COLD CLIMATE HOUSING RESEARCH CENTER
CCHRC

Promoting and advancing the development of healthy, durable and sustainable shelter for Alaskans and other circumpolar people through applied research.

CCHRC REPORT

Volume #8 Issue #2 October 1, 2008

Second Quarter Project Update

'an embarrassment of riches' by Nate Mohatt

Test Module for Northern Shelter Project

Tucked behind the RTF (Research and Testing Facility) is the seed of an idea. It's a black and green "box" that was built to fail. This is the first building for the Sustainable Northern Shelter project (see page 2), and was built with numerous monitors in it. Throughout this winter CCHRC staff will measure and monitor the insulation, building structure, permafrost protection and other elements of the building.

In Spring 2009, CCHRC will build homes in Anaktuvuk Pass and Point Lay based on designs developed with those communities, and using technology that will make them affordable and successful there. The test module will allow CCHRC staff modify designs based on the collected data. Ilisavik College and GW Scientific are working with CCHRC staff on the module.

Product Testing Lab

The "Certified Alaska Tough" designation will soon be a reality. With the hiring of Colin Craven, as the Product Testing Lab Director, CCHRC has begun the arduous process of developing protocols for the lab and selecting products for testing. Once the lab is operational in early 2009, Craven will begin evaluating products for their suitability to weatherization and retrofitting Northern homes for energy efficiency. "Windows, insulation, and boilers have been mentioned" as targets for testing, said Craven. "We want to determine, at the very least, if the product performs well and is durable in a Northern climate."

"Ultimately, Certified Alaska Tough will be a certification of quality, but our goal should also be to help raise the expectations of quality in building materials," said Colin Craven, Director of the CCHRC product testing lab.

(more on page 2)

('an embarassment of riches' con't.)

Wood Energy

If you've driven by the west side of the RTF, you've seen our newest addition. Adjacent to the RTF North Lab is a new "wood energy" testing bay, designed to test the fuel efficiency of wood burning appliances such as the recently popular wood-fired boilers. The testing will address three key issues: (1) what is the proper way to burn wood; (2) which appliances are most efficient; and (3) what can be done to minimize damage to the environment. Currently wood-fired boilers are not regulated by the EPA.

In addition, CCHRC will take delivery of a gassifier early this winter, which will run a diesel generator using gasified wood. CCHRC staff, led by Dave Misiuk, will test the gassifier for fuel efficiency and effectiveness and help write guidelines for use of such appliances in cold climates.

Hybrid Micro-Energy Project

The solar photovoltaic and solar thermal equipment installation at the CCHRC RTF is complete. Both systems are fully operational and contributing to the electrical and heating needs of the RTF. The solar photovoltaic arrays are also contributing to the GVEA Sustainable Natural Alternative Power program (SNAP). Demonstration projects are vital to confirming the viability of biomass, solar, and wind technologies and the integration of systems prior to large scale replication in Alaska. The photovoltaic panels have attracted much interest from visitors to the RTF and those riding by on the Alaska Railroad. We thank BP, the State of Alaska and the Fairbanks North Star Borough for contributions that have helped make this project possible.

Sustainable Northern Shelters Project Progresses

In mid-June, CCHRC sent a team of designers to the remote Nunamiut Inupiat village of Anaktuvuk Pass in the Brooks Range to work with community members on the Sustainable Northern Shelter Project. The goal is to design and construct an affordable, durable, and culturally-appropriate home suited to the needs of this unique community.

Over the course of three days Elders, young families, village leaders and designers looked at issues and developed strategies that would lead to a prototype home design to be built next spring in the village.

The home will implement an innovative construction assembly that will maximize durability, warmth, and indoor air quality while minimizing shipping, labor, and energy costs. The team will test these new technologies in a test module constructed at the Research and Testing Facility in Fairbanks this fall (see p. 1 for more information), and will return to Anaktuvuk Pass in November to present the results of design development to the community for further review and modification.

The village hasn't seen a new home built in over ten years. The goal of the SNS project is to build up to five in the next two years. The small, energy-efficient home has a target price of $100-$150,000. Anaktuvuk Pass is not accessible by road or barge, thus shipping, fuel, and construction costs have thwarted previous attempts to assuage the housing shortage common in much of rural Alaska. This project is aimed to fill that need.

The entire process has been filmed by CCHRC staff and will be available to the public later this year. The CCHRC hopes that the film can be used as a tool for other villages across rural Alaska and Canada to begin processes that will improve housing conditions in their own communities.

The CCHRC design team is partnering with Ilisagvik College in Barrow, thanks to the support of US Economic Development Administration. The college's construction science faculty will train interested villagers in the skills necessary to build the prototype. In addition, the project is supported by partnerships with Tagiugmiullu Nunamiullu Housing Authority (TNHA), Alaska Housing Finance Corporation (AHFC), Lifewater Engineering, Interior Regional Housing Authority, Canada Mortgage and Housing Corporation, GW Scientific, Remote Power Inc., Engineering and Environmental Internet Solutions, Fairbanks North Star Borough, UAF Toolik Field Station, and the Alaska State Museum.

"Best Practices" Videos in the Works

CCHRC staff are working on two videos that will feature "Best Practices" for building a new home and retrofitting an existing structure. These videos will be made available to the building community and to "do-it-yourselfers" who wish to better understand the process.

Fairbanks residents Gail Koepf and Rocky Reifenstuhl are building a **new home** and want to make it as energy efficient and 'green' as they can. CCHRC is consulting on the project to help them achieve their goal, and filming the process for the first of two "Best Practices" videos. The house will be a modest size for two people, with a wood-fired boiler, the REMOTE wall system, a gray water collection system, and highly efficient windows and other energy efficient features. After the project is complete, CCHRC will publish a "Best Practices" pamphlet and video on the construction. The pamphlets and video will be available at the CCHRC facility, will be used for CCHRC presentations, and could be featured on the web.

The second "Best Practices" video features the **retrofit** of an older building, the Northern Alaska Environmental Center—once a single family home. The goal of the project is to show how families can use available funding to improve their home's energy efficiency and save money in the long term. Energy savings will be made by reducing the building's carbon footprint, cutting down on fuel consumption. This will ultimately save the organization money, too. To help accomplish this, their plan includes installing energy efficient windows, a REMOTE wall, and additional roof insulation among other improvements. CCHRC is producing a video documentary on the project to help homeowners and builders plan for the most energy efficient retrofit of an older home. The video will air as a program on a local television station this fall. CHRC staff members Ty Keltner, Kristen Thomas and Dave Shippey are working on these projects.

Message from the President

Jack Hebert

Energy Crisis? Rather than a short lived crisis, I believe that this period in history is the new reality we must live in. Dependence on a single, sole diminishing resource as the fuel that runs a society is ending quickly, but not easily. Finding solutions to diversify energy resources, conserve energy, and optimize efficiencies in all elements of our lives will demand significant contributions from the best of every nation.

The current energy "reality" will require vision and creativity. Alaska, our country and the world will need to revisit the definition of success, where the good life is measured not on quantity but quality. Where worth is not determined by what we have materially accumulated but by the immeasurable riches of a healthy family, neighborhood, community and natural environment. In this "reality" the principals of sustainability for our species and the diverse life of this beautiful planet must come first.

The timeliness of the establishment of the Cold Climate Housing Research Center—and the contributions we can make—are a responsibility that we in the organization take very seriously. Despite the cool wet weather that most of Alaska has experienced, and the many challenges all of us will face as winter returns to the top of the world, your energized team at the Cold Climate Housing Research Center is actively working to find new building and energy solutions.

Your organization is attracting some very fine new talent. CCHRC has hired nearly a dozen remarkably bright, hard working Alaskans in the last quarter to add strength to our team, generate results, and advance our mission. Our financial foundation is sound and growing as CCHRC's agenda expands to meet accelerating needs in Northern communities. Maintaining a balance in our operations, while allowing programs to develop that reflect our mission, is no easy task. I read the CCHRC mission every day: "Promoting and advancing the development of healthy, durable, and sustainable shelter for Alaskans and other circumpolar people." I will not let us drift from that mission, nor will I hesitate to move that mission toward its potential. Collective vision, optimism and resolve are the fuel we need to drive us and following generations to a bright future.

We, our children and their children face an energy "reality" that will not diminish any time soon. All of us have a great opportunity to build a future that insures a good quality of life for everyone while sustaining and improving the health of the planet. Alaska's Cold Climate Housing Research Center will do its part. Your support and interest will strengthen what we do.

My best to each of you as the last days of autumn hint of the winter to come.

COLD CLIMATE HOUSING RESEARCH CENTER
CCHRC

1000 Fairbanks Street
P.O. Box 82489
Fairbanks, AK 99708-2489

Phone: 907-457-3454
Fax: 907-457-3456
Email: info@cchrc.org

Click on our new website:
www.cchrc.org

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http://www.cchrc.org/membership.html.

ENERGY FOCUS—*a Fairbanks Daily News-Miner column with articles contributed by CCHRC.*


A3

ENERGY FOCUS

Lighten your electric bill — install new lights

Editors note: This is the first of weekly energy conservation features provided by local agencies and individuals, including Alaska Cooperative Extension, Golden Valley Electric Association and Cold Climate Housing Research Center. Each will focus on saving energy, recycling and other sustainable-community practices for individuals to use at home or work. Columns are coordinated through the FOCUS Fairbanks group and Lori Hanemann, Local Issues Coordinator at the Northern Alaska Environmental Center. Suggestions on topics to address are welcome from readers at ourlives@newsminer.com.

By JOHN DAVIES
Cold Climate Housing Research Center

There are many different types of energy-efficient lighting available. For indoor use, typical choices involve replacing incandescent bulbs with compact fluorescent lights (CFL) or old fluorescent tubes (T12) with newer ones (T8 or T5).

LED lighting is available for some uses such as holiday and closet lighting, exit signs, work lights, etc., but for general illumination they are still somewhat expensive and limited in availability.

Replacing incandescent bulbs with CFLs is as easy as unscrewing the old bulb and replacing it with a CFL of comparable light output, usually measured in lumens. The energy savings can be 50-80 percent, and most bulb types are readily available.

This is a classic no-brainer, although there are some limitations — they don't work very well at low temperatures, if at all, and switching the light off and on many

Photo courtesy Cold Climate Housing Research Center
Dave Shippey, a Cold Climate Housing Research Center building manager, installs an energy-efficient lightbulb.

Energy conservation features provided by CCHRC are run every Thursday in the local section of the paper. Articles focus on energy issues. The articles are also available on our blog and include:

For Full Articles Visit:
http://www.cchrc.org/EnergyFocus/index.html

The CCHRC Report is sent to members, funding agencies and to those requesting information about CCHRC. Response to this report is welcome.

The Industry Advisory Council (IAC) is comprised of CCHRC corporate members and will offer advise on industry research needs. The Research Advisory Committee (RAC) is appointed by the Board of Directors to advise CCHRC on research. Contact a RAC committee member in your area with your input and concerns.

Research Advisory Committee
Regional Chairs

Southeast	Marquam George 8752 N. Douglas Juneau, AK 99801 (907) 796.6124 marquam.george@uas.alaska.edu
South Central	James Jackson P.O. Box 92301 Anchorage, AK 99509 justine@gci.net
Interior	Mike Musick P.O. Box 170 Ester, AK 99725 (907) 479-6190 mikemusick@gci.net
Bush	Jess Dilts P.O. Box 22 Hydaburg, AK 99922 (907)285-3666 jdilts@aptalaska.net