

Electronic and electrical products sold and discarded in Yukon

Introduction

Many electronics and electrical products contain components that can cause an adverse effect to environmental and human health when thrown into the landfill. Toxic metals such as cadmium, antimony and lead can be found in electronic products, and valuable components such as copper and gold can be removed from these products. Many small appliances (electrical products) contain electronic components as well.

This data was first gathered in 2013 based on what was available at the time (from 2011 and 2012). More recent data (from 2016) is now available and is presented side-by-side with previous data for comparison.

The electronic product industry in particular has undergone a significant change in recent years with products becoming lighter-weight, and the per-capita sales of products increasing as these products become more common in daily life.

The estimated cost of recycling electronic and electrical products has decreased in recent years. This is partly due to a higher amount of waste being recycled, leading to greater cost efficiencies on a per-tonne basis, and also because of the expansion of e-waste recycling facilities in Canada.

This data assumes that all products are purchased in Yukon and disposed of in Yukon. While this is not true in reality, there are no accurate estimates for cross-border shopping in Yukon. Implementation of the *Designated Material Regulation* would require collection and remittance of surcharges from designated products purchased online, and Yukon government would work with a national-level organization to ensure online sales are captured. There is no way to capture surcharges on products purchased in-person outside of Yukon.

This documents presents information on sales, disposal and recycling of electronic products, followed by information on sales, disposal and recycling of electrical products.

Electronic products

Electronic products sold in Yukon

There are no sources of direct data available on the number of electronic and electrical products sold each year in Yukon. Therefore estimates of sold and discarded electronics must be derived from other sources, such as other jurisdictions and estimates from the industry.

	Data from 2011/2012		Data from 2016	
Source of data	In 2012, the Government of Northwest Territories commissioned a report that estimated the quantities of electronic products purchased and discarded in NWT. ¹ Since Yukon and NWT share many characteristics (remote location, small population, and out-of-territory purchasing), this data was seen as very relevant to Yukon. Saskatchewan also published data from their program with very similar categories to Yukon's proposed program.		The data regarding per-capita sales presented below is an average of per-capita sales from four other jurisdictions in Canada,	
Categories	Units Purchased Per capita (average of NWT and SK)	Units Purchased (based on 2012 Yukon population)	Units Purchased	Units Purchased (based on 2016 Yukon population)
Desktop computers	0.083	2,967	0.031	1,107
Portable computers	0.208	7,494	0.152	5,451
Display (<29")	0.054	1,945	0.054	1,943
Display (>30")	0.054	1,945	0.077	2,759
Personal or portable audio/video systems	0.208	7,494	0.606	21,738

¹ Dessau Consultants prepared for the Government of Northwest Territories. *Inventory and Feasibility Assessment of Electronic Waste Recovery in the Northwest Territories*. December 2012.

http://www.enr.gov.nt.ca/sites/enr/files/web_pdf_ed_wrr_inventory_feasibility_assessment_final_report_10_december_2012.pdf

	Data from 2011/2012		Data from 2016	
Home audio/video systems	0.168	6,057	0.131	4,707
Desktop printers/fax machine	0.153	5,511	0.054	1,952
Computer peripherals	0.105	3,774	0.117	4,191
Non-cellular phones	0.133	4,798	0.059	2,121
Cellular phones and wireless devices	0.026	936	0.146	5,238
Vehicle audio/video systems (after-market)	0.150	5,394	0.020	702
Total		48,314		51,908

Electronic items discarded in Yukon

	Data from 2012-2013	Data from 2014- 2016
Source of data	<p>One source of data is a survey conducted by the Environment and Natural Resources Department of the Government of Northwest Territories in the spring of 2012. Respondents provided information on the type of electronics, the number of non-functioning (stored) items. The per-capita disposal of electronic items was extrapolated and multiplied by Yukon's population. The results showed 6.86 kg/capita.²</p> <p>This estimate is similar to British Columbia and Saskatchewan in the early years of their recycling programs at 4 to 5 kg/capita annually. An average of 5 kg/capita in Yukon in 2013 is equivalent to 180 tonnes.</p>	<p>Newer, lower weight technology means that annual per-capita weights have decreased in recent years.</p> <p>The per-capita average from British Columbia, Saskatchewan, Quebec, Nova Scotia and Prince Edward Island is 3.5 kg/capita. Based on Yukon's 2016 population, this is equivalent to 133 tonnes of electronic products disposed each year.</p> <p>This estimate contrasts with the United Nations Global E-Waste Monitor Report which estimated that Canadians generate 20.4 kg/inhabitant per year in 2014³ Based on this estimate, e-waste generated in Yukon was determined to be in the range of 9 to 10.4 kg per capita (or 325 to 375 tonnes total).</p>

Cost of recycling in Yukon

Currently, Whitehorse residents who wish to recycle electronic waste can drop it off at the municipal landfill for tipping fees ranging from \$5 to \$40. The remaining municipal and unincorporated solid waste facilities accept electronic waste at no charge. The Government of Yukon funds this program using general revenues. Electronic waste is shipped to electronics recyclers in southern Canada.

² Dessau Consultants prepared for the Government of Northwest Territories. *Inventory and Feasibility Assessment of Electronic Waste Recovery in the Northwest Territories*. December 2012.

http://www.enr.gov.nt.ca/sites/enr/files/web_pdf_ed_wrr_inventory_feasibility_assessment_final_report_10_december_2012.pdf

³ United Nations Report: THE GLOBAL E-WASTE MONITOR, Quantities, flows, and resources. 2014. <https://i.unu.edu/media/unu.edu/news/52624/UNU-1stGlobal-E-Waste-Monitor-2014-small.pdf>

	Data from 2013	Data from 2016
Source of data	<p>In 2013, the average cost/tonne of electronic and electrical recycling from the six established Canadian programs was \$1330/tonne.</p> <p>Based on the distance between Yukon and markets, and the expected backlog of heavier, older equipment that is difficult to recycle, a cost estimate of \$2,000 per tonne was used to make these estimates.</p>	<p>The final cost per tonne in Yukon under the 2016/17 publicly tendered e-waste transportation and recycling contract was \$1,440/tonne.</p> <p>An average cost estimate of \$1500/tonne was used for the calculations below, as there is still expected to be a backlog of heavier, older equipment that is difficult to recycle upon establishment of free recycling depots.</p>

Analysis of options

British Columbia surcharges and categories

	Units	Surcharge	Total
Desktop computers	2,967	\$2.25	\$6,675
Portable computers	7,494	\$1.00	\$7,494
Display (<29")	1,945	\$9.00	\$17,502
Display (>30")	1,945	\$19.00	\$36,948
Personal or portable audio/video systems	7,494	\$0.40	\$2,998
Home audio/video systems	6,057	\$2.50	\$15,143
Desktop printers/fax machine/peripheral	5,511	\$3.50	\$19,287
Non-cellular phones	3,774	\$0.45	\$1,698
Cellular phones and wireless	4,798	\$0.07	\$336
Vehicle audio/video systems (aftermarket)	936	\$2.50	\$2,341
Computer peripheral	5,394	\$0.00	\$0
		Sum	\$110,422
Tonnes of waste that can be recycled @ \$1500/tonne			74 tonnes

Yukon 2016 proposed regulation surcharges and categories

	Units	Surcharge	Total
Desktop computers	2,967	\$15.00	\$44,503
Portable computers	7,494	\$10.00	\$74,939
Display (<29")	1,945	\$12.00	\$23,336
Display (>30")	1,945	\$30.00	\$58,339
Personal or portable audio/video systems	7,494	\$6.00	\$44,963
Home audio/video systems	6,057	\$10.00	\$60,572
desktop printers/fax machine/peripheral	5,511	\$12.00	\$66,128
Non-cellular phones	3,774	\$2.00	\$7,547
Cellular phones and wireless	4,798	\$2.00	\$9,597
Vehicle audio/video systems (aftermarket)	936	\$6.00	\$5,618
Computer peripheral	5,394	\$1.00	\$5,394
		Sum	\$400,935
Tonnes of waste that can be recycled @ \$1500/tonne			267

Electrical products

Electrical products sold

There are no direct sources of data or estimates of the number of electrical products sold in Yukon. There is limited data available from the British Columbia program.

	Data from 2013	Data from 2016
Source of data	The British Columbia Electrical product recycling program 2013 annual report states that 1.56 electrical products were sold per capita in 2013. Based on the Yukon population, this means approximately 56,000 units. However, the British Columbia contains eight additional product categories than the proposed Yukon program. Therefore, it is expected that Yukon units will be lower than this. It is estimated that this value ranges from 23,000 to 36,000 units.	The British Columbia Electrical product recycling program 2016 annual report states that 1.69 electrical products were sold per capita in 2016. Based on the Yukon population, this means approximately 64,300 units. However, the British Columbia contains eight additional product categories than the proposed Yukon program. Therefore, it is expected that Yukon units will be lower than this. It is estimated that this value ranges from 23,000 to 36,000 units.

Electrical products discarded

	Data from 2013	Data from 2016
Source of data	Based on 0.69kg/capita collection from British Columbia in 2013, an estimated 25.0 tonnes of electrical waste was generated in Yukon each year.	Based on 0.96kg/capita collection from British Columbia in 2016, an estimated 36.8 tonnes of electrical waste is generated in Yukon each year.

Cost of recycling

Currently, there are no options to recycle electrical products in Yukon. Electronic and electrical products are processed at the same facilities and so it can be assumed that the cost of recycling of electrical products will be the same as electronic products.

	Data from 2013	Data from 2016
Source of data	<p>In 2013, the average cost/tonne of electronic and electrical recycling from the six established Canadian programs was \$1330/tonne.</p> <p>Based on the distance between Yukon and markets, and the expected backlog of heavier, older equipment that is difficult to recycle, a cost estimate of \$2,000 per tonne was used to make these estimates.</p>	<p>The final cost per tonne in Yukon under the 2016/17 publicly tendered e-waste transportation and recycling contract was \$1,440/tonne.</p> <p>An average cost estimate of \$1500/tonne was used for the calculations below, as there is still expected to be a backlog of heavier, older equipment that is difficult to recycle upon establishment of free recycling depots.</p>

Analysis

Since 2013, the British Columbia program has consolidated several product categories and reduced surcharges. The current categories and surcharges are presented below

Data is not available about individual categories. As such, ranges are presented below.

British Columbia surcharges and categories

	Surcharge	
Kitchen Countertop - Motorized	\$0.50	Low end (23,000 units): Revenue ranges from \$21,000 to \$22,000 High end (36,000 units): Revenue ranges from \$31,000 to \$34,000
Kitchen Countertop - Heating	\$0.80	
Kitchen Countertop - Heating -Coffee/Tea	\$0.70	
All microwaves	\$6.25	
Time Measurement	\$0.40	
Weight Measurement	\$0.40	
Garment Care	\$0.70	
Air Treatment appliances	\$1.00	
Personal Care appliances	\$1.00	
Full size floor cleaning devices	\$0.40	
Small floor cleaning devices	\$2.50	
Tonnes of waste that can be recycled @ \$1500/tonne		

Yukon 2016 proposed regulation surcharges and categories

	Surcharge	
Kitchen Countertop - Motorized	\$2.00	Low end (23,000 units): Revenue ranges from \$50,000 to \$60,000 High end (36,000 units): Revenue ranges from \$80,000 to \$90,000
Kitchen Countertop - Heating	\$2.00	
Kitchen Countertop - Heating -Coffee/Tea	\$2.00	
All microwaves	\$8.00	
Time Measurement	\$1.00	
Weight Measurement	\$1.00	
Garment Care	\$2.00	
Air Treatment appliances	\$1.00	
Personal Care appliances	\$2.00	
Full size floor cleaning devices	\$5.00	
Small floor cleaning devices	\$3.00	
Tonnes of waste that can be recycled @ \$1500/tonne		

