



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.*

Internet Web Site:  
[www.cchrc.org](http://www.cchrc.org)

# CCHRC REPORT

Volume 7 Issue 3

A publication of the Cold Climate Housing Research Center

October 2007

## Corporate Members

Alaska Housing Finance Corp.  
BP  
Capitol Glass/Northern Windows  
Dryvit Systems Inc.  
Geo-Watersheds Scientific  
Hébert Homes  
Lucky Distributing/Monitor  
Products Inc.  
Pioneer Glass  
Remote Power Inc.  
Siemens  
Spenard Builders Supply  
Thermo-Kool of Alaska

## Foundation Members

Denali State Bank  
Hall Quality Homes  
Heat-Line, A Division of  
Christopher MacLean  
Mt. McKinley Bank  
NCP Design/Build, Ltd  
Spinell Homes  
Usibelli Foundation  
Wells Fargo Bank

## Board of Directors

### Chair

*N. Claiborne Porter, Jr., AIA*

### Vice-Chair

*Charles Dearden*

### Treasurer

*Brent LeValley*

### Secretary

*Richard Green*

### Members

*Steve Burnett*

*Dave Dillard*

*Oliver Drerup*

*Jess Hall*

*Wendy Knight*

*Mark LaLiberte*

*Chuck Renfro*



*Composite photo of CCHRC with drawing of planned Solar Photo-Voltaic Panels*

*Setting up actual panels during snowfall on October 19th 2007*



*Alaska Style*

On October 6, 2007 Fairbanks joined some 100,000 people across the U.S. in learning about renewable energy and energy efficiency during the 12<sup>th</sup> annual American Solar Energy Society's National Solar Tour in Alaska. CCHRC took the lead to coordinate the Solar Tour in Fairbanks in cooperation with the Golden Valley Electric Association (GVEA) and the Cooperative Extension Service (CES).

About a dozen SNAP (Sustainable Natural Alternative Power) producers volunteered to place their homes and renewable energy systems on the Solar Tour. The Chena Hot Springs Resort sponsored tours of their geothermal power and heated facility followed up with an all local food banquet produced at Chena or by local Future Farmers of America. All proceeds from the dinner went to support FFA.

The Fairbanks Solar Tour began at the CCHRC's Research and Test Facility (RTF). CCHRC is installing 10 kw of tracking Photovoltaic solar electric panels. When combined with a future wood fired combined heat and power (CHP) unit the CCHRC Research and Testing Facility is expected to be a net producer of electricity and to consume zero fossil fuels for electricity and heat.

About 60 visitors braved the city's first snowfall to visit CCHRC for the Solar Tour. The SNAP producers received fewer visits due to difficult driving conditions. Next year the Solar Tour will move to September and coincide with the Renewable Energy Fair at Chena Hot Springs.

## Report on Arctic Energy Summit Technology Conference

John Davies

The Arctic Energy Summit (AES) Technology Conference, sponsored by the U.S. Department of State and organized by the Institute of the North, was held October 15 - 18, 2007 in Anchorage, Alaska.

The premier energy conference of the International Polar Year, the AES Technology Conference focused on the theme *The Arctic as an emerging energy province*, with energy experts from the Russian Federation, Canada, Norway, Finland, Iceland, the U.S. and other nations discussing issues on energy challenges and opportunities in the extractive and renewable fields, as well as tackling how to provide affordable energy to remote communities of the Arctic.

The Arctic is estimated to hold more than 25 percent of the world's undiscovered oil and natural gas resources, yet most of the region is remote and sparsely populated, and host to unique and fragile ecosystems. The future of many rural communities will depend on improving energy efficiency and developing renewable energy resources to replace costly and unhealthy fossil fuels.

High-level keynote speakers on energy-related issues presented on the conference opening day which was followed by 2 days of presentations and exhibits on both renewable energy opportunities and traditional extractive energy sources within the Arctic.

These technical presentations focused on the following topics:

1. Extractive energy development (fossil fuels)
2. Renewable power, especially in extreme remote areas
3. Rural issues related to energy development
4. Environmental, socio-economic & sustainability impact of energy projects in the Arctic.

The conference also held panel sessions on Arctic transportation, infrastructure and the impact of climate change, the Arctic's role in world energy security, impacts of energy development on Native peoples of the Arctic and the environ-

mental challenges of energy development, among other topics.

John Davies and Ryan Colgan represented CCHRC at the conference. John gave a presentation on the CCHRC *Hybrid Micro-Energy Project* and Ryan participated in a panel discussion of *Development of Rural Energy in the Arctic*.

There were many presentations on both fossil fuel and renewable energy resources. Ryan and I focused mostly on the renewable resource presentations; they included the following highlights:

- Wind is the most cost-effective alternative today and wind-diesel hybrids are being installed many locations, mostly in western Alaska. The most developed system is in Kotzebue with 17 wind turbines installed and generating about one megawatt of wind power.
- Solar PV is most attractive for smaller off-grid systems, but is still too expensive for large systems. Solar thermal systems have not been utilized very extensively.
- There is a very large geothermal potential in Alaska in a belt extending from Chena Hot Springs to Pilgram Hot Springs near Nome and along the entire Aleutian Island-Alaska Peninsula arc to Mt Spurr near Anchorage. Development of this resource will depend upon public policies that provide assistance in delineation of the hot zones and financing for the needed infrastructure.
- Storage hydro, in-stream hydro, and tidal flow all can provide significant electrical energy locally and regionally. Ocean Renewable Power Co. plans to test a very promising tidal flow system in Cook Inlet.
- Bio-mass combustion and gasification systems show great promise in providing direct space heat and in hybrid systems with existing diesel generators.

Information on all papers available at: [www.cchrc.org](http://www.cchrc.org)

## CCHRC Testing Wood Burning Systems

Dave Misiuk

Particulate testing of energy efficient wood burning systems is part of our Wood Energy Project, funded through the Fairbanks North Star Borough. Norbert Senf, president of the Masonry Heater Association, a Certified Heater Mason and designer of the first heater core developed in North America, is here helping Dave Misiuk set up a system to test particulates and calibrate equipment to give a result which will relate to the number the EPA uses for measuring particulates. The particle mix in most U.S. cities is dominated by fine particles (less than 2.5 micrometers in diameter) generated by combustion sources. CCHRC testing will catch particles from 10 to less than 2 micrometers in diameter. These particles pose the greatest health concern because they can pass through the nose and throat and get into the lungs.

*A Tigchel heater from the Netherlands and a heater core designed in the 1700s and faced by local masons await testing in the RTF North Lab*



## CCHRC Update

Gail Koepf

As you can see by the front cover picture, winter has arrived in interior Alaska. Our Research and Testing Facility (RTF) has been open for a year now & we are getting data from the building out to the public. Visit our website for updated data. [www.gwscientific.com/cchrc/rtf\\_data/REMOTE/remote.html](http://www.gwscientific.com/cchrc/rtf_data/REMOTE/remote.html) takes you to monitoring results from RTF walls sections. A CCHRC Snapshot on the Cold Weather Concrete demonstration poured & monitored here last spring is due out soon.

The RTF continues to host numerous events for the public and building professionals. A weekly tour for the public continues at 2:00 on Thursdays, scheduled tours for groups and the National Solar Tour. Meetings held here include: US Green Building Council of Alaska, Interior Alaska Building Association, the 9th International Conference on Permafrost, and borough meetings such as the Interior Issues Council and Cost of Energy Meetings. An Oil-Fired Condensing Boiler Technical Seminar is being held here this week along with a BP reception & tours for the Alaska Federation of Natives (AFN) and the University of the Arctic.

To keep up with the pace and to better utilize the building we are very happy to welcome the following new staff members:

**Ryan Colgan** was born and raised in Fairbanks, Alaska where he studied political science and economics at the University of Alaska Fairbanks. He worked for six years as staff in the Alaska State Legislature during which time he primarily focused on energy and natural resource issues. He has also worked as the Executive Administrator of the Alaska Gasline Port Authority, and the Biomass Energy Project Liaison for the Fairbanks North Star Borough. Ryan currently serves as the Vice-Chair of the Fairbanks North Star Borough Planning Commission and is working with CCHRC as an Energy Project Development Specialist.

**Kristen Thomas**, our new Information Technology Specialist, writes the following: My father was a general contractor so I grew up in the building community. My first jungle gym was a bulldozer and I spent a lot of my childhood on construction sites. As an adult I have always been interested in construction but nothing ever clicked with me until I discovered green building. For the longest time I couldn't figure out how to put my two passions of computer technology and sustainable building together until I found this position. I am so excited to be working with people who share my interests and be part of such a great organization.

**Becky Morgan** has joined our staff half time as Outreach Librarian. Becky is from the mountains of western North Carolina & has a degree in History from the University of Montana, a Masters in Librarianship from the University of Washington and has worked in Guam, Montana and California before recently arriving in Fairbanks. Becky will be managing our Builders Resource Library and also helping with outreach. She enjoys organizing and helping people find the information important to them.

**Becky Warren** is a part time student intern helping with research. She is applying to join the Regional Resilience and Adaptation (RAP) graduate program at UAF. **Marisa Potter** is a freshman student at UAF and helping out part time with reception duties.

CCHRC welcomes its members and Board of Directors to Fairbanks for the annual General Membership Meeting and a Board Meeting on October 27th, the day before our **Sustainable Northern Shelter Forum** opens. The various dates were set to encourage our members and directors and AFN Convention participants to attend this important Forum hosting an international group of experts speaking on circumpolar housing issues. Elections will be held for 4 seats on our 11 member board. An Industry Advisory Council meeting is also scheduled on October 27th.



## CCHRC Houses the Alaska Sustainable Energy Center

Ryan Colgan



*Consortium forms to  
Connect Alaskans to  
Sustainable Energy  
Solutions*

October marked the opening of the Alaska Sustainable Energy Center (ASEC); a consortium effort of CCHRC, the University of Alaska Fairbanks, the Fairbanks Economic Development Corporation (FEDC), and the Fairbanks North Star Borough (FNSB).

The ASEC is established to connect Alaskans and Alaskan communities to sustainable, cost effective, and environmentally sound energy models which involve both energy production and energy efficiency. "The ASEC is a gateway between industry, consumers, researchers, and those who have the tools necessary to implement projects," said Jack Hébert, President and

CEO of CCHRC, and board member of the ASEC.

A key element of ASEC's operations will be to demonstrate, test, and research both commercial and pre-commercial industry products.

"The demonstration, testing, and research of energy systems by this consortium of Alaskans equates to an 'Alaska Tough' stamp of approval. Alaskans need to know that a product is going to stand up to the extremes of our environment. If Alaskans are unsure, they will be unwilling to adopt new products even if it might save them money," said Jack Hébert.

The interim ASEC office is located at the CCHRC Research and Test Facility (RTF). Future plans call for the ASEC to occupy a standalone facility adjacent to CCHRC. The ASEC can be reached at (907) 457-3454 or by emailing Ryan Colgan at [ryan@cchrc.org](mailto:ryan@cchrc.org).



**COLD CLIMATE HOUSING RESEARCH CENTER**

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

Phone: 907-457-3454  
Fax: 907-457-3456

**Internet Web Site:**  
**[www.cchrc.org](http://www.cchrc.org)**

*Welcome new and renewing members*

- |  |                                  |
|--|----------------------------------|
| <b>Burnett Construction</b>                    | <b>Tilly &amp; Company, Ltd.</b> |
| <b>Wisdom &amp; Associates</b>                 | <b>Corbond Corporation</b>       |
| <b>3-2-1 Construction</b>                      | <b>Alaska Renovators</b>         |
| <b>Award Windows Inc.</b>                      | <b>Homan Inc</b>                 |
| <b>Bakk Insulation</b>                         | <b>Florcraft</b>                 |
| <b>Building Knowledge</b>                      | <b>Phil Kaluza</b>               |
| <b>Mathew Stais Architects</b>                 |                                  |
| <b>Ketchikan Indian Community</b>              |                                  |
| <b>Quintessence Corporation</b>                |                                  |
| <b>American Institute of Architects</b>        |                                  |
| <b>Anchorage Neighborhood Housing Services</b> |                                  |

**Membership: Please make sure your membership is updated. Membership level information and an application is available on our website at: <http://www.cchrc.org/membership.html>.**

**Message from the President/CEO Jack Hébert**

Dear Members and Supporters:

As you see from reading the CCHRC Report, your Housing Research Center continues to expand its agenda to address our core mission. The challenges we face in maintaining, let alone improving, the affordability of healthy, durable and sustainable shelter in Alaska can seem daunting as costs of energy rise. This is a global problem, one that will require a deep commitment on the part of individuals, institutions and governments if effective solutions are to be developed and initiated. CCHRC's role is timely and important. Buildings are not isolated components of our communities. The infrastructure and related energy required for building operation must be sustainable and practical. Where possible the whole system needs to be integrated. Buildings can incorporate in their design renewable energy production, water and wastewater recycling, conservation, energy efficiency and durability. Your Building and Infrastructure Research and Test Facility is a tangible example of what is possible. Alaska is full of pioneers and innovators. I believe that spirit is the strongest asset we bring to the family of Northern People.

The *Sustainable Northern Shelter Forum*, beginning Sunday October 28th, will allow the opening of a working dialogue between all that share a love of the Circumpolar World. This Forum will be a catalyst for a productive and collaborative research agenda that will result in tangible, positive progress toward applied solutions. I hope many of you will be able to attend in person or virtually.

My very best to each of you,

**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 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*

- |                      |   |
|----------------------|---|
| <b>Southeast</b>     | <i>Marquam George<br/>8752 N. Douglas<br/>Juneau, AK 99801<br/>(907) 586-2060<br/>blu@alaska.com</i>        |
| <b>South Central</b> | <i>Bob Lutje<br/>P.O. Box 111646<br/>Anchorage, AK 99511<br/>(907) 345-8861<br/>bob.lutje@acsalaska.net</i> |
| <b>Interior</b>      | <i>Mike Musick<br/>P.O. Box 170<br/>Ester, AK 99725<br/>(907) 479-6190<br/>mikemusick@gci.net</i>           |
| <b>Bush</b>          | <i>John Woodward<br/>P.O. Box 3407<br/>Homer, AK 99603<br/>(800) 301-5349<br/>panuktuk@yahoo.com</i>        |