OCEAN LEGACY FOUNDATION

British Columbia's Beverage Container Legacy: The Missing Millions

Table of Contents

Table of Figures

Table of Tables

Executive Summary

Ocean Legacy Foundation: a British Columbia-based, internationally recognized, non-profit organization working to identify, clean-up, and prevent plastic waste from entering tributary and marine ecosystems. Ocean Legacy Foundation is calling on the BC government to make BC's deposit refund system the leading Canadian beverage container recycling program in stewarding its beverage containers and bottle caps, ensuring none of these plastics end up in the ocean.

Every year, an estimated 8 million tonnes is deposited into our oceans and waterways globally, 43% of which is single-use, disposable plastics such as beverage containers and their caps, straws, plastic bags, and plastic cutlery. Mismanaged beverage containers and bottle caps are major contributors to ocean plastics litter across Canada.

BC was the first jurisdiction in the world to implement a regulated deposit refund system for beverage containers in 1970. Deposit refund systems have been proven world-wide to be the most effective tool to reduce beverage container litter and increase beverage container litter clean-up. However, BC deposit refund system return rates have been declining, and the province is not meeting its own regulated target for several beverage container sub-categories, including small plastic containers (≤1L), polycoat containers and pouches, and bag-in-a-box. Specifically, the percentage of small plastic containers in the beverage container stream is growing, while the number not returned for recycling is on the rise. At the same time, Alberta and Saskatchewan deposit refund systems have achieved average return rates 9% higher than BC in 2017.

Over a 5-year period (2013-2017), more than 1.6 billion beverage containers were not returned within BC's deposit refund system and could be coating BC's shorelines or floating in ocean currents.

In 2018, the European Parliament and Council passed a Single-Use Plastics Directive that requires its member states to increase the collection and recycling of beverage containers to achieve a 90% capture rate by 2025. At the same time, Canada led the G7 in developing the Ocean's Plastic Charter, while the Canadian Council of Ministers announced its Strategy on Zero Plastic Waste. The Canadian government also unanimously passed Motion 151, which recognized the need for all Canadian communities to do their part to combat plastic pollution in and around aquatic environments.

BC has the opportunity to become a world leader again in recycling beverage containers through a number of proven approaches, including:

- Raise Deposit Levels – higher deposit rates have been proven to yield better return rates
- Expand the deposit refund system to manage all beverage containers – collecting and recycling all beverage containers reduces consumer confusion and improves container return rates
- Keep caps on – training consumers to leave caps on their containers reduces littering and ensures this material can be recycled

Increasing the effectiveness of BC's beverage container recycling system will result in fewer containers becoming ocean litter, while reducing greenhouse gases through recycling, avoiding taxpayer waste management costs, and creating green jobs.

Ocean Legacy Foundation calls on the BC government to:

1. Increase the regulated deposit rate.
2. Add all beverage containers to the deposit refund system.
3. Require producers to collect and report on the recycling of bottle caps.
4. Raise regulated targets to at least that achieved by Alberta and Saskatchewan, with long-term targets matching the EU.
5. Enforce the regulated targets in a meaningful way, such as requiring producers to pay for the clean-up of ocean plastics equal to the amount by weight that they fail to collect and recycle.

Ocean Legacy Foundation

We are the Ocean Legacy Foundation: a British Columbia-based, internationally recognized, non-profit organization that was founded in 2014 to end ocean plastic waste. We work to identify, clean-up, and prevent plastic waste from entering tributary and marine ecosystems. Since 2014, we have collected over 70 tonnes of plastic waste from five different countries including focused operations in the Pacific Northwest, which have formed and enabled plastic waste removal collaborations worldwide.

We use a combination of tools and sustainable technologies, such as mapping (Figure 1 and Figure 2), education, collaboration, skills training, research, policy development, clean-up expeditions and plastic-to-fuel technologies, which when integrated together make up Ocean Legacy's unique and globally-leading Marine Debris Solutions Program.

Our goal is to give all types of plastic waste and litter economic value and to encourage greater global stewardship around ocean health issues. We believe that every action towards eliminating plastic pollution counts. We also believe that we need jurisdictions around the world to do their part to clean up the plastics that exist while preventing new plastics from entering ocean ecosystems. Together, we believe we can leave an ocean legacy that can sustain the health of our waterways for present and future generations.

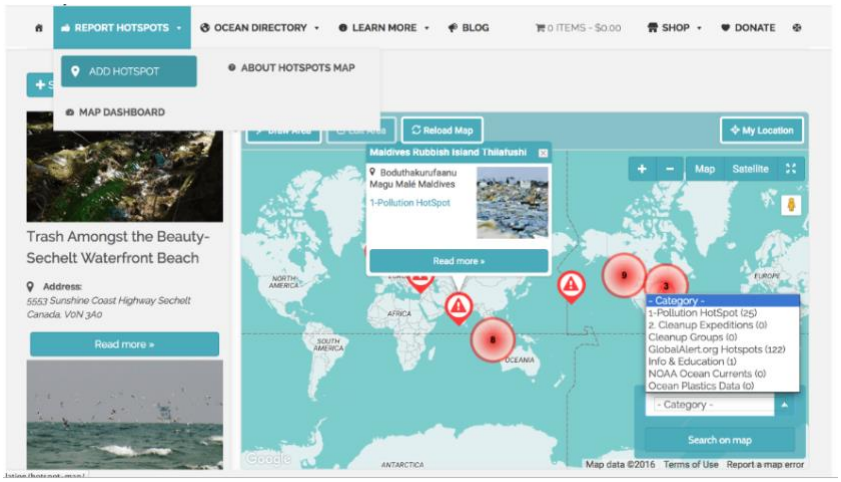

FIGURE 1: A VISUAL OF OCEAN LEGACY FOUNDATION'S INTERACTIVE HOTSPOT MAPPING TOOL[1].

[1]Ocean Legacy Foundation, 2019. https://oceanlegacy.ca/help-info/

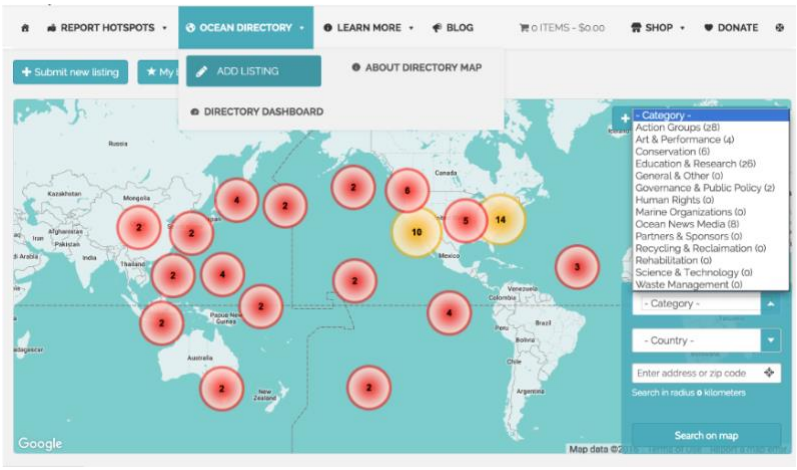

FIGURE 2: OCEAN LEGACY FOUNDATION'S GLOBAL INTERACTIVE DIRECTORY DASHBOARD MAPPING TOOL[2].

The Ocean Plastics Crisis

Oceans play a key role in our survival; we depend on the ocean. They provide sustenance and play, an integral role in regulating our global climate. Marine life depends on them, including 25 species at risk off British Columbia's shores[3].

Canada has more coastline than any other country in the world[4], including our beautiful British Columbia (BC) shorelines, which is home to seabirds, whales, and sensitive marine ecosystems. Canadian marine activities dependent on the health of our oceans and contribute more than $30 billion to our GDP[5]; providing more than 320,000 Canadian jobs.

Yet we are facing an undeniable, planet-wide ocean plastic waste crisis. Every year, of the more than 300 million tonnes of plastic produced globally[6,7], an estimated 8 million tonnes is

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[2] Ocean Legacy Foundation, 2019. https://oceanlegacy.ca/help-info/. Retrieved February 8, 2019.

[3] Fisheries and Oceans Canada, 2018. Search aquatic species at risk: British Columbia. Available at: http://www.dfo-mpo.gc.ca/species-especes/sara-lep/identify-eng.html?province=British%20Columbia.

[4] Office of the Prime Minister, 2016. Canada's Ocean Protection Plan. Available at: http://www.tc.gc.ca/media/documents/communications-eng/oceans-protection-plan.pdf . Retrieved: February 8, 2019.

[5] Fisheries and Oceans Canada, 2018. Maritime sector in Canada summary tables. Available at: http://www.dfo-mpo.gc.ca/stats/maritime-eng.htm. Retrieved: February 8, 2019.

[6] European Commission, 2018. A European strategy for plastics in a circular economy. Available at: http://ec.europa.eu/environment/circular-economy/pdf/plastics-strategy-brochure.pdf. Retrieved February 8, 2019.

[7] UNESCO, 2017. Facts and figures on marine pollution. Available at: http://www.unesco.org/new/en/natural-sciences/ioc-oceans/focus-areas/rio-20-ocean/blueprint-for-the-future-we-want/marine-pollution/facts-and-figures-on-marine-pollution/. Retrieved February 8, 2019.

deposited into our oceans and waterways[8]. Of this, 43% is single-use, disposable plastics such as **beverage containers and their caps**, straws, plastic bags, and plastic cutlery[9].

Shorelines all around the world are becoming coated in plastic waste, the oceans are becoming the largest "dumps" on the planet, and aquatic ecosystems are being transformed into "plastic soup" [10,11,12]. Ocean plastics are ubiquitous, polluting our freshwater ways and shorelines; causing damage to marine wildlife, habitat; and compromising human health. According to UNESCO[13], plastic debris causes the deaths of more than a million seabirds and 100,000 marine mammals every single year. Plastics have been found in the stomachs of birds, fish and whales; in our drinking water, beer, seafood, and table salt; and even in the human body[14]. Without intervention, global ocean plastics are expected to double by 2035[15]. If practices remain unchanged, it's expected there will be more plastic than fish in the ocean (by weight) by 2050[16].

[8] Jambeck, J; Geyer, R; Wilcox, C, Siegler, T.S.; Perryman, M, Andrady, A; Narayan; Lavender Law, K., 2015. Plastic waste inputs from land into the ocean. Science 13 Feb 2015: vol. 347 (6223). pp. 768-771

[9] CCME, 2018. Strategy on Zero Plastic Waste. Available at: https://www.ccme.ca/files/Resources/waste/plastics/STRATEGY%20ON%20ZERO%20PLASTIC%20WASTE.pdf. Retrieved: February 14, 2019.

[10] Charles Moore, 2009. Seas of Plastic. Ted Talk. Retrieved: February 6, 2019. https://www.ted.com/talks/capt_charles_moore_on_the_seas_of_plastic?language=en.

[11] Plastic Soup Foundation, no date. Available at: https://www.plasticsoupfoundation.org/en/files/what-is-plastic-soup/. Retrieved: February 6, 2019.

[12] Cho, R., 2011. Blog: Our Oceans: A Plastic Soup. January 26, 2011. Available at: https://blogs.ei.columbia.edu/2011/01/26/our-oceans-a-plastic-soup/. Retrieved: February 6, 2019.

[13] UNESCO, 2017. Facts and figures on marine pollution. Available at: http://www.unesco.org/new/en/natural-sciences/ioc-oceans/focus-areas/rio-20-ocean/blueprint-for-the-future-we-want/marine-pollution/facts-and-figures-on-marine-pollution/. Retrieved: February 6, 2019.

[14] Parker, 2018. In a first, microplastics found in human poop. National Geographic. Environment: planet or plastics. Available at: https://www.nationalgeographic.com/environment/2018/10/news-plastics-microplastics-human-feces/. Retrieved: February 8, 2019.

[15] European Commission, 2018. A European strategy for plastics in a circular economy. Available at: http://ec.europa.eu/environment/circular-economy/pdf/plastics-strategy-brochure.pdf.

[16] Ellen MacArthur Foundation, 2017. The new plastics economy: rethinking the future of plastics & catalysing action. Available at: https://www.ellenmacarthurfoundation.org/assets/downloads/publications/NPEC-Hybrid_English_22-11-17_Digital.pdf. Retrieved February 8, 2019.

Beverage Containers Contribute to Ocean Plastics: The Facts

Mismanaged beverage containers and their caps are a big concern locally and globally. Despite deposit refund programs for plastic soft drink containers operating in every province except Manitoba and Ontario[17], they are major contributors to ocean plastics litter across Canada (Figure 3).

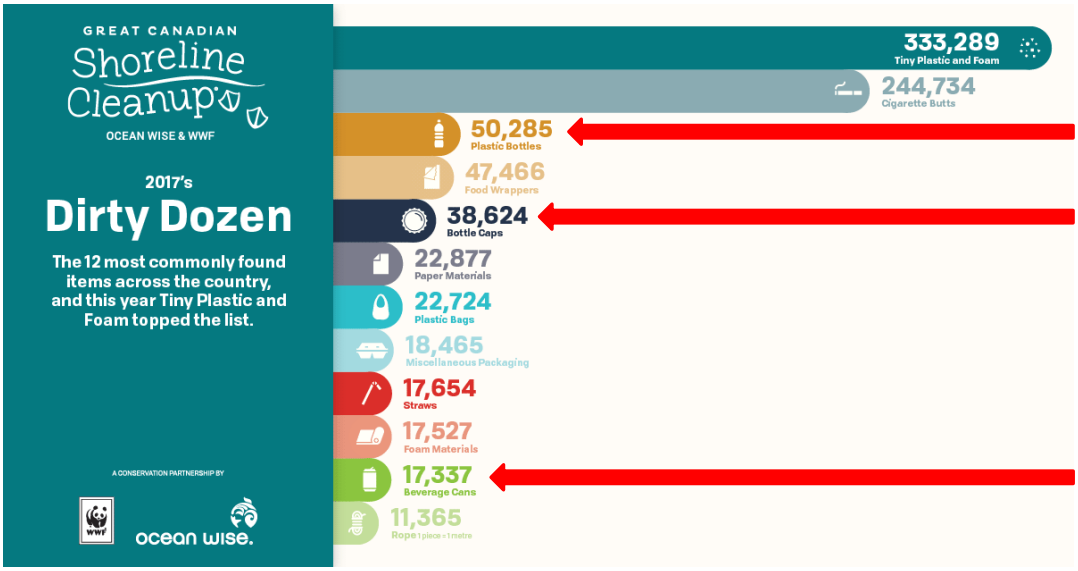

FIGURE 3: OCEAN WISE & WWF 2017 DIRTY DOZEN STATISTICS[18]

Beverage containers and their caps (and even drink box straws) enter the ocean through a variety of direct and indirect pathways. Direct pathways include: ocean dumping, shoreline littering, natural disasters and climatic variables such as blowing winds and rains (that pull beverage containers and other plastics from streetscapes, garbage cans, and recycling bins). The indirect pathways are through land-based sources (i.e., both inland and coastal communities) where plastic waste is allowed to funnel into stormwater runoff systems that eventually lead to the ocean[19],[20] (Figure 4).

[17] CM Consulting, 2018. Who pays what? An analysis of beverage container collection and costs in Canada, 2018. Available at: https://www.cmconsultinginc.com/wp-content/uploads/2018/10/WPW-2018-FINAL-5OCT2018.pdf. Retrieved February 10, 2019.

[18] WWF, 2018. 2017's Dirty Dozen. Available at: http://www.wwf.ca/newsroom/?uNewsID=27401#.

[19] National Oceanic and Atmospheric Administration, last revised February 1, 2019. Plastics. Available at: https://marinedebris.noaa.gov/info/plastic.html. Retrieved February 14, 2019.

[20] National Oceanic and Atmospheric Administration, 2018. Plastic marine debris. https://marinedebris.noaa.gov/sites/default/files/2018_Plastics_Fact_Sheet.pdf. Retrieved February 14, 2019.

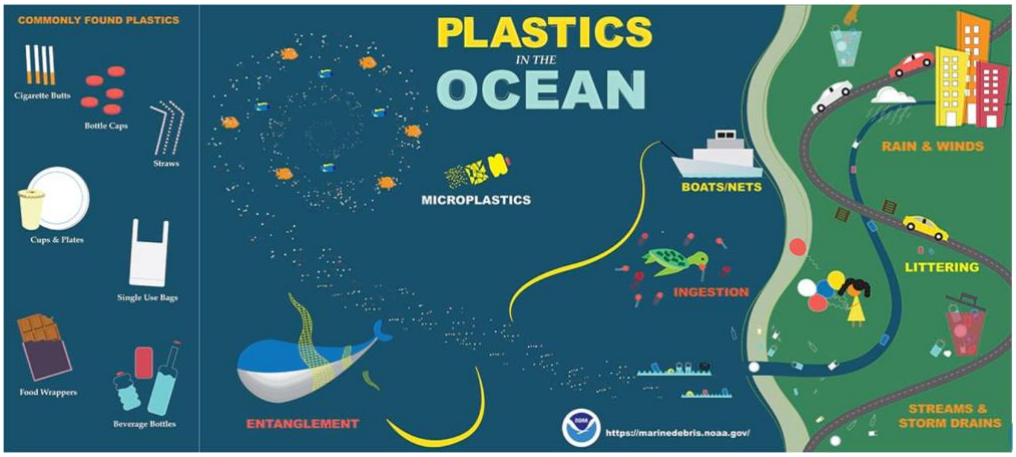

FIGURE 4: PLASTICS IN THE OCEAN (INFOGRAPHIC)[21]

Once in the ocean, polyethylene terephthalate (PET or PETE) beverage containers, like pop bottles, will eventually sink (due to their density compared to salt water) and become part of the ocean floor or can be swept back to shore[22]. Other plastic beverage containers made from high density polyethylene (HDPE), like milk jugs, and bottle caps (which can be made from HDPE or polypropylene) will float indefinitely, can be swept out to sea becoming caught in ocean currents (gyres) and travel great distances. Once in the ocean, containers and caps begin slowly degrading into microplastic fragments and can be consumed by marine life[23],[24]. WWF-Australia (2018) reports an estimated 40% of all marine mammals have been affected by eating marine plastics, and 56% of all whale and dolphin species have been recorded eating marine plastics. (Figure 5) [25]

According to the Ocean Conservancy, more than 80% of ocean plastics originate due to waste mismanagement by land-based sources, and three-fourths of this comes from uncollected waste or litter[26].

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[21] National Oceanic and Atmospheric Administration. 2011. Plastics in the ocean. Available at: https://marinedebris.noaa.gov/sites/default/files/OR%26R_Plastic_In_the_Ocean_Infographic_FINAL.pdf

[22] Smithsonian, 2018. Ocean: find your blue. Marine Plastics. Authored by the Ocean Portal Team. Reviewed by Dr. Jenna Jambeck, University of Georgia. April 2018. Available at: https://ocean.si.edu/conservation/pollution/marine-plastics. Retrieved: February 8, 2019.

[23] The Association of Plastics Recyclers, 2018. Recycling rigid plastics beyond bottles: caps on! Available at: https://www.plasticsrecycling.org/education/faqs/caps-on. Retrieved: February 9, 2019.

[24] Weule, 2017. Plastic and how it affects our oceans. ABC News. February 2017. Available at: https://www.abc.net.au/news/science/2017-02-27/plastic-and-plastic-waste-explained/8301316. Retrieved: February 9, 2019.

[25] WWF-Australia, 2018. Available at: https://www.wwf.org.au/news/blogs/plastic-in-our-oceans-is-killing-marine-mammals#gs.b0wHDpPb. Retrieved February 10, 2019.

[26] Ocean Conservancy, 2015. Stemming the Tide: Land-based strategies for a plastic- free ocean. Available at: https://oceanconservancy.org/wp-content/uploads/2017/04/full-report-stemming-the.pdf. Retrieved: February 8, 2019.

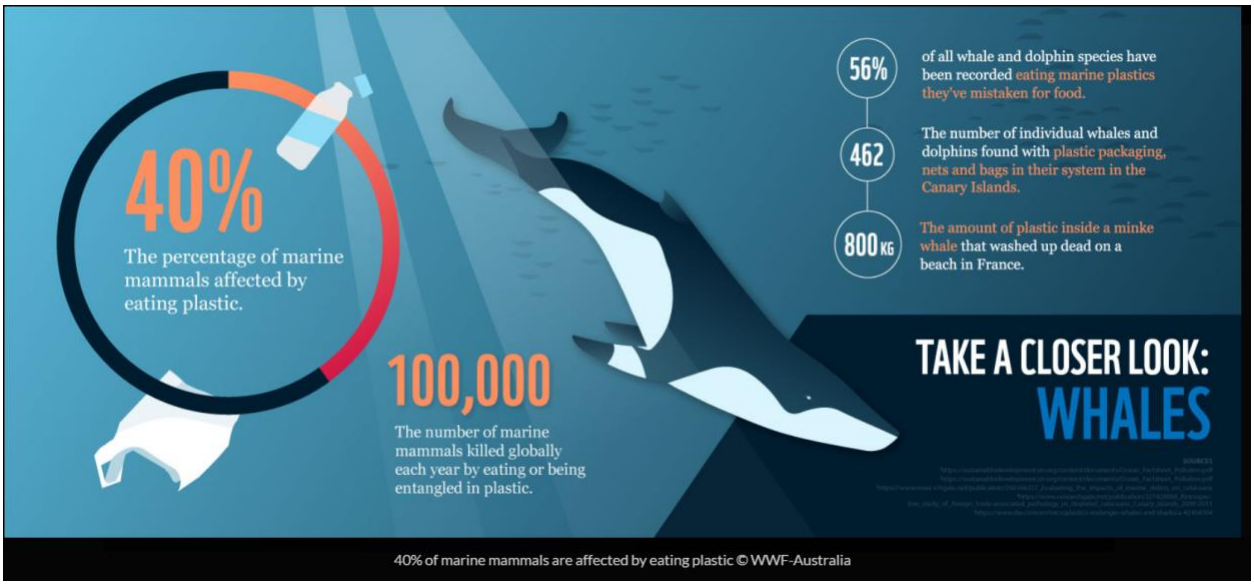

FIGURE 5: INFOGRAPHIC DEPICTING OF PERCENTAGE OF MARINE MAMMALS AFFECTED BY EATING PLASTIC (SOURCE: WWF-AUSTRALIA).

British Columbia's Leadership is Needed

BC was an early leader in tackling the issue of used beverage containers. In 1970, our province became the first jurisdiction in the world to implement a regulated deposit refund system for beverage containers, under its Litter Act[27]. In 1971, Oregon followed suit and became the first jurisdiction in the United States to implement a system[28]. Today, 40 jurisdictions (and counting) around the world have followed BC's lead and established their own deposit return systems to reduce litter and improve the collection and recycling of beverage containers[29].

BC now has the opportunity to show leadership once again. It's been fifty years since BC's deposit refund system was first implemented, and 15 years since its regulation was last updated. Unfortunately, its age is showing. Our deposit refund system (for all containers except beer) have seen declining, year-over-year returns (Figure 6 and Figure 7). At the same time, BC is not

[27] CM Consulting, 2012. Multi-Stakeholder Review of Prescriptive Measures in the Beverage Container Regulation Final Report. https://www2.gov.bc.ca/assets/gov/environment/waste-management/recycling/recycle/rel-res/multi_stakeholder_beverage_consultation.pdf.

[28] Container Recycling Institute, 2016. Bottle bill resource guide. Available at: http://www.bottlebill.org/. Retrieved February 10, 2019.

[29] CM Consulting and Reloop, 2018. Deposit Refund Systems for Beverage Containers: Global Review. Available at: https://reloopplatform.eu/wp-content/uploads/2018/05/BOOK-Deposit-Global-27-APR2018.pdf. Retrieved February 14, 2019.

meeting its own regulated target for several beverage container sub-categories[30], including: small plastic containers (≤1L); polycoat containers and pouches; and bag-in-a-box (Figure 8 to Figure 10).

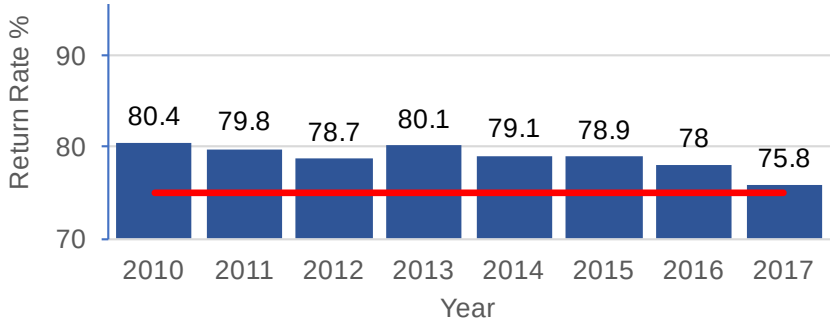

FIGURE 6: DECLINE IN ENCORP PACIFIC RETURN RATES 2010-2017

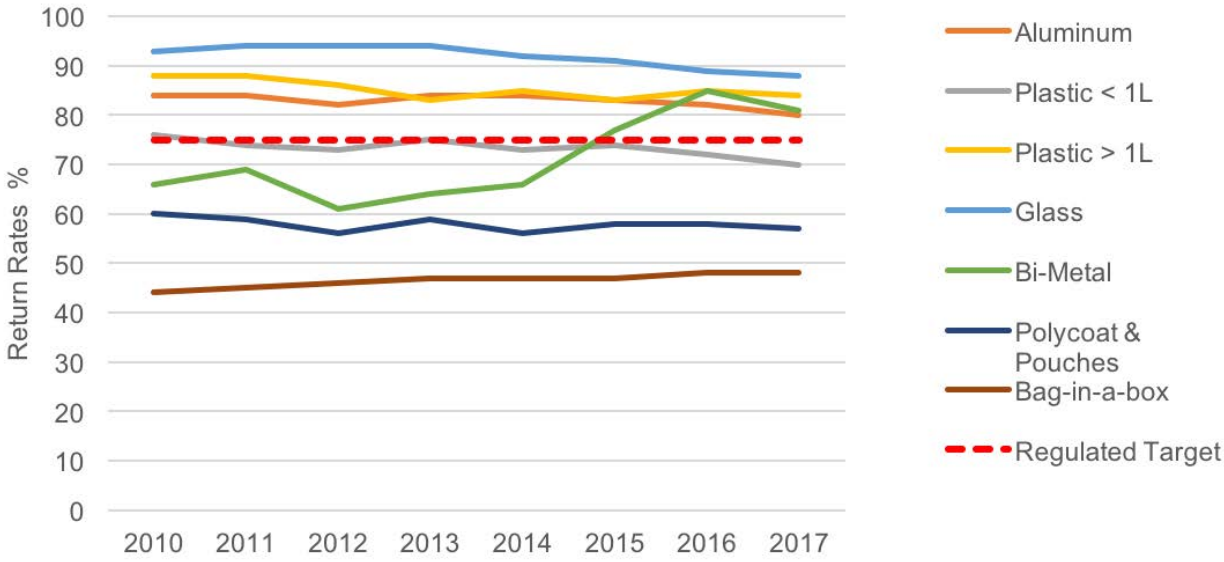

FIGURE 7: RETURN RATES BY CONTAINER SUB-CATEGORY

[30] Government of British Columbia. Recycling Regulation, Approval of extended producer responsibility plan. Section 5(1)(a)(i). Available at: http://www.bclaws.ca/Recon/document/ID/freeside/449_2004. Retrieved February 14, 2019.

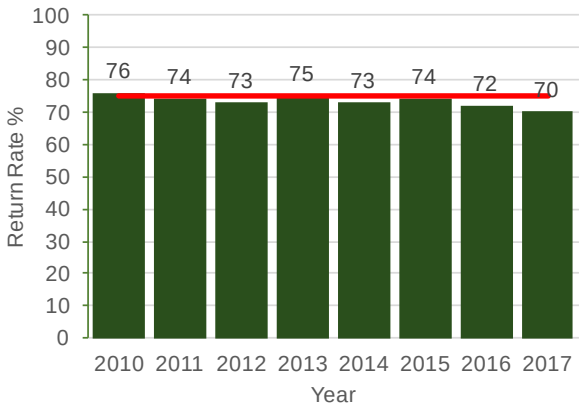

FIGURE 8: SMALL PLASTIC BEVERAGE CONTAINERS RETURN RATE

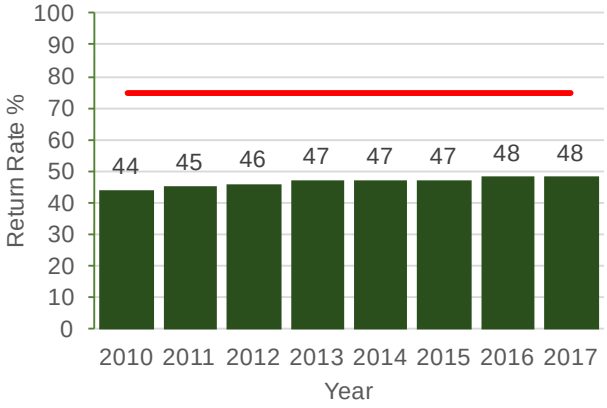

FIGURE 9: BAG-IN-A-BOX CONTAINERS RETURN RATE

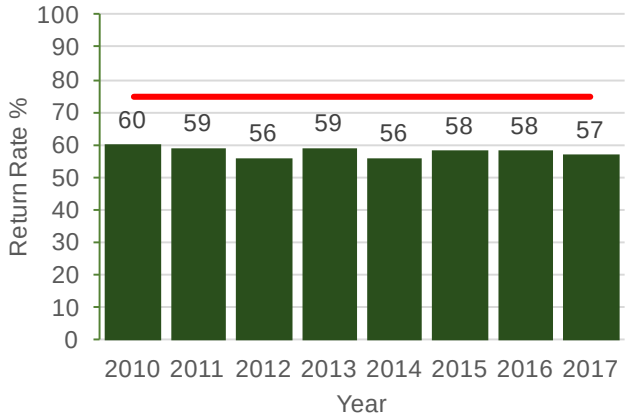

FIGURE 10: POLYCOAT AND POUCHES RETURN RATE

The decline in return of small plastic beverage containers seems to be a growing issue in the Encorp Pacific operated program. The percentage of these in this program is growing (from 30% in 2010 to 35% in 2017) and the number of small plastic containers lost (not returned for recycling) annually is on the rise (from 24% in 2010 to 30% in 2017) (see Table 1). Over the last five years, missing small plastic containers have made up large component of all missing containers in BC (see Table 2).

TABLE 1: SMALL PLASTIC BEVERAGE CONTAINERS SALES AND COLLECTION IN ENCORP PACIFIC'S PROGRAM[31]

ENCORP PACIFIC	Small plastic containers sold[32] (≤1L, units)	All containers sold (units)	% small plastic containers sold (% of total sold)	Small plastic containers lost (units)	% small plastic containers lost (% of total sold)
2010	380,805,378	1,277,506,339	30%	89,662,767	24%
2011	379,081,054	1,237,182,406	31%	100,400,220	26%
2012	381,385,703	1,237,108,765	31%	101,351,852	27%
2013	380,158,047	1,214,144,300	31%	96,286,321	25%
2014	397,071,333	1,224,579,061	32%	106,218,404	27%
2015	418,711,159	1,266,027,839	33%	109,526,421	26%
2016	431,900,607	1,282,922,473	34%	119,522,548	28%
2017	471,268,072	1,349,149,437	35%	143,627,268	30%

These results are disappointing when BC's performance is compared to the results achieved by Alberta and Saskatchewan, where deposit refund systems have achieved average return rates 5% higher than BC in 2017 (Table 2). The differences in regulated materials between the three provincial programs are noted.

[31] Encorp, 2017. Annual Report. Encorp Pacific, 2017. 2017 Annual Report. Page 21. Available at: https://www.return-it.ca/ar2017/pdf/AnnualReport.pdf. Retrieved November 2, 2018.

[32] In all tables and figures, units for plastic containers ≤1L or <1L include all plastic containers for the appropriate size category (i.e., including liquor and non-liquor containers). This was necessary because in 2017, Encorp began reporting plastic containers as one category regardless of the beverage it contained. Prior to this Encorp reported plastic containers and plastic liquor containers for both ≤1L and <1L).

TABLE 2: COMPARISON OF RETURN RATES IN BC, AB, AND SK OVER A 5-YEAR PERIOD[33]

YEAR	BC ENCORP PACIFIC + BRCCC Beer Cans (combined return rate)	AB ABCRC (return rate)	SK SARCAN (Return rate)
2013	84%	82%	82%
2014	83%	83%	86%
2015	83%	85%	82%
2016	82%	86%	87%
2017	80%	85%	85%
Regulated materials included	All ready-to-serve, excluding milk, milk substitutes and meal replacements. Beer cans.	All ready-to-serve, including milk, milk substitutes and meal replacements.	All ready-to-serve, including milk, milk substitutes. Excludes meal replacements.
Regulated materials not collected by organization(s)	Refillable Beer	Refillable Beer	Refillable Beer
Minimum deposit	5 cents Encorp containers 10 cents beer cans	10 cents	10 cents

BC's declining beverage container recycling performance is creating the perfect ocean litter storm in a province situated with a large coastline. In 2017, more than **387 million beverage**

[33] Return rates for Encorp, Alberta Beverage Container Recycling Corporation (ABCRC), and SARCAN were taken from each organization's Annual Report for each respective year. Like Encorp, neither ABCRC nor SARCAN manage domestic refillable beer bottles; in BC, AB and SK refillable beer bottles are managed by the national brewers' association in each province (e.g., the BC Brewers Recycling Container Collection Council). AB and SK return rates include all aluminum beer cans; whereas the BC Encorp return rate does not. As a result, we have included the combined return rates of Encorp Pacific plus BRCCC's beer cans to provide a more accurate comparison to the AB and SK programs.

- Encorp Pacific 2013-2017 Annual Reports. Available at: https://www.return-it.ca/about/annualreports/. Retrieved November 2, 2018.
- ABCRC 2014-2017 Annual Reports. Available at: https://www.abcrc.com/sustainability/. Retrieved November 2, 2018.
- SARRCAN 2013-2017 Annual Reports. Available at: https://issuu.com/search?q=SARCAN. Retrieved November 2, 2018.
- Brewers Recycling Container Collection Council, 2017. Annual Report to the Director 2017 Calendar Year. Available by email from Ministry of Environment and Climate Change Strategy. The BC Brewers Recycling Container Collection Council (the Brewers) collects and recycles BC's refillable beer bottles and beer cans.

containers[34] went 'missing' from BC's deposit refund system (Table 3), along with the almost **840 million beverage container caps**[35] that once sealed those containers[36]. Over a 5-year period (2013-2017), **more than 1.6 billion beverage containers** went "missing" from BC's deposit refund system[37] and could be coating BC's shorelines, ocean floors or floating in ocean currents (Table 3). This equates to over a million beverage containers per day that are sold and not recycled.

[34] The 387 million containers missing in 2017 was calculated using data provided by Encorp Pacific's 2017 Annual Report and the Brewers Recycled Container Collection Council's (BRCCC) 2017 Annual Report to the Director. Missing containers = Encorp Pacific (325,843,398) + missing BRCCC 2017 (58,967,820 beer + 2,359,980 refillables).

[35] The 840 million beverage container caps missing in 2017 was calculated using data provided by Encorp Pacific's 2017 Annual Report and the Brewers Recycled Container Collection Council's (BRCCC) 2017 Annual Report to the Director. Assume containers made of plastic, glass, refillable glass and gable top containers have caps (or corks). Missing caps (including corks) = Encorp Pacific (782,866,803) + BRCCC (57,004,620).

[36] Encorp Pacific (the producer responsibility organizations operating BC's deposit refund system for non-beer containers) requires 'caps off' when containers are returned to depots. Encorp encourages consumers to return caps to depots, but it does not report on the quantity of caps recycled. See Encorp Pacific, 2019. General Return-It Recycling Questions. Available at: https://www.return-it.ca/beverage/faqs/general/; and Encorp Pacific, 2017. 2017 Annual Report. Available at: https://www.return-it.ca/ar2017/pdf/AnnualReport.pdf. Retrieved November 2, 2018.

[37] Calculated using data from:

- Encorp Pacific, 2013-2017 Annual Reports. Available at: https://www.return-it.ca/about/annualreports/. Retrieved November 2, 2018.
- Brewers Recycled Container Collection Council, 2013-2017 Annual Report to the Director Calendar Year. The 2013-2016 reports are available at: https://www2.gov.bc.ca/gov/content/environment/waste-management/recycling/product-stewardship/stewardship-reports-plans. Retrieved February 14, 2019. The 2017 report is available by email from Ministry of Environment and Climate Change Strategy.

TABLE 3: BEVERAGE CONTAINERS MISSING FROM BC'S REGULATED DEPOSIT REFUND SYSTEM

YEAR	ENCORP PACIFIC beverage containers sold (million units)	BRCCC refillable beer and beer cans sold (million units)	Total all beverage containers sold (million units)	ENCORP PACIFIC beverage containers missing (million units)	BRCCC refillable beer and beer cans missing (million units)	Total all beverage containers missing (million units)
2013	1,214	606	1,820	242	45	287
2014	1,225	623	1,848	256	43	299
2015	1,266	645	1,911	267	50	317
2016	1,283	659	1,942	282	62	344
2017	1,349	670	2,019	326	61	387
5-Year Total	6,337	3,204	9,540	1,372	262	1,634

The Solution: Raise Deposits, Expand the System, Caps On

There are a number of proven approaches that could reduce the number of beverage containers not collected under the beverage container system that potentially become ocean plastic waste. These are outlined below:

Raise deposits

Effective deposit refund systems have been proven to drastically improve beverage container collection, reuse and recycling rates by placing a value on beverage containers[38]. Consumers and 'binners' (people who seek to collect wasted containers) have a financial incentive to collect containers and either directly return them to the collection system to realize their refund or donate the 'street value' of those containers to charities.

A global review of deposit return systems for beverage containers shows that higher deposit rates have been proven to yield better return rates[39],[40] (Table 4). According to the European

[38] CRI: Container Recycling Institute, 2013. Bottled Up: Beverage Container Recycling Stagnates (2000-2010). Available at: http://www.container-recycling.org/index.php/publications/2013-bottled-up-report. Retrieved March 14, 2019.

[39] CM Consulting and Reloop, 2018. Deposit Refund Systems for Beverage Containers: Global Review. Available at https://reloopplatform.eu/wp-content/uploads/2018/05/BOOK-Deposit-Global-27-APR2018.pdf.

[40] CM Consulting, 2003. Evaluating the Relationship Between Refund Values and Beverage Container Recovery. Available at: http://www.bottlebill.org/assets/pdfs/legis/canada/2003-RefundRecovery.pdf

Commission, in their European Strategy for Plastics in a Circular Economy, "the five best performing Member States with deposit schemes for PET bottles (Germany, Denmark, Finland, the Netherlands and Estonia) reached an average collection rate for PET of 94% in 2014"[41]. The minimum deposit rates for PET containers in these jurisdictions ranges from € 0.10 to € 0.13 per container.

TABLE 4: COMPARISON OF RETURN RATES BY CORRESPONDING MINIMUM DEPOSIT LEVEL

	Minimum regulated deposit (CAD)	Deposit Value	Return Rate (2017)	Return Rate
Germany	.37		98%	
Netherlands	.37		95%	
Norway	.31		92%	
BC Brewers[42]	.10		91%	
Alberta	.10		86%	
Saskatchewan	.10		85%	
Oregon[43]	.10		82%	
BC's Encorp Pacific	.05		76%	

BC has the opportunity to raise its minimum regulated deposit along with target return rates with the objective to achieve return rates that rival those in other jurisdictions across the globe. For example, the European Parliament and Council Single-Use Plastics Directive (passed on December 19, 2018) requires its member states to increase the collection and recycling of beverage containers to achieve a 90% capture rate by 2025 [44],[45]

[41] European Commission, 2018. European Strategy for Plastics in a Circular Economy. p.42. Available at: http://ec.europa.eu/environment/circular-economy/pdf/plastics-strategy-brochure.pdf

[42] Brewers Recycling Container Collection Council, 2017. Annual Report to the Director 2017 Calendar Year. Available by email from Ministry of Environment and Climate Change Strategy. The BC Brewers Recycling Container Collection Council (the Brewers) collects and recycles BC's refillable beer bottles and beer cans.

[43] The Oregon Beverage Container Recycling Cooperative (OBCRC), which targets a list of designated containers. Oregon raised its regulated deposit refund level from 5-cents to 10-cents in April 1, 2017. The return rate of 82% was achieved from April -December 2017. The rate achieved by the organization under a 5-cent deposit for the period of January to March 2017 was 59%.

[44] European Parliament, 2018. Single-use plastics: Commission welcomes ambitious agreement on new rules to reduce marine litter. Brussels, 19 December 2018. Available at: http://europa.eu/rapid/press-release_IP-18-6867_en.htm.

[45] European Parliament, 2018. Parliament and Council agree drastic cuts to plastic pollution of environment. Available at: http://www.europarl.europa.eu/news/en/press-room/20181219IPR22301/parliament-and-council-agree-drastic-cutsto-plastic-pollution-of-environment

Expand the deposit refund system to manage all beverage containers

Consumers drink a wide range of beverages away-from-home, including: milk, chocolate milk, soy milk and almond milk. In BC, only those milk, milk substitute and meal replacement beverage containers consumed 'residentially' are collected and recycled (through Recycle BC's residential paper and packaging recycling program). This is because the BC's Recycling Regulation only collects and recycles residentially generated packaging. There are two problems with BC's approach: 1) consumers purchasing and wanting to recycle beverages 'on-the-go' have limited recycling options; and 2) the number of overall non-deposit beverage containers recycled versus sold are not accurately tracked or reported on. Without data, it's impossible to accurately calculate the number of these containers available to become ocean litter. However, it is reasonable to assume, based on the performance of BC's residential curbside program (which achieved a 75% residential recycling rate in 2017[46]) versus the provincial deposit refund system (that achieved 75.8% province-wide across the residential and industrial, commercial and institutional sectors (Figure 6)), that at least 25% of the containers sold become available as litter.

Alberta and Saskatchewan have taken a different approach. These provinces added milk and milk substitutes to their regulated deposit refund systems in 2009 and 2017, respectively. Alberta's system also includes drinkable meal replacements and non-beverage dairy product containers (like cream) that are sold in containers that are similar to milk containers.

Keeping the system simple by collecting and recycling all beverage containers the same way regardless of where it is consumed (at home, work or play) reduces consumer confusion and improves container return rates.

Keep caps on

When consumers remove caps from their beverage containers, those caps become available for intentional or unintentional littering and could end up as ocean plastic. Bottle caps are too small to be captured in modern day 'material recovery facilities' or MRFs.

Bottle cap litter is a big ocean plastic problem. Besides being one of Canada's 'dirty dozen' plastics found on Canadian shorelines (Figure 3), the international community is also seeking ways to curb this nuisance material. The European Parliament and Council Single-Use Plastics Directive agreement suggests 'caps on' measures to make it more difficult for the public to litter this material.

Bottle caps can be recycled when left on empty beverage containers without contaminating the quality of recycling stream, as plastics recyclers generally shred the containers and then 'float' materials to separate the caps from the container materials. Alberta has recycled their containers

[46] Recycle BC, 2017. Annual Report 2017. Available at: https://recyclebc.ca/wp-content/uploads/2018/07/RecycleBCAR2017-June292018.pdf. Retrieved March 14, 2019.

with 'caps on' in this way since 2010. In Alberta's system, the cap material is recycled[47]. Training consumers to leave caps on their containers reduces the likelihood this material will be littered and ensures this small material can be recycled.

What's in it for BC?

Fewer mis-managed containers available to become ocean litter

Well-managed deposit refund systems have been proven world-wide to be the most effective tool to reduce beverage container litter and increase beverage container litter clean-up[48],[49] (see Figure 11 and Figure 12).

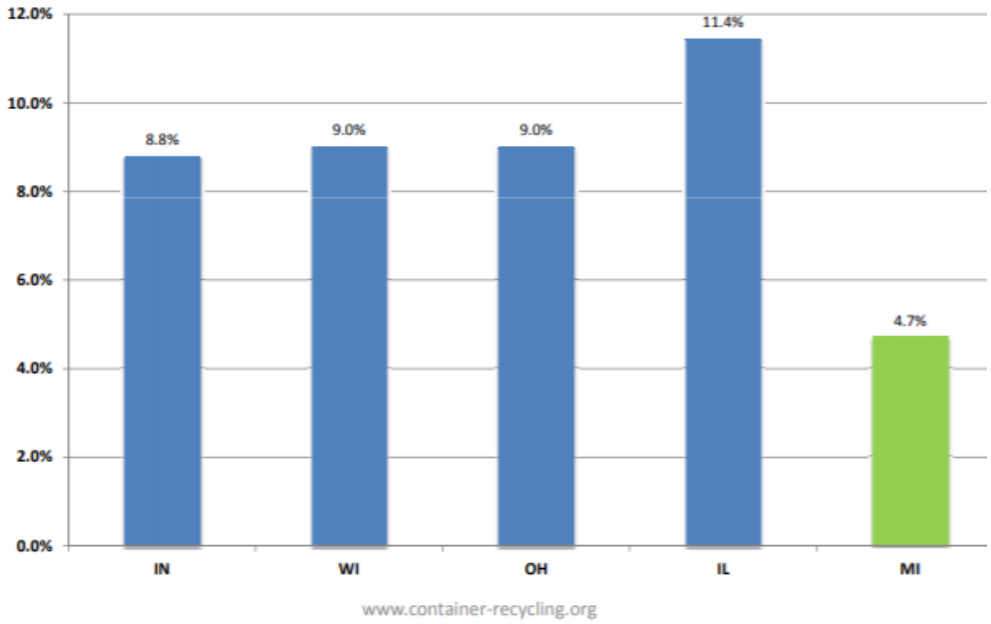

FIGURE 11: SOURCE CONTAINER RECYCLING INSTITUTE (2013) SHOWING FOUR STATES (INDIANA, WISCONSIN, OHIO, ILLINOIS) WITHOUT DEPOSIT REFUND SYSTEMS, AND ONE STATE (MICHIGAN) WITH A DEPOSIT REFUND SYSTEM.

[47] Guy West, Alberta Beverage Container Recycling Corporation. Personal communication February 7, 2019.

[48] European Parliament, 2011. Directorate General for external policies of the union. Briefing paper: a European refunding scheme for drinks. Available at: http://www.europarl.europa.eu/RegData/etudes/note/join/2011/457065/IPOL-AFET_NT(2011)457065_EN.pdf

[49] Container Recycling Institute, 2013. Impacts of Container Deposit Laws: Proven Effectiveness of Deposits to Reduce Beverage Container Litter. Presentation by: Susan V. Collins Container Recycling Institute on November 15, 2013. Available at: http://www.sjenvironment.org/ArchiveCenter/ViewFile/Item/2167. Retrieved February 7, 2019.

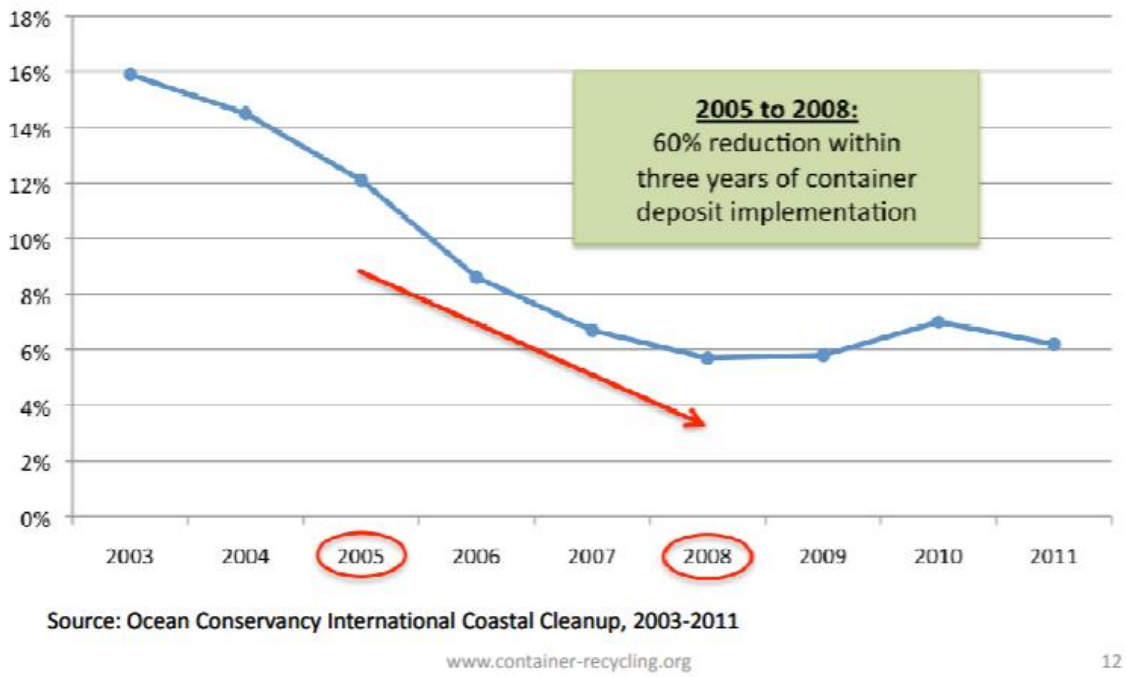

FIGURE 12: SOURCE CONTAINER RECYCLING INSTITUTE (2013) SHOWING LITTER REDUCTION FOLLOWING INTRODUCTION OF A DEPOSIT REFUND SYSTEM IN HAWAII.

Evidence also shows collection in Canada deposit refund systems get significantly higher return rates than non-deposit systems (Figure 13).

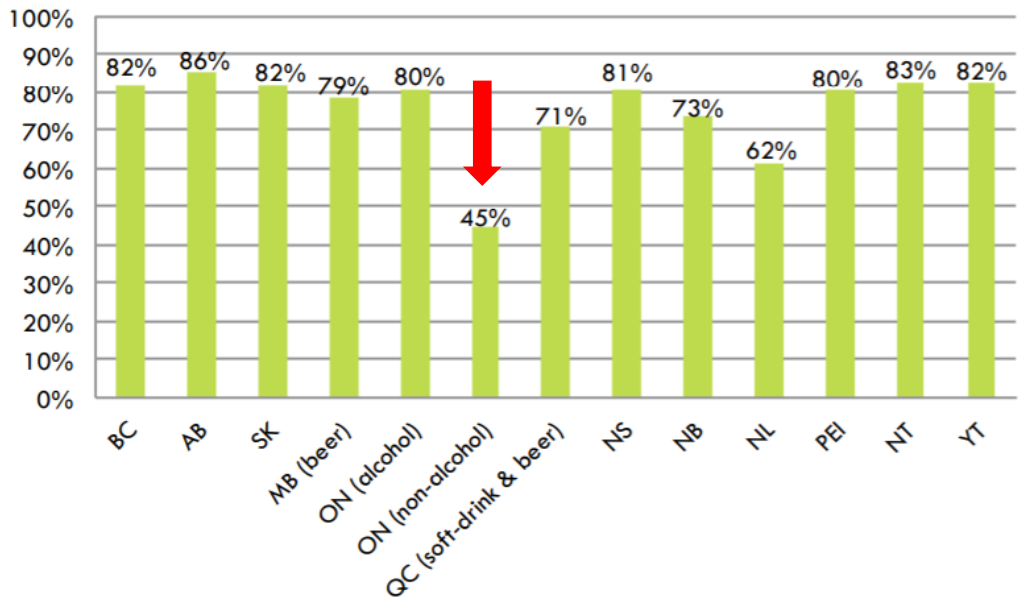

FIGURE 13: SOURCE CM CONSULTING (2018). RETURN RATES FOR ALL NON-REFILLABLE CONTAINERS IN CANADA[50]. IN THIS DIAGRAM, THE ONTARIO NON-ALCOHOL CONTAINERS ARE THE ONLY CONTAINERS NOT SUBJECT TO A DEPOSIT REFUND SYSTEM.

At the same time, evidence from Alberta and, Saskatchewan (Table 2) suggests that raising deposits from 5-cents to 10-cents would enable BC to increase its return rate to 80-85% recovery, while evidence from the EU (Table 4) suggests that raising deposit rates to 30-cents or higher would enable BC to achieve return rates above 95%.

Increased reduction of greenhouse gases (GHGs)

Encorp Pacific reports on the GHG benefits of its deposit return system:

In total, Encorp's activities in 2017 contributed to the reduction of about 103.8 thousand tonnes of CO_2 equivalent being released into the atmosphere, compared to 101.9 thousand tonnes in 2016. The increase in reduction is primarily due to the increase in volume of material recycled[51].

Every container recycled reduces GHG emissions. As shown, increasing return rates would have significant GHG benefits.

[50] CM Consulting, 2018. Who Pays What? An Analysis of Beverage Container Collection and Costs in Canada. Available at: https://www.cmconsultinginc.com/wp-content/uploads/2018/10/WPW-2018-FINAL-5OCT2018.pdf. Retrieved February 10, 2019.

[51] Encorp Pacific, 2017. 2017 Annual Report. Page 21. Available at: https://www.return-it.ca/ar2017/pdf/AnnualReport.pdf. Retrieved November 2, 2018.

Lower taxes

The most obvious economic benefit of deposit refund systems is their ability to increase the diversion of valuable commodities from local landfills and waterways. The need for diversion from landfill is becoming increasingly important as existing BC landfills near capacity and new ones are a greater challenge and cost to site. Deposit refund systems successfully pull materials from the waste stream for recycling and reduce the costs associated with municipal landfilling. A report by Morrison Hershfield (2016)[52] found that in 2014, BC's deposit refund system resulted in $17 million in avoided waste collection and landfilling costs and $21 million worth of recovered materials. In 2016, after a review of 20 studies on deposit refund systems around the world, CM Consulting concluded that deposit refund systems provide a significant net cost savings to municipalities, even when regulated packaging recycling programs exist alongside regulated deposit refund programs[53]. Recycle BC supports activities that divert glass (e.g., like glass beverage containers) from curbside recycling bin to depots. It states: "separating glass at curbside or delivering glass to depots helps ensure that more of it—and more of the other material—is recycled"[54]. Successful diversion programs benefit taxpayers who otherwise face the long-term costs of landfill closures, and who can benefit from savings related to reduced municipal spending on waste collection costs and from recovered material value.

Green jobs and support for low income earners

In a report commissioned by the Container Recycling Institute, CM Consulting and Morris (2011)[55] calculated that deposit refund systems create 11 to 38 times more jobs than a curbside recycling system for beverage containers: the more successful the system, the more jobs that are created. A report by Morrison Hershfield (2016)[56] found that in 2014, BC's deposit refund system resulted the addition of approximately 640 jobs. It should be noted that in 2014, Encorp's overall return rate was hovering around 79%, but this has since fallen to 76%. As a result, it's likely these values have declined correspondingly. However, if BC were able to reverse this trend and achieve the new European target of 90% recovery by 2025, then the avoided waste

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[52] Morrison Hershfield, 2016. Assessment of Economic and Environmental Impacts of Extended Producer Responsibility Programs Operating in BC in 2014. Available at: http://www.metrovancouver.org/services/solid-waste/SolidWastePublications/AssessmentofEconomicandEnvironmentalImpacts2014.pdf

[53] CM Consulting & Reloop, 2016. Studies confirm that Container Deposit Systems show big net savings to municipal budgets. Available at: https://reloopplatform.eu/wp-content/uploads/2016/06/Summary-of-studies_impact-of-DRS-on-munis-FINAL-31May2016.pdf. Retrieved March 14, 2019.

[54] RecycleBC, 2019. Recycling at home: How to recycle glass. Available at: https://recyclebc.ca/recycling-at-home/how-to-recycle-glass/. Retrieved March 14, 2019.

[55] CM Consulting and Jeffery Morris, 2011. Returning to Work Understanding the Domestic Jobs Impacts from Different Methods of Recycling Beverage Containers. Report for the Container Recycling Institute. Available at: http://www.container-recycling.org/assets/pdfs/reports/2011-ReturningToWork.pdf

[56] Morrison Hershfield, 2016. Assessment of Economic and Environmental Impacts of Extended Producer Responsibility Programs Operating in BC in 2014. Available at: http://www.metrovancouver.org/services/solid-waste/SolidWastePublications/AssessmentofEconomicandEnvironmentalImpacts2014.pdf

collection and landfilling costs, the value of recovered material and the jobs created would increase proportionally.

Low income populations also significantly benefit from deposit refund systems by using them as a means to supplement their income. In California, Ashenmiller[57, 58] found that deposit refund systems provide a significant percentage of income for professional scavengers, i.e., up to 22% of their total income. Ashenmiller also found that petty crime rates are 11% lower in the 11 American states that currently have bottle deposit laws, likely because these populations have other methods to supplement their incomes by seeking and returning bottles for refund.

British Columbia charities and community groups also benefit from BC's deposit refund systems by fund raising through bottle drives. While Encorp Pacific doesn't publicly report the overall net revenue contribution of bottle drives to non-profit causes, they do report that "the average bottle drive raises between $1,000 and $1,500" per drive, and that "some groups have even made over $3,000" in a half-day's work"[59]. When waste has value, British Columbians have proven they are happy to collect, save and then donate it for a good cause.

[57] Ashenmiller, B., 2009. Cash Recycling, Waste Disposal Costs, and the Incomes of the Working Poor: Evidence from California. Land Economics. August 2009. 85:539-551.

[58] Ashenmiller, B., 2010. Externalities from Recycling Laws: Evidence from Crime Rates. American Law and Economics Review. Vol. 12, No. 1 (Spring 2010), pp. 245-261. Published by: Oxford University Press

[59] Encorp Pacific, 2019. Encorp Return it, It's worth it -Programs and Events -Bottle Drives. Available at; https://www.return-it.ca/programs/bottledrives/. Retrieved: March 14, 2019.

Call to Action: BC Shows Ocean Plastic Leadership

In 2018, Canada led the G7 in developing the Ocean's Plastic Charter[60] (which was signed by the leaders of Canada, France, Germany, Italy, United Kingdom, the European Union), and the Canadian Council of Ministers announced its Strategy on Zero Plastic Waste[61]. These Canadian initiatives recognized the importance of deposit refund systems and extended producer responsibility to tackle beverage container waste and other single-use plastics. On December 5, 2018, the Canadian government also unanimously passed Motion 151, which recognized the need for all Canadian communities (federal, provincial, municipal and indigenous) to do their part to combat plastic pollution in and around aquatic environments, including implementing:

- New regulation to reduce (among other plastic debris) single-use plastics like beverage containers;
- Permanent, dedicated, and annual funding for the cleanup of plastic debris; and
- Education and outreach campaigns on the root causes and negative environmental effects of plastic pollution in and around all bodies of water62.

On December 19, 2018, the European Parliament and Council passed a trialogue agreement – the Single-Use Plastics Directive – that specifically requires its member states to increase the collection and recycling of beverage containers (and their caps) to achieve a 90% capture rate by 2025 [63] [64].

Ocean Legacy Foundation is calling on the BC government to make BC's deposit refund system the leading Canadian beverage container recycling program in stewarding its beverage containers and bottle caps, ensuring none of these plastics end up in the ocean.

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[60] G7 2018 Charlevoix, 2018. Ocean Plastics Charter. Available at: http://publications.gc.ca/collections/collection_2018/amc-gac/FR5-144-2018-32-eng.pdf

[61] CCME, 2018. Strategy on Zero Plastic Waste. Available at: https://www.ccme.ca/files/Resources/waste/plastics/STRATEGY%20ON%20ZERO%20PLASTIC%20WASTE.pdf. Retrieved: February 14, 2019.

[62] Parliament of Canada, House of Commons, 42 Parliament, 1st Session, 2018. Gord Johns, private members motion, current session. M-151: National strategy to combat plastic pollution. Decision made/agreed to: 2018-12-05. Available at: http://www.ourcommons.ca/Parliamentarians/en/members/Gord-Johns(89263)/Motions. Retrieved February 14, 2019.

[63] European Parliament, 2018. Single-use plastics: Commission welcomes ambitious agreement on new rules to reduce marine litter. Brussels, 19 December 2018. Available at: http://europa.eu/rapid/press-release_IP-18-6867_en.htm.

[64] European Parliament, 2018. Parliament and Council agree drastic cuts to plastic pollution of environment. Available at: http://www.europarl.europa.eu/news/en/press-room/20181219IPR22301/parliament-and-council-agree-drastic-cutsto-plastic-pollution-of-environment

We at Ocean Legacy Foundation call on the BC government to:

1. Increase the regulated deposit rate.
2. Add all beverage containers to the deposit refund system to reduce litter and increase the litter clean-up of containers not yet in the system.
3. Require producers to collect and report on the recycling of bottle caps to reduce bottle cap waste available to become ocean plastic.
4. Raise regulated targets to at least that achieved by Alberta and Saskatchewan, with long-term targets matching the EU.
5. Enforce the regulated targets in a meaningful way. For example, make producers pay for the clean-up of ocean plastics equal to the amount by weight that they fail to collect and recycle.

Appendix A: Timeline of BC's Deposit Return System

1970 British Columbia implemented Canada's and the world's first deposit return system for beverage containers. It is followed by Oregon in 1971 and Alberta in 1972.

1997 BC government enacts the Beverage Container Stewardship Program Regulation, which includes extended producer responsibility (EPR) requirements including:

- requiring producers to take responsibility for the system;
- managing the consumer paid deposit return system;
- financing system operations;
- meeting a minimum 85% recovery rate; and
- requiring that all containers supplied into BC be re-filled or recycled[65].

1998 Government expands its beverage recycling program

- The system now includes all regulated ready-to-drink containers; this led to 196 million more containers being recycled. Milk and milk substitutes are notable exclusions.

1999 Polycoat containers were added to the deposit return system.

2004 The government enacts the Recycling Regulation and Encorp was established as the Producer Responsibility Organization

- The regulation streamlined its EPR regulatory structure by implementing a single comprehensive, results-based regulation to cover all producer operated stewardship programs.
- It also lowered the required minimum recovery rates for beverage containers from 85% (Beverage Container Stewardship Program Regulation) to 75% and sets the current deposit and refund rates.
- Encorp was formed to manage all non-alcohol beverage containers, and later forms an agreement to also manage non-beer alcohol containers on behalf of liquor and wine stewards.

2007 Government approved Encorp's first five-year stewardship plan (2007-2012).

2014 Government approved Encorp's second five-year stewardship plan (2013-2017).

2017 Government approved Encorp's application to continue operating its 2013-2017 plan for the 2018-2023 period, pending consultation on and receipt of approval for two amendments:

[65] Recycle BC. Available at: https://recyclebc.ca/about-recyclebc/epr/. Retrieved: October 19, 2018.

- Updated program performance targets for the period of 2018-2022.
- Measures to address specific government policy guidance, such as dispute resolution.

2018

- May 8 Encorp began a 45-day public consultation on proposed plan amendments.
- July 24 Encorp releases a summary of the consultation findings.
- August 10 Encorp submits proposed amendments to government for review/ approval

2018 Current status of Deposit Return Systems

- Deposit return programs exist in every province except Manitoba, though the programs range in scope and service,
- Hundreds more have been implemented globally.
- BC has regulated EPR requirements for 14 categories of materials[66], which are managed by more than 20 EPR program operators[67].

[66] Recycling Regulation. Available at: http://www.bclaws.ca/Recon/document/ID/freeside/449_2004 Retrieved: October 19, 2018.

[67] Government of British Columbia. Product Stewardship Plans and Annual Reports. https://www2.gov.bc.ca/gov/content/environment/waste-management/recycling/product-stewardship/stewardship-reports-plans Retrieved: October 19, 2018.

Appendix B: Overview of BC's Recycling Regulation

BC's Recycling Regulation:

- Establishes the requirement for a deposit return system, i.e., establishes the minimum deposits that must be collected from and refunded to consumers;
- Requires "sellers" of beverage containers to collect a deposit from consumers that is not less than the minimum regulated deposit.
- Identifies and limits which containers are subject to deposit refund and who must pay the refund;
- Requires beverage container producers have a plan that collects and recycles beverage containers from container redemption facilities (e.g., depots, retailers that sell beverage containers);
- Requires producers to provide proof that materials collected are managed according to a 3Rs hierarchy that maximizes recycling over energy recovery; and
- Requires producers meet a minimum 75% recovery rate (i.e., collection rate) for 10 beverage container product sub-categories including:
  1. aluminum cans;
  2. refillable glass bottles;
  3. non-refillable glass bottles;
  4. plastic containers, able to hold 1 litre or less;
  5. plastic containers, able to hold more than 1 litre;
  6. drinking boxes;
  7. bag in a box;
  8. bimetal cans;
  9. gable top containers; and
  10. stand up pouches.

Since 1970, BC's deposit refund system has undergone many changes and has been regulated under several iterations of BC law (Appendix A). Since 2004, the BC system has been regulated under BC's Recycling Regulation, which establishes the legal framework requiring and defining:

1. Extended Producer Responsibility for designated materials (i.e., those identified in Schedules 1-5), including requiring producers (e.g., beverage container producers) to develop and implement a plan to meet regulated government recycling outcomes and targets; and
2. BC's deposit return system (Schedule 1).

Interestingly, the implementation of the Recycling Regulation actually lowered the regulated target recovery rate for beverage containers from 85% to 75% (Appendix A).

Since maximum deposits are not regulated, beverage container producers have the legal authority to charge higher than the minimum regulated deposits to encourage increased container returns. If the regulated targets were effectively enforced (e.g., with significant consequences for failure to achieve targets), then producers would have a legal (and potentially financial) incentive to make the program changes necessary to achieve regulated targets.

Additional notes

1. Since 2004, BC's deposit refund system (i.e., the Recycling Regulation, 2004) has remained virtually unchanged.
2. BC's deposit return system targets only a portion of the ready-to-serve beverage containers on the market. Milk, milk substitutes, and meal replacement containers are not subject to Schedule 1 of the Recycling Regulation and are not included in BC's deposit return system.
3. BC's deposit return system is operated by two producer responsibility organizations: Brewers Recycling Container Collection Council (the Brewers), which collects and recycles all domestic refillable beer containers and beer cans, and Encorp Pacific (Encorp), which manages all other regulated containers and the vast majority of containers in the system.