

# A Vision for the Future of Printed Paper and Packaging in Ontario



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The Ontario Circular Economy Innovation Lab (CEIL) is pleased to present a vision for the future of printed paper and packaging in a circular economy in Ontario. This document includes:



### The Vision

presents a desired future for printed paper and packaging that aligns with sustainability and the circular economy. The vision is deliberately ambitious and reflects the Rapid Lab's thinking on how these materials need to evolve over the coming decades.



### The Innovation Pathways

represent the key areas where collective efforts are needed to accelerate the transition to a circular economy for printed paper and packaging. These innovation pathways can be used at multiple levels: they can guide the transition for the system as a whole and can also be applied to develop detailed road maps for specific products and materials.



### The Circular Economy Framework

presents a definition and graphic that outline how materials ideally flow in a circular economy.

**The vision, innovation pathways and framework are outputs of CEIL's Printed Paper and Packaging Rapid Lab. They are working drafts that are intended to demonstrate the value of cross-sector collaboration, stimulate discussion around the future of printed paper and packaging and inspire action towards a circular economy.**

The following individuals participated in the Rapid Lab and contributed to the development of the vision, innovation pathways and framework.

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# Our Shared Vision & Innovation Pathways



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**In our vision, printed paper and packaging (PPP) in Ontario, and the entire system that supports it, are designed for:**



### Sustainability

Maximizing value and utility by:

- supporting multiple cycles of use,
- refurbishing, re-purposing, and recycling in closed loop systems,
- reducing materials where possible,
- re-integrating biological materials to the biosphere,
- respecting social equity, and
- aligning with science-based principles of sustainability.



### Functionality

Meeting market and regulatory requirements for function, branding, efficiency, safety, performance and cost throughout the PPP lifecycle.

In our vision, we have competitive, circular economy value chains for PPP that result in tremendous social, environmental and economic prosperity for all of Ontario's citizens. Ontario, as such, serves as a leader for a circular economy in PPP.

# Description of Success

To us, achieving this vision means that by 2030 Ontario's PPP system has:

- **Established prosperous resource markets that reflect the true costs and value of materials:** Strong and stable commodity markets exist for PPP materials to support multiple lifecycles; the true value created (i.e. social, environmental and economic) is reflected in pricing.
- **Eliminated and re-conceptualized waste:** PPP materials previously disposed of are now seen as valuable commodities and flow in closed loop cycles. In doing so, resources are used to their highest utility and value during their multiple lifecycles and reduced as much as possible.
- **Radically reduced emissions:** Greenhouse gas emissions from developing, managing and processing PPP materials throughout their multiple lifecycles are reduced enough to make significant progress on provincial, federal and global science-based reduction targets to combat climate change.
- **An aligned and level playing field:** Policies, incentives and financing mechanisms encourage circular economy solutions and reflect the true value and cost of PPP resources.
- **Been collaboratively designed:** Manufacturers, brand-owners, service-providers, industry associations and policy-makers contribute to the design of a PPP system that supports a circular economy.
- **Educated, aligned and engaged consumers:** Consumers are actively engaged in moving towards a circular economy, including driving change; learning resources and engagement opportunities on the circular economy for PPP are prevalent and accessible.
- **Enabled and amplified circular economy leadership:** Innovative circular economy business models and leaders are recognized, amplified and enabled.
- **Transparent reporting by all actors:** Progress towards a circular economy for PPP is regularly reported against established circular economy metrics and baselines by all relevant stakeholders in the system.
- **Highly effective resource management:** Efficient, innovative collection and sorting systems exist that support the circular economy and promote, enable and encourage the maximum recovery of value from resources for future lifecycles of PPP materials.
- **Optimized processes and lifecycles:** Processes at every stage of the PPP lifecycle (e.g. manufacturing, transportation, use) are highly efficient at eliminating waste, energy and materials and leveraging technology.
- **Improved social equity:** Stakeholders at all points in the value chain support the conditions for social equity and inclusiveness in their operations and procurement practices.

# Innovation Pathways

1

## Rethink waste and create a circular economy culture

Investing in outreach, education, training and collaboration across the value chain from producers to consumers. This includes:

- a. Engage consumers** to build their awareness and understanding of the circular economy.
- b. Engage businesses** and their associations around the business case for the circular economy and how to identify, develop and act on circular economy opportunities.
- c. Enable collaboration** through innovative processes that engage stakeholders across different sectors and value-chains.

2

## Optimize circular design and production processes for PPP

Changing how PPP is designed and manufactured to reflect the circular economy and the waste hierarchy. This includes:

- a. Product life-extension:** Designing PPP so that it can be repaired, repurposed and/or reused multiple times. This can enable product sharing and business models such as “product-as-service” where manufacturers sell a packaging service rather than the package itself.
- b. Circular supply chains:** Designing PPP products that i) use recycled and/or renewable materials and ii) can be readily recycled, composted or used as a bio-feedstock at end-of-life.
- c. Package optimization:** Reducing the amount of PPP required for a product (dematerialization) and eliminating waste disposal from production processes.
- d. Energy, water and carbon efficiency.** Using PPP materials with low embedded energy, energy and water-efficient production process and low-carbon, renewable energy sources.

# Innovation Pathways

3

## Strengthen province-wide material recovery systems for all PPP

Improving circular supply chains and systems for collection, sorting, redistribution, processing and reverse logistics. This includes:

- a. Create standard PPP collection** requirements across Ontario.
- b. Invest in advanced processing technology** to increase the quality and quantity of recovered materials.
- c. Adopt alternative collection systems** that optimize value (e.g. return to retail).

4

## Adopt public and private sector policies that support the circular economy

Aligning standards, policies, metrics and incentives with the circular economy imperative. This includes:

- a. Adopt metrics** that reflect the circular economy and the highest and best use of materials.
- b. Develop industry standards and guidelines** that support circular design and production.
- c. Invest in circular economy innovation** by providing financing, investment and grants to enable research, development and innovation around the circular economy.
- d. Align procurement practices** to support circular supply chains and markets.
- e. Align government policies and regulations** with the circular economy.



# Circular Economy Framework



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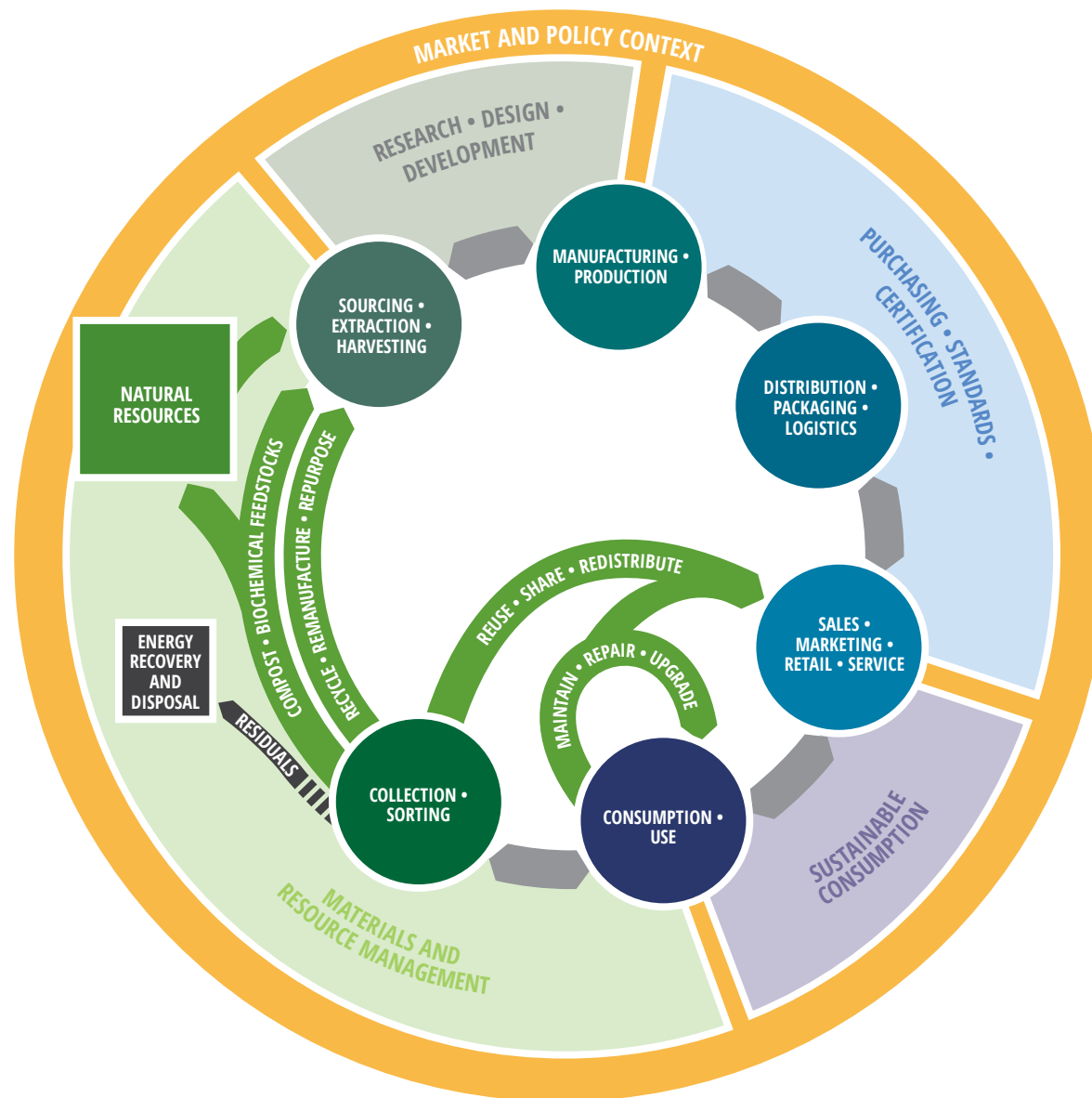
# Circular Economy Framework

**The Circular Economy** is an approach to maximize value and eliminate waste by improving (and in some cases transforming) how goods and services are designed, manufactured and used. It touches on everything from material selection to business strategy to the configuration of regulatory frameworks, incentives and markets.

In the conventional economy, materials move through a linear process of extraction, production, consumption and eventual disposal (“take-make-waste”). In contrast, a circular economy eliminates waste through the cycling of products and materials in interconnected systems, biological cycles and markets (“make-use-return” or “take-make-take-make-take-make”).

The overarching goal of the circular economy is to generate the highest utility and value from materials and products over their entire lifecycle. This includes economic, social and ecological value. Achieving this goal requires that all stakeholders in the economy strive to:

- Eliminate the concept of waste and the disposal of products and materials,
- Minimize the use of finite, non-renewable resources except in closed-loop cycles,
- Optimize the use of renewable resources at levels that can be sustained by natural systems, and
- Align market and policy incentives in support of these goals.



The Circular Economy Framework diagram presents a high-level map of how products and materials move through a circular economy. It is divided into three parts:

1. The inner circles present the key stages in the lifecycle or value chain of paper and packaging products;
2. The green loops present the various pathways for closing the cycle after first consumption or use; and

3. The outer circle presents the broader market and policy context that shapes decision-making within the system (Product research, design and development; Purchasing, standards and certification; Sustainable consumption and demand-side management; and materials and resource management).

# Definitions



## Maintain, Repair and/or Upgrade

Extending the life of the product through maintenance and repair. Ideally, products are designed to allow for upgrading with better components over time (e.g. computers, bicycles and cars can all be upgraded). This keeps the product in good condition for reusing, sharing or redistributing (below).



## Reuse, Share and/or Redistribute

Extending the life and utility of a product by sharing or otherwise passing it along to other users. This can be facilitated by new technology and service providers to help connect owners and new users (e.g. Airbnb, material exchange networks).



## Recycle, Remanufacture and/or Repurpose

Returning the product to the manufacturing and production stage through:

- **Recycling:** Breaking it down into its component parts and then reprocessing them into new forms in one of two ways.
  - **Upcycling** transforms the materials into something of equal or higher value than the original product (e.g. turning a plastic bottle back into a plastic bottle).
  - **Downcycling** transforms the materials into something of lesser value (e.g. turning a glass bottle into pavement).
- **Remanufacturing:** Processing the product to return it to “as new or better” performance.
- **Repurposing:** Processing the product so it can be used for a different purpose and function.



## Compost and/or Biochemical Feedstocks

Organic materials can be composted or processed into a feedstock such as a fuel through biochemical processing or thermochemical conversion. Composted materials support a circular economy by enabling the growth of new renewable organic source materials.



This document is an outcome of the Printed Paper and Packaging Rapid Lab that was hosted by The Natural Step Canada's Ontario Circular Economy Innovation Lab (CEIL) in October – December 2016.

CEIL's mission is to accelerate the transition to a circular economy in Ontario by bringing together private and public sector leaders to generate, test and implement innovative ideas and solutions.

CEIL is powered by The Natural Step Canada with support from IKEA Canada, Unilever, the Ontario Waste Management Association, Owens Illinois Inc, Canadian Tire, Canada's National Brewers, the Smart Prosperity Institute, Celestica, the Bank of Montreal Financial Group, Interface, WP Warehousing Inc., the J.W. McConnell Family Foundation and the Government of Ontario.

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