Packaging Towards a Circular Economy:

Addressing Today's Top Packaging Challenges

October 2017

TABLE OF CONTENTS

Prepared by Rachel Morier for PAC Packaging Consortium

INTRODUCTION

"Begin with the end in mind"

Can this packaging be recycled? This question poses an ongoing conundrum whether you make, sell, buy, collect, sort or reprocess packaging. Even though Stephen Covey was not referring to recycling when he stated "Begin with the end in mind" in his popular book *Seven Habits of Highly Effective People*, the quote's interpretation is two-fold for stakeholders in the packaging value chain. Whereas beginning with one's end goal in mind is definitely sound advice, beginning with a package's 'end-of-life' in mind in order to turn it back into a useful product is also great way to approach a circular economy strategy and to design waste out.

Producers want to ensure their packaging decisions to meet consumer demands for performance, cost savings and sustainability also do not have unintended consequences. Waste managers want to ensure that they are able to economically recover as many materials as possible while providing a valuable service to residents of a municipality. Often, consumers are communicating directly with either the packaging producer or their local municipality should they have concerns on how their discarded packaging is being managed. Disjointed communication between packaging producers and waste management has traditionally led to frustration and mistrust between stakeholders. As a result, communication is reactive rather than proactive to address packaging concerns, delaying opportunities to progress innovative solutions.

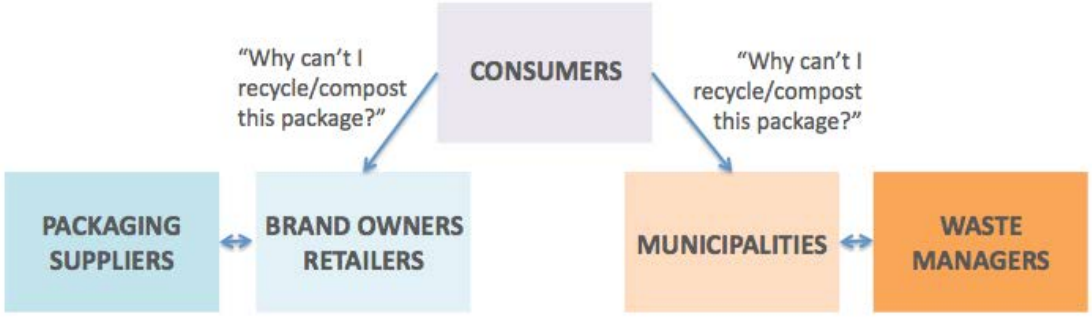


FIGURE 1.1 – COMMUNICATION GAP BETWEEN PACKAGING PRODUCERS AND WASTE MANAGEMENT INDUSTRY

Understanding how packaging can be diverted from landfill and avoid becoming waste is undoubtedly complex. When the inevitable answer to the question 'Can this packaging be recycled?' is 'It depends', the packaging industry and stakeholders along its value chain is left with insufficient information. Not only are answers needed, but more importantly, solutions are needed to address today's top packaging challenges to avoid waste.

PAC NEXT's Packaging Innovation Gateway Project

Poor next life options for packaging are a result of either mismatched design or a disconnected system, or both. The packaging industry is challenged to look beyond and explore less conventional solutions that move toward a circular economy. This means maintaining and promoting the value of packaging throughout the entire product life cycle, not just in the beginning or at the end. PAC helps to pursue new and innovative solutions in a safe, collaborative and material neutral environment through the Packaging Innovation Gateway project. This means seeking to bridge the communication gap between stakeholders in order to have a productive dialogue that realizes common sustainability goals.

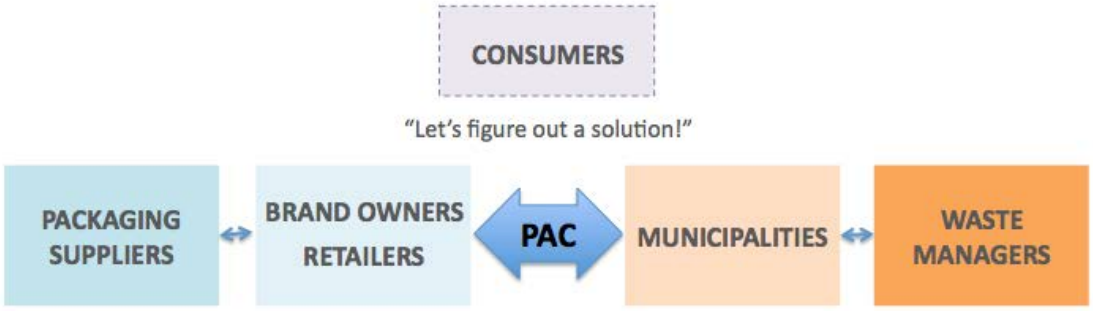


FIGURE 1.2 – PAC CONNECTS PACKAGING PRODUCERS WITH THE WASTE MANAGEMENT INDUSTRY

Led by Brent Heist of Procter & Gamble and Dan Lantz of Scout Environmental, the PAC NEXT Packaging Innovation Gateway project consists of over 30 members across the packaging value chain that meet every four to eight weeks to find solutions for the effective recovery and recycling of all packaging materials. Project team members expressed need for a better understanding of the circular economy context as it relates packaging and why it matters in order to achieve PAC NEXT's vision of *A World Without Packaging Waste*.

Defining a Circular Economy for Packaging

While there are a variety of interpretations of what the Circular Economy means, the most widely accepted definition is by the Ellen MacArthur Foundation which states, "A circular economy is restorative and regenerative by design, and aims to keep products, components, and materials at their highest utility and value at all times. The concept distinguishes between technical and biological cycles."[1] The challenge with this definition is that striving for the 'highest utility and value at all times' is subjective. For example, turning a bottle into a carpet rather than back into a bottle may be perceived as transforming a discarded package into something of lower value because the carpet would unlikely be recycled again. However, the carpet would allow for a higher utility because it would used for a longer period of time rather than the short shelf-life of a beverage bottle.

PAC NEXT believes that all waste diversion solutions are options worth considering as viable end markets for packaging materials depend on geographic accessibility and availability.

PAC NEXT supports the vision for the future of printed paper and packaging in a circular economy presented by the Ontario Circular Economy Innovation Lab (CEIL). CEIL engaged twenty-five influential leaders from across different value chains, many of them including PAC members, to develop a vision, a description of success, and innovation pathways that represent the key areas where collective efforts are needed to accelerate the transition to a circular economy for printed paper and packaging.[2]

[1] https://www.ellenmacarthurfoundation.org/circular-economy/overview/concept

[2] http://circulareconomylab.com/wp-content/uploads/2017/02/Vision-Future-Printed-Paper-Packaging-CIEL-1.pdf

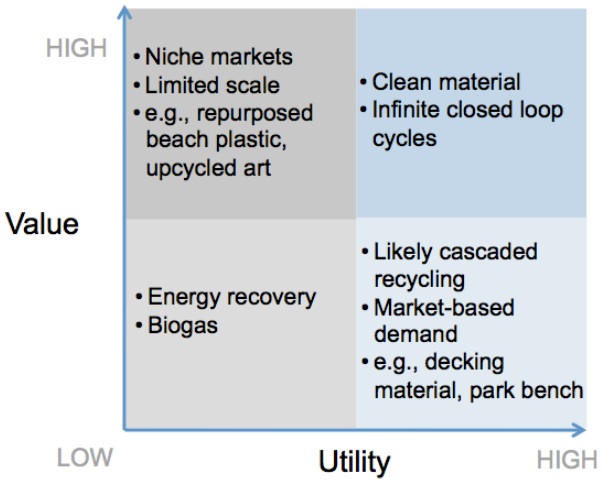


FIGURE 2 – VALUE AND UTILITY OF DIVERTED PACKAGING MATERIALS

Development of *Packaging Fact Sheets*

PAC NEXT originally created the *Top 10 Packaging Challenges For Recycling in a MRF* report in 2014 to provide simple and clear guidance, especially for packaging producers, on what can and cannot be recycled. While the principles of recycling have set the foundation for early circular economy thinking, the dialogue has since evolved and requires looking beyond recycling to include other options, such as composting, as a means to eliminate waste. The *Packaging Fact Sheets* is intended to evolve the dialogue from packaging challenges to opportunities where the content is solutions-focused to collaboratively explore, evaluate and mobilize packaging sustainability. The fact sheets also accommodate the increasing circular economy dialogue to not only provide guidance on what to do and what not to do, but also on *what can be done.* The fact sheets are accessible by individual packaging type to allow for easier updates on a timely basis and to add new packaging formats as needed.
To access the *Packaging Fact Sheets*, click here.

The *Packaging Fact Sheets* were developed to target members of industry. The focus is primarily on the Canadian market but notes developments also occurring in the United States and Europe. The *Packaging Fact Sheets* identify three impact areas that are critical to the success of closing the packaging life cycle loop:

DESIGN	The stage in which brand owners and producers have influence over packaging design, including material selection, structural design and on-pack communication
CAPTURE	The stage in which the consumer discards the material for collection at curbside, depot or return-to-retail to be sorted and baled at a MRF
RECOVERY	The stage in which baled materials are then sold to end markets that process the materials to make new products or alternative feedstocks (e.g., chemical recycling, fuel pellets)

TABLE A – THREE IMPACT AREAS IDENTIFIED BY THE PACKAGING INNOVATION GATEWAY PROJECT TEAM

Key Findings

The *Packaging Fact Sheets* identify 15 different packaging types with significant opportunity to reduce waste and recover more materials. Recommendations are provided in the *Packaging Fact Sheets* with the intention to educate readers so that they can make informed independent decisions on any actions they may choose to undertake. A summary of key recommendations are as follows:

DESIGN	• Use Life Cycle Assessment tools to support packaging design decisions • Minimize use of multiple material components • Understand local recycling and composting infrastructure before making claims
CAPTURE	• Use consistent messaging with consumers • Invest in sorting equipment upgrades • Work together with producers and processors to drive solutions that help reduce contamination
RECOVERY	• Communicate limitations to help improve material quality and value

TABLE B – KEY RECOMMENDTIONS FOR EACH IDENTIFIED IMPACT AREA

Emerging Packaging & Novel Materials

Adding new packaging materials or formats to the current packaging mix may mean adding complexity downstream during the recovery process. This complexity sometimes makes packaging feel 'stuck' – a life cycle assessment may have determined that a particular package design offers the best current environmental option but its next life options are poor.

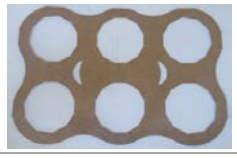
With growing demand for highly functional and personalized packaging, packaging innovation will not stifle. Bioplastics, intelligent packaging, including smart labels, interactive retail displays and packaging connectivity to mobile devices will continue to challenge the packaging industry to look for circular economy solutions.[3]

Over the years the packaging sector has been at the forefront of innovating solutions that address pressing concerns like food waste and changing demographics to smaller households with time-pressed consumers. Packaging has evolved to suit these new needs with innovations such as resealable features on packaging to keep food fresher for longer, lightweight packaging that is easier for consumers to take on-the-go, portion-packs allowing consumers to use only what they need, and more robust packaging to improve performance and reduce damage during shipping. The packaging industry has made great strides in addressing food waste[4] and will continue to play a key role in this global issue. All these benefits of packaging innovations are countered with the fact that they may not be as widely recycled or that more packaging is required. Success will be about finding the balance to

[3] http://www.green-alliance.org.uk/resources/Novel_Materials.pdf

[4] http://www.foodincanada.com/features/food-waste-fight/

successfully transition to a circular economy. As the pressure to create a waste-free economy grows, focus must not be lost on why different types of packaging are created in the first place.

EXAMPLES OF NEW OR MODIFIED PACKAGING EXPLORED BY THE PACKAGING INNOVATION GATEWAY PROJECT TEAM			
	Foodservice talc-filled polypropylene clamshell		Polypropylene tub with PETG shrink sleeve
	6-pack compostable beverage rings		Microwaveable aluminum trays

CONCLUSION

The Way Forward

Acceptance of new or modified packaging requires collaboration with the entire value chain, including consumers, and long-term investment of resources to increase chances of success. As the packaging material mix grows more complex and the cost to manage these materials continues to rise[5], not all packaging may be suited for curbside recycling. Overcoming trade-offs will be key to developing solutions that work towards a circular economy in the long run.

ACCEPTANCE OF NEW OR MODIFIED PACKAGING

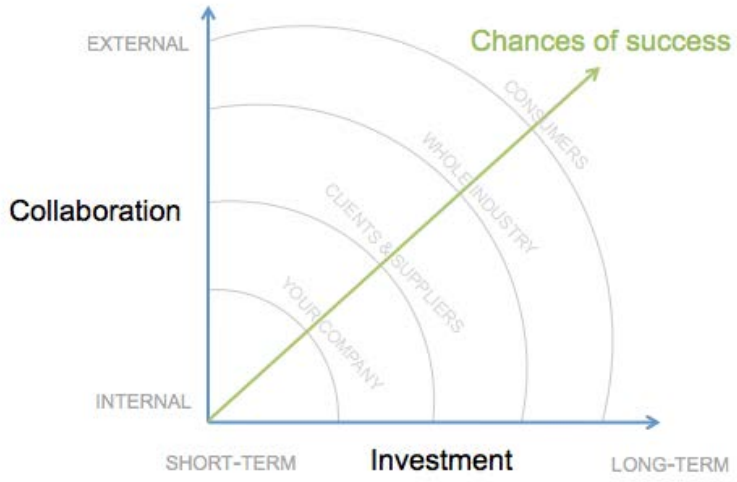


FIGURE 3 – ACCEPTANCE OF NEW OR MODIFIED PACKAGING REQUIRES COLLABORATION & INVESTMENT

[5] http://www.cmconsultinginc.com/wp-content/uploads/2015/04/EvolvingTonMayRRFinal.pdf

Packaging formats that experience skepticism on either recycling or composting claims tend to be a result of short-term planning, poor communication of why packaging decision was made, and/or no reconciliation of potential trade-offs with other stakeholders. Well-communicated objectives as well as engagement and willingness to accommodate needs of other stakeholders are critical factors to game-changing packaging sustainability success stories. With a shifting packaging policy landscape, stricter rules on material imports, increasing warning signs on the effects of climate change, and ongoing consumer demands for cost savings and performance, the time to achieve true collaboration for *A World Without Packaging Waste* is more pressing than ever.

PAC NEXT continues to work to provide industry with opportunities to engage, educate and ramp up innovative solutions in order to radically reduce both food waste and packaging waste for a circular economy.

Thanks to our members and external partners for their generous contribution of knowledge and expertise to develop the Packaging Fact Sheets. Since this work is a 'living' document, your feedback is welcome and valued in helping to make it accurate, relevant and useful.

If you wish to provide feedback or you have any questions or comments regarding this document, please contact Rachel Morier at rmorier@pac.ca.

Glossary of Terms and Abbreviations

ACC	American Chemistry Council
APR	Association of Plastic Recyclers
CPIA	Canadian Plastics Industry Association
BPI	Biodegradable Products Institute
Capture	The stage in which the consumer discards the material for collection at curbside, depot or return-to-retail to be sorted and baled at a MRF
Compostable	Capable of biodegrading and completely breaking down within specified conditions
Depot	A facility designed and operated for receiving and temporarily storing recyclable materials prior to their transport to a recycling center or end market
Design	The stage in which brand owners and producers have influence over packaging design, including material selection, structural design and on-pack communication
Diversion	The process of diverting solid waste from landfills
EfW	Energy-from-waste
HDPE	High-density polyethylene (Resin code #2)
LDPE	Low-density polyethylene (Resin code #4)
MRF	Material Recovery Facility
PCR	Post-consumer recycled
PET	Polyethylene terephthalate (Resin code #1)
PETG	Polyethylene terephthalate glycol-modified
PLA	Polylactic acid (Categorized under resin code #7 “Other”)
PP	Polypropylene (Resin code #5)
PS	Polystyrene (Resin code #6)
PVC	Polyvinyl chloride (Resin code #3)

R2R	Return-to-retail
Recyclable	Packaging that can be collected, separated, or otherwise recovered from the waste stream through an established recycling program for reuse or use in the re-processing of materials to manufacture new products
Recycled	Materials that have been recovered or diverted from the waste stream
rPET	Recycled polyethylene terephthalate (Resin code #1)
Reduction	Reducing the amount of materials used in the design, production or consumption of packaging
Recovery	The stage in which baled materials are then sold to end markets that process the materials to make new products or alternative feedstocks (e.g., chemical recycling, fuel pellets)
Renewable Content	The use, in the manufacturing of a package, of bio-based and natural resources that can be replenished through a natural process
SPC	Sustainable Packaging Coalition
SPI	Plastics Industry Association
SSO	Source separated organics

Acknowledgements

Much thanks to the Packaging Innovation Gateway project team because, without them, the *Packaging Fact Sheets* would not have been possible. Team members are listed below.

Dan Lantz (PAC NEXT Co-Chair)	Scout Environmental
Brent Heist (PAC NEXT Co-Chair)	Procter & Gamble
Patrick Kerrigan	Alpha Poly
Daniel Reshef	Canada Fibers Ltd.
Joe Hruska	Canadian Plastics Industry Association
Isabelle Faucher	Carton Council of Canada
John Baldry	City of Toronto
Nadine Kerr	City of Toronto
Craig Schwindt	CKF Inc.
Das Soligo	County of Wellington
Cheryl Sullivan	CS Consultants
Pascal Lachance	Danone
Pierre Benabidès	EEQ
Paulina Leung	Emterra
Peter Davidson	FX Creative
Guy McGuffin	GM Consulting
Tarik Jabrane	Innofibre
Bruno Ponsard	ITEGA
Patricia Enneking	Klockner Pentaplast
Ena Popic	Loblaws
Tim Goodman	NatureWorks LLC
Lisa Sepanski	Northwest Product Stewardship Council
Sego Jackson	Northwest Product Stewardship Council
Carol Zweep	NSF-GFTC
Karishma Chandok	PAC Packaging Consortium
John Mullinder	Paper & Paperboard Environmental Council (PPEC)
Svetlana Sheryaev	Recycle BC
Kevin Mehlenbacher	Region of Peel
Mariano Singzon	Region of Peel
Philippe Cantin	Retail Council of Canada
Alexandra Eakins	Sobeys
Marina Pietrosel	SustainableStrat Inc.
Christine Difabio	Unilever
Geoff Rathbone	Waste Diversion Ontario
Dave Faris Yousif	Yousif Consulting

PAC NEXT would also like to thank the following subject matter experts for their generous contribution of knowledge and time to provide feedback to the Packaging Fact Sheets.

Joseph Hall	Canadian Plastics Industry Association
Christopher McKillop	Club Coffee
Bryan Vickers	Glass Packaging Institute
Marie-Anne Champoux-Guimond	Keurig Canada
Heather Saranpaa	Mother Parkers Tea & Coffee
Liberatore Trombetta	Mother Parkers Tea & Coffee
Laura Stewart	National Association for PET Container Resources (NAPCOR)
Ryan Modlin	Owens-Illinois

