

Waste Management Industry Survey: Business and Government Sectors



2010



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Waste Management Industry Survey: Business and Government Sectors

2010

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- . not available for any reference period
- .. not available for a specific reference period
- ... not applicable
- 0 true zero or a value rounded to zero
- 0^s value rounded to 0 (zero) where there is a meaningful distinction between true zero and the value that was rounded
- p preliminary
- r revised
- x suppressed to meet the confidentiality requirements of the *Statistics Act*
- E use with caution
- F too unreliable to be published
- * significantly different from reference category ($p < 0.05$)

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Preface

This report presents the results of the 2010 Waste Management Industry Survey: Business Sector and the 2010 Waste Management Industry Survey: Government Sector. These surveys gathered information on the financial characteristics and waste management activities undertaken by companies, local governments and other public waste management bodies.

These services included the collection and transportation of wastes and of materials destined for recycling, the operation of non-hazardous waste disposal facilities, and the operation of transfer stations.

The results of these surveys provide a picture of physical characteristics of waste disposal and recycling as well as financial and employment features of businesses and local governments that provide waste management services.

The data have been analyzed and presented at a provincial level wherever it was possible to do so without compromising confidentiality.

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Highlights

- Nationally, the amount of non-hazardous waste sent to private and public waste disposal facilities decreased 4% from 2008 to approximately 25 million tonnes in 2010. Quebec and Alberta saw the greatest declines in waste disposal, each decreasing by 6% from 2008. Newfoundland and Labrador, Nova Scotia, and Saskatchewan had the highest increases over the same period, at 4% each.
- At 37%, residential waste accounted for slightly more than one-third of the total waste disposed in 2010. The disposal of residential waste decreased by 1% and the disposal of non-residential waste fell by 6% between 2008 and 2010.
- The amount of waste diverted to recycling or organic processing facilities decreased by 3% from 2008 to 8.1 million tonnes, or 236 kg per person in 2010. This decrease, which was the first since 2002, was fueled by an 11% decrease in non-residential waste diversion. In contrast, residential waste diversion increased by 5%. The largest increase in diversion was for electronic materials, at 60%.
- Operating revenues for governments from the provision of waste management services reached \$2.3 billion in 2010. Current expenditures increased 12% from 2008, totalling \$2.9 billion in 2010. Full-time employment in the government sector of the waste management industry rose by 5%.
- Revenues of Canadian businesses providing waste management services increased 2% from 2008 to nearly \$6 billion in 2010, while expenditures fell by 3% to just under \$5 billion. Full-time employment in the business sector increased by 2% during the same period.

Analysis

Total waste

Almost 25 million tonnes of non-hazardous waste were disposed in Canada in 2010, down 4% from 2008 but up 3% from 2002 (Chart 1). The total amount of residential waste disposed decreased by 1% between 2008 and 2010 to 9.3 million tonnes, while the disposal of non-residential waste declined by 6% to 15.6 million tonnes.

Chart 1

Disposal of waste in Canada from 2002 to 2010

million tonnes



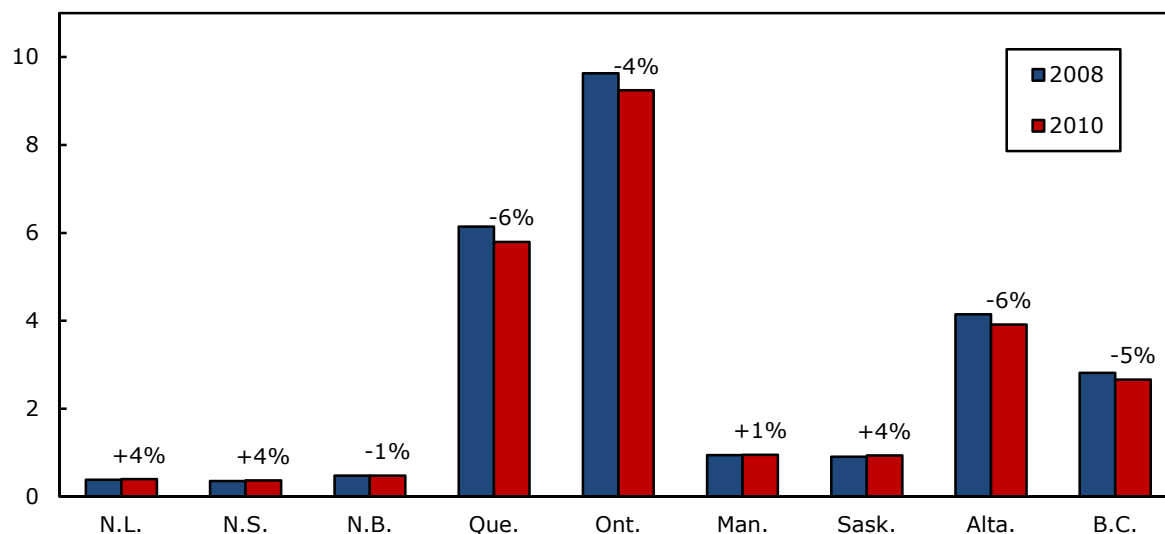
Note(s): Totals for 2002, 2004, 2006, and 2008 have been revised since their original publication.

Source(s): Statistics Canada, CANSIM table 153-0041 (accessed August 21, 2013).

Provincially, Ontario disposed the most waste at 9.2 million tonnes in 2010, followed by Quebec, Alberta, and British Columbia at 5.8, 3.9, and 2.7 million tonnes, respectively (Chart 2). The four provinces that disposed the most waste are also the four provinces with the highest population counts, according to the 2010 Statistics Canada population estimates.

Chart 2
Total waste disposed for selected provinces, 2008 and 2010

million tonnes

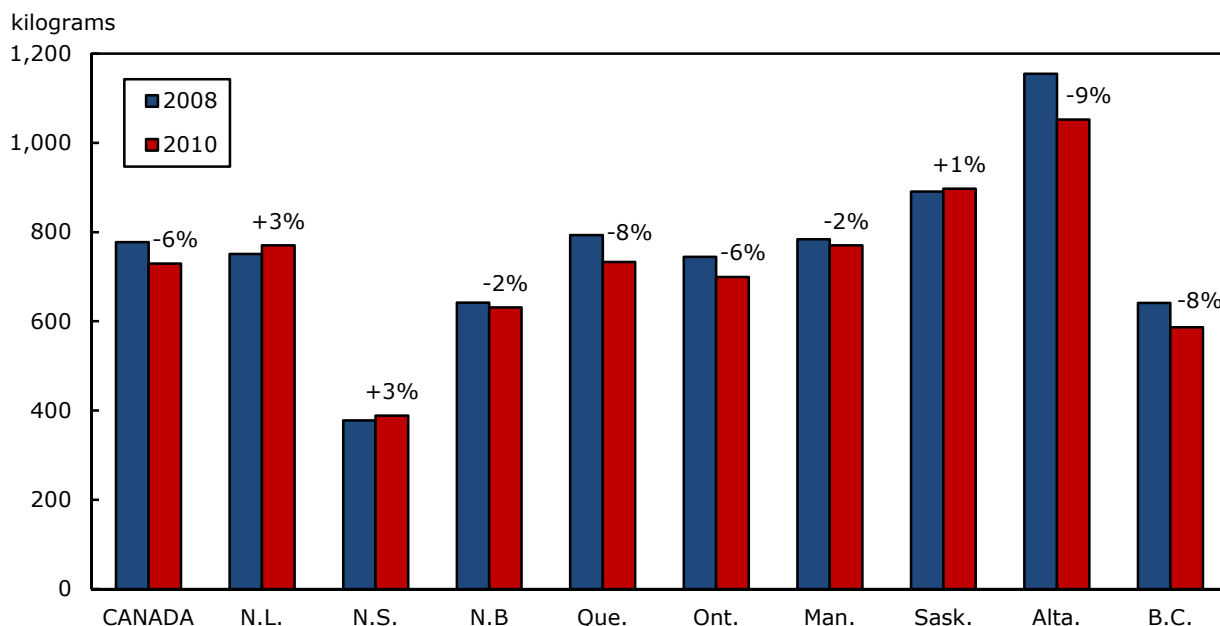


Note(s): Percentages indicate changes between 2008 and 2010. Data for Prince Edward Island, Yukon, Northwest Territories, and Nunuvut are not included in order to meet the confidentiality requirements of the Statistics Act.

Source(s): Statistics Canada, CANSIM table 153-0041 (accessed August 21, 2013).

Per capita waste disposal figures provide an additional perspective. On a per capita basis, a total of 729 kg of waste was disposed per person in 2010 (Chart 3). This per capita quantity, which includes both residential and non-residential waste, was down 6% from 2008. The province with the lowest per capita disposal rate in 2010 was Nova Scotia at 389 kg per person. British Columbia, New Brunswick, and Ontario also disposed less waste per capita than the national average. The province with the highest per capita disposal rate was Alberta at 1,052 kg per person. Per capita waste disposal decreased between 2008 and 2010 for all provinces except Newfoundland and Labrador, Nova Scotia, and Saskatchewan.

Chart 3
Per capita disposal of waste for Canada and selected provinces, 2008 and 2010



Note(s): Percentages indicate changes between 2008 and 2010. Data for Prince Edward Island, Yukon, Northwest Territories, and Nunavut are not included in order to meet the confidentiality requirements of the Statistics Act.

Source(s): Statistics Canada, CANSIM tables 051-0001 and 153-0041 (accessed August 21, 2013).

Residential waste

At 37%, slightly more than one third of waste for disposal came from residential sources in 2010. The total disposal of residential waste decreased by 1% between 2008 and 2010 to 9.3 million tonnes. Calculated on a per capita basis, the disposal of residential waste decreased by 3% to 271 kg per person.

Non-residential waste

Nationally, the total amount of non-residential waste fell by 6% to 15.6 million tonnes, while the per capita disposal of non-residential waste declined by 8% to 458 kg per person in 2010. Quebec, British Columbia, Alberta, and Ontario all contributed to the decrease. The amount of non-residential waste exceeded the amount of residential waste disposed in 2010 for all provinces examined. The difference is most notable in Alberta, where 75% of disposed waste came from non-residential sources.

Waste Diversion

The total amount of materials diverted for recycling or composting decreased by 3% from 2008 to approximately 8.1 million tonnes, or 236 kg per person in 2010. This decrease was driven by non-residential diversion, which declined by 11% to 3.6 million tonnes. In contrast, the diversion of residential material increased by 5% to 4.5 million tonnes over the same period of time.

Ontario, Quebec and British Columbia diverted the most waste by weight from all sources at 2.7, 2.3, and 1.5 million tonnes respectively. At 44%, slightly less than half of the diverted waste in the country came from non-residential sources, down from 48% in 2008.

Paper fibres¹ made up the largest portion of all diverted materials at 40% (3.2 million tonnes), followed by organic materials at 27% (2.2 million tonnes), and metals² at 12% (950,410 tonnes). The largest increase from 2008 was in the diversion of electronic materials, which was up 60% to 39,036 tonnes in 2010. There was also a 12% increase in the diversion of metal, a 5% increase in the diversion of plastics (313,036 tonnes), and a 1% increase in the diversion of glass (426,794 tonnes). There were decreases in the amounts of diverted construction, renovation, and demolition materials (down 9%), paper fibres (down 6%), organics (down 5%), and tires (down 4%) between 2008 and 2010.

Waste management industry financial and employment characteristics

Local government sector

Operating revenues

Operating revenues for local governments from the provision of waste management services totalled slightly more than \$2.3 billion in 2010³.

Current expenditures

At \$2.9 billion, or approximately \$86 per person, 2010 current expenditures for local governments across Canada increased by 12% from 2008. Collection and transportation costs represent the largest portion of the current expenditures at \$1.2 billion, followed by the operation of disposal/processing facilities (\$517 million), and tipping fees (\$425 million).

The largest increases between 2008 and 2010 were in contributions to landfill post closure and maintenance funds (\$93 million; up 60%) and the operation of recycling facilities (\$157 million; up 38%). The only category with decreases in current expenditures between 2008 and 2010 was the operation of transfer stations (\$146 million; down 13%).

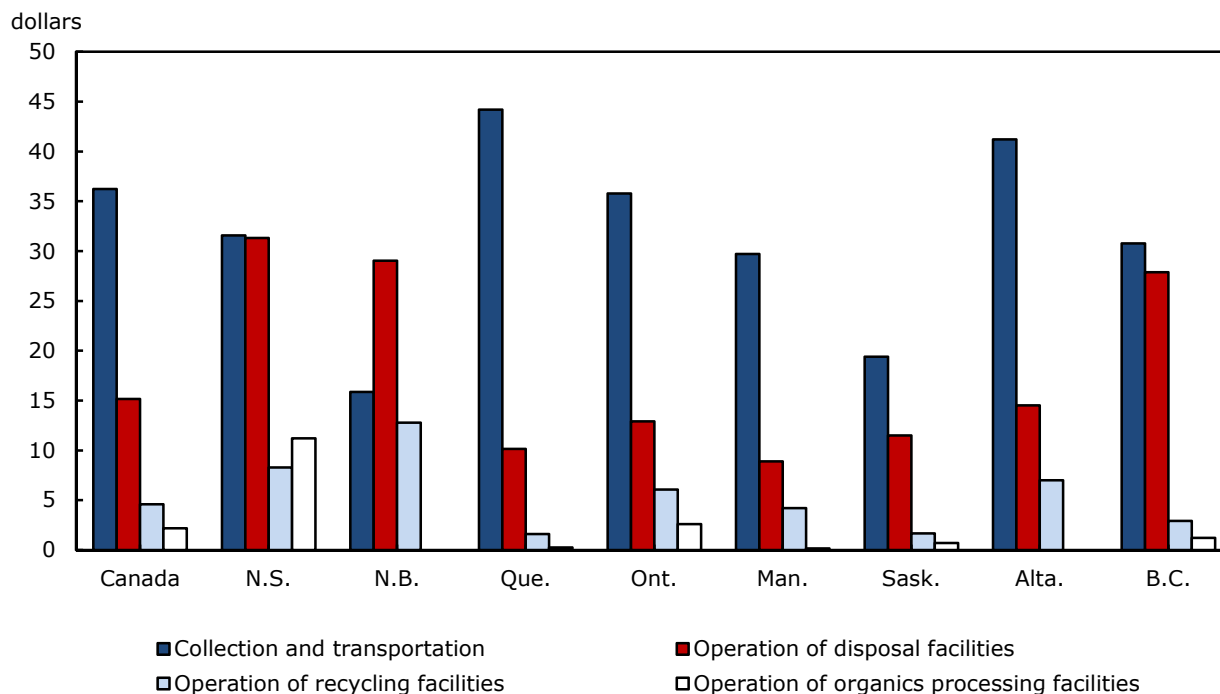
Per capita operating costs differ widely by province (Chart 4). Collection and transportation, which costs local governments approximately \$36 per person nationwide represents the largest waste-management per capita costs for most provinces. The only exception is New Brunswick, which spends more money per capita on the operation of its disposal facilities than it does on collection and transportation (\$29 per person versus \$16 per person). Nova Scotia spends almost equal amounts on collection and transportation as it does on the operation of disposal facilities.

1. Paper fibres include newsprint, cardboard, boxboard, and mixed paper fibres.

2. Metals includes ferrous metals, copper, aluminum, mixed metals, and white goods.

3. Includes revenues collected specifically for waste management purposes by local governments and other public waste management organizations that provided waste management services. This does not include general municipal tax revenues. Revenues from the collection of municipal levies are included in this total; however, prior to 2008 these revenues were not specifically requested from survey respondents. Comparison of 2008 local government operating revenues with previous years is not recommended. In 2010, further changes were made to the wording of the question. For this reason, caution should be used when comparing 2010 data with 2008 data.

Chart 4
Per capita current local government expenditures related to waste management for selected provinces, 2010



Note(s): Data for Newfoundland and Labrador, Prince Edward Island, Yukon, Northwest Territories, and Nunavut are not included in order to meet confidentiality requirements of the Statistics Act. For the same reason, the government expenditures related to the operation of organics processing facilities for New Brunswick and Alberta are not included.

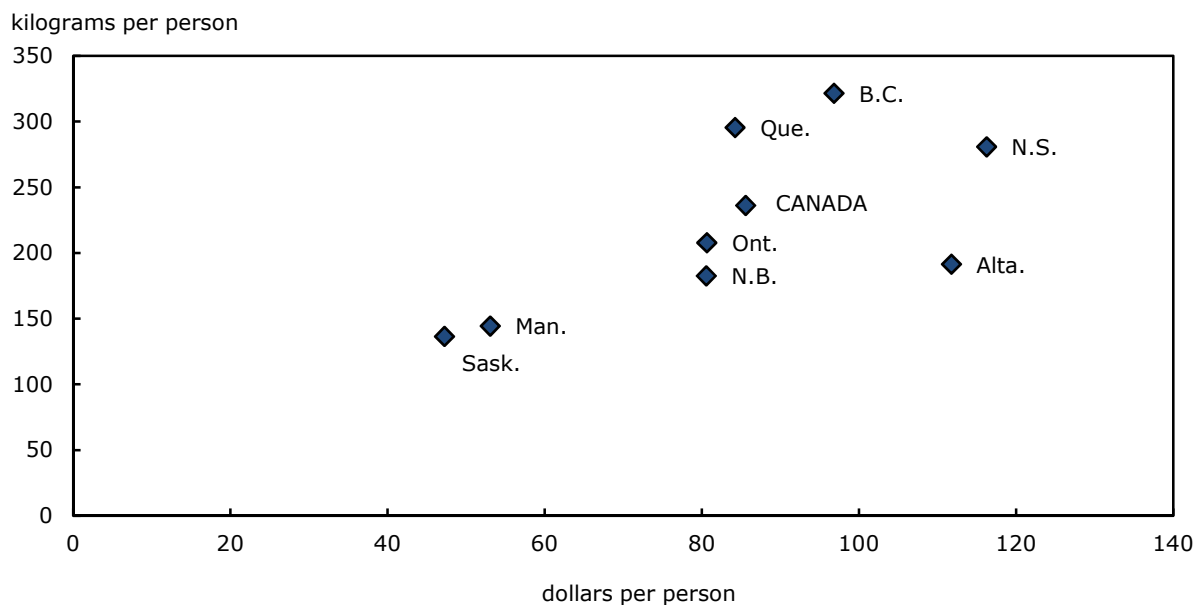
Source(s): Statistics Canada, CANSIM tables 051-0001 and 153-0045 (accessed August 21, 2013).

In 2010, local governments spent approximately \$15 per person on the operation of disposal facilities, \$5 per person on the operation of recycling facilities, and \$2 per person on the operation of organics processing facilities. The direction of public funds towards waste diversion varied amongst the provinces. For example, New Brunswick (\$13), Nova Scotia (\$8), Alberta (\$7), and Ontario (\$6) all spent more than the national average on the operation of recycling facilities per capita. Nova Scotia (\$11) and Ontario (\$3) spent more than the national average on the operation of organics processing facilities per capita.

Plotting the per capita amount of diverted waste against the per capita total current expenditures for each province reveals a relationship between money spent by governments and the proportion of waste that is ultimately diverted from disposal (Chart 5).

Chart 5

Waste diverted and local government current expenditures for selected provinces, 2010



Note(s): Data for Newfoundland and Labrador, Prince Edward Island, Yukon, Northwest Territories and Nunavut are not included in order to meet the confidentiality requirements of the Statistics Act.

Source(s): Statistics Canada, CANSIM tables 051-0001, 153-0043 and 153-0045 (accessed August 21, 2013).

Local governments in Nova Scotia, Alberta, and British Columbia had higher per capita operating expenditures than the national average of \$86 in 2010. British Columbia, Quebec, and Nova Scotia all diverted more waste from disposal than the national average of 236 kilograms per person. Saskatchewan and Manitoba had the two lowest per capita current expenditures as well as the two lowest diversion rates in 2010.

Total capital expenditures on the waste management industry by local governments totalled \$537 million in 2010, up by 9% from 2008. Alberta, British Columbia, Nova Scotia, and New Brunswick all surpassed the national average of \$16 per capita in capital expenditures.

Business sector

Operating revenues

Operating revenues for businesses in the waste management industry in Canada totalled almost \$6.0 billion in 2010, up 2% from 2008. The provinces with the largest operating revenues were Ontario at \$2.4 billion, Quebec at \$1.1 billion and Alberta at \$1.0 billion. The highest growth in revenues occurred in Newfoundland and Labrador (18%) and Saskatchewan (9%).

Operating expenditures

Gross operating expenditures for waste management firms in the business sector in Canada fell 3% between 2008 and 2010 to approximately \$5.0 billion nationally. New Brunswick (-6%), Ontario (-6%), Alberta (-5%), Yukon, Northwest Territories, and Nunavut (-5%), and Manitoba (-3%) all contributed to this decline. The remaining provinces experienced an increase in gross operating expenditures during the same time period.

Capital expenditures, which tend to vary significantly from year-to-year, fell 19% between 2008 and 2010 to \$335 million. The largest increase in capital spending was in Quebec (up 67% to \$77 million), while the largest decrease was in Alberta (down 53% to \$67 million).

Employment, local government and business sectors

The number of full-time workers in the waste management industry, including both the government and business sectors totalled just over 32,000 in 2010, an increase of 2% from 2008. Approximately 80% of the full-time workers are employed in the business sector. Full-time employment in the waste management industry rose by 5% in the government sector and 2% in the business sector. The number of part-time jobs in both sectors increased by 9% to nearly 3,000 employees, in total. The numbers of part-time employees in the government and business sectors are approximately equal.

Related products

Selected publications from Statistics Canada

16-002-X	EnviroStats
16-201-X	Human Activity and the Environment
16-253-X	Canadian Environmental Sustainability Indicators: Socio-economic Information
16-257-X	Environment Accounts and Statistics Product Catalogue
16F0006X	Environmental Protection Expenditures in the Business Sector

Selected CANSIM tables from Statistics Canada

153-0041	Disposal of waste, by source, Canada, provinces and territories, biennial
153-0042	Materials diverted, by source, Canada, provinces and territories, biennial
153-0043	Materials diverted, by type, Canada, provinces and territories, biennial
153-0044	Business sector characteristics of the waste management industry, Canada, provinces and territories, biennial
153-0045	Local government characteristics of the waste management industry, Canada, provinces and territories, biennial

Selected surveys from Statistics Canada

1736	Waste Management Industry Survey: Government Sector
2009	Waste Management Industry Survey: Business Sector

Selected summary tables from Statistics Canada

- *Disposal and diversion of waste, by province and territory*
- *Waste disposal by source, province and territory*

Statistical tables

Table 1-1
Disposal of waste — Province and territory

	Total waste disposal			Waste disposal per capita		
	2008	2010	Percentage change 2008 to 2010	2008	2010	Percentage change 2008 to 2010
	tonnes		percent	kilograms		percent
Canada	25,907,467^r	24,883,546	-4.0	778^r	729	-6.2
Newfoundland and Labrador	380,176 ^r	394,235	3.7	751 ^r	770	2.6
Prince Edward Island	x	x	x	x	x	x
Nova Scotia	354,231	367,246	3.7	378	389	2.8
New Brunswick	479,461	475,265	-0.9	642	631	-1.7
Quebec	6,146,319 ^r	5,795,707	-5.7	793 ^r	733	-7.5
Ontario	9,631,559	9,247,415	-4.0	745	699	-6.1
Manitoba	945,441 ^r	951,612	0.7	784 ^r	770	-1.8
Saskatchewan	902,943	937,268	3.8	891	897	0.8
Alberta	4,147,558 ^r	3,917,492	-5.5	1,155 ^r	1,052	-8.9
British Columbia	2,811,568	2,658,271	-5.5	641	587	-8.5
Yukon, Northwest Territories and Nunavut	x	x	x	x	x	x

Note(s): Figures may not add up to totals due to rounding. Total amount of non-hazardous waste disposal in public and private waste disposal facilities includes waste that is exported out of the source province or out of the country for disposal. This does not include waste disposal in hazardous waste disposal facilities or waste managed by the waste generator on site.

Source(s): Statistics Canada, Environment Accounts and Statistics Division, CANSIM tables 051-0001 and 153-0041.

Table 1-2
Disposal of waste — Source, province and territory

	Residential sources ¹		Non-residential sources ²		All sources	
	2008	2010	2008	2010	2008	2010
	tonnes					
Canada	9,350,354^r	9,256,540	16,557,113^r	15,627,006	25,907,467^r	24,883,546
Newfoundland and Labrador	200,918 ^r	x	179,257 ^r	x	380,176 ^r	394,235
Prince Edward Island	x	x	x	x	x	x
Nova Scotia	148,060	145,589	206,171	221,657	354,231	367,246
New Brunswick	233,703	219,486	245,758	255,779	479,461	475,265
Quebec	2,848,822 ^r	2,853,189	3,297,497 ^r	2,942,518	6,146,319 ^r	5,795,707
Ontario	3,231,399	3,204,264	6,400,160	6,043,151	9,631,559	9,247,415
Manitoba	400,297	388,683	545,144 ^r	562,929	945,441 ^r	951,612
Saskatchewan	289,760	283,726	613,182	653,541	902,943	937,268
Alberta	993,976 ^r	970,422	3,153,581 ^r	2,947,070	4,147,558 ^r	3,917,492
British Columbia	960,472	953,761	1,851,097	1,704,510	2,811,568	2,658,271
Yukon, Northwest Territories and Nunavut	x	x	x	x	x	x

1. Residential non-hazardous waste disposal includes solid waste produced by all residences and includes waste that is picked up by the municipality (either using its own staff or through contracting firms), and waste from residential sources that is self-hauled to depots, transfer stations and disposal facilities.

2. Non-residential non-hazardous solid waste are those wastes generated by all sources excluding the residential waste stream. These include: industrial materials, which are generated by manufacturing, and primary and secondary industries, and is managed off-site from the manufacturing operation; commercial materials, which are generated by commercial operations, such as, shopping centres, restaurants, offices, and others; and institutional materials which are generated by institutional facilities, such as, schools, hospitals, government facilities, seniors homes, universities, and others. These wastes also include construction, renovation and demolition non-hazardous waste, also referred to as DLC (demolition, land clearing and construction waste). These refer to wastes generated by construction, renovation and demolition activities. It generally includes materials, such as, wood, drywall, certain metals, cardboard, doors, windows, wiring, and others. It excludes materials from land clearing on areas not previously developed as well as materials that include asphalt, concrete, bricks and clean sand or gravel.

Note(s): Figures may not add up to totals due to rounding. Total amount of non-hazardous waste disposal in public and private waste disposal facilities includes waste that is exported out of the source province or out of the country for disposal. This does not include waste disposal in hazardous waste disposal facilities or waste managed by the waste generator on site.

Source(s): Statistics Canada, Environment Accounts and Statistics Division, CANSIM table 153-0041.

Table 2
Diversion of waste by province and territory

	Total materials diverted			Diverted materials per capita			Diversion rate	
	2008	2010	Percentage change 2008 to 2010	2008	2010	Percentage change 2008 to 2010	2008	2010
	tonnes		percent	kilograms		percent		
Canada	8,310,570^r	8,063,223	-3.0	249^r	236	-5.3	24.3^r	24.5
Newfoundland and Labrador	x	x	x	x	x	x	x	x
Prince Edward Island	x	x	x	x	x	x	x	x
Nova Scotia	289,950	265,467	-8.4	309	281	-9.2	45.0	42.0
New Brunswick	165,249 ^r	137,515	-16.8	221 ^r	183	-17.4	25.6 ^r	22.4
Quebec ¹	2,463,600	2,336,400	-5.2	318	296	-7.0	28.6	28.7
Ontario	2,781,830 ^r	2,749,047	-1.2	215 ^r	208	-3.4	22.4 ^r	22.9
Manitoba	165,667 ^r	178,481	7.7	137 ^r	144	5.1	14.9 ^r	15.8
Saskatchewan	122,932 ^r	142,659	16.0	121 ^r	137	12.6	12.0 ^r	13.2
Alberta	728,536	713,153	-2.1	203	192	-5.6	14.9	15.4
British Columbia	1,505,112	1,457,062	-3.2	343	322	-6.3	34.9	35.4
Yukon, Northwest Territories and Nunavut	x	x	x	x	x	x	x	x

1. Waste diversion data for the province of Quebec are derived from a survey administered by RECYC-QUÉBEC. Note that the amount of white goods reported by RECYC-QUÉBEC is disproportionately larger than that reported by other provincial and territorial jurisdictions. The definition of white goods and the collection methodology used by RECYC-QUÉBEC for this category of material differs from that of Statistics Canada's Waste Management Industry Survey, resulting in this discrepancy.

Note(s): Figures may not add up to totals due to rounding. This information covers only those companies and local waste management organizations that reported non-hazardous recyclable material preparation activities and refers only to that material entering the waste stream and does not cover any waste that may be managed on-site by a company or household. Additionally, these data do not include those materials transported by the generator directly to secondary processors, such as, pulp and paper mills while bypassing entirely any firm or local government involved in waste management activities.

Source(s): Statistics Canada, Environment Accounts and Statistics Division, CANSIM tables 051-0001, 153-0041 and 153-0043.

Table 3
Materials diverted by source, province and territory

	Residential sources ¹		Non-residential sources ²		All sources	
	2008	2010	2008	2010	2008	2010
	tonnes					
Canada	4,300,979^r	4,505,257	4,009,592^r	3,557,966	8,310,570^r	8,063,223
Newfoundland and Labrador	x	x	x	x	x	x
Prince Edward Island	x	x	x	x	x	x
Nova Scotia	149,961	136,967	139,989	128,500	289,950	265,467
New Brunswick	62,076 ^r	x	103,173 ^r	x	165,249 ^r	137,515
Quebec ³	1,046,000	1,112,694	1,417,600	1,223,706	2,463,600	2,336,400
Ontario	1,849,828 ^r	1,996,057	932,001 ^r	752,990	2,781,830 ^r	2,749,047
Manitoba	70,400 ^r	85,460	95,267 ^r	93,021	165,667 ^r	178,481
Saskatchewan	51,694 ^r	55,625	71,238 ^r	87,034	122,932 ^r	142,659
Alberta	391,709	332,722	336,827	380,431	728,536	713,153
British Columbia	614,204	676,102	890,908	780,960	1,505,112	1,457,062
Yukon, Northwest Territories and Nunavut	x	x	x	x	x	x

1. Residential non-hazardous recyclable materials include solid non-hazardous materials produced in all residences and include non-hazardous materials that are picked up by the municipality (either using its own staff or through contracting firms) and non-hazardous materials from residential sources that are self-hauled to depots, transfer stations and disposal facilities.

2. Non-residential sources include solid non-hazardous recyclable material from the Industrial, Commercial, and Institutional (IC and I) sector as well as the Construction, Renovation and Demolition sector (CRD). Materials are those generated by all IC and I and CRD sources in a municipality, and are excluded from the residential waste stream.

3. Waste diversion data are derived from a survey administered by RECYC-QUÉBEC.

Note(s): Figures may not add up to totals due to rounding. This information covers only those companies and local waste management organizations that reported non-hazardous recyclable material preparation activities and refers only to that material entering the waste stream and does not cover any waste that may be managed on-site by a company or household. Additionally, these data do not include those materials transported by the generator directly to secondary processors, such as, pulp and paper mills while bypassing entirely any firm or local government involved in waste management activities.

Source(s): Statistics Canada, Environment Accounts and Statistics Division, CANSIM tables 153-0042 and 153-0043.

Table 4-1
Materials diverted by type, province and territory — 2008

	Newfoundland and Labrador	Prince Edward Island	Nova Scotia	New Brunswick	Quebec ¹	Ontario	Manitoba	Saskat- chewan	Alberta	British Columbia	Yukon, Northwest Territories and Nunavut	Canada
	tonnes											
All materials	x	x	289,950	165,249^r	2,463,600	2,781,830^r	165,667^r	122,932^r	728,536	1,505,112	x	8,310,570^r
Newsprint	x	x	34,771	12,287	310,000	494,116	45,638	16,007 ^r	84,239	124,979	x	1,129,609 ^r
Cardboard and boxboard	x	x	27,271	15,111	456,000	419,690	38,249	19,723 ^r	115,789	260,478	x	1,381,298 ^r
Mixed paper	x	0	7,399	x	376,000	210,720	10,263	3,869 ^r	86,941	x	x	927,069 ^r
Glass	x	x	1,222	x	103,000	143,780	7,361	x	x	x	x	421,007
Ferrous metals	0	0	4,244	1,499	134,400	110,467	x	x	20,685	34,193	x	350,370
Copper and aluminum	x	x	581	x	19,200	17,363	4,146	x	6,814	x	x	58,950
Mixed metals	x	x	1,462	3,540	0	22,364	4,052	1,143	20,266	73,471	x	127,033
White goods	0	0	x	x	270,000	12,376	x	2,743	x	12,192	x	312,988
Electronics	0	0	x	x	7,000	4,419	99	x	5,429	x	0	24,367
Plastics	x	x	6,303	1,518	113,000	69,523 ^r	9,247	4,863	26,342	64,864	x	296,797 ^r
Tires	0	x	x	298	73,000	8,087	1,499	x	3,392	x	667	158,336
Construction, renovation and demolition	0	0	40,368	x	211,000	209,628	2,331	x	54,056	198,480	0	720,076
Organics	0	x	158,419	122,863 ^r	384,000	1,029,510	x	12,190	231,544	343,586	x	2,332,295 ^r
Other materials	x	x	2,400	954	7,000	29,786	703	1,009	10,111	9,101	x	70,375

1. Waste diversion data for the province of Quebec are derived from a survey administered by RECYC-QUÉBEC. Note that the amount of white goods reported by RECYC-QUÉBEC is disproportionately larger than that reported by other provincial and territorial jurisdictions. The definition of white goods and the collection methodology used by RECYC-QUÉBEC for this category of material differs from that of Statistics Canada's Waste Management Industry Survey, resulting in this discrepancy.

Note(s): Figures may not add up to totals due to rounding. This information covers only those companies and local waste management organizations that reported non-hazardous recyclable material preparation activities and refers only to that material entering the waste stream and does not cover any waste that may be managed on-site by a company or household. Additionally, these data do not include those materials transported by the generator directly to secondary processors, such as, pulp and paper mills while bypassing entirely any firm or local government involved in waste management activities.

Source(s): Statistics Canada, Environment Accounts and Statistics Division, CANSIM table 153-0043.

Table 4-2
Materials diverted by type, province and territory — 2010

	Newfoundland and Labrador	Prince Edward Island	Nova Scotia	New Brunswick	Quebec ¹	Ontario	Manitoba	Saskat- chewan	Alberta	British Columbia	Yukon, Northwest Territories and Nunavut	Canada
	tonnes											
All materials	x	x	265,467	137,515	2,336,400	2,749,047	178,481	142,659	713,153	1,457,062	x	8,063,223
All paper fibres	x	x	59,977	30,474	1,052,000	1,101,819	106,704	44,740	281,133	528,301	x	3,246,679
Glass	x	x	2,480	x	112,000	137,978	x	x	x	96,760	1,065	426,794
Ferrous metals	x	0	4,658	4,014	203,850	116,544	x	x	23,014	32,368	x	429,575
Copper and aluminum	x	x	x	x	30,550	17,791	3,218	x	x	6,981	x	72,108
Mixed metals	x	x	1,146	446	0	29,700	x	1,781	x	73,029	x	130,240
White goods	0	0	2,124	x	274,000	12,853	294	2,191	x	x	x	318,487
Electronics	0	x	x	234	7,000	10,181	166	x	7,707	x	x	39,036
Plastics	x	x	7,084	1,663	115,000	79,163	9,932	x	29,709	64,608	248	313,036
Tires	0	x	x	391	71,000	6,455	1,698	x	3,624	x	x	151,960
Construction, renovation and demolition	0	0	34,163	x	211,000	154,722	x	x	49,846	198,018	0	653,255
Organics	0	x	148,750	94,716	253,000	1,058,272	19,672	x	210,657	378,139	x	2,212,484
Other materials	x	x	3,016	3,329	7,000	23,569	863	770	13,746	x	x	69,569

1. Waste diversion data for the province of Quebec are derived from a survey administered by RECYC-QUÉBEC. Note that the amount of white goods reported by RECYC-QUÉBEC is disproportionately larger than that reported by other provincial and territorial jurisdictions. The definition of white goods and the collection methodology used by RECYC-QUÉBEC for this category of material differs from that of Statistics Canada's Waste Management Industry Survey, resulting in this discrepancy.

Note(s): Figures may not add up to totals due to rounding. This information covers only those companies and local waste management organizations that reported non-hazardous recyclable material preparation activities and refers only to that material entering the waste stream and does not cover any waste that may be managed on-site by a company or household. Additionally, these data do not include those materials transported by the generator directly to secondary processors, such as, pulp and paper mills while bypassing entirely any firm or local government involved in waste management activities.

Source(s): Statistics Canada, Environment Accounts and Statistics Division, CANSIM table 153-0043.

Table 5-1
Waste management industry by province and territory — Business sector characteristics

	Newfoundland and Labrador	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskat- chewan	Alberta	British Columbia	Yukon, Northwest Territories and Nunavut	Canada
	number											
Number of businesses												
2008	21	9	63	52	425	481	38	44	249	254	13	1,649
2010	26	8	60	56	426	483	45	43	255	282	13	1,697
Total employees ¹												
2008	194	111	863	598	5,949	10,589	531	1,119	3,054	3,443	99	26,550
2010	218	125	950	605	5,945	10,969	574	1,329	2,830	3,611	105	27,261
Full-time employees												
2008	166	111	x	548	5,735	10,342	511	x	2,888	3,342	91	25,327
2010	192	125	x	558	5,671	10,630	558	x	2,671	3,421	94	25,779
Part-time employees												
2008	28	0	x	50	214	247	20	x	166	101	8	1,223
2010	26	0	x	47	274	339	16	x	159	190	11	1,482
	thousand dollars											
Operating revenues ²												
2008	31,771	19,384	129,278	116,072	1,071,505	2,456,664	157,140	121,504	960,537	769,012	14,879	5,847,745
2010	37,509	19,519	136,407	112,450	1,138,489	2,398,797	155,141	132,401	1,009,426	806,437	13,184	5,959,762
Operating expenditures ²												
2008	28,647	15,543	116,422	107,972	933,828	2,218,034	126,917	106,068	786,955	665,607	12,728	5,118,722
2010	33,218	16,778	123,090	101,368	952,004	2,074,548	123,648	114,010	745,144	690,797	12,115	4,986,720
Capital expenditures ²												
2008	x	x	6,956	5,474	46,028	149,840	13,963	19,487	142,289	24,225	x	411,651
2010	x	x	10,077	x	76,747	128,424	8,997	11,358	66,589	22,336	x	335,302

1. Includes full and part-time employees. All employment estimates obtained from administrative data were counted as full-time employees.

2. Includes only those revenues and expenditures related to waste management activities.

Note(s): Figures may not add up to totals due to rounding. This table includes administrative data for businesses that were below the survey threshold for inclusion. As businesses may operate in more than one province or territory, the national totals will not equal the sum of the provincial totals.

Source(s): Statistics Canada, Environment Accounts and Statistics Division, CANSIM table 153-0044.

Table 5-2
Waste management industry by province and territory — Government sector characteristics

	Newfoundland and Labrador	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskat- chewan	Alberta	British Columbia	Yukon, Northwest Territories and Nunavut	Canada
	number											
Total employees ¹												
2008	127	x	308	219	766	3,184	211	270	1,409	910	x	7,502
2010	143	x	319	235	679	3,277	224	286	1,637	924	x	7,816
Full-time employees												
2008	88	x	275	176	464	2,761	166	188	1,128	693	x	6,017
2010	102	x	289	192	439	2,806	151	199	1,388	696	x	6,337
Part-time employees												
2008	39	x	33	43	302	423	45	82	281	217	x	1,485
2010	41	x	30	43	240	471	73	87	249	228	x	1,479
	thousand dollars											
Operating revenues ²												
2008	6,717	x	62,041	57,236	345,563	557,189	49,172	23,600	282,854	374,797	x	1,786,806
2010	x	x	64,775	51,964	415,280	839,455	61,786	38,785	371,401	435,700	x	2,321,007
All current expenditures ³												
2008	15,215	x	103,392	52,751	614,748	1,043,263	55,102	40,056	289,758	376,941	x	2,615,641
2010	x	x	109,857	60,650	665,699	1,066,105	65,558	49,333	416,147	438,479	8,028	2,919,928
Capital expenditures												
2008	x	x	20,851	13,205	112,594	187,847	3,985	7,768	89,637	27,635	x	493,866
2010	x	x	19,288	13,773	87,096	142,491	5,769	x	110,378	127,209	1,289	537,114

1. Includes full-time and part-time employees working in the waste management activities of surveyed municipalities.

2. Includes revenues collected specifically for waste management purposes by local governments and other public waste management organizations that provided waste management services. This does not include general municipal tax revenues. Revenues from the collection of municipal levies are included in this total; however, prior to 2008 these revenues were not specifically requested from survey respondents. Comparison of 2008 local government operating revenues with previous years is not recommended. In 2010, further changes were made to the wording of the question. For this reason, caution should be used when comparing 2010 data with 2008 data.

3. Includes current expenditures directed towards waste management services.

Note(s): Figures may not add up to totals due to rounding. This table includes local governments, waste management boards and commissions and provincial bodies responsible for the delivery of waste management services. No estimates have been made for non-surveyed municipalities.

Source(s): Statistics Canada, Environment Accounts and Statistics Division, CANSIM table 153-0045.

Table 6
Current expenditures by local governments on waste management by activity, province and territory

	Newfoundland and Labrador	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskat- chewan	Alberta	British Columbia	Yukon, Northwest Territories and Nunavut	Canada
	thousand dollars											
Collection and transportation												
2008	7,117	x	26,579	11,174	328,337	440,477	29,712	16,022	127,899	107,174	x	1,105,294
2010	x	x	29,843	11,942	349,361	473,229	36,703	20,256	153,497	139,427	3,052	1,236,696
Tipping fees												
2008	1,444	x	10,933	6,944	134,598	139,614	5,115	x	16,464	47,694	x	368,260
2010	x	x	11,315	10,372	160,110	97,311	7,540	3,613	81,535	46,317	x	424,773
Operation of disposal facilities												
2008	6,621	x	26,757	18,159	71,511	132,397	11,053	11,274	67,937	115,902	x	465,221
2010	8,294	x	29,593	21,869	80,292	170,979	11,015	12,019	54,046	126,234	x	516,991
Operation of transfer stations												
2008	0	x	6,581	x	6,458	88,250	x	678	13,986	49,142	x	168,638
2010	0	x	6,946	x	5,897	64,906	1,198	238	x	52,027	x	145,960
Operation of recycling facilities												
2008	0	0	7,635	2,541	13,169	61,229	4,716	2,155	16,964	4,664	570	113,643
2010	x	0	7,834	9,631	12,662	80,370	5,211	1,749	26,087	13,211	x	157,248
Operation of organics processing facilities												
2008	0	0	8,511	x	1,120	37,355	208	511	x	5,701	x	71,045
2010	0	0	10,602	x	2,050	34,475	208	754	x	5,568	x	74,525
Contributions to landfills post closure and maintenance fund ¹												
2008	0	0	4,283	1,218	4,084	21,091	1,244	x	9,225	10,179	x	58,401
2010	x	0	3,999	991	3,947	20,477	466	x	37,131	16,388	x	93,171
Other current expenditures												
2008	33	x	12,112	7,784	55,470	122,850	x	1,851	x	36,485	x	265,139
2010	109	x	9,726	2,367	51,382	124,357	3,218	x	33,128	39,306	x	270,564

1. Contributions to landfills post closure and maintenance fund were reported as other expenditures prior to 2008.

Note(s): Figures may not add up to totals due to rounding. Includes current expenditures directed towards waste management services.

Source(s): Statistics Canada, Environment Accounts and Statistics Division, CANSIM table 153-0045.

Introduction

The following information should be used to ensure a clear understanding of the underlying methodology of the survey and of key aspects of the data quality. This information will provide a better understanding of the strengths and limitations of the data and of how they can be effectively used and analysed. The information may be of particular importance when making comparisons with data from other surveys or sources of information and in drawing conclusions regarding change over time.

Why is there a need for information on the waste management industry?

A general increase in environmental awareness has raised concerns over the impacts that our activities have on the environment. The waste produced by society can impact the environment in various ways. For example, the generation and disposal of waste may contribute to soil and water contamination, while methane gas that is not captured at landfills adds to the accumulation of greenhouse gases in the atmosphere.

In turn, statistics on volumes of waste can help measure the effectiveness of environmental practices and policies. Canadians have access to an ever increasing array of environmental information on a variety of issues, including waste. As environmental awareness increases, Canadians need reliable environmental statistics in order to make informed decisions regarding their own patterns of consumption. As well, waste statistics can be used by researchers and policy makers to analyze industry trends and implement appropriate policy mechanisms.

The waste management industry

The services provided by the waste management industry include the collection and transportation of waste and materials destined for recycling (including composting), the operation of non-hazardous and hazardous waste disposal facilities, the operation of transfer stations, the operation of recycling and composting facilities and the treatment of hazardous waste.

The Canadian waste management industry embodies two inter-related elements. Waste management services can be provided directly by a public body, such as a local government (for example, city, town, regional district) or a waste management board or commission whose purpose is to coordinate the provision of such services. For example, a number of local governments may agree to jointly administer a landfill or a recycling facility.

Private firms are the second source of waste management services. Local governments may enter into contracts with these firms to provide certain waste management services or the businesses may directly enter into such arrangements with clients other than local governments. For example, a region may contract out curb-side waste and/or recycling services to a company and this same company may enter into separate agreements with apartment complexes or industrial operations.

Local government and other waste management service providers

For the purposes of this report, local government in Canada includes all government and quasi-governmental entities below the provincial or territorial level. Within this broad category, administrative functions are divided among municipalities, special purpose boards and local school districts. A further distinction is made between upper and lower tier municipalities. In this report, for the purpose of simplicity, the term local government is used to denote any of the following public organizations:

Upper-tier municipalities are those encompassing one or more local government entities, such as metropolitan corporations, regional districts, regional municipalities and counties.

Lower-tier municipalities are typically those whose borders can lie within or outside the jurisdiction of another level of municipality. These lower tier municipalities can include cities, towns, villages, townships, rural municipalities, districts and counties, and some quasi-municipalities, including local government districts and local improvement districts.

Other public waste service providers can come in a variety of forms, but as a rule consist of a group of local municipalities (usually at the lower tier level) who collectively provide a waste management service. A group such as this will typically oversee the contracting out of a specific service or set of services (for example, the operation of a materials recycling facility) but sometimes will also provide a service themselves (for example, the operation of a landfill).

Defining waste and its components

Waste management activities take many different forms and involve many different participants. This presents challenges when trying to prepare an integrated picture of activities, including the total materials managed.

One common thread is that all the materials handled are unwanted by their producer. The unwanted materials may be by-products of a production process— for example, fly ash from a furnace. 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 or a package that has been opened and emptied of its contents.

Concepts and definitions in the waste management area have been evolving over the past several years. The most common source of difficulty is in classifying types of waste. Strategies to compile waste statistics reflect the specific needs of statistical and analytical projects: by type (municipal solid non-hazardous waste, hazardous waste); by generator or by generating activity (residential, industrial, commercial, institutional and construction and demolition projects) as well as by type of material. The differences in the terminology that the various respondents use can create many operational difficulties when surveys are in the field. See [Data quality, concepts and methodology — Definitions] section used for this report). Progress is being made on both the national and international fronts toward the development and implementation of consistent classifications and measurement methodologies of waste management industry activities as well as the materials that this industry handles.

Overall approach: data sources and methodology

General methodology

This report presents the physical quantities, types and sources of waste and recyclable materials as well as financial and employment characteristics of the waste management industry. These estimates are based on the integration of two waste surveys conducted by Statistics Canada on a biennial basis: the *Waste Management Industry Survey: Business Sector* and the *Waste Management Industry Survey: Government Sector*. Essentially the same questions were asked for the waste and recyclable quantities and types sections of both surveys, however the financial sections differed somewhat.

To arrive at physical totals for the disposal and recycling sections, data from the two surveys were combined and duplicate entries were removed. These duplicates occur because operating arrangements of disposal and recycling activities can vary. Sites may be owned and operated by the same entity, but some sites may be owned by a government body and operated by a private firm. Since in some cases an owner of a facility may not have necessarily been the operator and the survey may have been completed by both the owner and the operator, care was taken to ensure that the information from each facility was only counted once. In these cases the information reported by the owner of the facility was typically used. However, in cases where there was a large difference in the information reported by the two respondents, further research was done to determine the reason for the discrepancy, and the appropriate response was used.

Not all of the population may have access to, or use, formal disposal or recycling facilities. In rural areas especially, arrangements can be made with a landowner to use property for the purpose of small-scale disposal sites ("dumps"). For this reason and others, a survey coverage population was developed using information provided by survey respondents as well as from other sources about the municipalities that were served by disposal and recycling facilities. Total populations were calculated for these municipalities using Statistics Canada data.¹ The difference between the total population and the covered population was calculated. A provincial per capita disposal figure was applied to this under covered population, and this total was added to the survey total to arrive at an adjusted disposal figure. The under-covered portion of the population is small and has been decreasing with each iteration of the survey.

It is assumed that all Canadians produce waste and that this waste must be disposed of in some manner, thus requiring an adjusted disposal figure. However, the same adjustment was not made to the recycling figures. Unlike waste, which can be disposed of in a hole at the back of someone's property, material to be recycled must be prepared and processed. While the smallest recycling depots may not be surveyed because they fall below the municipal population or business size thresholds for selection, the major material recovery facilities where this material is processed are covered by the survey. Therefore, most recycled material that falls within the conceptual parameters of this survey is captured and accounted for in the final estimate.

1. Statistics Canada, CANSIM, table 051-0001, "Estimates of population, by age group and sex for July 1, Canada, provinces and territories, annual".

Coverage

The classification of waste management services

The North American Industry Classification System (NAICS) is an industry classification system developed by the statistical agencies of Canada, Mexico and the United States. Created against the background of the North American Free Trade Agreement, it is designed to provide common definitions of the industrial structure of the three countries and a common statistical framework to facilitate the analysis of the three economies. NAICS is based on supply side or production oriented principles, to ensure that industrial data, classified to NAICS, is suitable for the analysis of production-related issues such as industrial performance.

Businesses falling into the following NAICS classifications are considered to be “in scope” for the *Waste Management Industry Survey: Business Sector*.

56211 Waste collection: This industry comprises establishments primarily engaged in collecting and hauling non-hazardous or hazardous waste within a local area. Establishments engaged in hazardous waste collection may be responsible for treating and packaging the waste for transport. Waste transfer stations are also included.

56221 Waste treatment and disposal: This industry comprises establishments primarily engaged in operating landfill sites, incinerators, or other treatment or disposal facilities for non-hazardous or hazardous waste. Establishments that integrate the collection, treatment and disposal of waste are also included.

56292 Material recovery facilities: This industry comprises establishments primarily engaged in operating facilities in which recyclable materials are removed from waste, or mixed recyclable materials are sorted into distinct categories and prepared for shipment.

56299 All other waste management services: This industry comprises establishments, not classified to any other industry, primarily engaged in waste management activities.

Note that missing from this list of classifications is NAICS 56291, Remediation Services. While in the same NAICS grouping as the waste management industry, this industry is not included as it does not provide waste management services as defined by the Canadian Council of Ministers of the Environment.

Source(s): Statistics Canada, North American Industry Classification System (NAICS) 2007, <http://www.statcan.gc.ca/subjects-sujets/standard-norme/naics-scian/2007/index-indexe-eng.htm>.

Reference period

The Waste Management Industry Surveys are biennial surveys. The information contained in this report reflects the total revenues, total operating and capital expenditures, total employment and waste quantities covering the financial year ending between April 1, 2010 and March 31, 2011.

Business sector

The 2010 *Waste Management Industry Survey: Business Sector* asked firms to report information on their waste management activities for each of their provincial and territorial operations. Businesses were selected based on the size of their workforce as well as the level of their total revenues. The threshold (based on revenue and employment levels) that was used to include or exclude a particular business from the survey mailout depended on the province or territory in which they operated. For example, surveyed businesses from Newfoundland and Labrador had a lower revenue and employment cut-off than those from Ontario.

The survey frame for the 2010 business survey was based on the 2008 survey supplemented and updated with information from the Statistics Canada Business Register (BR) and industry directories. Firms selected from the BR are a subset of the Waste Management and Remediation Services NAICS 562 (See text box “**The classification of waste management services**”). The combined list was cross-checked with other industry directories to avoid double-surveying of units.

For those firms not included in the survey because of their small size, administrative data on total operating expenditures, total operating revenues and total employment obtained from Tax Data Division and Statistics Canada's Business Register were used to estimate their contribution to the industry.

Government sector

Local governments and other public waste management bodies were selected for the *Waste Management Industry Survey: Government Sector* on the basis of a municipal population threshold that varied by province and whether or not a disposal, recycling and/or composting facility operated within their jurisdiction.

The mailing list for the 2010 survey was based on past survey information and supplemented by information obtained from provincial sources.

Municipalities as well as regional waste management service boards in the province of Quebec were added to the survey frame starting with the 2008 survey. Estimates for financial and employment data for the local government sector as well as disposal data were taken from these surveys. Prior to 2008, municipalities in this province had been excluded from the survey as the information was obtained from provincial sources.

Variables measured

For the reference year 2010, respondents were asked to report the following information:

- specific types of waste management activities conducted by the respondent;
- total quantities of non-hazardous waste managed in disposal facilities, recycled, composted, exported, and imported;
- sources of waste and recyclable and compostable material;
- total revenues realized from the sale of waste management services;
- total operating and capital expenditures; and
- total employment.

Data collection and processing

Data collection for both surveys took place during the fall, winter and spring of 2011 and 2012. Survey questionnaires were mailed to a total of 1,353 businesses and local governments. The responses were returned by mail. The questionnaires were addressed to a contact person who was either responsible for, or had knowledge of, the waste management operations of the survey unit.

For businesses that had operations in more than one province, a separate questionnaire was completed for each province in which the waste management business operated. For example, a business with operations in three provinces completed three questionnaires, each one describing the activities within a province. This was not a concern for the government sector.

Follow-ups by fax and/or telephone were carried out after the return due date to remind respondents to return their questionnaires.

Questionnaires were edited in two steps. First, validity edits were applied to ensure that responses to particular questions fell within a limited range of possible values. This type of editing was applied mostly to the questions on quantities but was also used to identify unusual values in the financial sections. A second step, consistency edits, was then undertaken. These identified occasions where the responses in one section of the questionnaire were logically inconsistent with those given in other sections.

Additional follow-up was carried out to collect missing data and to correct inconsistencies. The survey collection period was closed by mid May 2012.

Government sector waste management

Many local governments use the services of private sector waste management firms. It was essential that both the questionnaire structure and particular wording enabled respondents to distinguish between services they provided with their own employees and those which they contracted out. In the processing phase it frequently became necessary to contact respondents to clarify the nature of these relationships.

In addition, groups of municipalities work together to provide waste management services for their residents. In many areas, different tiers of local governments exist and governments in each tier may be involved in aspects of waste service delivery. Many alternative forms of service delivery were identified. For example:

1. A regional government might serve an area within which there are a number of local municipalities.
2. The upper tier government might provide all of the waste services.
3. Only the lower tier municipalities might provide services.
4. Both tiers might provide different services (for example, one operates a disposal facility; the other provides waste collection services).
5. Both tiers could be providing the same services to different parts of the region (a lower tier might run a disposal facility for just their municipality with the regional government running a disposal facility for the remainder of the region).
6. Municipalities in one or both tiers could act co-operatively through a separate government agency such as a regional waste commission that both collects waste and runs the disposal facility.
7. None of the governments in an area could be doing any waste management, leaving provision of waste services strictly to private sector firms.
8. A combination of the above scenarios.

Examples of each of these situations exist in Canada and both the survey vehicle and processing system had to be able to deal with these possibilities.

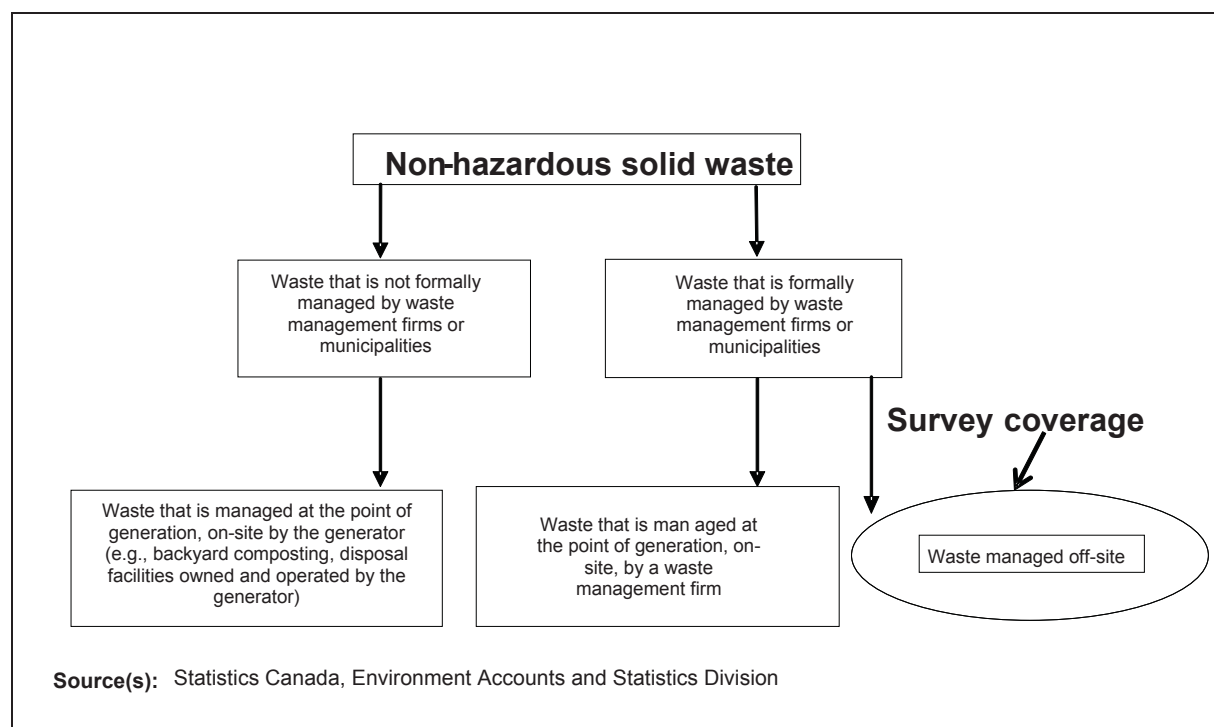
Extensive respondent follow-up was required in some cases. Returns for specific geographic areas were frequently processed together in order to build a clear picture of the service delivery area and to prevent either double counting or inadvertently missing pieces of information.

Evaluation of frame coverage

The estimates presented in this report refer only to waste and recyclable materials that have entered the managed waste stream; in other words, waste or recyclables that have been collected, processed or disposed of by a private waste management firm or local government organization. Therefore, waste or recyclables that are directly managed by the generator are not covered.

Figure 1

Waste management industry survey coverage



For example, waste created by a pulp and paper mill may be managed by the company on site or in another company-run facility without the assistance of separate service providers. As a result, these quantities would not be counted by either survey. Also, waste generators may manage some waste materials themselves. Many households and businesses have on-site composters that handle at least a portion of home and garden organic waste. While the amounts of compostable materials handled through central composting programs are included in the report, the on-site component is not. In addition, any unconventional methods of waste disposal, such as illegal dumping are not included in the survey coverage. (The above points are illustrated in Figure 1).

In-scope establishments

A total of 1,054 fully completed and partially completed in-scope questionnaires were returned for the 2010 survey cycle; 405 for the business sector and 649 for the government sector. For those questionnaires that were not returned, 231 were considered to be in-scope resulting in a combined total of 1285 in-scope respondents for the two surveys.

Closures, mergers and acquisitions, out-of-scope establishments

Since the 2008 survey, some structural changes have occurred in the waste management industry. In the business sector, of the establishments surveyed, 16 went out of business and 1 merger took place. Another 14 businesses that had provided waste management services in 2008 did not provide these services in 2010 and were determined to be out-of-scope for the purpose of this survey. There were not reported changes for government sector in the same period.

Revisions

Revisions are made for the previous survey reference period, with the initial release of the current data, as required. The purpose is to address any significant issues with the data that were found between survey cycles. The actual period of revision depends on the nature of the issue, but rarely exceeds three years. For the most current data please refer to CANSIM tables 153-0041 to 153-0045.

Data accuracy

Many factors affect the accuracy of data produced in a survey. For example, respondents may have made errors in interpreting questions, answers may have been incorrectly entered on the questionnaires, and errors may have been introduced during the data capture or tabulation process. Every effort was made to reduce the occurrence of such errors in the survey. These efforts included: a complete verification of keyed data, validity and consistency edits, extensive follow-up with the large businesses, and consultation with selected government departments and industry associations.

Response burden

In order to track and thus make improvements to lessen the burden that these surveys impose on respondents, they were asked to indicate the amount of time spent completing the questionnaire. The mean average number of hours reported by the respondents was 3.7.

In general, errors such as incomplete coverage of the universe, incorrect classification of business or government activity and inconsistencies in working definitions can be reduced if the survey is repeated at regular intervals and with sufficient frequency. In this way, the mailing list may be well maintained and the respondents will be familiar with the definitions used and the type of information required.

Incomplete coverage of the industry universe occurs when a firm in the industry is overlooked. If the reason for not including the firm is that it has been incorrectly included in another industry, this is termed a classification error. Such errors have an impact upon estimates. However, these errors are less frequent now than in the past with the adoption of the NAICS classification system (See Data quality, concepts and methodology — Definitions and text box, **The classification of waste management services**”).

Assessing data accuracy

One way to assess data accuracy is to compare it with data from other sources. For example, if the survey data indicates that the amount of waste disposed and diverted has risen substantially since the previous survey, one might also expect operating revenues and expenses to have risen. Similarly, if a provincial report is released indicating that the amount of diverted materials has increased significantly in that province, one might expect the data obtained from these surveys to follow the same trend. If the data did not follow the expected trends it would be investigated rigorously. One such comparison has been made with the business survey's financial data from 2010 against administrative data available on Statistics Canada's Business Register. In addition, recycling estimates were compared and validated with those published by the provincial governments of Nova Scotia and Ontario.

Response rates

The overall response rate for the 2010 waste management industry surveys, based on the ratio of the number of completed and partially completed questionnaires to the total number of in-scope questionnaires, was 75% for the business sector and 87% for the government sector.

Imputation rates

Although most businesses and local governments were very co-operative in answering the survey, some could not provide all the data required in the format in which it was requested. For example, facilities operating without a weigh scale had difficulties answering questions about the weights of material collected or disposed. In cases where values were missing from survey cells or where the respondent did not complete a questionnaire even after extensive follow-up, information was imputed.

Data reliability

Imputation rates are an indicator of data reliability. Imputation is a term that refers to the proportion of data that were not obtained directly through a survey but rather came from an administrative source or was estimated using defensible and replicable methodologies.

Imputation is necessary to “complete” the data picture when there are non or missing responses to certain questions or sets of questions.

Business sector

Employment and financial data for small firms that were not surveyed, as well as in-scope firms that did not respond were imputed. Administrative sources such as the Statistics Canada Business Register and tax records were used to fill in the missing values.

For large firms, the imputed values were compared with values from previous years and other sources, such as annual reports and security exchange filings to ensure that the imputed values were correct.

The overall imputation rate for the business financial variables was 26%.

Government sector

Historical data was used to fill in missing financial and employment values for the government sector survey. However due to the high response rate (87%) for this survey, very few values were in need of imputation.

Waste disposal and recycling

Imputation for missing values in the disposal and recycling sections involved a different set of processes. As these two sections on both the business sector survey and the government sector survey were identical, the results from the two surveys were easily combined. This made it possible to remove duplicate data and to obtain a completed response from partial responses. For example, in the case where a local government owns a landfill but contracts out its operation, both the government body and the contracted business may have reported for the landfill. In this case, the duplicated data would be removed so that the landfill was accounted for only once. Also, both respondents may not have been able to report for all aspects of the facility, but by combining responses a completed record could be obtained. To illustrate, a firm may have omitted the total quantity of waste disposed to the landfill but the municipality may have reported that value.

In cases where there were missing cell values in the completed survey forms, many of these values were obtained through an intensive period of follow-up through email or telephone calls. Any remaining values were obtained from provincial and local government contacts, industry experts and publicly available sources, such as the Internet.

The tables presented in this report cover the data that were determined to be of sufficient quality for publication at a disaggregated level. Data confidentiality considerations as well as imputation rates play a role in this assessment. Data must be released at a level where the disclosure of the identity of any respondent in any cell is not possible. In addition, the levels of imputation must remain within reasonable limits.

Data limitations

Every effort has been made to ensure that the data presented in this report are of both high quality and reliability. However, it is important to understand the limitations of the data presented. This knowledge will allow readers to make informed decisions before conducting further research or analysis using these data

Coverage

As discussed in Section "Data quality, concepts and methodology — Overall approach: data sources and methodology–**Evaluation of frame coverage**", the estimates presented in this report refer only to that material entering the waste stream and do not cover any waste that may be managed on-site by a company or household. While the majority of residential waste is handled by municipalities or private businesses, and thus included in the survey coverage, some non-residential waste is managed on-site by industrial generators. Also, some waste is transported by the generator directly to secondary processors. These practices are not currently accounted for by these surveys despite anecdotal evidence suggesting that they are becoming increasingly common.

Agricultural waste is not covered by these surveys. This waste is typically managed on-site or by specialized firms that are not classified by NAICS as part of the waste management industry.

In addition, these data do not include materials that were processed for reuse and resale, (e.g., wholesale of scrap metals or used clothing), nor those materials that are collected through deposit-return systems and therefore not processed at a material recovery facility.

Comparability of data and related sources

Comparisons between data sources

Quebec

Response burden for local governments has been reduced in the province of Quebec by using the results from a provincial survey administered by RECYC-QUÉBEC. Estimates for diversion in Quebec are derived using these data. This arrangement is reviewed after each survey cycle in order to determine whether the data collected and published by RECYC-QUÉBEC are indeed comparable to those data collected through Statistics Canada surveys. While the amounts reported in most of the categories of diverted materials are comparable to other provinces, the amount of diverted white goods is a notable exception. The definition of white goods and the collection methodology used by RECYC-QUÉBEC for this category of material differs from that of the Waste Management Industry Survey, resulting in this discrepancy.

Nova Scotia and Ontario

The government of Nova Scotia provides Statistics Canada with an aggregation of their diversion and disposal quantities obtained through their annual data call that goes out to municipalities in that province. Results from the Statistics Canada survey are compared to those obtained from Nova Scotia in order to identify, in advance, any significant differences between the two data sets. These differences are investigated and explained, where possible.

There is a similar data call initiated by the Waste Diversion Organisation of the province of Ontario that collects diversion data from its municipalities. These data are published on-line and accessed by Statistics Canada to compare and identify any significant differences between the diversion numbers obtained by the waste survey with those published by Ontario.

Comparisons over time

Data obtained from the 2010 survey are comparable with data from previous years for the following variables:

- Disposal data: comparable with 2002, 2004, 2006, and 2008. Some caution should be exercised when comparing disposal data prior to 2002 as exported wastes were not included in the estimates prior to 2002. As well, because RECYC-QUÉBEC data were used for the residential disposal statistics prior to 2006, some caution should be exercised when comparing these series to those that followed.
- Recycling data: comparable with 2000, 2002, 2004, 2006, and 2008.
- Business sector financial data: Most variables comparable with 1995, 1996, 1998, 2000, 2002, 2004, 2006, and 2008. Some variables have been added or dropped from cycle to cycle.
- Local government sector financial data: Most variables comparable with 1994, 1996, 1998, 2000, 2002, 2004, 2006, and 2008. Some variables have been added or dropped from cycle to cycle. Prior to 2008 revenues from municipal levies were not specifically requested from survey respondents. Consequently, government revenues increased significantly from 2006 to 2008. Comparison of 2008 local government operating revenues with previous years is not recommended. The wording of the question was further changed in 2010. For this reason, caution should be used when comparing 2010 data with 2008 data.

Measurement issues

Waste diversion generally refers to material that has avoided disposal through a combination of processes and actions, and refers to activities that handle the waste in such a way such that it is not disposed of in landfills or incinerators.¹ There are several points to consider when using these data.

First, the diversion figures include only materials that were processed for recycling at publicly or privately owned material recycling facilities. The data do not include materials that were processed and reused by a business or public body on-site as part of its production process or as part of a secondary economic activity. Those materials never entered the non-hazardous waste stream and therefore are not considered to be waste for the purposes of this survey.

Second, it is acknowledged that data from a large portion of the “reuse” category are not included in these tables. For example, used clothing that is donated to a retailer and resold is excluded, as are used appliances that are refurbished and resold. Deposit-return materials, such as beer bottles, are considered to be “reuse” and are not included in these tables unless they have been processed at a material recovery facility.

Third, these data do not include those materials managed by wholesalers of scrap metal, plastics or paper. As with the other data in this report, these data cover only those firms whose primary source of income accrues from waste management activities and those public bodies that provide waste management services.

Fourth, the agricultural sector is largely excluded from these data. Waste and recyclable materials (for example, dead livestock, manure) from farms are generally managed on-site by the producer or managed by firms who specialize in the management of agricultural waste. Most of these businesses are not classified as part of the waste management industry as defined by the North American Industry Classification System (NAICS).

Fifth, contaminated soil that is used as landfill cover or for some other beneficial purpose at a disposal facility (e.g. the building of berms) is excluded from these data. Other high tonnage excluded materials that should be noted are asphalt from roadworks, as well as debris from land clearing operations (for example, soil, brush, stumps).

Sixth, it is recognized that a potentially large quantity of materials diverted from landfills may be collected under stewardship or “take it back” programs. Stewardship programs exist at the national and provincial and territorial level for items such as tires, electronics, beverage containers, batteries, paint, used oil, etc. Some of these materials may be included in data collected by the survey if the firms involved in the collection and/or processing of these materials fall under the waste management industry as defined by NAICS, or if a municipality involved in the collection of materials or administration of a program has reported these materials on their survey.

Finally, composting data include tonnages managed through centralized programs that are owned and operated by municipalities, waste management boards or commissions as well as those facilities that are privately owned and operated. Compost data exclude biosolids processing or application and estimates for on-site composting programs such as backyard composting. In addition, data from on-site composting of industrial wastes or wastes from primary resource extraction (e.g., forestry or fishing) may be excluded if their main business activity does not fall under the waste management industry as defined by NAICS.

1. GAP Team, June 15, 2000, Manual on Generally Accepted Principles (GAP) for Calculating Municipal Solid Waste Flow. Toronto, p. 15.

Definitions

Composting

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

Construction, renovation and demolition waste (CR&D)

CR&D waste, also referred to as DLC (demolition, landclearing and construction waste), refers to waste generated by construction, renovation 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. CR&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.

Disposal facility

A facility at which waste is landfilled, incinerated, or treated for final disposal.

Diversion

Diversion represents the quantity of materials diverted from disposal facilities and represents the sum of all materials processed for recycling at an off-site recycling or composting facility.

Generation

Total generation is the sum of total non-hazardous residential and non-residential solid waste disposed of in an off-site disposal facility and the total materials processed for recycling at an off-site recycling facility.

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).

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

Industrial, commercial, and institutional (IC & I) waste 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, 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, restaurants, offices, etc. Some commercial waste (from small street-front stores, etc.) may be picked up by the municipal collection system along with residential waste;
- Institutional waste is generated by institutional facilities such as schools, hospitals, government facilities, seniors homes, universities, etc. This waste is generally picked up under contract with the private sector.

Non-residential waste

Includes municipal solid non-hazardous waste generated by industrial, commercial and institutional sources as well as waste generated by construction and demolition activities.

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.

Recycling

Recycling is the process whereby a material (for example, glass, metal, plastic, paper) is diverted from the waste stream and remanufactured into a new product or is used as a raw material substitute.

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.

Sanitary landfill

A landfill that, at a minimum, accepts only specified types of wastes and whose access is controlled (by a fence or staff, for example) in order to monitor the types and quantities of wastes being deposited. Often, it also includes landfills that have technologies in place to keep wastes and leachate from contaminating the groundwater. These can include systems that collect the leachate in order to treat and dispose of it.

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

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.

Waste for disposal

All materials not wanted by their generator and which are discarded for management at waste disposal facilities (excludes materials destined for recycling and composting).

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.