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## 1.0 Executive Summary

Climate change is a reality, and the Region is experiencing its impacts now. All sectors of the economy are being called upon to do their part to reduce emissions and build climate resiliency, including waste management. Emissions from Canadian landfills account for 23% of national methane emissions, a powerful greenhouse gas (GHG)<sup>1</sup> that is more than 25 times as potent as carbon dioxide at trapping heat in the atmosphere. At the same time, much of the material currently being thrown away has value and represents a lost economic opportunity for the Edmonton Metropolitan Region (Region).

The Edmonton Metropolitan Region Board (EMRB) plans for long-term sustainability of the Region through the development and implementation of a regional Growth Plan and the Metropolitan Region Servicing Plan (MRSP). The MRSP recommended initiation of regional collaboratives in priority servicing areas, including solid waste management. The Solid Waste Collaborative (collaborative) is comprised of representatives from each of the 13 EMRB member municipalities and a representative from each of the two waste commissions operating in the Region to advance a shared vision of “A Zero-Waste Region fueled by a Circular Economy”.

To ensure shared commitment to common goals, the collaborative has outlined the regionally significant work it proposes to focus on in the coming years within this Solid Waste Action Plan (action plan). In addition, it specifies the key performance indicators that it will use to measure progress and success over time.

Key provincial and federal initiatives that will have an impact on municipal waste programs and must be considered as the collaborative prioritizes its work moving forward include:

- Implementation of an Extended Producer Responsibility framework in Alberta.
- Introduction of Alberta’s Emissions Reduction and Energy Development Plan.
- Expected Right to Repair legislation in Canada.
- National labelling requirements.
- Regulations requiring a reduction in synthetic fertilizer across Canada.
- Canada’s commitment to Zero Plastic waste by 2030 and Net Zero by 2050.

The action plan also describes emerging trends and technologies that provide new challenges and opportunities for the collaborative as it identifies key areas of focus for the future. At the same time, municipalities continue to evolve local waste programs in ways that offer lessons learned and potential opportunities for expansion across the Region.

The action plan provides a review of the initiatives undertaken to date and summarizes what has been achieved since approval of the collaborative’s initial action plan. Building on this success, the collaborative has confirmed the strategic planning initiatives it believes have the highest value and that should be the highest priority for the Region. These initiatives reflect discrete projects planned as well as opportunities to collaborate on education and outreach programming, to develop partnerships that help realize shared goals, and to engage the committee and the Board as advocates to accelerate improvements to the regional waste management system.

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<sup>1</sup> Environment and Climate Change Canada. [Waste and greenhouse gases](#): Canada’s actions. Accessed May 2023.

## Solid Waste Collaborative – Action Plan 2023

The Solid Waste Roadmap (roadmap) lays out a high-level schedule to complete projects that require funding over the next four years. It is intended to secure high-level commitment to the priorities outlined. Next steps for the collaborative include completing Phase 1 of the Regional Organics Strategy as well as advancing a project charter for an Industrial, Commercial & Institutional (ICI) Waste Characterization Study for the Region.

## 2.0 Solid Waste Collaborative

In 2019, the Edmonton Metropolitan Region Board unanimously approved the inaugural Metropolitan Region Servicing Plan (MRSP)<sup>2</sup>. The MRSP represents the ongoing work of the Board toward fulfilment of its mandate as a growth management board under the Edmonton Metropolitan Region Board Regulation and is an essential plan to support implementation of the Edmonton Metropolitan Region Growth Plan<sup>3</sup>. Moreover, the MRSP represents a commitment to working together with a focus on responsible growth.

To help achieve enhanced municipal collaboration and service coordination, the MRSP recommended the initiation of collaboratives in regionally significant municipal service areas, including solid waste. The Solid Waste Collaborative (collaborative) is comprised of representatives from each of the 13 EMRB member municipalities and a representative from each of the regional waste commissions operating in the Edmonton Metropolitan Region (Region) (See Appendix A for a list of collaborative members). The collaborative leverages regional efforts and expertise, provides a supportive forum to foster research, supports sharing best practices, and enables evidence-based decisions and actions.

The important work of the collaborative is guided by the MRSP Standing Committee (committee) comprised of elected officials appointed from across the member municipalities. The committee provides ongoing guidance and direction to the collaboratives and monitors development, opportunities, and challenges for each service area to ensure continued alignment with regional priorities and the growth plan.

### 2.1 Vision

The collaborative is guided by a vision statement for solid waste management that reflects the desired future state and demonstrates alignment with the vision of the Edmonton Metropolitan Region Growth Plan and the MRSP Guiding Principles (See Appendices B and C):

*“A Zero-Waste Region fueled by a circular economy.”*

Zero Waste<sup>4</sup> represents an aspirational goal that will require minimizing the amount of solid waste generated and maximizing recycling and composting across the Region. The collaborative’s work will be guided by the Zero Waste Hierarchy (hierarchy) which describes a progression of policies and strategies to support the Zero Waste system, from highest and best to lowest use of materials. The hierarchy enhances the Zero Waste definition by providing guidance for planning and a method to evaluate different programs and solutions.

Building on Zero Waste principles, new and exciting strategies for building circular economies are emerging. A circular economy is one where resources are designed for longevity and can be reused,

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<sup>2</sup> Edmonton Metropolitan Region Board. 2019. [Metropolitan Region Servicing Plan](#).

<sup>3</sup> Edmonton Metropolitan Region Board. 2020. Edmonton Metropolitan Region Growth Plan: [Re-Imagine. Plan. Build](#). Accessed June 21, 2021

<sup>4</sup> The Zero Waste International Alliance, a world leader on the subject, provides the following generally accepted definition: “Zero Waste is the conservation of all resources by means of responsible production, consumption, reuse and recovery of products, packaging and materials without burning, and with no discharges to land, water, or air that threaten the environment or human health.”

repurposed, recycled, or repaired to extend their lifecycle for as long as possible. A circular economy promotes efficiencies in design and production while minimizing virgin resource extraction and creation. Circular economy solutions can contribute to widespread environmental, economic, and social benefits by reducing the impacts of material production, processing, and disposal and supporting economic diversification into lower-emissions products<sup>5</sup>.

As many circular economy opportunities are focused on building profitability as well as sustainability, businesses are leading this transition. However, the Region has an important role to play as new circular economy business models must have sufficient feedstock, the ability to process at scale, and a high potential market demand for the goods derived from these materials. These conditions can be difficult to meet at the municipal level and may require regional solutions for success.

## 2.2 Purpose

Minimizing the amount of waste that is generated and maximizing diversion of waste from landfill are important strategies in addressing climate change. In addition, improved waste management has important economic and social benefits, including job creation, economic diversification, food security, and cleaner open spaces and waterways.

Today, the Region has a complex system for managing solid waste with many actors playing a diverse set of roles. Municipalities establish waste programs, policies, and strategies for their communities. Waste commissions work to minimize the costs of waste services to their residents. Government-regulated stewardship programs help create and maintain sustainable recycling for post-consumer products. Public and private haulers, processors, and landfill operators directly measure volumes and costs and track emerging trends and innovation. Other important stakeholders include academia, the non-profit sector, and funding agencies.

There are compelling reasons to work together as a Region to address the challenges associated with improving the solid waste system. Legislative and regulatory changes; the movement of waste across borders; the scale of waste solutions; emerging technologies; and limited expertise, time, and money available at the municipal or sub-regional levels, all contribute to the case for regional collaboration.

The collaborative provides a mechanism to optimize available resources and maximize the Region's return on investment. Through regional cooperation, member municipalities are better able to address complex problems that would challenge each municipality on their own.

To ensure shared commitment, the collaborative has outlined the work it proposes to focus on and the associated outcomes it intends to achieve within this action plan. Providing a regional framework for action helps ensure that all members and stakeholders come together to advance initiatives that are cohesive, targeted, and strategic.

By establishing priorities for collaboration, and aligning regional and local actions, solutions can be implemented faster, in a more coordinated manner, and at the systemic level needed to drive real change. The action plan will aim to reduce barriers, increase capacity, and deliver co-benefits for member municipalities.

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<sup>5</sup> Emissions Reduction Alberta. [Circular Economy Challenge](#). Accessed May 2023.

## 2.3 Goals

Within the Solid Waste Collaborative Framework, members documented their agreement on how they will work together to build and achieve their shared goals. The following Collaborative goals were outlined:

1. To develop and maintain a regional Action Plan for solid waste that drives progress towards a shared regional vision of zero waste.
2. Establish interim measures of success to track progress in achieving regional solid waste priorities and to assess the performance of the Collaborative against its stated goals.
3. To foster collaboration through shared accountability for risk, investment and prioritization of projects and services.
4. To hold all members accountable for Collaborative success through shared responsibility and established processes.
5. To align prioritization and funding of solid waste projects at the regional level.
6. To maximize value through effective management and allocation of regional solid waste resources.

Building on work already completed within individual municipalities and across the Region, the Solid Waste Collaborative agreed to identify or confirm relevant actions of regional significance. Actions viewed as having regional significance are those that:

- Require agreement across the Region to drive consistency, efficiency, or economies of scale.
- Would exceed existing staff complements or require technical expertise not available within all member municipalities.
- Require funding outside of existing municipal budgets or capacity for member municipality contributions.
- Would be more successful executed as a Region or would benefit from a unified voice.

## 2.4 Approach

Each year, a portion of EMRB's operating budget is allocated to MRSP initiatives through the annual budgeting process. Following budget confirmation, the collaborative engages in a strategic planning process to assess, prioritize, and propose regional opportunities. Prioritization is based on the expected economic, environmental, and social benefits to the Region, combined with additional consideration given to:

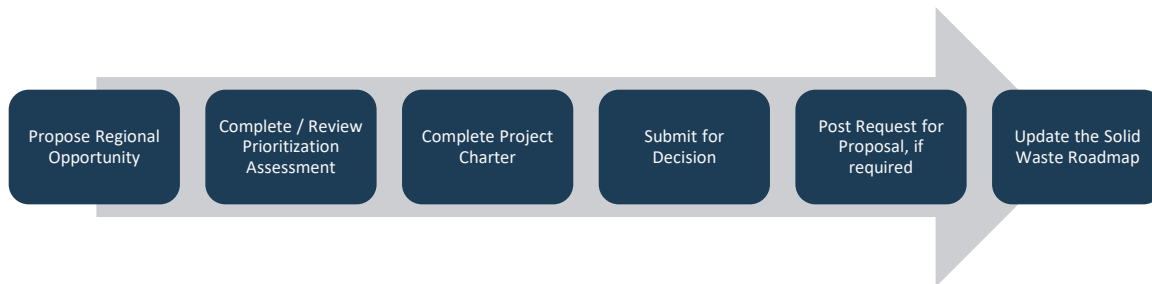
- Current capacity
- Resource availability
- Schedule efficiency
- Potential champions and partners

Actions identified as the highest priority are outlined within the action plan. Actions can range from discrete projects with a start and end date (e.g., a waste characterization study) to ongoing initiatives. Projects that require funding are added to the Solid Waste Roadmap (roadmap) that provides a high-level schedule for completing the work. Ongoing initiatives represent internal work that is likely to evolve over time (e.g., building a strategic partnership) and are only constrained by the capacity of the collaborative to advance them.

The committee reviews the action plan to ensure alignment with regional priorities and must endorse and recommend it before it is submitted to the Board for formal approval. The Board reviews the action plan to ensure alignment with the growth plan and the MRSP, and to provide high-level support for the work.

While approval of the action plan represents high-level support, all projects that require funding must be approved through a formal project approval process (as shown in Figure 1) prior to initiation.

Figure 1. Solid Waste Collaborative Project Approval Process



As the collaborative confirms the capacity to undertake the work, a project charter is developed. The project charter must contain sufficient information to determine if the value of the expected outcomes justifies the time and cost associated with completing the work. Although the project must be considered regionally significant, participation in a project will be voluntary for each municipality. A project may not benefit all municipalities equally; however, the project charter must be supported by the collaborative before it can move forward for decision.

Following confirmation of collaborative support, a completed project charter is submitted to the committee for review and guidance. If the committee recommends and endorses the project, it is submitted to the Board for approval and to authorize the resources needed to complete the work.

The action plan is updated each year to reflect progress, review and confirm priorities, and adjust the 4-year roadmap (as required).



### 3.0 Solid Waste Outlook

The world of waste is changing rapidly. Critical environmental, economic, and social drivers are leading to substantial changes to provincial and federal government direction that will have major impacts for the waste management system. There are also growing trends and emerging technologies that present new challenges and opportunities. Municipalities also continue to evolve their waste programs in ways that can offer lessons learned and signal opportunities for expansion across the Region. This section of the action plan outlines highlights key considerations for the collaborative as it plans its work moving forward.

#### 3.1 Provincial and Federal Government Initiatives

There are currently provincial and federal initiatives underway that will have a significant impact on how waste will be managed in the Region. There are also overarching strategies to reduce climate change that are calling on all sectors of the Canadian economy to do their part, including waste management. These initiatives are outlined below:

**Extended Producer Responsibility (EPR)** - EPR regulations went into effect in Alberta on November 30, 2022. EPR is an environmental/economic policy approach in which producers of products and packaging bear responsibility for ensuring those products and packages are properly managed at the end of their life cycle<sup>6</sup>. The transition to EPR will have important implications to every municipality in the Region as EPR systems for SUP/PPP and HSP will be operational by April 1, 2025.

**Emissions Reduction and Energy Development Plan** – This plan is Alberta's approach to enhance its position as a global leader in emissions reductions, clean technology and innovation, and sustainable resource development. Key actions are outlined in the circular economy, bioenergy, and agriculture sectors. An improved understanding of the finance and policy frameworks supporting implementation of the plan will be needed to understand how the Region can benefit from this investment.

**Right to Repair Framework** – Consultation on a plan to amend Canada's Copyright Act that would implement a consumer's right to repair electronics, home appliances and farming equipment<sup>7</sup> is expected to begin in summer 2023.

**National Labelling Efforts** – The Government of Canada is proposing to enact regulations using authorities under the Canadian Environmental Protection Act, 1999 (CEPA) to implement a national framework for plastic packaging and certain single-use plastics. Changes to labelling rules are expected to be phased in starting in 2026, to be completed by 2030.

**Fertilizer Regulation** – In 2020, the Government of Canada introduced a goal of reducing GHG emissions arising from fertilizer application by 30% (below 2020 levels) by 2030. To achieve this, the Canadian Food Inspection Agency (CFIA) made substantial amendments to the Fertilizers Regulations as part of its regulatory modernization initiative. Although the amendments came into force on October 26, 2020, a three-year transitional period was applied to aid industry in achieving compliance. As of October 26, 2023, all fertilizers will need to comply with the new registration requirements<sup>8</sup>.

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<sup>6</sup> Waste to Resource Ontario, 2013. [Extended Producer Responsibility Policy Paper](#). Accessed April 2023.

<sup>7</sup> CBC News. April 7, 2023. [Farm machinery included in right-to-repair plan announced in federal budget](#).

<sup>8</sup> Canadian Food Inspection Agency. [Amending a fertilizer or supplement registration under the "old" Fertilizers Regulations: Overview](#). Accessed May 2023.

**Zero Plastic Waste** – On June 22, 2022, the Government of Canada published the Single-Use Plastics Prohibition Regulations (SUPPR). The Regulations officially prohibit the manufacture, import and sale, and export of six single-use plastic items<sup>9</sup>. The SUPPR is being implemented on a staggered timeline. Restrictions on manufacturing and import of single-use-items began in 2022. Restrictions on sales will be implemented throughout 2023 and 2024, with restrictions on exports expected by December 20, 2025.

**Net Zero** – The Canadian Net Zero Emissions Accountability Act enshrines in legislation Canada’s commitment to achieve net-zero emissions across the Canadian economy by 2050. This Act highlights the need to reduce absolute GHG emissions across all economic sectors, including waste.

### 3.2 Emerging Trends and Technologies

Understanding emerging trends and technologies in waste management will help the Region maximize the economic, social, and environmental benefits achieved through waste system improvements. Important trends and technologies include (but are not limited to):

**Regenerative Practices** - An economy based on the principle of regeneration, is one that uses productive capabilities to not just reduce, but actually undo environmental harm, while also providing the products and services on which society depends. Regenerative practices are being used in farming, textiles, construction, plastics, and consumer goods.

**Product and Packaging Design** – Most products and packaging today are not designed to be recycled. One of the aims of EPR is to give producers an incentive to change product design for reuse as well as make it easier to recycle packaging and shift the responsibility to product manufacturers to recycle their own packaging and divert it from landfills. Design is one of the most important factors in improving recycling outcomes.

**Food Loss Prevention** – There are new strategies helping businesses to prevent food loss, such as on-site processing, development of higher-value products from retrieved or converted food waste, web-based wholesale marketplaces for surplus food, improved packaging options, and waste tracking technologies. These solutions can help businesses reduce costs, save resource inputs, reduce waste management and disposal fees, and increase profits through efficiency.

**Food Rescue** - Food rescue organizations are developing partnerships with producers and retailer and organizations such as Loop and Second Harvest are using apps to bring donors and recipients together. Restaurants and retailers are also using apps to sell products and meals approaching their best before or expiry dates to consumers at a discount.

**Smart Bins** – Artificial Intelligence (AI) is becoming more commonplace in waste management. Smart waste bins can be used to notify waste management companies when they are full to optimize routes, reduce labour, and save fuel. They can also be used to sort waste at the point of disposal in high-traffic areas such as public facilities. Finally, smart bins can display information to raise awareness and educate the public.

**Waste Vehicle Technology** – Waste collection vehicles can be equipped with systems that monitor the delivery of services and program participation as well as track waste diversion. Collection vehicles can also be equipped with Geographic Positioning Systems (GPS) and Radio-Frequency Identification (RFID)

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<sup>9</sup> The 6 SUI items included in the SUPPR are check-out bags, cutlery, foodservice ware, stir sticks, straws, and ring carriers. Source: [Environment and Climate Change Canada](#).

tag reading equipment and on-board weigh scales that gather detailed records of lift activities at specific locations. Waste vehicles are now using alternatives to diesel such as compressed natural gas, electricity, and hydrogen, can be used to reduce emissions and to improve fleet performance.

**Sorting Technology** - AI solutions scan waste and identify materials across many different categories or classes to increase sorting efficiency and accuracy. For materials recovery facilities, this can mean enhanced outputs, increased productivity, and reduced costs, as well as a rise in the number of valuable materials that are sent for recycling.

**Energy Recovery** – Energy recovered during waste processing results from the conversion of non-recyclable waste materials into usable heat, electricity, or fuel. In addition to generating energy, these technologies decrease the volume of solid waste destined for landfills and reduce carbon emissions.

**Consumer Demand** – Public and private environmental stewardship organizations are exploring policy options with the potential to impact consumer demand. Options such as implementing tax incentives or subsidies, mandating labelling guidelines, and restricting greenwashing<sup>10</sup>, all have the potential to impact consumer choices and shape producer decisions both upstream and downstream in the product supply chain.

### 3.3 Municipal Waste Program Changes

Across the Region, municipalities continue to evolve their waste, recycling, and organics programs. Keeping current with these advancements maximizes opportunities to expand benefits across the Region.

**Increased Recycling and Organics Collection** – The City of Edmonton will be expanding separate food scraps and recycling collection to apartments and condominiums, bringing these services to 167,000 residences across almost 3,400 properties—a process that will take place between the fall of 2023 and 2027.

**Design and Construction Standards** – To support the new recycling and organics collection programs for condos and apartments, the City of Edmonton is creating new developer standards. Waste Services is working with developers to provide more user friendly and clear tools to communicate basic requirements for a waste storage room and why these requirements are important.

**Waste Processing Capacity** – Last year, the City of Leduc posted a Request for Information (RFI) on Alternative Technologies, which closed on July 28, 2022. The City of Edmonton recently released a Request for Proposal (RFP) for waste-to-energy services and all member municipalities were invited to participate in the project. The City St. Albert is also currently exploring alternative organics processing options and Sturgeon County has a project underway to assess different waste processing technologies.

**Artificial Intelligence Pilot** – The City of Leduc will be partnering with Prairie Robotics to pilot a Cart Smart program. The program uses camera and GPS technology that detects contaminants in the green cart (organics) and residents with unacceptable items in their green cart will receive a mailer. The City is hoping to see a 50% reduction in contamination by making residents aware of their behaviour.

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<sup>10</sup> Investopedia defines greenwashing as the act of providing the public or investors with misleading or outright false information about the environmental impact of a company's products and operations.

**Collection Contracts** – Some municipalities have been extending existing waste collection contracts in preparation for the transition to EPR. This provides an opportunity for the Region to share best practices in contract terms and conditions, such as reporting requirements, service levels, fuel/energy types, and technology to maximize economic and environmental outcomes.

**Alternative Funding Options** – As the cost of waste management services increases, some municipalities are investigating user-fee models (e.g., pay-as-you-throw), additional revenue sources (sale of waste byproducts like compost and renewable natural gas), or asset optimization strategies to enable implementation of the actions needed to achieve stated diversion targets.

See Appendix D: Provincial and Federal Government Initiatives, Appendix E: Emerging Trends and Technologies, and Appendix F: Municipal Waste Program Changes for additional information.

## 4.0 Solid Waste Initiatives

The collaborative held its first bi-monthly meeting in October 2020 and the inaugural action plan was approved by the Board on August 12, 2021. Since its initiation, the collaborative has been focused on building a solid foundation to support future goals. This required a strong focus on foundational projects to develop consistent terminology, methodologies, and systems. Tackling these projects first has enabled greater insight into the opportunities with the highest potential return and those best realized using a regional approach.

This section provides an overview of the projects and initiatives undertaken to date and the additional capabilities achieved for the collaborative and the Region.

### 4.1 Regional Monitoring and Measurement Program.

In May 2021, the collaborative completed its first formal project to develop a Regional Monitoring and Measurement Program. Through this project, the collaborative initiated development of shared terminology, a common materials classification system, and key performance indicators (KPI's).

A common set of terms and clear definitions helps to drive greater consistency and shared understanding across each of the municipalities and the waste commissions. This nomenclature was intended to act as a platform for future data collection and analysis, and to enable future regional planning efforts.

The scope of the project also included reviewing national and international resources to provide guidance on a common material classification system. The collaborative supported the recommendation to adopt the Cascadia Consulting Waste Classification System (system). This system aligns with the Canadian Stewardship Services Alliance's National Reporting Guidebook<sup>11</sup> that sets out a national material list. It also summarizes which materials are covered in each of the four existing provincial Extended Producer Responsibility (EPR) programs in Canada and with the definitions used in wider material markets. An accepted system enables the collaborative to pursue waste characterization studies and modelling at the regional level and to compare results with other jurisdictions.

As part of this project, each member municipality was asked to provide their municipal waste data for a period of one year using a standardized data template. This data was compiled to demonstrate what a future regional solid waste data model could look like. Following completion of the project, the collaborative agreed there was significant value in continuing to maintain and improve waste data at the regional level.

The project also proposed a set of KPIs that, once developed, would help the collaborative to better understand and quantify current performance of the waste system in the Region:

- Reduced waste per capita.
- Recycled rate (recycled and composted).
- Percentage of citizens with access to recycling facilities.
- Cost per tonne for disposal.
- Agriculture plastics diverted.

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<sup>11</sup> Canadian Stewardship Services Alliance. (2019). [Part Three: National material list.](#)

- Avoided greenhouse gas (GHG) emissions<sup>12</sup>
- Direct, indirect, and induced jobs<sup>13</sup>
- Gross value added.

Defining these KPIs provided valuable insight into the data, systems, and structures needed to measure system performance. This work also confirmed the need for a Solid Waste Data Strategy to ensure regional data would be secure, accessible, and trusted.

## 4.2 Solid Waste Data Strategy

Recognizing the fundamental importance that data will play in achieving shared solid waste goals, the collaborative invested in development of the Solid Waste Data Strategy (data strategy). Completed between July 2022 and February 2023, the data strategy provides a formal mechanism to assess, prioritize, plan for, and implement the data and supporting tools that achieve the highest value for the Region. Through the data strategy, the collaborative:

- Established the data standards and methods needed to improve data access, data integrity, and data security for solid waste data.
- Recommended a governance structure and supporting roles and responsibilities to effectively coordinate data management between all stakeholders.
- Initiated a data support model that provides value to all stakeholders, is cost-effective, and makes effective use of limited time and resources.
- Established protocols to share information and data.
- Described the tools currently enabling collection and analysis of solid waste data and the expected next steps to enhance the value of solid waste data to the Region.
- Created a roadmap with the specific and actionable milestones needed to improve data integrity.

Data is considered to have integrity when users can trust the data to support key operational and decision-making processes. The data strategy outlined the actions needed to ensure that regional solid waste data is traceable and auditable and that recommendations provided to the committee and the Board are evidence-based.

## 4.3 Solid Waste Data Model

While initially created in 2021 as a template, evolution of the Solid Waste Data Model (data model) continued throughout development of the data strategy. The data model is now the primary tool for collecting and analyzing waste data at the regional level. Data from each member municipality and the waste commissions is aggregated within a mass balance model built using Microsoft Excel. The spreadsheet contains demographic, waste program, and volume data for residential waste and volume

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<sup>12</sup> Can be calculated based on tonnage of material recycled in a specific location (i.e., in the Region) using the US EPA's Waste Reduction Model ([WARM Model](https://www.epa.gov/warm)), or Environment Canada's GHG Calculator for Waste Management, requested through <https://www.canada.ca/en/environment-climate-change/services/managing-reducing-waste/municipal-solid/greenhouse-gases/calculator.html>.

<sup>13</sup> Can be calculated based on projected growth of the recycling sector as the tonnage of material recycled increases. This can be done through the tool developed for the Recycling Council of Alberta on the economic impacts of recycling.

estimates of non-residential waste for each member municipality. Standardized formats and consistent methodologies are applied to demonstrate integrity and enhance confidence in regional solid waste data.

Five years of data high-quality data has been provided. This information provides the collaborative with a more comprehensive picture of regional waste and represents the starting place to measure system-wide performance, supports improved data and trend analysis, and underpins evidence-based decision-making for future actions. This data also represents an important baseline for the Region. With each new project and initiative completed, the data model will grow and improve as new data sets are added and more sophisticated capabilities are enabled.

#### 4.4 Current State of Regional Organics

Despite significant economic, social, and environmental costs, much of the organic material generated in the Region still ends up in landfills. While most municipalities provide collection services for food and yard waste, residential garbage still contains substantial amounts of organics. In addition, more than half of the organic material generated in the Region comes from non-residential sectors and is managed through private hauler contracts, where diversion becomes more challenging or costly, and is often not tracked by municipalities.

Organic materials are a valuable resource that, when diverted from landfill, contribute to a range of purposes, including to reduce food insecurity, as source of animal feed, compost, and fertilizer to amend soil, as a source of renewable energy, and to produce bio-fuels and bio-products. Diversion also has the added benefits of extending the life of each landfill and minimizing harmful GHG emissions. However, improving the circularity of organic material requires development and support of a complex and interconnected system. To create the environment needed to transition to a more circular economy, governments, industry, and regional stakeholders must all work together to achieve common goals.

To provide a clear vision of what will be achieved by working together, the collaborative put forward a Regional Organics Strategy. As a successful strategy will require input from many stakeholders, the collaborative proposed completing this work in two phases:

1. Phase 1: Current State Analysis of Regional Organics (Currently underway)
2. Phase 2: Desired Future State of Regional Organics

An environmental scan of existing municipal organics programs and relevant strategies and plans for residential and non-residential organics management has been completed. Leading jurisdictions within Canada and across the world have been reviewed to highlight best practices and innovative circular models with a high degree of potential applicability for the Region.

Stakeholders from across the organics value chain have been identified to provide insight into the existing opportunities and barriers, as well as areas of regional strength and competitive advantage in the Region. A comprehensive engagement process is underway to help identify new strategies, potential synergies, strategic partnerships, and mutually beneficial solutions.

Expected to conclude in the summer of 2023, Phase 1 will identify the range of potential program, policy, regulatory, partnership, and advocacy actions available to the Region to improve organics management. This phase will also provide the committee and the Board with the evidence needed to help define the future state for organics in the Region within Phase 2.



## 5.0 Solid Waste Actions 2023 - 2027

The focus of the collaborative's work is directed towards strategic planning initiatives. These reflect discrete projects planned with a defined start and end date and specific deliverables that must be achieved. In addition, the collaborative has identified opportunities to combine forces to provide education and outreach programming, to develop partnerships that help realize shared goals, and to engage the committee and the Board as advocates to accelerate improvements to the waste management system in the Region.

### 5.1 Strategic Planning Initiatives

Strategic planning includes all activities related to growing regional knowledge or systems. Projects in this space include understanding the current and forecasted states, exploring best practices, and service modelling. These actions support a better understanding of where to focus regional initiatives. Strategic Planning actions include:

**ICI Waste Characterization Study** – Developing a detailed understanding of regional industrial, commercial, and institutional (ICI) waste including material types and volume. The goal of this study is to provide a more complete picture of the regional waste profile and will inform decisions regarding waste reduction and diversion strategies. A Regional ICI Waste Characterization Study is an important input to a Regional Organics Strategy and a Regional ICI Waste Strategy as well as a prerequisite for conducting regional waste modelling.

**Regional Organics Strategy – Phase 2: Desired Future State** – Building on the current state analysis of organics in the Region completed in Phase 1 and benefiting from the data compiled as part of the ICI Waste Characterization Study, Phase 2 of the Regional Organics Strategy will include development of a desired future state for the Region. The scope of the project will include:

- Prioritization of supported options.
- Defining roles, responsibilities, and strategic partnerships.
- Expected economic, environmental, and social benefits.
- Associated costs and implications.
- Creating an implementation plan to guide scheduling and execution of required initiatives.

**Regional ICI Waste Strategy** – Develop a comprehensive ICI Waste Management Strategy that addresses long term capacity, considers available similar models to provide a reward and encouragement system, and uses a social marketing approach to motivate change.

**Agriculture Waste Characterization Study** - Agricultural industry residues and wastes constitute a significant proportion of worldwide agricultural productivity. Although the total volume of waste produced by this sector is significantly lower when compared to wastes generated by other industries, the pollution potential of agricultural wastes is comparatively high on a long-term basis. Developing a detailed understanding of regional agriculture waste, including material types and volume as well as the methods currently used for disposal will provide an important input to a Regional Agriculture Waste Strategy.

**Regional Agricultural Waste Strategy** - This strategy includes working with Cleanfarms and other key stakeholders to review of best practices used in other jurisdictions, including existing EPR programs within Canada. Opportunities and potential incentives to achieve better waste diversion in the agricultural industry will be explored.



**Regional Waste Modelling** - This project includes mapping material flow and existing waste generation against regional waste facility capacity to identify opportunities for more efficient recycling/composting solutions, to optimize existing assets, and to forecast future processing needs. See Appendix D for a Regional Map of Waste Facilities.

**CRD Waste Characterization Study** – Developing a detailed understanding of regional construction, renovation, and demolition (CRD) waste including material types and volume. This study will provide a more complete picture of the regional waste profile and will inform decisions regarding waste reduction and diversion strategies. A Regional CRD Waste Characterization Study is an important prerequisite for the development of a CRD Waste Strategy and is an important input into regional waste modelling.

**Regional CRD Waste Strategy** - Engage the CRD sector to participate in the development of an overall strategy to address diversion and disposal of this waste. Explore voluntary program options as well as regulatory levers such as a Building Permit System or create space at existing landfills to provide areas to sort out recyclable CRD materials while other materials are stockpiled for uses such as alternate daily cover at the landfill or feedstock for energy-to-waste facilities.

## 5.2 Education and Outreach

Today, each municipality develops and delivers their own communication and education campaigns. The collaborative has identified an opportunity to leverage and share resources and to achieve administrative savings, expand potential reach, and accelerate behavior change. This may include actions such as cooperation on the design and messaging for promotion and educational materials (e.g., access to the Love Food, Hate Waste campaign), sharing ICI and construction site toolkits, standardizing municipal Waste Apps, consolidating school and outreach programs, and others.

During COVID-19, some municipalities shifted their school workshops to a virtual environment, offering real time and engaging sessions that encouraged students to reduce waste at home and school. This information could be shared and additional courses could be added to build a comprehensive inventory of online or virtual material to be delivered on demand.

## 5.3 Partnerships

As the collaborative continues its work, it will need to find and build strategic partnerships to encourage actions that are cross-cutting and complementary. Coordinating efforts and investments across the many actors that are advancing sustainable or circular solutions represents opportunities to use resources more efficiently, expand faster, and achieve better outcomes. Pursuing partnerships provides the chance to unite industry, the non-profit sector, academia and research institutions, and funding agencies in a whole-of-system approach to improving waste management.

Through its work, the collaborative will also identify opportunities to facilitate partnerships between organizations. Connector is a valuable role that can help identify and connect organizations with shared goals. For example, food rescue organizations are proactively partnering with businesses across the supply chain to capture and redistribute surplus food that would otherwise go to farmers for animal feed or to landfill. However, some organizations have indicated they require assistance to connect with larger national chains. Facilitating collaboration between employers, industry associations and the post-secondary community in the Region can help ensure that the skills being developed will meet the needs of the economy now and in the future.

## 5.4 Advocacy

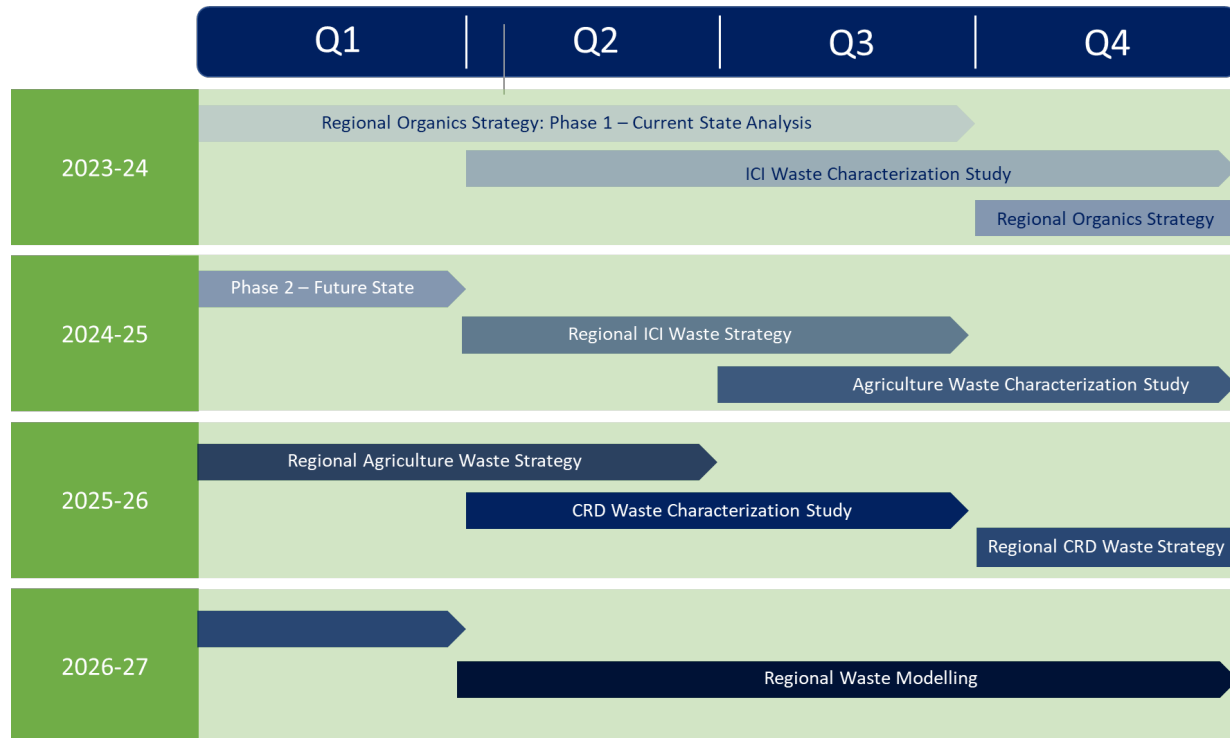
The collaborative, the committee and the Board have the power to bring actors from across the Region together to advocate for policy and additional resources. Uniting in a common cause with organizations such as Alberta Municipalities, Rural Municipalities of Alberta, and Edmonton Global can enhance collective outcomes.

The collaborative is in a unique position to advocate with industry, industry associations, waste generators, haulers, processors, and secondary marketplaces for greater data and information sharing, voluntary reporting, technical innovation clusters, and joint partnerships and infrastructure investments.

## 6.0 Solid Waste Roadmap

The roadmap is the culmination of analysis of operational realities, emerging trends and technologies, regional priorities, and collaborative capacity translated into specific, actionable projects to improve solid waste management within the Region. The roadmap is intended to set attainable goals and take realistic, incremental steps to provide value and encourage action when change can be accelerated through regional collaboration. The roadmap is intended to secure high-level commitment to the priorities outlined, as well as the resources and support needed to execute the work.

Figure 2. Solid Waste Roadmap



## 7.0 Next Steps

The collaborative continues to make progress on its approved plans including Phase 1 of the Regional Organics Strategy, an analysis of the current state of organics in the Region. This project will help identify the range of potential program, policy, regulatory, partnership, and advocacy actions available to improve organics management in the Region. Expected to conclude this summer, Phase 1 will provide the committee and the Board with the evidence needed to define the future state for organics in the Region in Phase 2. Following formal approval of Phase 1, the work proposed for Phase 2 will come forward in a separate project charter for review.

With support from the committee, the collaborative will advance the next project charter for an ICI Waste Characterization Study (study) to the Board for formal approval in tandem with the action plan. As outlined in the completed project charter, this study will be used to augment high-level estimates for ICI waste. Developing waste profiles for each business category will allow the collaborative to fill gaps for ICI waste within the data model and will inform future regional planning to identify opportunities to reduce, divert and reuse or recycle waste.

If approved, the study is anticipated to begin following completion of Phase 1 of the Regional Organics Strategy and is expected to take approximately nine months to complete. This schedule ensures that the information and data from this study is available to inform Phase 2, tentatively scheduled for early 2024. This data will also be a prerequisite to initiate a future regional ICI waste strategy.

## APPENDIX A: Collaborative Members

- Beaumont - **Lenore Turner**, Environmental Lead (Member); **Joshua Gale**, Operations Manager (Alternate)
- Devon - **Torrie Santucci**, Manager of Environment and Sustainability (Member); **Paresh Dhariya**, General Manager of Planning and Operations (Alternate)
- Edmonton - **Neil Kjelland**, Director of Sustainable Waste Processing (Member)
- Fort Saskatchewan - **Sadie Miller**, Waste Programs Supervisor (Member); **Janel Smith-Duguid**, General Manager of Infrastructure and Planning Services (Alternate)
- Leduc - **Michael Hancharyk**, Manager of Environment (Member); **Mike Pieters**, General Management of Infrastructure and Planning (Alternate)
- Leduc County - **Des Mryglod**, Director of Engineering and Utilities (Member); **Shailesh Modak**, Manager of Utilities (Alternate)
- Spruce Grove - **Kevin Stener**, Director of Public Works (Member); **Avelyn Nicol**, Senior Environmental Advisor (Alternate)
- St. Albert - **Katie Burd**, Waste and Diversion Operations Supervisor (Member)
- Strathcona County - **Leah Seabrook** (Chair), Manager of Waste Management and Community Energy Services; **Jason Casault**, Director of Utilities (Alternate)
- Sturgeon County - **Scott MacDougall**, Chief Operating Officer (Member); **Jeff Yanew**, Manager of Utility Services (Alternate)
- Leduc and District Regional Waste Management Commission - **Mike Pieters**, General Manager, Infrastructure and Planning; **Nathan Schaper**, Municipal Energy Project Manager (Alternate)
- Roseridge Waste Management Services Commission - **Susan Berry**, Executive Director; **Zachary Breshears**, Director of Operations (Alternate)

## APPENDIX B: Growth Plan: 50 Year Vision

### 50 YEAR VISION

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The Edmonton Metropolitan Region is the dominant hub for northern Alberta and is recognized globally for its economic diversity, entrepreneurialism, leadership in energy development, environmental stewardship and excellent quality of life.

The Region is anchored by a thriving core that is interconnected with diverse urban and rural communities.

The Region is committed to growing collaboratively through the efficient use of infrastructure, building compact communities, and fostering economic opportunities and healthy lifestyles.



Source: *Edmonton Metropolitan Growth Plan: [Re-Imagine. Plan. Build.](#)*

## APPENDIX C: Metropolitan Region Servicing Plan Guiding Principles

Creating common understanding of the shared servicing challenges is vital to creating an environment where municipalities can think and act in the best interest of the Region. The Metropolitan Region Servicing Plan<sup>14</sup> (MRSP) Principles reflect the regional imperative for working together and will provide critical guidance for the planning, investment, and coordination of the delivery of metropolitan services. The MRSP Principles are aligned with the guiding principles of the growth plan.

The MRSP Principles are to:

- Lead with a metropolitan mindset for the greater good.
- Pursue leading and innovative research, technology, and best practices.
- Build, collect, and share regionally relevant data, information, and knowledge.
- Prioritize regionally scaled service investments informed by evidence.
- Leverage sub-regional service initiatives to benefit the Region.
- Recognize the unique municipal service contexts.
- Guarantee the safety and wellness of citizens.
- Act in a regional manner with a unified voice.

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<sup>14</sup> Edmonton Metropolitan Region Board. 2019. [Metropolitan Region Servicing Plan](#). Accessed June 2021.

## APPENDIX D: Federal and Provincial Initiatives Impacting Waste

Critical environmental, economic, and social drivers are leading to substantial changes to federal and provincial government direction that will have major impacts for the waste management system. This section of the action plan outlines the key provincial and federal legislation, commitments, and initiatives that must be considered as the collaborative prioritizes its work moving forward.

### 7.1 Extended Producer Responsibility

Extended Producer Responsibility (EPR) regulations went into effect in Alberta on November 30, 2022. EPR is an environmental/economic policy approach in which producers of products and packaging bear responsibility for ensuring those products and packages are properly managed at the end of their life cycle<sup>15</sup>. Alberta will have two EPR systems:

- Single-use products, packaging, and printed paper (SUP/PPP).
- Hazardous and special products (HSP).

Oversight of Alberta's new EPR systems will be conducted by Alberta Recycling Management Authority (ARMA). Producer Responsibility Organizations (PROs) will need to be established by April 1, 2024 and will take responsibility for designing a common collection system, processing collected materials and achieving management targets as set out in the regulation. PROs will need to engage with stakeholders of the system, which includes municipalities and their contracted service providers. As most residents' point of contact for recycling services in Alberta's current collection system, municipalities bring operational experience that can be of value to producers and their PROs.

The transition to EPR will have important implications to every municipality in the Region as EPR systems for SUP/PPP and HSP will be operational by April 1, 2025. It will be a fundamental shift in the role municipalities will have in providing these services. The following services, facilities and will be impacted:

- Residential curbside recycling programs.
- Communal/depot recycling programs.
- Household hazardous waste depots and/or collection events.
- Material recovery facilities and other processing services.
- Assets related to providing these services.
- Procurement and contract management.
- Education and outreach programs.

Municipalities have been advocating for an EPR regulation in Alberta for many years, and as the regulation has now been approved, it is important that local and regional governments collaborate through the transition. Partnership organizations, such as Recycling Council of Alberta, Alberta Municipalities, and the Rural Municipalities of Alberta, are providing transition support to municipalities by initiating a Local Government EPR Collaborative, as well as providing education sessions to inform municipalities. Staying connected to this work is critical for municipalities and the Region.

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<sup>15</sup> Waste to Resource Ontario, 2013. [Extended Producer Responsibility Policy Paper](#). Accessed April 2023.



## 7.2 Emissions Reductions and Energy Development

The Emissions Reduction and Energy Development Plan is Alberta's approach to enhance its position as a global leader in emissions reductions, clean technology and innovation, and sustainable resource development. The plan outlines actions, opportunities, and new commitments to reduce emissions and maintain energy security through collaboration and partnerships, clean technology and innovation, and finance and policy frameworks. Key commitments are described within the plan for circular economy solutions that will reduce the impacts of material production, processing, and disposal, as well as support economic diversification into lower-emissions products. Alternatives to landfilling waste, such as waste to energy and anaerobic digestion (the breakdown of organic material in the absence of oxygen), reduce emissions as well as provide additional sources of renewable energy.

Through this plan, the Government of Alberta outlines important actions and opportunities in the circular economy, bioenergy, and agriculture sectors. An improved understanding of the finance and policy frameworks supporting implementation of the plan will be needed to understand how the Region can benefit from this investment.

## 7.3 Right to Repair

Most modern technology, especially anything with a computer chip inside, is rarely repairable. A growing right-to-repair movement has been pushing for legislation that requires access to repair services and tools. Canada's Budget 2023 announced that the federal government will work to implement a targeted right-to-repair framework for home appliances and electronics in 2024. This framework could include working with international partners and other stakeholders to explore a standard charging port for all handheld devices and laptops in Canada, with the aim of lowering costs for Canadians and reducing electronic waste. Farm equipment has recently been added in the right to repair conversation, as large machinery used in farming operations often has digital technology.

Consultation on a plan to amend Canada's Copyright Act that would implement a consumer's right to repair electronics, home appliances and farming equipment<sup>16</sup> is expected to begin in summer 2023. A well-designed right-to-repair framework has important implications for reducing costs to consumers, increasing product lifespan, reducing e-waste, and stimulating new circular business opportunities.

## 7.4 National Labelling Efforts

Even for enthusiastic recyclers, it can be difficult to know what goes where. The iconic recycling symbol of arrows chasing each other around a triangle or labelling something "recyclable" does not mean that the item can be recycled. To address this, the Government of Canada is proposing to enact regulations using authorities under the Canadian Environmental Protection Act, 1999 (CEPA) to implement a national framework for plastic packaging and certain single-use plastics. The proposed regulations would have three key elements<sup>17</sup>:

- **Recycled content requirements** that mandate minimum levels of recycled post-consumer plastics in packaging

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<sup>16</sup> CBC News. April 7, 2023. [Farm machinery included in right-to-repair plan announced in federal budget.](#)

<sup>17</sup> Canadian Food Inspection Agency. [Amending a fertilizer or supplement registration under the "old" Fertilizers Regulations: Overview.](#) Accessed May 2023.

- **Recyclability labelling rules** requiring accurate information be communicated to Canadians on whether packaging or single use plastics (SUP) are recyclable and how to dispose of these materials properly.
- **Compostability labelling rules** prohibiting the terms “biodegradable” or “degradable” on plastic packaging and SUPs and limiting the use of the term “compostable” to plastics that meet certain standards and labelling requirements.

The Government of Canada is proposing to phase in labelling rules starting in 2026, to be completed by 2030. These changes have important implications for local recycling and composting facilities. As plastic manufacturing is a key industry in the Region and the province has stated a goal to establish Alberta as the North America centre of excellence for plastics diversion and recycling by 2030, there are clear benefits to anticipating and preparing for a national labelling framework.

## 7.5 Fertilizer Regulations

In 2019, a Government of Canada study reported that agriculture was responsible for approximately 10% of Canada’s total GHG emissions. Of the total 73 tonnes of CO<sub>2e</sub>, emissions from synthetic fertilizers were estimated to have accounted for approximately 12.75 tonnes of that amount. In addition, that same data showed fertilizer use in Canada had increased by 71% between 2005 and 2019<sup>18</sup>, primarily driven by growing fertilizer sales in Western Canada.

In December 2020, the Government of Canada introduced its updated climate plan “A Healthy Environment and a Healthy Economy,” targeting the reduction of GHG emissions and the enhancement of carbon sequestration activities. This plan was inclusive of several measures impacting the agriculture and food industry, including the aggressive goal of reducing GHG emissions arising from fertilizer application by 30% (below 2020 levels) by 2030. To achieve this, the Canadian Food Inspection Agency (CFIA) made substantial amendments to the Fertilizers Regulations as part of its regulatory modernization initiative.

Although the amendments came into force on October 26, 2020, a three-year transitional period was applied to aid industry in achieving compliance. As of October 26, 2023, all fertilizers will need to comply with the new registration requirements<sup>19</sup>. Meeting this national target may have important implications for secondary compost markets in the Region.

If managed properly, incorporating compost is an effective long-term method for building soil fertility in organic production systems. Compost contributes to overall soil fertility by increasing organic matter, the water holding capacity of the soil, and, over a longer period of time, nutrient availability in soils. Compost also improves soil structure and stability, suppresses soil-borne diseases, and can increase the number of beneficial micro-organisms in the soil<sup>20</sup>.

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<sup>18</sup> Agriculture and Agri-Food Canada. [Discussion document: Reducing emissions arising from the application of fertilizer in Canada’s agriculture sector](#). Accessed May 2023.

<sup>19</sup> Canadian Food Inspection Agency. [Amending a fertilizer or supplement registration under the "old" Fertilizers Regulations: Overview](#). Accessed May 2023.

<sup>20</sup> ATTRA Sustainable Agriculture. [Toolkit: How to Reduce Synthetic Fertilizer Use](#). Accessed May 2023

## 7.6 Zero Plastic Waste by 2030

On October 7, 2020, Environment and Climate Change Canada (ECCC) announced proposed next steps to achieve the goal of [zero plastic waste by 2030](#). On June 22, 2022, the Government of Canada published the Single-Use Plastics Prohibition Regulations (SUPPR). The Regulations officially prohibit the manufacture, import and sale, and export of six single-use plastic items<sup>21</sup>. To enable industry to adapt to the changes, the SUPPR is being implemented on a staggered timeline. Restrictions on manufacturing and import of single-use-items began in 2022. Restrictions on sales will be implemented throughout 2023 and 2024, with restrictions on exports expected by December 20, 2025.

Canada's Budget 2022 provided \$183.1 million over five years, starting in 2022-23, to reduce plastic waste and increase plastic circularity by developing and implementing regulatory measures, and conducting scientific research to inform policy-making<sup>22</sup>. In alignment with Alberta's intention to become a plastics recycling centre of excellence, the Region may benefit from this funding.

## 7.7 Net Zero

In April 2021, in line with its obligations under the Paris Agreement, the Government of Canada announced a new GHG emissions reduction target of 40-45% below 2005 levels, by 2030. This target, along with other developments such as the passage of the Canadian Net Zero Emissions Accountability Act, which enshrines in legislation Canada's commitment to achieve net-zero emissions across the Canadian economy by 2050 and highlights the need to reduce absolute GHG emissions across all economic sectors, including agriculture and waste.

The Region could benefit from the Net Zero Accelerator (NZA) Initiative, which will provide up to \$8 billion to support large-scale investments in key industrial sectors, including waste management facilities. The NZA is part of the Strategic Innovation Fund, which accepts applications on an ongoing, non-competitive basis. The collaborative can also partner with industry and post-secondary and research institutions to help understand and quantify changes in waste management's contribution to regional emission reductions.

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<sup>21</sup> The 6 SUI items included in the SUPPR are check-out bags, cutlery, foodservice ware, stir sticks, straws, and ring carriers. Source: [Environment and Climate Change Canada](#).

<sup>22</sup> United Nations. [Canada is investing \\$183.1 million over five years, to reduce plastic waste and increase plastic circularity by developing and implementing regulatory measures, and conducting scientific research to inform policy-making](#). Accessed May 2023.

## APPENDIX E: Emerging Trends and Technologies

While there is significant urgency and complexity in developing better solutions for waste management, there are also emerging practices and technologies that are leading to rapid transformation in waste diversion. By embracing new opportunities, the Region can position itself as a leader in emissions reductions, clean technology and innovation, and sustainable resource development.

### 7.8 Regenerative Practices

An economy based on the principle of regeneration, is one that uses productive capabilities to not just reduce but will undo environmental harm, while also providing the products and services on which society depends.

Regenerative food production, which involves increased focus on continuous cover/zero tillage, the use of natural rather than synthetic soil amendments, and the increased precision in the application of fertilizers using techniques like slow/delayed released fertilizers can significantly reduce GHG emissions from food production by reducing the amounts of synthetic inputs and adding to soil health.

Regenerative practices are also being used in the development of textiles, construction materials, plastics, and consumer goods. For example, “Carbontech” is an emerging industrial sector that captures, transports, and converts different forms of “waste carbon” into a diverse array of valued products and services in a climate-beneficial way. Today, plastics are being made from carbon dioxide. Two companies, U.K.-based Eonic Technologies and Covestro, turn carbon dioxide into polyols, a major component of polyurethane. This material is used by Eonic to make car bumpers, building insulation, finishes and coatings, sneakers, and pillows, and by Covestro to make mattresses. A 2020 report from the nongovernmental organization Carbon180<sup>23</sup> assessed the total annual market opportunity in simply replacing existing materials with those that are derived from captured carbon dioxide (and are therefore regenerative) at US\$5.91 trillion globally.

### 7.9 Product and Packaging Design

Many products today are not designed to be recycled. One of the aims of EPR is to give producers an incentive to change product design for reuse as well as make it easier to recycle packaging and shift the responsibility to product manufacturers to recycle their own packaging and divert it from landfills. Design is one of the most important factors in improving recycling outcomes.

Labels on packaging that do not provide useful information make it difficult to know whether and how to recycle. Designing packaging to be made only from new, fossil-fuel based plastic suppresses end-markets for recycled plastics and removes incentives to invest in recycling infrastructure<sup>24</sup>. Canada’s new labelling framework will help to improve the design of packaging to make it more recyclable, make it more informative for Canadians, and contribute to more reliable end-markets for recycled plastic.

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<sup>23</sup> Carbon180. [A Review of Global and U.S. Total Available Markets for Carbontech](#). Accessed May 2023.

<sup>24</sup> Environment and Climate Change Canada. [Recycled content and labelling rules for plastics: Regulatory Framework Paper](#). Accessed May 2023.

## 7.10 Food Loss Prevention

Food losses are those that occur during primary processing, manufacturing, wholesaling, or during transportation from one stage to another. Losses can result from products that do not meet contracted specifications, inefficient inventory, spoilage due to inadequate temperature control in transport or storage, and other factors. Food loss can be avoided through strategies such as on-site processing, development of higher-value products from retrieved or converted food waste, developing web-based wholesale marketplaces for surplus food, improved packaging options, and advancing technologies that help track waste patterns. These solutions can help businesses reduce costs, save resource inputs, reduce waste management and disposal fees, and increase profits through efficiency.

## 7.11 Food Rescue

Food is an essential purchase for all Canadians. Despite high inflation and an escalating food insecurity crisis, 63% of the food being disposed of by Canadians is consumable.

Food rescue organizations are playing an increasingly important role in reducing or eliminating food waste from going into landfills to create a more efficient circular food value chain with more food going to families and less to landfills. Retailers are developing partnerships with food rescue organizations and organizations such as Loop and Second Harvest use apps to bring donors and recipients together. A series of apps have also launched to help restaurants and retailers sell products and meals reaching their expiry dates to consumers at a discount.

Farms supply retailers with produce but also donate excess crops or crops specifically grown for food rescue organizations, directly to food banks themselves (often at their own expense). In return, food rescue organizations often return non-edible food back to farms for compost or livestock feed.

## 7.12 Smart Bins

Artificial Intelligence is becoming more commonplace in waste management. One of the main benefits of using AI is better understanding patterns of waste production and consumption. For example, 'intelligent' waste bins can be used to notify waste management companies when they are full, which means that collection routes can be optimized, labour can be reduced, and fuel saved. New smart bins can also be used to sort waste at the point of disposal in high-traffic areas such as public facilities. Machine learning classifies the item by type of waste and directs it to its respective bin - recycling, organics, or waste. Smart bins can generate and report high-quality data for waste audits and generate dashboards that help monitor capacity, track diversion rates, identify trends, and assist in strategic planning. Finally, smart bins can display information to raise awareness and educate the public.

## 7.13 Waste Vehicle Technology

Waste collection vehicles can be equipped with systems that monitor the delivery of services and program participation as well as track waste diversion. Collection vehicles can also be equipped with Geographic Positioning Systems (GPS) and Radio-Frequency Identification (RFID) tag reading equipment and on-board weigh scales that gather detailed records of lift activities at specific locations.

Technology is helping to change the way waste is transported and systems are now used to monitor and improve fleet performance and minimize fuel consumption. AI data can also be used to adjust routes and provide service confirmation, when needed.

Traditional waste vehicles are fueled with diesel. However, municipalities are increasingly exploring alternative fuels in their fleets or encouraging transition through their waste collection contracts. Waste collection vehicles can use compressed natural gas, which can be generated at local processing facilities and generate lower GHG emissions. Vehicles can also be powered by electricity or hydrogen as part of a larger Green Fleet strategy.

### 7.14 Sorting Technology

At waste facilities, AI solutions scan waste and identify materials across many different categories or classes to increase sorting efficiency and accuracy. For materials recovery facilities, this can mean enhanced outputs, increased productivity, and reduced costs, as well as a rise in the number of valuable materials that are sent for recycling. AI solutions are now being used to differentiate between food-grade and non-food-grade plastics. This has the potential to increase the purity of recycled material to generate higher value products that can potentially increase markets or create new ones<sup>25</sup>.

Beyond the waste industry, all facilities that use raw materials or components to create a product must manage their waste. Patterns of waste may be hard to spot without significant data on facility processes. Current manual waste management strategies may work in theory but fail in practice or require too much additional labour to be feasible. New AI-powered tools can help facility managers effectively identify and manage sources of site waste. An optimized process not only improves waste management, but it may also save money, and help organizations meet corporate environment, social, and governance (ESG) commitments.

### 7.15 Energy Recovery

Energy recovery from waste is the conversion of non-recyclable waste materials into usable heat, electricity, or fuel through a variety of processes, including combustion, gasification, pyrolysis, anaerobic digestion and landfill gas recovery. These technologies decrease the volume of solid waste destined for landfills, and generate energy, reduce carbon emissions by offsetting the need for energy from fossil sources, and reduce methane generation from landfills<sup>26</sup>.

### 7.16 Consumer Demand

Informed consumer choices can potentially shape decisions made by producers both upstream and downstream in the product supply chain. There are opportunities to explore a range of future policy options across different orders of government, including tax breaks and subsidies, legally binding regulations, preventing greenwashing<sup>27</sup>, making circular options more convenient, and using eco-labels and measures targeting consumers to, for instance, enhance emotional attachment to products.

The European Union has already moved to put in place measures to make circular economy-friendly choices more attractive and convenient for consumers. For example, the European Commission's sustainable products initiative focuses on providing information through labelling and product passports,

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<sup>25</sup> Recycleye. [AI and Waste Recognition – Why It Works So Well](#). Accessed May 2023.

<sup>26</sup> United States Environmental Protection Agency. [Energy Recovery from the Combustion of Municipal Solid Waste \(MSW\)](#). Accessed May 2023.

<sup>27</sup> Investopedia defines greenwashing as the act of providing the public or investors with misleading or outright false information about the environmental impact of a company's products and operations.

and places product requirements focusing on durability and recyclability, among others. This initiative recognizes the key role of consumers in establishing a circular economy and is expected to enable an acceleration of circularity in the EU economy<sup>28</sup>.

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<sup>28</sup> European Union. [Enabling consumer choices for a circular economy](#). Accessed May 2023.

## APPENDIX F: Municipal Waste Program Changes

Across the Region, municipalities continue to evolve local waste, recycling, and organics programs. These advancements can offer lessons learned, highlight best practices, and offer insight into successful implementation strategies. Successful pilot programs also have the potential to be expanded across the Region.

### 7.17 Increased Recycling and Organics Collection

Edmonton City Council approved a new Waste Bylaw (20363) in February 2023, which will enable the expansion of separate food scraps and recycling collection to communal households, defined as [...]. City Council approved this program for apartments and condominiums in April 2022, and the new bylaw is the next step in bringing the service to 167,000 residences across almost 3,400 properties—a process that will take place between the fall of 2023 and 2027. Property owners, property managers, and Condo Boards are being asked to enable and ensure compliance with the bylaw at their properties, and to help residents learn to sort their waste using the information the City will develop and distribute.

### 7.18 Design and Construction Standards

To support the new organics collections program for condos and apartments, the City of Edmonton is creating new developer standards for communal properties. Waste Services released a Waste Storage Guideline to help developers in the early stages of their planning and to provide opportunity for feedback from internal and external stakeholders. Waste Services is also building a calculator, which will be hosted in the City of Edmonton website. The calculator is meant to provide a high-level estimate of the area a developer needs for a waste storage room, based on the number of units in a property. The idea is to provide more user friendly and clear tools to help developers understand the basic requirements for a waste storage room and why the requirements are important to meet.

Changes to the standards are expected to be controversial as waste rooms in mixed use buildings have historically been seen as obstacles to making additional revenue for properties. An engagement process was completed to better understand the needs of developers, but also to educate and collaborate with developers to find reasonable solutions which allow for safe and efficient waste collection.

### 7.19 Waste Processing Capacity

On March 31, 2023, the City of Edmonton posted a Request for Proposal (RFP) for waste-to-energy services. High-level details of the RFP included:

- The Contractor is responsible for building, owning, maintaining, and operating a facility capable of converting waste-to-energy.
- The facility is to be built within 40km (one way) of the Edmonton Waste Management Centre.
- Contractors can bid for any amount of waste up to 150,000 tonnes/year.
- The base term is 10 years of operations starting in 2027, but the Contractor can provide alternate pricing for 15 or 20 years for consideration of a longer contract (to be selected at the City of Edmonton's discretion).
- The City of Edmonton will pay a tipping fee in exchange for diversion services. All attributes relating to the waste-to-energy process (electricity/fuel, heat, beneficial byproducts, carbon credits, etc.) will be solely owned by the Contractor.



All member municipalities were invited to participate in this project. It was noted that this project represented a solution to only one portion of the City of Edmonton’s waste diversion goals, and they confirmed ongoing interest in collaborating with additional initiatives being considered across the Region.

Interest in waste processing capacity has also been expressed by other municipalities across the Region. Last year, the City of Leduc posted a Request for Information (RFI) on Alternative Technologies, which closed on July 28, 2022. The City St. Albert is currently exploring alternative organics processing options. Sturgeon County also has a project underway to assess different waste processing technologies.

## 7.20 Artificial Intelligence Pilot

The City of Leduc will be partnering with Prairie Robotics in a pilot that uses AI technology to implement a Cart Smart program. The program uses camera and GPS technology that detects contaminants in the green cart (organics) through imaging once items are collected into the hopper of the collection truck. After detection, residents with unacceptable items in their green cart will receive an “OOPS” mailer, to inform them that their green cart was contaminated. This information can be gathered and analyzed to develop education programs for the most problematic materials and areas.

The City is hoping to see a 50% reduction in contamination by making residents aware of their behaviour. Over time, reduced contamination can result in lower collection and processing costs, and cleaner recovered commodities. Evaluation of this pilot will also support the feasibility of greater expansion of this program across the Region.

## 7.21 Collection Contracts

As many municipalities have been extending existing waste collection contracts to prepare for the transition to EPR, the Region can share best practices amongst member municipalities regarding contract terms and conditions such as reporting requirements, service levels, fuel/energy types, and technology that will ultimately give the Region’s residents best and added value - economically and environmentally - under future collection contracts.

## 7.22 Alternate Funding Options

As the cost of waste management services increases, some municipalities are investigating user-fee models to lessen tax increases and further incentivize waste diversion. New funding or revenue sources may be required for some municipalities to implement the actions needed to achieve stated diversion targets.

User-fee models are consistent with other municipalities and waste programs across Canada. For example, the Region of Peel Waste Management program is developing a financial plan that considers a volume-based user fee to incentivize waste diversion and lessen tax increases. Results of engagement efforts with residents in the Region have signaled willingness to play a role in progress towards greater environmental responsibility.

Municipalities may also be considering revenue-generating opportunities, such as the sale of waste byproducts like compost and renewable natural gas. Asset optimization and/or divestment may also have implications for the service costs, including the expected life of assets, expected total life-cycle costs, and value realized within waste processing facilities, other infrastructure, and fleet assets.