

# Green Energy Production Scan Greater Toronto Area Jurisdictions

May 26, 2010



Report to the Greater Toronto Area Clean  
Air Council



Prepared by the Clean Air Partnership



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## PREAMBLE

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### Acknowledgement

Clean Air Partnership (CAP) would like to thank the members of the Greater Toronto Area Clean Air Council for their financial support, as well as their time and thoughtful reflections on this material. CAP would also like to acknowledge the ongoing support of the City of Toronto and the City of Toronto and the Toronto Atmospheric Fund.

### About the Clean Air Partnership

Clean Air Partnership (CAP) is a registered charity that works in partnership to promote and coordinate actions to improve local air quality and reduce greenhouse gases for healthy communities. Our applied research on municipal policies strives to broaden and improve access to public policy debate on air pollution and climate change issues. Our social marketing programs focus on energy conservation activities that motivate individuals, government, schools, utilities, businesses and communities to take action to clean the air.

Clean Air Partnership's mission is to transform cities into sustainable, vibrant, resilient communities, where the air is clean to breathe and greenhouse gas emissions are minimized.

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### About the Greater Toronto Area Clean Air Council (GTA-CAC)

The Greater Toronto Area Clean Air Council promotes the reduction of air pollution and greenhouse gas emissions and increased awareness of regional air quality and climate change issues in the Greater Toronto Area through the collective efforts of all levels of government. The Council identifies and promotes the most effective initiatives to reduce the occurrence of air pollution and greenhouse gas emissions in the GTA, and their associated health risks. The goals of the Council are:

- To enable solutions to air quality and climate change challenges through a dynamic network that expands knowledge and enthusiasm, and encourages practical and successful policies and actions.
- To promote a better understanding of air quality and climate change problems and their implications for public health among policy makers and to improve their ability to address these problems in an economically effective way;
- To explore opportunities for joint initiatives to reduce air pollution and greenhouse gas emissions in the GTA; and
- To liaise with municipalities in the GTA and across Canada, organizations with compatible mandates and communities within the region to share best practices for reducing air pollution and greenhouse gas emissions.

### About the Toronto and Region Inter-Governmental Declaration on Clean Air

On June 3, 2009, the GTA-CAC member municipalities signed on to the *Toronto and Region Inter-Governmental Declaration on Clean Air*, committing them to take action on clean air and climate change. **Article 3.4** of the Declaration calls on the signatories to:

***“Establishment of a Community of Practice to increase the implementation of renewable energy purchasing or production.”***

**Target: 15 members are producing or purchasing renewable power by 2010.**

**Renewable Energy Source:** “renewable energy source” means an energy source that is renewed by natural processes and includes wind, water, biomass, biogas, biofuel, solar energy, geothermal energy, tidal forces and such other energy sources as may be prescribed by the regulations, but only if the energy source satisfies such criteria as may be prescribed by the regulations for that energy source.”

This scan was developed in response to the green energy commitment, and is primarily intended to provide a list of municipalities that are currently producing renewable energy through installation of wind turbine, solar panels, cogeneration facilities, geothermal, photovoltaic system and other renewable energy producing facilities.



EXECUTIVE SUMMARY

ARTICLE 3	CORPORATE ACTION	STATUS
<p>3.4: Establishment of a Community of Practice to increase the implementation of renewable energy purchasing or production.</p> <p><b>Target: 15 members are producing or purchasing renewable power by 2010</b></p>		
<p>Town of Ajax</p>	<p><u>Ajax Steam Plant</u> conversion to a cogeneration facility.</p>	<p>In progress</p>
	<p><u>Fire Station</u> - LEED Certified.</p>	<p>Operational</p>
	<p><u>Town of Ajax New Operation Centre</u> consists of both Solar thermal and photovoltaic systems.</p>	<p>Operational</p>
	<p><u>Marshall Homes</u> subdivision development is the first LEED certified townhouse development in Ontario.</p>	<p>Operational</p>
	<p><u>Greenwood Pavillion</u> will feature sustainable design standards, geothermal heating and cooling and PV cells.</p>	<p>In progress</p>
<p>Town of Aurora</p>	<p><u>Bullfrog purchasing</u> for the City Hall.</p>	<p>2008-2010</p>
<p>City of Brampton</p>	<p>Town Hall purchasing Bullfrog Power.</p>	<p>In progress</p>



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ARTICLE 3	CORPORATE ACTION	STATUS
City of Burlington	<u>Appleby Woods Condominiums</u> - geothermal heating system.	Operational
	<u>Canadian Centre for Inland Waters</u> using cogeneration, photovoltaics, living walls and a waste-heat fired boiler.	Operational
	<u>Ironstone Condominiums</u> features geothermal heating and cooling, as well as solar water heating and electricity generation.	In progress
	<u>Mountain Equipment Co-op</u> features solar collectors on the roof, and purchases 100% wind energy.	Operational
	<u>Union Gas Headquarters</u> features cogeneration facilities and waste heat storage.	Operational
	<u>Strata condominium</u> features geothermal heating.	In progress
	<u>Walmart</u> features geothermal heating and purchases 100% renewable power.	Operational
	<u>Tansley Woods Recreation Center</u> using solar thermal heating.	Operational
Town of Caledon	<u>Caledon Centre for Recreation and Wellness</u> Cogeneration project.	Operational
	Mayfield Recreation Complex - Solar wall.	Operational
	Green Power Energy Purchasing for City Hall.	Since 2007



Green Energy Production Scan Greater Toronto Area Jurisdictions

ARTICLE 3	CORPORATE ACTION	STATUS
Regional Municipality of Durham	Small wind farm in Scugog being considered for 2010.	End of 2010
Town of East Gwillimbury	<u>Community Energy Plan</u> developed.	Ongoing
Regional Municipal of Halton	<u>The Landfill Gas Collection and Utilization Project</u> started in 2007 and involves Halton Region and Oakville Hydro working together to collect landfill gas and use it to produce electricity.	Operational
	<u>Residential solar thermal and photovoltaic project</u> Halton Region and Halton Environmental Network.	Ongoing
Town of Halton Hills	Halton Hills LEED Fire Halls with geothermal systems.	Operational
	Solar powered LED lights being used on town's multiuse pathways.	In progress
	<u>Liquid solar blanket project</u> – used on Town's indoor swimming pools.	Operational
	<u>Geothermal Heating</u> for the Devereaux House and two Fire Stations.	Operational
City of Hamilton	Landfill gas recovery project at Glanbrook Landfill site.	Operational
	<u>Woodward Avenue</u> cogeneration facility recovers methane from wastewater treatment process to produce electricity and heat.	Operational
	Hamilton <u>Downtown District Cooling Project</u> .	Operational
Township of King	LEED Certified Schomberg Arena and King Township Curling and Fitness Facility with a 10kW ground mounted solar array.	In Progress (scheduled for completion early 2011)
	Nobleton Outdoor Pool Solar Hot Water Heating System.	In Progress



Green Energy Production Scan Greater Toronto Area Jurisdictions

ARTICLE 3	CORPORATE ACTION	STATUS
Town of Markham	<u>Markham Civic Center photovoltaic system.</u>	Operational
	<u>Solar thermal system at Milliken community centre.</u>	Operational
	The Town has partnered with PowerStream, and expects to install 2 MW worth of solar PV installations on municipal buildings by 2012.	In progress
	Solar water heating system for Centennial Pool.	In progress
	<u>EcoLogo certified Markham District Energy system.</u>	Operational
City of Mississauga	<u>Hershey Centre photovoltaic system.</u>	Operational
	<u>Civic Centre</u> powered by Bullfrog (April 2008).	One-year pilot project which has been renewed annually
	<u>Bus shelter</u> solar lighting and LED traffic light signal heads.	Operational for 100 shelters and LED lights are at all intersections
	<u>Recovered Waste Heat at Iceland Arena:</u> Pool drain water waste heat recovery system at Mississauga Valley Community Centre Pool.	Operational New Technology Demonstration Project
	<u>Parking Meter solar lighting.</u>	Operational
Town of Newmarket	Newmarket EcoLogic Homes. <a href="http://www.newmarket.ca/userfiles/HTML/nts_1_5115_1.html">http://www.newmarket.ca/userfiles/HTML/nts_1_5115_1.html</a>	Operational
	Recovered Waste Heat to heat spectator benches in Magna Arena.	Operational

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ARTICLE 3	CORPORATE ACTION	STATUS
Town of Oakville	<u>Landfill gas collection</u> - Halton Region and Oakville. Hydro partnership).	Operational
	<u>Green Light Pact Program</u> – purchasing green energy from Oakville Hydro.	Ongoing
	<u>Solar lights</u> used for City’s walkways.	In progress
	Oakville Hydro Renewable Energy Standard Offer Program with Ontario Power Authority. <a href="http://www.oakville.ca/10806.htm">http://www.oakville.ca/10806.htm</a>	Ongoing
City of Oshawa	<u>Geothermal heating and cooling system</u> at UOIT being operated by OPUC	Operational
Regional Municipality of Peel	<u>Ridgeway Childcare solar thermal water heating system.</u>	Operational
	<u>Clarkson Photovoltaic Solar Flairs Project.</u>	Operational
	<u>Vera M. Davis Long Term Care Centre roof mounted photovoltaic system.</u>	Operational
	<u>Malton Village Long Term Care Centre green roof with photovoltaic component.</u>	Operational
	<u>Waste Operations Centre biodiesel project.</u>	Operational
	<u>Britannia Landfill and Gas Electricity Project.</u>	Operational
	<u>Three group homes</u> being retrofitted with solar domestic hot water, geothermal and HVAC systems.	In progress
	<u>Peel Region’s headquarters geothermal system.</u>	Operational

ARTICLE 3	CORPORATE ACTION	STATUS
City of Pickering	<u>Solar thermal</u> panels in condominium - downtown Pickering.	Operational
	<u>Vestas 1.8 megawatt wind turbine</u> at its Pickering Nuclear site	Operational since 2001
Town of Richmond Hill	<u>Town of Richmond Hill's</u> Municipal Offices solar power water heating system.	Operational
	Solar heating project approved in 2009 for the Bayview Hill Community Centre swimming pool.	In progress
	<u>Small wind turbine</u> at Richmond Green.	Operational
	Richmond Hill Performing Arts Centre uses geothermal heating.	Operational
City of Toronto	<u>Deep Lake Water Cooling</u> system for City Hall, Metro Hall and Police Headquarters (completed), Old City Hall and Union Station (will be completed in 2009).	Operational
	<u>Geothermal unit</u> at Exhibition Place and new Police Academy	Operational
	<u>Horse Palace</u> at Exhibition Place Photovoltaic (PV) pilot project	Operational
	<u>Toronto Solar Neighbourhood Initiative</u> - pilot project in Riverdale.	Ongoing
	<u>Solar Walls</u> at Central Management Garage, Police Garage, and Scadding Court Community Centre	Operational
	<u>Solar Powered lights</u> on 350 bus shelters across the city.	Operational
	<u>Solar Wall</u> at Lakeshore Maintenance Garage:	Operational



ARTICLE 3	CORPORATE ACTION	STATUS
City of Toronto (cont...)	<u>Green Energy Procurement Project</u>	In Progress
	Biogas recovery projects at landfills and treatment plants.	Operational
	<u>Fuel cell demonstration project</u> at Exhibition Place.	2003-2005
	<u>Centennial Recreation Centre</u> in Scarborough – Solar Heating System.	Operational
	<u>City Hall and Nathan Philips Square</u> 100% green energy provided by Bullfrog.	On going
	<u>Green Energy Procurement Project</u>	In Progress
	Biogas recovery projects at landfills and treatment plants	Operational
Regional Municipality of York	Pilot solar panels for York Region Transit and Viva bus shelters.	Operational
	<u>York Region Administrative Centre</u> is powered by Bullfrog.	Operational
	Wind mapping and feasibility study and review for wind power turbine at Sutton water plant taking place.	Ongoing



## Renewable Energy Production Scan in GTA-CAC Municipalities

### Town of Ajax

**Ajax Steam Plant Revitalization:** Proposed redevelopment of the Ajax Steam Plant into a cogeneration facility, which would produce electricity, steam and hot water.

The facility will be using wood waste biomass as a fuel source. This is considered a renewable energy under the Green Energy Act.

**Ajax Steam Plant Revitalization includes:**

- Four new wood-fired combustors and boilers;
- Two high-pressure turbines and one low-pressure turbine, producing up to 25 MW of electricity; and
- Best available emissions control (cyclones and high efficiency); and
- Rebuilding wood-fired combustor/boiler No. 7  
<http://www.townofajax.com/AssetFactory.aspx?did=5631>

**Power Production:** Proposed 25MW of electricity plus the production of steam and the possibility of hot/cold water.

**Funding:** Private developer

**LEED Certified Fire and Emergency Services Headquarters:** The two-story Fire Station and Headquarters also serves as the Town's Emergency Operations Centre. It boasts geothermal heating and cooling systems; has an extensive 'green' roof system with native and drought resistant plants; and uses significantly less water and energy than comparable facilities. There is a priority parking for hybrid and alternative fuel vehicles, and secure storage for bicycles. <http://www.townofajax.com/Page2775.aspx>

**Funding:** The Town of Ajax has received an AMO Federal Gas Tax Project Award for its

LEED Certified Fire and Emergency Services Headquarters. The \$11 million facility was completed in June 2008 with the help of \$1.2 million from the Federal Gas Tax Fund.

**Town of Ajax Operations Centre (800 Salam Road):** Integrated solar design within the proposed building is comprised of two systems:

- **A solar thermal system:** The solar thermal system will collect solar energy via a solar panel system and convert this energy to heat water to provide enough hot water to meet the demands of the typical work day.



- **Photovoltaic system:** the photovoltaic system features a series of panels, like the solar thermal system, and carries the collected energy to an inverter where it is converted to alternating current as useable electricity.

<http://www.townofajax.com/AssetFactory.aspx?did=6578>

**Funding:** The \$12.6 million LEED certified Operations and Environmental Services have received \$2.281 million Federal Gas Tax towards the construction of the facility.

**Town of Ajax Waterfront East Pavilion:** Currently under construction at the south-east corner of Ashbury Boulevard and Audley Road South, this 3,500 square foot pavilion will serve as a community destination and reststop on the east-end of the Town's seven kilometre waterfront trail. Targeted as a LEED building, many green initiatives have been incorporated to make the building energy efficient and sustainable; reducing future operating and maintenance costs for the Town. The building itself will be constructed using products with low Volatile Organic Compounds (VOC's) and materials with high recycled content. The landscaping will incorporate natural features, such as meadows, trees, shrubs, and grasses. The Town has also identified the new community pavilion as one of three locations integrated into the 2009/2010 Waterfront Recycling Program. The community pavilion area will be developed under a two-phase plan, with the pavilion being built by the end of 2009, and a future four-acre ecologically based park built by the end of summer 2011.

**Marshall Homes subdivision development:** On September 29, 2008, Ajax Town Council approved the first LEED Certified townhouse development in Ontario, making it the fourth LEED project in Ajax. The new development will be located at Riverside Drive and Birchmount Road, south of Rossland Road.

The 53-unit development, which is being built by Marshall Homes Corporation, will include at least one LEED certified block of townhouses. The LEED block is expected to include the following sustainable elements: energy-saving features, reduced water runoff techniques, water conservation technologies, and indoor air quality improvements. Environmental upgrade packages will be offered for the remaining units. <http://www.townofajax.com/Page2823.aspx>

**The Greenwood Pavillion,** which is scheduled for completion in June 2010, utilizes sustainable building design principles. The Pavillion will promote energy efficiency and water conservation through solar thermal heating for hot water, electricity generation from photovoltaic panels, geothermal heating and cooling, high efficiency lighting, and low flow plumbing fixtures utilizing gray water. <http://www.townofajax.com/Page4110.aspx>



## Town of Aurora

**Aurora Town Hall** powered by Bullfrog Power - a 2-year pilot project begun in April 2008 in partnership with York Region.  
<http://www.yorkregion.com/article/73500>

**Energy Retrofits:** In addition, Town of Aurora is aggressively retrofitting all town owned facilities to gain significant energy reductions working in order of oldest to youngest. The Town Hall is slated for retrofits in 2011. Town has focused on allocating resources to reducing energy consumption as a priority instead of supplementing existing consumption levels with renewable energy.

## City of Burlington

**Tansley Woods Recreation Centre:** launched a new solar thermal heating system on April 22, 2010. The 90 solar collector panels provide a total energy supply of 325 kW thermal and 25 per cent of the energy required to heat the pool at Tansley Woods Community Centre. This project will reduce the city's greenhouse gas emissions by approximately 67.5 tons each year. The solar thermal heating system will also reduce the city's hydro consumption by approximately 101,481 KWh per year and natural gas consumption by 24,138 m<sup>3</sup> and provide an estimated annual energy cost savings of \$27,033. These savings will allow the new system to pay for itself in a little more than two years.

### **Appleby Woods Condominiums** features:

- Ground source heating and cooling.
- On grid electricity from wind turbines (producing six kilowatts of power at its peak).
- On grid electricity from four 20-metre long solar arrays (generating another 25 kilowatts of power).
- Solar powered parking lot lighting.

### **Canadian Centre for Inland Waters**

- Home to a successful Federal Buildings Initiative energy efficiency improvement project which enables federal organizations to use savings from energy efficiency measures to finance capital costs of building upgrades, retrofits and installations. Included an 800-kilowatt cogeneration unit and a waste-heat-fired boiler were installed in the central plant to improve efficiency and permit main boiler shutdown in the summer months.
- Installed two solar walls to preheat incoming air, a photovoltaic system to generate electricity and a living wall.

### Ironstone Condominiums

- Geothermal heating and cooling system (Geothermal pump operated by solar panels will transfer water up and down the tower via pipes in the ground to heat the building in the winter and cool it in the summer)
- Solar panels pre-heat the hot water tanks as well as support the electrical needs of geo-thermal heating and cooling system.

### Mountain Equipment Co-op

- Solar collectors on the roof generate 56kW of electricity which is purchased by Ontario Hydro and fed back to the power grid. Revenue generated from the sale of this power helps offset the cost of purchasing the solar collectors and electrical system. In addition to generating electricity, the solar collectors produce heat that's supplied to the building heating and domestic hot water systems.
- MEC purchases wind-generated power to meet 100% of the building's electrical needs.

### Strata condominium

- Geothermal ground source heating.

### Union Gas Headquarters

- Combined heat and power generation to power the building and recover waste heat for building heating.
- Micro-turbine with heat recovery.
- Waste heat is stored in a thermal storage tank.
- Power sale to grid.

### Walmart

- Electricity to power the store is 100% renewable (from Bullfrog Power).
- Geothermal (geo-exchange) heating & cooling system.

## Town of Caledon

**Caledon Centre for Recreation & Wellness (CCRW):** The Caledon Centre for Recreation & Wellness (CCRW) has been chosen as the site for a natural gas cogeneration unit. Cogeneration (combined heat and power generation) is an established technology that uses a single process to generate both electricity and usable heat suitable for space heating, domestic hot water and possible space cooling. The Town's cogeneration unit will be powered by natural gas, allowing the CCRW to operate under reduced electrical load in the event of a power outage. The cogeneration unit at the CCRW continues to be a work in progress. The cogeneration unit at CCRW should produce 275 kW of energy. It has been estimated that it will reduce one tonne of CO<sub>2</sub> for every 1515 kWh electricity it produces.



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**CO<sub>2</sub> saved:** The cogeneration component could eliminate approximately 539 tonnes of carbon dioxide per year – the equivalent to removing 92 cars from the road (this work is still in progress). <http://www.caledoncitizen.com/news/2007/0523/news/005.html>

**Funding:** Caledon received \$750,000 from the provincial Rural Infrastructure Grant to pilot the Caledon Centre's Cogeneration project.

**Green Power Energy Purchasing:** The Town has expanded its green power purchase to four Town facilities in the Caledon East Civic Campus. This permitted all five facilities in the municipally-owned Caledon East Campus (Fire Hall, OPP Station, Caledon Community Complex and Arena, and Town Hall) to be powered by zero-emission, low-impact hydro. (Source: Environmental Action Report 2009).

**Power Purchased:** Town purchased 1,575,507 kWh of Ecologo Certified renewable energy.

**CO<sub>2</sub> saved:** This allowed the Town to reduce its CO<sub>2</sub> by 954 tonnes.

**Funding:** The premium associated with this purchase comes from Town budget. [http://www.caledon.ca/contentc/townhall/departments/planningdevelopment/EPO\\_2009\\_Enviro\\_Action\\_Report.pdf](http://www.caledon.ca/contentc/townhall/departments/planningdevelopment/EPO_2009_Enviro_Action_Report.pdf)

**Energy Audit:** Town of Caledon completed energy audits at the Caledon Community Complex, Mayfield Recreation Centre, Caledon Centre for Recreation and Wellness, and the Albion Bolton Community Centre, Lloyd Wilson Centennial Arena and Caledon Central Pool.

**Source:** [http://canmetenergy-canmetenergie.nrcan-nrcan.gc.ca/eng/buildings\\_communities/communities/publications/clarington.html](http://canmetenergy-canmetenergie.nrcan-nrcan.gc.ca/eng/buildings_communities/communities/publications/clarington.html)

### Regional Municipality of Durham

**Wind Energy:** Small wind energy garden being considered in Scugog for 2010.

### Town of East Gwillimbury

**Alternative Energy and Community Energy Plan:** Town currently looking into alternative energy source projects and has developed a [Community Energy Plan](#).

### Regional Municipality of Halton

**The Landfill Gas Collection and Utilization Project** started in 2007 and involves Halton Region and Oakville Hydro working together to collect landfill gas and use it to produce



## Green Energy Production Scan Greater Toronto Area Jurisdictions

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electricity. The Project eliminates almost 40,000 tonnes of carbon dioxide while generating just over 1 megawatt of electricity.

In 2011, Halton Region will be identifying opportunities to purchase power from renewable energy sources in 2011. The Region will also be conducting a renewable energy feasibility study at some Regional locations by year's end (2010).

**Residential Solar Network:** Halton Environmental Network working on the Halton Residential Solar Project to install 50 residential solar panels (photovoltaic and solar thermal) by end of 2009. [http://www.the-hen.net/index.php?option=com\\_content&task=section&id=21&Itemid=91](http://www.the-hen.net/index.php?option=com_content&task=section&id=21&Itemid=91)

### Town of Halton Hills

**LEED Fire Hall:** Town has completed the construction of two new LEED Fire Halls with geothermal systems. <http://www.town.halton-hills.on.ca/calendars/2009/LIB-2009-0003.pdf>

**Geothermal Space Heating:** The town received a grant from FCM Green Municipal Fund to retrofit its newly-acquired heritage building, Devereaux House, with geothermal space heating, as well as energy-efficient windows and lighting. [http://www.devereauxhouse.ca/about\\_us.htm](http://www.devereauxhouse.ca/about_us.htm)

**Funding:** \$34,000 Green Municipal Fund.

**Liquid Solar Blanket:** Town is using liquid solar blanket on Town indoor swimming pools. <http://www.haltonhills.ca/townhall/pdf/2007/hh-summary-environmental-initiatives.pdf>

**Solar Powered LED Lights:** Sections of a multiuse pathway lit with solar powered LED lights. About 65% of the Town's traffic lights have been converted to LED technology, with the long term goal being 100% LED use.

**Bullfrog Power:** January 2009 Light up the Hills event was 100% powered by Bullfrog. Town is examining the idea of purchasing Bullfrog Power incrementally throughout year, and/or adding one new building each year powered by green energy. The Town has also purchased green energy for specific events (i.e. Earth Hour) from Bullfrog Power.

### City of Hamilton

**Landfill Gas Recovery Project:** Glanbrook landfill gas recovery project (May 2009) generates electricity to sell to Ontario power grid. Project generates enough energy to power 2,100 homes for a year; \$10.3 million dollar cost will be recovered in 4 years, with



projected annual revenue of \$2.8 million dollars through the sale of electricity to the Ontario grid.

**CO<sub>2</sub> saved:** The facility reduces approximately 100,000 tonnes of carbon dioxide equivalent of emissions every year, which would otherwise be released to the atmosphere. The reduction of greenhouse gases is equivalent to removing 18,000 cars off the road or planting 9,200 hectares of trees.

<http://www.myhamilton.ca/myhamilton/cityandgovernment/newsandpublications/newreleases/2009news/05-22-09ka2.htm>

**Woodward Avenue cogeneration facility:** The 2006 Woodward Avenue cogeneration facility recovers methane from wastewater treatment process to produce electricity and heat. This is one of the largest-scale examples of biogas cogeneration in Canada. This 1.6 MW Cogeneration Facility takes methane gas created by the wastewater treatment process and produces electricity and heat. The Cogeneration Facility converts 32 per cent of the available energy in the digester gas to electrical energy (electricity) and 48 per cent to thermal energy (heat). This electrical power and heat is used to operate the Woodward Plant. The heat that is harvested from the engine saves in natural gas costs.

**CO<sub>2</sub> saved:** The cogeneration facility will reduce approximately 6,500 tonnes of greenhouse gas every year and approximately 130,000 tonnes of greenhouse gas over the 20-year contract lifetime of the project.

<http://www.myhamilton.ca/myhamilton/cityandgovernment/newsandpublications/newreleases/2008news/10-16-08ka.htm>

**Downtown District Cooling Project:** The system connects all downtown core City-owned buildings to a cold water piping system. First phase of the project was completed in spring 2009. <http://www.myhamilton.ca/NR/rdonlyres/5E3FF7DB-31A5-4F16-9099-7813142892A1/0/CorporateEnergyReport.pdf>

**Waste Heat Energy:** A project to use waste heat to melt snow on sidewalks in the winter being considered.



## Township of King

**Solar Photovoltaic Array:** The Schomberg Arena and King Township Curling and Fitness Facility will have a 10kW ground mounted solar array once the facility is complete (early 2011). The LEED certified Arena also has many other sustainable features.

**Solar Water Heating System:** Nobleton Outdoor Pool (seasonal) is in the process of receiving funds from Natural Resource Canada for a solar hot water heating system.

## Town of Markham

**Solar photovoltaic systems:** Markham Environmental Sustainability Fund funded installation of 10 kW grid solar photovoltaic systems on roof of the Markham Civic Centre. <http://www.markham.ca/markham/ccbs/DocExtract2.asp?Document=cl091110-006a-0002.htm&vpath=/markham/ccbs/indexfile/index/council/cl091110-006a-0002.htm>

Markham Council approved planning for the install and Feed-in-Tariff application for a 250kW solar photovoltaic system on the Town's building at 8100 Warden Ave. and a number of energy efficiency retrofits for a variety of Town buildings using Infrastructure Stimulus monies.

<http://www.markham.ca/markham/ccbs/DocExtract2.asp?Document=gc091214-0014.htm&vpath=/markham/ccbs/indexfile/index/general/gc091214-0014.htm>

Markham Council also approved recommendations by Town staff to begin negotiations with PowerStream to lease several Town roof's totaling approximately 1.7MW of photovoltaic development.

<http://www.markham.ca/markham/ccbs/DocExtract2.asp?Document=cl091215-0013-0006.htm&vpath=/markham/ccbs/indexfile/index/council/cl091215-0013-0006.htm>

The leases support the Town's investment in PowerStream's solar development business unit.

**In total the Town expects nearly 2MW of solar PV to be installed on its buildings over the next two years.**

**Solar thermal system:** at Milliken community centre (a seasonal system).

<http://www.markham.ca/markham/ccbs/indexfile/Agendas/2008/General/gco80505/MLLIKEN%20MILLS%20ENERGY%20RETROFIT.pdf>

**Solar water heating system:** Markham Centennial Pool is heated with a solar water heating system.

**District Energy system:** EcoLogo certified Markham District Energy system reduces greenhouse gas emissions by 50%, was expanded with a 5 mW heat and power



cogeneration facility (April 2009). Similar East Markham system going under construction in 2010-2011.

[http://www.markhamdistrictenergy.com/NEW/GUI/ASSETS/PDF/MEDI\\_EcoLogo\\_PR.pdf](http://www.markhamdistrictenergy.com/NEW/GUI/ASSETS/PDF/MEDI_EcoLogo_PR.pdf)

### City of Mississauga

**Hershey Centre Photovoltaic system:** The roof of the Hershey Centre is now home to a new team of 144 photovoltaic panels that connect to form the largest solar energy installation in Mississauga. Jointly funded by Enersource Hydro Mississauga and the City of Mississauga, the system will produce 25 kilowatts of electricity at peak output. The energy will be sold to the Ontario grid generating revenue of approximately \$12,500 per year.

**CO<sub>2</sub> saved:** The project is expected to reduce carbon dioxide emissions by 25,000 kilograms per year for approximately 25 years.

<http://www.enersource.com/HM/PressReleases.aspx?id=732&archive=1>

**Bullfrog Power:** City began purchasing green power for the Civic Centre from Bullfrog (April 2008) and has renewed the contract annually since.

[http://www.mississauga.ca/portal/home?paf\\_gear\\_id=9700018&itemId=104400301n](http://www.mississauga.ca/portal/home?paf_gear_id=9700018&itemId=104400301n)

**Bus Shelters Solar Lighting:** Currently 100 bus shelters are retrofitted by solar-powered lights. City expects to save approximately \$400 in hydro cost annually per shelter. In addition, City-wide retrofit program in 2003/04, installing new LED at 390 intersections reduced hydro by 85%, resulting in annual savings of \$460,000.

**CO<sub>2</sub> saved:** The project results in eliminating 1,253 tonnes of green house gas emissions.

[http://www.mississauga.ca/portal/residents/energy?paf\\_gear\\_id=9700017&itemId=103800693n](http://www.mississauga.ca/portal/residents/energy?paf_gear_id=9700017&itemId=103800693n)

**Waste heat recovery** from the hot ammonia refrigerant used in rink ice-making in Iceland Arena – the recovered energy is used to provide hot water for showers and ice resurfacing. This project helped the City to save 51,000 cubic meters of natural gas and 13,000 kilowatt hours of electrical energy with total energy saving cost of up to \$24,500 per year.

**CO<sub>2</sub> saved:** The project results in eliminating 102 tonnes of greenhouse gas.

[http://www.mississauga.ca/portal/residents/environment?paf\\_gear\\_id=9700020&itemId=104802729n](http://www.mississauga.ca/portal/residents/environment?paf_gear_id=9700020&itemId=104802729n)

**Solar thermal systems:** City is currently reviewing solar thermal systems for community pools and hot water heating.



**Energy Management Plan:** City has an internal energy management strategy which includes annual energy management improvements including energy audits, energy efficiency improvements and new computerized building automation systems in facilities, such as all fire stations. Also, the City has implemented new Corporate Green Building Standards and is in the midst of developing a Green Development strategy for the community development.

**Pool drain water waste heat recovery system at Mississauga Valley Community Centre Pool.** The system recovers 75% of the heat from 4000 litres of water that must be drained every day from the pool to meet health regulations and the recovered heat is used to preheat make up water to the pool, In addition, a drain water control and energy metering system monitors the saving and performance. Annual natural gas savings are estimated at 2,515 cubic meters resulting in greenhouse gas savings of 4,800 kg per year.

**Solar panels** have been installed on parking meters throughout Mississauga.

#### Town of Newmarket

Recovered Waste Heat to heat spectator benches in Magna Arena.

#### Town of Oakville

**Landfill Gas Collection and Utilization Project:** Halton Region and Oakville Hydro Energy Services Inc. Landfill Gas Collection and Utilization Project (2007), generates enough green power for 1,500 homes.

**CO<sub>2</sub> saved:** The project eliminates 80,000 tonnes of CO<sub>2</sub>.  
[http://www.oakvillehydro.com/pdf/halton-oakville\\_backgrounder.pdf](http://www.oakvillehydro.com/pdf/halton-oakville_backgrounder.pdf)

**Green Energy purchasing:** Town began purchasing 170,000 kW green energy from Oakville Hydro (2006) through Green Light Pact Program.  
[http://www.oakville.ca/Media\\_Files/environment/2009ESPFactSheet-energy.pdf](http://www.oakville.ca/Media_Files/environment/2009ESPFactSheet-energy.pdf)

**Solar lights used for Town's walkways:** This project is currently at pilot stage, when completed, will be recommended for all walkways around the City Hall.  
[http://www.oakville.ca/Media\\_Files/environment/ESPHighlightsReporto8.pdf](http://www.oakville.ca/Media_Files/environment/ESPHighlightsReporto8.pdf)

**Oakville Hydro** has installed solar photovoltaic 10kW panels on its Administration Building.



**Solar photovoltaic installations** have been investigated for select town facilities for participation in the MicroFIT program.

**Oakville Transit's** new building is being built to LEED standards including geothermal heat source for Administration section of building

### City of Oshawa

**Geothermal heating and cooling system at UOIT:** A combined heat and power plant owned and operated by Oshawa Power and Utilities Corporation (OPUC) and located on the Durham College/UOIT campus, has been in operation since March 2009. The 2.3 megawatt clean energy plant provides thermal and electrical energy to the college/university campus at an energy efficiency of approximately 80 per cent. The thermal energy from the plant is used to heat campus buildings and hot water. (<http://www.oshawa.ca/documents/Inside-Oshawa-2009.pdf>)

**City of Oshawa energy retrofit project:** The City's energy retrofit project includes the demolition of the Council Chambers as well as comprehensive energy and building system improvements to City Hall, the Arts Resource Centre, McLaughlin Library Branch and Robert McLaughlin Gallery. The project includes everything from new windows, lights and controls, to updated electrical systems, and heating, ventilation and cooling systems. The upgrades will make lighting, water and other building systems more efficient.

**Funding:** The City of Oshawa received \$2,217,603 funding from the Federation of Canadian Municipalities' Green Municipal Fund to undertake the energy retrofit project. ([http://www.colincarriemp.ca/pdfmedia/News%20release\\_22%20May%2009\\_Green%20municipal%20fund.pdf](http://www.colincarriemp.ca/pdfmedia/News%20release_22%20May%2009_Green%20municipal%20fund.pdf))

### Regional Municipality of Peel

**Bullfrog Power:** Green Energy Matters 2007 Summit in Peel powered by Bullfrog Power.

**Clarkson Photovoltaic Solar Flairs Project:** This is a partnership between Region of Peel and Enersource Corporation consisting of 9 pole mounted flower-shaped solar panel structures at Clarkson Wastewater Treatment Plant. <http://www.flickr.com/photos/gemmagrace/2359228633/in/pool-environmentallyfriendly>

**Geothermal heating and heat recovery ventilators:** Two Community Recycling Centres utilize geothermal heating and heat recovery ventilators. Engineering design was completed in 2008. The Centres are going through their permitting processes.



**Solar thermal water heating system:** Ridgeway Childcare installing solar thermal water heating system. The existing gas fired hot water heaters will be replaced with ultra high efficient, hot water heaters with a solar thermal component. Solar thermal heat system provide up to a 50 per cent reduction in natural gas consumption for domestic hot water heating. Project completed in 2009.

<http://www.peelregion.ca/health/cleanairpeel/initiatives/energy.htm>

**20 kW roof-mounted photovoltaic systems being installed on the Vera M. Davis Long Term Care Centre:** This will be the first project to participate in the provincial Standard Offer Program offering \$0.42/kWh. The expected electrical generation for the solar PV system is approximately 22,000 kWh per year. The project is currently going through the Connection Impact Assessment process with Hydro One Networks.

<http://www.peelregion.ca/health/cleanairpeel/initiatives/energy.htm>

**Green roof with photovoltaic component:** Malton Village Long Term Care Centre installed a green roof with photovoltaic component. The green roof is expected to be approximately 2500 sq ft. Projects of this nature typically lead to a 20 per cent reduction in building cooling energy needs and lead to a reduction in the local urban heat island effect. Phase 1 (solar PV panels embedded in a small green roof) was completed in 2008. The expansion of the green roof is scheduled for Spring 2010.

<http://www.peelregion.ca/health/cleanairpeel/initiatives/energy.htm>

**Geothermal system:** Region's headquarters geothermal system produces 15% of overall energy demand. Regional staff moved into the new headquarters building in early 2009. The geothermal system is currently in operation. The Region has committed to procuring all electricity for the building from certified renewable sources for a minimum of two years. <http://zoominlocal.com/ml-brampton-guardian/93c32lwSGz6vS83X/#?article=431710>

**Biodiesel production:** Waste Operations Centre collects used vegetable oil at community recycling centres, converts it into biodiesel for use in Operations Centre vehicles. Biodiesel has been produced at the Battleford Community Recycling Centre and used by the Region's Waste Operations fleet since 2007.

<http://www.peelregion.ca/pw/waste/crc/cooking-oil.htm>

**Landfill gas recovery:** Britannia Landfill and Gas Electricity Project reduce 10,000 tonnes of methane annually (250,000 tonnes of CO<sub>2</sub> equivalents). The five megawatt landfill gas power plant has been operating successfully since 2005.

<http://www.walkerind.com/IMS/pdf/blg.pdf>

**Solar domestic hot water, geothermal and HVAC systems:** Three group homes being retrofitted with solar domestic hot water, geothermal and HVAC systems (April 2009). <http://www.homesoflastingcharacter.com/housewarming/docs/newsrelease.html>



## City of Pickering

**Solar thermal panels:** A condominium in downtown Pickering is installing 76 solar thermal panels to become more energy efficient, and environmentally responsible. The solar panels installed on the roof of 1200 The Esplanade, an options for Homes condo built by Deltera, to heat the building's water supply. GTA-based Glenbarra Energy Solutions Inc. is managing this large-scale sustainable project.

<http://sustainablepickering.com/newss1.php?command=viewArticle&prevCommand=showall&ID=4&currentFeed=1>

**Wind Power:** In August 2001, Ontario Power Generation (OPG) installed a Vestas 1.8 megawatt wind turbine at its Pickering Nuclear site. The Pickering Wind GS typically produces enough electricity to supply the annual electricity needs of about 330 average homes. At full power, it can supply about 1,800 homes at any given time.

<http://www.cityofpickering.com/standard/lifestyle/waterfront/images/BackgrounderPWGS.pdf>

## Town of Richmond Hill

**Solar power:** Town of Richmond Hill's Municipal Offices hot water supply being heated using a new Solar Water Heating System. The system is expected to help the Town save \$9,000 a year compared to the Town's current natural gas heating system. The Solar Water Heating System is made of 12 solar collector panels installed on the south side of the roof and a storage tank, pump, required plumbing and computerized controls have been set up in the penthouse of the building. The solar panels have a working life of 20 years.

[http://www.richmondhill.ca/subpage.asp?pageid=news\\_releases\\_04\\_02\\_2008](http://www.richmondhill.ca/subpage.asp?pageid=news_releases_04_02_2008)

**Wind turbine:** Installation of a new small wind turbine at Richmond Green later this year to offset power needs.

[http://www.richmondhill.ca/subpage.asp?pageid=news\\_councilhighlights\\_03\\_23\\_2009](http://www.richmondhill.ca/subpage.asp?pageid=news_councilhighlights_03_23_2009)

**Geothermal heating:** Richmond Hill Performing Arts Centre uses geothermal heating.

**District heating:** District heating feasibility study in progress.

**Wind Power Project:** Town's wind power project on hold due to Oakridge's Moraine location.

**Solar heating:** Solar heating project approved in 2009 for the Bayview Hill Community Centre swimming pool.



## City of Toronto

**Deep Lake Water Cooling system:** City Hall, Metro Hall and Police Headquarters using Deep Lake Water Cooling system, saves up to 6.7 million kW annually. Old City Hall (2009) and Union Station (forthcoming) are in process of installing the system, this will add another 2 million kW of saved energy. Deep Lake Water Cooling being used by multiple buildings such as Ritz Carlton, Trump Tower, Maple Leaf Square and Ryerson University Business Centre.

<http://www.toronto.ca/environment/initiatives/cooling.htm>

**Geothermal unit:** The geothermal systems at Exhibition Place and at new Police Academy (since July 2009) are currently operational.

<http://wx.toronto.ca/inter/it/newsrel.nsf/7017df2f20edbe2885256619004e428e/aa0678d22d43621d852571d200693d86?OpenDocument>

**Solar Wall at Lakeshore Maintenance Garage:** The all-metal solar air heating system measures 91m long by 6.7m high (300ft by 22 ft), and was installed on the south wall of the building, which faces Lakeshore Boulevard. In addition to reducing heating costs and enhancing the indoor working environment, the cladding has also improved the overall appearance of the building.

**Solar walls:** Solar walls installed at Central Management Garage, Police Garage, and Scadding Court Community Centre to provide energy for heating.

<http://www.toronto.ca/ewmo/pdf/cmgsolarairheating.pdf>

**Solar-powered lights:** 350 transit shelters along city streets lit by solar-powered lights.

[http://www.toronto.ca/greenguide/energy\\_use.htm#city\\_energyuse](http://www.toronto.ca/greenguide/energy_use.htm#city_energyuse)

**Photovoltaic pilot project:** Horse Palace at Exhibition Place Photovoltaic (PV) pilot project started in August 2006. Installation has capacity of 100 kW and output of approximately 120,000 kWh per year. This project is one element of Exhibition Place's goal of becoming self-sufficient by 2010.

<http://wx.toronto.ca/inter/it/newsrel.nsf/7017df2f20edbe2885256619004e428e/aa0678d22d43621d852571d200693d86?OpenDocument>

**Toronto Solar Neighbourhoods Initiative:** This Toronto Atmospheric Fund pilot project is on-going in Riverdale, consisting of 150 systems, involving 15,000 people.

[http://www.toronto.ca/taf/pdf/cmmnty\\_cnslttns.pdf](http://www.toronto.ca/taf/pdf/cmmnty_cnslttns.pdf)

Sustainable Energy Fund provides up to 49% of total cost of projects, with zero interest for energy efficiency and renewable energy projects.

<http://www.toronto.ca/energy/sef.htm>

**Solar power projects (partial list):** Solar Powered Transit Shelters, Toronto Hydro Solar Installation at Commissioners Street, Solar Powered Pay and Display Machine, Horse



## Green Energy Production Scan Greater Toronto Area Jurisdictions

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Palace Photovoltaic Plant at Exhibition Place, TTC Microwave Transmitter Solar Photovoltaic Panel, Bloor West Village solar PV project, Solar Photovoltaic – St. Lawrence Parking Garage, Firehalls - #334, 424, Horgan Water Treatment Plant, Central Traffic and Police Garage, Civic Centres – North York, East York, Scarborough, Polar Bear Hold at Toronto Zoo, Alex Muir Park, Water Pumping in Don Valley

**Geothermal projects:** Yonge Hearts Childcare Centre, Metro Hall, Toronto Zoo, City Hall, Police Headquarters, Press Building Geothermal Plant at Exhibition place,

**Solar Heating System at 12 Community Pools including Centennial Recreation Centre in Scarborough – Solar Heating System:** An unglazed solar collector technology was installed to supplement natural gas for pool water heating. The solar system consists of 56 unglazed solar collector panels covering 248 m<sup>2</sup> of the south facing roof of the swimming pool area. These collectors weigh only 20 kg each when full. The system commenced in August 2006 with estimated CO<sub>2</sub> of 28 tonnes per year.  
[http://www.toronto.ca/ewmo/pdf/centennialpool\\_solar.pdf](http://www.toronto.ca/ewmo/pdf/centennialpool_solar.pdf)

The Toronto Atmospheric Fund provided support for the above mentioned City of Toronto's Green Energy projects.

**Bullfrog Power:** Power used at City Hall and Nathan Phillips Square is provided by Bullfrog, saving 17-20 million kW annually.  
<http://www.bullfrogpower.com/09releases/toronto.cfm>

**Green energy procurement project:** The EEO provides project reviews and assessments of green energy and electricity projects. Proposals under consideration are vetted against technological and financial feasibility. This is in support of a green energy procurement policy, which the office is helping develop with several divisions.  
<http://www.toronto.ca/energy/green.htm>

**Biogas green energy recovery initiative:** energy recovery at landfill sites (Keele Valley, Beare Road, Brock) and Asbridges Bay treatment plant.

**Fuel cell demonstration project at Exhibition Place:** The Fuel Cell Demonstration Project was an awareness program held over three summers at Exhibition Place (2003-2005). The event was a partnership with several producers of fuel cell technology and equipment, to demonstrate the potential reductions in emissions by the City.  
<http://www.toronto.ca/energy/green.htm>

**Biosolids Master Plan:** Report for the City's biosolids management considering increased incineration of biosolids to create electricity.  
[http://www.toronto.ca/wes/techservices/involved/www/biosolids/pdf/pis4/meeting\\_2009-02\\_responses\\_to\\_comments.pdf](http://www.toronto.ca/wes/techservices/involved/www/biosolids/pdf/pis4/meeting_2009-02_responses_to_comments.pdf)



**Wind Turbine:** at Exhibition Place.

**Solar Energy Fund (SEF):** \$20 million zero interest loan fund to assist with renewable energy installations.

### City of Vaughan

**PowerStream Head Office has sun-tracking solar panels:**

[http://www.city.vaughan.on.ca/vaughan/council/ward\\_1/pdf/20081020\\_124634.pdf](http://www.city.vaughan.on.ca/vaughan/council/ward_1/pdf/20081020_124634.pdf)

### Regional Municipality of York

**Pilot solar panels:** for York Region Transit and Viva bus shelters.

**Wind Power:** Wind mapping and feasibility study and review for wind power turbine at Sutton water plant taken place.

**Bullfrog Power:** York Region Administrative Centre is powered by Bullfrog.

[http://www.york.ca/NR/rdonlyres/7q6jhazmhm2w45meg56n554nnx3kchljkfawxqa2kpjifqtgymc57jb2gkpwrr5uc4wynme3rzdqzmqmjbf6taiwa/Media+Release+-+York+Region+and+Aurora+Sign+on+with+Bullfrog+Power+\\_Final\\_+-+April+22+2008.pdf](http://www.york.ca/NR/rdonlyres/7q6jhazmhm2w45meg56n554nnx3kchljkfawxqa2kpjifqtgymc57jb2gkpwrr5uc4wynme3rzdqzmqmjbf6taiwa/Media+Release+-+York+Region+and+Aurora+Sign+on+with+Bullfrog+Power+_Final_+-+April+22+2008.pdf)