Green Revolving Funds in Action: **Case Study Series**

Western Michigan University

Quasi-Revolving Fund

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Summary

Location: Kalamazoo, Michigan

Full-time student enrollment: 25,045 (undergraduate and graduate)

Combined gross square footage of all buildings on campus: 7,666,377

Endowment: $172 million

Type: Public

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Western Michigan University has designed an innovative "Quasi-Revolving Fund" model that demonstrates the institution's full commitment to incorporating sustainability into campus operations. The Quasi-Revolving Fund recaptures money from cost-savings, similar to a typical green revolving fund, but it also sources capital from the broader utilities, maintenance, and other budgets as necessary in a fluid manner. Therefore, its ability to finance projects is often far more substantial than the fixed pool of capital that comprises most revolving funds. As a result, it does not have a formal and consistent fund size; project finance opportunities are constantly tracked and reviewed as modifications to the overall utilities and maintenance budgets are made. This process allows for the institution to continuously invest in sustainability initiatives that promise a high rate of return without being limited by a lack of capital in the fund itself. Though the university began its Quasi-Revolving Fund in 1980, it did not begin to careful track project data until 1996. Since then, the fund's strategy for supporting sustainability improvements has achieved a 47 percent return on investment.

History

Western Michigan University's Quasi-Revolving Fund, established in 1980, is the oldest known green revolving fund at a college or university in North America.

The fund was initially created as the result of talks between business, facilities, and finance staff members, who gathered to brainstorm strategies for reducing the campus' utility budget.

"[It's] an example of where taking an anticipatory, life-cycle approach to utility cost management has a series of positive, cascading sustainability benefits,"

said Harold Glasser, Executive Director for Campus Sustainability.[1]

The Quasi-Revolving Fund is primarily used to address campus energy conservation and efficiency goals. The priorities of the fund have focused on improving campus energy-efficiency, including "traditional low-hanging fruit" projects of lighting upgrades as well as a larger retrofitting of the campus' natural gas power plant. Below is a timeline of significant dates in the life of WMU's Quasi-Revolving Fund, including significant projects and the development of the fund.

- 1979: Hired full-time Energy Manager
- 1980: Quasi-Revolving Fund launched with the aim to recapture savings from sustainability initiatives
- 1985: A capital investment financed the steam trap program for campus power plant
- 1985: Implemented a building automation system
- 1985: Second full-time position was added to assist sustainability initiatives implementation on the WMU campus
- 1999: Campus power plant phased out coal and switched to burning natural gas

Operations

WMU Quasi-Revolving Fund

Year Created: 1980

Size: $385,000*

Source: Utility funds, later joined by deferred maintenance funding

Average payback period 2.13 years

Administrator: Office of VP for Business and Finance

Average return on investment: 47 percent*

Total amount of money saved: $16.71 million*

**These numbers are based on $5.85 million that WMU has invested in direct project costs since 1996. The $385,000 figure approximates the total annual project investment since 1996.*

Sourcing Capital for the Quasi-Revolving Fund

While WMU's QuasiRevolving Fund operates like a traditional green revolving fund, it also broadens its scope by sourcing capital from budgets unrelated to cost-savings, like rebates from broader utilities and maintenance budgets.

The fund sources capital in this way in order to ensure adequate funding for projects, especially when they may require more than would have otherwise been available in a central and fixed revolving fund.

WMU cites this structure as one of its strengths, stating that only using green revolving funds to finance sustainability projects on the WMU campus would set artificial limits on what the

school could spend on sustainability improvements. By widening the scope of funding sources that feed the Quasi-Revolving Fund to include capital outside of cost-savings from previous energy-efficiency projects, the campus can finance multiple and especially high-capital projects that would otherwise be unattainable.[2]

By looking outside the Quasi-Revolving Fund to support sustainability projects on campus, WMU has "institutionalized sustainability into campus operations and promoted broad participation throughout our standard operating procedures and campus culture," said Glasser. Un-allocated funding in other budgets may then be available to finance sustainability improvements when they can demonstrate a reduction in resource-use for the campus.

"There is a strong commitment throughout the university to collaborate to use existing funding (and grow external funding) to creatively support the expansion of sustainability activities and initiatives on campus," said Glasser. "Funding from other divisions and offices on campus—such as Student Affairs and Extended University Programs—are frequently pooled to fund collaborative sustainability projects like the WESustain Ambassadors and our Eco-thon energy and residence hall leader sustainability engagement competition."[3]

Vice President for Business and Finance Lowell Rinker describes the effect on WMU's sustainability efforts as a re-framing of how to account for cost-saving sustainability projects.

"That's the beauty of treating these kinds of projects as investments rather than expenses... savings beget more projects which beget more savings."

The administration has acted with the perspective that, by capitalizing on opportunities for overall operational cost reduction, it can simultaneously support sustainability goals. According to Glasser, "our goal is to cost-effectively identify opportunities at all funding levels and to strategically employ existing funding mechanisms to reduce our bottom line energy and water costs."[4]

Few projects have exceeded the scope of what can be funded through the additional fund sources listed previously. But some projects, like WMU's conversion from coal to natural gas boilers in their campus power plant in 1999, are rolled into large-scale bond initiatives in order to be funded.

Accounting Measures

While WMU does track savings, allowing the university to reduce its utility expenditures over time, the savings are not deposited directly into the Quasi-Revolving Fund. Instead, the fund revolves through savings accruing in the general utilities and maintenance operational budget, which are then transferred to Quasi-Revolving Fund projects as needed; this process is done on a quarterly basis.

Prior to funding a project, potential energy savings and the resulting cost savings are estimated and discussed by a committee comprised of Facilities Management's Utilities and Maintenance groups, the Office of Business and Finance, and the Office for Sustainability. Depending on the project, some measurement and verification may be required to justify the cost savings, however most projects produce well-known and guaranteed energy and resource savings. Based on these calculations, the fund supports a variety of projects that generally fall under payback periods of 5 years or less.

Western Michigan University's is home to the first LEED Gold EB in higher education: WMU's College of Health and Human Services, which installed occupant sensors, a stormwater runoff management system, daylighting, and other resource-reduction strategies, saw a savings of 21 percent in energy and of 27 percent in water use on campus.

Choosing Projects

WMU refers to its overall strategy as a "life-cycle approach," one in which additional funds can be invested into campus sustainability initiatives that may have a longer payback period or do not demonstrate a financial advantage to the campus at all but are still projects that WMU seeks to implement on their campus.

While facilities and sustainability staff compile a list of potential projects that can be funded by the revolving fund, any member of the campus community can suggest a project to the fund. If for some reason a project does not receive funding one year, available funding may be rolled over to finance projects in the following year. The fact that unused funds can be rolled over from year to year prevents them from being re-absorbed and subsequently used by other campus budgets; this characteristic is a benefit of operating a green revolving fund on a university campus to fund sustainability initiatives. The office of the Vice President for Business and Finance handles accounting for these rollovers and other aspects of the fund's operations.

Gathering Project Proposals

Through the tracking of utilities and maintenance performance, the university is able to identify areas that would benefit from conservation and renewable energy. Existing projects are reviewed on a continual basis in order to calculate the project's performance and assess the need for maintenance. The fund has a rolling acceptance

process for potential projects, with new projects being proposed throughout the year.

The entire campus community, including administrators, faculty, staff, and students, is eligible to submit project proposals. Because utilities, facilities, and sustainability projects are paid for by a central campus budget, all projects are tracked and managed centrally by Facilities Management, which is also the main source of identifying new projects. In this way, recipient departments of sustainability improvements across campus are not responsible for making or receiving payments. For WMU, this fund structure serves as an advantage and makes savings accounting simpler. Worthy project proposals are not rejected, though in some cases they are delayed because project paybacks often increase when technology improves. While the particular technology of a given project does not always work as expected, Harold Glasser notes that staff at WMU learned from both successes and missteps related to fund projects.

"It's this emphasis on continuous improvement that allows WMU to constantly refine and improve our process," says Glasser.[5]

Managing the Quasi-Revolving Fund

The Quasi-Revolving Fund is housed within the Office of the Vice President for Business and Finance. Management and tracking of fund projects is also administered by Facilities Management. Projects are installed by Facilities Management and may also be implemented by the Office for Sustainability or other departments on campus. Depending on the extent of the project, the fund may seek external consultants and contractors to assist in project development and implementation. Though directing the fund is a collaborative process, the VP for Business and Finance is ultimately responsible for the management of the fund.[6]

Performance

Performance Data

Western Michigan University reported that since 1996, its total project costs were approximately $5.85 million, with an annual cost savings of approximately $2.75 million. As of 2010, the total cost avoidance from the implementation and installation of projects that targeted energy conservation and GHG reduction on the WMU campus is approximately $16.71 million.[7] The strength of the fund comes from its focus on overall operational cost reduction and redirecting a portion of those savings to sustainability projects, which yields far more significant results as opposed to funding projects on a simple one-time basis.

Since the fund was first created in 1980, it has completed 96 projects, with an additional five being worked on in the 2010 fiscal year. The fund has a high degree of participation from the campus, with 121 projects identified so far. The average project payback for these 96 completed projects is 2.13 years, with the longest project payback being 23 years. For all of WMU's funded projects, the average return on investment is 47 percent.

Examples of Projects

Building Efficiency Renovations

One of the projects that WMU's Quasi-Revolving Fund has financed is the renovation of Rood Hall, a 124,000 gross square foot classroom and laboratory building. The building was originally built in 1971. In 2006, the university addressed the need to renovate the building's interiors and upgrade a fire alarm system to comply with present-day fire code. Because the classroom ceilings of the building had to be removed during renovations, WMU recognized an opportunity to perform a building-wide energy upgrade on Rood. Projects inside the building included frequency drives, direct digital control, and T-8 lighting with occupancy sensors. The total project cost was $549,000, with a project payback period of 8.5 years.[8]

Heat Recovery

In 2000 WMU installed a heat recovery system that would recover waste heat from the Lawson Arena ice rink chillers and transfer it to the swimming pool in the campus Natatorium. The Lawson Arena and the Natatorium share

a common mechanical room, which made the challenge of connecting the two systems easier. A heat recovery unit (HRU) was installed to heat the pool in place of the previous method, steam heat generated from the campus central plant.[9] Initial project calculations projected the payback period to be under two years.

Improvements to Campus Power Plant

Through conservation and efficiency improvements to the campus power plant, WMU's greenhouse gas emissions per kilowatt hour are roughly half of the local utility's. The plant was converted to run on some natural gas in its small boilers in 1991 and underwent a complete conversion to natural gas in its large boilers a few years later, with the plant becoming completely independent of coal in 1999.[10] WMU is one of the first universities in the country to abandon coal from its power plant as its fuel source. The university also plans its purchase of natural gas to fuel its operations many years in advance to minimize cost, and constantly monitors plant efficiency and improved technologies for conservation. Though the campus has added nearly two million square feet of building space since the 1970s, the peak steam demand is approximately a third less than it was in the 1970s, a characteristic that is attributed to WMU's "aggressive" energy management system, which includes upgrades to the plant over time such as steam trap monitoring and building envelope and system upgrades.[11]

Lessons Learned

Considerations for New Funds

The case of WMU's Quasi-Revolving Fund shows that institutions will be able to identify and implement cost saving projects that can achieve short payback periods for many years without running out of opportunities. WMU has been able to implement many projects that produce high returns on investment, some of which are typically considered the "low-hanging fruit" of sustainability improvements (such as high efficiency lighting) and others which require a large upfront investment and yet still yield a substantial return (such as power plant improvements). This is due both to the variety and breadth of potential projects, and to the introduction of new technologies and economies of scale which have emerged in the decades since WMU's fund began. The fund's average ROI of nearly 50 percent proves that WMU has yet to run out of fruitful projects to implement, low-hanging or otherwise.

WMU recommends that other institutions looking to create a revolving fund on their own campus consider their Quasi-Revolving Fund approach.

"By not artificially limiting the funds that can be used to invest in energy conservation and GHG reduction, a vast array of new opportunities open up that can both lead to significant savings and have a profound impact on reducing the higher education institution's eco-cultural wake," said Harold Glasser.[12]

With the Quasi-Revolving Fund method, the university can justify diverting funds from a variety of budgets to finance sustainability investments. Since these investments will yield a high rate of return, it may be cost-effective for the university to engage in long-term borrowing—including the use of bonds—if the available on campus budgets are tight.

"Success has resulted from a broad array of projects on many scales that have helped to build the capacity and skills of our staff over time" said Glasser.[13]

Glasser recommends closely monitoring each project individually. "Technology doesn't always work as we hope or plan," he said. "Our staff has learned to closely monitor initiatives and evaluate

their success. This has, at times, required mid-course corrections and technology upgrades."[14]

In 2011, Western Michigan University became a Founding Circle institution in The Billion Dollar Green Challenge. As a Founding Circle member, WMU will expand on the priorities set forth in their original Quasi-Green Revolving Fund and explore the benefits and costs of a true, fixed-fund based green revolving fund. The new fund was championed by the Vice President of Business and Finance and university president Dunn and has committed $1 million dollars.

Endnotes

1 Glasser, Harold email to Rob Foley. "Re: Case Study on WMU's quasi revolving fund." May 26th, 2011.

2 Glasser, Harold interview with Rob Foley. March 15th, 2011.

3 Glasser, Harold. Email to Rob Foley, "Fwd: Case study on WMU's quasi revolving fund." May 26th, 2011.

4 Glasser, Harold interview with Rob Foley.

5 Glasser, Harold. Phone interview with Emily Flynn. October 28th, 2011.

6 Glasser, Harold. Email to Rob Foley. "Re: Case study on WMU's quasi revolving fund." May 26th, 2011.

7 Survey, "Revolving Loan Fund Survey November 2010 – Western Michigan University."

8 Glasser, Harold. Email to Rob Foley. "Fwd: Large quasi-GRF Project." July 14th, 2011.

9 Case Study ID 00-0021, "Western Michigan University Heat Recovery System." WMU Energy Office. Case study 00-0021 . Accessed September 30th, 2011.

10 Jarvis, George H., Director of WMU's Robert M. Beam Power Plant. History and Background of the Central Power Plant. May 2010.

11 Glasser, Harold. Email to Rob Foley, "Re: Case study on WMU's quasi revolving fund." May 26th, 2011.

12 Glasser, Harold. Email to Rob Foley, "Re: Case study on WMU's quasi revolving fund." May 26th, 2011.

13 Glasser, Harold. Email to Rob Foley, "Re: Case study on WMU's quasi revolving fund." May 26th, 2011.

14 Glasser, Harold. Email to Rob Foley, "Re: Case study on WMU's quasi revolving fund." May 26th, 2011.