SEDAC NEWS

What a business owner should look for in a prospective building

Buildings consume energy and water resources. The mechanical, electrical and plumbing systems all place demands on utility systems. As utility rates increase, so do the costs of building ownership and/or occupancy. For business owners considering construction of a new building, or leasing or buying an existing one, there are effective ways to help minimize the burden of utility costs. Simply stated - a well designed building will use significantly less energy than a conventionally designed building. Achieving high performance in buildings requires a holistic approach, ideally from the very beginning of the design process. Trying to make a building energy efficient after it has already been designed or constructed misses the target and multiplies costs. However, even existing buildings can vary widely in energy performance and reviewing key energy performance indicators can help.

To reduce utility costs, what are some of the most basic things to look for when considering a potential facility? Naturally, the following recommendations are generic and may change depending on the function of the building, however most are applicable to common building types.

Building orientation and fenestration (windows) are key opportunities for load reduction. Take advantage of the sun: look for the long axis of the building to be aligned in an east-west direction. This gives the building southern exposure which provides free heating from the low winter sun and ample daylighting year round. Proper window design requires shading techniques to intercept solar heat gain during cooling seasons. This can be accomplished with low emissivity coatings on the window glazing, overhangs above the windows, and deciduous shade trees. Windows on a south facing elevation (±15°) are preferred. Limit windows on the east (which lead to morning overheating) and west (which lead to substantial afternoon overheating). A moderate amount of north facing windows (although subject to cold, windy conditions) are acceptable, especially where daylighting opportunities (with the cool diffuse northern light) exist. The total percentage of window to wall area should be between 20 and 40%.

Next, address the building envelope (the walls, floors, roof, windows, doors). Insulate above the code requirements. Codes establish a bare minimum. In most instances, more insulation is better. Another very important envelope issue is adequate sealing. Detail the building seams to be air tight (with sealants, taping and weather stripping). It is not unusual for a large portion of a building’s energy requirements to be due to air leaking through the cracks (infiltration). The tighter the envelope, the smaller the energy bill.
To participate in the SB$E program, please contact us at: (800) 214-7954 or info@SEDAC.org
Smart Energy Design Assistance Center, 1 East St. Mary’s Road, Champaign, IL 61820
www.sedac.org

**EVENTS**

**DCEO Energy Summit for Local Government and Education**
Hosted by Illinois Central College
1 College Drive, East Peoria, Illinois
*August 8, 2007.* Register here.
This free conference is meant to target local government officials, K-12, junior colleges and higher education from around the State of Illinois. Find out what options are available which will enable better management of energy consumption and ultimately reduce utility expenses.

**Illinois Renewable Energy Fair**
*August 11 -12, Oregon Illinois*
Look for SEDAC’s Booth

**Corporate Climate Change**
*September 25 - 26, Chicago*

**IGSHPA Annual Conference**
*October 29-30, 2007*
Oklahoma City

**Green Building: The Nuts and Bolts for Contractors**
ONE DAY EVENTS PRESENTED BY: Wilbur Wright College and the U.S. Green Building Council - Chicago Chapter.

*October 26, 2007*

*November 30, 2007*

*January 25, 2008*
This Workshop is designed to educate the construction community about green building procedures and strategies, the LEED® rating system and the requirements that need to be met on the construction site and in the office to achieve a certified structure.

**WEBINAR**

**MIDWEST BUILDINGS TECHNOLOGY APPLICATIONS CENTER: Utility Risk Management for Colleges and Universities**
*Tuesday, July 24, 2007*
9:00AM—11:00AM (CT)
Cost: Free
Registration:
www.ecw.org/mwbuildings/webinars.php

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In many buildings the lighting system consumes too much energy. In a well designed building, this load is greatly reduced. Daylight can offset artificial lighting needs. Modern lighting components (high efficiency fluorescent lamps, ballasts, and LED exit lamps), make it possible to design lighting systems with excellent illuminance and lighting power densities less than 1 W/sf. Avoid incandescent lighting. Proper lighting layout and control systems (occupancy sensors, bi-level switching) further enhance lighting energy savings.

So, what should an energy-savvy business owner look for when choosing a building to lease, or when constructing a new building? Here are a few simple guidelines:

1. Choose buildings with the long axis oriented in the east-west direction. Look for the predominance of glazing on the south side with low emissivity (low-e) coatings, window overhangs, and deciduous shade trees that let in winter sun and block direct summer sun.
2. Choose buildings insulated beyond the basic code requirements. In most cases in Illinois this would be walls exceeding R-13 and roofs exceeding R-20, depending on construction technique.
3. Choose buildings incorporating double glazed low-E windows. Avoid buildings with single glazed windows or require a window upgrade before lease or purchase.
4. Choose buildings having lighting power densities of less than 1.5W/sf. Choose buildings using T8 or T5 fluorescent lighting technology. Avoid buildings using incandescent and old T12 fluorescent technology, or require an upgrade to CFL, T8 or T5 technology before lease or purchase.
5. Choose buildings with efficient HVAC systems. **ENERGY STAR** labeled equipment is recommended. Rooftop units are a poor choice if there is a significant heating requirement for the building. Air conditioning equipment should at least meet the current energy code, about EER 10, but EER 11.5 is recommended. Gas or oil-fired furnace or heating system efficiency should be at least 80 percent, but 92% efficiency is recommended. Air source heat pumps can be a good option in the southern part of the state, geothermal heat pumps are more appropriate in central and northern IL. Look for cooling systems that utilize free outdoor air cooling (have economizers) and ventilation systems that have heat recovery.
6. All thermostats should be programmable type and set to do less space conditioning during unoccupied periods.
7. Retail and other high traffic buildings should incorporate a vestibule entry.
8. Always require a copy of a full twelve months’ utility bills before leasing or purchasing an existing building. Calculate the annual $/sf cost for operation. Compare this building’s performance with the **ENERGY STAR** Target Finder at www.energystar.gov/index.cfm?c=new_bldg_design.bus_target_finder
9. **When in doubt contact SEDAC for a free energy assessment.**