PAY IT ONWARD

Revolving loan funds cycle back savings from energy efficiency improvements, seeding new projects going forward.

By Karla Hignite

Did you hear the one about the vice president for facilities who says to the CFO, "I know how we can make a 20 percent return on investment with no money down"?

That's no joke. In part, that's how development of the University of La Verne's green revolving fund transpired. Clive Houston-Brown is vice president for facilities and technology and chief information officer at the university, in La Verne, Calif. When he took his proposal to join the Sustainable Endowment Institute's Billion Dollar Green Challenge (www.greenbillion.org) to the president's cabinet, there was interest, but also concern, from cabinet members about committing the university to a new funded initiative.

So, Houston-Brown shifted gears and worked directly with La Verne's chief financial officer to identify options for incremental funding. "We determined that we could tap existing budgets for deferred maintenance, combine [them] with allocations from unexpended year-end funds, and focus on projects we needed to do anyway that fit within the scope of the challenge. We could then use the savings from those projects to begin building a permanent fund base for ongoing energy efficiency investments," explains Houston-Brown.

Since 2013, when La Verne officially launched its revolving fund with a $400,000 commitment, the university has spent $244,000 on its first 12 projects, ranging from a $736 lighting upgrade and a $797 turf conversion to a $27,500 faucet installation and a $66,000 lighting retrofit. The projects—six electrical and six water-related—spanned payback periods of less than one year to upwards of 15 years, with an average five-year payback for electrical projects, notes Houston-Brown.

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To learn more about Vermont's energy collaboration, see "Vermont's Energy Efficiency Edge," in *Business Officer Plus* at www.nacubo.org.

How it works. The basic idea behind a revolving fund is that capital is made available for a specific project with an anticipated return. As those cost savings—or, *avoided* costs—accrue, the money is returned to the fund and made available to invest in the next round of projects, and so on. This cycle of reimbursement continues for a given project until the principal (and in some cases, the interest) for that project loan has been fully repaid.

To date, about 50 institutions across the United States have committed nearly $110 million through the Billion Dollar Green Challenge.

Green revolving funds—set up to invest specifically in campus energy improvements, renewable energy, and/or water conservation projects—have been around in some form for decades. 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, notes Harold Glasser, the Kalamazoo-based university's executive director for campus sustainability and professor of environmental and sustainability studies. WMU's fund emerged from conversations among business, finance, and facilities staff members brainstorming strategies to reduce the campus utilities budget—with the 1970s Arab oil embargoes as backdrop, adds Glasser.

The University of Minnesota-Twin Cities has used its energy conservation internal loan program to methodically reduce energy costs and consumption, ever since the funding stream

was established in 1998. The program is capitalized through the university's broader internal loan pool used for various purposes campuswide, explains Mike Berthelsen, UMN's associate vice president of facilities management.

Increasing popularity. More recently this financing method has gotten renewed focus within the higher education community stemming from broader climate action planning, for which ongoing attention to energy efficiency is a core component, and through targeted efforts like those of the Sustainable Endowment Institute (SEI) challenge (see sidebar, "A Challenge to Encourage Self-Funding Energy Efficiency"). To date, 50 institutions from across the United States have committed nearly $110 million through the Billion Dollar Green Challenge, although dozens more institutions are pursuing this funding structure than have formally joined, notes Mark Orlowski, SEI founder and executive director. "While some institutions have other financing mechanisms in place for perpetual spending on energy projects, many institutions face internal debates about funding energy efficiency, if these projects are seen as an expense or as competing with other budget priorities," notes Orlowski. A revolving fund can help solve that dilemma by providing a consistent source of funding separate from the existing budget structure and recasting energy efficiency as an investment that pays off, he adds.

Fund management. Processes vary from one institution to another when it comes to the way institutions with self-managed revolving funds calculate return on investment and measure performance, employ accounting methods to track the flow of returns, and direct those savings once the original loan is repaid. What is consistent is a guaranteed return on your investment, says Seth Patton, vice president of finance and management for Denison University, Granville, Ohio. "Unlike most capital improvements, energy efficiency projects offer a full payback potential in the utility costs you avoid from implementing more efficient systems, processes, or products."

All the colleges and universities highlighted in this article are participants in SEI's Billion Dollar Green Challenge. The variety of approaches to setting up their green revolving funds reflects the flexibility and creativity afforded by this financing mechanism. And, the results these institutions have already realized show the potential of self-funding energy efficiency as a means to achieving real utility cost savings, while making significant headway in reducing greenhouse gas emissions and conserving water resources.

ADOPT YOUR MODEL

Like the University of La Verne, Denison University tapped existing budget allocations to launch its revolving fund, though with a formal plan to systematically seed the fund in subsequent years. In 2011, Denison conducted a campuswide energy audit to identify conservation measures to employ across the campus, yielding an initial list of 70 shovel-ready projects. This occurred around the same time that SEI launched its challenge. "We already knew we wanted to invest in energy efficiency. Our decision to establish a revolving fund as the means to doing so was easier than it may be for some institutions, because we already had the capital," notes Patton.

Denison has historically set aside funds as part of its operating budget to address deferred maintenance, renovations, and annual and ongoing maintenance, explains Art Chonko, Denison's director of facilities.

"We saw this as a ready source for beginning a self-sustaining fund, since many energy improvements often fall under deferred maintenance," notes Chonko. The idea was to take approximately $500,000 annually from Denison's plant adaptation and renewal budget and put it toward the revolving fund until [the fund] was fully seeded, says Patton. University leaders quickly approved the plan and Denison launched its revolving fund in the summer of 2011. To date, the university has allocated $1.8 million toward its goal to grow the fund to $3 million by

2016.

Agnes Scott College, Decatur, Ga., likewise launched its revolving fund in 2011, making a $1 million commitment to address energy-related retrofits throughout the institution's 29 buildings. However, college leadership took a different funding approach, opting for a donor-supported model supplemented with the additional utility savings from projects to further build up the fund, says John Hegman, vice president for business and finance. Setting up funding through the institution's endowment can pose logistical challenges, admits Hegman. "We were careful to establish this as a pooled fund so that we would not be restricted to doing projects based on a single donor's gift." Donors receive annual reports about projects and the returns on those investments. Gift commitments to date have reached $450,000. A potential $500,000 matching grant from a foundation, which is interested in the college's approach to perpetually funding sustainability projects, could soon push the institution over its goal to fully fund the loan program by the fall of 2015, says Hegman.

The California Institute of Technology, Pasadena, also uses its endowment structure for financing energy efficiency projects. The Caltech Energy Conservation Investment Program (CECIP), launched in 2008, was an outgrowth of the institution's climate action plan. While it took only several months to shepherd the concept of a revolving fund through the offices of business and finance, procurement, and the facilities department for formal approval, the bigger question was how to support Caltech's ambitious goal of using the fund to retrocommission all major campus buildings by 2015, says John Onderdonk, director of sustainability programs. "One model that seemed plausible was to set up CECIP within the institute's endowment to leverage the underutilized capital within the existing Capital Revolving Fund." This $25 million fund provides interim financing for donor-pledged projects while the gifts are being collected, explains Onderdonk.

PROVE IT WITH A PILOT

"To prove the concept, and to put all involved at ease, we decided to test using a portion of this fund for CECIP projects," says Onderdonk. A modest $25,000 lighting retrofit was selected as a pilot. The project consisted of installing LED lighting in two parking structures. After factoring in an $11,000 utility rebate, the out-of-pocket cost to Caltech was only $14,000. The new lighting saved Caltech $9,000 annually on its utility bill, allowing for a quick 1.5-year payback on the project. "This was an eye opener for everyone," says Onderdonk. Not only did this prove the program's potential, but it was also a good test run for developing specific project management processes related to use of the fund—from the protocol for discrete financial journal entries to methods for comprehensive internal audits. As importantly, it provided everyone involved a level of comfort in seeing how savings would be tracked through the cycle, notes Onderdonk.

Strategies to simultaneously invest in projects and build the value of a revolving fund can be tricky to balance.

Following the successful pilot, a formal request was made to set aside $8 million from the institute's Capital Revolving Fund for energy conservation projects. "We accompanied this request with a list of all the projects we could do with $8 million, estimating an average 20 percent ROI and requiring a payback of no more than six years," says Onderdonk. Caltech's board gave the green light, and the allowable funding allocation has since grown to $11 million. Because CECIP is not a stand-alone fund within the endowment, at any given time what is not invested in energy projects remains invested in the endowment via a money market fund, so that project funding typically can be accessed quickly when needed, notes Onderdonk.

The University of Vermont (UVM), Burlington, also tested its funding strategy, with two pilots: an exterior LED lighting upgrade and the installation of reusable thermal blanket systems for the university's steam distribution infrastructure. "This should be a practical exercise, not a

theoretical one. If you can show the results of an investment, that will usually provide the convincing evidence," suggests Richard Cate, UVM's vice president for finance and treasurer.

In considering how to make a significant impact with energy efficiency spending, Cate went where the money is: cash reserves. His proposal to earmark $13 million for an energy efficiency fund represented less than 10 percent of the total cash reserves UVM typically has on hand. This was a rather low-risk option, argues Cate. "Our cash reserves have been stable for many years, and this approach posed no adverse impacts to our institution's credit rating." And, because of their relatively quick payback potential, energy efficiency projects present a unique borrowing opportunity to invest those funds into something with a guarantee for a return—a return well above the 1.5 to 2 percent UVM might earn on those cash reserves on a good day, notes Cate.

When Cate presented this option to UVM's board in 2012, board members embraced the idea, attracted by the opportunity to make a long-term difference in energy use and utilities costs. "One requirement the board insisted on at the time was to limit projects to those providing no more than a seven-year payback," says Cate. He also suggested a $3 million spending cap for any single project. "That isn't to say we could not seek a waiver from that cap if a project offers even more significant energy savings with a greater outlay of spending," explains Cate. "This restriction was to document our intent to not tie up the full amount of funding in any given project and to ensure that this operates as a true revolving loan fund."

BUILD THE BASE

Strategies to simultaneously invest in projects and build the value of a revolving fund can be tricky to balance. According to Houston-Brown, La Verne's strategy for accelerating growth of the fund's permanent base is to return 100 percent of utility savings to the revolving fund until full principal repayment is achieved for a given project. Then for the next three years, 50 percent of utility savings will continue to feed the fund, with the other 50 percent of savings returning to the general fund. In that fourth year following full principal repayment, all savings will return to the general fund, explains Houston-Brown. "While this approach is more aggressive than some may want to follow, bear in mind that we began with a zero-dollar allocation to seed our fund, so we have some catching up to do."

Western Michigan's quasi-revolving fund sources capital from the broader utilities, deferred maintenance, and other budgets as necessary to finance energy conservation, explains Glasser. However, because annual funding in these other budgets fluctuates, the fund has never had a formal or consistent allocation, since the amount available might be subject to the effects of a harsh winter, unanticipated deferred maintenance costs, or utilities rate hikes, says Glasser. Despite the limitations of the fund's structure, the university has completed more than 100 projects using the fund since its inception, with an estimated $16.71 million net cost avoidance as of 2010, notes Glasser.

Coordinate with climate action plans. When WMU joined the Billion Dollar Green Challenge in 2011, the university committed to developing a new green revolving fund to expand on the priorities established by its quasi-revolving fund. "Our new approach is in concert with our climate action plan and will allow us to invest in larger projects through a fixed reliable funding vehicle so we can continue our energy conservation efforts in a planned and methodical manner," says Glasser. WMU's vice president for business and finance agreed to allocate $1 million over a four-year period to seed the new fund, appointing the associate vice president for facilities to lead the overall structure of the program.

The approach WMU has taken with its new green revolving fund is to generate a stable and consistent funding base that will support strategic planning for greenhouse gas reduction. "Our strategy is to use that first $250,000 and invest in the highest-return projects possible. For

year two, we capture all the net savings generated from the projects implemented, plus the next $250,000, and apply that in the same manner." This approach is already underway and will go on throughout year four, explains Glasser. "Whatever savings the university has achieved at the end of year five is the amount that will permanently shift from the utilities budget to this fixed fund to finance future energy projects." One more way in which WMU is attempting to maximize its cost avoidance benefits is to launch all new projects at the start of each fiscal year rather than spread them throughout the year so that each project has the full year to accrue benefits, explains Glasser.

Bundle projects. Like WMU, Denison has focused primarily on shorter-payback projects as it builds its revolving fund base. At the same time, the university is looking for opportunities to strategically bundle quick-payback projects with longer-term ones or even projects that don't generate a financial return but are beneficial in other ways, says Jeremy King, Denison's campus sustainability coordinator. One example of that is the funding of condensate meters that can help identify energy losses in the heating and cooling system. "Combining the cost of a meter with, for instance, a $15,000 lighting upgrade will increase both the cost and the length of payback of that retrofit. Yet, in the scheme of things, this can be a perfect solution for offsetting energy upgrades that won't earn a payback but are important nonetheless," says King.

The university is taking a similar approach with bundling the pursuit of multiple projects with varying payback schedules associated with a single building, notes Chonko. "This allows us to tackle multiple components of a building to make it as efficient as possible before moving on to the next building." As the fund nears full capacity, Denison will also begin to consider more comprehensive, longer-term investments like solar and geothermal, says King.

LEVERAGE FUNDING

Princeton University launched its $5 million energy efficiency revolving fund in 2012 to support ongoing campus upgrades as part of a larger $45 million energy master plan.

UVM will likely hit its $3 million single-project cap for the first time, as leadership considers applying that amount toward an overall $10 million chiller plant. The plant would allow the university to significantly reduce its energy costs associated with a $100 million STEM complex construction project that will add 191,000 square feet of space to campus infrastructure. "No doubt a project of this scale that involves linking buildings and chillers together requires greater detail in planning than a typical lighting retrofit, but the potential payoff in efficiency and reliability is substantial," says Cate. A large-scale project also showcases the opportunity to combine resources from a green revolving fund with other capital funding sources to leverage capacity for larger, more complex initiatives, adds Cate.

The ability to leverage resources from a green revolving fund is, in fact, a common theme among leaders whose institutions have an established fund. Berthelsen describes the University of Minnesota's revolving fund as a valuable resource expander: "Our internal loan pool for energy efficiency allows us to take on more projects and, often, those bigger projects than we otherwise might [consider]." One example is a $1 million-plus lighting retrofit that the general operating budget is not equipped to cover, says Jeffrey Davis, UMN's assistant director of energy management. About $2 million in new loans are generated from the fund each year for energy conservation measures, he adds.

"This works much like a home equity loan, where we have a line of credit available to us," explains Berthelsen. "Every project creates a separate loan payback schedule, which in our case must adhere to no more than six years." The loan program is currently funded at $4 million, though it has been as high as $6 million and is based on how much capacity university energy managers think is needed in a given year and how much is available from the university's broader loan pool, says Berthelsen.

For decades the campus has advanced its energy conservation goals through a variety of funding sources. "Many of the energy projects we pursue are also focused on increasing overall operational efficiency," says Berthelsen. Recently, the university broke ground on a combined heat and power plant. The $113 million project is projected to reduce the campus carbon output by 10 percent and annually return several million dollars in reduced annual operating costs back to campus units, says Berthelsen. While UMN's internal loan pool is not the only funding vehicle used for energy improvements, Berthelsen stresses that it is an important one. The program has been an essential tool for financing many of the energy conservation projects that have contributed to $4.6 million in annual avoided utility costs, adds Jerome Malmquist, director of energy management.

In addition to its steady pursuit of energy retrofits, Agnes Scott College is leveraging its green revolving fund to invest in several renewable energy projects. The college tapped the fund to partially finance a solar array on top of the college observatory and to finance one-third of a $600,000 geothermal installation as part of a $14 million building renovation. The balance for the geothermal project came from donors and from the sale of property assets on the edge of campus that the college no longer needed, notes Hegman. After combining funding sources and factoring in a utility rebate that further reduced the cost of the revolving fund's one-third share to $150,000, the payback period shrank from 20 years to a little more than six years, says Hegman.

INVEST, REDUCE, REPEAT

Princeton University, Princeton, N.J., has opted to tackle some bigger projects first. The university launched its $5 million energy efficiency revolving fund in 2012 to support ongoing campus upgrades as part of a larger $45 million energy master plan. Components of the plan are projected to reduce Princeton's annual energy budget by one-third and achieve $8.5 million in annual savings.

Many of Princeton's early projects were in connection with its central plant and yielded significant energy savings, says Tom Nyquist, Princeton's executive director of campus energy. The impact of addressing some big areas of waste up front is the lowering of per-unit energy costs across the board. "Because our chilled water is now less expensive, and our electric is less expensive, as we conduct studies for additional projects, we're finding that the payback is longer than it otherwise would be for even quick-return projects like lighting retrofits," says Nyquist. That said, once the university completes its plans for comprehensive LED conversions for much of its internal and external lighting, the institution stands to shave at least two or three megawatts off its current peak load, representing a 10 percent reduction in total demand.

"The end goal from all of this is to drive us toward a more efficient campus design," says Nyquist. What can sometimes get lost when analyzing project savings is the cumulative benefits of doing many projects, he adds. "Reducing overall campus load eases pressures to expand our plant capacity for future buildings, which avoids—or at least delays—additional capital costs. We know we will eventually have to expand plant capacity, but for now, all the projects we have done to reduce energy consumption represent real dollar savings, when we don't have to add a new turbine or chiller."

In addition to helping slow the rate of new capital expenditures, Princeton's green revolving fund fits perfectly with the institution's goals to reduce greenhouse gas emissions to 1990 levels by 2020, since the fund's projects are focused on energy conservation,

COME HEAR AND SEE IT

Attendees at the NACUBO 2015 Annual Meeting, in Nashville, July 18–21, can learn more about green revolving funds and how they work, during a presentation featuring three institutions included in this article. Representatives from Agnes Scott College, Denison University, and Princeton University will highlight the different self-managed funding

says Nyquist. The university factors in the potential for reduced carbon emissions and imposes a value of $45 per metric ton on its cost calculations. "Including carbon emissions costs in our studies can tip the balance in favor of more efficient technologies when doing a life-cycle cost analysis on HVAC and lighting systems for new buildings. It can also lower the simple payback below our threshold of five years for our energy retrofit projects," says Nyquist.

models and payback approaches employed by these institutions. Presenters will provide insight into the management structure and decision-making process for project selection and discuss how to start a fund with minimal investment, get buy-in from reluctant participants, and prioritize capital projects.

And why not share your campus efficiency story with others at the annual meeting? NACUBO's Sustainability Advisory Panel is once again hosting a poster display to allow institutions to exchange good ideas through visual representation of campus sustainability and energy efficiency projects and programs. Topics may encompass a wide range of campus efficiencies, including basic energy savings, water conservation, carbon reduction, innovative transportation efforts, food recovery, risk mitigation, environmental compliance, and other efforts. Participants receive a discounted meeting registration.

To view the 2014 posters, go to www.nacubo.org/am2014posters. Those interested in contributing a 2015 poster and obtaining the registration discount code can contact Sally Grans-Korsh, 202.861.2571, with their proposed topic by no later than June 1.

SET PAYBACK CRITERIA

For many colleges and universities, high on the list of criteria for project selection is payback potential. How institutions calculate ROI and the methods chosen to account for and track cost savings can vary widely among institutions. In most cases, once the cost savings have fully repaid the original loan, subsequent savings are reabsorbed into the utility or facilities budget or general operating fund. Some institutions add an interest rate to each loan, and some make quarterly versus annual transfers back to the revolving fund. All such decisions are often based on institution culture and existing accounting measures as well as the level of comfort of those centrally involved in the process.

Review the variables. When engineers and facilities staff at Agnes Scott College first gathered to determine the utility savings for various projects, discussions eventually turned to how to calculate for rainy days and sunny days, seasonal heating and cooling needs, and utility rate hikes, says Hegman. "It got to a point where we realized we would never move forward with a project if we felt we had to constantly change our model based on variables over which we don't have control. If we do nothing, we are still going to have rainy days and utility rate fluctuations."

The consensus was to calculate the savings under typical circumstances based on the appropriate measure—BTUs, gallons of water, kWh—and then freeze that calculation, says Hegman. "From that we could estimate what we stood to save, on an annual basis, and use that as our payback metric, without continually re-evaluating and readjusting those measures." Once a project's cost and anticipated payback are calculated, an account is created in the college's general ledger to show start and end dates for paying back the loan. "Because each project has a separate account line with a specific project number, everyone has access to track progress by project," notes Hegman.

Keep it as simple as possible. UVM likewise decided not to make the process more complicated than it had to be, says Cate. "For every project, we develop an anticipated payback that we then have audited by our third-party firm to verify the calculations. Based on that schedule, we make annual payments back to the cash reserves." As for the accounting, UVM's administrative business service center manages the transfers from the cash reserves to finance energy efficiency fund projects. Savings are realized in the general fund utilities budget, and then transferred back to the revolving fund account within the cash reserves as principal. Once a project has repaid its loan to the cash reserves, the avoided costs from reduced energy usage are redirected to the university utilities budget.

TRACK RESULTS

An emphasis on precision in cost calculations and energy savings is a high priority for

Caltech. "Of critical importance to us are our tracking and measurement efforts, not only because we are a scientific research institute, but also because we want to ensure that our process makes sense and our numbers are believable in the eyes of key stakeholders, including our finance and accounting folks and our auditors," says Onderdonk. Prior to undertaking any energy efficiency project, meters are installed on campus buildings to provide baseline information about energy use, so that reductions in consumption before and after the projects can be calculated, says Onderdonk.

With an interest in moving forward quickly, leadership decided to use the facilities general budget to finance metering costs for initial projects. Subsequent meter installations have been covered by CECIP funds and wrapped into the total cost of a project. "The metering allows for real-time calculation of energy use and actual savings over the life of the loan, rather than relying on one-time measures at the start of a project," says Onderdonk. Utility savings are calculated and returned to the capital revolving fund each quarter. Once a loan has been repaid, measurement and verification continues, and savings are redirected to the university's utility budget.

Early on, Denison University lacked the capability to precisely measure electric and water consumption at the building level for its initial projects. With new metering, and by tracking historical data, the university is in a much better position to develop predictive models regarding payback, says King. "We can get pretty close, but the reality is that we can't monitor every single nuance, so our payback is based on a mix of estimated and realized data."

Getting payback periods that you believe in and feel good about can be a challenge, admits Patton. "How to marry your payback system with your operating budget rests with accounting, so we made sure our controller was brought into those discussions." Once a project is approved, funds are directed from the revolving fund to a project-specific account. Payback is calculated annually. "As for utility rebates and incentives, we factor these in as part of the payback, not as a reduction to the initial project cost," says Patton. "This may not be a big deal in the end in terms of calculating payback, but we want to preserve a record of actual costs for each project."

That attention to detail in recording project progress is something King takes to heart when entering project-specific information into SEI's Green Revolving Investment Tracking System (GRITS) tool (see sidebar,"Tracking Progress and Payback of Energy Efficiency Initiatives"). For the 59 lighting retrofits Denison completed as part of a comprehensive lighting upgrade, the easier option would have been to lump these together, says King. "We think a better approach is to track our efforts building by building and project by project, so that we can look back and see that this type of energy measure in this type of building worked much better than this other approach in this other building." Separate tracking of projects is also more beneficial for sharing data among institutions, believes King. Beyond calculating financial metrics, the GRITS tool allows users to track savings in carbon emissions, gallons of water, kWh, and other metrics, and to monitor savings to date, year to year, and over the projected life of the project, notes King.

INTERNALIZE EXPERTISE

A bigger challenge than identifying which projects to pursue or how to account for cost and utility savings may be the staffing expertise to shepherd project development and implementation. Having already completed many building-by-building upgrades, UVM is now looking to tackle some larger projects that invest in central infrastructure, says Gioia Thompson, UVM's director of sustainability. "One challenge for many institutions may be a lack of internal capacity to manage those more-complex projects requiring a higher level of planning and expertise. While it takes time to build that internal

A bigger challenge may be staffing expertise to shepherd project development and implementation.

knowledge, one of the benefits of ongoing strategic investment in energy efficiency is the opportunity to grow and retain critical knowledge in-house."

Projects at UVM are vetted by the university's energy initiatives working group, which consists of physical plant, facilities design and construction, campus planning, and capital planning and management staff. Also joining this group as needed are representatives from Burlington Electric Department, Vermont Gas Systems, and Efficiency Vermont, the state's energy efficiency utility.

According to Richard Donnelly, a strategic planning manager for Efficiency Vermont, the value of a revolving fund is that it allows an institution to break free from a normal pace of projects and really accelerate energy efficiency efforts. "A $1 million fund is most efficient if all that money is working for you all the time," suggests Donnelly. Once an institution has a steady stream of savings that allow additional investments, the next significant hurdle is developing a pipeline of projects and implementing them to keep the funds invested, argues Donnelly. "Project development is key and requires a lot of data collection, physical assessment, and a high level of specialized expertise."

Conducting building audits and system evaluations, reviewing RFPs, seeking project approval, and analyzing financials—all these necessary steps of project development and implementation can take time, from a month to a year depending on the complexity of a project. Often staffing can become an issue, says Donnelly. "In some respects this is new territory, because most institution leaders are not used to proactively developing millions of dollars of energy efficiency projects that are not related to new buildings."

Donnelly suggests that some institutions need help getting through that project development bottleneck and that utility providers may be an untapped resource in that regard. "The traditional way in which many utilities have provided assistance is through rebates and incentives. While that is helpful for reducing a project's cost, more beneficial may the input and assistance they can provide for expanding and accelerating an institution's energy efficiency projects," says Donnelly.

Onderdonk agrees that it's worthwhile to work directly with your utility providers to see how you can partner on projects. "Because our utility providers are not always familiar with the specific operating requirements within Caltech's lab spaces, we have been diligent about explaining what we hope to accomplish through our energy projects. Very often this has required technical conversations at the engineer- and higher senior management-level positions," notes Onderdonk.

PERPETUATE BUY-IN

For Caltech, three groups have played key roles in the development of its revolving fund process, including utility company and engineering firm partners. The other two include Caltech's board of trustees, and the institute's vice president of business and finance. "Our trustees understood our risks of carbon and energy costs and deferred maintenance, and this program hits all three of those buttons," notes Onderdonk. "In fact, once the program was in motion, [the trustees] were the ones encouraging us to do more and [do it] faster."

California Institute of Technology's allowable funding allocation has grown to $11 million.

Likewise, having full buy-in from your chief business officer is crucial, argues Onderdonk. "In our case, our CBO put our proposed funding and accounting models through the paces to ensure their rigor." Every CBO should be involved in helping establish those major guidelines for how the program will operate, including sign-off approval thresholds, reporting requirements, and appropriate payback schedules, as well as helping others think through the university's risk profile, notes Onderdonk.

To some extent, Caltech's leaders have had to recalibrate relationships with some third-party

service providers. "This is not a performance contract relationship, where a company stands to profit from our energy savings," explains Onderdonk. The beauty of self-funding energy projects is that all the cost savings stay with the institution, he adds. "There were companies that said 'no thank you' when they realized that what we were asking for was their expertise in building and system audits and in identifying potential high-value energy- and water-saving projects," says Onderdonk. "Picking the right partners with regard to engineers and contractors requires concerted back-and-forth communication to ensure transparency with pricing models. We want to understand their margins and their labor costs so we can fit those into our project costs and payback calculations."

Because implementation of a revolving fund involves multiple stakeholders, even a well-executed plan requires ongoing attention to ensure continued buy-in. At the end of the first year of project implementation at La Verne, Houston-Brown got some pushback from the budget office when he submitted his request for an increase in utility budget operational dollars for the following year. "Why were we asking for a hefty annual increase in operational dollars when we had moved thousands from the utility account to the green revolving fund?"

To address that question, Houston-Brown gathered the data to verify that projected utility rate hikes were a primary culprit. Another factor, which some had forgotten, was that lighting was added to the football stadium the previous year. And, the savings from the first round of projects hadn't fully kicked in. "Because many of our initial projects were implemented near the end of the fiscal year, the dollar savings that first year were small—about $12,000. Already, toward the end of our second year, we have seen $44,500 in annual utility savings," says Houston-Brown. "Reconciling all those factors, I could show that our costs would have gone up by more than $100,000 for the next year had we done nothing the year prior with regard to energy conservation measures."

The numbers can be confusing, even for data-minded people, reminds Houston-Brown. "This process requires partnership so that everyone understands the flow of funding and is on board with payback strategies." It's also important to explain the lag time in savings. "In our case, it will likely be five years from the time we implemented our first projects before we begin to see the real impact of project savings flowing back to our general fund. Especially with our approach of building our revolving fund from scratch, you need a future-focused vision," says Houston-Brown. He asserts that, while the process is made easier if you can seed your revolving fund up front, it's not impossible to start from zero. "If key stakeholders can together figure out a creative way to approach this, you can do it," says Houston-Brown. "We are proof of that."

KARLA HIGNITE, Ogden, Utah, is a contributing editor for *Business Officer*.

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A CHALLENGE TO ENCOURAGE SELF-FUNDING ENERGY EFFICIENCY

In collaboration with 16 partner organizations, the Sustainable Endowments Institute (SEI) launched its Billion Dollar Green Challenge (www.greenbillion.org) in fall 2011 to encourage colleges, universities, and other nonprofit institutions to consider self-managed revolving funds. The big idea: As a means to finance energy efficiency improvements, institutions would use cost savings generated from implemented projects to fund future ones.

SEI Founder and Executive Director Mark Orlowski believes one reason some institution leaders may be reluctant to formally join the challenge is a misconception about how institutions must seed their fund. "Some think this must be set up through the institution's endowment, or that if funded through the endowment, this commits those funds in perpetuity for energy-related improvements." In fact, there are no requirements regarding capital sourcing or the length of time that a revolving fund must be maintained, explains Orlowski.

Among the requirements for joining the challenge:

1. The institution commits to investing $1 million, or the equivalent of 1 percent of the value of the institution's endowment, whichever is less.

2. The institution has six years to fully seed its fund.

3. At least half (50 percent) of the annual savings (i.e., cost avoidance) generated from a given project should return to the fund until the principal of each loan has been repaid. This is a recommendation, notes Orlowski. "While many decide to return 100 percent of savings to the fund until the loan is fully paid, some institutions may want to earmark some of those savings for other needs." Conceptually, if an institution is returning only 25 percent of savings back into the fund, then the payback for that project will take four times as long, making it far less effective, notes Orlowski. "The faster a project loan is repaid, the quicker those funds can be used to finance the next round of projects even before the principal is fully repaid on the previous project."

4. The institution must meet four quarterly benchmarks during the first year of the commitment:

- Within the first three months, develop a multistakeholder working group to develop a fund strategy.
- Within six months, perform an energy audit of at least 10 percent of total square footage of the institution's built infrastructure (an existing audit from within the past several years will suffice).
- Within nine months, develop operating guidelines and a management structure for the fund that specifies how projects will be selected, who is involved in that process, and so forth.
- By the end of year one, make the fund operational with some level of funding and at least one project selected, approved, and ready to implement.

SEI is currently partnering with several funders to establish a BEST (Banking on Energy Savings Together) Fund that would provide low or no-interest loans for under-resourced institutions as a means to establish a green revolving fund. The BEST Fund would provide up to $500,000 in initial capital, with project savings helping to build the institution's fund once the BEST loan is repaid, explains Orlowski. Applications for BEST loans may be available by late 2015.

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TRACKING PROGRESS AND PAYBACK OF ENERGY EFFICIENCY INITIATIVES

The Sustainable Endowments Institute (SEI) launched its Green Revolving Investment Tracking System (GRITS) tool in the spring of 2014, with lead financial support from the Kresge Foundation. The Web-based tool allows institutions to track the progress of their energy efficiency initiatives on a project-by-project basis, and financial and resource savings.

- **Calculating metrics.** With the development of GRITS 1.0, SEI's aim was to build something sophisticated enough to meet the needs of energy managers and business officers—and be able to calculate kWh and CO_2 reductions as well as net present value, loan payback, and other financial metrics, says Mark Orlowski, SEI founder and executive director. "We also wanted a user-friendly tool that faculty members might find helpful as a resource in their classes and that other staff members and students could use to input project updates," says Orlowski.
- **Comparing data and results.** GRITS provides different levels of access, including access by primary users authorized to create accounts, edit-level access for those approved to make updates, and read-only access. Three status levels are available for project tracking: proposed, in progress, and complete. All proposed and in-progress projects remain private and viewable by the institution only. Once a project is marked complete, it becomes part of the project library, which currently houses almost 600 projects viewable by project type, approach, and results, says Orlowski. "The library benefits the sector as a whole, serving as a way to benchmark best practices."

  The library operates much like kayak.com or expedia.com, where users can filter search data by project type—such as a heating and cooling project—or by geographic area, to see every project conducted by, for instance, a private college in the Northeast, explains Orlowski. Users can also view average costs, payback, and energy savings.

- **Going for bigger and bundled projects.** "We are starting to see more institutions looking beyond simple lighting projects to deeper retrofits that address the building envelope, including insulation and innovative technologies to reduce consumption," says Orlowski.

  In addition to increased sophistication of projects, another trend is a shift to incorporating longer-term projects. In part this may be because institutions are using project bundling to their advantage—for instance, combining quick-payback lighting retrofits with HVAC upgrades for one blended payback, as a way to

remain within the range of payback criteria set by the institution, notes Orlowski.

While use of GRITS is free to SEI's Billion Dollar Green Challenge (www.greenbillion.org) participants, any institution can sign up as a GRITS affiliate (www.gritsaffiliates.org) and use the tool to track project-level energy, financial, and carbon data.

"We are eager to see more institutions using GRITS, even if they prefer not to join the challenge," says Orlowski. SEI recently rolled out partnership agreements with APPA and the American College & University Presidents' Climate Commitment, and now 175 institutions are using the tool, says Orlowski. GRITS 1.1 was released in April 2015, and SEI will soon hear about a pending Department of Energy grant that would help provide funding for development of GRITS 2.0.

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