Johnson Center for Environmental Innovation

800 West College Avenue
St. Peter, MN 56082
(507) 933-7206

Strategic Plan February 2009

Mission and Goals

The Johnson Center for Environmental Innovation supports environmental sustainability on the Gustavus Adolphus campus and in the surrounding communities while equipping students to continue that work in their lives beyond Gustavus. To accomplish this mission, the Johnson Center works as a catalyst for environmental innovation on and off campus with the broadest understanding of innovation: not only technical innovation, but also business, policy, and social innovation.

In order to play that catalytic role, the Johnson Center pursues the following formal goals as its programs take shape:

> ***Leading***, ***encouraging,*** and ***enabling*** campus and community environmental stewardship innovations.
>
> ***Developing*** environmental leaders in cooperation with the Gustavus faculty and staff.
>
> ***Serving*** as a sustainability information resource for the campus and community.

External and Internal Background

The Johnson Center for Environmental Innovation (JCEI) was formed in response to the external recognition that sustainability requires our attention and an internal desire on the part of faculty, staff, and students that Gustavus take a visible role in meeting sustainability challenges.

Externally, there is a growing recognition that developing and maintaining an environmentally sustainable society will be a critical task for the current generation and generations to come. Voices from within academia (David Orr and James Gustave Speth, for example) and without (notably Al Gore and Thomas Friedman) have eloquently articulated the constellation of environmental challenges we face, ranging from inevitable competition for resources caused by growing populations to the potentially catastrophic effects of anthropogenic climate change.

Many of these voices, particularly those from academia, have noted the special role that colleges and universities can play by transforming their own operations while simultaneously preparing students for similar transformational roles. There are even clear signs that students “get it” also in that a college’s environmental and sustainability

initiatives have become a important information points in the student recruitment and college selection process.

In parallel to those external factors, there were many students, faculty and staff who recognized the imperative of environmental issues and wanted Gustavus to take a leadership role. Responding to these external forces and the internal response, a group of Gustavus faculty worked with then President Jim Peterson to secure the funding and inaugurate the Johnson Center for Environmental Innovation in August 2007.

The mission and goals for the JCEI, as outlined above, arise out of the first 18 months of the center's operation and the following points, which are key to understanding the ensuing strategic plan:

a. Environmental stewardship and sustainability cannot be located in any one program or department, but must be the business of the entire community. As a result, the JCEI effort to move Gustavus Adolphus toward greater sustainability must be an effort to equip and enable the community while pointing the way for the entire community to move forward.

b. Preparing our students to lead sustainability transformations after they graduate makes sense not only as a way to encourage needed change, but also ties the JCEI to Gustavus central educational mission. While this is good sense at any time, it is essential given current financial turmoil that will undoubtedly affect Gustavus operations.

c. Innovation in the face of our environmental challenges is often seen as a technical matter. While the necessary sustainable transformations will often have a technical component, Gustavus' liberal arts strengths lead naturally to a broader definition of innovations that recognizes social and cultural innovation as a requirement for true change and a focus for JCEI activities.

c. As an institution born out of a particular religious and ethical tradition, any conversation about sustainability and the environment, including those lead by the JCEI, will also be a faith and values discussion.

d. Our progress to sustainability will depend on action in the wider community. Likewise, the wider community will be an important source of support for the JCEI efforts. Hence, JCEI programs will consciously make connections off-campus.

***Strategies*[*]*:**

A. Develop innovative environmental programs that advance campus and community sustainability while preparing students for environmental leadership.

1. Test experiential learning programs that involve students in sustainability work using social entrepreneurship models (see attached Solar Thermal Utility and Big Hill Student Farm case examples).

Necessary resources: Staff time, faculty support, start-up funds for trial operations

Expected outcomes: Exemplary programs that demonstrate sustainability and develop student leaders.

2. Develop an ES course that supports student skill development in support of A.1.

Necessary resources: Staff time, ES faculty support, course development and equipment funds.

Expected outcomes: A stimulating course experience for students, A cadre of students prepared for the programs of A.1

B. Support and encourage campus environmental sustainability through cooperative relationships, appreciative inquiry, and public information.

1. Work cooperatively across campus to develop awareness and support steps toward sustainability by cosponsoring speakers and other educational events **(Author Doug Thorpe visit, Trinity Institute Radical Abundance webcast, Campus Energy Challenge events, Kitchen Cabinet)** that encourage campus conversations about sustainability including discussions that focus on faith and values.

Necessary resources: Staff time, staff support and funding

Expected outcomes: Greater awareness and participation in campus sustainability action; visibility for JCEI and environmental programs;

2. Highlight positive campus environmental actions and the people who make them happen by developing a webpage with a campus environmental action section and developing publicity material for off-campus use.

[*] Bold items in parentheses designate efforts that have already taken place or which are currently underway.

Necessary resources: Staff time and support from web team

Expected outcome: Positive attention to environmental action and encouragement for further steps; positive publicity for Gustavus.

3. Provide information that supports sustainable action on campus by serving as a consultant for environmental questions (**responding to questions from the community**) and developing a web page that displays campus environmental information and links to other information sources.

Necessary resources: Staff time, web team support, access to educational resources

Expected outcome: An environmentally aware and capable campus community

4. Teach in the Environmental Studies program to build relationships with students and faculty (Intro to ES, ES Senior Seminar, other courses as appropriate (see A.x)

Necessary resources: Staff time and funding for course development

Expected outcome: Faculty and students engaged in sustainability action on and off campus.

C. Explicitly lead targeted campus efforts where there is need and the JCEI can make a contribution.

1. Lead the effort to fulfill Gustavus' commitments under the American University and College Presidents Climate Commitment (AUCPCC).

Necessary resources: Staff time and collaboration time with colleagues

Expected outcome: A greenhouse gas emissions reduction plan and progress toward meeting the targets of the that plan

2. Support/lead initiatives that arise from the AUCPCC commitments and other campus environmental efforts (**wind initiative, energy conservation efforts, formation of an energy conservation committee, Recyclemania**) and involve students in those efforts.

Necessary resources: Staff time, staff support and funding

Expected outcome: Visible initiatives that move the campus toward greater sustainability, including reduced energy and material use as well asgreater reliance on renewable energy and resources. Student involvement and learning centered around these efforts.

D. Engage the surrounding community in cooperative action related to sustainability and environmental issues, serving as a resource when possible and inviting participation in college environmental and educational programs.

1. Participate in local regional initiatives that support sustainability (**Region 9 wind initiative, Minnesota Renewable Energy Society board**, regional energy and environmental programs) and raise the profile of the JCEI and Gustavus Adolphus College.

Necessary resources: Staff time, funding for travel to meetings, limited funds for targeted investment in programs

Expected outcomes: Thriving regional and local sustainability initiatives that are visibly connected to the JCEI and Gustavus. Reputation of the JCEI as a player in these efforts.

2. Serve as a liaison to connect students to local sustainability and environmental initiatives (**internships** with public and private agencies, experiential learning).

Necessary resources: Staff time, faculty support, funding for a selected subset of internships

Expected outcomes: Students engaged in meaningful environmental career explorations. Organizations benefiting from the relationship with students and Gustavus.

Support and resources

Aggregating the various items from the "*Necessary resources*" sections above, the clearest need is for JCEI staff time for program delivery and for administrative support. Secondary, but none-the-less essential, is the need for monetary support to cover various program activities: travel, student internships, seed money for outreach programs and demonstration projects, support for speakers, conferences and other educational resources.

To meet these needs, the JCEI will need to work with development office to accomplish the following:

1. Fully endow the JCEI to support staffing levels commensurate with programming activities. In the short-term (2-5 years), the anticipated staffing levels would be the JCEI Director position and an administrative support position. In light of program goals, it may also be useful to support 1 or 2 temporary student positions.

2. In addition to endowing personnel support, provision should be made for an annual core budget that focuses primarily on internal education and support for campus sustainability efforts, but also includes support for outreach activities (primarily transportation expenses) and seed money for the programs of Strategy A and D.

3. Building on the project development efforts of A and the outreach efforts of D, seek external sources of grant and designated foundation support for specific projects. Some of these efforts may be done in partnership with external partners.

GUSTAVUS

GUSTAVUS ADOLPHUS COLLEGE

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Activities

The following examples illustrate the Johnson Center's current efforts to meet these goals.

Leading: The Johnson Center Director co-chaired the campus working group focusing on the sustainability and environmental stewardship component of the strategic plan during Spring Semester 2008

Encouraging: The Johnson Center worked with committed staff and faculty across the campus to encourage energy conservation during a national energy conservation competition in February. Compared to an average of the last three years of data, electricity consumption was down by almost 9%.

Enabling: The Johnson Center sought and received a grant to construct a demonstration solar thermal system. The system will be constructed during the 2008-2009 academic year at the Melva Lind Interpretive Center housing the Johnson Center.

Developing: Two student internships have been developed with facilitation by the Johnson Center. One focuses on the intersection of diner choices and environmental issues in the

Gustavus Dining Services. For the second, a student is currently working to highlight city, county and campus environmental initiatives, and seek ways to make them more effective.

Serving: The Johnson Center Director has been consulted numerous times about environmental questions on campus and in the community, seeking to answer questions when able and to guide people to the best information sources. More formally, the Director developed a draft energy plan for the Gustavus Board of Trustees and is serving on the core committee guiding the development of the New Academic Building with explicit environmental goals.

Personnel

James Dontje joined the Johnson Center as Director in August of 2007. Although he grew up in northern Iowa, just 1.5 hours south of St. Peter, he came to Gustavus from Berea College in Kentucky where he served as the Compton Chair in Ecological Design. His graduate work, focused on water quality issues, was done in the Department of Biosystems and Agricultural Engineering at the University of Minnesota. He has also twice served three-year terms in international community development with the Mennonite Central Committee, first in Burkina Faso, West Africa, and then in Indonesia's Papua province.

In addition to her work supporting the Linnaeus Arboretum and the programs of the Melva Lind Interpretive Center, Shirley Mellema supports the Johnson Center for Environmental Innovation with administrative skills and a passion for positive environmental work.

Support

The Johnson Center for Environmental Innovation was established thanks to the generous support of Glen and Lavonne Johnson. Glen Johnson attended Gustavus for one year until financial difficulty halted his pursuit of formal education. He went on to a distinguished career as a newspaper editor, government official, and money market fund executive. In addition to a career in business and finance, LaVonne has been an ardent supporter of education and the arts. Both have been strong supporters of Gustavus over the years, with Glen having served on the Gustavus Board of Trustees. A restored wetland on Glen's family farm has also been made available as a field laboratory for Gustavus students.

Access

The Johnson Center for Environmental Innovation is located in the Melva Lind Interpretive Center. For directions, see http://gustavus.edu/arboretum/visiting.cfm.

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Solar Energy Services Model Initiative

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Responding to environmental issues in general, and the greenhouse gas emissions and climate change challenge in specific, student environmental groups and campus sustainability advocates have been pushing for greater renewable energy adoption by campuses. At Gustavus Adolphus College, a cooperative effort by faculty and students has led to a proposal that the campus acquire two utility-scale wind turbines to meet a majority of the campus electrical energy usage—the project now has administrative support and the college is awaiting the availability of suitable turbines.

The wind turbine effort highlighted the learning potential for renewable energy projects—students were involved in the wind resource study that supported project planning. But technical research and design are not the only ways to couple student learning with renewable energy resource development. Student learning and engagement can also come via student projects tackling other renewable energy challenges. The Johnson Center Solar Energy Services Model Initiative invites students to learn about the institutional, economic and business innovation required to shift our energy dependence from fossil fuels to renewable energy sources.

The challenge:

Proven renewable energy technologies are being adopted too slowly due to high initial costs, extended payback periods, and lack of widespread technical expertise.

Background:

Business and residential utility customers are used to paying the first costs for energy hardware (furnaces, air conditioners, and hot water heaters) as part of their home mortgage or facility costs. Operational costs (utility bills) are paid monthly as long as the structure is occupied.

By contrast, most renewable energy options are presented as an additional, high value purchase requiring significant capital expenditure (equipment and installation) and supplemental financing (first costs and ongoing costs of credit). Additionally, most effective renewable energy technologies work best in tandem with existing building infrastructure—hence renewable energy costs become add-ons rather than replacements. Finally, the overall lack of technical experience (trained installers) and infrastructure (lack of repair services) presents a barrier of risk and uncertainty.

While there is some hope that rising energy costs might spur increased adoption of renewable energy, the initial cost problem described above still presents a formidable barrier, especially for the existing stock of residential and commercial real estate where additional investments in energy infrastructure cannot be rolled into the initial mortgage financing of the structure. And due to lack of expertise on the part of installers and repair technicians, renewable energy systems are perceived to be more risky investments.

An energy services model is one tactic proposed for overcoming the barrier. Just as some companies have made a business of energy conservation performance contracting (investing in

energy conservation improvements in the facilities of a private or public institution in return for a share of the savings), the energy services model has an outside investor purchasing the renewable energy infrastructure and charging the "customer" in proportion to the energy delivered.

This model allows the energy service provider to use financial economies of scale and specialized technical expertise to overcome the barriers to renewable energy adoption. Capital costs are reduced to a monthly payment that is mostly or even wholly made up of money that would have been paid as a utility bill anyway. The energy service provider presumably will have multiple such projects in operation, allowing them to muster the technical expertise to properly support the renewable energy infrastructure

Within the framework of this model, various approaches are possible to further reduce financial barriers to renewable energy adoption. For example, in a regulatory environment where there are incentives (tax credits, sale of renewable energy credits, financing incentives) the energy service provider is better positioned to take advantage of the incentive than an individual consumer or business.

Johnson Center initiative:

To explore the energy service model's potential to catalyze the adoption of renewable energy, the Johnson Center for Environmental Innovation proposes to involve Gustavus students in an enterprise testing the concept in the St. Peter area. Students will have opportunities to develop the business plan, explore the ramifications of the program to determine its feasibility and potential hurdles that must be overcome, and to implement test applications in the community.

Although the initial student investigation might determine a different course of action, the initial thrust of the program will focus on solar water heating technology, a proven renewable energy approach that has good payback potential in residential and commercial settings.

Outcomes:

The energy services model initiative is expected to:

1. Introduce students and the community to new ways develop renewable energy infrastructure.
2. Provide working examples of renewable energy in the community.
3. Demonstrate how business activity can be used to generate positive environmental results.

Implementation:

The Director of the Johnson Center has formed an independent enterprise, Traversoleil LLC, that can enter into contractual arrangements with Gustavus Adolphus College. This arrangement will enable work in the commercial sector without endangering the college's non-profit status while also addressing liability issues that might otherwise occur, as it relates to the college, consumers and the students. Similar arrangements with other entities, such as the St. Peter Municipal Utility or private HVAC contractors, may also offer suitable business structures for this work.The next step will require identifying classes or other Gustavus educational endeavors that can benefit from this work, and extending invitations to faculty and students.

For supporters and alumni of Gustavus, this program offers the opportunity to provide financial support for start-up of the initiative; or in-kind support (e.g. legal or business services in development of the business arrangements).

Big Hill Student Farm—A full-season garden and learning opportunity

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During the fall semester of 2008, a group of Gustavus students began to implement plans for a Gustavus garden. The concept of a student-run farm or garden at Gustavus has been around for at least 10 years and these students resolved to make the idea a reality. The students have formed the Big Hill Student Farm organization with the following mission statement:

> *The Big Hill Student Farm works to advocate food responsibility, farming education, community involvement and progressive action. Our farm is completely student run because we want students to take action into their own hands and get dirty on the farm! Through the farm, we work to join our community, local farmers, nationwide campuses, and worldwide movements to grow our own, eat local and get back to our roots!*

The student group will be working during the 2009 spring semester to develop an organizational and operational structure that can be sustained across multiple academic years. While a garden offers great educational potential, our MN climate and the academic year also pose a significant challenge--the peak of the MN growing season happens when students are least likely to be on campus.

A group of interested and supportive Gustavus faculty and staff have observed that an integrated biological system (IBS) approach offers an exciting solution to that challenge. IBS could expand the educational possibilities of growing food on campus by allowing year-round production while creating a more ecologically sustainable food production system. Important features of an IBS approach are:

-intensive vegetable cultivation offering high yields in a small area with efficient use of water

-nutrient recycling through composting and vermicomposting of food waste

-coupling of mutually compatible biological systems (example: aquaponics--growing fish and using plants to keep the water clean). The emphasis is on creating nutrient cycles that conserve nutrients locally and do not generate waste.

-year round operation with low energy use through greenhouses that use passive solar design, renewable energy and novel approaches for heating (e.g. using the heat from compost piles to heat greenhouses)

IBS operations can be small or large, simple or complex, and their design is based on the climate and the available resources in the area. The following two internet links provide a text article and four video features of one such operation (called Growing Power and billed as "urban farm") in Milwaukee.

http://www.jgpress.com/archives/_free/001765.html#more

http://www.treehugger.com/files/2008/05/growing-power-urban-aquaponics.php

There is no standard template or form for these systems; developing one that fits our climate and the Gustavus community would be a challenging problem worthy of the student garden organizations ambitions. Additionally, there are many interesting research problems for students. Some potential avenues for exploration are listed below with the relevant Gustavus academic majors in parentheses):

- Greenhouse design with renewable energy (Physics, Environmental Studies, Applied Science)
- Integrated pest management for insect and disease control (Biology, Environmental Studies)
- Financial management for profitable operation (Business and Economics)
- Sustainable economic development strategies (Business and Economics, Environmental Studies)
- Nutrient and plant studies (Biology, Chemistry)
- Environmental education for children (Education and Environmental Studies)

An IBS operation would also be complementary to other Gustavus programs including several new developing emphases at Gustavus:

- Expanded incorporation of local foods in the Gustavus Dining Sevices.
- Environmental stewardship and community environmental outreach through the Johnson Center for Environmental Innovation.
- The Community Service Program's collaboration with the MN Sustainable Farming Association's Bush Foundation Grant.
- A Physical Plant operation and staff that supports and encourages student learning in relation to campus grounds and operations.

Institutional support for the student initiative will be critical for the Big Hill Student Farm and, fortunately, significant pieces of that student support are in place, including:

- Positive support for local sourcing of foods by the Gustavus Dining Services.
- A commitment from the Kitchen Cabinet, a Dining Services advisory group, to making the food, its origins, and the Dining Services, a focal point for community learning.
- A St. Peter community support for local food initiatives, evidenced by the St. Peter Community Gardens (developed in cooperation with the college) and the thriving St. Peter Coop food store.
- A growing emphasis on campus sustainability in all its forms via the recently-formed Johnson Center for Environmental Innovation and the Environmental Studies Program.

Start-up funds will support and encourage the initiative that generated the Big Hill Student Farm. First, they would fund student salaries for initial organizational and planning work, as well as for the first two seasons of operation. Salary support is especially critical as summer work will be necessary even if the IBS eventually enables more operation during the school year. Additionally, there will be the need for initial investments in equipment. After the first few seasons, the garden operation would be on a self-sustaining path with produce sales to the Gustavus Dining Services and the community off-setting operational costs.