COMMUNITY EXCELLENCE AWARDS
2010 Application

NAME OF LOCAL GOVERNMENT: District of Maple Ridge

PROJECT OR PROGRAM TITLE: Leisure Centre Energy Efficiency Improvements

Select your Category:
___ BEST PRACTICES, GENERAL
___ BEST PRACTICES, WEBSITE
___ BEST PRACTICES, CIVIC ENGAGEMENT

___ LEADERSHIP & INNOVATION, Small Community
___ LEADERSHIP & INNOVATION, Mid-size Community
___ LEADERSHIP & INNOVATION, Large Community
___ LEADERSHIP & INNOVATION, Regional District

___ PARTNERSHIPS: TOURISM

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manager of Sustainability

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By making this application, I understand that all materials will be kept by UBCM and are available for viewing by others through the UBCM Community Excellence Awards library.

Signature: __________________________ Name (Print): Laura Benson

Date: Aug 2, 2010
August 3, 2010

2010 Community Excellence Awards
Union of BC Municipalities
60 - 10551 Shellbridge Way
Richmond, BC V6X 2W9

Attention: Joslyn Young, Executive Coordinator

Dear Ms. Young:

Re: Application for 2010 Community Excellence Awards – Leadership & Innovation
Maple Ridge Leisure Centre Energy Efficiency Improvements

The District of Maple Ridge is very pleased to submit an application for the UBCM Community Excellence Awards: Leadership & Innovation (Large Urban Municipality). We have met the general criteria as set out in the UBCM Guidelines.

The energy efficiency retrofits at the Maple Ridge Leisure Centre are projected to significantly decrease energy consumption and reduce greenhouse gas emissions by 49% (393 tonnes). It is with great pride that we showcase the Leisure Centre as an example of the use of innovative mechanical systems and alternate energy, to reduce greenhouse gases and environmental impact.

We hope you will find our project and its unique features worthy of a UBCM Community Excellence Award.

Thank you for your consideration.

Sincerely,

Emile Daykin
Mayor

cc: Jim Rule, Chief Administrative Officer
Category:
Leadership & Innovation, Large Urban Municipality

Program Title:
Maple Ridge Leisure Centre Energy Efficiency Improvements

Submitted By:
Laura Benson, Manager of Sustainability & Corporate Planning, District of Maple Ridge

Summary:
As one of the key items included in the District of Maple Ridge’s Sustainability Action Plan, pursuing a high-profile energy efficiency project was a priority for Council. A combination of non-functioning and end of useful life mechanical equipment at the Maple Ridge Leisure Centre presented an opportunity to minimize the facility’s operational costs, but also to improve energy efficiency and reduce greenhouse gas emissions. The innovative design elements included in the improvements are projected to reduce natural gas consumption by 52% and reduce greenhouse gas emissions by 49%. In addition, this project also serves as a demonstration project to the community; it is the first District of Maple Ridge municipal project that utilizes solar panels. The District of Maple Ridge will use the Leisure Centre improvements as a model for our community and for future municipal building renovations and capital construction projects.
District of Maple Ridge

Maple Ridge Leisure Centre Energy Efficiency Improvements

*The Maple Ridge Leisure Centre gets “fit” and loses 393 tonnes of carbon dioxide emissions*

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A Commitment to Sustainability

In 2007, the District of Maple Ridge completed a Sustainability Action Plan; the aspiration of which is the environmental sustainability Community Vision 2025:

*Maple Ridge continues to lead the nation in preserving and enhancing its community’s quality of life, air, water and land. The District, long a front-runner in the protection of environmentally sensitive areas, is one of the first municipalities to promote green-building and innovative technologies in residential and commercial construction and infrastructure. The District has won a number of awards for its practices relating to energy use in civic buildings and the municipal fleet and its support of community waste reduction activities.*

One of the key action items included in the Sustainability Action Plan related to environmental sustainability is to pursue a high-profile energy efficiency project to send a clear message to the community about the District’s sincere commitment to sustainability, and the organization’s intent to be an environmental leader amongst Canadian municipalities.

As the District’s largest consumer of purchased energy, highest emitter of greenhouse gases and most popular public building, the Leisure Centre provided a logical choice for a high-profile energy efficiency project. The Leisure Centre is an 80,000 sq. ft. facility that serves many recreation needs in the community. The facility includes an aquatics centre with wade, lap, leisure and teach pools, hot tub, gymnasium, fitness areas, and the Greg Moore Youth Centre. This high-use facility serves two communities and has over 360,000 visits per year from Maple Ridge and Pitt Meadows residents.
The opportunity was timely in that the building’s heating system was nearing the end of its useful life, and the heat recovery component of the natatorium’s ventilation and dehumidification system was no longer operational.

**Innovative Project Design**

Maple Ridge Council felt strongly that this project presented an opportunity not only to minimize the facility’s operational costs, but also to significantly improve energy efficiency and reduce greenhouse gas (GHG) emissions – a major step towards achieving the District’s sustainability goals. As such, the project was tendered and designed to deliver the most life-cycle cost effective and environmentally sustainable set of solutions for replacing or retrofitting key components of the central heating system and the natatorium ventilation and dehumidification system.

The project was handled through a design-build process and features the following innovative design elements as part of the District’s strategy to reduce GHG emissions and energy consumption at the Leisure Centre:

- **Dehumidification Reclaim System** – this system provides most of the heat needed to heat the lap, leisure and teach pools. It also provides heat to preheat the domestic hot water system in conjunction to the solar hot water collection system.
- **Static Reclaim as part of the Dehumidification System** – this reclaim will almost eliminate the need for reheat, which was previously supplied by the heating coil in the main supply air handler.
- **Solar Hot Water Collection System** – 24 solar panels provide preheating for the domestic hot water and the back-up for the dehumidification reclaim system for the lap, leisure and teach pools.
- **Exhaust Air Reclaim System** – this system extracts heat from the air exhausted from the natatorium and uses it to heat the incoming ventilation and dilution air.
- **Filter and Pump Room Air Conditioning Unit** – the pump and filter room is humid and hot. This air conditioning unit extracts heat from the room and transfers that heat to warm the wade pool.

Energy efficiency retrofits were completed from August to December 2009, with a budget of $1 million.
Energy Modeling Projects Major Savings
The energy modeling\(^1\) of the mechanical retrofits calculates that there will be a significant decrease in natural gas and carbon dioxide equivalent emission levels as a result of the retrofit. It is interesting to note that this energy modeling was done prior to the addition of solar panels to the design; the solar panels are anticipated to decrease the natural gas consumption and carbon dioxide emissions even further.

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<tbody>
<tr>
<td>Natural Gas</td>
<td>16,810 GJ</td>
<td>8,040 GJ</td>
<td>-52%</td>
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<tr>
<td>Electricity</td>
<td>1,918,580 kWh</td>
<td>2,210,720 kWh</td>
<td>15%</td>
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<tr>
<td>Carbon Dioxide Equivalent Emissions</td>
<td>798 tonnes (in 2006)</td>
<td>405 tonnes</td>
<td>-49%</td>
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The operational cost savings associated with the changes in energy consumption are conservatively estimated at $85,000/year. As energy prices continue to rise the annual operational savings will increase accordingly.

The energy efficiency retrofit lowers the facility’s impact on the environment by reducing the quantity of carbon dioxide emissions from Leisure Centre operations. A decrease of 49% or \(393 \text{ tonnes}\) of carbon dioxide emissions is anticipated as a result of the retrofit. A reduction of 393 tonnes of carbon emissions is equivalent to a reduction of 13% of carbon dioxide emissions from overall municipal operations or 25% of corporate carbon dioxide emissions from municipal buildings\(^2\).

By voluntarily becoming a signatory to the BC Climate Action Charter, the District intends to act on the commitment of being a sustainable community by becoming carbon neutral by 2012, and this project plays a critical part in achieving that goal.

The reduction in carbon dioxide emissions also presents an operational cost savings in the future by reducing the quantity of offsets required to be “carbon neutral”. With carbon offsets estimated at $15/tonne, there is an additional estimated $6,000 in savings annually.

Results That Make a Difference

Energy Consumption
Energy consumption following the completion of the energy efficiency retrofits has been very close to the energy modeling. In the first half of 2010, we have seen a 47% decrease in natural gas consumption and an 11% increase in electricity consumption from the same period in 2009. The energy efficiency retrofits have reduced our reliance on non-renewable fuel sources and mitigates exposure to potential rising energy costs.

\(^1\) Morrison Hershfield Limited – Maple Ridge Leisure Centre Boiler and Mechanical Upgrade, Evaluation of Proposed Mechanical System Upgrades, September 3, 2009

\(^2\) 2008 carbon dioxide emission totals
Solar Hot Water Collection System
The Leisure Centre is the first District of Maple Ridge municipal project that utilizes solar panels as an alternative source of energy and they are surpassing performance expectations.

In February 2010, which had mainly clear skies and day time temperatures of approximately 15°C, facilities staff regularly saw the solar water temperature rise approximately 9 to12°C. The solar storage tank temperature continued to rise all day, even while the water was heating domestic hot water and pool heat pumps. Additionally the heat pump for the domestic hot water system was generally not required by noon, as the solar hot water collection system was generating enough energy at that time.

The successful use of solar panels has demonstrated to Council that even in a neighbourhood known locally as “Rainy Haney” solar energy is a viable source of clean energy for Maple Ridge. As such, Council has voluntarily endorsed a Provincial regulation which requires the accommodation of future installation of solar hot water systems for water heating. This new “Solar Hot Water Ready” building regulation will continue to expose the community to the benefits of solar energy and allow homeowners a less expensive and less intrusive way to utilize an alternate energy source.

Reclaim Systems/Air Conditioning
Natural gas consumption has decreased dramatically as a result of the dehumidification reclaim system. This system has resulted in a dramatic reduction of humidity in the pool areas. Additionally, there is reduced rusting of metals resulting in lower maintenance costs associated with replacement/cleaning of the metal.

Prior to the retrofit the filter and pump room was unbearably warm and warranted frequent breaks from the room to regulate personal body temperatures. The air conditioning system, which extracts and repurposes the heat in the filter and pump room, has lowered the temperature in the room and improved health and safety conditions for staff performing maintenance.

Grant Funding
Due to energy efficient technology installed for the retrofit, the project is eligible for “green” technology grants. Grants from ecoENERGY/SolarBC and the Terasen Gas Efficient Boiler Program (replacement program) are anticipated.
**Going Forward**
This project is a community demonstration of how energy efficiency retrofits can result in significant operational cost savings as well as reduced environmental impact. It required the joint efforts between the Parks and Leisure Services department, Sustainability and Corporate Planning department as well as the support of Council to make the project so successful.

The District is continuing to look at other municipal buildings that can utilize energy efficiency upgrades to reduce energy consumption and environmental impact. We will continue to use the Leisure Centre as a model for our community and for future municipal building renovations and capital construction projects.