

### Introduction

Waste statistics are important sets of information used to determine public policy and environmental practices. The Environment Accounts and Statistics Division of Statistics Canada plays a significant role in developing environmental statistics for Canada. One of the Division's objectives is to develop a complete set of statistics on the physical and financial dimensions of the management of waste.

### What is waste?

There have been several definitions of waste proposed in recent years. One common thread among these definitions is the concept that waste is a material that is unwanted by its producer. The unwanted materials may be by-products of a production process – fly ash from a furnace, for example. Alternatively they might be products, the inherent value of which has been consumed from the perspective of the current holder – for example, a newspaper that has been read, a package that has been opened and emptied of its contents or an apple eaten to the core are all similar insofar as they have lost their original inherent value from the consumers perspective.

If these materials lose this inherent value to such a degree that permanent disposal is the most viable option or perhaps the only available option, then a waste services provider acts as an agent that relieves the generator of the waste of the burden of disposal.

However, the material may have value from the perspective of someone else – the newspaper can be used as an input at a pulp and paper plant or the apple can be used by a composting facility – thus a waste services provider may divert such a material from the waste stream. Value is reintroduced to the material through a process that treats the material in such a way as to enable it to be reintroduced back into the market place as a valuable good. For example, the newspaper may be collected and taken to a Material Recycling Facility (MRF) where it is sorted from other items, bundled and compacted – thus preparing it in such a fashion that it is marketable (valuable) to a buyer such as a pulp and paper mill.

### What is the waste management industry?

The Canadian waste management industry embodies two inter-related elements – governments and other public organisations that provide or make provision for waste management services and private firms that supply these

services. To supply the information needed to depict these two elements, two survey vehicles are utilised. One is the Waste Management Industry: Business Sector Survey and the other is the Waste Management Industry: Government Sector Survey. Both of these surveys gather financial and human resource (e.g., revenues, expenditures, employment) and physical information (e.g., quantities of different types of waste disposed of or recycled) about the waste management industry.

For the purposes of these surveys, the waste management industry broadly includes all firms and public bodies operating in Canada that provide the services of collection, transportation, diversion, treatment or disposal of waste or recyclable materials. The majority of the establishment's revenue will come from provision of these services. To further define these broad activities:

- » Waste, recyclable and organic materials collection methods are curbside collection, back door pick-ups, and automated collection. The waste, recyclable or organic materials may be taken to an intermediate site or to a final disposal site.
- » Waste diversion includes any physical transformation of materials in preparation for recycling or reuse. Such activities include sorting, cleaning, and volume reduction as well as composting and anaerobic digestion.
- » Waste disposal facilities include landfills and incinerators/energy from waste facilities

#### Please exclude:

- » Wastes that are associated with primary resource extraction or harvesting (e.g. farm manure, fish waste from fish processing, market garden waste, orchard and urban forest tree prunings, mine or mill tailings, forest industry waste)
- » Conventional air pollutants
- » Liquid effluents from processing or manufacturing sites
- » Any materials used as landfill cover

- » Clean or contaminated soil including soil used as landfill cover
- » Industrial sludge
- » Gravel and rocks
- » By-products generically referred to as nuclear wastes
- » Oil field waste
- » Waste from portable toilets

This is consistent with the definition of waste used by the Canadian Council of Ministers of the Environment.

### **Estimating sources of waste (garbage), recyclables and organic materials**

It is acknowledged that it is often very difficult to track the quantities of waste and recyclable materials by source unless the business or local government collects or prepares materials from only one source (e.g., a firm that collects waste

only from IC&I sources).

In this survey, you are being asked to estimate the proportion of materials by source of material at three points (if applicable and known) at the facility where organic material is processed, at the facility where recyclables are prepared and at disposal. If you engage in one or more of these activities, you will be asked to estimate the proportion of waste, recyclable or organic materials from residential, non-residential and construction and demolition sources. While it is recognized that such estimates may be difficult to make, you are asked to be as accurate as possible.

## **Definitions**

### **Agricultural waste**

All waste materials produced as a result of agricultural activities, including, for example, residues from the application of pesticides, herbicides, fertilizers and other chemicals, wastewater, manure, bedding material, etc.

### **Anaerobic digestion**

A series of processes in which microorganisms break down biodegradable material in the absence of oxygen.

### **Bioreactor landfill**

A landfill where water and air are circulated into a specifically designed landfill in order to cause accelerated biological decomposition of waste material.

### **Biosolids**

Includes solid or semisolid material obtained from treated wastewater.

### **Bottom ash**

The residue ash that remains after the incineration of a waste material.

### **Clean fill**

Uncontaminated inert solid material including soil, rock, stone, dredged material, used asphalt, and brick, block or concrete. The soil is considered 'clean' because it has not been contaminated or affected, for example by a spill or release of toxic materials.

### **Composting**

Composting is an aerobic biological treatment process used most frequently in Canada at this time for management of biodegradable waste such as leaf and yard waste or food wastes. See also anaerobic digestion.

### **Construction and demolition waste (C&D)**

C&D waste, also referred to as DLC (demolition, landclearing and construction waste), refers to waste generated by construction and demolition activities. It generally includes materials such as brick, painted wood, drywall, metal, cardboard, doors, windows, wiring, etc. It excludes materials from land clearing on areas not previously developed. C&D waste can come from residential sources such as house renovations or from non-residential sources for example the construction or demolition of office buildings.

## **Contaminated soil**

Soils containing materials that, by their nature, require controlled disposal.

## **Electronics**

Electronics are items that function through the use of electricity and/or batteries. Also included are items that have a circuit board but do not necessarily require electricity from an outlet such as telecommunication equipment. Examples are personal computers, laptops, monitors, peripherals (e.g. printers, scanners), telephones, cell phones, facsimile machines, stereos, portable music players and children's toys containing electronic components.

## **Energy from waste (EFW)**

EFW refers to any waste treatment that creates energy in the form of electricity or heat from a waste source. Most EFW processes produce electricity directly through combustion, or produce a combustible fuel commodity, such as methane, methanol, ethanol or synthetic fuels.

## **Ferrous metals**

These are metals which contain iron. They may have small amounts of other metals or other elements added, to give the required properties. All ferrous metals are magnetic and give little resistance to corrosion. Steel is an example of a ferrous metal. The recycling of ferrous metals include but is not limited to the processing of tin/steel cans, strapping, as well as the extraction of metals from appliances.

## **Food waste**

Includes food wastes and food scraps from households and non-residential sources such as grocery stores, restaurants, etc, destined for composting or anaerobic digestion.

## **Forestry waste**

The debris or leftover waste from the management of forests. This would include trees, stumps, branches, etc., that were discarded.

## **Gasification**

A process, in the context of waste, that uses heat, pressure and steam to convert materials directly into a combustible gas.

## **Hazardous waste**

Includes materials or substances that given their corrosive, inflammable, infectious, reactive and toxic characteristics,

may present a real or potential harm to human health or the environment. Due to their hazardous nature they require special handling, storing, transportation, treatment and disposal as specified by the Transportation of Dangerous Goods Regulations (1985), The Canadian Environmental Protection Act (1988), The Basel Convention (1989), or the Export and Import of Hazardous Waste Regulations (1992).

## **Hazardous waste disposal**

Disposal of hazardous waste at a facility that meets legal standards for the disposal of hazardous waste (e.g., by incineration, controlled confinement, landfilling and other methods).

## **Hazardous waste recycling**

The recycling of hazardous wastes involves the treatment or processing of these wastes in order to reduce or transform them into a new or reuseable product or material that can in turn be used as an input into another production process.

## **Hazardous waste transfer facility or station**

Consolidation, temporary storage, and preparation for transport of hazardous waste to an appropriate facility for treatment, disposal, or reuse. Includes drop-off center services, transfer and container stations.

## **Hazardous waste treatment**

Treatment to reduce, eliminate, or transform hazardous waste. Processes include biological, chemical, and/or physical procedures; such processes may lead to disposal and/or to the recovery of recyclable material. Treatment services exclude incineration.

## **Household hazardous/special waste (HHW)**

Materials generated by residential households that can not be collected in standard residential recycling programs and present a risk to municipal waste management systems because of their hazardous and/or toxic nature. This includes solid or liquid materials, or containers holding gases which have outlived their usefulness. This waste may be flammable, corrosive, explosive or toxic and therefore should not be disposed in landfills or sewage systems.

## **Incineration / thermal treatment**

Incineration, in the context of waste, refers to the burning of waste. Incineration of waste materials converts the waste into incinerator bottom ash, flue gases, particulates, and heat, which can in turn be used to generate electric power. Most jurisdictions in Canada consider incineration to be disposal.

## **Industrial, commercial and institutional waste (IC&I, non-residential)**

IC&I Waste (industrial, Commercial, and Institutional) is the waste generated by all non-residential sources in a municipality, and is excluded from the residential waste stream. This includes:

- » Industrial waste, which is generated by manufacturing, and primary and secondary industries, and is managed off-site from the manufacturing operation, and is generally picked up under contract by the private sector;
- » Commercial waste is generated by commercial operations such as shopping centres, offices, etc. Some commercial waste (from small street-front stores, etc.) may be picked up by the municipal collection system along with the residential waste;
- » Institutional waste is generated by institutional facilities such as schools, hospitals, government facilities, senior homes, universities, etc. This waste is generally picked up under contract with the private sector.

## **Landfill**

A site, on land, that is used primarily for the disposal of waste materials. The contents of landfills can include garbage which is not processed, and also residual material from processing operations (MRF residues, incinerators ash, organic processing residues, etc).

## **Leaf and yard waste**

Includes any waste collected from a yard or garden such as leaves, grass clippings, plants, tree trimmings and branches.

## **Material Recycling Facility (MRF)**

A facility where materials that are collected for recycling are prepared or processed. The preparation or processing can include sorting, baling, cleaning, crushing, volume reduction and storing until shipment.

## **Metric tonne**

A measure of weight equal to 1,000 kilograms or 2,204 pounds.

## **Non-hazardous waste (garbage)**

Included in this category are materials, products or by-products for which the waste generator has no further use and which are received for disposal at waste disposal facilities or for processing at a waste processing facility.

## **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.

## **Organic processing services**

The breakdown of organic materials through either composting or anaerobic digestion processes.

## **Organic material collection, non-residential**

Collection of organic material, (e.g., food scraps, leaves, grass, wood waste and paper products), from sources such as heavy and light industry, manufacturing, agriculture, warehousing, transportation, retail and wholesale commercial activities, restaurants, offices, educational or recreational facilities, health and other service facilities.

## **Organic material collection, residential**

Collection of organic material, (e.g., food scraps, leaves, grass, yard trimmings), from dwellings, including apartment buildings and condominiums. Examples of collection methods are curbside collection, back door pick-up, and automated collection.

## **Plastic – PET (1)**

Polyethylene Terephthalate, commonly abbreviated as PET or PETE, is a polymer resin of the polyester family. PET is identified by the number 1 recycling symbol. Commonly recyclable PET materials include 2 litre soda bottles, water bottles, cooking oil bottles, peanut butter jars.

## **Plastic – HDPE (2)**

High Density Polyethylene is a polyethylene thermoplastic made from petroleum. HDPE is identified by the number 2 recycling symbol. Some commonly recycled HDPE materials include detergent bottles, milk jugs, and grocery bags.

## **Plastic - All others (3-7)**

Polyvinyl Chloride – PVC (3), Low Density Polyethylene – LDPE (4), Polypropylene – PP (5), Polystyrene – PS (6), Other (7).

Common uses: (3) plastic pipes, outdoor furniture, shrink wrap, water bottles, (4) dry cleaning bags, produce bags, trash can liners, (5) aerosol caps, drinking straws, (6) packaging pellets, Styrofoam cups (7) food containers.

## **Post closure and maintenance fund (landfills)**

This includes money set aside for the eventual costs associated with the maintenance and rehabilitation of a landfill after it closes. Such a fund is often called a landfill reserve fund.

## **Processing residue**

Material that was originally diverted from disposal either to be recycled or composted, but was disposed due to the unsuitability of the material for recycling/composting (i.e. the type of material could not be processed or it was contaminated).

## **Quantity of materials entering the facility**

The quantity, by weight, of unprocessed materials (e.g., organics) entering a processing facility (e.g., a central composting facility).

## **Recyclable material**

Any material that has reached the end of its useful life in the form or purpose for which it was initially made and that can be recycled into a material that has value as a feedstock in another production process.

## **Recyclable material collection services, non-residential (non-hazardous)**

Collection of non-hazardous recyclable material, (e.g., cardboard, paper, plastics, metals, glass), from sources such as heavy and light industry, manufacturing, warehousing, transportation, retail and wholesale commercial activities, restaurants, offices, educational or recreational facilities, health and other service facilities. Recyclable material may be taken to an intermediate site such as a material recycling facility or transfer facility.

## **Recyclable material collection, residential (non-hazardous)**

Collection of non-hazardous recyclable material e.g., cardboard, paper, plastics, metals, glass, from dwellings, including apartment buildings and condominiums. Examples of collection methods are curbside collection, back door pick-up, and automated collection. Recyclable material may be taken to an intermediate site such as a material recovery facility or transfer facility. Recyclable material may be collected on a regular or flexible schedule.

## **Recycling**

Recycling is defined as the process whereby a recyclable material (e.g., glass, metal, plastic, paper) is diverted from

the waste stream in order to be remanufactured into a new product, or is used as a raw material substitute.

## **Recycling centre / drop off depot**

A facility or site where the public can bring materials for recycling or re-use. In some cases, household hazardous waste or special waste is accepted at these sites.

## **Recycling services (non-hazardous waste)**

Recovery of recyclable material (e.g., cardboard, paper, plastics, metals, glass), from the non-hazardous waste stream by baling, cleaning, sorting, reducing volume and preparing for shipment. Generally these activities take place in a material recycling facility (MRF).

## **Residential waste**

Residential waste refers to waste from primary and seasonal dwellings, which includes all single family, multi-family, high rise and low rise residences.

It includes:

- » The waste picked up by the municipality, (either using its own staff, or through contracted companies), and
- » The waste from residential sources which is self-hauled to depots, transfer stations and landfills.

## **Residual waste processing**

An operation in which the physical or chemical properties of non-recyclable or compostable wastes are changed to reduce size and/or volume. Examples of waste processing are shredding, compaction & transformation.

## **Scrap metal**

Any metal cutting or reject of a manufacturing operation, which may be suitable for recycling.

## **Sources of materials**

Refers to the sources of generation of the waste or recyclable material. These sources are classified as residential, industrial, commercial and institutional (IC&I) and construction, renovation and demolition. It is sometimes difficult to ascertain the source of a given material because of lack of tracking or complex collection arrangements (e.g., when collection is contracted out or when collection vehicles pick up materials from a mix of sources on their routes).

## Source separated organic materials (SSO)

Source separation of organics is the setting aside of organic waste materials at their point of generation (the home, office, or other place of business) by the generator. Examples of SSO materials are food scraps, soiled paper packaging such as ice cream boxes, muffin paper, flour and sugar bags, paper coffee cups and paper plates

## Stabilized landfill

A stabilized landfill is similar to a conventional landfill except waste is screened and then mechanically and biologically treated prior to being landfilled. Screening of waste (usually from source separated collection programs) removes recyclable materials as well as other materials that should not be landfilled. The remainder is composted and then landfilled. This kind of waste treatment prior to landfilling reduces the production of landfill gas and leachate.

## Tipping fees (disposal fees)

Also known as disposal fees, these are fees that are paid to the owner, lessor or operator of a landfill for the right to dispose of waste within that landfill. These fees can be assessed on a weight-based (e.g., per tonne), volume-based (per cubic metre) or per item basis (fees that differ according to the type of material being disposed, such as white goods or tires). Tipping fees may also be paid to the owner or operator of recycling facilities, organic material processing facilities, or waste processing facilities.

## Transfer station (non-hazardous)

A facility at which wastes transported by vehicles involved in collection are transferred to other vehicles that will transport the wastes to a disposal (landfill or incinerator) or recycling facility.

## Waste collection services, non-residential (non-hazardous)

Collection of non-hazardous waste, garbage, rubbish, refuse, trash and commingled material from sources such as heavy and light industry, manufacturing, agriculture, warehousing,

transportation, retail and wholesale commercial activities, restaurants, offices, educational or recreational facilities, health and other service facilities. Waste may be taken to an intermediate site or to a final disposal site.

## Waste collection services, residential (non-hazardous)

Collection of non-hazardous waste, garbage, rubbish, refuse, trash and commingled material from dwellings, including apartment buildings and condominiums. Examples of collection methods are curbside collection, back door pick-up, and automated collection. Waste may be taken to an intermediate site or to a final disposal site.

## Waste hauling or transportation

The transportation of waste from one site or geographic area to another. This excludes the collection of waste and is limited to activities such as waste exporting or the shipping of wastes from transfer station to disposal or processing facility.

## White goods

Includes metal items such as: stoves, fridges, freezers, air conditioners, dehumidifiers, washers, dryers, hot water tanks, metal sinks, microwaves, and various other metal items.

## Wood waste

The primary constituents of wood waste are used lumber, trim, shipping pallets, trees, branches, and other wood debris from construction and demolition clearing and grubbing activities. It includes; dimensional lumber, plywood, particle board & fibre board, pallets/skids, crating, wood fencing, pressure treated lumber, wood shingles, wooden doors, creosoted wood products, demolition wood waste, painted wood.

## Conversions

One cubic yard = 0.764 cubic metres

1 kilogram = 2.2 pounds

1 metric tonne = 1000kg = 2200 pounds