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## ENVIRONMENTAL IMPACT

End Fate report for aluminum, plastic, glass, polycoat and other materials.

Detailed report on the reduction in greenhouse gas emissions, energy savings, and CO<sub>2</sub> equivalent reduced from recycling.

## 5.1 ENVIRONMENTAL REPORT

The Government of British Columbia has adopted public policies intended to promote a low carbon economy. As a stewardship agency operating under a provincial regulation, Encorp compiles applicable data, analyzes and reports on the impacts of its stewardship activities.

In 2016, Encorp recycled 92,910 metric tonnes of used beverage containers. The energy saved through the recycling of these materials has been converted into tonnes of carbon dioxide equivalent (CO<sub>2e</sub>) the common measure of greenhouse gases (GHGs), based on the US Environmental Protection Agency's Waste Reduction Model (WARM). The avoided emissions published in this report were calculated using the WARM version 13 (06/14) (*Refer to End Fate table on page 22*).

**In total, Encorp's activities in 2016 contributed to the reduction of about 101.9 thousand tonnes of CO<sub>2</sub> equivalent being released into the atmosphere, compared to 98.8 thousand tonnes in 2015.**

While recycling has an overall net benefit in terms of energy and emissions savings, the recycling process itself requires energy and thus has GHG emissions associated with it. When estimating net savings Encorp calculates the GHG emissions specifically associated with its stewardship activities.

Since Encorp is not a manufacturing company, the majority of our associated GHG emissions come as a result of transporting materials as well as heating and powering our network of facilities.

Therefore, we define Encorp's GHG inventory boundary from the point that empty containers enter into the Encorp system at either a depot or retailer, right through to when the materials are delivered to the end processors for recycling into new products.

Greenhouse gas emissions (GHGs) are estimated using conversion factors and methodologies developed by the World Resource Institute's Greenhouse Gas Protocol (WRIGGP). The collection, transportation and processing services provided to Encorp are done through third party independent contractors and the emissions produced by these activities are classified as Indirect Scope 3 GHG emissions in accordance with the WRIGGP. As there is limited data available for Scope 3 emissions we accept that our information may be less accurate.

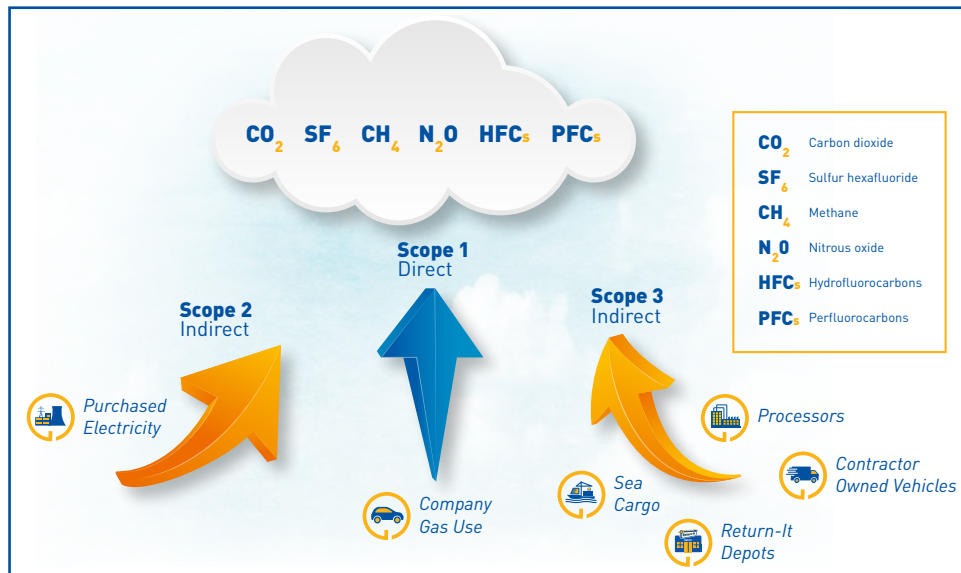
Emission calculations from electricity purchased were based on data gathered from a number of depots and processors in each region of the province. Results were used to estimate the energy use per metric tonne of material collected, then extrapolated to the total weight of used beverage containers collected in the province.

The estimated energy consumption in kWhs was then converted into the carbon dioxide emissions using the calculators offered by the WRIGGP. For estimated emissions inventory refer to the table on page 21.

## EMISSIONS INVENTORY SUMMARY








Type of Emission	2016 (tonnes CO <sub>2</sub> )	2015
<u>Direct emissions</u> are emissions from sources that are owned or controlled by Encorp		
Employee travel – gas use	14	28
<u>Indirect emissions</u> occur as a consequence of Encorp’s activities, but are from sources not owned or controlled by Encorp. Included are emissions from purchased electricity consumed by Encorp’s offices, depots, processors and transporters. <sup>i</sup>		
<u>Offices</u> (excluding head office)		
Purchased electricity in leased buildings (excluding head office)	1	1
Employee domestic air travel/business ferry travel	11	9
<u>Depots</u> – all purchased electricity/all natural gas consumed in owned or leased buildings	209	170
<u>Processors</u> – all purchased electricity/gas consumed in owned or leased buildings	65	48
<u>Transportation</u> – depots to processors		
Diesel fuel (trucks)	3,657	3,738
<u>Transportation</u> – processors to end markets		
Diesel fuel (trucks)	2,335	1,108
Rail (based on metric tonne km)	–	363
Sea Cargo (based on metric tonne km)	3,042	2,954
<b>Total Emissions from all sources</b>	<b>9,334</b>	<b>8,420</b>

<sup>i</sup> All indirect emissions except for office use were calculated based on the sample data provided by selected Depots, Processors, and Transporters.



## 5.2 CONTAINER RECYCLING END FATE REPORT

Material collected by Encorp is shipped to recyclers for further processing into new material in accordance with Section 8 of the Recycling Regulation.

Material Type	Fate of Material (2016)	Containers Sold (% of total)	Recovery % (by weight)	Energy savings	Weight diverted from landfill (mt)	Tonnes CO <sub>2</sub> reduced
Aluminum 	Aluminum cans collected in 2016 were sold and shipped to a re-melt facility in the USA and turned back into sheet stock for new cans.	33.5%	82.2%	93%	5,023.5	50,645
Plastic 	Plastic containers collected in 2016 were sold to Merlin Plastics and shipped to their two separate facilities in British Columbia and Alberta to be cleaned and pelletized to become new raw material and fibres.	38.5%	75.8%	86%	10,534.5	12,441
Glass 	Glass containers collected in 2016 were processed in British Columbia and shipped to various end markets including a plant that produces fibreglass insulation in Alberta; a facility that produces new glass bottles in Seattle USA; a facility that manufactures sandblasting materials in Quesnel B.C.; and municipal sites that use crushed glass as construction aggregates.	18.2%	88.3%	34%	74,710.4	25,977
Polycoat 	Polycoat containers collected in 2016 were sold to ICF International and shipped to manufacturing plants in South Korea, Thailand and India for material recovery and production of tissue paper from the recovered fibre.	8.7%	67.3%	53%	1,842.0	9,745
Pouches 	Stand up pouches made of layers of plastic and aluminum foil did not find end markets in 2016 and were stored in Delta. Testing conducted to turn them into septic tanks failed as the shredded material had too much aluminum content. Encorp continues to explore potential end markets and continues to send material for testing and evaluation to potential end recyclers.	0.3%	37.7%	53%	8.2	43
Bag-In-Box 	The plastic bladders inside the Bag-In-Box containers were shipped to a manufacturing plant in South Korea where the recycled plastic was made into reservoir tanks. Cardboard was recycled by local processors.	0.3%	47.9%	53%	444.6	2,357
Bi-Metal 	Bi-Metal containers collected were sold to scrap metal dealers for metal recovery.	0.5%	78.9%	82%	347.1	707
<b>2016 TOTAL</b>		<b>100%</b>	<b>85.4%</b>		<b>92,910.3</b>	<b>101,915</b>
<b>2015 TOTAL</b>			<b>87.4%</b>		<b>92,702.8</b>	<b>98,801</b>