Sustainable Toronto

Great Lakes & St Lawrence Cities Annual Conference
Niagara Falls NY - June 16, 2016

Fernando Carou. P.Eng.
Environment and Energy Division
Toronto is Succeeding

2007

Climate Change Action Plan
Toronto's bold Climate Change, Clean Air and Sustainable Energy Action Plan will see the City and its residents, businesses and communities take action to cut greenhouse gas emissions, clean the air and create a sustainable energy future.

2009

The Power to Live Green
Toronto's Sustainable Energy Strategy, the Power to Live Green, outlines initiatives to achieve the City's energy conservation, security and demand management goals and targets. These initiatives are also designed to generate financial and economic benefits for the City and its residents and businesses.

2011-2014

Climate Change Adaptation: Towards a Resilient City
Toronto's climate adaptation strategy, Ahead of the Storm: Preparing Toronto for Climate Change, outlines a number of actions that will improve the city's resilience to climate change and extreme weather events.

2015

Environmental Progress Report
Toronto is Succeeding

Contents

Introduction................................................. 2
Reduce GHG Emissions................................. 4
Clean Air.................................................. 9
Energy....................................................... 13
Green Space & Urban Agriculture................. 18
Sustainable Transportation.......................... 24
Clean Water.............................................. 35
Greening City Operations.............................. 40

Message from City Manager

It's my pleasure to share with you the 2015 Toronto Environmental Progress Report. This report documents the many achievements the City has made in partnership with communities and stakeholders across Toronto to advance Council’s environmental objectives and priorities. Supporting environmental sustainability was identified in the Council-endorsed City of Toronto Strategic Actions 2013 – 2018, and is an objective reflected across the programs and policies of the City of Toronto. Investing in our environment supports community health and quality of life, and creates economic opportunities in the green economy.

This report demonstrates that together, as a community, Toronto is moving towards the environmental targets set by City Council, including reducing greenhouse gas emissions, increasing the urban tree canopy, building infrastructure to support sustainable transportation choices, sending less waste to landfill, and ensuring beaches and a waterfront of high-quality.

While we are making progress, as Toronto continues to grow in size and prosperity, additional efforts will be needed to achieve our shared vision of a green, sustainable and livable city. Thank you to all Toronto residents for the critical role you play moving our city towards environmental sustainability.

Peter Wallace, City Manager

Awards

2015 Best Overall City To Live
- Economist Intelligence Unit

2015 Most Sustainable City In North America
- Arcadis Sustainable Cities Index

2014 Most Resilient City In The World
- Grosvenor Group

2014 Platinum Sustainable Communities ISO 37120
- ISO/World Council on Cities Data
Toronto is Succeeding

40 MW renewable energy installed between 2007-2012

Across Toronto we have reduced our emissions by 25% from 1990

Toronto City-owned buildings emissions reduced by 40%

450 Green Taxis

27% less street level air pollution from efficient street sweepers

72,000 Torontonians participated in the 2014 Clean-Up events

53% residential diversion rate

$7.1 billion = TO’s urban forest structural value

Swimmable beach days increased 26%

Greenroof area in TO = 42 football fields

1,000 bikes available in Bike Share program

848 km bike network across TO
But . . .

- Toronto is one of the ten most *traffic congested* cities in North America.
- Toronto’s *income inequality* has grown by 31% in the last 25 years.
- Toronto’s *youth unemployment* rate is around 20%.
- Toronto *not on track to reduce GHG emissions* by 80% by 2050.
- Toronto’s *current fiscal model may be unsustainable*.
- Toronto is *challenged to maintain a state of good repair* for its roads, transit, social housing, parks and water/wastewater systems & other services while also accommodating growth.
Toronto is Changing

Toronto’s population is growing & densifying at one of the fastest rates in North America, placing demands on services & infrastructure, energy systems & the environment.

About 50% of households live in multi-residential housing.

Employment in manufacturing has declined by about 26% over the last 10 years.

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

Toronto leads North American high-rise construction

Manufacturing’s grim battle to survive

Manufacturing in Ontario is facing a serious skills mismatch, with shortages in some areas and surpluses in others. Here’s why
Toronto’s Growth: 2000 vs 2014 Skyline

- **Daily Temperature Maximum**
  - 44°C 2040-50
  - 37°C 2000-09

- **Hot Days**
  - 66 above 30° 2040-50
  - 20 2000-09

- **Extended Heat Waves**
  - 2.5 per year 2040-50
  - 0.6 2000-09

- **Daily Rainfall Maximum**
  - 166 millimetres 2040-50
  - 66 2000-09

- **Heavy Rain Days >25mm**
  - 9 per year 2040-50
  - 19 2000-09

*Source: Toronto’s Climate Driver Study, 2011*
Extreme Rainfall
- higher maximum precipitation in one day
- more days with > 25mm
Extreme Heat
- higher maximum daily temperatures
- more days with > 30 C
- more heat waves (3 consecutive days > 32 C)

by 2040 expect 6 times more A/C use (days > 24 C)
“no water, no heat”  “by the 2nd day many residents started leaving”
“had to close shop. substantial amount of merchandise spoiled”

“emergency generator failed to start”  “generator repairman couldn’t get to us”  “could not get diesel fuel in time”
Toronto is Reducing its Environmental Footprint, but...

- Coal Phase Out
- Conservation
- Methane emissions reduction
- Land use: infill compact growth

~ 5 Mt reduction

~ 15 Mt reduction by 2050

Target 2012

Target 2020

Target 2050
Toronto’s GHG Emissions by Sector 2013 data

District Energy with local renewable energy sources & Efficient Buildings to reduce/displace natural gas.

Electric High-order Transit & EVs to reduce/displace fossil fuels.
Developing Toronto’s Transit Network

Existing & Current Projects
Developing Toronto’s Transit Network

6 to 15 years
Developing Toronto’s Thermal Networks
District Energy w/ Large Renewables

Opportunity for 30+ new District Energy systems in Toronto

2015 UNEP Report
Developing Toronto’s Thermal Networks
District Energy w/ Large Renewables

Toronto’s Deep Lake Water Cooling ENWAVE System

Sewer heat recovery, Large geo-exchange fields with solar collectors

Heat recovery from electric transit combined heat & power
Developing Toronto’s Thermal Networks
District Energy w/ Large Renewables

The cost to reduce CO₂ emissions decreases as energy systems move from individual buildings to large sites, blocks, and districts.
Modelling is showing that future Large Scale GHG emission reductions in Toronto will primarily come from two strategies:

1. **District Energy** w/ Large Renewables + Efficient Buildings

2. **Transit** + EVs

“For Cities to achieve a low-carbon future **District Energy** is to energy in buildings, what **Transit** is to transportation.”
ALIGNMENT: LOW CARBON FUTURE

Federal

Province

City
Climate change will be fought in cities. Toronto is ready to do its part, but we can’t do it alone –

John Tory #ParisAgreement #COP21
City of Toronto’s key current INITIATIVES

Transform TO – renewed climate action for a healthy equitable, prosperous Toronto. 30% GHG reduction by 2020, 80% GHG reduction by 2050 vs 1990
www.Toronto.ca/transformTO

Resilient City – climate change adaptation (update)

TO Core – planning the downtown (soft & hard infrastructure)
- Energy strategy
- Framework for acceleration of thermal networks w/ large renewables (district energy)
- Back-up power guidelines for Multi-residential buildings

Toronto Green development Standard – TGS V3 (2017/18 roll-out)

Toronto’s 1st Net-Zero District (energy & emissions)
Port Lands Revitalization Planning Framework

New Official Plan: energy strategy requirement for large developments
(plan for Net Zero energy & emission). Includes Guidelines for Net-Zero Opportunities for Large Developments
The Future Starts Now

2050 - 80% GHG reduction

34 years - not as long as it may seem

Decisions Now – determine our future
How do we support integration and collaboration toward carbon neutrality & resilience?

How do we maintain and build momentum?

How do we scale up our efforts?
Divided / Uncoordinated Action

Big Challenges
United /Coordinated Action

Big Challenges
Fernando Carou
City of Toronto
Environment & Energy Division

416 338-5479 fcarou@toronto.ca
www.linkedin.com/in/fcarou
www.toronto.ca/eed