

Purdue Sustainability Strategic Plan Report



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Prepared for

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Executive Summary

This report documents the results of the Purdue Sustainability Strategic Plan development process through January 2010. It provides a synopsis of the two meetings hosted by Purdue – fact finding meetings in November 2009 and a campus facilitated forum in January 2010 – and a discussion of the findings. The meetings were critical for learning stakeholder needs and values, and determining what Purdue students, staff and faculty want from their Sustainability Strategic Plan. From these meetings and ongoing collaboration with Purdue representatives, Collaborative has developed a Table of Contents that shows the proposed content and scope for the plan. Purdue representatives have also been working diligently to populate the Area Overview section under each Sustainability Program Area. The Table of Contents and unedited Area Overviews can be found in the report appendix. This report also discusses several matters critical to developing a robust sustainability program at Purdue, including the use of benchmarking tools, the current sustainability project approval process, and opportunities for integrating operations and academics/research activities.

In Phase II of the Sustainability Strategic Plan development, Purdue and Collaborative will work together in the following areas to complete the plan by Earth Day 2010:

- Refine and finalize the Area Overview sections,
- Develop the university's near and long term sustainability goals and make recommendations for prioritizing these goals,
- Better define the role and responsibilities of the Sustainability Council Steering Committee,
- Discuss the inclusion of sustainability indicator metrics in the plan document and populate selected metrics,
- Address the gaps described in this report and formulate solutions.

Collaborative thanks Purdue for the opportunity to be a partner in the development of its Sustainability Strategic Plan. We look forward to continuing the discovery process and working with the university to enhance its already stellar sustainability programs.

Introduction

Purdue University places great value in the pursuit and implementation of sustainable practices on campus. Since October 2008 the Office of Sustainability, headed by a Director of Sustainability, has worked to advance sustainability programs and encourage the campus community's participation in sustainability issues. Sustainability is cited as one of five key strategies for achieving the goals of the university's New Synergies Strategic Plan. Formal invitations were recently sent by Treasurer Al Diaz to members of the future Sustainability Council Steering Committee, which has been meeting informally over the last year. These are all clear indicators of Purdue's high-level commitment to campus sustainability.

Purdue has engaged Collaborative Project Consulting (Collaborative) to assess the university's existing programs and processes related to sustainability and assist with the development of a Sustainability Strategic Plan. The plan is intended to accomplish a number of things to formalize and publicize the university's sustainability agenda. It will provide a clear vision of what sustainability means for Purdue, and offer a much-needed strategic framework for cultivating a sustainable campus. It will increase the visibility of current sustainability programs throughout the campus's operational and academic departments. The plan will also elevate the campus community's understanding that sustainability is important to Purdue, ultimately resulting in the dedication of resources, time and commitment at the levels required to achieve the university's expansive vision.

Perhaps most importantly, the process of developing the Sustainability Strategic Plan is helping to initiate dialogues between different areas of campus. This is significant for Purdue. It was noted repeatedly by participants in the plan development process that there is a genuine opportunity to develop better linkages and encourage collaboration both across academic disciplines and between academics/research and the campus's operational units. The intent of the Sustainability Strategic Plan is to assist in bridging these divides. This starts with enabling everyone to join the conversation to help shape the university's sustainability agenda. By opening channels of communication and drawing in a diversity of stakeholders, ownership of sustainability will be dispersed across the university. To help ensure that all voices are heard, the Sustainability Strategic Plan will be a "living" document that the university community expands upon and refines over time.

Progress Briefing

Timeline

The Sustainability Strategic Plan is being developed along an expedited timeline to allow Purdue to unveil a document on Earth Day, April 22, 2010. This is a fitting event to put forward a strategic approach for integrating sustainability into and across operational units, academic fields, and research activities. The project is fundamentally on track to meeting the Earth Day target, with only one minor change to the original workflow plan.

After the contract was approved in late October 2009, Purdue and Collaborative selected November 19 to host a series of fact finding meetings on campus, and November 20 to host a campus-wide facilitated forum. In order to secure broad interest and participation in development of the Sustainability Strategic Plan, and ultimately its implementation, it was essential that a variety of stakeholder groups attend the forum. It soon became clear that the advance notice provided to key stakeholders to reserve the November 20 date was insufficient. Ultimately it was agreed that hosting a successful workshop that truly engaged the campus community would require additional lead time to ensure that all interested participants could attend. The date for the forum was moved to January 12, 2010 due to the Thanksgiving and winter breaks.

The November 19 fact finding meetings were held as planned, with additional meetings scheduled for the following day. Having this second day of meetings proved to be very valuable. Collaborative was able to meet with a larger number of stakeholders that are involved in a broader range of sustainability topic areas. A full list of focus areas and attendees is located in the appendix.

The facilitated forum held in January drew an impressive level of attendance and representation from numerous university stakeholder groups. Enthusiastic engagement by participants made the event an effective channel for collaborative development of the plan.

Plan Development

Considerable progress has been made in developing the Sustainability Strategic Plan itself. After the November onsite meeting, Collaborative developed a draft Table of Contents and provided it to Purdue for review and feedback. A revised Table of Contents that incorporates Purdue's input can be found in the appendix of this report.

Purdue representatives have also been working diligently to populate the Area Overview section under each Sustainability Program Area. The Area Overview sections will provide readers with an overview of existing conditions at the university and its current sustainable practices within each Program Area. The sections are intended to help contextualize sustainability within the campus's larger operations, and also provide space to highlight Purdue's sustainability achievements. Collaborative will modify the Area Overviews provided by Purdue for length and consistency of voice. We will also work with contributors to analyze the content and take care that only genuine achievements are presented in Overview sections, in order to avoid unintentional "greenwashing". The unedited Area Overviews can be found in the report appendix.

In addition to developing the Area Overviews, Purdue has begun identifying opportunities for improving existing programs and implementing new programs. Opportunities lists for each Program Area are located in the report appendix immediately after the Area Overview. The opportunities identified will be considered further and prioritized for the Sustainability Strategic Plan consistent with the overarching goals identified by the university as the development process continues.

Discovery and Fact Finding – November 2009

Collaborative Project Consulting met with nearly fifty Purdue staff, faculty and students over two days of onsite meetings in November 2009. In these initial discovery and fact finding sessions, Collaborative learned about Purdue’s current sustainability programs and solicited stakeholder visions for a strategic and integrated approach to future sustainability efforts. We would like to extend a sincere thank you to all participants for taking time to contribute to the development of the Sustainability Strategic Plan.

The onsite meetings served several purposes. First, it allowed Collaborative and many individuals involved with campus sustainability the opportunity to meet through face-to-face introductions. Second, it initiated a more formal conversation about the Sustainability Strategic Plan project. Most meeting participants were aware of the project, but in the rapidly-progressing timeline, not everyone had a complete understanding of its scope or intent. Third, it provided a forum in which Collaborative could learn directly about sustainability efforts at Purdue from individuals that play leadership roles in implementing and advocating for campus sustainability.

Sustainability is an expansive field that touches on every aspect of a university’s operation. To organize the conversation the day was divided into thirty minute sessions, each of which focused on a different sustainability topic area. Broadly, the scope of subjects discussed include the built environment; energy; recycling and waste management; transportation; purchasing; food; site and building operations and maintenance; student involvement; academics and research; and endowment and investments. A detailed list of focus areas is located in the appendix.

Each session was attended by university representatives responsible for implementing sustainability measures within the focus area, or who have a high degree of familiarity with the focus area as it relates to the campus. A representative from Duke Energy, Purdue’s utility provider, joined the “Alternative Energy Opportunities and Research Collaboration” session via conference call. Please see the appendix for the meetings schedule and complete list of attendee.

In each session, participants were asked to give an overview of the university’s current sustainable practices. We then discussed where participants see the potential to improve and reviewed opportunities for new projects and programs. In many of the sessions, participants already had several carefully considered ideas of how to enhance the sustainability program area they oversaw. Due to time limitations, only a few sessions were able to discuss sustainability indicators and possible metrics to track in order to benchmark and gauge sustainability performance over time. The opportunity to develop metrics for the Sustainability Strategic Plan, and the option to populate some or all of them, will be discussed further in Phase II of the plan development process.

The first day of meetings was rounded out with a tour of Purdue’s cogeneration plant and campus grounds. Collaborative saw several sustainability projects, including stormwater management systems using pervious paving, a green roof, and the beginnings of the campus’s first LEED® project.



Discussion of Findings

One of the primary insights we took away from these meetings was the understanding that a variety of sustainability efforts are well underway at Purdue. There are clearly many talented, well-informed and highly-motivated people working to advance the university's sustainability programs. It was fascinating to learn about the countless programs already in place at Purdue, and even more exciting to hear enthusiastic plans for new projects and programs. In each meeting it was clear that there is either a long-standing history of sustainability implementation, or representatives are keenly aware of the opportunities for improvement and eager to put ideas into practice. In many instances it was a combination of both.

Several themes emerged during the visit that are likely to form the backbone of the plan, given their significance to cultivating a strategic and integrated approach to campus sustainability. The idea most emphasized by participants was the need to improve formal collaboration across disciplines and departments. Many participants expressed concern that there is too little communication and collaboration between operational units and research/academics. This means that the campus is not fully benefitting from the knowledge resources within its existing environmental research centers. Additionally, many suggested that faculty and student involvement in campus sustainability initiatives could be improved. Identifying strategies for nurturing these types of partnerships will be a major component of the Sustainability Strategic Plan.

A second theme we noted in the meetings is the unrealized opportunity to invest in on-campus resources. This relates directly to the first theme with regards to supporting and applying the intellectual and knowledge resources of faculty and researchers to on-campus sustainability efforts. It also includes the opportunity to invest in staff resources by supporting continuing education and professional development related to sustainability. Developing this type of program will better equip staff to implement intelligent sustainability programs and projects with confidence.

In this instance, the term "resources" refers not only to human resources, but to natural resources. Purdue has already embraced this idea in its food services program. Post-consumer food waste generated at the dining facilities is pulped onsite and sent to the West Lafayette wastewater treatment plant to power the anaerobic digester. Investing in programs with a similar goal – to take advantage of on-campus natural resources including stormwater, rainwater, wind, biomass and animal waste – can significantly reduce the university's environmental impact and may generate cost savings.

Another underlying theme repeated in several sessions was the existence of barriers to implementing sustainability projects and programs. Lack of funding, of course, is a persistent and expected problem at any public university, especially in a time where higher education institutions across the country are facing extreme financial hardship. However, a second barrier was mentioned a number of times across different focus areas. Lack of high-level support from Purdue's senior management in the form of project sign-off was pinpointed as a significant barrier. Participants described performing detailed planning, research and feasibility studies, only to have the project stall without explanation at the senior management level. Revisiting – and possibly redesigning – the formal process for submitting sustainability projects for senior level approval is a topic for further investigation and will be an important component of the Sustainability Strategic Plan.

Campus Facilitated Forum – January 2010

The campus facilitated forum brought a variety of stakeholders together to consider the direction and goals of the university’s sustainability program. The event was open to the entire university community so that any interested individual could contribute to developing the plan. Through facilitated interactive exercises, workshop participants generated and prioritized goals, developed approaches to realizing those goals, and considered how the interplay between different stakeholder groups affects goal achievement. Overall, the forum underscored the sentiment observed at the November meetings that greater clarity of values and goals, along with high-level direction and support from senior administrators, is needed to create a cohesive and inclusive sustainability program at Purdue.

Outreach to a number of different stakeholder groups was performed to encourage participation from a variety of campus community members. Faculty, staff, undergraduate and graduate students, senior administrators, Global Sustainability Institute representatives, community members, utility provider representatives, and Sustainability Steering Committee members were among the stakeholder groups invited to join the forum. These groups were contacted via direct email invite, email distribution lists, and an announcement on Purdue’s sustainability website. A personal invitation was extended by Treasurer Al Diaz to members of the university’s senior administration to emphasize the need for representation from this stakeholder group. In total, over 450 individuals from both on campus and off campus received email notification of the event.

Turnout to the forum was excellent; about 70 participants joined the event. A poll of the room confirmed that the following stakeholder groups were present: staff from a number of departments (including facilities operations, utilities, food services, housing, and procurement), engineers and design professionals, faculty, students, senior administrators, community members, contractors, and alumni.

Purdue in the News

For the first facilitated exercise, Collaborative instructed participants to jot down a headline they would like to read about Purdue’s sustainability program in the *Exponent* in 2 years, in the *Journal & Courier* in 5 years, and in *USA Today* in 8 years. In this exercise, a headline serves as a proxy for what the participant regards as the most important sustainability program area in which Purdue should make significant progress, within a specified timeframe. Given the expansive scope of campus sustainability, and the opportunity to choose only three headlines, this exercise exposes the relative importance of each program area to the participant group as a whole.

The table below shows the distribution of headlines for each year as a percentage of total headlines received for that year. Asterisks in the table mark the sustainability program areas that were referenced with the greatest frequency. It is worthwhile to mention that in instances where a Leadership headline made specific mention to a sustainability topic area – for example, “Purdue leads IU in highest number of green buildings” – the headline was counted in both the Leadership and the Green Building program area. When a Leadership headline made a general reference to sustainability – for example, “Purdue wins Big 10 environmental stewardship award” – the headline was counted only in the Leadership program area. The same logic was applied to headlines related to Academics and Research.

Sustainability Program Area	% of Headlines - 2 years	% of Headlines - 5 years	% of Headlines - 8 years
Transit	1.79	1.67	0.00
Water Resources	0.00	0.00	1.67
Green Building	7.14*	5.00	6.67
Energy and Climate Protection	35.71*	30.00*	30.00*
Procurement	3.57	1.67	0.00
Waste Management	12.50*	13.33*	5.00
Food Systems	1.79	1.67	0.00
Academics and Research	1.79	3.33	15.00*
Endowment/Development	0.00	0.00	0.00
Community Relationships	0.00	1.67	0.00
Economics	7.14*	11.67*	13.33*
Leadership	25.00*	30.00*	28.33*
Quality of Life	3.57	0.00	0.00

The vast majority of 2 year headlines are concentrated in just three sustainability program areas: Energy and Climate Protection (35.71%); Leadership (25.00%); and Waste Management (12.50%). The Economics and Green Building program areas received the same percentage of headlines (7.14%), rounding out the six the most frequently cited program areas for this set of headlines. This trend continues in the 5 year headlines, except that headlines are squarely concentrated in just four program areas: Energy and Climate Protection (30.00%); Leadership (30.00%); Waste Management (13.33%); and Economics (11.67%). The same program areas are again echoed in the 8 year headlines, with Energy and Climate Protection (30.00%); Leadership (28.33%); and Economics (13.33%) returning in the top four. However, headlines concerned with Waste Management drop significantly in frequency, and Research and Academics (15.00%) joins the top four program areas.



There are three underlying stories told by the headline exercise that can help shape the development of Purdue’s Sustainability Strategic Plan. The first is that forum participants are primarily concerned with issues related to energy use reduction and climate change, and view this as having ongoing importance for the university’s sustainability program in the future. The second is that the group places great value in benchmarking. This is borne out in the prevalence of Leadership headlines, since benchmarking against external baselines and organizations is how leadership is measured. A discussion of sustainability benchmarking tools for higher education is discussed further in the next section of this report. The third story is that there is a strong interest in linking sustainability and economics. The frequency of Economics headlines shows that finding

efficiencies through sustainability projects to improve Purdue's finances is important to the group. That the frequency of Economics headlines trends upward over the 2, 5 and 8 year headlines reveals the expectation of increased profitability over time. It suggests that participants recognize an initial period of investment, but want to see impacts on the university's budget that are increasingly headline-worthy in future years.

Stakeholder Shuffle

In the second facilitated exercise, each table developed goals for Purdue's sustainability program through the eyes of a given campus stakeholder. Stakeholder identities at a table were then shuffled so that additional stakeholder perspectives could come into play in the prioritization of goals.

For the first part of the exercise each table was assigned to act as a different stakeholder group. The groups were selected from the master list of stakeholders identified in the room poll, and included students, faculty, senior administrators, facilities/operations staff, community members, housing, food services, and engineers/design professionals. Each table recorded eight sustainability goals from the perspective of their assigned stakeholder group. Next, the tables wrote down eight resources they possess as a stakeholder group that can support sustainability goal achievement.

In the second half of the exercise, the tables were asked to act as a committee where each person assumed the identity of a different stakeholder. With all stakeholder groups represented, each table evaluated the goals and strategies proposed by the single stakeholder group in the first part of the exercise. As a committee, the tables worked together to prioritize the top goals and attach resources and strategies to those goals. The committees then reported out to the entire forum.



Exit Survey

An exit survey was administered at the conclusion of the forum to give attendees the opportunity to provide feedback on the event and additional input into the plan. Giving participants a means for providing comments anonymously was intended to allow all voices and concerns to be heard. The survey questions asked for ideas or concerns that were overlooked, preferred next steps for the development process, and any additional thoughts on the Sustainability Strategic Plan. The complete exit survey is located in the appendix.

Collaborative tabulated the topics cited in the responses to evaluate which themes were most important to the group. We found that survey responses were concentrated in the following areas: develop Sustainability Strategic Plan; senior administrative support; benchmarking; communication; and student engagement. The responses suggest that participants were very pleased with the first step a forum represents, and are eager to sustain the current momentum and develop a plan.

Sustainability Benchmarking

Benchmarking Explained

Developing successful sustainability programs requires the use of benchmarking, a mechanism that drives continual improvements by measuring performance and evaluating progress towards goals. Some universities compare current environmental performance against a baseline performance level and a desired performance level to determine whether or not sustainability practices are generating the intended result. However, this only takes history and self-selected goals into account. Benchmarking brings an important external variable into the assessment. With the benchmarking process, a university looks outside its own boundaries to compare its performance within an external context, such as peer institutions or an external standard. By expanding the assessment beyond government regulation and internal performance metrics, a university can better evaluate its response to environmental issues, and identify and implement improvements in accordance with current environmental best practice.

The Sustainability Strategic Plan will discuss five peer benchmarking programs that are commonly used in higher education, each of which is described briefly below. Using these benchmarking programs can provide Purdue with a more meaningful understanding of its environmental performance and enable informed assessment and refinement of sustainability initiatives. Additionally, using these widely-accepted benchmarking tools will provide Purdue with a set of metrics consistent with those used at other participating universities. This will help Purdue assess whether or not it is competitive with other higher education institutions within the campus sustainability arena.

College Sustainability Report Card – The Report Card is an initiative of the Sustainable Endowments Institute. This nonprofit organization “engages in research and education to advance sustainability in campus operations and endowment practices”. Report Card is unique in its consideration of endowment practices as part of a complete sustainability program. The Report Card assesses 300 public and private colleges and universities with the largest endowments and provides grades for performance across 43 indicators in nine main categories. Participating institutions are asked to complete surveys which are graded and made available on the campus’s online profile. By posting survey responses online, the Report Card provides universities with the opportunity to learn about best practices employed by high scoring campuses and peer institutions. The website offers a convenient comparison tool that enables side-by-side assessment of schools for any year, or range of years, the report card was completed. This enables prospective and current students to evaluate different schools’ performance in all sustainability categories over time.

- Additional information about the Report Card can be found at: www.greenreportcard.org
- Purdue’s 2010 Report Card grades and survey responses can be found at: www.greenreportcard.org/report-card-2010/schools/purdue-university

Greenline Analysis – Greenline Analysis is the environmental stewardship branch of the company Sightlines, which manages the largest verified facilities database in the country. Greenline examines metrics for carbon footprint/greenhouse gas emissions; waste production and recycling; water consumption; and green construction techniques. The Greenline web-based tool allows participants to examine trends in environmental performance and benchmark against peer institutions. Roughly 60 higher education institutions currently use Greenline Analysis.

- Additional information about Greenline Analysis can be found at: www.sightlines.com/content.aspx?pg=greenline

Leadership in Energy and Environmental Design – Developed by the U.S. Green Building Council (USGBC), the LEED green building rating system is the de-facto national standard for the design, construction, and operation of high-performance, sustainable buildings. LEED provides reliable third-party verification that a building is designed and constructed according to current best practices for sustainability. The LEED program is used by many higher education institutions to green both new capital projects and existing building stocks. As of September 2009, LEED initiatives have been adopted by 39 colleges and universities across the country.

- Additional information about the USGBC and LEED can be found at: www.usgbc.org

Sustainability Tracking, Assessment & Rating System – The program website describes STARS as “a voluntary, self-reporting framework for gauging relative progress toward sustainability for colleges and universities”. A primary goal of the program is to establish a common standard of measurement for sustainability in higher education so that meaningful comparisons can be drawn over time and across institutions. STARS was developed by the Association for the Advancement for Sustainability in Higher Education (AASHE) in a collaborative effort with other non-profit organizations and higher education associations.

The STARS program awards points to campuses for satisfying the requirements of credits that fall under three main category headers: Education & Research; Operations; and Planning, Administration & Engagement. Campuses are then given a rating of bronze, silver, gold or platinum based on total points accumulated. A STARS rating is good for three years before an institution must submit for a new rating. This rule aims to promote a balance between verifying continual improvement towards sustainability and burdensome reporting requirements. After a pilot run that saw participation from 71 universities and colleges, STARS 1.0 and its Reporting Tool will have a formal public launch in January 2010.

- Additional information about the STARS program can be found at: www.aashe.org/stars
- The STARS Early Release Technical Manual, which includes credit criteria and scoring information, can be found at: www.aashe.org/files/documents/STARS/STARS_1.0_Early_Release_Technical_Manual_0.pdf

The Climate Registry – The Climate Registry is a non-profit organization that provides consistent and transparent standards for calculating, verifying and publicly reporting greenhouse gas emissions. The voluntary program aims to create credible and accurate standards and tools for emissions reporting that are applied consistently throughout North America. As of January 2010, The Registry has 388 corporate, non-profit and government members from across 26 sectors.

Greenhouse gas emissions data submitted to The Registry is independently verified by private companies with expertise in tracking emissions to ensure accuracy. Third party verification establishes a baseline against which organizations can identify offset projects. The emissions reductions realized from these projects could ultimately be sold on a carbon market at significant real value to the organization. However, emissions reductions can only be considered if they originate from a third-party verified inventory.

The Registry is a valuable benchmarking tool to begin using from a strategic perspective because most legislation currently pending nationally mentions The Climate Registry as the probable repository for greenhouse gas emissions upon the creation of a cap and trade system and EPA’s adoption of mandatory reporting.

- Additional information about The Registry can be found at: www.theclimateregistry.org

Current Benchmarking Activities at Purdue

Purdue currently uses two of the five benchmarking tools described above. A brief summary of the extent to which the university utilizes these programs follows.

College Sustainability Report Card – Purdue has participated in the College Sustainability Report Card since 2007. The university’s overall grade and nine main category grades from 2007 through 2010 is shown in the table below. The table shows that Purdue’s grades are mostly constant or trending upward from 2007 to 2010, with the exception of the Green Building category. A spreadsheet showing the historical grades for all Big Ten Universities is located in the appendix.

To help strategically prioritize opportunities to improve grades in the various Report Card categories, Purdue and Collaborative have developed a spreadsheet that contains Purdue’s 2010 responses and evaluates the difficulty level (easy, medium, or hard) for implementing or enhancing sustainability initiatives to satisfy specific Report Card questions. Communicating sustainability to on and off campus audiences was identified as a primary strategic goal in the onsite meetings, and since improving Purdue’s Report Card grades is a directly relevant strategy for achieving that goal, the spreadsheet will be a useful guide for developing the Sustainability Strategic Plan and prioritizing sustainability initiatives. Please refer to the report appendix to view the spreadsheet.

THE COLLEGE SUSTAINABILITY REPORT CARD											
Year	Overall Grade	Administration	Climate Change and Energy	Food and Recycling	Green Building	Student Involvement	Transportation	Endowment Transparency	Investment Priorities	Shareholder Engagement	
2010	B-	C	C	B	D	B	B	A	A	D	
2009	B-	C	C	B	C	C	B	A	A	D	
2008	C	C	C	B	C	--	C	C	A	F	
2007	C	D	C	C	D	--	--	A	A	F	

Leadership in Energy and Environmental Design – The Roger B. Gatewood Wing addition to the Mechanical Engineering Building is Purdue’s first project to formally pursue green building certification through the LEED program. It is currently tracking Gold level certification. Many of Purdue’s standard building design and construction practices already meet LEED requirements. Consistently benchmarking against an external standard will allow Purdue to verify this is true across projects, while also helping the campus develop additional sustainability measures that align with current best practice.

A straightforward way to ensure that benchmarking with LEED is applied consistently in capital projects is to adopt a green building policy. Having a formal policy would benefit Purdue in many ways. The act of adopting a high-visibility commitment to green building is an effective way to communicate the importance of sustainability to the campus community. Additionally, having such a policy would raise Purdue’s grades and ratings in other campus sustainability benchmarking tools described here, which also positively communicates the campus’s commitment to on and off

campus audiences. And finally, the opportunity for community outreach is presented each time a new project earns LEED certification. The formal recognition conferred through LEED certification provides both ongoing educational opportunities as well as a source of pride for the campus.

Due to the significant combined benefits that having a green building policy can confer – both in terms of reliable benchmarking and Purdue’s broader sustainability goals and outreach efforts – the topic will be addressed further in the course of the plan development process.

Benchmarking Opportunities

Purdue has the opportunity to make use of three additional benchmarking tools: Greenline environmental impact baseline and trending analysis, the STARS campus sustainability rating program, and The Climate Registry greenhouse gas emissions verification and reporting program. A discussion of their benefits and relevance to Purdue follows.

Greenline Analysis – Purdue University, along with University of Illinois and Penn State, were the first Big Ten Universities to contract Sightlines’ facilities assessment services in 2003. Sightlines measures, monitors and benchmarks facilities, environmental and financial data for roughly 200 institutions. Each year, Sightlines verifies and qualifies data provided by Purdue through trending review, discussions and a campus visit. The analysis provided by Sightlines allows the university to identify facilities maintenance and rehabilitation needs, staffing needs, and opportunities for energy conservation. Purdue can compare its operational and facilities performance to peers with a portfolio of similar facilities types using the Sightlines categorization method called “tech rating”. For example, Purdue’s West Lafayette campus has a nanotechnology research center that is highly energy intensive due to the nature of its laboratory requirements. Benchmarking against universities with a similar “tech rating” provides Purdue with an “apples to apples” comparison of its current and historic practices.

The university may find it advantageous to begin using Sightlines’ Greenline Analysis. This branch of Sightlines enables a campus to track several sustainability indicators including waste production and recycling, water consumption, and green construction techniques. Additionally, Greenline enables a campus to assess its carbon footprint and greenhouse gas emissions. Sightlines works with campus staff to collect data and measure scope one, two, and three emissions inventories using the Clean Air–Cool Planet (CA-CP) standards recommended by the American College & University President’s Climate Commitment (ACUPCC). As Purdue develops its climate protection program and emissions reduction projects, expanding its current use of Sightlines to include Greenline Analysis may be an effective strategy for compiling, managing and evaluating environmental benchmarking data.

Sustainability Tracking, Assessment & Rating System – While this program is effectively in its infancy, it is developed and administered by a well-known and highly-regarded organization. Over 780 colleges and universities are members of the Association for the Advancement of Sustainability in Higher Education (AASHE) as of January 2010, which makes widespread participation in the STARS program very likely.

In fall 2009, the Political Science 527 course “Environmental Politics and Policy” evaluated Purdue’s current sustainability activities using the STARS 1.0 program. Students were divided into teams to conduct the analysis, calculate the STARS rating, and report on the findings. A report detailing the class’ consensus regarding the STARS program, its value for Purdue, and the university’s likely rating should it officially participate is forthcoming.

The Climate Registry – Purdue actively engages in the climate protection conversation within in its research centers, its operational activities, and its academic endeavors. In spring 2007, an interdisciplinary class of 29 students and six instructors calculated the university’s annual carbon emissions. The report evaluates the carbon footprint resulting from a number of sources including energy production and consumption; building construction; land management; transportation; and purchasing decisions. The report also suggests a number of ways to reduce emissions and achieve climate neutrality. This important study provides a comprehensive understanding of the university’s emissions breakdown, and where it is best served to target its climate protection activities.

The Climate Registry is a potent benchmarking tool that can supplement Purdue’s understanding of its emissions profile. The Registry is poised to become the single national repository for greenhouse gas emissions. The program itself does not require participants to commit to any emissions reductions. Instead, the intent of the program is to establish protocol and maintain consistency in emissions reporting, thereby providing a stable foundation for future carbon markets. Participating in this benchmarking program would provide Purdue with a greenhouse gas emissions baseline that is verified according to a nationally-accepted standard, and would enable the university to track its progress over time. Additionally, verifying emissions annually using third-party verifiers can provide Purdue’s administrative leadership, the campus community, and the public with assurance that the university is inventorying its emissions consistently and accurately over time.

Gap Analysis

Conversations with Purdue have revealed two major disconnects in the university's existing sustainability program. Gaps identified in research/operations collaboration and the sustainability project approval process are currently working against the optimal functioning of Purdue's sustainability program.

Research/Operations Collaboration

The first disconnect was alluded to in the Introduction of this report. Many participants at the November fact finding meetings observed an opportunity for increased collaboration in sustainability matters between different areas of campus. These participants expressed a need for better integration between campus operational activities and the university's academic and research units. There is a wealth of knowledge and expertise in both segments of campus, and both areas can benefit greatly from engaging with one another. The challenge is in developing appropriate channels for communicating and nurturing these opportunities.

A current development on the Purdue campus is particularly relevant to this issue. Three existing research centers that focus on climate change, energy and environmental research – the Center for the Environment (C4E), the Energy Center (EC), and the Purdue Climate Change Research Center (PCCRC) – will soon merge under one roof in Discovery Park. The director of the new Global Sustainability Initiative will be uniquely positioned to facilitate collaboration between the campus's operational units and research units. First, he or she will have an intimate understanding of the funding landscape and research activities taking place within the centers. Second, as a senior administrator, he or she will have the influence required to champion the integration of current research topics with the deployment of on-campus sustainability projects. We recommend that Purdue consider the value in having the director act as a co-chair to the Sustainability Council Steering Committee, so that he or she can be well-informed regarding campus sustainability issues. This person will work closely with the Director of Sustainability and Environmental Stewardship in the Physical Facilities Department, who currently chairs the Sustainability Council Steering Committee. In this way, the new director will be knowledgeable in both areas of campus, and can effectively cultivate and create linkages between academia and Purdue's operational activities.

This senior administrative position can also be a key spokesperson for sustainability, someone that articulates the importance of linkages between campus sectors and communicates sustainability research initiatives to the campus community. Broad outreach efforts by the director to heighten the profile of campus sustainability can help draw interest from individuals with a range of backgrounds, including research, engineering, and social and political science. While it is unreasonable to think that a single person can bridge the gap between operations and research completely, it would be valuable to task the new Global Sustainability Initiative director with opening dialogues and developing means for nurturing mutually beneficial relationships between these units.

Project Prioritization and Approval Process

The second major disconnect identified by Purdue is the lack of a clear process for considering, prioritizing, and approving or denying sustainability projects. As noted in the Discovery and Fact Finding section of this report, many participants in the November meetings described how projects are often shelved indefinitely when brought to senior management for final approval. Clearer guidelines for the project development and approval process is plainly needed, especially when times of financial adversity means the university must be particularly selective when choosing from a pool of many good and important potential projects.

Collaborative has identified an opportunity for the Sustainability Council Steering Committee to assume a primary role in this process. Formal invitations to join the Committee were recently sent by Treasurer Al Diaz and Provost Randy Woodson. Individuals invited include representatives from different campus operational areas, academics/research, fiscal affairs, and the graduate and undergraduate student population. At this point it is unclear whether this is a higher-level steering committee to a larger sustainability council – presumably made up of several smaller subcommittees each with a different sustainability area focus – or whether this group will serve as the sole advisory committee on sustainability. Since the Committee is new, it has not yet adopted a mission or charter, and the person to whom the Committee ultimately reports has not been finalized. This is not a problem, however. The Committee’s status as a brand new campus entity is an ideal time to develop and articulate explicit guidelines for the project prioritization and approval process, and clearly define the Committee’s role and responsibilities in this effort.

In general, the Committee can provide much needed structure to the project approval process by collectively evaluating and prioritizing sustainability projects according to guidelines developed by the Committee. The group can then summarize its findings and provide recommendations to the appropriate senior management officials. In this way, projects are vetted through a formal process by a number of persons with different backgrounds and sustainability areas of expertise, which ultimately enables senior administrative staff to make better-informed decisions.

While the two gaps identified in this section have a significant effect on the health of Purdue’s sustainability programs, there are a number of potential solutions that could be employed simultaneously to help bridge these disconnects. We have described major opportunities here based on an evaluation of established practices as well as changes to the university’s operational arrangement that are currently underway. Discussing these gaps and developing solutions will continue to be a significant component of the Sustainability Strategic Plan development process.

Next Steps

In Phase II of the Sustainability Strategic Plan development, Purdue and Collaborative will work together in the following areas to complete the plan by Earth Day 2010:

- Refine and finalize the Area Overview sections,
- Develop the university's near and long term sustainability goals and make recommendations for prioritizing these goals,
- Better define the role and responsibilities of the Sustainability Council Steering Committee,
- Discuss the inclusion of sustainability indicator metrics in the plan document and populate selected metrics,
- Address the gaps described in this report and formulate solutions.

The tentative timeline for activities through the Earth Day target date follows.

February 2010

- Determine roles for plan contributors
- Finalize Area Overview sections
- Determine metrics
- Collect data to populate metrics
- Gap study with stakeholders
- Begin goal development and prioritization

March 2010

- Goal development and prioritization
- Integrate prioritized goals with Area Overviews
- Define role for Sustainability Council Steering Committee
- Issue draft plan

April 2010

- Review draft plan with teleconferences as needed
- Attend presentation to the Board of Trustees, if appropriate
- Issue final plan

Purdue Sustainability Strategic Plan Outline

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Contributors

Letter from President Córdova

Preamble

Goals

1. Improve formal collaboration across disciplines and departments
 - Sustainability Steering Committee
 - Global Sustainability Initiative
2. Invest in on-campus resources
 - Natural resources
 - Staff, academic and research resources
3. Communicate sustainability to on and off campus audiences
 - Improve College Sustainability Report Card grades
 - Develop communication channels across campus
 - Enhance outreach through the Cooperative Extension

Sustainability Staffing

Peer Benchmarking Programs

1. College Sustainability Report Card
2. Sightlines facilities and environmental metrics verified database
3. USGBC's LEED green building certification system
4. AASHE's STARS campus sustainability rating program
5. The Climate Registry greenhouse gas emissions verification and reporting program

Sustainability Program Areas

1. Site Considerations

- 1.1 Area overview
- 1.2 Benchmarking metrics
- 1.3 Topics
 - 1.3.1 Master planning and land use
 - 1.3.2 Transit
 - 1.3.3 Stormwater
 - 1.3.4 Operations and maintenance

2. Water Resources

- 2.1 Area overview
- 2.2 Benchmarking metrics
- 2.3 Topics
 - 2.3.1 Site water
 - 2.3.2 Building water
 - 2.3.3 Infrastructure water
 - 2.3.4 Resource conservation and protection
 - 2.3.5 Emissions inventory

3. Built Environment

- 3.1 Area overview
- 3.2 Benchmarking metrics
- 3.3 Topics
 - 3.3.1 Green building certification
 - 3.3.2 Construction best management practices

- 3.3.3 Operations and maintenance
- 3.3.4 Building energy
- 3.3.5 Renewable energy
- 3.3.6 Emissions inventory
- 3.3.7 Occupant engagement
- 4. Materials Management**
 - 4.1 Area overview
 - 4.2 Benchmarking metrics
 - 4.3 Topics
 - 4.3.1 Purchasing
 - 4.3.2 Resource library
 - 4.3.3 Chemical redistribution
 - 4.3.4 Recycling and waste management
- 5. Food Systems**
 - 5.1 Area overview
 - 5.2 Benchmarking metrics
 - 5.3 Topics
 - 5.3.1 Purchasing
 - 5.3.2 Energy use
 - 5.3.3 Waste management
 - 5.3.4 Demonstration gardens
 - 5.3.5 Community Outreach
- 6. Academics and Research**
 - 6.1 Area overview
 - 6.2 Benchmarking metrics
 - 6.3 Topics
 - 6.3.1 Academics
 - 6.3.2 Research centers
 - 6.3.3 Faculty
 - 6.3.4 Operation-student-faculty linkages
- 7. Endowment/Development**
 - 7.1 Area overview
 - 7.2 Benchmarking metrics
 - 7.3 Topics
 - 7.3.1 College Sustainability Report Card
 - 7.3.2 AASHE metrics
 - 7.3.3 Development Officer education and outreach
- 8. Community Relationships**
 - 8.1 Area overview
 - 8.2 Benchmarking metrics
 - 8.3 Topics
 - 8.3.1 Learning rates, health and productivity
 - 8.3.2 Campus-city-county partnerships
 - 8.3.3 Greening the on-campus experience
 - 8.3.4 Connecting with off-campus students

Appendix

**Purdue University Sustainability Strategic Plan
Onsite Meetings November 2009**

Thursday, November 19, 2009

Time	Location	Attendees	Area of Focus
8:00-8:30	UPOF 107	Dr. Robin Ridgway, Director of Sustainability and Environmental Stewardship Dr. Jim Schweitzer, Director of Radiological and Environmental Management Meghan Leiseberg, Managing Director, Physical Facilities	Overview of Sustainability at Purdue
8:30-9:00	UPOF 107	Dr. Robin Ridgway, Director of Sustainability and Environmental Stewardship Erick Vanmeter, Director of Utilities Jay Schwartz, Operations/Distribution Manager-Utilities	Energy Production, Utility Distribution and Metering
9:00-9:30	UPOF 107	Luci Keazer, Senior Lab Architect/Engineer Gene Hatke, Senior Architect	LEED-NC, LABS21
9:30-9:45		BREAK	
9:45-10:15	UPOF 107	Dr. Larry Nies, Professor, Civil Engineering Dr. Leigh Raymond, Associate Professor, Political Science Dr. Elizabeth McNie, Assistant Professor, Political Science/Earth and Atmospheric Sciences	Curricula, Student Support, Research Infrastructure
10:15-10:45	UPOF 107	Erick Van Meter, Director of Utilities Jim Lefeld, Director of Renewable Energy, Duke Energy Dr. Klein Illeliji, Assistant Professor Ag and Biological Engineering Dr. Sandy Fleeter, Mcallister Distinguished Professor, Mechanical Engineering	Alternative Energy Opportunities and Research Collaboration
10:45-11:15	UPOF 107	Jim Knapp, Senior Civil Engineer Don Staley, Senior Landscape Architect John Collier, Director, Campus Master Planning	Sustainable Sites, Stormwater Management, Campus Master Planning
11:15-12:00	UPOF 107	Carmen Martin (BGI President), Rachel Huber (BGI member, energy council member), Joan Allatta (NetImpact advisor), Stephanie Williams (MBA student), Katie Jones (BGI Policy)	Student and Student Club Involvement
12:00-12:30	UPOF 107	Gary Evans, Director, Grounds Terry Ashlock, Director, Building Services Adam Krajcicek, Hazardous Materials Manager Terry Cegielski, Assistant director grounds and sustainability	Recycling, Waste Management, Waste Minimization
12:30-1:00	Lunch		
1:00-1:30	UPOF 107	Alan Leonard, Director, Service Enterprises Jim Knapp, Senior Civil Engineer Holly Alexander, Parking Facilities Manager	Transportation Services, Mass Transit, Transportation in the Campus Master Plan, Parking
1:30-2:00	UPOF 107	Blaine Miller, General Manager Building Systems Kurt Stull, Director, O&M, Building Operations and Energy Management Bob Morman, Day General Manager Terry Cegielski, Assistant Director, Grounds and Sustainability	Building Energy Management, LEED EB, Green Cleaning
2:00-2:30	UPOF 107	Larry Pherson, Director, Purchasing Services	Purchasing
2:30-3:00	UPOF 107	Keith Moore, Senior R & R and Data Program Manager Dan Schuster, Campus Energy Data Coordinator	Sustainable Energy Management Plan
3:00-3:15	UPOF 107	BREAK	
3:15-5:00	Campus Tour	Robin Ridgway, Erick Vanmeter, Jim Knapp, Terry Cegielski	

Friday, November 20, 2009

Time	Location	Attendees	Area of Focus
8:30-9:00	UPOF 107	Terry Cegielski, Assistant Director, Grounds and Sustainability Bob Mindrum, Director, Purdue Memorial Union Shelly Cochran, Director, Food Stores Jill Irvin, Director, Dining Services	Food, Dining Services
9:00-9:30	UPOF 107	Dave Musi, Utilities Engineering Group Manager Erick Vanmeter, Director of Utilities Keith Moore, Senior R & R and Data Program Manager Dan Schuster, Campus Energy Data Coordinator	Possible Energy Efficiency Incentives/Collaboration with Duke/Vectren
9:30-10:30	UPOF 107	Dr. Leigh Raymond, Associate Professor, Political Science	Sustainability in the Curricula
10:30-11:00	UPOF 107	Scott Siedel, Senior Director, Investments	Investments and Endowment
11:00-12:15	UPOF 107	Dr. Robin Ridgeway, Perrin Pellegrin, Trista Little	Debrief and Next Steps
12:30-1:30	Lunch		
1:30-2:30	Hovde 223	Al Diaz, Executive Vice President for Business and Finance and Treasurer Bob McMains, Vice President, Physical Facilities	

Purdue Strategic Sustainability Plan Facilitated Forum January 12, 2009

Introductions <ul style="list-style-type: none">• Why are we here – the big picture• November 2009 fact finding meetings briefing
Tools for Campus Sustainability Planning (Collaborative) <ul style="list-style-type: none">• Sustainability Steering Committee• Benchmarking and progress measurement
Facilitated Discovery and Prioritization Sessions (Interactive)
Break
Facilitated Discovery and Prioritization Sessions (Interactive)
Conclusions from workshop and next steps (Interactive)
Adjourn

PARTICIPANT EXIT SURVEY
Purdue Sustainability Strategic Plan Facilitated Forum

- 1) What are the two best ideas you heard today?

- 2) Please share ideas or concerns that may have been missed at today's workshop...

- 3) What next steps would you like to see in the plan development process?

- 4) Do you have other thoughts about the Sustainability Plan? They go here...

Thanks for being part of the Forum!

College Sustainability Report Card
Historical Grades
Big Ten Institutions

	Weight	1/9th	1/9th	1/9th	1/9th	1/9th	1/9th	1/9th	1/9th	1/9th	1/9th
	Overall Grade	Adminis- tration	Climate Change & Energy	Food & Recycling	Green Building	Student Involvement*	Transpor- tation**	Endowment Transparency	Investment Priorities	Shareholder Engagement	
Purdue University											
	2007 Grades	C	D	C	C	D	*	**	A	A	F
	2008 Grades	C	C	C	B	C	*	C	C	A	F
	2009 Grades	B-	C	C	B	C	C	B	A	A	D
	2010 Grades	B-	C	C	B	D	B	B	A	A	D
	Change in grade from previous year	same	same	same	same	down	up	same	same	same	same
Indiana University											
	2007 Grades	D+	D	D	D	C	*	**	F	B	D
	2008 Grades	C	C	D	C	C	*	C	C	A	D
	2009 Grades	C+	C	C	C	C	B	C	B	A	D
	2010 Grades	B-	B	B	B	C	A	C	C	A	D
	Change in grade from previous year	up	up	up	up	same	up	same	down	same	same
Michigan State University											
	2007 Grades	C	A	B	B	B	*	**	F	C	F
	2008 Grades	B	B	B	B	B	*	A	A	A	F
	2009 Grades	B	A	B	B	B	B	A	A	A	F
	2010 Grades	B	A	B	B	C	B	B	A	A	F
	Change in grade from previous year	same	same	same	same	down	same	down	same	same	same
Ohio State University											
	2007 Grades	C	C	D	C	B	*	**	B	C	D
	2008 Grades	C+	A	C	C	B	*	C	B	C	D
	2009 Grades	B	A	A	B	C	B	C	A	A	D
	2010 Grades	B	B	B	B	C	B	A	A	A	C
	Change in grade from previous year	same	down	down	same	same	same	up	same	same	up
Pennsylvania State University											
	2007 Grades	C+	A	B	A	B	*	**	F	C	F
	2008 Grades	B	A	B	A	A	*	B	A	C	D
	2009 Grades	B	B	A	A	A	B	B	C	C	D
	2010 Grades	B	A	A	A	B	B	C	C	A	D
	Change in grade from previous year	same	up	same	same	down	same	down	same	up	same

*Student Involvement added for 2009 College Sustainability Report Card

**Transportation added for 2008 College Sustainability Report Card

Prepared by: Purdue Office of Institutional Research

**College Sustainability Report Card
Historical Grades
Big Ten Institutions**

	Weight	1/9th	1/9th	1/9th	1/9th	1/9th	1/9th	1/9th	1/9th	1/9th	
	Overall Grade	Adminis- tration	Climate Change & Energy	Food & Recycling	Green Building	Student Involvement*	Transpor- tation**	Endowment Transparency	Investment Priorities	Shareholder Engagement	
University of Illinois											
	2007 Grades	C	A	B	C	A	*	**	F	C	F
	2008 Grades	B-	B	B	B	A	*	D	A	C	F
	2009 Grades	B-	B	B	B	A	C	B	A	C	F
	2010 Grades	B-	A	B	A	B	B	A	C	C	F
	Change in grade from previous year	same	up	same	up	down	up	up	down	same	same
University of Iowa											
	2007 Grades	C+	B	B	C	B	*	**	B	C	F
	2008 Grades	B-	B	B	B	B	*	A	B	C	F
	2009 Grades	B-	B	B	B	B	C	A	B	C	F
	2010 Grades	C	B	B	B	C	C	C	F	B	F
	Change in grade from previous year	down	same	same	same	down	same	down	down	up	same
University of Michigan											
	2007 Grades	B+	A	A	A	C	*	**	B	A	D
	2008 Grades	B+	A	B	A	B	*	A	B	A	D
	2009 Grades	B	B	B	B	B	C	A	A	A	D
	2010 Grades	B+	B	B	A	B	B	A	A	A	D
	Change in grade from previous year	up	same	same	up	same	up	same	same	same	same
University of Minnesota											
	2007 Grades	B-	B	B	B	B	*	**	F	C	A
	2008 Grades	B	C	B	A	B	*	A	C	C	A
	2009 Grades	B+	B	B	A	B	C	B	A	A	A
	2010 Grades	A-	A	A	A	C	B	A	B	A	A
	Change in grade from previous year	up	up	up	same	down	up	up	down	same	same
University of Wisconsin											
	2007 Grades	B	B	B	B	C	*	**	A	C	A
	2008 Grades	B+	B	B	A	B	*	A	A	B	B
	2009 Grades	B	C	C	A	B	C	B	A	B	B
	2010 Grades	B	B	C	A	B	C	A	A	B	B
	Change in grade from previous year	same	up	same	same	same	same	up	same	same	same

*Student Involvement added for 2009 College Sustainability Report Card

**Transportation added for 2008 College Sustainability Report Card

Prepared by: Purdue Office of Institutional Research

College Sustainability Report Card - Opportunities Spreadsheet

Category Grade	2010 Response	Achievement Difficulty			Comments
	Yes/No	Easy	Med	Hard	
ADMINISTRATION C					
SUSTAINABILITY POLICIES					
1) Does your school have its own formal sustainability policy?	N	X			It is unclear what kind of sustainability policy the Report Card is asking for. Is it a broad commitment? A specific type of policy for a given operational area? Given the ambiguity, this is listed as an "Easy" target because the Strategic Plan will contain numerous suggestions for sustainability policies that Purdue will feel comfortable with adopting formally. The new Sustainability Council Steering Committee can also be charged with drafting a formal broad commitment policy statement on sustainability that can satisfy this question.
2) Has the president of your institution signed the American College and University Presidents Climate Commitment (ACUPCC)?	N	--	--	--	Purdue has elected not to sign the ACUPCC, which requires a commitment of institutional resources that it cannot speak for at this time. The university supports climate protection, however it does not view the ACUPCC as the most appropriate vehicle for developing or communicating GHG reduction commitments or efforts on campus.
3) Has your institution signed the Tallories Declaration?	N	X			The Declaration is consistent with Purdue's goals and mission as a public university. It is anticipated that it will be relatively straightforward to sign the Declaration with the proper internal review.
4) Is there a sustainability component in your institution's master plan and/or strategic plan?	Y	--	--	--	
ADVISORY COUNCIL					
5) Does your school have a council or committee that advises on and/or implements policies and programs related to sustainability?	N	X			Formal invitations were recently sent out to the Sustainability Council Steering Committee.
6) Provide the name of the committee and list the number of meetings held since August 2008.	--	X			Information will be available for the 2011 Report Card.
7) Provide the number of stakeholder representatives on the committee - Admin, Faculty, Staff, Students, Other.	--	X			Information will be available for the 2011 Report Card.
8) Provide the name of the chair of committee for the 2009/10 academic year, and indicate which stakeholder group the chair represents.	--	X			Information will be available for the 2011 Report Card.
9) To whom does the committee report (e.g. president, vice president)?	--	X			Information will be available for the 2011 Report Card.
10) List key issues/programs that the committee has addressed or implemented since August 2008.	--	X			Information will be available for the 2011 Report Card.
SUSTAINABILITY STAFF					
11) Does your school employ sustainability staff (excluding student employees and interns)?	Y: Three positions	--	--	--	
12) Does the head of sustainability staff report directly to the president or another high level administrator (e.g. vice president, vice chancellor)?	Y: VP Physical Facilities	--	--	--	
OFFICE OR DEPARTMENT					
13) Does your school have an office or department specifically dedicated to furthering sustainability on campus?	Y: Office of Sustainability	--	--	--	
WEBSITE					
14) Does your school have a website detailing its sustainability initiatives?	Y	--	--	--	
GREEN PURCHASING					
15) Does your school have a formal green purchasing policy?	N	X			Purdue can tailor a purchasing policy to be as ambitious as is appropriate for the university. The Report Card does not seem concerned with what the goals are, just that a guiding policy is in place.
16) Does your school purchase ENERGY STAR qualified products?	Some: Not required but encouraged.	X			A section for ENERGY STAR items can be included in the Purchasing Policy.
17) Does your school purchase environmentally preferable paper products (eg 100% PC recycled content, certified by the Forest Stewardship Council)?	Some: Toilet paper is 90-100% recycled fiber and a min. of 75% PC waste. Paper towels are made from 70% recycled fiber.		X		This is a "Medium" target because the cost is potentially prohibitive to meet these requirements for "all" purchases. The question suggests that 100% PC recycled content constitutes "environmentally preferable". It may be difficult to justify the cost increase from 70% or 75% to 100% under this definition. Purdue can craft a purchasing policy that follows the LEED-EBOM requirements for paper products, and purchase accordingly. This should allow Purdue to claim "all" for this answer because LEED is a nationally-accepted environmental benchmark.
18) Does your school purchase Green Seal, Environmental Choice certified, or biorenewable cleaning products?	Some: In the process of converting the academic campus to Green Seal biorenewable chemicals. Have converted 1/2 of the campus and will be completely converted by end of 2009.	X			
19) Are your school's computer/electronics purchase decisions made in accordance with standards such as the EPEAT tool?	N			X	Research is required.

20) Does your school use only pesticides that meet the standards for organic crop production set by the US department of Agriculture or Canadian Organic Standards (excluding on-campus farms)?	Some: We use horticulture oil instead of insecticides.		X		Purdue can inventory its pest control chemicals and research alternatives for any pesticide that doesn't meet the Report Card requirements. Purdue can also craft an Integrated Pest Management Plan that emphasizes preventative measures (exclusion, sanitation etc) to prevent infestations. The plan would prioritize use of least-toxic products when treatment is required, and only allow toxic treatments when absolutely necessary.
CLIMATE CHANGE & ENERGY C					
GREENHOUSE GAS EMISSIONS INVENTORY					
21) Has your school completed a GHG emissions inventory?	N: But during Spring 2007 an interdisciplinary class calculated Purdue's annual carbon emissions.		X		Purdue reports GHG emissions under EPA's mandatory GHG emissions reporting rule. However, this mandate excludes significant emission sources. The university will consider doing an inventory consistent with The Climate Registry protocol.
COMMITMENT TO GREENHOUSE GAS EMISSIONS REDUCTION					
22) Has your school made a commitment to reducing GHG emissions by a specific amount?	N			X	Purdue must determine its GHG emissions before it can develop and commit to reasonable and meaningful reduction targets and strategies.
REALIZED GREENHOUSE GAS REDUCTIONS					
23) Has your school achieved a reduction in GHG emissions?	--			X	Purdue has completed a number of projects that reduce emissions. However, it can't be determined if overall emissions are increasing or decreasing - or by how much - until a GHG emissions inventory is completed. If emissions are increasing despite efficiency/conservation projects, the campus will need to pursue more aggressive strategies and implement additional projects, making this a "Hard" target.
24) Provide the total heating and cooling degree days averaged over the past three years.	Provided	--	--	--	
25) Provide GHG emission figures on a per-thousand-sq. ft basis for the past 3 years.	--		X		
26) Please provide GHG emissions figures on a per full time student basis for the past 3 years.	--		X		
ENERGY EFFICIENCY					
27) What programs or technologies has your school implemented to improve energy efficiency?	Wade utility plant, retrocx on 3 bldgs, reviewing operations of HVAC systems of 16 bldgs, looking at inefficiencies of 3 bldgs, adjusting HVAC systems operations to correspond with actual occupancy periods.	--	--	--	Purdue will continue to implement projects and programs that improve energy efficiency.
ENERGY CONSERVATION					
28) Do you facilitate programs that encourage members of the campus community to reduce energy use (eg. Cash incentives, signs to turn off lights etc)?	Y: Variety of programs. Metered residence halls, stickers on fume hoods.	--	--	--	
RENEWABLE ENERGY GENERATION					
29) Does your school generate renewable electricity?	N		X		Many detailed feasibility studies have been completed. Approval and funding issues make this a "Medium" target.
30) Does your school have solar hot water?	N		X		Solar hot water could be used as part of the condensate storage system.
RENEWABLE ENERGY PURCHASE					
31) Has your school purchased electricity from renewable sources or renewable energy credits (RECs)?	N	--	--	--	Purdue elects to fund energy efficiency/conservation projects and renewable energy projects above purchase of RECs.
32) Has your school purchased non-electric energy from renewable sources?	N	--	--	--	Purdue elects to invest in on-site use of biomass rather than purchase it.
ON-SITE COMBUSTION					
33) Provide total BTUs of energy for heating from on site combustion.	Provided	--	--	--	
34) List each fuel source and the percent of overall BTUs derived from that source.	93% Indiana coal; 7% natural gas	--	--	--	
35) Is any on site combustion for heating and cooling derived from renewable sources?	N	X			Purdue is developing a flex fuel boiler retrofit project.

FOOD & RECYCLING B					
RECYCLING OF TRADITIONAL MATERIALS					
36) Please indicate which traditional materials your institution recycles?	Aluminum, cardboard, glass, paper, plastics, pallets, motor oil, florescent lamps, metals, leaves, chemicals, batteries, tires, ballasts, monitors, solvents, brush, shop rags.	--	--	--	
RECYCLING OF ELECTRONIC WASTE					
37) Diversion rate	34.2%	--	--	--	
38) Does your institution have an electronic recycling program?	Y: Computers, batteries, light bulbs, printer cartridges, other e-waste.	--	--	--	
COMPOSTING (ASIDE FROM DINING FACILITIES)					
39) What percentage of your campus's landscaping waste is composted or mulched?	100%	--	--	--	
40) Do you provide composting receptacles around campus in locations other than dining halls?	Y: There are composting bunkers located in several academic areas. These bunkers are serviced regularly and taken to the centralized compost area in the gravel pit.	--	--	--	
SOURCE REDUCTION					
41) Do you have any source-reduction initiatives?	Y: Project Move Out at the end of the school year, trayless day in the dining facilities, university warehouse for surplus.	--	--	--	
GREEN BUILDING D					
GREEN BUILDING POLICY					
42) Does your school have a formal green building policy?	N	X			The Strategic Sustainability Plan will advocate for the adoption of a green building policy.
GREEN BUILDING STANDARDS					
43) Indicate LEED certified buildings.	0	X			Gateway addition will be the first LEED project.
44) Indicate buildings that meet LEED certification criteria but are not certified.	0	X			
45) Indicate buildings that are ENERGY STAR labeled.	0		X		Purdue's building metering program will enable this.
RENOVATIONS AND RETROFITS					
46) Indicate LEED EB certified buildings.	0			X	This is a "Hard" target in terms of getting funding and approval, especially in the current budgetary environment. Staff to do the project are also not apparent.
47) Indicate buildings that meet LEED EB certification but are not certified.	0	--	--	--	Purdue does not want to guess at whether a building meets EBOM criteria or not.
48) Indicate renovated buildings that are ENERGY STAR labeled.	0		X		Purdue's building metering program will enable this.
49) What energy efficiency technologies have you installed in existing buildings?	T8 lighting, incandescent to fluorescent, dimmers, timers on HVAC, occupancy sensors.	--	--	--	
50) What water conservation technologies have you installed in existing buildings?	Low flow plumbing fixtures, 1/8 gallon urinals, cooling systems to chilled water, flow restrictors and dual flush valves on existing plumbing fixtures.	--	--	--	
51) What percentage of your institution's non-hazardous construction and demolition waste is diverted from landfills?	0	X			Purdue recycles all construction fill and concrete, but not the waste materials from the construction project itself. The university will need to develop protocol for tracking and quantifying diverted materials, and research opportunities to divert additional materials types.

STUDENT INVOLVEMENT B					
RESIDENTIAL COMMUNITIES					
52) Are there any sustainability themed residential communities or housing options at your school?	N			X	Given the financial situation and that there is likely a small pool of students interested in sustainability-themed living, making this is a "Hard" target. This question is also insinuating that its not just a demo room or suite, its an entire residence hall or house. Having a themed house or res hall is only workable when there are a lot of interested students.
NEW STUDENT ORIENTATION					
53) Does a portion of your new student orientation specifically cover sustainability?	Y: An informative brochure is handed out to all new incoming students, as well as several PSA's that are aimed at new students.	--	--	--	While question 52 may be hard, a green demonstration room or suite in a residence hall that is sustainability themed has much potential. UC Berkeley has this sort of program, where all freshman tour the green dorm where they are introduced to low cost, easy ways to be green such as energy star appliances, environmentally preferable personal care products, etc.
INTERNSHIP/OUTREACH OPPORTUNITIES					
54) Does your school offer on-campus office-based sustainability internships or jobs for students?	Y: 2 paid positions	--	--	--	
55) Does your school have residence hall Eco-Reps or other similar programs to promote behavioral change on campus?	N	X			Purdue is discussing setting up departmental "sustainability committees" modelled after its highly successful safety committee program.
STUDENT ORGANIZATIONS					
56) Does your school have active student-run organizations devoted to sustainability efforts on campus?	Y: Several listed	--	--	--	
SUSTAINABILITY CHALLENGES AND COMPETITIONS					
57) Does your school organize any sustainability challenges/competitions for your campus and/or with other colleges?	Y: Initiated 2008. Fall and spring, 4 residence halls to reduce energy, water and waste. Started a water bottle program.	X			
TRANSPORTATION B					
CAMPUS MOTOR FLEET					
58) How many vehicles are in your fleet?	178	--	--	--	
59) List the number of alt fuel vehicles.	28 hybrid (Chevy Malibu), 0 electric, 9 biodiesel, 2 smart cars, 114 flex fuel.	--	--	--	
60) What is the average GHG emissions rate per passenger mile of your institution's motorized fleet?	.76 lbs CO2e	--	--	--	
LOCAL TRANSPORTATION ALTERNATIVES					
61) Does your school offer incentives for carpooling?	Y: Boilerride program facilitates carpooling.		X		Purdue will consider opportunities to directly incentivize carpooling.
62) Does your school offer public transportation subsidies?	Y: Bus is free	--	--	--	
63) Does your campus provide free transportation around campus?	Y: Bus is free	--	--	--	
64) Does your school operate free transportation shuttle to local off campus destinations?	N: But no charge for regular citywide bus transport.	?	?	?	
BICYCLE PROGRAM					
65) Does your school offer a bicycle sharing/rental program or bicycle repair shop?	N			X	Purdue piloted a bike sharing program that had problems with mechanical issues and stolen bikes. A student-run bike repair shop has a higher likelihood of happening but requires someone to champion it and students committed to running it.
CAR-SHARING PROGRAM					
66) Does your school partner with a car share program?	N			X	There is not a great deal of interest in this at Purdue.
PLANNING					
67) Does your school have policies that support a pedestrian friendly or bike friendly campus (e.g. in the schools master plan, a policy prohibiting vehicles from the center of campus)?	Y: TDM plan being developed.	--	--	--	
68) What percentage of individuals commute to campus via environmentally preferable transportation	10%	--	--	--	

STATISTICS					
69) Campus setting	Suburban				
70) Total buildings	375				
71) Combined gsf	11,568,009 ASF				
72) FT enrollment (undergrad and grad)	36,901				
73) Part time enrollment	3,189				
74) Part time enrollment as a proportion to a full time course load	--				
75) Percent of FT students that live on campus	98%				
OTHER AREAS OF ENVIRONMENTAL ENGAGEMENT					
76) Outdoors club	Y				
77) Disposable water bottle ban	N	--	--	--	Purdue elects not to implement a bottle water ban. The university supports the use of reusable bottles by selling them, giving them to freshman students free of charge, and setting up filtered water refilling stations. Eliminating bottled water for sale is likely to increase purchases of less healthy drinks, since those are the other options in the absence of bottled water.
78) Participation in Recyclemania	N	X			Recyclemania will start January 2010.
79) Student trustee position	Y				
80) Environmental science/studies major	Y				
81) Environmental science/studies minor or concentration	Y				
82) Graduate-level environmental program	Y				
83) Student green fee	N			X	Student support for this is currently low.
84) Alumni green fund	N			X	
85) Revolving loan fund for sustainability projects	N			X	The question asks that the fund be used for sustainability projects, not just energy efficiency projects. These typically have lower paybacks than energy efficiency projects to be redirected into the fund. The current fiscal situation makes this this a difficult endeavor at this time.
86) Campus garden or farm	Y				
87) Single-stream recycling	Y				
ENDOWMENT SURVEY					
SHAREHOLDER ENGAGEMENT D					
1) How does your school handle proxy voting on environmental, social, and governance issues?	Purdue Board of Trustees approved investment policy instructs our Custodian to vote our proxies.			X	The Green Report Card website says that the average grade in the Shareholder Engagement category is a D, so Purdue is in good company. There is a list here of colleges that received an A: www.greenreportcard.org/report-card-2010/categories/shareholder-engagement/leaders . Purdue can review the practices of these institutions to see if any could be workable at Purdue.
2) If you answered "g" or "h" to question 1, please provide the following information about the committee: Name of committee: Number of meetings held since August 2008: Name of chair(s): Position of chair : To whom does the committee report: Number of administrators on committee: Number of alumni on committee: Number of faculty on committee: Number of staff on committee: Number of students on committee: Number of trustees on committee:	--			X	
3) Please indicate what information about proxy voting records is made available to each of the groups listed under "Your answers" (select all that apply): (a) No information is made available (b) Votes cast on proxy resolutions only by category (and not company specific) (c) Votes cast on proxy resolutions on a company-specific level (d) Votes cast on proxy resolutions on a company-specific level, including the number of shares	B, C, D - Information is made available upon request	--	--	--	
4) Where is information about proxy voting records made available?	C - Information is sent to individuals upon request.	--	--	--	

ENDOWMENT TRANSPARENCY A					
5) Please indicate what information about endowment holdings is made available to each of the groups listed under "Your answers" (select all that apply): (a) No information is made available (b) Asset allocation (c) List of external managers (d) List of mutual funds (e) Equity holdings (f) Fixed income holdings (g) Real estate holdings (h) Hedge fund holdings (i) Private equity holdings (j) Venture capital holdings (k) Natural resource holdings (l) Cash (m) Other holdings (please specify) (n) All holdings	Available to trustees, senior administrators, and other select members of the school community: N Available to all members of the school community, including faculty, staff, students, and alumni: N – Except information exempt from public open record law by Indiana code: SECTION 3. IC 20-12-1-13 Available to the public: N – Except information exempt from public open record law by Indiana code: SECTION 3. IC 20-12-1-13	--	--	--	
6) Please indicate where information about endowment holdings is made available to the school community and to the public: (a) Information is not made available. (b) Information is available at the investment office or similar office on campus. (c) Information is sent to individuals upon request. (d) Information is on the school website with password protection. (e) Information is on the school website and is accessible to the public.	To the school community: C – per a public record request To the public: C – per a public record request	--	--	--	
INVESTMENT PRIORITIES A					
7) Is your school currently invested in any of the following areas? (Please list all that apply.) (a) Renewable energy funds or similar investment vehicles (b) Community development financial institutions or community development loan funds (c) On-campus energy and/or water efficiency projects through the endowment (as an investment and not a payout) (d) None of the above	A - Renewable energy funds or similar investment vehicles.				
8) Is your school currently exploring investment in any of the following areas? (Please list all that apply.) (a) Renewable energy funds or similar investment vehicles (b) Community development financial institutions or community development loan funds (c) On-campus energy and/or water efficiency projects through the endowment (as an investment and not as a payout) (d) None of the above	A - Renewable energy funds or similar investment vehicles.				
9) Does your school have any investment policy provisions, or use any investment managers, that consider environmental/sustainability factors? (a) No (b) Yes (please describe) (c) Currently under consideration (please describe)	Y: some of the Endowment's investment managers invest in clean energy and alternative fuels				
10) Does your school offer donors the option of directing gifts to an investment fund that considers environmental/sustainability factors? (a) No (b) Yes (please describe) (c) Currently under consideration (please describe)	N				
11) Please provide total endowment value as of the following dates:	6/30/2008: \$1,736B 9/30/2008: \$1,645B 12/31/2008: \$1,414B 3/31/2009: \$1,320B				

Site Considerations

Area Overview

1.1.1 Master planning and land use

- The West Lafayette campus of Purdue University grew from a Beaux Arts core which is now most evident in its northeast quarter. The agricultural campus developed south of this core and, as time passed, expanded to the west. Student housing developed west of the academic campus and recreational facilities occurred west of student housing. Classrooms are concentrated within a ten minute walking distance, the time between classes. Since the mid-1980s, pedestrian malls and green space have replaced extraneous vehicular traffic and parking in key pedestrian areas within the campus core. Service and facilities operations are moving south of campus on land which was formerly mined for gravel. Recent developments include the research focused Discovery Park west of the agricultural campus and, the northwest athletic facility on the uplands northwest of campus.
- Identifying a Central loop is underway.
- Arboretum designation for entire campus grounds. The mission of The Purdue Arboretum is to collect and display woody landscape plants from around the world in a way that enhances the educational, research, and outreach mission of Purdue University, promotes environmental sustainability, and increases the beauty of the Purdue campus.

1.1.2 Transit

- The university utilizes City Bus of Lafayette for campus bus service. Students and staff ride free with a Purdue ID. There are a number of campus-only loop routes as well as routes connecting campus to the greater community.
- Physical Facilities operates a free taxi service for staff and utilizes Club Cars for campus travel. Eighty percent of campus rental vehicles are flex fuel and 20% are hybrids. The entire campus fleet uses either B10 biodiesel (10% biofuel, 90% petrol) or E10 (10% ethanol, 90% petrol) which is purchased off campus.
- Transportation demand management study is in progress
- In response to national concerns regarding dependency on foreign oil, energy conservation, and environmental impact, Transportation Service has taken the initiative to recycle whenever possible, and to consider the use of alternative fuels, flexible fuel vehicles, and hybrid vehicles.
 - In 2004, Transportation Service began to stock B2 Biodiesel (2% biodiesel and 98% petroleum diesel). Biodiesel contains no petroleum, but it can be blended at any level with petroleum diesel to create a biodiesel blend. Since it is made in the United States from renewable resources, such as soybeans, its use decreases the dependence on foreign oil and contributes to the economy. The successful acceptance and performance of B2 Biodiesel, lead Transportation Service to bump up to a B5 Biodiesel blend (5% biodiesel and 95% petroleum diesel) in August of 2006. Purdue research results indicated that fuel containing 10 percent biodiesel will reduce pollution without compromising fuel economy (Purdue News Service, ShaferIndyGo, 9/8/08). Therefore effective September 2008, Transportation received approval to move to B10 for general vehicle use. Currently, diesel-powered vehicles such as buses, coaches, fire response vehicles and large service trucks are using B10 Biodiesel.

- Transportation Service took an additional step in 2005 in the use of alternative fuels with the move from regular unleaded gasoline to Gasohol or E10. E10 is a blend of 10% ethanol and 90% unleaded gasoline, and is the current blend being dispensed.
- The focus has not been limited on energy fuels alone. Transportation Service began purchasing flex-fuel vehicles in 2004. Flex-fuel vehicles operate using unleaded gasoline, or E-85, a blend of 85% ethanol and 15% unleaded gasoline. The first hybrid cars were added in 2006 to the Purdue fleet. The car fleet is currently comprised of 100% flex-fuel and hybrid units. Their performance has been monitored via data collection and customer feedback.

Cars	Number	Type	%
Flex-Fuel	78	Chevy Impala	72%
Hybrid	28	Chevy Malibu	26%
Electric	2	SmartCars	2%
Total Cars	108		100%
Vans	Number	Type	%
Flex-Fuel	36	Various sizes, makes	55%
Regular	29	Various sizes, makes	45%
Total Vans	65		100%

- Parking spaces to be reallocated over time (describe plans to better utilize existing lots and remove others)
- In a proactive step to promote alternative transportation to and from campus for students, faculty and staff, a carpooling initiative called BoilerRide was launched in March 2009. BoilerRide is a web-based, geographic information system, ride-matching application. This program encourages carpooling by making it easy for Purdue staff and students to find ride-sharing partners.

1.1.3 Stormwater

- Purdue recently completed a storm water master plan. Harrison Pond, in the former gravel mine south of campus, receives 90% of campus storm water runoff.
- Pollutants are a concern because Purdue has five to seven wells on the west side of campus and the pond is thought to contribute to their source. A portion of campus along Northwestern Avenue contributes to West Lafayette’s combined sewer system.
- New developments on campus must comply with NPDES phase II standards as well as Indiana Department of Environmental Management (IDEM) rule five and rule 13 requirements.
- Best management practices installed on campus include infiltration beds beneath two new football practice fields and surrounding parking lots; bioswales at Pao and Mann Halls; and porous paving at the Horticulture Building, the west side of the stadium parking lot, and at the Rush Memorial on Centennial Mall.
- The Purdue Research Foundation installed a porous parking lot at Third and Russell streets adjacent to campus.
- The student led Boiler Green Initiative installed a green roof with storm water data recorders on Schleman Hall in 2009.

1.1.4 Site operations and maintenance

- Campus organic waste from grounds operations is delivered to Soilmaker, a recycling operation on leased university-owned land. Compost and topsoil is then purchased from Soilmaker for use on campus.
- In response to a waste stream study commissioned by the Physical Facilities Department of Buildings and Grounds, comingled recycling receptacles were distributed across campus in 2009.
- Masonry demolition materials are stockpiled in the former gravel mine area and crushed for use as construction aggregate.
- A de-icing brine (beet juice derivative) is used to reduce salt applications on streets during winter storms.
- Smoking is not permitted within 30 feet of campus buildings.

1.1.5 Urban Forest

- Approximately 8,000 trees are currently maintained on campus. Approximately 150 new and replacement trees are planted annually. The Tree Protection and Trimming Policy governs procedures to protect existing trees and replace those damaged by construction. Purdue was designated a Tree Campus USA by the National Arbor Day Foundation in 2009. The Purdue campus was formally established as The Purdue Arboretum in spring 2009. Efforts are currently underway to identify and eradicate invasive plants on campus.

Opportunities

1.1.1 Master planning and land use

- Currently, a transportation demand management study is underway. The campus bicycle system includes marked connector bikeways with adjacent parking which is surveyed and adjusted twice each year. While there is an excess of bicycle parking on campus, demand has increased dramatically in recent years. Efforts are also underway to connect campus routes with the city's shared-use trail system.
- Locate the Grounds Department and Transportation Services in the same area to enable resource sharing and prevent duplication of infrastructure – parking space, vehicles, gas pumps, maintenance garage area and equipment etc.
- Targeted turf replacement where not programmatically necessary and where campus community is not likely to resist the change
- Increase density on existing developed footprint
- Maintain and enhance walkability of campus
- Develop State Street as a mixed use, collaborative research spine
- Orient future buildings to maximize passive energy utilization
- Protect open space west of campus to the extent possible
- Concentrate vehicular movement and parking around future perimeter parkway and prioritize transit, bicycle, and pedestrian circulation within campus core
- Locate the Grounds Department near Transportation Services to minimize distance for fueling and maintenance
- Develop the Northwest Athletic Complex site to maximize ecologic function and connect adjacent, fragmented forest tracts.

1.1.2 Transit

- Expand alternative transportation programs: park and ride using existing community/commercial parking lots; Zipcar; explore value of a vanpool program

- Expand connections to the community – develop incentives for staff to utilize mass transit and to reside closer to the university and local community in order to reduce vehicular commuting
- Establish an internal campus transit loop
- Vehicle purchases: look into plug-in electric vehicles, develop purchasing guidelines and minimum fuel efficiency requirements by vehicle type
- Develop an inventory for greenhouse gas emissions related to transit (staff/faculty/student commute; university-sponsored air travel; university fleet) and develop a program for tracking data and reporting annually
- Install on-campus pumps for E85 to increase utilization

1.1.3 Stormwater

- Explore opportunity for using storm water as makeup water for the south cooling tower.
- Explore reusing blowdown water from the Satellite Chiller Plant as makeup water to reduce sewer loading.
- Prioritize capture and infiltration of roof runoff along Northwestern Avenue (city CSO area)
- Prioritize capture and infiltration of parking and street runoff in other parts of campus
- Maximize reuse and infiltration of storm water as close to rainfall site as possible

1.1.4 Site operations and maintenance

- Expand anti-idling policy currently applicable to grounds and police department to all service vehicles campus-wide
- Evaluate current integrated pest management (IPM) program and policy to consider compliance with EBOM requirements to support LEED certification
- Continue to research a switch to propane for grounds maintenance equipment when equipment comes to end of its useful life.
- Continue to research battery-powered equipment that still meets the criteria needed to maintain the Purdue campus.
- Make use of resources available onsite by using mulch generated through landscape maintenance practices; limit use of virgin mulch to only the most high-profile areas of campus, or consider a ban
- Redirect well flush water for irrigation, chillers, or infiltration (45,000 gal/flush)
- The Airport plans to convert airfield lighting and signage to low energy LED fixtures
 - Using federal funding, convert the runway and taxiway lights and guidance signage system to LED fixtures, which consume 75% less power than the current fixtures and require significantly less maintenance. There is the possibility of 100% federal funding being available in 2010 that we plan to try and get for this purpose
- “Chain of custody” certified papers. Printing Services is in the process of FSC (Forest Stewardship Council) certification. This certification ensures that Printing Services will not utilize papers derived from old-growth forests or from trees that if harvested, would harm wildlife.

Water Resources

Area Overview

2.1.1 Site water

- Purdue sits on an incredibly prolific aquifer called the Teays River Valley and enjoys a low-cost high quality water supply (\$1.04/1,000 gallons)
- Some programs are under way to install low flow fixtures in buildings throughout campus. These projects serve a dual purpose:
 - They reduce the amount of potable water required for building use and
 - Reducing the amount of waste water leaving campus and going to the local POTW decreases Purdue's cost to dispose of wastewater.
- Campus Irrigation system overview: The total number of irrigation systems on campus is 60 systems with 500+ valves. Of this number 26 are new technology and the rest are up to 30 to 40 years old using some very old basic technology. When we say smart technology were talking about the control system. "Smart" sprinkler controllers reduce outdoor water use by monitoring and using information about site conditions (such as soil moisture, rain, wind, slope, soil, plant type, and more), and applying the right amount of water based on those factors—not too much and not too little—to maintain healthy growing conditions. We are currently using 2 new soil sensors and 7 new rain sensors but all of our systems can be retrofitted that are the newer type. The sensors can help eliminate over watering, by automatically adjusting to the current weather conditions. It is the simplest and most effective way to turn the newer controllers into "smart controllers". Current irrigation technology and practices have made "smart" irrigation and control an important part of the landscape irrigation industry. Adopting water savvy habits and utilizing efficient irrigation products not only helps reduce water waste, but also saves money while promoting a healthier lawn and landscape. Smart Control technology automatically adapts to changing weather conditions to provide a landscape with the right amount of water all season long. Sound water delivery and management practices are necessary to distribute water to adequately maintain plant health while protecting water resources and the environment. Other benefits of the "smart control technology is during hot weather, plants require more water than during cooler periods. "Smart" controllers adjust the amount of water applied accordingly. If significant rainfall occurs, rain sensors compensate by reducing the amount of water as appropriate. If you have a soil type that absorbs water very slowly or a property with steep slopes, "smart" controllers will use that information and apply less water, more frequently, to minimize run-off.

Opportunities

2.1.1 Site water

- Older portions of the irrigation system can be updated to a weather-sensing system with central controls. About 50% of the existing systems need upgrading.

2.1.2 Building water – regulated and process

- All buildings are metered for water. This includes deduct meters for water diverted to the storm sewer system for purposes of preparing our own bill for WL POTW for actual sanitary treatment.
- Metering is currently read by a radio transmitter system and converted to Excel.

- Single point reads and web based system is under construction. This will allow campus access to data.
- Adopt minimum flush and flow requirements for all water-using fixtures (lavatories, toilets, urinals and showers) purchased for new construction and retrofits
- Pilot waterfree urinals and dual-flush toilets

2.1.3 Infrastructure water

- Explore opportunity to use stormwater in the cooling tower to offset potable water use
- Explore opportunities to reduce the amount of water entering the sanitary system to reduce costs: e.g., satellite chiller plant blow down water.
- Develop and implement a cooling tower water management plan that results in optimal water efficiency and chemical usage
- Expand chilled water loop system wherever possible to eliminate the need for potable once-through cooling water.

2.1.4 Resource conservation and protection

- Promote water conservation at Green Week and other campus sustainability related events
- Work with students to perform water audits on an older, middle aged and newer building (or administrative, light research and heavy research) to develop baselines for water efficiency improvements over time
- Capitalize on synergies with Wellhead Protection Program and protection of groundwater resources
- Include educational component in the metering project by publicizing water usage data via the sustainability website so that it is readily available.

Built Environment

Area Overview

3.1.1 Green building certification

- The first project to pursue LEED certification is the Roger Gatewood Wing of Mechanical Engineering, which is tracking Gold.
- Twelve staff within the Physical Facilities Department are LEED Accredited Professionals. LEED-APs in the Office of the University Architect evaluated in-depth the credits required to achieve LEED certification with respect to a typical new building project on the West Lafayette campus. An appropriate level of effort and achievement was defined for each LEED credit, to be confirmed on a case-by-case project basis. Current university design and construction standards already support the prerequisites and many credits. It is feasible to recommend LEED certification for most projects, and silver or gold levels are attainable with a reasonable amount of effort.
- Based on two LEED registered projects on a silver/gold track, less than 1% of the total project cost could be attributed towards LEED certification. These costs include LEED consulting, A/E premiums for LEED efforts, energy modeling (though becoming standard), and contractor LEED costs. Not included in LEED costs are high-performance building elements such as fundamental and enhanced commissioning, energy optimization strategies, measurement and verification of energy, lighting and thermal comfort controls, water efficient landscaping and fixtures, and innovative design initiatives. These are selected based on their value to a project over the building life-cycle, regardless of LEED certification. Our goal is a well designed and constructed sustainable building, not chasing points.

3.1.2 Building Operations

- Retro-commissioning of academic buildings for energy efficiency (e.g. fine tuning the mechanical systems to reflect changes in building use).
- The "Black & Gold & Green" environmentally safe cleaning program, which is based on bio-renewable chemistry instead of petrochemicals. Our pilot program is expanding beyond Discovery Park.
- Green Cleaning "Best New Program" Award Highlighted in American School & University Magazine: As noted in a November 2009 report, Purdue University was selected as the winner of the Best New Program award in the Universities category of the 2009 Green Cleaning Award for Schools & Universities. This award is sponsored by American School & University magazine. In recognition of this honor, Purdue's program was highlighted in a recent issue of American School & University magazine. An article describing Purdue's award winning program may be accessed at <http://asumag.com/green/purdue-university-200912/>.
- Partnering with Intercollegiate Athletics and the student organization Boiler Green Initiative to remove recyclables from Ross-Ade Stadium during football season.
- Replacement of older T-12 fluorescent lights with more energy efficient T-8 lighting.
- Carbon dioxide sensors that tell systems when lecture halls are empty, and occupancy sensors that signal when restrooms are not being used, lessening the need for air treatment in those areas.
- Use of soy-based hydraulic oil in elevators.
- Recycling programs that capture and divert paper, cardboard, metal, plastic, glass, wood, e-waste, batteries, and construction debris. There are more than 200 Recycling Centers

strategically placed in buildings across campus, along with recycling containers that collect office paper in another 1500 work areas.

- Use of environmentally preferred products like low VOC-emitting paints, carpeting and resilient flooring made from "green" resources, new technology emergency lighting, can liners, hand towels and mop heads made from recycled materials.

3.1.3 Construction best management practices

- All construction requirements are outlined in the University's Consultant Handbook

3.1.3 Building energy

- The West Lafayette Campus Utilities are supplied by the Wade Utility Plant. Wade is a combined heat and power facility that houses four (4) boilers. Three are coal-fired and one is gas/oil fired. Wade provides most of the heating steam, chilled water supply and on average 60% of the electricity used by campus.
- Purdue has been making electricity as a byproduct at its power plants for over 100 years using the highly efficient combined heat and power co-generation process. Though the primary purpose of the plant is to provide steam for heating and cooling the campus, we take advantage of the fact that we can get energy out of the high pressure steam from our boilers before it is sent out to campus buildings at a lower pressure.
- We run the higher pressure steam through our turbine generators to lower the pressure and make electricity at the same time. In this way, electricity at Wade can be produced at over 60% efficiency as compared to a commercial utilities' 35% efficiency...and it saves the University money at the same time. This high efficiency energy production also results in decreased conventional pollutant and carbon emissions on a unit of useable energy basis.
- The following is a description of the equipment in the plant:

- Steam Generation Capacity: Approximately 800,000 PPH

TWO STEAM GENERATORS Coal-fired:

Each unit capacity 200,000 lb. steam/hr.

Operating conditions: Pressure: 650 psig temperature: 825 degrees F.

Spreader stokers handling coal, at full load: Approximately 300 tons/day for each unit.

Maximum coal demand approximately 600 tons/day for the plant.

ONE STEAM GENERATOR - Oil & Gas-fired:

Unit capacity 200,000 lb. steam/hr.

Operating conditions: Pressure: 650 psig temperature: 750 degrees F.

Designed for #2 fuel oil, at full load approximately 39 gallons per minute.

Natural gas delivered to burners at 15 psi 300,000 cubic feet per hour at full load.

ONE STEAM GENERATOR COAL FIRED FLUIDIZED BED (Boiler #5)

Unit capacity 200,000 lb. steam/hr

Operating conditions: Pressure: 650 psig temperature: 810 degrees F. Crushed / air swept coal stoked. Approximately 300 tons/day of coal and 108 tons/day of limestone maximum.

Wade's Boiler #5 is a circulating fluidized bed boiler, a clean coal technology boiler design that came out of the Department of Energy's Clean Coal Program in the late 1980's. This boiler was purchased in 1989 and allows the use of Indiana coal as its fuel but has very low emissions. In keeping with Purdue's forward thinking approach to its

utility infrastructure, even years later, Boiler #5 is still the only operating CFB boiler in Indiana. And we are currently replacing one of our older and less efficient stoker boilers with a 2nd fluidized bed boiler to make the Purdue Utility Plant even more environmentally friendly and continue to be a leader in clean coal technology

- Power Generation Capacity: 42.8 Megawatts

TWO TURBINE/GENERATOR FOR ELECTRICITY:

1) Back pressure unit: Capacity 11000 KW

Generator output at 12,500 volts.

Turbine can supply extraction steam at 125 psi. and 15 psi. exhaust

Turbine throttle valve inlet operates at 600 psi and 825 degrees F.

2) Combination condensing/extraction turbine/generator: Capacity 30000 KW.

Generator output at 12,500 volts.

Turbine can supply extraction steam at 125 psig.

Turbine throttle valve inlet operates at 600 psig and 825 degrees F.

Turbine can admit steam at 15 psig.

ONE DIESEL FIRED GENERATOR FOR ELECTRICITY:

Unit Capacity 1800 kw

Generator output at 12,500 volts.

- Chilled Water Capacity: 28,750 Tons

NINE WATER CHILLERS:

Five electric-driven centrifugal compressors 2,000 tons each

One turbine-driven centrifugal compressor 5,000 tons 125 psi to condensate.

One turbine-driven centrifugal compressor 6,250 tons 650 psi to condensate.

One turbine-driven centrifugal compressor 3,000 tons 125 psi to condensate.

One turbine-driven centrifugal compressor 4,500 tons 125 psi to condensate.

- In 2007, Purdue completed the replacement of some 40 year old pollution control equipment with the installation of a state of the art emissions control system on Boiler #2. This new system consists of a fabric filter or “baghouse” and an innovative flue gas cooling system. The system controls particulate matter and mercury emissions by capitalizing on the unique temperature-dependent behavior of mercury. Ours is one of only a few installations of its kind in the United States and is an excellent example of how our thorough understanding of our boiler’s unique characteristics allows us to create high-performance solutions

- Wade Utility Plant statistics:

Wade Utility Overall Budget (Fiscal year 2008-09)	\$14,641,484
Number of Employees	70
Coal Consumed	168,050 Ton
Limestone Consumed	11,647 Ton
Natural Gas Wade	43,580 MCF

Ash Generated	25-30K Ton
Steam Generated	2,935,296 Klb
Peak Steam Load	541.145 Klb.
Export Steam to Campus	1,373,364 Klb.
Peak Export Steam	378.1 Klb/hr.
Chilled Water Production to Campus	90,104,767 ton-hr
Peak Chilled Water Load to Campus	26,900 ton
Electricity Consumed on Campus	291,628,081 kWh
Electricity Generated	95,548,910 kWh
Electricity Purchased	196,079,171 kWh
Peak Campus Electrical Load	47,800 MW
Natural Gas Used on Campus	91,120 MCF
Potable Water Consumed on Campus	1039 Mgal.

- Purdue mandates commissioning for all newly constructed buildings, with commissioning agent engaged and active during the design.
- New or renovated laboratories are designed and constructed using LABS21 energy efficient approaches.
- Fume hood energy conservation stickers display the resulting energy savings and reduced carbon footprint when users close sashes of variable air volume fume hoods.
- Energy reduction opportunities in laboratories are prioritized for future energy cost savings projects.
- All new buildings are designed to meet the minimum energy efficiency requirements of ASHRAE Standard 90.1 – latest version.
- Campus-wide metering project is underway – Phase 1 targets large buildings Over 100k square feet that use 60% of campus energy. HFS and ATHL buildings are the main part of PH 2 targets with a completion date anticipated to be within the next several years.
- Receiving proposals with the remaining buildings following as ECI funding comes available. Meter inventory to select Energy Enterprise System – this system will integrate meter information and allow us to analyze real-time consumption.
- Completing pilot projects to establish individual building control sequence of operations, recommend, and implement changes.
- The West Lafayette campus will complete its second year of retro-commissioning this spring.
 - The first year focused on developing the process, implementation team, and documentation and included an extensive analysis of Peirce Hall, Beering Hall, and Stone Hall. Results for these three buildings uncovered an average energy reduction of 46 MBtu/ft². 75% of the conservation opportunities identified during the first year have been implemented while the remaining measures are either in construction or design

- development. To date, the actual savings are exceeding the expected reductions by approximately 4%.
- The second year of retro-commissioning will be complete May 2010 and consists of extensive analysis of the Mechanical Engineering Building, Mathematical Sciences Building, and Hansen Life Sciences Research Building. Also included in this second year program is a controls optimization portion for sixteen additional facilities which identifies inefficiencies in the energy management system algorithms. Currently, this program has identified an average of 32 MBtu/ft² in energy savings opportunities.
 - In addition to the energy reduction measures, the retro-commissioning analysis has uncovered water conservation opportunities that are being applied campus-wide.
 - During the past year 20 buildings have had the flush valves for all water closets and urinals retrofitted with flow restrictive devices. Based on initial testing, these devices are expected to yield domestic water savings in the range of 15-20%.
 - Once-through systems that utilize domestic water as a cooling source have been identified to convert to the campus chilled water system resulting in savings in excess of a million gallons a year for one facility.
 - Water conservation audits have been performed on many of the campus' largest consumers of domestic water with many measures being implemented to curb process usage.
 - In response to the results revealed during the retro-commissioning process, many additional conservation analyses have been initiated.
 - A thorough comparison of occupancy and air-handling unit schedules has been performed and are continuously being modified and adjusted to minimize conditioning of unoccupied areas.
 - Cooling coil sequences are being modified to minimize simultaneous heating and cooling occurrences.
 - Control loops are being re-calibrated or tuned to reduce overshooting scenarios.
 - A Semi-annual competition to reduce electricity and water use is conducted in four residence halls.
 - Boiler Green Initiative student club received a grant and installed energy stickers at light switches in two classroom buildings, monitoring use before and after sticker installation.
 - Students in architectural engineering classes are conducting building audits and providing conservation recommendations.
 - Engagement of student interns with engineering groups within Physical Facilities.
 - Schleman Hall's balcony is the site of a recently installed green roof.
 - With the help of a \$68,700 grant and Purdue University architects, Boiler Green Initiative led the way on this project. Soil moisture probes, rain gauges, and temperature probes powered by a solar panel will measure water levels to determine the plants' absorption of rainwater.
 - Multiple buildings evaluated structurally for possible green roof installations
 - All new installations of the Purdue "Gothic" exterior light fixture will be LED rather than HPS. Reducing the wattage of the fixture by approximately 75W and reducing maintenance costs. First installation of the new fixture took place along the sidewalk North of Mollenkopf (11 total fixtures). 9 fixtures are to be installed adjacent to the ME Gatewood Addition.
 - Armory Parking lot – will be installing LED lighting .
 - Encouraging the use of LED lighting, on a limited basis, in new buildings and in select renovation projects.

- The process has begun to replace University Residences' existing 2.5 gpm shower heads with 1.75 gpm shower heads to experience an immediate water consumption reduction of thirty percent
- The process has begun to replace University Residences' existing 2.2 gpm faucet aerators with 0.5 gpm faucet aerators to experience an immediate water consumption reduction of seventy-seven percent
- An aggressive Preventive Maintenance Program has been implemented for University Residences' HVAC and refrigeration cooling equipment to ensure the systems are clean and well maintained while providing energy optimization

3.1.4 Campus Renewable Energy

- The Beck Agricultural Center has a small photovoltaic systems installed as part of its conference center.

Opportunities

3.1.1 Green building certification

- Pilot a LEED-EB: O&M project where occupants are willing to support sustainability goals
- Adopt minimum certification requirements for new construction buildings over a certain square footage or budget – LEED-NC Silver
- Adopt minimum certification requirements for tenant improvement projects over a certain square footage or budget – LEED-CI Certified

3.1.1 Construction best management practices

- Develop construction waste diversion guidelines for contractors and minimum diversion requirements
- Develop a construction indoor air quality management guideline for contractors to protect IAQ in new construction and renovation projects

3.1.3 Building energy

- Energy efficiency guideline to exceed ASHRAE 90.1 by at least 20% for new building projects.
- Senior staff engineers and architects are evaluating ASHRAE 189 Standard for High Performance Green Buildings for adoption if formally approved in summer 2010 as expected.
- EnergyStar benchmarking – calculate EnergyStar scores for a subset of campus buildings to develop baselines for different building types and to compare to the national average.
- Purdue's Wade Utility Plant and its utility distribution system has set a goal to participate in a DOE/EPA partnership as a pilot facility to become certified as a high-efficiency system; similar to the existing Energy Star program
- Develop a measurement and verification plan to complement the metering project
- Research facility operation
- Additional green roof installation on Mann.
- Enhance and expand Purdue Energy Conservation Program by additional signage, exploration of building operating requirements and making energy use data readily available.
- Put the campus utility metering program on the fast track for completion as soon as possible.
- Implement immediate steps in energy reduction on campus including the following actions:
 - Adjust Building Controls Systems ("BCS")
 - Rapidly expand implementation of a campus un-necessary lighting "lights out" campaign
 - Establish an energy conservation hotline & progress tracking website
 - Launch an energy conservation partnership pilot program

- Ask upper administration to make formal campus announcement & media release promoting value and necessity of energy conservation
- For retro-commissioning-
 - Continue RCx through-out campus to include:
 - Extensive RCx for problematic facilities (specifically comfort-related)
 - Controls optimization for all facilities
 - Abbreviated RCx for facilities not included in item #1 to focus predominantly on the main equipment pre-functional and functional testing. This would include air handling units, hydronic (heating hot water and chilled water) systems, and heat recovery systems while excluding the terminal or room level systems
 - Continuous commissioning
- In addition to the RCx, we will
 - Begin much more aggressively scheduling facilities with regards to occupied/unoccupied periods (since this is the easiest, lowest cost savings we can have on the mechanical side)
 - Investigate integrating the building automation system with other control systems such as lab, lighting, and security systems
 - Optimize the chilled water pumping system to retrofit the numerous constant volume building pumping systems with variable flow capabilities
 - Implementing demand-side limiting which would temporarily disable prioritized equipment from the power (electric, steam, chilled water) system to avoid peak rate implications or momentary equipment capacity restrictions

3.1.4 Renewable energy

- Wind
 - A team of EPICS students have proposed installing a small wind turbine on the northwest corner of campus to power the intramural field lights. The team has not received approval from Purdue administration
 - Dr. Sandy Fleeter of Purdue's Mechanical Engineering has proposed to site a small turbine at the Beck Center with the existing photovoltaic unit.
 - Purdue's Animal Sciences Research and Education Center ("ASREC"), a 1700 acre plot west of campus, has hosted a meteorological tower for four years. The data collected thus far from the tower indicate that the wind resources in this area are substantial. The University could pursue a 10-20 MW installation at this site (approx ½ peak demand on the campus).
- Alternative fuels for the Wade Boilers
 - Boilers 2 and 5 are each technically capable of utilizing the following possible alternative fuels:
 - Tire derived fuel
 - Clean wood waste
 - Railroad ties
- Biomass cofiring project for Boiler #5:
 - Dr. Klein Illeliji has been working with Wade over the past 2 years evaluating the potential to utilize the following fuels in Boiler #5:
 - Switch grass
 - DDGS
 - Wood waste
 - Krannert's NetImpact student group performed a business analysis on a variety of alternative fuels and found that if rail road ties were used as an added fuel, a second fuels feed system (\$2 million) would have a 2 year payback.

- Purdue's ASREC farm has manure supplies that could be used as sources of energy through anaerobic digestion
- Dr. Cary Mitchell of Purdue's Horticulture Department has a project in the very beginning stages that would construct high tunnel greenhouses near Wade's South Cooling Towers and use the waste heat and eventually stack gases to heat and supply greenhouses.

3.1.5 Emissions inventory

- Link emissions of conventional pollutants and carbon to per unit energy use on campus and use this as a metric along with economics.
- Quantify greenhouse gas emissions associated with on-campus generated energy and purchased energy to develop a campus baseline and track over time as different factors – such as energy efficiency/conservation projects, renewable energy projects, and campus growth in students and square footage – change over time
- Synergies with EPA Greenhouse Gas Reporting requirements set to begin January 2010.

3.1.6 Occupant engagement

- Behavioral energy projects
- Educational literature was developed and is annually dispensed electronically to inform student residents how to operate their heating and cooling systems properly
- Occupant education – website information, LED screens in lobbies, building dashboard website
- Develop best practices pamphlet as a resource for building users on ways they can save energy
- Energy competitions are held each semester (autumn for Green Week and spring for Earth Day) among the metered residence halls . Consideration is under way to challenge other universities within the State of Indiana to energy competitions.
- Departmental Sustainability Committees
- Housing and Food Services (HFS) has established a Sustainability Workgroup which is prioritizing sustainability initiatives and will be presenting its findings to the senior staff in February 2010
- Dining Services has established a Sustainability Committee which reviews all dining venues and practices
- A website was developed displaying energy and water consumption in metered residence halls www.housing.purdue.edu/universityresgreen
- Energy Policy development (departmental billing/grant incentive program)

3.1.7 Living laboratories

- Hicks Undergraduate Library green roof replacement offers many research data opportunities
- Boiler Green Initiative (BGI); a student organization which focuses on sustainability initiatives, developed informational literature on how to live green at Purdue. This information is provided to all student residents at the beginning of each school year

Materials Management

Area Overview

4.1.1 Recycling and waste management

- New recycling program rolled out to exterior areas on campus.
- BGI takes the lead in recycling at the football games.
- Desk-side trash containers are being replaced with recycling containers to encourage recycling. Dual-stream recycling is a program that collects office paper separately from other mixed recyclables. Recyclable materials other than office paper can be disposed of together in a mixed-recyclables container. These items are then sorted and processed by the vendor. To our knowledge, Purdue is the only large institution with such a program being rolled out.
- 48% overall diversion rate (for 2009)
- Purdue owns a hazardous waste management facility to handle laboratory waste. 50% of the campus's waste goes to an energy recovery facility. This program also has a waste minimization and pollution prevention program run through the Department of Radiological and Environmental Management.

4.1.2 Warehouse and Surplus Property

- Beginning July 1, 2009, Physical Facilities/Warehouse and Surplus will offer a new service to University departments for the safe and secure disposal of electronic storage media. "Recycling for the Future" is a collaborative effort between Materials Management and Distribution, University Warehouse and Surplus, and ITaP's Secure Purdue initiative. The "Recycling for the Future" program offers a systematic, auditable, and reliable process for the disposal of electronic storage media containing University data. The various types of media are shredded with a high-powered shredder at the University Warehouse and the shredding byproducts are disposed of in an environmentally-friendly manner by contractors that handle e-waste. Items that can be destroyed using the new shredder include hard drives, disk arrays, USB keys, CDs, and DVDs, among others.
- By having the Warehouse and Surplus operation manage the selling and/or recycling of items like PC, Tables, Machinery, Televisions, Washers and Dryers, and more, keeps these items from being discarded in our local landfill. In fact the operation recycles and/or repurposes approximately 500,000 pounds – over 200 tons of material on an annual basis. This emphasis on recycling saves Purdue money by eliminating the fees associate with discarding these items as waste and, in many cases provides an opportunity to recoup University money by selling to the public or recycling companies. FY 2008-09, the Warehouse and Surplus operation had returned to departments approximately \$250,000 dollars from those sales.

4.1.3 Material Management and Distribution Center

- We are currently involved in the negotiations with vendors to provide incentives allowing us to reduce our operational expenses and create a safer environment by reducing the number of vehicle on campus.
- We have been combining more loads to reduce fuel consumption and have reduced our fuel expenses by 50% annually. By also preparing more mixed loads for buildings we have also reduced the number of trips necessary to a building which results in reduction of some traffic on campus.

- Utilizing smaller vehicles like vans for short, low volume route(s) which has added to the reduction of fuel consumption.
- We have reduced the evening pickup to two locations from 5 without sacrificing customer service. This eliminates two vehicles on the end of day collection run.
- Throughout the building we promote recycling and have visible recycle containers for paper, cans, shrink wrap, and plastic bottles.
- University Stores worked with Building Services and the House Keeping Committee and has converted 60 items from non-green to green products. Some of the items are: floor care products, brooms, bag liners, etc.

4.1.4 Transportation Service

- Transportation Service has a constant stream of waste materials that are recycled or reused every day. Though the Environmental Protection Agency (EPA) closely monitors the department's waste removal, the staff in Transportation Service takes great care in partnering with environmentally friendly agencies.
- Efforts include:
 - Plastic, cardboard, and newspapers are separated and collected by Purdue's recycling crew.
 - A 2,000-gallon underground tank holds used oil which is routinely collected and recycled.
 - Used anti-freeze is also recycled.
 - Scrap iron (broken parts, old rims etc.) and vehicular radiators are placed into a recycling bin and are collected by a Lafayette scrap metal dealer.
 - Used oil filters are separated by metal and paper and are recycled.
 - Gas fuel filters, along with absorbent pads, are shreddable products with high-energy content value. These products are picked up by Heritage Environmental Services in Indianapolis.
 - Batteries are returned to Lafayette Auto Supply for recycling.
 - Shop rags are given to Cintas, Inc., a uniform supply company located in Frankfort, Indiana. They launder and return the rags for reuse.
 - Contaminated, old, and watered gases are stored in a 55-gallon drum that is collected by Heritage Environmental. Heritage transfers the material to Lone Star Industries in Greencastle, Indiana. Lone Star uses the recycled fuel for their cement kiln during the manufacturing process of cement and concrete products. Waste by-products fulfill eighty percent of their fuel needs.
 - The fluid used for cleaning parts in the Transportation shop is collected by Crystal Kleen, a sister company of Heritage Environmental, for use in their HCC Reuse Program. The recycled solvent is used as an ingredient in a manufacturing process.
 - Printer cartridges are recycled by Creative Solutions.

4.1.5 Printing Services

- Printing Services' sustainability efforts reflect our responsibility and commitment to the environment by saving both energy and our scarce natural resources; we will continue to pursue efforts towards this end.
- Paper is by far the single largest used consumable product of a print job. Printing Services strives to use recycled papers and/or papers manufactured in accordance with sustainable forestry practices whenever possible.
- By using PDF proofs, Printing Services is actively reducing the amount of material required to produce projects, eliminating the paper, energy and emissions required for a traditional

hardcopy proof. This process also expedites the turnaround time and eliminates the need to transport paper proofs via couriers, reducing fuel use and carbon emissions.

- CTP (computer-to-plate) technology is a development in digital technology which has allowed Printing Services to bypass the use of film by producing plates directly from a computer. This process reduces the amount of chemicals and materials required to produce printing projects.
- The printing process requires the use of some chemicals. Printing Services strives to continually review our usage and has made many product changes opting to utilize more environmentally friendly chemicals. All used chemicals are disposed of within the regulatory guidelines.
- Our wide format printer utilizes ECO solvent based inks vs. solvent based inks. The ECO solvent based ink reduces volatile organic compound (VOC) emissions and paper recyclability. Printing Services also uses dry toner in our color printing devices which is widely acceptable as deinkable during the recycling process.
- The HP Indigo 5000 digital press eliminates the need for producing plates completely for jobs produced on this equipment, reducing chemical usage. Offering quality equal to or better than traditional offset press work, the Indigo 5000 facilitates on demand printing, promoting economical production of print runs that fit customer needs vs. printing larger quantities which require storage. The Indigo 5000 also produces personalized, one-to-one marketing pieces, customized for each recipient, which help to streamline reprinting and reduce postage costs.
- Printing Services recycles all residual paper, cardboard and used offset plates remaining from print jobs. We encourage all of our employees to do their part to help the environment by having recycling receptacles for paper, plastic, cardboard and aluminum available within the department.

4.1.6 Central Machine Shop

- The Shop has for many years recycled metals left over from the parts it machines and fabricates. Steels, stainless steels, aluminum, brass and copper are separated and recycled regularly.
- For approximately 8 years, the shop has recycled office paper, mixed paper, and cardboard, adding the recycling of plastics in the last year or two.
- Used cutting oils and solvents have been collected and sent to REM for over 20 years. Efforts to switch to water-based lubricates have been very successful. The latest change has been to switch to a water-based parts cleaning system this last year from the old solvent-based unit used in the past.
- Food services recycles all cardboard, tin, aluminum, plastic and paper.

4.1.7 Purchasing

- Purdue purchases \$200 million worth of goods annually
- 80% of this is office/lab supplies, tools etc under \$1,000
- Guy Brown is the campus's main supplier of office supplies
- 65% of purchases are done through catalogs
- Purdue uses an e-procurement system – pricing varies between normal and environmentally preferable products
- Guy-Brown has a four-day delivery week implemented to reduce travel

Opportunities

- Construction waste diversion is not tracked
- Household hazardous waste program that accepts community-generated waste could be reestablished

- Simple, comprehensive purchasing guidelines are needed
- E-procurement system enhancements could improve level of green procurement
- Buyer education and training (for items over \$10,000) is needed
- Need to begin tracking data to benchmark purchasing performance
- Improve green chemistry practices in teaching labs
- Improve research lab practices – chemical inventorying, waste management, etc
- Chemical source reduction and substitution needed
- Dual stream recycling could be expanded to all areas of campus including athletics facilities, Stewart Center and the Purdue Memorial Union.
- Coal ash from the Wade Utility plant has in the past been used in a number of recycling applications: compost enhancement, soil amendments, as well as possible outlets for sludge stabilization etc. With University interest, these programs could be restarted.

Food Systems

Area Overview

5.1.1 Food Purchasing

- Purdue has defined local food as food produced in-state and the four adjacent states
- Food distributor (Piazza Produce) automatically replaces non-local products with local ones when the pricing is the same
- Because of this process, 3% of food purchases were local in 2008, and 5% in 2009
- Organic foods are a lower priority due to low student demand and higher prices
- EnergyStar equipment is required for products that are eligible for the EnergyStar rating
- Coca Cola contract requires delivery with a hybrid truck
- Urban Market carries 35% organic products
- Green cleaning program includes Apex cleaning products and Ecolab dilution systems
- "Local Purchasing": We have defined "local" to be "Indiana and the four states that touch it" (IN, KY, OH, IL & MI).
 - Purchase data for Fiscal year 2008-2009 reflects:
 - Total food purchases for FY 2008-2009 were \$12,712,466
 - The volume of purchases from this 5 state region totaled \$9,278,991 (73%)
 - The purchases from within the State of Indiana totaled \$6,510,058 (51.2%)
 - Total fresh produce purchases were \$1,483,060 (11.7%) Of this number approximately 5% of the fresh produce purchased was grown in the 5 State local region.

(NOTE: The numbers above reflect the State that companies ship their products to us from. It is not necessarily where their corporate headquarters are located, or where the checks are paid to. Some of the numbers included are distributors who may purchase their products from outside this region but ship to us locally).

- Sourcing Eco Friendly Products and Services
 - During Fiscal Year 2008-2009 disposable cups were changed from Styrofoam to a recycled, compostable material product.
 - Food Stores contracted bio fuel consultants to remove all used cooking oil from campus. All used oil is collected and turned into bio fuel.
 - Food Stores re-negotiated the student laundry contract. This resulted in all laundry equipment installed on campus to be front loading energy efficient equipment.
 - Food Stores contracted snack and hot food vending services. The new contract required the supplier to provide energy star rated equipment, where available.

5.1.4 Waste management

- Post-consumer food waste is scraped from plates, pulped and sent to the West Lafayette waste water treatment facility to power the anaerobic digester saving approximately ten thousand dollars annually
- Used oil is sent to Biofuel
- All plastic shrink wrap on pallets is recycled (6-7 green bins per day)
- Pallets are exchanged with the vendor or recycled; damaged ones are sent to a company that turns them into mulch

- Trayless food service was piloted and an 18% reduction in food waste was experienced – students hated it
- Napkins (non-bleached, 100% recycled fiber) are placed on tables so students take only as they need them and don't grab a handful at the start of food service
- Extra food is sent to a food bank – diverted 12,000 lbs to date
- Reusable mugs, bottles and bags are sold in the student stores and given to freshmen for free – a filtered water station in the Student Union lets students fill bottles
- All carry out items are recyclable plastic except one Styrofoam soup bowl (a replacement has been identified but the cost is prohibitive at this time)
- Food Stores recycles paper, cardboard and plastic materials.
- Food Stores evaluated their delivery schedules to customers. Between July and November 2009 Food Stores reduced fuel expenses by \$1,138 or 30.6% over prior year.
- Food Stores meat processing room processes over 4,000 pounds of meat daily. Less than ½ of a 50 gallon barrel per week is scrap. All other meat scraps are recycled back into the product mix.
- Food Stores contracted meat and bone scraps removal from campus to a company who renders these products into products that are used in animal feed, beauty products and other goods.

Opportunities

- Implement on-campus composting program to divert compostable products and packaging and provide Ag Ops with a useful product
- Research crops are plowed into the ground – there is an opportunity to use crops in meals
- Pre-consumer (food prep waste) is not sent to the water treatment plant because it is too large – a grinder (\$50,000) would allow Purdue to divert this waste stream; compostable products could be ground up as well
- Develop a student education campaign to convey value of programs
- Conduct needs assessment for exterior recycling bins and optimal locations to site them
- Lighting usage study and needs assessment with ultimate goal of retrofitting appropriate areas to provide the optimal lighting and use less energy
- Switch to (nearly) phosphorus-free dishwasher cleaning solution
- Develop partnership with Ag Ops to support academics, student involvement and local products
- Greenhouse/hoop house
- Continue working with corporate entities operating on campus to reduce packaging waste (e.g. Starbucks, Salsa)
- Expand Coca Cola hybrid delivery truck program to other vendors, if and when available
- Opportunity to partner with the Horticultural Department – which wants to have collaborative themed gardens – to develop a demonstration food/herb garden

Academics and Research

Area Overview

6.1.1 Academics

- Ecological Sciences and Engineering (ESE) is one of Purdue's Interdisciplinary Graduate Programs (IGPs) that spans the Colleges of Agriculture, Engineering, Liberal Arts and Science. Students achieve academic depth within the home department of their advisor.
- Purdue just obtained a new NSF IGERT grant for graduate education around the theme "The Solar Economy" with PI Rakesh Agrawal and numerous Co-PIs across campus.
- Several one-time project-based classes with an on-campus or community sustainability focus. For example, the 2007 Purdue carbon neutrality class, and the current water footprint course, as well as sections of the Engineering Projects in Community Service (EPICS) program
- The President's Leadership Class for outstanding first-year students has had a sustainability theme for the past 2 years.
- Some environmental centers (e.g. the PCCRC) already circulate classes with a particular environmental theme (e.g. climate-relevant courses) every year.
- The ESE and DEEE maintain an updated list of courses related to sustainability.
- Research centers and ESE have hosted wide range of interdisciplinary poster sessions, for both graduate students and undergrads working across wide range of environmental science and policy issues. Multiple opportunities every year for students to present at these gatherings.
- An Environmental Policy Minor in the Political Science Department (open to all undergraduates) and an Environmental & Ecological Engineering minor in Engineering (open to non-Engineers) is available.
- Introduction of sustainability as a primary design constraint into the First Year Engineering courses (ENGR 126, ENGR 195), reaching almost 2000 students per year.
- More interdisciplinary classes on environmental topics are being taught, often cross-listed across multiple departments.
- Student environmental groups such as Boiler Green Initiative and Green Build are active.
- PCCRC helped send 3 outstanding Purdue undergraduates to COP15 in Copenhagen, where they blogged about their experience. (<http://www.purdue.edu/climate/cop15/>)

6.1.2 Research centers

- A great deal of research taking place on campus falls within the sustainability field. At a University like Purdue, this list is virtually endless. More than 150 faculty identified their research as "environmental" during the 2005-06 scoping process for developing the proposal for the Discovery Park Center for the Environment.
- New interdisciplinary research focus areas are continuously being explored, including:
 - Persistent organic pollutants, solar cell technology, emissions trading policy, biofuels policy and technology, sustainability in engineering education, climate modeling, climate change mitigation and adaptation, water quality and pollution issues, green building design, and biodiversity conservation, among many other issues.
- Examples of some of the existing centers and synergistic efforts under the theme of the Sustainability Institute/initiative include:
 - Climate Change Research Center
 - Energy Center
 - Center for the Environment
 - PICES (Purdue Interdisciplinary Center for Ecological Sustainability)

- The Purdue Water Community

6.1.3 Faculty

- College of Engineering as part of the Engineering 2020 program provides faculty with monetary compensation for developing –educational or class modules that incorporate sustainability concepts into existing traditional disciplinary courses.
- Many environmental graduate students, both within and outside ESE, are populating their advising committees with diverse, interdisciplinary set of faculty across colleges, and are doing excellent work on a wide range of environmental topics.
- Most faculty are active in multiple sustainability themed Centers or synergistic groups, mentioned above under research centers.
- Joint-appointed environmental hires are increasingly common, including recent appointments across Political Science, Agronomy, and other departments with EAS.

Opportunities

6.1.1 Academics

- Formalize a process to maintain an accurate and up to date list of relevant courses that includes new and one-time variable title offerings.
- Create an inclusive group to study and recommend how best to incorporate sustainability into the Purdue curriculum. It is important that this would be cross-college and broadly interdisciplinary, including students, faculty, and administrators.
- Provide education and outreach to student advisors to direct students into sustainability themed courses and minors.
- Create and support a group with the responsibility for developing a vision for future Purdue Green Weeks, including better connection of important campus sustainability improvement projects to each annual Green Week.
- Make offering sustainability-themed, cross-disciplinary courses easier for faculty, logistically and otherwise
- Develop short-term sustainability certificate/continuing education for non-degree seeking candidates/professionals
- Promote the development of more service learning courses with faculty sponsorship that use on-campus projects to teach and apply sustainability principles
- Investigate options for additional graduate level IGPs or certificate programs. For example, when the new public policy institute opens there will be many opportunities for environmental or science and public policy concentrations.
- Better support and utilize campus service-learning classes to identify and implement campus sustainability opportunities.

6.1.2 Research centers

- Better integrate current research with the deployment of on-campus sustainability projects to create linkages between academia and Purdue's operational activities to involve students and operational staff in using campus as a living laboratory. This should include role for social sciences and programs for modifying individual choices or behaviors related to environment.
- Conduct round the year research and educational seminars, workshops, conferences, and events involving sustainability
- Explore global research opportunities in sustainability with key partnering institutions around the world.
- Continue to build stronger research and teaching linkages between social science and humanities and engineering and science faculty across campus.

Endowment and Development

Area Overview

- The Purdue Endowment on June 30, 2009, was \$1.45 billion.
- The Endowment is comprised of individual donor-directed true endowments and quasi-endowment accounts that have been created internally to support the University's mission. The individual endowments buy shares in the investment pool on a monthly basis and are tracked with unitized accounting, similar to a mutual fund. Annually, for each donor dollar that is received and invested, the Endowment's current spending policy allows a distribution of 4.5% based on a twelve-quarter rolling average of the market value. The spending rate is reviewed annually by the Investment Committee to ensure that the spending from the Endowment remains aligned with financial and policy objectives and to protect the assets of Purdue.
- As approved by the Purdue Board of Trustees the investment objective of the Endowment is to attain an average annual real total return (net of investment management fees and after inflation) in excess of the spending rate over the long term, defined as rolling five-year periods, and to outperform the median endowment within a universe of other similarly-endowed universities.
- Historically, sustainability related projects have not been specifically solicited for by Development. However, recently several accounts have been set up that focus on sustainability: The Roger Gatewood wing of Mechanical Engineering Building and the Herrick Lab renovation.

7.1.1 College Sustainability Report Card 2010

- Purdue scored well in two of the three areas .
- 'A' in Endowment Transparency - The investments of the Purdue Endowment are available to the public per open records law: Except holdings exempt from public open record law by Indiana code: SECTION 3. IC 20-12-1-13 (private equity fund, real estate fund, venture fund, hedge fund, natural resources or absolute return fund).
- 'A' in Investment Priorities - The investment objective of the Endowment is to attain an average annual real total return (net of investment management fees and after inflation) in excess of the spending rate over the long term, defined as rolling five-year periods, and to outperform the median endowment within a universe of other similarly-endowed universities. The Endowment's investment managers invest in clean energy and alternative fuels which improved the letter grade.
- 'D' in Shareholder Engagement - Per the Investment Policy the master trustee/custodian shall handle the voting of proxies and tendering of shares in a manner consistent with the objectives contained in the Investment Policies and in the best interest of the University, reserving the right for the Investment Committee to provide specific directions as it deems appropriate. Currently all proxies are voted with management.

Opportunities

- The Campaign for Purdue could be reviewed by the Development Office and assessed as to whether there were any sustainability related funding needs that fit well with the University New Synergies Strategic Plan.
- Development Officer education and outreach
 - Hold quarterly updates to inform Officers of projects in need of funding so that Officers can relay this information to potential donors
 - Develop an information packet for Officers to have on hand to provide potential donors

Community Relationships

Area Overview

8.1.1 Existing campus-city-county partnerships

- Purdue hosts a Community garden near Purdue Village
- There is a partnership between Purdue and the City of West Lafayette where the new West Lafayette anaerobic digester accepts “yak” (ground food waste) which generates methane gas and is harvested to produce electricity for the West Lafayette waste water treatment facility. This initiative diverts an average of twenty tons of yak per month from the landfill and saves the university almost ten thousand dollars annually.
- A new 2009 corporate partner Bio Fuel Consultants was awarded a contract to utilize spent cooking oil and grease to make bio fuel. This initiative diverts approximately twenty thousand gallons into bio fuel.

8.1.3 Greening the on-campus experience

- Sustainability outreach at freshmen orientation – targeted not only at students but at parents
- Opportunities for student involvement
 - Student groups including Boiler Green Initiative, Environmental Science Club, Energy Club, Engineering for a Sustainable World, Pugwash, Net Impact Club
 - Representation in student government
 - There is currently one 10 hour per week internship in Sustainability.
 - Green Week is a week set aside each autumn semester to engage students, faculty and staff; educate; and potentially experience positive behavior modification while concentrating on daily themes such as energy and water conservation; recycling; transportation and environmental stewardship.
 - Project Move Out 2009 continued University Residences’ annual efforts at landfill diversion by re-purposing an estimated ten tons from the landfill and saved \$600 in labor and tipping fees and benefited a total of 378 households by allowing local low-income families to shop for free through student discarded household items and clothing
 - Boiler Television (BTV) produced and aired four Public Service Announcements on sustainability featuring the popular Forest the Puppet
 - Residence halls regularly re-purpose furniture among halls
 - A website was developed to promote sustainability initiatives being investigated and implemented within University Residences www.housing.purdue.edu/sustainability
- Opportunities for staff and faculty involvement
 - Department-level sustainability committees (Forestry and Natural Resources started a Department Sustainability Committee that makes decisions/recommendations on departmental operations, purchasing, recycling, etc) Biweekly meeting with the Purdue Energy Council to plan, share and keep informed on successful campus energy initiatives
 - Monthly meeting with the Purdue Sustainability Committee to recommend campus wide sustainability initiatives
 - Green Week included an Indiana Sustainability Forum which included sustainability officers from higher education institutions throughout the State of Indiana
 - A Traveling Green Trophy has been established to be awarded monthly in acknowledgment of the effort of University Residences’ Facility Managers who institute

some form of cost cutting measure by saving energy or water, increasing recycling or in general making strides for facilities to be more green and sustainable

Opportunities

8.1.1 Student opportunities

- Similar to Indiana University's program, Purdue could choose to fund several internships in sustainability for students.
- A way to continue to strengthen the relationship between the academic side and the operational side is for the Department of Sustainability to offer research assistantships to several graduate students to study on-campus sustainability related topics. The students' major professor would remain the advisor but the topic selection and awarding of the assistantships would come through the Sustainability Steering Committee.

8.1.2 Campus-city-county partnerships

- Household hazardous waste program that accepts community-generated waste on an annual basis could be reestablished
- Purdue has a tremendous opportunity to continue its historical role as advisor to the state through the Cooperative Extension Services. Already there are advisors identified in the areas of biomass research and alternative energy as well as the energy efficiency programs of the Technical Assistance Program. These programs must continue to be supported and should be expanded to serve the growing need in the state.

8.1.3 Greening the on-campus experience

- Create a demonstration dorm that showcases green living to students.
- Encourage the creation of Departmental level Sustainability Committees
- Post unobtrusive, consistent signage next to sustainability projects of interest around the campus

8.1.4 Connecting with off-campus students

- Develop the sustainability website to better engage off-campus students – not only by enhancing the website or developing content, but by providing a sustainability link on the homepage
- Partner with local business surrounding the campus that are popular with students to develop green projects and outreach
- Green major events that off-campus students attend such as Boiler Gold Rush.
- Connect with alumni through outreach/projects at sporting events (e.g. recycling at football games was a great project)
- Include sustainability projects and research in the alumni magazine/other alumni publications