CIRCULAR ECONOMY SOLUTIONS SERIES

WCEF2021 Side Event:

SOLUTIONS PATHWAYS WORKSHOP FOR CIRCULAR PLASTICS IN CANADA

EVENT SUMMARY

APRIL 7, 2021 |

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1. Background

On February 3, 2021, the Circular Economy Leadership Coalition and GLOBE Series convened a group of stakeholders for a solutions-oriented, interactive, virtual workshop focused on pathways to achieve a more circular plastics economy in Canada. The workshop, part of the Circular Economy Solution Series 'Circular Plastics' track featured expert insights into practical applications of upstream innovation for plastics packaging, and interactive breakout sessions that allowed participants to strategize together on how to scale ideas and overcome barriers to plastics packaging innovation in Canada.

An official side event of the World Circular Economy Forum (WCEF) 2021, the virtual workshop built on the first WCEF Plastics Side Event ("A Brave Conversation") hosted by the Circular Economy Solution Series on November 18, 2020, and was designed to link with existing circular plastics efforts in Canada, including:

- Environment and Climate Change Canada (ECCC) and its single use item stakeholder engagement initiatives;
- The Canadian Council of Ministers of Environment's Canada-wide Strategy on Zero Plastic Waste;
- The Canada Plastics Pact Innovation Pathways (i.e., Product Design, Material Circularity, and Policy and Standards);
- The Chemical Industry Association of Canada's Operation Clean Sweep;
- CSA Group's research on defining plastics recycling; and
- Current efforts in Alberta (e.g., Plastics Alliance of Alberta) and Quebec (e.g., Circular Plastics Taskforce).

At the November 18 webinar, the Circular Economy Solutions Series brought in an expert speaker from SystemIQ to discuss their Breaking the Plastics Wave report, which highlighted a number of important solution pathways for action and innovation as part of a system change 'wedge' diagram (see Figure 1). This workshop built on that initial high-level conversation and went deeper on the solution pathway 'wedges'.

More than 150 stakeholders participated in the workshop, including from a wide range of companies, organizations, and sectors, as well as industry stakeholders from the technology, infrastructure, policy, investment, and the innovation ecosystem across the plastics packaging and alternative materials value chain in Canada, as well as a small number from Europe and the United States. See Appendix A for the Workshop Agenda.

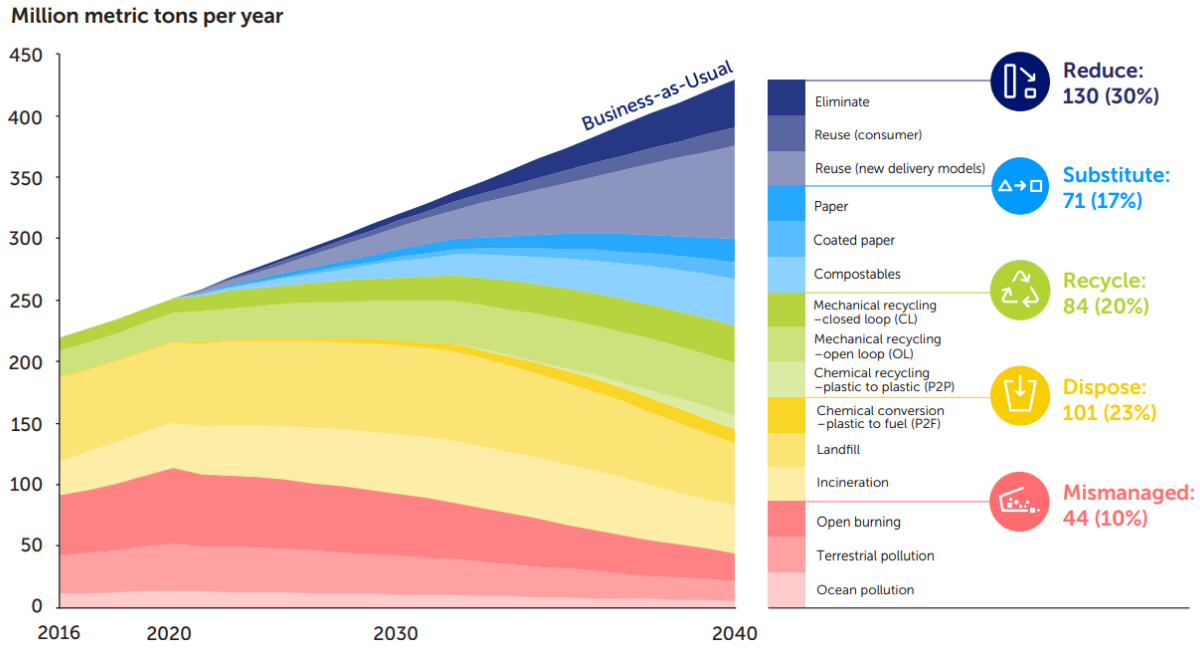


Figure 1: Plastic solution pathways for action and innovation system change 'wedge' diagram.

Source: Pew Charitable Trusts & SystemIQ (2020), "Breaking the Plastic Wave: A comprehensive assessment of pathways towards stopping ocean plastics pollution".

2. Key Take-aways: Plenary Presentation

Plastics pollution entering the environment has become a major challenge of our day and is a by-product of our current 'linear' plastic system. It is fair to say that embracing a circular plastics model presents economic opportunities by capturing the billions of dollars globally worth in wasted plastic resources from entering the environment and by bringing forward new business models.

Canada is in a unique position as it relates to advancing the circular plastics agenda: we have many resin producers that bring knowledge and established infrastructure, we have emerging policy and regulatory frameworks including a growing interest in extended producer responsibility, and we have many technology innovators and emerging platforms, such as digital, that can enable new solutions such as reuse and supply chain tracking and transparency.

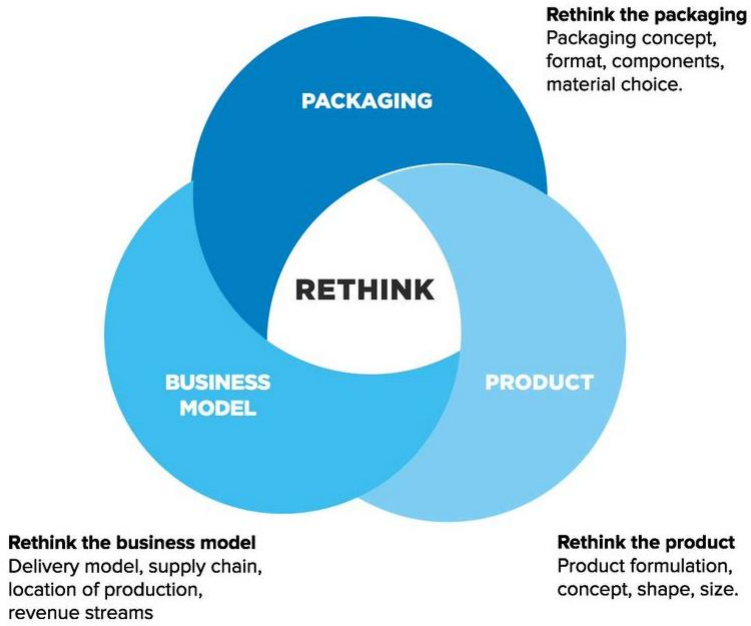
We need to build on our assets and underlying sector strengths, bridge the extensive supply chain and address market gaps, and find innovative solutions that work for Canada.

Keynote Presentation: Ellen MacArthur Foundation

Participants heard from keynote speaker Josephine Christoffersen, who is with the New Plastics Economy Innovation Team at the Ellen MacArthur Foundation (EMF) – based in the United Kingdom. Josephine was one of the lead researchers for EMF's **Upstream Innovation Guide for Packaging Solutions**. As part of the Innovation Team, Josephine works primarily with catalyzing reuse packaging solutions and the broader upstream innovation mindset.

Insights:

- Upstream innovation requires a shift in mindset to include rethinking:
    - Products
    - Business models
    - Packaging



- Three strategies are essential to upstream innovation:
    - **ELIMINATION** – Packaging is eliminated while user experience is maintained or enhanced – through either *direct elimination* for packaging that does not serve an essential function or *innovative elimination* for packaging that does serve an essential function.
        - **Opportunities**:
            - Removing unnecessary plastic films, tear-offs, or multi-buy packaging
            - Solid products
            - Edible or dissolvable packaging
            - Creating common and aligned understanding of 'unnecessary packaging'
    - **REUSE** – Packaging is reused, rather than discarded after one use, creating value for both users and businesses. Business models include: Refill at home; Return from home; Return on the go; Refill on the go; and Business to business.

        - **Opportunities**:
            - Solid or concentrated products
            - Subscription services
            - IoT integration in dispensers
            - Deposits and rewards systems
            - Shared infrastructure
            - Smart systems for tagging and tracking
            - Standardization
    - **MATERIAL CIRCULATION** – Packaging is designed so that the materials it is made from can be recycled or composted and includes considerations for plastics recycling, plastics composting, and plastic packaging substitution to a non-plastic material.
        - **Opportunities**:
            - Creating dedicated systems to capture compostable materials
            - Streamline and simplify packaging design
            - Changes to product and/or business model to allow recyclable packaging to be used.

3. Key Take-aways: Breakout Discussions

Following the keynote presentation from the Ellen MacArthur Foundation, participants joined breakout room discussions based on their areas of highest interest. The breakout rooms were designed to align with the upstream innovation pathways from the SystemIQ report and EMF's Upstream Innovation Guide. Industry leaders in each breakout room provided short presentations to set up the discussions in each room, sharing some best practices and lessons learned from their own experiences and organizations. The breakout presenters were:

- **ELIMINATION (ROOM #1):** Katrina Shum, Sustainability Manager, North America, Lush Cosmetics
- **REUSE (ROOM #2):** Jennifer DeBuisson, Senior Director Government & Public Affairs, The LEGO Group
- **REUSE BUSINESS MODELS (ROOM #3):** Amy Sandhu, Head of Sustainability & Government Relations, BASF Canada
- **SUBSTITUTION & COMPOSTABLES (ROOM #4):** Paul van der Werf, Senior Consultant, AET Group
- **MECHANICAL RECYCLING (ROOM #5):** Jean-Luc Lavergne, CEO, Lavergne Group
- **CHEMICAL RECYCLING (ROOM #6):** Jocelyn Doucet, CEO, Pyrowave

Participants were then invited to share their knowledge and apply learnings to tackle challenges in line with the best suited Canadian innovation pathways, solutions, and investment opportunities using a combination of open discussion, chat box, and Miro whiteboard.

Below is a summary of key points from each breakout room discussion focused on each of the plastic solution pathways for action and innovation.

ELIMINATION (ROOM #1)

Three important solution pathways surfaced as part of the discussions within the "Elimination" breakout; in particular the importance of: (1) Collaboration (2) Standardization of outputs and (3) Consumer behaviour shifts. Each one is described in more detail below.

Solution #1 – Collaboration

- Collaboration with stakeholders across the supply chain is important for enhancing the opportunities for elimination. For example, collaboration can help support the development of shared systems such as the Swedish grocery delivery pallets and crates that allow for the elimination of individual packaging.
- In addition, shared information on suppliers that have expertise, products and capacity that can support elimination can also help. This could include partnering with manufacturers who can make a company's branded products.
- Collaboration can support the co-creation of innovation labs, joint challenges / solutions (by sector / industry) or other platforms (such as investment funds) that can support approaches to elimination.
- An important consideration includes laws around competition that might need to be addressed to enable collaboration; consider OpenIP licensing as a potential enabler.

Solution #2 – Standardization

- Standardization should be flexible, allowing for ongoing iteration and continuous learning through consumer feedback and industry experience.
- Opportunities include the potential to link the benefits from eliminating packaging to environmental benefits, such as greenhouse gas emission reductions.
- Apps/software can be developed to standardize the display of product information and eliminate the need for labelling on packaging.

Solution #3 – Consumer Behaviour Shifts

- Behaviour change can support elimination by making it simple for consumers. As one example, degradable / dissolvable product coatings or wrappings can eliminate the need for food packaging.
- More research is needed to better understand consumer values / perceptions on what type of products are a best fit with elimination, the need for product labelling, etc.
- It is important to examine barriers to elimination more closely and work to remove them (as well as test their validity).
- Slow or backwards innovation can help – i.e., learning from traditional methods of consumption, taking away products that people don't need.
- There is an opportunity to rebrand and a role for marketing departments to shift consumer perceptions – i.e., "naked products are attractive". There is a need to steer away from appearance and focus on functionality of product.
- Brand owners and manufacturers could invite zero-waste "keener" consumers to participate in pilot schemes.
- Also need considerations around equality and how product pricing might be impacted through the elimination of packaging so it is accessible to all consumers.

Other Considerations:

- Opportunities may exist to prioritize local producers, shortening the supply chain and eliminating the need for packaging of food products in particular.
- Related to storage of products that may spoil over time, infrastructure on the retail side must be able to adapt to different products and those that are 'package free'. Storage and processing facilities (for food) can consider approaches that reduce the need for packaging (e.g., smoke houses, drying, community freezers).

REUSE (ROOM #2)

Three important solution pathways surfaced as part of the discussions within the "Reuse" breakout; in particular the importance of: (1) Consumer behaviour shifts and awareness building (2) Processing and (3) Improved tracking and traceability. Each one is described in more detail below.

Solution #1 – Consumer Behaviour Shifts & Awareness Building

- There is a need to normalize reuse as an acceptable behaviour and model.
- There is a need to better education the consumer with respect to the options available. Product labelling is an important consideration in terms of providing consumers with appropriate labels that will facilitate reuse models.
- Investment by governments and others into educational programs at all levels is needed. This can leverage the work of advocacy groups/NGOs.
- Businesses should integrate reuse (and other circularity components if relevant) into traditional marketing campaigns to drive and normalize the association of reuse models with shoppers and consumers.
- Stakeholders can collaborate on the messaging and key actions to inform the public and encourage the change they want to see.
- Digital media campaigns centered around the goal of education and shifting consumer behaviours toward sustainability should be enhanced.
- Governments can lead by example, promoting circular/reuse solutions in procurement and other initiatives. Packaging reuse and product stewardship considerations can also be included in RFP and procurement processes.
- Regulations must also consider health and other requirements as it relates to reuse models – and communicate how any real and/or perceived risks are being addressed.
- Equity and accessibility factors should also be considered when designing reuse platforms.

Solution #2 – Processing (Integrated Facilities with On-site / Local Capacity)

- Reuse requires specialized, integrated facilities (that allow for on-site and local reprocessing) and innovation in this space to allow for the maximum amount of product of all types to be processed at a single facility.
- There is a need to set up infrastructure that enables returns alongside purchasing of products and reusable packaging.
- Space-planning upfront is required given reusables take up more space than disposable packaging.
- Reuse models must consider how economies of scale can impact on costs in terms of processing facilities, as well as networks of drop off locations.
- Investments into processing facilities and related infrastructure by brand owners, consumers, and governments will be necessary, as well investments into workforce education and training.
- Programs are needed that encourage facilities to take on re-use models, including cleaning and sterilization.
- Reusable and washable containers, as well as pallets, should be standardized along the supply chain to help with designing facilities for processing and so that disposables can be eliminated.
- This includes standardized take-back and sanitization infrastructure for different sectors and product types.
- There is also a need to redesign and standardize shipping systems to incorporate reverse logistics, making use of empty containers and unused space (see: https://circularsupplychains.com/cargo-carousel-system/)
- Regulations regarding health requirements for reuse must be established, as well as common standards developed in line with accepting items for reuse and refill.
- It will be important to encourage pre-competitive collaboration and sector-based discussions in this regard.

Solution #3 – Improved Tracking & Traceability

- There is a need for better tracking of reusable packaging, including the support for the application of new technologies and data management solutions (such as RFID, web-based trading freeshares linked to the UPC codes, and internet of things applications).
- Advanced sorting and recycling could be enhanced with the application of AI technologies inline with tracking items.
- Partnerships between brand owners may be needed to share in the upfront cost.
- Privacy considerations will also be critical to how these systems are designed and implemented.

REUSE BUSINESS MODELS (ROOM #3)

Three important solution pathways surfaced as part of the discussions within the "Reuse Business Models" breakout; in particular the importance of: (1) Incentivizing behaviour change (2) Designing for reuse from the beginning and (3) Encouraging industrial symbiosis models. Each one is described in more detail below.

Solution #1 – Incentivize Behaviour Change

- There is a need to incentivize behaviour change in order to enable reuse business models engaging with all stakeholders and throughout the entire system / value chain.
- Incentives could include those financial as well as non-financial, as well as innovative approaches such as 'gamification'.
- Consumer engagement, education, and awareness campaigns will be important, with a need to change perceptions and make reuse models appealing to the public.
- There is also a need to demonstrate the financial benefits to companies / organizations in order to encourage their adoption / implementation.
- Opportunities exist to learn from and copy global examples of best practice to accelerate reuse models.

Solution #2 – Design for Reuse from the Start

- There is a need to consider reuse models and product design right from the beginning, allowing for easy separation of components and materials.
- Consider opportunities to reuse components that still offer value (while others may have reached the end of their life cycle).
- This will also require investments in research to explore for material compatibility.
- More supports should be focused on entrepreneurs and SMEs as they are often important drivers of innovation.

Solution #3 – Industrial Symbiosis Models

- Exploring industrial symbiosis and a related database of companies and their needs could help connect industries together and support reuse business models.
- Regulations / zoning that allow industrial parks that embrace the concept of industrial symbiosis can help in co-locating aligned businesses and support collaboration across the value chain.
- Collaboration among competitors will lead to faster adoption and scale-up. Companies can share logistics networks, as well as collaborate on the investments in critical reuse infrastructure / reverse logistics.
- Distributed Ledger Technology (DLT), for example, is now evolving to a stage where track and trace circularity is feasible and achievable. A distributed ledger is a consensus of replicated, shared, and synchronized digital data geographically spread across multiple sites, countries, or institutions – unlike with a distributed database, there is no central administrator.

SUBSTITUTION & COMPOSTABLES (ROOM #4)

Three important solution pathways surfaced as part of the discussions within the "Substitution and Compostables" breakout; in particular the importance of: (1) Enhanced research into substitute packaging and materials (2) Supply chain innovation and investments in processing infrastructure and (3) Improved labelling for compostable packaging. Each one is described in more detail below.

Solution #1 – Enhanced Research into Substitute Packaging & Materials

- There is limited availability of suitable alternatives for various single-use items and packaging applications (e.g., alternatives that serve the same function as plastic options such as plastic liners in drink cups, plastic straws, etc.)
- There is a need for more funding and to invest in research and the development of compostable materials and alternatives, including in areas of:
    - Barrier films for paper / fibre-based packaging;
    - Bioplastics (e.g., Innovative Solutions Canada challenges);
    - Catalyst research (i.e., that can help to speed up the breakdown of compostable plastics); and
    - Biomimicry-inspired applications that allow for learning from nature.
- Incentives can also be directed toward the use of biomass/ biomaterials that are carbon neutral.

Solution #2 – Supply Chain Innovation & Investments in Processing Infrastructure

- Onsite collection remains a critical supply chain issue for compostables.
- There is also a need for dedicated infrastructure to manage compostable items outside of the green bin organic collection programs (i.e., purpose built infrastructure is needed given the various retention times for processing compostables versus standard greenbin materials).
- Need compostable standards that are designed around packaging that can break down within existing infrastructure.
- Access to information is a key issue in terms of having the infrastructure that aligns with the need / volumes of compostable products requiring processing.
- Many smaller composting facilities lack the pre-processing equipment to handle larger quantities of compostable packaging.
- Producers need to be able to record and report on compostable packaging that are captured at composting facilities.
- Opportunities exist to work more closely with biomass feedstock suppliers to reintegrate biomaterials. Biomass Quality Network Canada is developing standards for agriculture and forestry feedstocks for biofuels, chemicals, and materials (e.g., including crops such as hemp and forestry).
- Collaborating with suppliers is essential for developing the materials used for packaging and/or the options for eliminating packaging materials.
- There is also a need to gain better access to feedstocks that can support the development of related primary chemicals.
- Opportunities exist to explore the potential to convert existing newsprint / paper mills to suitable alternative packaging products.

Solution #3 – Improved Labelling for Compostable Packaging

- Improved awareness is needed that considers the waste efficiency hierarchy (e.g., create organic compost before AD) and provides clarity on optimal applications.
- Clear and consistent labelling for packaging can help to support this effort.

MECHANICAL RECYCLING (ROOM #5)

Three important solution pathways surfaced as part of the discussions within the "Mechanical Recycling" breakout; in particular the importance of: (1) Enhanced collection and sorting infrastructure (2) Investing in smart and digital technology applications and (3) Addressing the price differential between virgin and recycled plastics. Each one is described in more detail below.

Solution #1 – Enhanced Collection & Sorting Infrastructure

- Improved collection and sorting infrastructure are critical, including a need to ensure effective source separation occurs (either by the consumer or household and/or at Material Recovery Facilities) and that it is economically viable.
- It is important to consider both macro process factors (i.e., logistics and supply chain), as well as micro process factors (i.e., at the facility level).
- There is a need to improve sorting processes to increase the value of recycled plastics #3-#7.
- Laminated pouch packaging (i.e., flexible packaging) often contain multiple layers of different plastics which makes them more difficult to recycle. Films are too light and therefore need a lot of material to make economical, so many facilities do not want to collect them.
- Standardization can help in terms of the types (and colours) of plastic packaging that exists, as well as eliminating the most difficult to recycle plastics.
- This will require an investment by government at all levels (municipal, provincial, federal), as well as investments from consumer package goods companies in terms of extended producer responsibility (EPR), although the economics behind return system and supporting logistics need improvement.
- EPR is incentivizing brand-owners and manufacturers to incorporate environmental considerations into the design of products and packaging.
- OEMs should also be incentivized when they use recycled content in products.
- Prioritization should also exist (for example, ensuring that food grade recycled content is only used for food-related applications).
- Finally, there is also a need for more public education programming to obtain buy-in on investments.

Solution #2 – Invest in Smart & Digital Technology Applications

- There is an opportunity to invest in advanced recycling and sorting technologies in Canada to enhance mechanical recycling facilities, including in areas such as robotics, optical sorting, AI, and tracking / transparency across the supply chain.
- It is important to ensure access of MRFs to latest / most efficient sorting technologies.
- Robotics for picking specialty crops are being developed rapidly given the value of some crops which allows an economic return; a similar model is needed for recycled plastics to drive investments in technologies of this nature (e.g., robotics and AI implementation).
- Pre-competitive collaboration in this space to support idea sharing and tech investment is key.
- Consider the use of / adaptation of leading-edge technologies already applied by other industries / sectors (e.g., agriculture, food processing, and manufacturing sectors).

Solution #3 – Address Price Differential Between Virgin & Recycled Plastics

- There is a need to use tools to make the price of post-consumer recycled (PCR) plastic competitive with virgin plastic in order to increase 'buy in'. There are multiple ways to do this, including the potential to:
    - Make the supply chain shorter;
    - Improve bale quality through standardization;
    - Add taxes on landfilling and/or on virgin plastics or non-renewable feedstocks; and
    - Require a minimum percentage of PCR content in products and/or develop financial incentives that encourage the use of recycled content (as long as the target is achievable in a cost effective manner and adequate supply exists).

- Price is closely associated with 'quality' or useability (though not exclusively), and working on quality as an outcome of processing will drive price down over the mid- to long-term.
- It is important to provide ways to internalize the environmental impacts of virgin material to equilibrate the cost equation that currently makes recycled resins more expensive. Example is to have mandatory recycled content targets or setting taxes on virgin feedstocks, similar to the European Union.

CHEMICAL RECYCLING (ROOM #6)

Three important solution pathways surfaced as part of the discussions within the "Chemical Recycling" breakout; in particular the importance of: (1) Effective collection and sorting processes (2) Technologies that can enhance recyclability and (3) Greater consistency and standardization. Each one is described in more detail below.

Solution #1 – Effective Collection & Sorting Processes

- Having the proper, cost effective infrastructure to collect plastic packaging materials and sort them so that these can be fed into chemical recycling processes is essential to success.
- How can the efficiency of sorting infrastructures be improved to minimize losses in preparing feedstocks for chemical recycling processes?
- Building capacity for extracting materials to meet the growing demand for chemical recycling options will be important.
- Investments are needed to implement equipment in existing sorting facilities to ensure the proper materials can be extracted for chemical recycling processes.
- Investments in the form of public-private partnerships will be essential.
- Create incentives for companies to add recycled materials into their products. Minimum recycled content is essential to kick-starting the circular plastics economy.
- Education and broader engagement across all stakeholders are also key.

Solution #2 – Technologies that can Enhance Chemical Recyclability

- Producers and processors must work on technologies which can enhance the reusability of recycled plastics back to their monomer forms.
- Challenges exist in terms of purifying monomers, especially when chemical additives are common in feed source.
- Developing new material processing techniques for separating polymers will be important and require more investment in R&D.
- Minimizing the amount of different plastics included in packaging will help make it easier for recycling.

Solution #3 – Greater Consistency & Standardization

- There is a need for greater consistency of specifications when it comes to chemical recycling.
- Waste definitions must be changed / modernized and harmonized with circular economy to make it easier to take waste as feedstocks in chemical recycling processes.
- It is important to understand the roles of chemical recycling versus mechanical recycling, including their ability to scale and replicate.
- For chemical recycling, low carbon or sustainable technologies are needed; its not the energy consumption that is the issue as much as the type of energy that can be used for chemical recycling processes.
- There is a need to develop more standardized technology processes and procedures to compare environmental impacts of chemical recycling technologies based on standardized scenarios.
- Consistency and harmonization of coding and recycling approaches across provinces and cities will help scalability of solutions across Canada.

SYSTEM-WIDE CONSIDERATIONS

In the final round of breakout group conversations, participants discussed the system-wide barriers and related enablers for addressing plastic packaging issues and opportunities across all solution innovation pathways, as summarized below. These areas can be considered opportunities for further engagement and the next round of deeper dive discussions over the coming months that must be addressed to realize the solution pathways that will support the circular plastics economy transition.

Barriers

Key barriers highlighted in the breakout discussions relevant to all innovation pathways included:

- Cost challenges
- Limited demand and markets for recycled products
- Industry resistance
- Infrastructure gaps
- Lack of funding and access to capital for commercializing and scaling solutions
- Lack of information, knowledge, and awareness
- Disconnects across the stakeholder value chain
- Lack of supportive policy and/or regulation

Enablers

The enablers highlighted below will be important areas of focus for addressing the key barriers that will allow for a system-wide approach to addressing Canada's plastic packaging issues.

- **Greater Collaboration Across Stakeholders**
    - Collaboration across industry and government will be important for addressing the upstream innovation opportunities and designing new systems.
    - Facilitated networking can encourage more industrial symbiosis.
    - There is a role for creating coordinating bodies at larger scale to enable the bigger picture and support collective action (e.g., Alliance to End Plastic Waste, Canada Plastics Pact).
    - Consider establishing cross-sector, intra-sector "roundtables" for collaboration in any given ecosystem.
    - There are also systems needed that address key barriers and challenges people face when trying to participate.
- **Design-thinking & System-wide Transition Planning**
    - Functionality (not cost) should serve as the key driver for choosing plastic over other materials in order to minimize the use of plastics in applications that cannot be recycled.
    - Producers should consider a framework that factors in end-of-life design criteria by product type (i.e., products must be designed with a specific end-of-life in mind).
    - Transition plans should be developed that focus on phasing out a reliance on recycling and in favour of greater elimination and reduction of plastic packaging over the longer-term.
    - Opportunities exist to leverage Canada's research institutions and capacity in a larger way to focus on circular plastics challenges and business model innovation.

- **Supportive Policy & Regulation**
  - Industry taking pro-active steps now can help to avoid additional regulatory requirements in the future.
  - Standardizing and harmonizing policies (e.g., EPR) and recycling programs across jurisdictions will help, including collection programs across provinces and outside of urban centres.
- **Increased Standardization**
  - There is a need to develop more national standards around plastic packaging and recycling, as well as in upstream innovation areas such as elimination, reuse, and substitution.
  - Properly defined terminology for recycling and related systems will help (building off existing work by organizations such as CSA Group).
  - Key outcomes from standardization could look to reduce the variety of packaging types that are hard to recycle and simplify efforts for industry and consumers.
  - Harmonized labelling for end-of-life processing could also help, including 'zero waste' or circular product and business / facility certifications.
  - True/full cost accounting for materials can help to equalize pricing and markets.
  - Recycled content targets and standards is an important driver for change.
- **Incentives**
  - Incentives should be designed to make it more financially attractive to support circular economy solutions over non-circular options.
  - Opportunities exist to provide funding for small businesses to retrofit their operations so they can continue to serve their customers with less packaging.
  - Incentives for small businesses and producers can be designed to support the reduction of packaging, as well as to set up reuse models to handle reusable packaging and related infrastructure.
  - Incentives can also be developed for consumers that enables them to choose easier to recycle plastics (e.g., return deposits for certain types of plastics).
  - Incentives are also needed to create downstream demand in emerging technologies, as well as in start-up technologies.
  - Opportunities exist to better coordinate available funds for circular plastics related initiatives, including through grants and tax incentives.
- **Investments in Infrastructure**
  - Infrastructure investments should be shared by producers and governments (including considerations for public-private partnerships).
  - Industry can partner with local governments to test new packaging products at processing facilities (e.g., the use of compostable alternatives).
  - Accelerated depreciations will help amortize new infrastructure assets for circular economy.
  - Traceability and access to better information / data across value chains is needed to enable investments in solutions.
- **More Education and Awareness**
  - To get increased collection rates, there is a need for more investment in public education, including around properly sorting product packaging to allow for better collection and more cost-effective recycling.
  - Marketing campaigns can help shift perceptions around upstream options, including elimination, reuse, and compostables / substitutes. This could include sharing more success stories and leveraging key influencers to normalize reuse / reduction.
  - Opportunities exist to work with education systems to build awareness from an earlier young age.

Appendix A | Workshop Agenda

Below is the final agenda for the workshop program, including speakers / presenters.

Program Overview	Timing:
Plenary 1: Opening & Context Setting *Format: Plenary* 1. Introductions & Session Objectives o **Moderator:** Paul Shorthouse, GLOBE Series / Circular Economy Leadership Coalition 2. Context-setting Keynote Presentation An overview of upstream innovation processes and requirements based on EMF's Upstream Innovation publication. o **Keynote Presenter:** Josephine Christoffersen, New Plastics Economy Innovation Team, Ellen MacArthur Foundation 3. Workshop 'Rules of Engagement' o **Moderator:** Paul Shorthouse, GLOBE Series / CELC	20 min.
Breakout 1: A Deep Dive into Innovation Processes for Circular Plastics *Format: Breakout Room Discussions* EMF report highlights 3 key strategies for upstream innovation and action: Elimination, Reuse, and Material Circulation. Suggested that the breakout rooms align with this, informed by the innovation pathway 'wedges' from the "Breaking the Plastics Wave" report by The Pew Charitable Trusts and SYSTEMIQ. Participants pre-selected their breakout topics of highest interest as part of the registration process. 2. ROOM 1: Elimination. Processes for eliminating plastic at the source (direct or innovative elimination) – part of 'reduction' wedge. Criteria for assessing eliminating plastics applications (or not), representative innovations (focus on Canadian examples where possible); interactive (via Miro) exploration of ideas and special considerations for Canada. o **Presenter:** Katrina Shum, LUSH o Facilitator: Paul Shorthouse, GLOBE Series / CELC 3. ROOM 2 Reuse. Focus on reuse packaging, products and applications, including four consumer-facing models and B2B approaches – part of 'reduction' wedge. Explore representative innovation and investment requirements, and barriers / enablers (focus on Canadian examples where possible); interactive (via Miro) exploration of ideas and special considerations for Canada. o **Presenter:** Jennifer DuBuisson, LEGO o Facilitator: Elizabeth Shirt, GLOBE Series 4. ROOM 3: Reuse Business Models. Focus on reuse business models and innovative platforms for distribution and logistics – part of 'reduction' wedge. Explore representative innovation and investment requirements, business models, and barriers / enablers (focus on Canadian examples where possible); interactive (via Miro) exploration of ideas and special considerations for Canada.	50 min.

○ **Presenter:** Amita Sandhu, BASF Canada ○ Facilitator: Joanne Gauci, National Zero Waste Council 5. ROOM 4: Substitution & Compostables. Focus on substitution to non-plastic and alternative materials for packaging (e.g., paper, compostables, etc.) – part of 'substitute' wedge. Explore material alternatives to plastics, including representative innovation and investment requirements, as well as barriers / enablers (focus on Canadian examples where possible); interactive (via Miro) exploration of ideas and special considerations for Canada. ○ **Presenter:** Paul van der Werf, AET Group ○ Facilitator: Sarah Brooks, The Natural Step Canada 6. ROOM 5: Mechanical Recycling. Focus on mechanical recycling technologies and infrastructure innovation – part of 'recycle' wedge. Explore technologies, infrastructure, and processes, including representative innovation and investment requirements, as well as barriers / enablers (focus on Canadian examples where possible); interactive (via Miro) exploration of ideas and special considerations for Canada. ○ **Presenter:** Jean Luc Lavergne, Lavergne Group ○ Facilitator: Bruce Dudley, The Delphi Group 7. ROOM 6: Chemical Recycling. Focus on chemical (i.e., molecular or monomer) recycling technologies and infrastructure innovation – part of 'recycle' wedge. Explore technologies, infrastructure, and processes, including representative innovation and investment requirements, as well as barriers / enablers (focus on Canadian examples where possible); interactive (via Miro) exploration of ideas and special considerations for Canada. ○ **Presenter:** Jocelyn Doucet, Pyrowave ○ Facilitator: Carol-Ann Brown, The Delphi Group	
Plenary 2: Report Out & Systems Discussion Context Setting *Format: Plenary* Bringing the group back together in plenary in order to provide: • Brief report back on Breakout 1 findings by breakout group Facilitators • Framing and context setting for 'systems-thinking' and cross-sector collaboration breakouts. ○ **Moderator:** Paul Shorthouse, GLOBE Series / CELC Re-assign to six randomly generated breakout groups to cross-pollinate ideas around a common question for all groups.	10 min.
Breakout 2: Cross-Pollination & Systemic Issue Considerations *Format: Breakout Room Discussions* Breakout discussions to focus on linkages between plastic packaging solution pathways, guided by two to three parallel questions, which might explore areas such as cross-sector barriers to innovation, infrastructure and technology gaps, business model development, and investment needs – as well as the highest-priority pathways, the related inter-dependencies, and key investments needed in Canada over the next five years.	30 min.

Plenary 3: Report Out & Wrap-up *Format: Plenary* Collective return to the plenary for close out, including: • Facilitators briefly report back on the SINGLE most compelling thing they heard from the cross-sectoral breakout (e.g., AHA moment, most important thing, etc.) • Closing and next steps / wrap-up. ○ **Moderator:** Paul Shorthouse, GLOBE Series / CELC	10 min.
TOTAL TIME	**120 min.**