

Durham York Energy Centre DYEC Contributing to a Sustainable Future

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SWANA
New York Federation
May 17, 2016



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(270,000t)/yr**
 - **Recycling – 55,000MT(60,630t)/yr**
 - **Organics – 74,000MT(81,570t)/yr**
 - **Re-Use/Other – 6,000MT(6,614t)/yr**
 - **Residual – 110,000MT(121,250t)/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 (MRF)
- 2 contracted 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 scheme 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” was introduced as part of the Provincial budget.
- Ontario expects to eventually raise \$1.9 billion annually from the sale of carbon allowances

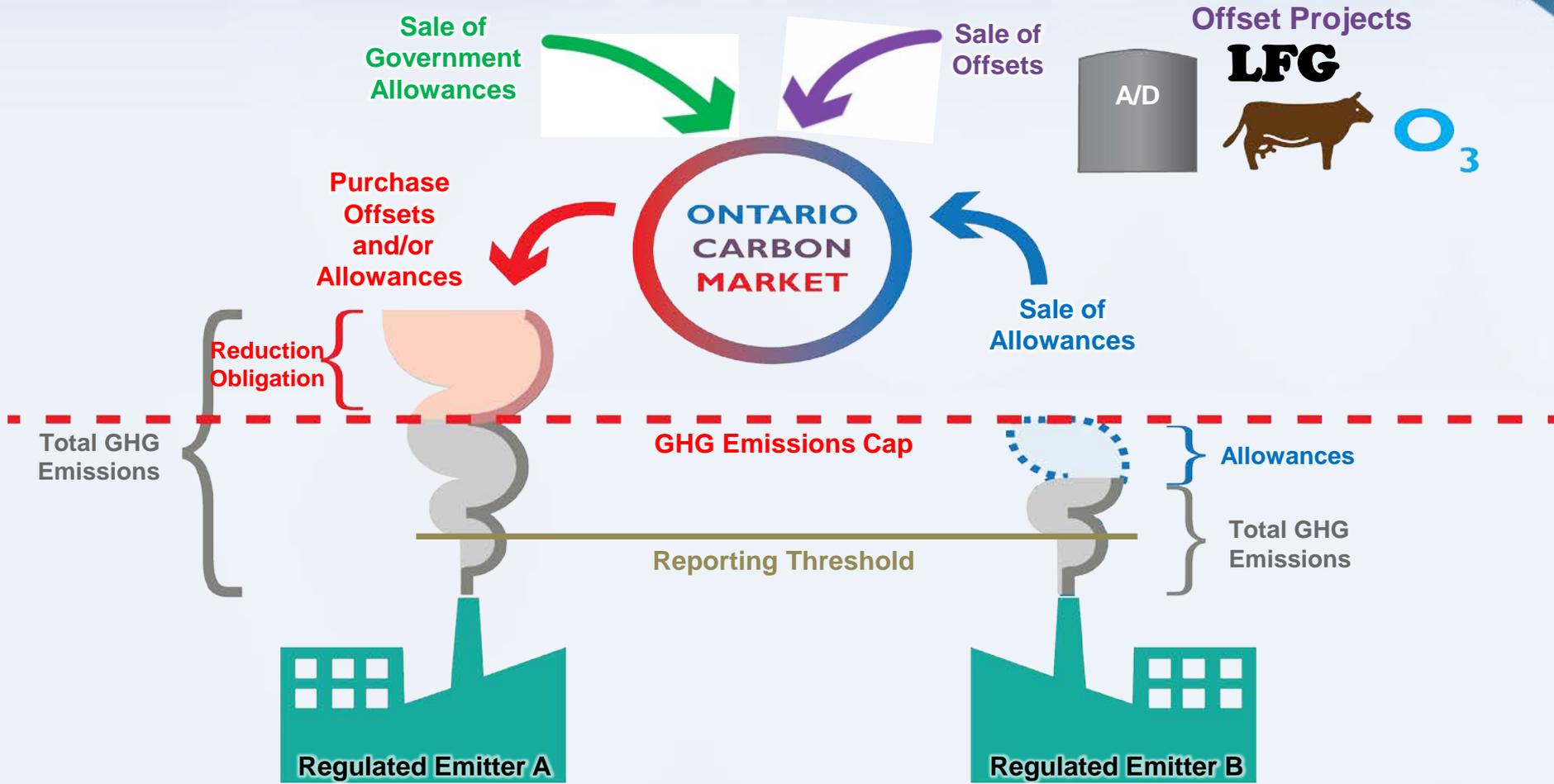
How Will The Proposed Program Work?

Ontario's Cap and Trade System will apply to point source emissions, transportation and heating fuel supply, and electricity distribution.

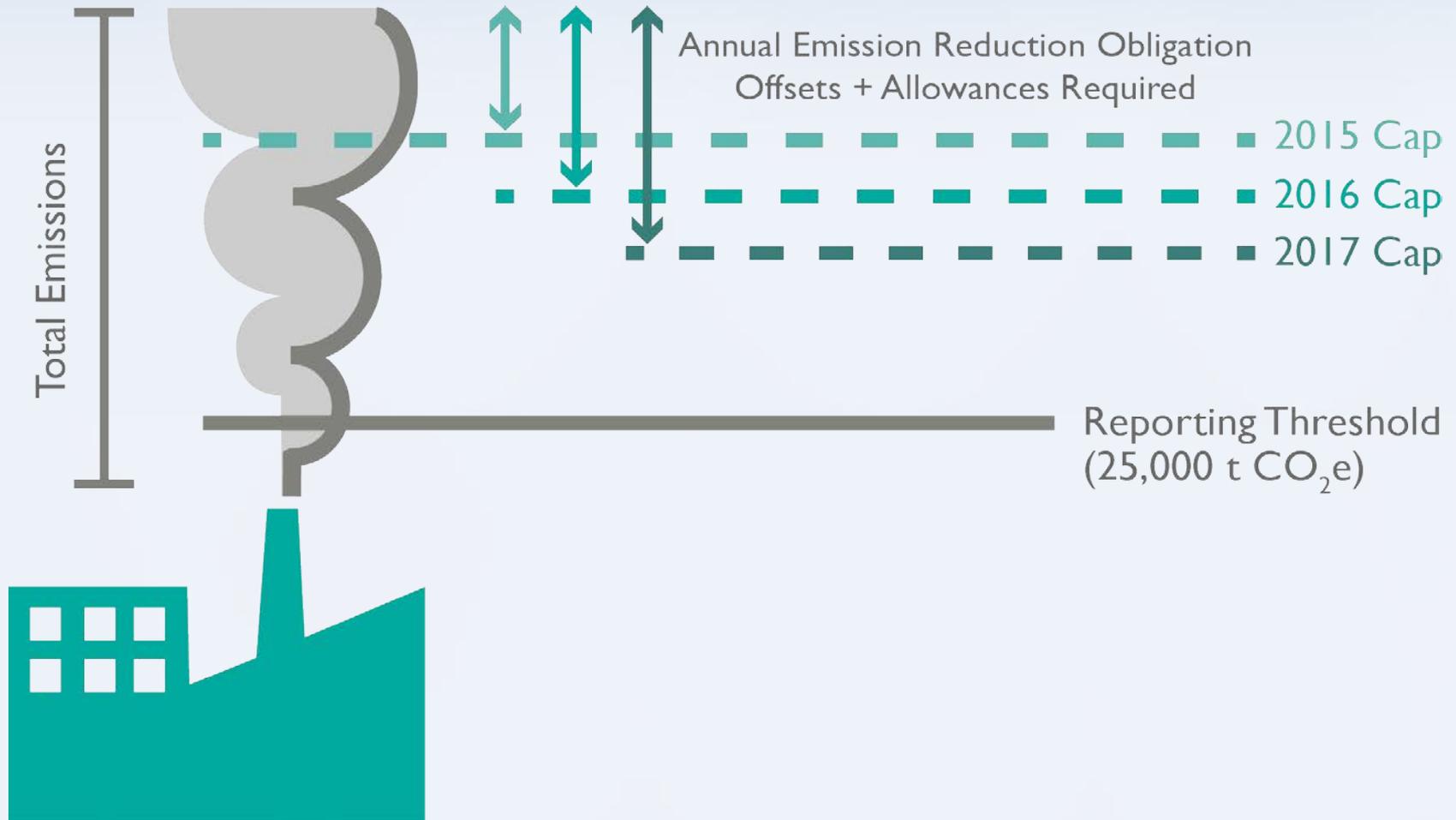
Bill 172 proposes:

- An outline for how the carbon market will be regulated and how it will work for each facility
- eligibility for free allocations and how these allocations will decline in the first compliance period
- An outline for when offsets can be used and registration requirements; offset protocols will be developed in a separate regulation to be published later

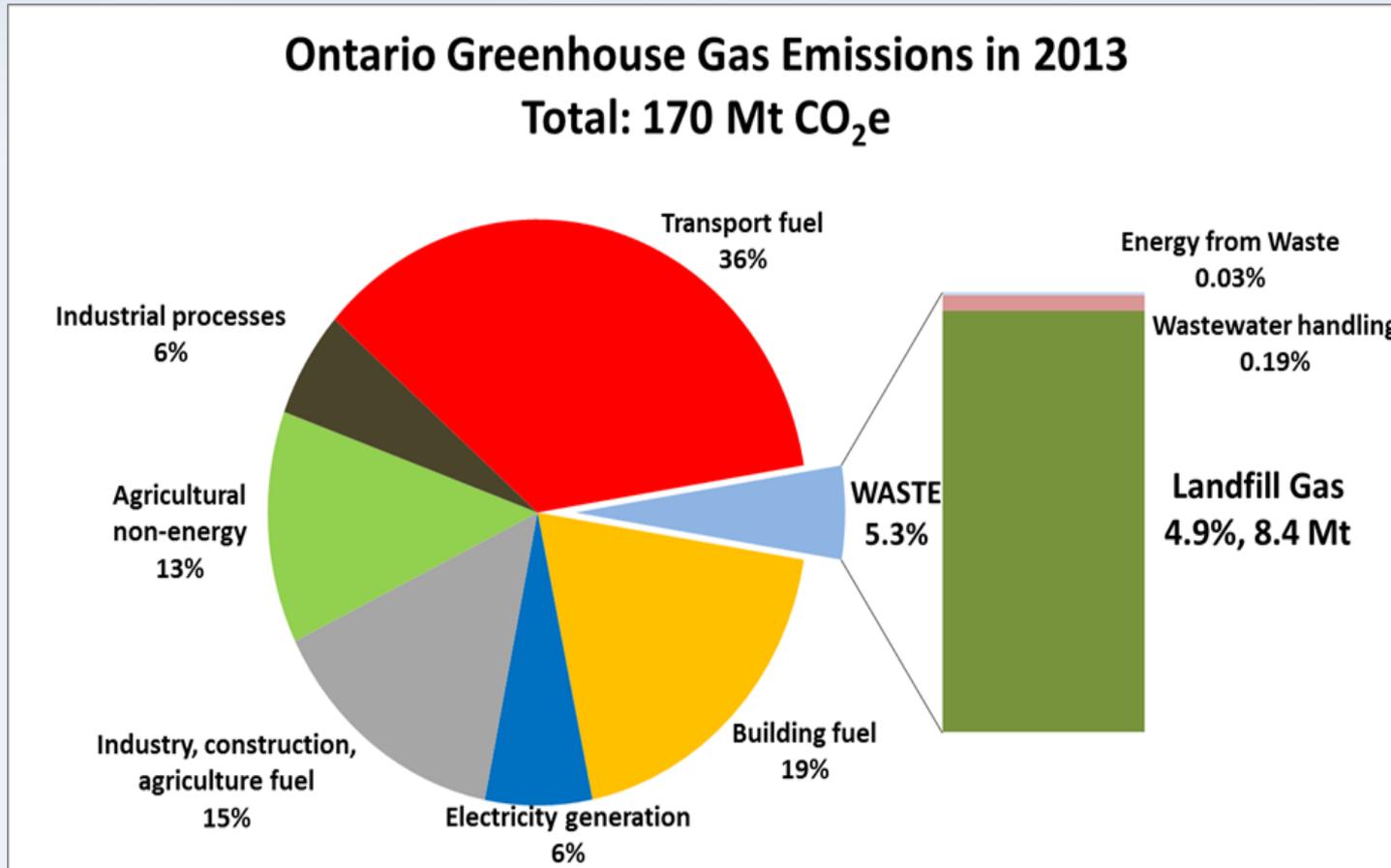
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Waste Management's Contribution



Carbon Emissions in Durham Region

Waste Management has been identified as a significant carbon emitter in Durham Region due to the following:

- 1 operating local landfill (closed 2014)
- 1 contracted landfill for 100,000MT(110,000t)/yr in US (replaced by DYEC 2015)
- 6 closed landfills under Region jurisdiction and numerous older, unknown landfills
- Long haul waste transport to US landfills (replaced by DYEC 2015)
- Waste collection operations

Landfill

- Significant contributor of methane – Durham eliminated landfilling of waste in 2015
- Transport to US landfills
- Durham is piloting a landfill mining project to eliminate methane emissions from a closed landfill and eventually delist site

Durham York Energy Centre

- Eliminated dependence on US landfills
- Local disposal solution significantly reduces long-haul transportation needs
- the 4th R – recovery of energy from methane generating waste
- Is an emitter but significantly less than landfills
- Emissions from natural carbon sources do not count toward cap and trade, those from anthropogenic carbon do

Diversion

- 55% of 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
- Composting keeps organics out of landfill, produces CO₂

Green Bin

- Diverting organics eliminates associated methane emissions from landfill
- Produces CO₂
- Proposed anaerobic digestion facility captures methane to replace fossil fuels and generates offsets

Energy from Waste → Climate Change



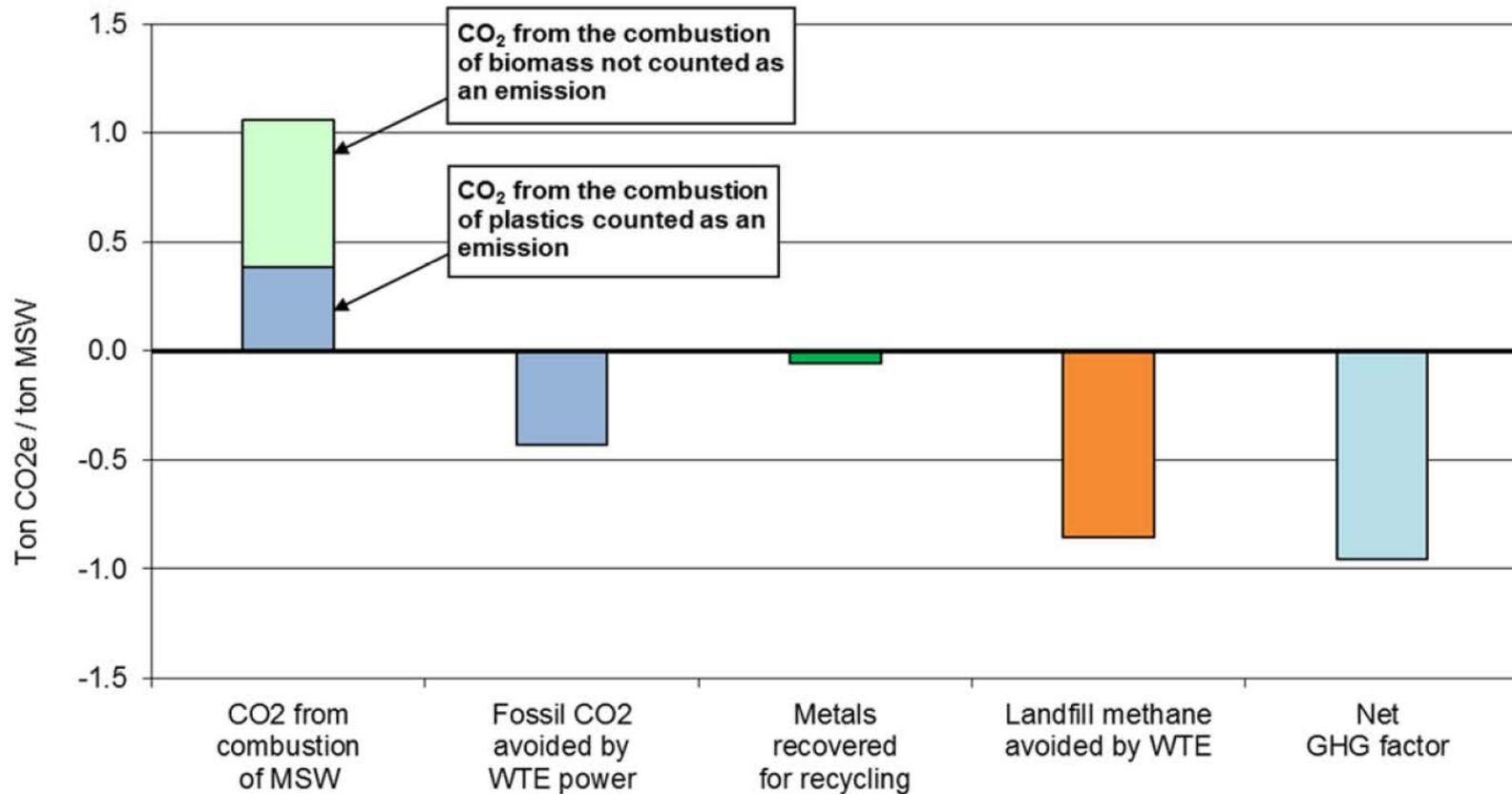
- Processes 140,000 MT(154,300t)/yr of residual municipal solid waste from Regions of Durham and York
- Eliminates methane generation and dependency on methane generating landfills
- Local solution avoids long-haul transport emissions
- Captures all available energy in residual waste stream
 - Generates up to 17.5 MW of electricity - 15 MW per year sold to the Ontario electricity grid
 - Designed to provide process up to 7 MW of heat to neighbouring Courtice WPCP and district heating to the Clarington Energy Park (up to 500,000 sq ft office space)
 - Produces some CO₂ and CO

Energy from Waste → Climate Change



- Up to 100,000MT (110,000t)/yr of CO₂e reduced annually by diverting 140,000 MT(154,300t)/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.

Energy from Waste → Climate Change



Transportation → Climate Change

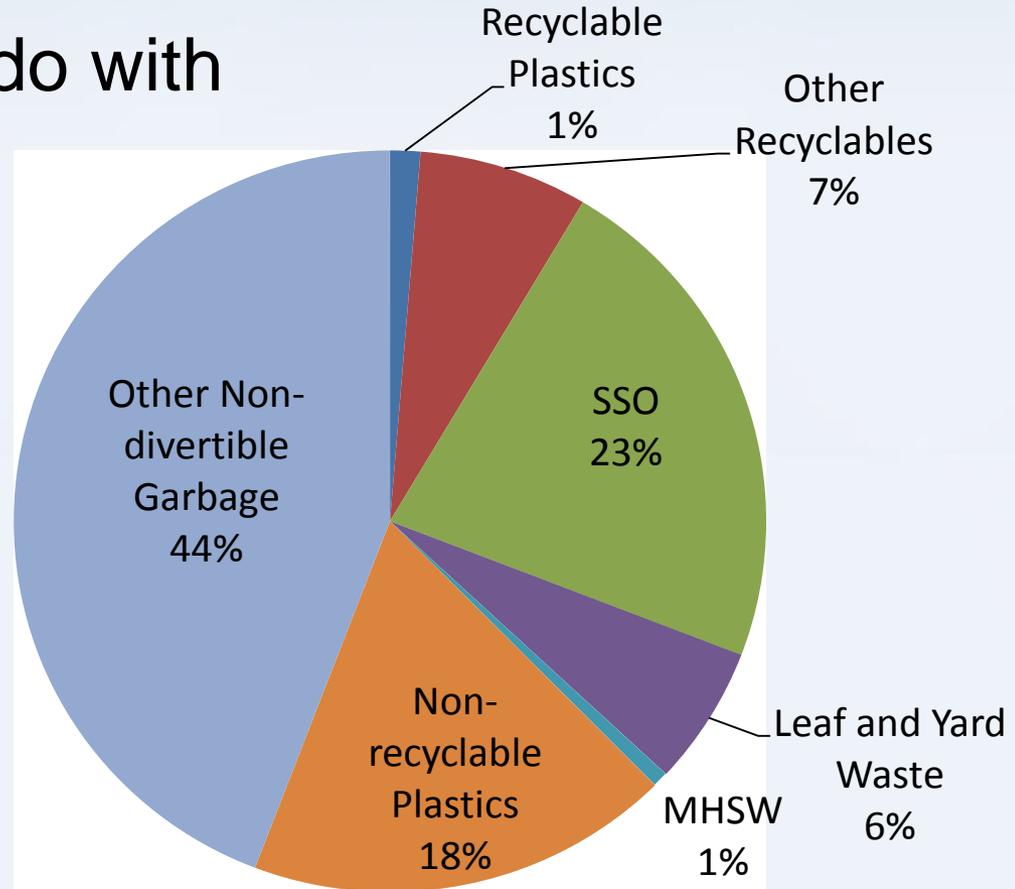


- Residential Collection
 - 70 collection vehicles on the road daily
 - 2,600 square kilometers (1,000 sq mi) covered weekly
- Daily haulage to New York landfill (previously)
 - 400 km (250mi) round trip
 - 20 transfer trailers per day
- Daily haulage to Durham York Energy Centre (currently)
 - 40 km (25mi) round trip
 - 18 transfer trailers per day (higher local payload allowance)

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 MT(35,270t) of organic waste is lost to the residual fraction every year – could be recovered
- Approximately 9,000 MT(9,920t) 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
- Catalytic technologies for energy from waste facility to control NOx and SOx
- Use of renewable natural gas in waste collection vehicles
- Low temperature waste heat for greenhouses
- Continued advocacy to shape Ontario's carbon policy and enhance climate change mitigation through innovative waste management initiatives

Thank-you

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