



Fairbanks Nonprofit Retrofit Pilot Project

March 2017

Purpose

The Cold Climate Housing Research Center launched a pilot project with Denali Commission, Rasmuson Foundation, and Rural Community Assistance Corporation to help Alaskan nonprofit and tribal organizations save money by making their buildings more energy efficient. Started in 2014, the project provided energy audits and access to low-interest loan financing to encourage energy efficient retrofits in buildings.

The program also provided guidance through the entire energy retrofit process, including arranging energy audits, discussing financing options, coordinating contractors, and establishing plans for maintenance and energy monitoring. The intention of the project was to pave the way for a self-sustaining statewide program for nonprofit energy efficiency retrofits. More information about the pilot project is available at fnrp.cchrc.org.

Project goal

The goal of the project was to learn how to implement a self-sustaining energy efficiency program that could provide comprehensive energy retrofits for buildings statewide. The pilot project staff interviewed nonprofit participants and tracked retrofits and energy savings in order to inform future energy efficiency programs in Alaska. Over the three years of the pilot project, energy prices fell in Alaska, reducing the incentive to implement retrofits. The opportunity for grant funding has likewise decreased, making the lessons learned and best practices identified in this project important for the efficient operation of future energy retrofit programs in Alaska.

Project outcomes

Ten organizations received audits on 12 buildings through the pilot project, and an additional two organizations used the technical assistance component of the program.

- Audits predicted an average energy savings of 27% for nonprofits if all retrofits were completed (compared to the original estimate of 33%).
- One nonprofit, the Fairbanks Resource Agency, utilized the loan to finance a retrofit to its mechanical room. The loan was used to replace a failing boiler with a new energy efficient boiler.
- Of the seven nonprofits that provided post-retrofit energy data, six demonstrated energy savings. The Interior Community Health Center, Midnight Sun Council, and Alaska Dog Musher's Association reported increases in their mission services through increased use and operating hours of their buildings after the retrofit.

CASE STUDY: Alaska Dog Musher's Assn.



The Alaska Dog Musher's Association clubhouse was built in the early 1980s to provide a warm gathering place during sled dog races. Through the pilot program, the nonprofit received an energy audit and technical assistance to make a number of improvements to the building. The organization self-financed a total of \$22,000 in energy improvements and reduced annual energy costs by \$5,000 in 2016.

Upgrades	Cost	Results
installed setback thermostats; sealed and insulated ductwork	\$9,000	reduced energy costs by \$5,000 in 2016
replaced 2 doors, 3 windows, & re-insulated floor	\$13,000	

Pilot Cohort

Alaska Center for Children and Adults
Alaska Dog Musher's Association
Breadline Inc. – Stone Soup Café
Carol Brice Family Center
Fairbanks Resource Agency
Greater Fairbanks Community Hospital Foundation
Interior Alaska Center for Non-violent Living
Interior Community Health Center
Midnight Sun Council, Boy Scouts of America
North Star Council on Aging
St. Matthew's Episcopal Church
Tanana Chiefs Conference

Are audits indicative of energy savings potential?

The pilot project was not able to assess this question because few nonprofits undertook the majority of the audit recommendations. Seven nonprofits participated in exit interviews during the project's third year. Of those, only two (Alaska Dog Mushers Association and the North Star Council on Aging) implemented the majority of their audit recommendations. In both cases, the organizations were able to bundle the construction tasks and employ a single contractor for most of the retrofits. This indicates that bundling retrofits may help nonprofits implement recommendations. Energy programs can further encourage comprehensive retrofits by providing program participants with accurate construction estimates, a list of preferred contractors, and a single page scope of work when hiring a contractor.

Six of the seven nonprofits that provided energy data saw energy use drop by an average of 24% over seven buildings, with a program average of 19%. Alaska Dog Mushers Association actually exceeded the predicted savings, reducing its annual energy use by over 40%.

CASE STUDY: Tanana Chiefs Conference (TCC)



The Tanana Chiefs Conference is a tribal consortium of 42 Interior Alaska villages. The organization offers health and social services to members while balancing traditional Native values with modern demands. TCC received energy audits on their two largest buildings in Fairbanks through a separate commercial energy audit program, and participated in the pilot project to access technical assistance and loan financing. Management decided to only implement audit recommendations that could be completed by existing maintenance staff.

While TCC realized \$58,726 in annual energy savings compared to their baseline energy use, the audit predicted an additional \$30,000 annual savings if other recommendations, such as retrofitting the domestic hot water systems, had been completed.

Upgrades	Cost	Results
placing headbolt heaters in parking lot on a timer	N/A	reduced energy costs by \$58,726 in 2016
re-commissioning the HVAC system	N/A	

CASE STUDY: St. Matthew's Episcopal Church



St. Matthew's Church, established in 1904, provides the Fairbanks community with spiritual services, baptisms, weddings, and funerals. In addition, the building serves as a homeless shelter, and meeting place for Alcoholics Anonymous, veteran support groups, Native community and leadership meetings, and yoga classes. The Church participated in the pilot project with two buildings: their Church and the rectory. After receiving the results of the energy audit, they decided the rectory was not in good enough condition to warrant an energy retrofit, and demolished the building. They completed many of the audit recommendations for the Church, using a mix of volunteer and contracted labor.

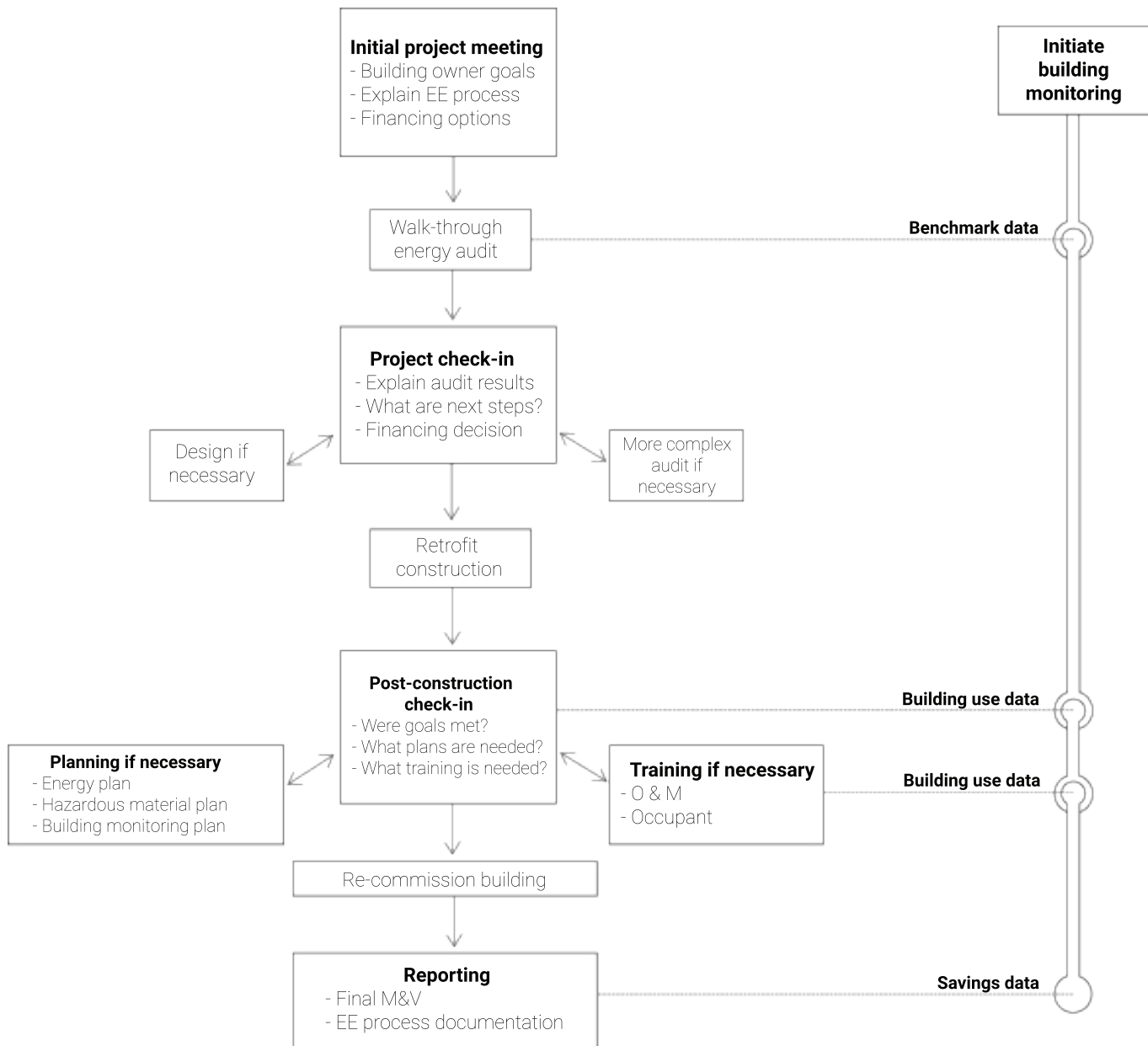
Upgrades	Cost	Results
installed setback thermostats	\$234	reduced energy costs by \$1,362 in 2016
replaced exterior lights with LED bulbs	\$1,644	

Energy retrofit program components

To ensure successful implementation of audit recommendations, energy retrofit programs should be comprehensive, flexible, and "packaged." This way the program acts as a one-stop shop for organizations looking to complete a retrofit while still being adaptable to each individual participant's goals, building, and capabilities.

The graphic on the next page shows how such a program might work. Frequent communication with building owners, beginning before the energy audit even occurs, helps maintain momentum and ensure the building owner's goals are being met. Continuous energy monitoring, through watching energy bills or using building monitoring equipment, helps demonstrate savings potential and actualization. Finally, financing needs to be addressed upfront and continuously so that building owners and boards have the resources and time needed to fund the retrofit and realize energy savings.

After construction is complete, the energy retrofit process should include measures to ensure recommendations are long-lasting. The energy retrofit should be documented where the building owner and maintenance staff can access construction information if needed at a future date. Building



staff and occupants might need training on how to use and maintain new building components. Owners can also use this time to create planning documents to guide building energy use, hazardous materials, and maintenance.

Finally, programs should include an opportunity for looking back at the retrofit process and assessing what components worked well and what can be improved for the next participant.

Challenges to statewide expansion

Energy efficiency is very important in Alaska because of the cold climate and high energy costs. Energy retrofits can reduce energy costs and make buildings safer and more comfortable. However, this pilot project was not self-sustaining, and expanding it to other locations, especially in rural Alaska, adds challenges.

In rural Alaska, accurate baseline energy use is more difficult to obtain, program costs increase with the necessity of remote travel, communication cannot always occur in person, and the likelihood of loan financing—which, even in Fairbanks was only utilized by one organization—is unknown. Further, acting on audit recommendations by proceeding to design and construction may require skilled contractors not local to the community. Thus, training building staff on new building systems is even more important, as repairs may not be easily fixed by a local contractor.

A program that addresses all of these issues in a cost-effective fashion does not happen in the first iteration. Nonetheless, a comprehensive energy efficiency program that builds on the experience from projects that occur in Alaska's larger cities to increase program efficiencies and encourage complete retrofits is a first step toward helping rural Alaskan buildings achieve energy efficiency.

Challenges to self-sustaining energy retrofit programs

Loan financing that directs interest back to the energy retrofit program is one method to generate income for a self-sustaining energy retrofit program. However, many organizations in Alaska are not accustomed to using loans. In the pilot project, only one nonprofit utilized the loan financing option. Fairbanks Resource Agency (FRA) borrowed money to replace a failing oil-fired boiler and re-pipe its mechanical room. FRA utilizes loans for other reasons (such as to purchase vehicles) and thus did not face some of the barriers to loan financing identified by other organizations in the pilot project:

- Self-financing was possible and preferable to applying for a loan and paying interest.
- Board was reluctant to take on debt and obligate future board members to repay it.
- Grant-funding restrictions prevented taking on debt.
- Long internal approval process to take on debt.
- Unfavorable loan terms and long application process.

Many of these barriers can be addressed through upfront and frequent communication on financing options and emphasizing the immediate benefits of energy savings. Building owners and boards should assess their financial situation before the energy audit, and, if a loan might be necessary, begin applying for approval within their organization and planning as to how to meet monthly payments in the future.

It is imperative for the loan financing to include a straightforward, quick application and favorable terms. Also, allowing the loan to finance non-energy efficiency retrofits will increase the appeal to organizations searching to make improvements to their building. For instance, consider a nonprofit organization that wants to remodel their kitchen. One loan that could cover the entire project, both the energy efficiency and design changes, would be more attractive than using multiple funding mechanisms for the project.

Project partners

Cold Climate Housing Research Center
Rasmuson Foundation
Denali Commission
Rural Community Assistance Corporation
The Foraker Group
Alaska Housing Finance Corporation
Alaska Mental Health Trust Authority
Arctic Alliance for People

Finally, while loan financing should be encouraged for all participating organizations, it should be optional. Organizations capable of self-financing a retrofit quickly should be allowed to do so to realize energy savings and maintain internal momentum on the retrofit process. However, organizations opting out of the loan financing deny energy retrofit programs income from interest that can be used to finance the program for future participants.

For this reason, it is important that energy retrofit programs diversify income sources beyond loan interest. For instance, all participating organizations can pay a small fee for the energy audit both to offset program costs and to demonstrate a commitment to the energy retrofit process. If loan financing is optional, organizations opting out of loan financing can pay an additional fee towards the continuation of the program.

Energy retrofit programs must operate efficiently in order to self-sustain from audit fees and loan interest alone, which requires continually learning from past program iterations. This pilot project was a first step towards achieving a self-sustaining program that results in safe, healthy, efficient buildings in Alaska.

CASE STUDY: Interior Community Health Center

"Staff commented that they really liked the LED lighting better and they felt safer as they were going out to their cars."



The Interior Community Health Center provides health care to poor and underinsured people, including child screenings, physicals, and mental health services. Through the self-financed retrofit program, the organization reduced energy costs for its 20,000 sq. ft. building from \$100,000 to \$86,000 a year. They also increased operating hours to serve more patients. Results of the program are highlighted below:

Upgrades	Cost	Results
Replaced parking lot lights	\$13,000	ICHC reduced energy costs by \$14,000 a year.
Reprogrammed air handling unit setting that had caused the unit to run continuously	N/A	