Advancing Sustainability at WPI

The Development of a Comprehensive Program for Investing In, Promoting, and Managing Sustainable Practices at WPI

An Interactive Qualifying Project submitted to the faculty of Worcester Polytechnic Institute in partial fulfillment of the requirements for the Degree of Bachelor of Science.

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Abstract

This report introduces a set of recommendations to the WPI President's Task Force on Sustainability for the improvement of the current sustainability program. Through analysis of other campus sustainability programs and with the guidance of Task Force members, I have proposed a four part plan that would put WPI in a position to become an innovator in campus sustainability. The plan is to create a sustainability endowment, a revolving loan fund, an incentives program, and a sustainability coordinator staff position.

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Chapter 1: Introduction and Summary

One of the most pressing issues society is facing today is how our actions are likely to affect future generations, and the environmental health of the planet in the future. This is the concern of the sustainability movement. Promoting sustainability is especially important at colleges and universities, because the knowledge gained at these campuses shapes the minds of the future leaders of society. Because of this educational mission and because universities have significant wealth, resources, and ability, it is important to introduce the concept of developing sustainable campuses (Cole, 2003). The aim of sustainable development is to meet "…the needs of the present without compromising the ability of future generations to meet their own needs" (Sustainable Campus 2007).

The current state of sustainability affairs at WPI is in its early stages, yet it has a bright future. WPI has recently appointed a committee to work for the advancement of sustainability, the President's Task Force on Sustainability. With this important first step, WPI has been able to make strides in the right direction with a recycling program, website, and other initiatives. However, this is taking place out of the public eye of the campus. Also, these small programs are not mandated or as effective as they could be. For example, the recycling program recycles only 13% of the school's trash (WPI 2008). There is also a lack of time and resources to make programs like this more efficient. The Task Force is a committee made up of people who all have other jobs and commitments and cannot focus solely on the issue of sustainability. Even when they have the time, there is no fund of money that can be used solely for sustainable causes.

The Sustainable Endowments Institute, a respected non-profit research group, released a report card grading campus sustainability and WPI scored in the lower quartile with a D-. Details on this can be found in the background chapter. One aspect of this organization is that it encourages the practice of investing university endowments in sustainability related funds, such as renewable energy, clean technology, and local businesses, and developmental loan funds. Also noted was that about one third of all campuses with sustainability programs have a paid staff member (SEI 2007). The lack of paid staffing and lack of commitment to sustainable investments at WPI are the major problems that I have addressed in my IQP, which was developed to satisfy the following objectives:

- Promote awareness of sustainability on the WPI campus
- Encourage other members of the WPI community, besides the task force, to initiate sustainability related goals and projects

- Create a self-sufficient sustainability budget and possibly bring returns to the school
- Save on energy costs, waste costs, and any other costs incurred in a campus lacking sustainability initiatives.

This report presents a plan to deal with the needs of WPI's sustainability program and fulfill these objectives, sending WPI to the forefront of campus sustainability programs. The plan addresses the major needs of funding, staffing, and motivating the community through four proposed elements:

- ✓ Sustainability endowment
- ✓ Revolving Loan Fund
- ✓ Incentives Program
- ✓ Sustainability Coordinator

These four elements are intended to be interconnected with each other, with the endowment supplying capital for the revolving loan fund and also allocating a budget for the coordinator's salary and the incentives program. The flow of this plan is shown below in Figure 1, and is discussed in the following four sections. Note how the Sustainability Endowment parallels the WPI Endowment.

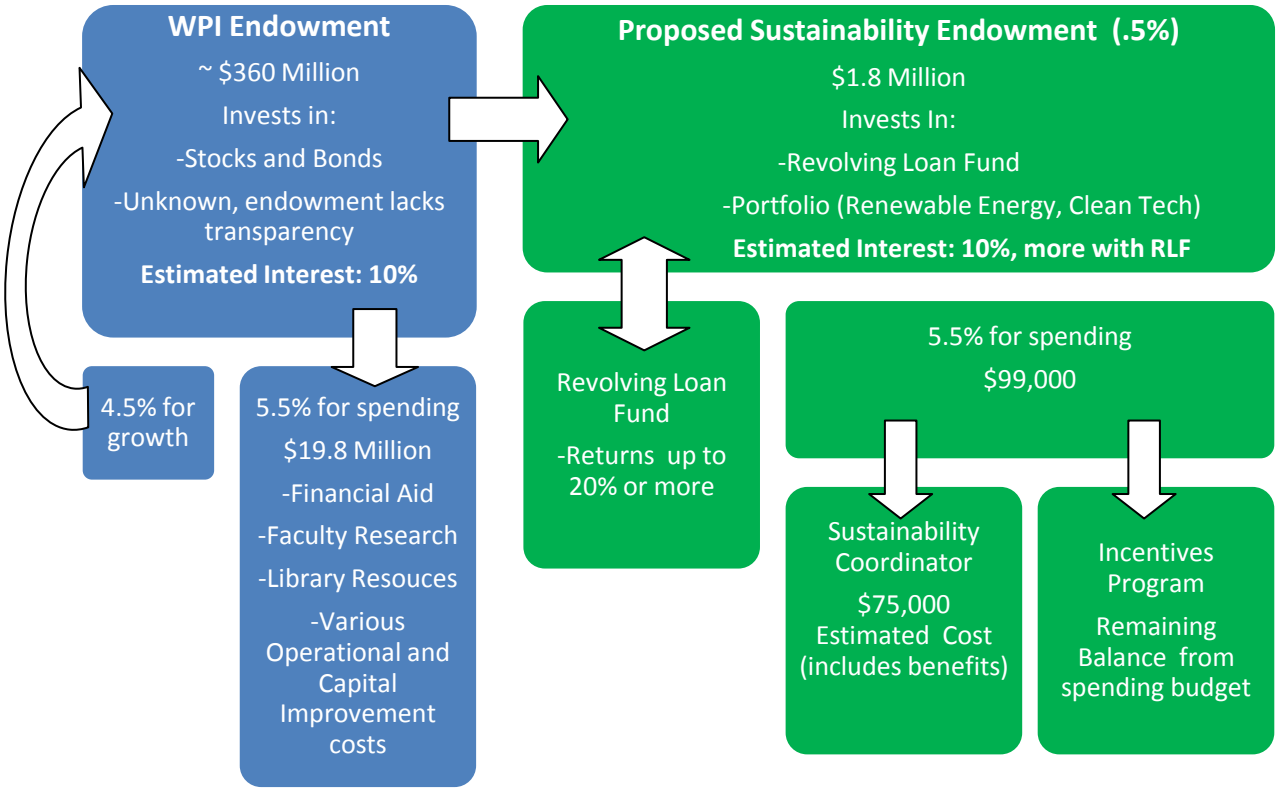


Figure 1: The Plan

1.1 Sustainability Endowment

This plan recommends WPI set aside one half of one percent of its university endowment for the sole purpose of investing in and running a campus wide program for sustainability. This amount, which would be just under $2 million dollars, would be used for a variety of things that would all benefit the school. It would invest in renewable energy and clean technology stocks, which in itself contributes to the well being of all society. It would also invest in a new WPI sustainability revolving loan fund I am proposing that is likely to generate substantial returns. In fact, with the loan fund, the estimated interest would likely be higher than that of the regular endowment, allowing for a significant growth in this recommended sustainability budget. The sustainability endowment would work like the university endowment, in that only 5.5% would be budgeted for spending, and this amount would be able to cover the salary of the sustainability coordinator and the incentives program. This sustainability endowment would fund an enhanced sustainability program at WPI.

1.2 Revolving Loan Fund

The next element of this plan is a revolving loan fund (RLF). This type of funding mechanism would bring great potential to the program at WPI. An RLF in this context is an amount of money that is loaned out for sustainability related projects at little or no interest and is paid back within a specified period of time in cost savings that are generated. There are many examples of RLF's that are successful. One is Harvard's, which brings in returns over 20% annually on average (Harvard 2007). This Harvard fund is discussed more in depth in the background chapter. Having an RLF at WPI would be possible in my plan because of the endowment. This report outlines a process for people requesting a loan, which involves mainly meeting criteria and working with the Coordinator before filling out an application. This process is discussed more in depth in the results chapter.

1.3 Incentives Program

An incentives program for sustainability at WPI would have an impact on the whole campus, in that it would promote the awareness and knowledge of the issue of sustainability to the masses in a positive manner, supported by incentives. The incentives program would be run by the coordinator and include competitions, non-competitive initiatives, scholarships, and recognition. One important type of competition that is a part of this plan is an energy competition. This would be a dorm versus dorm comparison of energy use reduction over a certain period of time. For this, electricity monitoring technology would be used, and its been shown that these types of competitions are effective (Petersen, et. all 2007). Energy competitions, sustainable design proposal competitions, and recycling competitions would all

be created with the goal of promoting awareness and getting student, faculty, and staff involved in the movement of sustainability. This incentives program is the element that should get the campus excited about sustainability.

1.4 Sustainability Coordinator

The element of my plan that addresses the need for a staff member is the sustainability coordinator. This staff member is to be hired full-time, with the salary covered by the spending budget of the sustainability endowment. A paid staff member is something that one third of campus sustainability programs have (SEI 2007). Coordinators exist at a number of schools and have all kinds of job titles, and importantly a number of schools encountered in the research of this report had at least one paid staff member for sustainability. With this proposed coordinator, the Task Force will no longer have to work overtime to get something done. The plan states that the coordinator will report to meetings and present ideas to the Task Force.

The coordinator's job will be to promote awareness of sustainability and stimulate others to practice sustainability throughout the entire campus through the distribution of educational materials, development of important sustainability initiatives, and organization of sustainability related activities. The major responsibilities of this job are to:

- Facilitate President's Task Force on Sustainability
- Manage the Revolving Loan Fund
- Manage the Incentive Program
- Manage Website
- Coordinate Annual Sustainability Report
- Manage Work Study students and student volunteers in promoting awareness and running programs

For a detailed explanation of these duties, see section 4.4.2.

1.5 Conclusion

The Task Force can move forward after reading this plan and convene to discuss the possibilities. Introducing these four elements into the structure of the university is partially explained in each of the respective sections (see Chapter 4). The sustainability endowment is the cornerstone of this plan. In order to implement this, the Board of Trustees of the university will need to be convinced. The following is a scenario of a number of actions the Task Force could take to begin implementing the recommended plan.

1. Develop a final proposal of plan with endorsement of whole Task Force

2. Present to Board of Trustees and President
3. Once approved, hire a sustainability coordinator
4. Choose consistent meeting schedule for Task Force and coordinator
5. Have coordinator begin recommended Incentives plan (see Figure 2 below)
6. Decide if Revolving Loan Fund committee is necessary, and appoint members
7. Determine amount of money to be set aside for Revolving Loan Fund
8. Design Loan Fund applications and outline WPI specific criteria
9. Construct green investment portfolio and begin investing
10. Monitor plan and help coordinator maintain interest in whole community

Recommended Plan to Coordinator for Implementing Incentives Program

- ✓ Generate materials promoting knowledge of sustainability and distribute to the campus public with student staff
- ✓ Organize a campus wide design competition for sustainability
- ✓ Organize Dorm vs. Dorm Competitions, maybe an Olympics
- ✓ Organize club vs. club competitions
- ✓ Organize Spirit Week Competition
- ✓ Organize Greek Week Competition
- ✓ Organize sustainability related event for New Student Orientation
- ✓ Create a suggestion box in plain sight of the campus to be looked at most likely by hired Work Study students or student volunteers
- ✓ Manage Incentive Program fund and allocate funds to clubs or parties attempting to add to the culture of sustainability on campus
- ✓ Accept proposals for sustainability related projects (either independently created designs, MQP's, IQPs, or course based projects) and determine with the Task Force which should be funded
- ✓ Distribute awards and scholarships discussed on a yearly basis

Figure 2: Plan for Coordinator with Incentives Program

In addition to this proposed plan, the Task Force should solicit ideas from the general campus public of students, faculty, and staff. While this plan focuses mainly on economic and environmental sustainability, there are implicit social outcomes, and the Task Force should continue to consider explicit social initiatives. Some may say the Sustainability Coordinator should be a representative to the city of Worcester's sustainability program as part of the social aspect. Also the coordinator could balance duties differently between leadership, technical loan fund advice, management skills, and involvement in the social aspect of sustainability. This plan of creating a sustainability endowment, revolving loan fund, incentives program, and sustainability coordinator has the potential to improve the economic, environmental, and social well-being of WPI while also improving its reputation among colleges and universities.

Chapter 2: Background

The goal of this project is to generate a set of recommendations to WPI on how to expand its sustainability program. The first section introduces important developments in campus sustainability. Secondly, I analyze the situation here at WPI and its potential areas of improvement, putting this proposal in context. After these sections, the background chapter is then arranged fundamentally the same as the results chapter. The final three sections cover the needs I assessed WPI has in its sustainability program; organizing a budget, developing incentives, and creating a sustainability staff position. The organization of this chapter is best described in Figure 3.

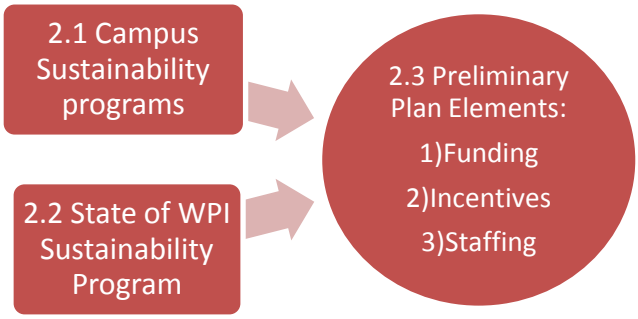


Figure 3: Organization of Background Chapter

2.1 Campus Sustainability

The need for developing sustainability initiatives on campuses today comes from many concerns. Our effect on the environment, availability of energy resources, and a new way of evaluating economics are all related to sustainability. Research has shown that levels of carbon dioxide and other greenhouse gases in the atmosphere have jumped significantly since the industrial revolution. This has caused a negative effect on the environment, contributing most importantly to worldwide climate change, and also causing poor air quality and acid rain in many places (Sustainable Campus 2006). The graph on the left in Figure 4 shows levels of carbon dioxide in the atmosphere measured in parts per million.

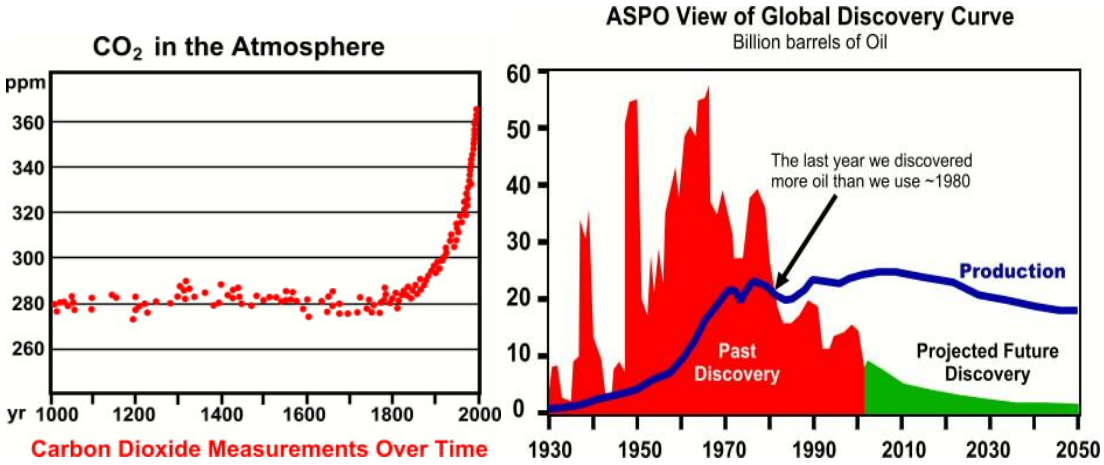


Figure 4: CO_2 levels chart and oil discovery curve

In addition to environmental concerns such as greenhouse gases and climate change, there is an energy crisis going on. The price of oil has risen over $100 per barrel, affecting all aspects of the economy. Non-renewable energy sources such as oil are depleting and are forecasted to spike tremendously in price, more dramatically than even now, and continue to increase due to this growing lack of supply. The chart on the right (part of Figure 4) preceding this paragraph shows the significant decrease in oil discovery observed by the Association for the Study of Peak Oil (Sustainable Campus 2006). The alternative to these energy issues is renewable energy, which also is better for the environment and sometimes referred to as clean energy. Sources of renewable energy include solar power, biopower, wind power, fuel cells, and others (Northeast Sustainable Energy Association 2001). Many campuses across the country today have taken steps to invest in these new technologies, or even to introduce renewable energy to their infrastructures.

2.2 The sustainability movement at WPI

WPI defines sustainability as “an integrated, three-part approach for achieving the goals of environmental preservation, economic prosperity, and social equity for all members of society” (WPI 2008). With the advent of an appointed committee serving in the interest of sustainability in the past year, development of a website, and beginnings of a campus wide recycling program, WPI has shown that it is committed to beginning a serious campus sustainability movement. However, the current system has no dedicated human resources or specified budget to implement a serious sustainability program, which is where this IQP comes in. This project is intended to find a solution to these problems.

2.2.1 Progress in Sustainability

In September of 2007 the President's Task Force on Sustainability was created in order to:

> "Provide leadership and coordination for WPI's campus-wide efforts in energy and resource conservation, and reduction in the harmful environmental impacts of our operations, all directed toward enhancing the long-term sustainability of WPI's activities and the environment in which we are a part." (WPI 2008)

This task force, all appointed by the President, includes some staff high in the school's administrative hierarchy. It includes the Provost, the CFO, the Assistant Vice President for Facilities, the Vice President for Student Affairs and Campus Life, the Director of Public relations, three members of the school's faculty, and four student representatives. The creation of this Task Force finally gave WPI a footing in the field of sustainability, but this committee was not completely effective without having a structured plan guiding it (WPI 2008).

With the help of the task force, WPI expanded its materials management program that collects recyclables and safely disposes of other objects. As of now, about 13% of the waste generated by WPI is recycled, leaving much room for improvement (WPI 2008).

Another accomplishment of the sustainability movement at WPI was actually passed in February 2007. The Board of Trustees passed a resolution stating that all buildings constructed by WPI from then on would need to pass LEED certification. Before the resolution was passed, the Bartlett Center admissions building was completed in 2006 and was LEED certified. The first building constructed since the resolution was passed is the new residence hall to be completed in August of this year, known as East Hall. This new dormitory will seek LEED silver certification (WPI 2008).

WPI has also made progress in electricity monitoring and measuring greenhouse gas emissions through two student projects. While these projects may have provided insight and important information relative to the current situations at WPI, they did not explicitly develop methods to reduce green house gas emissions or energy consumption.

One of the aspects of WPI's sustainability program is its commitment to social equity, which relates to providing communities with necessary resources and civic learning. WPI's work in the social sustainability category has been notable over the years, and is interwoven with its academic presence in sustainability. The IQP work done by students at project centers around the world is often centered on helping communities operate more sustainably. WPI students

have completed projects about renewable energy sources, Greenhouse Gas emissions, waste management, water management, and nearly every topic in relation to sustainability (WPI 2008). However, these are mainly done off campus, and if my system is put into place, the WPI administration will look into the development of sustainability related technologies being put into use on the WPI campus.

2.2.2 Criticism of Sustainability at WPI

The WPI administration has hit a crossroads this year in its sustainability programming after the release of the Sustainable Endowments Institute College Sustainability Report Card (Figure 5). While there have been major developments in the sustainability movement on campus, the program still lacks in many of the criteria outlined by this scholarly report.

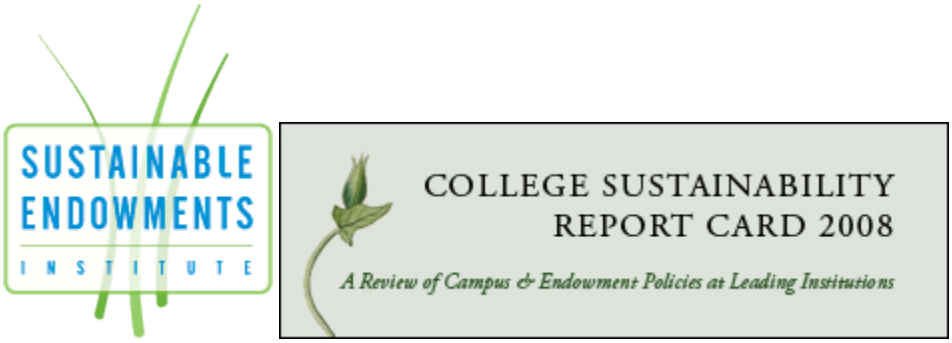


Figure 5: Logo of SEI and of its annual report card

The College Sustainability Report Card is a highly visible study conducted by the Sustainable Endowments Institute, a research organization that is part of the Rockefeller Philanthropy Advisors. It examines the sustainability programs of the 200 schools in the country with the highest endowments. The report grades schools based on the following criteria:

1. Administration: This category rates schools on whether they include sustainability as part of their fundamental mission statement, if policies are in place regarding sustainability, if there is any full time staff (i.e. a sustainability coordinator), if there is an office established, and if there is a sustainability committee.
2. Climate Change & Energy: The grade in this category reflects a campus's effort to improve energy efficiency in their operations and focus on conservation. It also rates colleges and universities on renewable energy commitments.
3. Food & Recycling: This grade rates a campus's effort to use locally produced food in dining services and also its programs relating to recycling and composting.

4. Green Building: This category rates a school's commitment to using green technology in construction of new buildings and also in renovations of old buildings. Participating in LEED rating system is a plus.
5. Transportation: This is a rating of a school's policy on promoting alternative transportation, using alternative or hybrid fueled vehicles in its own fleet (police, facilities staff, maintenance vehicles), and making the campus pedestrian and bike friendly.
6. Endowment Transparency: This category grades schools positively that have their investment information open to the public, encouraging schools to be promote discussion about their endowment investments.
7. Investment Priorities: Grades were based on "prioritizing return on investment, investing in renewable energy funds, and investing in community development loan funds" (SEI 2007).
8. Shareholder Engagement: This category rates a school's commitment to giving shareholders the ability to influence investments.

Completed in the fall of 2007, this report gave WPI an overall grade of D- (See Appendix C). Out of all two hundred schools graded, twenty one scored this grade and six received F's. Overall, 3 % of the schools received A's, 28% received B's, 41% received C's, 25.5% received D's, and 2% received F's (SEI 2007).

Since this report was published in October of 2007, it will undoubtedly be better for next year with the formation of the Task Force and other improvements. However, an important issue WPI did not look into since the report came out was making sustainable endowment investments. This is especially shown in an "F" grade for WPI in endowment transparency and shareholder engagement. Across all campuses, these two categories received the most F's out of the eight used for grading. Endowment investment transparency is an important part of how business is conducted today. It is a measurement of how open an organization is about its investments, and WPI has not made its investments publicly available. Stepping forward into the upcoming school year with a clear plan of investing in sustainability would help WPI to reach new levels in its sustainability program and improve its grade on this report card. Shareholder engagement can be defined as people with vested interest in sustainability being able to express their concerns and ideas. A number of schools show shareholder engagement with the creation of sustainable interest committees that report to their boards of trustees. The three schools proclaimed "Endowment Sustainability Leaders" by the Sustainable Endowments Institute each have a committee formed to recommend investments. Carleton College has the

Carleton Responsible Investment Committee, while Dartmouth has the Advisory Committee on Investor Responsibility, and Williams College has an advisory committee on shareholder responsibility. The President's Task Force on Sustainability at WPI corresponds to these named committees, and would help to promote making positive sustainability related investments to the WPI Board of Trustees if given a sort of proxy vote. A grade of "C" was received in investment priorities and the report pointed out that WPI has not expressed explicit interest in renewable energy or sustainability funding (SEI 2007).

The analysis provided by the Sustainable Endowments Institute and also by me has shown that WPI needs to focus investment and spending more on the principle of sustainability if it wants to generate a serious sustainability plan. This led to my further analysis of other colleges and universities and eventually the development of a final plan.

2.3 Sustainability programs at Colleges and Universities

A significant portion of research for my IQP was studying sustainability programs at institutions across the country and the world to determine ways of improving WPI's sustainability platform. I learned a great deal about programs, and a major source of information was the web site of the Association of the Advancement of Sustainability in Higher Education (Figure 6).

Figure 6: AASHE logo

This site led my research to many other places, and among others, it led me to find the program that had the most articulate web site and the best run program, Harvard University's Green Campus Initiative. This program was a major influence on this plan.

2.3.1 Potential Funding Mechanisms

I spent a large amount of time in the early stages of my research looking for potential ways to fund a sustainability program at a college and found a number of methods. These were methods listed at AASHE's website at the funding page with notable examples, and links to where more information can be found. AASHE outlines different funding mechanisms on their

site, and the first two I describe are the ones I integrated into my plan. The other methods of funding should be kept in mind and could be looked into at a later date by the Task Force.

Revolving Loan Funds

A Revolving Loan Fund is in general used for small businesses or start-ups. It is a fund that loans money up front with little or no interest to a party. The loan is eventually paid back into the fund by that party, using savings or returns incurred from the investment. The fund then invests into a second party, and so on, hence the word "revolving." In broad context, revolving loan funds are great for starting up and developing credit (Wikipedia, 2008). They are used in the realm of campus sustainability because they allow colleges to undertake expensive projects without having to deal with the high initial cost. The returns that accumulate over time from loans can then be reinvested into the school's loan fund, theoretically causing a never-ending flow of money (AASHE 2008).

Harvard University's Green Campus Loan Fund (GCLF) was the principal source of my eventual creation of the proposed WPI loan fund. The Harvard University Loan fund is actually in its second generation; the first began in 1993 and was known as the Resource Conservation Incentive Program (RCIP). Due to a lack in overall knowledge and capacity of the program, it ceased to exist in 1998. A report was written on the RCIP's impact on Harvard both economically and sustainably. This report, written by Jonathan Levy and Kumkum M. Dilwali, found the $1.5 million dollar loan fund yielded an annual average savings of $880,000. This was also complimented by an average annual return of 34%. There was also a yearly reduction in emissions most notably of carbon dioxide, which was reduced by 8,800,000 pounds per year. These results were due to the completion of 35 projects completely funded by the fund. Since the report found such favorable results, it is no surprise that a new similar fund was proposed shortly thereafter (Levy, Dilwali, 2000). Examining the managerial and business shortcomings of Harvard's first attempt at a revolving loan fund helped me to begin to formulate a plan.

The second version of the RCIP, the Green Campus Loan Fund, took 12 months of lobbying and formal presentations before it finally got running. The GCLF proposed to borrow $3 million from the Harvard budget, and that was how it began. It started out with a budget of $150,000 for staffing that covered all administration of the fund. The average Return on Investment of the GCLF by category, as of November 5 2007, is shown in Figure 7. Harvard is clearly managing its program properly, earning an A- on the Sustainable Endowments Institute's Green Report Card, the highest grade given out and shared with only 5 other recipients. In that respect, Harvard shows that it pays to put a significant amount of money into an investment that, with sufficient scrutiny and analysis, is nearly risk free (Harvard 2007).

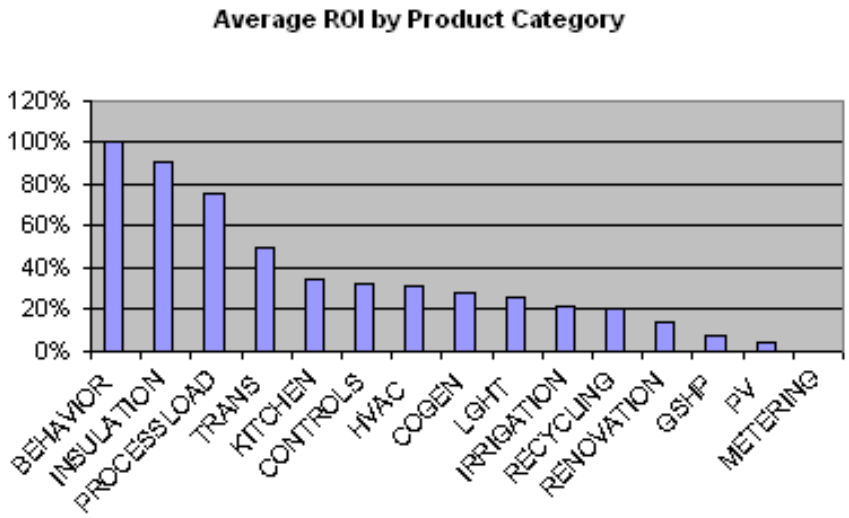


Figure 7: Harvard GCLF Returns as of 11/5/07

Other Revolving Loan Funds that were major influences in my research were the ones at Macalester College and the University of Maine. It may be more likely that this WPI plan would have a smaller budget all around, simply due to the size of this institution. For example, similar programs at the University of Maine, 11,400 students, and Macalester College, 1900 students, are much smaller in scale. U Maine started with a $300,000 loan from the U Maine foundation, and Macalester College started its loan fund with $27,000 from academic departments, all compared to Harvard's massive operating budget, which started in the 1990s at $1.5 million but is now around $12 million. Another similar revolving loan fund program can be found at Tufts University. It is interesting to note that each of these preceding examples have the same rule, mandating a maximum payback period of 5 years (AASHE 2008).

Endowments

Eventually research of schools and guidance from Professor Jiusto led me to the investigation of endowments and the possibility of committing a portion to sustainability. Endowments are funds kept by universities that accumulate over time from donations and investment interest. A limited amount of the interest is allocated for spending, and this varies at every school. The oldest endowed sustainability program is located at the University of New Hampshire, and a great deal of information on it can be found at its web site. My research of endowments led me to the Sustainable Endowments Institute, where I learned about the investments of 200 schools in its annual report and learned the importance of making sustainability related investments (SEI 2008). The major use of this second funding mechanism was to be a source of the revolving loan fund and other aspects of my proposed plan.

Discussion of my plan regarding the Sustainability Endowment can be found in section 4.1 of this report.

Other Methods of Funding

Savings from sustainability measures is an interesting and self-explanatory method of funding. Schools with sustainability programs include an economic factor in their evaluation of sustainability, and energy saving measures lead to decreased cost. The University of British Columbia uses savings to develop a fund, and this is discussed more in depth in the next section of the background. The concept of a revolving loan fund is based on the principal of recycling savings back into a fund, so my plan essentially relies on savings from sustainability measures in that sense (AASHE 2008).

Another funding source found on the AASHE website is **government incentives**. This type of funding is used when some branch of government decides to provide incentives to a university for using an innovative and helpful technology. Ball State University, for example, received $48 million for overhauling its heating facilities; replacing coal boilers with fluidized bed combustion units (AASHE 2008).

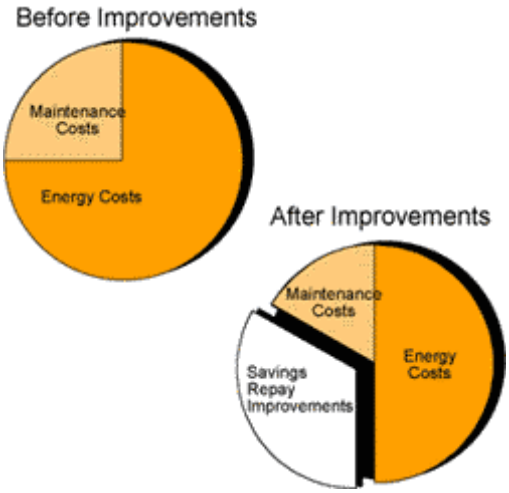


Figure 8: How Performance Contracting Works

Performance contracting is another way to fund sustainable projects. An illustration of how a performance contract works is shown in Figure 8. A Performance contract is an agreement made with an energy service company. This company installs energy improvements for a college for little or no cost, with a guarantee that the savings will pay for the installation within a certain time period (Energy Services Coalition 2004). One place where this type of contract has been used is the Cape Cod Community College. Some efficient technological upgrades were installed there that had a cost of over $1.3 million, with nothing paid up front.

Funding can also be provided from **Foundations**, non-profit organizations grown through donations that are similar to university endowments, except they usually have a common purpose. The University of Maine Green Loan Fund received its initial fund from the U Maine foundation. Also, Aquinas College received grants from two different foundations, the Steelcase Foundation, 5 years and $1 million dollars, and the Wege Foundation, 5 years and $100 thousand. Aquinas used this foundation to finance solar panels on its library, a composting project, and a recycling program (AASHE 2008).

2.3.2 Incentive Programs at other institutions

My research of incentive programs at other institutions led me to a number of programs that did similar things. The common theme of programs was competitions, namely energy competitions.

Harvard University has an incentives program known as the Green Living Program, a detailed and comprehensive movement organized by staff and students. The Green Living Program encompasses both competitive and non-competitive initiatives that have been successfully helping the cause of sustainability on the Harvard campus. The entire green living program is described at the Harvard Green Campus Initiative's website under the green team resource link. The site even outlines a method of starting up a green living program similar to Harvard's. It gives advice on developing a budget, fundraising, organizing management, and general tips on running a sustainability program (Harvard 2008).

An example of an awareness-spreading conservation program is one at the University of British Columbia. The program is known as the Sustainability Coordinators program, and involves faculty and students. Their usage of the term *sustainability coordinator* loosely relates to the staff position I am proposing in my plan however it has some major differences. Anyone can apply to be a sustainability coordinator at UBC, and it is a volunteer position. Coordinators basically promote energy conservation and awareness of how to live more green in an overall sense. This program saves around $75,000 in energy costs on the University of British Columbia campus with no cost. This type of program would add to the funding source at WPI, and also supplement the population of the university with an awareness of the repercussions of everyone's actions on the world around them, hopefully causing a campus wide movement (UBC 2008).

There is a wealth of information around about competitions for incentives in the campus sustainability culture. In fact, the campus culture section of the AASHE website, found on the resource center page, shows a number of these. The common theme of competitions

was dorm versus dorm energy competitions. Oberlin College ran a dorm energy competition that had notable results. It was conducted with a number of dorms competing against each other to see who can reduce their electricity and water consumption the most (Oberlin 2007). The winning dorm in this competition reduced electricity consumption by 56% (Petersen, et. all 2007). Some schools, such as Duke and Harvard, incorporated these types of competitions into multi-faceted competitions, and Duke's is discussed in section 4.3.1.

Another form of competition found in research is actually how Oberlin's Competition was funded. It is a grant from the Environmental Protection Agency and is known as the P3 competition. P3 stands for People, Prosperity, and the Planet, and it is a campus sustainability design competition. If an idea makes it to Phase One of the competition, it receives a grant for $10,000 that is used to develop the design. The design team is then given a period to complete design and invited to a national sustainable design expo, where the winner receives a grant of up to $75,000 (EPA, 2008). The whole recommended plan for incentives for sustainability can be found in section 4.3.

2.3.3 Sustainability Staffing at other institutions

The question of whether there should be dedicated sustainability staffing at WPI is answered simply by my research of every other element of my plan. Every leading college I looked at, from researching funding to researching incentive programs, had some form of staffing employed. According to the Sustainable Endowments Institute yearly report card for sustainability, 37 percent of all schools employ full-time staff dedicated to sustainability (SEI 2007). This finding, coupled with my interactions with Clark's sustainability coordinator and learning through my interview with Professor Ward that there is interest among the Task Force in creating such a position, led me to see that the need for a sustainability coordinator at WPI is definite. Additional information on sustainability staffing can be found in the sustainability coordinator part of the results chapter (section 4.4).

Chapter 3: Methodology

The goal of this project was to develop a program at WPI that would encourage sustainable practices on campus. This included researching the funding options and feasibility of having an ambitious sustainability plan that would promote awareness, create savings for the school, and increase the prestige of WPI in this field. The resulting plan was based on four major elements, a sustainability endowment, revolving loan fund, sustainability coordinator, and incentives program.

In order to complete this major plan development, the following objectives were completed:

- Review sustainability programs at other colleges and universities
- Present ideas to WPI President's Task Force on Sustainability
- Develop four part business plan of sustainability

3.1 Review Sustainability Programs at other Colleges and Universities

The first objective of my project was to research and gain ideas from the sustainability programs of other colleges and universities. I began this process by meeting with a member of the WPI library staff, and discussing the project. I was then directed to databases filled with scholarly articles that are available to WPI. In addition to scholarly works I went about researching by using the website for the Association of the Advancement of Sustainability in Higher Education, referring to the Sustainable Endowments Institute website, and various web searches.

Reviewing these online databases of articles led me to a few sources, yet tended to be more focused on methods of assessing universities in general, such as the development of the Canadian Sustainability Assessment Framework (Cole, 2003) or the implementation of specific initiatives, like waste management programs across the nation and their effectiveness (Creighton, 1993). This methodology of searching broad topics like campus sustainability through these databases and Google scholar brought some resources, however I found the best studies of effectiveness of administration and budgeting policies at other places.

The AASHE website is an extensive source of information that allowed me to see the sustainability programs of a number of colleges and universities. The features within this site that I found the most useful for this report were the sustainability officer survey, the section on various types of funding, the section on peer outreach campaigns in schools, the campus culture section, and basically everything under the resource section. The AASHE website, since

it was filled with links, guided me along my research by sending me to a number of college's websites that had valuable information, such as Harvard's Green Campus Initiative website, Oberlin's dorm competition website, Duke's Eco Olympics website, the University of Maine's website, and many others. On these websites, I found some useful journal articles relevant to this report reviewing some of these programs (AASHE 2008).

In order to gain perspective and background knowledge on endowments in general and their usage relating to sustainability, I searched "sustainability endowment" on Google and came across the *Sustainable Endowments Institute*. This research organization is a division of Rockefeller Philanthropy Advisors that grades colleges and universities on their green practices and investments. This organization composed the College Sustainability Report Card and I found and used a large amount of information from this document (SEI 2008).

3.2 Present Ideas to WPI President's Task Force on Sustainability

The second objective of my project was to present the ideas I had for this sustainability plan to the members of the Task Force. This objective was harder to fulfill than the others, because of the time period in which this project was done, during the summer. One member of the Task Force that I worked with extensively and provided me with the most information was my project advisor, Professor Scott Jiusto. I attempted contacting various other task force members via electronic mail, and received two responses, Professor Krueger and Professor Ward. I interviewed both professors, and the focus of these meetings was for me to show them my plan and ask for constructive criticism on what should be done.

Professor Jiusto helped to focus me along on my project, and along the creation of the plan. He shaped the idea of the final plan involving the four major elements and advised me along the whole way of the project. The endowment piece was an idea presented to me by him (S. Jiusto, personal communication, May-July 2008).

In the interview with Professor Rob Krueger, he gave me advice on how to advance my research and improve the plan. He told me to present my ideas in the beginning of interviews instead of after a series of opinion questions, to contact Dave Schmidt, Clark University's sustainability coordinator, and to reduce the endowment proposal to one half percent, down from one percent. These were the points of his that I heeded (R. Krueger, personal communication, June 20 2008).

The interview with Professor Matt Ward brought substantial advice also. One major point he made about my plan was that I need to specify the individual who will be the official

supervisor to the proposed coordinator. I took note of this recommendation and added to my section on the sustainability coordinator. He also told me to discuss methods of fundraising to be used in addition to the endowment piece, and this I agree with also (M. Ward personal communication, July 10, 2008).

3.3 Develop four part business plan for sustainability

The last objective in this IQP was to develop a comprehensive business plan for sustainability that would effectively satisfy the following objectives:

- Promote awareness of sustainability on the WPI campus
- Encourage other members of the WPI community, besides the task force, to initiate sustainability related goals and projects
- Create a self-sufficient sustainability budget and possibly bring returns to the school
- Save on energy costs, waste costs, and any other costs incurred in a campus lacking sustainability initiatives

From research and discussion, the four part plan was developed. The elements of this plan are: 1) create a **sustainability endowment**, 2) institute a **revolving loan fund**, 3) develop an **incentives program**, and 4) create a full-time **sustainability coordinator** staff position (Figure 9). The revolving loan fund plan was developed first, with inspiration from Harvard's revolving loan fund. Next developed was the incentives program plan. This plan took the longest, because it is the one that has the most variability out of the four elements. Next was the endowment section. The final element of the plan that was developed was the proposal for the Sustainability Coordinator.

Once the four part plan was developed, it was presented to the Task Force for consideration. This was done to provide the committee with ideas that they could hopefully work with and use in the development of a proposal to be sent to the president.

Chapter 4: Results and Recommendations

The research of campus sustainability programs and discussion with Task Force members has led me to the creation of a comprehensive plan. The plan is fundamentally based on funding and providing staff in order to further the development of initiatives relative to sustainability at WPI. I determined the best way to accomplish these basic aims was through the development of a plan including these four major elements:

- Establishing a Sustainability Endowment
- Investing in a Revolving Loan Fund
- Developing an Incentives Program
- Creating a Sustainability Coordinator Position

The following chapter of this report provides a detailed recommendation of the plan one element at a time. Figure 9 illustrates how all these elements come together, while showing the parallels between the operation of the sustainability endowment and the WPI endowment.

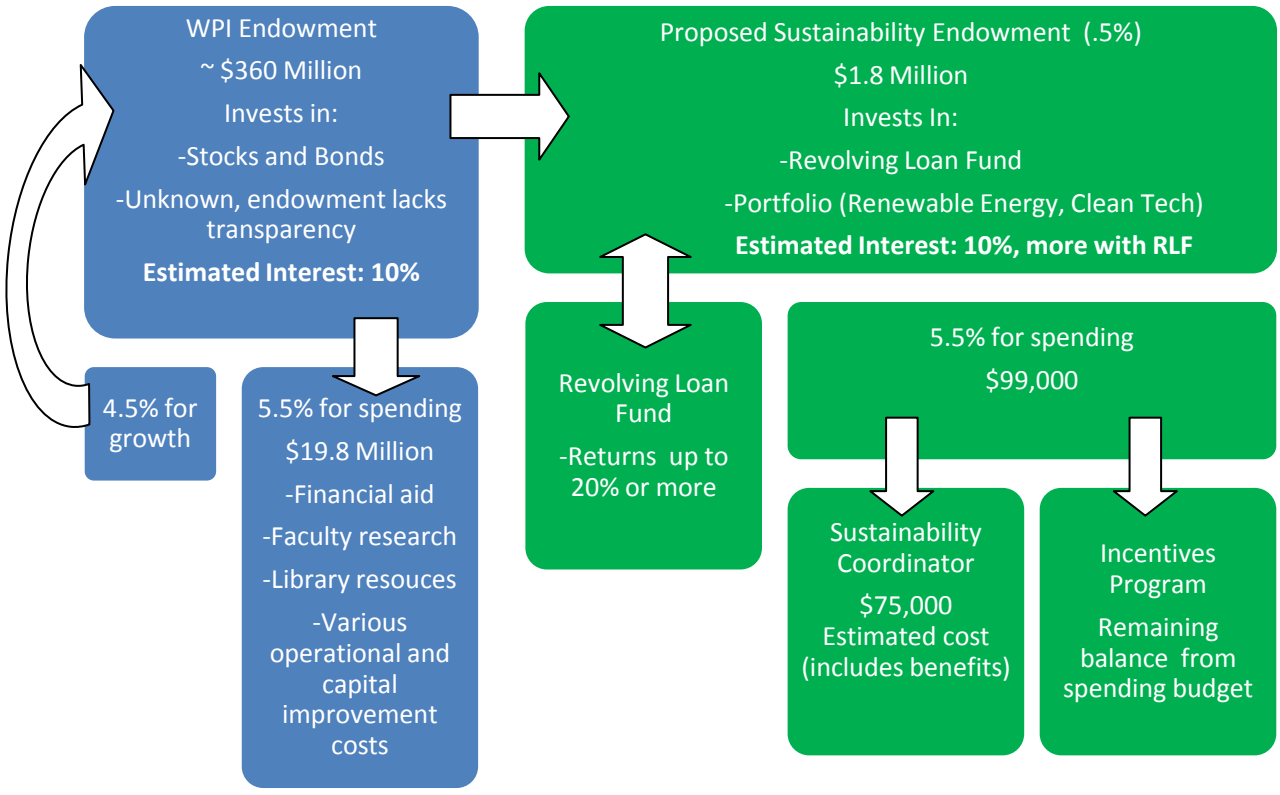


Figure 9: The plan

4.1 Development of a Sustainability Endowment

A University Endowment is a fund of money that, over time, accumulates into a substantial amount of money through a combination of donations made by alumni and others, and interest received from investments. Every institution has a different endowment policy; however the theory behind them is pretty much the same. The bulk of it is invested in various stocks and funds, creating interest. The rate of interest on these investments over many years averages around 10%. About half of this is typically allocated for spending by the school. WPI's endowment policy allows for spending of 5.5%. This money is used to fund items considered a priority by the school. WPI's main priorities, as listed on its website in the office of development and alumni relations web page, are financial aid, faculty teaching and research, and library resources (WPI 2008). The rest of the ten percent is returned to the endowment, causing growth. Schools also use endowment funds in their operational budgets, and capital improvements are very important.

4.1.1 Creating the Sustainability Endowment

In order for WPI to improve its standing in the sustainable campus movement there needs to be more commitment to sustainability in its investments. One place where this is brought to attention is the 2008 College Sustainability Report Card published by the Sustainable Endowments Institute, referred to in the background chapter of this report (see section 2.2.2).

A way to insure that WPI engages in sustainable investment policies is to put aside a branch of the endowment and call it the sustainability endowment. This would be a percentage of the endowment devoted entirely to investing in sustainability on campus and beyond. This sustainability endowment would greatly add commitment to sustainability at WPI, while also adding to the transparency of WPI's endowment. The endowment would require integrating the Task Force and proposed sustainability staff member into the process of choosing wise and sustainable investments for the school.

My plan for creating this endowment is to set aside 0.5% of the current university endowment for it, which would be a total of about $1.8 million dollars. The bulk of this money would be concentrated on investments. A portfolio will be devised by members of the President's Task Force filled with investments in renewable energy, environmentally friendly practices, local businesses, and revolving loans for innovative sustainability projects on campus. In accordance with the WPI endowment policies, no more than 5.5%, or $99,000, would be allocated for other spending that would not bring direct returns.

4.1.2 Positive Outcomes of a Sustainability Endowment

The proposed sustainability endowment amount at this juncture is designed so that it would be just enough to cover the salary of a paid staff member with a small amount left for other expenses. According to a survey done by the American Association for Sustainability in Higher Education (AASHE), salaries vary greatly among officers of sustainability at campuses but the average for one with an advanced degree at a private college is $52,000 per year (AASHE 2008). With benefits added to that, the amount left for other use is about $25,000. This means the proposal covers the salary of a sustainability coordinator and funding for an Incentive Program geared towards motivating the community with knowledge about sustainability. The sustainability coordinator position and Incentive Program will be discussed in greater detail in later sections of this IQP report.

The major source of returns on this proposed endowment is realistically not going to be from investing in stocks of renewable energy. Instead it would be in the proposed Revolving Loan Fund (see section 4.2). One campus that has achieved great success with their revolving loan fund is Harvard University, since the introduction of the Green Campus Loan Fund in 2002. "As of November 2007, GCLF projects are projected to save the university $3,847,587 per year with an average project ROI [return on investment] of 26%..." (Harvard 2007). A graph of returns from the GCLF organized by category of project is located in the background chapter of this report (Figure 7). Revolving loan funds are being used at a number of universities to fund Sustainability initiatives, for example the University of Maine, Macalester College, and Carleton College (the aforementioned sustainable endowment leader) are some of many colleges currently investing in this type of fund (AASHE 2008). Revolving Loan Funds will be addressed in greater detail in the next section of this report.

With this sustainability endowment fund in place, the task force essentially becomes a functioning board of sustainability trustees that will recommend investments to the WPI Board of Trustees. This fund is the basis for the entire plan, and while 0.5% is proposed, hopefully more can be added in the future. One way the fund will grow is by receiving donations from alumni, and I suggest that this sustainability endowment be place under the list of WPI's named endowments. These operate by having a minimum amount required for donation, and are a more specific way for alumni to contribute to the overall endowment of the school. The establishment of this Sustainability Endowment will allow WPI to move forward in the field of college campuses with sustainability programs, and it would likely prove to be a lucrative investment at the same time.

4.2 Investing in a Revolving Loan Fund

The spending budget under my plan would go to the coordinator's salary and incentives program, but would not be large enough to finance full scale infrastructural improvements to the school that would bring long term savings and innovation to WPI. Of all the funding mechanisms possible, the one that has proven most successful in this regard and has the most potential for large returns is the revolving loan fund. This plan recommends that the returns accumulated from this fund be reinvested into the proposed WPI sustainability endowment, and help it grow with its returns. The basic process of how the proposed revolving loan fund would operate at WPI is illustrated in the graphic below (Figure 10).

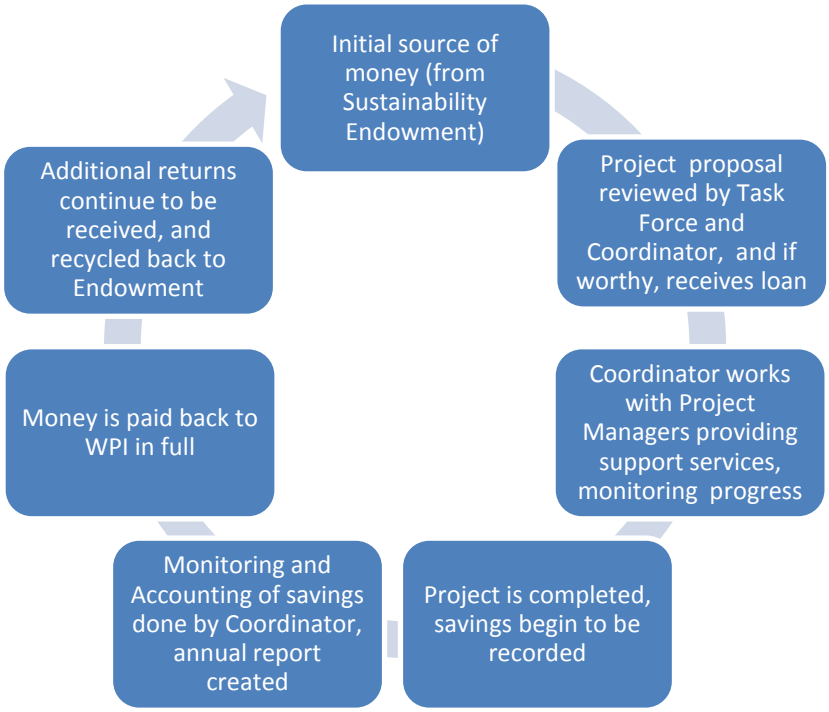


Figure 10: Revolving Loan Fund Process

My plan for the WPI revolving loan fund uses Harvard University's revolving fund, known as the Green Campus Loan Fund (GCLF), as its principal model. Harvard adopted this revolving loan fund in 2001 and it is a great success. I described some successes of this RLF in the previous section of this chapter, and also in the background chapter of this report. This section outlines the process of introducing a revolving loan fund to our campus, and it is subdivided into the following sections:

- Opening a Revolving Loan Fund
- Maintenance of a Revolving Loan Fund

- Possible issues with Revolving Loan Funds
- The process of applying for a Loan

4.2.1 Opening an RLF

To create a revolving loan fund, there needs to be an initial source of money. My plan has this covered, with the sustainability endowment. The only question is how much money should be set aside for this fund, and how much for other investments. This sort of detail, among others, is best decided by the Task Force, with its administrative power and financial knowledge.

One alternative way to add money to the Revolving Loan Fund would be the way the University of British Columbia raises money. Their volunteer sustainability coordinator program leads to energy savings, and is discussed in greater depth in the background chapter of this report (UBC 2008). In the situation of my plan, such savings could go back to the endowment and contribute to the revolving loan fund. In the same sense as this UBC program, my proposed WPI incentives program (see section 4.3) will conduct smaller scale awareness-type initiatives, and also campus wide competitions that together should bring in a fair amount of savings to recycle back into the sustainability endowment. These savings could be invested in the loan fund.

4.2.2 Maintenance of a RLF

The WPI loan fund would be run by the members of the President's Task Force on Sustainability and the sustainability coordinator. If the Task Force isn't given total power over the sustainability endowment, the Board of Trustees would have to be involved. An effective way to control the fund would be dividing the Task Force further and creating a loan fund committee within it. This committee would be responsible for developing specific criteria for the fund (see section 4.2.4). The committee would also review applications based on these criteria, promote the well-being of the fund and support continuous growth of it, and lastly insure the fund is running efficiently, effectively, and responsibly. The Task Force and the Coordinator, or possibly the loan fund committee, would also monitor the progress of projects by offering support services (Harvard 2007).

4.2.3 Possible Issues with RLFs

Developing a revolving loan fund may be a complicated operation that has some risks involved, however, we can learn from the already developed GCLF and build upon it. One issue is that accounts between capital improvements and operations are usually unrelated and

separate, so using savings to repay loans is not commonplace. The major issue is that correctly estimating the overall savings from energy conservation is a challenge in itself, and it is important that all projects stemming from this fund be properly executed and prepared. These concerns in the execution and preparation of projects lead to the development of a management plan. This plan calls for the sustainability coordinator to offer support services to make sure projects are sufficiently monitored. Major challenges that may arise in developing and running a Revolving Loan Fund are knowledge of the program and overall capacity of the loan fund's staff (Harvard 2007). With the proposed addition of a sustainability coordinator to WPI and the institution of an incentives program and awareness campaign, the usage of a comprehensive Revolving Loan Fund program here has major potential for overcoming these obstacles and achieving success.

4.2.4 Applying for a Loan

In order to insure loans are not given out inappropriately, a structured loan application process needs to be used. The process is based on determining the need for a project and then the actual process of completing an application. This entire four step process of requesting and receiving a revolving loan fund is described in Figure 11:

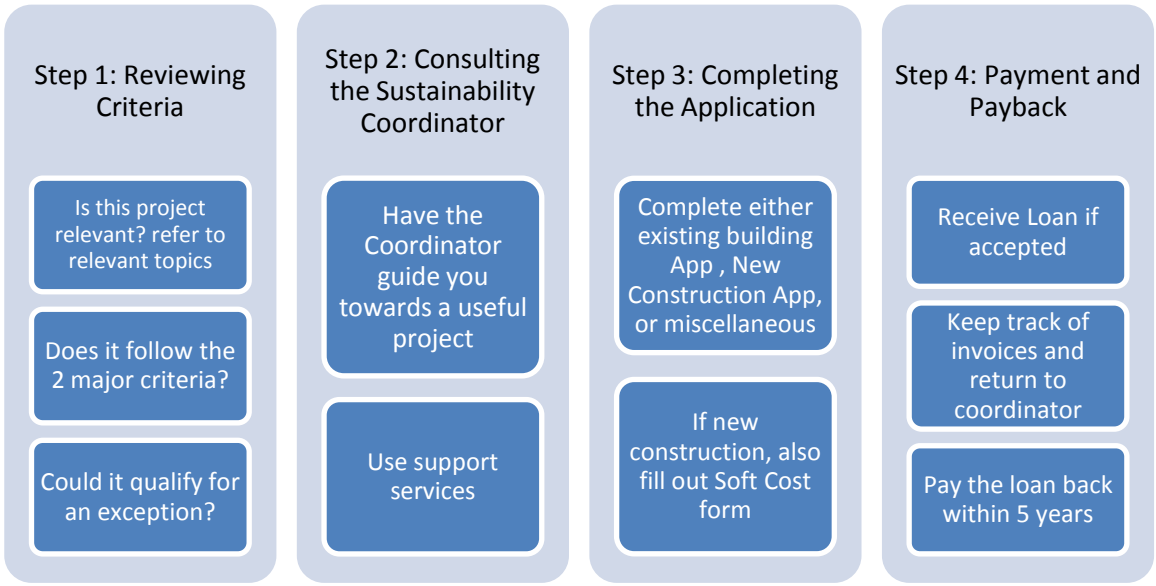


Figure 11: Applying for a loan from an RLF

Step 1: Reviewing Criteria

In order to run a successful Loan Fund for WPI, the application process needs to be outlined in detail. The first step of the application process is evaluating whether the proposal meets the specified criteria. This list of topics, based entirely on the GCLF, is the basis of

whether a proposal would receive consideration for a loan, before being evaluated for the major criteria.

Relevant Topics (Harvard 2007)

- Greenhouse gas reductions
- Energy conservation
- Water conservation
- Sewage and storm water output reductions
- All types of pollution reduction
    - Hazardous waste
    - Solid waste
    - Liquid waste
    - Gaseous emissions
- Operations improvements that decrease environmental impacts
- Environmental procurement practices
- Environmental leadership development within the University
- Number of individuals with improved environmental literacy and increased levels of participation in conservation activities
- Education of and reputation building with surrounding community

If a project is considered to be within the general realm of the above topics, there are two major standards that must be met in order to be considered for the fund. These two criteria have been briefly mentioned in the previous section of this loan fund plan, and are reasonable for use at WPI.

1) A project must create an improvement that causes a direct reduction in the environmental impact of the University, lowers cost to the university, promotes prosperity of local goods producers, or a combination of these, while doing so with an innovative approach and design. Also, routine or scheduled maintenance projects would only be considered if the design is innovative and environmentally beneficial (Harvard 2007).
2) The project must have a payback period of five years or less. This five year guarantee can be argued and changed in proportion to the amount of money available in the fund.

Once the sustainability endowment is established and has been revolving and accumulating returns, it could then be appropriate to re-evaluate and possibly increase the payback period. The Harvard method allows for a few exceptions to the criteria in certain situations that could be of use to the WPI community. Rebates from utilities and others can be

included when pay back periods are calculated, meaning a rebate can reduce a period down to five years and make it eligible. WPI may also elect to give out smaller loans for use in studying the feasibility of a project, up to $20,000. These mini-loans would either be paid back within two years or, if the study finds the project feasible, the amount would be incorporated into the 5 year fund. WPI should definitely look into funding for photovoltaic projects for renewable energy even though payback usually takes a little longer. The final exception to the criteria is project bundling, which is a term that means using one loan for multiple projects, and this helps balance longer payback projects with ones of short payback periods (Harvard 2007). These exceptions and special cases for loan funds should be kept in mind during the development of a loan fund.

With the utilization of subject screening and criteria analysis, the committee reviewing it then has guidelines to refer to when looking for legitimate projects. While meeting only one criterion may prove to be sufficient because of the exceptions, meeting multiple criteria gives a project precedence over other proposals. These criteria are a good overall measurement of promoting sustainability through funded projects, and should be used for the WPI revolving loan fund. In fact, it could be seen that these criteria effectively describe the campus sustainability movement as a whole.

Step 2: Consulting the Sustainability Coordinator

Once the criteria are reviewed by the applicant, it is recommended that applicants contact a staff member before ultimately applying. The coordinator would be the default person for this, however there may be a member of the Task Force with particular interest in the proposal. This staff member then offers a variety of support services meant to make sure the project would fit within the aforementioned criteria. This interaction between staff and potential benefactors is meant to be ongoing if the project is ultimately given a loan for development. The coordinator will offer support with the following issues, taken from the GCLF guidelines:

- Project identification and feasibility assessment
- Rebates and grants
- Project management and implementation
- New technology identification and evaluation
- Targeted education and training for building and facility managers, occupants and clients
- Publicity and communication

The creation of the sustainability coordinator position offers necessary guidance with the Revolving Loan Fund during the application process (Harvard 2007).

Step 3: Completing the Application

Once the criteria are reviewed and the coordinator has helped the party go over the services available, the application must be completed. I recommend there be three separate types of applications, one for upgrades to existing infrastructure, one for building an entirely new facility, and one for miscellaneous projects that do not have to do with large infrastructural improvements.

The application for upgrading a building would be much less involved than for a new building. The GCLF application is modeled for this and can be found in Appendix A. This application should be only a page long and is divided into sections. Section I, Administration, identifies a Project Sponsor, Project title, Project Executive, and if applicable the name and number of the building being modified. Section II involves describing the project through its objective, implementation plan, and environmental impact reductions, including utility bill reductions. The third section deals with funding and accounting, an anticipated schedule is required as is a detailed breakdown of finances. The fourth section is entitled approvals and is where the document is signed. The proposal for building upgrade construction should be heavily based on the GCLF's (Harvard 2007).

When proposing construction of a new facility, the application should be much more detailed. The GCLF application is an Excel workbook with multiple sheets in it, and the link to this is found in Appendix A. For new construction, the applicant has to prove the project will be worth the loan by first describing the difference between this project and a standard building in compliance with codes. The applicant must then do a comparison of elements of the design case with elements of a similar design using non-green technologies (sometimes referred to as "base case"). This requires cost estimates, and could include "elements relevant to building envelope, electrical systems, schedules, and mechanical and plumbing systems" (Harvard 2007). The next spreadsheet in this detailed application based on the GCLF would be a calculation sheet that once again compares the base case to the design case in areas relating to specific costs. This spreadsheet would also ask for estimated emissions reductions and loan payback time. The summary spreadsheet follows this, and would be similar to the application for existing buildings. This sheet would ask for project description information, project cost, and accounting. It would also ask for base cost and design cost, with the difference between the two taken as the amount of money the project is eligible for. The rest of the workbook

should contain various spreadsheets that show forecasted utility pricings in the region in the upcoming years. These sheets additionally show that after five years of loan time, the maintenance bills for the structure are increasing. In addition to the single form, another form for new construction is recommended, for soft costs incurred by LEED in order to get a LEED inspection and certification; in addition to soft costs from architects, engineers, and general contractors. The GCLF soft cost form is a page long and can be referred to in Appendix C (Harvard 2007).

The final loan application option is for a project that may not be as large scale or expensive as the former two types. This would be for a miscellaneous improvement idea that would come from one of the other realms of sustainability, such as transportation upgrades or technological advances to processes that take place already. This application would be structured similarly to the existing construction application, but more based on content, basically similar to the Green Loan Fund (GLF) application from the University of Maine (see Appendix A). The GLF application can also be found in the appendix (University of Maine 2008).

When one of these applications is completed, it is to be reviewed by the proposed WPI Revolving Loan Fund committee, and if accepted, the fourth step takes place. If not accepted, the party can elect to have a meeting with the committee, or likely just the coordinator, and discuss whether the project has potential if restructured or if there is no possibility at all.

Step 4: Payment and Payback

Once the project is underway, invoices need to be sent to whoever is in charge of the fund. In the case of the GCLF, payments are completed back annually. The WPI fund could create separate payment plans with each loan or simply stay with a rigid payback. The payback plan is complicated and should be designed by someone more qualified than me, such as the CFO of WPI, or someone in the administration with financial credentials. The Revolving Loan Fund is an important element in the overall plan, because it provides the possibility for very large returns that would benefit all three of the other elements of the plan.

4.3 Development of an Incentives Program

The development of an incentives program for sustainable projects on the WPI campus would be an integral part of my proposed sustainability plan. While the outcome of this program may be incentives, this is not the only reason why it is important. This program is essential because it involves the spreading of knowledge and awareness about the world around us. Instilling the public of WPI with knowledge of sustainability is the best way to start

getting everyone involved. Incentives for spreading the sustainability movement would involve both competitive and non-competitive programs that would result in prizes or recognition. In addition to simply rewarding actions, knowledge of sustainability should be spread within the incentive program. This would involve the distribution of educational materials alerting students, faculty, and staff about the repercussions of wasting resources or damaging the environment. With the implementation of an incentive program run by a sustainability coordinator, the WPI community would have a chance to become a leader in the campus sustainability movement.

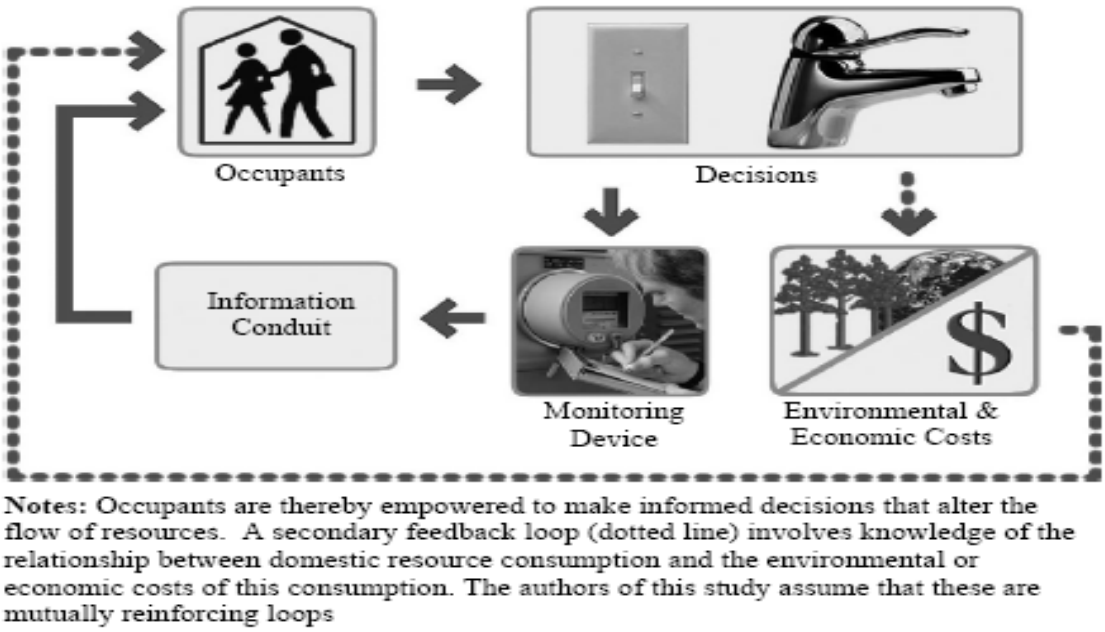
4.3.1 Competitions for Incentives

Competitions among student organizations and other groups on campus could definitely stimulate interest, create savings, and promote innovation on the WPI campus. Some types of competitions include:

- Energy conservation (electricity, heating, water)
- Water consumption monitoring
- Knowledge of sustainability
- Recycling
- Composting of trash
- Motivation of peers
- Sustainable project design

One competition that could be used as a model for WPI was Oberlin College's Dorm Energy Competition, briefly discussed in the background chapter (section 2.3.2). This was conducted with a number of dorms competing against each other to see who can reduce their electricity and water consumption the most. The school developed the campus resource monitoring system which should be studied by WPI (Oberlin 2007). A similar one could be designed, building on the electricity monitoring IQP done at WPI recently (WPI 2008). The system relays real time consumption statistics to a web site (Oberlin 2007). If WPI adopts the plan outlined there should be enough funding to have prizes or recognition, thereby increasing motivation and commitment of students. The winning dorm in the aforementioned Oberlin competition reduced its electricity usage from its baseline readings by 56% during the two week competition. Also, the monitoring system found the numbers to remain low after the competition. The illustration following this paragraph (Figure 12) was taken from a journal article that analyzed dorm energy competitions. It shows how informing college students of the impact of their energy use often results in making responsible energy saving decisions.

(Petersen, et. all 2007). These findings prove that this dorm energy competition was successful and show that WPI should use it as a model to conduct a similar competition as part of an incentives program and expect positive results.



Notes: Occupants are thereby empowered to make informed decisions that alter the flow of resources. A secondary feedback loop (dotted line) involves knowledge of the relationship between domestic resource consumption and the environmental or economic costs of this consumption. The authors of this study assume that these are mutually reinforcing loops

Figure 12: Feedback caused from exposure to energy monitoring

A more involved incentives-laden competition would be a series of events known as an Olympics, which would have a dorm energy type of competition within it. A program of this nature is currently run at Duke University. It is known as the Eco-Olympics, and it consists of a series of events that award point totals to each dorm. The events included at the Duke program are an energy competition, recycling analysis, filling out a survey, attending "eco films" showings, a trivia night, finding trash and recycling it, and a motivator award (Duke 2006). This type of competition would be greatly suited for WPI. It should happen between dorms, Greek houses, academic buildings, or a combination of them. One recommendation is that WPI have this type of competition between dorms for a period of a few weeks, and also run a separate parallel competition between Greek organizations during Greek Week. A number of institutions have participated in competitions similar to Oberlin's and Dukes, some have been called competitions, a few are called the "Green Cup", and all kinds of names have been used. The fact is competitions generate interest in sustainability and provide incentives to people to follow sustainable practices.

A design competition as part of the incentives program is another necessary part of my recommendation, because it would supply candidates for the revolving loan fund. It would also stimulate interest on campus. The process of the Environmental Protection Agency's P3 design competition, described in the background chapter (section 2.3.2), is a useful model for this sort of competition. The WPI design competition would be advertised throughout the campus, with the advertising financed by the Incentives Program budget. Proposals deemed sufficiently innovative and important would be funded by the Revolving Loan Fund. This sort of design competition would fit well into the proposed Incentives Program and the plan in general.

4.3.2 Non-competitive Programs

The spirit of competition brings many positive elements to a campus but a more non-competitive aspect should also be included in the development of an incentive program. Through the development of these campaigns and initiatives, it is the goal to spread knowledge and awareness of the importance of sustainability while saving the university money at the same time.

One aspect of a non-competitive program is providing recognition or a loan for the proposal of a project. A suggestion box provided in the campus center, or a comment made on the already existing forums on the WPI site (WPI 2008), is the simplest form of this. When a proposal for innovation on the sustainability front is submitted to the coordinator's office and deemed useful, an award could be presented such as a "WPI Sustainability Innovator Award" or "Sustainability Coordinator's Proposal Award". The proposal would then have a possibility of receiving money from the WPI Revolving Loan Fund. In addition to basic recognition being given out to students for these efforts, a sustainability scholarship should be offered. In fact, a group of scholarships known as the Sustainability Scholarships should be created, consisting of a handful of scholarships that are given to students who show leadership in the campus sustainability movement or have won the sustainability design competition. The amount of money devoted to such awards is unknown at this point, and would be dependent on other expenditures of the incentives program. Since the sustainability endowment is intended to grow, monetary awards are likely to start small. Tuition breaks of some sort should also be made available to students nominated for such awards.

Smaller scale sustainability measures would be encouraged also, with the administering of small grants to clubs or organizations for promoting the subject. One hypothetical situation that would involve this is an organization wanting to post sustainable living tips on walls of

buildings and the coordinator deciding it is a good idea and giving them $30 to buy recycled paper and organic markers for posters.

4.3.3 Incentives for Sustainability in Academics

Another important aspect of the Incentive Program would be to encourage the promotion of sustainability in academics. This would be recognition for a faculty member incorporating sustainability into an MQP, an IQP, or a course. It could also be recognizing a student project and awarding a scholarship from the previously proposed sustainability scholarship series. One idea for an incentive for sustainability in academics would be a "Sustainability Coordinator's IQP Award," which would be similar to a President's IQP award except it would recognize the IQP that does the most to improve the sustainability of a community or of WPI. It should also be considered for MQP's. Incentives for green academics are ideal for WPI because they show dedication to the principle of sustainability, and these projects could even be put to use by the Task Force at WPI if deemed useful enough.

4.4 Creating a Sustainability Coordinator Position

For WPI to have a truly beneficial and innovative campus sustainability program there needs to be a paid staff member involved. The creation of the President's Task Force on Sustainability was a great beginning to the overall management plan of sustainability at WPI; however Task Force members have other responsibilities as professors, school administrators, and students that do not allow them to fully commit themselves to developing sustainable practices and projects on the campus. This is why the creation of a position dedicated to the coordination of sustainability-related activities is necessary at WPI. According to the Sustainable Endowments Institute, 37 percent of schools employ full-time staff dedicated to sustainability (SEI 2007).

4.4.1 Responsibilities of the Sustainability Coordinator

The coordinator will be in charge of managing the day to day processes of the sustainability program. Table 1 shows job duties of existing sustainability staff members and is taken from a 2008 sustainability officer survey conducted by the Association for the Advancement of Sustainability in Higher Education:

Task, Issue or Role	Average Percentage of Time Spent	Standard Deviation
Overall Sustainability Coordination	28.7	20.7
Work with Students	14.9	13.7
Energy Efficiency and Management	9.6	10.4
Recycling and Waste Reduction	8.4	13.8
Community Outreach	6.8	7.5
Data Collection and Reporting	6.0	5.1
Building Construction and Management	5.4	5.6
Research Issues	3.7	4.8
Other	3.1	9.8
Environmentally Preferable Purchasing	2.6	3.8
Transportation	2.6	3.6
Curricular Issues	2.3	3.4
Teaching Courses	2.2	4.4
Green Dining	1.9	2.7
Environmental Health and Safety	1.8	6.1

Table 1: Time spent on job duties by sustainability officers, from 2008 AASHE Sustainability Officer Survey

Fifty-eight sustainability officers responded to this survey. These survey results give a foundation of what the proposed WPI coordinator essentially should be doing with their time (AASHE 2008). The duty referred to as overall sustainability coordination would, in the WPI situation, have to do mainly with the organizing of the incentives program and the management of the Revolving Loan Fund. This management aspect of the coordinator would be a major focus of the WPI plan.

Clark University's sustainability coordinator position is a model that should be referred to in the creation of the coordinator at WPI, but not solely. The summary of its position is close to the one that should be put in place at WPI, and the complete job summary can be found in the Appendix of this report. Part of it states that the position, "will serve as a facilitator in the University's move toward environmental sustainability…responsible for developing, implementing, and maintaining a sustainability program…"(D. Schmidt, Personal Communication, June 30 2008). Its duties are divided into broad coordination of environmental sustainability, an estimated 70% of the time; and specifically managing the waste stream of the university the rest of the time (D. Schmidt, Personal Communication, June 30 2008). This position is mostly focused on the environmental aspect of sustainability, which is only one third of the proclaimed WPI sustainability program, which also encompasses economic and social sustainability. In addition to this discrepancy, my plan calls for the WPI Coordinator to manage the application process of the Revolving Loan Fund (section 4.2) and a fully functioning Incentive Program (section 4.3).

4.4.2 Duties of Proposed WPI Sustainability Coordinator

The coordinator's job will be to promote awareness of sustainability and stimulate others to practice sustainability throughout the entire campus through the distribution of educational materials, development of important sustainability initiatives, and organization of sustainability related activities. The rest of this section describes in detail how this would be accomplished.

- Facilitate President's Task Force on Sustainability

In order to do this, the coordinator would organize campus wide sustainability initiatives. Further campus initiatives should be looked into, such as transportation changes, energy efficiency standards, carbon footprint analyses, and any other possibilities. It also means monitoring the recycling program on campus and similar programs.

- Manage the Revolving Loan Fund

The coordinator will be a key component in the management of the loan fund. Whether a separate loan committee is formed or not, the coordinator is going to review applications and recommend which one receives a loan to everyone in the Task Force. The coordinator would also provide support services for whoever applies for a loan. Once a loan is dispensed, the coordinator must monitor the progress of projects receiving loans.

- Manage the Incentives Program

The incentives program will be managed by the coordinator almost entirely, with some help provided by student volunteers and work study students. Competitive and non-competitive events promoting sustainable practices will be created, and then organized by the coordinator. Small grants should be given out to clubs and organizations for sustainability related usage. The coordinator will also develop awards and scholarships to be approved by the Task Force.

- Manage Website

The coordinator will be in charge of keeping the sustainability website updated.

- Coordinate Annual Sustainability Report

The coordinator will be in charge of completing this annual report. This will involve the delegation of work among task force members, others, and the coordinator.

- Manage Work Study students and/or student volunteers

The coordinator will be able to use the help of these student assistants in any other aspect of the job. These students will assist in the creation of materials to be distributed to the school, even as simple as posters with information.

4.4.3 Compensation of the Sustainability Coordinator

To determine a basic range of salary for this coordinator position, I will refer to a survey conducted by AASHE. Due to the nature of this proposed position at WPI and its wide range of administrative and management responsibilities, in conjunction with the need for day-to-day coordination of work, it seems this would need to be a position with a salary towards the higher end of the spectrum. The AASHE survey has figures of the salaries of sustainability officers classified into those with advanced degrees and those without advanced degrees. My proposed coordinator would preferably have an advanced degree, due to its extensive range of responsibilities. Table 2 shows salary ranges for those holding advanced degrees (AASHE 2008).

Years of Experience	Number of Respondents	Average Salary ($)	Standard Deviation
0-5	11	44,200	15,200
6-10	10	58,800	15,400
11-15	8	83,100	33,900
More than 15	11	79,200	42,700

Table 2: Salary for sustainability officers with an advanced degree, taken from 2008 AASHE survey

The true analysis of the salary that should be given to this proposed coordinator should be done by WPI human resources when the time comes, however it is useful to see that about $50,000 set aside would properly fund a coordinator position, plus an additional estimated 50% of this salary for benefits.

4.4.4 Management plan

My proposed management plan (Figure 13) for sustainability is straightforward. The coordinator will be in charge of day to day operations regarding sustainability at WPI, reporting to the Task Force on a regular basis. Large scale projects requesting loans are not to be approved by the coordinator alone, the Task Force will be instrumental in these types of decisions, and likely the Loan Fund committee proposed in the RLF section of this report. Reporting to the coordinator will be a pair of students participating in the federal work study program, if that is possible. If not work study, there should definitely be a presence of student volunteers.

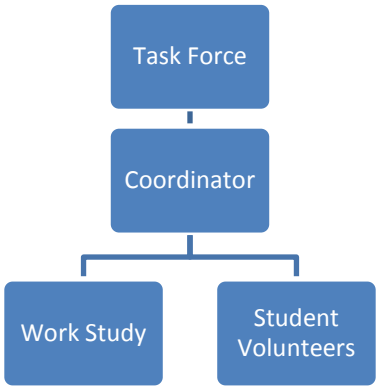


Figure 13: Sustainability Management Plan

When the coordinator is hired, there will have to be meetings of the Task Force more often, which would be led by the coordinator. This coordinator would spend these meetings doing the following:

- Stating the progress of current initiatives and programs
- Bringing forward plans for initiatives to be implemented in the future
- Discussing applications for loans and progress of ongoing projects
- Discussing the current state of the spending budget and whole sustainability endowment

While the coordinator is to report to the Task Force and work with members of it to achieve goals, there needs to be one specific supervisor overseeing the coordinator. Table 3 shows a variety sustainability staff members, pointing out who supervises them at a number of selected schools.

College	Position Title	Supervisor's Title
American University	Environmental Coordinator	Director of Physical Plant Operaions
Bowdoin College	Coordinator for a Sustainable Bowdoin	Director of Facilities Management
California State University, Chico	Sustainability Coordinator	Director of Environmental Programs
Cornell University	Sustainability Coordinator	Executive Vice President for Finance and Administration
Duke University	Sustainability Coordinator	Executive Vice President
Dartmouth College	Sustainability Coordinator	Executive Officer, Provost's Office
Muhlenberg College	Sustainability Coordinator	Capital Projects Manager
Yale University	Sustainability Director	Deputy Provost and Associate Vice President for Facilities

Table 3: Other coordinators and supervisor titles (AASHE 2008)

The proposed WPI Sustainability Coordinator could work under a number of administrators, or report directly to the President. There are arguments for a few positions. Working under the Assistant Vice President for Facilities would be reasonable because of the nature of energy conservation and project analysis that is to be approached by the coordinator. Reporting to the Vice President of student affairs and campus life is also a reasonable possibility, because of the nature of the proposed incentive program and the presence of student representatives working under the coordinator. Another possible supervisor to the coordinator would be the Executive Vice President CFO, which is a legitimate option because the whole sustainability plan will involve a separate endowment and a serious financial aspect relating to the overall image and prosperity of the school (WPI 2008). Since these officers are all included in the Task Force, this subject should be addressed by the body of the Task Force when establishing the coordinator position.

The presence of students in the process of coordinating sustainability is of high importance. A number of universities have instituted the use of peer to peer sustainable outreach campaigns in order to encourage sustainability in student life. One popular term for such a student is Eco-Rep, and a list of these peer sustainability positions and links is found at the AASHE website under resources. The Eco-Rep program at Carnegie Mellon University can be used as a model for the student involvement proposed in this plan. Students apply to be an Eco-Rep in the dorm or house that they live in, and the chosen candidates are trained to gain knowledge and perspective on the impacts individual college students can have on sustainability. These Eco Reps help to motivate the student body, and would work with the Sustainability Coordinator (Carnegie Mellon 2008). In the proposed WPI program, the student sustainability representatives would work with the Coordinator on incentive programs and essentially work as ambassadors between the school administration and the student body. The advent of a sustainability coordinator position at WPI is both necessary for the continuation of the sustainability program and very possible with the creation of the sustainability endowment.

4.5 Conclusions

The plan I recommended outlines what I believe are the best steps the President's Task Force can take in order to improve WPI's sustainability program. Introducing these elements into the structure of the university is partially explained in each of the respective sections. The sustainability endowment is the cornerstone of this plan. In order to implement this, the Board of Trustees of the university will need to be convinced. The following is a scenario of a number of actions the Task Force could take to begin implementing the recommended plan.

1. Develop a final proposal of plan with endorsement of whole Task Force

2. Present to Board of Trustees and President
3. Once approved, hire a sustainability coordinator
4. Choose consistent meeting schedule for Task Force and coordinator
5. Have coordinator begin recommended Incentives plan (see Figure 14)
6. Decide if Revolving Loan Fund committee is necessary, and appoint members
7. Determine amount of money to be set aside for Revolving Loan Fund
8. Design Loan Fund applications and outline WPI specific criteria
9. Construct green investment portfolio and begin investing
10. Monitor plan and help coordinator maintain interest in whole community

Recommended Plan to Coordinator for Implementing Incentives Program

- ✓ Generate materials promoting knowledge of sustainability and distribute to the campus public with student staff
- ✓ Organize a campus wide design competition for sustainability
- ✓ Organize Dorm vs. Dorm Competitions, maybe an Olympics
- ✓ Organize club vs. club competitions
- ✓ Organize Spirit Week Competition
- ✓ Organize Greek Week Competition
- ✓ Organize sustainability related event for New Student Orientation
- ✓ Create a suggestion box in plain sight of the campus to be looked at most likely by hired Work Study students or student volunteers
- ✓ Manage Incentive Program fund and allocate funds to clubs or parties attempting to add to the culture of sustainability on campus
- ✓ Accept proposals for sustainability related projects (either independently created designs, MQP's, IQPs, or course based projects) and determine with the Task Force which should be funded
- ✓ Distribute awards and scholarships discussed on a yearly basis

Figure 14: Plan for Coordinator with Incentives Program

In addition to this proposed plan, it would be beneficial for the Task Force to solicit ideas from the general campus public of students, faculty, and staff. There will likely be different ideas of what the Sustainability Coordinator position should be. Some may say the coordinator should work as a representative to the city of Worcester, working with the city's sustainability committee on local issues, as well as with the Task Force. The fundamental balance of the coordinator's position can be seen in different ways. In this report, the major focus was on the economic and environmental aspects of sustainability. This may be alright because of the school's involvement with project centers both oversees and in the United States, contributing

positively to communities. So it is true that aspects of social equity that are implicitly contained in the plan and the current situation, however the Task Force should remain interested in developing an explicit policy on social sustainability. There is much to be discussed about how the position should be focused on the distribution of responsibilities such as leadership, technical loan fund advice, management and organizational skills, and involvement in the social aspect of sustainability.

Implementing this proposed plan into the framework of Worcester Polytechnic Institute is a process that may involve a multitude of opinions and visions held by members of the administration, while also the involvement of the entire campus community, and even the people of the city of Worcester. This plan of creating a sustainability endowment, revolving loan fund, incentives program, and sustainability coordinator has the potential to improve the economic, environmental, and social well-being of WPI while also improving its reputation among colleges and universities.

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Appendix A: Revolving Loan Fund Applications

Carleton College: Carleton Revolving Fund Checklist

Sustainability Revolving Fund – Project Checklist

"Revised Draft – 10-31-07"
RDL

Overview – These items will be required to be addressed in the project submittal

- Project Definition
- Project Scope
- Key assumptions/Constraints
- Project approach/Methodology
- Project Schedule
- Financial / "Pay Back" Plan
- Risks and Contingencies
- Post Project Review
- Signatures

Project Definition includes:

- History and background – Why is this project important? Why do we want to do this project?
- Current Conditions – What is the situation now?
- Project Customer – Who will benefit from this project?
- Overview of what this project involves
- Measures of success; financial, educational, environmental
- Key terminology definitions

Project Scope includes:

- What will be done and who will be involved
- What the roles and responsibilities will be, of those involved
- What is included and what is not included (and why)
- What the "deliverables" will be; i.e. what will be accomplished, what will we see or be able to measure?
- Expected duration of project installation

Key Assumptions/Constraints includes:

- Assumptions made about the variables
- Limitations of scope and results
- Calculation of estimated emission reductions

Found at: http://apps.carleton.edu/campus/sustainability/initiatives/SRF/

Project Approach/Methodology includes:

- Where the work will be performed
- Who will do the work
- How the performance will be measured
- What the definition of success will be

Project Schedule includes:

- Assumptions about the project schedule
- Project milestones (key events) – when will these happen and in what order?
- When the actual installation work will be performed
- Estimated equipment delivery schedules, and length of installation and troubleshooting

Financial/Pay-back Plan includes:

- Detailed project budget
- One time expenses; equipment, consultants, installation costs, etc.
- On-going expenses; operating costs, energy usage, labor involved, replacement parts, etc.
- Expected life of project
- Expected returns/outputs of project (money saved/generated, labor saved, etc.) including calculation of simple payback (initial cost(s) divided by annual returns minus annual operating expenses), and an explanation of how returns will be measured and who will verify.

Risks/Contingencies include:

- What could impact project success
- Market or revenue uncertainties
- How risks will be managed

Post Project Review includes:

- Who will initially be responsible to follow-through to collect information to determine the success and returns of the project
- How records will be kept
- How success (or not) of the project will be reported, and at what intervals
- Who will be responsible for the on-going operation of the project

Signatures/Approvals

- Project Originator
- Project Sponsor (Faculty or Staff)
- SRF Committee member

Found at: http://apps.carleton.edu/campus/sustainability/initiatives/SRF/

Harvard GCLF Applications

New Construction App and Soft Costs App

Found at: http://www.greencampus.harvard.edu/gclf/

Existing Buildings Application

Found at: http://www.greencampus.harvard.edu/gclf/documents/hgci_gclf_app.pdf

Harvard Green Campus Loan Fund
PROJECT PROPOSAL
Shaded areas reserved for HGCI use only

GCLF Project #	
Date Received	

I. ADMINISTRATION

1. Project Sponsor (Faculty or Department)	2. Project Title (Department Name – Target Infrastructure – Intended Modification)
3. Project Executive (Individual)	4. Building Name and Number (if applicable)

II. PROJECT DESCRIPTION

A. OBJECTIVE

Describe project objective. What operations and/or behaviors does this project address?

B. IMPLEMENTATION PLAN

Describe specific project details. How will the project objective be met?

C. ENVIRONMENTAL IMPACT REDUCTIONS

Describe in detail the project's anticipated environmental impact reductions, including yearly utility reductions.

III. FUNDING & ACCOUNTING

A. PROJECT LOAN SCHEDULING	Anticipated Start Date	Anticipated Completion Date	Project Payback Period

B. PROJECT FINANCES			
	Capital Budget		Is this project eligible for a rebate? Yes ☐ No ☐
	Non-Capital Budget		
	Total Budget	$0.00	

Detailed breakdown of anticipated expenses required on a separate sheet of paper.

Account Number	Tub	Org	Object	Fund	Activity (NOT CIP)	Sub-Activity	Root
Account Loan Paid To							
Account Loan Repaid From							

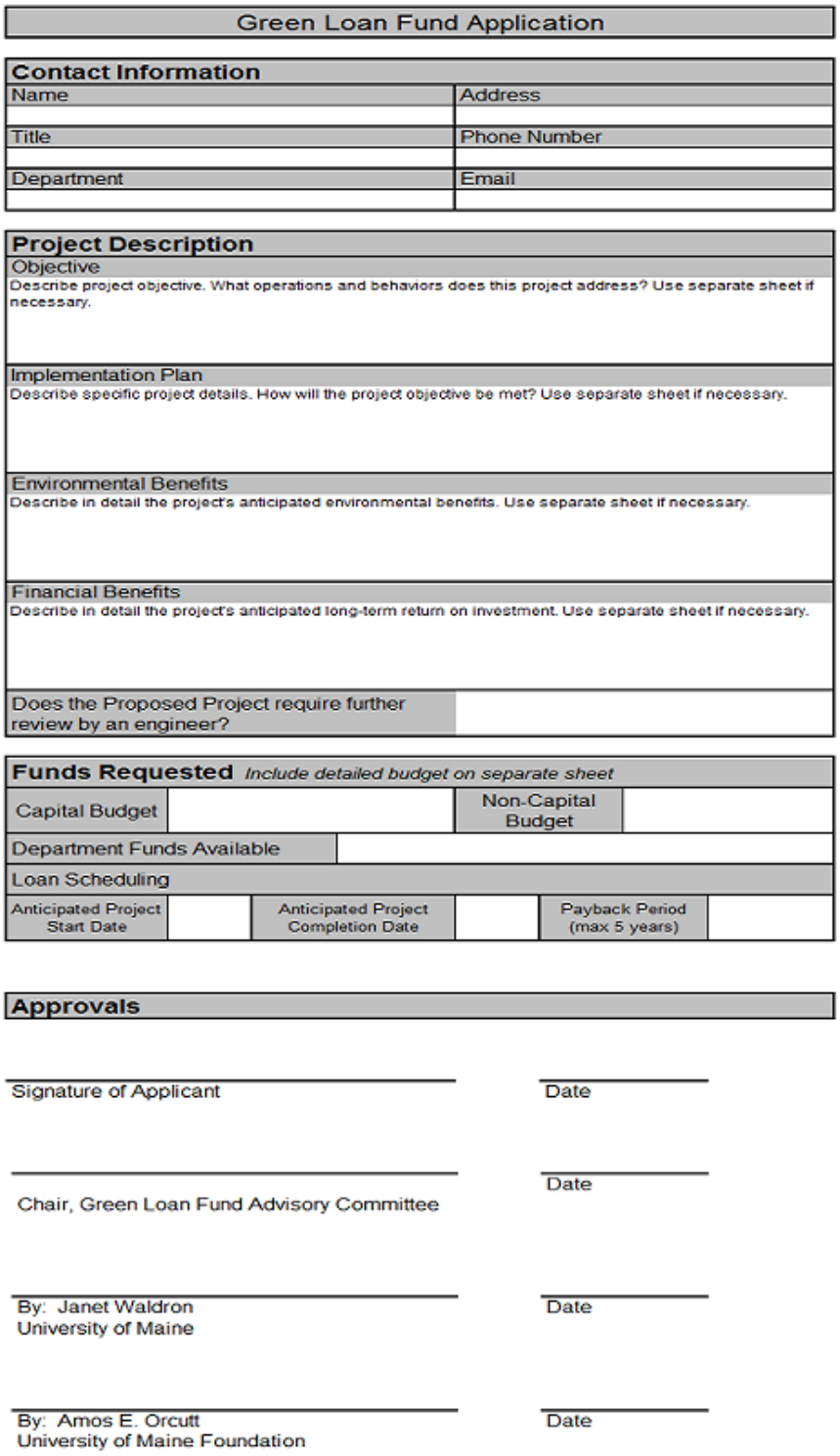
IV. APPROVALS Type or print name and date, then initial for approval.

1. Project Executive	Date	2. Project Sponsor	Date
3. GCLF Coordinator	Date	4. GCLF Advisory Committee	Date
5. HGCI Co-Chair	Date		

GCLF_Project Proposal_02_05_01

University of Maine Green Loan Fund Application

Found at: http://www.sustainability.umaine.edu/green_loan.html



Green Loan Fund Application

Contact Information	
Name	Address
Title	Phone Number
Department	Email

Project Description
Objective
Describe project objective. What operations and behaviors does this project address? Use separate sheet if necessary.
Implementation Plan
Describe specific project details. How will the project objective be met? Use separate sheet if necessary.
Environmental Benefits
Describe in detail the project's anticipated environmental benefits. Use separate sheet if necessary.
Financial Benefits
Describe in detail the project's anticipated long-term return on investment. Use separate sheet if necessary.

Does the Proposed Project require further review by an engineer?	

Funds Requested *Include detailed budget on separate sheet*					
Capital Budget		Non-Capital Budget			
Department Funds Available					
Loan Scheduling					
Anticipated Project Start Date		Anticipated Project Completion Date		Payback Period (max 5 years)	

Approvals

Signature of Applicant — Date

Chair, Green Loan Fund Advisory Committee — Date

By: Janet Waldron
University of Maine — Date

By: Amos E. Orcutt
University of Maine Foundation — Date

Appendix B: Interviews with members of the Task Force

Summary of Interview with Robert Krueger

Interview conducted 6/20/08

Interviewing Advice

- Don't start off with questions before presenting ideas
- Maybe next time send slides and/or questions out before interview

Project Advice

- Suggests I talk to Dave Schmidt –sustainability coordinator at Clark-ask him about his budget and what he accomplishes
- Explain how it improves the school
- Explain why this plan is necessary, it's the right thing to do?

Accessing the Endowment

- Points out that getting 1% of the endowment would be hard-suggests .5%
- Did math and determined this would leave a budget of about $ 175,000 (5% of the sus. Endowment) for coordinator and other things
- Told me to talk to Dexter Bailer-VP for Development and Alumni Relations

Learning about Sustainability Coordinator position

- Suggests I talk to Dave Schmidt –sustainability coordinator at Clark-ask him about his budget and what he accomplishes
- Suggests talking to already established Coordinators throughout the region

Summary of Interview with Matthew Ward

Interview Conducted 7/10/08

Discussion of Coordinator position

- Coordinator would work with office to find funding
- Question: Who would coordinator's boss be? A VP? Facilities? Jeff Solomon? IGSD?
- Shoot high for position-Dean of sustainability?
- Be able to argue why coordinator tasks can't be done by a volunteer committee (task force)
- Identify schools with a coordinator
- Someone has already volunteered to take coordinator position

Alternative methods of Funding

- Additionally-fundraising, corporate sponsorships, external funding
- It is difficult to get money from administration
- Donations, prizes from corporate sponsors
- Payback of endowment from corporations

General Sustainability Topics

- Usage of paper a big problem on campus-partially recycled at least should be used
- Recycling, source reduction
- Batteries can be recycled
- People should better understand their impact on the environment
- Ward started the Task Force

Marketing the Plan

- Recommends talking to President Berkey
- Alternatives should be made clear
- This plan should be marketed appropriately to trustees

Appendix C: WPI on College Sustainability Report Card

Found at: http://www.endowmentinstitute.org/report2008/profile225.pdf

WORCESTER POLYTECHNIC INSTITUTE

D-

$354 million

Administration	F	Worcester Polytechnic Institute has no known policy relating to campus-wide sustainability initiatives.
Climate Change & Energy	F	A class installed a small solar array on campus in order to raise awareness of green energy options. The institute has not made public any steps taken to address energy efficiency or conservation possibilities, and has not made progress toward the use of renewable energy.
Food & Recycling	C	The institute contracts with two local producers, including a local dairy. Dining services provides reusable dishware to students and has eliminated the use of Styrofoam products. Cooking oil is recycled through the institute's "Fry-o-Later" program.
Green Building	D	The institute dedicated its first LEED-certified building in 2006, but has no known green building policy.
Transportation	F	The institute has not made public any programs or practices that encourage or facilitate the use of alternative forms of transportation.
Endowment Transparency	F	The institute has no known policy of disclosure of endowment holdings or its shareholder voting record. Therefore, there is no known ability to access this information.
Investment Priorities	C	The institute aims to optimize investment return and has not made any public statements about investigating or investing in renewable energy funds or community development loan funds.
Shareholder Engagement	F	The institute has not made any public statements about active ownership or a proxy voting policy.

Data compiled from independent research as well as through a dining services survey. Endowment size in upper right corner is as of June 30, 2006. For information on data collection and evaluation, please see the Methods section on page 228.

Appendix D: Job Description of Clark Sustainability Coordinator

1. **POSITION SUMMARY STATEMENT**
   What is the basic function and purpose of position within the University?

   The Sustainability Coordinator will serve as a facilitator in the University's move towards environmental sustainability, acting through a collaborative process involving staff, students, faculty and administrators. The incumbent is responsible for developing, implementing, and maintaining a sustainability program encompassing various areas of the organization and its environment.

2. **DETAILED DESCRIPTION OF ONGOING RESPONSIBILITIES** (use additional sheet if needed)
   What are the main duties of the position? ***List in order of importance, indicate approximate percent of time required for each task*** (on an annual basis).

   Essential Duties and Responsibilities:

   Coordinate environmental sustainability (broadly). Approximate percent of time: 70%

   1. Initiate new programs to establish and strengthen sustainable practices across the campus and work to foster collaboration among the areas of teaching, research, campus operations, student life, and community service.

   2. Oversee the collection, synthesis, and dissemination of data on energy use and other performance indicators for the campus. Design and develop tools, methodologies, and metrics to support the sustainability goals and objectives and for coordinating their implementation. This includes such things as the compilation of data on greenhouse gas emissions and its dissemination through reports, educational signage, and brochures.

   3. Actively and effectively advocate for the change in culture and practices that will make Clark more environmentally sustainable.

   4. Work with the Clark Environmental Sustainability Task Force (comprised of faculty, staff, and students) and other appropriate committees to provide technical and policy advice on sustainability to the Clark community.

   5. Provide support to Residential Life initiatives to increase the sustainability of student residences and the environmental literacy of the student body.

   6. Liaise with counterparts at other educational institutions, businesses, government, and the community to promote collaboration and information exchange.

   7. Serve as the clearinghouse for requests for information related to sustainability issues at Clark.

   Manage the Waste Stream (specifically). Approximate percent of time: 30%

   1. Oversee the day to day operations of the recycling program with the specific goal of increasing the amount of Clark's trash recycled to 35% or better.

   2. Monitor and document, on a monthly basis, Clark's waste stream. Measure and document the amount of waste that is recycled and the amount sent to landfills.

(D. Schmidt, Personal Communication, June 30 2008).

3. Investigate the changes in the recycling industry and recommend any changes to Clark's program that appear economically feasible.

4. Build relationships with the coordinators of recycling at other Colleges in Worcester. Investigate partnerships with other colleges that may be mutually beneficial.

5. Hire, train and supervise approximately 15 student recycling assistants.

Other Duties and Responsibilities:

1. Other tasks as defined by supervisors related to successful energy management or waste management

Special Licenses, Tools and Equipment Skills Needed:

None.

3. **QUALIFICATIONS:**

A. What level of formal education, if any, is required to do this job and why? (applicants who not be considered qualified without this level of education.)

1. Bachelor's degree in environmental studies, political science, economics, geography, sociology or related field.

B. How many years of previous experience in similar or related work is required for a person new to this job?

2. Two to four years of experience, with practical experience in facilitating groups, communications, and project management.

C. What **required** knowledge, skills, or abilities are needed to accomplish this job? (Individuals must possess the knowledge, skills and abilities or be able to explain and demonstrate that the individual can perform the essential functions of the job, without or without reasonable accommodation, using some other combination of skills and abilities.

3. Strong working knowledge and passion for the concept of sustainability, awareness of the central issues and controversies in the discourse on sustainable development. Able to apply concept in the residential campus context.
4. Demonstrated organizational, communication and interpersonal skills.

Minimum Requirements:

- Superb administrative and organizational skills in the handling of multiple program responsibilities and large amounts of information
- Ability to work with divergent views on sustainability
- Outstanding written and oral communication skills
- Basic knowledge and understanding of a recycling and waste management program
- Ability to facilitate a diverse group of individuals and engage effectively consensus-based decision-making
- Ability to work flexible hours (evening meetings, etc.)
- Capability of overseeing and motivating a student work force

(D. Schmidt, Personal Communication, June 30 2008)

- Intermediate skills in Word (able to incorporate graphics into reports), Excel (able to format spreadsheets and do simple statistical calculations), PowerPoint (able to create templates). Experience using Outlook and conducting Internet-based research
- Experience composing and delivering presentations
- Works well independently and as part of a decentralized, non-hierarchical team and can follow priorities while maintaining flexibility

D. What **preferred** experience, knowledge, skills would be helpful in accomplishing this job?

A Masters degree in environmental studies, political science, economics, geography, sociology, or related field.

Assets

1. Comfort around top management, as well as staff at all levels.
2. Organizational agility (knows how organizations function).

4. **DIRECT SUPERVISORY RESPONSIBILITIES:**
(List job title and the number of employees in each title who report to person in this position.)

Title	Number (full time or part time)
Student Recyclers	**13 (part time)**
Student Recyclers (Co-Managers)	**3 (part time)**
Student Interns	**3 – 6 (part time)**

This job description in no way states or implies that these are the only duties to be performed by the employee occupying the position. Employees will be required to perform other job-related duties as needed by the University.

(D. Schmidt, Personal Communication, June 30 2008)