



Dickinson College  
Self-Study Report  
February 2012

## **Sustainability Initiative: A Defining Characteristic of Dickinson College**

### **A. Educating for a Sustainable Society**

We are currently in the midst of a major new initiative aimed at making sustainability a defining characteristic of a Dickinson education on par with our program in global education. Our aspiration is to be a national leader and model of educating for a sustainable society in a global environment. Dickinson is 1) integrating sustainability across the college curriculum, spanning the arts and humanities, social sciences and physical sciences; 2) linking our efforts to expand and enhance sustainability in the curriculum to strengths in global education, sustainable campus operations and community focused co-curricular programs; and 3) working to infuse awareness, values and practices in campus life and community service that reinforce our sustainability goals. We seek to engage students in these multiple facets of the college's sustainability commitment. In particular, we aim to provide them with opportunities to apply concepts from the classroom to wider-world problems and then draw on their experiences to enrich what happens in the classroom, not only for themselves but for their peers as well.

Educating for a sustainable society is a far-reaching and transforming initiative, but it is also a natural extension of the college's long-standing mission to provide a useful education in the liberal arts. Our students will encounter novel challenges from globalizing social and economic institutions, transforming technologies and a growing human footprint that is rapidly changing the Earth's atmosphere, oceans, climate and ecological systems in unprecedented ways. These dynamic forces interact with and compound continuing challenges of poverty, hunger, injustice and conflict. Our graduates need a 21st-century skill set that prepares them to integrate knowledge about such complex problems, learn from and adapt to changing conditions, and envision and implement sustainable solutions.

The sustainability initiative is nascent—its goals and modes still emerging, its intended outcomes only beginning to be realized. Nonetheless, given its importance and the transformative scope of its aspiration, the college decided to make it a focus of our self-study. We do this with confidence that the self-study process will help us refine our goals, develop further metrics to measure progress, and set in motion processes for continued monitoring and decision-making that will guide our sustainability initiative to successful outcomes.

### **History of Sustainability at Dickinson**

Dickinson has a decades-long tradition of environmentally-conscious education, campus operations and student leadership (See [Green Roots](#), History of Sustainability and Environmental Programs at Dickinson College, 1966-Present.) Dickinson has been a steward of the 3,400-acre Reineman Wildlife Sanctuary since 1966, offered its first environmental studies course in 1970, established a certificate program in 1980 and established B.A. and B.S. degrees in environmental studies and sciences in 1994. Students, staff and faculty have worked since 1986 through the Alliance for Aquatic Resource Monitoring (ALLARM) with community watershed associations to protect the streams of Pennsylvania. Students started a sustainable living residence (the "Treehouse") in 1991 as an experiment that is now a dynamic community housed in a LEED Gold residence hall; a community garden in 1999 that blossomed into the 180-acre Dickinson College Organic Farm; and a biodiesel project in 2006 that has expanded to produce 200 to 300 gallons of biodiesel from waste vegetable oil each month.

The Office of Campus Operations has been aggressive in reducing energy consumption since the oil price shocks of the 1970s, initially for financial reasons and later for environmental ones. In 1991, the newly created Commission on the Environment (COTE) made environmental protection and improvement explicit objectives of the college. At its first meeting, COTE adopted the position that “The students, staff, administration and faculty of Dickinson College are committed to improving and protecting the environment. To this end, the campus community is prepared to dedicate its resources—the knowledge, expertise, skills and time of its people; its ability to communicate to an extended community; its available facilities and its assets” (Annual Report on Sustainability, Campus Operations, 2009). Since then, COTE and Campus Operations have championed energy and resource conservation; recycling of metal, paper and plastics; reduction of food waste; development of renewable energy; and purchasing policies that have reduced the ecological footprint of the campus.

Sustainability was further embedded in campus governance and planning when it was included with accountability as a “Defining Characteristic” of the college in our 2005 [Strategic Plan II](#). In order to provide a forum that could bring together all members of our community to share information on projects, events and issues, COTE was reorganized in 2006 as the Dickinson Society Advocating Environmental Sustainability ([SAVES](#)). In addition, an alumni group—Alumni for a Sustainable Dickinson—was founded by a 1999 graduate; the group’s advocacy helped lead to identifying sustainability as one of the special areas of the Annual Fund to which alumni may contribute. Finally, Dickinson in 2007 signed the American College and University Presidents’ Climate Commitment (ACUPCC) and incorporated sustainability values and goals in our 2008 [Campus Master Plan](#).

Our cumulative activity on sustainability positioned us to launch a major, comprehensive initiative in this field. The factors that particularly propelled our decision to move in this direction included:

- Sustainability is integrally connected to our mission of educating engaged citizens,
- Sustainability as a subject of study aligns strongly with our commitments to interdisciplinarity and to active learning that connects the classroom and wider world,
- We have excellent resources to match the global/local nature of sustainability—these include a) our network of study-abroad sites and b) Carlisle-area resources including the college farm, the Reineman Wildlife Sanctuary and the campus itself, and
- As an initiative that originated largely with our facilities staff (a highly unusual, yet welcome source for curricular development), the sustainability initiative can uniquely include all elements of the Dickinson community in our educational program.

### **Planning, Governance and Support of the Sustainability Initiative**

The evolution of the sustainability initiative reflects the open, participatory approach to governance that Dickinson values. Realizing that Dickinson had developed many of the pieces needed to be a national leader for sustainability, but recognizing that a more cohesive, deliberate approach would be needed to attain that goal, we secured a planning grant from the Andrew W. Mellon Foundation. During summer 2007, 21 members of the faculty and 14 administrators met to assess existing resources and plan our next steps. They produced recommendations for a

comprehensive program to integrate study of the environment into our academic program and developed a proposal for external funding support (“An Interdisciplinary Curricular Initiative on the Environment”) from the Mellon Foundation. The proposal was successful. In 2008, the Mellon Foundation awarded a grant of \$1.4 million to Dickinson. The college committed to more than match the grant, bringing total funding for core elements of the initiative to \$3.1 million. (The full proposal is available in AD-Self-Study Documents.)

At the heart of the grant—and of our initiative more broadly—was creation of the Center for Sustainability Education ([CSE](#)). Staffed by a director, two coordinators and a half-time administrative assistant, and guided by a steering committee, the center leads the curricular initiative and facilitates connections between the curriculum, co-curricular programs and campus operations. The Mellon grant and match also provided for a new professor of environmental health, a geographic information systems (GIS) specialist, two postdoctoral fellows and a Sustainability Education Fund (SEF) to support curriculum, professional development and student-faculty research projects. A three-year NASA Global Climate Change Education grant of \$487,000, received in 2009, is providing resources for similar efforts to integrate climate change in the curriculum. The college is leading the project “[Cooling the Liberal Arts Curriculum](#), A Campaign for Climate Change Education at 4-Year and 2-Year Liberal Arts Colleges” in partnership with four community colleges.

A new President’s Commission on Environmental Sustainability (PCES), comprised of senior officers, faculty, staff, students and alumni has been established to exercise oversight of the initiative at the highest level. The commission provides strategic planning and advice to the president on all aspects of sustainability, including the academic, co-curricular, operational, financial, student life and community outreach dimensions.

Further steps to implement the initiative followed. Dickinson in 2009 adopted a Climate Action Plan that set 2020 as a target date for attaining zero net emissions of greenhouse gases (Dickinson College [Climate Change Action Plan](#), Climate Neutral by 2020). In 2010 we also signed the [Talloires Declaration](#), Association of University Leaders for a Sustainable Future. Our Strategic Plan III (SP III) reaffirms sustainability as a defining characteristic of the college and identifies sustainability as an area of heightened educational emphasis for a 21st-century skill set. SP III commits the college to “identifying Dickinson’s unique approach to sustainability, defining more fully the place of sustainability in the curriculum and taking full advantage of sustainability’s potential for enhancing active learning by tying curriculum to operations, service and the wider world. One definite focus ... must be melding our international and sustainability initiatives to create a *global sustainability* dimension unique among American colleges and universities” (SP III, p. 10).

## **B. Progress Report**

In the short time since launching of our sustainability initiative, Dickinson has received recognition from multiple external organizations, giving evidence that we are establishing ourselves as a national leader for sustainability in higher education.

- The college received straight A's on the 2011 [Green Report Card](#) of the Sustainable Endowments Institute (SEI), making us one of only seven schools in the nation to receive top marks.
- *Sierra Magazine* rated Dickinson the second '[coolest school](#)' in the nation in its 2010 evaluation of sustainability performance, and *Forbes* named Dickinson as [one of America's greenest colleges](#) and universities.
- Recent awards include the ACUPCC [Climate Leadership Award](#), the [Pennsylvania Governor's Award for Environmental Excellence](#), and the Karl Mason Award (given to ALLARM by the Pennsylvania Association of Environmental Professionals).
- In 2010 ALLARM received a grant of \$185,000 from the Colcom Foundation to support its activities in monitoring Marcellus Shale natural gas drilling in Pennsylvania.
- The Henry Luce Foundation has included Dickinson among only five colleges nationally to receive grants of \$50,000 under its new Luce Initiative on Asian Studies and the Environment (LIASE). This award was preceded by a major grant in 2004 from the Henry Luce Foundation for [curricular innovations](#) in environmental science and studies.
- Most importantly, the college in 2011 received a "gold" rating (the highest possible) in the new Association for the Advancement of Sustainability in Higher Education ([AASHE](#)) STARS assessment system. This achievement is particularly noteworthy because the STARS system was developed through wide consultation in the higher education system and because STARS is comprehensive in measuring participants' achievements in all three areas of 1) education, curriculum and research; 2) operations; and 3) planning, administration and engagement.

The review of progress on sustainability that follows here focuses primarily on achievements since the 2008 announcement of the initiative. We address four domains of the initiative in our review: education and research, campus operations, campus culture and community engagement.

## **Education and Research**

Progress in sustainability education and research includes enhancing sustainability across the curriculum; strengthening our environmental studies and science program; and increasing opportunities for experiential learning about sustainability. (See "Educating for a Sustainable Society, A Report for the 2008-2009 Academic Year," Division of Academic Affairs, Dickinson College for details. This and other divisional planning reports are available at [sustainability reports](#).)

Sustainability Across the Curriculum: Problems of sustainability arise in nearly all areas of human endeavor and will be encountered by our graduates whatever their chosen field of study and future work. Creating a sustainable society will require knowledge and skills from many different disciplines and interdisciplinary approaches. With this in mind, we are integrating sustainability throughout the curriculum—adding new sustainability courses, enhancing sustainability-related content in existing courses, creating connections across disciplines and promoting active learning pedagogies in our sustainability curriculum.

Since 2008 we have been promoting inclusion of sustainability related content and competencies into existing courses and the development of new sustainability courses through faculty study

groups and small grant programs for faculty and curriculum development. Criteria were established to identify courses that are strongly focused on sustainability (Sustainability Investigations) and courses that are related to sustainability (Sustainability Connections). A capability was added to the online course selection system for students to search electronically for Sustainability Investigations and Connections courses. Our efforts have resulted in sustainability being taught in numerous courses offered by more than 20 different academic departments and programs that span the arts and humanities, social sciences and laboratory sciences. (See [Sustainability Curriculum](#)).

In fall 2011, a task group of the CSE Steering Committee was formed and charged with developing a framework to guide further integration of sustainability across the curriculum. A draft framework was prepared and shared with the campus community. (See AD-Self-Study Documents.) The draft framework proposes a definition of sustainability, learning goals, a structure of learning that includes coursework, service, leadership and independent work, and an assessment plan. The draft envisions engaging all students in sustainability learning, providing a lens through which to view their liberal arts education holistically. Some will elect to engage deeply and broadly with sustainability learning and attain mastery of the learning goals at advanced levels. Others will engage to a lesser degree and attain mastery at more basic levels. Open hearings are scheduled for spring 2012 to obtain feedback on the framework. It is expected that a proposal will be presented to the Academic Programs and Standards Committee (APSC) by the end of the spring 2012 semester and brought to the full faculty for a decision in fall 2012.

Sustainability itself is, of course, a contested term. The CSE task group's working definition of sustainability is the capacity to improve the human condition in this and future generations without degrading the natural world. The draft sustainability learning goals presented to the campus are for students to be able to:

*Think critically* about human interactions with the environment, the motivations and consequences of the interactions, and the means and challenges for improving the quality of life for all people while protecting and enhancing the natural world for future generations;

*Make informed decisions* to advance sustainability goals that are based on credible evidence, meet clearly articulated decision criteria, are appropriate to their cultural context and are guided by carefully considered values;

*Communicate effectively* with diverse audiences in a variety of media to raise awareness, increase understanding and motivate action for sustainability; and

*Solve problems* with others and individually in their professional, civic and personal lives by applying sustainability concepts, values and approaches.

Multiple programs are at work to expand the sustainability curriculum. The Valley and Ridge study group, modeled after the Ponderosa Project of Northern Arizona University and the Piedmont Project of Emory University, convenes faculty for a two-day workshop each May to generate projects that add sustainability content and place-based and service-learning pedagogies to new and existing courses. Faculty work on their projects over the summer, teach their courses



in fall or spring and participate in other activities over the year, for which they receive a \$1,000 stipend. Thirty-three faculty members from 21 departments and all three academic divisions have received training through [Valley and Ridge](#) since 2008, resulting in 16 new and 26 revised sustainability-related courses.

A second study group, Changing Planet, focuses on interdisciplinary teaching about climate change. Supported by the NASA grant, it is open to faculty from any college or university, with priority given to faculty from Dickinson and partner community colleges. (The NASA partner schools are Harrisburg Area Community College, Montgomery College, Montgomery County Community College and Northampton Community College; each also has an articulation agreement with Dickinson to facilitate matriculation of their students at Dickinson after completion of a two-year degree. The climate change project is helping to strengthen our relationships with these community college partners.) The Changing Planet study group is led by four Dickinson faculty members and has been convened twice, in 2010-11 and 2011-12. Forty-six faculty from more than a dozen disciplines have participated, including 11 from Dickinson College and 35 from 20 other colleges and universities. The Dickinson participants are adding climate change content to 12 new or revised courses in biology, earth sciences, physics, environmental studies, international business & management, psychology, English and religion.

In addition to the study groups, two grant programs support faculty teaching and scholarship that advance the goals of the sustainability initiative. Sustainability Education Fund (SEF) grants (funded initially by the Mellon Foundation and now continued through Dickinson's operating budget) support sustainability projects broadly defined, while Cool Climate Grants (funded by NASA) support climate change projects. Thirty-one SEF grants have been awarded since 2008 for sustainability-related curriculum, professional development and student-faculty research projects. SEF awards have ranged from \$500 to \$16,500, for a total of \$113,750. Ten climate change projects have received Cool Climate Grants ranging from \$1,500 to \$10,785 and totaling \$35,000. Both programs are administered by CSE and coordinated with the work of our Research and Development Committee. These two grant programs have yielded five new courses and revisions to 13 others.

In sum, these programs have generated new and revised courses in anthropology, biology, earth sciences, classics, East Asian studies, English, French, German, history, international business & management, math, physics, psychology, sociology, religion, Russian, women & gender studies and other fields. Supported research includes studies of wildlife behavior and habitat, pollution in stream sediments, the effects of ocean acidification on marine systems, community impacts of natural gas development from the Marcellus Shale, energy consumption behaviors of students and ecocriticism. Grants also supported development of seasonal/local menus for the college dining hall, design and production of a solar-powered vehicle, creation of a teaching garden and corresponding K-6 curriculum and production and performance of dances that reflect humans' relations with the environment. (See [faculty funding](#).)

A sustainability-themed residential learning community for first-year students was initiated in 2008. Students who register for one of the First-Year Seminars included in the learning community live in a common residence hall, participate in co-curricular programs and work together to reduce their ecological footprint.

The 2010 learning community, *A Food Odyssey*, consisted of six seminars that investigated questions about food, health, farming and sustainability from a variety of perspectives. Conversations about food and sustainability were extended beyond the learning community to the entire campus through our Clarke Forum speaker series. The Clarke Forum chose *Thought for Food* as its 2010-11 theme and brought Eric Schlosser, Michael Abelman, Marian Nestle and others to campus to speak about food and sustainable farming. On a different but related subject, Sandra Steingraber spoke about the impact of hydraulic fracturing in the Marcellus Shale region.

In October 2011, Dickinson hosted Seeding the Future, a two-day conference on using college farms and gardens to teach the liberal arts. More than 200 faculty and students from 60 colleges and universities attended. Other environment and sustainability-related speakers and events scheduled for 2011 included Morin Kamga, organic coffee/fair trade entrepreneur from Cameroon; Japan's Disaster panel discussion; and Michael Klare who spoke on "The Great Struggle Over Energy," giving an overview of the coming struggle to determine which types of energy will dominate the global economy in 2041 and beyond, and how that struggle will affect the world's major peoples, states and corporations.

Environmental Studies and Spatial Literacy: Strengthening environmental studies and spatial literacy are two specific priorities identified in 2007 by the sustainability-initiative planning group. With the help of our Mellon grant, we have created a new tenure-track faculty position in the environmental studies department, a Geographic Information System specialist position and postdoctoral fellowships in sustainability and spatial studies. Dr. Greg Howard was recruited in 2008 for the environmental studies position, adding new expertise to the department in environmental risk assessment, epidemiology and air quality, and new courses on environmental health and urban environments. The new position also expands the department's capacity to meet the growing demand for introductory environmental studies courses.

James Ciarrocca was recruited to fill the GIS specialist position, enabling the environmental studies department to offer introductory and advanced GIS courses every year. Previously these courses had only been offered irregularly by adjunct faculty. Our new specialist also provides important support for faculty in all disciplines to adopt and use GIS in their teaching and research as well as for student-faculty research that applies GIS. Additional spatial literacy and GIS capabilities are provided by the Mellon Postdoctoral Fellows in Spatial Studies of Sustainability. Dr. Simona Perry, our first Fellow, taught courses on social science research methods that included GIS, engaged students in field research that applied GIS to study community effects of Marcellus Shale gas development and collaborated with faculty in the ES and other departments to organize events on shale gas development. Our second Mellon Postdoctoral Fellow, Kristen Brubaker, began her work in August 2011.

Experiential Learning Opportunities: Dickinson's [Living Laboratory Project](#) engages students in varied and expanding opportunities for experiential learning about environmental, social and economic sustainability on campus and in the community. Each serves as a living laboratory in which students learn how things work in real world settings, test their ideas and demonstrate solutions.



The Alliance for Aquatic Resource Monitoring ([ALLARM](#)) currently employs 12-14 students to train and provide technical assistance to volunteers of community watershed associations, enabling them to monitor and protect waters in their localities. Student staffers have a high degree of responsibility; they build skills for working with community organizations, communicating science to diverse audiences and developing protocols for data collection and testing that respond to community needs. This past year ALLARM staff developed new protocols—now endorsed by Pennsylvania state officials—for citizen monitoring of potential water contamination from natural gas development of the Marcellus Shale and are working with watershed organizations across the state to train their members in the protocol. As a result, Dickinson students are playing an active role on the frontline of an environmental issue of critical importance to the region.

In the four short years since it began operations, the [Dickinson College Farm](#) has rapidly expanded and diversified its production and the role of student workers who learn about sustainable, organic practices for farming vegetables, livestock husbandry, land stewardship, native pollinators, biodiversity conservation, pest management, greenhouse technologies, irrigation systems and solar energy technologies. Students volunteer for “weed and feed” at the farm on Friday afternoons. Eight to 12 work part-time as paid “student farmers” during the academic year, and three to four work full-time over the summer under the mentorship of the farm’s manager and assistant manager. In addition, three May graduates are employed full-time for six months each year. Students visit the farm with their art, biology, earth science, English, environmental science, First-Year Seminar, international business & management and religion classes; conduct field labs; perform independent and student-faculty research; install public art projects; take and lead tours of the farm; attend harvest festivals; take cooking classes; and bike to the farm for potlucks and bonfires.

Dickinson’s [biodiesel shop](#), established in 2006, is operated by student interns who apply concepts from chemistry, physics, computer science, environmental science and biology along with practical skills in pipe-fitting, carpentry, mechanics and electrical systems to process waste vegetable oil into a fuel that is used in our farm equipment, municipal waste truck and central energy plant. The interns give tours of the shop and demonstrations at local festivals to educate the public about biodiesel and renewable energy.

Student interns worked with college staff to prepare Dickinson’s first greenhouse gas inventory in 2008 and climate action plan in 2009, learning concepts and skills that will prove valuable as more organizations step forward to take action on climate change. Students in the spring 2011 course SUST 301, Practicum in Sustainability, evaluated our climate action plan and developed recommendations for new projects that will help us meet our commitment to attain zero net emissions by 2020. INBM 300, Going Green: Challenges and Opportunities, and ENST 406, Sustainability Theory and Practice, are other examples of courses that have used the campus as a living laboratory for learning. (For details of these courses, see [case study](#) and [project](#).)

Global Education: Dickinson’s exceptionally strong program in international education offers us a platform for adding a distinctive, global dimension to our sustainability efforts. We are linking sustainability to global education in a variety of important ways. For example, Dickinson faculty have developed a program of [“Mosaics”](#)—intensive, interdisciplinary, semester-long research

programs designed around ethnographic fieldwork and immersion in domestic and global communities. These are now being designed around sustainability. During the 2008-09 academic year, Jenn Halpin (The College Farm, environmental studies) and Susan Rose (sociology) offered a Mosaic focused on Venezuela. In the fall students enrolled in an ethnographic field course addressing sustainable agricultural systems and cooperative movements—Venezuela and the U.S.: Sustainable Agro-Ecosystems and Cooperative Movements (ENVS311/SOC313). They examined sustainable agricultural practices in the U.S. and Venezuela, the Bolivarian process, and the cooperative and mission movements in contemporary Venezuela. They then traveled to Venezuela from January 1-16, 2009 to work in the fields at La Alianza, a model organic food production cooperative, learning about sustainable agricultural practices including vermiculture. Students also conducted in-depth interviews about the cooperative's practices and philosophy with local people and activists. The last few days were spent in the coastal towns of Choroni and Chuau, visiting community-organized eco-tourism projects and cacao plantations. During the spring semester students processed, analyzed, archived and presented their final research projects.

In fall 2011, Jeff Niemitz (Earth sciences), Jeremy Ball (history and Africana studies) and Neil Leary (Center for Sustainability Education) team-taught the [Global Climate Change Africa](#) Mosaic, a four-course interdisciplinary exploration of climate science, human and ecological risks from climate change, ecological history of Africa, and international climate change negotiations. The program included three weeks of field work in Durban, South Africa to attend the 17th Conference of the Parties (COP-17) of the United Nations Framework Convention on Climate Change and participate in a service learning project with an orphanage for HIV/AIDS impacted children. Students conducted and videotaped interviews with UN conference delegates and are using the interviews to write research papers during the spring 2012 semester. Students will also give presentations to community groups about their work and will assist with creating an online, searchable archive of the videotaped interviews that will be available to researchers and the public.

In addition to individual Mosaics, we are taking steps to integrate sustainability into our study-abroad program more systematically. Neil Leary, CSE director, attended the 2011 meeting of the Resident Directors of our study-abroad programs to lead a session on *Embedding Sustainability in Dickinson's Global Programs*. This session was led in workshop fashion, with directors and staff breaking into smaller groups to write learning outcomes that connect sustainability with global education that they would like to see integrated into each of their respective programs. In the semester following the workshop, three sites began to incorporate a greater emphasis on sustainability. The Toulouse program revised its orientation to include speakers and representatives from local community-service projects related to sustainability. The program now requires that all participants get involved in community- or service-based projects. Initial reports from the onsite director are that this benefited both the community in Toulouse and the students themselves, who now tend to be more engaged with their host site. In addition, the program in Yaoundé, Cameroon has introduced more academic excursions and guest lecturers linked to sustainability issues, and developed a greater number and variety of community-service projects dealing directly with problems of sustainability. These projects and visits include work with the GIC Sondason cooperative, an organic and fair trade agricultural community in Bafang, and Harambe, Cameroon, and a social entrepreneurship facilitator in Yaoundé. Finally, our program in Moscow, a city where sustainability efforts are much less prevalent than at our other sites, has begun to develop relationships with academics and community organizations to support

student-research projects in this area. Already a Dickinson senior has done research on past recycling efforts in Moscow and why they have not been more successful or pervasive.

As an important complement to our efforts to develop a sustainability dimension to our semester and year-long study-abroad programs, we are also developing summer opportunities. In summer 2011, Marcus Key (geology) led a course titled *Environmental Challenges of the Southern Arava* in partnership with the Arava Institute for Environmental Studies in Israel. The [Arava program](#) offered students an interdisciplinary approach to examining environmental, political and social issues surrounding and confronting the Middle East and its scarce water resources. The Arava program piloted what we envision as a series of summer courses focusing on distinctive aspects of sustainability and taught at Dickinson's existing centers abroad. During summer 2012, the Arava program will be joined by a program at University of Bremen focusing on alternative energy resources and the politics of Germany's Green movement, as well as a program in Yaoundé exploring financial, environmental and social sustainability in both urban and rural Cameroon. The [Bremen](#) program will highlight specifically the politics of sustainability in Europe. It will include visits to regional wind and solar energy sites, as well as oceanography and coastal management sites, and it will make direct and intentional use of University of Bremen's five sustainability-focused centers. The [Cameroon](#) program will feature visits to microlenders and women's cooperatives, and it will incorporate a series of guest lectures by government officials, proprietors of sustainable businesses and managers of local farming cooperatives. Significantly, the content and connections developed for the summer programs will be incorporated into our semester and yearlong programs at these sites, expanding opportunities for all students regardless of period or term of study.

Beyond our existing sites, in 2012 we are launching also a sustainability summer program in Shanghai. Funded by our Luce Foundation LIASE grant, the program provides students with an in-depth understanding of the myriad environmental challenges currently facing the People's Republic of China, as well as proposed solutions. Students will meet with policymakers, industrialists, legal scholars and environmental NGOs to gain an appreciation of the complexity of environmental policy in China. We anticipate applying to Luce for a grant to expand this first effort into a series of sustainability programs in China and Japan. For more information, see [summer programs](#).

## **Campus Operations**

Areas of progress in sustainability in campus operations include improvements in energy and water management; increased reliance on renewable energy, more efficient waste management; and a significantly greater commitment to environmentally conscious building design.

Energy and Water Management: Dickinson's history of aggressive energy management has yielded a campus that is highly energy efficient and low in greenhouse gas emissions per student and per square foot of building space. A substantial improvement in our energy performance was realized when our new high-efficiency central energy plant came online in 2006. The \$6 million plant supplies heat and cooling to 60% of the campus and reduces energy consumption by an estimated 5%. In 2010 we began experimenting with burning [VIESEL](#), a carbon-neutral fuel made of 100% recycled vegetable oil in the central energy plant boilers. (Stuart Lamb, class of

1964, provided advice and technical assistance for conversion of energy plant boilers to VIESEL; he has subsidized the cost of the fuel.) The switch has the potential to significantly reduce our consumption of fossil energy, greenhouse gas emissions and costs. Other recent energy conservation measures include a temperature policy that sets thermostats at 68 degrees Fahrenheit in the heating season and 74 degrees in the cooling season; retrofits to install energy-efficient fans and motors in buildings; conversion of 99% of campus lighting to use efficient compact and standard fluorescent lighting; installation of motion sensors for lighting fixtures in most academic buildings; replacement of all washers and dryers with high efficiency, Energy Star compliant units; an energy demand curtailment program during winter break; and educational campaigns to encourage turning off lights, computers and other appliances when not in use.

Dickinson is also making strides in managing and reducing water demand. The new top-load washing machines save an estimated 1.25 million gallons of water per year. A policy of unlimited free washing and drying was changed in 2009; students now can wash and dry one load per week for free and pay for additional loads. This policy reduced the number of washer and dryer loads by more than 40% from 2008, saving 310,000 gallons of water and 41 metric tons of carbon dioxide per semester. Other water management measures include integrating the swimming pool's filtration system with the athletic center's HVAC system, replacing all showerheads in residence halls with ultra-low flow fixtures, and using waterless urinals in new construction and renovations. On the college farm, rainfed cultivation of vegetables is supplemented by occasional irrigation with water collected from the barn roof, stored in a pond, and pumped to the fields using a solar-powered pump. Serving our college-grown vegetables in place of conventionally grown vegetables in the dining hall reduces the "virtual water footprint" of the campus.

Renewable Energy: Dickinson College has 88KW of solar photovoltaic arrays that generate electricity for use on campus and at the farm, supported by grants and gifts from the Pa. Department of Environmental Protection (Pa. Energy Harvest Grant Program), the Student Senate, the Sustainable Energy Fund and the Mesa Energy, LLC Energy Farmers™ Program. Students have been involved in planning and installing many of the arrays, and many are used by Dickinson courses and campus tours for educational purposes.

In 2002 Dickinson began purchasing Renewable Energy Credits (RECs) equivalent to 9% of our annual electricity consumption from Community Energy. Purchases of RECs were increased to 50% of our electricity consumption in 2008 and to 100% in 2009, or 18 million kWh. Our purchases of RECs help finance development of wind energy in Pennsylvania and offset our annual emissions of greenhouse gases by 10,000 metric tons of carbon dioxide. Dickinson won a [Green Power Champion](#) award from the U.S. Environmental Protection Agency in 2010 for supporting green energy through purchases of renewable energy credits.

Waste Management: An estimated 35% of Dickinson's waste generation is diverted from landfills by recycling and composting. Nearly 100% of food waste from the dining hall is composted at the College Farm and used to improve soils. All take-out containers, plates and utensils purchased by dining services are biodegradable, and these materials are also collected and composted at the farm. These measures cut the volume of waste going from the dining hall

to the landfill by 50% and reduced tipping fees paid by the college. Since 2005, Facilities Management, the Student Senate and Project S.H.A.R.E. have teamed up for the annual U-turn yard sale at the end of each academic year. Students donate food, clothes, furniture, appliances, schools supplies and other items as they pack up for the end of the year. About three tractor-trailer loads of items are diverted from the landfill for sale. The proceeds benefit the United Way of Carlisle and donated food goes to the Project S.H.A.R.E. food bank.

Environmental Building Design: Dickinson College has adopted a policy to construct all new buildings and major renovations to meet requirements for LEED Silver certification. We have exceeded Silver and earned Gold certification for the three projects that we have completed since adopting this policy. The Center for Sustainable Living, or [Treehouse](#), moved into a new space in 2006 that is the first college residence hall to receive LEED Gold certification in Pennsylvania. The innovative design includes passive solar design and a pellet stove to reduce conventional heating needs; light tubes and open spaces to provide natural light and reduce electrical lighting needs; a gray water system to collect water from the showers and sinks for use in the dual-flush toilets; and other features to save energy and water. Since receiving its Gold rating, solar thermal and solar electric systems have been added.

The 90,000 square foot [Rector Science Complex](#) is our second building to receive LEED Gold certification. It features an “energy wheel” that exchanges heat between outgoing and incoming air to reduce space conditioning needs; day-lighting throughout the building; high-efficiency windows, interior sunshades, and exterior sun shading; occupancy sensors; waterless urinals; environmentally friendly building materials; and reuse or recycling of 90% of demolition materials. Rector received an honorable mention in *Environmental Design + Construction* magazine’s [Excellence in Design Awards](#) competition.

[Althouse Hall](#), constructed in 1957-1958, underwent a major renovation in 2009 and received LEED Gold certification in the existing building category. Green features of this academic building include retaining 99.6% of the pre-existing walls, floors and roof; use of recycled materials for more than 25% of total building materials; water saving technologies; automated lighting and thermal controls; energy efficient windows and shading; high efficiency heating, ventilation and air conditioning equipment; water efficient landscaping and control of erosion and water runoff from the site.

### **Campus Culture**

The achievements noted above could not have been attained without a campus culture for sustainability values, behaviors and practices shared by many students, staff, faculty and administrators. Each constituency has played an important role in moving the college forward. Early members of COTE, facilities management staff, Treehouse residents, ALLARM interns, student farmers, sustainability coordinators and interns, planning group members of the sustainability initiative, the Socially Responsible Investment discussion group, senior officers, faculty and many others have acted as agents of change to build this culture of sustainability.

Three recent initiatives promise to make significant contributions to this culture. These include a new Eco-reps program, increased emphasis on sustainability in new student orientation and a

new neighborhood model for the first-year residential experience. Eco-reps are peer-mentors who volunteer two to three hours per week to promote sustainable behaviors in the residence halls. Each residence hall is assigned an Eco-rep who educates peers about the why and how of energy, water and paper conservation; provides basic information about what and how to recycle and compost, and acts as a liaison between students and staff.

Sustainability was made more prominent in new student orientation in fall 2010 than in previous years. More than a quarter of the first-year class visited the Center for Sustainability Education and learned about its programs during the “Rush the Campus” scavenger hunt. Students spent one afternoon of orientation in “Discover Dickinson” programs that helped them develop a sense of place and reflect on sustainability values. The programs included walking and biking tours of the campus and Carlisle, visiting the college farm, planting a medicinal garden and producing a batch of biodiesel. The morning of the fourth day featured a presentation of Dickinson’s sustainability programs followed by a viewing of the film *The Story of Stuff* and discussion of the film in small groups.

A new “neighborhood” model of residence life was launched for first-year students in fall 2010. The neighborhood model gives students a high degree of responsibility for governance and building community. The expectation is that they will learn and apply problem-solving skills, grow from dependence to engaged citizenship and become invested stakeholders in their neighborhood. In the process, we believe that students will develop habits and a sense of responsibility to their place of habitation and fellow inhabitants that are consistent with a sustainability ethic.

### **Community Engagement**

Working in and with the communities in which we live and study is an important aspect of our sustainability initiative. As already noted, ALLARM has been collaborating for years with community groups to protect the waters of Pennsylvania. The college farm is another locus and catalyst for community service—hosting school and other community groups for educational events; performing extension services for area landowners and farmers; helping found Farmers on the Square, a Carlisle farmers market; sponsoring a variety of events and working with the Pa. Association for Sustainable Agriculture; and donating produce to Project S.H.A.R.E., a social service agency and food bank founded by a Dickinson alumna and housed on the college campus.

Dickinson partnered with the Carlisle Borough Council and other community groups to support the “road diet,” a transportation plan that was implemented in 2011 to ease automobile congestion, calm traffic and make Carlisle more pedestrian and bicycle friendly. Dickinson is active on other transportation issues, working to promote regional rail transit in Cumberland Valley and the “Rails-to-Trails” project that will connect Carlisle and other communities via a system of bike trails. We are active with the Clean Air Board of Central Pa. seeking ways to reduce diesel particulates from trucking that pollute the air in our region.

Dickinson also works with other members of the higher education community to promote sustainability. We are a long time and active member of the Pa. Environmental Resource



Consortium (PERC), a statewide consortium of colleges and universities that work together for a sustainable future. Dickinson has been represented on the executive committee of PERC since 2009 and helps organize and host many of PERC's events. At the national level, we are signatories of the American College and University Presidents' Climate Commitment and members of the AASHE, for which we organized national webinars on the U.N. climate change conference in Copenhagen as well as sessions at the AASHE annual conference in 2010. We are also members of the National Council on Science and the Environment (NCSE), with which we are collaborating on a project to develop materials for teaching about climate change.

In sum, in regards to sustainability Dickinson has come a long way in a very short time. We have made significant changes and additions to the educational program and have also built the institutional infrastructure to maintain and assess all aspects of our sustainability commitment. Fundamental challenges remain, including further defining the place of sustainability study in the curriculum, meeting our commitments in regards to carbon neutrality and refining our ability to evaluate the impact of both our educational program and our greener operations. We look forward to meeting these challenges by drawing on the contributions and engagement of all segments of the Dickinson community—students, faculty, staff, alumni and friends of the college.

### **C. Assessment of the Sustainability Initiative**

Dickinson College participates in the Sustainability Tracking, Assessment and Reporting System (STARS) of the Association for Advancement of Sustainability in Higher Education (AASHE). STARS is a self-reporting framework for colleges and universities to measure their sustainability performance in the areas of (i) education and research, (ii) operations, and (iii) planning, administration and engagement. Participating schools submit detailed information on more than 60 metrics, which are aggregated to provide performance scores and ratings. Nearly 400 schools have registered to participate in STARS and 153 had completed and submitted their STARS report as of January 2012.

CSE coordinated collection of the data needed to prepare Dickinson's STARS report and completed and submitted the report to AASHE in June 2011. Dickinson earned a Gold STARS rating for our performance, a rating attained by only 15.7% of the schools that have submitted reports, giving evidence that our performance ranks among the best in the nation. Our scores, reported below, are well above the average for participating schools, indicating that our college-wide sustainability initiative is yielding noteworthy results in each major category of performance. Our full STARS report is available to the public ([Dickinson STARS Report](#)).

<b>Performance Category</b>	<b>Dickinson's Score</b>	<b>Average of Participating Schools</b>
Education & Research	70.2%	50.3 %
Operations	54.4%	36.8%
Planning, Administration & Engagement	76.1%	58.1%

As AASHE has noted, assessment “mechanisms have been underutilized in furthering sustainability education initiatives” (*Sustainability Curriculum in Higher Education: A Call to Action*, 2010). Dickinson is actively participating in the national effort to develop appropriate evaluative tools. For example, our provost will be a participant at the upcoming (March 1, 2012) AASHE CAO Summit tasked with designing a blueprint and guidelines for sustainability education from the present through 2017. At the same time, we also recognize the need to develop assessment tools of our own. As noted previously, the CSE Steering Committee is working on development of a framework for sustainability-across-the-curriculum with the intention to bring a proposal to the Academic Programs and Standards Committee and to the full faculty in coming months. This work includes development of a plan for assessment of educational outcomes of the sustainability initiative. While AASHE STARS includes assessment of sustainability education and research, it is not tailored to the specific goals that are taking shape for our initiative. It is envisioned that CSE will coordinate assessment of sustainability education and will engage faculty members in the assessment. (For sustainability assessment, see AD-Self-Study Documents.)

Quantitative metrics that are likely to be included in the assessment are the number of Sustainability Investigations and Connections courses offered each semester, the distribution of these courses across departments, student enrollments in the courses, and the number and percentage of graduating seniors who have taken two or more the courses, and participated in one or more sustainability related co- or extra-curricular activities. Sustainability education also will be assessed qualitatively by evaluating learning outcomes. It is anticipated that each year a sample of Sustainability Investigations and Connections courses will be selected for assessment. Course syllabi, assignments, rubrics, examples of student work, and departmental assessments will be collected for the selected sample of courses and reviewed from the perspective of sustainability competencies. Learning outcomes of sustainability internships, extracurricular and co-curricular activities with a sustainability dimension will also be assessed. Over time, these metrics will allow us to make meaningful judgments about the success of various parts of our program and will also create an objective framework for future developments and modifications. Much remains to be defined, but we should note that the Environmental Studies/Science senior survey serves as one prototype already in place. (See AD-Self-Study Documents.)