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The State College Role in Advancing Environmental Sustainability: Policies, Programs and Practices

By Thomas Harnisch,
Research Associate

The American higher education enterprise has the capacity and fortitude to confront many of the country's most pressing energy and environmental challenges. Many institutions and state college systems are using campus resources to carry out grassroots environmental initiatives. These activities have yielded important environmental, educational, and economic dividends. Continued campus efforts will be most successful to the extent that policymakers provide leadership and support to advance common environmental agendas.

Context

In the past few years, awareness of global environmental challenges has received renewed attention. From Vice President Al Gore's activism to relentless energy price increases and the escalating evidence of man-made climate change, the resulting "green" movement is continuing to gain widespread exposure in politics, education, business, and everyday life.

Leadership in this movement is a natural fit for the "public purpose" mission of American state colleges and land-grant institutions. Higher education in the United States is a $300 billion industry with the active audience, intellectual resources, and research-related infrastructure to drive positive change at the local level. Most importantly, institutions of higher education also have the ability to transfer the knowledge, skills, ideas and values needed to usher in a new era of environmental sustainability in the 21st century.

Students and administrators are increasingly capitalizing on their roles at colleges and universities by organizing sustainability committees, formulating strategies to reduce environmental impact, and executing eco-friendly campus policies that are socially, economically and environmentally responsible. According to the *2008 College Sustainability Report Card*, the proportion of institutions committed to reductions in carbon emissions increased from 14 percent in 2007 to 50 percent in 2008. There has also been a vast enrollment increase in the American College and University Presidents Climate Commitment, a program that solicits voluntary pledges from college and university presidents to create an inventory of campus greenhouse gases, take action to reduce or eliminate emissions, and share findings with their peers. Thus

far, 546 presidents in all 50 states have signed the commitment, including approximately 100 members of the American Association of State Colleges and Universities.

Some colleges and universities are also participating in the Chicago Climate Exchange, a voluntary yet legally binding carbon trading program that forces campuses to either reduce emissions or buy carbon credits from other participants. Essentially, this is a market-based approach that treats carbon emissions as a commodity. The participating campuses, along with corporations and other entities, exchanged 23 million tons of carbon last year, up from 10.3 million in 2006.

While these eco-conscious efforts are progressive and commendable, there are limitations to how much institutions can do on their own. The primary issue is cost, especially in the short term. Transitioning from traditional to alternative forms of energy, building LEED (Leadership in Energy and Environment Design)-certified facilities, and developing eco-friendly campus programs can be expensive, though there are many environmental initiatives that simply make good business sense. Many environmental sustainability initiatives can cost-effectively reduce campus-operating costs.

A related issue is that of priorities, or where environmental initiatives fit among competing institutional needs. During a time of constrained state higher education appropriations, some would argue that holding down tuition prices for students and families, attracting and retaining faculty, and assuring quality instruction and other student services should take precedence over some of the lower return on investment environmental sustainability initiatives. As a result, leadership and financial support from state policymakers to make environmental sustainability a priority on college campuses would help secure new sustainability programs and accelerate existing efforts.

This paper first presents a background of key changes college campuses can make to limit emissions and provide institutional savings. Also provided is an analysis of creative campus-level efforts yielding key economic, educational and environmental dividends. Finally, leadership and legislative efforts are highlighted to demonstrate how state and federal policies and partnerships can effectively enhance campus-level efforts to invest in the next generation of technologies, practices and leaders.

Observations

Campus-based environmental initiatives are increasingly attractive to higher education leaders and are being introduced in many areas of campus operations. There are three primary environmental challenges for college campuses: inefficient facilities, reliance on fossil fuel-based energy sources, and emissions stemming from transportation.

Facilities: Campus facilities have an impact on the environment because they utilize natural resources and building materials, require energy for heating and cooling, and disrupt the immediate ecosystem. Because of this, administrators are making efforts to minimize their campuses' environmental footprint. The *2008 College Sustainability Report Card* affirms that eco-friendly buildings are growing in popularity, with the percentage of schools with green building policies swelling from 48 percent in 2007 to 69 percent in 2008.

Many universities choose to achieve LEED certification when constructing new buildings or retrofitting existing ones. This certification demonstrates that the facility incorporates eco-friendly measures in its construction and operations. Some universities have decided to bypass certification, but nonetheless have incorporated environmentally sensitive measures in the construction of campus buildings.

Energy: Energy management is another key issue for college administrators. With escalating energy prices and limited budgets, college officials are considering how to reduce waste through comprehensive energy management programs. According to a recently released report from the American Association of State Colleges and Universities and SunGard Higher Education, energy management is the top source for cost savings for institutions, with 4 in 5 survey respondents indicating it as a key method for improving the institution's bottom line.

Institutions of higher education also achieve cost savings through a combination of solar, wind, biomass, and geothermal energy sources. For example, the National Wildlife Federation suggests that while the cost of solar energy is often higher than traditional sources, subsidies and grants, coupled with lowering prices, are making photovoltaic cells better options for college campuses. Many institutions have invested in wind power, since it can be cost effective against new coal or gas fired power plants while providing less volatile fuel costs that won't be penalized by any new cap-and-trade legislation.

Transportation: Besides buildings and energy, automotive emissions stemming from campus commutes by students, faculty and staff are a major contributor to air pollution. Some schools are combating this by increasing access to eco-friendly transportation options, including carpooling, bus transit passes, and preferred parking for multiple-occupancy vehicles. Some administrators have even proposed building more residential housing to reduce campus commutes.

Individual colleges and universities are reaping the economic, environmental and educational benefits of "green" changes. According to the Environmental Protection Agency (EPA), sustainable development "marries two important themes: that environmental protection does not preclude economic development and that economic development must be ecologically viable now and in the long run."[1] By this definition, college sustainability programs should be viewed as long-term investments that will deliver greater economic efficiency and substantial monetary returns to students, institutions and communities. The U.S. business sector often describes sustainability as the triple bottom line, creating healthier ecosystems, social systems and economies. AASCU institutions have been at the forefront of many of these changes. Some examples include:

Renewable Energy: The University of Minnesota has proven to be a leader in harnessing area resources, investing in the local economy, and developing a framework for energy independence. The University of Minnesota, Morris (UMM) and the University of Minnesota West Central Research and Outreach Center (WCROC) are partnering to develop innovative energy solutions for rural Minnesota. The WCROC purchased a wind turbine in 2005, and UMM has received bonding approval for a second turbine. The first wind turbine meets 50 percent of UMM's energy needs, and the second should provide enough energy to power the entire campus.

This fall, UMM also plans to unveil a biomass research and demonstration facility that will use biomass products to both heat and cool the campus. Instead of using electricity, the biomass steam will be used in an "absorption chiller" that provides cold air to campus facilities. In addition, plans are underway to use the steam to power a turbine and provide auxiliary power for the campus. These biomass products, like corn stalks and prairie grass, mostly come from local producers and will keep an estimated half million dollars in the regional economy.

In addition to being environmentally conscious and economically prudent, these campus efforts have spawned a key research coalition. The Green Prairie Alliance, a group of researchers from UMM, WCROC, and the United States Department of Agriculture Soils Lab, are planning research on the effect of biomass on soil production. In particular, the researchers plan to investigate the feasibility of returning ash from the biomass facility back to the soil to minimize any environmental impact.

High-Performance Buildings: Eastern Connecticut State University (ECSU) has realized cost savings while increasing amenities in student housing. The university revamped an electrically heated, 30-year-old, nine-story residence hall with geothermal energy. The change greatly reduced energy consumption while adding air conditioning. In addition, 30,000 to 150,000 gallons of water from the geothermal processes were diverted into a local river, helping it retain its aquifer level and thus limiting harmful environmental impacts. This move alone saves ECSU thousands annually in energy costs while reducing environmental pollution.

[1] http://www.epa.gov/sustainability/basicinfo.htm.

Reducing Transportation Pollution: Located in a region with some of the highest diesel prices in the nation, Appalachian State University in western North Carolina has undertaken efforts to develop alternative forms of energy. In 2006, with leadership from students and faculty, the university invested in creating a project that converted vegetable oil from local fast-food restaurants into biodiesel, resulting in substantially lower emissions. This success was nationally recognized when a group of Appalachian State students drove a 100 percent biodiesel-powered van from campus to Washington D.C. and won a $10,000 award from the EPA's National Sustainable Design Expo. The campus continues to be an innovative leader in biodiesel research while sharing its work with members of the community.

Expanding Environmental Education and Outreach: Frostburg State University (Md.) has fully utilized its Appalachian hills locale to not only invest in wind and solar energy, but also to transfer knowledge to its local community. Through funding from the Appalachian Regional Commission, Frostburg offers a certified training program for local citizens to install solar and wind generation systems in their homes. It also combines online and classroom instruction with training and lab experiments. In addition, Frostburg connected solar panels and a wind turbine to a campus house to demonstrate the viability of these forms of energy.

State and federal policy efforts hope to encourage more campus sustainability efforts, create new jobs, and spur research to achieve greater energy independence.

Federal: Federal lawmakers have introduced legislation prompting renewable energy investments on college campuses. For example, the Energy Independence and Security Act of 2007 includes a $250 million annual allocation in grants and $500 million in loans for renewable energy and energy efficiency projects to be used for sustainability efforts on college campuses. Senator Bernard Sanders (I-VT) led efforts to include this provision in order to provide colleges and universities with the means to explore alternative forms of energy and other eco-friendly efforts.

The legislation also offers grants of up to $500,000 to fund innovative energy sustainability projects. One provision of the Sanders bill requires half of the money allocated for higher education institutions be distributed to colleges and universities with endowments of less than $100 million and mandates student involvement in all levels of planning. The legislation was passed and signed into law by President Bush last December; however, funding still has yet to be appropriated.

The Higher Education Sustainability Act (HESA) has been included in the U.S. House of Representatives reauthorization of the Higher Education Act and as a separate bill in the Senate. This legislation would authorize $50 million in grants annually for five years to be distributed by the Department of Education and is aimed at supporting 25 to 100 sustainability programs at higher education institutions/consortia. It hopes to produce three million "sustainability-literate" college graduates each year, and strengthen sustainability efforts in higher education. The House and Senate have both passed differing versions of the Higher Education Act reauthorization and are currently working in conference committee to produce a final version of the bill.

These pieces of legislation are crucial to building and sustaining this movement because higher education budgets in many states are very constrained, and continued experimentation and research will need funding. In addition, the Sanders legislation would specifically help smaller institutions, which often may not have the resources to make improvements with high initial costs.

The higher education community should also be aware of broader policy efforts to cut greenhouse gases. Legislation generally regarded as "environmental" may have significant implications for colleges and universities. For example, Senators John Warner (R-VA) and Joe Lieberman (I-CT) have introduced America's Security Climate Act, a "cap and trade" bill which hopes to reduce U.S. greenhouse gases by as much as 70 percent of 2005 levels by 2050. The auction monies from the carbon exchange will be spent in part on higher education to research and educate the public about climate change. Many college and university presidents and governmental relations officers are recognizing the importance of expanding their involvement in federal and state legislation. From very specific education bills to those that provide support for more general efforts, such involvement works to provide healthier economic conditions for the future.

States: Across the nation, there are a myriad of state grant programs that encourage environmentally friendly transitions, but most state legislatures and governors have largely overlooked the specific issue of campus sustainability. Besides the environmental benefits, these innovative efforts may yield considerable dividends for state economies to be at the forefront of the "green" transition and train the next generation of engineers, scientists and business people in this field. There are, however, notable exceptions in which state policymakers have been active in directing and supporting efforts toward campus sustainability, providing funds for business/school partnerships and research, and creating "green-collar" jobs.

Wisconsin: In 2006, Governor Jim Doyle (D) outlined his "Declaration of Energy Independence" plan, a comprehensive vision of energy independence that includes goals to make University of Wisconsin campuses at Green Bay, Oshkosh and River Falls completely energy independent by 2012. This effort could reduce 260,000 tons of coal consumption over a decade, reduce greenhouse gas emissions by 676,000 tons, create jobs, and work to achieve greater energy independence.

Iowa: Recognizing the role higher education plays in energy independence, Iowa developed the Iowa Power Fund, a $25 million venture created to accelerate the state's leadership in energy production and conversion. The Power Fund will "provide financial assistance to entities conducting business, research, or programs in Iowa that will reduce energy consumption, lower greenhouse gas emissions, and reduce dependence on fossil fuels and foreign energy."[2] The Iowa Board of Regents is actively working to take advantage of the Power Fund and make the state's college campuses less dependent on fossil fuels.

Washington: In 2008, Governor Christine Gregoire (D) signed sweeping legislation (HB 2815) that will fully integrate colleges and universities into efforts to "minimize the potential to export pollution, jobs and economic opportunities."[3] The law requires a climate impacts group at University of Washington to report and offer recommendations to the legislature regarding new science on climate change. In addition, resources at the state's universities will be used to analyze labor market trends and formulate strategies for ensuring that women and minority groups are active participants in "green-collar" jobs. Finally, the new law creates a special state account that provides grants for worker training in green jobs and also seeks to reduce state expenditures on fossil fuels by using alternative energy sources.

Oregon: Oregon is tapping into higher education for research on climate change. In 2007, Oregon

[2]http://www2.state.ia.us/Regents/Meetings/DocketMemos/08Memos/feb08/0208_ITEM18.pdf.
[3]http://apps.leg.wa.gov/documents/billdocs/2007-08/Pdf/Bills/Session%20Law%202008/2815-S2.SL.pdf.

Governor Ted Kulongoski (D) signed legislation to establish an Oregon Climate Change Research Institute within the University of Oregon System. The institute serves as a state leader in climate change research and provides local governments with technical assistance in developing climate change policies, practices and programs. The institute is also charged every two years with reporting the status of climate change science and the effect of climate change in the state to the legislature and governor.

California: California has pending legislation to enhance the priority of creating "green-collar" jobs. Fabian Núñez (D), the speaker of the California Assembly, has introduced the Green Collar Jobs Act of 2008. This legislation calls on the California community colleges and Board of Regents to help "develop a comprehensive array of programs, strategies, and resources to address the workforce needs that accompany California's growing green economy."[4]

While the efforts by these public officials are exemplary, they may not be enough to meet the energy and other environmental sustainability demands of the future. Some current regulations from state legislatures prohibit smart sustainability investments. An example of this is the common practice by states of separating construction funds from operating funds for higher education, requiring acceptance of lowest cost bids on construction, and producing energy inefficient facilities which cost much more over the life of the building. A revised appropriations process would take into consideration the long-term cost savings of incorporating energy-efficient principles into building design.

Conclusion

The need for partnerships between higher education and state policymakers is great, particularly with respect to utilizing the full potential of campus resources: facilities, technologies, research and faculty-led innovation. Efforts to date have been encouraging and mostly successful, but statewide leadership is needed to advance sustainability as a public policy priority. With solid legislative commitments and financial support, colleges and universities can do more to enhance eco-friendly opportunities for students, modernize their campus operations, train and inform members of the community, develop their economies by making use of local resources, and foster discoveries to build a cleaner, safer and better future.

National Resources

American Association of State College and Universities and Sungard Higher Education. Cost Containment Survey. Shares the results of a survey on college and university practices with regards to controlling campus costs. **http://www.aascu.org/policy/media/cost.pdf**

American College and University Presidents Climate Commitment. Details the framework of the program. **http://www.presidentsclimatecommitment.org/html/about.php**

Association for the Advancement of Sustainability in Higher Education (AASHE). Provides excellent resources on campus-level initiatives. **http://www.aashe.org/index.php**

Chicago Carbon Exchange. Overview that provides background on the carbon trading system. **http://www.chicagoclimatex.com/content.jsf?id=821**

Environmental Protection Agency. Provides a definition of and basic information on sustainability. **http://www.epa.gov/sustainability/basicinfo.htm**

Office of U.S. Senator Patty Murray. Text of sustainability legislation. **http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=110_cong_bills&docid=f:s2444is.txt.pdf**

Sustainable Endowments Institute. *College Sustainability Report Card* (2008). Provides a review of campus and environmental endowment policies at select institutions. **http://www.endowmentinstitute.org/sustainability/CollegeSustainabilityReportCard2008.pdf**

State and Local Resources

California. State of California: Speaker Fabian Núñez. Assembly Bill 3018. **http://info.sen.ca.gov/pub/07-08/bill/asm/ab_3001-3050/ab_3018_bill_20080222_introduced.pdf**

[4]http://info.sen.ca.gov/pub/07-08/bill/asm/ab_3001-3050/ab_3018_bill_20080222_introduced.pdf.

Iowa. State of Iowa Board of Regents. Outlines a partnership between the legislature and college campuses on college and university sustainability.
http://www2.state.ia.us/Regents/Meetings/DocketMemos/08Memos/feb08/0208_ITEM18.pdf

Minnesota. University of Minnesota-Morris. Building solutions for energy reliance. Outlines measures taken by the university to use renewable energy.
http://www.morris.umn.edu/ummnews/View.php?itemID=5768

Oregon. State of Oregon Legislature. HB 3543. Establishes a Climate Change Research Institute at Oregon State University.
http://www.leg.state.or.us/07reg/measures/hb3500.dir/hb3543.en.html

Washington. State of Washington Legislature. HB 2815. Signed into law by Washington Governor Christine Gregoire.
http://apps.leg.wa.gov/documents/billdocs/2007-08/Pdf/Bills/Session%20Law%202008/2815-S2.SL.pdf

Wisconsin. Office of Governor Jim Doyle. Governor Doyle Announces Four UW Campuses to Be Energy Independent By 2012.
http://www.wisgov.state.wi.us/journal_media_detail.asp?locid=19&prid=2344

Contact: Tom Harnisch, Research Associate at harnischt@aascu.org