

August 2016

Green Discussion Paper  
Advancing the Concept of the Circular Economy in Canada

Prepared for the National Zero Waste Council  
By Mike Phillips



# TABLE OF CONTENTS

<b>EXECUTIVE SUMMARY</b>	<b>3</b>
<b>THE CIRCULAR ECONOMY AND WASTE PREVENTION</b>	<b>5</b>
<b>WASTE PREVENTION VALUE PROPOSITION</b>	<b>7</b>
<b>CASE STUDIES</b>	<b>10</b>
<b>BARRIERS TO ADOPTION</b>	<b>10</b>
<b>OPPORTUNITIES AND RECOMMENDATIONS</b>	<b>12</b>
<b>INFORMATION AND AWARENESS</b>	<b>12</b>
<b>PARTNERSHIP AND COLLABORATION</b>	<b>14</b>
<b>BUSINESS SUPPORT SCHEMES</b>	<b>14</b>
<b>POLICY DEVELOPMENT</b>	<b>15</b>
<b>APPENDIX A – CASE STUDIES</b>	<b>17</b>





## EXECUTIVE SUMMARY

To support the Circular Economy Working Group of the National Zero Waste Council, this report aimed to clarify the concept of the circular economy in relation to the upstream waste prevention values of the council and identify the advantages of this congruency. Through a literature review and informational interviews with multiple council members, current practices were analyzed to explore how the concept of the circular economy is being applied in Canada and where opportunities exist to advance the concept further. The scope of the report includes solely the technical cycle of the circular economy and omits analysis pertaining to the biological cycle.

### Key Findings:

- The National Zero Waste Council is well positioned to help advance the concept of the circular economy across multiple jurisdictions in Canada.
- Circular business models to this point in Canada have focused downstream on recycling and recovery. As other countries have exemplified, a more proactive waste prevention approach can lead to better results. Recycling and recovery models close the loop less efficiently and require additional input resources in order to re-circulate materials into use. This does not coincide with waste hierarchy priorities or the focus of the Council.
- Both waste prevention objectives and a genuine circular economy both intend to eliminate waste entirely from product lifecycles before recycling, recovery or landfill options. Establishing a genuine circular economy includes capturing the value of resources not only downstream through recycling and recovery but in the upstream stages of the product lifecycle as well.
- An upstream waste prevention focus on product design (design for disassembly, repair, reuse, remanufacture) can extend the useful life of materials and capture value by allowing materials to easily re-circulate into use with limited additional inputs required. This product life extension creates value through resource efficiency and allows products, components and materials to circulate continuously at their highest value and utility for the longest period of time.
- Decoupling economic activity from intensive resource use by replacing virgin raw materials with secondary materials creates environmental benefits and business advantages. This is achieved through the elimination of waste management costs, the reduction in raw material extraction and re-circulating goods into use with minimized expenditures. A sustainable business practice can drive customer loyalty and brand reputation.



Ten case studies were selected from Canada and around the world to highlight business models and initiatives that have created benefits by successfully merging circularity and waste prevention objectives. The cases can be found in the appendix of the report. Drawing on these examples, the report explored how the concept of the circular economy can be advanced through communication campaigns, collaborative partnerships, business support schemes and policy development. With a wide membership base across Canada, the National Zero Waste Council can advocate for change and champion cross-jurisdictional directives.

The report suggests that Canada can advance the concept of the circular economy through the following recommendations:

- Communicate the significance of the waste hierarchy
- Improve the culture of reuse with increased transparency
- Inspire behavioral change through awareness and social marketing campaigns
- Support the creation of consistent goals, objectives and performance measures nationally
- Monitor the success of Canada's National Industrial Symbiosis Program
- Encourage the provision of incentives to audit current business models
- Support circular start-ups with funding
- Promote sustainable procurement and green purchasing policies
- Legitimize the circular transition with Federal legislation and policy creation





## THE CIRCULAR ECONOMY AND WASTE PREVENTION

The circular economy is an evolving economic model predicated on a systems-based approach to eliminate waste. This paradigm marks the movement away from the conventional “take-make-dispose” model of production and consumption to one based on continuous use, resource efficiency and regenerative design. To minimize inputs of finite natural resources, the circular economy aims to maximize the value of each product, component and material by extending its useful life. Given the complexity of a single product’s lifecycle, grasping the full extent of material flows can be challenging. Despite this challenge, the commitment to a circular economy continues to gain momentum around the world.

Both government and business in Europe have embraced the circular economic model, whereas in Canada this transition has progressed at a much slower rate. To this point, the management of waste in Canada has been primarily reactive. While an impetus to transition from the linear model has begun, initiatives have focused downstream and have commonly targeted the recycling and recovery of post-consumer materials<sup>1</sup>. And while returning end-of-life waste products to beneficial use through these processes is valuable, Figure 1 suggests that preventing waste altogether is the most favourable action. After all, the best way to manage waste is to avoid generating it in the first place.

Canada’s waste management priority has been to close the loop and ensure that outputs of one process can be the inputs for another. However, wasteful outputs are not produced solely at the end-of-life of a consumer product. Waste is generated at nearly every stage in the product lifecycle through the consumption of energy, water, chemicals and resources<sup>2</sup>. As the intention of the circular economy is to eliminate waste entirely, there is opportunity in Canada to be proactive and create change beyond post-consumer waste solutions. To accomplish this, a waste prevention application is necessary. Upstream transformations in the way that we design, produce and consume goods will be required.

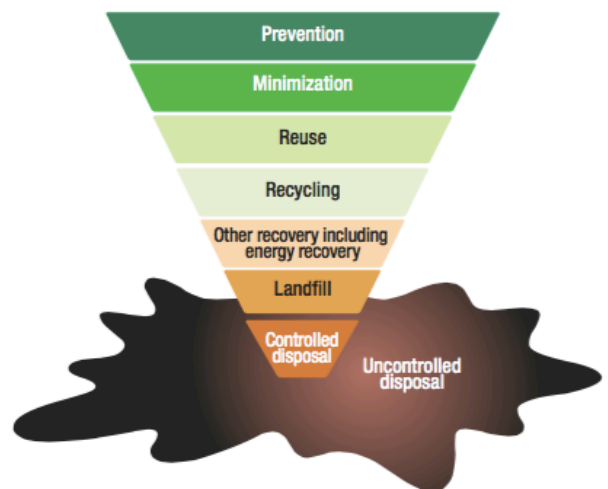


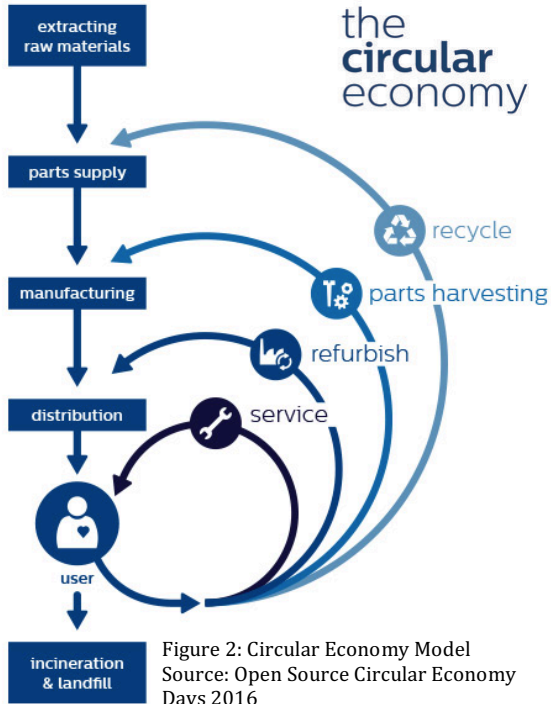
Figure 1: Waste Management Hierarchy  
Source: State of Waste Management in Canada, 2014

The upstream waste prevention values of the National Zero Waste Council (the Council) align with the zero-waste intentions of the circular economic framework. At this time, resource

<sup>1</sup> Canadian Council of Ministers of Environment. (2014). *State of Waste Management in Canada*. Retrieved from: [http://www.ccme.ca/files/Resources/waste/wst\\_mgmt/State\\_Waste\\_Mgmt\\_in\\_Canada%20April%202015%20revised.pdf](http://www.ccme.ca/files/Resources/waste/wst_mgmt/State_Waste_Mgmt_in_Canada%20April%202015%20revised.pdf)

<sup>2</sup> UN Environmental Programme. (2015). *Global Waste Management Outlook*. Retrieved from <http://www.unep.org/ietc/Portals/136/Publications/Waste%20Management/GWMO%20report/GWMO%20full%20report.pdf>

recovery and recycling are the two circular models with the most currency. While these processes are able to close the loop and contribute to a goal of circularity, these are downstream from the Council’s primary focus and less effective in waste prevention.



Waste prevention refers to eliminating the production of waste before it enters the recycling stream, energy recovery stream or landfill<sup>3</sup>. Changes to upstream activities such as harvesting raw materials, product design, manufacture and transportation can accomplish this. Establishing a genuine circular economy includes capturing the value of resources not only on the back-end through recycling and recovery, but on the front-end of a product lifecycle as well<sup>4</sup>. This systems-based approach will reduce waste generation throughout the entirety of the process.

The Council works diligently to influence the behaviour of businesses and encourage careful decision making in the sourcing of materials and design of products. Most products today are designed to be obsolescent and replaced within years of their production. However, extending the life of products

through innovation and the reimagining of business models will alleviate pressure on the waste stream. To facilitate this, the Council urges businesses to tackle waste problems at the source and design out waste from their products. By designing with disassembly, repair, reuse or remanufacture in mind, the utility of products can be extended and delay the need for replacement goods. This resource efficiency allows for the continuous use of materials in a closed-loop system and reduces the need for new virgin resource inputs.

The waste prevention lens is a relatively untapped perspective for the circular economic framework in Canada. That being said, this lens has potential to inspire innovative business models that capture both competitive advantages and environmental benefits. With its focus on cross-sector collaboration and a wide membership base across Canada, the Council is in a unique position to foster change between multiple stakeholders and advance the concept of the circular economy across the nation.

<sup>3</sup> Canadian Council of Ministers of Environment. (2014). *State of Waste Management in Canada*. Retrieved from: [http://www.ccme.ca/files/Resources/waste/wst\\_mgmt/State\\_Waste\\_Mgmt\\_in\\_Canada%20April%202015%20revised.pdf](http://www.ccme.ca/files/Resources/waste/wst_mgmt/State_Waste_Mgmt_in_Canada%20April%202015%20revised.pdf)

<sup>4</sup> Comere, E. (2016). 'Recycling Cannot Support Circular Economy Alone'. Triple Pundit. Retrieved from: <http://www.triplepundit.com/2016/04/listen-recycling-cant-support-circular-economy-alone/>



## WASTE PREVENTION VALUE PROPOSITION

The waste prevention perspective can contribute significantly to circular innovation and create mutual benefits for consumers, businesses and the environment. The diagram produced by the Ellen MacArthur Foundation (Figure 3) displays the value creation potential for circular strategies that align with waste prevention objectives.

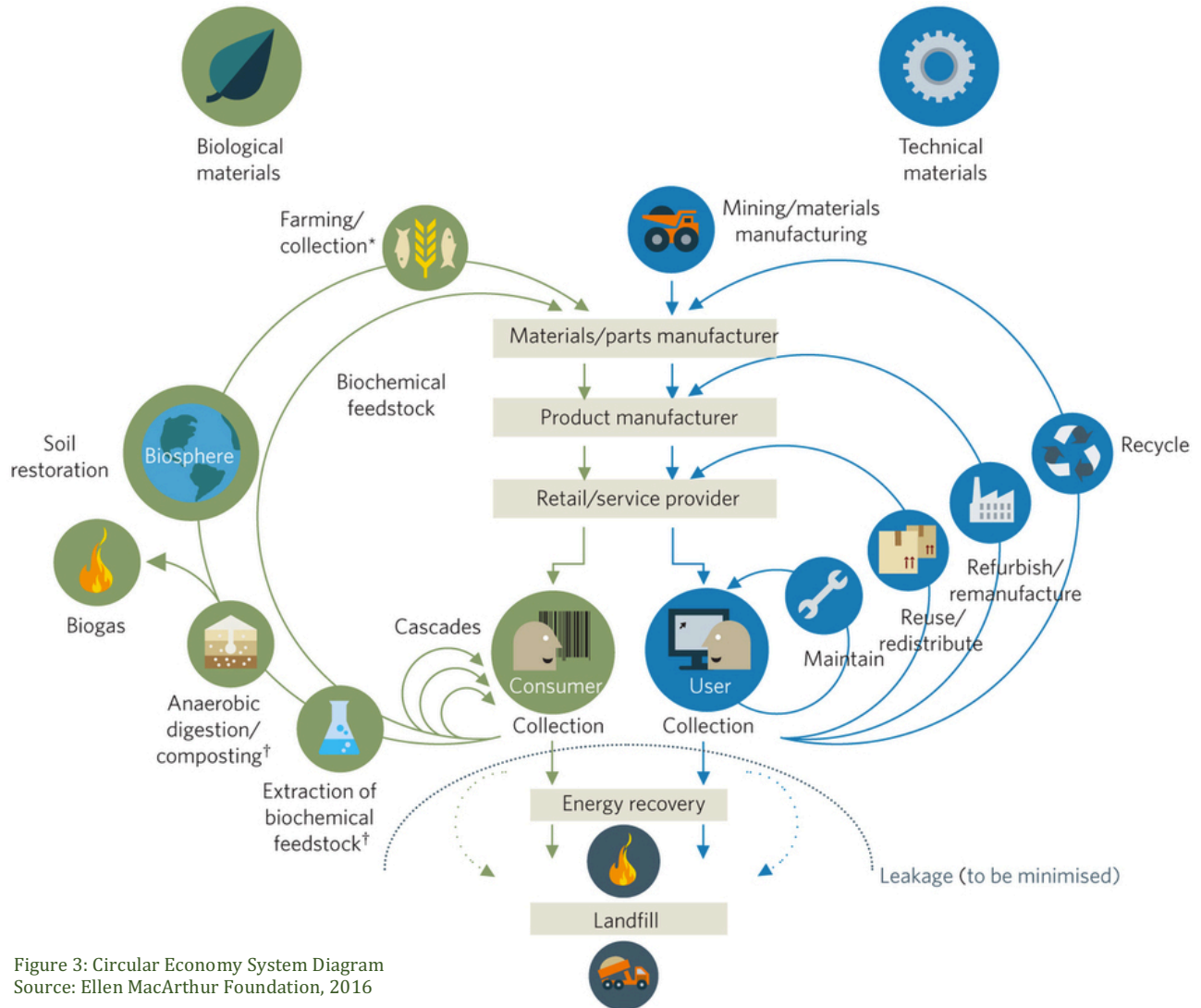


Figure 3: Circular Economy System Diagram  
Source: Ellen MacArthur Foundation, 2016

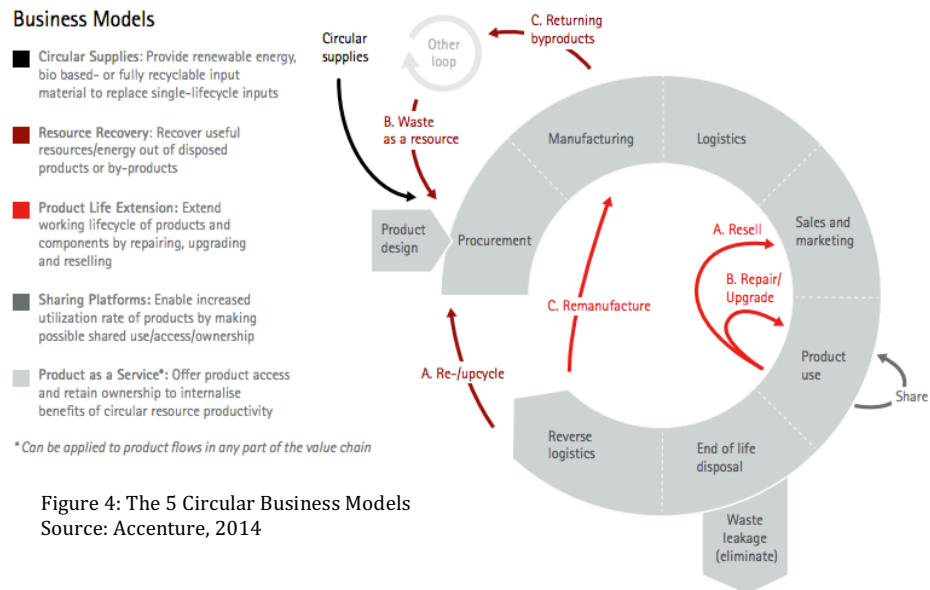
As the right side of the diagram depicts, there are several processes which can close the loop once products have reached their end-of-life. These include maintenance or repair, reuse, remanufacture and recycling. The size of the loop indicates the amount of value lost as a result of additional resources or processes required to bring a component, material or product back into use<sup>5</sup>. In other words, as we move from the inner loops of the circular economy (repair, reuse, remanufacture) to the outer loops (recycling), there is an increase in carbon, energy and resource

<sup>5</sup> World Economic Forum. (2014). Toward the Circular Economy: Accelerating the scale up across global supply chains. Retrieved from: [http://www3.weforum.org/docs/WEF\\_ENV\\_TowardsCircularEconomy\\_Report\\_2014.pdf](http://www3.weforum.org/docs/WEF_ENV_TowardsCircularEconomy_Report_2014.pdf)

expenditure required to effectively close the loop. The ideal circular economy captures the value of input resources within the inner loops by keeping products, components and materials circulating continuously at the highest value for the longest period of time<sup>6</sup>. By replacing virgin materials with secondary materials in the inner-loops, Canada can decouple economic activity from intensive resource use and succeed without consistent energy or virgin raw material inputs<sup>7</sup>. This decoupling allows for maximized waste prevention benefits and profitable value creation.

Waste prevention initiatives, including repair, reuse and remanufacture, minimize the negative externalities associated with harvesting virgin raw materials, manufacturing and processing activities<sup>8</sup>. These include waste, energy, water, hazardous chemicals and greenhouse gas emissions. By extending the lifecycle of products, components and materials, the inner-loops of the circular economy diminish the need for virgin inputs and preserve the stock of finite resources. With this in mind, the transition to secondary inputs and continuous use can prevent land degradation and assist in reaching climate change and greenhouse gas reduction targets. Three times as much energy is used in the extraction of virgin raw materials compared to substituting re-used components through remanufacturing<sup>9</sup>. If business can adapt to design with repair, reuse and remanufacturing in mind, consumers can be selective in the products they support and therefore help combat waste generation. This will require behavioural change upstream and downstream.

The circular economy has evolved into an opportunity for business to innovate and create competitive advantages while being mindful of waste generation. At this point, five innovative circular business models have been popularized and these are featured in Figure 4.



<sup>6</sup> Zero Waste Scotland. (2016). Making Things Last: A Circular Economy Strategy for Scotland. Retrieved from: <http://www.gov.scot/Resource/0049/00494471.pdf>

<sup>7</sup> Club of Rome. (2016). The Circular Economy and Benefits for Society. Retrieved from: <http://www.clubofrome.org/wp-content/uploads/2016/03/The-Circular-Economy-and-Benefits-for-Society.pdf>

<sup>8</sup> Oregon Waste Prevention Strategy. (2007). Retrieved from: <http://www.deq.state.or.us/lq/sw/wasteprevention/wpstrategy.htm>

<sup>9</sup> Club of the Rome. (2016). The Circular Economy and Benefits for Society. Retrieved from: <http://www.clubofrome.org/wp-content/uploads/2016/03/The-Circular-Economy-and-Benefits-for-Society.pdf>





As Figure 4 illustrates, the models represent the multiple ways in which current business practices can be reimaged. Though defined into 5 specific models for this example, businesses will need to be flexible and develop circular strategies which fit within their own unique values and current practices. The models focused on achieving tighter loops are most desirable due to their minimal waste generation and maximum value creation<sup>10</sup>. Despite each model's distinctive attributes, adopting a waste prevention perspective can consistently deliver cost savings, added value and a boost in brand reputation.

Designing out waste from current practices can deliver enormous cost savings and eliminate the expenses related to collecting, transporting and disposing of waste. By leveraging reuse, repair and remanufacture within the inner-loops of the circular economy, less demand for virgin input materials will increase competitiveness by eliminating the need to find, source, and extract cheap materials. This reduction in resource dependency will help manage company risk and reduce vulnerability to fluctuating commodity prices. Designing products to re-circulate into usefulness without adding costs to the business allows them to be sold at lower rates compared to competing businesses and value can be passed onto the customer.

Reimagining current business practices with consideration for waste prevention can foster strong relationships with customers and improve brand reputation. As awareness for environmental issues grows, commitment to sustainability and green business practices can attract new customers and allow businesses to flourish in new segments of the market. Creative business models can transition from the outright sale and individual ownership of products to models built around lending and the sale of long-term service packages. By promoting the sharing of assets and long-term agreements, businesses will have an opportunity to drive loyalty in their customer base and increase profit margins.

The potential benefits of a waste prevention approach are clear, however determining how to best adjust business models in order to acquire these benefits will be difficult. The route towards capturing the circular advantage will be unique for each business, however focus on the following foundational waste prevention principles can ensure results:

- Systems-thinking to design out waste from the entire product lifecycle
- Upstream waste elimination before recycling, recovery and landfill options
- Design products for easy disassembly, repair, reuse and/or remanufacture
- Keep products, components and materials at their highest value for the longest time
- Maximize the utility of input materials through continuous use and product life extension
- Replace virgin raw material inputs with secondary (reused, remanufactured) inputs

---

<sup>10</sup> Accenture. (2015). Waste to Wealth: The Circular Economy Advantage. Retrieved from: [https://www.accenture.com/\\_acnmedia/Accenture/ConversionAssets/DocCom/Documents/Global/PDF/Strategy\\_7/Accenture-Waste-Wealth-Exec-Sum-FINAL.pdf](https://www.accenture.com/_acnmedia/Accenture/ConversionAssets/DocCom/Documents/Global/PDF/Strategy_7/Accenture-Waste-Wealth-Exec-Sum-FINAL.pdf)



As the circular economic framework gains momentum, there are numerous examples of businesses that have accepted this challenge and continue to utilize a waste prevention perspective in order to achieve circularity.

## CASE STUDIES

The case studies within Appendix A are examples of circular innovation with a waste prevention focus aligned with the vision and principles of the Council. The advantages of this approach are evidenced by these 10 unique business models and community initiatives. These examples are intended to highlight the valuable role that waste prevention can play in the circular economy and encourage similar strategies to be advocated for in the future. Examples are sourced from Canada and around the world.

## BARRIERS TO ADOPTION

The commitment to a circular economy has been limited in Canada compared to the rest of the world. This can be attributed to multiple factors. It will be the task of the Council, businesses, municipalities and the provinces to address these obstacles and advance the circular economy in both scale (widespread adoption) and scope (a waste prevention perspective).

The focus of waste management in Canada has revolved around downstream initiatives such as recycling and waste-to-energy advancements. As the circular economy discourse has spread, there has been a change in language and a growing emphasis on closing the loop to ensure the outputs of one entity become the inputs of another. These approaches do not fully realize the intent of the circular economic framework which aims to completely eradicate the generation of waste. To this point, the concept of waste prevention has been confused with recycling and resource recovery with policies and regulations dedicated towards waste diversion as opposed to waste prevention. As a result, the advancement of a genuine circular economy has been hindered by a lack of clarity, communication and education regarding the scope of the framework.

For existing businesses to rethink their current practices and potentially change their entire business model requires intensive upfront investments of time, money and research. With globalization traversing the lifecycle of products across the world, an audit or assessment of even one product's ecological footprint can be a large endeavour involving multiple parties and a commitment from staff. While onerous, this initial evaluation of the current model would be essential in order to locate outputs within a product lifecycle and make calculated adjustments. Alternatively, burdensome evaluations of current practices will not be applicable to new businesses and as a result, the barriers associated with a circular transition will be minimized. As a result, start-ups have an opportunity to create a circular model which lends consideration to





waste prevention objectives from the outset. However, for both new and existing businesses, financial investment for the research and development of circular business models will be necessary.

Business leaders, particularly those who have found their success under conventional frameworks, are likely to support the status quo and a business-as-usual approach. Council, policy makers and advocates for the circular economy are challenged with demonstrating the competitive advantages that a waste prevention driven circular framework can offer. There is an existing perception that repairing, reusing and remanufacturing products will drastically reduce profits by lowering demand for new products. Businesses are fearful that designing for durability and continuous use will eliminate the need for replacement items and reduce profit margins. As a result, the competitive pressure in today's world drives the status quo and hinders both creativity and circular innovation. The challenge will be to assist businesses in re-envisioning their current practices and re-thinking the way in which they deliver products and or services to customers. By highlighting creative options such as access-over-ownership models, businesses may begin to think outside of the box and ultimately turn to the mutual benefits of waste prevention and the circular advantage.

Recovering materials through repair and remanufacturing help to extend the useful life of products and represent an efficient use of resources. One obstacle lies in determining the reverse logistics associated with closing-the-loop in these processes and retrieving the products from consumers in order to continue their life. While a business may have designed for repair and ease of reuse or remanufacture, these processes cannot be fulfilled if there is no mechanism in place to encourage customers to return the product to the company. These incentives can be built directly into the business model with a simple mail-back system or a lease-over-ownership agreement. Alternatively, financial incentives in the form of a deposit system may be effective as well. Depending on the business model, it will be important to determine the reverse logistics upfront in order to close the loop, keep products in continuous use and capitalize on the value creation within the inner-loops of the circular economy.

The Council has the membership base and expertise to contribute to advancing this concept and determine how it can be better communicated and developed in a Canadian context. While the aforementioned barriers to adoption do exist, the Council is perfectly situated to capitalize on their mutually reinforcing ability to both achieve waste prevention objectives and advance the concept of the circular economy in Canada. This can be achieved by advocating for communication strategies, creative partnerships, business support schemes and policy developments.





## OPPORTUNITIES AND RECOMMENDATIONS

The final section of this discussion paper presents existing opportunities to advance the concept of the circular economy in Canada. Recommendations have been developed with attention paid to successful communication campaigns, partnership opportunities, businesses support schemes and policy developments which have created momentum towards this transition in other parts of the world. They have also been selected due to their alignment with the waste prevention values of the Council. Understanding the benefits of this upstream focus, the Council can champion these recommendations to various stakeholders and help to advocate for change across jurisdictions. While change can be in many forms, the focus will be on modifying behavior, inter-firm relations and the design of products. Based on a scan of current best practices, Canada can advance the concept of the circular economy through the following directives:

### INFORMATION AND AWARENESS

#### **Communicate the significance of the waste hierarchy**

Developing a communication campaign that highlights the value in moving upwards on the waste hierarchy will help to differentiate between waste management and waste prevention goals. In recent decades, the focus has been on encouraging recycling and this movement has gained momentum in both scale and scope. However, as recycling has been promoted and encouraged, efforts to promote the reuse, repair and reduction of waste have lagged behind. As the more desirable options, awareness of these valuable alternatives is essential. A communication strategy to emphasize the effectiveness of waste reduction and reuse would help to solidify the priorities of a waste prevention agenda. The messaging could be simple and draw on the popular 3 R's: Reduce, Reuse and Recycle – in that order.

#### **Improve the culture of reuse with increased transparency**

The perception of reused products, components and materials in Canada is that they are of lower quality. In order to change this perception of second-hand materials, action must be taken to build the confidence level in reused items and educate consumers of the value of reuse. As part of Value Village's Rethink Reuse program, a survey of 3097 people aged 18 or above was conducted. Over two thirds of participants were unaware that reuse more effectively prevents waste compared to recycling<sup>11</sup>. In order to change consumer behavior, the public must understand both the financial and environmental benefits they can receive when shopping second-hand. Scotland's Revolve Reuse Standard (included as a Case Study in Appendix A) demonstrates how the culture of reuse can be changed through building consumer confidence and transparency regarding the reuse process. By increasing this transparency surrounding reused items and how

<sup>11</sup> Value Village. (2016). Rethink Reuse Report. Retrieved from: <https://www.valuevillage.com/reusereport>



they are prepared before re-sale, consumers can be confident that they are purchasing safe products of high-quality and excellent value.

### **Inspire behavioral change through awareness and social marketing campaigns**

Consumers can make more ethical choices and support waste prevention objectives if they are provided the necessary information about the products they consume. By providing consumers with a detailed breakdown of a product and its ecological footprint, demand for waste-generating products should decrease and force businesses to adopt less waste intensive production practices.

Europe has had success with awareness techniques such as EcoDesign and Energy labeling practices. By providing detailed information to consumers about products, customers are more aware of the impact of their purchases and can make ethical decisions to support waste prevention objectives<sup>12</sup>. Beyond comparing products based on energy efficiency standards, a similar standard model could be developed which assesses products based on their ease of disassembly, repair or reuse.

In addition to raising awareness, behavioral change can be inspired through community-based social marketing (CBSM) campaigns. Research in social psychology has suggested that this approach is far more effective in influencing behavior than traditional information-based initiatives<sup>13</sup>. While consumers may be aware that purchasing environmentally-friendly products can have a positive impact, this information may not influence purchasing decisions. A CBSM approach would establish the barriers preventing these ethical choices, determine potential motivations and create a community level advertising campaign to influence dominant perceptions and societal norms. Five steps have been identified for the CBSM approach and can be found at the link below. After the success of the community level campaign has been assessed, the message can be magnified to a larger market and spread consistently across multiple jurisdictions.

Community-Based Social Marketing Framework and Tools

<http://www.cbsm.com/pages/guide/fostering-sustainable-behavior/>

---

<sup>12</sup> Bickham, T. (2016). Circular Procurement Driving Value through Values. *Supply and Demand Chain Executive*.

<sup>13</sup> Mohr, D.M. (2011). Sustainable Behavior: An introduction to community based social marketing. Retrieved from: <http://www.cbsm.com/public/world.lasso>



## PARTNERSHIP AND COLLABORATION

### **Support the creation of consistent goals, objectives and performance measures nationally**

At this point, the approach for waste management across Canada has been different for each province. With different use of language, ways to measure progress and goals identified, it is difficult to analyze Canada's progress towards waste prevention as a whole. Moving forward, the paradigm shift towards the circular economy provides an opportunity to create a nation-wide waste prevention strategy which emphasis circular principles. By creating consistent language, goals, objectives and performance measures, it will unify the country in a clear direction towards zero waste and allow for progress to be monitored more effectively. This unifying strategy has been common in Europe, where the circular economy has advanced much further than in Canada.

### **Monitor the success of Canada's National Industrial Symbiosis Program**

Canada will be taking part in a National Industrial Symbiosis Program (NISP) and it is important that the Council monitor the success of this program closely. Industrial symbiosis has the potential to provide waste prevention benefits, however the focus is most often geared towards recycling linkages and closing the loop between firms<sup>14</sup>. The Council should evaluate how well firms are able to limit waste generation through the sharing of resources and expertise. A waste prevention focus in these partnerships can focus on shared transportation and shared facilities to save water, energy and reduce the emission of GHGs. If the NISP produces successful waste prevention results, similar agglomerative partnerships at the local level can be incentivized in the future.

## BUSINESS SUPPORT SCHEMES

### **Encourage the provision of incentives to audit current business models**

Going circular requires an initial investment of money, time and energy. In order to rethink a current business model, a baseline of the current approach is required to determine existing inefficiencies and waste generated throughout the product lifecycle. This initial cost can be a significant barrier to circular innovation. To alleviate this barrier, financial incentives could be provided by government for businesses willing to assess their current material flows. This incentive may encourage businesses to participate in the circular economy who are apprehensive due to the cost of initiating this process. By shouldering some of the initial risks, financial support can assist in the research phase of circular business development and help reveal immediate opportunities to transition towards a more circular process. If businesses are willing to assess

---

<sup>14</sup> National Industrial Symbiosis Program. (2016). Retrieved from: <https://nispcanada.com/>





current practices and remain open to change, it is very likely that waste prevention opportunities and their associated competitive benefits will be exposed.

### **Support circular start-ups with funding**

Government could provide funding and support to selected candidates who have proposed innovative projects which support circular objectives. This funding could be available for new businesses, existing businesses looking to change their practices, non-profit organizations and community groups. Two similar government initiatives have been successful elsewhere:

The Green Deal approach in the Netherlands can be modified to fit the circular economic context in Canada. The Green Deal creates a mutual support service agreement for companies working towards circular strategies and facing barriers<sup>15</sup>. The role of the government is to create space for innovative initiatives through various support mechanisms: changing legislation and regulations, providing access to networks, and providing financial support. The goal is to remove obstacles that are hindering businesses in the implementation of sustainable initiatives.

Through the EU Action Plan for the Circular Economy, the EU intends to support circular start-ups by providing funding for research and innovation to industries and businesses. As part of their 'Industry 2020' campaign, the action plan will earmark €650 million to innovators to reduce financial constraints and encourage the growth of circular economic practices<sup>16</sup>.

## **POLICY DEVELOPMENT**

### **Promote sustainable procurement and green purchasing policies**

Sourcing from suppliers who are dedicated to waste prevention objectives can create numerous benefits and foster strong relationships with like-minded procurement organizations. Government and major institutions have the opportunity to be leaders in green purchasing and this can be achieved through the creation of specific sustainable purchasing policies. By including a sustainable procurement component in the strategic planning goals of an organization, guiding documents can lay out the priorities and necessary resources required for leading this purchasing transition.

Victoria, B.C. created a 2-year sustainable procurement action plan which outlined the program initiatives, implementation tasks and necessary department commitments<sup>17</sup>. An action plan of

---

<sup>15</sup> Government of the Netherlands. (2015). The Green Deal Approach. Retrieved from: <http://www.greendeals.nl/wp-content/uploads/2015/03/Green-Deals-folder-ENG.pdf>

<sup>16</sup> EU Action Plan for the Circular Economy. (2014). Retrieved from [http://ec.europa.eu/environment/circular-economy/index\\_en.htm](http://ec.europa.eu/environment/circular-economy/index_en.htm)

<sup>17</sup> State of Municipal Sustainable Procurement in Canada. (2011). Retrieved from: [http://www.buysmartbc.com/Library/Resources/Municipal\\_Sustainable\\_Purchasing\\_in\\_Canada\\_2011.pdf](http://www.buysmartbc.com/Library/Resources/Municipal_Sustainable_Purchasing_in_Canada_2011.pdf)



this focus can help deter procurement organizations from purchasing goods or services based solely on the cheapest prices. Developing this type of policy will incentivize suppliers to design with end-of-life in mind and ensure their materials are designed to be waste-conscious.

If all tiers of government and large institutions were to adopt similar sustainable procurement policies, green purchasing could be scaled beyond the selection of individual products or services towards the tendering of major infrastructure projects. Applying a green purchasing policy to larger comprehensive projects can drastically reduce the ecological footprint associated with resource-intensive developments.

### **Legitimize the circular transition with Federal legislation and policy creation**

By including the transition to a circular economy in legislation and policy, this paradigm shift will be legitimized as more than just a 'buzzword' but something Canada is passionately striving towards and dedicated to. This is an effective way to communicate goals and harmonize regulatory frameworks across the country.

In 2010, the Scottish Government adopted Scotland's Zero Waste Plan which includes a number of policy measures designed to minimize waste and encourage circularity<sup>18</sup>. This unifying strategy includes policies surrounding landfill bans, energy input restrictions and increasing reuse. Zero Waste Scotland, a society funded by the government, has been created to support the delivery of Scotland's circular economic strategy and gathers evidence to support new circular policy creation. By formalizing objectives within distinct strategies and policy directives, Scotland is demonstrating their dedication to going circular and eliminating waste.

In Japan and China, waste prevention and a circular economic focus have been mandated through legislation and this has contributed to their progress. With China's Circular Economy Promotion Law (2008) and Japan's Basic Law for Establishing the Recycling-Based Society (2008), these countries have demonstrated the legitimacy of waste prevention as a priority for their environmental goals. A similar message can be created in Canada to remove any buzzword perceptions and emphasize that the circular transition is a legitimate nation-wide long-term aspiration.

The circular economy encompasses multiple sectors and it is important for policy to reflect this integration. Not only should waste policies include the circular economic model but other policies surrounding economic development, innovation and investment should be geared toward the circular paradigm as well. This will disperse the concept across sectors, enhance exposure and reach new audiences who can contribute to the integrated adoption of the circular model within society.

---

<sup>18</sup> Scotland Zero Waste Plan. (2010). Retrieved from: <http://www.gov.scot/Topics/Environment/waste-and-pollution/Waste-1/wastestrategy>





## APPENDIX A – CASE STUDIES

### **Repair Matters**

Vancouver, B.C.

Repair Matters is a community driven initiative intended to extend the useful life of goods through repair and collective problem solving. The organization envisions a world where all objects are designed to facilitate repair and endless reuse. Since 2015, they have focused on starting this conversation and provide a space for the community to save money, socialize, build capacity and reduce waste generation.

The organization hosts bi-monthly workshops with a variety of partners across different neighborhoods in Vancouver. Driven by volunteers, the aim is to empower the repair community and ensure that repair is an easy, free and accessible alternative to the throw-away culture of today. With expert volunteers on site, community members bring in damaged goods, borrow tools, troubleshoot repair solutions and learn the importance of repair in accomplishing waste prevention objectives. By re-integrating a repaired item into use, participants learn the value of product life extension and help eliminate the negative externalities associated with recycling and waste generation.

This circular initiative can change the way consumers view products; not as something to be disposed of or replaced, but as something to be fixed and reused continuously. This supports a circular process based on continuous use and maximizing the utility of materials.

For more information regarding this organization including past and future events:

More Information about Repair Matters:

[Repair Matters Homepage](http://repairmatters.ca/)

<http://repairmatters.ca/>

### **Revolve Reuse Quality Standard**

Scotland, U.K.

The Revolve Reuse Quality Standard is an innovative circular strategy intended to encourage the purchase of reusable materials in Scotland. Designed to combat the negative perception associated with reusable goods, this national standard restores confidence in the safety and quality of second-hand items to prevent early disposal. Re-use focused businesses pay to join the initiative and apply for accreditation after training, assessments, mystery shoppers and other legislative requirements have evaluated their current practices. Applicants are tested on customer service, the preparation of their re-used goods and the testing of goods for health and





safety. Once accredited, regular testing ensures that accreditation remains meaningful and organizations are held to a high quality standard for their second-hand items.

Businesses displaying the Revolve Standard demonstrate their commitment to quality service and reusable goods. This creates a competitive advantage over non-accredited organizations of a similar focus. Customers who previously felt apprehensive about the second-hand market can select a Revolve verified company and confidently enjoy a unique selection of quality products at low rates. This is a win for consumers, businesses and the environment. By changing the culture surrounding reuse, the increase in second-hand purchases can increase revenues while simultaneously preventing the creation of waste.

More information about the Revolve Reuse Quality Standard:

[Revolve Reuse Homepage](http://www.revolvereuse.com/)

<http://www.revolvereuse.com/>

[Detailed Case Study from Ellen Macarthur Foundation](https://www.ellenmacarthurfoundation.org/case-studies/scotland-increasing-customer-confidence-in-reused-products)

<https://www.ellenmacarthurfoundation.org/case-studies/scotland-increasing-customer-confidence-in-reused-products>

## **The Soap Exchange**

Victoria, B.C.

The Soap Exchange is a locally owned and operated business which promotes reuse and waste prevention through the sale of re-fillable soaps and cleaning products. With locations in Victoria, Nanaimo and Saskatoon, the Soap Exchange provides a circular solution to plastic packaging waste through the supply of reusable bulk and commercial packaging. To prevent packaging from entering the waste and recycling systems, customers bring in their own containers to be refilled with products such as shampoo, conditioner, dish soap, laundry detergent and stain remover. Refillable containers are also provided in-store for a refundable deposit to incentivize continuous use. Unlike other comparable businesses, the average lifespan of a Soap Exchange refillable container is between 6 and 8 years. To reduce the environmental impact of transportation and increase convenience, customers can bring all of their containers at the same time to be 'topped up' whether they're empty or not. This reduces the amount of special trips necessary to refill individual end-of-life containers. Providing these services has driven brand reputation and customer loyalty since 1993.

This waste prevention focus helps the business reduce waste management costs and improve their bottom line. By focusing on concentrated products, the Soap Exchange allows users to achieve results with less and extends the useful life of each bottle of purchased product. As a result, customers need not purchase products as frequently. This leads to enormous annual savings of an estimated 20-30%. By focusing upstream, the Soap Exchange demonstrates the





value of continuous use and showcases the benefits of both product life extension and circularity.

More about Soap Exchange:

[Soap Exchange Homepage](http://www.victoriasoapexchange.com/about/)

<http://www.victoriasoapexchange.com/about/>

[Interview with Soap Exchange Owner](http://www.goodplanet.com/blogs/news/28120193-reduce-reuse)

<http://www.goodplanet.com/blogs/news/28120193-reduce-reuse>

## **Institute for a Resource Based Economy (IRBE) - Kitchen Library and Sharing Depot**

Toronto, Ontario

In 2012, a non-profit social enterprise known as the Institute for a Resource Based Economy (IRBE) began launching projects to combat the current economic model with resource sharing initiatives. This group has since launched several successful sharing platforms in multiple locations within Toronto including the The Toronto Tool Library. Beyond this popular example, IRBE has contributed to two other circular sharing initiatives which continue to help promote waste prevention objectives in Canada: The Kitchen Library and the Sharing Depot.

IRBE helped to incubate the Kitchen Library during its first year of operation and continues their support by providing promotional resources and offering combined membership discounts for members of the Toronto Tool Library. As the first non-profit lending library of kitchen appliances in Canada, the Kitchen Library allows members to borrow expensive and rarely used kitchen appliances for 3 to 7 days. For \$9/month, this membership eliminates the need for individual ownership and prevents bulky equipment from sitting idly in cupboards for the majority of the year. Approximately 100 appliances are available for borrowing.

Additionally, IRBE has developed a new circular sharing platform known as the Sharing Depot or 'Canada's first library of things'. Members of the sharing depot have access to a wide range of goods which are used minimally throughout the year or for special occasions. Items available for borrowing include camping equipment, board games, sporting equipment, house party supplies and toys.

These sharing platforms provide financial and space-saving alternatives to the individual ownership of goods and appliances. By providing access to these materials, items will spend less time on shelves and more time as useful and valuable assets. This form of circular innovation and resource efficiency can be a catalyst for changing the current culture of consumption and slowing the pace of waste generating production process.

More information about IRBE:

[Kitchen Library Homepage](http://thekitchenlibrary.ca/)

<http://thekitchenlibrary.ca/>





**Sharing Depot Homepage**  
<https://sharingdepot.ca/>

## **MachineryLink Solutions**

Kansas City, Missouri

Launched in 2015, MachineryLink Solutions is the agricultural industry's first internet-based equipment sharing program. The program is a peer-to-peer model allowing farmers, agricultural retailers and rural residents to borrow or rent expensive agricultural machinery from one another. For renters, this is a cost-effective alternative to individual ownership. For owners of these assets, the renting of equipment provides an additional income for machinery that would typically sit idle for the majority of the year. With more than 1,200 users and tens of millions of dollars worth of equipment, nationwide sharing has allowed farmers to loan equipment across states at different stages in the growing season. This allows owners to extract the most value out of each piece of machinery and ensures equipment is being used at its full capacity.

To join the site, list equipment and browse the listings, there is no charge for users. When a transaction is complete, MachineryLink Solutions takes a cut of this agreement to provide umbrella insurance and eliminate any distrust or skepticism between owner and renter.

The movement away from individual ownership promotes a shift in the current culture of consumption and can reduce the production of this resource-intensive machinery. The sharing of assets should erode the demand for new equipment, keep existing machinery in continuous use and support the agricultural community in utilizing their resources more efficiently. This will reduce waste generation in the industry. While the platform is currently only available in the U.S., the President of the company has cited future interest in other markets including Canada.

More information about MachineryLink Solutions:

**MachineryLink Homepage**  
<https://www.machinerylink.com/>

**Interview with President Jeff Dema**  
<https://www.realagriculture.com/2016/05/farm-equipment-enters-the-online-sharing-economy/>

## **Rype Office**

London, England

Rype Office provides environmental and cost friendly office furnishing to companies through a circular model of remanufacturing. The remanufactured furniture is sold at 50% of the cost of traditional furniture and one third of the environmental footprint. Customers have the option to purchase or lease new furniture designed for remanufacturing, purchase refurbished furniture







with cost savings or have their existing furniture renovated with durability in mind. The company procures furniture, components and materials designed for reuse and through either a lease or buy-back program guarantees to recover items to be remanufactured and continually used again and again.

Avoiding disposal after single-use, Rype Office's remanufacturing achieves multiple lives from each piece and maximizes the value of input materials. While the perception of second-hand items can hinder the appeal, by definition, remanufactured goods must be returned to as-new or better than new quality. In other words, this circular model does not sacrifice quality for price. The remanufacturing process reduces the need for the input and transportation of virgin raw materials associated with new furniture products. This results in incredible cost savings for Rype Office which are then passed onto the consumer through lower prices. As a result, this closed looped system prevents waste through continual use while simultaneously creating a competitive business advantage and loyal customers.

More information about Rype Office:

[Rype Office Homepage](http://www.rypeoffice.com/)

<http://www.rypeoffice.com/>

[Detailed Case Study from Ellen Macarthur Foundation](https://www.ellenmacarthurfoundation.org/case-studies/circular-economy-options-in-office-furnishing)

<https://www.ellenmacarthurfoundation.org/case-studies/circular-economy-options-in-office-furnishing>

## **Ecovative Design**

Green Island, New York

Founded in 2007, Ecovative utilizes bio-adaptation to replace plastics, foams and other packing materials with their trademark Mushroom Material. Mushroom Material is a compound of recovered agricultural waste and a fungus cell from the roots of a mushroom known as Mycelium or 'nature's glue'. When the two are mixed, strong fibres are created which in 5 to 7 days can be assembled into almost any shape and ready for use. This packaging production process is completed without the use of chemicals or fossil fuel inputs. Once the Mushroom Material packaging has served its purpose, it can be composted to add nutrients to soil.

The aim of Ecovative Design is to displace environmentally harmful materials from the packaging world. With a Mushroom Material engineered wood and packaging foam alternative currently available, the organization is in the process of developing a sustainably produced insulation product. By designing their products with end-of-life in mind, Ecovative has successfully designed-out waste from their production process. As a certified Cradle to Cradle innovation, this circular biomaterial innovation also recovers the waste of agricultural producers and uses it as an input for new and useful sustainable materials.





More information about Ecovative:

[Ecovative Homepage](http://www.ecovatedesign.com/home)

<http://www.ecovatedesign.com/home>

[Detailed Case Study from Ellen Macarthur Foundation](https://www.ellenmacarthurfoundation.org/ce100/directory/ecovative-design)

<https://www.ellenmacarthurfoundation.org/ce100/directory/ecovative-design>

## **REEP Technologies**

Israel

REEP Technologies has developed a breakthrough circular innovation which re-imagines the way in which people and offices use paper. Designed with re-use and waste prevention in mind, two products have been invented to extend the useful life of each piece of paper and reach a high level of resource efficiency. First, REEP has designed an erasable paper which is compatible with any laser printer or copier. Second, a laser based REEP machine similar in size to that of any multi-purpose office printer is able to remove the ink on this paper, digitize the information, securely archive it in the cloud and produce fresh REEP paper ready to be reused. The REEP device can remove toner and hand written marks from all existing laser copiers and printers. Printed or written paper documents can be erased and reused approximately twelve times before entering the conventional recycling system.

Without impacting the way offices currently operate, this technological innovation increases document security, eliminates the need for filing, scanning or shredding services and reduces the negative externalities associated with the traditional recycling process. By reusing each piece of paper a dozen times, the need for shipping, storing and recycling is greatly reduced. This has both cost-saving and environmental benefits. Reducing the frequency of these processes can reduce office costs by up to 50% and reduce the environmental footprint of the office paper lifecycle by up to 90%.

More information about REEP Technologies:

[Reep Technologies Homepage](http://reepcorp.com/)

<http://reepcorp.com/>

[Detailed Case Study from Ellen Macarthur Foundation](https://www.ellenmacarthurfoundation.org/case-studies/reep)

<https://www.ellenmacarthurfoundation.org/case-studies/reep>

## **Bundles**

Amsterdam, Netherlands

Bundles is rethinking the way we do laundry through a pay-per-use model and promoting access over the individual ownership of washing machines. Based on a product-as-a-service model, Bundles leases washing machines to customers for a monthly fee based on their machine





requirements and expected use frequency. The monthly bundle includes the distribution, installation and ongoing repair or maintenance of the machine. By maintaining ownership of the assets, Bundles is able to recover machines which customers no longer need or repair those which have been damaged to extend their useful lives. By sourcing durable input materials and ensuring the machines are designed with disassembly in mind, Bundles appliances have twice the life of a traditional washing machine.

As an energy-smart enterprise, devices are attached to each machine allowing Bundles to monitor the energy consumption associated with each customer wash. An app is provided allowing customers to track the overall cost of their laundry including energy, water and detergent consumption. Access to this information raises awareness for the environmental costs associated with each load, encouraging behavioral change and waste reduction. By paying per use rather than the product itself, customers have access to a high quality product and are encouraged to be both cost and energy efficient concurrently.

Bundles hopes to expand the range of appliances that it offers and explore other markets around the world.

More information about Bundles:

[Bundles Homepage](https://www.bundles.nl/)

<https://www.bundles.nl/>

[Detailed Case Study from Ellen Macarthur Foundation](https://www.ellenmacarthurfoundation.org/case-studies/internet-enabled-pay-per-wash-a-model-offering-multiple-benefits)

<https://www.ellenmacarthurfoundation.org/case-studies/internet-enabled-pay-per-wash-a-model-offering-multiple-benefits>

## **Value Village**

Canada, U.S. and Australia

Value Village is a for-profit global thrift retailer offering up to 50% cost savings for secondhand clothing and gently used household items. With over 330 locations, the company is driven to improve lives and the health of the planet through the promotion of reuse. As one of the world's largest polluters, clothing and textiles has been a main area of focus for the organization which aims to reduce the water and energy intensive production of these products. By encouraging the donation and purchase of reusable items, the organization extends the lives of products and prevents more than 650 million pounds of materials from entering the waste stream annually. For items which are not sold in store, the organization partners with local recycling firms or donates materials to developing countries in need.

Value Village has created a circular campaign entitled 'Rethink Reuse' that hopes to eliminate the unwanted or unneeded clothing which continually reaches the waste stream. Through





communication strategies, the organization intends to raise awareness surrounding the benefits of both donating and purchasing reusable goods. While great gains have been made in recycling in recent decades, 'Rethink Reuse' is motivated to emphasize reuse in a similar manner and highlight that reuse is a waste-friendly alternative to the traditional resource intensive recycling process.

More information about Value Village:

[Value Village Homepage](https://www.valuevillage.com)

<https://www.valuevillage.com/about-us>

[Rethink Reuse Campaign](https://www.valuevillage.com/rethinkreuse)

<https://www.valuevillage.com/rethinkreuse>

