# GREEN ROOTS

THE SUSTAINABLE LAWRENCE INITIATIVE

## 2009-10 Report on Activities

## Executive Summary:

- Lawrence opens its first LEED Gold certified building – the 107,000 sq. ft. Warch Campus Center
- River Walk and Gilboy Council Ring completed
- New College Avenue median improves campus aesthetics and pedestrian safety.
- Green Roots committee extended for three additional years as the University Committee on Environmental Sustainability.
- President's cabinet endorses a sustainable building policy.
- Community read of Farm City: The Education of an Urban Farmer, by Novella Carpenter, engages 16 faculty and 96 students in a discussion of local, sustainable agriculture.
- 9th place finish (our of ~350 schools) in Recyclemainia
- 2.94 kW solar array installed on Youngchild Hall
- Small house energy challenge nets a 19% reduction in natural gas use for 5 small residences.
- Ralph Nader addresses Lawrence
- The Convocation, Povolny and Spoerl lecture Series all dedicated to sustainability themes (15 talks and presentations in all)
- ~9% of every food dollar spent locally, supporting local farmers and Wisconsin economy
- Nearly 30 tons of kitchen prep waste composted in garden this year.
- Energy audit for campus shows a reduction in total energy on campus used by 38% since 2002 and by approximately 10% this year.
- Green Roots invited 'speaker' at the Midstates Consortium sustainability meeting.
- Reduced use of 8.5 X 11 paper by more than 500,000 sheets
- Campus wide use of recycled lavatory paper products.
- Sustainability a major theme of the first draft of the university strategic plan
- LU profiled in the Princeton Review Guide to Green Colleges

## Introduction:

Green Roots: The Sustainable Lawrence Initiative was launched officially at the Matriculation Convocation on September, 25 2008. The goal of the initiative is to focus the attention of the university at large on issues pertaining to sustainability. To that end a committee was formed and charged with task of coordinating university operations and programming related to sustainability.

## Membership:

Because the GR initiative is campus wide, representation from all divisions of the college, non-teaching faculty, and two LUCC appointed students were included. The committee for 2009-10 consisted of the following members:

Jeff Clark (Geology and Environmental Studies)*
Andrew Knudsen (Geology and Environmental Studies)
Monica Rico (History and Environmental Studies)

Jason Brozek (Government and Environmental Studies)
Andy Mast (Conservatory)
Julie Fricke (Librarian)
Nancy Trusedell (Dean of Students and Vice President for Student Affairs)**
Greg Griffin (Campus Center Director)
Dan Meyer (Director of Facilities Services)
Brit Oleson (Greenfire; LU 2010)
Vince Dyer (LUCC; LU 2010)

*Faculty Associate to the President
**Term I only

Green Roots in conjunction with President Beck proposed to the Faculty Committee on University Governance (FCUG) that the committee be extended for an additional three years as a presidential committee. The FCUG brought the proposal to the faculty on April 16, 2010 where it was endorsed. The faculty handbook will be updated to include this new committee description which can be found in Appendix A. Lawrence University is now a member of the Association for the Advancement of Sustainability in Higher Education (AASHE).

## Summary of 2009-10 Academic Year Activities, Initiatives, and Accomplishments:

With guiding principles established last year, the committee continued its review of university operations in the eight following areas; Water, Food, Buildings, Curriculum, Energy, Waste and Recycling, and Transportation. Within each of these areas the committee worked to identify and prioritize opportunities. What follows is a summary of our findings and future recommendations. We found, in the first year of GR, different elements and organizations of campus we moving towards sutainability, but that there was very little communication and coordination of these efforts. We worked to addressed that over the two years of the initiative. Now sustainability has a clear presence and identity on campus which enables us to be more efficient and effective in the future (e.g. less duplication of effort, reinvention of the wheel) In our efforts to coordinate sustainability efforts and to publicize them, we present all activities of which we are aware in each of the focus areas. In many instances Green Roots worked in collaboration with students, faculty, and existing campus groups like Facilities Services, ITS, Dining Services, Greenfire, LUCC Committee on Environmental Responsibility, Communications, and Admissions.

### *Water*

Water use on campus is driven by five primary sources – laundry facilities, showers, toilets, dining services, and grounds keeping. Conservation practices were initiated in 2008, including a decision not to serve bottled water on campus. Additionally, Bon Appétit is using modern, water-efficient appliances as part of the new dining facilities in the Warch Campus Center (WCC). This is in addition to the other water-efficient fixtures that were installed as part of the Campus Center's construction. The WCC

scored 4 out of 5 possible points in the LEED Water Efficiency Category, including points for water-efficient landscaping, water-efficient appliances, and overall reductions in expected usage.

The main residential uses of water are in showers, laundry, and flushing toilets. Unfortunately, not all residence halls are individually metered for water usage which makes comparison between halls and identification of high use areas difficult.

Toilets are replaced with low flow models (according to state building code) whenever renovations are made. Low-flow shower heads were explored, but there were concerns that (1) the initial financial outlay to fit every shower in the student residence houses and halls was not feasible, and (2) in the past, low-flow heads were replaced by students with less efficient showerheads. However, as existing showerheads wear out and replacements are purchased, the provisional Green Purchasing Policy (see below) would require Facility Services to purchase and install low-flow models. Likewise, the recently-adopted Building and Renovation Policy (see below) encourages new construction and major renovations on campus to meet LEED Silver or similar certifications, of which a major component is water efficiency.

Campus laundry facilities are maintained by Mac-Gray Intelligent Laundry Systems. All washing machines and driers provided by Mac-Gray are high-efficient, Energy Star-rated appliances. As a corporation, Mac-Gray is committed to sustainable practices, including water conservation. They note on their website that managing environmental impact, "is a corporate priority that calls for knowledge, and the commitment of our employees and business partners to treat the environment with a sense of responsibility."

The main buildings and grounds use of water comes in irrigating the athletic fields and the Sustainable Lawrence University Garden (SLUG). In 2008, Megan Bjella presented ideas about water usage on athletic fields, developed as part of an independent study project. At this time, the Athletic Department recommends against cessation of watering on athletic fields, because of the need to maintain high-quality and safe playing surfaces. However some fields like the softball and baseball fields will be not be watered during the summer because they will not be used for competition until the next spring. Football and Soccer Fields however need to be maintained throughout the summer. Other lawns around the campus are not watered regularly. SLUG has adopted a water efficient drip irrigation system for approximately ½ of the garden. Oren Jakobson, the student manager of SLUG, reports that the company that manufactures this drip irrigation system does not support the type of intensive planting that SLUG does, and for the foreseeable future, drip irrigation will need to be supplemented with traditional watering. A rainwater harvesting system has been set up to capture rainwater from the 12'X24' garden shed.

Future Work (completed work from previous year by check mark):

- ✓ Investigate installation of low-flow shower heads
- SLUG to go 100% drip irrigation
- Incorporate water conservation into the final Green Purchasing Policy

- Implement water conservation measures are part of building renovations (as suggested in sustainable building policy – see below)
- Detailed accounting of water use
- Water meters in all residence halls
    - Target high-use facilities for further investigation
    - Hold a water-saving contest between residence halls

## *Food*

Last year Dining Services (DS) estimated that approximately 8% of the food served in LU dining facilities came from local sources including the Sustainable Lawrence University Garden (SLUG).

In the fall of 2009, Lawrence University contracted out dining services to Bon Appétit (BA). They have a corporate goal of sourcing at least 20% of the food purchased from a 150 mile radius and they continue to support SLUG through purchasing of produce at farmers' market prices. The final tally for 2009-10 indicates that approximately 9% of food purchase was local. This falls significantly short of the 20% goal and improvement in this realm will need to be prioritized by BA in the coming year.

BA has also run innovative campaigns in its dining halls such as the Low Carbon Diet and a Food Waste Minimization program (see www.bamco.com/page/3/sustainable-food-service.htm). Collaboration between SLUG and BA diverts some 30 tons of kitchen prep waste per year from the landfill to the SLUG compost operation. Another collaboration between BA and a student group, Greenfire, is the Clean Plate Challenge. Post-consumer food and drink waste during dinner periods for a full week was measured. The baseline data showed that the amount of solid waste (not including drinks) per diner dropped from 2.56 oz in 2009 to 2.39 oz in 2010. It should be noted that this is based on very little data and that a longer term study should be conducted. Additionally non-consumable dinner waste (rinds, cores, bones, napkins), accounted for 15-35 pounds each night. All of these materials would be compostable if Lawrence had access to an industrial composter, which would prevent over 2,000 pounds of food and napkin waste from going to the landfill (or down the drain) each week. Greenfire measured dinner waste for a week during January as part of their "Clean Plate Challenge". The baseline data showed that the amount of solid waste per diner dropped from 2.56 oz in 2009 to 2.39 oz in 2010. It should be noted that this is based on very little data and that a longer term study should be conducted.

Bottled water can no longer be purchased in the WCC, but BPA-free reusable water bottles were issued to all LU community members at the start of the academic year. Efforts to minimize packaging and waste generated primarily at the snack bar are ongoing. Reusable clam-shells are available for a one-time $4 purchase, but they are rarely used. Reusable stainless steel hot-beverage containers are also available for purchase and GR has provide 400 coupons (at $4 each) to offset the $7 cost.

GR will meet with BA this summer and yearly thereafter to review and reassess implementation strategies and goals.

Future Work (completed work from previous year by check mark):

- ✓ Investigate large scale composting to include post-consumer waste (see also section on waste reduction below).
- ✓ Continued collaboration with students in SLUG to maintain strong garden program and connection with Fox Cities Community Gardens Partnership
- Continued collaboration with Bon Appétit
    - Improve communication between customer and green dining options (e.g. clamshells, re-useable hot and cold beverage containers.
    - Increase to 20% purchase of local foods
- Record post-consumer waste for at each meal for 2-3 weeks.

## *Buildings*

The Gold LEED-certified Warch Campus Center officially opened in the fall of 2009. As the campus moves into a renovation phase over the next decade the committee discussed the opportunities that would come with retrofit of existing buildings. The end result was the following sustainable building policy, which was endorsed by the president's cabinet.

"Ongoing building maintenance and operation as well as renovation shall incorporate principles of sustainable design, building, and operation including energy efficiency, indoor air quality, water conservation, construction site and waste management, and use of local materials. All new construction shall be designed to meet or exceed LEED Silver standards or at an equivalent level to those of a comparable rating system."

Future Work (completed work from previous year by check mark):

- ✓ Develop a policy that can be used to guide new campus construction and renovation according to sustainable principles
- Revisit recent remodels like Youngchild to see if it is LEED or Energy Star equivalent.
- Compare performance of WCC to like buildings in like climatic settings.
- Develop a plan and model for retrofitting small houses and dorms.

## *Energy*

A comprehensive energy use audit and greenhouse gas emission inventory was conducted for the main campus and Bjorklunden. Current and historical data back to 2002 on use of natural gas and electricity, demographics of the university, building sq. footage was gathered in consultation with Facilities Services and the Office of Institutional Research. Information on the mix of energy used to generate electricity was supplied by Randy Sable of WE Energies. These data were analyzed using the Campus Carbon Calculator™, a tool developed by Clean Air-Cool Planet Inc. This is the accepted methodology by

which over 600 colleges and university track and report their carbon emissions to AASHE. According to the user manual, the Campus Carbon Calculator

> "…uses standard methodologies codified by the GHG Protocol Initiative, and employed by corporations, the state of California, The Climate Registry, and other entities to account for greenhouse gas (GHG) emissions. These methodologies are currently the most accurate and widely accepted amongst policy makers. Inventories produced by the Calculator are compatible with current standards used to craft forthcoming cap-and-trade policy." (Campus Carbon Calculator, 2008)

An analysis of our emissions sources indicates that the vast majority (85% - see Table 1 and Figure 1) of $CO_2$ is produced through the use of electricity and natural gas. Though solid figures on commuting and directly financed travel are unavailable, other institutions of similar size report a similar breakdown. This analysis suggests that efforts directed at reducing the use of electricity and natural gas (heating and hot water) will have the largest proportional effect on reducing our carbon foot print. These data also suggest that a record keeping system for travel be explored.

| Select Year --> | 2009 | Energy Consumption | $CO_2$ | $CH_4$ | $N_2O$ | $eCO_2$ |
|---|---|---|---|---|---|---|
| | | MMBtu | kg | kg | kg | Metric Tonnes |
| **Scope 1** | Co-gen Electricity | - | - | - | - | - |
| | Co-gen Steam | - | - | - | - | - |
| | Other On-Campus Stationary | 118,421.3 | 6,260,581.0 | 631.7 | 13.2 | 6,279.0 |
| | Direct Transportation | 1,559.7 | 109,370.1 | 21.9 | 7.5 | 112.1 |
| | Refrigerants & Chemicals | - | - | - | - | - |
| | Agriculture | - | - | - | - | - |
| **Scope 2** | Purchased Electricity | 98,847.2 | 9,006,181.9 | 80.8 | 152.3 | 9,053.1 |
| | Purchased Steam / Chilled Water | - | - | - | - | - |
| **Scope 3** | Faculty / Staff Commuting | 11,278.4 | 790,846.7 | 158.2 | 54.4 | 810.6 |
| | Student Commuting | 191.3 | 13,412.2 | 2.7 | 0.9 | 13.7 |
| | Directly Financed Air Travel | 1,396.2 | 274,133.7 | 2.7 | 3.1 | 275.1 |
| | Other Directly Financed Travel | - | - | - | - | - |
| | Study Abroad Air Travel | 3,293.4 | 646,625.3 | 6.4 | 7.3 | 648.9 |
| | Solid Waste | - | - | - | - | - |
| | Wastewater | - | - | - | - | - |
| | Paper | - | - | - | - | - |
| | Scope 2 Trans. & Distrib. Losses | 9,776.1 | 890,721.3 | 8.0 | 15.1 | 895.4 |
| **Offsets** | Additional | | | | | (450.6) |
| | Non-Additional | | | | | (157.8) |
| **Totals** | Scope 1 | 119,981.1 | 6,369,951.1 | 653.6 | 20.7 | 6,391.1 |
| | Scope 2 | 98,847.2 | 9,006,181.9 | 80.8 | 152.3 | 9,053.1 |
| | Scope 3 | 25,935.4 | 2,615,739.1 | 177.9 | 80.9 | 2,643.8 |
| | All Scopes | 244,763.7 | 17,991,872.1 | 912.3 | 253.8 | 18,088.0 |
| | All Offsets | | | | | (608.4) |
| | | | | | **Net Emissions:** | **17,479.6** |

Table 1: Breakdown of 2009 $CO_2$ production from university operations. The overall energy consumption of each category is shown and the amount of $CO_2$, $CH_4$, and $N_2O$ produced by those activities are calculated based upon our energy mix. $eCO_2$ is the sum of these emissions and used to normalize emissions

from various greenhouse gases to that of equivalent carbon dioxide emissions.. Due to lack of data, only order of magnitude estimates of student, faculty, and staff travel (directly sponsored and commuting) were included in this analysis.

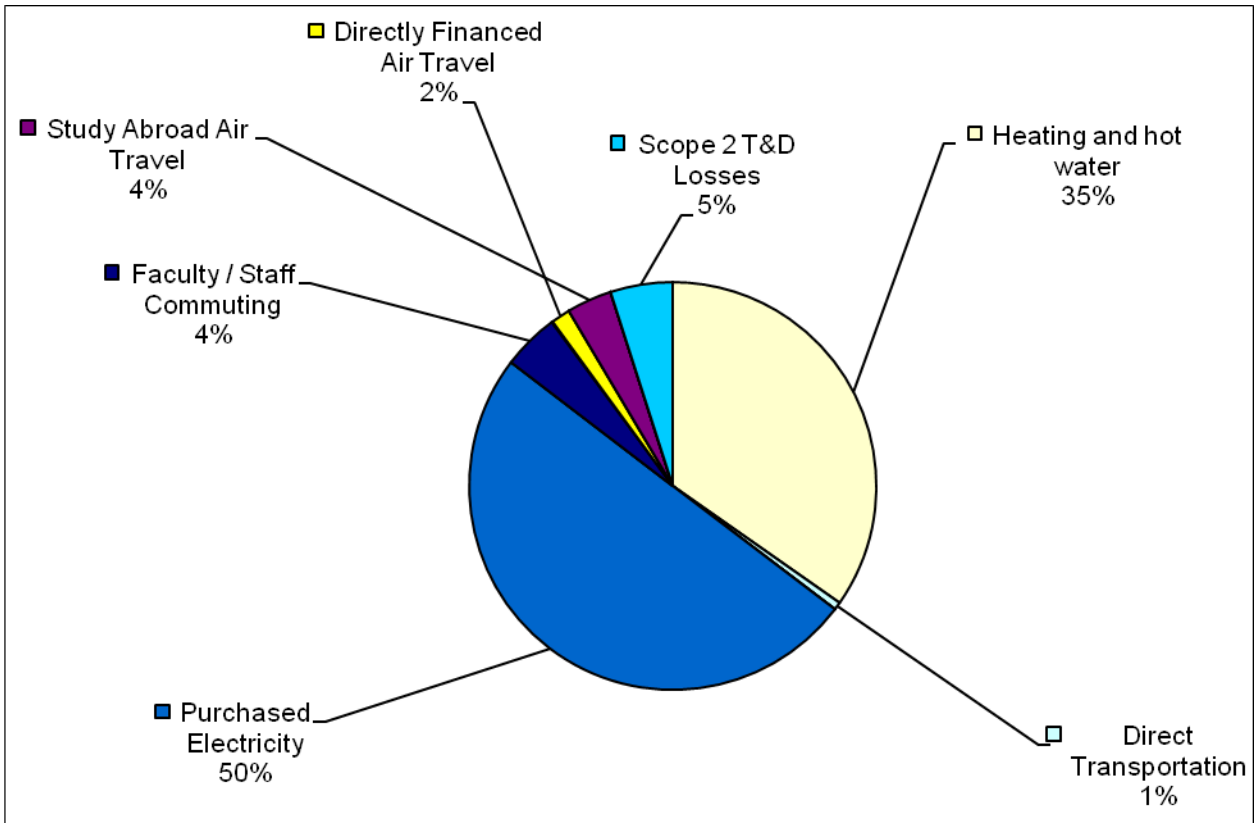


Figure 1: Breakdown of 2009 $CO_2$ production from university operations. Figures reflect equivalent $CO_2$ emissions, such that emissions of other greenhouse gases are normalized by their global warming potential. Due to lack of data, only order of magnitude estimates of student, faculty, and staff travel (directly sponsored and commuting) were included in this analysis.

Lawrence has reduced its scope 1 and scope 2 (See Table 1) gross greenhouse gas emissions by approximately 27% from 2002-2007 (Figure 2). On a per square foot basis greenhouse gas emissions have dropped 40% over the same time period. Some of this reduction is due to a change in the fuel mix that Wisconsin Energies (WE) uses to make electricity (Table 2). With the exception of our purchase of renewable energy directly through WE, the energy mix is beyond our control. Within our control, however is how much energy we use on campus and we have made strides towards energy efficiency in the past eight years that have directly reduced our greenhouse gas emissions.

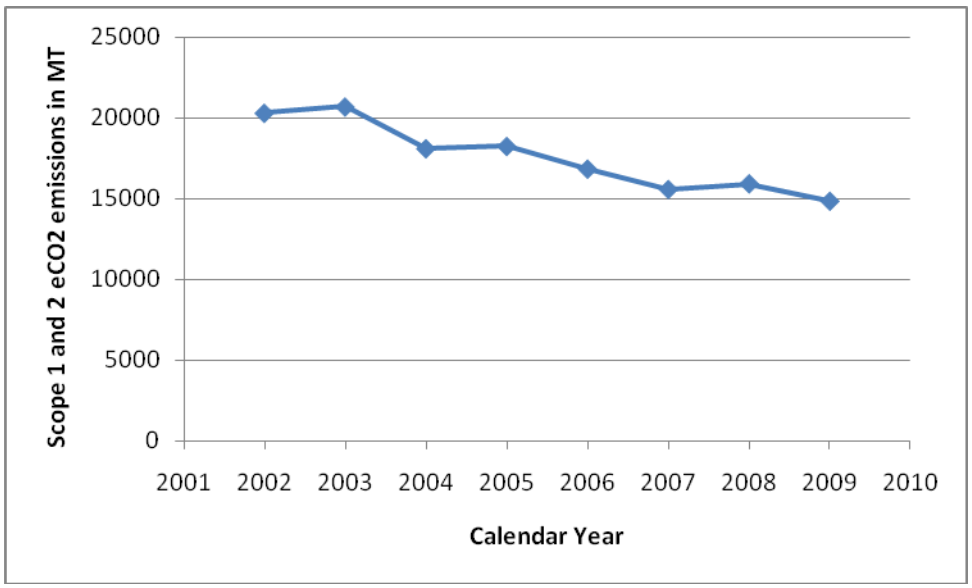

Figure 2: Scope 1 and Scope 2 equivalent carbon dioxide emissions of Lawrence University in metric tons (MT) per year.

| Year | Coal | Natural Gas | Nuclear | Renewable | $CO_2$ Per Megawatt Hour [1] |
|---|---|---|---|---|---|
| 2001 | 70% | 1% | 28% | 1% | 1659.7 |
| 2002 | 69% | 1% | 29% | 2% | 1646.2 |
| 2003 | 70% | 0% | 29% | 1% | 1624.3 |
| 2004 | 71% | 0% | 28% | 1% | 1669.2 |
| 2005 | 71% | 4% | 25% | 1% | 1644.4 |
| 2006 | 64% | 5% | 30% | 1% | 1568.5 |
| 2007 | 64% | 7% | 28% | 1% | 1610.4 |
| 2008 | 65% | 7% | 27% | 1% | 1646.5 |
| 2009 | 55% | 8% | 32% | 5%* | 1,469.2 |

Table 2: Wisconsin Energies Fuel Mix and Carbon Dioxide emitted Per Megawatt Hour . Data provided by Randy Sabel of WE. *In 2009 2% of the energy mix came from renewable sources and Lawrence University purchased an additional 3% for use in the Warch Campus Center.

The combined use of electricity and natural gas (for heating, cooking, and hot water) at the Appleton campus has decreased by over the last 8 years by 5% and 36% respectively (Figure 3). During that same time period, however building square footage increased by 16% with the addition of Hiett Hall in 2003 and the Warch Campus Center in 2009. Temperatures also change from year to year as reflected by the heating degree day trend line (Figure 3). Normalizing the total energy use data by square footage and temperature proxies (HDD and CDD) allows direct comparison between years (Figure 4). These data

[1] Sabel, Randy, Wisconsin Energies. Personal communication, March 2009.

indicate a 38% reduction in energy use per square foot per HDD + CDD since 2002. This suggests that our efficiency in energy use has improved over time.

Improved energy efficiency can be attributed to three main factors. First, both the WCC and Hiett hall were built to at least LEED silver standards (though certification was not sought for Hiett). Our new buildings are simply more energy efficient than the older ones and this underscores the importance of adding energy efficiency measures in all building renovations and new buildings. The second factor is the move to a distributed rather than a centralized heating system which started in 2005-06. The most recent change was the implementation of a new HVAC policy in April of 2009 and the change in academic calendar in which the campus is closed from Thanksgiving until just after New Year's day. Together these changes reduced consumption of energy (primarily natural gas) by ~10% over 2008 (normalized by HDD).

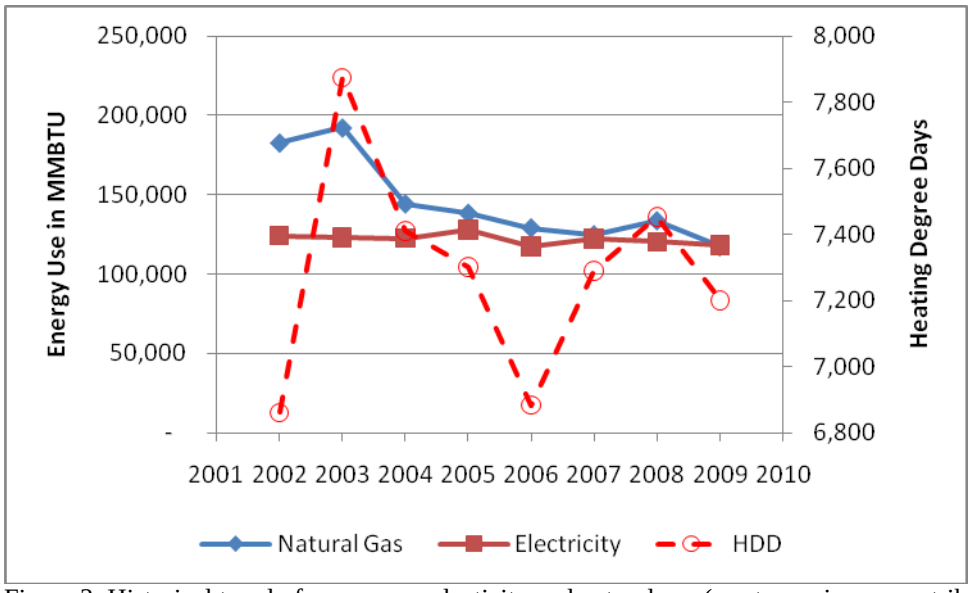


Figure 3: Historical trend of energy use electicity and natural gas (our two primary contributors to $CO_2$ emissions) and heating degree days for each year. MMBTU = 1 mega btu = 1 decatherm.

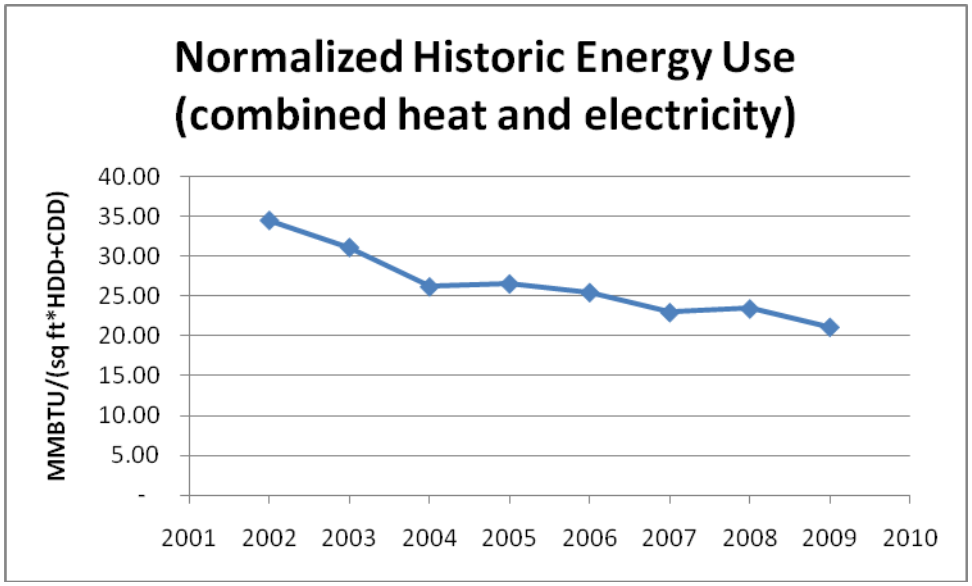

Figure 4: Combined natural gas and electicity expressed as megaBTUs (decatherms) from 2002 through 2009. The energy use has been normalized by square footage and the summ of heating degree days (HDD) and cooling degree days (CDD).

A relatively minor reduction in energy use came through a pilot energy reduction competition. Eight small houses were invited to see by how much they could reduce their energy use (normalized by HDD) during winter term. These houses were chosen because they had meters for each building and because we had some historic energy use data. The incentive offered was that any resulting savings in money based upon normalized energy saved and the price of that energy) would be returned to the house's activity fund. To further stimulate reductions Green Roots agreed to match the winning houses savings. Five houses accepted the challenge and the results were impressive as seen in Table 3 below. If similar results could be realized across the campus this would result in significant reductions in natural gas used and monetary savings. Facilities services is aggressively pursuing getting all residences metered individually in order to track use, identify inefficient buildings, and to facilitate these types of competitions.

| House | Therm reduction (2009-2010) | % reduction |
|---|---|---|
| 739 Alton (Greenfire) | 404 | 26.3 |
| 206 S. Lawe (Swing) | 267 | 10.2 |
| 300 S. Meade St. (Big Exec) | 353 | 15.1 |
| 203 Union St. (yellow house) | 350 | 28.3 |
| 217 Union St. (Spanish) | 132 | 16.2 |

Table 3: Natural gas energy reduction comparing Jan-Mar 2010 to 2009 and the percent reduction of gas used at five small houses on campus.

Campus energy reduction competitions and improvements in implementation of the HVAC policy over break and during the year might lead to additional reductions in energy use for heating, but electricity use is more difficult to reduce. A "slay the vampires" campaign against devices that draw power when on standby mode was launched in the fall. The effectiveness is unknown, but likely small compared to the initiatives described above. Instructional Technology Services is also experimenting with smart power strips that are on motion sensors. The results of that pilot project are

unknown at this point. Replacing all lighting with lower wattage fluorescents should be phased in and all lecture halls should be equipped with motion sensors and timers to control lights when not occupied. More significant additional reductions in energy use will require substantial investments in infrastructure such as placing the Music Drama center on its own boiler system and investments in on-site production of energy such as renewables and co-generation.

*On-site energy production:*
In the 2009-10 academic year the university commissioned professional assessments of three different renewable energy systems, solar photovoltaics, solar thermal, and wind power at Bjorklunden. Two first-year students, Austin Federa and Will Meadows (LU'13) worked with Northwind Renewables to assess the impact of installing photovoltaics on campus. The students also worked with this committee to apply for external grants from WE Energy and Focus on Energy. Together they garnered approximately $18,000 in funding. The remaining $10,000 was funded by Facilities Service, Green Roots, and LUCC. A relatively small 2.94 kW solar array for use in courses was installed over the week of April 19th and began producing power in May. It is estimated that this array will produce approximately 3200 kWh per year and will reduce our $CO_2$ production by 3.5 tons/year. The payback on the initial investment is ~18 years over a useful life span of 30-40 years.

Based upon an initial independent study project by Steve Schnorr (LU'10), a wind assessment of the Bjorklunden property was performed by Kettle View Renewable Energy. Bjorklunden was chosen over the main campus due to space limitations at the main campus, city ordinances against such structures, and because the wind resource is superior along the lakeshore. The assessment indicated that a refurbished 225kW unit would produce approximately ½ of the lodge's electricity and would have a payback of just over years with state and utility incentives.

The feasibility of installing a co-generation system on the LU boiler system is currently underway. A solar thermal was performed also by Northwind renewables in May of 2010 to determine the effectiveness of offsetting some of the Buchannan Keiwitt center's pool. Details of these assessments will be provided in next year's report.

Future Work (completed work from previous year by check mark):

- Review HVAC policy implementation
- Develop a series of BMP for office/room heating and cooling.
- Residence Life training (heating/cooling, recycling, etc.)
- ✓ Work on a vampire voltage elimination campaign
- ✓ Continue exploring possibility of wind power at Bjorklunden
- "Turn it off" campaign with stickers on bathroom and other switches not already on motion sensors.
- Meter all residence halls
- Put Music and Drama center on own boiler
- Upgrade air handler in Science Hall
- Upgrade lighting across campus

- Install motion sensors/timers in all lecture halls
- Assess feasibility of cogeneration
- Assess feasibility of solar hot water heater for pool.

## *Waste Reduction and Recycling*

A popular mantra than can be applied to any resource is Reduce, Reuse, Recycle. The order of the mantra is important for reducing the amount of consumption is the most effective environmentally. Last year we generated 18,810 cubic yards of waste, of which 5975 yards was recycled material. Our waste diversion rate is therefore 32%. These figures come from Waste Management, which simply records the size of the container and the number of times it is emptied to determine the cumulative volumes. Unfortunately this system is inadequate for recording our actual waste production. Clearly the issue of waste minimization and recycling needs more attention, but we have achieved modest successes.

<u>Reduce:</u>
In addition to the paper reduction measures undertaken last year we did the following: We focus here on efforts to reduce paper use on campus because paper accounts for approximately 40% of landfilled waste (Rathje and Murphy, 2001). Other reductions such as energy, food, and water are discussed in their own sections. Last year we estimate that the campus purchased 4590 reams of paper as reported by Office Max, this year they report that we ordered 7661 reams of paper. We are currently investigating if there are problems with the data and what might account for the uptick in use. We believe that there should have been reduction in paper use because of the following measures taken by various offices. For example:

- Admissions reduced paper use by approximately 20,000 sheets using laptops borrowed from Environmental Studies.
- Drafts of honors project submitted for review can now be double sided. The honors committee is currently exploring electronic archival as well.
- The conservatory reports a reduction in 23 cases (230 reams or 100,000 sheets) of paper
- The library reports a reduction in 20 cases (200 reams or 115,000 sheets) of paper (this is a 22% reduction in use) attributed to double sided print capabilities and print release stations.
- The print shop reported a reduction in use from 1500 reams in 2008-09 to 867 reams this year.
- Some courses go all electronic (for example)
    - ENST 150 – enrollment 58
        - Ave handouts: 5pgs (X 26 class meetings X 58 students = 75,400
        - Lab hadouts: 5pgs X 5 labs X 58 = 1450
        - Labs turned in: 8 X 5 X 58 = 2320
        - Exams = 12pgs X 2 X 58 = 1392
        - Total = 80,562
- Electronic course catalogs (saves ~180 sheets X 1500=270,000 sheets)

- Combined report on Giving/President's report (saves ~10sheets X24,000=240,000 sheets)

Clearly the data we have are not in concert with efforts to reduce paper use. We will investigate a system of paper use accounting to try and more accurately determine actual paper use on campus.

Reuse:
Opportunities for reuse are somewhat limited. Computers are routinely cycled through the faculty and student labs. Many faculty allow students to use the back of already used paper for assignments and Central Services (CS) makes scratch pads out of unused print runs.

We have also taken steps to increase the amount of "green" paper on campus. For example, the environmental studies department uses 100% post consumer recycled paper for its printing, but is unique in that regard. To move the entire campus to 100% post-consumer recycled paper would cost ~$0.54 more per ream), to move to 30% post-consumer paper would cost ~$0.40 more per ream. *Lawrence Today* is printed on Forest Stewardship Certified (FSC) paper manufactured w/in 100 miles of our printer. According to Sara Gorton, our custodial supervisor, all bathroom paper products in the campus center are made from 100% post-consumer recycled material. Brown hand towels for the rest of campus are also 100% recycled, white rolled towels are 40% recycled and all toilet paper is 100% post-consumer content.

Recycle:
This year Lawrence university entered Recyclemania, a national recycling competition. Cosponsored by Greenfire and Campus Life, LU took 9th out of nearly 350 schools in the per capita classic division. This contest was most valuable as a tool for establishing baseline data about campus waste production. In a typical week, Lawrence produces 20,000-24,000 pounds of trash and 10,000-11,000 pounds of recyclables with around 1,000-1,200 pounds being cardboard from dining services. Using a Full Time Equivalency of 1,927 people, Lawrence produces 16-18 pounds of total waste per capita per week, with around 5-5.5 pounds of that being recycled. Though these results are encouraging, it should be noted that these data were also provided from WM and so are simply estimate based upon the size of each container and the frequency of pick up.

Future Work:
- Faculty education on double-sided printing
- ✓ Work with Honors committee to accept double sided honors projects
- ✓ Follow up with the registrar on getting rid of paper notifications;
- ✓ Electronic submission of tutoring reports from the CTL
- Adopt use of recycled paper campus wide
- Lower print runs for Conservatory programs
- ✓ Work with Greenfire and Residence Life on recycling campaign
- ✓ educate campus about single stream recycling
- develop Campus Center recycling center for old cell phones, etc.

- New Campus Center and disposables: follow up on report from Megan Bjella and commitments from Greg Griffin about not using plastic bags, reusable to-go containers
- ✓ Double check on the practices of our electronics recycler.
- Develop system for tracking actual amount of waste and recycling produced
- Develop system for tracking amount of paper used on campus.

## *Curricular and Co-curricular*

To date there has been no serious effort to incorporate sustainability "across the curriculum." However, there is a well established environmental studies major and curriculum at Lawrence with contributors from 12 different academic departments. Approximately ¼ of the student body takes an Environmental Studies course each year. A pilot community read program was conceived and implemented in part to gauge student and faculty interest in sustainability issues, but primarily to bring students, faculty, staff and Appleton community members together to read and discuss a book with strong elements of environmental sustainability.

The book chosen was Farm City: The Education of an Urban Farmer, by Novella Carpenter (Penguin Press, 2009). Andrew Knudsen wrote the following review of Farm City for the April issue of *Lawrence Today*:

> "When you think of local, organic, sustainable food, what comes to mind? An idyllic farm in the rolling hills? A bustling farmer's market? A vacant lot in the slums of Oakland? Novella Carpenter's memoir shares a slice of her life as a farmer squatting on an abandoned lot in Oakland, California. She brings you along as she picks up a mail-order bee colony, chases escaped turkeys, and dumpster dives to feed two hogs (yes, she raised pigs in Oakland!). Along the way, she wrestles with the question of what it means to be a farmer and the very real challenge of feeding herself."

Sixteen members of the faculty and staff, along with ninety-six students had similar conversations across eight section of Community Read. The four-week course culminated with an optional essay contest and a campus visit from Novella Carpenter herself. Novella spent four days in the Fox Cities, including speaking engagements at the Appleton and Neenah Public Libraries (as part of the Fox Cities Book Festival), a Q&A with students and faculty, an informal potluck dinner, and a morning of work at the Sustainable Lawrence University Garden.

Student and faculty assessments are ongoing, but initial results show that there is very strong support for continuing Community Read in 2011 and beyond. Considerations for future Community Read programs include whether or not to continue the focus on agriculture, whether the details of the class (ENST 320, 1 credit, S/U, no required writing assignment) fit faculty and student's expectations, and whether to continue trying to bring authors to campus as part of the program.

The Environmental Studies Symposium (ENST 300), taught by Monica Rico, focused on the greening of higher education. In addition to the Spoerl lecture speakers (see below) small groups of students

- developed an "eco-tour" of sustainability-related sites and programs on campus, such as the garden, the Warch Center, and the solar panels, along with a "sustainability map" to be used in campus outreach efforts (Admissions, Reunion Weekend, etc.)
- researched native plants, collaborated with grounds crew to discuss site and budget, and installed demonstration bed of native plants outside Mudd Library
- researched current campus efforts to support bicycling, developed budget for expansion of bike program, and created cycling-awareness communication plan
- researched potential sites for a green roof, various products, developed budget and secured funding for pilot project

Future Work (completed work from previous year by check mark):

- ✓ Follow up on the possibility of a "community read" project;
- ✓ ENST 300: Symposium on Environmental Topics will focus on sustainability and college campuses
- ✓ Collaboration with Government Department to include environmental speakers as part of Winter and Spring Povolny Lecture series.
- Continue with community read program for 2010.
- ENST 300 course on waste reduction.

## Presentations about Green Roots

Invited presentation, plenary panel participant, and poster presentation at Midstates Consortium campus sustainability workshop
Presentation at Upper Midwest Assoc. for Campus Sustainability (UMACS)

## Sponsored and Co-sponsored Events

### *Spoerl Lecture Series in support of ENST 300: Environmental Studies Symposium – The Greening of Higher Education*

May 12:
"Sustainability and the Liberal Arts"
Nan Jenks-Jay, Dean of Environmental Affairs, Middlebury College

May 18:
"The Role of the Arts in Sustainable Community Development"
Amara Geffen, Director of the Center for Economic and Environmental Development, Allegheny College

February 19:
"Education in Action for a Sustainable Future"

Debra Rowe, President, U.S. Partnership for Education for Sustainable Development and Professor, Sustainable Energies and Behavioral Sciences, Oakland Community College

### *Earth Week Events and Speakers*

Monday April 19:
• 4:30 Science Hall Colloquium, Science Hall 102
• Steve Miles, Supervisor, Dolores Conservation District, Cortez, Colorado
• "Taming Tamarisk in Western Colorado: a grass roots conservation effort at the headwaters of the tamarisk infestation"

Tuesday April 20:
• 11:10 Convocation, Memorial Chapel
• Rebecca Solnit, essayist, "Swimming Upstream in History: Hope, Disaster, Utopia"

• 7 pm, Povolny Lecture, Science Hall 102
• George Wyeth, Stephen Edward Scarff Memorial Visiting Professor
• "Change Isn't Easy: An Inside Perspective"

Wednesday April 21:
• 8 pm, Warch Campus Center Cinema, film: "Earth Days"
• 9:30 pm, Warch Campus Center, band: Morsoul www.MorsoulMusic.com

Thursday April 22:
• 4:30 pm, Wriston Auditorium, Visiting Artist, Jerilea Zempel, "Art and the Environment"

Friday April 23:
• 3:10 pm, Science Hall 102, Tim Ehlinger, associate professor, Great Lakes Water Institute, University of Wisconsin – Milwaukee "Ecological Risk Assessment Frameworks and Indicators for Sustainable Development in Coastal Lake Systems,"

## Other Events

### *Convocation series*

October 20
"Geomimicry: Good Design from the Earth"
Marcia Bjornerud, Lawrence University professor of geology and Walter Schober Professor of Environmental Studies

April 20
"Swimming Upstream in History: Hope, Disaster, Utopia
Rebecca Solnit, essayist

May 20
"America at the Crossroads: Accepting the Climate Change Challenge"
Robert Hartwell '69, Vermont State Senator

*Povolny Lecture Series in international Studies:*

April 20
"Change Isn't Easy: An Insiders Perspective"
Geogre Wyeth, Stephen Edward Scarff Memorial Visiting Professor
Director of the EPA's Policy and Program Change division

April 26
"Comedy, Economics and Climate Change
Yoram Bauman

May 10
"Environmental Change and Governance: A Legal Perspective"
Lee Paddock, associate dean for environmental law at George Washington University.

*Other talks of interest:*

April 6:
The Story Behind Food
Dayna Burtness, Midwest Fellow, Bon Appétit Management Company Foundation

May 18:
"Red Alert: Saving the Planet with Indigenous Knowledge"
Dan Wildcat, director of the Haskell Environmental Research Center at Haskell Indian Nations University, Lawrence, Kansas.

## *Transportation*

For 2009-10, Lawrence continued to run shuttles to destinations of interest 5 days a week and to and from Alexander Gymnasium. The LUCC student welfare committee voted to extend the shuttle program into the 2010-11 academic year. The bike program was deemed successful and some students are seeking funding for additional bikes. A bike mechanic visits campus 1 day a week. The university no longer subsidizes student parking in off campus garages.

GR explored the possibility of a getting a "zip" car on campus. The committee felt that the cost of the vehicle was prohibitive using only the campus population. We did not try to find a community partner, but this could be a way of effectively sharing the cost. No further progress was made with Valley Transit from the 2008-09 year based on student feedback describing lack of interest.

- ✓ The expanded van service will be assessed in the middle of fall term.
- ✓ Parking ramp costs will again be charged to students as will passes for the 24 hour student spaces
- ✓ An area near the Banta Bowl will be reserved as free parking for students who do not need their cars often.
- ✓ GR may explore the "Zipcar" concept further.
- ✓ GR continue to explore routes with Valley Transit.
- Look into ride share/web ride board.

### *Funding*

Green Roots explored funding mechanisms with the development office and with the Long Range Financial Planning Committee (chaired by Provost Burrows and VP for Business affairs Riste). Development has fully engaged with fund raising for specific green initiatives (i.e. solar panels and wind power at Bjorklunden). Establishing a more general "green" fund was not as well received. Fortunately the LRFPC was amenable to establishing a fund that could be used to promote and continue green initiatives. This fund will roll over from year to year allowing unused sums to accumulate. The funding level for 2010-11 is $40,000. The LUCC CER developed its own funding mechanism whereby students can apply to LUCC for funding of sustainability themed projects. This past year funding was awarded to the solar panel project as well as the construction of a hoop house for the garden.

- Establish a 'green' fund with contributions from students, alumni, and university.

## References Cited

Campus Carbon Calculator, 2008, User's Guide Version 6.4.

Darby, S., 2006, The Effectiveness Of Feedback On Energy Consumption, Environmental Change Institute of Oxford University.

Rathjae, W., Murphy, C., 2001, Rubbish! The Archaeology of Garbage. Arizona University Press, 263p.

## Appendix A

### *The University Committee on Environmental Sustainability*

Members: Three faculty members, one of whom will be appointed by the president and designated as chair; two student representatives (appointed by LUCC, one of whom shall be a member of the LUCC Committee for Environmental Responsibility); the Vice President for Student Affairs (or a designate of that office); and the Director of Facilities Services (or a designate of that office). Faculty committee members will serve staggered multi-year terms.

Purpose: To improve the environmental sustainability of Lawrence University by continuing with existing efforts related to university operations and promoting environmental awareness, and by exploring new opportunities in these areas. The committee will be responsible for:

1. Identifying and addressing environmental sustainability challenges for Lawrence University;

2. developing procedures for periodic review and revision of environmental sustainability initiatives;

3. record keeping on all environmental sustainability efforts;

4. reporting to the Lawrence community and external agencies on the state of environmental sustainability at Lawrence;

5. promote awareness of environmental sustainability related issues.

To these ends, the committee will:

1. advise the president and cabinet on matters relating to environmental sustainability;

2. promote student, faculty, and staff engagement in improving the environmental sustainability of Lawrence;

3. prepare and publish on the Lawrence website an annual report of environmental sustainability efforts;

4. sponsor, on an annual basis, workshops, symposia, or other events for faculty, staff, students, and the broader Fox Cities community on environmental sustainability related themes.

Duration:

The form and function of this committee will be reviewed after three years by the President, the Faculty Committee on University Governance, and the committee itself. At that time, this ad-hoc review group will recommend a long-term structure to ensure the continuance of environmental sustainability efforts at Lawrence.