Investment Primer

For Green Revolving Funds

Dano Weisbord
Principal Author

Mark Orlowski
Contributing Author

Sustainable Endowments Institute

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Introduction

Energy Efficiency: Economic and Environmental Benefits

With buildings consuming almost half (49 percent) of all energy used in the United States and three quarters of all electricity, energy efficiency upgrades "represent a significant opportunity to save money, reduce climate impacts and generate jobs," according to a March 2012 report by Deutsche Bank Climate Change Advisors and The Rockefeller Foundation.

United States Building Energy Efficiency Retrofits calculates thatinvesting $279 billion in building retrofits in the United States could "yield more than $1 trillion of energy savings over 10 years."

This would be the equivalent to savings of approximately 30 percent of the annual electricity spending in the U.S. Furthermore, the report indicates investing at that level could create more than "3.3 million cumulative job years of employment." Much of this work requires on-site community-based jobs that cannot be outsourced overseas and thus catalyzes a multiplier effect in the local economy.

"Investing $279 billion in building retrofits in the United States could "yield more than $1 trillion of energy savings over 10 years."

The great opportunities for savings and greenhouse gas reduction by remediating building energy waste is also emphasized in a 2009 study by McKinsey & Company. *Unlocking Energy Efficiency in the U.S. Economy* underlines the national need: "Energy efficiency offers a vast, low-cost energy resource for the U.S. economy—but only if the nation can craft a comprehensive and innovative approach to unlock it."

Developing return-oriented green revolving funds (GRFs) is a rapidly growing trend at colleges and universities. A green revolving fund (GRF) is a special account designated for investment in on-campus projects that improve energy efficiency or decrease material use. GRFs invest in a variety of cost-saving initiatives, resulting in significant financial and environmental benefits.

Financing Energy Efficiency with Green Revolving Funds

According to *Financing Sustainability on Campus*, published by the National Association of College and University Business Officers (NACUBO) and Second Nature, "Revolving loan funds offer a flexible, inexpensive means of funding sustainability projects that carry ancillary benefits of engaging students directly in campus initiatives."

This *Investment Primer* is designed for key decision makers, such as senior financial officers or boards of trustees' investment committees, who want to learn more about developing a GRF. It discusses critical financial and fund-structuring issues that institutions should consider when developing a GRF. Recommendations are based on research conducted by the Sustainable Endowments Institute for its report *Greening the Bottom Line* **greenbillion.org/resources**, and on interviews with experts in higher education finance, operations and sustainability.



Boston University's Sustainability Revolving Loan Fund financed the Campus Fitness Center lighting and energy upgrades, a building renovation that has saved the University as much as 546,000 kWh a year.

Definition of Green Revolving Fund (GRF)

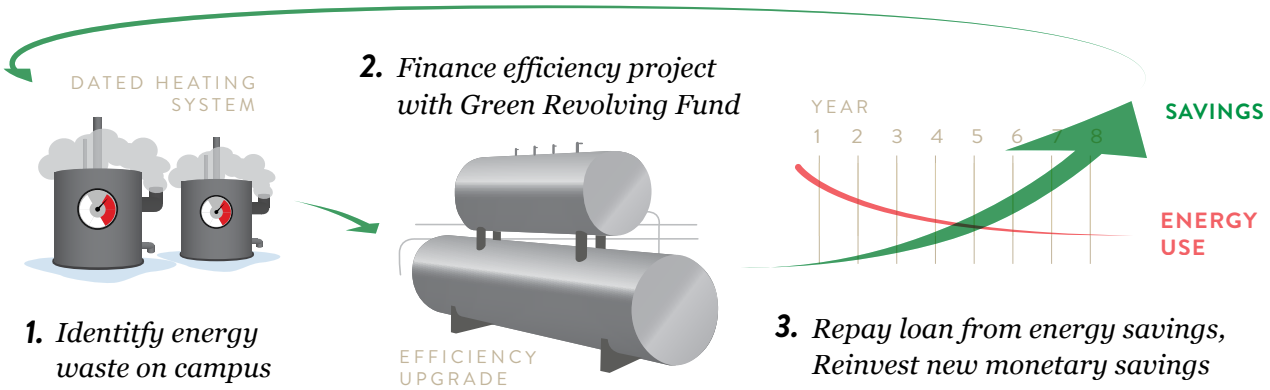


FIGURE 1: Green Revolving Fund Capital Cycle

GRFs have been created at more than 60 colleges and universities, with more than 75 percent of GRFs formed in the past four years.

A Green Revolving Fund (GRF) is an innovative financial tool that supports the efficient delivery of on-campus sustainability projects. It is usually a special account designated for investment in projects that improve energy efficiency or minimize the use of material resources, thus reducing environmental impact and operating expenses. Operational savings (or a portion thereof) are returned or "revolved" back to the GRF account. This characteristic replenishes the GRF and provides capital for returns to investors and for financing the next round of projects without the need for additional external capital (see Figure 1.)

GRFs have been created at more than 60 colleges and universities, with more than 75 percent of GRFs formed in the past four years. These funds have been developed using a variety of structures and funding sources; each specific design reflects the needs and resources of individual institutions.

Financial and Administrative Benefits

GRFs can play a significant role in improving many aspects of institutional environmental performance; however, this section focuses on five financial and administrative benefits: investment value, capturing savings normally lost in structuring capital and operational budgets, administrative efficiency, engaging campus stakeholders in lowering operational costs, and enhancing institutional reputation.

Investment Value

Institutions with established GRFs have demonstrated that prudently selected project portfolios lead to strong returns on investment over time. Performance was a central focus of Greening the Bottom Line, the Sustainable Endowments Institute survey of GRFs published in 2011. This survey identified 52 colleges and universities in North America with operating GRFs. Nine institutions provided return on investment (ROI) figures for their funds; many more provided performance information on individual projects. Reported annual returns ranged from 29 percent to 47 percent with a median annual ROI of 32 percent.

While the sample size is small and the majority of GRFs relatively new, we are confident that the performance of carefully structured GRFs is strong. We draw this conclusion based on performance information for numerous individual projects submitted by multiple survey participants, and data from three long-established GRF portfolios that have demonstrated solid returns over time.

The three long-established GRFs are: Western Michigan University Fund (1980); Stanford University's Retrofit Program (two programs, the first established in 1993), and the Harvard University Green Loan Fund (2001).

Western Michigan University has funded 101 projects with a portfolio ROI of 47 percent and an average simple payback of 2.1 years. The school reported that "[s]ince 1996, our total project costs are approximately $5.85 million, and our annual cost savings are approximately $2.75 million, with a total cost-avoidance [as of October 2010] of approximately $16.71 million."

The Harvard University Green Loan Fund (GLF) reported an average ROI of 30 percent as of October 2010. The Harvard Green Loan Fund has funded 185 projects since inception, invested $16 million and now produces annual savings of $4.8 million.

Stanford University has two GRF programs in operation that have a combined value of $25 million. The Retrofit Program had initial funding of $10 million, and the Whole Building Retrofit Program had initial funding of $15 million. Stanford reports that these programs have demonstrated an average payback period of 3.5 years.

The Harvard Green Loan Fund has funded 185 projects since inception, invested $16 million and now produces annual savings of $4.8 million.

Capturing Savings Normally Lost in Capital and Operational Budgets

GRFs increase investment in energy efficiency projects without straining operating or capital improvement budgets. For many institutions, the desire to save first costs runs counter to improving environmental performance. This is because more efficient project components (such as high-efficiency HVAC systems or airtight detailing)



Western Michigan University has invested $5.8 million in energy-efficiency projects on campus, and has calculated that their cost savings as a direct factor of these projects totals nearly $17 million since the Quasi-Revolving Fund was initiated in 1980. WMU is home to the College of Health and Human Services, the nation's first LEED Gold EB in higher education.

have a higher first cost than similar traditional components. In his 2009 article *Building the Business Case for Campus Sustainability*, Michael Crowley previously of the firm Environmental Health and Engineering notes that, *"…investment opportunities for sustainability projects are often not realized because their long-term operational savings are not recognized in capital project budgets."*

GRFs provide an institutionalized platform for evaluating and funding more expensive project components that generate long-term cost savings. Additionally, a GRF can help free operating or capital improvement budget resources to fund other priorities by becoming the primary mechanism for financing energy-efficiency upgrades.

Administrative Efficiency

GRFs are ongoing sources of capital for projects that reduce operating costs. While launching and managing a GRF requires upfront investment of time and resources, benefits from the fund's revolving nature are lasting. Once the GRF is established, administrators can realize savings in time and energy formerly used to accommodate varied and inconsistent requests for funding of sustainability projects across multiple budgets, departments and campus organizations. Because sustainability projects tend to be numerous and smaller in scale than traditional capital projects, a GRF with clear criteria provides a structure that communicates performance requirements for individual projects to interested campus stakeholders.

Engaging Campus Stakeholders

A GRF can become a strong reinforcement for existing conservation measures. Implementing a formal conservation and emissions reduction program with a GRF raises awareness and encourages participation from administration, faculty, staff, and students, who can now actively participate in campus sustainability by identifying projects or by serving on project review committees. By engaging different stakeholder groups, a GRF provides a channel by which a broader cross section of the school community can help contribute to improving campus sustainability and efficiency. For example, the University of Notre Dame's Green Loan Fund fund is governed by a committee comprised of five administrators, five faculty members, five staff members, and two students. The committee focuses the fund's $2 million in capital on investments promoting community involvement around efficiency projects, most notably a $200,000 lighting retrofit throughout all 29 residence halls on campus.

Once the GRF is established, administrators can realize savings in time and energy formerly used to accommodate varied and inconsistent requests

Enhancing Institutional Reputation

Establishing a GRF demonstrates a clear institutional commitment to investing in energy conservation and other sustainability projects. These are increasingly important to admissions offices in attracting top students and to development offices looking to build increased giving participation rates among young alumni. For example, among 7,445 college applicants who participated in the Princeton Review's 2012 College Hopes & Worries Survey, nearly 7 out of 10 (68 percent) [of college applicants surveyed] indicated that having information about a school's commitment to the environment would influence their decision to apply to or attend the school.

Finding Initial Capital

GRFs have been created at more than 60 colleges and universities. The initial capital has come from a variety of sources including administrative budgets, gifts, grants, student fees, and endowment investments. These sources are discussed briefly below; endowment investing is also covered in greater detail in the section *Endowment Investing in GRFs*.

Administrative Budgets

Administrative budgets are a common source of initial GRF capital. Operating budgets can provide one-time capital infusions for a GRF or annual capital infusions over several years.

Some colleges have used central administrative funds and/or departmental budgets (*e.g.,* facilities or dining). A few have used these allocations as a challenge mechanism by offering an administrative grant that matches gifts from charitable organizations or alumni.

Another source of revenue that institutions have used to fund their GRFs are payments from participation in utility demand-response and load curtailment programs.

A third source to consider is the operational savings associated with existing budgeted funds for energy-efficiency projects. A GRF can be funded by capturing the utility savings expected from current investments. For example, if an institution invests $1 million in energy efficiency in the first year and and projects utility costs to be reduced by $250,000 in the 2nd year, some or all of the savings can be transferred from the utilities budget to a GRF instead of lowering the utilities budget in the second year.

Gifts or Grants

An institution can use individual gifts or foundation grants as a capital source. The Student Climate Action Revolving Fund at Furman University (South Carolina) was funded entirely by a foundation grant. Establishing a GRF can also be a useful and appealing gift opportunity for donors. Because it continues to generate money, funding a GRF offers the donor some of the benefits of an endowed gift. A gift of $10,000 to a green revolving fund has an immediate impact. Furthermore, over 10 years, the revolving fund will provide more than $25,000 in cumulative savings to the institution (due to an average three- to four-year project repayment period).



In 2010, the University of Colorado at Boulder installed 52 photovoltaic panels and an electric car charging station at the Wolf Law Building, features that provide the building with approximately 11.96 kWh every hour.

Student Sources

Fees assessed by the college or student government organization may be a potential capital source. The **University of Colorado, Boulder Case Study** describes how student funds originally intended to finance efficiency measures in student-owned buildings helped establish a $500,000 GRF. In addition, many institutions are using student green fees to fund sustainability initiatives on campus. Bellevue College (Washington) established a $350,000 GRF using student fees as the capital source. Budgets for student activities may be an appropriate source of capital if the GRF is targeted toward student ideas, innovation and involvement.

Endowment Investment

Investing endowment capital in a GRF can provide initial funding with low risk and fixed income. Structuring such an investment requires careful planning. We highlight some issues associated with this approach in greater detail in the section *Endowment Investing In GRFs*, below. See also the **California Institute of Technology (Caltech)** and **Weber State University** case studies (both institutions used endowment investments as their primary source of initial capital).

Bellevue College (Washington) established a $350,000 GRF using student fees as the capital source.

Structuring a GRF

GRFs should match institutional resources, goals, and programs. While there is no one-size-fits all template for GRF structure, there is a common set of considerations that need to be decided during fund development. These are discussed in the following sections: purpose of the GRF, determining size and expected return, two models for returning operational savings to the fund, growing the fund and endowment investing.

Purpose of the GRF

The purposes of GRFs generally fall into the following three categories: efficiency, innovation or a hybrid that includes both goals. These categories were developed by looking at the many funds identified by the *Greening the Bottom Line* survey to distinguish types of GRF investments and where project ideas originate. Having a clear purpose for a fund makes decisions about structure and management easier. The following fund types are intended to foster dialogue on GRF purpose and mission.

- ***Efficiency*** **funds** provide capital to energy and/or water efficiency measures. The benefits of this model are focused on resource reduction and cost savings.
- ***Innovation*** **and engagement funds** explicitly seek community or academic engagement in developing projects. This model uses the power of the purse to enhance educational benefit or promote positive cultural change inside an institution.
- ***Hybrid*** **funds** target resource reduction and cost saving, but they also consider community engagement and outreach goals. Many existing GRFs take the form of hybrid funds.

Determining Size and Expected Return

There is no universal formula for determining appropriate fund size or expected return. The best approach is to model a GRF according to its intended purpose. Three- to five- year plans can be modeled fairly easily, and project ideas may already exist in institutional climate action or energy plans. There are three considerations when modeling a GRF:

- **Cost of utilities.** Does the institution have a long-term contract, or are rates adjusted on an annual basis for electricity and fuel? As energy prices rise, project paybacks get shorter

and revolving fund investments help act as a hedge against future energy price increases.

- **Increases in utility budgets due to new buildings.** New campus buildings result in increased utility budgets. Many schools use their GRF to invest in elements of capital projects such as super efficient HVAC equipment or airtight detailing; these have marginally greater costs than standard specifications, but they will reduce utility expenses. If campus growth is expected, administrators should consider increases in utility budgets driven by new construction.
- **Projects that were once deemed too expensive become affordable through economies of scale and improved technology.** One common example has been retrofitting lighting. Retrofitting incandescent lighting with fluorescent is almost always worthwhile; and many campuses are now reporting retrofitting fluorescent with LED lighting given recent quality improvements and decreasing costs.

GRFs can encounter challenges if they are too small. For example, if a fund is not large enough to make a demonstrable impact on campus energy use, investments will not be sufficient to improve the institution's overall environmental performance in a measurable way. In addition, the administrative resources required to set up and manage the fund may not make it worthwhile.

There is one final consideration when determining the size of a GRF: if the GRF invests in energy retrofits, the fund size needs to be related to the utility budget. If savings from the utility budget are the primary source of GRF regeneration, then the total possible annual return can only equal the value of the combined utility budgets. It is highly unlikely that most institutions will be able to reduce utility budgets to zero given existing technologies. Institutions should consider the size of current and future utility budgets and model a fund based on those budgets.

Returning Operational Savings to the GRF: Accounting and Loan Models

GRF accounting structures fall into two categories: the loan model and the accounting model. These models are described in greater detail below. Generally the selection of model will be determined by whether utility costs are borne by a single central budget or by multiple budgets across different institutional entities.

Loan model

In the loan model, the project proponent (department, school or campus group) signs a loan agreement, at which point funds are transferred to their budget. Loan repayment is typically managed through budget transfers, but the project proponent is obliged to initiate the transfer back to the GRF.

The loan model is useful when project proponents can use their budgets to repay a loan. Typically, this model applies to departments or schools that control their own utility budget, or where the GRF is financing projects that create savings

in locally controlled budget items such as paper, rather than utilities. Each loan recipient must initiate debt service payments to the GRF and bear the operating risk associated with efficiency projects (see *Risk* section below). The Energy and Climate Revolving Fund at the University of Colorado, Boulder uses the loan model.

Accounting model

In the accounting model, funds are transferred to the project proponent (department, school or campus group). Repayment is handled by transferring funds back to the GRF from a centrally managed budget where the savings will be realized (*e.g.,* an electricity budget).

For example, a project has an initial cost of $30,000 and is expected to save $10,000 per year. The GRF provides the $30,000 up front. Repayment is made over three years by transferring $10,000 each year from the utilities budget to the GRF. In year four (and for the remainder of the project lifespan), the savings created by the upgrade would be realized annually through a reduction in the utilities budget.

In most institutions, this procedure is handled by the finance/budget office and takes place at the beginning or end of each fiscal year. The Energy Efficiency Fund at the University of Calgary uses the accounting model. They note that their utility budget is "centrally funded and paid; as such, there is no funding directly to the units. Savings realized against the utility budget will be reallocated into the Energy Efficiency Fund."

The type of capital sourced for the GRF can affect the choice of a model. For example, GRFs with funds sourced from the endowment may have specific reporting requirements and include more formal documentation and control procedures, similar to loan agreements for funding campus conservation projects.

Growing the Fund

The simplest GRFs remain at a fixed value. The GRF is funded, projects are paid for, and then operational savings are used to repay the GRF. Middlebury College is phasing in a $1 million GRF over four years. Middlebury has seeded the GRF with $350,000 and are raising funds for the balance.

Some institutions choose to grow their funds according to the way they are managed over time, often to meet energy and climate goals or to repay an initial source of capital. Two operational ways to grow a GRF are adding fees (or interest) to repayment or investing utility savings into the fund after the initial capital has been repaid.

Interest payments or administrative fees

Several colleges and universities have instituted administrative fees or interest payments. These are rolled into the project cost, effectively extending the payback period and reducing return on investment. Fees are added to the GRF either to maintain the fund at a constant value relative to inflation or to cover administrative costs. Harvard University's Green Loan Fund added a 3 percent annual administrative fee

to all projects to cover the cost of running the fund. This fee is paid by the school or department that receives funding from the GRF.

Continuing repayment beyond cost of project

One way to grow a GRF is to continue directing operational savings (or a portion of savings) generated by a project back into the GRF after the total project cost has been repaid.

For example, a funded lighting project has a simple payback of three years and includes new lighting with an expected operational lifetime of 10 years. The project saves $10,000 each year. After three years, when the project has repaid the capital cost, all or part of the next seven years' annual savings of $10,000 could be directed to the GRF. Savings can be split between the GRF and another budget line. This practice should not be continued beyond the expected life of a particular measure because at that point, capital should be directed toward maintenance, replacement or upgrades.

Weber State University's GRF uses utility savings after a given project has been repaid by splitting the savings 75 percent to the GRF and 25 percent to the general university budget. Thus, the GRF builds a pool of capital separate from the original endowment investment.

Endowment Investing in GRFs

Endowment investing was introduced in the section *Finding Capital to Establish a GRF*. It is discussed in this section because investing endowment funds in a campus GRF may affect how the GRF is structured, specifically regarding who benefits from investment returns and who bears the risk.

How it works

At its core, investing endowment funds in a GRF is an agreement between the institution's finance and investment functions. Depending on the institution, these functions may be located in the same office and report to the same director, or they may be separate. The relationship between these functions and their willingness to collaborate is critical to the success of endowment investment in a GRF.

Each institution will find the best way to make an endowment investment work for its situation. For discussion purposes, two possible models are explored below: the fixed income model and the equity model.

The Fixed Income Model

In this model, the endowment lends a certain amount of capital to the GRF. The GRF then pays a stipulated interest rate (fixed or variable) to the endowment each year. The principal is returned in full to the endowment by the end of the specified period (*e.g.,* 10 or 15 years).

Under this arrangement, the finance function is responsible for the GRF's successful operation and financial performance. The investment function may ask for assurance if the GRF

is unable to pay the agreed interest rate in a given year. Additionally, the financial function may need to identify a known source of capital from which this obligation can be paid if performance falls below expectations.

This model has a particular benefit if returns generated by the GRF exceed the amount to be returned to the endowment or the money could be used to further capitalize the GRF. Building the GRF in this way would allow it to continue after endowment principal is returned.

The Equity Model

In this model, the financial and investment functions form a partnership. This might be a legal entity such as a limited liability partnership. Endowment funds are invested in the GRF for a specified period. The ROI is shared based on fund performance rather than a formula. Given the potential return of a GRF (20-30 percent annually), this may be an appealing option for the investment function; the upside could provide larger returns than agreeing to a fixed rate. The returns can be shared on any basis agreed to by the partnership. In this model, the risks of under performance are shared by the financial and investment functions.

Institutions should consider the following guidelines in structuring an endowment investment:

- **Agree on the terms of endowment investment.** For example, the GRF will invest in projects with an expected simple payback of 5 years or less. See *Project Criteria and Approval* below.
- **Agree on the terms of principal repayment.** Will principal be returned in a balloon payment at the end of the term or be amortized over the period of investment? Will the agreement include an option to "unwind" the investment before the end of the term, such as terms stating that principal will be returned in portions of X if called upon?
- **Agree on the terms of interest payment.** The GRF needs to invest in projects that have a yield equal to, or better than, the interest obligation. While institutions enjoy considerable latitude in fixing the terms of a loan, colleges and universities often set interest rates equal to the endowment's historical performance or some other benchmark. Using the prime interest rate plus 2-3 percent would be one sound, conservative way to structure the rate of return to the endowment.

Two endowment investment examples

The California Institute of Technology and Weber State University (Utah) have invested endowment funds in their GRF. Caltech used a portion of its endowment designated for capital projects to begin the Caltech Energy Conservation Investment Program (CECIP) Weber State University considered a variety of funding alternatives including bond, municipal lease, and endowment investment. They report that "after some analysis, we determined that the endowment would be the best method for funding these projects."

Managing a GRF

Before a GRF becomes operational, managers need to consider how to handle several core functions. How will the fund operate? Where will project proposals originate? How will projects be selected for funding? What will the associated costs be? This section discusses each of these questions. Examples of operating funds can be can be found online in the *Case Studies* section at **greenbillion.org/resources**.

Fund Administration and Governance

Fund administration includes monitoring projects and fund performance. Performance can be measured in cost savings, energy/materials reduction and/or effective use of GRF resources.

Oversight of fund performance is often delegated to an individual or group. The process may be as simple as assigning a sustainability officer and a member of the finance office or lead to the creation of a committee charged with meeting the GRF's goals and within the specific institutional context. Making these assignments before the GRF begins funding projects will allow for smooth operation.

Monitoring and Cost Accounting

Administering the fund requires tracking changes in the cost of energy and materials over the project's lifetime and includes tracking actual performance of projects as well as changes in utility costs over the term of repayment.

Institutions with building-level and/or sub-meter data can monitor project performance directly. However, the infrastructure for collecting this level of data may not be present on all campuses or buildings. Institutions that lack building-specific meter data have launched GRFs by implmenting other measures to ensure fiscal conservatism. For example, if GRF repayments are based exclusively on estimated savings, these savings can be shared between the utility budget and the GRF, thus creating a cushion in the utility budget to hedge against under-performing projects.

Some institutions monitor GRF effectiveness by observing how quickly they are able to reinvest capital. Monitoring effectiveness in this manner not only documents how quickly projects pay back, but also how quickly projects can be identified, approved and executed.

Finding Potential Projects

Most institutions find projects in one or more of the following ways:

- From in-house energy and/or systems experts such as energy, HVAC, power plant or other technical managers;
- From external experts who perform energy and building audits;
- By engaging students, faculty and staff in identifying potential projects.

External expertise can come in many forms. There are firms willing to conduct free audits for lighting or other areas in the hope that they will be selected to provide the retrofitting. This can be a good way to get started or focus on a particular issue.

Project Criteria and Approval

Once potential projects are identified, specific projects or groups of projects must be selected and approved for funding. Project approval is a distinct operation within a fund's administration. It can be carried out by the fund's administrators or delegated to other groups. The majority of GRFs identified in *Greening the Bottom Line* used committees or committee input to select projects. Committee membership is frequently linked to the group that initiated the fund and/or provided the source for the funds.

Criteria

Establishing criteria for approving an individual project or a project portfolio will ensure that the GRF carries out its intended goal. Clear criteria may also reduce project approval time. Institutions have established a variety of criteria, but most include the following:

- **Environmental benefits**: does the project save water, electricity, carbon, fuel, paper or a combination of these?
- **Size:** is the initial cost above or below a previously established limit?
- **Payback:** does the GRF require a minimum return on investment?
- **Confidence:** will a given project achieve the predicted savings?
- **Educational benefits:** does this project contribute to student, faculty or staff education in some way? Does it connect to an academic program or department?
- **Measurability:** can benefits be measured directly? Indirectly? Does the project promote environmental and financial benefits in some ways that cannot be quantified?

Underwriting and Reporting

If there is a loan agreement between the entity completing the project and the GRF, the loan documentation should include project criteria as the basis for underwriting the loan. In addition, where fund administration is happening at arm's

length, reporting requirements for project and capital performance should be included in a loan agreement. The University of Colorado provides a useful **sample loan agreement**.

Most institutions with GRFs have used in-house expertise (environmental, facilities and financial staff), so the costs have been minimal and fully internalized.

Establishment and Operating Costs

Setting up a GRF requires a certain amount of staff time, though the amount of time spent need not be significant. Most institutions with GRFs have used in-house expertise (environmental, facilities and financial staff), so the costs have been minimal and fully internalized. For any institution, the following activities will require staff time, whether it is from internal team members or external consultants:

- Establishment
  - Developing the mission and goals
  - Developing criteria
  - Developing administration and governance
  - Establishing project/portfolio criteria
  - Establishing internal control requirements
  - Obtaining legal review as desired or required
- Operation
  - Fund administration
  - Project management (often rolled into the cost of individual projects)
  - Project development (typically in the form of an energy manager or energy audit[s])

Most institutions with GRFs have used in-house expertise (environmental, facilities and financial staff), so the costs have been minimal and fully internalized.

Operational Risks

Although they are generally limited, there are some risks in operating a GRF. The more common risks are discussed below.

Sufficient Project Identification

A few institutions have reported that once they have established GRFs, they have not been able to locate enough projects to fund, or that there were not enough projects to keep the project pipeline filled. This appears to be a relatively low risk when considering the number of projects completed on campuses that have operated GRFs over a long period (Harvard, Stanford, Western Michigan University). However, a lack of viable projects has been reported as an obstacle on a small number of campuses, particularly those using the Innovation and Engagement GRF model.

In response, some of these institutions have launched a variety of project identification strategies, such as marketing the GRF, soliciting input from campus stakeholders, promoting interdepartmental projects, and targeting student involvement. This risk can be mitigated by executing a project identification plan in advance of GRF establishment. (See *Finding Potential Projects* section, above on page 17).

Uncertainties

The value to an institution of investing in an efficiency project (through a GRF or otherwise) is based on the estimated operational savings of that project. Installed projects may not perform as predicted due to a number of potential risks including:

- **Operational changes**: a building's usage pattern may shift due to fluctuations in weather, programming, staffing, or budgets, and this can impact the project's projected performance and estimated returns.
- **Technical difficulties:** equipment failures, non- or under-performance of new technologies
- **Decrease in commodity prices**: if the cost of utilities goes down, projects will result in delivering longer than expected payback periods.

- **Catastrophes**: locations of capital investment could be damaged or lost due to fire, natural disasters and other catastrophic events.

Two aspects of a GRF help mitigate these risks: All investments are in infrastructure that is owned and/or operated by the institution. Therefore, the risks are not significantly different from any other capital project. GRFs can take a portfolio approach by investing capital in many different projects; this significantly reduces risks associated with non-performance of a single project.

Resources for Management

Once established, a GRF generally provides a reliable, ongoing source of capital for efficiency projects. However, if fund management becomes too onerous or time-consuming, a GRF may not be worth the effort. A few schools that established small funds have cited disproportionate labor involved in tracking the savings from small projects relative to the GRF's return. Specifically, they had difficulty separating the relatively small cost savings produced by efficiency projects from normal fluctuations in utilities costs for a specific building.

Availability of Invested Funds

Once GRFs are invested in projects, the capital is no longer liquid; however, because the GRF is repaid using existing GRF annual returns of 20 to 30 percent as a guide, the entire capital investment in a project or portfolio of projects becomes available again within two to five years.

Further Information

This primer covers critical financial and administrative questions most often raised by senior financial officers, boards of trustees' investment committees, and key decision makers considering development of a GRF. It is intended to stimulate discussion and provide a starting point from which institutions may develop GRFs that match their resources, goals and programs.

For more information about developing a GRF or joining the Billion Dollar Green Challenge, please visit:
greenbillion.org

or contact the Sustainable Endowments Institute at **info@greenbillion.org**, or phone: 617-528-0010.