



🎯 Solutions
to Reduce
Packaging for
Canadian Food
Retailers. ♻️ 🔄

Équiterre

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About Équiterre

Équiterre seeks to make the necessary collective transitions towards an equitable and environmentally sound future more tangible, accessible and inspiring. By 2050, Équiterre will have contributed to the emergence of solutions, to the transformation of social norms and to the adoption of public policies that enable new, low-carbon ways to feed ourselves, get around, and produce and consume. Designed for our communities, these new principles will be respectful of our ecosystems and in line with social justice. Recognized for its credibility and pragmatism, Équiterre brings together experts in education, mobilization and public policy. Équiterre seeks to influence public, corporate and government decision-making in an effort to accelerate the transition to a more environmentally responsible, equitable and resilient society. The organization proposes solutions on how to demonstrate, mobilize and influence towards the desired social transformation. Its expertise, achievements, network and influence make it a major player in the climate and environmental movement. With 30 years of experience, Équiterre is one of Quebec's and Canada's most influential environmental organizations, thanks in large part to the support of over 126,000 followers and 23,000 members.

One of Équiterre's strategies is to accelerate the transition to a sustainable circular economy. Geared to our collective well-being, this circular economy will internalize the impacts (costs) on human beings and the environment. Accordingly, Équiterre explores waste management issues through the lens of source reduction and circular economy.

Waste management has a role to play in the green transition, in terms of both changing the modes of production and consumption to avoid wasting our precious resources, and of developing alternatives that extend the life of existing products and encourage their reuse.

Food packaging is front and center in any discussion about source reduction. While initiatives to make unpackaged food more accessible have proliferated over the years, such products remain outside the reach of most Canadians. This research paper seeks to document the issues and suggest ways of giving all Canadians greater access to bulk or minimally packaged food products.

Context

This report is part of a pan-Canadian study coordinated by Équiterre, the purpose of which was to identify and understand the challenges and opportunities faced by Canadian food retailers and distributors in moving towards a zero waste (ZW) product offering, in response to new consumer expectations regarding environmentally responsible consumption.



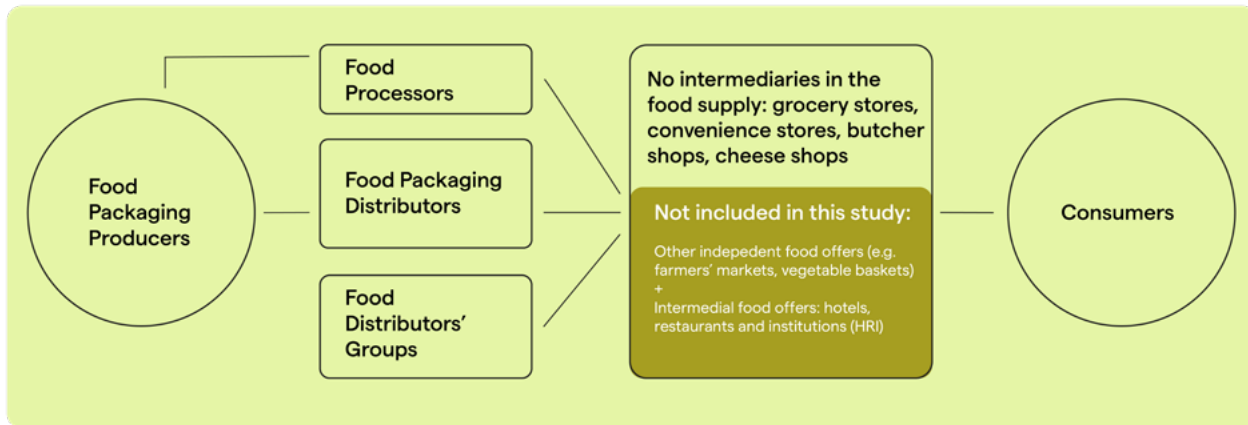
It begins with an overview of current Canadian ZW practices. It then identifies associated levers and obstacles as seen from the industry, retailer and consumer points of view. Finally, it provides recommendations to governments, industry and the public.

Initially, the research team wanted to present a complete ecosystem that included primary, secondary and tertiary packaging, but the data collection was naturally oriented toward the reduction of primary packaging because of a lack of data on secondary and tertiary packaging. Therefore, although the data on primary packaging is limited, the information collected through the various research streams is more comprehensive than for other types of packaging. The research team has nevertheless chosen to retain specific

elements relating to secondary and tertiary packaging, but these are not consistently included in the report.

Despite the intention to be as exhaustive as possible, this study remains exploratory. In this respect, certain details are worth noting. Although food waste is closely linked to the ecosystem under study, a number of the analyses fail to quantify it, even though it would have provided some very interesting insights into the study. In addition, the hotel, restaurant and institutional (HRI) sectors, as well as food suppliers without intermediaries (e.g. organic vegetable baskets, farmers' markets, etc.), were left out of this study, despite the fact that they are stakeholders in the various ZW initiatives. The framework for the study is shown in Figure 1.

Figure 1. Framework for the study



1. The zero waste offering in Canadian food retail stores

The **food supply chain** comprises many steps, including the **cultivation, handling, processing, distribution, retail sale and consumption of food**. At every stage, it is possible to intervene and reduce packaging.

The concept of ZW appeared in the scientific literature as early as the 1970s (2). The most current definition of **zero waste (ZW)** comes from the Zero Waste International Alliance:

"The conservation of all resources by means of responsible production, consumption, reuse, and recovery of products, packaging, and materials without burning and with no discharges to land, water, or air that threaten the environment or human health".

+ STAKEHOLDERS

All persons and organizations involved in the food production, distribution and consumption chain.

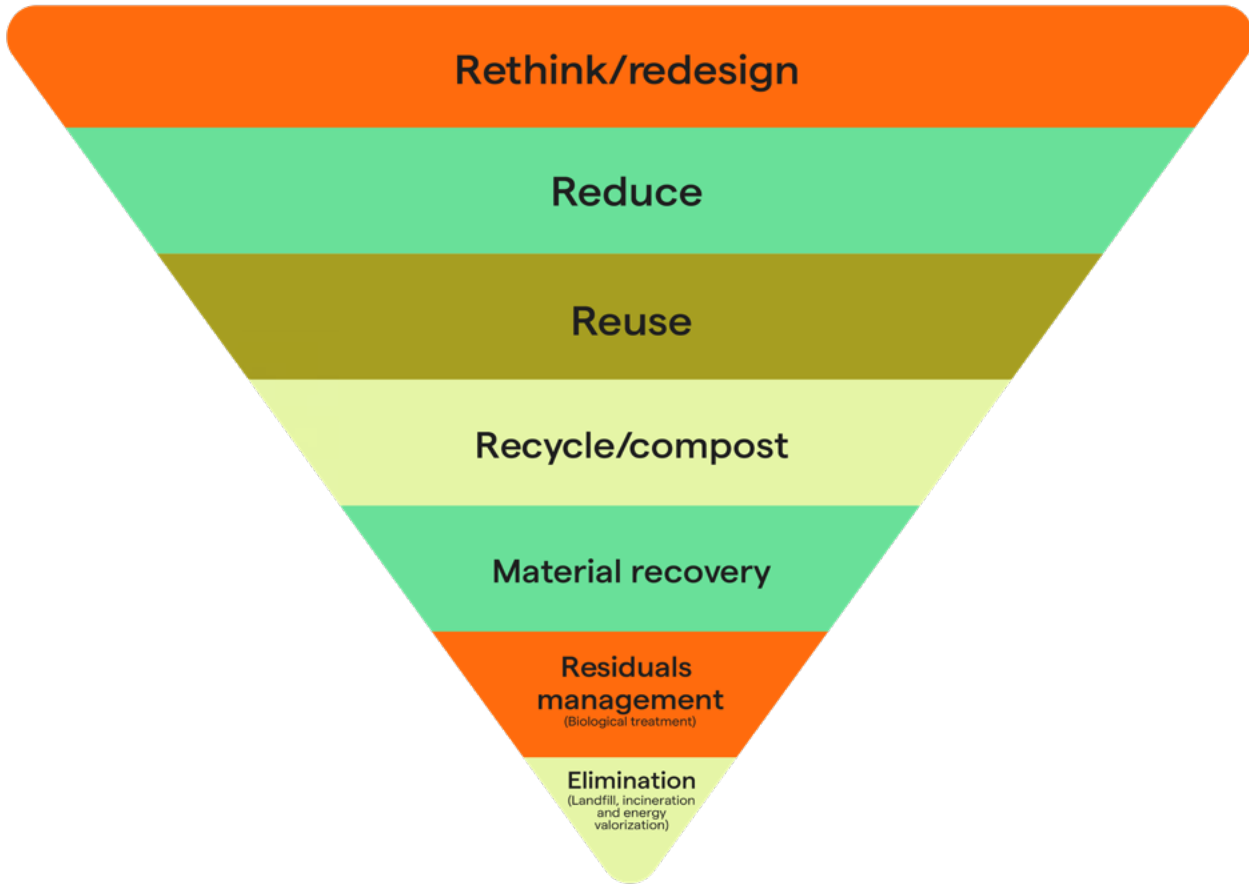
This definition is complemented by a hierarchy of practices, shown in Figure 2, to identify the broad categories of actions and their prioritization. Implementing the ZW concept involves rallying society's **stakeholders**¹ to improve waste management throughout a product's entire **life cycle**, from resource extraction to end of life, in various industrial sectors. The concept also includes behavioural changes among the different actors.

+ LIFE CYCLE

All the stages in the life of a product, from design to disposal (resource extraction, manufacture, transportation, purchase, use, repair, refurbishing, recycling, recovery, disposal).

¹ All definitions are also presented in Annex 1.

Figure 2. Zero waste hierachy



Source: Adapted from the Zero Waste International Alliance, 2018



1.1 CIRCULAR ECONOMY MODEL

ZW fits in with the **circular economy** model, as opposed to the **linear economy** model. Figure 3 takes a hierarchical approach to illustrate the various circularity strategies according to a hierarchical approach. Thus, to lessen the pressure on natural resources, **eco-design** and optimizing the use of existing products - that is, the containers and packaging covered by this report - must be prioritized over giving resources a new life.

+ CIRCULAR ECONOMY

A production, exchange and consumption system aimed at optimizing resource use at every step of a product's life cycle, while reducing its environmental footprint and contributing to individual and community well-being. (4)

+ LINEAR ECONOMY

An economic model consisting of the extraction of raw materials necessary for production, and their subsequent processing, consumption and disposal.

+ ECO-DESIGN

A product design strategy aimed at considering and minimizing potential environmental impacts (5).

With this circular model, strategies that fall under the **Rethink (1)** category should be given top priority. These are aimed at reducing the quantity of virgin resources consumed.

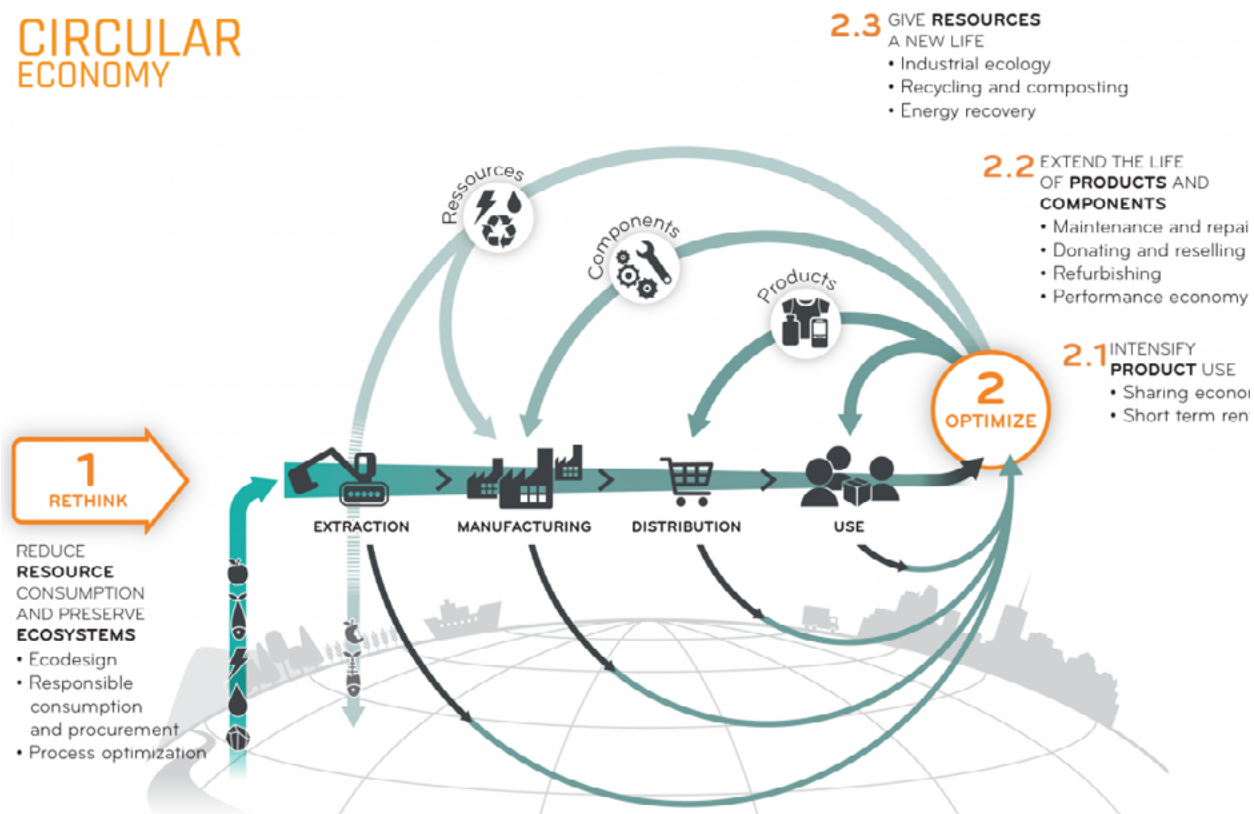
The circular economy calls for **source reduction** of the amount of resources extracted. Strategies to **Optimize (2)** by intensifying product use (2.1) or extending product life (2.2) are also set out. ZW is inherent to each of the circular economy strategies. By reducing the amount of packaging used throughout the food production and distribution process, and by extending the use of certain containers and packaging, a ZW approach helps to decrease the amount of raw materials and energy resources that go into their manufacture, while limiting the amount of waste materials recycled (2.3) or eliminated subsequently.

+ SOURCE REDUCTION

Action that helps prevent or reduce the generating of waste during product design, manufacturing, distribution and use (4).

Figure 3. Circular economy diagram

CIRCULAR ECONOMY



Source: Institut EDDEC, 2018. In collaboration with RECYC-QUÉBEC. This illustration may be reproduced, but must not be modified.



1.2 GROCERY SHOPPING IN CANADA

In Canada as elsewhere, the food sector encompasses a wide range of businesses. ZW grocery stores fall into the specialized food store category, as shown in Table 1. This classification reflects the fact that the ZW offer remains marginal, setting it apart from traditional food stores.

Factoring in all of these stores, **36,286 establishments** were active in 2021 in Canada. Ontario had the most food stores (37.6%), while Quebec and Alberta had the second and third highest percentages of these establishments (25.7% and 12.9%, respectively). (6)

Based on the information currently available, it is impossible to judge the size of the ZW movement in Canada. While a number of stores sell some of their products without packaging (e.g. fruits and vegetables in tradi-

tional grocery stores), it is mostly **bulk** grocery stores that follow the ZW model in any meaningful way.

Just because a store sells bulk items does not mean it follows the ZW principle, as evidenced by the fact that some stores with a bulk business model still sell “bulk” food that is prepacked. They may also allow customers who forgot to bring their containers to buy non-returnable, single-use or reusable containers and bags on site. Similarly, some grocery stores purchase bulk products that they pre-package prior to sale (8, 9, 10 and 11).

The first stores to have adopted a bulk-based business model did so with the aim of offering more economical shopping. With the advent of stores specializing in natural and organic food, often sold in bulk, waste reduction and organic food became more of a focus for bulk stores.

+ BULK

Offering bulk products allows grocery shoppers to bring their **reusable personal containers** or to use **returnable containers** provided by the store and fill them themselves (7).

+ REUSABLE PERSONAL CONTAINER

A container brought by a consumer to a store to fill with products or have the store staff fill with products.


+ RETURNABLE CONTAINERS

Containers (e.g. cans, bottles, jars) provided in exchange for a set price which is reimbursed when the product is returned either to the merchant who supplied the product or to another merchant.

Table 1. Food store categories

Traditional	→ Supermarkets, grocery stores and convenience stores
Specialized	→ Butchers, bakeries, ZW grocery stores, etc.
Beer, wine and spirits	→ Liquor stores and Crown corporations (e.g. Société des alcools du Québec, The Beer Store in Ontario).
Large supermarkets	→ Walmart, Costco, etc.
Alternate distribution circuits	→ Public markets, farm sales, etc.

Meanwhile, the COVID-19 pandemic has affected consumer behaviour when it comes to packaging. **Environmental and health concerns have surfaced while consumption habits have shifted.** (12, 13 and 14) However, the studies examined as part of this research date back primarily to the start of the pandemic,² and given the lack of studies documenting the changes in ZW practices from 2020 to 2023, it was not possible to draw any conclusions regarding how these behaviours will evolve. One other impact of the pandemic revealed by press reports was the significant growth in the financial profits of a number of grocery chains (16, 17 and 18).

 Inspiring initiative - There are a number of directories that identify bulk grocery stores or businesses that offer ZW products:

- [Let's Go Zero Waste](#)
- [Zero Waste App](#)
- [Nature Action Québec](#)
(In French only)
- [Les pages vertes](#)
(In French only)

² One Quebec study from 2021 concluded that there has been an increase in bulk purchasing since the start of the pandemic (15).

1.3 PRODUCTION AND USE OF FOOD PACKAGING IN CANADA

Reusable packaging has been present in the production and distribution chain for a long time. However, a transition towards single-use packaging has been observed in previous decades, mainly for reasons of "simplifying" the producer-to-retailer supply chain (19). On the downside, this shift has generated significantly more waste, and the costs related to the disposal or recycling of single-use packaging are high. Reducing the amount of packaging, as well as replacing certain containers and packaging with reusable alternatives, are among the solutions explored in this report for implementing practices in line with the circular economy, especially for the sake of reducing pressure on the use of natural resources.

This section presents data to illustrate the issues surrounding this topic and those related to the deployment of reusable alternatives.

1.3.1 Issues related to and impacts of single-use packaging

Packaging distributors consider the information on the food packaging market in Canada too sensitive to be made public. That said, a number of studies focusing on the pollution caused by packaging – especially plastic – have given us some idea of the volume of these items on the market.


In 2017, the City of Vancouver reported that the collection and cleaning of single-use food packaging in public spaces cost **2.5 million dollars a year** (23). It should also be noted that the Canadian market for virgin plastic packaging is 30 times larger than for packaging composed of recycled materials, with annual sales of C\$10 billion for the former and C\$350 million for the latter (20).

Of the **4.6 million tonnes of plastics produced and imported annually into Canada, almost half (47%) consist of packaging** (20). This makes packaging the largest single sector of plastic waste generation. According to the Canadian Plastics Pact, **57% of the 1.9 million tonnes of plastic packaging put on the market in Canada in 2020 will not be recyclable** (21). Data on the plastic recycling rate in Canada shows that it fluctuates between 6% and 9% (20 and 22). While the recycling rate for plastic packaging is as high as 15% (18), it is clear that there is a long way to go to achieve better results.


1.3.2 The reusable container and packaging market

Although precise figures are lacking, the Canadian reusable packaging market pales in comparison to the market for single-use packaging. Industries have become more proficient at producing single-use packaging than the reusable variety, making it necessary to source reusable food packaging from abroad. The reusable packaging market is in fact well established in Asia, and is expanding in Europe. It should also be pointed out that a number of Canadian manufacturers are willing to produce reusable food packaging, but are reluctant to invest in the highly expensive production of adapted moulds (24).

The management of reusable containers and packaging also requires its own infrastructure and logistics model to deal with transportation, washing, and redistribution for reuse.

 Inspiring initiative - Financial support for the production of moulds

→ Thanks to financial support from the *Fonds d'initiative et de rayonnement de la métropole* (FIRM, in Montréal), the organization *La vague* can now produce a reusable beverage cup through a single-use food packaging manufacturer in Central Québec.



The ZW approach is designed to reduce waste throughout the entire life cycle of purchased products, thus decreasing the overall environmental footprint of food.

2. Research question, objectives and methodology

From the standpoint of food supply and packaging practices in Canada, and in light of the opportunities generated by ZW, the goal of this research is to answer the following question: **How can source reduction be applied to packaging and integrated into the food product supply chain to uphold Canadians' rights to environmentally responsible consumption?**

To that end, the study's objectives are to:

- Establish a greater understanding of ZW issues in Canada's food sector;
- Document the obstacles and levers to food packaging reduction for food packaging value chain actors, food retailers and consumers;
- Propose ZW measures adapted to Canada;
- Inform governments of the proposed measures.

The next sections of the report are structured as follows:

- Section 3 presents the functions of food packaging.

- Section 4 relates the findings from the literature review to the obstacles and incentives for the adoption of ZW practices. These are categorized according to the various players involved in the food production, distribution and consumption chain (manufacturers, food retailers and consumers).
- Section 5 details the results of the legislative and public policy analysis at the federal, provincial and municipal levels.
- Section 6 proposes a series of recommendations designed to accelerate the implementation of ZW processes and practices by the various stakeholders in the food system.

A **review of the literature** cataloging the obstacles and incentives to reducing food packaging throughout the food production and distribution chain was carried out in addition to an analysis of pro-ZW measures throughout the world. A legislative analysis was also done. To examine the issues from the perspective of the various actors in the food industry, **interviews** were conducted with stakeholders in the food packaging value chain, while **food retailer focus groups** were coordinated. A **survey** was also conducted among 2,002 Canadian consumers between February 8 and 22, 2022. Details of these various research mechanisms can be found in Annex 2.

The limitations of this study relate firstly to the interviews with industry stakeholders, which were conducted primarily (9 out of

16) with companies in Quebec. In addition, only one company that manufactures ZW food products was available for an interview. Also, there were fewer actual interviews with retailers than anticipated due to sample selection barriers in the provinces of Alberta and Ontario. One element that cannot be overlooked is the fact that the pan-Canadian survey was conducted during the COVID-19 pandemic. Despite various precautions taken in this regard, results may have been affected by factors such as changes in purchasing behaviour and household spending. Furthermore, the 'non-ZW' issues were not analyzed in detail; these include health, food waste (not quantified in the studies) and costs related to managing the ZW supply. Finally, although the delivery-based shopping model is growing, the study focused solely on in-store shopping.

Throughout the course of the research, a significant lack of data on secondary and tertiary packaging was noted.³ This has limited the ability to provide an overall picture of the amount of food packaging generated in Canada. It also directed research toward a more detailed analysis of primary packaging.



³ This situation is consistent with what was observed elsewhere, notably in France, where CITEO did not have detailed data on this type of packaging in the summer of 2022 despite a very short-term target for switching to reusable containers and packaging. In fact, in France, 5% of packaging must be reused by 2023, and this percentage will increase to 10% in 2027. (25 and 26)

3. Functions of food containers and packaging

Packaging functions are quite varied and can be grouped into three main categories (27):

- To protect the product (avoid losses, ensure sanitary handling, etc.);
- To facilitate handling, storage and transportation;
- To communicate (provide information on a product's brand, nutritional features, origin and expiry date; attract the consumer's attention by making the product stand out, etc.).

Despite its negative impacts on resource use, food packaging – be it single-use or reusable – does have certain benefits, such as reducing **food loss and waste throughout the product's life cycle**, lowering risks to human health, and making handling and transportation more efficient (27).

While all types of packaging impact the environment, the use of plastic, generally perceived as one of the worst packaging materials in terms of pollution (28 and 29), has been widely documented. Commonly used as a packaging material, plastic is especially hard to manage in its end-of-life.

In addition, a variety of provincial and municipal container and packaging management practices (e.g. deposit-refund system, variation in materials accepted in curbside recycling), combined with the complex composition of plastic containers and packaging, make it more difficult to manage their recycling. This results in three million tonnes of plastic ending up in landfills in Canada every year (30 and 31). There are a number of other issues related to the disposal of plastics, including the diversity of packaging types and the design of mixed-material packaging, which makes sorting them more difficult for the public and recycling facilities.

Taking into account the current food packaging situation as well as the definition of ZW used in this study, the implementation of a ZW strategy within the food production and distribution chain revolves around two issues:

- Avoiding packaging as much as possible and eliminating **overpackaging**, in order to keep only "necessary" packaging;
- Optimizing packaging (for example, by increasing the **packaging/content ratio**).

+ OVERPACKAGING

Packaging that exceeds what's required to protect the product from potential damages or that is added for esthetic reasons. Overpackaging can also occur when products are excessively subdivided (e.g. mini yogurt tubs, mini packs of cookies).



3.1 PRIMARY, SECONDARY AND TERTIARY PACKAGING

In the case of **prepacked products**, three main types of packaging are present throughout the classic supply chain (32), as seen in table 2.

+ PACKAGING/CONTENT RATIO

Product quantity in relation to packaging quantity.

+ PREPACKED PRODUCT

A product is prepacked when placed in a package of whatever nature without the purchaser being present, and when the quantity of product contained in the package has a predetermined value and cannot be altered without the package either being opened or undergoing a measurable modification. For example, a vacuum-packed piece of pre-cut cheese is considered prepacked (32).

Table 2. Types of packaging in the supply chain

Primary packaging	Sales unit packaging for direct sale to the consumer or end user. This is the packaging seen by the end customers when they buy a product. This packaging is in direct contact with the product (e.g. cardboard box containing pasta).
Secondary packaging	Packaging composed of several primary packaging materials within a single sales unit. It covers the primary packaging, allows for handling and can be used for placement on display shelves directly at the retailer. It can consist of cardboard, dividers, plastic film, etc. (e.g. plastic package containing several pasta boxes).
Tertiary packaging	Packaging for handling secondary packaging and for shipping. This packaging makes it possible to group together a large quantity of products to facilitate their handling, storage and shipping. It is generally composed of a pallet, plastic film or straps (e.g. pallet containing a number of cases of pasta boxes).

3.2 REUSABLE PACKAGING

Primary packaging is the most visible and the one for which consumer awareness is the greatest, as it is part of the content that ends up in the grocery basket.

To reduce the amount of primary packaging, retailers can offer a ZW service that will influence the type of packaging or even exclude it altogether. ZW offerings include:

- Products requiring no container or packaging (e.g. fruits and vegetables).
- Bulk products, which are placed in reusable personal containers or in standard format returnable and reusable containers provided by the store. Customers can fill the containers themselves, or staff can fill them in designated areas and at food counters (e.g. salad bar, cheese bar, meats section).

- Pre-filled products, sold directly in returnable containers, that are reusable. These containers are recovered post-food consumption, sterilized and refilled. In such cases, the food is sold in returnable containers, of which there are many types, including those which can be refilled multiple times, such as the standard brown beer bottle, private deposit containers (for such things as milk and yogurt), bulk deliveries by retailers, etc.

The various systems for distributing bulk products are presented in table 3.

When it comes to secondary and tertiary packaging, the ZW offer consists mainly of various types of reusable shipping containers and packaging used for handling, shipping and storage. They are useful for products in transit, and can take the form of reusable pallets, large-format product containers for bulk sales, etc.

Table 3. Bulk system categories

Display	Products that can be easily handled (e.g. robust fruit and vegetables such as potatoes or apples)
Bin with scoop or tongs	Solid food products (e.g. dried fruit, cereal, legumes, flour, sugar)
Gravity-fed dispensers	Small, dry and solid food items that can be poured out (e.g. pasta, rice, semolina, legumes, nuts)
Automatic dispenser	For products that can flow (e.g. oil, vinegar)

Source: Planète and ADEME, 2012

3.3. LIFE CYCLE ANALYSIS OF THE ZERO WASTE OFFER

ZW products are not automatically better for the environment than regular ones. One method for quantifying the environmental impacts of the various container and packaging options, and for validating best-use scenarios, is the life cycle assessment (LCA). This method, illustrated in figure 4, consists in identifying the potential impacts of a product or service, and the stages at which they manifest themselves: 1. production, 2. distribution, 3. use and 4. end-of-life management.

+ LIFE CYCLE ASSESSMENT (LCA)

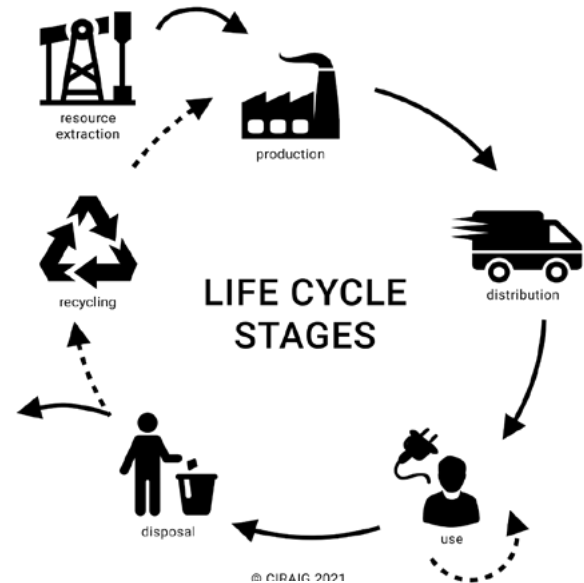
Methodology used to quantify potential environmental impacts during the entirety of a product's life cycle, that is, from resource extraction to product delivery to the client (cradle to gate) or to end of life (cradle to grave). (33)

To reach conclusions about ZW using the LCA method, generally, a range of bulk products are compared to their packaged counterparts.

Meta-studies involving the review of numerous LCAs confirm that, **in most cases, after a certain number of uses, reusable products are more advantageous than single-use packaging in terms of energy, water use and climate change** (19).

Generally speaking, studies agree that bulk products are preferable to packaged ones, even though, in certain cases, the impacts of bulk products may exceed those of packaged versions.⁴ A study by RELOOP PLATFORM and

Figure 4. Life cycle analysis diagram



Source: CIRAIG, 2021

Zero Waste Europe (35) clearly showed that, **of the 32 LCA studies detailing the environmental impacts seen in a variety of scenarios, 72% concluded that reusable packaging is preferable to single-use packaging.** With regards to takeout food, every scenario studied showed that employing reusable containers also has less impact on the environment than using disposable options (36). Lastly, studies by the International Reference Center for Life Cycle Assessment and Sustainable Transition (CIRAIG) on single-use versus reusable dishes in a cafeteria (37), and on reusable coffee cups in restaurants (38), reach conclusions in line with this trend.

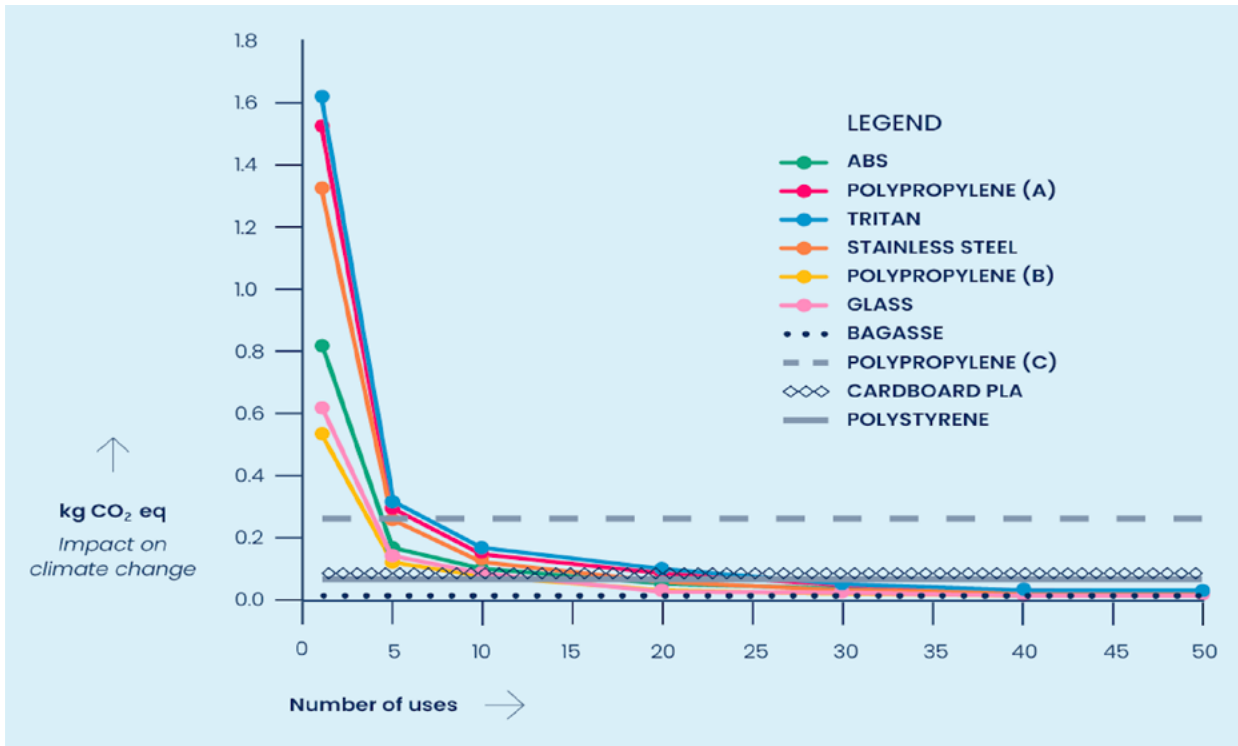
LCAs conducted in the province of Quebec have concluded that, after 30 uses, returnable take-out containers have almost no more environmental impacts, making them a more environmentally responsible option than most compostable or recyclable single-use packaging.

⁴ For example, a study carried out by Scharpenberg et al. (2021) found that, when sold in bulk, shower gel, gummy bears, detergent and noodles have a larger impact on water consumption (as their bins must be cleaned), yet lesser impacts on climate change (35).

In terms of climate change, figure 5 illustrates the drastic decrease in the environmental impact of different reusable container

options after a few cycles of use, compared to their single-use alternatives. This trend holds true for the other impact categories.

Figure 5. Environmental impacts of the various types of packaging according to the number of uses - "Climate change" criteria example



Source: La vague and CT Consultant, 2023

This figure also reveals that after only about ten uses, the type of material used to manufacture reusable containers no longer has much bearing on environmental performance.

3.4 FUNCTION OF PACKAGING AS IT RELATES TO FOOD WASTE

One of the main functions of packaging material is to protect, and extend the useful life of, the product it contains. That being the case, food losses – which can have a very significant impact on the environment as a whole – should be considered in a food packaging LCA.⁵ If the packaging helps reduce food waste, does it become acceptable?

In **developing countries**, the food supply chain reveals that the biggest losses occur at the beginning of the food chain, whereas in **developed countries**, they are generated all along the food supply chain (40). A study looking into food waste in Canada shows that it occurs at every step of the production and consumption chain, as summarized in Table 4. (41)

Table 4. Avoidable food waste in Canada in 2019

Sector	Millions of tonnes	Proportion (%)
Production	0.66	5.9
Distribution	0.55	4.9
Packaging	2.25	20.1
Processing	2.57	23.0
Hotels, restaurants, institutions (HRI)	1.44	12.9
Retail sale	1.31	11.7
Households	2.38	21.3
Total	11.17	100.0

Source: Value Chain Management International, 2019

Excluding factors such as moisture loss and the weight of inedible parts, an estimated 30.4% of food is lost or wasted in Canada (42). It is primarily the behaviours of company managers and consumers, among other individuals, that explain excessive waste throughout the value chains of fresh and processed food (30 et 43). However, it seems these behaviours are linked to the unintended consequences of the processes, policies and legislation that shape the manner in which the agri-food sector is structured and operates.

Some examples of “waste creators” (30) can be found in table 5.



⁵ Despite the significant environmental impacts of packaging, one of the main findings is that food waste is worse than packaging. It generates a greater impact than packaging's end of life (1, 27 and 39) as well as more greenhouse gasses (GHG) (in the case of plastic packaging) (30).

Table 5. “The seven creators of waste”

Factors	Related impacts
Overproduction	Excessive production and/or poor flow of products through the chain, often resulting in the need to apply discounts to push products through the system before they spoil.
Defects in products or equipment	Low-quality products, incorrect use of equipment, communication errors, shortened shelf-life, failed delivery.
Excess inventory	Lengthy delays, poor customer service, long cycle times, and excessive spoilage that occurs at any point along the chain, including in households.
Inappropriate processing	Incorrect procedures or systems, often when simpler approaches would be more effective.
Excessive transportation	Excessive and often complex and costly movement of products or information.
Waiting	Long periods of inactivity that impede the flow of materials or information, lengthen lead times, and increase spoilage.
Unnecessary movement	Poor design of any link or workstation along the chain, or of the overall chain itself, often leading to lost or damaged items.

Source: Value Chain Management Centre, 2010

In short, while packaging can be a lever for reducing waste thanks to its protective function, it can also cause waste when predetermined quantities of fresh produce exceed needs, driving overconsumption (e.g. a pack of six peppers, some of which will be wasted by the person who bought it). The latter explains why bulk buying, which allows individuals and retailers to purchase only the exact amount of product or food they need, can also be a lever for reducing food waste.

Both packaging and food waste impact the environment. On the one hand, the loss of certain sensitive foods generates more GHGs; on the other hand, poor management of used packaging produces litter, including marine pollution, which heavily impacts biodiversity loss and human health.

4. Barriers to and incentives for zero waste production, distribution and consumption

This section is based on the results of the review of the literature and identifies the obstacles and incentives to the rollout of ZW products in grocery stores, with a focus on the three main stakeholder categories: the industry, retailers and consumers.

The results of the literature review are complemented by those obtained through interviews with stakeholders in the food packaging value chain (4.1), focus groups with food retailers (4.2), and the Canada-wide consumer survey (4.3).

4.1 STAKEHOLDERS IN THE FOOD PACKAGING INDUSTRY

Containers and packaging, produced from various materials such as paper, cardboard, plastic, metal and so forth, are purchased directly by the food processing companies or packaging distributors. Food products are distributed directly to food retailers or via distribution centres managed by the corporations that own them. Finally, packaging distributors also sell food counter containers

to grocery stores. In other words, various companies may be involved in the development of containers or packaging.

The literature review identified a number of industry-related constraints and levers.

When it comes to disincentives, heightened logistical complexity, reorganizing supply chains to ensure the availability and return of packaging (which requires a system for storage, collection and cleaning, where applicable), upgrading the management of distribution and returns as well as making inventory management more efficient, are all barriers to industry participation. The unstable return rate and the rotation of reusable packaging that can impact the system, are

also viewed as challenges by the industry, as is the significant initial investment required to implement a new reusable container or packaging system. Lastly, other perceived negatives include the risk of reduced brand loyalty, due to the loss of visual identification cues, and a reduction in the level of product quality and safety. (19)

Key factors for developing a sustainable reusable packaging system include better collaboration between the supply chain and the distribution system. Add to this the use of pooling systems, which include some degree of standardization (e.g. pallets, bottles, a traceability system). On a smaller scale, there are reports that deposit-refund systems are prompting customers to return containers and packaging in good condition. Finally, the prospect of reduced costs for product customization is also seen as an economic incentive. (19)

To document industry practices, data was collected from 16 industry players, including individuals working in companies that pro-

duce and distribute food packaging (paper, cardboard and plastic); companies that collect, process and recondition packaging; a number of food manufacturing companies; one equipment manufacturer; one grocery retailer and one food corporation.

Each interview yielded new information, resulting in a degree of repetition in the themes discussed. The following sections summarize the initiatives, barriers, and incentives associated with the industry. The initiatives relate to projects already implemented by the organizations to promote ZW.

4.1.1 Industry-identified zero waste initiatives

Faced with the challenges of adopting a Zero Waste strategy, a small proportion of those interviewed mentioned initiatives that had been implemented to address the Zero Waste offer in grocery retail outlets. Table 6 summarizes the major initiatives designed to reduce packaging volume identified during the interviews.



Table 6. Initiatives identified by value chain stakeholders interviewed

Initiatives	Details
Eco-design of packaging	To reduce packaging, the organizations surveyed rely mainly on eco-design. This involves redesigning the packaging system to reduce the volume of materials used or to avoid superfluous elements, primarily by decreasing the thickness of the material. A policy of reducing the weight of packaging was also mentioned.
Packaging food in returnable multiple-fill containers	One food producer uses only one type of returnable and reusable container to market their product, allowing them to sell directly to grocery stores and to differentiate themselves from competitors. However, this practice does not appear to be widespread.
Food sold in bulk by food manufacturers	Some food manufacturers have developed a bulk offer or promoted the use of reusable containers.
Transporting food on reusable pallets	Liquid inputs purchased in large quantities are usually delivered in intermediate bulk containers (commonly called "boilers"). One company also uses collapsible and reusable plastic or wire mesh containers to transport other goods. One person interviewed mentioned the use of returnable pallets, which he claims are becoming more and more common. ^{6 and 7}
Reuse of certain packaging	Although not necessarily produced with reuse in mind, certain types of packaging are in fact being reused by distributors. "All the packaging that we get is reused or recycled [...]," a participant mentions. "The cardboard corners, they're all reused. We use them to rebuild pallets and then send them back."

4.1.2 Barriers to the offer of products in a zero waste format

In general, being able to offer ZW products requires the lifting of numerous social, technical, logistical, financial and regulatory barriers.

The most frequently identified barriers, listed in descending order:

1. Consumer behaviour;
2. The doubts interviewees had about the positive impacts of ZW from a life-cycle analysis perspective;
3. Doubts regarding the feasibility of ZW;
4. The industry's limited interest in, and capacity for, change;
5. Negative food safety-related perceptions of ZW.

While these considerations were not observable from the literature review, most of the organizations surveyed attributed the lack of ZW practices to consumer behaviour. Consumers are portrayed as having to juggle numerous priorities, having to manage busy schedules, resorting to convenience foods, not being willing to pay more for environmentally friendly options, knowing little about packaging, or set in their ways. Yet, as interviewees point out, ZW requires the consumer to go the extra mile to clean and transport reusable containers.

A number of those interviewed raised doubts about the environmental benefits of ZW products from a life-cycle perspective.

For example, several mentioned that one of the main functions of packaging is to extend the shelf life of products. Controlled atmosphere packaging, for example, can help preserve food and combat food waste. From this standpoint, the environmental impacts of food wasted through incorrect bulk handling of sensitive items would exceed those avoided by skipping packaging. Similarly, ZW offerings are still seen as having a significant environmental impact due to their cleaning and transportation requirements. One other consideration raised by interviewees is that reusable packaging has a greater initial environmental impact and requires several use cycles before it is comparable to single-use products. Concerns about life-cycle were not identified in the literature review and therefore add to our study.

Further, according to the information seen in the literature review, several of the interviewees questioned the feasibility of ZW, underlining the potential challenges of implementing it in grocery stores. It should be noted that these doubts were raised by businesses both upstream and downstream in the value-chain. For many, the bulk format and reusable containers would only apply to a limited number of food items. Such solutions would not lend themselves to delicate fruits (e.g. raspberries, blueberries, pears), prepared foods and many of the center-aisle foods (e.g. individual cakes).

⁶ In Quebec, CHEP distributes blue palettes on consignment: <https://www.chep.com/ca/en/services-solutions>

⁷ Internationally, the red pallet is also used: <https://www.lpr.eu/>

→ 4.1.2.1 The industry's capacity for and interest in change

Some interviewees, especially those upstream in the production chain, showed little interest in seeing their sector move towards a ZW offering. They noted how requested changes could have a negative impact on their sector or on businesses that have invested heavily in equipment to recover and recycle containers and packaging.

Underlying this opposition by the interviewees was the perception that there is limited capacity to integrate into this new market. They felt that deployment of a ZW offering would not be part of the core business of packaging manufacturers. Only one participant, a packaging manufacturer, was actively adapting his business to cleaning reusable containers.

→ 4.1.2.2 Food safety perceptions of industry representatives

According to interview participants, options like bulk products or reusable containers are perceived as being more conducive to the transmission of pathogens, contaminants or allergens. However, it is important to note that this is more belief than fact, since the scientific literature shows that the ZW format can be quite sanitary (7).

→ 4.1.2.3 Regulatory considerations

Interviewees were divided as to the effectiveness of current regulations. According to some, the legislation is politically motivated, with no basis in research and devoid of understanding of its impact on the value chain. According to those interviewed, **Extended Producer Responsibility (EPR)**

programs or **single-use products** prohibition strategies tend to distort the value chain, create red tape, target the wrong issues or fail to actually reduce the use of resources. Other participants saw these regulations as interesting policy incentives.

+ EXTENDED PRODUCER RESPONSIBILITY (EPR)

An approach designed to transfer responsibility for the management of waste generated by the consumption of goods to the businesses that market them.

+ SINGLE-USE PRODUCTS

Items intended to be thrown away after only one use (e.g. shopping bags, straws, utensils). (44)

Regardless of their views on the effectiveness of regulations, participants highlighted the challenges of adapting to local regulations. **Regulations and targets vary across the provinces and even municipalities, making it difficult for Canada-wide companies to implement broader initiatives.**

→ 4.1.2.4 Additional barriers

Among the other barriers identified by the industry, some are noteworthy and reinforce findings in the literature review.

These include:

- The costs to various supply-chain stakeholders caused by changes in supply and distribution practices;
- The issue of having to wash reusable containers and packaging;
- A lack of environmental data upon which to base sound choices;
- The role of packaging in differentiating a product and consumer attachment to brands;
- The limited influence on other stakeholders, both consumers and brand holders;
- Concerns about product returns including the resulting financial impacts;
- The limited availability of ZW items, curbing the variety of products offered;
- A minimization (or sometimes even denial) of the issues related to overpackaging.

Finally, some participants attribute their lack of ZW offerings to the absence of specially designed reusable packaging. Reusable packaging for food counters or take-out foods is reportedly less known among Canadian stakeholders. Similarly, while some dairies distribute their products in refillable containers, few brands use this solution, at least in North America. Food processors and retailers seem to be waiting for these solutions to become more widely available before adopting them.



4.1.3 Incentives for offering zero waste products

Most of the respondents felt that they could influence the other stakeholders in the chain.

Packaging manufacturers, for example, advise food producers on issues such as environmental impact, food conservation or large retailers' requirements. They also respond to packaging challenges raised by their customers. Other interviewees thought their influence was limited, especially in dealing with major brands, and, despite their insights into packaging design, were still waiting to be asked before developing a ZW offering. All this points to the need for greater collaboration between stakeholders, as highlighted in the literature review.

Some interviewees mentioned the following potential economic benefits of switching to a ZW offer:

- Environmentally friendly products make a good impression (although the loss of visual markers may negatively impact customer loyalty);
- Reusable secondary and tertiary packaging is more robust and reliable, which could have a positive impact on supply costs;
- Reducing packaging will lower costs for the business;
- Deposits on containers build customer loyalty since customers return the containers to the store for a refund. This system requires little effort on the part of consumers, especially if cleaning activities are performed by the retailers.

Most of the incentives and opportunities identified involve **government intervention**. The following sub-sections summarize the solutions identified by interviewees for accelerating the transition to ZW.

→ 4.1.3.1 Federal or provincial government framework

The various levels of government can act by setting priorities and establishing targets. Participants stressed the need for consistency among the different objectives set by government departments. For example, should priority be given to reducing packaging, cutting food waste or fighting climate change? How should these objectives be prioritized in relation to one another?

Some interviewees stressed that they believe governments should leave it to industry to determine the means for achieving targets. Others felt that governments can play a more forceful role by setting standards for ZW or by banning packaging misuse.

The Canadian government's recent decision to legislate single-use plastics was mentioned by several people, and illustrates the divide among survey participants. For example, some say the ban on plastic beverage-container rings is too prescriptive and targets low-volume products. Others find that the measure targets the overuse of plastic products for which reusable or compostable alternatives exist.

→ 4.1.3.2 Establishing a financial framework for packaging

Most participants stressed the need for a financial framework around packaging, but disagreed on the best regulatory tools.

The majority understood the importance of incentives - which reward those who implement worthwhile initiatives and disadvantage those who do not - and agreed with the principle of extended producer responsibility. However, a few participants raised issues regarding the implementation or harmonization of EPR programs across Canada.

→ **4.1.3.3 Participation in the supply chain to standardize containers and manage their reuse**

Some participants see the value in local or community governments becoming actively involved in **reverse logistics**. For example, one participant who uses a private deposit system in marketing his product is open to adopting a standardized container that could be used by multiple companies. A centralized collection and cleaning system, similar to what is done for beer bottles, would allow for economies of scale. Another participant suggests that municipalities could collect returnable containers separately for reuse.

+ REVERSE LOGISTICS

The process of collecting, sorting and processing to enable the return of goods (45).

→ **4.1.3.4 Financial and technical support for the establishment of a ZW offering**

Respondents mentioned automation, research and development in the area of packaging, LCA of packaging options, and the dissemination of decision-making tools.

Offering more bulk products and private deposit systems may require cleaning equipment or upgrades to manufacturers' facilities, in which case the various stakeholders may require assistance.

→ **4.1.3.5 Documentation and dissemination of ZW best practices to sensitize industry players to the positive impacts**

While the various players in the chain influence each other naturally, some see the value in governments disseminating good practices and coordinating the chain. The sharing of North American initiatives or case studies demonstrating the benefits of ZW will convince industry players to adopt such practices.





4.2 FOOD RETAILERS


Retailers, the penultimate supply chain actors before consumers, are responsible for providing consumers with all the products and services they need in one place (46).

To successfully remove packaging, researchers have found it necessary to reinvent the practice of shopping (47), offering retailers a leading role. This would involve:

- Reframing the shopping experience so that it's more meaningful and reflective of a new set of values (e.g. healthy eating, environmental responsibility);
- Equip consumers to develop the new skills needed to change their purchasing habits and adopt zero waste practices;
- Refit the store so that its physical layout can accommodate ZW purchases.

There are different drivers and disincentives for retailers to engage in ZW. With respect to disincentives, the need for additional space and the food-safety requirements around receiving and storing reusable containers are among the concerns of retailers. Also, the

maintenance and cleaning of containers and packaging are seen as extra tasks (although having third-party companies take on the risk and responsibility of collecting and maintaining packaging may be an innovative solution). Furthermore, time-consuming in-store operations for product and inventory handling could increase labour costs, as could the reusable packaging system itself, primarily due to logistical issues and low market volumes. To ensure the financial viability of the ZW offer, merchants need regular customers who are committed to this type of environmentally responsible format. Lastly, more time-consuming purchases and limited product variety are perceived as disadvantages for the customers.

 Inspiring initiative - Various organizations have developed online guides designed to support merchants wanting to offer a ZW option:

- LOCO Épicerie zéro déchet has produced a guide entitled "[Mise en place d'un centre de distribution zéro déchet](#)" [Setting up a zero waste distribution centre] (only available in French).
- *La Table de concertation sur la réduction à la source* has produced a guide entitled "[Guide des bonnes pratiques sanitaires en alimentation pour la gestion des contenants et autres objets réutilisables](#)" [Guide to healthy food handling practices for managing containers and other reusable items] (only available in French).

With regard to incentives, customer loyalty, for example, can increase thanks to the refill concept, and the brand's environmental image can improve. Suppliers and consumers are expected to adopt more resource-efficient behaviour. Society is expected to reap a number of benefits from ZW, including:

- Support for small regional farmers, since local sourcing requires less transportation and thus less primary, secondary and tertiary packaging;

→ Greater transparency throughout the supply chain; and

→ Better informed consumers. (1, 48 and 49)

As part of the research, a number of semi-structured group interviews were conducted with food retailers (managers and owners of grocery stores, convenience stores, specialty stores, cheese shops and butcher shops). The following subsections describe the barriers to and incentives for ZW identified by participants.



4.2.1 Barriers to the zero waste offer

Focus group participants identified a number of issues related to increasing the availability of ZW in their businesses such as regulations, food safety, food waste, higher expenses related to ZW management and resistance to change.

Most participants indicated that ZW complicates operations and logistics, leaving them with the impression that bulk foods entail additional responsibility that is difficult to manage. In fact, a broad range of extra challenges, all related to the implementation of bulk supply, inhibit initiatives. These elements were also noted in the literature review.

The focus groups also revealed that retailers' activities are heavily influenced by the other stakeholders in the supply chain. If those other players develop environmentally responsible initiatives, then it is easier for retailers to work with them to reduce the amount of waste from their operations.

A number of individuals underlined this issue, making it clear that efforts from all actors from the supply chain are required in order for the Canadian food retail sector to successfully reduce packaging.

One of the most frequently raised issues was the monetary aspect of grocery-store profitability. Several times, profitability margins and the costs associated with waste and packaging were mentioned.

The concept of resistance to change was analyzed from the perspective of cultural and/or behavioural change, and excludes any logistical or financial aspects. The resistance to change identified by retailers comes from customers, head offices, brands that dictate policy, and the industry in general.

Finally, the COVID-19 pandemic significantly slowed efforts to reduce containers and packaging in the food industry. Its effects have gone far beyond the use of packaging and have caused considerable logistical challenges for grocery stores.

The sections that follow will provide more details on the findings from the focus groups.



→ 4.2.1.1 Internal logistics and management

Hiring and retention of staff	<p>Participants discussed how staff shortages challenged their efforts to make their ZW initiatives sustainable. Training employees to handle bulk products would be a difficult prospect to contemplate.</p> <p>Pre-packaged products, which allow consumers to serve themselves without assistance, require fewer employees on the floor to prepare specific quantities.</p>
Additional training required to implement a bulk system	<p>Increasing the number of directives, and implementing them, would add to the time and financial resources required.</p>
Labour shortages	<p>For retailers, their employees are a source of green initiatives and ideas. The current labour shortage would slow down the flow of useful new ideas for developing greener strategies internally.</p>
Workload faced by grocery store managers and owners	<p>The generally small internal structures of grocery stores, would converge crisis management and day-to-day problems to the managers and owners, who, as a result, would have very little time for developing new initiatives.</p>
Food losses	<p>Concerns were expressed regarding the potential for losses due to contamination or spoilage.</p>
Operational changes	<p>The application of a ZW policy would be onerous for some departments (e.g. meat and fish stores) considering the strict sanitation rules that retailers are subject to.</p>
Deposit-return system	<p>Space and sanitation concerns were noted by the merchants; the deposit system would have implications for the overall hygienic condition of the building (mosquitoes, worms, etc.) and would require time and storage space they lack.</p>

→ 4.2.1.2 Supply chain

Difficulties in changing purchases from suppliers and wholesalers	Some retailers would like to have the option of returning empty containers, such as cans or bottles that have been brought back by consumers, to other players in the chain.
Cooperation among the various players in the supply chain	In order to implement initiatives, collaboration would be required. For example, a milk supplier could take back empty glass bottles from consumers, or warehouses could employ reusable shipping crates to transport their products to stores.
Food pre-packaged by suppliers	Retailers are receiving more and more pre-packaged goods (e.g. cold cuts and vegetables in plastic packaging).

→ 4.2.1.3 Profitability

Financial risk related to losses from unsold food	The loss of freshness in bulk foods would lower sales and create financial losses for the business.
Space optimisation	Retailers would be reluctant to offer more products in bulk because of space shortages.
Presence of duplicate products	Since the demand for bulk products is marginal, products stocked in the ZW section would also be found among the packaged items in the "regular" sections of the store, lowering the profitability of the retail space.
Installation of dispensing machines	Dispensers to replace the usual individual containers would be just as expensive and require extra management.

→ 4.2.1.4 Consumer preferences

Quest for the perfect fruit or vegetable	Faced with extremely selective consumers, it would be more advantageous for retailers to package vegetables in small quantities than to let people choose for themselves, which sometimes involves touching and possibly damaging the food.
Attractiveness of the freshest product	Routinely seeking out products with the longest expiration dates would place pressure on stock rotation in the grocery store aisles.
Day-to-day consumption in metropolitan areas	Consumers who shop daily, rather than weekly, would be less prepared. For example, it might be trickier for someone stopping in on the way home from work to carry reusable containers for ZW purchases.
Product variety	Consumers would want a broad selection, so moving from numerous packaged options to one or two bulk choices (e.g. laundry detergent) would go against demand.
Consumer education and awareness	Consumers would generally be the ones who demand and initiate change, they would need to learn more about the issues surrounding product safety, freshness and quality.

→ 4.2.1.5 Regulations

Lack of regulatory uniformity	Municipal regulations vary from city to city.
Health requirements of the <i>Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec</i> (MAPAQ)	<p>Merchants are held responsible for maintaining sanitary conditions, ensuring that customers leave with products that are both safe and fresh, and this may be inconsistent with bulk products, which they feel present a high risk of contamination, primarily due to the freedom granted to consumers.</p> <p>Businesses fear losing their licenses or facing legal action in the event of contamination from dirty containers brought in by consumers.</p>

→ 4.2.1.6 Resistance to change

Time required for ZW	Today's fast-paced consumer habits mean that customers generally make their purchases on the fly, and therefore don't have reusable containers with them.
"Green" solutions accepted	Consumers assume that recycling and composting are "green" solutions that eliminate the need for them to bring in their own containers in order to avoid single-use packaging.
Brand/chain policies	Retailers who operate under a particular brand name (chain) are bound by head office policies (marketing based on the use of specified containers, mandated presentation, etc.). Therefore, they feel powerless to establish a ZW policy of their own.
Resistance on the part of major chains	While they supposedly have the power to influence supply chain players, very large retailers would use various excuses for not moving toward ZW.



→ 4.2.1.7 COVID-19 Pandemic

Sanitary measures	Waste increased due to requirements to wash hands, wear masks and disinfect shared items and surfaces.
Perception of contamination risks	The use of reusable bags and contact with food items such as fruits and vegetables, which are perceived as contamination risks, would have caused a significant rise in the use of plastic bags.
Going backwards on ZW	During the first months of the pandemic, some retailers would have chosen to package in small quantities all the products they offered in bulk, a phenomenon that would have encouraged some customers to resume old habits. return to this purchasing practice. Such decisions were based on retailers' perceptions that this is what their customers wanted.
Waste-reduction initiatives suspended	<p>Plastic waste reduction initiatives, pilot projects and new methods developed to encourage ZW and deposits were discontinued for several months - some even talked about "starting over from scratch" regarding the elimination of single-use plastics in their grocery stores.</p> <p>Within the context of the COVID-19 pandemic, bulk products would have been perceived by stakeholders as less hygienic. While neither federal nor provincial governments banned the sale of foods in bulk, several chains would have temporarily paused the sale of self-serve foods or revised protocols for their use.</p>
Budget constraints	Participants mention that the pandemic put a damper on various initiatives and that they eliminated budgets that could have been used for implementing ZW.

4.2.2 Incentives for the zero waste offer

Only a few incentives were mentioned in the focus groups with retailers. These included the staff and customer loyalty created by the ZW business model, the ease of offering certain types of products in bulk, and the opportunity, thanks to the bulk offering, to reduce operating costs related to the purchase of packaging.



→ **4.2.2.1 Support for zero waste practices**

<p>Consulting service offered by a NPO</p>	<p>An external firm can support retailers by assessing their situation and identifying ZW practices they can adopt. This could include, for example, discontinuing the use of plastic bags, analyzing all avoidable packaging being used, and creating incentives to purchase food that is close to expiry or being spoiled, but is still edible, by attaching a 40%-off label.</p>
<p>Digital app</p>	<p>In cases of anticipated losses, there is an app that allows some customers to purchase food that is close to its expiry date or damaged but still edible.</p>

→ **4.2.2.2 Consumer profile**

<p>Consumer awareness of ZW</p>	<p>People aware of the benefits of ZW are more open to consuming products that meet this criterion.</p>
<p>Socio-demographic customer profile</p>	<p>The consumer's age ("young"), level of education ("educated" and "university educated") and origin ("European", among others) would all influence the demand for packaging-free products.</p>
<p>Nature of product</p>	<p>Certain items are more likely to be bought in bulk (yogurt, milk, nuts, rice, flour, soaps).</p>

→ 4.2.2.3 Financial considerations and support for retailers

Profitability	Since packaging represents a major expense, it is advantageous for retailers to reduce any unnecessary packaging (e.g. polystyrene trays and plastic shrink wrap).
Image and values	The ZW offer would increase the customer base, reflecting a business with environmentally responsible practices aligned with their values.
Assistance provided to support ZW initiatives	The prospect of obtaining subsidies is attractive.

→ 4.2.2.4 Retailers' environmentally responsible commitments

Sense of owner commitment	The mission, vision and values of a business are intimately linked to the owner's commitment to environmental responsibility, and reinforce their brand image, not only with their customers, but with their staff.
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4.3 CONSUMERS

The literature reveals growing consumer concern about the amount of packaging used and a willingness to take action on the issue. For some, shopping for groceries without any single-use packaging is seen as a new way to consume sustainably (49).

To explore the perceptions of Canadian consumers, a cross-Canada survey was conducted. It reveals consumer practices and knowledge about the environment and ZW, the drivers and inhibitors of this practice, and support for various public policies. A total of 2,002 Canadians answered the survey between February 8 and 22, 2022. Details on the sample composition are provided in Annex 2. The survey results are linked to the results of the literature review in subsections 4.3.1, 4.3.3 and 4.3.4.



4.3.1 Consumer profile and perceptions

According to recent articles on the subject, consumers expect environmentally friendly packaging on three key dimensions (50):

- Packaging materials;
- Manufacturing technology;
- Market appeal.

Their focus is clearly on the product contained within the package, since the relationship with the package is short-lived. Once it arrives at its destination, the packaging is no longer needed and is, in some circumstances, a significant waste-management issue. (51)

Consumers' perception of environmentally friendly packaging continues to vary, and their understanding of the recyclability of materials is limited.

Consumers also attach importance to features such as design and price, while manufacturing technologies are less known to them and have less influence on their buying decisions. (50)

Circular economy, naturalness and design are also factors in how the public evaluates packaging materials (29). Consumers "evaluate the environmental sustainability of packaging types based primarily on the type of material used and on what they can personally do at the disposal stage." (52)

Consumers realistically assess the environmental impacts of paper, cardboard and metal, while the positive impacts of plastic packaging are underestimated, and those of glass and biodegradable plastic packaging are greatly overestimated. (29)

Limited knowledge of the impacts associated with the various types of packaging results in less environmentally friendly purchasing

habits than expected, prompting researchers to recommend "science-based awareness training, clear product and packaging information based on labeling designs ["eco-labeling"] and advice on sustainable behaviour [...]" (29).

Canadian public support for packaging reduction

In Quebec, a survey by the *Observatoire de la Consommation Responsable* (53) showed that 96.5% of Quebecers surveyed believe that waste reduction, such as avoiding overpackaged products or buying in bulk, should be a cause for concern for the entire population.

A research from Dalhousie University (54) found that 93.7% of respondents in a Canadian survey were "personally motivated to reduce their use of single-use plastic food packaging because of the impact it has on the environment."

→ 4.3.1.1 Purchase of bulk products

- According to the survey conducted as part of this study, 41% of participants reported buying in bulk. Of these, some are more likely to make bulk purchases:
- Men (at 45.3%), which contradicts the literature suggesting that women are more likely to engage in environmentally responsible behaviour (36% of women indicated doing so in this survey);
- Youth: 56% of those aged 18-24 indicated that they shop in bulk, as did half those aged 25-39;

- Individuals with at least one college degree;
- Individuals who are employed;
- Householders with young children;
- Individuals residing in a large urban centre;
- Individuals who engage in active mobility, or use public transportation or car sharing;
- No significant distinction in political leanings was noted among those who make bulk purchases.

Quebecers are less likely to buy in bulk than are residents of other parts of Canada. Only 25.8% of Quebec respondents indicated that they buy in bulk, compared with 45.1% in Ontario and 43.7% in British Columbia. This result and the one related to gender are at odds with other studies or seem counter-intuitive. Explanations for this disparity may include biases within the survey:

- A misinterpretation of the ZW concept, despite the fact that respondents were provided with a definition;
- A self-selection bias: people more likely to take environmentally responsible actions were more likely to participate in the survey.

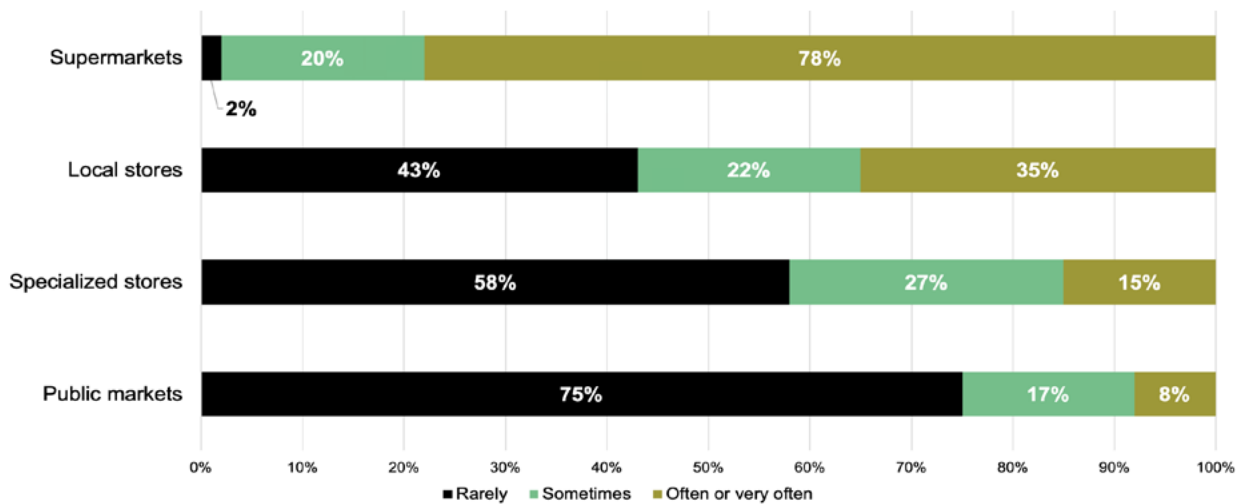


→ 4.3.1.2 Types of stores frequented

Supermarkets were the most popular stores among survey participants, with over three in four respondents (78%) shopping there often or very often, i.e. at least once a week. Local stores (within a 15-minute walking distance from home) are frequented often or very often by just over a third of the respondents

(35%). A mere 15% of respondents patronize specialized grocery stores (e.g. bakeries, butchers, fruit stores) at least once a week. And fewer than one in ten often shop in a public market. Figure 6 breaks down the percentages for the various types of stores.

Figure 6. Shopping at various types of food stores



Thus, the store types rank as follows:

1. Supermarkets
2. Local stores
3. Specialized stores
4. Public markets

→ 4.3.1.3 Consumption habits among bulk shoppers

Of the 41% of respondents who say they buy products in bulk – 812 individuals – most do so at their traditional grocery store. Just under half do so at specialized stores, and a fifth of these individuals bring their own containers. Table 7 shows where bulk shoppers make their purchases.

Fruits and vegetables are the items most often purchased in bulk, while cheese, juice and drinks are least purchased in bulk. Table 8 lists the most popular bulk shopping categories among the 41% of survey respondents who said they buy in bulk.

Table 7. Shops frequented for bulk purchases

Shop	Percentage of bulk shoppers (812 individuals) ⁸
Regular grocery stores that sell bulk products (e.g. store brand, local products)	70%
Specialized bulk goods stores	47%
Specialized stores (e.g. fruit and vegetables, bakery, cheese) with their own containers	21%

Table 8. Bulk shopping frequency by product category

Product category	Percentage of bulk shoppers who always or often buy these products in bulk
1. Fruits and vegetables	54%
2. Dry foods (e.g. pasta, beans, nuts)	36%
3. Fresh products (e.g. meat, fish)	35%
4. Cheese, juice and drinks	29%



8 The sum of responses exceeds 100% because there were multiple response options.

4.3.2 Bulk shopping intentions

→ 4.3.2.1 Perceived ease of bulk purchasing

The above results echo those from the question about how easy the respondents find buying certain products in bulk. The products most commonly purchased in bulk are also the most easily obtainable in this format, according to those surveyed – and vice versa. This is reflected in Table 9, which shows the degree to which the respondents find it easy to purchase these bulk products.

Table 9. Degree to which products are easy to buy in bulk, by category

Product category	Percentage of respondents who find these products easy to buy in bulk
1. Dry foods (e.g. pasta, beans, nuts)	61%
2. Fruits and vegetables	59%
3. Juice and drinks	36%
4. Fresh products (e.g. meat, fish)	31%
5. Cheese	30%

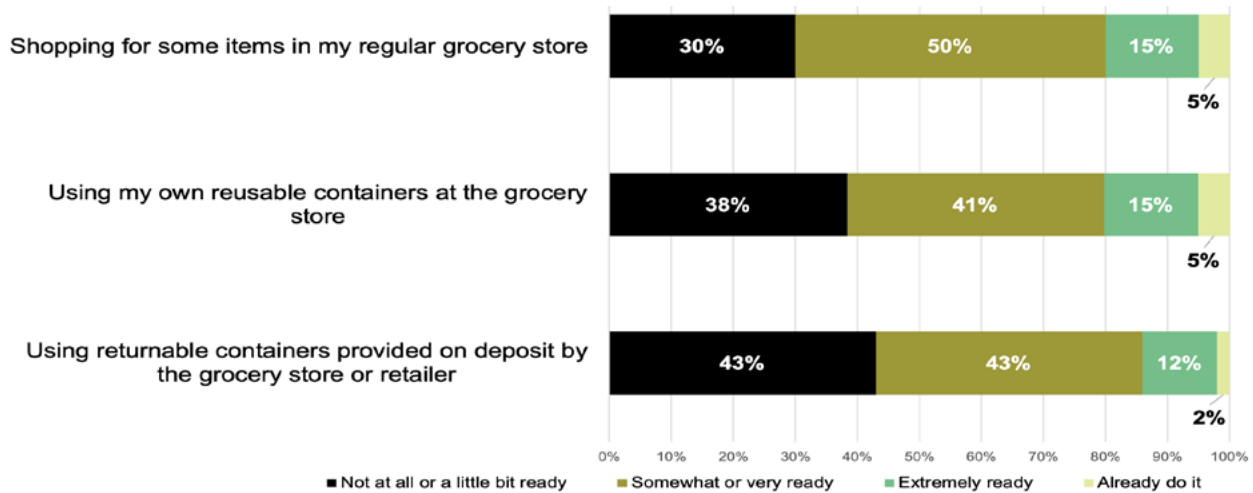
→ 4.3.2.2 Assessing the transition to action

For each of the three proposed options - 1) buying a portion of their groceries in bulk at their regular grocery store, 2) bringing their own containers, and 3) using returnable containers - more than half of respondents said they were "moderately, very, or extremely willing" to do so. Doing a portion of their grocery shopping in bulk at their local store is the most popular option, with 65% of respondents being "moderately, very or extremely willing" to do so. Fewer (30%) say they are not, or not very willing to follow this course.

However, the results for the other two bulk buying options are more nuanced. Respondents are less willing to use their own containers. Finally, regarding the use of returnable containers, more respondents (43%) said they were not very or not at all willing to do so in preference to the other two options, while the percentage of people moderately or very willing to take this action was the same (43%). Figure 7 shows the responses from all respondents regarding their interest in choosing each of these three bulk purchasing options.

The proportion of respondents who say they already use one of these three bulk purchasing options is lower than the proportion who currently make certain purchases in bulk (41%). This may be because buying unpackaged fruits and vegetables may have been considered buying in bulk, while this was not among the response choices for this question, which was designed to measure willingness to change.

Figure 7. Intent to act on various bulk purchase options



Thus, the option for which readiness to take action is highest is that of doing a certain portion of shopping in bulk in their usual grocery store, while using returnable containers is the least desired option. This may show that consumers are open to buying in bulk only when they do not have to change their habits.

Three profiles emerge from these results:

- **“Committed”** individuals are ready to take at least one of these actions or are already doing at least one of them;
- **“Interested”** individuals are somewhat or fairly ready to adopt at least one of these habits;
- **“Resistant”** individuals have little or no intention of taking any of these actions.

Certain sociodemographic characteristics influence the intention to change:

- Women (43%) are more prepared than men (32%) to translate intentions into action;

- Younger people are more likely to change their habits (40% of 18-24 year-olds and 43% of 25-39 year-olds say they are willing to buy in bulk at their traditional grocery store), while those between 40 and 55 are the least willing (32%);
- The proportion of those who are not willing to buy in bulk is greater for those without a college or university degree (14.4% vs. 9.9% for those with a college degree, and 8.8% for those with a university degree);
- Employed individuals are less likely to resist buying in bulk (9.8%) than those without jobs (13.8%);
- Those who position themselves on the left side of the political spectrum are more willing to shop in bulk (43.9%) than those positioning themselves on the right (41%) or at the centre (36.9%).

→ 4.3.2.3 Factors motivating people to buy in bulk

Among the respondents who are already taking at least one of these three bulk buying actions or who are somewhat, fairly or completely ready to do so (i.e. those falling into the **interested** or **committed**

categories), the main inducement for bulk shopping is the reduction of waste. Table 10 presents the motivational categories for buying in bulk, in order of importance.

Table 10. Motivations for buying in bulk

Motivations	Percentage of "interested" and "engaged" respondents who agreed (1581 individuals)
Reusing my containers is a good way to reduce the amount of waste I produce.	43%
I always look for the best prices on the things I buy.	43%
I want to be able to buy just the right amount of the products I need.	37%
Bulk products are a good option if I want to reduce my grocery bill.	36%
I want to change my habits to reduce my environmental footprint.	28%
I want to get involved in the zero waste movement.	19%
I want to buy products that are good for the environment.	17%
I want to buy products that are good for my health.	14%
This option is available near me.	11%
No particular (or some other) reason.	1%

A number of socio-demographic factors influence the motivation to buy in bulk:

- Environmental benefits and the ability to adjust the quantity of products purchased are more important to women than they are to men;
- Men are a bit more concerned than women that these options be available nearby and that they be healthy options;
- People 55 and over place greater importance than other age groups on being able to buy the quantity they want;
- Younger people (18-24) and those aged 55-64 are more motivated than others by the store's proximity;
- Unemployed people are more motivated by environmental considerations and the ability to buy the exact quantity than those who are employed;
- Employed people attach greater importance to the healthiness of products than do those who are unemployed;
- People living in Quebec and British Columbia are more motivated by environmental benefits than are people in the other provinces.



4.3.3 Barriers to buying in bulk

Among the major barriers mentioned in the literature review are the need to bring back empty containers, the complexity of filling them, the potentially higher price for bulk products and the limited range of unpackaged products available. Some consumers are also concerned about hygiene issues associated with the bulk distribution system. The potential unavailability of refills, and the initial cost of a bulk dispenser in a refill system (e.g. the cost of the deposit on a standard refillable container) are also cited in the literature. Finally, there is a limited understanding of how to discern and evaluate the environmental impacts of packaging, which adds to the difficulty of making an informed decision, as does a lack of knowledge regarding unpackaged food offerings (19, 48, 49, and 55).

→ 4.3.3.1 Findings from the Canadian population

The survey found that among those “**resistant**” to buying in bulk, the main deterrent was fear of inadequate product hygiene. However, there are a variety of other reasons for not buying in bulk. Table 11 shows, in order of importance, the barriers measured in the survey.

Thus, we see a certain correlation between these results and the major deterrents identified in the literature review. Sanitation issues, the complexity and effort involved in buying products in bulk (e.g. having to wash and

bring containers in), the potentially higher prices of these products, and the range of products offered are all impediments that have been identified by the consumers surveyed, at various levels, and have also been raised in previous studies.

The information and food hygiene provided by packaging are the most important considerations influencing product selection, which is consistent with the most significant obstacles to buying in bulk.

Several sociodemographic differences were observed among the disincentives to buying in bulk:

- The effort required is more of a hindrance for men than it is for women (65% vs. 48%), but the hygienic barriers are more important for women (67% vs. 51%), as is the lack of information (25% vs. 11%);
- Hygienic considerations are more important for older individuals than for younger people (74% for those aged 64 and over vs. 46% for those aged 18-24);
- The lack of product information is mentioned more by those aged 64 and over (28%) than by the other age groups (e.g. only 8% for those aged 18-24);
- Younger people are more limited by the effort required to buy in bulk (63% of 18-to-24 year olds and 65% of 25-to-49 year olds vs. 38% of those 64 and older).

Table 11. Barriers to buying in bulk

Barriers	Percentage of "resistant" individuals who agreed (1105 individuals)
I have doubts about sanitary conditions.	24%
That option is not available near me.	24%
I don't look specifically for bulk options.	19%
I find that the products sold in bulk lack information (e.g. origin, date of manufacture, expiration date, nutritional value).	18%
I have doubts about freshness.	16%
It's hard for me to carry my containers around.	14%
I am concerned about products being contaminated with COVID-19.	13%
I don't like having to clean my reusable containers.	13%
It's too much effort for me.	13%
I find that the items are more expensive.	10%
For me, there is no financial incentive to buy groceries in bulk.	10%
I like to buy things spontaneously, which I can't do in a store that sells in bulk.	9%
I find that there is not enough variety in the products available in bulk.	9%
I don't want to change my habits.	8%
I like the way packaged goods are presented.	7%
I'm not familiar with the concept of a zero waste grocery store.	6%
I worry about allergy risks.	5%
I don't like the products offered in bulk stores.	4%
I don't know how the system works.	3%

4.3.4 Incentives to buy in bulk

The main incentives for consumers to buy ZW products are individual factors such as personal values, environmental commitment, sense of guilt, and so on. The personalization of the act of buying something, notably through the shopper's choice of container and quantity, was also mentioned. Store loyalty and availability of staff are also important, as are positive contacts with staff and an eco-friendly image. The ability to obtain information about store operations and the values promoted by the ZW concept also register as positives, as does the increased variety of the food and products offered. Finally, among the motivators are certain reduced costs and price incentives (such as discounts for reuse) and the convenience of the reusable packaging system, including home delivery and ease of use (19, 48, 49, and 55).

→ 4.3.3.2 Findings from the Canadian public

Regarding the actions needed to promote the sale and purchase of bulk products, consumers surveyed believe that responsibility lies primarily with the industry. In fact, 38% say that the solutions need to come from the manufacturers (producers), while 29% feel that the responsibility lies with the retailers. Governments were held responsible by 17% of respondents, followed closely by the public (16%).

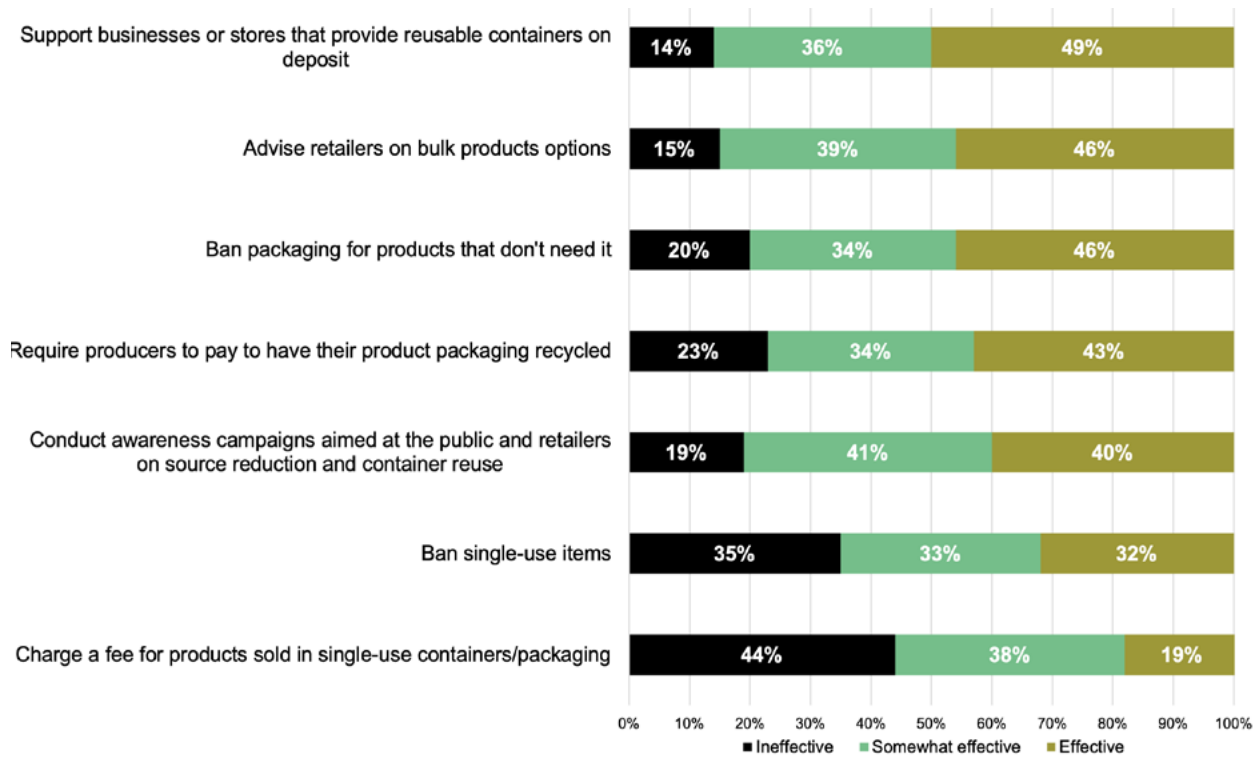
The respondents' view of the industry's responsibility is consistent with their desire to see increased availability of bulk products in stores. **A strong majority (87%) felt that grocery stores should offer these types of products**, with 22% feeling that it should be mandatory, and 66% feeling that it should be voluntary. Just 5% of respondents said that bulk options should not be developed in stores.

While the deposit-return system was the option that respondents indicated they were the least enthusiastic about, they were more positive when asked if this offer should be expanded to the large grocery chains. Nearly half (46%) felt that this offer should be available in the major chains, and one-quarter (26%) said it should be available in all grocery stores. A minority (11%) did not want to see this type of system in place.

In terms of the effectiveness of public policy measures to reduce waste, according to consumers, regulatory measures would be less effective, even though they are more restrictive. Indeed, the two measures perceived by respondents as being the most effective in reducing waste are support for businesses that already offer bulk options and advice for retailers on how to offer such options. According to Canadians surveyed, the two least effective measures are more restrictive: charging a higher price for single-use packaging and banning single-use items. Figure 8 presents respondents' perceptions of the effectiveness of seven specific measures suggested in the survey.



Figure 8. Perception of the effectiveness of certain public measures in reducing waste



In conclusion, this Canada-wide survey shows that a relatively high proportion of the public is already engaged in buying, or prepared to buy, certain food items in bulk. Overall, we observed strong interest in having a greater number of options for ZW purchases. **The considerations motivating those who buy in bulk are primarily financial and environmental in nature. The main barriers to bulk buying are related to hygiene and accessibility,** yet many other factors limit this practice. While more than half of those surveyed are moderately or somewhat ready to switch to bulk purchasing, a significant proportion of these individuals claim to be only slightly ready, or not ready at all. Nevertheless, a clear majority believe that the offer of bulk products needs to be expanded. Finally, the incentives supported by the public are mostly

voluntary in nature; these include supporting the industry that already offers bulk-buying options, and establishing consulting services for those players who do not yet do so.

This disconnect between a willingness to buy in bulk and support for developing an improved supply underscores the importance of addressing structural constraints in order to increase opportunities for shoppers to buy in bulk through public policies that encourage behavioral change. The next section looks at the legislative apparatus that can support this willingness.

5. Legislative and public policy analysis

To date, there have been no scientific studies documenting public policies on consumption of ZW or packaging-free products. Most studies have focused on single-use plastic packaging and the measures taken to reduce or eliminate it. According to a vast study on this subject, Europe leads the way in legislative measures, accounting for 62% of the policies identified.

Few public policies, statutes and regulations are directly aimed at reducing the quantity of containers and packaging; instead, most seek an improved management of end-of-life products (e.g. improvements to recycling) and better product design (e.g. eco-design and use of recycled materials). And when legislation seeks to reduce the amount of packaging by banning single-use items, it is usually only plastics - including bioplastics - that are targeted.

As for public measures specifically targeting packaging-free consumption, a few have emerged in recent years. Upstream's Reuse policy matrix identifies some of these (56).

In the case of ZW consumption and bulk selling, most current policies are indirect. Rather than specifically targeting ZW consumption, they focus more broadly on the following:

- Improved end-of-life waste management (e.g. implementation of selective waste collection, including recycling of certain materials, deposit system for beverage containers, etc.);
- Accountability and product design (e.g. EPR programs, a percentage of recycled materials in the making of products, and incentives for eco-design).

A number of recent studies have been published by organizations committed to packaging-free consumption, and many of their findings line up on certain points (32 and 57):

- There is a lack of harmonization of the various legislative texts when it comes to information on products' life cycle (e.g. transparency regarding total cost of packaging) and on sanitation standards;
- Management of bulk selling is not explicitly mentioned in the current acts and regulations.

The following section sets out the legislative texts that are helping grow the ZW movement. This will be followed by a Canadian judicial overview, at both provincial and federal levels, to identify rectifiable shortcomings.

5.1 LEGISLATION FAVOURING ZERO WASTE PRACTICES

The European directive on packaging and packaging waste suggests a number of measures to be taken by member states to foster ZW practices. These include the use of deposit systems and the dictating of a minimum percentage of reusable packaging to be sold annually for each packaging flow. However, the member states are dragging their feet in putting these recommendations into practice.

A draft regulation was submitted to the European Parliament on November 30, 2022. It provides targets for source reduction and reuse, including 40% for reusable take-out food packaging and 25% for reusable non-alcoholic beverage containers by 2040. Unlike directives, this regulation will be binding on EU member

states, and they will be required to comply with it. At the time of this writing, the legislative process was underway. (58)

5.1.1 French legislation and *Loi anti-gaspillage pour une économie circulaire*

In Europe, France leads the way with its *Loi anti-gaspillage pour une économie circulaire* (AGEC) [anti-waste law for a circular economy] (26). This act imposes an entire body of regulations aimed at reducing single-use packaging while encouraging the sale of bulk and ZW products in grocery stores.

In the AGEC law, bulk selling is defined as the sale of packaging-free products in a quantity of the consumer's choosing, using reusable containers.

One of the AGEC's objectives is to achieve a 5% rate of reusable packaging by 2023 and 10% by 2027 (26).

In addition, the *Loi climat et résilience* [climate and resilience law] requires food retailers occupying more than 400 m² of space to dedicate 20% of their store to bulk selling by 2030 (59).

Table 12 provides examples of measures included in the AGEC Law that promote zero waste consumption in the food sector.

Table 12. Examples of measures fostering zero waste consumption under the AGECE law

Measure	Timeline
Requirement to sell fruits and vegetables without any packaging	Between January 1, 2021 and 2026
Stores required to accept consumers' reusable personal containers	January 1, 2021
Responsibility for the cleanliness and suitability of personal containers rests with the consumer	January 1, 2021
Lower pricing for customers who bring their own containers	January 1, 2021
Private deposit system (free or paid) for larger stores	January 1, 2021
Ban on plastic overpackaging of fresh fruits and vegetables weighing less than 1.5 kilograms (kg)	January 1, 2022
Ban on labels affixed directly onto fruits or vegetables, unless the labels are compostable and made up, in whole or in part, of biobased materials	January 1, 2022
Reduce single-use plastic packaging by 20%, at least half of which is to be achieved through reuse	2025

In this transition to a packaging-free sales system, France's Agency for Ecological Transition (ADEME) has been mandated by the government to document the process and collect the data necessary to monitor the measures in place.

The regulatory and communication measures included in this law enable an increase in the market share of bulk-packaged sales in that country and help reduce the amount of single-use packaging (60), while working to change behaviour and monitoring to ensure that targets are met.

5.1.2 Legislation in other countries

Similarly, two regions in Spain (Navarra and the Balearic Islands) have defined obligations regarding the marketing of beverage containers. In Navarra, hotel, retail and restaurant businesses will be required to serve 80% of beer, 70% of soft drinks and 40% of water in reusable containers by 2028. By the same year, 15% of beverage containers sold in stores must be reusable (56).

5.2 PUBLIC POLICY AND LEGISLATION IN CANADA

Public policies affecting the food production and distribution chain are currently being applied at the national, provincial and municipal levels. Roles and responsibilities for environment and health are shared between the federal and provincial levels. Some areas of intervention - such as waste management -

fall more under provincial jurisdiction (61), and provinces delegate much of this responsibility to the municipalities, partly because of the associated community-based services.

5.2.1 At the federal level

In June 2018, at the G7, Canada proposed the Ocean Plastics Charter, which to date has been endorsed by the European Union, 27 countries, 26 companies and organizations, and 49 regional partners (62). Regarding plastic-related issues specifically, the call for an international treaty has been heard. In March 2022, at the United Nations Environment Programme (UNEP) annual conference in Nairobi, all attending countries committed to establishing a "legally binding instrument" within the next two years to control plastic pollution on a global scale (63).



The Government of Canada has undertaken a number of initiatives aimed at reducing the use of plastics. In November 2018, Canada committed to implementing a **Zero Plastics Waste Strategy** (64) which draws on "a vast array of government programs and regulations, as well as voluntary initiatives by industry, community and environment organizations." (64) As its name implies, the strategy focuses exclusively on plastics.

In 2022, Canada adopted the Single-use Plastics Prohibition Regulations, which ban a number of single-use items covered by Canadian regulations. These include shopping bags, utensils, food containers manufactured from problematic plastics, beverage packaging rings, stir sticks, and straws (44). However, the majority of these items don't change the grocery basket directly because they are more likely to be found in the restaurant sector. Furthermore, while these bans send out a strong message against plastic pollution, they do not directly support packaging-free consumption and have no influence on secondary and tertiary packaging.

In its Management Framework for Single-Use Plastics, the Government of Canada encourages reuse and the development of businesses that sell products in bulk, providing a guide for those wishing to start this type of business (67). However, there are no mandatory measures proposed to accelerate this transition.

The **Canada Plastics Pact** (66) brings together "diverse leaders and experts in the national plastics value chain to collaborate and rethink the way we design, use, and reuse plastic packaging to realize a circular economy for plastic in Canada."

Two of its four goals for 2025 can potentially impact packaging reduction:

- Identifying problematic or unnecessary plastic packaging so that it can be more easily eliminated;
- Rethinking the way packaging is designed in order to incorporate it into a circular economy (66).

A roadmap for strengthening the management of single-use and disposable plastic products was adopted in September 2022. However, it does not propose any specific targets for reuse, nor does it include all types of single-use packaging or specific measures to support the development of reusable alternatives. (67)

Table 13 presents the laws and regulations that can potentially impact ZW food production and consumption, as well as the relevant issues identified in this area.



Table 13. Federal legislative content related to zero waste consumption in Canada

Act	Description	Issues
Canada Consumer Product Safety Act	An act respecting the safety of consumer products.	Lack of specific points on procedures for ZW consumption (e.g. bulk purchasing, handling of reusable containers). ⁹
Consumer Chemicals and Containers Regulations	Regulations respecting the safety of consumer products. These include a number of definitions of containers, including that of single-use containers.	The regulations do not include anything specific about ZW consumption or reusable containers.
Consumer Packaging and Labelling Act	An act respecting the packaging, labelling, sale, importation and advertising of pre-packaged and certain other products. It provides definitions of containers, packaging and the information required on them.	The lack of information available at the time of purchase regarding the environmental impact of packaging does not allow the public to make informed purchasing decisions.
Food and Drugs Act	An act respecting food, drugs, cosmetics, and therapeutic devices which provides details regarding health-related aspects of products and their containers.	The Act provides nothing specific regarding ZW consumption and packaging-free sales.
Weights and Measures Act	Rules related to the purchase and sale of measured products and services. Responsibility for the accuracy of the measuring devices rests with the device owner (usually the retailer).	The tare protocol relating to the purchase and sale of measured goods and services in refillable containers is not defined.
Canada Labour Code	An act designed to consolidate certain statutes respecting labour. The maximum load an employee is allowed to lift or carry manually without training is 10 kg. For heavier loads, "the employee shall be instructed and trained by the employer in a safe method of lifting and carrying that load."	The carriage of ZW products often involves loads greater than 10 kg. Good ergonomic practices regarding the sale of bulk foods are not specifically defined.

⁹ It should be noted that the provinces also have the authority to establish such procedures.

5.2.2 In the Provinces

The two systems under which food containers and packaging are managed provincially are the deposit-refund system for beverage containers and the curbside collection system for recyclable containers and packaging. The types of containers and packaging involved, and how they are managed, vary from province to province.

In addition, the existing EPR programs do not always seem to be effective when it comes to packaging eco-design. Incentives do not seem to have the desired effect (68). Finally, the EPR programs do not directly target the implementation of a packaging-free product offer; nor do they include targets for container and packaging reuse. However, in Quebec, businesses required to pay a contribution for the selective collection of packaging can be offered a 20% bonus on these contributions if the containers are designed with the intention of being reused (69). The impacts of this measure that was introduced in 2022 were not known at the time of this report was being written.

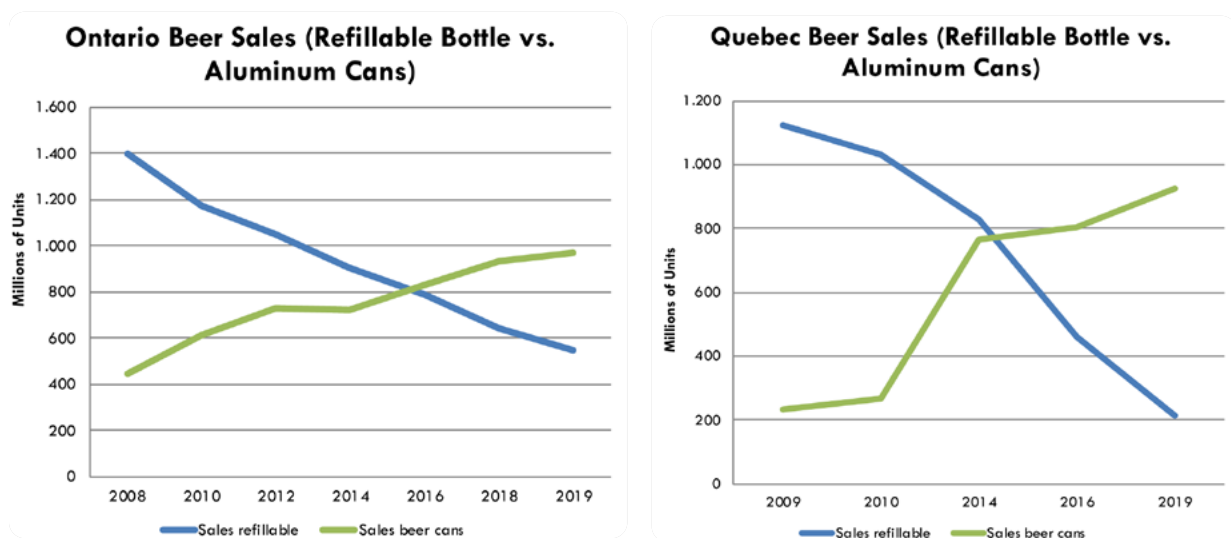
Private deposit-return systems for refillable containers are one option comparable to ZW. These containers come in standard sizes and are reused numerous times (e.g. 10 to 25 times in Quebec in the case of beer bottles) before eventually being recycled (70).

The deposit system, as presently constituted, is not specifically aimed at supporting the supply of refillables. This is evidenced by the lack of reuse targets in the provinces.

While not all deposit-return systems were studied in this research, a snapshot of how beverage containers are managed in Canada reveals that Quebec and Ontario alone account for 70% of all refillable beer bottles, and their declining use is very visible, as Figure 9 illustrates.

While provinces such as Quebec once had targets for marketing a certain proportion of refillables (70), these were no longer in effect at the time this report was being written.

Figure 9. Trends in the amount of beer sold in refillable single-use containers in Ontario and Quebec



Source: CM Consulting, 2020

5.2.3 In municipalities

A number of cities and municipalities have adopted binding regulations to support ZW initiatives. For example, since January 1, 2022, Vancouver has charged customers 25 cents for single-use coffee cups to encourage the use of personal or returnable reusable containers. However, the regulation quickly exposed weaknesses in enforcement, as businesses shifted away from ZW practices in order to maximize profits by charging for disposable cups (71). Indeed, businesses are keeping the new charges and are encouraged, but not required, to reinvest the revenues in reusable alternatives.

In Quebec, the municipality of Prévost chose to adopt a different strategy in 2020, by collecting fees on single-use items and holding them in a "Responsible Consumption Fund," which can be used to implement source-reduction measures and reusable alternatives. The regulation applies to various categories of single-use items, from windshield washer fluid containers to water bottles and various dishes. The fees range from 10 to 50 cents (72). This regulation also introduces the concept of an obligation to supply certain products in bulk, for which the containers are subject to a levy. The municipalities of Mascouche and Terrebonne announced similar regulations in 2022.

While these regulations help reduce the amount of packaging, their enforcement remains limited in scope, applying more to the food service sector than to grocery stores.



6. Recommendations

In a context where there are significant information gaps - because they are either not public or do not exist - it is difficult to provide a vision of the priority actions that need to be taken. What are the opportunities for reducing containers and packaging at the source? What are the expected results? What are the potential impacts and, and what volume of packaging reduction is possible? These questions still need to be answered.

However, In light of the information gathered throughout the research process - including three data collections from the field - it is clear that the voluntary measures put in place by various industry players, or those initiated by the public, have reached their limits :

- Governments have focused more on reducing certain single-use plastic items and on recycling. There is no legislative framework, no measures of **ecofiscality** or public policies, and no action to support ZW or a reduction in packaging;
- There is a notable reluctance on the part of industry to change its ways, and the incentives for change available to retailers answerable to large food corporations are limited;
- A number of innovative organizations and businesses are leading the way. They have developed and deployed ZW options (e.g. local grocery stores, reusable container systems), but making these practices more widespread remains a challenge.

+ ECOFISCALITY

The application of various fiscal tools aimed at modifying habits with a view to preserving the environment (e.g. carbon tax).

With more than 50% of the population having reported that they are extremely, very or somewhat willing to adopt at least one ZW habit (4% having already taken some action), it is clear **that government leadership is critical in initiating and implementing a transition to ZW**. A number of retailers have pointed out that government regulations forcing the development of ZW initiatives would allow for a faster and better transition. Food industry stakeholders stressed the importance of predictability regarding measures, supporting the need for customer awareness and a timeline for changes in

habits. Consumers' reluctance is often linked to doubts about the safety of these products, or to this option not being available where they live. A strong majority of the population (80%) agrees that banning some types of packaging is an effective measure to reduce the amount of packaging waste.

Therefore, supporting the development of the ZW offering calls not only for creating conditions favourable to ZW, but also imposing result-based requirements, both in terms of the bulk offering and implementation of systems that enable the use of reusable containers and packaging.

To accomplish those goals, this report identifies four categories of recommendations:

- Amend Canadian legislative framework to include binding targets;
- Provide logistical and financial support to the industry;
- Accelerate the supply of ZW foods;
- Raise awareness of ZW among stakeholders.

Sections 6.1 to 6.4 outline these various recommendations and contain examples of how they can be implemented. It is only with the support of these different actions that a change to more sustainable practices in the food sector will be possible.

The box below outlines changes to Canadian legislation that would encourage ZW practices and support these actions.



Canadian Legislative Framework for ZW Practices

→ Canada Consumer Product Safety Act:

✓ Establish a clear legal definition of a reusable container, taking into account the potential minimum number of uses¹⁰ and environmental safety, especially given that the container will possibly be washed in domestic or industrial dishwashers.

→ Canadian Environmental Protection Act:

✓ Establish material and design criteria to ensure the safety of reusable plastic containers used as part of a ZW consumption system.

→ Food and Drug Act:

✓ Establish and disseminate safety protocols for reusable containers according to type of use (e.g. food, cosmetics, household products). Ensure that these can incorporate design recommendations for safety. Note that health and safety standards for bulk supply and personal container management could also be defined at the provincial level.

✓ Impose standards on reusable containers to facilitate their cleaning, handling and use options in multiple businesses.

→ Weights and Measures Act:

✓ Establish a tare weight protocol for the purchase of bulk products in used containers in order to clarify and standardize these procedures and the responsibilities of various food industry stakeholders..

→ Canada Labour Code:

✓ Establish good ergonomic practices specific to the distribution and sale of bulk foods: e.g. maximum weight, use of carts, placement of silos according to weight in order to limit movement.

¹⁰ Based on various LCAs, after a hundred or so uses, the environmental benefit is largely achieved for most materials.

In addition to a binding legislative framework, **improved traceability of the flow of single-use and refillable containers and packaging** is still essential if numerical targets are to be achieved. Indeed, it is clear that a glaring lack of data

is hampering the understanding of the current situation regarding food containers and packaging in Canada, adversely affecting the recommendations that can be proposed to support the transformation of the food supply.

The stakeholders involved are represented by the following pictograms:



Governments



Industry



Retailers





Population







Major retail chains




6.1 SET BINDING TARGETS FOR THE DELIVERY OF SHORT-TERM RESULTS




Recommendations	Examples of application
<p>Make bulk supply mandatory for certain products</p> 	<ul style="list-style-type: none"> → Prioritize products that can be easily offered packaging-free, are already frequently purchased in bulk, and are seen to be easier to purchase that way: dry goods, fruits and vegetables, and beverages. → Focus on major retail chains and larger stores (e.g. 400 m² or more) to maximize impact and specify a proportion of space to be designated for bulk products (e.g. 20% by 2030). → Consider the potential for reducing the environmental footprint, based on existing research, when determining foods and products to be prioritized.
<p>Set reuse targets for packaging</p> 	<ul style="list-style-type: none"> → Set targets at the federal level for the deployment of reusable containers and packaging, fostering the harmonization and enhancement of EPR systems at the provincial level.


6.2 PROVIDE FINANCIAL AND LOGISTICAL SUPPORT

Recommendations	Examples of application
<p>Encourage development of the reuse and bulk-supply chains</p> 	<ul style="list-style-type: none"> → Identify the most easily standardized primary containers and packaging. → Offer support to industry and retailers for equipment purchases, research toward a better environmental understanding of various scenarios, and the return of manufacturing capabilities to Canada. → Support the scaling up of packaging reduction and reuse projects. → Fund the development of product and packaging awareness training and eco-labelling practices.
<p>Clarify regulatory food-safety requirements for ZW practices and bulk products</p> 	<ul style="list-style-type: none"> → Publish and disseminate guidelines and tools regarding food safety, bulk foods and reusable packaging supply.
<p>Standardize tax regulations with respect to returnable packaging</p> 	<ul style="list-style-type: none"> → Detax all primary, secondary and tertiary reusable/refundable containers and packaging. → Tax single-use packaging where bulk or reusable options exist. → Provide an exemption for homeless or low-income individuals and for products offered as samples. → Institute a binding framework to ensure that monies collected are used solely to fund the transition to reuse. → Dedicate a portion of the sums collected through EPR and single-use taxation to promoting packaging-free consumption practices.
<p>Support the adaptation of industry operations to ZW production and distribution patterns</p> 	<ul style="list-style-type: none"> → Support the development of reusable container and packaging systems. → Support changes demanded by the industry: purchase of equipment, supply chain adaptation, access to coaching, research and development services, etc. → Provide support for recruitment and training of the dedicated ZW workforce

6.3 ACCELERATE THE SUPPLY OF ZERO WASTE FOODS

Recommendations	Examples of application
<p>Allow customers to use their own containers when purchasing fresh and bulk products</p> 	<ul style="list-style-type: none"> → Reinstate practices that were in place prior to the COVID-19 pandemic, and allow the use of personal containers for fresh food services. → Invest in increasing the range of ZW foods being offered to customers. → Train staff in ZW practices. → Help customers change their habits.
<p>Adjust pricing policies to foster ZW</p> 	<ul style="list-style-type: none"> → Implement practices designed to ensure that the bulk option is less expensive than the packaged option. → Avoid favouring multi-pack discounts at the expense of unit discounts in order not to penalize the purchase of quantities appropriate to the customer's needs.
<p>Implement reverse logistics systems that contribute to the establishment of supply chains</p> 	<ul style="list-style-type: none"> → Initiate and maintain collaboration with brand owners in order to have their initiatives tested or imported into Canada. → Expand collaboration with grocery chain house brands (comprising roughly a quarter of grocery store sales) to help them adapt packaging to their own logistical constraints and ZW practices. → Use proven strategies as leverage: <ul style="list-style-type: none"> ● Attractiveness of cheaper products and standardized packaging from private labels to bring attention to healthy products made from local ingredients or with a low environmental impact; ● Standardized reusable packaging, thereby facilitating reverse logistics; ● Pool logistics equipment and share cleaning costs.

<p>Encourage short supply channels to retailers</p> 	<ul style="list-style-type: none"> → Develop solid relationships with local producers. → Promote local sourcing, based on a short loop. → Ensure a supply that takes into account urban, suburban and rural realities.
<p>Implement a ZW offering, based on prioritized product categories</p> 	<ul style="list-style-type: none"> → Use studies and analyses to prioritize the selection of products offered in bulk.
<p>Implement reverse logistics systems that contribute to the establishment of supply chains</p> 	<ul style="list-style-type: none"> → Promote eco-design of containers and packaging (primary, secondary, and tertiary) to facilitate the logistics of storage, collection, and washing. → Establish distributor container and packaging recovery processes that are integrated with normal procurement activities. → Promote the use of electronic systems for managing reusable containers and packaging based on product type. → Investigate the possibility of having third parties manage packaging, washing and storage, etc. → Investigate return issues for unused or damaged products.




 **Inspiring initiative** - Thanks to a number of companies that are developing standardized reusable food container and packaging systems, retailers can share infrastructure and minimize costs associated with the reuse system.

Two organizations, one in the United States and one in France, have developed a range of standardized food containers for reuse:

→ [RESOLVE](#)

→ [CITEO](#)

6.4 RAISE AWARENESS AMONG STAKEHOLDERS REGARDING ZERO WASTE

Recommendations	Examples of application
<p>Publicize and document promising initiatives</p> 	<ul style="list-style-type: none"> → Publicize initiatives and create partnerships to ensure that successful initiatives are replicated in Canada. → Conduct case studies highlighting environmental and economic benefits, while acknowledging industry concerns (technical, regulatory or logistical barriers). → Present Canadian or North American initiatives by early adopters, highlighting specific cultural and demographic consumption patterns.
<p>Make unpackaged foods attractive</p> 	<ul style="list-style-type: none"> → Promote the most environmentally positive options possible (based on life-cycle analyses in the relevant regional contexts). → Deploy in-store marketing programs tailored to the ZW offering. → Conduct information campaigns on bulk options, feasible practices, environmental positives, and best practices. → Organize practicums, offer short videos, and invite experts to give training sessions to improve skills and promote timely updates of environmental knowledge. → Work with producers to offer consumers their favourite brands in bulk.
<p>Continue to consume ZW or begin the transition to buying in bulk</p> 	<ul style="list-style-type: none"> → Demand that retailers offer foods in bulk. → Bring in one's own reusable containers.

5. Conclusion

The research has shown that there are multiple ZW container and packaging options available. These include bulk supply or the use of returnable refillable containers, and are consistent with scientifically validated LCA approaches and a circular economy perspective.

Successful practices can be found all over the world, along with proven standards, laws and regulations that can serve as examples for expanding ZW in Canada. Also, many businesses currently offer bulk and ZW options.

The findings of this study show that a true ZW strategy will come into being when there is the capacity to provide consumers with real opportunities to shop for groceries by purchasing products that are:

- Packaging-free;
- Available in bulk, using their own containers;
- Available in returnable and reusable containers.

The cross-Canada survey revealed that, while consumers are open to moving toward ZW, they want more convenience. A certain resistance to change on the part of businesses in the food production and distribution chain interviewed for the study, which was exacerbated by the COVID-19 pandemic, indicates that voluntary measures have reached their limits.

Various stakeholders are blaming each other: industry claims insufficient consumer demand to bring in a supply, while consumers complain about limited supply. Food retailers, who have been making significant profits since the start of the pandemic, justify their inaction based on logistical and financial considerations. As a result, the supply of ZW products has been slow to arrive.

One clear thing is that in order for an integrated ZW system to be established within a reasonable timeframe, government leadership, including a restrictive framework and targeted goals, is essential. It would also be helpful if the offering of ZW products were facilitated and supported by the actions of industry, retailers, and consumers. Ultimately, the deployment of the ZW offer must take into account urban, suburban and rural realities, since the modalities and delays in supply, as well as the sales volumes, have an impact on the food being offered.

With respect to research, several related avenues of work could help improve the state of knowledge and support change. Among these are studies in:

- The quantification and traceability of primary, secondary, and tertiary packaging across the food sector, including HRIs;
- The exploration and identification of business models demonstrating benefits of ZW practices;
- Analysis of the rapidly growing grocery delivery model, which is having an impact on shopping habits.



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Annexes

ANNEX 1. GLOSSARY

Bulk: Offering bulk products allows grocery shoppers to bring their **reusable personal containers** or to use **returnable containers** provided by the store and fill them themselves (7).

Circular economy: A production, exchange and consumption system aimed at optimizing resource use at every step of a product's life cycle, while reducing its environmental footprint and contributing to individual and community well-being. (4)

Eco-design: A product design strategy aimed at considering and minimizing potential environmental impacts (5).

Ecofiscality: The application of various fiscal tools aimed at modifying habits with a view to preserving the environment (e.g. carbon tax).

Extended Producer Responsibility (EPR): An approach designed to transfer responsibility for the management of waste generated by the consumption of goods to the businesses that market them.

Life cycle: All the steps in the life of a product, from design to disposal (resource extraction, manufacture, transportation, purchase, use, repair, refurbishing, recycling, recovery, disposal).

Life cycle assessment (LCA): Methodology used to quantify potential environmental impacts during the entirety of a product's life cycle, that is, from resource extraction to product delivery to the client (cradle to gate) or to end of life (cradle to grave). (33)

Linear economy: An economic model consisting of the extraction of raw materials necessary for production, and their subsequent processing, consumption and disposal.

Overpackaging: Packaging that exceeds what's required to protect the product from potential damages or that is added for esthetic reasons. Overpackaging can also occur when products are excessively subdivided (e.g. mini yogurt tubs, mini packs of cookies).

Packaging/content ratio: Product quantity in relation to packaging quantity.

Prepacked product: A product is prepacked when placed in a package of whatever nature without the purchaser being present, and when the quantity of product contained in the package has a predetermined value and cannot be altered without the package either being opened or undergoing a measurable modification. For example, a vacuum-packed piece of pre-cut cheese is considered prepacked. (32).

Returnable containers: Containers (e.g. cans, bottles, jars) provided in exchange for a set price which is reimbursed when the product is returned either to the merchant who supplied the product or to another merchant.

Reusable personal container: A container brought by a consumer to a store to fill with products or have the store staff fill with products.

Reverse logistics: The process of collecting, sorting and processing to enable the return of goods (45).

Single-used products: Items intended to be thrown away after a single use (e.g. shopping bags, straws, utensils) (44)

Source reduction: Action that helps prevent or reduce the generating of waste during product design, manufacturing, distribution and use (4).

Stakeholders: All persons and organizations involved in the food production, distribution and consumption chain.

ANNEX 2. DETAILED METHODOLOGY

Table 1. SUMMARY OF METHODOLOGY FOR EACH RESEARCH STEP

Research method	Details of methodology used
Review of literature	<ul style="list-style-type: none"> + Selection of 89 recent articles in various disciplines: e.g. environment, law, engineering, consumer economics and sciences. + Documentary research: e.g. media articles, government and legislative documents, reports and websites of organizations, businesses, groups and citizen outfits, scientific articles.
Legislative analysis	<ul style="list-style-type: none"> + Research survey of international legislation in connection with ZW: Canada (federal, provinces and municipalities), Europe, Asia and Oceania. + Identification of promising measures for Canada and the provinces.
Interviews with stakeholders in food packaging value chain	<ul style="list-style-type: none"> + Sixteen semi-directed interviews held February 9 to April 21, 2022 → Direct contact with industry stakeholders and snow-ball sampling. The businesses surveyed are from several Canadian provinces, with no attempt to ensure equal regional representation. → Use of an interview guide revised by various research stakeholders. → Transcription, coding and thematic analysis of the transcript content.
Focus groups with food retailers	<ul style="list-style-type: none"> + Drafting of an interview guide to ensure consistency across the project's various themes. + Three group discussions (10 people representing 25 grocery stores) in Quebec were held by videoconference between April 27 and May 19, 2022.¹¹

¹¹ The Retail Council of Canada (RCC), as the only organization with a membership that includes the large food retailers, was unable to provide the support we had hoped for, because they felt it to be at the discretion of retailers to respond or refer to grocery store managers. Whether contacted by the Retail Council of Canada or by the research team, the potential participating retailers refused to participate, except in Quebec. Most of the responses received were referrals to the respective head offices. Reasons cited for non-participation include: lack of interest, no ZW or reuse initiatives in their grocery stores, the pandemic making it impossible for ZW and reuse activities or actions to be undertaken, major supply chain challenges, little flexibility, since any initiatives are directed by the large food corporations to their grocery stores, and regulatory changes related to Extended Producer Responsibility (EPR) in Ontario and Quebec that are overwhelming the head offices.

	<ul style="list-style-type: none"> + The data were analyzed in NVivo (a specialized qualitative data management software), the responses were categorized by theme (e.g. type of obstacles and incentives), and the frequency of responses associated with the terms was noted. + Via an inductive approach, themes emerged from the review of the literature and from the focus groups. These were then structured to form a “theme tree.”
Canada-wide consumer survey	<ul style="list-style-type: none"> + The survey questionnaire was based on the deterrents and incentives identified in the literature review and on the themes and topics in which a lack of information was identified. + Online survey of 2,002 Canadians from February 8 to 22, 2022. <p>→ Criteria were applied to obtain a representative sampling of the Canadian population: age, gender, language, province, education, income, household size, occupation, civil status, place of birth and residential status.</p>

SAMPLING OF THE FOOD PACKAGING INDUSTRY

Table 2. Participant profiles

Identifiant	Type of business	Location
P1	Food packaging distributor	Nova Scotia/Canada
P2	Food packaging manufacturer • cardboard	Ontario/Canada
P3	Food packaging distributor	Quebec
P4	Food packaging manufacturer • plastic	Quebec
P5	Equipment manufacturer	Quebec
P6	Grocery retailer	Quebec
P7	Food manufacturer	Quebec
P8	Collecting, processing, packaging operation	Quebec
P9	Food packaging manufacturer • plastic	British Columbia
P10	Food packaging distributor	Ontario/Canada
P11	Food packaging manufacturer • plastic	Quebec
P12	Food packaging manufacturer • cardboard	Toronto/Canada
P13	Grocery retailer	Quebec
P14	Food products corporation	Quebec/Ontario/ New Brunswick/ Canada
P15	Food manufacturer	Quebec
P16	Food packaging distributor	Toronto/Canada

INTERVIEWS WITH FOOD RETAILERS

All interviewees were owners of at least one grocery store and held management positions. Table 3 lists their characteristics.

Table 3. Profile of participants who were owners of grocery stores in Quebec

Identifier	No. of grocery stores	Type of business	Size of grocery store	City or region
A	8	Convenience and grocery stores	Small	Montréal
B	4	Grocery and speciality shops	Small and medium	Montreal
C	2	Grocery and cheese shops	Small	Montreal
D	1	Grocery store	Average	Montreal
E	4	Butcher shops	Small	Sherbrooke, Magog and Boucherville
F	2	Grocery stores	Medium	Saint-Jean-sur-Richelieu and Delson
G	2	Grocery stores	Medium	Lévis
H	1	Grocery	Medium	Lévis
I	2	Grocery stores	Small	Montreal
J	1	Grocery	Average	Victoriaville

CANADA-WIDE SURVEY

Details of the sample composition for the Canada-wide survey are presented in the tables below. A total of 2,002 Canadians were surveyed.

Gender	
Females and non-binary persons	51%
Male	49%

Age	
18- 24	11%
25- 39	24%
40- 54	26%
55- 64	18%
65 and over	21%

Highest level of education	
No diploma, high school diploma, technical diploma or college degree	72%
Graduate diploma (university)	28%

Province	
Alberta	11%
BC	14%
Manitoba	2%
New Brunswick	2%
Newfoundland and Labrador	3%
Nova Scotia	38%
Ontario	0.4%
PEI	23%
Quebec	3%
Saskatchewan	3%

Children living in the household	
Yes	28%
No	72%

Gross annual family income	
\$125,000 or over	14%
\$80,000 to \$124,999	24%
\$50,000 to \$79,999	23%
Less than \$49,999	29%
Prefer not to answer	10%

Type of community where living	
Large urban centre	28%
Large city	18%
Average-size city	22%
Small town, village or rural community	31%
Don't know	1%

Mother tongue	
French	21%
English	70%
Other	9%

Political orientation	
Left	17%
Centre	59%
Right	12%
Prefer not to answer	12%

Principal occupation	
Full-time employee	44%
Part-time employee	12%
Full-time student	5%
Student and employed	2%
At-home parent	3%
Retired	26%
Unemployed	5%
Other	3%

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Équiterre's offices are located on Indigenous lands that have not been ceded by treaty, which we now call Montreal and Quebec City, where different Indigenous peoples have interacted with each other. We recognize that Indigenous peoples have been protecting their territories since immemorial times and have been using their traditional knowledge to guard the lands and waters. We are grateful to live on these lands and are committed to continuing our efforts to protect them. As an organization concerned with environmental and social justice, Équiterre respects the important links between the past, the present and the future. We recognize the road ahead in implementing our mission, while building relationships with Indigenous peoples in humility, respect and dialogue.

Équiterre^o

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