

THE UNIVERSITY MODELING SUSTAINABILITY AS AN INSTITUTION

*"The significant problems we face cannot be solved
at the same level of thinking we used when we created them."*

—Albert Einstein

Creating a healthy and environmentally sustainable campus requires an integrated, systemic approach. Institutional departments of purchasing, facilities management, and planning and design working together can implement an integrated approach to the management of the institution and, with the help of staff, faculty and students, support a campus-wide sustainability initiative. Institutional managers can implement the principles of sustainability, and simultaneously realize several benefits. These include long-term cost- and resource-savings, and increased status as an environmental leader on campus and in the community. This brief introduces examples of campus systems practicing sustainability, how they are accomplishing it, and the benefits they receive. It is divided into three conceptual areas:

- The Flow of Goods and Services
- Campus Infrastructure
- Systemic Transformation

Contacts and references are listed along with brief profiles of campus initiatives nationwide. We hope this information will speak to campus administrators and staff and pique their interest in expanding or starting sustainable practices on their own campuses.

For more information, visit <http://www.secondnature.org>

THE FLOW OF GOODS AND SERVICES

Who might be involved?

Facilities and financial managers, environmental health and safety managers, purchasing managers, transportation managers, dining facilities managers, university hospital administrators, maintenance services staff, custodial staff, department heads, and faculty and students.

Why become engaged?

Over \$146 billion are spent each year by U.S. colleges and universities for goods and services (ULSF, *The Declaration* Vol.1, 1996), an amount greater than the GDP of all but twenty countries in the world. Imagine the leverage if universities were modeling sustainability by purchasing environmentally friendly products. The purchasing agent makes key decisions about which products to purchase, from paper to energy, and, in the case of larger universities, can affect the manufacture or distribution of products through contractual agreements. The responsibility for goods and services does not end there, however: the full life span of the product or service must be taken into account, and the management of waste must also be a concern.

A purchasing agent at a university, whether a departmental administrator, service center staff, dining facility manager or head of the purchasing department, is in a position to reduce waste, reward durability, minimize environmental hazards, and increase the use of recycled materials. Of course, these key decisions are not made without input from other parts of the campus system, but the purchasing agent acts as the ultimate "environmental gatekeeper" of the university.

Profiles of Success

- ***Purchasing at Rutgers University***

Beginning in 1988, Kevin Lyons, Head of Purchasing at Rutgers University, Camden, has led a university-wide commitment to sustainability through his purchasing department. His program has included analyzing and reducing the waste stream, developing a recycling program, implementing campus environmental policy, cooperative purchasing agreements and coordinating more environmentally compatible contracts. Over 10 years, Rutgers Camden saved \$7.5 million and dramatically reduced its environmental impact. Because Rutgers' environmental programs save money they have become institutional practice.

- ***Sale of Surplus Property at the University of Wisconsin-Madison***

Daniel Einstein, Environmental Management Coordinator at the University of Wisconsin-Madison, has built a multi-faceted program that includes redistribution of used property, saving the cost of buying new products as well as avoiding the waste created and energy used in their manufacture. The SWAP posts inventories of available office and lab equipment and chemicals on the web. UW has redistributed 1,000 tons of lab equipment in a year, saving up to \$240,000 in avoided annual purchase and disposal costs. On another front, Einstein has renegotiated the contract under which recyclers can buy the University's waste paper, eliminating fees and generating income for the university—an average of \$120,000 per year.

- ***Reducing Chemical Waste at the University of Minnesota-Duluth***

U Minn. made an agreement with a local hospital to achieve zero-discharge of persistent toxic substances, an issue at the forefront of the environmental health movement. The University reports that phasing-out mercury use has significantly reduced costs of hazardous spill cleanups. They have instituted micro-scale projects in undergraduate chemistry and research labs that dramatically reduce the quantities of chemicals used, purchased and discarded. One professor was able to reduce solvent waste from 2,500 gallons to 23 gallons, saving \$37,000 annually. Students also helped identify sources of mercury pollution and teachers came up with new laboratory methods to deal with them.

- ***Minimizing Food Service Waste at Appalachian State University***

Appalachian State Food Services began recycling cardboard in 1989. Since then, students on campus have recognized Ron Dubberly, Food Service Director, as a friend of environmental initiatives. More than 140,000 pounds of cardboard is recycled each year by Food Service. In addition, they began to sell and support the use of reusable mugs in the dining areas, and have begun a food waste composting program that will prevent the use of a half-ton of chemical fertilizers by the University each year.

- ***The Wind Power Referendum at the University of Colorado-Boulder***

In the spring of 2000, students at UC Boulder initiated a referendum to increase student fees and fund the purchase of wind power for 3 campus buildings that are paid for by student fees and are student-controlled: the student union, recreation center and campus medical center. By a 6 to 1 margin, the referendum passed, resulting in a \$1 per student/per semester student fee increase that would generate \$60,000 a year to purchase output from one turbine at the Excel Wind Farm. The University began purchasing the wind power in September 2000, and it now provides 35-40% of the energy used by those buildings.

CAMPUS INFRASTRUCTURE

Who might be involved?

Architects, engineers, physical plant staff, custodial and maintenance staff, environmental health and safety managers, buildings and grounds managers, campus planners, and faculty and students.

Why become engaged?

Second Nature believes that the sustainable design and management of facilities and physical plants presents a valuable opportunity for institutional transformation on campus. The planning, design and implementation process can bring stakeholders from across the campus community into a common conversation, striving towards common goals and tangible results. Colleges and universities construct buildings, maintain sanitation systems and facilities, provide heat and power, employ and house people, and contract with government and private institutions. These activities provide unparalleled teaching and learning opportunities for faculty, staff, students, administrators and members of the extended community.

Imagine a sustainable design or facilities management project as the opportunity to create:

- buildings that are ecologically sound and showcase very visibly an institution's commitment to a just and sustainable future;
- working and living spaces that promote positive social interaction and thereby contribute to community-building and community engagement;
- environments that help students, faculty, staff and visitors live and work comfortably and productively and reduce the physical problems associated with less environmentally sound materials;
- facilities that, over the long run, contribute to financial savings and resource efficiency;
- surroundings that provide rich opportunity for community-wide collaboration and experiential learning.

Profiles of Success

Energy

- **Pennsylvania**
A consortium of twenty-five Pennsylvania colleges and universities have committed to purchase wind power. In this way, Pennsylvania colleges and universities are assuming a leadership role in sustainable energy that reduces adverse impacts from energy production to human health and the environment including the threat of global warming. The Pennsylvania Consortium for Interdisciplinary Environmental Policy is partnering with Community Energy, Inc., a wind power marketer, on this project.
- **State University of New York-Buffalo**
Volunteer building coordinators turn off lights and equipment each day and help educate building occupants. The University kept energy costs constant on one campus since 1993 while constructing 6 new buildings and expanding the campus by 20%. A cumulative \$65 million has been saved as a result of this project, while fostering an ethic and awareness on campus related to long-term judicious resource use.

Transportation

- **Cornell University**
Rather than building new parking lots to accommodate a burgeoning number of commuters, transportation managers at Cornell decided to institute a bus pass system for the faculty, staff and students. The Transportation Demand Management Program (TDMP) allowed the University to avoid \$13 million in costs over a six year period, an annual savings of more than \$3 million. This plan saves valuable green space, reduced auto travel by 25%, and significantly reduces auto emissions.

- **University of Colorado-Boulder**

As part of a comprehensive transportation management scheme, Will Toor and students at the University's environmental center have organized efforts to increase bus ridership and advocate alternative means of transportation. The student bus pass program alone generated an annual cost savings of \$1 million while increasing ridership by five times earlier levels, reducing the amount of space paved for parking spaces, and reduced air pollution created by automobiles.

Landscape

- **Seattle University**

Conventional herbicides are hard on the environment and expensive to purchase. Ciscoe Morris, Grounds Manager at Seattle University, developed a method of using ground cover to out-compete weeds. By avoiding the cost of herbicides, they are saving about \$1300 per year in addition to lowering campus exposure to toxic chemicals.

- **Middlebury College**

Middlebury College uses passively aerated windrows as their method of choice for composting 75% of campus food residuals. Through the savings created by avoiding fertilizer purchases for landscaping and gardening, the operation pays for itself. It was not easy finding the right "fit" to their composting needs, but Norm Cushman of the Facilities Management team, is now seeing an average annual savings of \$102,000 since 1993.

Architecture and Design

- **Eastern Michigan University**

At EMU, the purpose of designing the new Everett L. Marshall building in an environmentally sustainable manner was to reflect the values of the College of Health and Human Services that it will house. Nearly every interior feature contains recycled components, and the building's HVAC and energy systems are super-efficient.

- **Northland College**

The new Wendy and Malcom McLean Environmental Living and Learning Center is probably the most advanced environmental residence hall in the world. At a cost of \$4.1 million, the hall houses 117 students, has two greenhouses, a wind tower, PV arrays and other special features. A recent study estimates that the building achieves 50% greater efficiency than a standard building.

- **University of Wisconsin-Green Bay**

An academic building at UW-Green Bay is about to become one of the most energy-efficient buildings ever constructed. The focus of the new 120,000 square foot facility will be its advanced Building Integrated Photovoltaic (BIPV) energy system. Early estimates include an annual savings of 42,000 lbs. coal, 74,000 lbs. CO₂, 340 lbs. SO₂, and 400 lbs. NO_x.

Research and Medical Facilities

- **Brown University**

Through a look at the Geo-Chemistry lab through the eyes of undergraduates directed by Kurt Teichert, Brown's Environmental Coordinator, many inefficiencies were discovered in light fixtures and fume hood operation. By making some simple low-tech behavioral changes, including reminders to turn off fume hoods, as well as installing energy efficient light fixtures and occupancy sensors, the Geo-Chem lab has realized an annual cost savings of about \$15,000, and is preventing the release of 85,036 lbs. CO₂, 2,081 lbs. SO₂ and 933 lbs. NO_x per year.

- **University of Texas at Houston**

UT-Houston is dedicated to becoming the model health sciences university of the 21st century. Sustainability is one of their aspirations around that goal, and is fully supported by Brian Yeoman of Facilities, Planning and Development at UT. Energy saving initiatives have included lighting retrofits and occupancy sensors. New contracts that utilize integrated pest management and integrated landscaping were drafted in favor of traditional, more hazardous approaches. Purchasers reviewed products throughout the university and changed their suppliers of carpet and ceiling tiles to ones who are more environmentally compatible.

Investing

- **Columbia University**

Socially responsible investing became a key issue with students at Columbia in 1999 when the group Students for Socially Responsible Investing (SSRI) was formed. Now the President of Columbia has recommended the formation of the Advisory Committee on Socially Responsible Investing. The committee's mission is to provide a permanent channel for conveying to the University Trustees concerns of the Columbia community regarding socially responsible investing issues and the endowment.

- **University of Louisville**

Through Sustainable Urban Neighborhoods (SUN), the University reaches out to the West End Enterprise Community by investing in its people and their future. Investments include scholarships to local junior colleges, small business training, micro-lending, home ownership support, community design and planning, and crime prevention. Service-learning opportunities for Louisville students are also provided through this program. These investments are not only good for the community, but will result in long-term sustainability for the University it supports.

SYSTEMIC TRANSFORMATION

A key component to the creation of a sustainable institution is the adoption of a campus-wide policy or mission statement. The process around the development of a larger-scale plan brings stakeholders (administrators, staff, faculty, students and community members) to the table and encourages open discussion and creative problem solving. Ultimately, an integrated vision of the institution emerges.

Harvard University

The Guiding Principles of the Harvard Green Campus Initiative include:

- Engage with local area leaders to define local needs and opportunities for institutionalizing environmental impact reduction
- Support the development of a learning organization and a living laboratory for the practice and development of environmentally preferred practices at the local level through the provision of training, education, information, measurement, communications and network building, research, trials, standards and guidelines
- Build communities of participation across university student, administration and academic constituencies to maximize synergies by aligning and synchronizing efforts
- Provide clear measurements of progress in engagement and activity

John F. Kennedy University

JFKU announced that it will strive to become the first university in the United States to be designed in its entirety using "Green Principles." The specific goals of building an entirely new campus include:

- Striving for the highest possible rating from the US Green Building Council's Leadership in Energy Efficient Design (LEED) rating system;
- Maximizing the use of green building materials throughout all aspects of design and construction, including campus furnishings;
- Designing the energy and water consumption needs using environmentally sensitive yet highly efficient methods;
- Integrating the principles of sustainability into the curriculum.

Ball State University

Recommendations by the Green-2 Committee stress the need for broad participation by all areas of the university and the local community to address critical environmental issues:

- Provide an organizational structure and personnel to support and sustain green initiatives, including funding opportunities;
- Encourage campus and community involvement through Green Issues Awareness and the Environmental Education Resource Center;
- Improve campus environmental performance through a recycling program, a bikeway system, hybrid vehicle use, and energy conservation;
- Increase students' exposure to sustainability principles through curricular requirements and universal programs.

RESOURCES

Additional Writings

- Anderson, R. (1998), Mid-Course Correction: Toward a Sustainable Enterprise—the Interface Model. Peregrinsilla: Atlanta, 204 p.
- Benyus, J. (1997), Biomimicry: Innovation Inspired By Nature. William Morrow: New York, 308 p.
- Creighton, Sarah Hammond (1998), Greening the Ivory Tower. MIT Press: Cambridge.
- Eagan, D. and Keniry, J. (1998), Green Investment, Green Return: How Practical Conservation Projects Can Save Millions on America's Campuses. National Wildlife Federation: Washington, DC, 77 p.
- Keniry, J. (1995), Ecodemia. National Wildlife Federation: Washington, DC, 222 p.
- Lowe, Ernest, Moran, S. and Warren J. (1997), Discovering Industrial Ecology: an Executive Briefing and Sourcebook. Battelle: Columbus, 191 p.
- Lyons, K. (2000), Buying for the Future. Pluto Press: London, 161 p.
- Managing Green Teams (1998), Moxen, J. and Strachan, P., eds. Greenleaf: Sheffield, 268 p.
- McDonough, W. (1999), The Hannover Principles: Design for Sustainability. William McDonough + Partners: Charlottesville, 122 p.
- Sustainable Architecture White Papers (2000), Brown, D., Fox, M. and Pelletier, M., eds. Earth Pledge Foundation: New York, 324 p.
- Wackernagel, M. and Rees, W. (1996), Our Ecological Footprint: Reducing Human Impact on Earth. New Society: Philadelphia, 160 p.

Design Standards & Criteria

- Leadership in Energy and Environmental Design (LEED) System: <<http://www.leadbuilding.org>>
- ISO 14001 <<http://www.iso14000.com>>
- Hannover Principles <<http://www.mcdonough.com>>
- The Natural Step: <<http://www.naturalstep.org>>

Online Contacts

- EPA - Environmentally Preferable Purchasing: <<http://www.epa.gov/opptintr/epp>>
- The U.S. Green Building Council: <<http://www.usgbc.org>>
- Environmental Building News: <<http://www.buildinggreen.com>>
- Oikos: <<http://www.oikos.com>> *Online database of green building products.*
- GreenSpec: <<http://www.greenspec.com>> *Environmentally preferable building materials.*
- University Leaders for a Sustainable Future: <<http://www.ulsf.org>>
- National Wildlife Federation - Campus Ecology: <<http://www.nwf.org/campus>>
- Green Money: <<http://www.greenmoney.com>>
- Coalition for Environmentally Responsible Economies (CERES): <<http://www.ceres.org>>

Second Nature is a Boston-based national nonprofit organization working to help higher education prepare future professionals for the increasingly complex environmental and social challenges we face. We offer colleges and universities a range of programs, training sessions, one-on-one consulting and resources to make the integration of environmental sustainability thinking "second nature" to higher education.
