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The Clean Air PARTNERSHIP

Green Energy Production Scan
Greater Toronto Area Jurisdictions

September, 2009

Report Prepared For:
Greater Toronto Area Clean Air Council

GTA CleanAir COUNCIL

Report Prepared By:
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Preamble

Executive Director:
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The Clean Air Partnership (CAP) would like to thank the members of 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 Toronto Atmospheric Fund.

About the Clean Air Partnership
The 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.

About the Greater Toronto Area Clean Air Council (GTA-CAC)
The Greater Toronto Area Clean Air Council promotes the reduction of air pollution emissions and increased awareness of regional air quality 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 smog and other forms of air pollution in the GTA, and their associated health risks. The goals of the GTA-CAC are: To enable solutions to air quality challenges through a dynamic network that expands knowledge and enthusiasm, and encourages practical and successful policies and actions. The goals of the Council are:

- To promote a better understanding of air quality 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 related health risks, in the GTA; and
- To liaise with municipalities in the GTA and across Canada and wherever possible with neighbouring jurisdictions in the United States, organizations with compatible mandates, and communities within the airshed to share best practices for reducing smog and air pollution.

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

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, photovoltaic system and other renewable energy producing facilities.

Executive Summary

Article 3	Corporate Action	Status
3.4: 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**	**Corporate Action only**	
Town of Ajax	Town of Ajax Open House Ajax Steam Plant conversion to a cogeneration facility.	In progress
	Fire Station - LEED Certified	Completed in 2008
	Town of Ajax New Operation Centre consists of both Solar thermal and photovoltaic systems.	In progress
Town of Aurora	Bullfrog purchasing for the City Hall.	2008-2010
	Retrofitting town owned facilities to Conserve energy.	Town Hall is scheduled for retrofit in 2011
City of Brampton	Bullfrog energy purchase for the Town Hall ??	
City of Burlington	Appleby Woods Condominiums - geothermal heating system.	Fall 2009
	Wind Turbine - the Brant Street Pier wind turbine	On-hold
Town of Caledon	Caledon Centre for Recreation and Wellness Cogeneration project.	2008
	Mayfield Recreation Complex - Solar wall	In progress
	Green Energy PowerHouse. 2007-2008 Progress report	2008 (currently on hold)
	Expansion of Green Power energy purchase for Town's facilities. 2007-2008 Progress Report	In progress
Town of Clarington	The Urban Archetypes Project – Neighbourhood Energy Consumption Audit.	
Region of Durham	Regions of Durham and York embarking on a study for generation of energy from waste. Regional Municipality of Durham Newsletter	June 2009
Town East Gwillimbury	York Region Household Hazardous Waste Depot powered by Bullfrog. Community Energy Plan	Ongoing
Region of Halton	The Landfill Gas Collection and Utilization Project - Halton Region and Oakville Hydro Energy Services Inc. working together to collect landfill gas and use it to produce electricity. The project provides enough "green" energy to power approximately 1,500 homes.	In progress
	Residential solar thermal and photovoltaic project Halton Region and Halton Environmental Network.	Ongoing

Article 3	Corporate Action	Status
Town of Halton Hills	Halton Hills LEED Fire Halls with geothermal systems.	In progress
	Liquid solar blanket project – used on Town's indoor swimming pools.	In progress
	Solar water heating for the Gellert Community Centre.	In Progress
City of Hamilton	Landfill gas recovery project at Glanbrook Landfill site.	Operational
	Woodward Avenue cogeneration facility recovers methane from wastewater treatment process to produce electricity and heat.	In progress
	Hamilton Downtown District Cooling Project	
Township of King	Solar Renewable Domestic Hot Water Pilot Project.	
	EcoLogo methane burning co-generation plant.	
	Landfill gas generation - 2008.	
Town of Markham	Markham Civic Center photovoltaic system.	Completed
	Solar thermal system at Milliken community centre.	Ongoing
	Solar water heating system for Centennial Pool.	
	EcoLogo certified Markham District Energy system.	Ongoing
	Residential renewable energy program – a partnership between Town of Markham, York University and Enbridge.	June 2009
City of Mississauga	Hershey Centre photovoltaic system.	Completed
	Civic Centre powered by Bullfrog (April 2008).	One-year pilot project
	Bus shelter solar lighting and LED traffic light signal heads.	Completed for 65 shelters
	Recovered Waste Heat at Iceland Arena:	Completed
Newmarket	Newmarket EcoLogic Homes. http://www.newmarket.ca/userfiles/HTML/nts_1_5115_1.html	In progress
	Bullfrog for the York Region Administrative Centre.	Ongoing
Town of Oakville	Landfill gas collection - Halton Region and Oakville. Hydro partnership)	Ongoing
	Green Light Pact Program – purchasing green energy from Oakville Hydro.	Ongoing
	Solar heating for community pools.	Completed
	Solar lights used for City's walkways.	Pilot
	Oakville Hydro Renewable Energy Standard Offer Program with Ontario Power Authorit. http://www.oakville.ca/10806.htm	Ongoing
City of Oshawa	Gas-fired cogeneration facility at GM Motors	Completed
	Geothermal heating and cooling system at UOIT.	Completed
	City of Oshawa energy retrofit project for City Hall, the Arts Resource Centre, McLaughlin Library Branch and Robert McLaughlin Gallery. Three group homes being retrofitted with solar domestic hot water, geothermal and HVAC systems.	Ongoing

Article 3	Corporate Action	Status
Region of Peel	Ridgeway Childcare solar thermal water heating system.	Completed
	Clarkson Photovoltaic Solar Flairs Project	Completed
	Vera M. Davis Long Term Care Centre roof mounted photovoltaic system.	completed
	Malton Village Long Term Care Centre green roof with photovoltaic component.	Completed
	Peel Region's headquarters geothermal system	Completed
	Waste Operations Centre biodiesel project	Completed
	Britannia Landfill and Gas Electricity Project	Completed
City of Pickering	Solar thermal panels in condominium - downtown Pickering	Completed
	Vestas 1.8 megawatt wind turbine at its Pickering Nuclear site	Operational since 2001
	Office Tower with LEED Silver Standard	Completed
Town of Richmond Hill	Town of Richmond Hill's Municipal Offices solar power water heating system	April 2008
	Small wind turbine at Richmond Green	2009
	Richmond Hill Performing Arts Centre uses geothermal heating?	
Simcoe Muskoka HU	Nothing yet	
City of Toronto	Deep Lake Water Cooling system for City Hall, Metro Hall and Police Headquarters (completed), Old City Hall and Union Station (will be completed in 2009)	Ongoing
	Geothermal unit at Exhibition Place (operational), new Police Academy (July 2009)	Ongoing July 2009
	Horse Palace at Exhibition Place Photovoltaic (PV) pilot project	In progress
	Toronto Solar Neighbourhood Initiative - pilot project in Riverdale.	Ongoing
	Centennial Recreation Centre in Scarborough – Solar Heating System.	Operational
	City Hall and Nathan Philips Square 100% green energy provided by Bullfrog.	Completed
City of Vaughn	The City is building a LEED certified new City Hall to be completed in 2010. Partnership with PowerStream Power Saving Blitz Program.	2010
Town of Whitby	Nothing yet	
Region of York	Pilot solar panels for York Region Transit and Viva bus shelters. Wind mapping and feasibility study and review for wind power turbine at Sutton water plant taken place.	

Renewable Energy Production Scan in the GTA Municipalities

Town of Ajax

- Proposed redevelopment of the Ajax Steam Plant into a cogeneration facility which would produce electricity, steam and hot water. http://www.townofajax.com/AssetFactory.aspx?did=5641
- Ajax Boiler Plant Revitalization including:
    - 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 baghouses); and
    - Rebuilding wood-fired combustor/boiler No. 7

  http://www.townofajax.com/AssetFactory .aspx?did=5631

- 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. 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 draught resistant plants; and uses significantly less water and energy than comparable facilities. There is even priority parking for hybrid and alternative fuel vehicles, and secure storage for bicycles. http://www.townofajax.com/Page2775.aspx
- Town of Ajax New Operation 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

Town of Aurora

- Aurora Town Hall powered by Bullfrog - a 2 year pilot project begun in April 2008 in partnership with York Region. http://www.yorkregion.com/article/73500
- In addition TOA is aggressively retrofitting all town owned facilities to gain significant energy reductions working in order of oldest to youngest. The Town hall is slate for retrofits in 2011. To date Manager of facilities still feels that the most environment energy and cost effective measures are related to reducing energy consumption instead of supplementing existing consumption levels with renewable energy. He feels that the technology and know how of installers are still too risky compared to the proven success of retrofitting. (Christina Nagho July 31st).

City of Brampton

- Purchasing bullfrog energy for the Town Hall.

City of Burlington

- A Wal-Mart powered by geothermal energy (all construction-related processes were powered by Bullfrog). The project completed in 2008-2009. http://cms.burlington.ca/Page3347.aspx and https://www.bullfrogpower.com/09releases/WM_burlington.pdf
- Appleby Woods condominiums will have geothermal heating and cooling, on-grid electricity from wind turbines, four 20 metre solar arrays, solar lighting for parking lot.
- Corporate project currently investigating implementation of solar thermal energy to help heat the Tansley Woods Recreation Centre. Tansley Woods – Installation date estimated to be fall 2009. http://cms.burlington.ca/Page3340.aspx and http://www.applebywoods.com/enerbuild.html
- The Brant Street Pier, the City of Burlington and Burlington Hydro teamed together to explore ways to demonstrate their commitment to energy conservation in the community. The Pier will become a signature destination on Burlington's waterfront upon completion in the fall of 2008. Extending 132 meters over Lake Ontario, it will provide breathtaking views of the lake and Burlington's shoreline. The nearly 7 meter blades of the wind turbine will produce 10 kW of electricity which will be fed back into the grid through the Ontario Power Authority Renewable Energy Standard Offer Program. Projects funded by the Conservation and Demand Management Programs have resulted in significant environmental and energy related impacts:

- City-wide demand reduction of 1.5 mW,
- Annual consumption reductions of over 6,000 mWh,
- Reduction of CO2 emissions in excess of 4,000 tonnes per year.

https://www.eda-on.ca/eda/edaweb.nsf/0/dc7cf4cf7f9af22d85257448006a27a8/$FILE/BurlingtonHydro_EDA_Distributor_Sep08.pdf

The Brant Street Pier is currently on hold due to a crane accident causing the shutdown of the operation pending on an investigation. However, the plans for the wind turbine are still in effect and the turbine will be put up once the pier is completed. http://cms.burlington.ca/Page2367.aspx

- City is working with Halton Environmental Network on a solar residential program.

Town of Caledon

- Caledon received $750,000 from the provincial Rural Infrastructure Grant to pilot the Caledon Centre's Cogeneration project. 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 component could eliminate approximately 539 tons 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

- A solar feasibility study was completed for the Caledon Centre for Recreation and Wellness. If deemed to be feasible by both the study and the municipality, the replacement of conventional electricity sources with solar energy sources will serve to reduce both energy costs and the impact of electricity generation on the environment. Source: Council Report: pr06-23\ Town of Caledon Progress report – 2007 – 2008
- The town has started to develop a corporate energy management plan.
- Solar wall to be installed at the Mayfield Recreation Complex.
- Green Energy PowerHouse Workshop - In partnership with Hydro One Networks, the Town hosted a PowerHouse Workshop in June 2008. Funded by the Ontario Ministry of Energy, PowerHouse is a partnership between Enersource Hydro Mississauga, Hydro One Networks and Hydro One Brampton. PowerHouse is a new loan or rebate pilot program that

gives residential homeowners access to zero-interest loans ranging from $2,000 to $50,000, or a rebate for installing qualifying renewable electricity generation technologies. Hydro One reports that they are receiving an excellent response from Caledon residents as a result of this workshop. Qualifying renewable energy technologies include solar thermal, solar photovoltaic, geothermal, and small wind (HYDRO ONE NOW HAS PROJECT ON HOLD) Source: http://www.town.caledon.on.ca/contentc/townhall/departments/economicdevelopment/2007-2008_ProgressReport_lowres.pdf

- Green Power energy - 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) 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, and will be completing audits at two additional facilities this fall - Lloyd Wilson Centennial Arena and Caledon Central Pool.
- Provincially-funded Energy Audit ($20,000) of Caledon Town Hass is completed.

Town of Clarington

- The Urban Archetypes Project, initiated by Natural Resources Canada's to develop energy profiles for average households within two communities: Hobbs Drive and Newcastle Village in the Municipality of Clarington. Source: http://canmetenergy-canmetenergie.nrcan-rncan.gc.ca/eng/buildings_communities/communities/publications/clarington.html
- Newcastle Community Improvement Project (no further information).

Region of Durham

- Regions of Durham and York completing a feasibility study on a residual waste plant, which would recover the heat produced from burning residuals and convert it into steam to produce energy. http://www.region.durham.on.ca/default.asp?nr=/council/2009/ch062409.htm&setFooter=includes/councilFooter.inc
- Durham and York Regions have developed independent long-term Waste Management Strategy Plans to effectively address managing the wastes

from their individual jurisdictions in the future. Limited landfill capacity in Ontario - combined with the general public's growing opposition to landfill - has increased the desire to develop innovative alternatives to current waste disposal methods in an expedited manner. Ontario's Ministry of the Environment and the State of Michigan have committed to slowly decrease and eliminate cross border haulage and disposal of residential waste from Ontario by the end of 2010. The critical realization that the export of garbage cannot be considered as a long-term solution for managing residual waste must be addressed.

- Durham and York Regions have partnered to undertake an environmental study designed to investigate alternative methods to manage future residual waste. The study is entitled "The Durham/York Residual Waste Study". This study addresses the social, economic and environmental concerns of residents through an Environmental Assessment process. http://www.durhamyorkwaste.ca/
- Small wind energy garden being considered in Scugog for 2010.
- Energy from Waste Facility in the Region of Durham has been considered. http://www.region.durham.on.ca/departments/health/pub/energyFromWasteReport.pdf

Town of East Gwillimbury

- York Region Household Hazardous Waste Depot powered by Bullfrog.
- Town currently looking into alternative energy source projects.
- Community Energy Plan. http://www.eastgwillimbury.ca/Assets/Environment/CEP+Pres+(Nov+17+08).pdf

Regional Municipality of Halton

- Halton Region and Oakville Hydro Energy Services Inc. are working together in partnership on Landfill Gas Collection and Utilization Project (2007). The system generates enough green power for 1,500 homes to eliminate 80,000 tonnes of CO2. http://www.region.halton.on.ca/ppw/waste/landfillgasproject.htm
- 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

Town of Halton Hills

- Town in process of building two new LEED fire Halls with geothermal systems. http://www.town.halton-hills.on.ca/calendars/2009/LIB-2009-0003.pdf
- Liquid solar blanket used on Town indoor swimming pools. http://www.haltonhills.ca/townhall/pdf/2007/hh-summary-environmental-initiatives.pdf
- Sections of a multiuse pathway lit with solar powered LED lights.
- Solar-powered water heating system for the Gellert Community Centre. http://www.town.halton-hills.on.ca/calendars/2009/PDS-2008-0061.pdf
- Examining idea of purchasing Bullfrog power incrementally throughout year, and/or adding one new building each year powered by green energy.
- January 2009 Light up the Hills event was 100% powered by Bullfrog.

City of Hamilton

- Landfill gas recovery project (May 2009) at Glanbrook Landfill site, 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. 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/newsreleases/2009news/05-22-09ka2.htm
- 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. 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. 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. http://www.myhamilton.ca/myhamilton/cityandgovernment/newsandpublications/newsreleases/2008news/10-16-08ka.htm
- Downtown District Cooling Project connecting all downtown core City-owned buildings to a cold water piping system; first phase completed in

spring 2009. http://www.myhamilton.ca/NR/rdonlyres/5E3FF7DB-31A5-4F16-9099-7813142892A1/0/CorporateEnergyReport.pdf

- Project to use waste heat to melt snow on sidewalks in the winter being considered.

Township of King

- Solar Renewable Domestic Hot Water Pilot Project.
- EcoLogo methane burning cogeneration plant.
- Landfill gas generation for 2008.

Town of Markham

- Markham Environmental Sustainability Fund funded installation of 10 kW grid solar photovoltaic systems on roof of the Markham Civic Centre. http://www1.cityoflompoc.com/councilagenda/2007/070918/070918.pdf
- Solar thermal system at Milliken community centre (a seasonal system). http://www.markham.ca/markham/ccbs/indexfile/Agendas/2008/General/gc080505/MILLIKEN%20MILLS%20ENERGY%20RETROFIT.pdf
- Solar water heating system for Centennial Pool.
- 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
- Town moving forward on residential renewable energy program through partnership with Enbridge Gas Distribution, York University (Faculty of Environmental Studies), Bullfrog Power, Enerworks and Natural Resources Canada. Pilot project will equip up to 500 homes in four communities, Thornhill, Buttonville, Unionville and Milliken, with rooftop solar thermal systems. Two panel systems resemble roof-top skylights, weighing 100 pounds and occupying about 5.9 m2. Solar panels able to provide up to 60% clean energy for residential water heating system. http://www.cansia.ca/Content/Documents/Document.ashx?DocId=54499

City of Mississauga

- 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. The project is also 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
In 2008 the Hershey Centre generated energy and sold it to Ontario power grid at rate of $0.42/kwh.

- City began purchasing green power for the Civic Centre from Bullfrog (April 2008) with hopes it will be extended.
http://www.mississauga.ca/portal/home?paf_gear_id=9700018&itemId=104400301n
- Bus Shelters Solar Lighting – currently 65 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 and eliminating 1,253 tonnes of green house gas emissions.
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; eliminating 102 tonnes of greenhouse gas with total energy saving cost of up to $24,500 per year.
http://www.mississauga.ca/portal/residents/environment?paf_gear_id=9700020&itemId=104802729n
- City is currently reviewing solar thermal systems for community pools and hot water heating.

Town of Newmarket

- York Region Administrative Centre is powered by Bullfrog.
http://www.york.ca/NR/rdonlyres/7q6jhazmhm2w45meg56n554nnx3kchljkfawxqa2kpjjfqtgymc57jb2gkpwrr5uc4wynme3rzdqrzmqmjbf6taiwa/Media+Release+-+York+Region+and+Aurora+Sign+on+with+Bullfrog+Power+_Final_+-+April+22+2008.pdf
- Newmarket EcoLogic Homes - Newmarket is the home of Canada's first environmentally-friendly subdivision. In 2008, construction began on 34 EcoLogic homes located on the Stickwood-Walker Farm property. The EcoLogic development is the first residential development in Canada to be built entirely to Leadership in Energy and Environmental Design (LEED) platinum specifications. These homes will achieve and exceed specific

environmental targets, including a 50 per cent reduction in household water draws, a 35 per cent reduction in overall discharge flows and a 60 per cent reduction in solid waste, greenhouse gas production and energy consumption compared to conventional homes. http://www.newmarket.ca/userfiles/HTML/nts_1_5115_1.html

Town of Oakville

- Halton Region and Oakville Hydro Energy Services Inc. Landfill Gas Collection and Utilization Project (2007), generates enough green power for 1,500 homes, eliminates 80,000 tonnes of CO2. http://www.oakvillehydro.com/pdf/halton-oakville_backgrounder.pdf
- Oakville Hydro secured a Renewable Energy Standard Offer Program with Ontario Power Authority, allows the former to sell renewable energy back to the Ontario power grid (2007). http://www.oakville.ca/10806.htm
- 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
- Town using solar heating for community pools. http://www.glslcities.org/Oakville%20waterfront.pdf
- Solar lights used for City's walkways - at pilot stage, will be recommended for all walkways around the City Hall. http://www.oakville.ca/Media_Files/environment/ESPHighlightsReport08.pdf
- Solar heating for community pools http://www.oakville.ca/Media_Files/environment/2009ESPFactSheet-energy.pdf

City of Oshawa

- Private builder working with General Motors to build a gas-fired cogeneration facility of 110 mW for the GM Auto-Plus. http://www.oshawa.ca/agendas/Development_Services/2008/12-15-Special/2008-12-15_Minutes_DSC_25.pdf
- 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)

- Oshawa Centre (commercial) gets 30% of power from green energy.
- The City of Oshawa received $2,217,603 funding from the Federation of Canadian Municipalities' Green Municipal Fund to undertake an 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. (http://www.colincarriemp.ca/pdfmedia/News%20release_22%20May%2009_Green%20municipal%20fund.pdf)

Regional Municipality of Peel

- Green Energy Matters 2007 Summit in Peel powered by Bullfrog power.
- Projects in Region of Peel Renewable Energy Plan include Clarkson Photovoltaic Solar Flairs Project - partnership between Region 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
- Two Community Recycling Centres utilize geothermal heating and heat recovery ventilators.
- 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. 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's per year. http://www.peelregion.ca/health/cleanairpeel/initiatives/energy.htm
- 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. http://www.peelregion.ca/health/cleanairpeel/initiatives/energy.htm
- Region's headquarters use geothermal system, produces 15% of overall demand; have been procuring energy from renewable sources for at least

two years. http://zoominlocal.com/ml-brampton-guardian/93c32IwSGz6vS83X/#?article=431710

- Waste Operations Centre collects used vegetable oil at community recycling centres, converts it into biodiesel for use in Operations Centre vehicles. http://www.peelregion.ca/pw/waste/crc/cooking-oil.htm
- Britannia Landfill and Gas Electricity Project reduce 10,000 tonnes of methane annually (250,000 tonnes of CO2 equivalents). http://www.walkerind.com/IMS/pdf/blg.pdf
- Request for pre-proposal (RFP) for biomass energy recovery from wood waste and composting programs has been sent out. (?)
- Geothermal systems being used in two buildings. (?)
- Three group homes being retrofitted with solar domestic hot water, geothermal and HVAC systems (April 2009). http://www.homesoflastingcharacter.com/housewarming/docs/newsrelease.html
- Floating photovoltaic technology project at one water treatment plant.
- Large solar hot water installation on a social housing tower.
- 28.5 kW photovoltaic system at upcoming Lakeside Water Treatment administration building.
- Inverter-less photovoltaic system at a recycling facility.
- 10kW parallel thin film project ballast mounted on a flat roof.
- 10kW building integrated photovoltaic system on a new aesthetically designed carport.
- Commission of the first commercial scale geothermal building. http://www.peelregion.ca/planning/officialplan/pdfs/ROPA20-adoption-council-report.pdf

Town of Pickering

- A condominium in downtown Pickering is installing 76 solar thermal panels to become more energy efficient, and environmentally responsible. The solar panels are being 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

- Office Tower with LEED Silver Standard - the new office tower will overlook the Pickering GO station with stellar views of Lake Ontario. More importantly, this 132,000 square foot project will be built to LEED Silver standards, making it one of the most visible examples of sustainability in Ontario.
  http://www.cityofpickering.com/standard/cityhall/news/past/OfficeTowerMay09.html

Town of Richmond Hill

- Town's main municipal offices use solar power to heat water. Installation of solar panels on the roof at the main Municipal Offices to heat the water; the Town of Richmond Hill's Municipal Offices hot water supply will be heated using a new Solar Water Heating System (April 2008). 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
- 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
- Using biodiesel and ethanol-enhanced gasoline in fleet vehicles.
- Richmond Hill Performing Arts Centre uses geothermal heating.
- District heating feasibility study in progress.
- Town's wind power project on hold due to Oakridge's Moraine location.

Simcoe Muskoka HU

City of Toronto

- 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 system –will add another 2 million kW of saved energy.
  http://www.toronto.ca/environment/initiatives/cooling.htm
- Deep Lake Water Cooling being used by multiple buildings such as Ritz Carlton, Trump Tower, Maple Leaf Square and Ryerson University Business Centre.

- Geothermal unit at Exhibition Place operational, another to be operational at new Police Academy in July 2009. http://wx.toronto.ca/inter/it/newsrel.nsf/7017df2f20edbe2885256619004e428e/aa0678d22d43621d852571d200693d86?OpenDocument
- 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
- 350 transit shelters along city streets lit by solar-powered lights. http://www.toronto.ca/greenguide/energy_use.htm#city_energyuse
- 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. Project 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 pilot project on-going in Riverdale, consisting of 150 systems, involving 15,000 people. 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
- As of December 2008, Toronto's fleet had total of 410 green vehicles including hybrids, hydrogen minibuses, hydrogen fuel cell gators, smart cars, electric and natural gas vehicles. http://www.toronto.ca/legdocs/mmis/2009/gm/bgrd/backgroundfile-20243.pdf
- Over 100 vehicles running on natural gas, hydrogen filling station at Exhibition Place, gasoline with 10% ethanol, on-road diesel containing biodiesel made from soy.
- TTC has run a biodiesel pilot project, considering hybrid vehicles for next purchase of its 330 buses.
- 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 currently under development with Energy Efficiency Office.
- Biogas green energy recovery initiative at landfill sites and treatment plants. http://www.toronto.ca/energy/green.htm
- Fuel cell demonstration project at Exhibition place. http://www.toronto.ca/energy/green.htm
- Master Plan Report for the City's biosolids management will be completed in fall 2009, considering increased incineration of biosolids to create electricity.

http://www.toronto.ca/wes/techservices/involved/wws/biosolids/pdf/pis4/meeting_2009-02_responses_to_comments.pdf

- 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 m² of the south facing roof of the swimming pool area. These collectors weigh only 20 kg each when full. The commenced in August 2006 with estimated CO_2 of 28 tonnes per year. http://www.toronto.ca/ewmo/pdf/centennialpool_solar.pdf

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
- 50 kW wind turbine at the Maple Honda sale centre. (http://www.indigowindenergy.com/IndigoWES-Projects.html)
- Woodbridge's St. Jean de Brebeuf Catholic High School officially launched its new solar photovoltaic system in March 2009. The system, which includes five solar panels arranged in the shape of a cross above the school's main entrance, is the first of its kind in the York Catholic District School Board. The system has a generating capacity of 1.2 kilowatts. That electricity is sold back into Ontario's electricity grid at a rate of 42 cents per kilowatt hour. Since first being switched on in November, the five solar panels have already earned more than $106.
- The City has participated in PowerStream Power Saving Blitz program - retrofitting approximately 25 small buildings with more energy efficient upgrades to lighting. http://www.city.vaughan.on.ca/environment/pdf/SpotlightOnEnvironment2ndEdition.pdf
- The City is building a LEED certified new City Hall to be completed in 2010 (estimates are that it will save $450,000/year in energy costs). https://enews.vaughan.ca/corporations/ward_1/general/resources/vv2020_StrategyBook%5B1%5D.pdf

There are several examples of green buildings in Vaughan:

- EarthRangers
- PowerStream
- Scott Somerville Fire and Rescue Service Station No. 7-9
- Civic Centre

Town of Whitby

Regional Municipality of York

- Pilot solar panels for York Region Transit and Viva bus shelters.
- Wind mapping and feasibility study and review for wind power turbine at Sutton water plant taken place.