Catalogue no. 16F0023X

Waste Management Industry Survey: Business and Government Sectors

2006

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Statistics Canada
Environment Accounts and Statistics Division

Waste Management Industry Survey: Business and Government Sectors

2006

Published by authority of the Minister responsible for Statistics Canada

June 2008

Catalogue no. 16F0023X

ISSN 1701-5677

Frequency: Biennial

Ottawa

La version française de cette publication est disponible sur demande (nº 16F0023X au catalogue).

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The following standard symbols are used in Statistics Canada publications:

.	not available for any reference period
..	not available for a specific reference period
...	not applicable
0	true zero or a value rounded to zero
0s	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

Acknowledgements

The contributions of the respondents, industry groups and provincial environmental departments were critical to the successful completion of the surveys and are gratefully acknowledged.

This report was prepared by the Environment Accounts and Statistics Division under the direction of **Rob Smith**, Director and **Bruce Mitchell**, Chief, Environmental Protection Accounts and Surveys. Data collection for the surveys was conducted by the Operations and Integration Division (**Mel Jones**, Director) and the Environment Accounts and Statistics Division. Data from Public Institutions Division (**Catherine Boies**, Director) were also used in the preparation of this report.

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Preface

This report presents the results of the 2006 Waste Management Industry Survey: Business Sector and the 2006 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 and hazardous waste disposal facilities, the operation of transfer stations and the treatment and disposal of wastes deemed to be hazardous.

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

- In 2006, the amount of waste disposed in public and private disposal facilities increased 8% since 2004. The province of Alberta had the highest increase at 24% while Prince Edward Island decreased the amount of waste for disposal by 13%. (Table 1-1)
- The disposal of waste from residential sources increased 3% while waste disposed from non residential sources increased 11% since 2004. The province of Alberta had the largest increase in non-residential waste for disposal increasing 33% from 2,133,890 tonnes in 2004 to 2,846,189 tonnes in 2006. (Table 1-2)
- Diverted materials per capita increased to 237 kilograms per Canadian from 222 kilograms. The province of New Brunswick had the highest increase, up 82% to 337 kilograms per person. Quebec, Prince Edward Island and British Columbia were not far behind achieving per capita diversion above the national average. The diversion rate in Canada remained stable at 22%. (Table 2)
- Materials prepared for recycling increased 9% between 2004 to 2006. Organic materials had the largest increase at 32%. (Table 4-2)
- Materials prepared for recycling from residential sources increased 11% between 2004 and 2006. This was a larger increase over non-residential sources which increased 7%. (Table 3)
- Revenues for businesses engaged in waste management increased 17% between 2004 and 2006 while operating expenditures increased by 12%. Employment was down slightly by 5% across the country for the same time period. (Table 5-1)
- Operating revenues for local governments from the provision of waste management services increased 16% to slightly more than $1.0 billion in 2006. Total current expenditures by local governments in Canada increased to $2.0 billion from $1.8 billion in 2004. Employment in the government sector rose by 5%. (Table 5-2)

Analysis

Total waste

In 2006, Canadians produced over 1000 kg of waste per person, up 8% from 2004. Of this total, 835 kg went to landfills or was incinerated while 237 kg was diverted from landfill. Overall, this translates into 35 million tonnes of waste handled by the waste management industry; 27 million tonnes of that waste was disposed in landfills or was incinerated and almost 8 million tonnes were diverted from disposal and processed through material recovery facilities or centralized composting operations.

Approximately 22 million tonnes of waste came from non-residential sources in 2006 while the other 13 million tonnes was from residential sources.

There are several factors that drive increases in the production of waste. Population growth, increased economic activity and rising incomes may be contributing factors. In an active economy, more goods and services are purchased by businesses and households. Goods have packaging that must be disposed or recycled or, the good itself may be discarded or recycled once it is used. Between 2004 and 2006, there was a 6% increase in GDP observed nationally.[1]

Disposal

Canadians sent just over 27 million tonnes of waste for disposal to landfills or incinerators in 2006 which is an 8% increase over 2004. This increase in disposal is higher than the previous increase of 5% between 2002 and 2004.

All provinces showed increases in the amount of waste sent for disposal except for Prince Edward Island. This province posted a 13% decrease since 2004. This is the first decrease observed in disposal between 2002 and 2006. Also, several provinces (Nova Scotia, New Brunswick, and Newfoundland and Labrador) showed small increases of less than 2%.

Approximately 1/3 of waste for disposal came from residential sources while the other 2/3 came from non-residential sources. This was virtually unchanged from 2004. The majority of the increase in waste disposed between 2004 and 2006 came from non-residential sources. The amount of waste from residential sources increased by 3% between 2004 and 2006 to 9.2 million tonnes. During the same time period, the amount of non-residential waste increased by 11% to 18.0 million tonnes.

Overall, the 8% increase amounted to an additional 2 million tonnes of waste disposed by Canadians in 2006 over the 2004 estimate. The province of Alberta contributed almost 37% to that increase, Ontario and Quebec contributed 31% and 18% respectively.

Rates of disposal

Per capita measures of waste disposal provide a way of examining changes in disposal while at the same time accounting for the effects of population. In some cases, increases in the amount of waste being sent for disposal could be attributed to population growth and not necessarily due to the production of more wastes.

On average, each Canadian was responsible for 835 kilograms of waste disposed in 2006. Nova Scotia remained the province with the lowest per capita disposal at 430 kilograms. New Brunswick and British Columbia followed

1. Statistics Canada, CANSIM, Table 379-0025, “Gross Domestic Product (GDP) at basic prices, by North American Industry Classification System (NAICS), annual”.

with 601 kilograms and 675 kilograms per person, respectively. Quebec, Manitoba, Saskatchewan, Alberta and the Northwest Territories exceeded the average national per capita amount of waste disposed.

On average there was a 6% increase in per capita waste disposed; provincially, Alberta posted a significant increase of 18%. The next highest increase was in Manitoba at 10%.

Alberta

The recent 2006 Census revealed that Alberta's population grew by more than 10% since the 2001 Census.[2] Since the last Waste Management Industry survey in 2004, estimates indicate a 5% increase in population.[3] This increase is also the highest increase of any province or territory in Canada during those two years. Nationally, population increased 2% in the same time frame.

Overall, waste disposed in Alberta increased 24% to 3.8 million tonnes in 2006. Non residential waste disposed in Alberta increased by 33% in 2006 whereas the residential portion increased by only 3%. This compares to a national 11% increase in non-residential waste disposed.

In 2006, Alberta also had the largest amount of per capita waste disposed in Canada with each Albertan sending more than one tonne of waste for disposal. Excluding the Northwest Territories, Quebec was the next highest with nearly 250 kilograms less waste disposed per person.

Sources of waste for disposal

Waste from non-residential sources usually accounts for the majority of waste for disposal. This held true in 2006 with non-residential sources contributing 66% of the waste for disposal while 34% came from residential sources.

Alberta had the highest proportion of waste disposed from non-residential sources at 75% closely followed by Yukon Territory at 74%. The next highest was Quebec at 68%. Newfoundland and Labrador had the lowest proportion of waste disposed from non residential sources at 44%.

On a per capita basis, 283 kilograms of residential waste and 552 kilograms of non-residential waste were sent for disposal (Text table 1). Nova Scotia had the lowest per capita disposal from residential sources at 181 kilograms. British Columbia and the Yukon Territory also had lower than average per capita disposal from residential sources at 222 and 214 kilograms respectively. Although the per capita disposal of residential waste in Alberta is fairly close to the Canadian average, waste per capita from non-residential sources far exceeds the other provinces and territories. Alberta disposed 844 kilograms per person from non-residential sources. The second highest is Northwest Territories with 665 kilograms followed by Quebec with 604 kilograms. The increases in waste for disposal in Alberta are believed to be coming from industrial, commercial and institutional sources as well and construction and renovation activities.

2. "Population and dwelling counts, for Canada, provinces and territories, 2006 and 2001 censuses – 100% data", *http://www12.statcan.ca/english/census06/data/popdwell/Table.cfm?T=101*, accessed May 27th, 2008.
3. Statistics Canada, CANSIM, Table 051-0001, "Estimates of population, by age group and sex for July 1, Canada, provinces and territories, annual".

Text table 1
Disposal of waste by source and by province and territory, 2006

	Residential proportion of waste	Non-residential proportion of waste	Residential sources per capita	Non-residential sources per capita
	percent		kilograms	
Newfoundland and Labrador	56	44	446	353
Prince Edward Island	x	x	x	x
Nova Scotia	42	58	181	248
New Brunswick	48	52	289	312
Quebec	32	68	285	604
Ontario	35	65	292	530
Manitoba	44	56	386	483
Saskatchewan	36	64	300	544
Alberta	25	75	289	844
British Columbia	33	67	222	454
Yukon Territory	26	74	214	595
Northwest Territories	34	66	347	665
Nunavut	x	x	x	x
Canada	**34**	**66**	**283**	**552**

Source(s): Statistics Canada, Environment Accounts and Statistics Division.

Diversion

Materials processed for recycling increased 9% to just over 7.7 million tonnes in 2006. While most materials showed increases since 2004, organics such as food wastes and leaf and yard wastes showed the largest increase of 32%. At 21%, plastic materials prepared for recycling had the second largest increase.

Paper fibres still make up the majority of all diverted materials accounting for 44%. However, organic materials represented 26% of all materials diverted in 2006, increasing this share from 21% in 2004.

The rate of diversion of materials from landfill between 2004 and 2006 remained constant at 22%. Several provinces diverted more than 25% of their waste from landfills. Nova Scotia had the highest diversion rate at 41% followed by Prince Edward Island (38%) and New Brunswick (36%). New Brunswick had the greatest change in its diversion rate increasing 12 percentage points over the 2004 rate to 36% in 2006. British Columbia and Quebec also exceeded the national diversion rate achieving 32% and 27%, respectively. Provinces such as Newfoundland and Labrador, Ontario, Manitoba, Saskatchewan, and Alberta all diverted less than 20% of their waste from landfills.

Waste management industry financial characteristics

Local government sector

Operating revenues

Operating revenues for local governments from the provision of waste management services increased by nearly 16% to slightly more than $1.0 billion in 2006. Several provinces experienced higher growth in operating revenues than others. New Brunswick and Quebec had increases of slightly over 20% between 2004 and 2006 while the increase in Alberta was 35% to $174 million. Saskatchewan and Manitoba had slightly lower revenues in 2006 than in 2004 at $15 million and $26 million respectively.

Operating expenditures

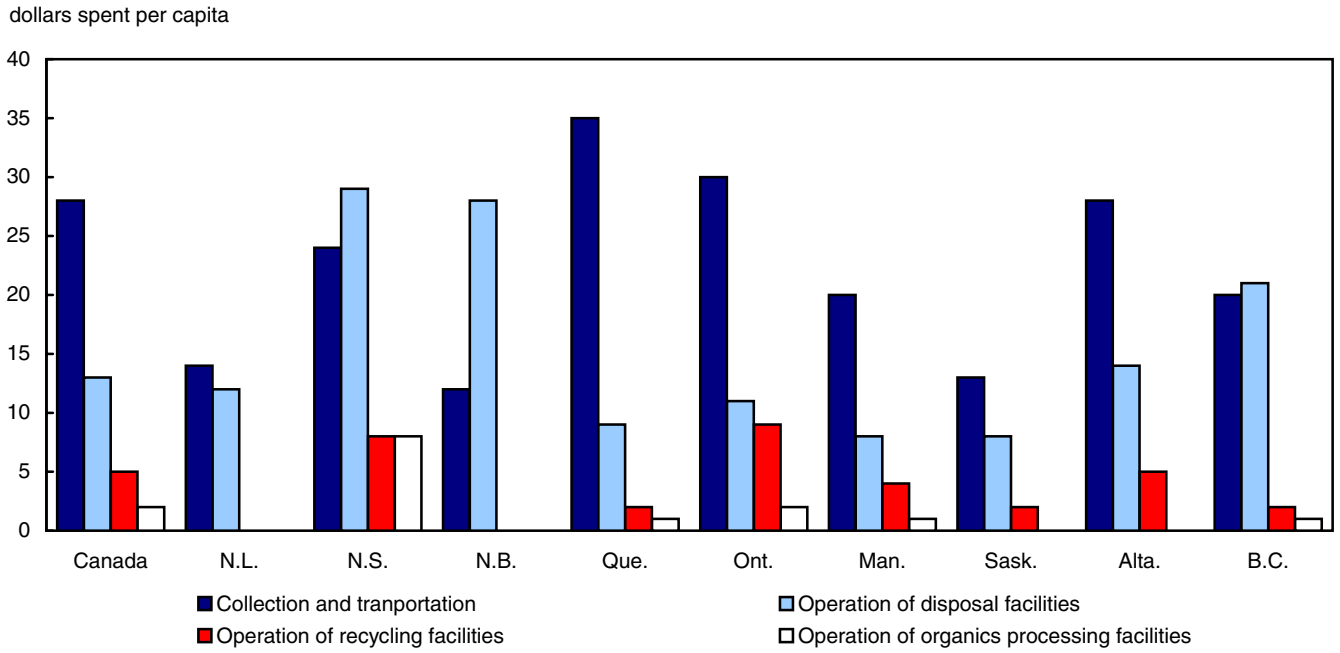
Total current expenditures by local governments in Canada increased to $2.0 billion in 2006 from $1.8 billion in 2004. At over $900 million, collection and transportation continued to make up the lion's share of current expenditures

in 2006. Operation of disposal facilities consumed the next largest share of the total amount of current expenditures at $419 million followed by tipping fees at $194 million. Current expenditures on the operation of recycling facilities increased by 47% to $171 million between 2004 and 2006.

Capital expenditures totalled $312 million in 2006, down 16% from 2004.

Provincially, it is useful to look at the per capita expenditures on waste management activities as well as the per capita quantity of waste diverted from landfill.Nova Scotia and New Brunswick spent the greatest amount (nearly $30 per person) on the operation of disposal facilities (Chart 1). Ontario spent the greatest amount on recycling facilities at $9 per person while Nova Scotia led in expenditures per person on the operation of organics processing facilities at $8 per person.

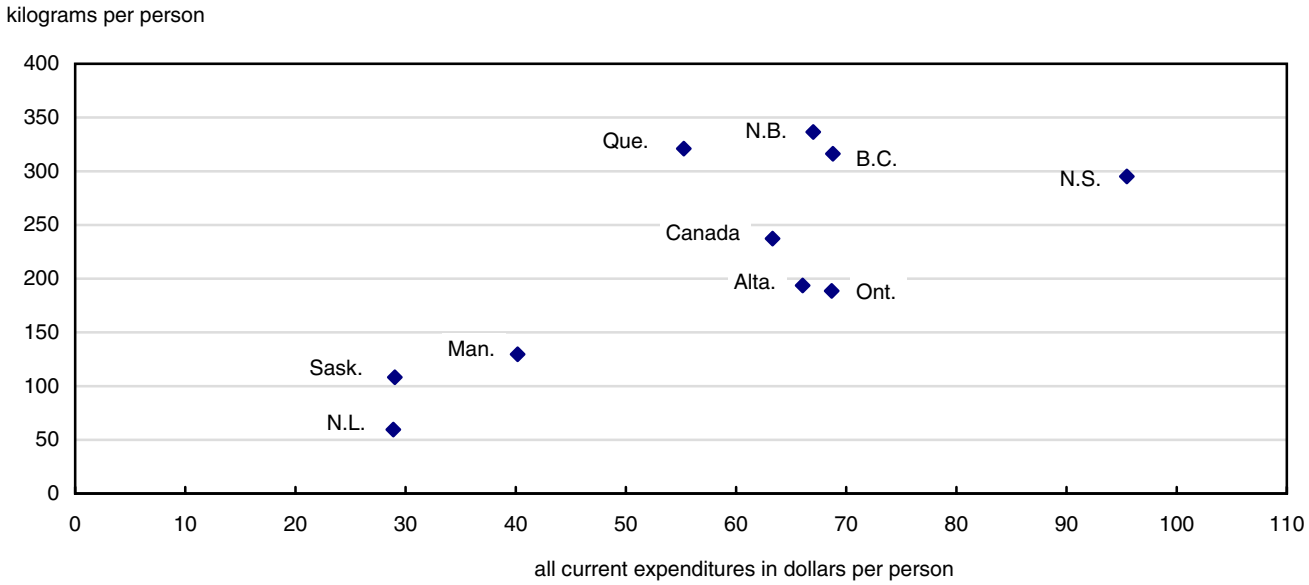
Chart 1
Current local governments expenditures [1] related to waste management, 2006



1. Data for Prince Edward Island, Yukon Territory, Northwest Territories and Nunavut is not included in order to meet the confidentiality requirements of the Statistics Act.

Source(s): Statistics Canada, Environment Accounts and Statistics Division

Chart 2
Waste diverted and local government current expenditures per capita, 2006



Source(s): Statistics Canada, Environment Accounts and Statistics Division

An examination of per capita expenditures on waste management activities and the amount of waste diverted per capita indicates that those provinces that spent more money per capita were generally able to divert greater amounts of waste per person (Chart 2).

Quebec, British Columbia, New Brunswick, Nova Scotia, Alberta, and Ontario all spent over $55 per person in total on waste management. New Brunswick, Nova Scotia, Quebec, and British Columbia diverted more than the national average of 237 kilograms/person from landfill.

Manitoba, Saskatchewan, and Newfoundland all spent $40 or less per person on waste disposal and diverted at least 100 kilograms per person less than the national average of 237 kilograms per person.

Business sector

Operating revenues

Revenues for the business sector from 2004 to 2006 increased by 17% to $5.1 billion. The highest growth in revenues, for businesses in the waste management industry between 2004 and 2006, occurred in: British Columbia (23%), Quebec (21%), Alberta (20%), and Nova Scotia (20%). Newfoundland was the only province where a drop (21%) was reported by businesses in revenues from the waste management industry.

Operating expenditures

Gross operating expenditures incurred by waste management firms increased by 12% from 2004 to $4.3 billion in 2006. Capital expenditures dropped by 1% to 300 million dollars in 2006.

Firms in most provinces increased their operating expenditures between 2004 and 2006. Several provinces had firms with increases in operational expenditures over the national average (12%) during this period. Firms in Nova Scotia, British Columbia, and Alberta had increased expenditures of 22%, 21%, and 19% respectively.

Businesses in Saskatchewan, Manitoba, and New Brunswick remained stable, while in Prince Edward Island and Ontario there were modest (10%) increases in operating expenditures. Newfoundland was the only province where businesses had a substantial drop (21%) in operating expenditures over this period.

Employment, local government and business sectors

Employment in the waste management industry totalled 31,017 employees in both the government and business sectors. This represents a drop in total employment of 3% between 2004 and 2006. Approximately three quarters of those employed in the waste management industry work in the business sector. Employment in the business sector of the industry was down by 5% across the country between 2004 and 2006, while during the same period employment in the government sector in waste management rose by 5%.

Related products

Selected publications from Statistics Canada

16-002-X	EnviroStats
16-201-X	Human Activity and the Environment: Annual Statistics
16-253-X	Canadian Environmental Sustainability Indicators: Socio-economic Information
16-257-X	Environment Accounts and Statistics Product Catalogue
16F0002X	Waste Management Industry Survey: Government Sector, 1994
16F0003X	Waste Management Industry Survey: Business Sector, 1995

Selected CANSIM tables from Statistics Canada

153-0041	Disposal of waste, by source, Canada, provinces and territories, biennial
153-0042	Materials prepared for recycling, by source, Canada, provinces and territories, biennial
153-0043	Materials prepared for recycling, 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

- *Government pollution abatement and control expenditures*
- *Waste disposal, by source, by province*
- *Disposal and diversion of waste, by province and territory, 2002 and 2004*

Statistical tables

Table 1-1
Disposal of waste by province and territory

	Total waste disposed			Waste disposed per capita		
	2004 [r]	2006	Percentage change 2004 to 2006	2004 [r]	2006	Percentage change 2004 to 2006
	tonnes		percent	kilograms		percent
Newfoundland and Labrador	400,048	407,728	1.9	773	800	3.4
Prince Edward Island	x	x	-12.6	x	x	-12.7
Nova Scotia	399,967	401,670	0.4	426	430	0.7
New Brunswick	442,173	450,238	1.8	588	601	2.2
Quebec [1]	6,454,000	6,808,440	5.5	855	890	4.1
Ontario	9,809,264	10,437,780	6.4	790	822	4.0
Manitoba	928,117	1,024,272	10.4	793	869	9.6
Saskatchewan	794,933	833,753	4.9	799	844	5.7
Alberta	3,077,311	3,819,872	24.1	959	1,133	18.1
British Columbia	2,767,657	2,917,080	5.4	658	675	2.6
Yukon Territory	20,800	25,245	21.4	674	809	20.1
Northwest Territories	41,978	42,884	2.2	980	1,011	3.2
Nunavut	x	x	5.0	x	x	2.3
Canada	**25,226,765**	**27,249,178**	**8.0**	**788**	**835**	**6.0**

1. The 2004 waste disposal data are derived from a survey administered by RECYC-QUÉBEC. In 2006, disposal data were derived from Statistics Canada's 2006 Waste Management Industry Survey.

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

Source(s): Statistics Canada, Environment Accounts and Statistics Division.

Table 1-2
Disposal of waste by source and by province and territory

	Residential sources [1]		Non-residential sources [2]		All sources	
	2004	2006	2004	2006	2004	2006
	tonnes					
Newfoundland and Labrador	228,004	227,618	172,044	180,110	400,048	407,728
Prince Edward Island	x	x	x	x	x	x
Nova Scotia	179,262	169,337	220,705	232,333	399,967	401,670
New Brunswick	208,120	216,357	234,053	233,881	442,173	450,238
Quebec [3]	2,209,000	2,183,788	4,245,000	4,624,653	6,454,000	6,808,440
Ontario	3,489,917	3,705,235	6,319,347	6,732,545	9,809,264	10,437,780
Manitoba	450,658	455,304	477,459	568,968	928,117	1,024,272
Saskatchewan	279,420	296,062	515,513	537,691	794,933	833,753
Alberta	943,420	973,683	2,133,890	2,846,189	3,077,311	3,819,872
British Columbia	919,323	956,968	1,848,335	1,960,113	2,767,657	2,917,080
Yukon Territory, Northwest Territories and Nunavut	x	x	x	x	x	x
Canada	**8,961,583**	**9,238,376**	**16,265,183**	**18,010,801**	**25,226,766**	**27,249,178**

1. Residential non-hazardous wastes disposed 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 wastes 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.
3. The waste disposal data prior to 2006 were derived from a survey administered by RECYC-QUÉBEC.

Note(s): Figures may not add up to totals due to rounding. Total amount of non-hazardous waste disposed of 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 wastes disposed in hazardous waste disposal facilities or wastes 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	
	2004 [r]	2006	Change 2004 to 2006	2004	2006	Change 2004 to 2006	2004	2006
	tonnes		percent	kilograms		percent		
Newfoundland and Labrador	35,308	30,385	-13.9	68	60	-12.7	8.1	6.9
Prince Edward Island	x	x	3.2	x	x	3.1	34	37.8
Nova Scotia	239,845	275,983	15.1	256	295	15.4	37.5	40.7
New Brunswick	139,262	252,174	81.1	185	337	81.8	24	35.9
Quebec [1]	2,130,100	2,456,300	15.3	282	321	13.8	24.8	26.5
Ontario	2,414,552	2,396,856	-0.7	194	189	-3	19.8	18.7
Manitoba	157,490	152,799	-3	135	130	-3.6	14.5	13
Saskatchewan	114,182	106,868	-6.4	115	108	-5.7	12.6	11.4
Alberta	620,080	652,637	5.3	193	194	0.2	16.8	14.6
British Columbia	1,209,216	1,366,191	13	288	316	9.9	30.4	31.9
Yukon Territory, Northwest Territories and Nunavut	x	x	51	x	x	50	11.9	15.9
Canada	**7,112,735**	**7,749,030**	**8.9**	**222**	**237**	**6.8**	**22.0**	**22.0**

1. 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.

Table 3
Materials prepared for recycling by source, by province and territory

	Residential sources [1]		Non-residential sources [2]		All sources	
	2004	2006	2004	2006	2004	2006
	tonnes					
Newfoundland and Labrador	x	x	x	x	x	x
Prince Edward Island	x	x	x	x	x	x
Nova Scotia	148,542	138,869	91,305	137,114	239,847	275,983
New Brunswick	56,977	32,675	82,285	219,499	139,262	252,174
Quebec [3]	697,000	934,260	1,433,100	1,522,040	2,130,100	2,456,300
Ontario	1,380,767	1,511,467	1,033,785	885,389	2,414,552	2,396,856
Manitoba	71,384	70,239	86,108	82,560	157,492	152,799
Saskatchewan	43,263	38,578	70,920	68,290	114,183	106,868
Alberta	304,820	329,542	315,260	323,094	620,080	652,636
British Columbia	592,243	625,827	616,971	740,364	1,209,214	1,366,191
Yukon Territory, Northwest Territories and Nunavut	x	x	x	x	x	x
Canada	**3,363,803**	**3,744,843**	**3,748,934**	**4,004,187**	**7,112,737**	**7,749,030**

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 table 153-0042.

Table 4-1
Materials prepared for recycling by type, by province and territory — 2004

	Newfound-land and Labrador	Prince Edward Island	Nova Scotia	New Bruns-wick	Quebec [1]	Ontario	Manitoba	Saskat-chewan	Alberta	British Columbia	Yukon Territory, North-west Territories and Nunavut	Canada
	tonnes											
Newsprint	x	x	26,972	5,092	516,000	410,496	27,871	19,057	99,083	140,942	x	**1,254,678**
Cardboard and boxboard	x	x	30,485	12,411	402,000	467,476	51,214	17,545	99,515	214,215	x	**1,322,774**
Mixed paper	x	x	7,657	6,929	113,000	154,910	25,261	4,624	33,935	201,956	x	**548,978**
Glass	x	x	2,126	x	94,000	189,804	7,813	x	49,739	36,981	x	**395,150**
Ferrous metals	x	0	2,951	1,540	119,100	83,866	13,733	x	19,022	22,471	x	**287,280**
Copper and aluminum	x	x	x	x	11,000	21,327	x	x	x	5,870	x	**49,476**
Mixed metals	x	0	6,105	2,422	0	34,641	4,535	1,961	11,447	80,530	x	**146,022**
White goods	x	x	4,584	x	183,000	26,178	x	x	12,108	x	0	**236,683**
Electronics	0	0	x	x	3,000	5,259	x	x	x	x	0	**10,245**
Plastics	x	x	3,846	1,111	72,000	52,935	4,255	4,736	10,372	42,509	x	**192,088**
Tires	0	x	x	x	62,000	6,441	3,569	16,467	5,657	38,508	x	**136,386**
Construction, renovation and demolition	x	x	59,355	14,984	288,000	303,277	x	13,234	27,926	140,514	x	**848,197**
Organics	0	x	93,458	90,585	225,000	573,098	15,636	x	234,970	254,878	x	**1,519,601**
Other materials	x	x	1,737	1,963	42,000	84,842	x	x	x	24,088	x	**165,180**
All materials	**35,308**	**x**	**239,845**	**139,262**	**2,130,100**	**2,414,552**	**157,490**	**114,182**	**620,080**	**1,209,216**	**x**	**7,112,735**

1. 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 table 153-0043.

Table 4-2
Materials prepared for recycling by type, by province and territory — 2006

	Newfound-land and Labrador	Prince Edward Island	Nova Scotia	New Bruns-wick	Quebec [1]	Ontario	Manitoba	Saskat-chewan	Alberta	British Columbia	Yukon Territory, North-west Territories and Nunavut	Canada
	tonnes											
Newsprint	x	x	33,128	10,011	593,000	380,281	34,240	19,905	65,119	x	x	**1,261,891**
Cardboard and boxboard	x	x	31,373	9,808	462,540	474,211	44,442	16,925	121,886	280,131	x	**1,471,315**
Mixed paper	x	x	8,592	x	130,460	194,698	17,710	3,195	78,657	x	x	**688,003**
Glass	x	x	1,511	0	117,000	179,341	7,973	x	x	39,406	x	**400,003**
Ferrous metals	x	0	2,962	x	111,800	80,794	18,360	x	20,034	22,811	x	**278,036**
Copper and aluminum	x	0	x	x	10,000	21,290	3,227	x	x	x	x	**51,225**
Mixed metals	x	x	x	x	18,500	22,343	3,779	2,065	14,745	81,595	x	**148,231**
White goods	x	x	4,700	x	248,000	22,023	x	3,092	12,099	7,158	x	**299,397**
Electronics	0	0	0	x	3,000	4,251	x	x	2,631	x	0	**11,357**
Plastics	x	x	4,540	864	95,000	60,195	5,696	4,637	14,852	44,956	x	**232,339**
Tires	x	x	x	x	70,000	4,948	955	x	2,508	35,987	x	**138,646**
Construction, renovation and demolition	0	0	51,263	10,633	236,000	187,353	2,704	x	34,300	188,323	x	**715,364**
Organics	0	x	133,934	x	360,000	732,200	12,490	3,627	231,459	292,031	x	**2,006,461**
Other materials	x	0	1,808	323	1,000	32,927	353	x	6,099	1,575	x	**46,763**
All materials	**30,385**	**x**	**275,983**	**252,174**	**2,456,300**	**2,396,856**	**152,799**	**106,868**	**652,637**	**1,366,191**	**x**	**7,749,030**

1. 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 table 153-0043.

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

	Newfound-land and Labrador	Prince Edward Island	Nova Scotia	New Bruns-wick	Quebec	Ontario	Manitoba	Saskat-chewan	Alberta	British Columbia	Yukon Territory, North-west Terri-tories and Nunavut	Canada
	number											
Number of businesses												
2004	44	13	90	76	495	458	53	52	208	270	18	1,725
2006	24	5	56	49	414	410	26	37	193	231	11	1,477
Total employees [1]												
2004	298	144	952	804	6,083	9,729	529	1,096	2,472	2,869	113	25,089
2006	226	105	804	627	5,430	9,547	547	1,064	2,529	2,923	69	23,871
Full-time employees												
2004	239	144	871	683	5,826	9,328	514	930	2,295	2,686	97	23,613
2006	171	105	716	494	5,106	9,243	510	888	2,372	2,821	59	22,485
Part-time employees												
2004	59	0	81	121	257	401	15	166	177	183	16	1,476
2006	55	0	88	133	324	304	37	176	157	102	10	1,386
	thousand dollars											
Operating revenues [2]												
2004	26,509	16,498	100,891	68,127	863,260	2,037,570	105,834	98,496	466,023	624,170	9,404	4,416,782
2006	20,952	18,699	120,663	70,146	1,043,895	2,353,301	115,736	99,838	556,758	765,511	10,913	5,176,411
Operating expenditures [2]												
2004	22,804	14,188	90,856	63,918	794,680	1,826,824	87,371	88,153	369,272	475,651	8,734	3,842,452
2006	17,906	15,538	110,850	66,206	895,108	2,003,318	89,925	87,239	438,647	575,130	9,270	4,309,137
Capital expenditures [2]												
2004	3,165	1,429	8,714	7,791	70,252	128,702	4,699	8,076	34,776	38,752	282	306,640
2006	626	x	5,688	6,802	67,559	145,938	x	6,631	31,537	23,909	1,657	303,221

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

	Newfound-land and Labrador	Prince Edward Island	Nova Scotia	New Bruns-wick	Quebec [1]	Ontario	Manitoba	Saskat-chewan	Alberta	British Columbia	Yukon Territory, North-west Terri-tories and Nunavut	Canada
	number											
Total employees [2]												
2004	109	x	320	207	581	2,723	270	267	1,264	955	x	6,798
2006	112	x	315	211	702	3,134	228	269	1,220	864	x	7,146
Full-time employees												
2004	78	x	271	173	376	2,357	191	171	843	714	x	5,240
2006	75	x	276	172	454	2,737	168	161	990	641	x	5,744
Part-time employees												
2004	31	x	49	34	205	366	79	96	421	241	x	1,558
2006	37	x	39	39	248	397	60	108	230	223	x	1,402
	thousand dollars											
Operating revenues [3]												
2004	4,288	x	37,692	31,324	137,870	269,521	26,731	15,651	129,596	222,874	x	895,987
2006	4,606	x	41,092	38,824	166,376	309,055	26,376	15,064	174,495	235,891	x	1,036,903
All current expenditures [4]												
2004	12,399	x	77,292	46,340	350,319	756,159	45,336	27,688	181,367	266,986	x	1,783,772
2006	14,730	x	89,276	50,197	422,753	872,572	47,332	28,653	222,623	297,181	x	2,066,919
Capital expenditures [5]												
2004	583	x	11,791	8,010	17,995	267,473	1,426	7,295	22,163	32,423	x	369,620
2006	2,102	x	35,373	10,615	67,204	107,384	2,812	6,277	44,761	34,808	x	312,028

1. Data before 2006 on operating revenues, employment, current expenditures and the breakdown of current expenditures are imputed or derived from administrative sources.
2. Includes full-time and part-time employees working in the waste management activities of surveyed municipalities.
3. Includes revenues collected specifically for waste management purposes by local governments and other public waste management organizations that provided waste management services. They do not include general municipal tax revenues.
4. Includes current expenditures directed towards waste management services.
5. Includes capital expenditures that were made by local governments and other public organizations for waste management purposes.

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, by province and territory

	Newfound-land and Labrador	Prince Edward Island	Nova Scotia	New Bruns-wick	Quebec [1]	Ontario	Manitoba	Saskat-chewan	Alberta	British Columbia	Yukon Territory, North-west Territories and Nunavut	Canada
	thousand dollars											
Collection and transportation												
2004	5,938	x	21,242	7,428	222,987	335,971	24,249	13,775	82,724	88,220	x	810,351
2006	6,958	x	22,183	9,294	269,093	375,619	23,435	13,236	93,001	88,310	x	911,676
Tipping fees												
2004	1,125	x	2,729	6,400	31,875	80,329	6,728	459	10,254	30,230	x	172,298
2006	1,396	x	9,158	6,094	38,465	83,998	7,234	521	11,407	32,105	x	194,634
Operation of disposal facilities												
2004	5,116	x	27,864	20,018	58,704	130,109	8,955	7,835	36,151	80,133	x	377,612
2006	6,070	x	26,985	20,968	70,842	137,406	9,730	7,999	46,287	89,704	x	419,003
Operation of transfer stations												
2004	x	x	935	x	1,738	45,786	687	x	9,730	34,442	x	95,267
2006	0	x	4,056	1,837	2,098	45,946	791	328	13,263	39,721	x	109,038
Operation of recycling facilities												
2004	x	x	6,945	4,113	15,400	65,712	4,135	1,255	12,469	5,362	x	116,923
2006	x	0	7,735	x	18,584	109,177	4,913	1,795	17,222	7,599	x	171,351
Operation of organics processing facilities												
2004	0	x	5,425	x	3,672	20,411	x	323	18,748	4,941	x	56,967
2006	0	0	7,341	x	4,431	26,004	640	x	x	6,329	x	70,624
Other current expenditures												
2004	x	x	12,153	6,595	15,944	77,842	114	3,575	11,290	23,658	x	154,354
2006	305	x	11,818	x	19,240	94,421	589	4,251	17,174	33,414	x	190,593

1. Data before 2006 on operating revenues, employment, current expenditures and the breakdown of current expenditures are imputed or derived from administrative sources.

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 "**Definitions**"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. The decision of which respondent's information to use was based on the results of this research and professional judgement.

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 undercovered population, and this total was added to the survey total to arrive at an adjusted disposal figure. The undercovered 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 a "blown-up" 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, 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 a "blown-up" figure is not required.

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, 2006 and March 31, 2007.

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 CAN: This Canadian 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: Statistics Canada, North American Industry Classification System (NAICS) 2002, *www.statcan.ca/english/Subjects/Standard/naics/2002/naics02-index.htm*.

Business sector

The 2006 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 2006 business survey was based on the 2004 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 once more 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 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 2006 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 for the 2006 survey. Estimates for financial and employment data for the local government sector as well as disposal data were gleaned from these surveys. In the past, municipalities in this province have been excluded from the survey as the information was obtained from provincial sources.

Variables measured

For the reference year 2006, respondents were asked to report the following information:

- specific types of waste management activities conducted by the respondent;
- total quantities of non-hazardous and 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 spring and summer of 2007. Survey questionnaires were mailed to a total of 1,327 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 local government survey.

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 applied. 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 early November 2007.

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 tier 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. Or, there may be numerous combinations 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.

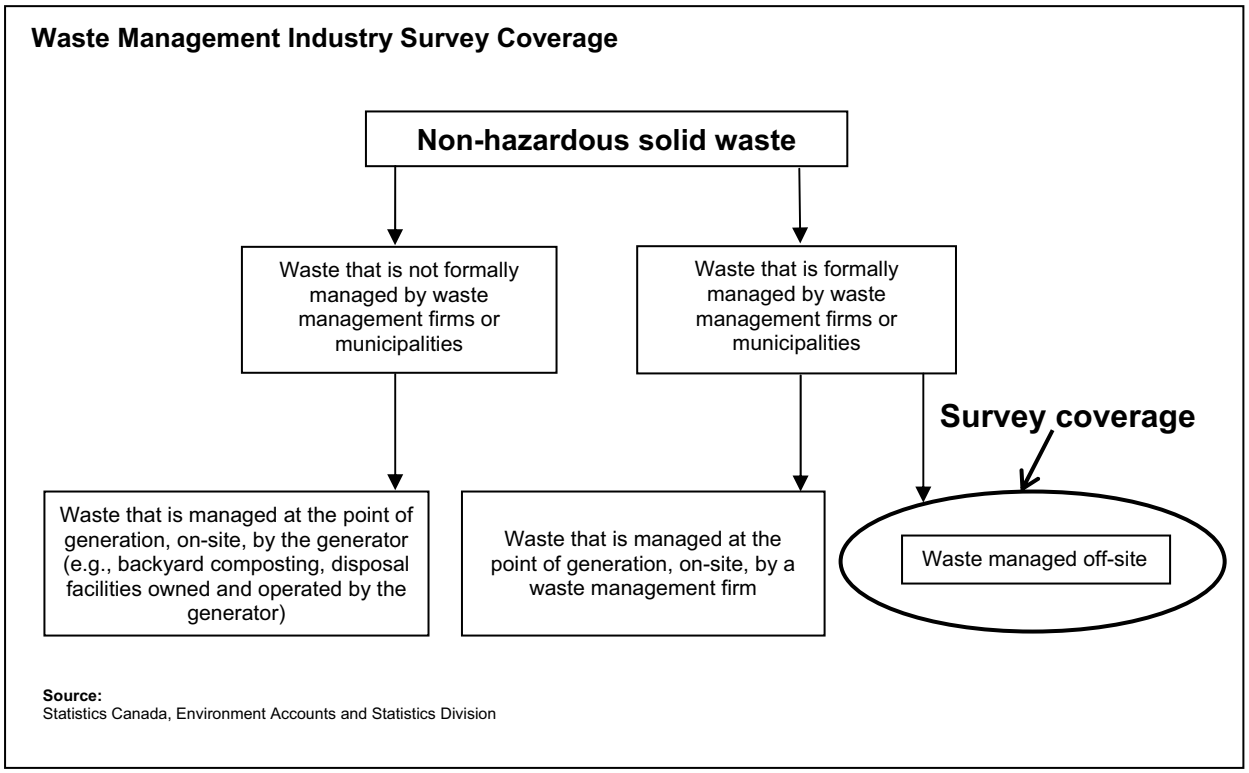
Extensive respondent follow-up was required in some cases. Returns for specific geographic areas were frequently processed together in order to build a clear picture of the service delivery area and to prevent either double counting or inadvertently missing pieces of information.

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 business 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

In-scope establishments for the 2006 survey cycle, a total of 998 fully completed and partially completed in-scope questionnaires were returned; 374 for the business sector and 624 for the government sector. For those questionnaires that were not returned, 159 were considered to be in-scope resulting in a combined total of 1,157 in-scope respondents for the two surveys.

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

Since the 2004 survey, some structural changes have occurred in the waste management industry. Looking at the business sector, of the establishments surveyed, 21 went out of business and 29 mergers took place. Another 51 businesses that had provided waste management services in 2004 did not provide these services in 2006 and were determined to be out-of-scope for the purpose of this survey. Among the local governments surveyed, two municipalities amalgamated, becoming either a part of an existing municipality or forming a new municipality and another four were found to be out-of scope for the 2006 cycle.

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 4.05.

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 so that the mailing list is well maintained and the respondents are 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 — Overall approach: data sources and methodology section, text box, **The classification of waste management services**”).

Assessing data accuracy

One way to assess data accuracy is to compare it to the trends of other data collected. For example, comparing the waste statistics for 2006 with those for 2004, it is apparent that there has been substantial revenue growth in the Canadian waste management industry. On a per capita basis, more non-hazardous waste was disposed and diverted during 2006 than in 2004. As would be expected, the upward trends seen in the waste quantity estimates are reflected in the financial and employment estimates of the business and government sectors of the industry.

Comparing the waste data with known economic trends is another way of validating the data. Economic growth[1] is one indicator of the general state of the economy. Positive growth, such as the 6.0% increase in GDP observed nationally from 2004 to 2006[2] , typically indicates an active economy: people spent more money on goods and services in 2006 than in 2004. This increase in production may contribute to an increase in waste production. For example, in an active economy, more goods and services are purchased by businesses and households. There is more packaging around these goods that must be disposed or recycled. The good itself maybe discarded or recycled once it is used. Or, an older item that the newly purchased good is replacing is disposed or recycled.

The active housing market[3] in many parts of Canada may have also contributed to the waste generation increase. Debris is created through the construction of new homes or refurbishing of existing ones. As well, when Canadians

1. Economic growth has been measured as Gross Domestic Product or the growth in the market value of all goods and services produced within Canada.
2. Statistics Canada, CANSIM, Table 379-0025, “Gross Domestic Product (GDP) at basic prices, by North American Industry Classification System (NAICS), annual”.
3. Statistics Canada, CANSIM, Table 027-0009, “Housing starts, under construction and completion”, annual”.

change homes they generate waste through their use and subsequent discarding of moving materials, purchases of new items for the home and the disposal of items that are unwanted.

Response rates

The overall response rate for the 2006 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 83% for the business sector and 88% for the government sector. An alternative response rate of 84% was calculated for the business sector based on total revenues.

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 form 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 quality of the imputed values was high.

The overall imputation rate for the business financial variables was 17%.

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 (88%) 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. Examples are those facilities where a local government owned a landfill but contracted out the operation of that landfill and both the government body and the contracted business reported for the landfill. The duplicated data were removed so that each landfill was reported for only once. Also, each of the two 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 missing values were obtained through an intensive period of follow-up through email or telephone calls. The 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 estimates 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 estimates.

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, it is believed that a significant quantity of non-residential waste is managed on-site by industrial generators. Also, much is 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. Anecdotal evidence suggests that these practices 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, for example wholesale of scrap metals or used clothing or those materials that are collected through deposit return systems and which are not processed at a material recovery facility.

Classification and measurement of waste flows

Improvements are constantly being sought with a view to standardize definitions of waste concepts and methods to calculate waste flows in Canada. While with each survey cycle improvements are made, some inconsistencies remain. For example, some jurisdictions consider the reuse of asphalt as recycling while other jurisdictions do not. Some include landfill cover materials in their quantity calculations and some do not.

In addition, various methods of waste measurement exist. Some facilities measure waste quantities by weight while other use volume and still others have no method of measurement. As reporting standards are agreed upon, Statistics Canada’s waste management surveys will be revised appropriately.

Comparability of data and related sources

Comparisons between data sources

As mentioned in the section on Data Accuracy, without a nationally standardized system of classification and measurement it is difficult to compare quantities of waste and recyclables between municipalities. Issues of confidentiality also impede these comparisons.

Quebec

In previous survey cycles, response burden has been reduced in the province of Quebec by using the results from a provincial survey administered by RÉCYC-QUÉBEC. Estimates for diversion and waste disposal have been routinely used in the statistical tables in this report. This arrangement is reviewed after each survey cycle in order to determine whether the data collected and published by RÉCYC-QUÉBEC are indeed comparable to those data collected through Statistics Canada surveys. For the reference year 2006, municipalities in Quebec were surveyed for the first time. Results from the Waste Management Industry survey were compared against the data from the provincial survey. Initial assessments of the RÉCYC-QUÉBEC data indicate that the estimates of the disposal and diversion are comparable. This comparability may be monitored and assessed in future surveys.

Comparisons over time

Data obtained from the 2006 survey are comparable with data from previous years for the following variables:

- Disposal data: comparable with 2002 and 2004. Some caution should be exercised when comparing disposal data prior to 2002 as exported wastes were not included in the estimates prior to 2002.
- Recycling data: comparable with 2000, 2002, 2004.
- Business sector financial data: Most variables comparable with 1995, 1996, 1998, 2000, 2002 and 2004. 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, and 2004. Some variables have been added or dropped from cycle to cycle.
- Some of the data for the years and variables listed above have been revised and the user should consult the Environment Accounts and Statistics Division for the latest estimates.

Revisions

The on-going development of nationally consistent methodologies will aid making future year to year comparisons possible. Data for the most recent year are subject to revisions. The overall biennial rate of revision for the disposal and diversion quantity data at the national level has been approximately 1-2% in each the past three survey cycles. Higher rates sometimes occur at the province/territory level. Revisions to financial and employment data have been negligible.

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]

However, it must be noted that the diversion figures presented in this report should be used with some caution. They are a proxy for total waste diversion in Canada. 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 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 or waste management boards or commissions as well as those facilities that are privately owned and operated. Compost data excludes estimates for on-site composting programs such as backyard composting. In addition, data from on-site composting of industrial wastes, for example, those firms engaged in the composting of wastes from primary resource extraction (for example, 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 waste or food wastes.

Construction and demolition waste

Includes wastes generated by construction, renovation and demolition activities. It generally includes materials such as wood, drywall, certain metals, cardboard, doors, windows, wiring, etc. 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.

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 all materials designated as hazardous, due to their nature or quantity, and requiring special handling techniques as specified by legislation or regulation.

Incineration

Incineration, in the context of waste, refers to the burning of waste. Most jurisdictions in Canada consider incineration to be disposal.

Industrial, commercial and institutional waste

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, restaurants, 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, 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

Includes solid waste from residential sources, which includes all households, 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 taken by the generator to depots, transfer stations and disposal facilities.

Sanitary landfill

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

Tipping 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 (for example, per tonne), volume-based (per cubic metre) or per item (fees that differ according to the type of material being disposed, such as white goods or tires) basis. Disposal fees are sometimes known as tipping fees.

Transfer facility

A facility at which wastes transported by vehicles involved in collection are transferred to other vehicles that will transport the wastes to a disposal 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.