

Editorial

Sustainability and Innovation Share the Gold

By Rosina M. Bierbaum and David C. Munson Jr.

Almost immediately after returning from his trip to the Beijing Olympics, President Bush signed the Higher Education Opportunity Act (H.R. 4137, now P.L. 110-315), which extends and amends the Higher Education Act. At 1,158 pages, the new law probably isn't on anyone's poolside reading list. But what should be assigned reading is the medal-winning provision on university sustainability programs contained within it.

For college presidents, deans, and faculty everywhere, the passage of the new law—and its university sustainability grants program—is long overdue. Fortunately for today's students, the University of Michigan (UM) and dozens of other higher education leaders have acted deliberately and quickly. We have been making investments in cutting-edge and responsive environmental degree programs and sustainability efforts for more than a decade—investments aimed at increasing knowledge to enhance the quality of life, both now and for the long-term future.

For example, UM just welcomed the inaugural class in its first-of-its-kind Engineering Sustainable Systems (ESS) dual-master's degree program—a program between its highly ranked College of Engineering and School of Natural Resources and Environment. The dual-degree program provides students with the knowledge and skills needed to address the diverse sustainability challenges facing society, from energy security and climate change to biodiversity loss and unmet basic needs of developing countries. With the new law, we now have Uncle Sam—at least symbolically—standing in our corner as we grow ESS.

Because of the statute's grant program, initiatives like the UM ESS degree may become more common. The U.S. Secretary of Education, in consultation with the administrator of the U.S. Environmental Protection Agency, will offer competitive grants to establish sustainability research programs, develop more

academic programs, and extend practices on sustainability. The grants cover expenses from staff training and establishing new course guidelines to implementing sustainable practices such as energy management, green building, and green purchasing. More than 220 colleges and universities endorsed the proposed law, not to mention scores of higher education associations, nongovernment organizations, and corporations.

This level of support shouldn't come as a surprise. As a sector, higher education has been at the forefront of the U.S. environmental and economic sustainability movement. In fact, 15 years ago UM established the Erb Institute for Global Sustainable Enterprise to produce the type of business and environmental leaders needed to address the issue of corporate sustainability. The institute piloted UM's concept of environmentally focused dual-degree programs, which have grown beyond business to include law, public policy, health, economics, urban planning—and, now, engineering. Twenty-five percent of this fall's incoming class in the School of Natural Resources and Environment is pursuing dual degrees, which will allow these students to perform equally well whether in the halls of public policy, industry, or government, from General Electric and Boeing to the National Wildlife Federation and the U.S. Department of Agriculture.

As we take our innovative strides, universities and colleges across the country are reorganizing and rebranding themselves—inspired and guided by sustainability themes—in order to seize opportunities and position themselves better with federal funding agencies, foundations, and prospective faculty and students. Again, these are efforts that the new law should create and sustain. More recent examples include:

- In July, Colorado State University launched that state's first School of Global Environmental Sustainability, an umbrella organization designed to encompass all environmental education and research and better prepare students for the growing green workforce.
- In May, the University of Washington proposed a College of Environment, consolidating 400 faculty members on three campuses across 18 fields of study, in part to better resolve complex regional, national, and international environmental challenges.



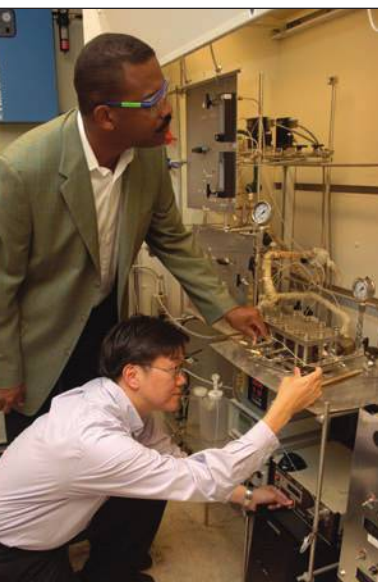
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- Last year, Arizona State University created a School of Sustainability within its Global Institute of Sustainability.

This small list is representative of the entrepreneurship that the new law's university sustainability grant program can enhance. That spirit of innovation guided the University of Michigan several years ago as it began building what would become today's 52-credit ESS program.

UM decided to introduce the program for a number of reasons. Factors affecting the environment, the use of resources, the population, and the distribution of wealth are on a global collision course. Engineers are critical players in determining whether sustainability practices will become a working part of our culture. Depth in engineering and breadth in sustainability analysis will give graduates the ability to evaluate and adapt the design of technologies in ways that improve the quality of life for all. As a result, global climate change, energy security, ecological degradation, environmental threats to human health, and resource scarcity are among the critical challenges they will be ready to address.

Society is faced with the paradox that technology is at the same time the enabler for our unsustainable lifestyles and a necessary element to create new systems and lifestyles that harmonize our quality of life with the reality of planetary ecosystems. The question for higher education is: How quickly will we respond to this challenge?

To answer this question, we can look in two places. First is the design curricula of engineering schools; the second is the broader environmental engineering and science curricula. Where these curricula meet, there is a chance of developing engineers expert in the design of environmental systems. Not many universities have top-ranked programs in both engineering and environmental science. As a leader in both areas, UM was a natural place to offer this cutting-edge program.

But sustainability is not just environmental. Sustainable technologies have become critical to the growth of business. There is nothing sustainable about products that don't sell or are not compliant with the regulatory environment. Our new crop of students will have the know-how to make sustainable design a profitable activity and contribute to economic transformation.

For example, a typical mechanical or chemical engineer with a master's degree might consider a plug-in hybrid electric vehicle a sustainable technology because it uses much less gasoline, but a graduate of the ESS program

would say that approach is not sustainable unless our electricity infrastructure is much different than it is today. The ESS graduate would also know how likely it is that this infrastructure will change, the timeline on which it could occur (if at all), and the most cost-effective engineering designs for vehicles to take advantage of a cleaner electrical grid.

The University of Michigan has a tradition of emphasizing sustainability research and education through dual-degree programs. In a recognition and expansion of that tradition, Mary Sue Coleman, president of UM, recently announced a five-year plan to hire 100 new interdisciplinary tenure-track faculty. The university decided that nearly half of the first 25 of these new junior faculty will be in areas associated with sustainability. These professors will hold joint appointments and be hired as clusters of collaborators who want to solve common problems together. They will conduct research and teach students new ways of thinking and working collaboratively.

The success of the new federal law though, won't be measured just in the number of interdisciplinary faculty hired or ESS-type degrees that come into existence in the years ahead. It will be measured by how well information and ideas are shared within the higher education community.

To that end, the act calls for regular gathering of higher education sustainability experts, federal staff, and business leaders to collaborate on the practices and principles of sustainability. It also calls for a national summit to support sustainability curriculum development and sustainable management practices on college campuses—something we welcome and would be honored to host.

It was heartening to see the law's authors, including one of our own representatives, Michigan's Vernon Ehlers (R), acknowledging academia's unique place at the environmental table. "Achieving more sustainable environmental, economic and social systems will require new research, education, and technology development, and innovative policy approaches that are flexible and use market mechanisms while engaging relevant stakeholders from the private and public sectors," the authors noted early this year. "For the nation to remain competitive in this global world of increasingly limited natural resources, higher education institutions need to take immediate steps to create new research, education and technology development that reflect the framework of sustainability."

We score that comment a perfect 10.