



Environment & Energy Division

Jim Baxter, P.Eng. MBA
Director

Five Year Business Plan (2014-2018)

Who we are



Context



Core Objectives

- Reduce Emissions to the Environment
- Realize Savings through Energy Conservation & Demand Management
- Energy Security & Supply
- A Resilient City

Our Initiatives



October 23, 2013

Parks & Environment Committee



Environment & Energy Division

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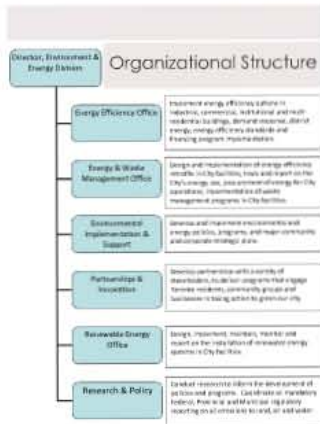
Our Initiatives



October 23, 2013

Parks &
Environment
Committee

Who we are



ktl.com

KTLP-11

Leadership:



Key strategies include:

- Climate Change Action Plan
- Sustainable Energy Strategy
- Climate Adaptation Strategy



Results

- Surpassed 2012 GHG reduction target of 15%
- Exceeded 89MW electricity demand reduction target
- Annual savings of \$5M at City Facilities

Merger



Vision

lead the development and implementation of innovative environmental and energy policies and programs, and inspire citizens, businesses, organizations and other stakeholders to work with City staff to make Toronto North America's most environmentally sustainable city.

Mission

provide corporate leadership, coordination and accountability for environmental and energy sustainability outcomes



Director, Environment & Energy Division

Organizational Structure

Energy Efficiency Office

Implement energy efficiency options in industrial, commercial, institutional and multi-residential buildings, demand response, district energy, energy efficiency standards and financing program implementation.

Energy & Waste Management Office

Design and implementation of energy efficiency retrofits in City facilities, track and report on the City's energy use, procurement of energy for City operations; implementation of waste management programs in City facilities.

Environmental Implementation & Support

Develop and implement environmental and energy policies, programs, and major community and corporate strategic plans.

Partnerships & Innovation

Develop partnerships with a variety of stakeholders, to deliver programs that engage Toronto residents, community groups and businesses in taking action to green our city.

Renewable Energy Office

Design, implement, maintain, monitor and report on the installation of renewable energy systems in City facilities.

Research & Policy

Conduct research to inform the development of policies and programs. Coordinate all mandatory Federal, Provincial and Municipal regulatory reporting on all emissions to land, air and water.

Key

- Clim
- Susto
- Clim

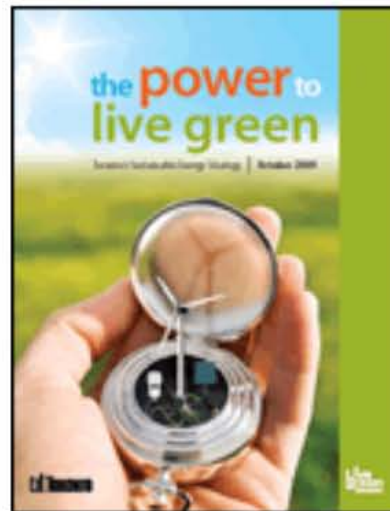


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April 2008

Merger

Toronto
Environment
Office



Energy &
Strategic
Initiatives



Environment
& Energy
Division

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provide corporate leadership, coordination and accountability for environment and energy sustainability outcomes

Principles

- Industry Leader**
The TotalEnergies will deliver long-term sustainable results.
- Innovation**
We will embrace opportunities and challenges and embrace change.
- Accountability**
Our activities will contribute to achieving the long-term goals for Transition.
- Be Professional**
We will provide transparent and high quality information to our stakeholders.
- Be Efficient**
Our operations will be based on digital technologies and innovation to maximize our EBITDA, assets and assets.
- Engage the community**
The activities will be defined by dialogue with the citizens and businesses of France.

Principles

Deliver Results

Our initiatives will deliver tangible, measurable results.

Innovate

We will recognize opportunities and challenges and embrace change.

Add value

Our initiatives will contribute to achieving the long term vision for Toronto.

Be Professional

We will provide knowledgeable, unbiased advice to senior management and Council.

Be Rigorous

Our recommendations will be based on detailed business cases and extensive measurement, verification, research and analysis.

Engage the community

Our activities will be informed by dialogue with the citizens and businesses of Toronto.

Context

In the News



NATIONAL POST

Downtown Toronto's pace of population growth triples, outpacing suburbs as Echo Boomers flock towards urban centre report



MEGAN O'TOOLE | Jan 22, 2013 3:55 AM ET | Last Updated: Jan 24, 2013 1:51 PM ET

[More from Megan O'Toole](#) | [@megan_otoole](#)



/26/13

Toronto leads North American high-rise construction - The Globe and Mail

THE GLOBE AND MAIL



REAL ESTATE

Toronto leads North American high-rise construction

TARA PERKINS - REAL ESTATE REPORTER

The Globe and Mail

Published Monday, Oct. 22 2012, 7:36 PM EDT

Last updated Monday, Oct. 22 2012, 7:38 PM EDT

Six Canadian cities are among the top 10 in North America for the number of high-rises and skyscrapers being built, a finding that illustrates just how far the construction markets in Canada and the United States have diverged.

Toronto tops the list by a margin that has widened over the past year. Canada's most populous city now



INFRASTRUCTURE

Is it lights out for Toronto's electrical grid?

MARCUS GEE

The Globe and Mail

Published Saturday, Jan. 28 2012, 6:00 AM EST

Last updated Thursday, Sep. 06 2012, 11:57 AM EDT

can't imagine in a modern society how we're not able to keep our power on. Why haven't we made it a priority?"

s budget chief, councillor Mike Del Grande, says he has had two transformers blown out on his street. Anticipating trouble with the grid, he bought a gas-run power generator.

Ontario hydro prices rising – again – as of Nov. 1

BY ANTONELLA ARTUSO ,QUEEN'S PARK BUREAU CHIEF

FIRST POSTED: THURSDAY, OCTOBER 17, 2013 04:21 PM EDT | UPDATED: FRIDAY, OCTOBER 18, 2013 09:23 AM EDT



Ontario smart meter. (Dave Abel/Toronto Sun files)

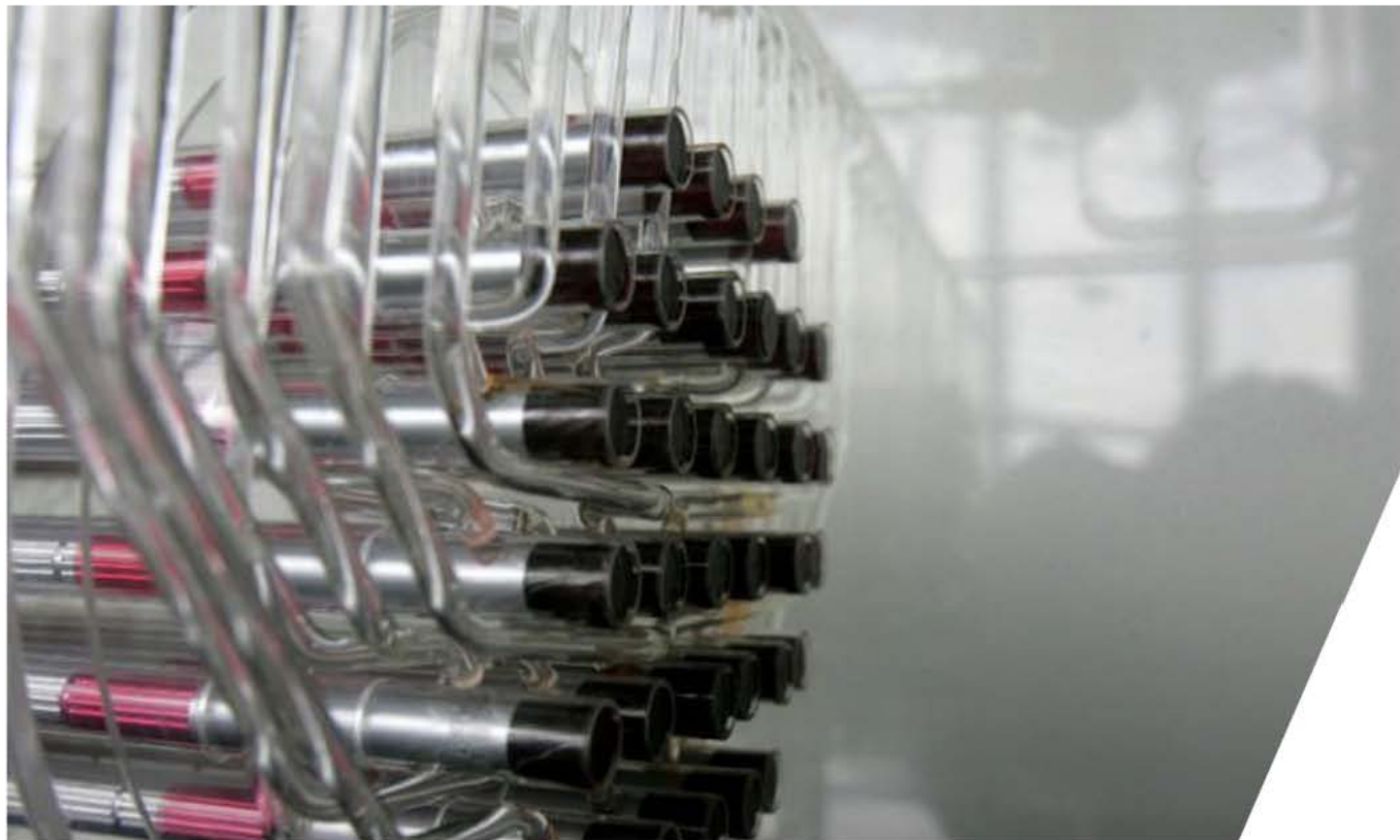
TORONTO - Get ready to get zapped. Again.

Ontario hydro prices as of Nov. 1 — a move expected to add \$4 to the average consumer's monthly electricity cost and 3% to the total bill.

No new nuclear planned for Ontario, Liberals say

BY ANTONELLA ARTUSO ,QUEEN'S PARK BUREAU CHIEF

FIRST POSTED: THURSDAY, OCTOBER 10, 2013 02:56 PM EDT | UPDATED: THURSDAY, OCTOBER 10, 2013 03:02 PM EDT



By: Ja

Opinion / Editorial Opinion

Cities can plan now for serious climate change impact

City infrastructure is the most vulnerable element of our economy and communities.



» TORONTO STAR «

By: Jason Thistlethwaite Published on Mon Nov 19 2012

Toronto's infrastructure is the city's first line of defence but also its greatest vulnerability to

Business

Toronto's July flood listed as Ontario's most costly natural disaster

Insurance Bureau of Canada says property damage caused by storm that swamped the GTA on July 8 is more than \$850 million.



FRANK GUNN / THE CANADIAN PRESS

A tow truck driver floats a car out of the Don Valley Parkway on Monday, July 8 2013.

Mayor Ford urges conservation with power grid 'hanging on by a thread'



<http://metronews.ca/author/metrojessica/> By Jessica Smith (<http://metronews.ca/author/metrojessica/>)

Metro



A woman wades through flood water on Lakeshore West during a storm in Toronto.

THE CANADIAN PRESS/Frank Gunn

Torontonians weren't able to conserve enough power in the wake of the storm to prevent Toronto Hydro

July 8



thes
Air pollution
Ham...

Air pollution causes cancer, says World Health Organization

Hamilton Spectator

LONDON What many commuters choking on smog have long suspected has finally been scientifically validated: Air pollution causes lung cancer.

The International Agency for Research on Cancer declared late last week that air pollution is a carcinogen, alongside known dangers such as asbestos, tobacco and ultraviolet radiation. The decision came after a consultation by an expert panel organized by IARC, the cancer agency of the World Health Organization, which is based in Lyon, France.

"We consider this to be the most important environmental carcinogen, more so than passive smoking," said Kurt Straif, head of the IARC department that evaluates cancer-causing substances.

IARC had previously deemed some of the components in air pollution such as diesel fumes to be carcinogens, but this is the first time it has classified air pollution in its entirety as cancer causing.

The risk to the individual is low, but Straif said the main sources of pollution are widespread, including transportation, power plants, and industrial and agricultural emissions.

Air pollution is a complex mixture that includes gases and particulate matter, and IARC said one of its primary risks is the fine particles that can be deposited deep in the lungs.

"These are difficult things for the individual to avoid," he said, observing the worrying dark clouds from nearby factories that he could see from his office window in Lyon. "When I walk on a street where there's heavy pollution from diesel exhaust, I try



Air pollution has eclipsed second-hand smoke as the 'most important environmental carcinogen,' says the IARC.

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- A Resilient City



Our Initiatives



Engaging Residents & Businesses

BETTER BUILDINGS PARTNERSHIP

Conservation & Demand Management Program

Results (to date):

- 2,114 Projects completed
- 31,000 Person years of employment
- \$265 million utility cost savings
- 91 MW Electrical demand reduction
- 810,000 Tonnes of CO₂ emissions reduced




Live green Toronto

- 4,000 hours of service provided by Live Green Toronto volunteers in 2013
- 150 public outreach events each year
- 30,000 residents and 400 businesses participate in the Membership Card program



Smart Commute

- 80 partner businesses representing 250,000+ commuters
- Delivered in partnership with Metrolinx



eco roof

- 65 person years of employment
- 240,000 square metres of roof space retrofitted (about 44 football fields)



A few of our Partners



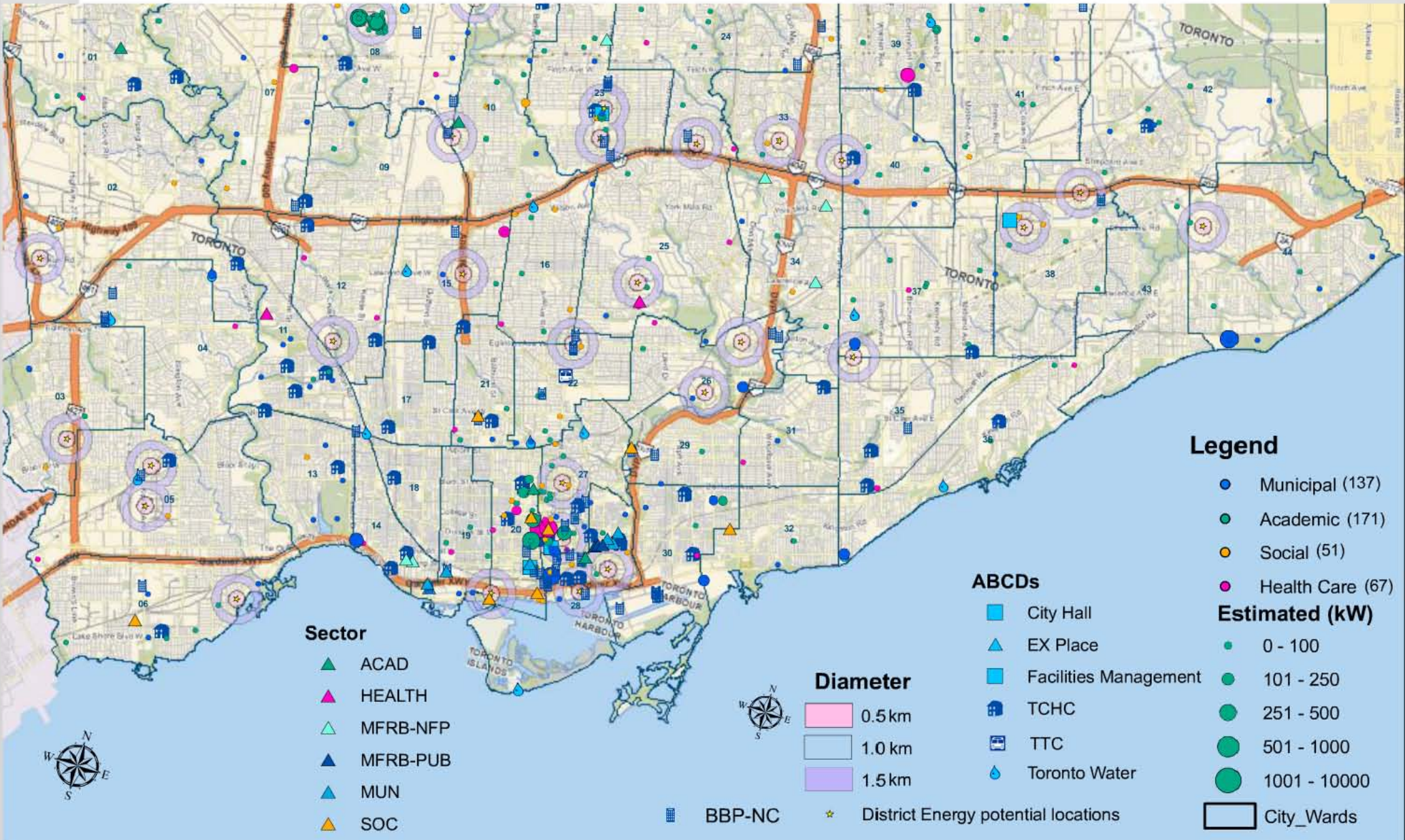


Conservation & Demand Management Program

Results (cumulative)

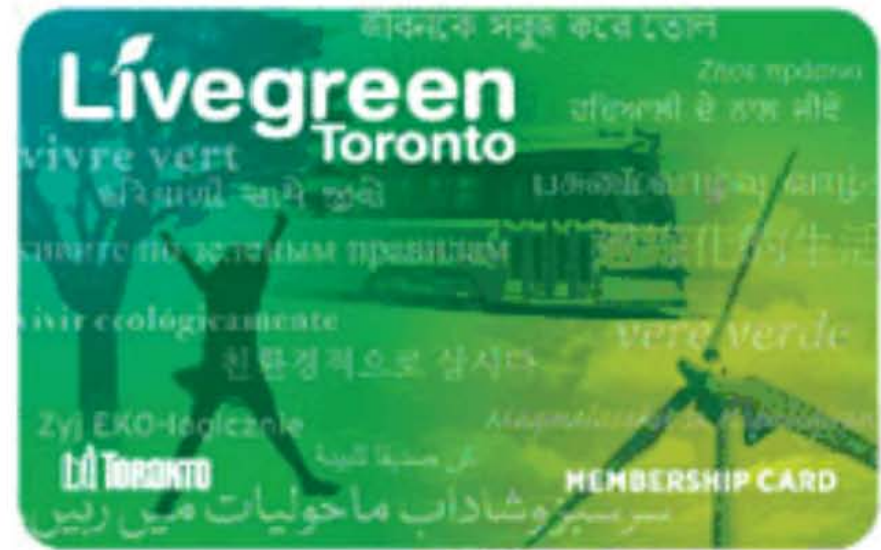
- 2,114 Projects completed
- 31,000 Person years of employment
- \$268 Million utility cost savings
- 91 MW Electrical demand reduction
- 510,000 Tonnes of CO₂ emissions reduced







- 4,000 hours of service provided by Live Green Toronto volunteers in 2013
- 150 public outreach events each year
- 30,000 residents and 450 businesses participate in the Membership Card program





- 80 partners/businesses, representing 250,000+ commuters
- Delivered in partnership with Metrolinx

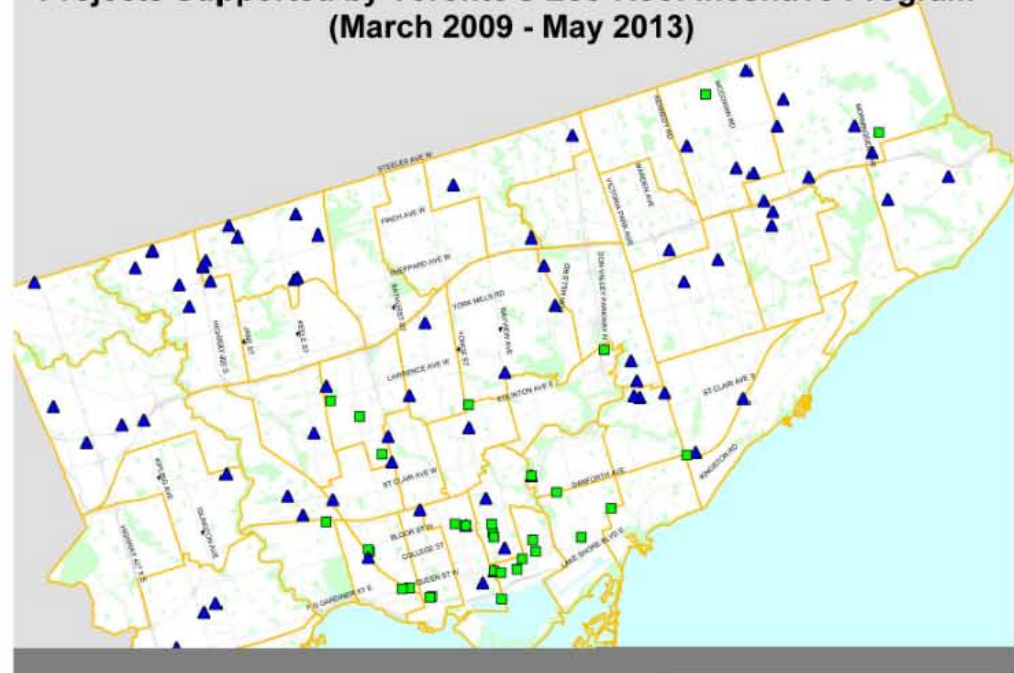




- 65 person years of employment
- 240,000 square meters of roof space retrofitted (about 44 football fields)



**Projects Supported by Toronto's Eco-Roof Incentive Program
(March 2009 - May 2013)**



A few of our Partners



EXCHANGE TOWER





Environmental & Energy Leadership by Example

Renewable Energy at City Facilities

 **TORONTO**

Joint Solar PV program with Toronto Hydro > 1 MW

- 10 projects approved
- Additional projects in application stage



Energy Retrofits at City Facilities



- Projects (500+ buildings)
- Retrofits pay for themselves
- Results
 - \$5 million annual savings
 - 58 million kWh saved
 - 6,000 kW demand reduction
 - 2.2 million m³ of natural gas reduced
 - 18,000 tons GHG reduced

Resilient City Working Group

- High level evaluation of potential risks
- Actions required to mitigate and manage risks
- Present to Council in December 2013



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Outreach & Education



Engage staff at each major City buildings in greening their workplace.

Generate ideas and implement water conservation and solid waste diversion initiatives.



Community Events

- 150+ outreach events per year
- Live Green Toronto Festival attracts over 40,000 people



Community Energy Plans

- Completed: Lawrence Allen and Mimico
- In progress: Scarborough Centre, Etobicoke Centre, Lower Yonge Precinct.





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**LIVEGREEN
TORONTO
FESTIVAL**



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MIMICO COMMUNITY ENERGY PLAN

Mimico 20/20

Energy Strategy

Efficient Buildings



A community energy strategy is being prioritized and integrated for the Mimico 2020 revitalization. The community energy strategy will prioritize energy conservation for both new

Smart Energy Grid



and existing buildings and include a balance of local, clean and renewable energy supply technologies. Integrating on-site, efficient, clean and market viable energy supply technologies

Building Scale Local Energy



into the planning efforts will help reduce building related Greenhouse Gas emissions and improve energy security and resiliency for Mimico 2020. Residents and building owners will also

Block Scale Local Energy



be better protected against increasing energy costs as their energy demands are minimized and the supply is based on supplemented by local on-site alternatives.

Building & Block Scale Local Energy + Smart Energy Grid

Ground Source Heat Pumps



Combined Heat and Power



Solar



Future Technology



Building Renewal



The existing building stock is predominantly 1990s construction with little investment in building renewal and energy efficiency. Investing in building renewal can bring new life to the community, improve building energy efficiency and reduce the operating cost to residents and owners. High-level energy conservation measures have been defined for the renewal of the existing Mimico buildings. Measures have been grouped based on expected payback period.

Step 1

<3 Year Payback

Common area lighting retrofits
Low-flow fixtures
Air sealing windows and AC units
CO-monitoring garage exhaust
Building retro-commissioning



Step 2

>10 Year Payback

Suite control upgrades
Apartment electricity metering



New Construction



The revitalized Mimico will feature new buildings, designed and built to high energy efficiency standards. The predominant archetypes expected within the Mimico 2020 are mid-rise (5 to 8 storeys) and hi-rise (10 to 16 storeys) residential buildings. For the purpose of this study, energy efficiency thresholds have been defined for the new buildings, targeting a 35% and 50% energy savings relative to the Model National Energy Code for Buildings (MNECB). Key

High Performance Features:

High performance envelope

40%-50% window to wall ratio

Occupancy sensors and controls

High efficiency gas-fired boilers

Efficient lighting design

Low Flow fixtures





Policy Development & Implementation

Environment & Energy Advisory Group

- A component of the City Manager's Corporate Strategic Plan
- Advises CCO on key environmental and energy issues



Residential Energy Retrofits through LICs

- Phase one (2014 launch)
- 2,000 residential properties (single-family, multi-residential)
- reduce their energy consumption by 20% – 50%



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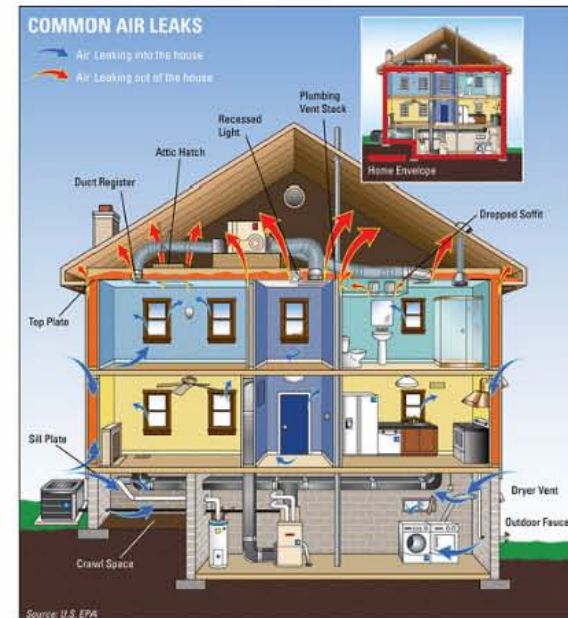
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Coordination & Strategic Planning

Cross-corporate coordination

- Executive Environment Team
- Resilient City Working Group
- Clean Air Council
- Civic Action

Coordinate City input to external policy/regulations

Making Choices Knowing Our Limits and Staying Within Them



Ontario

- Regional Electricity Plan
- Ontario's Long Term Energy Plan
- Conservation First consultation
- Regional Energy Planning consultation
- Ontario Feed-in-Tariff

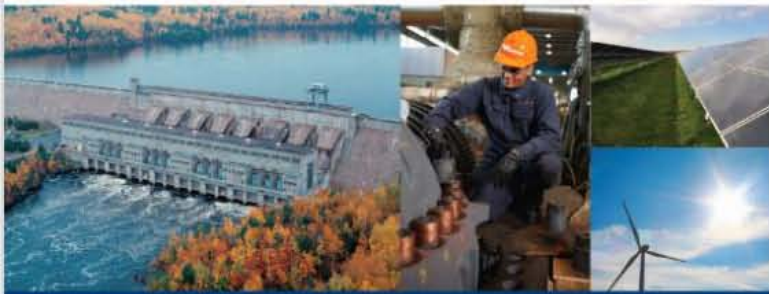
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Making Choices

Reviewing Ontario's Long-Term Energy Plan



- Regional Electricity Plan
- Ontario's Long Term Energy Plan
- Conservation First consultation
- Regional Energy Planning consultation
- Ontario Feed-in-Tariff

Reporting & Evaluation

Regulatory Reporting

Where the Environment & Energy Division is the lead, ensure that the City complies with all mandatory Federal, Provincial, and Municipal regulatory reporting requirements.

Sustainable Neighbourhoods & Local Air Quality Improvement Initiative



- Local Air Quality Studies completed for Wards 30 & 32
- Wards 5 & 6 will be completed in 2013
- 12 to 15 additional Wards will be completed in 2014

Assessment of Energy Needs

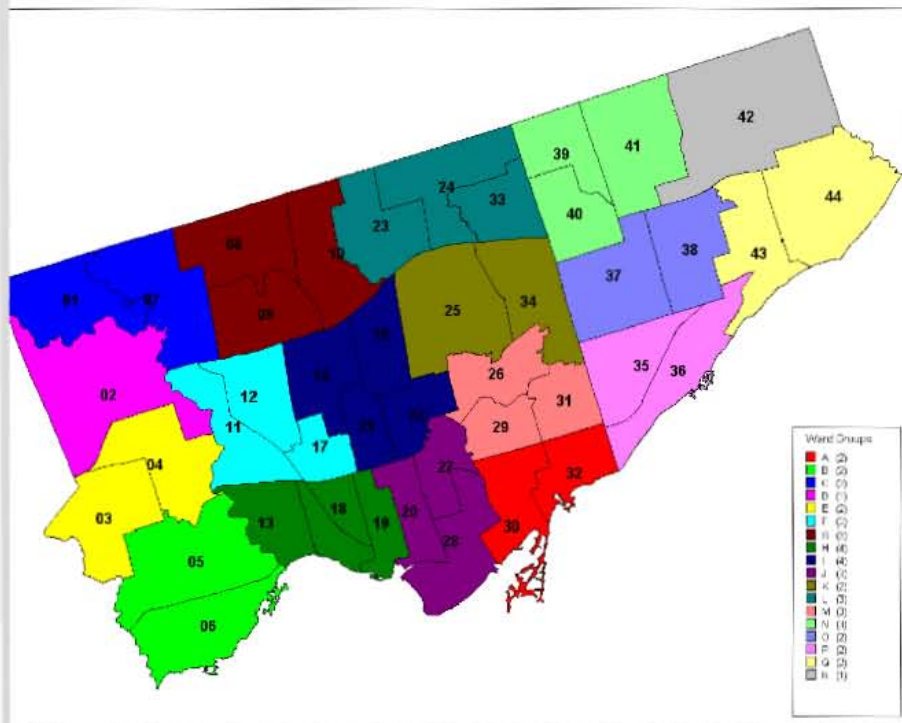
On Nov 1, 2012 City Council requested the City Manager to report on the energy and electricity needs associated with:

- City's Official Plan
- Economic Growth Plan

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Service Delivery & People Management

Establish service and reporting standards



Rigour

- Business cases
- Critical thinking

Ed Toronto Environment & Energy Office

Business Case: District Energy System at Exhibition Place

- Conducted a business case analysis, assessing challenges and opportunities
- Analyzed full potential of existing and new district energy assets
- Investigated alternative development
- Addressed City objectives in preparation for 2015 Smart City Goals
- Developed strategic role of related capital investment

Overview

The project is to investigate the existing district energy plants, the cases study at the Exhibition Place and the

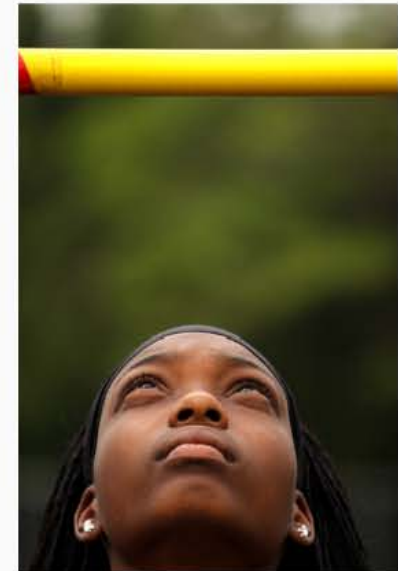
The City will be in position to develop the to generate an attractive financial rate of return of 10% on capital

People Plan

- Diverse workforce
- Talent management
- Internships/urban fellows



Establish service and reporting standards



Rigour

- Business cases
- Critical thinking



Business Case: District Energy System at Exhibition Place

- ✓ Leadership in local energy solutions: converting challenges into opportunities
- ✓ Realize full potential of existing under-utilized energy assets
- ✓ Stay ahead of new development
- ✓ Advance City objectives in preparation for 2015 Pan AM Games
- ✓ Generate attractive rate of return on capital investment

Overview

The project is to interconnect two existing isolated energy plants; the steam plant at the Coliseum Complex and the

The City's role will be to continue to develop the to generate an attractive internal rate of return of 18% on capital

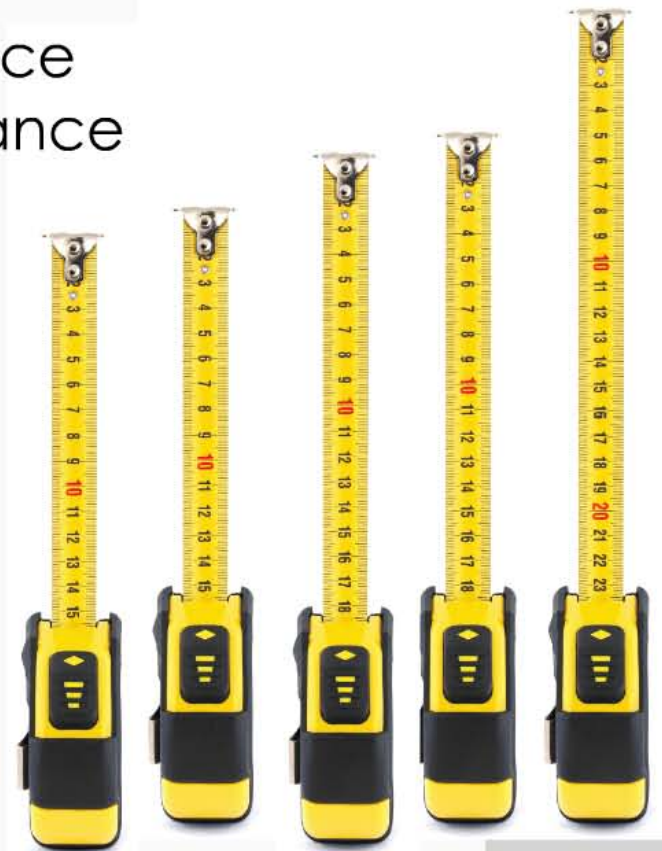
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Measuring Our Success

- Environmental performance
- Energy performance
- Economic and financial performance
- Community engagement performance
- Operational Performance



Our Approach

- Lead by example
- Incorporate local energy & environmental solutions
- Seek partnerships
- Create value for the City

Create Value for the City

- Economic benefit
- Energy security
- Environmental benefit

“The trouble with our times is that the future is not what it used to be.”

Paul Valery (French Poet, Essayist and Critic, 1871-1945)