



ENERGY TECHNOLOGY R&D **HIGHLIGHTS** for COMMUNITY PLANNING

IN THE NEWS

**INTEGRATED COMMUNITY ENERGY SOLUTIONS -
A ROADMAP FOR ACTION**

EQUILIBRIUM™ COMMUNITIES INITIATIVE

PLANNING TOOLS

**AN INTEGRATED PLANNING PROCESS
FOR NEIGHBOURHOOD DEVELOPMENT**

URBAN ENERGY ARCHETYPES

COMMUNITY ENERGY CASE STUDIES

COMMUNITY ENERGY TECHNOLOGIES - RESEARCH IN PROGRESS

**LEADERSHIP IN COMMUNITY SOLAR HEATING SYSTEMS:
DRAKE LANDING SOLAR COMMUNITY**

**ENERGY CASCADES AND LOW ENERGY
HEAT FOR NET-ZERO COMMUNITIES**

**OVERVIEW OF RESEARCH
IN INTEGRATED ENERGY SYSTEMS**

**EXPLORING GEOGRAPHIC INFORMATION SYSTEMS (GIS)
TO CHARACTERIZE AND MAP ENERGY**

IN THE NEWS

INTEGRATED COMMUNITY ENERGY SOLUTIONS

A Roadmap For Action:

The Council of Energy Ministers released *Integrated Community Energy Solutions – A Roadmap for Action*, on September 1, 2009, at its annual meeting. The Roadmap presents the role that Canada's federal, provincial and territorial governments can play to advance Integrated Community Energy Solutions (ICES). The Roadmap sets out a broad strategy for action and provides a Menu of Tools that federal, provincial and territorial governments can choose from, as they see fit, to advance community energy performance and complement existing sectoral energy efficiency activities. This collaborative effort was led by Natural Resources Canada and drew on the technical base and industry knowledge of CanmetENERGY and the expertise of the CanmetENERGY Communities team.

*For more information, contact
Renée Lazarowich at renee.lazarowich@nrcan.gc.ca*

EQUILIBRIUM™ COMMUNITIES INITIATIVE

Natural Resources Canada's CanmetENERGY is working to accelerate the development of sustainable communities that are energy efficient, economically viable and vibrant places to live. CanmetENERGY is an equal partner with CMHC in the \$4.2 million Initiative. The selected proponents (approximately 6) will have access to CanmetENERGY's energy expertise, with the aim of improving energy performance in the selected Improvement Projects, and of monitoring the Showcase Projects.

*To be kept informed of the Initiative's progress, contact us at
equilibrium.communities@nrcan-rncan.gc.ca
to be added to the distribution list.*

PLANNING TOOLS

AN INTEGRATED PLANNING PROCESS FOR NEIGHBOURHOOD DEVELOPMENT

CanmetENERGY's pilot study provides proof that all parties can benefit when they use an integrated planning process to developing sustainable neighbourhoods.

Collaboration throughout the planning process - between developers, the municipality and other stakeholders - can increase the opportunity to evaluate and select sustainable alternatives for neighbourhood development. It can also reduce many barriers to their implementation. CanmetENERGY's integrated approach for neighbourhood planning was piloted at the mixed-use Emerald Hills Urban Village in Strathcona County, Alberta. The approach is documented in the recently published book, *SuNLiving: Developing Neighbourhoods with a One Planet Footprint*, and is available, along with the results, on the website, sunliving.ca (in both English and French) for use by other communities.

*For more information, contact
Renée Lazarowich at renee.lazarowich@nrcan.gc.ca*

URBAN ENERGY ARCHETYPES

Establishing the Community Energy Signature:

CanmetENERGY's Urban Archetypes Project established an understanding of how different neighbourhoods use energy with the objective to help improve the ability of municipalities to incorporate energy criteria in their planning process.

The project explored, in thirty-one neighbourhoods within eight cities across Canada, how urban form (land use and infrastructure) influences vehicle transportation energy and average household energy consumption. CanmetENERGY selected a set of characteristics (urban indicators) to define neighbourhoods, simulated their energy use, and investigated the relationship between those two facets.

The Archetypes are available for download, in both English and French, from the Buildings & Communities section of CanmetENERGY's website canmetenergy.nrcan.gc.ca. In the near future, the methodology for developing the neighbourhood energy signature, and an analysis of the relationship between the urban indicators and the household energy use, will also be posted.

*For more information, contact
Jessica Webster at jessica.webster@nrcan-rncan.gc.ca*

PLANNING TOOLS

COMMUNITY ENERGY CASE STUDIES

Community-scale developments provide municipalities and developers with options for energy reductions, along with unique financial and operational models that are not viable at the component level of individual houses or buildings.

CanmetENERGY brings you a series of case studies portraying the decisions already made by numerous communities across Canada. The cases provide information about each project's context; energy decisions; drivers and rationale to do the project; timelines and status; descriptions, milestones, and considerations for implementation; costs and financing; relationship to other best practices; and lessons learned. The cases are separated into two categories: District Energy or Community Energy Plans.

To access the case studies in pdf format, in English or French, visit the Buildings & Communities section of CanmetENERGY's website canmetenergy.nrcan.gc.ca.

Contact anna.munro@nrcan.gc.ca if you have a community energy story that you would like to share through our website.

COMMUNITY ENERGY TECHNOLOGIES
- RESEARCH IN PROGRESS

**LEADERSHIP IN COMMUNITY SOLAR HEATING SYSTEMS:
DRAKE LANDING SOLAR COMMUNITY**

The award-winning Drake Landing Solar Community (DLSC) is a master planned neighbourhood of 52 homes in the Town of Okotoks, Alberta, Canada that has successfully integrated Canadian energy efficient technologies with solar thermal energy.

DLSC is heated by a district system designed to store abundant solar energy underground during the summer months and distribute the energy to each home for space heating needs during winter months.

Completing its second year of operation in 2009, the system is on target to fulfill 90% of each home's space heating requirements from solar thermal energy by 2012 – an unprecedented achievement anywhere in the World.

In addition to the solar space heating system, each home includes an independent solar hot water system that meets 60% of the domestic hot water needs.

For more information, visit the Drake Landing Solar Community website at www.dlsc.ca or contact Doug McClenahan at dmcclena@nrcan.gc.ca.

ENERGY CASCADES AND LOW EXERGY HEAT FOR NET-ZERO COMMUNITIES

CanmetENERGY is actively researching major integrated energy systems including distributed cogeneration, heat and electricity storage, control systems and strategies for low-exergy systems for clusters/community applications, considering low-grade and waste heat availability and load diversity, with proper matching of energy supply quality to energy requirements.

The research will provide a clear path to the most sustainable community systems and equipment and clarify their ability to make clear decisions with regards to financial economy, overall energy inputs and community impact, all based on solid experimental data and modelling.

For more information, contact Skip Hayden at skip.hayden@nrcan-rncan.gc.ca

COMMUNITY ENERGY TECHNOLOGIES
- RESEARCH IN PROGRESS

OVERVIEW OF RESEARCH IN INTEGRATED ENERGY SYSTEMS:

CanmetENERGY's experts are:

- Pushing real efficiency limits of fuel-fired systems in residential and commercial building applications, with the goal (and regs) that all fuel-fired systems in Residential & Commercial applications be condensing.
- Working closely with industry (utilities, users, manufacturers), provinces, standards & reg orgs.
- Developing efficiency standards and efficiency policy incentives.
- Using alternate renewable fuels and energy carriers including alcohols, bio-oils, H₂, MSW, and NH₃.
- Further integrating advanced systems and energy cascades.
- Further integrating, renewables and storage, including PHEV.
- Refining combined generation of electricity and heat, with overall efficiencies three times that of a central thermal generating station and with a 6-fold reduction in GHG's. They will be designed to supply all the space and water heating requirements of a dwelling and most, if-not-all, of the electricity, while still capable of sending electricity back to the grid.
- Refining technologies such as the stirling, fuel cell, modulating engines and thermophotovoltaics.

For more information, contact

Skip Hayden at skip.hayden@nrcan-rncan.gc.ca

COMMUNITY ENERGY TECHNOLOGIES
- RESEARCH IN PROGRESS

**EXPLORING GEOGRAPHIC INFORMATION SYSTEMS (GIS)
TO CHARACTERIZE and MAP ENERGY:**

CanmetENERGY is exploring the integration of energy information into Geographic Information Systems (GIS) as a means of incorporating energy consumption information into decisions on municipal land use assignments. These maps will allow planners to model future energy performance when assessing future land use scenarios, population projections and potential energy efficiency improvements.

Smart Growth on the Ground is being used to develop Prince George's downtown redevelopment plan. CanmetENERGY's energy characterization and mapping is serving to a) establish residential energy performance targets, and b) to expand Smart Growth on the Ground's scenario analysis to include energy implications. The energy maps developed by CanmetENERGY will include a visual overview of the current residential building stock in the city along with its respective simulated energy use. Work is ongoing with the City of Prince George to make the energy maps available in a format useful for integration into their Official Community Plan review process.

A preliminary Foundation Research Bulletin can be accessed on the Smart Growth Website at:

http://www.sgog.bc.ca/uplo/PG_6_%20Residential_Energy_Characterization.pdf

For more information on the Prince George Project, contact Jessica Webster at jessica.webster@nrcan-rncan.gc.ca.