

Community Energy Planning Mission

Alberta, 2007

Mission Report

November 2007



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**Federation of Canadian Municipalities
Community Energy Planning Mission to Alberta
July 28 to August 3, 2007**

Background	3
Overview.....	4
The Alberta context	4
Site visits and presentations	5
Destination: Edmonton, Alberta	5
CO ₂ RE program	5
Riverdale NetZero Project	5
Edmonton transit technology	6
Mill Woods Police Station	6
Edmonton Waste Management Centre	6
Edmonton's waste management system.....	7
Edmonton's municipal solid waste gasification project.....	7
Alberta Association of Municipal Districts and Counties.....	8
Destination: Strathcona County, Alberta.....	9
Centre in the Park.....	9
Community Energy Centre	9
Emerald Hills Urban Village.....	10
Alberta Research Council.....	10
Integrated Manure Utilization System.....	11
Sand Recycling Ltd.....	11
Destination: Town of Olds, Alberta	12
Municipal Sustainability Planning Pilot Project	12
OCSI Biofuel Technology Centre	12
Destination: Calgary, Alberta.....	13
2006 Climate Change Action Plan.....	13
eCycle Solutions.....	14
Calgary Water Centre.....	14
Climate Change Central	15
Destination: Airdrie, Alberta	15
Airdrie Environmental Education Centre	15
Destination: McBride Lake, Alberta.....	16
McBride Lake Wind Farm	16
Destination: Okotoks, Alberta.....	16
Sustainable Okotoks.....	16
Mission delegates	17
FCM staff	20

Community Energy Planning Mission to Alberta July 28 to August 3, 2007

Background

Annual Community Energy Planning Missions are organized by the FCM Centre for Sustainable Community Development (CSCD). The Centre offers resources for municipal governments to achieve their sustainable development goals, including the Green Municipal Fund (GMF).

The Green Municipal Fund

FCM's Green Municipal Fund (GMF) offers a range of resources and services that specifically address the sustainable community development needs of municipal governments. The Fund provides low-interest loans and grants, builds capacity, and shares knowledge to support municipal governments and their partners in developing communities that are more environmentally, socially and economically sustainable.

The Government of Canada endowed FCM with \$550 million to establish GMF to provide a long-term, sustainable source of financing for municipal governments and their partners. GMF operates at arms-length from the federal government, and supports municipal governments, and their partners, to improve air, water and soil quality, and to address climate change.

To date, over 650 GMF studies, field tests, plans and capital projects have been approved for funding of \$380 million, leveraging over \$1.9 billion of economic activity in nearly 300 communities across Canada.

For more information, visit www.sustainablecommunities.fcm.ca.

GMF funding is complemented by a Capacity Building program, which shares the knowledge and experience gained by municipal leaders through GMF-funded studies and projects. It informs, inspires and supports municipal governments to implement sustainable community development projects and practices.

The Capacity Building program includes six campaigns, one for each sector of municipal activity funded by GMF. Through these campaigns, the program collects the knowledge and experience gained by municipal leaders and engages municipal governments to share this knowledge with other municipalities. In addition to the campaigns, it includes the Partners for Climate Protection (PCP) program, the FCM-CH2M HILL Sustainable Community Awards, the FCM Sustainable Communities Conference and the annual Community Energy Planning Mission.

The prime objective of the Mission is to learn from officials in the public and private sectors of the host communities how policies, programs and technologies have been used to create more sustainable communities. The Mission provides Canadian municipalities with a valuable learning experience that demonstrates, first-hand, how the concept of community energy planning supports sustainable community development and generates economic and environmental benefits locally and nationally.

The Mission is a key program that informs and inspires leaders who are in positions to replicate these leading examples of sustainable community development.

Overview

From July 28 to August 3, 2007, 36 elected and senior staff municipal officials, representing 26 municipal governments, visited leading-edge examples of sustainable community development in Alberta. Delegates visited over 15 leading sustainable community development sites and projects, including a net-zero home, a LEED® Gold police station, a street sand recycling yard, a manure-to-energy plant and a large-scale wind farm.

While all previous Missions have visited European countries, the 2007 Mission delegates were presented with examples of excellence right here in our own backyard. This year's Mission to Alberta focused on Canadian achievements and the advances Canadian communities have made in recent years in sustainable projects and practices. It enabled Mission participants to see innovative projects in a Canadian context that can be more readily duplicated in any region of the country.

This report briefly summarizes the initiatives presented to Mission delegates. Presentations and case studies highlighting particular programs and sites are available on the FCM Centre for Sustainable Community Development website at www.sustainablecommunities.fcm.ca.

The Alberta context

Given the advances Canadian communities have made in recent years in implementing sustainability practices and reducing greenhouse gas (GHG) emissions, FCM decided that the 2007 Mission should be a domestic event. The province of Alberta was chosen as the destination because of the opportunities to visit a variety of world-class sustainability projects implemented in recent years by rural and urban municipalities. Many of these projects received financial support from GMF.

From large centres like Calgary and Edmonton to small municipalities like Okotoks, Alberta's municipal leaders have demonstrated their commitment to a more sustainable future.

Alberta also has excellent sources of renewable energy, including wind and solar energy, and biomass. Along with leading municipal governments, research organizations and partnerships such as the Alberta Research Council and the Edmonton Waste Management Centre of Excellence are well positioned to explore these options. Provincial and municipal investments in sustainability, through innovative programming and incentives, such as grants and rebate programs, also support Alberta's growing body of best practices.

Delegates reported that, as a result of the Canadian context of this Mission, presentations and site visits were more relevant to them since projects were developed within a familiar economic and fiscal framework. Many projects seen in northern Europe were supported by unique government-based subsidies and tax advantages and are not always easily replicable in Canada.



The McBride Lake Wind Farm generates 235,000 megawatt hours (MWh) of electricity annually. Photo courtesy of Sandor Derrick Consulting/Sandor Derrick

Site visits and presentations

Delegates to the 2007 Mission received 27 presentations over several days of site visits. Supporting material from each presentation is available from the FCM Centre for Sustainable Community Development website at www.sustainablecommunities.fcm.ca. This report provides summary and key contact information from each presentation. Many of the site visits are profiled in greater detail through individual Mission case studies.

Destination: Edmonton, Alberta

CO₂RE program

Launched in 2004, the City of Edmonton's Carbon Dioxide Reduction Edmonton (CO₂RE) program is a community-wide initiative aimed at reducing Edmonton's GHGs. A multi-sectoral group of more than 30 people worked with the city for over two years to develop a single, coordinated plan. This group, known as the CO₂RE team, consulted extensively with many local groups, organizations and the public to develop a consensus on the best approach and strategies. The city attributes much of its success to establishing partnerships between community and business to develop promotional materials, rebates and other incentives that encourage citizens to reduce their GHG emissions. The program earned the city an FCM–CH2M HILL Sustainable Community Award in the planning category in 2005. Edmonton's GHG reduction strategy was also supported by a \$100,000 grant from GMF.

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“It is easier to connect the dots: to see how this might work in my Canadian community.”

Robert Tarleck, Mayor
City of Lethbridge, Alta.

Riverdale NetZero Project

The Riverdale NetZero Project will build Edmonton, Alberta's first house to produce more energy than it consumes over the course of a year through energy-efficient design and the use of renewable energy. The house features grid-connected photovoltaic panels to generate electricity, solar water and space heating, and several energy-efficient appliances and technologies. This construction, a duplex close to downtown in Edmonton's Saskatchewan River valley, was one of 12 projects across Canada selected for sponsorship under the Canada Mortgage and Housing Corporation's EQUilibrium Housing design-build initiative. It is the most northerly of the 12 EQUilibrium projects.

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Edmonton transit technology

The City of Edmonton is evaluating the most current propulsion technology available for Edmonton's transit bus fleet. Supported by the University of Alberta and Checkel Engineering, the city is testing hybrid and clean-diesel buses, and an electric trolley. The city will assess the costs and benefits of the available options and make its recommendations for the future transit bus fleet procurement strategy in the spring of 2008.

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"I have already started working on some projects that were inspired by the initiatives we learned about."

Dana Schmidt, Sustainable Development Coordinator
Town of Stony Plain, Alta.

Mill Woods Police Station

Edmonton's new Mill Woods Community Patrol Southeast Division Station is the first police station in North America to achieve a Gold rating under the Leadership in Energy and Environmental Design (LEED®) rating system. The building features a well-insulated envelope; high-efficiency, gas-fired boilers; low-flow toilets flushed with grey water from sinks and showers, extensive natural light, and energy-efficient lights and windows. The building is the first building in Edmonton, the second in Alberta, and only one of 17 across Canada to achieve a LEED® Gold rating.

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Edmonton Waste Management Centre

The Edmonton Waste Management Centre is the cornerstone of Edmonton's highly regarded solid waste management system. The 550-acre centre is home to North America's largest solid waste composting operation, a highly effective commingled recyclables processing facility, a landfill gas recovery and generation system and other leading-edge facilities. A major electronics waste recycling facility is currently under construction that will complement Alberta's two-year-old electronics recycling legislation.

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Edmonton's waste management system

The City of Edmonton's waste management system integrates collection programs, processing and disposal, business development, and research and financing programs. Well-established reduction, recycling and composting programs divert 60 per cent of the city's waste from landfill. The city's waste management branch engages the community in several ways, including direct information programming and social marketing, education in schools, facility tours and open houses, an e-learning program, the media, and workshops for residents. The city's "Eco Stations," which accept household hazardous wastes, are widely supported by residents. The Edmonton Waste Management Centre (see above) processes and disposes of the city's waste.

"I am going to be advocating a much more coordinated approach to waste management."

Alan Nixon, Councillor
District of North Vancouver, B.C.

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Edmonton's municipal solid waste gasification project

The City of Edmonton reviewed over 150 gasification technologies to determine the feasibility of converting the energy remaining in waste into fuels, electricity, steam, or all three, and offsetting the use of fossil fuels to generate power. The study identified an innovative Canadian technology developed by Enerkem Technologies that produces synthetic gas or syngas from uniform feedstock pellets. Based in part on the results of the study, the city plans to develop a municipal solid waste (MSW) gasification demonstration facility, complete with integrated research and development capability, at the Edmonton Waste Management Centre. The gasifier is expected to increase the city's diversion rate from 60 to 90 per cent.

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Alberta Association of Municipal Districts and Counties

The Alberta Association of Municipal Districts and Counties (AAMD&C) is a 100-year old advocacy organization for rural Alberta municipalities. Its 68 core members represent about 97 per cent of Alberta's land mass.

AAMD&C headquarters

The building that houses the AAMD&C is a model of sustainable design. A 28-panel, ground-mounted, "grid-tie" solar photovoltaic (PV) system supplies the building's electricity needs and feeds extra power to the local grid. Producing 6,200 kilowatt hours (KWh) per year, it is the largest PV system in Alberta. Combined with another system on the other side of the building, AAMD&C's PV system generates over 7,000 KWh per year. The facility receives 100 per cent of its heat through an underground thermal energy storage (UTES) system; no secondary heating system is installed. The system in the AAMD&C building cools the space 43 per cent better than air conditioning. A grass-pave system preserves soil structure and reduces stormwater runoff, and recycled-tire pathways welcome staff and visitors to the facility. The features of this new 13,000-square-foot building combine to keep the energy bill the same as its much smaller, 4,000-square-foot predecessor. The AAMD&C's PV system was installed as part of the Alberta Solar Municipal Showcase, an initiative supported by a \$350,000 grant from GMF.

"Good opportunity to share political challenges in different jurisdictions — good to share ideas of how to implement new strategies in times of every decreasing fiscal capacity."

Alan Nixon, Councillor
District of North Vancouver, B.C.

AAMD&C's Integrated Community Sustainable Plans Toolkit

The AAMD&C developed an interactive toolkit to help member municipalities to complete their Integrated Community Sustainability Plans (ICSPs) as required by the Government of Canada New Deal for Cities and Communities in 2005. The toolkit provides municipalities with a guided process to set a vision, goals, strategies, performance measures and a budget. It enables them to determine how their goals relate to the environmental, economic, social and cultural aspects of their communities, and to track their progress and report against performance measures, their budget and their target timeframe. This flexible tool accounts for the diverse needs and capacities of AAMD&C's members, and builds their capacity to do long-range planning. A reporting tab enables them to generate pre-formatted ICSP, management and annual reports.

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Destination: Strathcona County, Alberta

Centre in the Park

Centre in the Park will be Strathcona County's first comprehensive sustainable community. To be developed over the next five to seven years, Centre in the Park will be a multi-use area that will include residential buildings, retail services, walkways, a central plaza and public spaces. The vision is to create a pedestrian-oriented centre for Strathcona County within the heart of Sherwood Park that is focused on recreational, cultural, government and business activities and that encourages year-round use. Community design principles, including the triple-bottom-line approach and inclusion of a community energy system and a community centre, will be applied.

“It is wonderful to go to a conference and learn new things, to feel inspired, and work with a group that has a passion for sustainability on all fronts.”

Dana Schmidt,
Sustainable Development Coordinator
Town of Stony Plain, Alta.

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Community Energy Centre

The 3,300-square-foot Community Energy Centre will fulfill all of the heating needs for Strathcona County's Centre in the Park. The building's efficiency, innovation, stormwater management system, and low site disturbance, among other factors, earned the building a Silver rating under the LEED® rating system. The centre is anticipated to reduce GHGs by 1,100 tonnes per year. Its dedicated space for public education will be used to promote community energy, energy and water conservation, recycling, and waste and GHG reduction. The initial feasibility studies for the centre were supported by a \$55,000 grant from GMF.

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Emerald Hills Urban Village

Emerald Hills Urban Village is a collaborative sustainable urban neighbourhood (SUN) pilot project to provide a model for developers working in partnership with a municipality to foster and institutionalize sustainable urban neighbourhoods. The 20-hectare (50-acre) site will include a mix of building and housing types and land uses, including residential, commercial and retail. The developer, Christenson Developments, is pilot testing the SUN holistic planning process (SUN HPP), developed by Natural Resources Canada. It takes a systems approach to sustainable community development by integrating social, environmental, economic, and cultural strategies into the planning process. The project is supported by a \$350,000 grant from GMF.

Contact

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Alberta Research Council

The Alberta Research Council (ARC) is currently applying its strategic research, technology services and technology commercialization efforts to designing, developing and demonstrating new and innovative landfill gas (LFG) technologies. ARC is contributing to the application of bioreactor technology at the Aquaterra landfill to increase the rate of decomposition of waste, enhance LFG production, and extend the life of the landfill. The council is also operating methane oxidation filter beds in Leduc, a feasible technology for small and medium-sized landfills to reduce their LFG emissions without an LFG collection and treatment system. In Fort McMurray, a booming oil and gas town, ARC is helping with the construction of a new landfill and assessing the potential for generating energy or reducing GHGs.

Contact

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“There was an excellent cross-section of participants; geographically, by municipal size and by range of complexity. Overall, the Mission far exceeded my expectations.”

Lloyd Talbot,
Manager and Senior Planner
Selkirk and District Planning Area Board
Selkirk, Man.

Integrated Manure Utilization System

The Integrated Manure Utilization System (IMUS), Highmark Renewable Inc.'s first large-scale installation, is the largest feedlot manure-to-energy plant in the world. The IMUS processes about 15 per cent of the manure generated from a 36,000-head feedlot owned by Highland Feeders Ltd. The system produces about 20 tonnes of premium biofertilizer along with up to 24,000 kWh of green electricity. About 30 to 40 per cent of the electricity generated by the plant is used between the plant and the feedlot; the rest is put onto the Alberta power grid, which generates revenue. Highmark Renewables is also building a moderate line of ethanol products. FCM's Green Municipal Fund supported IMUS with an \$800,000 grant and a \$1.6 million loan.

"I completely loved it! I returned to my community with hope for the future and a sense of commitment to do what I can to make the world and our town, specifically, a better place."

Terry Webster, Councillor
District of Hudson's Hope, B.C.

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Sand Recycling Ltd.

Sand Recycling Ltd. partnered with the Edmonton Waste Management Centre of Excellence to implement an innovative process to recycle street sand used for traction in winter. The Sand Recycling facility at the City of Edmonton's Poundmaker Snow Storage site can process up to 150,000 tonnes of used street sand, removing contaminants such as salt, hydrocarbons and harmful materials. All but two per cent of sand is diverted from landfill. The resulting product, recycled street sand, is suitable for reuse at a cost below market value for new material. This initiative earned the project team the Transportation Association of Canada's Environmental Achievement Award in 2004. GMF supported this project with a \$618,923 grant.



Delegates learn about the street sand recycling process at the Sand Recycling facility.

Photo courtesy of City of Kitchener/Gary England

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Destination: Town of Olds, Alberta

Municipal Sustainability Planning Pilot Project

The Alberta Urban Municipalities Association (AUMA) is currently in phase 3 of its Municipal Sustainability Planning (MSP) project. In phases 1 and 2, resources and tools were developed to assist communities in integrating sustainability into their planning processes. In phase 3, AUMA is supporting five pilot communities — Chauvin, Thorhild, Claresholm, Pincher Creek and Olds — in developing their municipal sustainability plans.

As part of its participation in the MSP pilot phase, the Town of Olds has conducted ongoing community outreach and education, provided training on the Natural Step™ framework for all town administration staff, and focused on its ongoing sustainability projects. To date, the town has implemented a number of energy-efficient initiatives at its arena, along with a recycling program, curbside composting, and a toilet rebate program. The town has invited comments on a draft sustainability plan and plans to present it to council in 2008.

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OCSI Biofuel Technology Centre

The Olds College School of Innovation (OCSI) Biofuel Technology Centre houses a biodiesel production unit and a compost technology centre for municipal waste. This facility is used to conduct applied research, and to test and demonstrate biodiesel technology. In a joint project with Biofuel Canada Ltd. and Lakeland College, and with additional support from the community, industry and government, the facility is slated to produce 45,000 litres of biodiesel in its first year of operation. Its primary feedstock will be virgin canola of various grades.

The centre also provides curbside composting and grass collection bins to homeowners, along with compost bags, at a nominal cost. Compost is sold to community members in the spring.

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Destination: Calgary, Alberta

2006 Climate Change Action Plan

The City of Calgary's *2006 Climate Change Action Plan — Target Minus 50* is an ambitious plan that aims to reduce corporate GHG emissions by 50 per cent by 2012. This target has since been increased to 60 per cent. All of the city's business units will contribute to the reductions, including its fleet, utilities, transit, roads, buildings, waste and recycling services. The city signed a 20-year agreement with its wholly owned subsidiary, Enmax Energy Corporation, to meet 75 per cent of its electricity requirements from renewable sources.

The 2006 Action Plan also introduced a community GHG reduction target of 30 per cent by 2030, which was later increased to 50 per cent by 2036 through a community-based initiative called *imagineCalgary*. The *imagineCalgary* plan sets a 100-year vision for the city that integrates environmental, social, economic, infrastructure and governance systems.

“The 2007 Mission proved the strength of the decision to base the program in Canada. While I loved the Danish experience, I found this year's Mission more relevant to the Canadian experience and more tightly focused.”

Robert Tarleck, Mayor
City of Lethbridge, Alta.

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eCycle Solutions

eCycle Solutions operates one of the most advanced electronics recycling facilities in North America. Approved and certified as an electronic waste processor under the provincial recycling program, the company disassembles and shreds 500 to 700 tonnes of municipal and industrial, commercial and institutional (ICI) electronic waste per month. Computers, monitors, printers, fax machines, and televisions from Alberta, Saskatchewan and British Columbia are reduced to their component parts, and then safely recycled. Only one per cent of electronic waste received at the Alberta Recycling Management Authority's 150 drop-off locations and processed by eCycle solutions is sent to landfill.

"The most important aspect for me was confirmation that a triple-bottom-line approach to community sustainability can work."

Andy Shadrack, Director
Regional District Central Kootenay, B.C.

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Calgary Water Centre

The Calgary Water Centre is the City of Calgary's largest green building initiative. The 183,000-square-foot facility has been strategically designed and constructed with the well-being of the environment and its 800 employees in mind. Featuring one of the first green roofs in Calgary, rainwater reuse, optimal natural lighting, high air quality and a sophisticated mechanical system, the Water Centre consumes approximately 58 per cent less energy and 59 per cent less water than a conventional building of its size. The centre's open floor plan is designed, in part, to foster a better flow of information, increase communication, teamwork and healthy working relationships among co-workers. The project team aims to achieve a Platinum rating for the building under the LEED® rating system.

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Climate Change Central

Climate Change Central (C3) is a not-for-profit, private–public partnership that provides funding and works with Alberta municipalities to take action on climate change. C3 leverages partnerships to support innovation and deliver effective initiatives that are aligned with federal and provincial plans to the extent possible. It has worked with many municipalities to investigate renewable energy options, such as solar and biomass; build sustainable municipal buildings, such as Canmore’s LEED® Silver-rated civic centre; and implement sustainable transportation projects. In future, C3 aims to explore large-scale carbon capture, high-speed rail and electric vehicles.

“Having the Mission in Canada makes sense as what we saw was obviously doable for all of us.”

Terry Webster, Councillor
District of Hudson’s Hope, B.C.

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Destination: Airdrie, Alberta

Airdrie Environmental Education Centre

The Airdrie Environmental Education Centre is the only Canadian municipal facility of its kind. The straw bale construction features a tight building envelope, radiant in-floor heating, a photovoltaic electrical system, a “solar wall” that pre-heats air for the heat recovery ventilator, potable water collection and filtration, energy-efficient windows, recycled and locally sourced building materials and xeriscaped green spaces. The unique building earned the City of Airdrie an FCM–CH2M HILL Sustainable Community Award in the buildings category in 2003.

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Destination: McBride Lake, Alberta

McBride Lake Wind Farm

The McBride Lake Wind Farm is home to 115 wind turbines optimally spaced to generate 235,000 MWh of electricity annually — enough electricity to power 32,500 homes for one year. The energy generated by this cumulative wind power reduces annual carbon dioxide emissions by 235,000 tonnes per year. Manufactured by Vestas, a Danish leader in wind technology, the turbines occupy less than two per cent of the total farmland in the area. Farmers who own the land receive a percentage of the value of the electricity generated by the turbines, which varies according to the number of turbines on their property. The wind farm is an equal partnership between Enmax and TransAlta Wind, which operates the facility.

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Destination: Okotoks, Alberta

Sustainable Okotoks

Sustainable Okotoks is a visionary, internationally lauded municipal development plan that places significant importance on living within the town's environmental limits, including its land inventory and the carrying capacity of the Sheep River. The product of extensive community consultation, Sustainable Okotoks emphasizes water conservation and management, solid waste management and innovative energy efficiency initiatives.

One such initiative is the construction of Drake Landing, a subdivision of 52 energy-efficient, single-family homes built to R-2000 and Built Green™ standards that are heated by solar energy collected and stored underground in a district thermal solar energy system. It is anticipated that once the required amount of solar energy is captured and stored, the subdivision will achieve 90 per cent of its required heat and hot water from solar energy. Each home emits 83 per cent less GHGs, and consumes 30 per cent less energy in one year, than a conventional home. Drake Landing is the first installation of solar seasonal storage technology in North America and has been called the most ambitious solar project in the world. GMF supported the Drake Landing development with a total of \$2,579,454 in grants and a \$450,000 loan.



Municipal Manager Rick Quail describes innovative technologies used in the Drake Landing solar community.

Photo courtesy of Sandor Derrick Consulting/Sandor Derrick

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District of Highlands, B.C.

TERRY WEBSTER, Councillor
District of Hudson's Hope, B.C.

CAROLYN BONNICK, Administrator
District of Hudson's Hope, B.C.

BRENDA HOLMLUND, Councillor
District of Tumbler Ridge, B.C.

RALPH DREW, Mayor
Village of Belcarra, B.C.

ALAN NIXON, Councillor
District of North Vancouver, B.C.

LOUISE BAXTER, Alderman
City of Spruce Grove, Alta.

ROBERT TARLECK, Mayor
City of Lethbridge, Alta.

CHERYL DICK, CEO
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Town of Stony Plain, Alta.

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Beaver County, Alta.

MANNY DEOL, Town Manager
Town of Drayton Valley, Alta.

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ELAINE WYATT, Mayor
Village of Carmacks, Yukon

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Government of Nunavut

BOB HAWKESWORTH, Alderman
City of Calgary, Alta.
President, Alberta Urban Municipalities Association

BOB BARSS, Director
Alberta Association of Municipal Districts & Counties

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