



Green Expectations

From wind turbines to green dorms, from turf roofs to eco-friendly cleaning fluids, IHEs are exploring environmentally friendly ways to conserve energy, save money—and help the planet. BY ALANA KLEIN

In a cornfield within eyesight of **Carleton College's** (Minn.) campus stands a towering sleek, stark-white structure that looks like the Mercedes-Benz logo. But it's hardly an advertisement for the luxury car brand. Rather, it's a 240-foot-tall wind turbine designed to produce up to 1,650 kilowatts of energy—enough to meet the yearly electricity needs of 600 homes or 40 percent of the university.

Energy derived from wind is considered clean and “green” because its source is inexhaustible and nonpolluting. While the energy generated from the turbine is not directly used to power the college, it does flow directly into the electrical grid of Northfield, Minn., where the college is located. From there it is sold and used locally.

“The Iraq war brings home that we should be more sufficient fuel-wise,” says Richard Strong, Carleton's director of facilities. “The turbine is

a way for Carleton to take responsibility for its energy production and feel that it is contributing to the nation's conservation efforts.”

Blowin' in the Wind

Carleton pursued the wind turbine project after being approached by a local wind advocacy group in 2002. But students also influenced this decision. For the last two years, the student government had been lobbying for cleaner energy sources. They had actually agreed to pay higher student fees to offset the expected higher costs of producing green energy. This option was explored but it proved too costly for the college. Buying just 10 percent of green energy from the college's utility company, Xcel, would have cost them a premium of about \$30,000 a year, Strong says.

“We had to ask ourselves: What would be the value of that stream of payment over time?”



Campaigning for Energy Savings

Last summer, a few days after a black-out gripped Buffalo, N.Y., the **University of Buffalo** was called upon by the regional grid to reduce its electricity use. The university took the request seriously. It amassed \$11,000 in electricity savings in one day. "In this one day everybody pitched in to save. While we can't keep up this level of vigilance every day, if we just do a quarter of what we did on that day, every day, we would increase savings dramatically," says Walter Simpson, energy officer at the university.

While Simpson says the university has promoted energy conservation for the last 20 years, the blackout was a catalyst for change on campus. This spurred two energy conservation campaigns that were recently launched: the "Do it in the Dark campaign," geared directly to students, and the "You Have the Power" campaign aimed at all university constituents. The latter encourages students, staff, and faculty to be mindful of lighting, heating, cooling, and computer conservation. "Do it in the Dark" reminds students to use power-management/saving features on their computers.

"Energy use in dorms and campus apartments has skyrocketed. The students leave their computers on all the time. There's this sense of wanting to be online all the time," Simpson says. While it's too early to track the impact of the campaigns, the "report energy waste" feature on the "You Have the Power" campaign site has received much feedback. Contests and rewards (such as iPod minis) encourage student participation.

It just seemed more cost effective to finance a wind turbine, produce our own green energy and then sell it back to the utility," he says. Both parties benefit from this agreement. Carleton sells 100 percent of its green energy to Xcel for 3.3 cents a kilowatt and Xcel sells its energy to Carleton at 5 cents a kilowatt. Unfortunately, the school cannot directly use the energy generated from its turbine because it is located too far from campus. Turbines built in the future—Carleton is currently considering building two more—will hopefully have this interconnectivity, Strong says.

But Carleton isn't getting rich off of Xcel's payments. In fact, the \$1.8 million turbine is only slightly profitable if not break-even right now. But thanks to the state of Minnesota, the college receives a production credit of 1.5 cents per kilowatt-hour for a 10-year period. The Minnesota Department of Commerce has also chipped in by bestowing the college a \$150,000 grant.

Over the next 20 years, the predicted life span of the turbine, Strong predicts that the college will earn anywhere from \$250,000 to \$750,000. But he also says it will take 10 to 12 years to pay back costs. "The economics here were important. Without proving that this could be a break-even operation, the trustees would not have supported this," Strong explains.

Benefits of Wind Energy

Nestled in the heart of the abundantly windy Midwest, Carleton was a fitting candidate for a wind energy solution. On a wind scale of 1 to 7 that measures wind speed distribution, Northfield is considered a 4. "We've acknowledged that in this part of the world it's possible to use wind energy," Strong says. "We want to make an example of our turbine to encourage others in the area to explore this option." Several IHEs from western Minnesota to Iowa to North Dakota have already expressed interest in mirroring Carleton's progressive ways. **St. Olaf College**, located nearby, has already picked a site for its new turbine, and **Gustavus Adolphus College**,

just a few hours away, has already started fundraising for the two turbines it would like to construct.

This wind turbine fever is partly due to the recent advances in wind power technology. "Two or three years ago, it wouldn't have been feasible to put up a turbine," Strong says. "The turbines are now larger and the blade lengths are longer, which allows the turbine to pick up more area and catch more wind."

Wind energy has also become one of the best solutions to air pollution. Since the turbine started spinning last September, the college has already reduced some 2,000 tons of carbon dioxide from being emitted into the air, Strong says. It is estimated that in the life span of Carleton's turbine, the college would reduce CO₂ emissions by 1.5 million tons. A coal-fired power plant, in comparison, must emit 360 times more sulfur dioxide, nitrous oxide, and

carbon dioxide to generate the same amount of electricity over the turbine's lifespan, according to the Danish study of the Ministry of the Environment.

Despite the documented environmental benefits, there was still some early skepticism about the turbine.

"Some people would ask: Well, if it's such a good idea then why hasn't someone else done it?" Strong says. "Our answer is: Sometimes somebody has to be the first." There were some initial concerns about turbine noise and bird kills, but neither has posed a problem. "You can't hear the turbine unless you're 100 feet away and it's more likely that birds will be killed by a picture window than a turbine," Strong says.

Green Living

The University of South Carolina boasts a large-scale green project of a different kind. It opened its first "green dorm" last November, a 172,000-square-foot, \$30.9 million complex known as the West Quad. It is said to be the largest green residence hall in the world. "But you wouldn't know it," says Michael Koman, environmental protection manager for University Housing at USC. "It's not some big fancy

The turbine is a way for Carleton College to take responsibility for its energy production.

spaceship. It has a traditional Georgian style and blends in nicely with other buildings," he says. "It has actually turned out to be one of the prettiest buildings on campus."

Green nuances include special light shelves in the windows that deflect natural light into the rooms and reduce the heat of direct sunlight. There are interior lights with motion sensors that detect when someone enters and exits a room and turn lights on and off accordingly. In addition, a hydrogen fuel cell generates partial power for the building's 9,000-square-foot learning center, and there are low-flow plumbing fixtures, and high efficiency washers and dryers. There is even a turf roof that absorbs heat and reduces rainwater runoff. And the building houses a café that sells health foods and environmentally aware products.

Remarkably, the university did not have to spend additional funds to accommodate these green features. "Most of us thought there would be a 25 to 30 percent premium," says Gene Luna, director of Student Development and University Housing. "But we have been able to demonstrate that you can accomplish sustainability without premium cost." Luna says the upfront cost of the building is comparable to a traditional building of its size. He expects to see up to \$50,000 in energy savings.

Getting Students Involved

Of course, savings can only be accomplished with the help of the 500 students who live

in the complex. "There was an important educational element in teaching the students about this facility," Koman says. "We have tried to make students aware of the impacts of their decisions and encourage them to make the right choices."

To encourage students to conserve, USC has created a variety of attractive incentives. Students can see how much energy they are using via three interactive touch screen displays located in the lobby. They can also access this information on the web. And those students who use less energy than the student average are eligible for award money of

Students can see how much energy they are using via three interactive touch screen displays.

\$100 to \$150. And since students have full control of the temperature in their rooms—each room has its own thermostat—they can save easily on cooling and heating.

The West Quad also boasts a LEED (Leadership in Energy and Environmental Design) certification, which means that it has met the criteria for building a high-performance sus-

tainable building according to the U.S. Green Building Council. "I pushed for LEED to be used on the project because it gave us a blueprint for greening a building," explains Koman. "Without a standard to follow, we would have had some green aspects but limited consistency and quality."

LEED, which provides a third-party verification rating system for facilities, has certified 10 higher ed projects, and has about 134 higher ed institutions registered. "Our service prevents people from *green washing*," says Sabrina Morelli, a LEED program coordinator, referring to the act of presenting false claims about a building's environmental benefits. An example, she says, would be to label a building green only because it has a turf roof.

Scrub Certification

Middlebury College (Vt.) boasts a handful of environmentally friendly buildings, none of which are LEED certified. "The certification is purely for publicity," says Dave Ginevan, executive vice president of Facilities Planning at Middlebury. "I don't believe in spending the money to get a score or a rating or an OK from an outsider. We'd rather spend the money on hiring energy and environmental consultants who can help us build good buildings."

Middlebury has accomplished this with its McCardell Bicentennial Hall, a 22,000-square-foot, \$47 million structure that opened in 2000. It features triple glazing in windows to add more insulation, a ventilated "cold roof" design for energy efficiency, a six-inch air/insulation space between the shell and structural exterior walls for effective drainage, solar-powered lights, porous paving to filter runoff and return water for aquifer recharge, and local green-certified wood used for paneling. "In some cases our sustainable design exceeds LEED's," says Nan Jenks-Jay, director of environmental affairs and professor of Environmental Studies at Middlebury. "We can address things that are important to us in our region of the Northeast that LEED can't.

LEED is a one-size-fits-all approach." For example, 70 percent of wood used in the building was provided by Vermont Family Forests, a Vt.-based organization committed to ecological sustainable forestry. "We were



WEST QUAD: Light shelves shade windows to reduce direct sunlight heat while reflecting natural light into rooms.

Things to Consider Before Going Green

1 Establish why you are going green.

Most likely not all of your decision makers will be convinced that “green” buildings are the way to go. You may need help convincing them. Some of the most common reasons for building green include:

- Local requirements – Many areas around the country are passing new building requirements to meet LEED criteria.
- Financial – Green buildings provide tremendous savings in utility costs and maintenance reduction.
- Occupancy well-being and productivity – Studies show occupants of green buildings to be more productive and have fewer sick days.
- Green Ethic/Responsibility
- Demand – Your student body, faculty, or community may be pushing for green buildings.
- Image, PR, recruitment (of students, grants or donors).

2 Make the commitment early to a green building. Ensure that you have a champion within your organization who will ‘remind’ you if you start to waiver or return to older habits. Publicize the commitment to provide incentive to stay on track.

3 Hire the right people. Utilize your in-house experts in green building technology and construction. Choosing an experienced architect who is committed to green buildings is key to your success.

4 Educate decision-makers early. Develop partnerships, seek grants, or find other funding opportunities early on. Make your partners and benefactors aware that green buildings do not have to cost more, take longer to build, or use radical new technologies to be successful.

Michael Koman is the environmental protection manager for University Housing at the University of South Carolina.



U OF GEORGIA'S FIRST TURF ROOF (shown in its beginning stages) absorbs storm water runoff and stabilizes building temperatures.

a catalyst for the state of Vermont to support the fledgling industry of green-certified wood,” Jenks-Jay says. The Northeastern Loggers’ Association awarded Middlebury with the 2003 Outstanding Use of Wood Award.

Veggie Roofs: A Storm Water Management Solution

While Middlebury is chock-full of high-tech green innovations, there are also ways to incorporate green practices on a smaller scale. Tim Carter, a doctoral student at **University of Georgia**, is proving this point with the creation of the university’s first vegetated, or turf, roof, on the Science Library-Boyd Hall Graduate Studies building. Lined with thin layers of living

on the intensity and duration of the storm event (and there are many storms in this part of the Southeast), the green roof retained 42 to 92 percent of the rainfall. This is partly because many of the roof’s plants are drought-resistant, and thus absorb and retain water easily, Carter says. He has also noticed more stable temperatures inside the building. This is due to the soil and vegetation that are absorbing solar energy and preventing its transfer into the building.

Given the early success of the veggie roof, administrators are already talking about implementing them on other university buildings. “We’re taking baby steps,” says Dexter Adams, director of the grounds and campus landscaping at UGA. “People are still threatened by the idea of change. They worry about the integrity of their roofs. But this shows them that this isn’t some crackpot radical idea and that there can be advantages and that it doesn’t create a lot of extra work or money.” Green roofs can range anywhere from \$9 to \$40 a square foot; Carter spent about \$14 to \$16 a square foot, covering about 459 square feet of space.

There’s also an aesthetic benefit to these roofs. “I don’t know many people who would rather look at gravel,” Carter says. Besides, this technology is not new. Green roofs have been utilized all across Europe, especially in Germany. But before North America, let alone its colleges and universities, can follow Europe’s lead, “the educational learning curve must be overcome,” says Carter. “Through education we can hopefully institutionalize this practice all over the private sector.”

Green and Clean

While the more visible green initiatives tend to get the most attention, more discreet green practices, such as green cleaning, also

Roofs are often considered unusable space, but roofs actually provide an ideal green space.

plants, veggie roofs control storm water runoff, erosion, pollution, create wildlife habitat, and conserve energy. “Roofs are often considered unusable space, but roofs actually provide an ideal green space,” Carter says. Urban areas, such as downtown Athens, can especially benefit from them. “Space is at such a premium that the city isn’t going to knock down a building to build a park or make room for green space.” As a result, storm water runoff doesn’t get absorbed and in turn pollutes water sources.

Carter’s project, which was completed last October, has already revealed some of the roof’s benefits. He found that depending

deserve recognition. Green cleaning refers to the use of cleaning products “that cause less toxic pollution and waste, conserve resources and habitats, and minimize global warming and ozone depletion,” according to the website of Green Seal, an independent nonprofit organization that promotes green products. “We’re cleaning with as many green chemicals as we can. Not only is it better for the environment, but it’s better for the health of our cleaning staff and those who use our facilities,” says David Fowler of **University of Maine’s** Department of Facilities Management. Fowler switched to green cleaning about eight months ago after putting out a bid for a green vendor. “I keep a pretty close tab on what other schools are doing and I just felt that it was time to go green,” he says. Butcher’s Inc., based in Massachusetts, won that bid. They currently provide all the cleaning products (all of which are certified by Green Seal) for U of Maine. These include carpet cleaners, floor cleaners, and window washing liquids. “We could easily use Windex or Benzene-containing carpet cleaners—they work fine. But they’re harmful to the environment,” he says.

Fowler assures that the quality and cost of these green products are comparable to what he used in the past. It currently costs \$200 per month for supplies for a basic cleaning of an average-sized 50,000-square-foot building. What’s different is the versatility of these green chemicals. “We used to have 15 chemicals in our janitor closet to clean 140 buildings, including dorms, dining halls, and lecture halls. Now we only use three. That’s consolidation,” Fowler says.

In addition to using eco-friendly chemicals, green facility maintenance also plays an important role in conservation on campus. “You always think of greening in conjunction with construction projects,” says William McKenna, project manager at **Eckerd College** (Fla.), who oversees the college’s facilities operations. “But we

think of greening as a day-to-day operation affecting everything from sanitation and recycling to the types of chemicals you use for preventive maintenance.”

Many of Eckerd’s environmental strides are a result of its partnership with UNICCO, an integrated facilities services outsourcing company. McKenna says that UNICCO’s contract is performance-based and that it must meet stringent benchmarks in terms of energy consumption.

Through UNICCO, Eckerd intends to re-

We used to have 15 chemicals in our janitor closet... now we only use three.

duce energy consumption by 30 percent via changing air filters more frequently, managing the central chiller system that generates cold water (thus, reducing the amount of energy needed to cool a building), and moving all of their mechanical equipment to digital control systems.

“With a digitized system we can have more accurate control of the temperature and airflow and the time of day when they’re used,” McKenna says. Under the arrangement with UNICCO, Eckerd also uses 100 percent reclaimed water, which is water that is sent to the sewer, treated, and then recycled back into the campus. “We’re a campus of 188 acres, so you can imagine how much water we use for irrigation. This is a great water-saver,” he says.

Previously, Eckerd had outsourced through a different company, one that McKenna says was not committed to green cleaning. “Eckerd has always been environmentally oriented given the nature of our campus and location,” he says. “We’re kind of immersed in the environment, as we are located at the edge of

RESOURCES



- UNICCO**
www.unicco.com
- U.S. Green Building Council**
www.usgbc.org
- Green Seal**
www.greenseal.org
- Butcher’s**
www.butchers.com

Learn More About Green Initiatives


“Green” is finding its way on the agenda of college administrators as more pressure comes from student groups and faculty. Ultimately, green initiatives mean improved health for building occupants, increased productivity, improved student performance, decreased absence and a contribution to the environment and its inhabitants. Here’s how to get information:

Learn from independent experts: Contact associations such as APPA and NACUBO. Your associations make it easy to share information that would otherwise be considered proprietary in the business world. The Ashkin Group, LLC, U.S. Green Building Council, and GreenCleaning.com are also good resources.

Learn from each other: Share amongst each other. Contact schools who are now certifying under the U.S. Green Building Council’s LEED rating systems. They have already done their research on new construction, as well as the operations, cleaning and maintenance of existing buildings.

Learn from product suppliers: Supply vendors are another great source for information. Many companies such as Johnson Wax have a complete line of new green chemicals that are cost competitive and have received Green Seal certification. Filter suppliers can provide the latest information on HVAC filter products that capture airborne particulates that meet LEED standards. Equipment providers such as Rubbermaid and Advance carry products from micro-fiber dusters, mops, etc. as well as HEPA, and similar high-filtration vacuums, environmental carpet/floor cleaning machines.

—Bert Ouellette is director of Business Development for UNICCO and a former college administrator.

the water. Ecological issues are part of our culture. It just made sense to switch to a greener vendor.” 



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