



Food and Organic Waste Framework
Meeting #2: Current State and Priority Issues

March 3, 2017

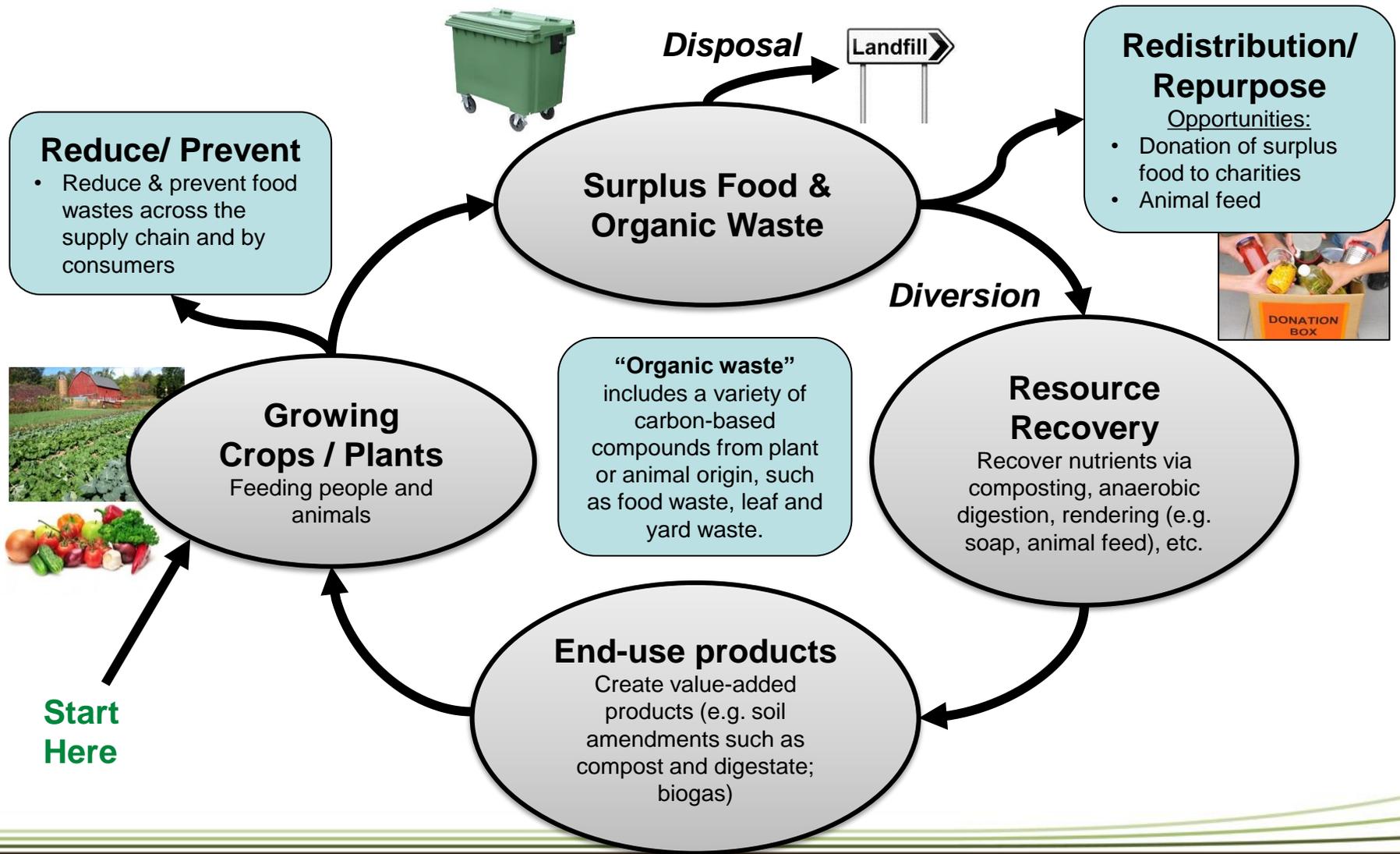
Resource Recovery Policy Branch
Ministry of the Environment and Climate Change

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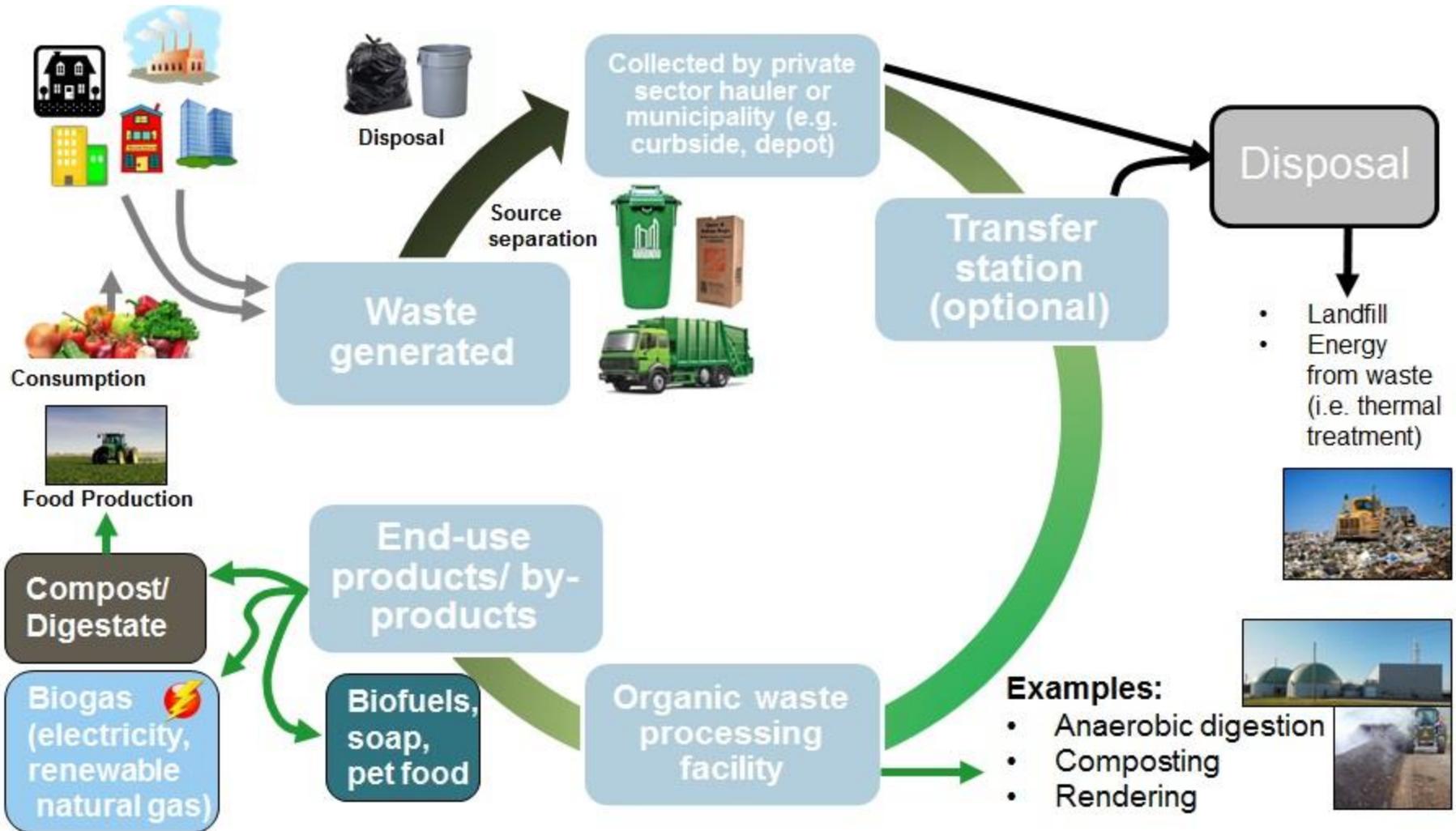
AGENDA ITEM #2

CONTEXT: FOOD AND ORGANIC WASTE

Life Cycle of Food and Organic Waste



How is food & organic waste currently managed?



Roles and Responsibilities – Food and Organic Waste

Federal Government

- Regulates food safety and related areas (e.g. consumer packaging and labeling, animal feed, fertilizers)

Provincial Government

- Protect environment and human health by regulating and enforcing laws relating to waste management in Ontario, and establishing policies to support such efforts
- Establish a legislative and regulatory framework that maximizes the diversion of waste from disposal towards other beneficial uses

Municipal Governments

- Regulate waste management activities within their jurisdiction (e.g. by-laws)
- Locate, finance and operate municipally owned waste management infrastructure

Households / Consumers:

- Active participation in food waste reduction and organic waste diversion

IC&I Sectors

- Comply with federal, provincial and municipal requirements that govern the generation and management of all of their wastes
- Typically achieved through specific contracts with private sector waste management companies. In some cases, municipalities may choose to provide services

Waste Management Industry

- Collects and manages wastes (e.g. material recovery facilities, composting facilities). Complies with federal, provincial and municipal requirements that govern the management of wastes

Government of Canada – Legislative Framework: Food / Organic Waste:

Feeds Act

Animal Feeds

- Schedules IV and V – Feeds Regulations
 - Establishes ingredients that are considered safe for use as animal feed
 - Identifies as materials that remain after or are produced during the processing, manufacture, preparation or sale of human food, and that have nutritional value
- Health of Animals Regulations
 - Generally protects livestock and bans the feeding of certain mammalian proteins, including ruminant meat and bone meal, to cattle and other ruminants

Safe Food for Canadian Act, 2012

- Consolidates the authorities of the Fish Inspection Act, the Canada Agricultural Products Act, the Meat Inspection Act, and the food provisions of the Consumer Packaging and Labelling Act

Food and Drugs Act

- Food Packaging Regulations
 - Regulates the packaging of consumer goods to support food safety

Fertilizers Act

- Some soil supplements, including digestate from anaerobic digestion, can be regulated as fertilizers or supplements

Ontario – Legislative Framework: Food / Organic Waste

Environmental Protection Act (EPA)

Waste Diversion Requirements/ Plans

- O. Reg. 101/94: Recycling and Composting of Municipal Waste
 - Municipalities (> 50,000 people) have a system to collect leaf and yard wastes (curbside and/ or depot)
 - Municipalities (> 5,000 people) to offer home composter at cost or less
 - Regulates leaf & yard waste composting and sets out resulting compost quality criteria
- O. Reg. 102/94: Waste Audits and Waste Reduction Work Plans
 - Large IC&I facilities make “reasonable efforts”: waste reduction workplan, audits, recycling.
- O. Reg. 104/94: Packaging Audits and Packaging Reduction Work Plans
 - Requires some manufacturers (e.g. food & beverage) to conduct packaging audits and packaging reduction work plans

Renewable Energy Approvals (REA)

- O. Reg. 359/09:
 - The EPA governs the requirement to obtain a REA for a renewable energy project. O.Reg. 359/09 classifies such projects (e.g. anaerobic digestion, solar, thermal, treatment and wind) facilities), provides exemptions and regulates REA applications and facilities depending on the facility class

Management/ Disposal

- Reg. 347: General Waste Management
 - Sets requirements and standards for managing wastes, including requirements for waste related Environmental Compliance Approvals and exemptions from approvals
- O. Reg. 535/05: Ethanol in Gasoline
 - Requires gasoline placed in the Ontario market to contain an annual average of at least 5% ethanol by volume
- O. Reg. 97/14: Greener Diesel
 - Requires diesel placed in the Ontario market to contain at least 4% bio-based diesel with at least 70% lower GHGs
- Landfilling Gas Collection
 - O. Reg. 232/98 and Reg. 347 requires planning for landfill gas capture from landfills; Landfill sites are also governed by Environmental Compliance Approvals
- Compost Quality Standards:
 - Sets standards for composting a range of materials to ensure quality end-products that are protective of the environment and human health. Referenced in Reg. 347
- Guideline for the Production of Compost:
 - Best management practices for composting facilities
- D-Series Guidelines:
 - Provides guidance on land use planning decisions, include siting of waste related facilities

Ontario – Legislative Framework: Food / Organic Waste (continued)

Nutrient Management Act

- O. Reg. 267/03: General
 - Regulates land application of nutrients, including non-agricultural source materials (e.g. biosolids)
 - Enables up to 50% of off-farm feedstock for on farm anaerobic digesters

Other (Food Donations)

- Local Food Act, 2013
 - Community Food Program Donation Tax Credit for Farmers
- Donation of Food Act, 1994
 - Protects food donors from liability to encourage donations

Resource Recovery and Circular Economy Act

- Provincial interest and policy statements:
 - Provide provincial policy direction to further the provincial interest in relation to food and organic waste, and ensure consistent and coordinated action is taken by key decision makers
- Producer responsibility:
 - Ability to place requirements on producers related to waste reduction, reuse and recycling, service standards and promotion and education

Northern Services Board Act

- Provides for authority for voluntary local services board (LSB) to deliver approved services to residents. These boards are set up in rural areas where there is no municipal structure to deliver services such as fire protection or garbage collection

Municipal – Legislative Framework: Food / Organic Waste

Municipal Act

Provides municipalities the power to govern their affairs as it considers appropriate and to enhance the municipality's ability to respond to municipal issues

Waste Diversion Requirements / Plans

- Municipalities may pass by-laws related to waste management
- Municipalities have the power to enter and inspect a waste disposal site to conduct tests and take samples

Planning Act

Municipalities carrying out their duties shall have a regard to the following matters of provincial interest, among others:

- Adequate provision and efficient use of waste management systems
- Minimization of waste

Issued under Section 3 of the Planning Act, municipalities use the Provincial Policy Statement to develop their official plans and to guide and inform decisions on other planning matters.

City of Toronto Act, 2006

- Allows the City to provide any service that the City considers necessary or desirable for the public.
- The City may pass by-laws for:
 - Economic, social and environmental well-being of the City.
 - Health, safety and well-being of persons.
 - Services and things that the City is authorized to provide

Waste Diversion

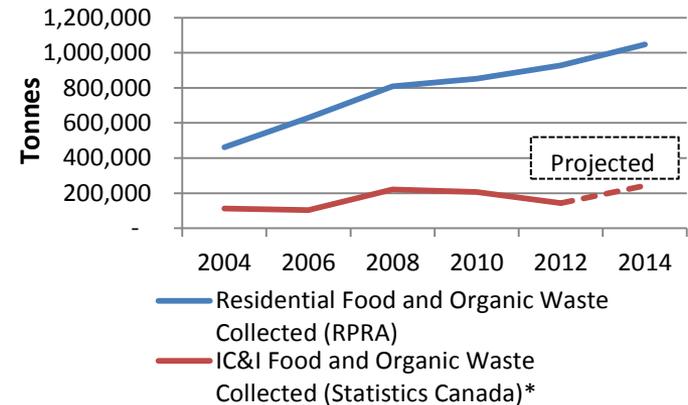
- The municipality has the power to enter and inspect a waste disposal site to conduct tests and take samples

Food and Organic Waste: How is Ontario Doing?

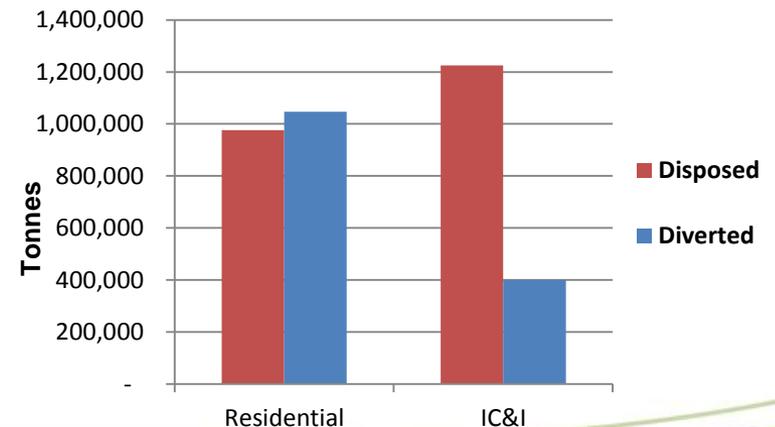
Context:

- Food and organic waste (i.e. source separated organics and leaf & yard) represent about one third of total waste generated in the province (~32%)¹
- About 1.4 million tonnes of food and organic waste diverted in 2014, with 1 million diverted by municipalities, and the rest by IC&I sectors¹
- In 2014, some 37 municipalities, representing ~71% of Ontario's population offered green bin programs voluntarily, including curbside / depot collection⁵
 - Municipalities with green bin programs diverted about 480,000 tonnes of household organic waste in 2014²
 - 7 municipalities offer green bin services to apartments/condo (i.e. multi-unit res. buildings)⁵
- In 2014, 107 municipalities diverted 567,000 tonnes of leaf and yard waste.²
- Organic waste processing facilities: 41 composting sites & 35 anaerobic digestion sites (6 industrial & 29 on-farm)⁴
- Estimated notional organic waste processing capacity of 2.3 million tonnes in 2014⁴

Food and Organic Waste in Ontario - Residential Vs. IC&I - 2004-2014^{2 & 3}



Organic Waste: Disposed vs Diverted (2014)¹



Sources of data: Reports on Organic Waste Management in Ontario, prepared for MOECC, 2015¹; Resource Productivity and Recovery Authority (RPRRA), Organics Tonnage for 2014, 2016²; Statistics Canada, Waste Industry Survey, 2015³; Ontario Waste Management Association (OWMA), State of Waste in Ontario: Organics Report, 2016⁴

Food Loss and Waste

Context

- Ontario Community Food Program Donation Tax Credit for Farmers, under the Taxation Act, 2007: provides tax credits to persons that donate agricultural products to eligible community food programs
- Ontario Donation of Food Act, 1994: protects food donors from liability as a result of injuries caused by the consumption of donated food, to encourage donations, subject to certain limitations

Behavioural Challenges

- Practices that can lead to excess food, food loss and waste (e.g. poor portioning, planning, storage practices; convenience factor)
- “Sell by” and “best before” dates

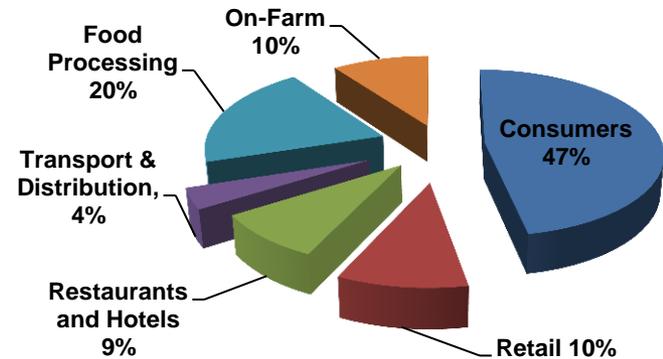
Logistic Complications – Donations/ Redistribution

- Infrastructure and logistical challenges (e.g. donation/redistribution of excess food)
- Food safety concerns

Liability/ Brand Concerns - Donations/ Redistribution

- Concern about liability for food donors. Perceived risks to brand reputation

Where is Food Wasted? ¹ (Share of Value of Food Waste in Canada)



Key Figures:

- A 2014 study calculated the cost of wasting food at roughly \$31 billion in Canada; equivalent to about \$12 billion for Ontario/ \$868 per capita/ year¹
- Annual tonnage estimates of 6-7.3 million tonnes of food waste or 177-276 kg per capita²

Sources of data: Value Chain Management Institute (VCMI), 2014 ¹; Paul van der Werf / Jason Gilliland, 2016 ²

Diversification versus Disposal

Context

- About 38% of food and organic waste generated was diverted in 2014 – or 62% ending up in disposal (i.e. landfill, energy from waste facility)¹
- Diversion from disposal happens at a significantly different rate at the residential sector compared to the IC&I sectors:
 - Residential sector: 48% (i.e. household organics, leaf & yard waste)¹
 - IC&I sector: 25% (i.e. source separated organics)¹
- Economics of waste: cheap cost of disposal is a disincentive for diversion (see Table 1)
- Estimated 40% of IC&I waste sent for disposal in the US, including Michigan & New York State (~ 3.2 million tonnes in 2015)^{2&3}
- Diverting 1,000 tonnes of organic waste generates 60% more GDP and 40% more jobs than disposal¹

Ontario's Waste Stream¹

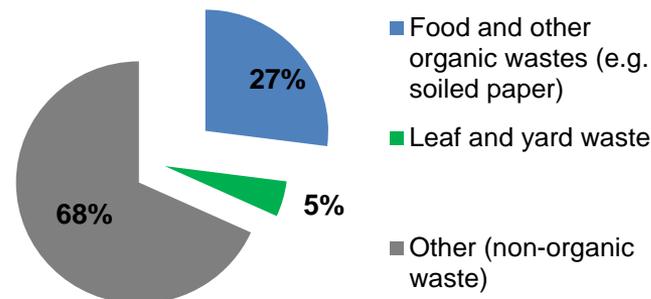


Table 1: Diversification versus Disposal (Average Cost Per Tonne)¹

	Food / organic waste diversion	Disposal
Ontario	Municipal: \$268 IC&I: \$205	\$134
US	N/A	\$118

Definitions:

- *Diversion includes:* composting, anaerobic digestion
- *Disposal includes:* Landfill, thermal treatment (with or without energy recovery)

Sources of data: Reports on Organic Waste Management in Ontario, prepared for MOECC, 2015¹; Michigan DEQ 2016; New York State DEC 2016

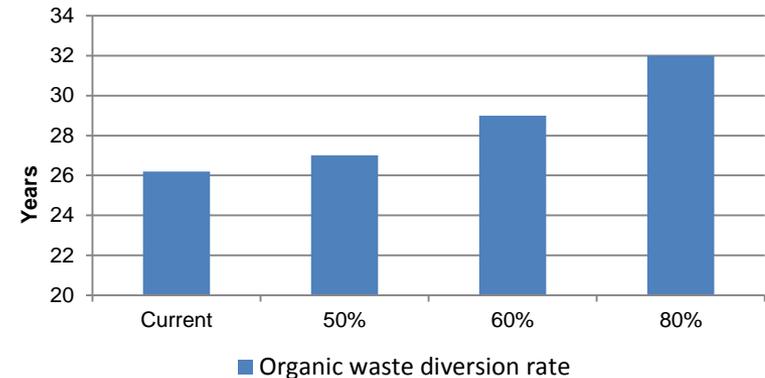
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Landfill Capacity

Context

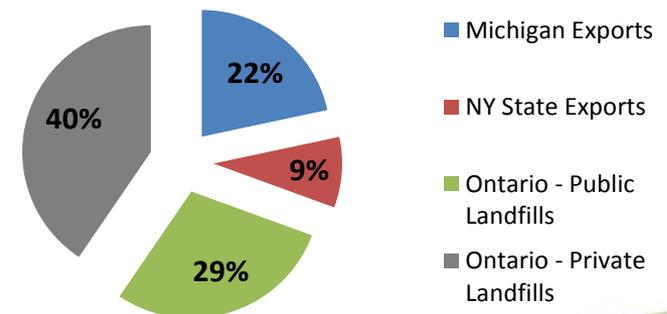
- Active landfills in Ontario: 32 large sites - over 1.5 million m³ in size - and 850 small landfills¹
- Remaining landfill capacity estimated to be worth about 26 years²
- 75% of remaining capacity is held by 15 large sites (both private and public)³
- Increasing diversion of food and organic waste could save many years of landfill space, avoiding costly landfill expansions and the need for new landfill developments
 - Increasing Ontario's diversion rate for organic waste, over a 10 year period, to about 60% could avoid over \$111 million in costs related to developing new landfill capacity⁴

Impact of Increasing Organic Waste Diversion Rate on Remaining Landfill Capacity (Years)⁴



* Includes source separated organics and leaf and yard waste, from residential and IC&I sources

2014 Waste Landfilled by Ontario as a %³



Sources of data: MOECC, Small and Large Landfill Sites (updated yearly)¹; MOECC, 2016²; OWMA, Landfill Report, 2016³; Reports on Organic Waste Management in Ontario, prepared for MOECC, 2015⁴

Greenhouse Gas (GHG) Emissions

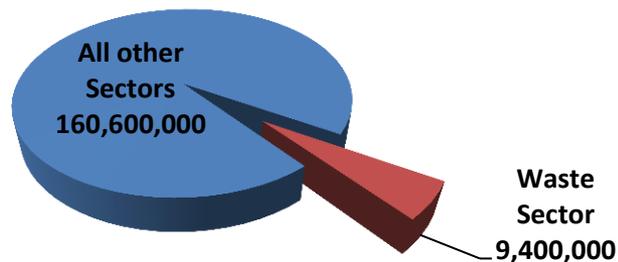
Context

- Sending organic waste to landfill:
 - Contributes to landfill gas emissions (primarily methane - global warming potential 25 times that of carbon dioxide)
 - Fails to recognize organic waste as a resource – for production of compost/digestate, electricity, heat, biofuels and/or renewable natural gas
- Other materials such as wood, paper, cardboard, and textiles/leather can also contribute to landfill gas emissions

Key Figures:

- Most organic waste sent for disposal ends up in landfill (i.e. ~95% of waste sent for disposal), contributing to landfill gas emissions¹
- About 9.4 Mt of GHGs result from the waste sector; about 6% of Ontario's GHG emissions. Of this, 90% are from landfills. Absolute GHG emissions from the waste sector have increased by 19% between 1990-2014²
- Landfill gas capture at landfills over 1.5 million m³; capture rate between 50-75%¹
 - 32 large landfills covered by regulations

GHG Emissions in Ontario
(ECCC, 2016)²



Sources of data: MOECC, 2015¹; Environment and Climate Change Canada (ECCC), 2016²

Questions for Discussion

Q: Are there any additional key figures or information that you would like to share, to set the context?

Q: Are there any challenges / opportunities related to the data?

AGENDA ITEM #3

**FOOD AND ORGANIC WASTE
MATERIALS AND ISSUES**

What is Food and Organic Waste? (1/2)

“**Organic Materials:** Materials that are or were once living, such as leaves, grass, yard trimmings, agricultural crop residues, wood waste, and paper and paperboard products or food scraps.”

(Statistics Canada, *Waste Management Industry Survey*)

Material	Description (common materials)	Sources (examples)	Current Approach (examples)
Surplus Food	Cooked or raw food that is safe for use through a donation program (e.g. food that are perishable or non-perishable)	Households, grocery stores, restaurants, food processors, and farmers	Voluntary – some charities or other not-for-profit organizations accept safe surplus food
Food Waste	Cooked or raw food preparation scraps, spoiled food, or food that was not consumed by the residential or IC&I sectors (may not be suitable for donations or repurposing)	Households, grocery stores, restaurants, hospitals, long-term care facilities, schools, universities / colleges, hotels	Voluntary – many municipalities offer collection
Food processing / manufacturing waste	Food and organic material that is a waste or by-product of producing / preparing foods (e.g. food residue and non-saleable products)	Food processing and manufacturing sector	Voluntary diversion
Soiled paper	Used paper towels, facial tissues and non-waxed paper bags/packaging	Households and businesses that prepare or sell food products, such as restaurants, grocery stores	Voluntary diversion – many municipalities offer collection
Leaf and yard waste	Hedge trimmings, leaves small tree limbs, trunks, or stumps, Christmas trees, and pumpkins	Households and landscaping / gardening businesses, retailers	Mandatory collection applies to municipalities with a population of 50,000 or more (O.Reg 101/94)

What is Food and Organic Waste? (2/2)

Material	Description (common materials)	Sources (examples)	Current Approach (examples)
Compostable products and packaging	<ul style="list-style-type: none"> Compostable products (e.g. absorbent hygiene products – diapers, feminine hygiene products and incontinence products, compostable cups, cutlery, plates) Compostable packaging (e.g. compostable plastic wrapping) 	Households, restaurants, and hospitals and long-term care facilities	Voluntary diversion – a few municipalities offer collection of limited materials
Biosolids	A nutrient rich material that remain after being treated at a wastewater facility	Wastewater processing facility (e.g. municipal wastewater, pulp and paper)	Either land applied, composted, processed via anaerobic digestion (digestate), or sent for disposal (i.e. landfill or incineration/ thermal treatment). Ontario regulates the application of biosolids on land and as a feedstock in making compost. Ontario generates about 3.5 million tonnes (wet) of sewage biosolids and 1 million tonnes (wet) of pulp and paper biosolids per year
Fats, oils and greases	Sources of fats, oils and greases include: <ul style="list-style-type: none"> Meat fats; lard; cooking oil; butter and margarine; etc. 	Food sector (e.g. restaurants, catering, food processors)	Fats, oils and grease from the food sector are typically collected via interceptors, required by some municipalities, and containers for used vegetable oil. Currently being managed via a voluntary-market driven approach (e.g. rendering, anaerobic digestion)
Other compostable materials	Pet waste, dryer lint, house plants, ash, and hair from households are included in some municipal green bin programs	Mainly households, municipal sources (e.g. parks), some retail establishments	Some organic waste processing facilities may accept these materials while others do not (e.g. processing method / technology, risk of contamination). Some municipal green bin programs include these materials

- Data Challenges:** Lack of data on most of these wastes (e.g. tonnes generated, diverted & disposed)

What Do We Know?

- Ontario has made considerable progress in diverting food and organic waste over the last 10 years, and much of this has been led by the voluntary efforts of municipalities
- Municipal leaf and yard waste collection programs are successful, under Ontario Regulation 101/94 (Recycling and Composting of Municipal Wastes)
- Residential green bin programs are primarily focused in the Golden Horseshoe area. Some other municipal examples include Ottawa, Kingston, and Sudbury
- Existing food and organic waste processing capacity meeting current needs in terms of tonnes diverted (e.g. source separated organics, leaf and yard, biosolids)
- Variety of end-market products for processed food and organic waste, e.g. compost, digestate, biofuels (biogas, renewable natural gas, biodiesel, ethanol, etc.), electricity, animal feed, etc.
- Diversion of food and organic wastes creates opportunities to extend the lifespan of Ontario's landfills
- Existing initiatives promote the redistribution of surplus food, supported by Donation of Food Act, 1994 and Taxation Act, 2007

Identified Issues – General

- Significant quantities of food and organic waste sent to disposal each year, creating several issues:
 - **Generates significant GHGs and contributes to climate change** (e.g. landfill gas emissions, embedded energy in food)
 - **Puts pressure on Ontario’s landfill capacity.** Increasing organic waste diversion would reduce the need for new landfill sites and/or expansions of existing landfill sites
 - **Lost opportunity to feed people and animals.** Food can be donated (e.g. food rescue programs) and/ or used as animal feed before it becomes a waste.
 - **Lost nutrients.** Compost, digestate and other soil amendments produced from organic waste processing can support healthy soils. In addition to providing nutrients, they help improve soil condition (water holding capacity, nutrient holding capacity, soil tilth); add organic matter; stimulate microbial activity for a healthier soil environment; add micronutrients; and provide erosion control
 - **Lost market opportunity.** Controlled processing of organic wastes can provide valuable by-products, many of which can displace fossil fuels (e.g. biogas), derived products (e.g. fertilizer, biofuels, bioproducts for car parts etc.)

Issues – Food Loss and Waste

- Lack of awareness, recognition of problem and availability of tools to make informed decisions in Ontario – across the supply chain and by consumers
- No apparent incentives to reduce the amount of food waste going to disposal – although potential cost savings to businesses and consumers
- Food waste not a priority – most businesses and households not aware of the amount of food waste and financial impacts
- Issue of food loss and waste cuts across the supply chain, with many different players, from farm to table, with consumers responsible for the largest portion
- Recognition that there is avoidable and non-avoidable food waste (e.g. spoiled vegetables vs. vegetable peelings/scraps), and should be treated differently
 - Surplus food is food that is still safe to eat, that has not become a waste
- Lack of data on the problem – where does food waste occur and why
- Focus to date has been on diversion instead of prevention

Issues – Food and Organic Waste Diversion

Residential Food and Organic Waste:

- High costs of green bin program development and management remain an obstacle.
- A number of municipalities in Ontario remain without green bin programs; some municipalities who offer curbside leaf and yard waste collection do not offer green bin programs
 - Performance of some green bin programs are lagging (i.e. need to increase capture rates of organic waste generated, increase household participation, and decreased contamination)
- Green bin services are not available to most residents of multi-unit residential buildings, either not offered or not adopted by building owners (i.e. private sector collection)
- Collecting food waste in Northern Ontario and rural areas can lead to potential incidents with wildlife that is not found in urban settings

IC&I Food and Organic Waste:

- There appears to be low diversion figures in the IC&I sectors for food & organic waste
 - Ongoing data gaps because of lack of reporting requirements (e.g. how much organic waste is actually diverted from the IC&I sectors – as opposed waste audits and modelling / surveys)
- Limited existing regulatory requirements on organic waste in IC&I sectors (except O. Reg. 102/94)
- Disposal costs are lower than diversion costs - voluntary actions from the IC&I sectors are unlikely/marginal, unless it creates net savings
- Most voluntary actions are result of corporate social responsibility actions (i.e. large businesses)
- Limited issues with leaf and yard wastes from IC&I sectors as most municipalities are offering a leaf and yard waste program, including collection at depots, transfer stations or landfills

Issues – Processing Capacity

- Any new diversion requirements will require Ontario to significantly increase the diversion of food and organic waste. This could be phased-in (e.g. 4+ years) for infrastructure to develop (e.g. environmental approvals, municipal zoning approvals)
- Additional processing capacity will be needed near where the materials are generated
- Location and operation of the facilities can be sub-optimal leading to:
 - Facilities established too close to sensitive land uses (e.g. residents) and lead to odour, noise and other nuisance complaints
 - Facilities not operating at their desired capacity (e.g. lack of available supply, odour issues leading to shut-down & scale back of operations)
- Stakeholders have expressed concern with existing approvals process and have suggested a need to streamline the approvals process to encourage and expedite construction of new food and organic waste processing capacity
- Contamination of source separated organics (i.e. green bin waste) a common issue, impacting the production of quality end products (e.g. compost, digestate) and needing pre-processing of wastes
 - Additional efforts, tools, technologies and costs may be needed to address the issue

Issues – End-Markets

- New, expanded and diversified end-markets will be needed if organic waste processing capacity is increased
- Lack of support for the creation of new, expanded and diversified end-markets for food and organic waste, and ensuring best and highest use (i.e. environmental and economic benefits)
- The low market value of compost / digestate, the limited ability to add value to compost/ digestate makes it an economic challenge for compost/ digestate producers and force many facilities to rely on tipping fees as a main source of revenue
- High cost of transporting compost / digestate from processing facilities for agricultural application further impacts the economic viability of compost as an end-product
- Anaerobic digestion facilities can benefit from biogas by-products (e.g. electricity, heat, renewable natural gas)
- Difficulties in raising awareness of other products in addition to composting and anaerobic digestion such as pyrolysis (e.g. biochar), rendering (e.g. biofuels, pet food) and creation of bio-products (e.g. biomaterials in car parts)

AGENDA ITEM #4

SCOPING ACTIVITY

Instructions for Scoping Activity

Exercise 1: Scoping

- Goal: Enable working group to determine what materials should be considered “in scope”, “out of scope” for the Food and Organic Waste Framework

Instructions:

- For each material identified in the far left hand column, answer the guiding questions under the Guiding Questions Column with either “Yes, No, or Maybe”
- For each material, indicate if the material should be considered either “In, Out, or Maybe” under the Scope Decision column based on the majority of your answers (e.g. primarily “yes”, primarily “no”)
- For each material, place the corresponding name card under the appropriate heading (In, Out or Maybe) on the Collaborative Wall

AGENDA ITEM #5

ISSUE IDENTIFICATION DISCUSSION

Questions for Discussion

- Q: Are there any other issues not identified in the previous slides that should be addressed in the framework?
- Q: Are there any issues that are not relevant?
- Q: Are there any opportunities related to the issues?
- Q: What are the priority issues?

AGENDA ITEM #6

PRIORITIZATION ACTIVITY

Instructions for Prioritizing Activity

Exercise 2: Prioritization of “In Scope” Materials

- Goal: Enable the working group to come to a consensus on priority materials for consideration in the Food and Organic Waste Framework

Instructions:

- In the prioritization column, rank all the “In Scope” materials only (giving #1 the most priority for consideration, #2 the second etc.)
- Using the coloured dots (3) provided, place your top ranked materials under the appropriate material headings on the Collaborative Wall. Note: multiple dots may be used per item if desired

AGENDA ITEM #7

NEXT STEPS

Proposed Next Meeting Agenda

Meeting #3: Food Waste Prevention and Food Waste Diversion

- Purpose:
 - To provide detailed jurisdictional best practices related to food waste and food diversion
 - To discuss the opportunities and challenges associated with food waste prevention and food diversion activities in residential and IC&I Sectors
 - To provide a 101 on resource recovery and waste reduction policy statements, under the Resource Recovery and Circular Economy Act, 2016
 - To identify and prioritize tools/actions/performance measures
- Presentation of informational / background materials to be provided by the MOECC and/or a Stakeholder Working Group member (TBC).

Questions for Discussion

- Q: Are there any suggestions for the agenda?
- Q: Would any members be interested in bringing forward an overview of how organic materials are managed in their sector?
- Q: Are there any other stakeholders that should be invited to the next meeting?