

Higher Education in a Warming World

The Business Case for Climate Leadership on Campus

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Highlighting the business, educational and moral arguments
for reducing greenhouse gas emissions on campus,
with best practices from U.S. colleges and universities.

The Campus Ecology program
of the National Wildlife Federation
promotes climate leadership and
sustainability among colleges and
universities by providing resources
and technical support, creating
networking opportunities and
organizing educational events.



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COVER IMAGES LEFT TO RIGHT: LEED-certified David Letterman Communication and Media Building, Ball State University, Indiana – courtesy Ball State University Photo Services. Photovoltaic array (50 kilowatts) at Santa Clara University in California – by Charles Barry, SCU photographer. Red fox in summer – Corbis.

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■ Overview

If any sector of society has the potential to model the transition to a low-carbon future, it is higher education. With their depth of expertise, innovative research and societal influence, colleges and universities have been at the forefront in addressing global warming. As living laboratories, campuses have developed and implemented cutting-edge energy conservation practices and clean power technologies. Of even greater importance, they are educating future generations of engineers, architects, scientists, business leaders, teachers, government officials and citizens to create effective solutions to global warming.

“No institutions in modern society are better equipped to catalyze the necessary transition to a sustainable world than colleges and universities. They have access to the leaders of tomorrow and the leaders of today. What they do matters to the wider public.”

—David W. Orr, professor and author, Oberlin College, from *The Last Refuge*

As a founding organization of the climate action movement, NWF’s Campus Ecology has helped hundreds of colleges and universities cut greenhouse gas emissions, save millions on energy costs and embed environmental values in campus operations and curriculum. Campus Ecology has worked closely with all types of schools: public and private, large and small, community and technical colleges. As a result, it has a breadth of experience, ideas and resources to offer any college or university. The mission of Campus Ecology is to foster climate leadership on campuses nationwide and to protect wildlife and our children’s future against the growing threat of global climate change. This report is a guide for administrators, staff, faculty and students exploring the implications of climate change and seeking cost-effective solutions. It presents a scientific overview of global warming and a review of the business, educational and moral arguments for confronting this problem. Case studies from a diverse group of leading campuses illustrate energy-conserving and emissions-saving projects, effective financing strategies and creative ways to involve the campus community. A section on the planning process and implementation steps is included to help campuses get a jump on cutting costs and reducing their carbon footprint.



David J. Eagan

NWF’s goal for society—and for higher education—is to reduce carbon emissions by 2% per year, leading to an 80% cut by 2050. Achieving 2% or greater reductions each year can start with simple actions like lowering the thermostat or installing occupancy sensors. But this call for action on campus goes beyond asking for small steps. Heeding the world’s top scientists who warn that global warming will trigger a potential cascade of negative consequences, Campus Ecology urges bold action and critical leadership today and throughout the next decades, when our actions will determine the fate of the climate for generations to come.

“Students on today’s campuses are helping to lead the way now, and will soon be the leaders in business and government who will be called on to address this ongoing worldwide threat.”

—Al Gore, former Vice President,
in April 2007 Broadcast of NWF Chill Out: Campus Solutions to Global Warming

4. Green buildings

Building green is giving campuses the chance to “get it right this time.” Technology exists today to construct buildings that use half the energy—or less—of conventionally built structures. Building projects at campuses have demonstrated that green construction does not have to require more financial green (see Harvard example below). But regardless of upfront costs, green buildings are a cost-savings bargain over their lifetimes. And they have become prominent symbols of a school’s commitment to sustainability.

“Our main problem is that we have buildings that are energy drains because they were built in the 1950s when energy was cheap. (But) they are also historic landmarks, so you are under constraints when you try to retrofit them.”

—David Baker, Vice President for External Affairs, Illinois Institute of Technology

While new buildings can be designed with state of the art efficiency, adding square feet usually means an increase in net emissions. Unless a building is designed to produce all of its own energy (a feat achieved by **Oberlin College’s** Adam Joseph Lewis Center which is a net exporter of electricity) or another building is torn down, once online a new structure causes an upward tilt to the campus energy total. With that in mind, the existing stock of 240,000 college and university structures is where the greatest emissions savings await. Green renovations offer the chance to preserve a piece of history and also take a bite out of the energy bill.

Laboratories

In April 2002 the **University of California, Santa Barbara**¹²⁰ opened the doors of the Donald Bren School of Environmental Science and Management—the first laboratory to receive the LEED Platinum award for new construction. This green laboratory surpasses Title 24 (California’s energy code) by more than 30%, saving the campus \$50,000 and preventing 275 tons of CO₂ emissions per year. To provide some of its own energy, Bren Hall has a 42 kW photovoltaic array that provides 7-10% of the building’s energy, cutting 20 tons of emissions a year.



LEED-certified David Letterman Communication and Media Building at Ball State University (Ind.) opened in 2007.

Residence Halls

West Quad, the new 500-bed residence hall at the **University of South Carolina at Columbia**,¹²¹ is larger than its traditionally built sister residence East Quad, but requires 45% less in energy costs. Opened in 2004, the building is Silver LEED certified and features the latest technology and environmental systems for conserving water and energy. It saves around \$40,000 in electrical costs and the same amount in water. The building also serves an educational mission as the home of the Environmental Awareness Learning Community at USC.

At **Northland College**¹²² (Wisc.), the McLean Environmental Living and Learning Center was one of the earliest green campus buildings, opening in 1998. This 38,000 square foot, 114-student residence was co-designed by students to be a teaching tool featuring energy-efficient construction, PV arrays, solar water preheating, a wind turbine, greenhouses and some composting toilets. It exceeds code requirements for efficiency by over 50%.

Renovations

Harvard University¹²³ completed a green renovation of a historic building on campus in 2006, earning the coveted LEED Platinum certification. Its 40,000 square foot Blackstone Office Renovation project included a ground-source cooling system, energy-efficient fixtures, an Energy Star reflective roof, and sophisticated ventilation controls. Energy use in summer is reduced 42% beyond code requirements. Construction and demolition waste was 99% recycled, cutting 15% off the overall project budget. Costs were \$250 per square foot which is in line with non-green renovations, thus the project had no net “green premium.”

High performance

BUILDING STANDARDS

Guidelines and standards for green buildings can give direction to the design process as well as targets for efficiency and cost-savings. These are two of a number of programs that offer such guidance.

The **Leadership in Energy and Environmental Design (LEED)** Green Building Rating System is the nationally accepted benchmark for the design, construction and operation of high performance green buildings. LEED promotes a whole-building approach to sustainability by recognizing performance in five areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection and indoor environmental quality. See <http://www.usgbc.org/LEED>

The **New Jersey Higher Education Partnership for Sustainability (NJHEPS)** developed a two-volume “High Performance Campus Design Handbook.” **Volume 1** is an overview and rationale for green design, especially in the New Jersey higher education context. **Volume 2** is a technical guide for planners, designers and facilities personnel. Its guidelines have been adopted by many schools in New Jersey and around the U.S. See <http://www.njheps.org/projects/greenbuildings.htm>

Hundreds of campus buildings are certified or registered through LEED or have been designed according to their standards with the intention of applying for certification.

Here is a sample.

Commitment to high performance through LEED¹²⁴

SCHOOL	ACCOMPLISHMENTS AND PLANS
University of Florida	Beginning in 2006, UF will require LEED Silver criteria for design and construction for all major new construction and renovation projects. To date the campus has two Gold Certified buildings, eight certified buildings, and several registered.
California State University, Chico	Two campus buildings are registered with LEED and the campus has made a commitment that all newly constructed buildings will meet LEED Silver requirements.
Southern Methodist University (TX)	The Embrey Building, which opened in September 2006, is pursuing LEED certification at the Gold level.
Cape Cod Community College (MA)	The Lyndon Lorusso Applied Technology Center received its LEED Gold certification in 2007.