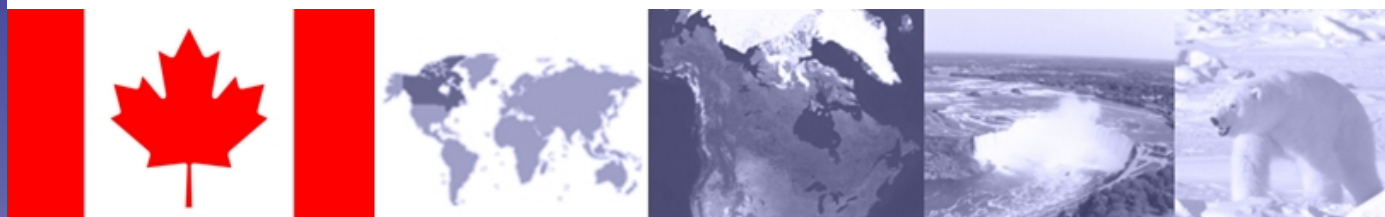


## Economical heating and cooling systems for low energy houses



### Canada

Canada is represented by the **Laboratoire des Technologies de l'Énergie - LTE** (Energy Technologies Laboratory), a division of the Hydro-Québec Research Institute.

**Hydro-Québec** is one of the largest Canadian utilities and one of the largest hydro-electric utilities in North-America.

#### National team leader



#### Vasile Minea, Ph.D.

Hydro-Québec Research Institute  
 Laboratoire des technologies de l'énergie (LTE)  
 Chercheur - Utilisation de l'énergie  
 600, avenue de la Montagne  
 Shawinigan, G9N 7N5  
 Phone: (819) 539-1400 (1507)  
 Fax: (819) 539-1409

[minea.vasile@lte.ireq.ca](mailto:minea.vasile@lte.ireq.ca)

[www.ireq.ca](http://www.ireq.ca)

### Canadian national project

The national project of Canada presents EQuilibrium Housing Pilot Demonstration Initiative and NOVOCLIMAT Program.

EQuilibrium housing integrates high-performance, energy-efficient passive solar design and commercially available on-site renewable energy systems such as solar heating, air and ground-source heat pumps.

EQuilibrium housing also incorporates the principles of occupant health and comfort, affordability, resources conservation and reduced environmental impacts. These significantly reduce greenhouse gas emissions and minimize the detrimental environmental impacts of housing on water, land and air.

The goals of EQuilibrium housing is to build the capacity of Canada's housing and renewable energy industry sectors to create high-quality housing across the country over the long term and achieve acceptance of low-impact healthy houses and sustainable communities. Twelve demonstration projects have been selected by Canada Mortgage Housing Corporation throughout Canada.

The NOVOCLIMAT label is a voluntary program of the "Agence de efficacité énergétique (EAE)" (Energy efficiency agency) of the province of Québec (Eastern Canada) and sets requirements concerning energy consumption, indoor comfort, building materials and building quality.

Results of the national Canadian project will include:

- Description of a number of key features as climate specific design, energy-efficient construction and renewable energy devices (PV, solar thermal and ground-source heat pumps)
- Calculation and control methods for integrated low-energy systems
- Economic and environmental evaluations
- In-field testing/monitoring methods and equipment and energy results
- Best practices in cold climates
- Future developments and R&D opportunities
- Proposals for design guidelines for integrated heat pump systems in low-energy houses

## Canadian links

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### Canada Mortgage and housing corporation

Information in English and French at:

 <http://www.cmhc-schl.gc.ca>



### AEE- Agence de l'efficacité énergétique du Québec

The mission of the AEE is to promote the energy efficiency and to develop new technologies for all energy sources and in all sectors of activity.

The Agency develops and promotes energy efficiency program and ensures their implementation and monitoring.

More information at :

 <http://www.aee.gouv.qc.ca>



### NOVOCLIMAT

Building label of Quebec province of Canada for low energy houses based on the Canadian building standard R-2000. Information to the NOVOCLIMAT standard in French at:


 <http://www.aee.gouv.qc.ca/habitation/novoclimat>



### R-2000 Building Standard

R-2000 is made-in-Canada home building technology with a worldwide reputation for energy efficiency and environmental responsibility. The R-2000 Standard is a series of technical requirements for new home performance that go way beyond building codes. Every R-2000 home is built and certified to this standard.

Information to the R-2000 standard in English at:

 <http://r2000.chba.ca/>



### Canadian GeoExchange Coalition

Members: BC Hydro; Hydro-Quebec; Manitoba Hydro; Milton Hydro; SaskPower and Yukon Energy Corporation Partners: Earth Energy Society; Geothermal Heat Pump Consortium; Natural Resources Canada

Information in English at

 <http://www.geo-exchange.ca/>



## Canadian Solar Building Research Network (SBRN)

The Canadian Solar Building Research Network (SBRN) aims at developing the solar-optimized buildings as integrated advanced technological systems that approaches net-zero energy consumption while being cost effective and comfortable.

The SBRN was launched in 2006 by Natural Sciences and Engineering Research Council of Canada. SBRN includes researchers and experts from Canadian universities, Natural Resources Canada, Canada Mortgage and Housing Corporation and Hydro-Québec. The budget of the Network is about C\$6 million, including supports from the Net-Zero Energy Home Coalition and Canadian Solar Industries Association.

More information in English and French at

 <http://www.solarbuildings.ca>



## Concordia University - Montréal

Concordia is a large University in Montreal (Quebec), Canada. Their more than 180 undergraduate programs and 70 programs leading to Master's and doctoral degrees are divided into four Faculties, of whom Arts and Science, and Engineering and Computer Science. In 2007, Hydro-Québec donates 8 million C\$ to Concordia University's of Engineering and Computer Science.

Information in English and French at:

 <http://www.concordia.ca/>

## IEA HPP Annex 32

IEA HPP Annex 32 is a corporate research project on technical building systems with heat pumps for the application in low energy houses. The project is accomplished in the Heat Pump Program (HPP) of the International Energy Agency (IEA).

Internet: <http://www.annex32.net>

