DESIGNING FOR COMPOSTABILITY IN CANADA

How Do We Use and Recover More Compostable Packaging?– Canadian Perspectives

MARCH 19, 2019

zero WASTE
NATIONAL ZERO WASTE COUNCIL
An Initiative of Metro Vancouver

About the National Zero Waste Council

The National Zero Waste Council, an initiative of Metro Vancouver, is a leadership initiative bringing together governments, businesses and non-government organizations to advance waste prevention in Canada and the transition to a circular economy.

The objective of a circular economy is to "*keep resources in use for as long as possible, extract the maximum value from them whilst in use, then recover and regenerate products and materials at the end of each service life.*"[3] The ultimate or ideal ability of a product to work in a circular economy can be considered its **circular economy potential**; many types of packaging have a circular economy potential that is not fully being met.

The Council's Product Design & Packaging Working Group considers the relationship between the design of products and their end-of-life. Previous projects include the *Design Portfolio: Celebrating Canadian design for waste prevention and systems thinking*, the underlying *Key Principles for Waste Prevention and Systems-Thinking*, promoting these principles in webinars and presentations across the nation, and the publication series and info graphic Can I compost that? Designing for Compostability in Canada. These resources are located at *www.nzwc.ca.*

zero WASTE
NATIONAL ZERO WASTE COUNCIL
An Initiative of Metro Vancouver

The Council recognizes the contribution of Dr. Love-Ese Chile in the preparation of this report and the guidance of the Product Design and Packaging Working Group in its development.

Cover page: Novamont North America and New England Compost, LLC.

Overview

Certified compostable packaging has become more commonly used in food packaging and could play a more important role in both diverting waste from landfills and meeting circular economy goals. Compostable packaging is designed to be disposed of in existing publicly accessible organics compost infrastructure and then to be recycled back into fertile compost. As a material, compostable packaging flows through a life cycle that links various stakeholder groups into a sustainable materials management value chain or circular economy.

To understand the future for compostable packaging, the Product Design and Packaging (PDP) Working Group of the National Zero Waste Council (Council) commissioned a multi-stakeholder consultation to engage producers of compostable packaging, users of packaging and managers of resulting waste streams to learn how they think these materials can be fully utilized and recovered to achieve their circular economy potential.

Complexities surrounding the uniform use and recovery of compostables across Canada were first highlighted in the Council's "*Case Study on Compostables in Canada*" published in 2018. This case study found that compost manufacturing infrastructure, public policies, private programs, economics and public perceptions were all factors that impact the use and recovery of compostable packaging. The non-alignment among key stakeholder groups within the value chain has meant that compostable packaging is not always entering the intended waste stream, and therefore creating marketplace confusion and limiting the use and recovery of compostable packaging. Building on the 2018 study, the ongoing multi-stakeholder consultation identified important opportunities for fully utilizing compostable packaging in Canada.

Through the consultation, participants were asked to explore key issues and identify strategic solutions to improve the use and recovery of compostable packaging in Canada. Through this process the need for more rigorous enforcement of existing labelling regulations was identified as important. At the same time stakeholders across the value chain expressed a desire to develop easy to understand resources and publicly accessible databases that would facilitate and enhance communications throughout the value chain. In general, stakeholders believe that better communications and public education for end users, waste stream managers and the compostables industry would encourage more facilities to accept compostables and make composting practises for compostable packaging more uniform. To realize the opportunities associated with closing the loop on compostable packaging, governments, businesses and non-government organizations will need to take leadership in identifying interconnected solutions required to achieve full circularity for compostable packaging.

Contents

Introduction

TERMINOLOGY

In this study, the terms: certified compostable, compostable products and packaging, and compostables are used interchangeably to refer to both complex compostable products that have third-party certification for compostability as well as plant fibre-based packaging that is commonly accepted to breakdown in compost facilities. Certification bodies in North America include Bureau de normalisation du Québec (BNQ) and Biodegradable Products Institute (BPI) and the relevant standards are BNQ 0017, ASTM D6400 and ASTM D6868.

The terms circular economy and circularity are used to describe regenerative systems that keep resources in use as long as possible and extract maximum value from resources while in use. In the context of compostable products and packaging, this translates into preventing waste through new and innovative business models, improved design of packaging, upgrading and innovating end-of-life processing and resource recovery.

SCOPE OF STUDY ON COMPOSTABLE PACKAGING

Creating sustainable products involves not only the development or selection of materials, but also the design of an interconnected material cycle in which products are used and from which sustainable value is recaptured after use. Compostable packaging is designed to flow into this kind of material cycle (Figure 1). Base materials can be generated from agricultural biomass and/or fossil sources and are converted into products and packaging for the food service industry. At the end of their use, compostable products and packaging are collected into end-of-life waste streams and their value is recovered by generating compost that is reapplied to the land. Recycling in a closed-loop primary recycling system may represent higher value end use, however this requires functioning and accessible recycling streams for compostable packaging and products.

Out of scope for this study are some of the other benefits of compostable packaging. For instance, food destined for the landfill in compostable packaging can be delivered directly to composting facilities, thereby reducing food waste. In addition, any actions to locate or expand composting facilities represent investment in community infrastructure and generates new jobs while creating a product that can be bought and used locally to regenerate soils.

The scope of this study is limited to how to increase the potential to increase the flow of compostable packaging to centralized compost manufacturing facilities.

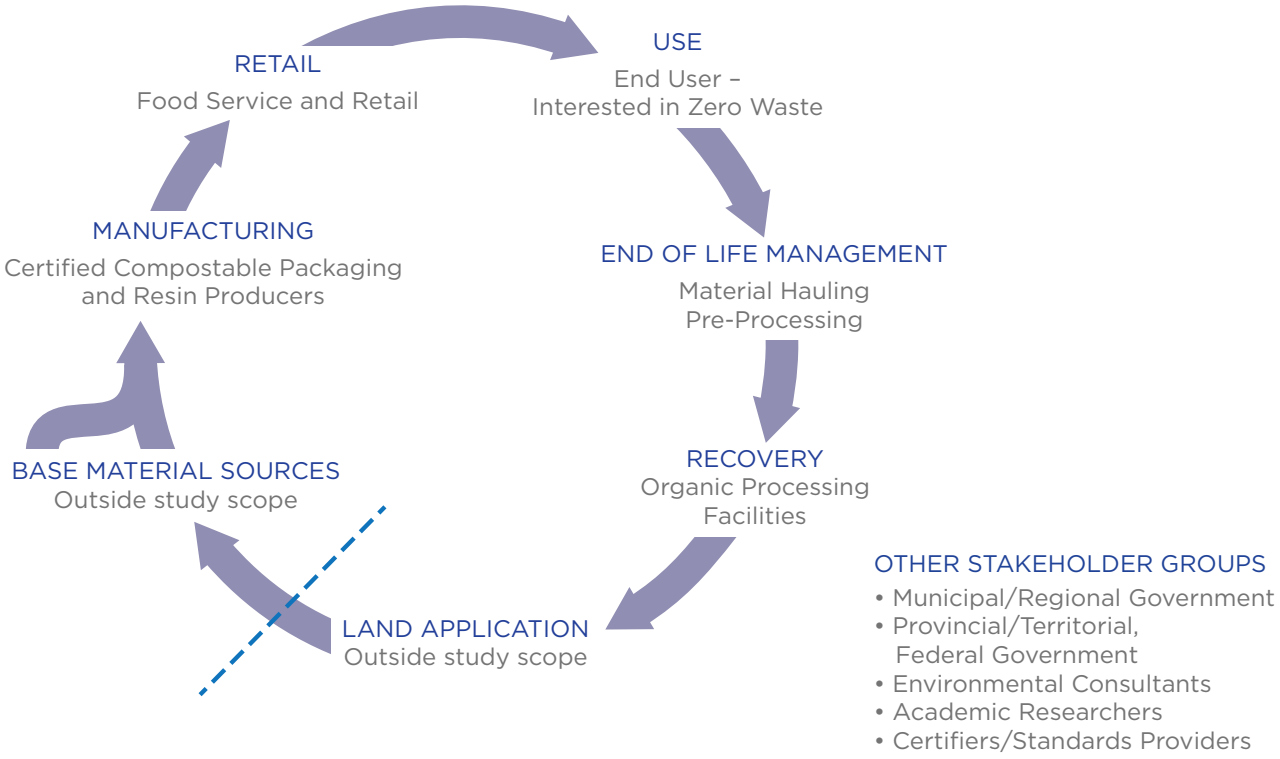

FIGURE 1 Interconnected material cycle for certified compostable packaging including stakeholder groups in the value chain and others. Note that sourcing of base materials and options for land application of resulting compost are outside the scope of this study.

RESEARCH METHODOLOGY

The study was executed via multi-stakeholder consultation designed to explore the challenges to the use and recovery of compostable packaging and products outlined in the 2018 *Case Study on Compostables in Canada*. Survey respondents were asked to give their opinions on broad value-chain issues as well as specific programs or policies which could form solutions to identified barriers. Consultation methods included a Round Table, phone interviews and online surveys. In total, 47 stakeholders were engaged during the consultation process, with 28 stakeholders responding to the survey.

Multi-stakeholder Consultation - Results and Discussion

Initial consultation was designed to determine key areas where actionable solutions could be implemented. A selection of opinion leaders was asked to identify the greatest challenges to the use and recovery of compostable products and packaging using the factors identified in the *Case Study on Compostables in Canada*. The initial survey of stakeholders identified barriers to expanding the use and recovery of compostable packaging and an individual sense of what barriers should be prioritized in terms of action. The discussion at a subsequent Round Table produced a more illuminating discussion of actions to overcome the identified barriers.

Stakeholders indicated that **the lack of regulation and oversight for labelling and marketing compostables** is the most significant barrier to the use and recovery of compostable packaging. Survey respondents called for a legislated definition for compostables based both on certifications and case-studies. The respondents noted that with easy to understand labelling, compostables could be distinguished from other packaging materials in the waste stream and this would help simplify public education. The participants in the Round Table emphasized that enforcement of certifying compostable packaging was essential to maintain creditability.

The lack of harmonized policies within the composting industry was also identified as a significant barrier to the use and recovery of compostables in Canada. Stakeholders participating in the Round Table discussed how industry alignment would help create a clear pathway for compostables. This could be accomplished through the formation of an industry association that would guide progress on policy and practices alignment.

It was recognised that ensuring there are **organic diversion programs that accept compostables** is an important enabler to the use and recovery of compostables. Stakeholders shared a desire to find more effective ways to reach out to municipalities and their waste management partners, to try and better understand how these programs could be instituted and expanded. Furthermore, the **creation of data sets**, based on case studies, of how compostable packaging degrade under a variety of composting conditions would help to inform owners of composting facilities, and their regulators, on optimal compost processing conditions for compostable packaging.

Survey results outlined key target areas and interactions within the value-chain that are of high importance that were addressed in a second phase of stakeholder consultation.

	HIGHEST PRIORITY			LOWEST PRIORITY		ROUND TABLE COMMENTS	WEIGHTED SCORE
	5	4	3	2	1		
LACK OF REGULATORY OVERSIGHT FOR LABELLING AND MARKETING	0	1	2	1	1	3	16
LACK OF PRIVATE POLICY HARMONIZATION WITHIN AND BETWEEN INDUSTRIES (I.E. COMPOST MANUFACTURING, PACKAGING, CERTIFICATION BODIES)	0	1	1	1	2	4	15
ORGANIC DIVERSION PROGRAMS THAT DO NOT ACCEPT COMPOSTABLE PACKAGING	1	1	0	1	0	1	12
PACKAGING TECHNOLOGY DESIGN THAT DOES NOT MATCH WITH COMPOST FACILITY CAPABILITIES	1	1	0	1	0	0	11
DIFFICULTIES IN PUBLIC EDUCATION, AWARENESS AND PERCEPTION OF COMPOSTABLE PACKAGING	1	0	1	1	1	0	11
PUBLIC POLICIES THAT LACK HARMONIZATION ACROSS GOVERNMENTS	1	1	0	0	0	0	9
ECONOMICS ASSOCIATED WITH COST OF COMPOSTABLE PACKAGING RELATIVE TO CONVENTIONAL PACKAGING	1	0	0	0	1	1	7

TABLE 1. Key barriers to expanding the use and recovery of compostable packaging and prioritization by stakeholders for action.[a]

[a] Weighted from 5 to 1 for highest to lowest priority. Round table comments are weighted as 1.

A larger representation of stakeholders across the compostables value chain were engaged in a second round of consultation. Respondents were asked to narrow down the broad issues highlighted by first-round survey respondents and then to consider specific solutions. Participants included representatives from federal, provincial and municipal governments, compostable packaging producers and suppliers, food service buyers and users, and knowledgeable public users, as well as waste management industry players such as waste haulers, material pre-processors, and material recovery facility operators (Figure 2).

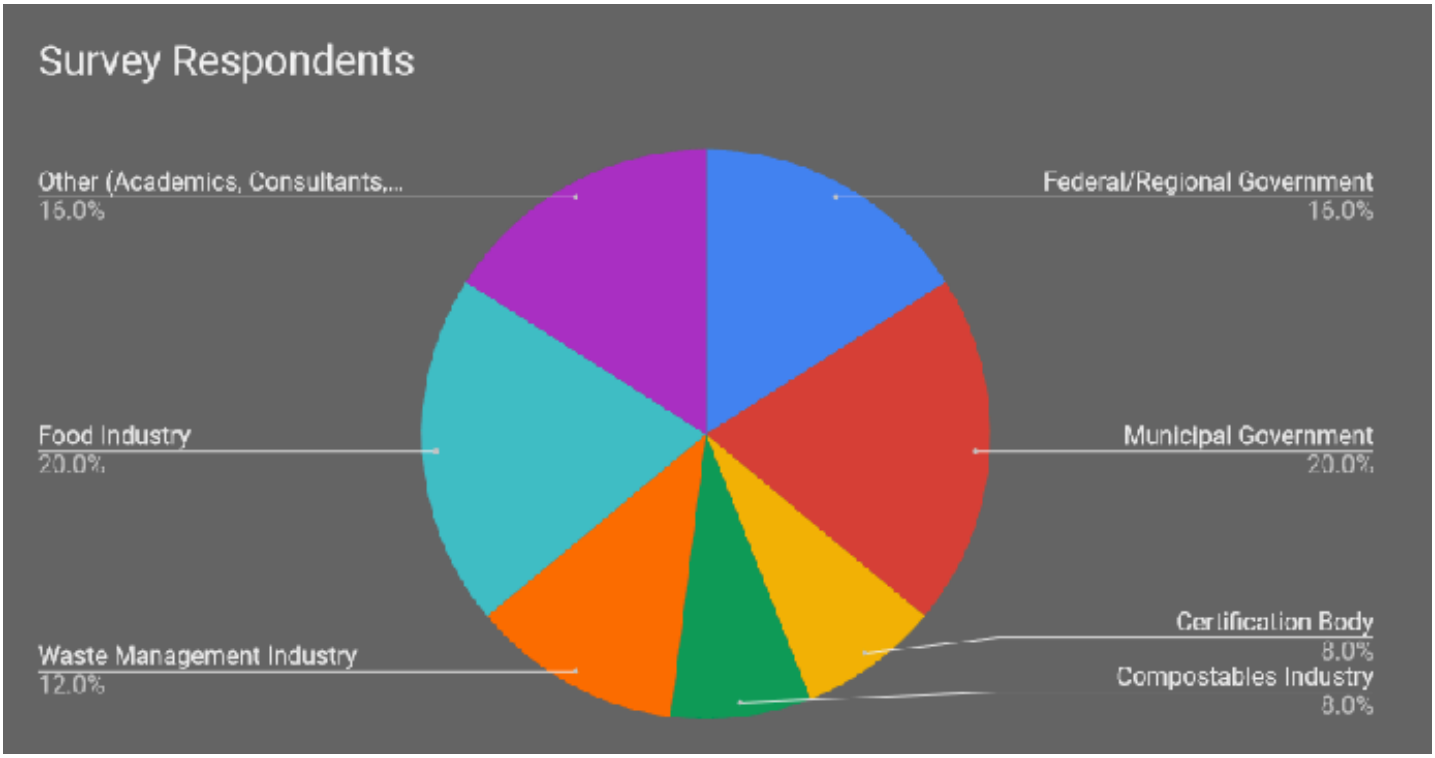

FIGURE 2 Breakdown of participants in the second phase of consultation. The Other category includes: Academic Researchers, Consultants, Journalists, Not-for-Profit Groups. The Waste Management Industry includes: Waste Haulers, Material Pre-Processors, and Material Recovery Facility Operators

Survey respondents were asked for their input and suggestions on strategies for labelling, monitoring and enforcement guidelines meant to prevent green-washing and create well-defined waste streams. Stakeholders stated an important starting point is ensuring a clear, legislated definition of "compostable product" is in place that aligns with other international jurisdictions. Currently, Canada's official definition of compostable exists in the form of *CAN/CSA-ISO 14021, Clause 7.2.1:*

"A characteristic of a product, packaging or associated component that allows it to biodegrade, generating a relatively homogeneous and stable humus-like substance."

There is agreement from the respondents across the value chain that the definition of "compostability" should be primarily based on substantiated evidence of material to breakdown down safely without harming the environment (Figure 3).

The European Parliament has recently approved the following definition:

"Biodegradable and compostable plastic packaging means a polymer capable of undergoing physical, biological decomposition, such that it ultimately decomposes into carbon dioxide (CO^2), biomass and water and in accordance with European standards for packaging recoverable through composting and anaerobic digestion."

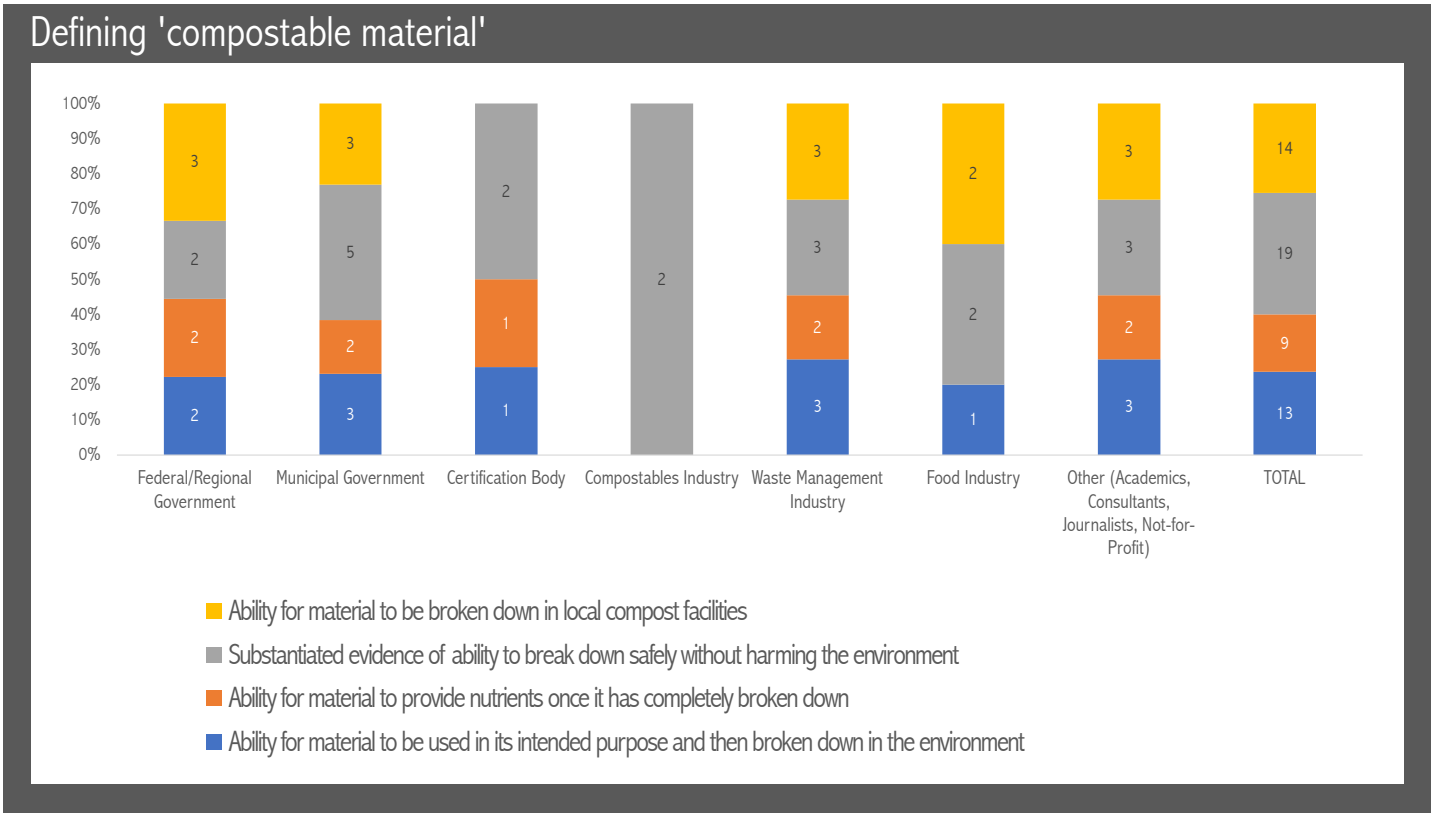

FIGURE 3 Survey responses by stakeholder group. Respondents were asked which aspects are important to consider in a definition of compostability. (Numbers within bars signify number of responses).

This definition is less ambiguous and aligns with the requirements of Canadian survey respondents, and could be used as a model definition to be translated to the Canadian space.

When asked for their opinion on labelling guidelines, value chain stakeholders agreed that all compostable materials sold in Canada should have a third- party certification, with every part of the packaging being certified compostable (Figure 4). Users and waste system managers emphasized that there should also be systems in place to verify access to local collection and processing infrastructure to ensure recovery of compostable materials. Recovery facility managers also highlighted that from their perspective it is important that compostable products provide nutrients to the compost after breakdown, so the highest quality compost can be produced.

Current legislation for compostability claims is outlined in *CAN/CSA-ISO 14021, Clause 7.2.2.2*. This clause states that all compostability claims should specify:

- The type of composting facility or process in which the identified component is compostable (home-composting facility or an on-site or central composting facility).
- Identify specifically which components are compostable, and if the user of the product is required to separate those components a clear direction on how to do so must be included.

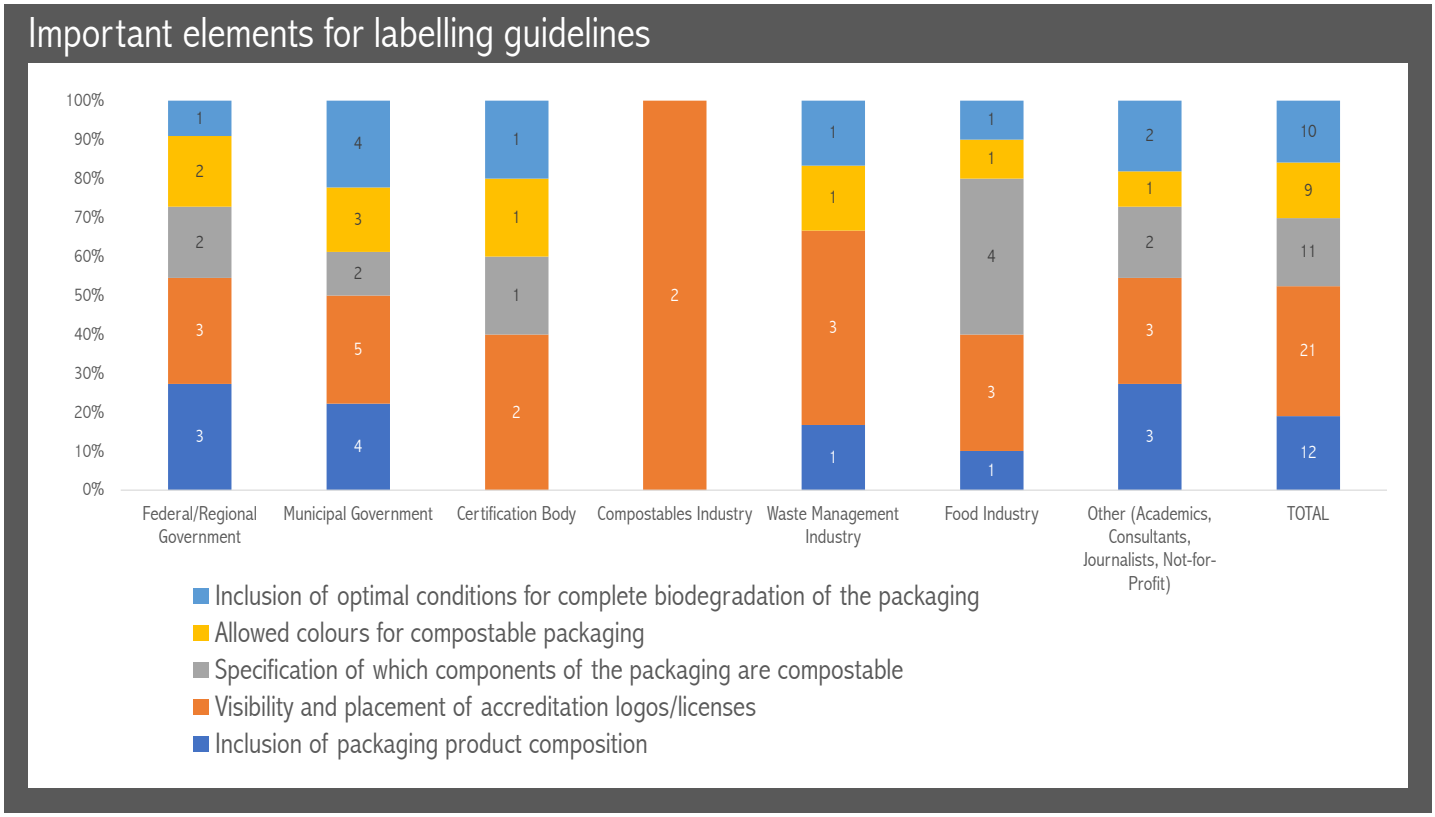

FIGURE 4 Survey responses by stakeholder group. Respondents were asked which aspects are important to consider in labelling guidelines. (Numbers within bars signify number of responses).

Further important stipulations can be found in "*CAN/CSA-ISO 14021, Clause 7.2.2.4*" which has specific wording encompassing access to appropriate facilities:

- The manufacturer should be able to verify that suitable facilities are conveniently available to a reasonable proportion of purchasers, potential purchasers, and users in the marketplace in which the product is to be sold, in order to make an unqualified claim of "compostable".
- If these facilities are not conveniently available to a reasonable proportion of purchasers, potential purchasers, and users in the area in which the product is marketed, the claim should be qualified to identify the limited extent of the facilities or infrastructure available for composting. Where feasible, this qualification must be specific.
- Example:
  Preferred: This package is compostable in municipal composting programs in Southern Ontario only.
  Discouraged: This package is compostable where municipal facilities exist.

Although legislation for compostable products and packaging do exist in Canada, survey results highlight that stakeholders may not be aware of this legislation and there is the need for more stringent monitoring and enforcement. In tandem with ensuring regulatory compliance, other avenues to improve composting include better education within the compostables industry to ensure people are adhering to industry guidelines.

Encouraging programs which provide technical review and field testing of compostable products, would help compostable packaging producers ensure successful biodegradation in local facilities. Specific testing in technologies such as: anaerobic digesters, in-vessel, aerated static pile, mass bed, turned windrows, and agitated continuous flow systems will allow the true feasibility of compostable products as food related feedstock for industrial composting facilities to be determined.

Stakeholders supported labelling guidelines that address the visibility and placement of accreditation logos and licenses, and it was agreed that reducing consumer confusion will have a significant impact on recovery of compostable materials. Many stakeholders noted that this could be easily achieved by visually differentiating compostable and non-compostable packaging, so long as a strong regulatory enforcement mechanism is in place. Claims using terms like: *biodegradable, renewable, green, eco-friendly, environmentally neutral, safe and better, easy on the environment, return to nature without a trace*, should also be avoided or substituted as they tend to confuse consumers about which end-of-life streams the product is suitable for.

Currently *CAN/CSA-ISO 14021, Clauses 5.8.1 and 5.8.2* state that if an environmental claim is made, the use of a symbol is optional. Though symbols used to make an environmental claim should be simple, easily reproducible and capable of being positioned and sized to suit the product to which the symbol is likely to be applied. Each certification group has a unique logo which may be adding to consumer confusion. This could be an opportunity to create a nation-wide easily recognisable logo that can distinguish compostable materials from non-compostables.

To ensure credibility and accountability, stakeholders believe that compostability claims need to be properly monitored and enforced (Figure 5). In the current Canadian context, Consumer Packaging and Labelling Act laws are administered and enforced by the Competition Bureau however, there is no explicit process to bring claims about compostability to the Bureau. Survey results highlighted that important aspects of monitoring and enforcement guidelines should focus on: a) expectations of certification standards and their role in the circular materials economy, b) framework for obtaining accreditation, c) appropriate wording around compostability claims, and d) type of penalties or enforcement actions.

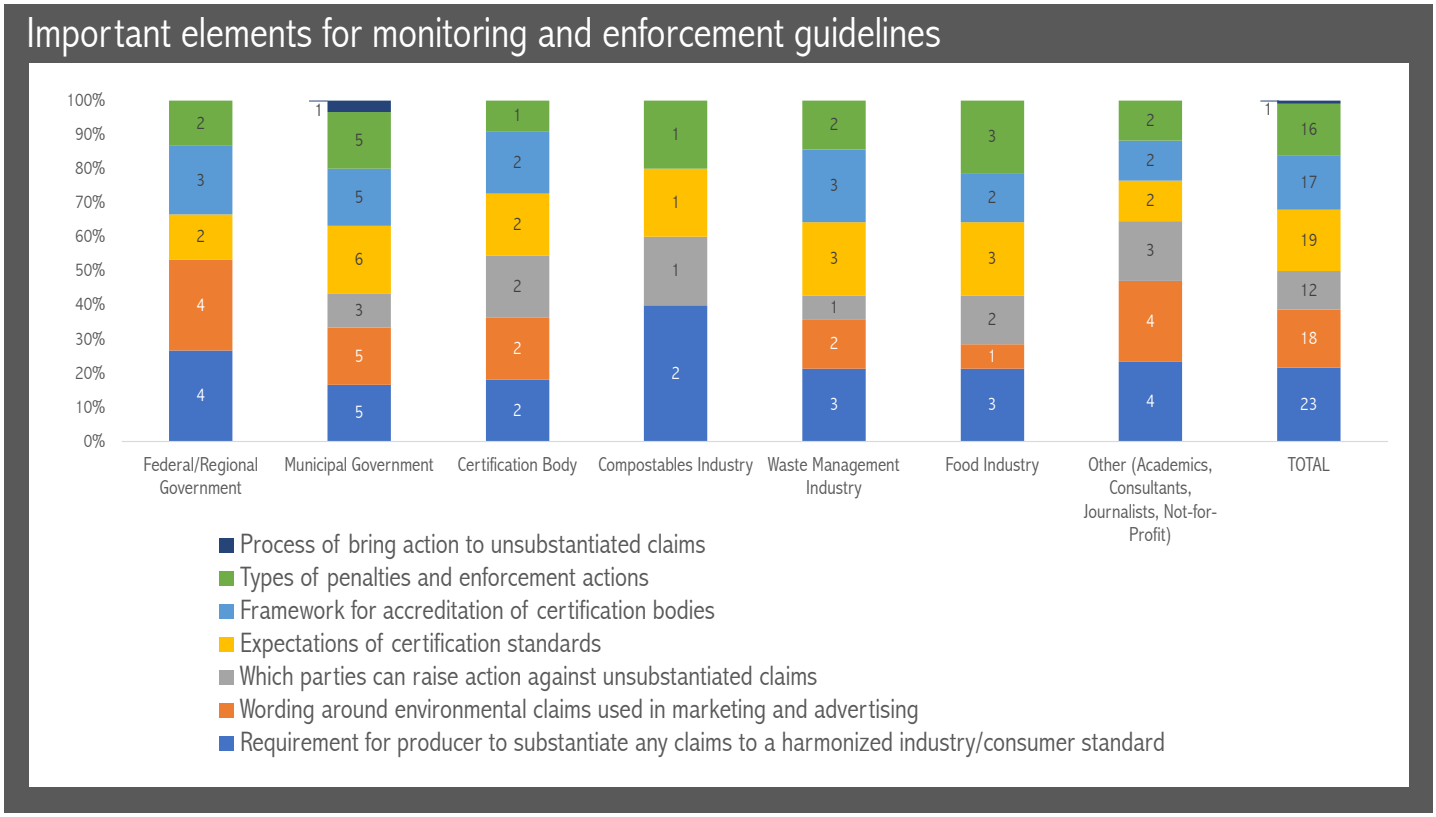

FIGURE 5 Survey responses by stakeholder group. Respondents were asked which aspects are important to consider in monitoring and enforcement guidelines. (Numbers within bars signify number of responses).

Stakeholders in the expansion of production and recovery of compostable packaging in Canada proposed that a strong collaborative network pushing the design of a compostables material cycle may be important otherwise, further actions could be challenging to complete successfully (Figure 6). A credible Canadian compostables industry association that aids in promoting compostable materials was further explored in the stakeholder consultation. The value chain called for a highly collaborative organization that is involved in developing national standards for compostables. Primary mandates of this group would include: a) preventing of green-washing by confirming the validity of compostability claims, b) assessing consumer complaints, c) enforcing instances of non-compliance with regulations, d) facilitating discussion between stakeholder groups and, e) encouraging demand and use of compostable products (Figure 7). A useful example to look towards is the Canadian Plastics Industry Association which has been the national voice for and leader in plastics industry sustainability since 1943.

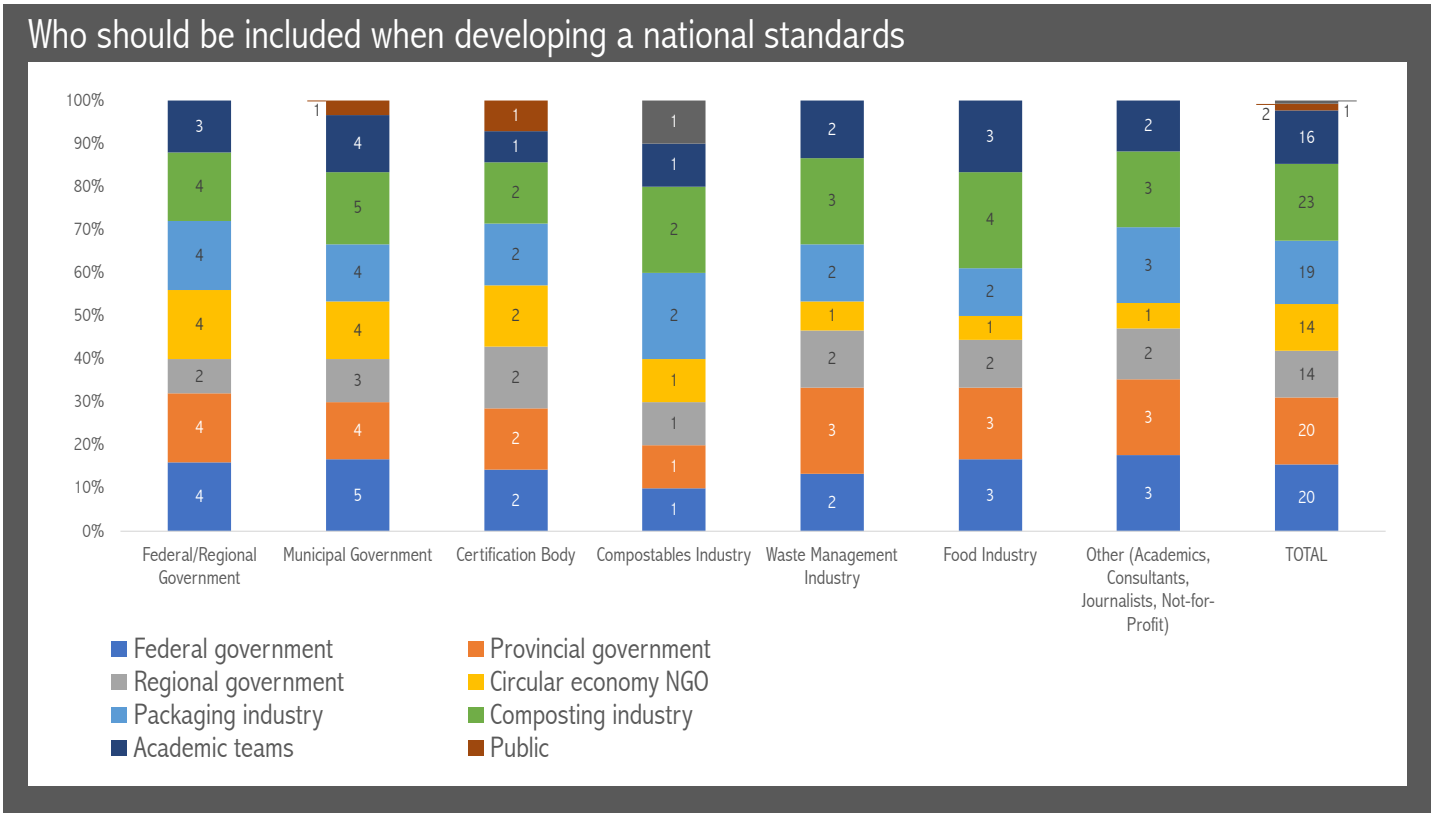

FIGURE 6 Survey responses by stakeholder group. Respondents were asked which stakeholder groups should be included in an industry association. (Numbers within bars signify number of responses).

Respondents were asked to outline other opportunities to expand the viability of compostable packaging in Canada (Table 2). Stakeholders from across the value chain expressed a desire for publicly accessible databases on the composition of common compostable packaging as well as information on the best compost practises that enable full biodegradation of compostable products. Access to educational resources such as these, supported by research programs that continue exploring favourable composting conditions for biodegradation, would improve confidence in certification standards and increase acceptance of compostable packaging by compost facility operators. Sharing end-of-life performance data with those responsible for beginning and middle-of-life decisions would also assist manufacturers to develop optimal material formulations that show enhanced compostability and inform retailers on which compostable products and packaging would both suit their end use and that are proven in local compost facilities.

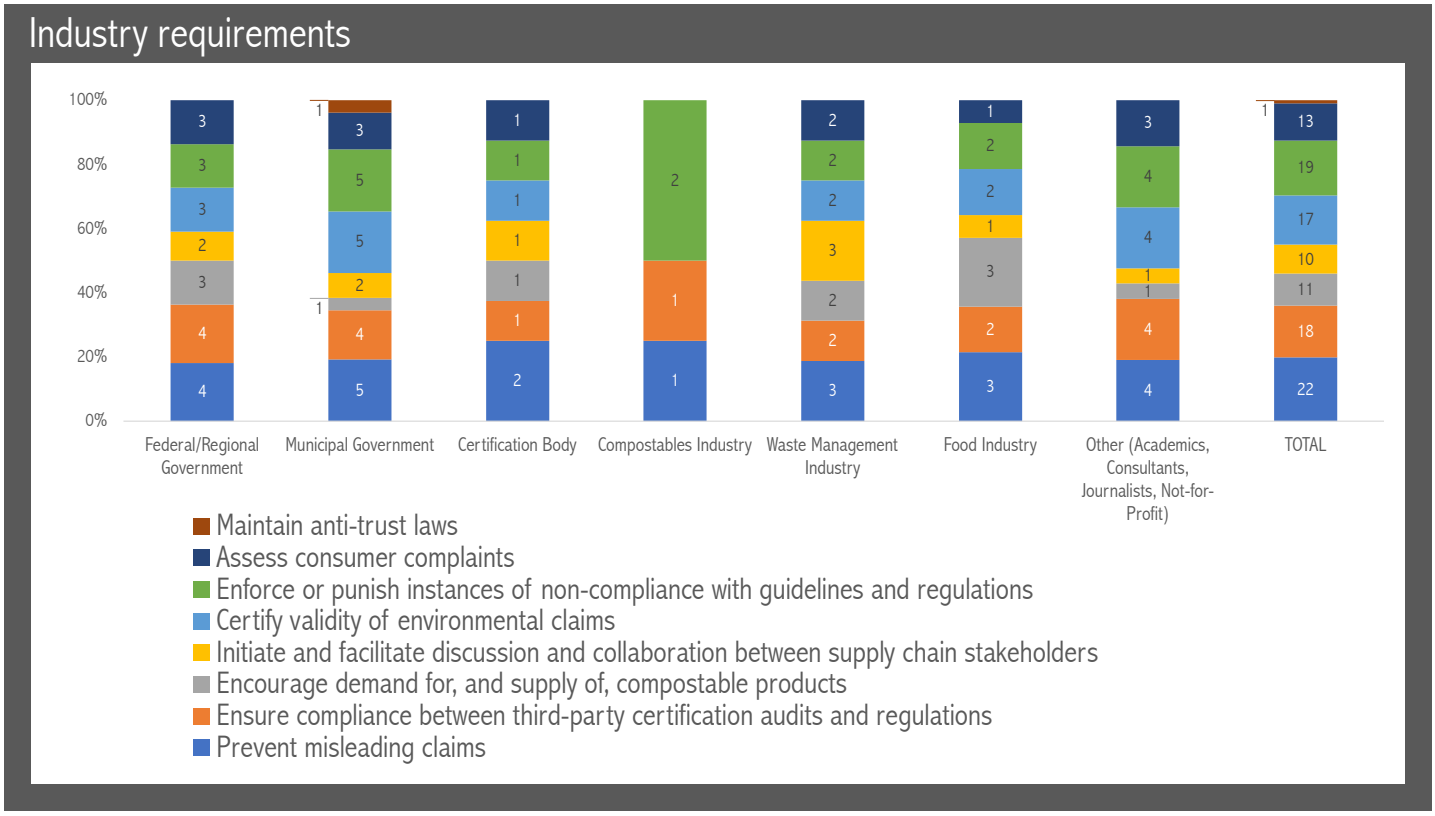

FIGURE 7 Survey responses by stakeholder group. Respondents were asked what roles a compostables industry association should take. (Numbers within bars signify number of responses).

Supporting innovation in waste processing and conversion technology and licensing new facilities charged with processing predominantly compostable packaging, could drive industry adoption and standardization of compostable packaging and products. To ensure widespread collection of compostable packaging, new systems should be explored to sort and manage disposal of compostable packaging in public spaces and the home. With this, regional guidelines and program support could be implemented to help private businesses manage food and compostable packaging waste generated at large events.

CHALLENGE	OPPORTUNITY IDENTIFIED	STAKEHOLDERS TO ASSIST IN SOLUTION
NO ACCESS TO INFORMED ADVICE	• Literature review on current and future recovery methods for compostables • Open access data and research to support and expand certification standards • Open access data and research to support public policies • Research and development support	• Certification Body • Compostables Industry • Waste Management Industry • Academic Research Team
INCOMPLETE BIODEGRADATION OF CERTIFIED COMPOSTABLE PRODUCTS IN MANY FACILITIES	• Support implementing new technologies • Industry wide adoption and standardization • On-site waste management technology • Licensing of facilities processing compostable packaging • Database of non-compliant products and businesses	• Federal Government • Municipal Government • Compostables Industry • Waste Management Industry • Academic Research Team
NO INFRASTRUCTURE FOR WIDESPREAD COLLECTION	• Regulations and programs for food waste and compostable material inputs • Systems to manage sorting and disposal in public spaces or in the home • Regulation for closed events to require compostables • Extended producer responsibility	• Federal Government • Municipal Government • Compostables Industry • Waste Management Industry • Food Industry • Academic Research Team

TABLE 2. Opportunities and solutions identified by survey respondents.

Conclusion

The multi-stakeholder consultation described in this report revealed the dynamic nature of the factors and relationships within the compostables value-chain in Canada. Despite sharing core values centred around pollution reduction, waste elimination and creation of a value-generating recovery system for compostable packaging in Canada, stakeholder groups face both specific and common challenges that prevent the expansion of the use and recovery of compostable packaging.

The common goal is to create viable systems to ensure:

- the collection of clean waste streams for compostable packaging
- efficient and complete biodegradation of compostable materials, and
- generation of useful compost material.

The stakeholders involved in the consultation. expressed a desire to work collaboratively to achieve these goals and various recommendations for steps forward emerged from research results (Figure 8). Key opportunities focus on strengthening communications and connections within the compostables value-chain including: development of an unambiguous legislated definition for compostability, ensuring regulation compliance through stringent monitoring and enforcement, and production and circulation of educational resources within the value chain and among end users.

Next steps for the compostables packaging industry will be to further explore methods to implement solutions to identified priorities.

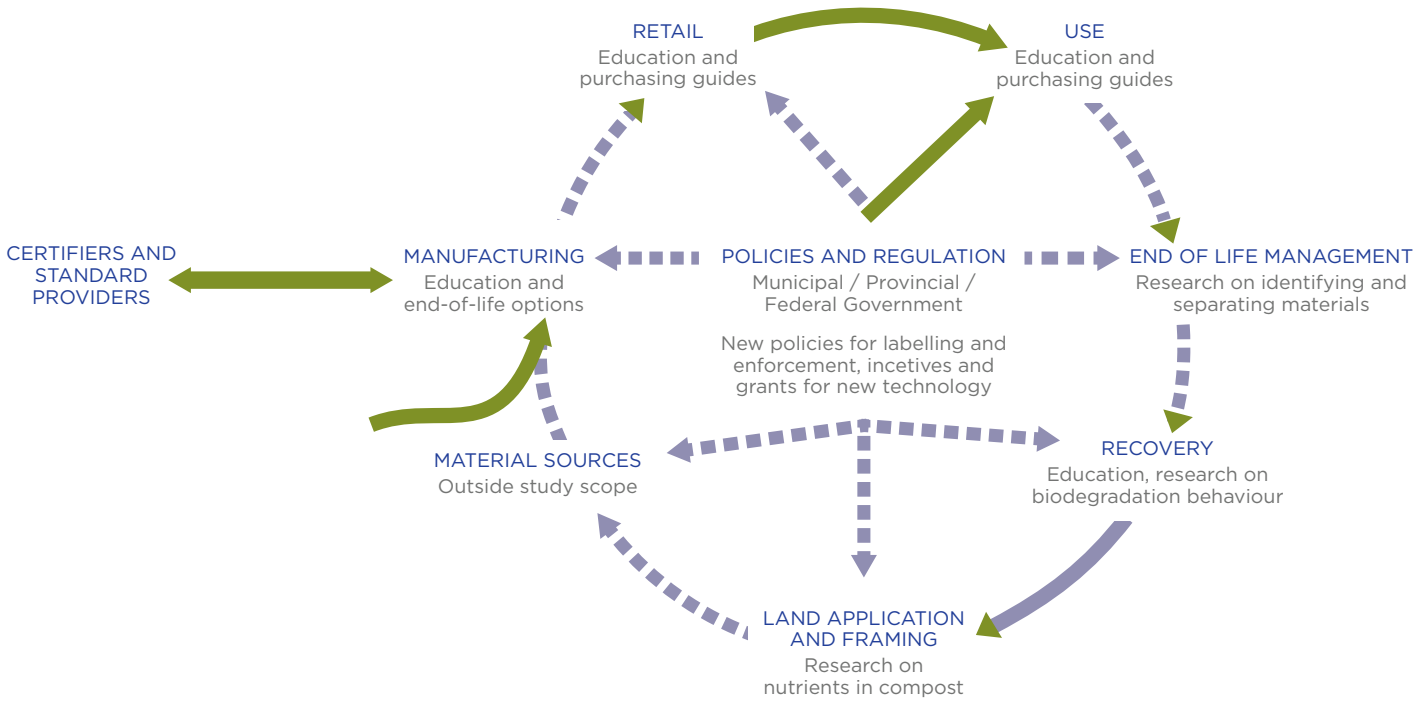

FIGURE 8 Missing links within the compostable packaging value chain. Solid lines are interactions that are well supported while dashed lines are indicative of problematic interactions that require further work. Stakeholder solutions appear under each step in the value chain.


zeroWASTE
NATIONAL ZERO WASTE COUNCIL
An Initiative of Metro Vancouver