

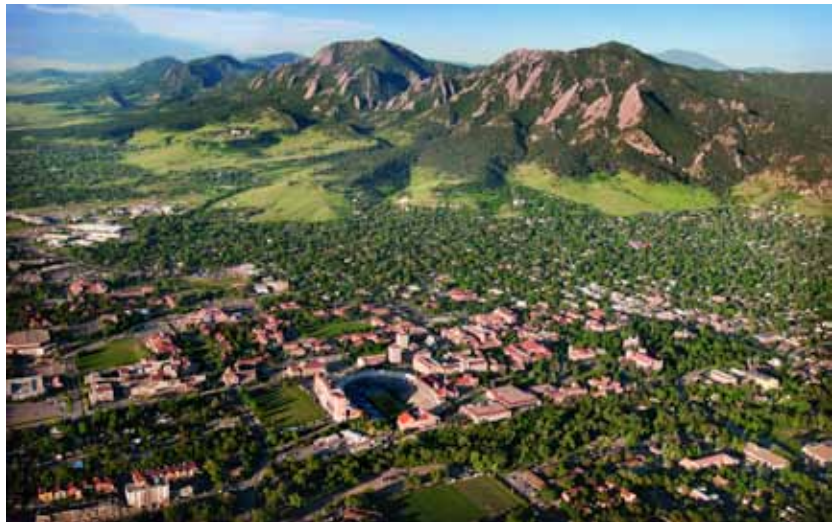
University of Colorado at Boulder

Energy and Climate Revolving Fund

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Summary

Location: Boulder, Colorado

Full-time student enrollment: 29,952

Combined gross square footage of all buildings on campus: 10,334,473

Endowment: \$948,000,000

Type: Public

This case study was supported by generous contributions from: David Rockefeller Fund, HOK, John Merck Fund, Kresge Foundation, Merck Family Fund, Roy A. Hunt Foundation, U.S. EPA Green Power Partnership and Wallace Global Fund.

The University of Colorado at Boulder's student-run Environmental Center leads the campus' sustainability efforts. The Center created the Energy and Climate Revolving Fund (ECRF) in 2007 to finance energy-efficiency upgrades. The ECRF functions as a source of funding for project loans and provides a method of financing projects that seeks to save the university money through reduced utility bills. The fund is primarily used in buildings that are managed by the student government, each of which has its own facility manager and budget. Once a facility has paid back the loan to ECRF, the subsequent savings on utility bills remains in that facility's budget, with the amount of money that is returned to the fund determined by the projected cost savings. As of 2010, the ECRF has been used to finance over 80 efficiency measures in three buildings and has provided a total of \$379,600 toward projects that will decrease the university's greenhouse gas emissions.

History

Background of Sustainability on Campus

The university's large student government has a budget of \$35 million and a high level of autonomy on campus. The student government houses the university Environmental Center, which has served as the hub for environmental initiatives on campus since it was established in 1970. The Center's managing student board is supported by eight permanent staff members, including Dave Newport, the Center's Director. The Center coordinates programs including the campus recycling program, the student bus pass and bike-sharing programs, and university efforts to utilize renewable energy and decrease overall energy use on campus.¹

In 2007, the student government passed a bill pledging that its three student-managed buildings—the Student Recreation Center, the Wardenburg Health Center, and the University Memorial Center—will become carbon-neutral. This prompted the idea for the Energy and Climate Revolving Fund.

CU-Boulder's administration, too, has included sustainability as a priority in its master and

strategic plans. The university's commitment to reduce carbon emissions calls for a 20 percent carbon reduction by 2020, 50 percent by 2030, and a reduction of 80 percent by 2040.

The ECRF has provided a tool for CU-Boulder to increase the number of energy-reduction projects they can finance and to advance university-wide environmental progress.

Initiating the Fund

Dave Newport, the university's Director of the Environmental Center, proposed creating a green revolving fund to the student government as a means to provide a financing mechanism for the energy improvements and carbon emissions reductions that the university had already committed to implement. To formulate the proposal, Newport looked at green revolving funds at six other schools to compare their structures, methods of operations,

and success rates. Newport also sought advice from a small number of fund managers.

Student government passed the bill unanimously and allocated \$521,186 out of its operating reserves budget to begin the ECRF.² The money in this fund was collected for use in any retrofit or renovation project that reduced carbon emissions and energy use in the student-run buildings. Project requirements are minimal: as long as the project or set of projects repaid the loan in less than five years, the project will be considered for funding.

Operations

Energy and Climate Revolving Fund Overview

Year created: 2007

Size: \$521,186

Source: student union budget

Average payback period: 5 years

Administrator: Director, CU Environmental Center

Largest project financed:
\$395,600 for a leveraged multi-project bundle in the student union

Average return on investment: 37.81%

Identifying Project Opportunities

When the ECRF was created, the university spent \$21,186 to hire a professional engineering firm to conduct an energy audit of the student-run buildings on campus. The firm also assisted in the identification of further opportunities for future ECRF projects. However, this strategy for identifying projects eventually proved to be unsuccessful, as the firm's proposed projects were based on incorrect assumptions due to a failure in communication with CU facility managers. As a result, few of firm's proposals were carried through to the construction phase.

After this setback, administrators in the Environmental Center decided it would be more effective to allow facility managers to identify opportunities for energy-efficiency projects on their own, and sought to work with the contractors with which they had existing relationships. As Newport said, "Facilities managers have confidence ... in the contractors they deal with every day."³

Facility managers on campus directly benefit from the fund. For projects that sought funding prior to the creation of the ECRF, managers were



The photovoltaic panels pictured above are located on the roof of the Wolf Law Building, and are just 52 of the total 472 panels located around CU that help to offset campus-wide energy use.

required to include the cost of a desired project in a budget proposal to student government; these requests are not always granted. By applying for an ECRF loan, facility managers are able to take an active role in securing financial support for efficiency projects. Jimmie Baker, the Facility Manager for the University Memorial Center, uses the ECRF funding to supplement his building's budget, something that he says helps to cover the costs of more capital-intensive energy projects.⁴

Approving Proposals

To review and approve ECRF projects, the student government set up a board specifically for the revolving fund. The chair of this board, a student, is also the chair of the student government finance board. The board includes university staff, including the CFO for student government, the head of engineering, the director of the Environmental Center, and a faculty member.

Applications for projects are open to facility directors in student-run buildings,

as well as the heads of facilities for other buildings across campus.

The Energy Program Manager for CU's Environmental Center collaborates with facility managers in the project application process, assisting in the writing proposals, the analysis of a project's potential for future energy savings, and the creation of a repayment plan.

The collaboration is undertaken to ensure that every project submission has a better chance of getting approved by the ECRF board; the board must unanimously approve a project for it to qualify for funding. Unanimity is integral for project approval because all facility managers hold seats on the fund board; if one of the managers is unsatisfied, he may not apply for future projects. Baker, who has applied to the ECRF for funding on a number of projects, said that the assistance of Environmental Center staff makes the application process "very smooth and easy to navigate." All six projects proposed by FY 2010 have been approved.

In order for a project to be approved, it must contain a plan to repay the loan within five years based on the project's expected utility cost savings. If the payback period is longer than five years, the proposal must specify the alternate sources of funding that will cover a portion of the project costs. This funding can come from grants or from the facility's own budget. The funding alternatives allow for a loan from the ECRF to be returned within five

years, even if it takes longer for the money spent on the project to return in utility savings.

In many cases, projects funded by the ECRF are proposed as “bundles,” which incorporate a number of different energy-saving measures.

Some of these projects have quick repayment periods, like a project that replaces light bulbs with CFLs, while others have longer periods, like a project that installs energy-efficient windows. As long as the average payback period of the bundle is five years or less, the projects can be approved.

The six bundles that have been funded by the ECRF have encompassed over 80 separate energy-efficiency measures.

Repayment of Loans

The fund operates based on a straightforward loan system. Once a project has been implemented, the facility manager is in charge of paying back the loan according to the payment plan, regardless of actual cost savings. As Newport explained, there would be difficulties with identifying the actual cost savings by looking at building utility meters. “The weather changes, the use of the building changes, new capacity is added, more people plug in their computers—there’s so many things that can cloud the calculation of actual savings.”

It’s essential to calculate sound future energy and capital savings of a project during the proposal stage, says Newport.

Contractors help the managers outline costs and savings of the projects that are being considered. The proposal is then passed between Environmental Center staff and facility managers until a model has been developed that will definitively return the entire funding that the project will require.

To account for potential deviations in the projected calculations, the payback plans are structured so that the regular loan repayments are less than the amount of money that will have been saved by the time the payment is made. This leaves a net savings in the facility’s budget even while the loan is being repaid.

The interest rate on loans ranges between 1 and 2 percent. This rate is comparable to what the interest that would accrue if it were held in the bank, as the university only invests its liquid assets in structures with low risk and subsequently low interest rates. The low cost of borrowing is crucial to the number of projects that the ECRF can review. According to Newport, a higher rate would be a disincentive to projects as facilities would have no reason to choose ECRF over a bank loan for efficiency upgrades.

Student-Managed vs. University-Managed Buildings

Since the money in the fund belongs to the student government and was originally intended for use in the organization's three buildings, projects in these buildings can access funding more easily. When a project is proposed in a student-run building, grants from the Environmental Center are available to supplement loans from the ECRF. These grants can cover 10 to 20 percent of a project's costs and do not need to be paid back.

This past year, after completing many simple projects in student facilities, the fund has begun accepting applications for projects in all campus buildings to increase the number of possible projects it can fund. However, for non student-run buildings, additional grants are not available. Furthermore, the facilities managers in these buildings must match money committed by the ECRF with a significant investment of their own, though the exact amount has not yet been determined. As of 2010, ECRF had not received any project proposals for non student-operated buildings.



Though CU's University Memorial Center began renovations to improve building operations in 2001, the ECRF loaned \$395,000 to the student union for a project bundle that included installation of energy and energy-efficient lighting technologies.

Performance

University Memorial Center Bundle

In 2010, ECRF saw the largest bundle proposal submitted to date. The bundle focused on the 190,000-square-foot student union, the University Memorial Center. The building accommodates over 14,000 visitors each day. The bundle featured projects including window and door replacements, innovative lighting technology like LED light retrofits and occupancy sensors, insulation of the water heater and ceilings and the installation of variable-speed drives, new heat reclaimers, refrigeration temperature monitoring, and the installation of new steam-trap systems.

This bundle is projected to cost \$395,000. Funding for the efficiency measures was secured from the following sources:

- \$131,000 from an ECRF loan.
- \$90,000 from the building's budget.
- \$174,000 grant from the Energy Efficiency Fund, spread over two fiscal years, which did not have to be repaid.⁵

The projects are expected to save \$48,360 per year. Subtracting the grant money from the total project costs, the bundle will be paid back in

4.5 years. In order to return the fund's loan in five years, plus the additional \$2,691 incurred from 1.25 percent interest, the University Memorial Center will only have to payback an annual average of \$26,912 to ECRF.⁶

The rest of the money that is saved on utility costs will go back into the building's budget, returning the investment that had initially been provided by the facility manager to supplement the ECRF loan. After five years and the full repayment of the loans, the funds will begin to accrue as savings.

Performance Data

Though it has been only three years since the inception of the fund, it has already seen success in its operation.

The university's total energy use has gone down 23 percent since 2005, already surpassing its goal of a 20 percent energy reduction by 2012. Newport attributes the majority of this savings directly to the three student-managed buildings in which the ECRF projects have taken place.

Lesson Learned

Challenges Faced

One of the most difficult parts of having money to lend out in this fund has been getting people to use it, as campus facility managers were initially wary of going into debt for projects. Prior to the fund's initiation, facility managers had financed efficiency projects using their buildings' budgets which did not require any payback. "Now, we're asking a facilities manager to also be a borrower, and it's a new paradigm for them," Newport said.⁷

While the loan fund has yet to gain the confidence of facilities directors across campus, Newport recognizes that it will take some time. In early conversations with Harvard's first revolving fund manager, Newport was told that it would take three or four years for a fund to gain momentum.

The Environmental Center staff overcomes this challenge by working closely with facility managers to model and demonstrate the cost savings that are achievable through such energy-efficiency projects. The Center encourages facility managers to partner with the professionals whom they have good working relationships in order to ensure the success of the project and the use of ECRF money.

Another issue for facility managers is hesitation over whether the cost savings will be reclaimed by budget cuts or other areas of campus with financial hardships. As ECRF projects have resulted in lower energy and other utility bills, facility managers have more money left over in their budgets. The main concern is that the student government will notice this surplus money and reduce their budgets, leaving them with zero net savings.

ECRF has loaned \$379,600 toward efficiency projects and as of FY 2010 projects an annual energy savings of \$83,943.⁸

"That's a legitimate fear, especially in budget cutting days: they'll do all this work and they'll save all this money, but in year six, when they don't have to send me a check, that money will get taken away from them," explained Newport.⁹ So far, there have been no proposals to trim budgets as a result of surplus energy savings. However, Newport has reassured

facility managers that he will advocate for their ability to retain the surplus funds.

The Future of the Fund

As of FY 2010, the fund was slightly over 60 percent invested; Newport would like to be about 80 percent invested. With a \$195,000 balance remaining in the fund, Newport is concerned that the student government will reclaim some of the money. To overcome this, he plans to lend out an additional \$100,000 over the next academic year.

Endnotes

- 1 “About Us,” University of Colorado Environmental Center, accessed December 9, 2010, <http://ecenter.colorado.edu/resources/about-us>.
- 2 “University of Colorado Student Union Legislative Council.” April 7, 2006. Accessed November 15, 2011. <http://cusg.colorado.edu/sites/default/files/FBA041007.pdf>
- 3 Newport, interview with Nathaniel Herz, October 2010.
- 4 Baker, email to Rebecca Caine, January 2011
- 5 Newport, Dave. email to Rebecca Caine. “Ecrf.” January 10th, 2011.
- 6 “University of Colorado Energy and Climate Revolving Fund Project Application.” University Memorial Center, July 2010.
- 7 Newport, interview with Nathaniel Herz, October 2010.
- 8 ECRF Analysis, CU-Boulder Environmental Center, December 2010.
- 9 Newport, interview with Rebecca Caine, December 2010.