

An abstract graphic featuring a central white circle with a thick grey border. Inside the circle, the text "CIRCULAR ECONOMY GLOBAL SECTOR BEST PRACTICES SERIES" is written in a bold, dark blue, sans-serif font. Radiating from the circle are numerous thin, colorful lines in various colors (red, orange, yellow, green, blue, purple, pink, grey) that extend towards the edges of the frame, creating a sunburst or starburst effect. The lines vary in length and thickness, and some are solid while others are dashed.

CIRCULAR ECONOMY GLOBAL SECTOR BEST PRACTICES SERIES

BACKGROUND MATERIALS FOR CIRCULAR ECONOMY SECTORAL ROADMAPS

INTRODUCTION

NOVEMBER 2020



**Smart Prosperity
Institute**

About Smart Prosperity Institute

Smart Prosperity Institute (formerly Sustainable Prosperity) is a national research network and policy think tank based at the University of Ottawa. We deliver world-class research and work with public and private partners – all to advance practical policies and market solutions for a stronger, cleaner economy.

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ABOUT THE GLOBAL SECTOR BEST PRACTICES SERIES

This publication series aims to provide a starting point in the journey towards a circular economy. These materials are intended to be used as a background resource and rich reference source for future efforts to engage Canadian firms and innovators in this transition, and to build sector-based roadmaps to a circular economy in Canada.

Twelve core strategies for *rethinking* resource consumption and *optimizing* the use of resources to transition to a circular economy are detailed in the Introduction to the series. Real-world practices supporting these strategies are being catalogued for seven sectors, each profiled in its own document:

1. Minerals and Metals
2. Electronics
3. Agri-food
4. Construction
5. Plastics
6. Bio-economy
7. Automotive

INTRODUCTION: ABOUT THE SERIES

The prevailing current model of the economy is described as linear: more than 90% of the resources which are extracted for the global economy are used once only, and then disposed of.¹ This wastes economically valuable material resources, unduly harms the environment, and generates avoidable greenhouse gas emissions. An alternative model, the circular economy, proposes a vision for an economy that closes material loops, optimizes the use of resources, and reduces the level of virgin resources consumed. It does this using a combination of strategies and business models. As this model moves from aspiration to practice in countries around the world, a growing number of examples illustrate how it can be applied in various sectors of the economy.

To advance Canada's transition to a circular economy, graduate student researchers at the Smart Prosperity Institute, in collaboration with L'Institut EDDEC, undertook an effort to catalogue the strategies and practices supporting the transition to a circular economy. This work draws on real-world examples from around the globe across seven sectors that are important to the Canadian economy: automotive, agri-food, bio-economy, construction, electronics, minerals and metals, and plastics. They found that globally, businesses are already implementing a wide range of practices that incorporate circular economy principles, whether or not these practices are explicitly identified as circular, or part of a larger, company-wide greening strategy.

Circular Economy Global Sector Best Practices aims to provide a starting point in the journey towards a circular economy. It is intended to be used as a background resource and rich reference source for future efforts to engage Canadian firms and innovators in this transition, and to build sector-based roadmaps to a circular economy in Canada.

Each report profiles one sector. It begins with an outline of the economic and environmental importance of the sector, including data on economic potential of wasted resources where available. It then profiles the existing circular practices that were identified in the sector, organized according to a common framework for circular economy approaches and strategies developed in 2018 by L'Institut EDDEC in collaboration with RECYC-QUÉBEC.² The profile begins with a high-level summary of the circular practices found in each sector, and snapshots of these practices in application, and then moves on to list applied, real world examples for each of these strategies and practices. The report concludes with a list of additional resources for researchers, practitioners, and policy-makers: selected global public policies, and an annotated bibliography of key reports specific to circularity for that sector.

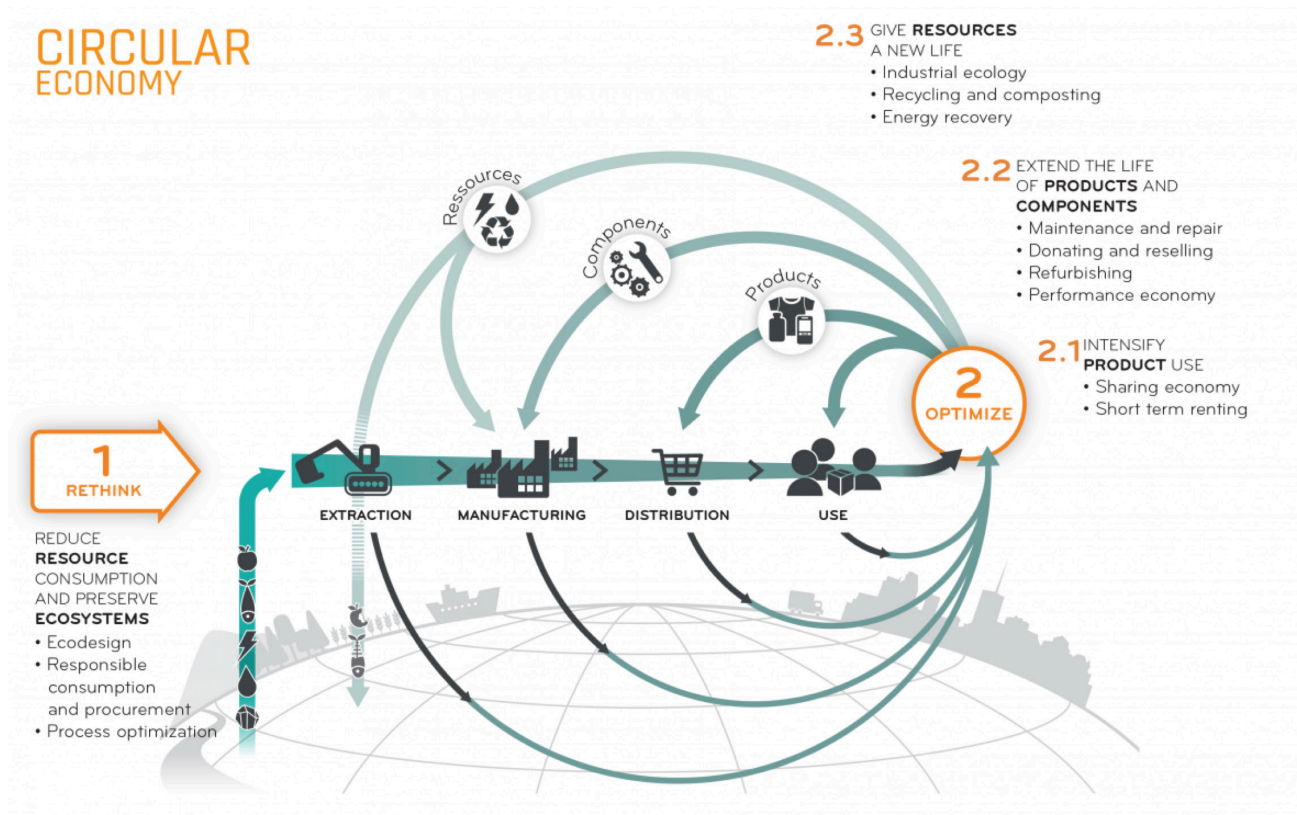


Figure 1. A Circular Economy. Source: Institut de l'environnement, du développement durable et de l'économie circulaire (I-EDDEC). (2018). Circular Economy in Quebec.

STRATEGIES FOR A CIRCULAR ECONOMY

Transitioning to a circular economy will require **rethinking** and **optimizing** use of resources. Twelve core strategies for doing so were identified in previous research by L'Institut EDDEC in collaboration with RECYC-QUÉBEC. These strategies served as the framework for categorizing current industry practices in the Circular Economy Best Sector Practices research project. The descriptions for these twelve strategies are provided below.

RETHINK

Objective 1: Reduce resource consumption and preserve ecosystems



Ecodesign³ is a design approach that considers the environmental impact of a product, service, process, or system throughout its entire lifecycle.⁴ Eighty percent of impacts can be avoided at the design stage. Ecodesign aims to use minimum resources, produce the least waste and pollution possible, reduce the impacts of distribution, and support easy reuse and recycling.⁵



Process optimization is an operations strategy that aims to continuously and iteratively eliminate waste through improved production processes. It involves making only what is necessary in order to minimize excess inventory, and streamlining production to reduce time spent on production and improve flow processes.⁶



Responsible consumption and procurement is when buyers take into account environmental and social impacts at all stages of the product life cycle⁷ when making their purchasing decisions. These buyers can be involved in the economy as a private or public entity, or as citizen consumers.

OPTIMIZE

Objective 2: Intensify product use



The sharing economy is a marketplace, or economic relationship, that consists of giving, swapping, borrowing, trading, and sharing products and services free or for a fee.⁸



Short-term renting refers to a process where the consumer has access to a product for a limited time while ownership continues to be maintained by the provider.⁹ It is distinguished from leasing as short-term rental contracts typically have a duration of one year or under.

Objective 3: Extend the life of products and their components



Maintenance and repair

prolong product use, extending the product's useful lifetime. Ease of maintenance and repair, either for the consumer or the producer, are maximized in the design phase of the product, service, process, or system.



Donating and reselling

gives a product a new life, extending its useful lifetime. Ensuring that used products are attractive to buyers, such as by guaranteeing data privacy for used cell phones, encourages product donation and reselling.



Refurbishing means

collecting discarded products or materials that can be refinished and sanitized to serve their original functions.¹⁰ It minimizes the input of resources by updating or transforming existing products with new components, rather than replacing the product altogether. Refurbishment is often aesthetic in nature and results in a product that may or may not be comparable with new or remanufactured products, although the refurbished product is in good condition.



A performance economy or functional economy is

one where economic importance is placed upon renewable and infinite resources, such as labour or service, as opposed to the consumption of finite materials.¹¹ In this strategy, there is a focus on the selling of product services rather than products themselves. The product's performance prevails over its possession, leading to the decoupling of added value and energy and raw material consumption.

Objective 4: Give resources new life



Industrial ecology uses

one organization's waste as another's input or raw material. As one example, industrial symbiosis is a partnership between organizations in one area where partners provide, share, and reuse resources to generate shared value.¹²



Recycling and composting

are two distinct processes that recover recyclable materials to reintroduce them into a new product cycle and breakdown organic matter for alternative use respectively.¹³ The recycled materials are reused either in a closed-loop system (i.e. reused in similar products) or an open-loop system (i.e. reused in other products). Reused materials can either result in something of a greater value (upcycling) or lesser value (downcycling) than the original. Composting occurs when unwanted organic material is mixed with specific quantities of air and water to aid in the decomposition process. Matter produced from composting can be used for a variety of agricultural purposes, such as growing plants.



Energy recovery is a waste

treatment process that generates energy in the form of electricity, heat or fuel.¹⁴ Energy recovery is a preferable waste handling process rather than sending waste to landfill, but it should be considered as one of the last options at the end of life, after reuse, refurbishing, and recycling.

CONCLUSION

The transition to a circular economy will not happen overnight. Governments at all levels, industry, and non-governmental organizations have a vital role to play in catalyzing a transition to a circular economy. Yet the seeds for this transition already exist, all around. The challenge is to bring these to scale. This series is intended to serve as a starting point for this transition by providing background resources, and a rich source of references that inform future efforts to disseminate circular practices and design sector-based circular roadmaps.

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