Funding Sustainable Initiatives:
Should Williams Implement a Revolving Loan Fund?

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Introduction

Colleges across the country spend millions of dollars on utility bills each year. While a portion of these costs are necessary, new technologies to utilize energy more efficiently are becoming more readily available. As a result, there is enormous potential for college campuses to implement these practices which will result in substantial cost savings while simultaneously reducing an institution’s environmental footprint. But, these technologies often come at a premium. Higher capital costs oftentimes blind campus administrators from the potential long-term savings in operating budgets that these energy-reducing measures provide. Even institutions that are committed to increasing campus sustainability must deal with the reality of tight budgets. Especially during hard economic times, administrations are forced to reevaluate priorities, usually favoring the here-and-now over long-term sustainability. The availability of funds, therefore, is a critical element in implementing environmental sustainability projects on college campuses. Colleges currently use a variety of mechanisms to fund “green” projects, including administrative allocation, department budgets, endowment funds, alumni donations, student government funds, student fees, foundation grants, and revolving loan funds. Using revolving loan funds as a means to fund sustainable initiatives on college campuses is a fairly new, innovative approach, and it will be the focus of this paper. First, the logistics and implications of a revolving loan fund will be explained. Next, an overview of Williams College and its sustainability initiative funding process will be presented. The utilization of this mechanism on other campuses will then be analyzed. Finally, this paper will discuss the feasibility of implementing a revolving loan fund at Williams and if one should, in fact, be employed.
**Revolving Loan Fund**

A revolving loan fund is an innovative funding mechanism being used by some college campuses to finance sustainable initiatives. Essentially, it is a pool of money that is available to fund “green” projects that have quantifiable, monetary savings, which usually come in the form of reduced operating costs. Projects must generate enough savings to pay off the loan over a designated time period. This cycle allows for the same funds to be available for more projects in the future. The revolving loan fund approach combines the ideas of economic and environmental sustainability.

The parameters of a revolving loan fund are very flexible and can be made to suit a campus’s best interests. These parameters include the types of projects that can be funded, a payback period, the percentage of monthly savings that must go back to the fund, and the amount of the original loan that must be repaid. For example, a fund may require a 5-year payback in which 90% of a project’s savings accrue to the fund until 100% of the project’s cost is paid off. These parameters provide a 0% interest loan to borrowers and should result in a constant level of available funds over time. Another possibility is a fund that requires a 7-year payback in which 50% of a project’s savings filter back into the fund until 125% of the project’s cost is repaid. This contract structure makes funds available at a higher cost in the long run, but more savings accrue to the borrower in the short run. It will also take longer for this fund to replenish itself, but the size of the revolving loan fund will increase over time.

Here is an example of how such a fund works using the first set of parameters. Suppose a campus wanted to replace its incandescent light bulbs with more efficient compact fluorescent (CFL) light bulbs. These light bulbs use 2/3 less energy than
standard incandescent bulbs, but they are more expensive. The initial capital cost of the project is $1,000, but the annual operating costs will drop from $900 to $300 resulting in an annual $600 in energy savings. Suppose a facilities manager at Eph University decides to borrow the money needed to finance the project from a revolving loan fund on campus. Since 90% of the savings must go towards paying off the loan, $540 will be returned to the fund each year. In this example, it will only take 1.85 years to pay off 100% of the initial loan. In the end, the revolving loan fund is back to its original amount, the campus has more efficient lighting fixtures, and money is saved on the utilities bill each month. While this is a highly simplified example, a revolving loan fund does have the potential to provide a “win-win” situation for those concerned with economic and environmental matters.

Revolving loan funds can achieve several objectives. First, they can help make funds more available for sustainable projects. By providing 0% interest loans, virtually anyone who submits a proposal that meets the appropriate criteria can initiate his or her own project. Second, they refocus one’s attention from initial capital costs to operating cost-savings over time. This shift in ideology is important for sustainability efforts in general which require longer-term thinking. Revolving loan funds can also be used as a tool to educate people about the types of factors that must be considered before approving “green” projects and about sustainability efforts on campus in general. A fund’s operations can be a collaborative effort that includes participation from the administration, faculty, and students. Another benefit of a revolving loan fund that is especially relevant today is its isolation from economic conditions. While most schools can adjust their funding for such initiatives annually depending on their financial
situation, revolving loan funds are self-sustaining so they do not rely on external financing.

Revolving loan funds also have some drawbacks. First, the short payback periods are limiting. Larger projects usually require high capital costs and result in a lower return on investment. While these projects can be extremely beneficial in the long run, revolving loan funds are unable to provide the necessary financing. The payback period of a revolving loan fund could be extended, but it would then be difficult to fund several projects at once because it would take longer for the fund to replenish itself. In addition, economic incentives on the individual level do not always exist to fund such projects. While a college campus may save money from installing a new energy-saving product, the individual may gain nothing more than the satisfaction of helping the environment which unfortunately is not always enough of an impetus. Cost-savings can also be difficult to measure. Fluctuations of a building’s energy use cannot always accurately be attributed to a single, new product. While there are obviously some difficulties in implementing revolving loan funds, some colleges have reaped the rewards of this funding mechanism.

**Williams College**

Williams College is a small liberal arts institution located in Williamstown, MA. In fiscal year 2008, the college spent $175 million on operating expenditures and had a $1.8 billion endowment (Williams College Office of Public Affairs 2008). With just over 2,100 students, the relatively large 450-acre campus operates over 100 buildings and these numbers continue to expand. This has contributed to the college’s rising utility bill.

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1 The economic downturn in fiscal year 2009 has resulted in a significant decrease in the school’s operating budget and endowment, but these numbers have not yet been published.
since 1990 (see Appendix 1). Today, the school dedicates about 4% of its operating budget to utility costs, up from a low of 2.35% in 1999 (Boyd 2009). Williams operates under a centralized funding structure in which financial decisions for the entire school are made by the administration. As a result, departments have fairly little autonomy and all costs and savings accrue to the campus as a whole.

The Williams College administration is dedicated to increasing the sustainability of the campus. In January of 2007, the college’s trustees adopted a goal of reducing its greenhouse gas emissions by the year 2020 to 10% below the 1990-1991 emissions level. Later that year, a $5 million gift from Selim Zilkha, class of ’46, prompted Williams to launch the Zilkha Center for Environmental Initiatives which “incorporate[s] principles of sustainability into the fabric of campus life” (Williams College 2008). While the Zilkha Center receives $250,000 from this gift each year, the administration allocates an additional $2 million per year to fund sustainable initiatives on campus (Finan 2009). In fiscal year 2009, the Zilkha Center committed to fund 22 sustainability projects costing a total of $2,225,900 (Boyd 2009). The projects ranged from installing more efficient lighting in athletic facilities to adding new boilers in Greylock Dining Hall to installing photovoltaic arrays at the school’s offsite shelving facility. The current poor economic conditions have led the school to cut back the sustainable initiative budget for fiscal year 2010, but it is still over $1 million (Finan 2009). While Williams is on the path to a more sustainable campus, there is still a lot of room for improvement (see Appendix 2). There is ample opportunity for conservation and renewable energy projects that will both lead to cost savings and a reduction of the school’s environmental footprint.
Case Studies

*Harvard*

Harvard University is the first college campus to have utilized this approach. In 1993, the university launched the 5-year trial of the Resource Conservation Incentive Program (RCIP) which was a $1.5 million revolving loan fund that provided 0% interest loans for environmentally sustainable projects that had a maximum of a 5 year payback. From 1993-1998, the fund, which is operated by Harvard administrators, financed 35 projects for a total of $2.6 million (Levy and Diwali 2000). These projects resulted in an annual savings of $880,000, averaging a 34% return on investment. In addition, the projects yielded an annual reduction of carbon emissions of 35,000 pounds (Levy and Diwali 2000). The program, now called the Green Campus Loan Fund (GCLF), was reinstated in January 2002, but this time the fund started out at $3 million. It matched the success of the trial period inspiring the university’s president to double the size of the fund in December 2004 and again in April 2006 to a total of $12 million. At present, the GCLF has funded 153 projects for a total of $11.5 million with a median return on investment of 27%, resulting in over $4 million of savings (President and Fellows of Harvard College 2009).

While these numbers are impressive, more factors must be considered. An extensive study was carried out analyzing the initial trial period of the program and it found mixed results (Levy and Diwali 2000). The fund did remove some of the barriers to finance and freed up money for several projects, but facility managers found the parameters of the loans limiting. Several projects were proposed in the first year but there was a significant drop-off in ensuing years, signaling that most of the projects with short paybacks were carried out in the early stages. One Harvard facility director noted,
“[Under the RCIP], you shouldn’t spend money on green projects if there is no cost benefit. If Harvard took away the payback period limits and said ‘be green,’ more projects could be feasible.” (Levy and Diwali 2000, under “Survey Findings”). The authors of the study concluded that “the performance of the RCIP (and other similar revolving loan programs) might be better measured by the growth in the number of projects supported over time, the growth in participation and awareness, and the annual financial savings, rather than indicators of payback periods and rates of return” (Levy and Diwali 2000, under “Discussion”). The success of the more recent GCLF suggests that Harvard was able to find its way around some of the initial problems that it faced.

Harvard’s success is promising, but there are some fundamental differences between the university and Williams College. The most relevant disparity is the schools’ funding structures. While colleges within Harvard University operate as separate entities, Williams has a centralized structure. At Harvard, each school has its own budget and pays for its own operating expenses. Therefore, facility directors at these schools have an economic incentive to borrow from a campus-wide revolving loan fund for capital expenses because after the loan is paid off, the individual school captures the long-term savings. At Williams, on the other hand, the school administration pays for all of the capital and operating expenses, therefore any savings go directly back to the college thus reducing the incentive for individuals to initiate such projects. This also makes it more difficult to measure the cost-savings. Instead, Williams College’s structure provides incentives for the administration to take action. It also allows for broader, campus-wide change resulting from larger, more costly initiatives. Williams already designates more money towards sustainable initiatives than Harvard when considering their size.
differential—while Harvard has an operating budget 10x the size of Williams’, the $12 million fund is only 6x larger than the $2 million dedicated to sustainable initiatives. For these reasons, Harvard’s success is not a prescription for Williams to carry out the same practices.

*Macalester*

In Spring 2006, students at Macalester College started their own revolving loan fund called the Clean Energy Revolving Fund (CERF). The fund began with $23,000 from the college’s student government and Environmental Studies department and it has since grown to over $100,000 (Campus InPower 2009). The CERF financed several projects ranging from water conservation to building insulation efforts and has achieved $40,000 in annual savings. Macalester has taken a more collaborative approach than Harvard—the fund is operated by a 5-person board including 2 students, a faculty member, an administrator, and an alumnus. Timothy Denherder-Thomas, student and co-founder of the CERF at Macalester, claims that one of the biggest successes of this program is that “it has helped change the frame of how administrators approach sustainability from one of cost to one of opportunity… it has also empowered students to think differently about the way we make change—innovating, rather than solely advocating” (Campus InPower 2009, 44). This displays the intangible, and possibly equally as important, benefits that a revolving loan fund can bring to a campus.

While Macalester’s revolving fund is much smaller than Harvard’s, this example may be more applicable to Williams. A student-led, collaborative initiative for smaller projects on campus is much more feasible given the Zilkha Center’s mission statement. The College is dedicated to educating its students about matters of sustainability and this could be a great way to get students involved. Again though, the economic incentives that
motivate people to participate are not present. Perhaps a system could be implemented in which a small proportion of the savings goes directly to the students, via a student activities organization such as All Campus Entertainment (ACE) or a neighborhood governance board. Ultimately, this would be a very small scale project and would act more as an educational tool. On a larger scale and most importantly, Williams already appears to have attained the institutional commitment that the students at Macalester desire.

**Model**

I created a model to compare the current funding structure at Williams to a situation in which the administration utilized a revolving loan fund. The model assumes that sustainability projects have a 20% rate of return on average (lower than the ROI displayed by projects at Harvard) and thus an average 5-year payback. These models assume that the revolving loan fund is controlled by the Zilkha Center and that only the Center can use the fund to initiate projects. In addition, the Zilkha Center will initiate the same projects regardless of the funding mechanism, as long as it can afford them. The models also assume that Facilities is capable of starting a maximum of $2 million in projects per year. In the revolving loan fund scenario, 100% of the savings are filtered back into the loan until 100% of the project is paid off. After that, additional savings will accrue directly to the school, as is currently the case.

Since revolving loan funds suffer an initial drop off during the first few years of loan disbursement, a larger initial investment than the annual status quo is necessary. In order for the Zilkha Center to maintain its same level of activity, an initial investment of $6 million is needed (Fig. 1). This amount will allow the fund to sustain itself without
Figure 1. Annual funds available for sustainable initiatives.

sacrificing any productivity during its early stages. While it is unlikely that the
administration would be willing to dedicate 3x its usual amount in a given year at no cost,
it must be explained that they will no longer have to commit $2 million per year to the
Center. Instead, the Center will operate off of its savings from its projects that increase
energy efficiency. Since the school pays the utility bill, it must be agreed that the
estimated 20% return on investment will be given back to the Zilkha Center as a means to
replenish the fund. Obviously, it would be very difficult to get the administration to agree
to these terms, but ideal conditions will be assumed so that a comparison between the
status quo and such a system can be made.

The results of this comparison show that a revolving loan fund would provide no
added benefit to the school. In fact, a revolving fund is actually more costly when long-
term savings are considered. In both of these schemes, a total of $20 million is spent on
projects over a 10-year time period (see Appendix 3). Since the ultimate goal of these
funding schemes is to make available the maximum amount of money for sustainable
initiatives, these two schemes provide the same benefit—both on an annual and long-
Table 1. Aggregate totals of 10-year time period.

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term basis. Although there is $6 million available in the first year in the revolving loan fund scenario, only $2 million is used because of the capacity of Facilities. The leftover money also allows for the same amount of money to be invested during subsequent years.

The key to this comparison is the total cost to the campus administration (Table 1). At first glance, it appears as though the current system costs the administration $2 million per year. Upon further examination, the cost to the administration is significantly less. Since the administration pays both the capital costs and operating costs on campus, the savings from a reduction in operating costs filter back to the school. As a result, the actual cost to the administration per year must take into consideration annual savings from previous projects. For example, in the proposed model, the actual cost to the school is $1.6 million in year 2 (see Appendix 3). This cost drops to $0 by year 6 and the school actually has net savings in the following years. Because of the College’s centralized funding system, savings from previous projects accrue to the school indefinitely.

In a traditional revolving loan fund system, a project’s savings go back into a fund only until the capital cost is repaid. In the Williams context, though, the repayment terms in a revolving loan fund scheme would need to change a bit. Savings would still go back into the fund until the loan is paid off, but instead of the savings in subsequent years accruing to the individual—or school in Harvard’s case—that took out the loan, the
savings will go right back into the school as is currently the case. For example, 100% of
the savings from years 1-5 will go back into the loan in year 6, returning it to the $2
million level, but in year 7, 100% of the savings from years 2-6 will go back into the fund
while the savings from year 1 ($40,000) will go directly to the school. As a result, after
the 10 year time span is over, the actual cost to the school in both scenarios is $2 million.
The difference between the two models lies in the opportunity cost present before the
revolving loan fund levels out. During year 1, there is $4 million left idle in the revolving
loan fund scenario. Ideally, this money would be invested or put in a bank so that it can
earn interest. In the current system, that excess $4 million can be thought of as being kept
in the endowment which earns an average annual return of 9% (Williams College 2005).
As a result, the revolving loan fund system sacrifices the $360,000 that could have been
made in the first year alone if the money was kept in the endowment instead. Any time
that money is idle in the revolving loan fund account, potential money is being lost.

Conclusion

The centralized funding structure at Williams, coupled with the fact that the
school’s administration is already committed to promoting sustainability, reduces the
value of a revolving loan fund on campus. In a sense, the school as a whole operates like
a revolving loan fund: the administration gives money to the Zilkha Center, the Center
initiates conservation projects that reduce the school’s utility bill and the cost-savings
filter back into the school’s budget. As a result, the school has an economic incentive to
continue giving money to the Center to finance these initiatives. A revolving loan fund
might be better suited for a college that does not have the same level of commitment to
funding sustainability projects. In this case, a small-scale fund can be used as a tool to
demonstrate to a college’s administration the financial gains of investing in conservation projects, but these benefits have already been realized by Williams College’s administration.

In their analysis of the revolving loan fund operated by Harvard University, Levy and Diwali conclude that the fund could be improved by expanding its roll

…to foster long-term investments, introduce green concepts in the design phase, and assist in the implementation of environmentally-sound initiatives without quantifiable payback periods. An even broader paradigm would involve the provision of grant money, which could be used to help train staff members, to provide incentives for environmental innovations, and to encourage purchases of new technology. In this way, the university as a whole could invest funds that would spur sustainable resource consumption across a number of facilities, with savings accruing to the facilities and numerous benefits gained by the university as a whole.” (Levy and Diwali 2000, under “Discussion”)

The current system of funding sustainability initiatives at Williams already accomplishes all of these objectives. As a result, Williams should maintain its current funding practices in its pursuit of a more sustainable campus.
References


Appendix


![Utilities Expenditures Graph]

Source: Boyd, Stephanie, 2009, Financing Sustainability, April 23


![Financial Savings Graph]

Source: Boyd, Stephanie, 2009, Financing Sustainability, April 23
3. Year-by-year Analysis (in millions of dollars)

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