

How Durham's Integrated Waste Management System Supports New Provincial Climate Change Initiatives

Peter Veiga

Region of Durham - Waste Management

Compost Council of Canada
26th Annual National
Organics Recycling Conference
Niagara Falls, Ontario

Regional Municipality of Durham



- **Borders Toronto to the east**
- **2,600 sq. km (1,000 sq. mi.)**
- **Population - 655,000**
- **Total annual solid waste – 245,000 MT/yr**
 - **Recycling – 55,000MT /yr**
 - **Organics – 74,000MT /yr**
 - **Re-Use/Other – 6,000MT /yr**
 - **Residual – 110,000MT /yr**
 - **55% Diversion from Disposal**

Durham's Integrated Waste Management System

We collect from:

- Residential users (220,000 hhlds)
- Apartment buildings (25,000 units)
- Commercial and Institutional in local Business Improvement Areas (limited)

We own/operate:

- 3 waste drop off facilities
- 4 household hazardous waste facilities
- 7 closed landfills
- 1 material recovery facility
- 2 composting facilities – SSO/L&YW
- 1 efw facility (Durham York Energy Centre)

Ontario's Proposed Cap and Trade Program

- April 2015 - Ontario proposed a cap and trade plan to reduce carbon emissions in the province and join those already implemented in Quebec and California.
- February 24, 2016 - Bill 172 – “The Climate Change Mitigation and Low-carbon Economy Act, 2016” was introduced as part of the Provincial budget.
- Received Royal Assent on May 18, 2016
- Ontario expects to eventually raise \$1.9 billion annually from the sale of carbon allowances to be used for investments to reduce carbon emissions in transport, buildings, etc.

Carbon Emissions in Durham Region

Waste Management was identified as a carbon emitter in Durham Region due to the following:

- 1 operating local landfill (closed 2014)
- 1 contracted landfill in US (replaced by EFW 2015)
- 6 closed landfills under Region jurisdiction and numerous older, unknown landfills
- Long haul waste transport to US landfills
- Waste collection operations

Durham Initiatives → Climate Change



- Landfill
 - Eliminated landfilling of waste in 2015
 - Durham is piloting a landfill mining project to eliminate methane emissions from a closed landfill and eventually delist site
- EFW
 - Eliminated dependence on US landfills
 - Local disposal solution significantly reduces long-haul transportation needs
 - the 4th R – recovery of energy from methane generating waste
- Diversion
 - 55% of generated waste in Durham Region is recycled into new products or composted
 - Recycling recovered materials significantly reduces GHG emission rates compared to use of virgin materials
- Green Bin
 - Diverting organics eliminates methane emissions from landfill
 - Proposed anaerobic digestion captures the methane for use as a replacement for fossil fuels

Landfill Mining → Climate Change



- Landfill mining as proposed by Durham eliminates the need for perpetual care
- Recovers materials from mined landfill
- Non-recyclable materials sent for energy recovery to enhance diversion potential of the mining project
- Eliminates methane emissions from mined landfill

Energy from Waste → Climate Change



- Processes 140,000 tonnes/yr of residual municipal solid waste from Regions of Durham and York
- Captures all available energy in residual waste stream
 - Generates up to 17.5 MW power per year - sold to the Ontario electricity grid under PPA
 - Designed to provide process heat to neighbouring Courtice WPCP and district heating to the Clarington Energy Park (up to 500,000 sqft office space)
- Eliminates landfill in Durham and long term methane emissions – 1/10th of the carbon emissions over 10 years vs landfill

Energy from Waste → Climate Change



- Up to 100,000MT/yr of CO₂e reduced annually by diverting 140,000 MT/yr of waste from landfill to DYEC.
- Up to 4,200 tonnes per year of ferrous and non-ferrous metals recovered from DYEC for recycling that would otherwise have been landfilled.
- Each ton of ferrous and non-ferrous (mostly aluminum) metal recycled saves 2 tons and ~10 tons of CO₂e/ton, respectively.

Transportation → Climate Change



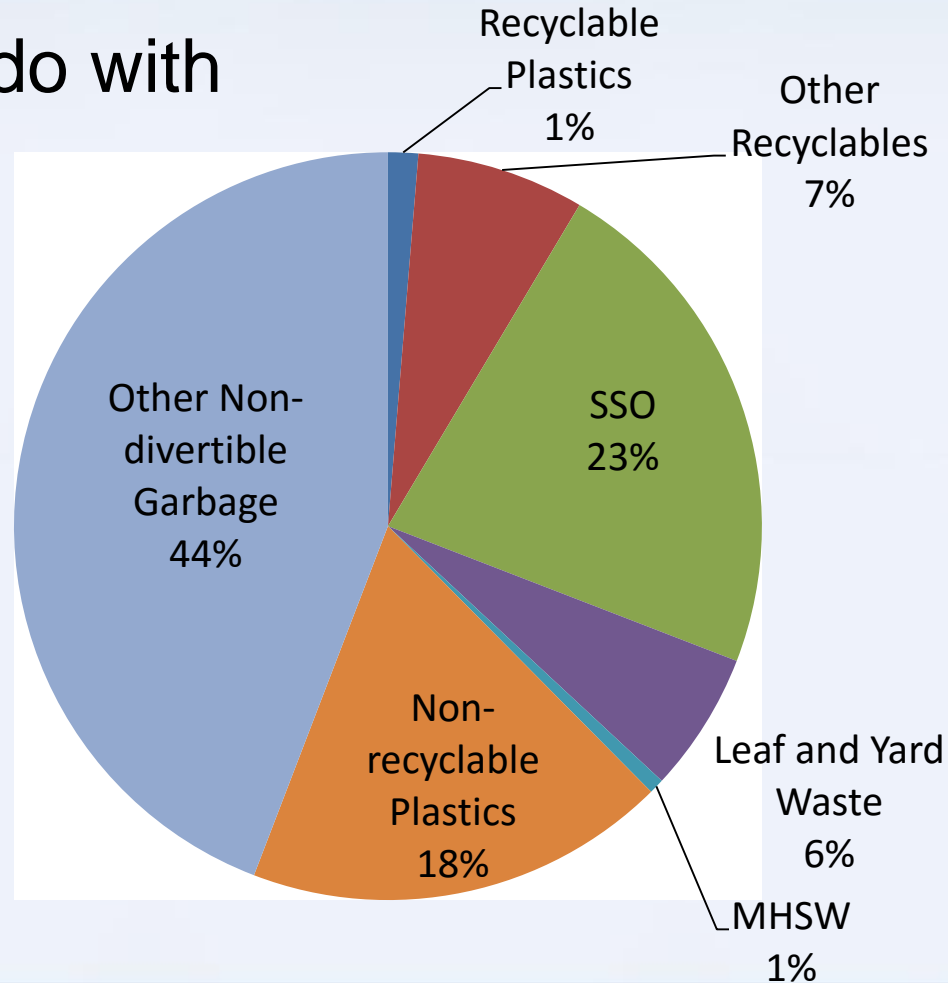
- Residential Collection
 - 70 collection vehicles on the road daily
 - 2,600 square kilometers covered weekly
- Daily haulage to New York landfill (previously)
 - 400 km round trip
 - 20 transfer trailers per day
- Daily haulage to Durham York Energy Centre (currently)
 - 40 km round trip
 - 18 transfer trailers per day (higher local payload allowance)
- Eliminates 6,500 tonnes of annual carbon emissions from long haul transportation

Current Opportunities Being Explored



What else can we do with what's left in the garbage bag?

Household garbage contains over 50% divertible material!



Enhanced Recovery Strategy



- Approximately 32,000 tonnes of organic waste is lost to the residual fraction every year – could be recovered
- Approximately 9,000 tonnes of recyclable material is lost to the residual fraction every year – could be recycled
- Improved pre-sorting and anaerobic digestion technologies will facilitate greatest capture of these resources
- Energy recovery and increased recycling will maximize cap and trade offsets and minimize greenhouse gases

In 2016 Durham will:

- Issue an RFP for enhanced integrated waste management system that will include pre-sorting transfer facility and Anaerobic Digestion to maximize resource recovery and offset fossil fuel use
- Select pre-sort technologies capable of recovering maximum amounts of organic and recyclable materials from residual waste generated by single and multi-family homes

Future Carbon Reduction Opportunities



In the future, Durham will also investigate:

- Carbon capture from DYEC emissions through engineered biomass growth (such as algae) for use as an alternative fuel source
- Low temperature waste heat for greenhouses
- Use of renewable natural gas (RNG) in waste collection vehicles
- Continued advocacy to shape Ontario's carbon policy and enhance climate change mitigation through innovative waste management initiatives

Thank-you

Peter Veiga
peter.veiga@durham.ca

Waste Management
Regional Municipality of Durham

