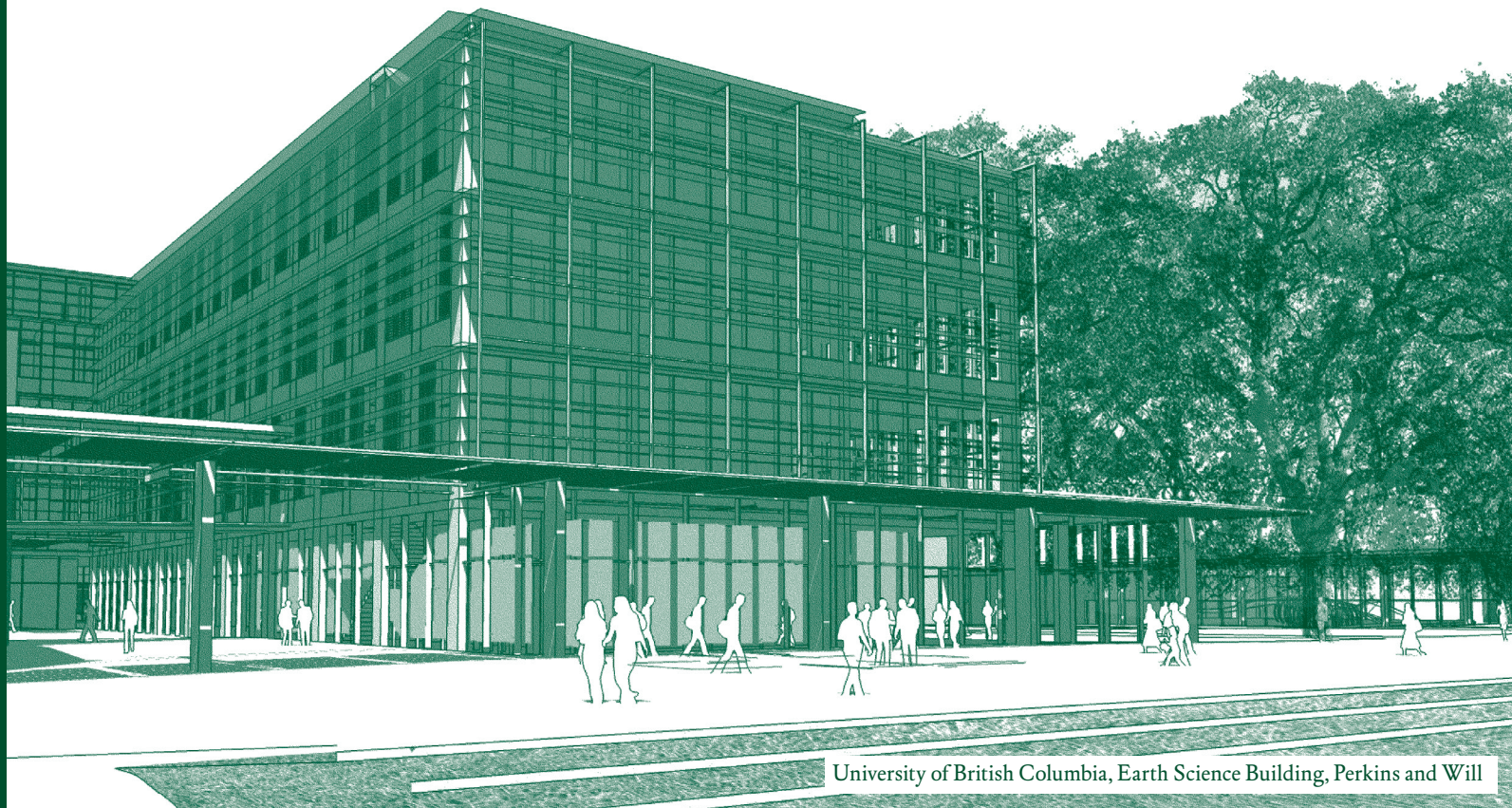
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Green Revolving Funds:

An Introductory Guide to Implementation & Management

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Prepared by ICF International for the Sustainable Endowments Institute

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Executive Summary

The goal of this introductory implementation guide is to provide practical guidance for designing, implementing, and managing a green revolving fund (GRF) at a college, university, or other institution. The GRF model is widespread in higher education, with at least 79 funds in operation in North America representing over $111 million in committed investment as of late 2012. GRFs have proven their ability to reduce operating costs and environmental impact while promoting education and engaging stakeholders. The number of GRFs in operation has increased 60 percent since 2010 and 15-fold in the last decade (see *Greening the Bottom Line 2012* report).

In 2011, the Sustainable Endowments Institute (SEI) launched The Billion Dollar Green Challenge, an initiative that encourages colleges, universities, and other nonprofit institutions to invest in their own GRFs. As part of this initiative, SEI has researched GRFs at a wide range of institutions and has developed a suite of tools and resources to support GRF adoption (see Chapter 5: The Billion Dollar Green Challenge).

However, it can be difficult to establish and manage an effective GRF. There is a need for a guiding document that taps into the expertise of presidents, administrators, facility managers, sustainability directors, students, consultants, and other stakeholders with GRF experience to establish best practices. This Guide—a co-publication of SEI and the Association for the Advancement of Sustainability in Higher Education (AASHE)—is intended to fulfill that need.



University of Colorado Boulder, Center for Innovation and Creativity

The Guide is informed by data and insights from schools that have already incorporated GRFs into their campus operations. It includes information from (1) interviews with dozens of stakeholders representing institutions that vary in size, setting, and wealth; (2) research conducted by SEI, AASHE and other organizations; (3) and the direct experience of its authors in implementing and advising on GRFs at a variety of institutions.

Anyone interested in establishing, managing, or researching GRFs will benefit from this Guide. While the Guide is targeted at higher education, its principles can be applied to many other sectors, including K-12 schools, healthcare institutions, municipalities, and private companies.

This introductory guide is not intended as a technical guidance document, but rather as a high-level overview of GRF establishment and management. A more detailed comprehensive guide will be available in spring 2013. Key chapters are summarized below.

Chapter 1: What is a Green Revolving Fund?

Chapter 1 introduces readers to the green revolving fund (GRF) concept. A GRF is an internal fund that provides financing to parties within an organization to implement energy efficiency, renewable energy, and other sustainability projects that generate cost-savings. These savings are tracked and used to replenish the fund for the next round of green investments, thus establishing a sustainable funding cycle while cutting operating costs and reducing environmental impact.

There are several advantages of GRFs that go beyond one-time investments. Revolving funds build the business case for sustainability, engage and educate the campus community, convey reputational benefits, and create fundraising opportunities in a way that conventional investments do not. GRFs are being successfully employed by a wide range of schools—including public and private institutions with varying sizes, locations, strategic priorities, and levels of endowment wealth. These funds regularly achieve high financial returns, with a median return on investment of 28 percent annually.

Chapter 2: The Anatomy of a Green Revolving Fund

No two GRFs are the same. Chapter 2 of this Guide discusses how each component of a GRF can be designed, customized, and optimized for your institution. Sources of GRF seed capital are diverse and include administrative budgets, endowment assets, student fees, and alumni donations. Fund accounting may be done using either the loan model, in which funding is distributed to individual project owners, or the accounting model, in which funding is transferred to and from a central account. There are also several options for fund oversight, such as the use of a management committee or housing the fund in a specific office. Funds may differ in terms of their project criteria—such as payback requirements or environmental benefits—and whether they track project savings using engineering estimates or empirical measurement.

Chapter 3: 10 Steps to a Successful Green Revolving Fund

Chapter 3 of this Guide includes a step-by-step roadmap for how to design, implement, and manage a successful GRF. A few key themes are present throughout all 10 steps. First, use existing research and strong data analysis to inform your GRF strategy when building the case for the fund, setting up its structure, and identifying and selecting projects. Second, dedicate time and resources to undertaking a thorough stakeholder engagement process, both to build buy-in and to leverage the insights of experts on your campus to improve the fund. Third, tailor the mission, structure, and management of your fund to the unique characteristics of your institution.

Chapter 4: Common Obstacles to Green Revolving Fund Implementation

Several obstacles are often encountered during GRF development and management. Chapter 4 of this Guide outlines those issues and offers best practices for overcoming them based on insights from GRF leaders. To avoid financial obstacles, gain a comprehensive understanding of your institution's accounting system, incentive structure, and sustainability investment portfolio to inform the design of your fund. To overcome administrative and political obstacles, build a strong business case for the fund using performance forecasts and comparisons with peer institutions.

To the readers of this guide

Whether you are a student leader excited about the prospect of reducing your school's carbon footprint, a sustainability coordinator building a strategic plan, a facility manager exploring options for energy efficiency retrofits, an administrator seeking advice on GRF management strategies, or a researcher interested in innovative sustainability financing mechanisms, we hope you find this Guide to be a useful resource. Through this document, our goal is to facilitate the continued growth of GRFs as an effective tool for cutting expenses, reducing environmental impact, and enriching campus communities.

Chapter 1:

What is a Green Revolving Fund?

This chapter:

- Provides a high-level overview of the GRF model
- Discusses some common arguments for investing in a GRF

2.1 The green revolving fund model

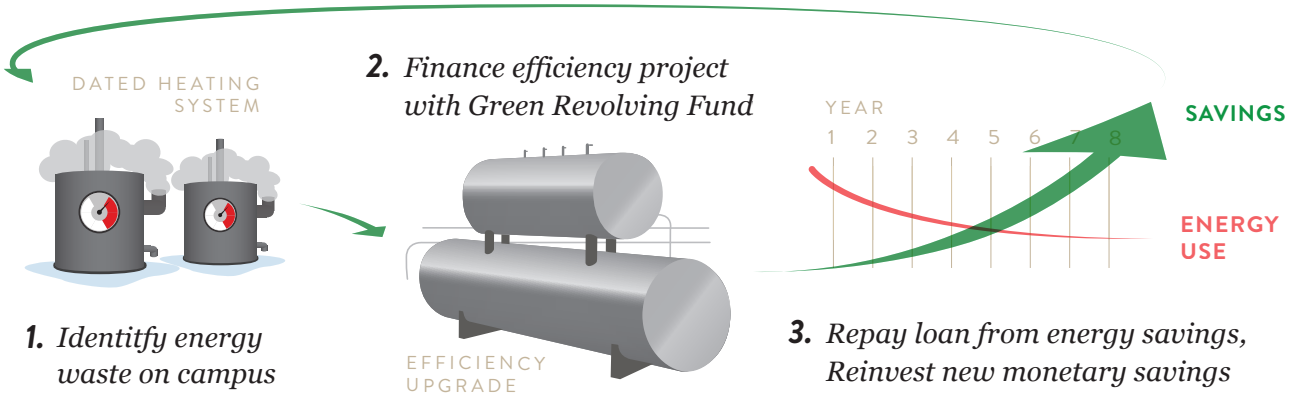
Facing budget cuts and rising energy costs, many educational institutions are grappling with how to finance urgently needed—but capital intensive—energy efficiency upgrades on campus. One strategy for overcoming these challenges is creating a green revolving fund (GRF). A GRF is an internal investment vehicle that provides financing to parties within an organization for implementing energy efficiency, renewable energy, and other sustainability projects that generate cost-savings. These savings are tracked and used to replenish the fund for the next round of green investments, thus establishing a sustainable funding cycle while cutting operating costs and reducing environmental impact.

Green revolving funds are often managed by a committee drawn from different stakeholder groups on campus. These may include students, faculty, facility or energy managers, administrators, sustainability coordinators, and others. Funds may also be managed directly by administrators or by the Facilities, Finance, or Sustainability Office. While GRFs can finance many types of projects, they typically target energy, water, and waste reduction due to their potential cost savings. Projects have included lighting upgrades, boiler replacements, water pipe insulation, low-flow toilets, building envelope upgrades, solar panels, and more. After reviewing a variety of funds in higher education, SEI developed the following two criteria for a green revolving fund:

1 The fund must finance measures that reduce resource use (e.g., energy, water, waste) or mitigate greenhouse gas emissions (e.g., renewable energy).

2 The fund must revolve so that at least some of the savings generated by reducing operating expenses are required to be repaid to the fund, thus providing capital for future projects.

Figure 1: *How Green Revolving Funds Work*



2.2 The case for green revolving funds

Non-revolving investments from an operating budget, capital budget, or endowment can also drive improvements in campus environmental performance. So why should you adopt a GRF?

There are several key advantages that revolving funds hold over traditional non-revolving expenditures. Revolving funds:

Demonstrate the business case for sustainability: Despite the large cost-saving potential of energy efficiency and sustainability investments, many institutions perceive them as an expense only. Rather than simply allowing the savings from these projects to be absorbed into the operating budget, a GRF tracks the savings distinctly and directs them into future projects—thus creating a measurable return on investment (ROI). Established GRFs report a median annual ROI of 28 percent (see SEI's *Greening the Bottom Line 2012* report), reliably outperforming average endowment investment returns while hedging against rising energy costs.

Engage and educate the campus community: Whereas traditional capital improvement investments are typically managed by a small team of administrators, a GRF can bring diverse stakeholders together to make decisions about investments and build a sustainability strategy. GRFs can also issue loans to projects proposed by students and other community members, thus promoting entrepreneurship and outside-the-classroom learning.

Convey reputational benefits: A GRF can signal your institution's commitment to sustainability and operational efficiency in a way that one-time investments cannot. It is a unified, purposeful investment vehicle that generates more positive press than conventional top-down investments.

Catalyze a culture shift: A GRF also represents a commitment to larger strategic goals, such as greenhouse gas reductions, and provides a tangible vehicle for achieving them. "A GRF provides constant focus on the idea that you want continuous improvement until you get to a carbon footprint of zero," says Anthony Cortese, Founder and Senior Fellow at Second Nature and Trustee of Tufts University and Green Mountain College. "That doesn't happen if you use debt financing or some other kind of capital financing."

Create a programmatic approach: A GRF creates a formalized program of sustainability investments rather than a series of one-off projects. GRFs typically include specific requirements to ensure fiscal discipline, environmental responsibility, and a clear financing process that funnels savings from past projects into current spending plans. In some cases, this source of funding actually enables projects to be implemented that would otherwise be omitted. For example, the University of New Hampshire historically struggled with a complicated financing process that sometimes prevented them from investing in high-return energy efficiency projects. "A GRF allowed us to get the wrinkles out and allowed everyone to say 'I trust this methodology,'" says Matt O'Keefe, Energy Manager at UNH.

Leverage savings into opportunity: GRFs are a great way for organizations to capitalize on the savings from energy efficiency projects to promote sustainability in general. For example, Dartmouth College's GRF directs 10 percent of the savings from projects into a Green Community Fund. Students, staff, and faculty can then apply for money from this fund for projects that promote sustainability on campus, whether or not they have financial paybacks.

Track performance: You cannot manage what you do not measure. A GRF creates a streamlined process for an institution to distinctly track, manage, and analyze the financial and resource savings resulting from sustainability projects. The Green Revolving Investment Tracking System (GRITS) was developed as part of The Billion Dollar Green Challenge, and collects, standardizes, and analyzes data related to GRF performance (see Section 5.3: Resources).

Seize new fundraising opportunities: Some institutions have had success with fundraising for a GRF, both from alumni and external foundations. For example, President Elizabeth Kiss and her development team at Agnes Scott College raised over $400,000 in seed capital from donors within a few months by pitching their fund's strong ROI and its potential to turn the campus into a living laboratory for sustainability.

Despite the strong case for the GRF approach, it may not be the best strategy for every institution. For example, an institution may not yet want to commit the cost-savings from energy efficiency to future projects until it has verified that there are enough investment opportunities available to absorb such funding. In other cases, an institution's procedure for financing projects may be set up in a way that does not lend itself to a revolving approach. Potential GRF adopters should carefully weigh the associated pros and cons of the model to ensure that it is appropriate for them.



Lane Community College – Health & Wellness Center. Large projects funded by GRFs can generate a high volume of savings while providing a visible symbol of an institution's commitment to sustainability.

Chapter 2:

The Anatomy of a GRF

This chapter:

- Discusses key components that make up a green revolving fund strategy
- Provides a menu of options for how each fund component might work
- Provides recommendations for tailoring each component to your institution

No two green revolving funds are exactly the same. While all GRFs finance measures that improve environmental performance and use the associated cost-savings to finance future projects, they can differ on a wide range of parameters including structure, size, mission, management, project criteria, funding sources, payback requirements, and more. Successful funds will be tailored to the distinct structure and culture of their home institution. Perhaps the most powerful attribute of the GRF model is that each of its components can be adapted to the unique challenges, goal, and opportunities that you face. Key components are discussed below.

2.1 Seed capital

Capital for a GRF may be obtained from a variety of funding sources, and some institutions have combined multiple sources. Potential seed funding sources are discussed below.

Operating budgets

Annual operating budgets are the most common source of GRF seed capital. This budget is often the most readily available and flexible funding source, and because the savings that GRF projects generate will often come from the operating budget, it may be seen as the most appropriate source of seed capital. An operating budget may provide a one-time infusion of capital or multiple infusions over time to scale the fund gradually.

Within operating budgets, common sources can include the facilities, sustainability, or energy budgets, as well as other departmental budgets or administrative funds. In some cases, shrewd fund proponents have been able to tap into unused or underutilized budgets to launch a GRF, thus converting these funds into a high-return investment opportunity. For example, the University of Vermont is using a portion of its cash reserves— normally held in low-risk investments before being spent—to seed its GRF.

Endowment principal

An institution may also invest its endowment funds directly into a GRF. Given recent volatility and risk in financial markets, investing in high-return, low-risk sustainability projects on campus may present a favorable option for endowment managers. Refer to SEI's GRF *Investment Primer* for more detailed guidance (see Section 5.3: Resources).

Utility rebates and incentives

Utility companies often offer programs to large institutional customers to encourage them to reduce energy use, such as rebates, demand response, or other incentives. In exchange for conserving electricity or natural gas through upgrades and retrofits, colleges and universities are often given reduced rates or cash rebates, which they can then use to seed a GRF. Sometimes GRF project savings then translate into even further incentives from the utility company.

Capital budgets

Institutions often have funds set aside for large capital projects such as new construction and renovations. These funds may be housed within a facilities budget, within the endowment, or as a separate budget entirely. Capital budgets are often already used to fund large energy efficiency projects, making them a logical source of seed money.

Cost-savings or revenue from existing projects

A GRF can be financed from savings or revenue being generated by projects that were financed by other means. This may provide a low-risk option if decision-makers are hesitant to commit capital to a GRF without proof of actual savings from projects within the institution. For example, the savings from a lighting upgrade or revenue from the sale of renewable energy credits (RECs) from on-site solar power generation may be used to start the fund without requiring additional capital.

Students

Student sources of capital include a green fee levied on students (either mandatory or voluntary) or student government funding. If proposing a fee, it is advisable to first conduct a willingness-to-pay analysis by polling the student body to: 1) assess support for the fee, 2) determine the optimal size of the fee, and 3) estimate the revenue that the fee will generate for planning purposes.

Donations and grants

Many institutions, especially colleges and universities, have relationships with outside foundations or other donors who seek to foster research and improve programs and operations. GRFs are often appealing because of their interdisciplinary scope, ability to promote education and engagement, and environmental and economic benefits. The Jessie Ball duPont Fund recently launched the first foundation grantmaking program in the country specifically designed to help seed green revolving funds at a select group of colleges.

Some funds start with a few large alumni donors, and others are part of targeted sustainability or broader fundraising campaigns. A gift to a GRF combines the immediate impact of an annual fund gift with the longevity of an endowment gift. A hypothetical $100,000 contribution will provide more than $555,000 in cumulative savings to the institution over 10 years (based on the median 3.5 year project repayment period reported in *Greening the Bottom Line 2012*).

Government funding

A variety of government programs exist that can be used to seed a GRF, including programs at the federal, state, and local levels. Institutions have used both American Recovery and Reinvestment Act (ARRA) grants and state energy efficiency programs to either start funds directly, or to implement projects whose savings are then used to seed a revolving fund.

Key considerations for seed capital

There is often a tradeoff between risk and reward when allocating funding to a GRF. Large capital allocations from existing sources (e.g., an endowment or capital budget) enable the fund to finance large capital-intensive projects that will produce a high volume of savings. Large funds are also more likely to become firmly established because they have more flexibility to finance projects and pay fund management expenses, but they represent the most institutional commitment. Conversely, incremental funding strategies (e.g., annual allocations from the operating budget, savings from existing projects, or an annual student fee) put fewer resources in play if the fund encounters obstacles, but this may prevent the fund from becoming established and quickly achieving the highest cost-savings.

Many institutions have started their funds small to demonstrate effectiveness, then scaled up once the administrative structure is operational. As Rosi Kerr, Dartmouth College's Sustainability Director, noted, "I would rather start small and knock it out of the park than bite off more than we can chew initially." For example, the Harvard Green Loan Fund was capitalized with $1.5 million in 1993, and was revived and enlarged to $3 million from the President's Office budget in 2001. As a result of its consistent success, it was doubled in 2004 and again in 2006 to arrive at its current size of $12 million. However, other schools such as Macalester College have encountered problems with starting small, finding that less capital in a GRF leads to a proportionately higher administrative cost and burden on staff, and less flexibility in choosing and installing projects.

When deciding how to size your fund and at what rate (if any) to scale it over time, factors to consider include 1) the volume of potential projects and their ability to absorb capital, 2) your institution's tolerance for change and financial innovation, and 3) the capacity of your fund management team and facilities department to support project implementation.

2.2 Accounting systems

The accounting system is the backbone of a GRF. This component includes the accounts, stakeholders, procedures, and rules that are involved in moving GRF-related money within the institution. Accounting is often the most complex component of successful fund design, so it should be addressed early.

Accounting systems can be divided into two broad categories:

Under the **loan model**, the project applicant (e.g., department, school, campus group, etc.) actually borrows money from the fund via a budget transfer. The project owner is then responsible for repaying the loan (with or without interest, see next section), using the savings the project produced within his or her own campus unit. This model works best when project applicants have control over distinct operating budgets, discrete ownership of projects, and facilities staff or building technicians to assess potential improvements.

Under the **accounting model**, funds are transferred to the project applicant, or to a central facilities department, but repayment is made via a transfer of funds back into the GRF from a centrally managed operating budget (often utilities) where the savings were generated. The project recipient typically does not have discrete ownership of the project. This model works best when there are no autonomous entities (e.g., colleges, schools) within an institution, or when those entities draw from the same central budget. The GRF may be a distinct account (often with its own account number) or it may take the form of a concept or agreement (e.g., a line item on annual budgets) without maintaining a physical account balance.

Successful funds have been developed using both models. The key lesson across all institutions is that the GRF accounting system must be tailored to work within the existing system. A GRF is not a pre-defined

entity to be adopted wholesale; it is a flexible concept that can be molded to fit with your institution's current standards and practices. Experience has shown that adapting the model is crucial for smooth implementation. SEI's GRF *Investment Primer* (see Section 5.3: Resources) provides more discussion.

2.3 Payback mechanics

The size and timing of repayments to the GRF may also be customized. For example, projects may repay only a portion of their savings to the fund each fiscal year or period. Alternately, they may be required to repay an amount greater than the original loan value, either by paying interest on outstanding loan balances or by repaying more than 100 percent of the loan value in total. In some cases, an administrative fee has been levied on projects in order to cover the fund's operating costs. Where GRFs target mainly projects that create savings in the central utilities budget, interest or a fee is sometimes charged only on loans for departments outside of the central budget such as athletic stadiums or student government-owned buildings.

There is often a tradeoff between making GRF financing attractive to funding applicants and the need to cover administrative costs or grow the fund over time. Project recipients might prefer to retain a portion of annual savings, but it will be at the expense of quickly replenishing the fund. Similarly, charging interest or requiring repayment over and above the loan value will allow the fund to grow organically without additional capital infusions, but this places a higher cost on project owners. The correct balance will depend on your institution's political environment and the goals of your fund.

2.4 Fund oversight

The set of stakeholders tapped to oversee a GRF is another key consideration that affects both the politics of the fund and its performance. There are three broad options for selecting projects and managing the operations of a GRF (the details of management are discussed in Section 2.5: Fund Operations):

- **A management committee** is the most common GRF leadership model. Such a committee may be formed from a pre-existing body such as a working group or may be formed specifically for the GRF. Stakeholder groups who will be involved with or affected by the fund (e.g. students, facility managers, faculty, administrators) should typically be represented on this committee to maintain buy-in and contribute their expertise.

- **Staff and resources from a relevant office** may be used to oversee the fund—often the finance, facilities, or sustainability office.

- **A dedicated manager** may be appointed specifically to run the fund, or fund management may be added to the job responsibilities of a current administrator.

Management by committee is often advantageous for several reasons. First, it leverages the unique breadth of expertise in a campus community. Second, it promotes engagement and awareness of the fund. Third, it promotes cross-disciplinary collaboration and innovation. Fourth, it reduces the burden that falls on any one member of the committee. If a student green fee or student government funds are used to capitalize the GRF, it is particularly important to have student representation on the fund committee. However, a smaller management team housed in a single office may offer tighter control of financing and a more streamlined process for issuing loans.

In some cases, the leadership structures highlighted above have been combined, with different groups managing different aspects of the fund. For example, a sustainability director or administrator may serve as the fund manager and coordinate the operations of the fund, with a committee (sometimes chaired by the fund manager) that selects projects and provides guidance.

2.5 Fund operations and project selection

The management of fund operations involves a broad array of duties. Many institutions create a GRF charter, an official and publicly available document that explains how the fund operates. This is particularly important when campus community members will be applying for GRF financing. Charters are often developed from a written proposal used as a forum for discussion during fund design and may use much of the same language (see Steps 2, 4, and 7 in Chapter 3 for more discussion of proposals, charters, and other documentation).

It is important to clearly specify your fund's procedure for reviewing, evaluating, and selecting projects. Project selection may be conducted by soliciting applications from the campus community and putting them through a competitive process. Alternatively, fund managers may select projects non-competitively. For example, they may compile a prioritized list of potential projects identified via an energy audit and select projects from this list. If using this approach, it is advisable to have a representative from the facilities department either on the management team or in close contact with the team in order to streamline this process. Projects may also be identified from previously existing lists such as deferred maintenance, or through research by other groups on campus.

2.6 Project criteria

When assessing potential projects, it is helpful for fund managers to work from a specific set of project criteria. These criteria may include both hard requirements and preferred attributes. Some common project criteria include:

- Payback duration
- Capital cost
- Specific environmental benefits such as resource conservation or greenhouse gas reduction
- Cost-effectiveness metrics such as greenhouse gas reduction per dollar of capital cost
- Potential for community engagement and collaboration
- Educational benefits

Project criteria should be selected based on two factors. First, they should promote the mission of the fund. A GRF that is focused on maximizing operational efficiency might have aggressive payback requirements, whereas a fund that emphasizes community engagement might favor projects that are student-led. Second, criteria should be tailored to the actual portfolio of projects that are available for investment.

Consider incorporating flexibility in project requirements at the discretion of the fund managers. They may need to adapt as the portfolio of available projects changes over time or as unique opportunities arise. For example, a project may compensate for failing to meet financial requirements with outstanding performance in other areas such as education, engagement, or tackling deferred maintenance. In addition to specific criteria, projects should also be prioritized in a way that best allocates limited resources while accounting for the feasibility and timing of projects given other constraints, such as staff availability.

2.7 Measuring savings

The GRF model relies on capturing cost savings to replenish the fund, so the method by which those savings are measured is crucial. There are two main strategies that fund managers may use to calculate savings from projects in order to determine repayment amounts.

First, fund managers may use front-end savings estimates based on engineering analysis. This method relies on technology specifications and assumed usage patterns to predict future performance. This is the most straightforward and inexpensive approach, but it will not capture any deviations in the event that a project performs better or worse than expected.

Second, fund managers may retroactively calculate savings based on actual performance. This entails using a measurement and verification (M&V) approach to directly meter savings while accounting for conflating factors like weather and usage patterns. This approach is more accurate but also more costly and labor-intensive.

There are several potential levels of rigor for M&V analysis. An institution may perform rigorous building energy modeling based on submetering data, or it may measure pieces of equipment individually and extrapolate for the full set of equipment installed. Another option is to conduct a less rigorous assessment of whether utility costs are decreasing over time. This will not be sufficient to calculate project repayments, but it can help verify that a project or portfolio of projects is decreasing costs broadly.

Some institutions benefit from a best of both worlds approach in which the loan approval and repayment schedule are based on estimated savings, but M&V is then performed to verify that the project is functioning according to projections. This has the added administrative benefit of not requiring updates to the repayment process based on performance unless necessary. Other schools, such as the University of Denver, perform both upfront and retroactive M&V on larger projects, and use project specifications and engineering estimates for smaller ones.

2.8 Long-term strategy

A GRF can drive broader strategic initiatives, including Sustainability Master Plans or Climate Action Plans (CAPs). When defining your fund's long-term vision, consider two key possibilities. First, it is often effective to tie the fund to long-term goals like emissions reductions or capital improvement plans, both when building buy-in for a GRF and when operating it. This connects the fund with other initiatives and may provide a source of capital to meet campus objectives. Second, GRFs present a unique opportunity to bring campus stakeholders to the table—both as part of a management committee and as project applicants. This can create a forum for collaboration and innovation that goes beyond financing.

"The climate issue and the challenge of making affordability and accessibility of higher education a priority—the two work together. It's not one versus the other," said Anthony Cortese, Founder and Senior Fellow at Second Nature and Trustee of Tufts University and Green Mountain College. "A GRF is a way to get a serious focus on deferred maintenance at the same time that we push toward dramatically reducing the carbon footprint."

GRF Anatomy in Practice: Four Case Studies of Successful Funds

School	Seed Funding	Fund Oversight	Accounting System	Project Criteria	Measuring Savings
Agnes Scott College	Alumni and foundation donors, utility savings	Sustainability Steering Committee	Accounting model	Payback critical for selection – flexible time periods	Repayments based on estimates and measured savings
California Institute of Technology 1891	Money market fund within endowment	Sustainability Director and Energy Manager; with approval from AVP of Facilities and VP of Business and Finance	Accounting model	6-year payback requirement	Repayments based on estimates and measured savings
Iowa State University	President's administrative funding	Director of Sustainability; Advised by Loan Fund Advisory Committee	Loan model	5-year payback requirement	Repayments based on estimated savings but confirmed with measurement and verification
The University of Vermont	Operating cash reserves	VP of Finance and Administration; Advised by Energy Initiatives Committee	Accounting model	7-year payback requirement; GRF returns 5 percent of its outstanding balance annually to cash reserve	Varies by project

For example, the University of New Hampshire formed an Energy Working Group with the goal of meeting its greenhouse gas emissions reduction targets under its CAP. When the GRF was established, this group became the management committee for the fund and now uses the fund as the main financial instrument to drive progress toward CAP goals.

Matt O'Keefe, Energy Manager of UNH, notes that their GRF has turned energy efficiency projects into a consistent program rather than a series of one-off investments, which has increased interest from potential funders. "We've already leveraged the fund to participate in larger programs and receive grant money," he says. For example, a grant of $50,000 for a solar power installation might turn into $400,000 of investment over 10 years as savings revolve. "I talk about how money will be leveraged into this program, and people are a lot more interested."

Chapter 3:

10 Steps to a Successful GRF

This chapter:

- Presents a step-by-step guide to designing, implementing, and managing a GRF
- Provides key considerations and resources for each step

This chapter provides a roadmap for designing, implementing, and managing a successful GRF. These steps will aid you in developing a fund that: 1) maintains high financial and environmental performance, 2) effectively engages key stakeholders on campus, and 3) is tailored to the unique character of your institution. While each fund development process will differ by institution, this chapter provides a general framework that is widely applicable across institutions. Each step addresses a separate component of the GRF creation process, and they are positioned roughly in the order they should be conducted. However, the steps are often interconnected. Elements of each step may need to be addressed before or after the point at which it is listed.

Step 1: **Do your homework**

The first step in developing a successful GRF is to gain an understanding of the range of GRF models and to begin thinking about how the design of your fund can be tailored to your institution. Much work has already been done in this area, and using existing materials can cut months from the fund development process. There are two key areas in which research is crucial.

First, learn about GRFs in use at your peer institutions. Gain a basic understanding of how these funds are structured, the types of projects they typically finance, and popular variations on the GRF model in use by institutions similar to your own. Several resources have been assembled as part of The Billion Dollar Green Challenge to facilitate this, including GRF case studies as well as *Greening the Bottom Line 2012* (see also Section 5.3: Resources). A keen understanding of GRFs at peer institutions can help build the case for your fund while providing ideas for how to best adapt the model.

"Don't reinvent the wheel. Talk to other universities who have made this work and assimilate those programs into a custom program that will work at your school" said John Onderdonk, Caltech's Director of Sustainability Programs.

Second, be sure to examine the elements of your own institution's operations that are relevant to a GRF. These include:

- How are utility services distributed and paid on campus? Is the entire institution run as one large unit or is the university split into smaller, autonomous departments or schools?
- How is money transferred internally? Universities often have accounts associated with each department and organization and it may be necessary to secure an account for the GRF.
- Which stakeholders contribute to decisions about facility operations and project finance? Who will need to be consulted in order to build buy-in for the fund?
- What is the current state of energy efficiency and auditing on campus? Have any studies been done to identify potential energy efficiency or sustainability projects?

Step 2: **Select your model**

Early in the fund development process, tentatively outline a basic structure and mission for the fund. GRFs have many variable elements that can be adapted to the unique challenges, opportunities, and priorities of your institution. There are no established rules for how a GRF must be structured, so be on the lookout for opportunities to innovate. Chapter 2: Anatomy of a GRF provides specific guidance and decision points for each component of a GRF.

Fund design should be an iterative and interactive process. It is often helpful to begin with a concept proposal, which can serve as a point of discussion with stakeholders on campus as you seek their feedback. This may take the form of a document, presentation, or a few talking points. Engage key stakeholders with this proposal early and often, being sure to include facility managers, energy managers, sustainability directors, investment managers, and administrators in charge of operations and finance. Student groups and faculty can also provide valuable feedback, particularly those active in sustainability, economics, and engineering. The goal of this initial round of discussions is to identify logistical, political, and financial barriers to a GRF; develop a strategy for overcoming these barriers; lay the groundwork for building future support; and refine the structure of your proposed fund to capture opportunities at your institution.

Step 3: **Assess opportunity and run the numbers**

In order to implement a successful GRF, it is important to first understand its investment potential at your institution. This can be done by in-house facilities staff (they may already have a wish list of projects) or by hiring a contractor to perform an energy audit. If your institution has signed on to The Billion Dollar Green Challenge, consider consulting the project library of the GRITS web tool (see Section 5.3: Resources) for examples of projects typically financed by GRFs. If the fund will solicit project applications from the campus community, it can be useful to determine in advance which projects are likely to receive financing in the first round and assess their potential performance as well.

The ideal result of this step is a pipeline of projects that the GRF will likely finance in the first few rounds of investment, including estimates of the costs and savings associated with each project and a forecast of how the portfolio of projects as a whole will perform. Forecasting the fund's expected performance over the first few years—including metrics like total savings, annual return on investment (ROI), average payback period, and net present value (NPV)—is also helpful for building buy-in and tailoring your fund model to maximize performance. This can be done in GRITS or using custom-made spreadsheets, which can then be used for tracking once the fund is launched (see Step 9: Track performance for more information, including a sample performance analysis graph).

Step 4: **Build buy-in**

A key component of developing a successful GRF is thorough stakeholder engagement. First, determine the key stakeholders and decision-makers whose support will be required to establish and sustain a GRF. Second, consider those stakeholders' responsibilities in the institution, the performance metrics on which they are evaluated, and how a GRF can be leveraged to help them meet their goals. Third, engage those stakeholders to refine the GRF proposal so that it is in line with the needs and goals of all parties. A written proposal (building from the concept proposal in Step 2: Select your model) can be a helpful tool during this process. This document can serve as a forum for discussion and debate as the GRF concept evolves, and in many cases it can evolve into the fund charter once the proposal is approved.

Note that building buy-in and a sense of collective ownership should be a continuous process that occurs along with all of the other steps. However, it is particularly important in the early stages, in order to streamline the fund's development and ensure that no office or stakeholder is inconvenienced or left out.

Step 5: **Secure seed capital**

The process of securing seed capital can range from a straightforward allocation of available funding to a laborious multi-month process of consulting decision-makers. It is therefore advisable to begin this effort early. See Section 2.1: Seed capital for a review of each potential source of seed funding.

One key strategy is to look for underutilized capital, particularly if you are having difficulties identifying potential funding sources. Because of the high returns and low risk associated with GRF investments, such a fund is often a favorable alternative to allowing capital to go unused or poorly used. To finance Caltech's $8 million GRF, for example, administrators tapped into a money market

rainy day fund within the endowment that was going largely unused while earning 1-2 percent annual returns. The money now generates a return of 24 percent annually.

The size of the GRF and the amount of capital to be raised should match your fund's goals and the campus' potential for projects. Step 3: Assess opportunity is crucial in order to determine an appropriate size for the fund.

Step 6: Establish financial flows

All stakeholders should feel comfortable with the loan and repayment process. Before any project is undertaken, involved parties must understand:

- Who pays the project invoice, which account they use, and when those funds will be available
- Which account will be making repayments over the course of the loan, how often those repayments will occur, and the total of each repayment as well as the overall repayment obligation
- How all of these flows of money will appear on the various departmental budgets and balance sheets (if multiple departments are involved)

Establishing this internal accounting procedure is the point at which many GRF proposals stall or fail entirely, often because technical details are overlooked by fund proponents or are met with red tape. Be sure to begin engaging on this issue early in the process. Some institutions have an independent account with its own ID number for a GRF while others simply make an agreement to acknowledge the savings of the GRF as annual budgets are distributed (see Section 2.2: Accounting systems). Look at how external purchases are made at your institution and how funds are transferred internally, then base flows of GRF payments upon these preexisting channels.



Stanford University rebate from utility PG&E. Demand-side energy efficiency is a sustainability cornerstone in Stanford's energy solutions portfolio. Such rebates are also often used for GRF seed funding and project repayments.

Step 7: Launch the fund

Launching the fund is an important process in and of itself, especially if your fund relies on project applications from the campus community. If your institution has joined The Billion Dollar Green Challenge, this is also a good time to reach out to The Challenge network for best practices and guidance from those with GRF management experience.

When launching a GRF, it is useful to have the first round of funding planned out. The insights from Step 3: Assess opportunity will be useful to that end. As projects are being implemented, make sure to continue the planning process for future waves of projects or applications, as well as for fund management, outreach, and meetings of the leadership team. Planning for the future is important not only to efficiently manage the fund and ensure that its capital remains effectively invested, but also to show campus stakeholders how the fund is progressing and demonstrate success.

It is important to establish your fund in a way that fits within the campus culture and administrative structure. Specifically:

- Formalize the GRF with a fund charter, bylaws, memorandum of understanding, formal project criteria, and any other necessary guiding documents. Be sure that all relevant stakeholders are aware of these documents.
- Consider developing a website for the fund. This can provide a useful venue for informing the campus community about the fund, posting official fund documents, providing tools and resources for getting involved or proposing projects, and reporting on the fund's progress to the public.
- Consider providing office hours for inquiries about the fund. This is particularly important if you will be soliciting project applications from the campus community, as questions will arise.

Finally, when the fund is launched and the first few rounds of investment are underway, there are a few key questions to be evaluated to ensure the fund runs smoothly. These include:

- Is the GRF identifying enough projects to utilize its capital? Where else should you look?
- Are those responsible for managing the fund communicating effectively with each other and with other stakeholders? Is enough staff time being allocated to manage the fund?
- Are stakeholder needs identified in Step 4: Build buy-in being met? Are these expectations reasonable in practice? If so, how can resources be directed to meet them?
- What questions are arising from stakeholders? Can resources be provided to address them?

Step 8: **Implement projects**

Implementing the initial round of projects will inevitably lead to challenges and unexpected obstacles. There may be difficulties with fund transfers and accounting, changes in maintenance plans that disrupt your expected pipeline of projects, projects that underperform once implemented, and other potential issues. See Chapter 4: Common obstacles for specific challenges often encountered and strategies for overcoming them.

One approach to reduce these risks is a soft launch in which the first round of investment targets projects that are expected to be straightforward and are being implemented by trusted project managers. Another strategy is to begin with a manageable fund size and scale it up over time as success is demonstrated (see Section 2.1: Key considerations for seed capital).

Nevertheless, inform stakeholders that obstacles will likely arise, and recognize that how they are handled will set the tone for future operations. Be sure to include all relevant stakeholders in the troubleshooting process. Despite the pressure to produce successes and prove the GRF model, work through challenges slowly and carefully. Publicize successful projects to place any challenges in the context of the broader GRF program and continue to justify the use of capital for the fund.

Fund managers should be in close contact with the facility managers, engineers, or contractors who implement the projects and can therefore provide on-the-ground perspective. This will allow problems to be identified and resolved more quickly. Monthly or quarterly progress reports may be useful for this purpose.

Step 9: **Track, analyze, and assess performance**

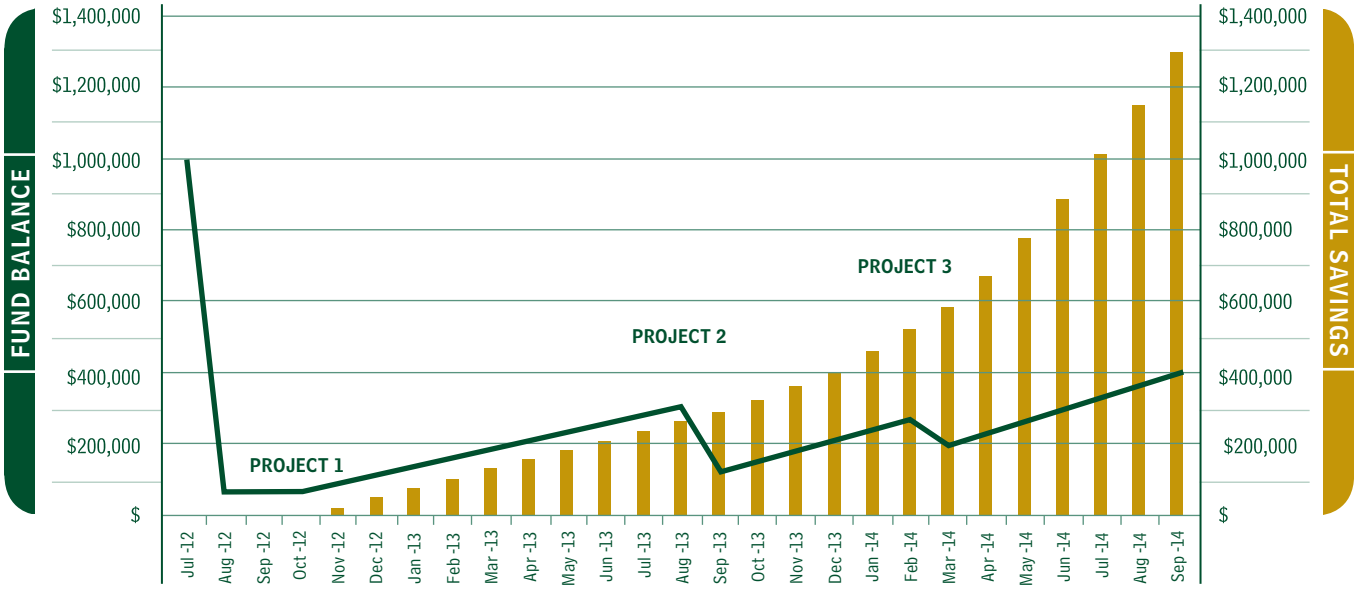
Once the fund is operating, tracking the performance of individual projects and the entire GRF portfolio over time is the next important step.

First, determine the method by which you will measure savings from individual projects (see Section 2.7: Measuring savings). Install any required submeters and establish baseline data before project implementation, then create a spreadsheet or use another software application such as GRITS (see Section 5.3: Resources) to manage this data over time. Thorough project tracking will involve recording the specifications of technology installed and estimating expected savings; comparing those estimates to usage rates determined early on via energy monitoring to ensure that projects are operating correctly; and then confirming savings more conclusively later on by comparing submeter data to the baseline you have established.

Note that even if you have elected to determine project repayments based on estimated savings only, conducting some measurement and verification (M&V) of individual projects will help to confirm that they are operating as expected. Find a balance between what is necessary for project troubleshooting and determining payback and what is feasible given staff capacity and budget.

Second, develop a system for tracking and analyzing the overall activity of your GRF project portfolio. The GRITS tool is specifically designed for this function. Institutions also often use spreadsheets built from scratch or accounting software for this purpose. Verify that overall GRF performance is consistent with the forecasts conducted in Step 3: Assess opportunity above. If there is a discrepancy, determine its cause. It is often helpful to conduct forecasts that are updated each year to chart a path forward for the fund and manage expectations. See the Sample GRF Portfolio Analysis graphic for an example of how fund performance can be visually represented.

Sample GRF Portfolio Analysis:
Fund balance and total institutional cost-savings over time



This graphic demonstrates how total capital available to the GRF and cost-savings generated by GRF investments can be modeled over time. Such a graph is useful for forecasting future performance, illustrating historical data, or a combination of the two.

It is also advisable to benchmark the performance of projects, buildings, and the fund as a whole against those of other institutions. In cases where you are underperforming, take the opportunity to identify the underlying causes and learn from peer institutions.

Step 10: **Optimize and improve**

While some of the main benefits of a GRF are stability and longevity, it must still adapt to changing conditions. Even after launching, the fund's design and management should be dynamic and adaptable. The most successful funds periodically reassess their performance and optimize accordingly. Some funds undertake a formal strategic review of their charter and governance every few years. It is important to not only address aspects of the fund that are performing poorly, but also to reassess more foundational aspects of the fund such as which stakeholders are involved, how cost savings are being measured and revolved, the fund's mission and project criteria, and how the fund interacts with broader campus initiatives and goals.

One key area for monitoring and optimization is project performance. Key questions to consider include:

- Which types of projects are performing especially well, both within your institution and among your peers? Consider using these as a model for new projects.
- Where are project applications or ideas originating and which parts of campus could be engaged further?
- Are your original project criteria still effective for guiding the fund managers' decisions? They may benefit from adjustments as opportunities are exhausted or new ones emerge.
- If the fund is performing well, could it be expanded with more capital infusions?

Leverage the data on project performance collected in Step 9: Track performance to answer these questions and adjust your fund strategy (and the associated documentation). Adjustments may include expanding or narrowing project criteria (e.g., relaxing short payback requirements as the most cost-effective projects are exhausted), pulling in new stakeholders or staff to help identify or track projects, and adjusting the fund's accounting procedures.

Chapter 4:

Common Obstacles to GRF Implementation

This chapter:

- Identifies common obstacles in the design, implementation, and management of a GRF
- Provides best practices for overcoming these obstacles based on insights from GRF leaders

A wide range of factors will determine which obstacles your institution faces in implementing a GRF. This chapter includes some of the most common challenges encountered by GRF proponents.

4.1 Financial obstacles

1. Cutting operating budgets as a result of improved efficiency

While the ultimate goal of energy efficiency projects is to reduce operating expenses, cutting operating budgets immediately can create practical and political obstacles. Many facility managers face an "efficiency budget cut paradox" in which they are disincentivized to improve building efficiency because, if they cut costs, their operating budget will simply be reduced accordingly in the next fiscal year. The GRF model can help to address this issue by facilitating the careful tracking and management of savings resulting from projects. By tracking savings explicitly, stakeholders can negotiate when and by how much operating budgets will be cut in response to those savings.

A GRF also presents opportunities to precisely direct the flow of money within an institution. For example, a portion of the savings from GRF projects may be allocated to a separate account earmarked for specific purposes. Another option is to require only a certain portion of savings to be repaid into the fund, allowing the project owner to immediately receive some of the financial benefit even while the project cost is being repaid. Finally, a GRF helps to restore the incentive to conserve by formalizing project savings and revolving them back into the fund, which can then be tapped by the same stakeholders for future projects.

2. Difficulties in integrating the fund with the current accounting system

Creating the accounting architecture for a GRF is a complex but crucially important step. If you encounter difficulties integrating your fund with current accounting procedures, here are a few points to consider:

- Financial professionals, such as the CFO, account managers, and business and finance staff, have a unique understanding of an institution's accounting system. Be sure to involve these professionals early in the fund design process and continue to seek their feedback, as their buy-in and expertise will be crucial.

- Remember that "GRF" is a flexible term, and such a fund can be structured in many different ways. GRFs range from a distinct account that issues loans (e.g., Harvard) to a simple agreement among budget managers that savings will be revolved as a line-item on budgets each year (e.g., UNH). Build a model that works for you.

- Consult with financial experts at other institutions, either through The Challenge or by reaching out on your own. Also consider seeking the advice of SEI or other consultants.

4.2 Administrative and political obstacles

1. Administrative fees and the rising cost of complexity

Success can create its own administrative problems as the fund grows and evolves. These may include the challenge of finding permanent staff time to devote to fund management and conducting due diligence on proposed projects. Fund managers often struggle to find the funds necessary to cover these costs. One solution is to ensure that loan repayment terms capture enough revenue each year to sustainably administer the fund. For established funds, consider tapping operations budgets, president's funds, or even internal or external grants to fund staff and administrative costs while not burdening loan recipients.

Instituting an administrative fee from the outset can help manage expectations and prevent resistance later on. One strategy is to wrap the money a fee would generate into the repayment terms (i.e. asking loan recipients to pay back more than 100 percent of the loan value from generated savings) to reduce the political pushback associated with a "fee."

2. Securing executive/board support

For many fund proponents, convincing top-level decision-makers to consider a GRF is the largest and most important barrier to success. Though the information needed by these leaders to make a decision will vary, there are a few key arguments often cited by successful fund implementers:

First, build the business case. Cite examples of the high financial returns of energy efficiency, on your campus or at other institutions. Also identify some projects your fund is likely to finance and forecast the fund's expected performance in detail (see Step 3: Assess opportunity, in Chapter 3).

Second, provide case studies to illustrate how GRFs have performed at similar institutions. While decision-makers want to be innovative, they often require reassurance that the model you are proposing has been tested elsewhere. See Section 5.3: Resources for useful materials.

"For me, it was critical that our GRF linked up with these broader themes of what kind of college and learning community we aspire to be," said Elizabeth Kiss, President of Agnes Scott College. "The most powerful teaching you do is by being a role model."

Third, connect the fund to the educational mission and priorities of your institution. As Elizabeth Kiss, President of Agnes Scott College, explains: "For me, it was critical that our GRF linked up with these broader themes of what kind of college and learning community we aspire to be. The most powerful teaching you do is by being a role model. If we want our students to contribute to building a more sustainable world, what better way than to be on that journey of discovery ourselves? So while I worried whether we had the right mechanisms in place at the outset to track the savings in a rigorous way, I realized that figuring out what we needed to do would be a powerful learning experience for us and for our students too."

Chapter 5:

The Billion Dollar Green Challenge

5.1 Overview

Launched by the Sustainable Endowments Institute in 2011, The Billion Dollar Green Challenge encourages colleges and other nonprofit institutions to reach a collective total of $1 billion dollars of investments in self-managed GRFs that finance energy efficiency improvements. Participating institutions will achieve reductions in operating expenses and greenhouse gas emissions, while having developed a regenerating fund for future projects. To help create and guide The Challenge, SEI assembled a diverse group of advisors and partner organizations. For a complete list of advisors, partners and funders please see http://greenbillion.org/about/.

5.2 Signing on

In order to join The Billion Dollar Green Challenge, an institution must commit to the following:

1 Establish and maintain a fund that reaches $1 million or the equivalent of 1 percent of the institution's endowment (whichever is smaller) within four years.

2 Revolve at least 50 percent of the cost savings generated by funded projects until the project loan is repaid.

3 Become part of The Challenge network and agree to engage with other institutions, sharing data and best-practices.

There is flexibility in the requirements for signing on. For institutions with smaller endowments, consider the option to invest one percent instead of $1 million. Also note that you need not have a fully operational fund; you need only commit to developing one. Institutions should consider joining The Challenge early in the fund development process. Many of the resources and networking opportunities it offers are useful during fund design and implementation as well as management. For more information on how to get involved with The Billion Dollar Green Challenge, see www.greenbillion.org.

5.3 Resources

This Introductory Implementation Guide is part of a suite of resources that have been created as part of The Billion Dollar Green Challenge. More information on the resources listed below is available at: http://greenbillion.org/resources

Case studies:

SEI has published case studies of GRFs at nine colleges and universities.

Investment Primer:

This document is designed for senior financial officers and trustees and answers critical financial questions most often raised when considering development of a GRF.

Greening the Bottom Line:

This report is a survey of North American GRFs in higher education, versions of which were published in 2011 and 2012. The report summarizes and

analyzes GRF-related data on fund structure, fund performance, projects financed, and more.

GRITS:

The Green Revolving Investment Tracking System (GRITS) was designed to manage every aspect of an institution's green revolving fund, including aggregate and project-specific financial, energy, and carbon data.

Networks and consultancies:

The Challenge provides access to a dedicated network of peer institutions that are actively pursuing the GRF approach and can share data, insights, and best practices. Several private consultancies also offer services to support GRF development, including ICF International (the principal authors of this Guide), AtSite, Cadmus Group, and GreenerU.

Sample documents:

Examples of fund proposals, charters, performance forecasts, and other documentation are publicly available on the SEI website. A more comprehensive list of non-public sample documents are available upon joining The Challenge.

List of revolving funds:

The Association for the Advancement of Sustainability in Higher Education (AASHE) maintains a list of revolving loan funds at higher education institutions, including a brief description of each fund. The resource is available to anyone at an AASHE member institution.



Furman University. Collaboration on GRF projects creates opportunities for education and engagement, both within a campus community and across the broader sector of higher education and beyond.

Next steps

The trend toward green revolving funds in higher education appears to be picking up speed. With 85% of funds established since 2008 and committed capital now exceeding $100 million across all known GRFs in higher education, revolving sustainability finance is a rapidly evolving field. At the same time, the GRF approach has already begun to expand to new sectors, including healthcare institutions, K-12 schools, and municipalities. The model also has potential to expand into private companies, governments at all levels, and beyond.

Our hope is that this Guide—and the more detailed Comprehensive GRF Implementation Guide to be released in spring 2013—will provide a useful tool for navigating this changing landscape. With smart implementation that takes advantage of emerging best practices, GRFs can continue to capture financial and environmental benefits, engage and educate campus communities, and build the business case for sustainability.

Authors & Acknowledgements

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