

December 14, 2007

Attn: Jim Tracy
Facilities Management
Vermont Law School
PO Box 96
So. Royalton, VT 05068

Re: Energy Evaluation of Vermont Law School

Dear Jim,

Thanks again for taking the time to show me around Vermont Law School. This letter will help summarize some of the major energy-saving opportunities at your site and should serve as a guide for improvements in the future. Although we only viewed about half of your campus buildings, many of the recommendations outlined below will make sense in any of the locations where you have energy-using components.

Lighting

The lighting systems used in your LEED-Silver certified buildings should provide insight into the recommended lighting technologies for other spaces around campus as well. High-performance T8 (HPT8) and screw-based compact fluorescents (CFLs) are some of the most efficient forms of lighting available and should be incorporated as much as possible. For any spaces still using T12 fluorescents or higher-wattage metal halides, there is a short payback when switching to the newer HPT8 fluorescent technology. For fixtures that use standard T8 bulbs instead of the HPT8 technology (lamp and ballast combo), a retrofit to HPT8 is not cost-effective based on the energy savings. However, there are energy-saving 25- and 28-watt bulbs that can replace the existing 32-watt bulbs whenever one burns out. This is a great way to reduce energy use by 12-20% per fixture if the space can operate with slightly lower light levels.

It is great to see Vermont Law School is making the change to CFLs for incandescent bulbs in many locations. As you are aware, Efficiency Vermont is able to provide incentives to help reduce the cost of these bulbs. CFLs come in a variety of shapes, sizes, and wattages, and can be used in most screw-based applications. These bulbs use 1/3 to 1/4 of the energy compared to an incandescent or halogen bulb of equivalent light output, resulting in significant energy savings. There are now specialty options that include dimmable, flood/reflector lamps, and ones suited for recessed can fixtures. You mentioned the school recently bulk-purchased CFLs to replace bulbs around campus; if you send me a copy of the receipt or invoice, I should be able to secure you a rebate.

Although we would normally recommend occupancy sensors in many office applications, it appears most of the campus' occupants are very diligent about turning lights off when they leave a room—there were no unoccupied offices I encountered where the lights were left on. There might be an application



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for occupancy sensors for fixtures over the book stacks in the Cornell Library. A fixture-mounted occupancy sensor connected to several adjacent fixtures would provide an opportunity for electricity savings when people aren't perusing the library shelves. One common concern is that it may serve as a distraction to students studying nearby; conducting a pilot on one of your floors would provide a better indication of this. Efficiency Vermont could help with a cost-share arrangement if you are interested in pursuing this pilot idea further.

Heating, Ventilating, and Air Conditioning (HVAC)

For buildings with energy management systems (EMS), retro-commissioning these systems can result in at least 10% electrical savings for your HVAC system. Retro-commissioning involves working with an engineer to evaluate the control scheme of the HVAC system to ensure it is operating properly and according to the occupancy schedule. Efficiency Vermont can help defray the cost of an in-depth study of your current HVAC systems to ensure they are operating according to the current needs of a space. Cornell Library and Chase Community Center are the best candidates for this type of work.

For buildings with simpler thermostat-based systems, installing programmable thermostats usually results in energy savings that pay back the investment in less than one year. These thermostats automate the setback of building temperatures to lower levels during the heating season when the building is unoccupied, ensuring you are using less heat when it is not needed. Buildings such as Jacobs House, Eaton House, and Pierce House would experience a reduction in heating fuel use after installing a programmable thermostat.

For furnaces, considering installing electronically commutated motors (ECMs) on blower fans. These motors typically use 40% less electricity than a standard "shaded-pole" motor. Efficiency Vermont provides incentives to help you make the switch to this energy-efficient option.

Computer Lab & Servers

There are many options now available to sites with substantial computer/server usage (like yours). Changing to a "virtualized" server system lessens the number of servers needed to support a network, and can greatly reduce electricity (and cooling) required. Schools such as St. Michael's College and Middlebury College have pursued the advantages of consolidated and virtualized servers, thereby increasing the efficiency of their IT operations.

On the moderately cool day I visited (40-45°F outside temp), the HVAC system in your computer lab was calling for cooling. If your HVAC units have an economizer mode (most newer units do), you should take advantage of the "free cooling" this mode offers during cooler temperatures. When it is cold outside (roughly less than 55°F), the economizer mode will act as a fan and pull in cool outside air to provide air conditioning to your building instead of running the compressor inside the unit. For sites that air condition during even the cooler months (like yours), switching to economizer mode can result in significant energy savings, as the air is cooled naturally without additional electrical work.

If you are looking to upgrade any of your existing HVAC units, be sure to compare the seasonal energy efficiency rating (SEER) or energy efficiency rating (EER) among the units. We are able to provide incentives for units less than 5.4 tons of cooling with a 14 SEER and 12 EER rating and for most higher-tonnage units with an 11.5 EER. Please refer to the enclosed HVAC rebate form for 2007 incentive amounts.

Vending Misers®

Most vending machines on campus present an opportunity for electrical savings. Vending Misers (http://www.usatech.com/energy_management/energy_vm.php) utilize occupancy sensors to turn off

lights to a vending machine or to cycle the refrigeration compressor to be used less frequently (while still keeping your beverages plenty cold). There are different Vending Misers for various applications, including snack and drink machines. Energy savings are typically in the 30-40% range, depending on the location.

Miscellaneous Appliances

In buildings with hot water heaters where the hot water is used infrequently (Pierce House comes to mind), consider switching to an on-demand system. In a standard hot water system, a 30-40 gallon tank is filled with hot water, the hot water is used, and the tank is filled again. However, when only a small amount of water is used for hand washing and light kitchen applications, the hot water simply sits in the tank for a long period of time and gives up its heat to the surrounding area (the basement). This is an inefficient way to maintain water at a certain temperature for usage. Instead, an on-demand system will produce hot water the instant you call for it, with no tank “standby” losses.

In your employee/student lounges that include coffee pots, it is worthwhile to have the appliance on a 7-day timer that will switch off the burner/warming elements during overnight hours and on weekends. Also consider using a thermos or insulated container that the coffee can drip into when freshly brewed to keep it warm throughout the day. This will keep you from having to warm the coffee all day using the machine’s pot warmer. Although these measures do not result in massive electrical savings, every little bit helps (especially if there are several coffee pots around campus where these ideas can be applied).

Again, thanks for your interest in working with Efficiency Vermont to reduce electricity costs on your campus. If you are interested in finding out more detailed information about any of the recommendations above, please do not hesitate to contact me at tperrin@veic.org or via phone (802)860-4095 x1158.

Sincerely,



Tim Perrin
Business Development Specialist