

Energy : Expanding Clean Energy and Energy Efficiency - Manitoba Helping the World



Manitoba is fortunate to have access to many sources of renewable energy. Our provincial greenhouse gas (GHG) emissions are comparatively low, in part, because 98 per cent of Manitoba's electricity generation comes from renewable water power.

Our fortunes are further improved by the specific local geography and new engineering designs which provide hydro options with very little flooding. These types of hydro opportunities have greatly reduced significant impacts on the surrounding environment.

It makes good sense for Manitoba to continue to invest in energy efficiency and all forms of renewable energy production. These investments not only keep our emissions low here at home, they also contribute to greater emissions reductions outside our province, through our export of clean energy to replace fossil-fuel power in other jurisdictions. New investments in wind and energy efficiency will add to Manitoba's ability to displace fossil fuels outside our borders.

Expanding Manitoba's clean energy portfolio has already earned the province much success. In 2004 and again in 2006, **Manitoba received an "A" rating from the Canadian Energy Efficiency Alliance (CEEA)**, a non-profit organization charged with promoting energy efficiency in Canada. This grade was the highest in the country, and it was the second time in a row Manitoba led the nation. New programs to retrofit low-income housing across Manitoba build on this success and provide multiple benefits. These include savings on utility bills for low-income families, local employment and training opportunities, improved housing stock as well as GHG reductions.

Manitoba has an abundance of both wind and water. In fact, hydro provides a perfect backup system for wind power. We can store water when the wind is blowing and release water to generate electricity when the wind is calm. Wind power investments continue to grow and new, low-impact, hydro generation is under construction. As well, green heat alternatives, which include geothermal and biomass energy, are widely used in Manitoba, thanks to low-interest loans and other support.

All these strengths will help Manitoba improve our standing as a clean energy provider and meet our **future goal: to be coal-free and have one of the lowest carbon-energy systems on the continent.**

One coal-fired station can emit nearly as much as the total emissions for all of Manitoba.

The greatest impact of Manitoba's clean energy production will be felt in other jurisdictions. By importing Manitoba's clean hydropower, these regions can eliminate emissions from coal-fired and other fossil fuel energy sources.

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Actions to date

ENERGY EFFICIENCY

- **Manitoba Hydro Power Smart programs.** Between 1985 and 2005/06, provincial energy-efficiency activities have achieved GHG emission reductions of over 767,000 tonnes. Manitobans have seen the savings on their energy bills (more than \$228 million in total) as a result of these upgrades.
- **A new \$35-million fund has been established (using profits from Manitoba Hydro's electricity exports) to target home-efficiency upgrades especially for low-income families, and for alternative energy research and development such as geothermal power.** The best example of the multiple benefits of energy efficiency can be seen in the Low Income Energy Efficiency Initiative. Over 150 low-income dwellings have been retrofitted in Winnipeg and Brandon. This has saved approximately \$400 per household on annual utility costs, while providing lasting employment skills to local residents.



Red River College

- **Green buildings.** Manitoba currently has 32 projects registered with the **Canada Green Building Council (CaGBC)**. **The provincial government has a new Green Building Policy that applies to new residential, commercial and institutional projects funded by the Government of Manitoba, including Crown corporations and agencies.**

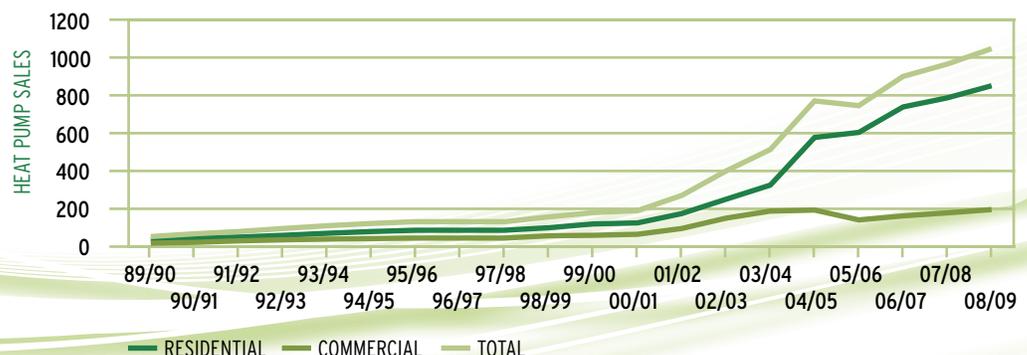
This policy requires all new capital projects, including schools and health care facilities, to be certified at a minimum LEED® [Leadership in Energy and Environmental Design] Silver standard by the CaGBC, and exceed Model National Energy Code of Canada requirements by at least 33 per cent. **The University of Manitoba is one of the first universities in Canada to offer LEED® accreditation courses to students for academic credit.**

EARTH ENERGY (GEOTHERMAL POWER)

Manitoba Hydro offers homeowners low-interest loans to assist with the cost of installing geothermal heat pumps.

- **Since 2000, Manitoba has quadrupled its annual rate of heat pump installations; has trained over half of Canada's heat pump installers; and has been recognized as a national leader in the adoption of geothermal technology.** Manitoba Hydro offers low interest on-bill financing for residential installations and incentives for many commercial installations, including \$1.7 million in incentives for commercial customers alone. Other measures also encourage the use of energy efficient appliances. Manitoba's domestic geothermal heat pump industry has grown from \$3 million to \$30 million annually, during the same period.

MANITOBA GEOTHERMAL HEAT PUMP SALES, 1989/90-2008/09



Energy-efficient buildings deliver significant cost savings.

For example, new buildings that participate in the federal Commercial Building Incentive Program (CBIP) have averaged approximately **36 per cent** reductions in energy use, compared to the 1997 Model National Energy Code of Canada for Buildings.

WIND ENERGY

- Wind monitoring sites located in the province have increased from zero in 2001 to more than 70 in 2006.
- Manitoba's first wind farm at St. Leon generates 99 megawatts (MW) of clean power. The 63 wind turbines represent a \$210-million project that will result in significant employment opportunities; \$20 million in municipal taxes; and approximately \$10 million in local landholder payments over the 25-year lifespan of the project. In addition, having a 99-MW wind farm up and running is equivalent to reducing 260,000 tonnes of global GHG emissions and can have the same positive impact as taking 50,000 cars off the road or planting 1.2 million trees.¹⁶

WATER ENERGY

- The 200-MW Wuskwatim Hydro Station on the Burntwood River is now under construction. To minimize flooding, the station was redesigned from a 340-MW to a 200-MW station. This change reduced flooding from 140 square kilometres to less than one-half a square kilometre. The Wuskwatim project is a partnership with the Nisichawayasihk Cree Nation.
- In the longer term, the 1,250-MW Conawapa project offers similar opportunities to produce power with very little impact on the environment, compared to other renewable forms of power generation. The project also has the potential to reduce global GHG emissions by seven megatonnes.

MINIMIZING RELIANCE ON FOSSIL FUELS

- Since 1990, Manitoba Hydro has worked to minimize reliance on fossil fuels in Manitoba's energy system, by shutting down four of Brandon's five coal-fired generating stations, converting the Selkirk Generating Station from coal to natural gas, and extending the power grid to eight northern communities previously served by diesel generation. Manitoba Hydro's diesel generation emissions have been cut nearly in half since 1990.

Next steps: to 2012 and beyond

EXPANDING ENERGY EFFICIENCY

- In 2006, Manitoba Hydro announced targets for even greater Power Smart savings – to 848 MW and 2,695 gigawatt hours (GWh) of electricity savings and 101-million cubic metres of natural gas savings by 2017/2018. These combined savings are expected to result in total global GHG emissions reductions of 2.01 million tonnes by 2017/18.
- An energy code will be required as part of the Commercial Building Code by 2010. Manitoba has begun implementing some of the recommendations of the Energy Code Advisory Committee (www.gov.mb.ca/est/energy/pdf/ecac_report.pdf). This includes holding stakeholder consultations in the fall of 2008, before establishing an energy code in Manitoba.
- Manitoba will require minimum efficiency standards for natural gas furnaces by 2009.

¹⁶ Manitoba Science, Technology, Energy and Mines; Energy Development Initiative

- **A Lower Income Energy Efficiency Program was launched by Manitoba Hydro in December 2007. It is based on the two successful pilot projects; one launched in Winnipeg's inner city; and one in Brandon's low-income neighbourhoods.** The Winnipeg project, in the Centennial Street neighbourhood, has retrofitted over 110 homes since December 2006. The Brandon project has retrofitted 48 homes since fall 2007. Partnering with the federal government, the goal will be to roll out the new program province-wide with a target of 4,600 low-income dwellings to be retrofitted over the next three years.
- **An energy-efficiency pilot program for First Nations is also underway in the Island Lake Community.** This winter road community is actually comprised of four First Nations: Garden Hill, St. Theresa Point, Red Sucker Lake and Wasagamak. This project will target 101 homes across the four communities.
- **The provincial government's Green Building Policy that requires a minimum of LEED® Silver standards will be enshrined in new climate change legislation.**

Expanding green heat

EARTH ENERGY (GEOTHERMAL POWER)

- **The province and Manitoba Hydro will continue to work with the building and geothermal industries to help increase geothermal uptake in Manitoba. Manitoba Hydro's Earth Power Program** will continue to align itself with the changing needs of the industry and the market. In 2007, the loan program offered homeowners up to \$20,000 at a new low interest rate, to help with the upfront investment of installing a geothermal heat pump.
- **The Manitoba Geothermal Energy Alliance (MGEA) will expand its certification and training requirements.** A new quality assurance program funded by the Manitoba Government will provide a high quality of service from any certified MGEA installer.
- **The province is also intensifying its commitment to geothermal energy through the Manitoba Green Building Policy, Manitoba Hydro's Earth Power Program,** and demonstrations of new heat-pump technologies.
- New climate change legislation will ensure that property owners are not at a disadvantage in the assessment process for having geothermal installations.

BIOMASS ENERGY

- The province will provide funding to expand opportunities to use biomass as an alternative energy source in Manitoba.



Expanding renewable power generation

- Building on Manitoba's renewable hydro-electric power base, there will be continued progress towards more renewable power such as wind. As evidence of future growth in alternative energies, Manitoba Hydro is evaluating its 300 MW Request for Proposals in 2008.
- Wind monitoring towers are being erected in off-grid, diesel-serviced communities.
- Solar energy is increasingly being used by Winnipeg's green buildings, in several of the city's swimming pools, and at a downtown, low-income, high-rise buildings.
- The province funds research into solar power. Demonstration projects and broader applications of this renewable energy, such as solar hot water heaters, are being explored.

MOVING TO A COAL-FREE MANITOBA

With the conversion of the Selkirk facility to natural gas in 2002, the coal-fired electrical generating station in Brandon is the last coal-fired facility in Manitoba. Through new climate change legislation, restrictions will be placed on the use of the facility; it will be used only to support emergency operations, such as times of drought. In addition, a new coal-reduction strategy and a new tax on coal emissions will be introduced.

FROM FOSSIL FUELS TO RENEWABLES IN OFF-GRID COMMUNITIES

New climate change legislation will require that options be developed to move off-grid, remote, northern communities (supplied only by diesel power) onto a secure supply of renewable energy.

ENHANCED OIL RECOVERY

Carbon dioxide based oil recovery – where CO₂ is injected underground for enhanced oil recovery – may reduce Manitoba's CO₂ emissions by storing the CO₂ that would otherwise be released into the atmosphere. A pilot project in southwestern Manitoba is already underway to evaluate the technical and economic feasibility of injecting CO₂ into Manitoba oil pools.

BECOMING THE CONTINENT'S LOWEST CARBON LEADER

The measures outlined in this plan make Manitoba one of the lowest carbon jurisdictions on the continent.

Further longer term targets to reduce Manitoba's reliance on fossil fuels, including gasoline, natural gas and coal, will be outlined in a **new energy strategy**, to be released by fall 2008.