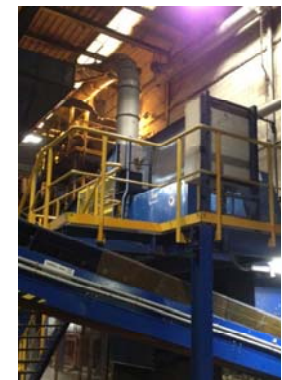




Will Waste Composition Changes Impact Technology Choices in Waste Handling?

Michael Cant
Principal, GHD Canada



Overview

- Waste is in the News – every week
- Nobody wants our recyclables
- What about plastics
- What to do with organics
- What about Mixed Waste Processing
- Conclusions

Recycling crisis hits Quebec as China rejects waste imports, CBC November 1, 2017

- Quebec is sounding the alarm over a recycling crisis now that China, one of the province's biggest buyers of recyclable material, no longer wants it.
- About 60% of materials collected in Quebec are sent abroad, mostly to China
- **China has banned 24 kinds of waste from abroad in effort to tackle growing environmental disaster CBC March 28, 2018**

Your recycling could become trash: The 'golden age' of recycling is coming to an end, CBC December 27, 2017

- In what many are calling a "waste crisis," Canadian municipalities are already finding they have no place for their mounting trash to go — but into the landfill.
- Halifax is seeking special permission from Nova Scotia to dump growing piles of plastic, the size of houses.
- "The province has banned basically every material in this facility from going to landfill. The challenge is when there's no market to take it, it's not recyclable anymore and it needs to find a home. And unfortunately landfilling is the only available option at this point."

And there is more!

'We're not hitting the panic button': City unsure how China's recycling ban will affect local programs CBC Winnipeg January 2018

- It isn't that they've banned all imports, but they've certainly made it much more stringent — the quality requirements to ship it over there,“

Backlog means recyclable material could end up in a Calgary dump CBC

- A Chinese ban on most foreign recycling material is leaving some Canadian municipalities with stockpiles of papers and plastics, much of which may eventually end up in the dump.

City sitting on 5K tonnes of material after China stopped accepting recyclables



And more!

- **China has banned 24 kinds of waste from abroad in effort to tackle growing environmental disaster CBC March 28, 2018**
- **The biggest recycling mistakes Canadians continue to make Globe and Mail April 23, 2018**
- **Many Canadians are recycling wrong, and it's costing us millions CBC April 6, 2018**



Last Month!

Your lifestyle is making blue box recycling unsustainable CBC March 27, 2018

- The problem is that we're now throwing out a huge variety of new types of packaging — mostly plastics, sometimes glued to other materials like metals — that recycling programs were never meant to deal with. Meanwhile, the materials that they were designed to collect, sort and resell make up a shrinking proportion
- Newspaper, for example, used to be the backbone because it's easy to recycle and it's worth a good bit of money."
- Being replaced with plastics, which are typically more difficult and expensive to collect, sort and recycle, and worth less money when they can actually be resold.
- This problem, dubbed "the evolving ton," threatens to make many blue box programs unsustainable.



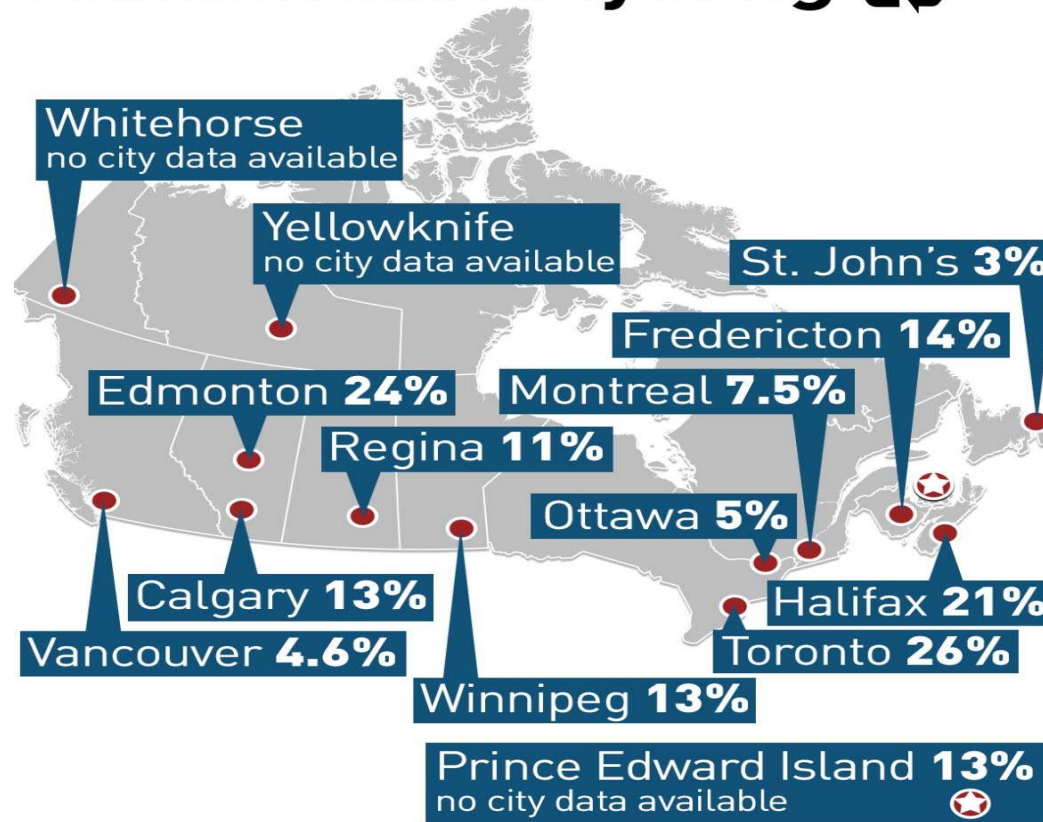
What about Alberta

The future of recycling in Alberta

- For many of the province's recycling programs, everything goes into one bin.
- With little sorting happening, few markets are still willing to take the unsorted waste, she said.
- It's then up to recycling programs on the municipal level — which are often funded by tax dollars — to deal with the unwanted waste.
- We need to take a closer look at our systems and design it more effectively so we get marketable materials coming out.

Why?

Contamination rates for residential recycling ♻️



cbcnews.ca

China does not want to process our waste

- We are not alone
- Europe
- Australia
- USA
- Waste crisis: Australia isn't recycling, we're 'just collecting' May 5, 2018

What Does all this mean?

- Storage of recyclables
- Some being landfilled
- Development of new markets
- We need to remove contaminants - slow down the lines, add new equipment

China is expanding waste bans and it's going to get messy in the recycling bin, April 24, 2018

- China has expanded its waste import ban and will close its borders to an additional 32 types of solid waste, including slag and scrap metal, by 2020. The announcement, jointly issued Thursday (April 19th) by the Ministry of Ecology and Environment and three other ministry-level departments, is the country's latest push to eliminate wastes from overseas — and the environmental problems they pose.
- ***By 2020, China has vowed to phase out any imported waste that could be replaced by domestically available resources.***
- In January and February of this year, Chinese customs seized a combined 50,000 tons of illegally imported waste. And in an intensified crackdown earlier this month, customs seized an additional 110,000 tons of foreign trash.

Interesting

Plastic bag battle ignites as industry challenges Victoria ban, CBC January 30, 2018

- Under the ban, stores will still be able to offer paper or reusable bags for a cost if customers ask. Stores can also still offer plastic bags to package bulk items as well as meat, prescriptions and dry cleaning.
- The plastic bag association is a non-profit organization which advocates on behalf of Canadian plastic bag manufacturers and distributors.
- The organization filed a petition last week, seeking to quash the bylaw on the grounds Victoria city council overreached its authority.

What about Plastics

Trudeau not ready to join British PM's ban on single-use plastics CBC April 19, 2018

Prime Minister Justin Trudeau stopped short today of echoing British Prime Minister Theresa May's call for Commonwealth members to ban single-use plastics — but pointed to a planned discussion at the next G7 summit, being hosted by Canada later this year.

May announced earlier Thursday that her government is banning plastic straws, cotton swabs and other single-use items with the aim of eradicating avoidable plastic waste by 2042 as part of a "national plan of action."



Feds Get Involved

Canada to use G7 presidency to push environmental 'zero plastics waste charter' CBC March 7, 2018

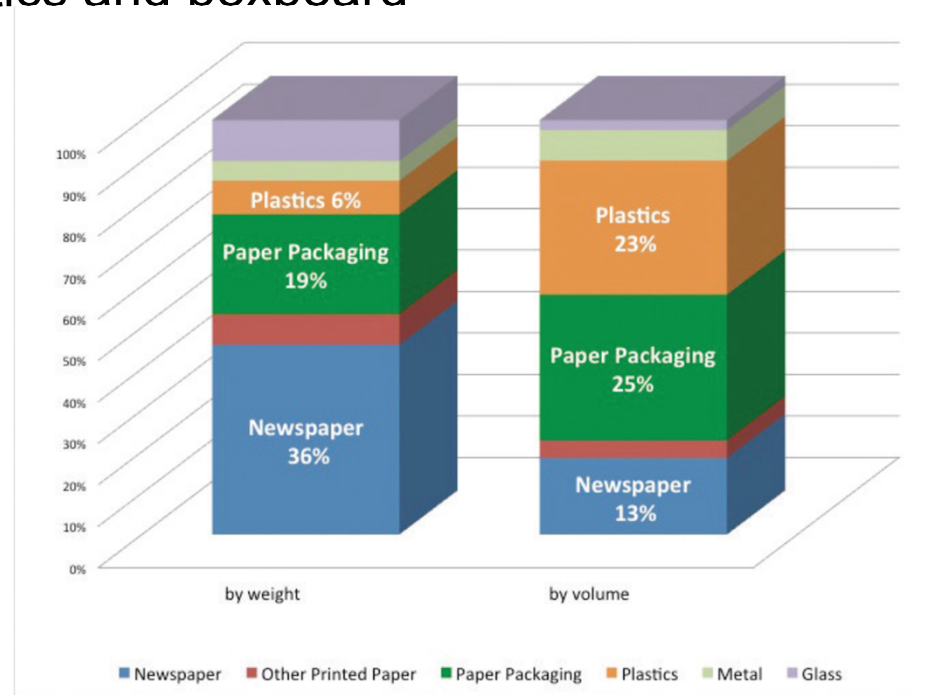
"We could build on goals like having 100 per cent reusable, recyclable or compostable packaging,"

It would be up to individual countries to decide how to implement the goals of zero plastics waste, said McKenna. In Canada, the federal government could provide resources to municipalities to improve recycling.



Changing Waste Stream

- Decreases in newsprint, steel and other paper
- Increase in plastics and boxboard



Will Packaging Continue to Change?

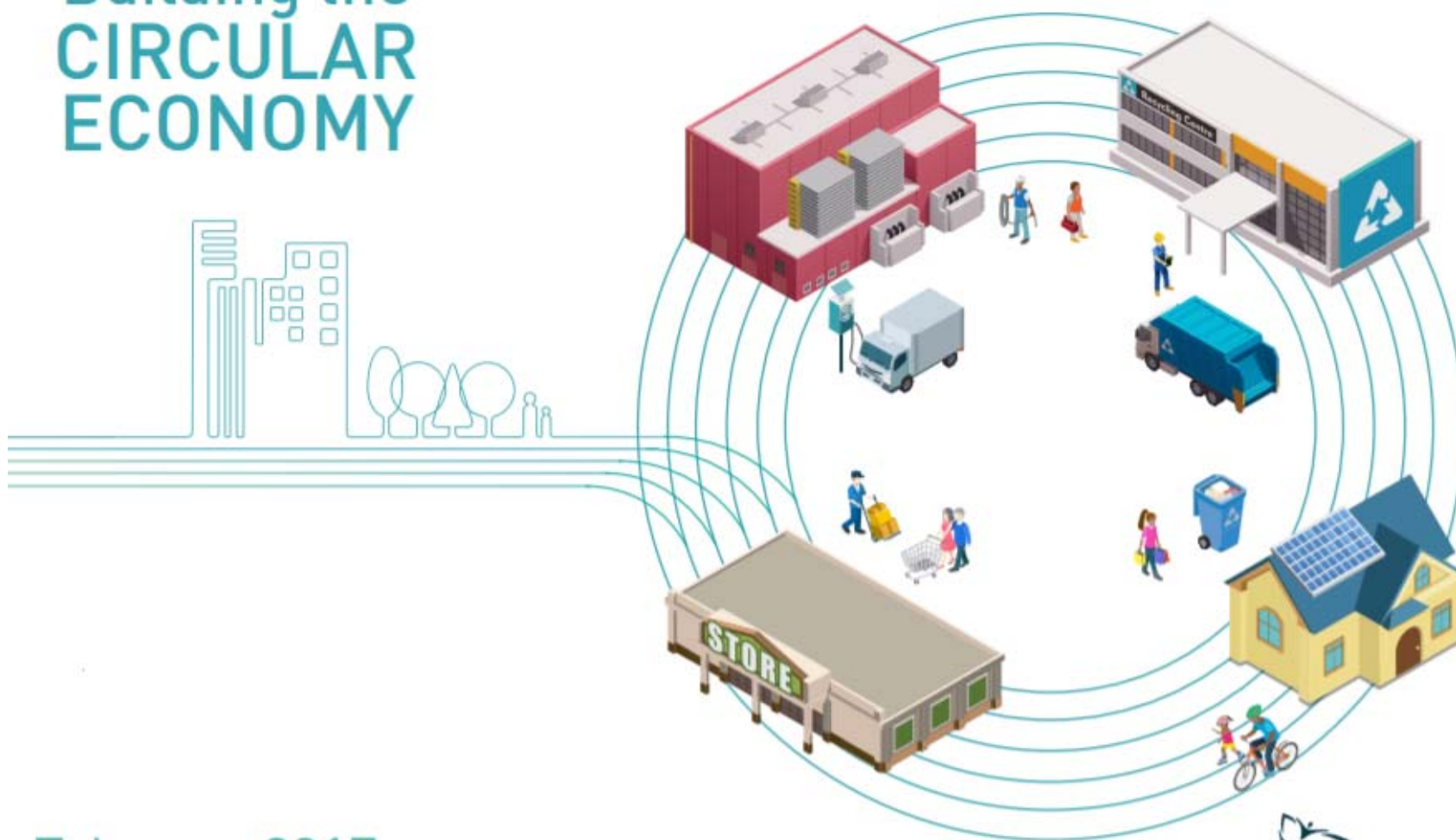
- Environment ministers endorse plan to make all packaging recyclable by 2025 , Australia April 2018



Should we care?

- Declining tonnage in blue box – more plastics less paper
- What happens to the system if all plastic packaging is recyclable?
- With light weighting organics are becoming larger percentage of waste stream
- Will more packaging be classified as compostable?

Strategy for a **WASTE-FREE ONTARIO** Building the **CIRCULAR ECONOMY**



February 2017

DISCUSSION PAPER: ADDRESSING FOOD AND ORGANIC WASTE IN ONTARIO

Province. The Framework's aim is to:

- Reduce the amount of food that becomes waste
- Remove food and organic waste from the disposal stream
- Reduce greenhouse gas emissions that result from food and organic waste

Ontario Ministry of the Environment and Climate Change

While current efforts to divert food and organic waste avoid approximately one megatonne of greenhouse gas emissions, the ministry estimates that doubling the food and organic material diversion rate from 38 per cent to 80 per cent would lead to a reduction of an additional 1.2 megatonnes in greenhouse gas emissions and bring us closer to our climate change goals.

ontario.ca/climatechange

Climate Change
Action Plan



PROPOSED FOOD AND ORGANIC WASTE FRAMEWORK

Includes:

Part A: Food and Organic Waste Action Plan
Part B: Food and Organic Waste Policy Statement

Ministry of the Environment and Climate Change

November 2017



Part B: Proposed Food and Organic Waste Policy Statement

Municipalities that Currently Provide Curbside Collection of SSO

| Entity | Proposed Target |
|-------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| <i>Municipalities that currently provide curbside collection of source separated food and organic waste</i> | 70% waste reduction and resource recovery of food and organic waste generated by single-family dwellings by 2023 |

Part B: Proposed Food and Organic Waste Policy Statement

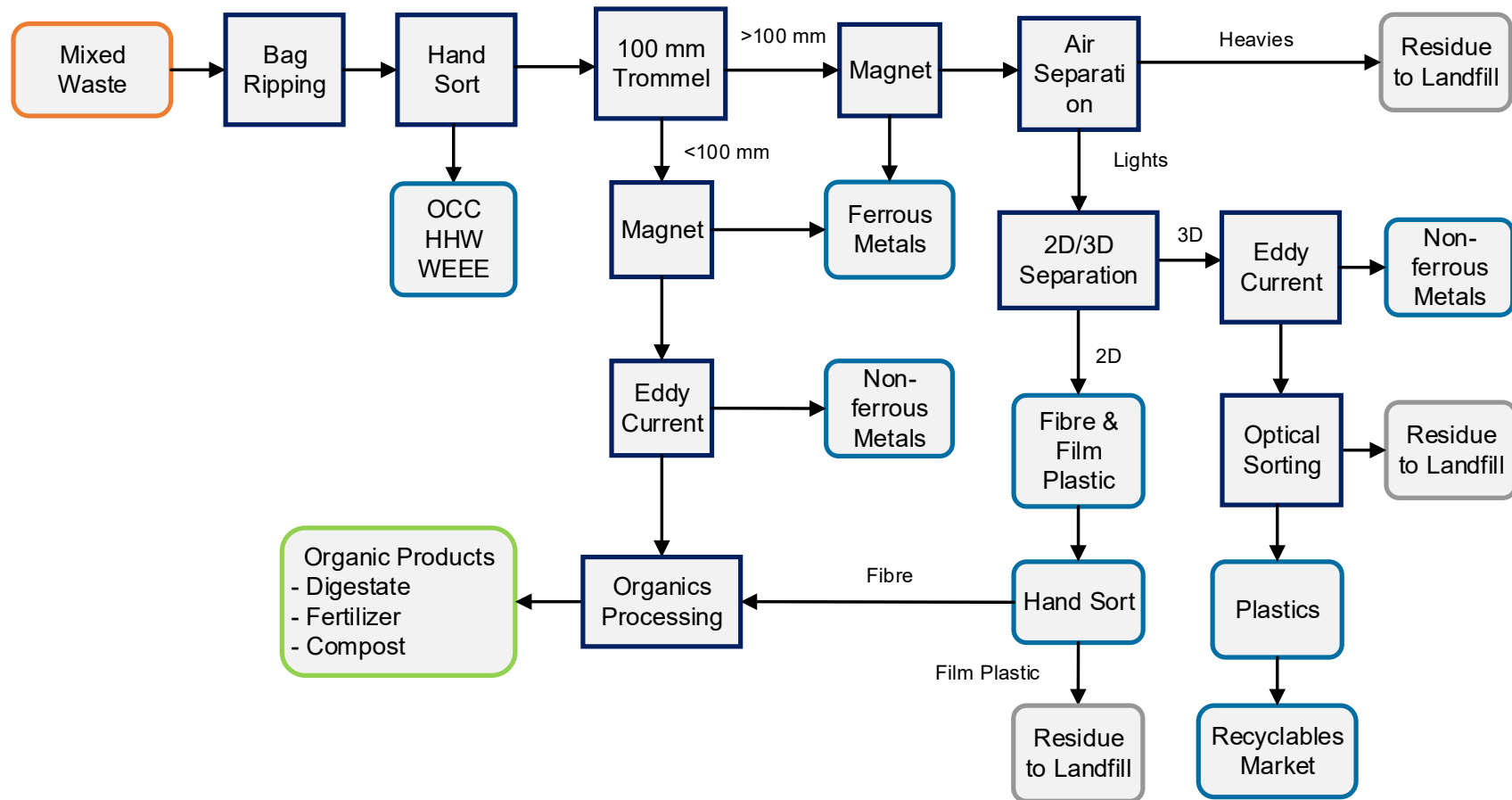
| Entity | Proposed Target |
|-------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Municipalities in Southern Ontario (lower-tier or single-tier) with population >50,000 and a density >300 persons / km ² | <ul style="list-style-type: none">• 70% waste reduction and resource recovery of food and organic waste generated by single-family dwellings by 2025• Curbside collection of food and organic waste to single family dwellings |
| IC&I facilities that generate more than 300 kg/week | <ul style="list-style-type: none">• 50 - 70% <i>waste reduction and resource recovery of food and organic waste</i> generated by the building by 2025 |

In addition to curbside collection of source separated food and organic waste, other collection methods, such as directing disposal streams to ***mixed waste processing***, may be used to support collection of additional food and organic waste.

Horsham Facility – West Sussex 300,000 tonnes

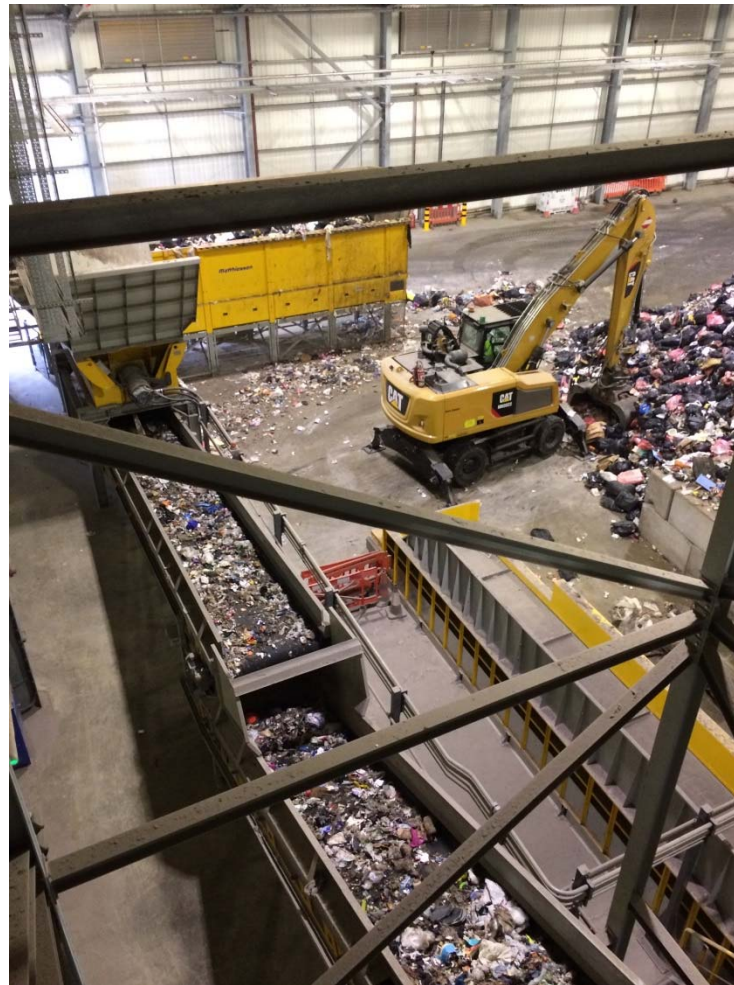


Typical Mixed Waste Processing Facility



- Recovery of organics, ferrous metals, non-ferrous metals, and plastics
- Fibers re-directed to organics processing
- Majority of Organic Fraction Mixed Waste (OFMW) in <100mm fraction
- Manual sort for OCC and Hazards removal

Receiving Area - Milton Keys facility



After Bag-Breaking



Trommel



Trommel



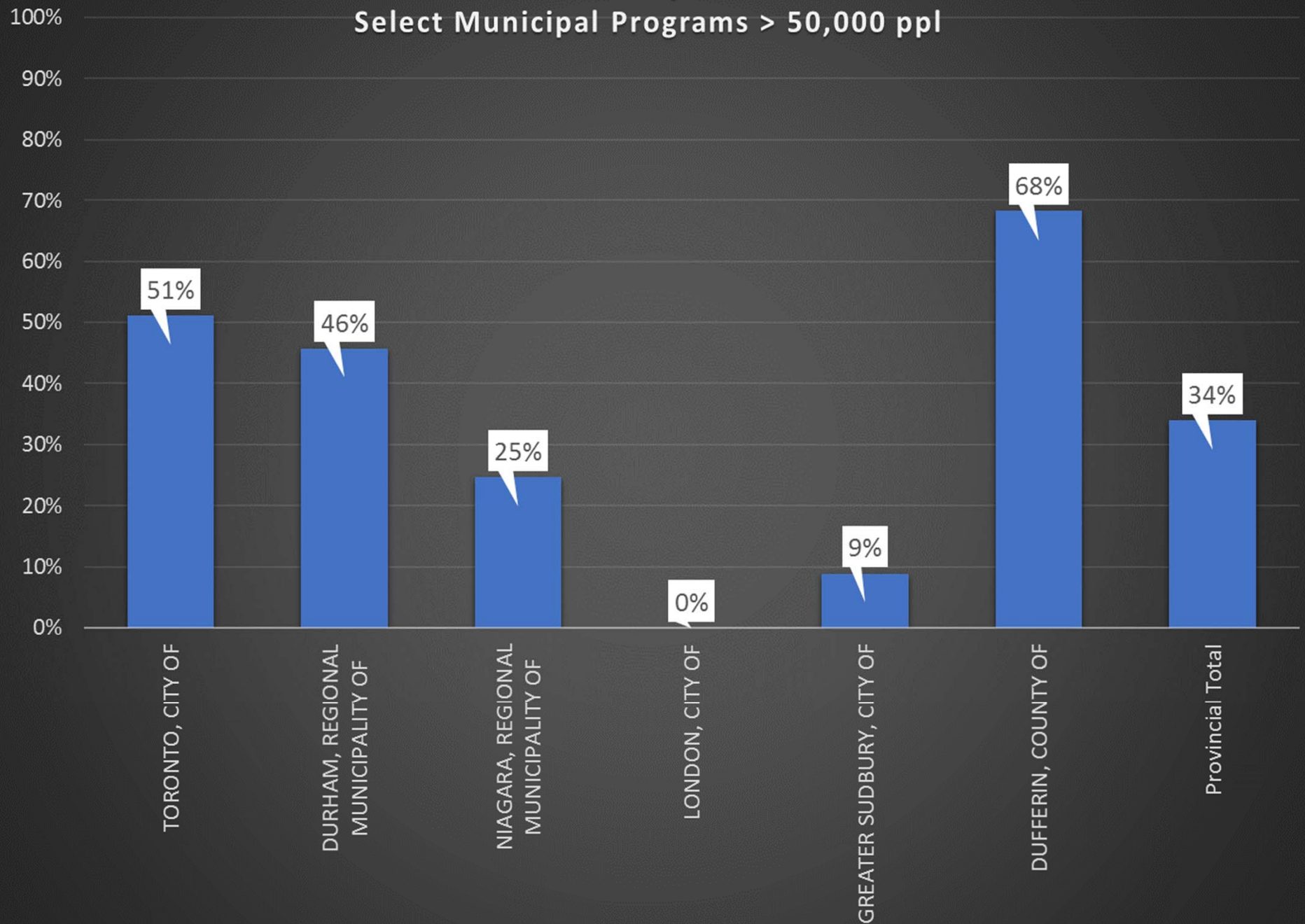
After the Trommel



Optical Sorting



Calculated Capture Rate Select Municipal Programs > 50,000 ppl





65% Organics Removal

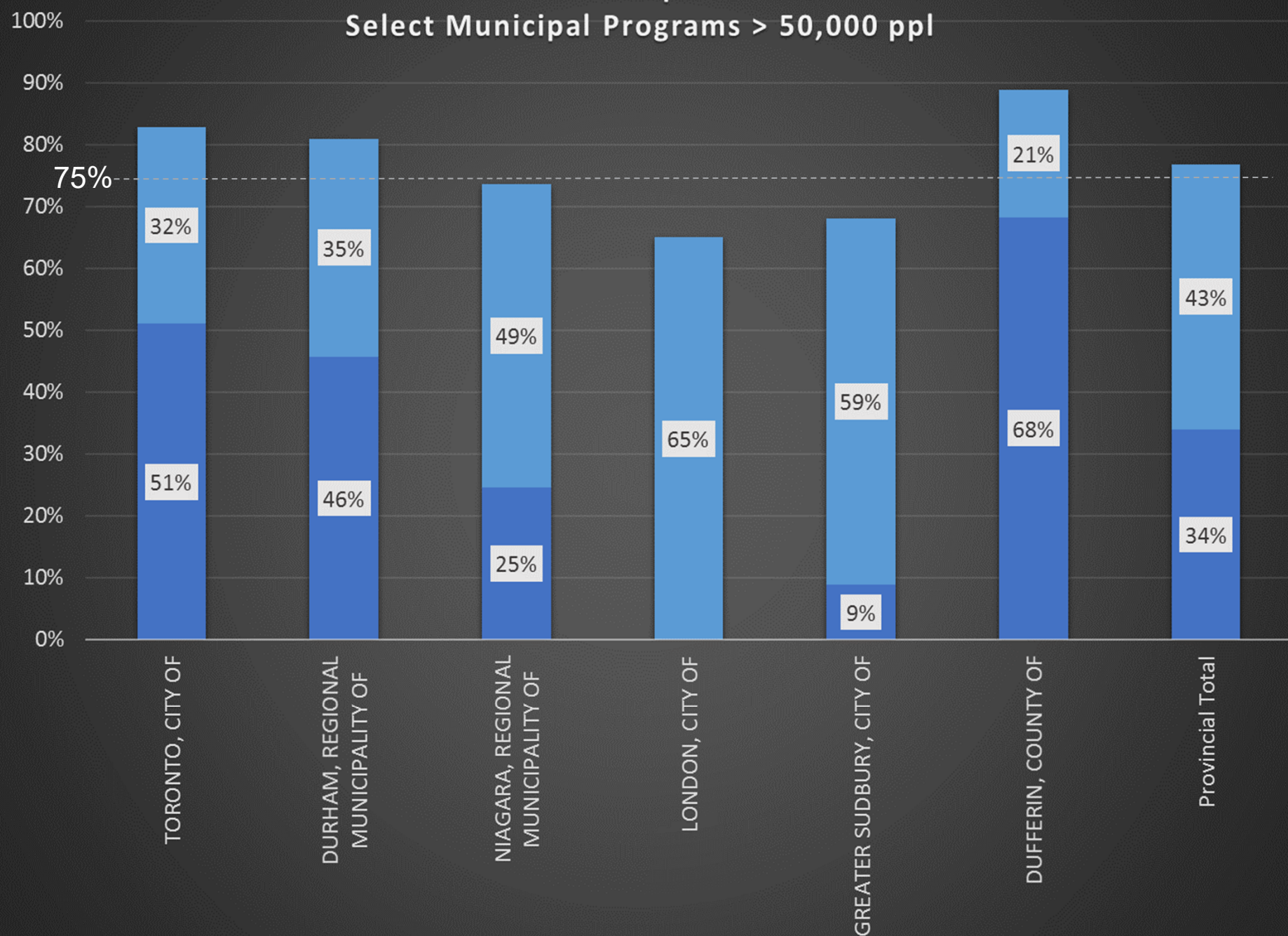
A closer look at the Numbers...

| Municipal Program | (A) Calculated Organics Waste Generation (tonnes) | (B) Organics Diverted (tonnes) | Capture Rate = B/A | (C) MWP Organics Captured | Capture Rate with MWP = (B+C)/A | GHG Emissions (B+C) (tCO ₂ e) |
|-------------------|---------------------------------------------------------------|-----------------------------------------|--------------------------|------------------------------------|---------------------------------------------|---------------------------------------------------|
| Toronto | 204,403 | 104,368 | 51% | 65,022 | 83% | 166,002 |
| Durham | 56,897 | 26,010 | 46% | 20,076 | 81% | 45,164 |
| Niagara | 41,010 | 10,112 | 25% | 20,084 | 74% | 29,591 |
| London | 35,481 | 0 | 0% | 23,062 | 65% | 22,601 |
| Sudbury | 18,564 | 1,647 | 9% | 10,995 | 68% | 12,390 |
| Dufferin | 4,271 | 2,917 | 68% | 880 | 89% | 3,721 |
| Provincial | 1,216,357 | 412,794 | 34% | 522,316 | 77% | 916,407 |

Annual totals based on 2015 RPRA data.



Calculated Capture Rate Select Municipal Programs > 50,000 ppl



Conclusions

- Waste stream has the potential to significantly change in next 10 years
- Recyclables will need to be cleaner moving forward
- Organics is making up a larger percentage of waste stream (by weight)
- Increased interest in the removal of organics from both the residential and IC&I sectors
- Processing technology evolving to energy generation
- Mixed Waste Processing is evolving and being considered



It is Time to Become Part of the Conversation





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