

**Submission for the Single-Use Plastics Study
Standing Committee on the Environment and Sustainable
Development**

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April 7, 2021

Waste Management and Keeping Plastic Resources out of the Environment

We share a common goal: to preserve our environment, the health and wellbeing of all Canadians and ensure our children and their children can enjoy the great unspoiled nature and beautiful landscapes of Canada and the world we live in. We find ourselves amidst a triple crisis: the pandemic, the burden population growth is having on the earth's ecosystems and averting what could be the biggest economic crisis we've experienced in the last century.

We have a global waste management crisis:

We as Canadians are not alone on this planet. 7.8 Billion **[1]** people demand a fair chance to participate in the wealth and healthcare we take for granted. We must find a way to accomplish this without jeopardizing our planet and fragile ecosystems. We have long outlived the model of a linear economy. There are simply too many people, competing for too few resources, for mother earth to support sustainably.

The problem we are facing is turning a 1960's linear economy into the future ready economy Canada and the world needs. An economy, that is highly circular and keeps the materials we are using for health, safety, and food in a continuous loop and out of landfills and the environment. Globally 2 billion tonnes of solid waste are produced every year. In Canada we represent 34 million tonnes of that total. Plastic waste is 10% of this and plastic packaging accounts for 5% **[2] [3]**. Banning safe and fully recyclable plastic products will not solve our waste crisis. It will very likely increase the amount of waste we produce and result in other, unintended negative consequences **[4]**. We need to select materials that can be reused again and again, accomplished through incited innovation and technology development. It is up to us and the opportunity is now to transition Canada into a world leader of the circular economy.

Why packaging:

Food waste is a strong contributor also to climate change. Packaging is used to eliminate food waste **[5]**. Today, plastic is the most effective packaging material when considering a fully circular economy. Plastic packaging provides safe food at the lowest possible impact on climate and environment when compared to alternatives like glass, aluminum, or paper **[6]**. At Husky we are experts in converting substrates into products and packages. We are conducting research and relate to researchers globally, in the quest of developing an even better and more sustainable materials.

Contrary to the picture created in today's mainstream media, plastic is currently the best choice in fighting both the climate and the waste crisis. Alternatives like aluminum, glass, and paper are inferior to plastic when measured against the needs of a truly circular economy:

- Providing the lowest carbon footprint
- Ability for infinite material reuse and recyclability
- Food safety
- Limits mining and destroying our natural habitats and forests

- Safety, velocity and convenience of a fully circular economy.

No material available today compares to the ability of plastic when measured against these criteria [7] .

Perhaps the strongest endorsement globally for the use of plastics today are medical devices. Worldwide 73% of medical devices are made of plastic [8]. The medical industry is increasingly choosing plastic because of its unique combination of safety, hygiene, durability, adaptability, lightweight and unbreakable nature. Plastic is not toxic, it's lifesaving.

The benefits plastics provide to the medical device industry are the same reasons plastics have found widescale use in a variety of applications, including food and beverage. If plastics are banned, alternative materials would have to be selected to provide the level of hygiene, protection, function and user friendliness consumers demand.

Impact of proposed legislation:

The proposed change by Canada's federal government to CEPA will de facto classify ALL Plastic Manufactured Items as toxic. This designation is not warranted, and raises the potential for significant unintended consequences:

- Canada will likely become even more dependent on foreign nations for life essential medical supplies – a situation I would already classify as critical.[9]
- It will stifle Canada's rapid progress in building a truly circular economy. Already Millions of dollars of investments in recycling have been put on hold or shifted to the US
- Transportation and handling of plastic recyclables will be designated as toxic substances, adding additional complexity to an already complicated import process.
- The approach may violate the Canada/Mexico/USA trade agreement
- There will be a huge economic impact to Canada's mostly small and medium sized plastic manufacturers who like many small businesses have been devastated by the COVID lockdowns:
 - o Plastics is 5% of Canada's manufacturing sector, contributing \$35B to our GDP.
 - o Over 1900 businesses and 370,000 direct and indirect jobs will be impacted [10].
- Because the study does not consider the total environmental impact of alternatives to plastic, this legislation will push Canada further away from full circularity, increase our carbon footprint and very critically increase the impacts of mining and deforestation on our natural habitats and pristine natural environments.

The solution exists:

1. Select materials that ensure essential goods like food, beverages and medical devices are safe, convenient to use and are not wasted
2. Ensure those materials have the lowest total environmental footprint to produce initially and that they are reusable over and over again
3. Harmonize and upgrade Canada's waste management systems to ensure these vital and reusable resources are collected for reuse. Within that framework provide consumers with more convenient collection options and expand successful ones like Ontario's blue box program. What I'm talking about is transitioning to resource management, away from the dated concept of waste management.
4. Established minimum recycled content requirements for all packaging material, including plastics.

5. Foster innovation and incentivize industry to invest in state-of-the-art recycling infrastructure for a world leading truly circular economy.

This isn't a pipe dream; it's already being done, and the results are proven. We can begin implementing this plan immediately. Norway and Germany are already achieving collection rates of 97% for plastic manufactured items like plastic bottles. 845,000 tonnes of plastic bottles are already being recycled globally, back into new bottles, five times the volume Canada currently uses. **[11]** Locally, Ice River Springs, a true Canadian entrepreneurial success story, produces bottles made from 100% circular recycled plastic and have been doing it for a decade.

Some final thoughts from a proud Canadian:

The pandemic has taught us the value of resilient Canadian supply chains. It's taught us that without a domestic industry for essential goods, like medical supplies, Canadians are left begging for table scraps from foreign nations. Canada is one of the greatest nations on earth. We have a wealth of natural resources, we have some of the most unique, beautiful and undisturbed natural environments left in the world, we are an innovative people, we are leaders, we face issues with a thoughtfulness and passion others hope to emulate.

What we don't do is declare non-toxic materials toxic. We don't ban, we encourage innovation and inspire young minds to turn threats into opportunities. Most importantly we consider carefully the unintended consequences of our decisions before we leap. We certainly don't destroy the livelihoods of 370,000 fellow Canadians amid a pandemic and economic crisis. In summary, in my Canada we don't deem anyone or any business as "non-essential" in the pursuit of an ideological vision. We work together to solve our problems.

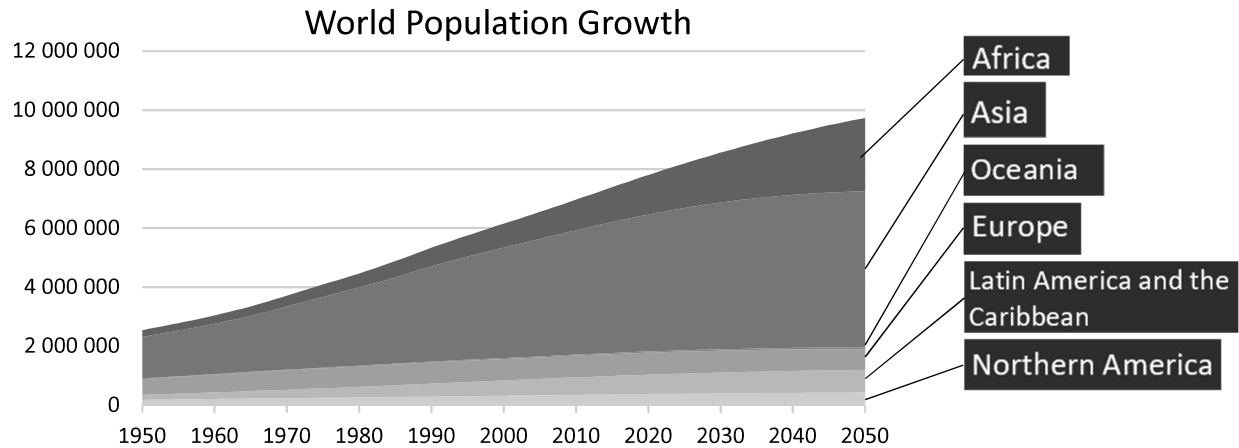
Instead of placing jobs, the environment and potentially public health at risk, a public private partnership along the lines of what I've laid out could position Canada as a world leader in reducing its environmental burden, create hundreds of thousands of new jobs, allow Canada to become self-reliant in essential goods like medical devices and provide real opportunity for our children. Building, not banning, is the answer.

About Husky:

Husky Systems, a global world leader in the supply of equipment and solutions that convert raw materials, most commonly recyclable polymers, into a variety of finished goods. Husky is one of the world's largest suppliers of conversion equipment serving the food, beverage, personal care, home care and medical device markets. The company is a leader in enabling the circular economy, having provided its first solutions for incorporating post-consumer materials into new containers over 20 years ago. Today it works with the world's largest brands through package design and the supply of innovative new conversion technologies to enable their vision for sustainable packaging. The company is also an essential supplier to the manufacturers of Medical IV components, blood tubes, syringes and diagnostic testing consumables.

Supporting Documentation

[1]



- 7.8 billion people
- 2.5x more than 50 years ago
- Projected to be 9.5 billion by 2050
- Needing 30 per cent more water, 40 per cent more energy and 50 per cent more food
- Consumption per capita is up 2.1x (inflation adjusted)

Population Dynamics, Department of Economic and Social Affairs, United Nations

[2] & [3]

2.01 Billion Tonnes of Global Waste

- What a Waste 2.0, A Global Snapshot of Solid Waste Management to 2050, World Bank Group

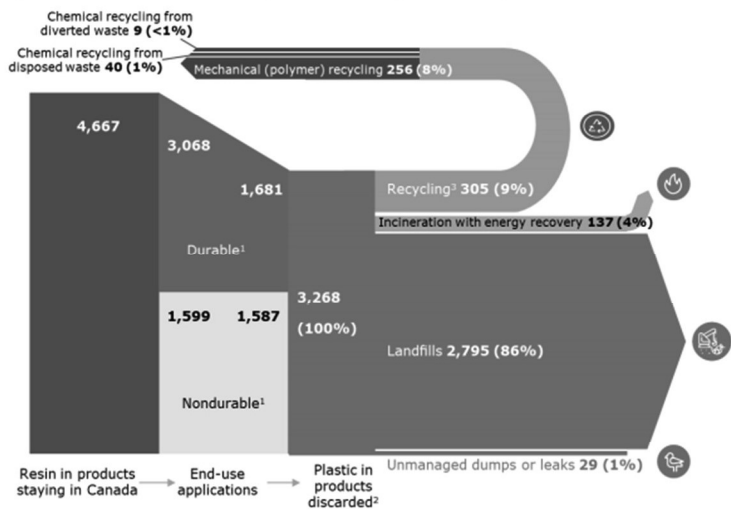
Canada Waste – 34 Million Tonnes

- National Waste Characterization Report, The Composition of Canadian Residual Municipal, Government of Canada Publications

Canada Plastic Waste – 3.268 Million Tonnes

- EN - Economic Study of the Canadian Plastic Industry, Markets and Waste: summary report, <https://www.canada.ca/en/environment-climate-change/services/managing-pollution/publications/plastic-waste-report.html>
- FR - Étude économique sur l'industrie, les marchés et les déchets du plastique au Canada : rapport sommaire, <https://www.canada.ca/fr/environnement-changement-climatique/services/gestion-pollution/publications/rapport-dechets-plastiques.html>

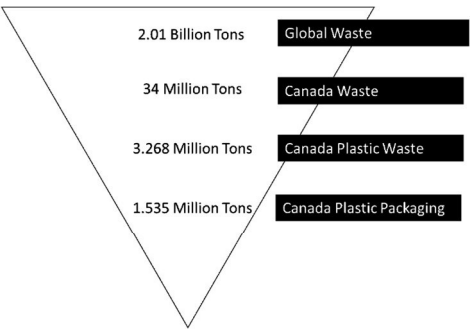
Figure 1: Canadian resin flows in thousands of tonnes per annum, 2016



¹ Durable applications with an average lifetime > 1 year will end up as waste only in later years; given market growth and increase share of plastics in durable applications (e.g., construction, cars) plastics waste generated today is less than what is being put in the market that same year. On the contrary nondurable applications go almost straight to waste.
² 1,587 thousand metric tons of mixed plastic waste from nondurable applications plus 1,681 thousand metric tons of mixed plastic waste from production in previous years.
³ Output recycling rate, after taking into account process losses.

Canadian Plastic Packaging – 1.535 Million Tonnes

- ~47% of Plastic Waste Generation is from Packaging- FAQ on Plastics, Our World in Data




[4]

Tsiamis, D 2018, 'Role of plastics in decoupling municipal solid waste and economic growth in the U.S.', Waste Management, vol. 77, pp. 147-155

[5]

- How Packaging Contributes to Food Waste Prevention, Denkstatt

Recorded changes of food waste shares due to changes in packaging:

Sirloin steak:	12 %	➔	3 %	
"Bergbaron" cheese:	5 %	➔	0.14 %	
Yeast bun:	11 %	➔	0.8 %	
Garden cress:	42 %	➔	3.4 %	
Cucumber:	9.4 %	➔	4.6 %	

Adding 1.5g PE film to 480g cucumber: Cucumber life is extended from 3 to 14 days, and food waste at retailers is cut by 50%

- Quantifying the value of packaging as a strategy to prevent food waste in America, Ameripen

Food Item	GHG Emissions Ratio: Food to Packaging
<i>Ham (cooked)</i>	624:1
<i>Beef</i>	370:1
<i>Cucumber</i>	178:1
<i>Whole Chicken</i>	114:1
<i>Cheese</i>	52:1
<i>Fish</i>	13:1
<i>Pasta</i>	7:1

Source: Sealed Air, Internal Life Cycle Study 2017

[6]

For the benefit of our investigation we asked ourselves the question: if not plastics, what else?

- Aluminum is a good material, it is lightweight, blocks light and in most applications is unbreakable. It is, however, a reactive material and as such every aluminum can has a plastic liner. A plastic coating on the inner wall of every aluminum container is used to prevent the aluminum from reacting with the food or beverage it's protecting. Aluminum is today a highly recycled material, but new cans cannot be made from 100% recycled content. Mining and producing new aluminum are highly invasive to the natural environment and given its higher melting point significantly more energy intensive than plastic. To illustrate this impact replacing just the PET bottles produced in Canada with aluminum cans would add 266,000 tonnes of carbon emissions, require the strip mining of 133,380 tons of bauxite ore, and 38,532 tons of red mud, a truly toxic substance. [12]
- Glass is an exceptional material. It is hygienic, reusable and has a great feel. Its disadvantages are that it is heavy, breakable and the most energy intensive to produce and recycle. Because it is breakable the use of additional secondary packaging for distribution is required. Broken glass is hazardous. Because it's heavy it is much more energy intensive to distribute. To illustrate this impact replacing just the PET bottles produced in Canada with glass would add 463,600 tonnes of carbon emissions. [12]
- Paper on the surface looks to be a good alternative. However, it has limited applications because on its own it cannot contain liquids and fats. Like aluminum, when used in these applications it requires protective layers and binders, essentially turning paper into difficult to recycle multi material composites. Even in applications where moisture is not present, paper can only be recycled 5-7 times before its fibers become too short to be reused. Those limitations mean that new forests must be continually harvested to fill this void. For example, replacing plastic bags with paper ones in Europe has been estimated to increase carbon emissions by 1.6x, require cutting down 2.2 million more trees, and increase freshwater use equivalent to 60,000 Olympic swimming pools.

- New and advanced biomaterials – We are involved in the testing of many promising future materials, but none today have the combination of function, total environmental footprint and conversion capability to be considered suitable replacements to plastics.

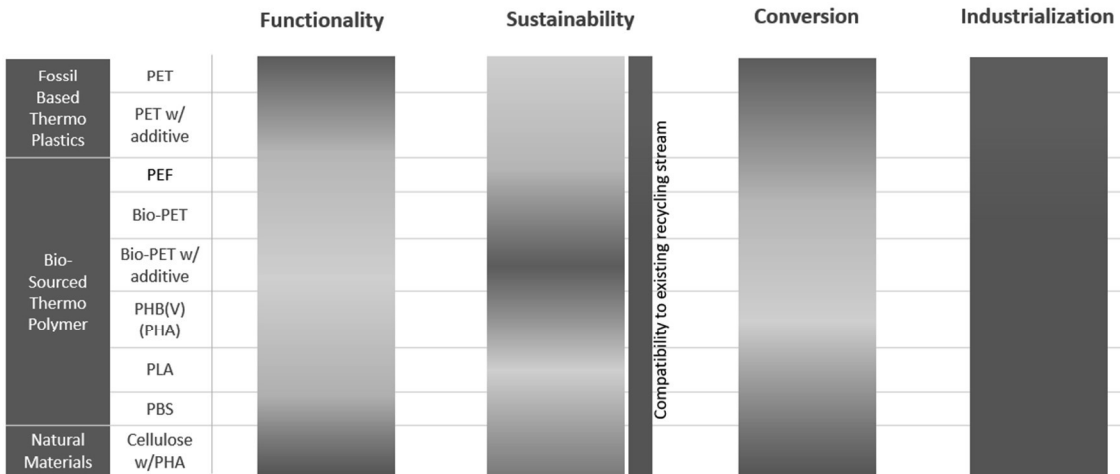


- Life cycle assessment of various ALPLA packaging units and alternative materials, C7-Consult
- Plastics Paradox by Dr. Chris DeArmitt FRSC

[7]

Parameter	PET	Aluminum	Glass	Paper
Multi Material	Mono	Aluminum + Paper	Mono	Paper + Liner or additive
Carbon Footprint CO2 Equivalent	<62g (100% rPET)	105g (1.7x PET)	274g (4.4x PET)	100g (1.6x PET)
Melting Energy	3.5 kJ	7.6 kJ (2.1x PET)	374 kJ (78x PET)	N/A
Infinite Recyclability	<ul style="list-style-type: none"> ○ Maximum of 100% recycled content ○ Infinite Recyclability 	<ul style="list-style-type: none"> ○ Maximum of 90% recycled content ○ Infinite recyclability, but energy intensive 	<ul style="list-style-type: none"> ○ Maximum of 95% recycled content ○ Infinite recyclability, but energy intensive 	<ul style="list-style-type: none"> ○ Beverage containers are typically virgin ○ Can only be recycled 5-7 times and typically down cycled.
Food Safety	Mostly Inert	<ul style="list-style-type: none"> ○ Reactive ○ Contamination on Lid 	Inert	Depends on liner ex. PFAS
Mining / Forest		1-1.5 Tons Red Mud	<ul style="list-style-type: none"> ○ Sand is the single most mined commodity 	Consumes trees and requires forest management

			o Quality sand is becoming scarce	
Velocity	5 Day	60 Days	30 Days	N/A for beverage



- o Life Cycle Inventory of Three Single-Serving Soft Drink Containers, Franklin Associates
- o National Overview: Facts and Figures on Materials, Wastes and Recycling, United States Environmental Protection Agency
- o Responsible Sourcing - Paperboard, TetraPak
- o Recycling Unpacked, Assessing the circular potential of beverage containers in the United States, Metabolic
- o Glass Recycling Facts, Glass Packaging Institute
- o Evans, K 2016, 'The History, Challenges and New Developments in the Management and Use of Bauxite Residue', Journal of Sustainable Metallurgy, vol 2, pp. 316-331
- o 6 things you need to know about sand mining, Matthew Hall, Mining Technology
- o 5 days for PET - The source for this number is Husky discussions with 2 different customers who own and/or operate a closed loop – 1 in Germany and 1 Ontario.
- o Aluminum Can Recycling Holds at Historically High Levels, 2014 The Aluminum Association
- o Benefits of Glass Packaging, Glass Packaging Institute
- o Plastics and Sustainability: A Valuation of Environmental Benefits, Costs and Opportunities for Continuous Improvement, American Chemistry Council & TRUCOST

[8]

World Medical Disposable Raw Material Demand by Product Group & Region (million dollars)					
Item	2005	2010	2015	2020	2025
Medical Disposables Raw Materials	6880	9250	12220	15800	20400
By Product Group:					
Plastic Resins	4810	6580	8820	11500	15000
Nonwoven Fabrics	1360	1790	2340	3030	3900
Elastomeric & Rubber Materials	203	277	361	470	600
Paper & Paperboard	179	211	238	270	300
Metals	172	199	228	260	290
Glass	124	148	171	190	210
Other Raw Materials	32	45	62	80	100

In 2020, Plastic counts 72.8%

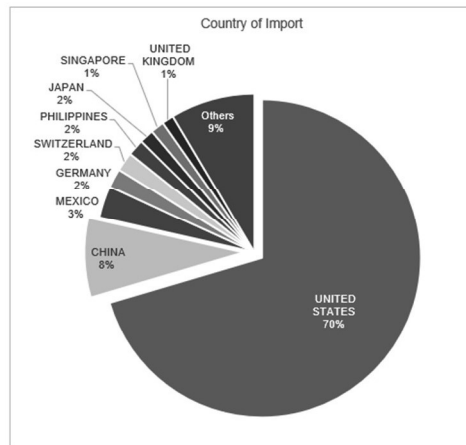
In 2025, plastics expects to be 73.5%

Source: The Freedonia Group

[9]

Canada Syringes Market

Consumptions: (3 year average)	US\$178M
Import: (3 year average)	US\$125M
% of import:	70.4%



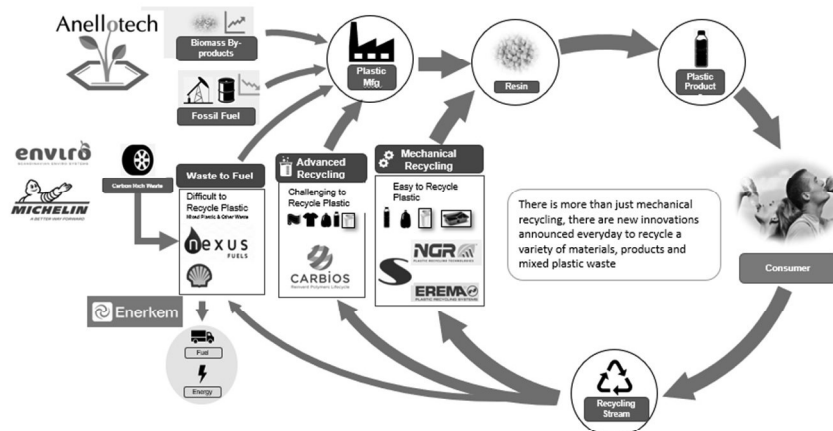
Reference: Consumption from Globaldata
Import data from Datamyne

[10]

- EN - Economic Study of the Canadian Plastic Industry, Markets and Waste: summary report, <https://www.canada.ca/en/environment-climate-change/services/managing-pollution/publications/plastic-waste-report.html>
- FR - Étude économique sur l'industrie, les marchés et les déchets du plastique au Canada : rapport sommaire, <https://www.canada.ca/fr/environnement-changement-climatique/services/gestion-pollution/publications/rapport-dechets-plastiques.html>
- Direct Jobs = 93,000 from Econmic Study of the Canadian Plastic Industry, Markets and Waste
- Indirect Employment Multiplier 3x direct jobs = 3x 93,000 = 279,000, Total Jobs = 93,000 + 279,000 = 372,000 Jobs

[11]

Investment in recycling value recovery streams



- Norway – PET collection rate of 97%
 - PET plastic bottle recycling rates in select countries 2018, Ian Tiseo, Statista
- Germany – PET Collection rate of 97%
 - Global Deposit Book 2020 European Chapter, Reloop Platform

- rPET Facts
 - Bottle to Bottle
 - Global Annual Bottle to Bottle rPET in 2018 was 845,000 tonnes
 - Aluminum vs plastic: who'll win the water bottle war?, Wood Mackenzie
 - Cal. Avg. PET Bottle Weight of 22g → **38.5 Billion recycled bottles**
 - Canada uses an estimated **7.6 billion** PET bottles (GlobalData)
 - The Global annual rPET used in bottle to bottle applications is Roughly 5 times the annual Canadian PET Bottle consumption
 - German rPET
 - 540,000 tonnes of PET Consumption in Germany (Annual European Survey on PET Recycle Industry, ICIS)
 - 93.5% PET Recycling Rate (Combined DRS and Curbside value – kunststoffverpackungen 2018 Get the facts PET drinking bottles)
 - Cal. Avg. PET Bottle Weight of 22g → **23 Billion bottles**
 - Canada uses an estimated **7.6 billion** PET bottles annually (GlobalData)
 - The annual German rPET processed is roughly 3 times the amount of annual Canadian PET Bottle consumption

[12]

Environmental Impact of Converting Canada's PET system to Alternatives

- Canada uses an estimated 7.6 billion PET bottles (GlobalData)
- Scenario 1 – Canada Converts PET to Aluminum Cans
 - Additional Red Mud and Mining Impact:
 - All PET bottles to cans, they would add an estimated 38,532 tonnes of red mud.
 - Would need additional 29,640 tonnes of primary aluminum and require an estimated 133,380 tonnes of bauxite ore.
 - GHG Impact
 - All PET bottles to cans would add 266,000 tonnes of CO₂e
- Scenario 2 – Canada Converts PET to Glass bottle
 - GHG Impact
 - All PET bottles to glass would add 463,600 tonnes of CO₂e

Assumptions for Red Mud and Alumina

- Estimated 70% recycled content in every can
 - average recycled content in a can stated by The Aluminum Association
- 13g can – 3.9g of primary aluminum per can
- Estimated 1.3 tons of red mud/ton of primary aluminum
 - Environmental profile report for the European aluminum industry, 2013, European Aluminum Association
 - 5.07g of red mud per can
- Each ton of primary aluminum requires 4.5 tonnes of bauxite ore (NR Can)

Assumptions for GHG emission:

- Estimated average PET GHG = 115g/bottle CO₂ Equivalent
- Estimated average AL Can GHG = 150g/can CO₂ Equivalent
- Estimated average Glass bottle GHG = 176g/bottle CO₂ Equivalent
 - Source is LCI of Three Single-Serving Soft Drink Containers, 2009, Franklin Associates – converted to per package.