASHRAE Level I Walk-Through as prescribed by the Procedures for Commercial Building Energy Audits manual. This manual "sets out generalized procedures to guide the analyst and the building owner, and provides a uniform method of reporting basic information." This widely recognized approach breaks the energy audit activities down into three incrementally more complex levels of effort: 1) Level I Walk-Through, 2) Level II Energy Survey and Energy Analysis and 3) Detailed Analysis of Capital-Intensive Modifications.

An ASHRAE Level I Walk-Through begins with a preliminary energy-use analysis that is used to benchmark a building's energy performance and related cost for each fuel type utilized in the building. The auditor will conduct a brief "walk-through" to document any special problems or needs the facility might have, followed by a space function analysis to develop a rough estimate determining energy use for all significant operations categories. Finally, potential savings are calculated for identified low-cost and no-cost opportunities. These types of opportunities are usually operational changes and maintenance procedures, which can usually result in significant savings. Any capital improvement opportunities are noted for further study, along with an initial estimate of related costs and savings.

An ASHRAE Level II Energy Survey and Engineering Analysis moves beyond the steps in a Level I Walk-Through to include a significant amount of research concerning the mechanical and electrical system design, as well as operating conditions. Key operating parameters such as schedules, water and air temperatures, humidity levels, ventilation quantities and light levels are measured and then compared to design levels. The time taken to conduct these measurements depends largely on whether the information has to be logged manually or electronically. After a breakdown of the total annual energy use, all possible energy-saving modifications to equipment and operations are documented along with estimated costs and savings projections.

Implementation of the energy audit recommendations will generally see a payback period of less than two years with energy reductions ranging from 20 to 40 percent. To ensure maximum efficiency on an ongoing basis, some type of commissioning process such as retro-commissioning or Continuous Commissioning is generally suggested. And if you are not eligible for federal stimulus funding to get your energy savings activities

going, check with your local utility to see if they have a program that follows similar guidelines as the steps described above. Many are subsidizing some or all of the costs associated with either energy audits or existing building commissioning. Or, you could fund these options in your upcoming budget. Don't look at it as an expense but rather an investment that will pay-back quickly and ultimately put money back into your budget.