



**SMART
ENERGY
DESIGN**
Assistance Center

Smart Energy Design Assistance Center

Newsletter Vol. 3, No. 9, September 2007

www.sedac.org

SEDAC

The Smart Energy Design Assistance Center (SEDAC) provides advice and analyses, enabling small businesses in the State of Illinois to increase their profitability through the efficient use of energy resources. SEDAC is sponsored by the Illinois Department of Commerce and Economic Opportunity's *Small Business Smart Energy Program (SB\$E)* and provides valuable services at no cost to small businesses. SEDAC is managed by the University of Illinois at Urbana-Champaign.

EVENTS

2007 POWER QUALITY CONFERENCES, sponsored by Illinois Electric Council and Springfield Electric. 8.5 PDU **September 18 - 20 in Collinsville, Bloomington, and Naperville. 8:30 am - 4:30 pm.**
REGISTER

CORPORATE CLIMATE CHANGE
September 25 - 26, Chicago

IGSHPA Annual Conference
October 29-30, 2007
Oklahoma City

GREEN BUILDING: THE NUTS AND BOLTS FOR CONTRACTORS
October 26

ONE DAY EVENTS PRESENTED BY: Wilbur Wright College and the U.S. Green Building Council - Chicago Chapter.

GREENBUILD 2007
November 7 - 9, 2007, Chicago

MEEA CONFERENCE
January 9 & 10, 2008, Chicago

SEDAC NEWS

To Reheat or Not To Reheat? (That is the Question)

Most building operators have from time to time noticed that on hot muggy summer days their boilers are running at nearly 50 percent capacity and wondered why. The answer is often "reheat" if they have a Variable Air Volume (VAV) system. In this type of system air is provided at 55 degrees F to each variable air volume box. These boxes vary the volume of cold air provided to each space depending on the space cooling load. There is usually a minimum setting, i.e. the box can reduce the flow only so much, because of space ventilation air requirements. Sometimes this results in more cold air being provided than is actually needed, and that is often where reheat comes in. If the zone is too cold with the VAV box at its minimum setting, the reheat coil is activated, warming up the supply air temperature.

Another reason that reheat may be used is to control the space relative humidity (RH). When air is cooled it loses moisture as condensation. However, the air itself as it leaves the coil is close to saturation (i.e. 100 percent RH). Reheating the cold saturated air reduces the relative humidity which is important for comfort or for many industrial situations.

This reheating process is wasteful, since it means reheating air that has already been cooled. But, can it be avoided? We at SEDAC have pondered this question, and have advised some folks to "just turn off the boiler and see what happens". The usual responses (the polite ones) are "it can't be done" and "we'll lose control of humidity".

Well, it turns out it can be done. Our colleagues at Waste Management Research Center (WMRC) have recently described a large modern commercial building happily running in the muggy heat of central Illinois and using no boiler energy for reheat. We visited this building on a hot August day with dew point temperature in the low 70's. Indoor air temperatures ranged from 72 to 76 degrees F, and the RH's were between 39 and 44 percent – in other words the building felt extremely comfortable.

How is the building operator doing it? Using controls, applying hard work, and making use of a good HVAC contractor. Here are the steps he took:

1. Used CO₂ sensing and data logging to adjust outside air intake dampers.
2. Corrected chiller compressor sequencing and lowering chilled water supply temperature to increase dehumidification at the cooling coils.
3. Adjusted and fine tuned individual zone VAV boxes to tailor the air flow to the space cooling load. The result was reduced total supply air flow and variable frequency drives never exceeding 30 percent of full capacity.

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EDUCATION

October 26, 2007: 9:30 am – 12:30 pm:

Beyond Code: Energy Efficient Commercial Buildings 3 HSW LUs in AIA/CES, \$40, Multi-University Center, 1010 Jorie Blvd., Oak Brook.

Techniques for reducing energy usage in commercial buildings (new designs and retrofits). Integrated design, modeling, methods, and code implications will be covered.

October 26, 2007: 1:30 pm – 3:30 pm:

Energy Efficiency Benefits of the EPACT 2005 2 HSW LUs in AIA/CES, \$30, Multi-University Center, 1010 Jorie Blvd, Oak Brook.

Guidance on the tax benefits available for commercial buildings and the quantification and requirements for tax credits and deductions under the Energy Policy Act of 2005.

November 2 and December 7: 9:30 am to 5:00 pm: Basics of Architectural Lighting,

7 HSW LUs in AIA/CES, \$225, Multi-University Center, Oak Brook.

November 3 and December 8: 9:30 am to 5:00 pm: Building Life-Cycle Cost

Estimation, 7 HSW LUs in AIA/CES, \$225, Multi-University Center, 1010 Jorie Blvd., Oak Brook

Call 888/633-3603 to register.

Online Classes are available through SEDAC and the Office of Continuing Education at UIUC:

The Architecture of Sustainability: 10 modules - individual or packaged.

Module 1: 3 AIA LUs/CEUs-\$75. Modules 2-10: 1 AIA LU/CEU, \$50.

Package of 10 modules: 12 AIA LUs/CEUs, \$450.

Energy Basics for Small Business. Module 1: The Language of Energy: 1 AIA LU/CEU, \$25.

Registration is continuous at www.continuinged.uiuc.edu click on Green Design

OTHER EDUCATION

Geothermal Systems for Water Source Heat Pumps and Central Systems

September 24 - 26, 2007: University of Wisconsin at Madison

Building Operator Certification Training Schedule

Oct. 2, 2007 - April 1, 2008: Chicago

Oct. 9, 2007 - April 8, 2008: Edwardsville

Oct. 4, 2007 - April 3, 2008: Normal

Jan. 17, 2008 - June 19, 2008: Chicago - Level II

SEDAC NEWS

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Contributing to the success was that the building had a good Building Automation System and lots of glazing so solar gain could do some of the reheating. Bottom line: average monthly utility bills dropped from \$15,000 per month to \$9,000 per month. The gas company showed up and replaced the meter, because they couldn't believe the numbers!

News from the Legislature

Illinois' clean energy bill, the "Illinois Power Agency Act," passed both houses of the General Assembly on July 26, and was signed by Governor Blagojevich on August 28, 2007. The bill requires utilities to implement cost-effective energy efficiency programs to meet an escalating savings target that reaches 2.0% by 2015. Demand side management programs are also required by the bill, with a reduction of 0.1% of peak load demand required each year from 2008 to 2018. A Renewable Energy Standard (RES) requires utilities to meet 2% of supply with renewables in 2008, ramping up to 25% by 2025. Additionally, 75% of the renewable energy is required to come from wind. As part of the larger rate-relief package included in the bill, a new state agency is created with responsibility for managing energy purchases on the wholesale market and a cap is placed on the rate impact from the bill's efficiency and renewable energy provisions.

Building Tune-Up Strategy from ENERGY STAR

As we approach Fall, now is a good time for building operators to prepare for the heating season by performing routine maintenance:

Lighting + Supplemental Loads: 1. Follow a strategic lighting maintenance plan of scheduled group relamping and fixture cleaning. 2. Measure and ensure proper light levels. 3. Calibrate lighting controls.

Building Envelope: Tighten the building to reduce air infiltration by locating and sealing all air leaks in the windows, doors, walls, and roofs.

Controls: Calibrate the indoor and outdoor building sensors. Calibration of room thermostats, duct thermostats, humidistats, and pressure and temperature sensors should be in accordance with the original design specifications. Calibrating these controls may require specialized skills or equipment, such as computer software.

Heat Exchange Equipment: Clean the air side of heating and cooling coils, whether in an air handler or in a rooftop unit, to reduce deposit buildup. Replace filter media and maintain a regular schedule of changing them.

Heating and Cooling System: Conduct a boiler tune-up, maintain cooling towers, clean air cooled condenser coils, replace refrigerant filters as needed.

To participate in the *SB\$E* program, please contact us at: (800) 214-7954 or info@SEDAC.org
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