# A Great Lakes Circular Economy Strategy & Action Plan For Plastics

FORGING A FUTURE WITHOUT PLASTIC PACKAGING WASTE & POLLUTION

Circular Great Lakes

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AN INITIATIVE OF: CGLR COUNCIL OF THE GREAT LAKES REGION

# Acknowledgment

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# Contents



*TORONTO, ONTARIO*


*CHICAGO, ILLINOIS*

# Introduction

Plastics touch every aspect of our economy and daily lives, from consumer goods such as food and beverage containers, to a wide array of household products. It is a versatile, lightweight material, designed for durability, affordability, and sustainability. However, for all of its unique properties and socio-economic and environmental benefits, we are not capturing the full value of this vital material around the world and in the bi-national Great Lakes region.

For example, as a result of outdated and inefficient resource recovery systems across the bi-national Great Lakes region, an overwhelming majority of valuable materials that we use is sent to landfills. In fact, as we see nationally in the United States and Canada, we are only recycling about 18% of plastics in the region. Similarly, as seen in waterways around the world and in our oceans, an alarming and growing amount of plastic litter is leaking into our environment and the Great Lakes, the largest freshwater system on the planet. This is creating a new pollution problem that is impacting wildlife and the drinking water for some 40 million Americans and Canadians.

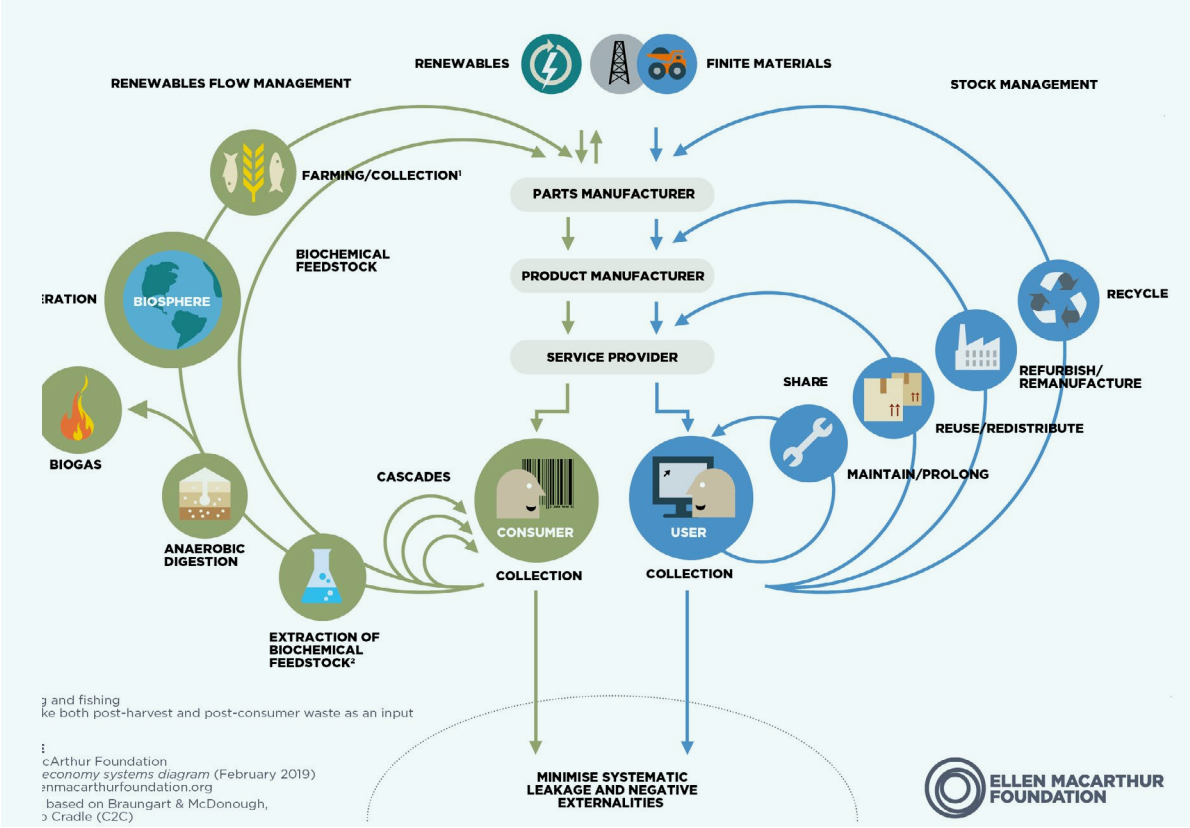
The sustainable management of materials is key for shifting to a circular economy in the bi-national Great Lakes region. Closing the loop and forging a future without plastic packaging waste and pollution in the region, however, will not be an easy undertaking. The challenges ahead and the systems change needed are sizable. Too many households in the region still do not have access to the full range of plastics recycling, at their curb or another convenient location. Plastics recycling rules differ from jurisdiction to jurisdiction, with materials management policies in many places in the region favoring low-cost landfilling and a throw-away economy instead of resource recovery and reuse. The region's recycling infrastructure is aging, was designed for a simpler waste stream, and lacks investment and advancements in technology. But, all of these obstacles and others can be overcome. Increasing our plastics recovery and recycling rates is a key component of achieving a circular economy and is the focus of this strategy and action plan.

Circular Great Lakes was formed by the Council of the Great Lakes Region in 2021 with a simple goal in mind: bring stakeholders from across different domains and borders together to foster the collective priorities, actions, and investments necessary for realizing a zero-plastic waste future in the region within the next decade. Organized on a regional, bi-national scale, and taking advantage of long-standing commercial connections between the United States and Canada as well as corporate carbon reduction, sustainability, and purchasing strategies, the Great Lakes circular economy strategy and action plan for plastics outlined in this document provides the framework for eliminating plastic packaging waste and litter in the bi-national Great Lakes region.

## WHAT IS A CIRCULAR ECONOMY?

Valuable materials are being lost to landfills. Worse, this material, mostly plastic, is leaking into our environment in the form of public litter and from other industrial and municipal sources and pathways. The circular economy is a model for moving beyond traditional industrial processes and a way of life founded on the endless consumption and disposal of finite resources. A common global definition of a circular economy put forward by the Ellen MacArthur Foundation is the following:

> *"A systems solution framework that tackles global challenges like climate change, biodiversity loss, waste, and pollution. It is based on three principles, driven by design: eliminate waste and pollution, circulate products and materials (at their highest value), and regenerate nature. It is underpinned by a transition to renewable energy and materials. Transitioning to a circular economy entails decoupling economic activity from the consumption of finite resources. This represents a systemic shift that builds long-term resilience, generates business and economic opportunities, and provides environmental and societal benefits."*




Closer to the bi-national Great Lakes region, the Save of Our Seas 2.0 Act[1], passed by the United States Congress and became public law in 2020, defines the circular economy as an economy that uses a systems-focused approach and involves industrial processes and economic activities that are restorative or regenerative by design; enable resources used in such processes and activities to maintain their highest values for as long as possible; and, aim for the elimination of waste through the superior design of materials, products, and systems (including business models).

## WHY IS A CIRCULAR ECONOMY FOR PLASTICS IMPORTANT FOR THE BI-NATIONAL GREAT LAKES REGION?

The bi-national Great Lakes region, shared by the United States and Canada and comprised of eight states from New York to Minnesota and the Canadian provinces of Ontario and Québec, is the engine of the North American economy, driving more than 50% of annual goods trade between the two countries and supporting some 51 million jobs, or roughly one-third of the combined American and Canadian workforce. In fact, with an estimated GDP of US$6 trillion (CA$7.8 trillion), if this mega-region, home to 107 million people, were a country, it would equal the third largest economy in the world.

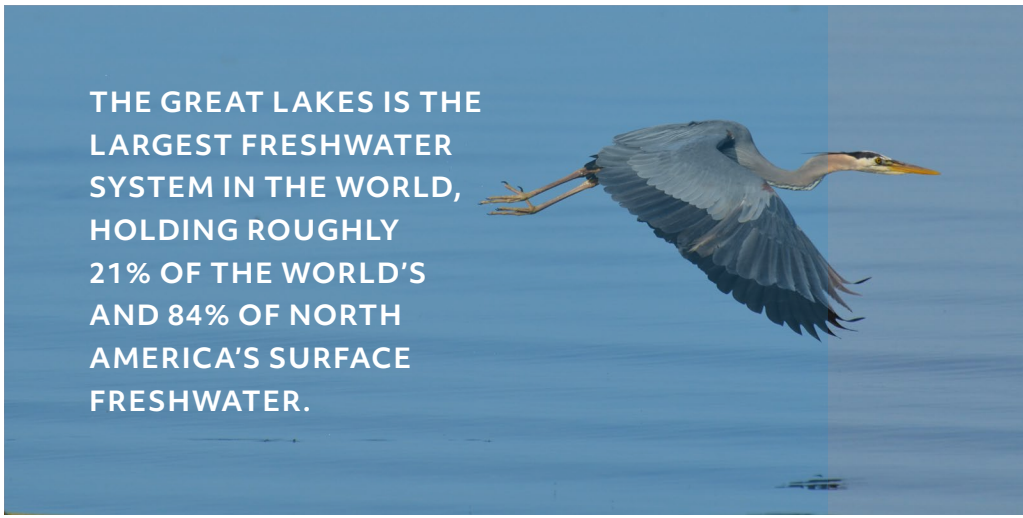
Because of the region's population size, it would the 12th largest nation in the world by population if it were a country. As a result of its large industrial base, the Great Lakes plastics industry is a key element of the regional and North American economy. For example, the export and import of plastic resins and products from the U.S. Great Lakes states to Canada, and from Ontario and Québec to the eight Great Lakes states totaled US$6.8 billion (CA$8.8 billion) in 2020. The U.S. and Canadian plastics industry in the region is also a big employer, employing over 270,000 people in 2020 on both sides of the border.

At the heart of the regional economy are the five Great Lakes, the largest freshwater system in the world, holding roughly 21% of the world's and 84% of North America's surface freshwater. With over 10,000 square miles (16,000 kilometers) of shoreline, the Great Lakes, an inland sea, are a globally significant natural resource that sustain life for thousands of species and provide a source of clean drinking water and recreational opportunities for millions of Americans and Canadians. Due to the Great Lakes Water Quality Agreement, the health of the Great Lakes has improved over the last 50 years, and in some specific areas, such as designated Areas of Concern, the restoration of these sites has been dramatic. However, as we recognize these achievements, old challenges persist and new ones have emerged that require the region to remain focused on working together to protect this global commons, such as climate change, urban sprawl, industrial and agricultural pollution, and habitat loss.

Plastic waste and litter, as an example, have become a major environmental problem and concern in the Great Lakes. The US Chamber of Commerce Foundation estimates that 81% of the Great Lakes region's post-consumer waste is lost to landfills[2], including valuable plastics materials. Furthermore, a study by the Rochester Institute of Technology showed that an estimated 22 million pounds of plastic could be entering the Great Lakes every year[3], while other studies have shown concentrations of microplastics reaching levels as high as 1.25 million particles/km2, levels that are on par with what is found in the ocean's garbage patches[4].

Cleaning up the region's plastic litter and pollution problem is costly, with studies estimating it could cost in the order of US$400 million (CA$518 million) annually to combat and curtail the sources and pathways of plastics entering the environment, from increasing the frequency and impact of beach and waterway cleanups and public anti-littering campaigns, to the installation of other innovative open water and catch basin capture devices. However, it is widely recognized that cleaning up plastic material in the environment and in the Great Lakes, while necessary, is not a long-term solution. The bi-national Great Lakes region must stop valuable plastics from becoming waste and litter in the first place, and ultimately pollution; the region must close the loop.

The environmental imperative of closing the loop is clear, especially in terms of preventing marine litter (UN SDG 14), building sustainable cities and communities (UN SDG 11), and the responsible production and consumption of materials (UN SDG 12). The socio-economic benefits are equally compelling, as global projections show that shifting from a linear to a circular economy for plastics could be worth hundreds of billions per annum thanks to the creation of new jobs and businesses, operational savings, new product innovations as well as increased product sales and enhanced returns, or from investments in infrastructure. The same plastics circular economy benefits could be realized in bi-national Great Lakes Region too. In fact, increased collection, processing, and manufacturing of recycled plastics in the region alone could yield the opportunity to create more than 100,000 direct new jobs[5], with an equal or greater number of indirect and induced jobs generated in the businesses that supply goods and services to the recycling sector or by changes in consumer behaviors.



## ABOUT THE CIRCULAR GREAT LAKES INITIATIVE

Shifting to and realizing the full socioeconomic and environmental benefits of a plastics circular economy is a monumental task facing the world, all nations, and the bi-national Great Lakes region. Like elsewhere, no one level of government or sector in the region has the sole power, knowledge, and/or investment dollars required to achieve the system level changes necessary to create a regional and cross-border circular economy and a zero-plastic waste future.

Consistent with the marine debris prevention priorities outlined in the Environmental Chapter of the new United States-Mexico-Canada trade agreement, the circular economy and recycling ambitions identified in the US Environmental Protection Agency's National Recycling Strategy (2021)[5] and the Canadian Council of Ministers of the Environment's Strategy on Zero Plastic Waste (2018),[6] and the Council of the Great Lakes Region's (CGLR) commitment in the National Oceanic and Atmospheric Administration's Great Lakes Marine Debris Action Plan to develop a strategic plan to advance a circular economy and resource efficiency in the Great Lakes region, the CGLR formed the Circular Great Lakes collaborative in March 2021.

With support from over 20 key actors from business, government, academia, and the non-profit sector, the Circular Great Lakes initiative guided by a fact-based gap analysis conducted by RRS for the CGLR, seeks to seed and accelerate the transition to a circular economy for plastics across this deeply integrated economic region, from New York to Minnesota and across the border with the Canadian provinces of Ontario and Québec.

The five-year strategy and action plan proposed in this document sets out a framework for the targeted cleanup, plastics collection, processing, end-markets, policy, and consumer actions that, when implemented will drive the bi-national Great Lakes region's move toward circularity, in partnership with other like-minded endeavors, notably the Alliance to End Plastic Waste and the United States and Canada Plastics Pacts as part of the Ellen MacArthur Foundation's Global Plastics Pact Network.

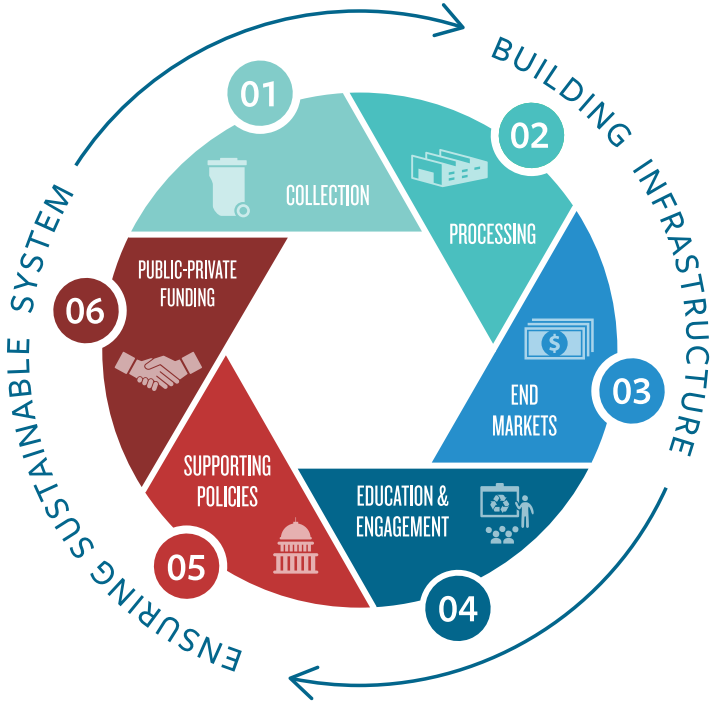
By working together, the bi-national Great Lakes region can: eliminate land-based plastic packaging litter; increase plastic packaging recycling rates and the supply of recycled plastics feedstocks to meet recycled content targets; reduce GHG emissions; and, attract new job-creating circular economy end-markets and manufacturing opportunities. By working together, a future without plastic packaging waste and pollution in the region is within our reach.

PART ONE

# The Gap Analysis And Key Findings – Where Does The Region Stand Today?

Plastics dominate today's post-consumer packaging, and the demand for high-performance plastics is expected to grow – significantly. However, unlike other materials, such as paper and glass, only a very small portion of the plastics that we use in our economy is being collected and repurposed. The scale of the problem in the bi-national Great Lakes region, where 82%, or 12.8 million tons of recyclable plastics, rigids, and flexible materials are being wasted and lost in the regional economy is enormous. We are throwing out US$1.7 billion (CA$2.1 billion) worth of valuable and reusable plastics every year.

In order to understand the flow and management of valuable plastic materials in the bi-national Great Lakes region, the region's performance in six key areas of best practice was assessed – collection, processing, end markets, education and engagement, supporting policies, and public-private funding, as these are the basis of high performing material recovery system as well as the foundation of a successful and stable circular economy.

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# Key Findings

## WHERE DO WE STAND?

### COLLECTION

- Lack of consistent automatic curbside with roll carts in communities.
- Lack of access to drop-offs in communities.
- Need to expand the streams that are collected to pull valuable materials from the landfill and environment.
- Emerging plastic packaging items are not widely collected.
- Processing and reclamation gaps limit collection of resins with known end markets.
- Uncertain if collection programs are achieving economies of scale to capture effectively for market.

### PROCESSING

- Processing of plastic resins varies across the region and at the community level.
- A number of material recovery facilities (MRFs) are not equipped to sort emerging plastic packaging due to aging equipment, lack of investment, and insufficient economies of scale.
- Emerging plastic packaging is identified as contaminants.
- Large percentage of the opportunity stream is flexible packaging plastics (FPP).
- 14% of the municipal solid waste stream being landfilled is made up of rigid and film plastic.
- Region home to first North American MRF to pilot scalable solution for recycling flexible plastic packaging from curbside MaterialsRecoveryfortheFuture.com
- Lack formal, wide-spread models for reuse and repair.

### END MARKETS

- Established domestic regional markets for core recyclables.
- Visual identification of emerging packages is difficult and inaccurate.
- Look-alike issues are common during sorting, reclamation and end market manufacturing that trigger bale rejections.
- Lack of information transparency and tracking creates waste.
- Tracking of plastic with tracers, digital watermarks, and open sharing of composition data could increase supply and quality of recycled plastic for manufacturing by 2-4x.
- Plastic is a high performing material substitute for many virgin materials used in building products.

# Key Findings

## WHERE DO WE STAND?

### EDUCATION & ENGAGEMENT

- Need consumer and government engagement programs with regularly updated information about the state of play in the region and its communities.
- Average community budget for education spend in the states was $45,239, or $0.80 per household. High performing community budgets spend at least $2 per household, and have clear campaigns and messages to influence behavior.
- Individual state, US National, and Canadian education programs, recognition, and affiliates could be better utilized.
- Collaborative partnerships to help with education, such as The Recycling Partnership, are growing.

### SUPPORTING POLICIES

- Supportive State policy and local ordinances in community programs boosts program investment and recovery, one example is mandatory recycling ordinances. Ordinances vary and occur at community level.
- 2 States have bottle bills, Michigan and New York. The average amount of PET recycled (on a pounds per capita basis) in bottle bill states is over 3.5x greater than in non-bottle bill states.
- Ontario and Quebec have active EPR legislation for packaging. New York has a proposed EPR bill.
- Strategies for managing plastics waste and litter vary at the community level.
- Landfill bans and enforcement are proven to drive infrastructure modernization and investment (collection, processing, etc.).
- Enforcement of ordinances and recycling policies at community level varies throughout the bi-national Great Lakes region.
- Lack of end market access to supply drives decision to landfill lightweight, low value plastics that lack markets.

### PUBLIC-PRIVATE FUNDING

- 5 of the 10 states and provinces offer public and private sector grants for recycling infrastructure, projects, and programs. 4 offer public sector only grants.
- There is private investment towards recycling infrastructure projects and programs in the Great Lakes Region.
- When municipal processing fees are leveraged with private sector investment, and commodity revenue funding, resources are multiplied.
- Region is home to NextCycle Michigan (NCMI), an innovative state program providing funding and technical support to accelerate private sector recycling supply chain development in the state.


GLEN ARBOR, MICHIGAN

PART TWO

# The Great Lakes Plastics Circular Economy Vision: A Future Without Plastic Packaging Waste And Pollution

*The bi-national Great Lakes region has reinvented itself time and again. As the United States and Canada, and the world, pursue a new economic model, one that thrives on the responsible production and consumption of materials, the region can lead the way in achieving a circular economy, starting with valuable plastics. It can be the agent of change for forging a future without plastic packaging waste and pollution.*

There are many aspects of a circular economy. The concepts behind it might seem novel and new. In reality, the fundamentals of a circular economy have been around for a long time. After all, the phrase REDUCE, REUSE, RECYCLE, now a global call-to-action, was introduced by Pollution Probe, Canada's oldest environment charity and a Circular Great Lakes Knowledge Partner, in the early 1970's.

What has changed over the last fifty years is the volume and type of valuable plastic products we make and use to meet our demands as consumers and industry—a business model that has pushed our natural systems and aging economic infrastructure to, and often beyond, their limits. The way in which materials like plastics flow through our cities and economy has also changed considerably as a result of globalized trade, supply networks, and outdated waste management practices.

Inspired by a mounting plastic pollution problem in the largest freshwater system in the world and a failing material waste management system for plastics, the Circular Great Lakes initiative is convening a diverse coalition of perspectives and interests in the bi-national Great Lakes region – companies, leading academics and nonprofit organizations, and federal, state/provincial and local government agencies – to take on these challenges together.

If the Circular Great Lakes initiative is successful at the end of this initial five-year strategy and action plan (which will be reviewed annually), the bi-national Great Lakes region will be on its way to forging a future without plastic packaging waste and pollution. The region is working collaboratively, across borders and sectors, to achieve a series of priority projects within three strategic pillars of action:

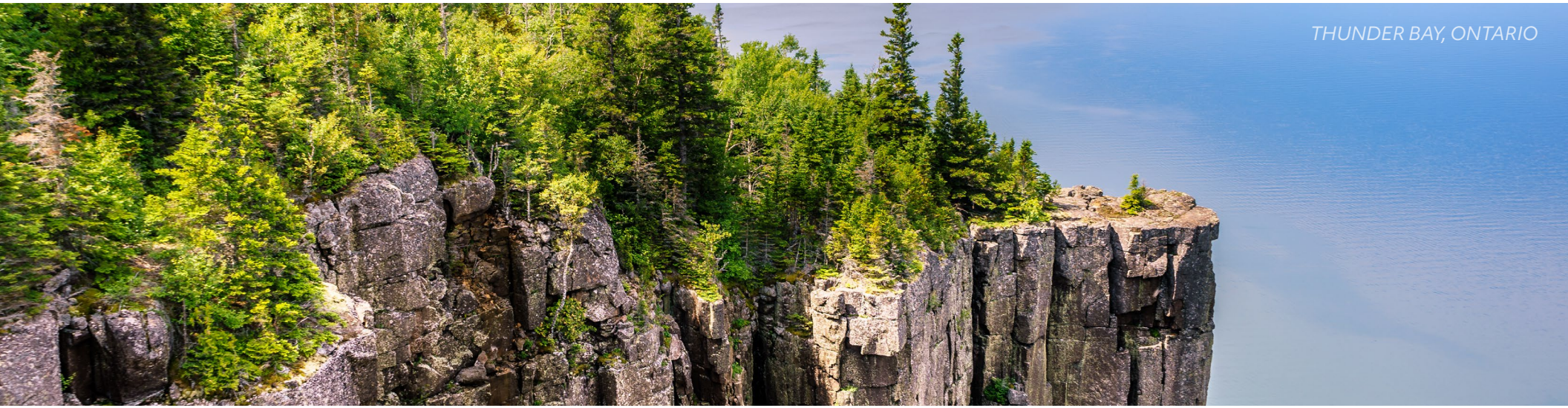
Cleaning up and stopping plastic litter from entering the Great Lakes and our environment through major sources and pathways, including by expanding of the joint Great Lakes Plastic Clean-up led by CGLR and Pollution Probe.

Capturing significantly more value from plastics packaging by co-investing in, and rapidly scaling, the recovery and processing of plastics, with a priority focus on flexible plastics packaging.

Facilitating a supply of high-quality plastics material by educating consumers and changing recycling behaviors, as well as by promoting and adopting sustainable materials management policies, advanced sorting technologies and new product design standards.

**THE PILLARS FORM THE BASIS FOR SEVERAL PRIORITY ACTIONS OVER THE NEXT FIVE YEARS. SUCCESS IS CONTINGENT UPON UPON COLLABORATION, AS WELL AS FUNDING.**

*GRAND HAVEN, MICHIGAN*


THUNDER BAY, ONTARIO

PART THREE

# A Five-Year Roadmap: Moving From Vision to Action

*Due its population size, economic interdependencies, and shared natural spaces and interests with respect to protecting the environment, the bi-national Great Lakes region, in many ways, resembles a country. By bringing together businesses within the plastics value chain, government decision-makers at all levels, leading researchers and centers of excellence, as well as nonprofit advocates and agents of change, we are united in our commitment to collaborate and act swiftly, as a region, to tackle a concerning plastic packaging waste and pollution problem, connecting both countries in a common effort to close the loop and form a circular economy.*

By joining forces through the Council of the Great Lakes Region and its Circular Great Lakes initiative, the bi-national Great Lakes region will: form innovative circular economy partnerships that overcome the complexities of solving the plastic packaging waste and pollution challenge facing the region; co-create, implement, and scale impactful plastics circular economy priorities and projects; and, mobilize public-corporate-philanthropic dollars and spur co-investment in order to accelerate the transition to a Great Lakes circular economy for plastics.

More important, at a time of economic revitalization across the bi-national Great Lakes region and building the region's future competitiveness and sustainability through the Circular Great Lakes initiative, we will use our know-how and influence to position the region at the leading edge of an emerging and quickly evolving circular economy for plastics, in North America and the world. This will ensure the Great Lakes can successfully compete for the new circular economy industries and jobs that are being created.

To begin, we need a starting point on the path to forging a Great Lakes circular economy for plastics and ending plastic packaging waste and pollution. Outlined on the pages that follow are our priority areas of focus and initial moves. As much as we must remain focused on achieving these priorities, we must also be adaptive in a rapidly changing operating environment so that we can learn and adjust accordingly.

PRIORITY ONE:

# Clean-up and End Plastics Litter and Pollution

80% of the litter washing up on the shores of the Great Lakes is plastic, and an estimated 30% of storm drain litter in the United States is plastic according to Keep America Beautiful's latest National Litter study. To highlight the plastic litter and pollution problem further, between 2015 and 2020 over 4.8 million plastic pieces were collected during volunteer beach and waterway clean-ups, with cigarette butts and plastic food and beverage containers being the most common item collected. Closer to manufacturing centers, pre-production plastic pellets that are used to make plastics products, known as nurdles, have also been found on the region's beaches as a result of industrial spills and a train derailment along the coastline of Lake Superior.

The impacts of plastic litter, especially microplastic pollution, in the Great Lakes are varied and unfortunately still not fully studied and understood. However, as found in marine environments in other parts of the world, we do know that fish and birds in the Great Lakes mistake small, broken-down plastics as food and ingest it, filling their guts; we know that birds can entangle themselves in this litter, such as fishing line. We acknowledge that continuously capturing and cleaning up plastic litter is not a long-term solution, but it is necessary if we are to protect the health of the Great Lakes today and for the foreseeable future.

Working with a diverse network of public, private, and nonprofit partners and funders, the Circular Great Lakes initiative will serve as a catalyst for supporting the study of plastic pollution sources, pathways and impacts, as well as the elimination of land-based plastic packaging and cigarette litter. This will be achieved, in part, by expanding the Great Lakes Plastics Cleanup launched by the Council of the Great Lakes Region and Pollution Probe in 2020.

# Priority One Action Plan: Clean Up and End Plastics Litter and Pollution

| OBJECTIVES | TOP TIER | STEPS |
|---|---|---|
| **Objective 1: Eliminate land-based plastic packaging litter from the Great Lakes** | **1.0** Establish consistent container deposit policies and programs in the bi-national Great Lakes region to encourage and reward consumers to return valuable plastic material. | **1.1** Conduct policy and program analysis to inform the development of a regional framework. |
| | | **1.2** Form working group to review analysis and provide recommendations for consistent implementation across the Great Lakes region. |
| | | **1.3** Develop collateral to show government and legislative leaders the environmental and circular economy benefits of better return and collection programs for consumers. |
| | **2.0** Improve and widen consumer education and awareness interventions across the region to improve end-of-life management for different plastic streams. | **2.1** Build awareness by developing and launching regional consumer education campaigns: Great Lakes Litter Prevention Campaign and Don't Waste Campaign. Use consistent messaging using positive norms – clean environment, beautification, etc. |
| | | **2.2** Deepen understanding of plastic impact to environment by establishing an industry sponsored Plastic Litter Research Fund. |
| | | **2.3** Form a Great Lakes Circular Economy Institute to develop a curriculum and training program to educate policymakers/lawmakers, businesses, and other public institutions about circular economy best practices, starting with plastics. |
| | | **2.4** Form a Great Lakes Greening Government Collaborative to advance circular procurement practices and targets at state/provincial and local level. |
| | **3.0** Enhance collection at away from home spaces, such as beaches and marinas. | **3.1** Convene a bi-national stakeholder advisory group representing public and private parks to identify barriers and/or overcome collection and diversion issues. |
| | | **3.2** Facilitate and spur co-investment in education, involvement, and infrastructure between public and private stakeholders. |
| | | **3.3** Work with public works departments, park systems, and managers of publicly accessible spaces in the region to install recycling receptacles for right-sized service (enhance away from home collection programs). |
| **Objective 2: Eliminate land-based cigarette butt litter from the Great Lakes** | **1.0** Raise awareness and develop programs to eliminate cigarette butt litter at beaches, parks, docks and harbors. | **1.1** Form working group of key value chain members to participate in ongoing beach cleanups with further analysis of data and brands. |
| | | **1.2** Conduct consumer educational campaign with respect to cigarette butt litter. |
| | | **1.3** Develop collection strategies and provide support to install and publicize capture equipment. |

PRIORITY TWO:

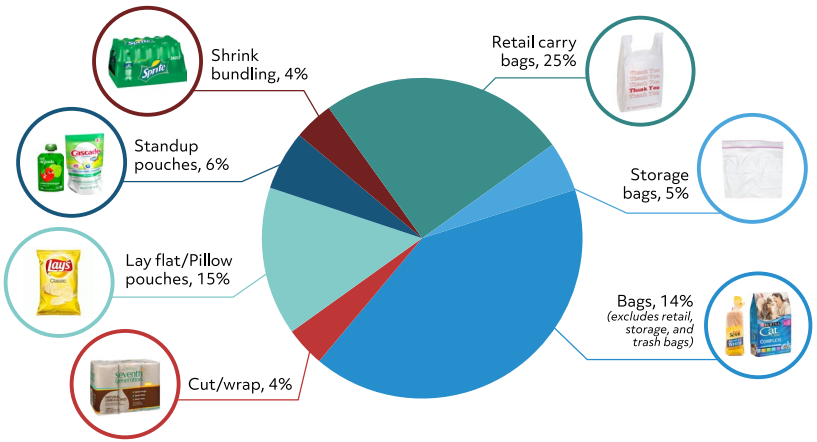
# Accelerate Development of Great Lakes Flexible Plastic Packaging Recycling Supply Chains and Markets

In the bi-national Great Lakes region, over three-quarters of the region's core plastic packaging and emerging plastics packaging is lost to landfills. The low per capita recovery rate for this material is driven in part by uneven access to curbside and drop-off collection programs. The ability to recover these resins is also diminished by a lack of capacity to process prevalent emerging plastics into high quality, high quantity commodity bales.

Despite the fact that there are over 200 material recovery facilities (MRFs) in the region that process core recyclables, most are unable to sort today's light weight plastic packaging formats due to aging equipment and insufficient economies of scale to supply this as post consumer recycled (PCR) feedstock for end markets. As a result, large quantities of post-consumer flexible plastic packaging (FPP) is landfilled every year. Approximately 12 billion pounds of FPP is generated in the United States annually, twice the size of the PET bottle market (Flexible Packaging Association study, 2013).

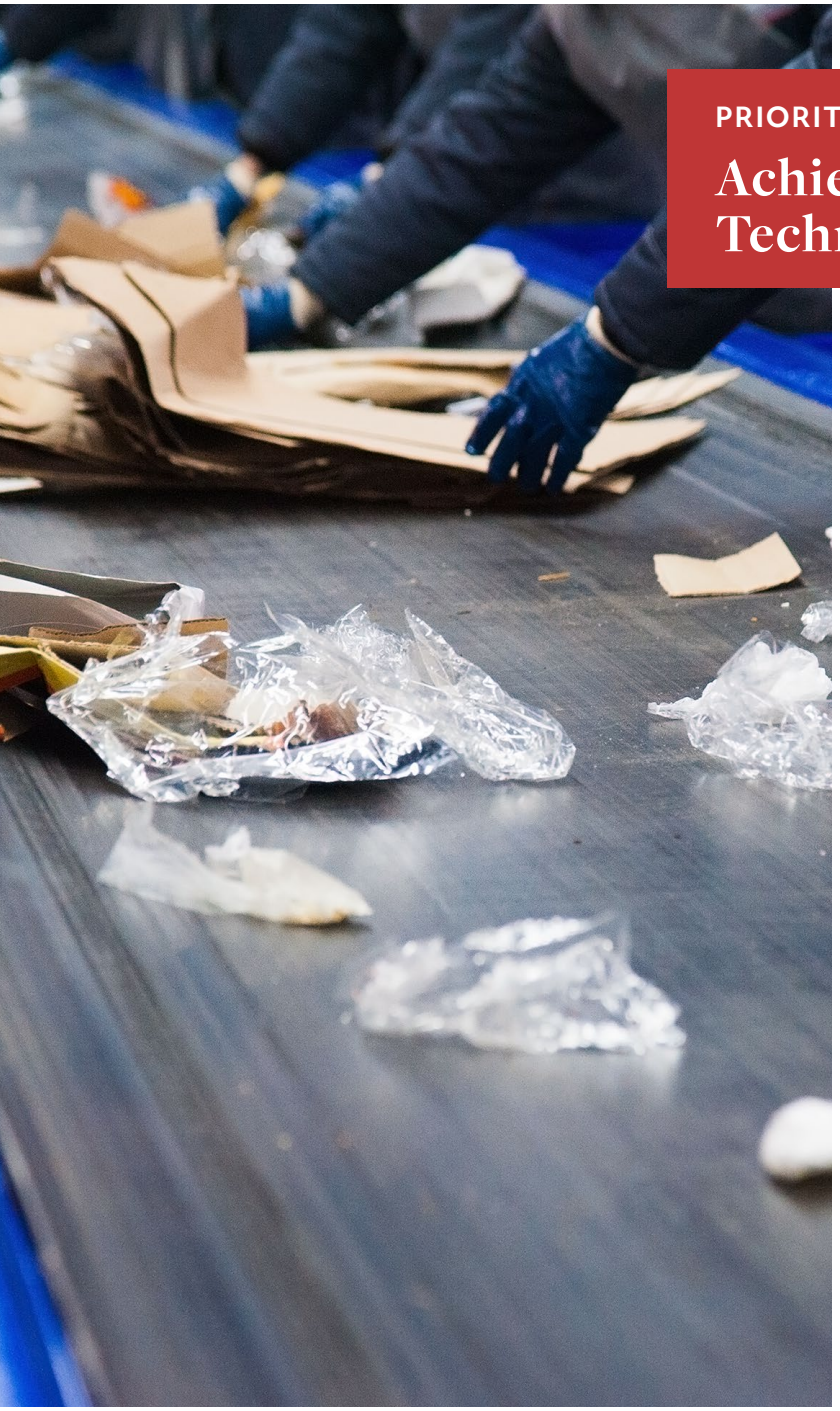
Brands need more PCR to deliver on their recycled content goals. The bi-national Great Lakes region, the most densely populated and biggest manufacturing region in the world, generates a large FPP waste stream representing a significant opportunity. The Circular Great Lakes initiative, first focusing on improving and increasing collection, sorting, and processing for end market uptake, will work with partners to optimize the Great Lakes materials management and recovery system in four key opportunity zones for recycling – Pennsylvania-New York-Quebec, Michigan-Ontario-Ohio-Indiana, Illinois-Wisconsin-Minnesota, and Northern Minnesota-Northern Ontario.

## Flexible Plastic Packaging By Industry



# Priority Two Action Plan: Accelerate Development of Great Lakes Flexible Plastic Packaging Recycling Supply Chains and Markets

| OBJECTIVES | TOP TIER | STEPS |
|---|---|---|
| **Objective 1: Scale MRF processing and expand end market capacity** | **1.0** Scale Materials Recovery for the Future (MRFF) flexible packaging sortation and end market learnings to four large hub-and-spoke MRFs. | **1.1** Stakeholder Analysis – Identify large MRFs and communities served that are candidates for upgrades or new build investment. |
| | | **1.2** Supply Chain Engagement – Enter into discussions with targeted MRF operators, reclaimers, end markets and other co-investors to provide equipment grant funds necessary to add MRF sorting capacity. |
| | **2.0** Support development of priority end markets that have proven acceptance of PCR flexible packaging for product lines. | **2.1** Co-invest in two additional PCR building material plants, tripling regional end market capacity to make PCR products from flexibles. |
| | | **2.2** Pilot emerging recycling technologies and reclamation wash lines to unlock reprocessing polyolefins into higher value products. |
| **Objective 2: Increase post-consumer supply of flexibles collected** | **1.0** Improve collection in Great Lakes supply sheds targeting identified gaps and barriers to ensure convenient collection is available. | **1.1** Identify and assist 5 entities lacking residential universal curbside collection with lidded carts to implement a program. Also increase overall recovery of other resins and recyclables in single stream (paper, cardboard, aluminum, glass). |
| | | **1.2** Identify and assist 5 entities to expand collection to multi-family and other underserved populations. |
| | | **1.3** Identify rural regions not well served by MRF infrastructure and develop hub and spoke collection. |
| | **2.0** Promote household access to bagged or separate collection programs for smaller MRFs and communities (Hefty Energy Bag, SC Johnson, IRG PRF initiative). | **2.1** Engage bagged plastic packaging collection stakeholders to join the Circular Great Lakes initiative and identify smaller communities for implementing more bagged programs. |
| | | **2.2** Track, evaluate and promote results of programs accordingly. |
| | **3.0** Collect post-consumer film packaging on 10 Great Lakes higher education campuses for recycling. | **3.1** Target clean, easy to collect supply of films from multi-unit residential and other commercial buildings on campuses. |
| | | **3.2** Promote expanded drop-off to viscerally engage key stakeholders and consumers in film recycling. |
| | | **3.3** Implement Circular Great Lakes Universities Plastics Film and Packaging Recycling Challenge. |



PRIORITY THREE:

# Achieve a Step Change in Plastics Recycling with Technology, Policy, and Education

There is no shortage of valuable and reusable plastics in the bi-national Great Lakes region. For manufacturers, plastic helps get products to consumers safely and efficiently and is most often the lowest carbon footprint option compared to other materials. Yet, far too much plastic ends up in our regional landfills, in our environment, and in the Great Lakes. To overcome challenges in the system relating to the sustainable management of this vital material, technical innovation and new solutions for collecting and processing are needed. Of the region's 216 MRFs, 20%, a total of 42 facilities, have the required throughput and space, providing a starting point for retrofit projects right now. Focusing on demonstration projects and expanding adoption at these facilities will provide commercially viable technology-led solutions and the necessary 60% increase in processing that will be required to achieve a 50% recycling rate for plastics in the region.

Immediate improvements in plastics traceability, advanced MRF sorting, and new reclamation processes will all be required to overcome significant materials management barriers. Given the variety of polymers used in packaging, raising recycling rates in a single collection stream depends on solving the challenge of efficiently identifying and sorting different plastic resins, as well as simplifying the variety of packaging manufactured for brand owner use. Transforming the current process through the application of advanced technologies will supply better quality and quantities of recycled resin to meet (re)manufacturing demand, while delivering new jobs, and realizing landfill tip fee savings and GHG emission reduction benefits at the scale of local economies.

Additionally, supportive sustainable materials management, circular economy policies, private sector recycled content targets, procurement policies, private-public co-investments, and consumer education will all be needed to help drive a step-change in recovery, recycling, and reuse. As an example, there are a variety of policies that can be enacted to drive collection for recycled commodities. Policies, such as beverage container deposit laws and extended producer responsibility measures, can be highly successful at increasing collection volumes. On a per capita basis the average amount of PET recycled in bottle bill states is over 3.5 times greater than non-bottle bill states. Moreover, policies that establish and/or support recycling collection programs can drive the supply of recyclable materials and could help bring curbside access to 23% of communities in the region that don't have curbside access.

# Priority Three Action Plan: Achieve Step Change in Plastics Recycling with Technology, Policy, and Education

| OBJECTIVES | TOP TIER | STEPS |
|---|---|---|
| **Objective 1: De-risk management of plastic packaging by establishing transparent tracking and tracing of resins through the supply chain.** | **1.0** Evaluate recent application of disruptive technologies to collect, identify and sort packaging to plan pilot. | **1.1** Perform initial feasibility study, assessing vision systems, artificial intelligence, tracers, digital labels and information technologies. |
| | | **1.2** Select MRF partner for pilot project, reclamation and community collection partners and co-investors to design approach. |
| | | **1.3** Define equipment and system configuration specifications and establish pilot performance goals. |
| **Objective 2: Demonstrate efficient identification and sorting of different plastics packaging through integrated application of advanced technologies.** | **1.0** Conduct Pilot Project. | **1.1** Install artificial intelligence-enabled advanced MRF opticals and robotics. |
| | | **1.2** Iterate through system testing across nodes (MRF, reclaimer, community recycling ). |
| | | **1.3** Analyze detailed composition data and increase in throughput. |
| **Objective 3: Create open, rapid sharing of bale composition via transparent, cloud-based storage of information that is accessible to the supply chain, eliminating rejections of large quantities during reclamation while improving purity.** | **1.0** Develop cloud-based data platform module for pilot composition data. | **1.1** Evaluate IBM PRISM model or other methods for consolidating and sharing data on resins and contaminant levels. |
| | | **1.2** Form small work group to design module. |
| | | **1.3** Test and implement module. |

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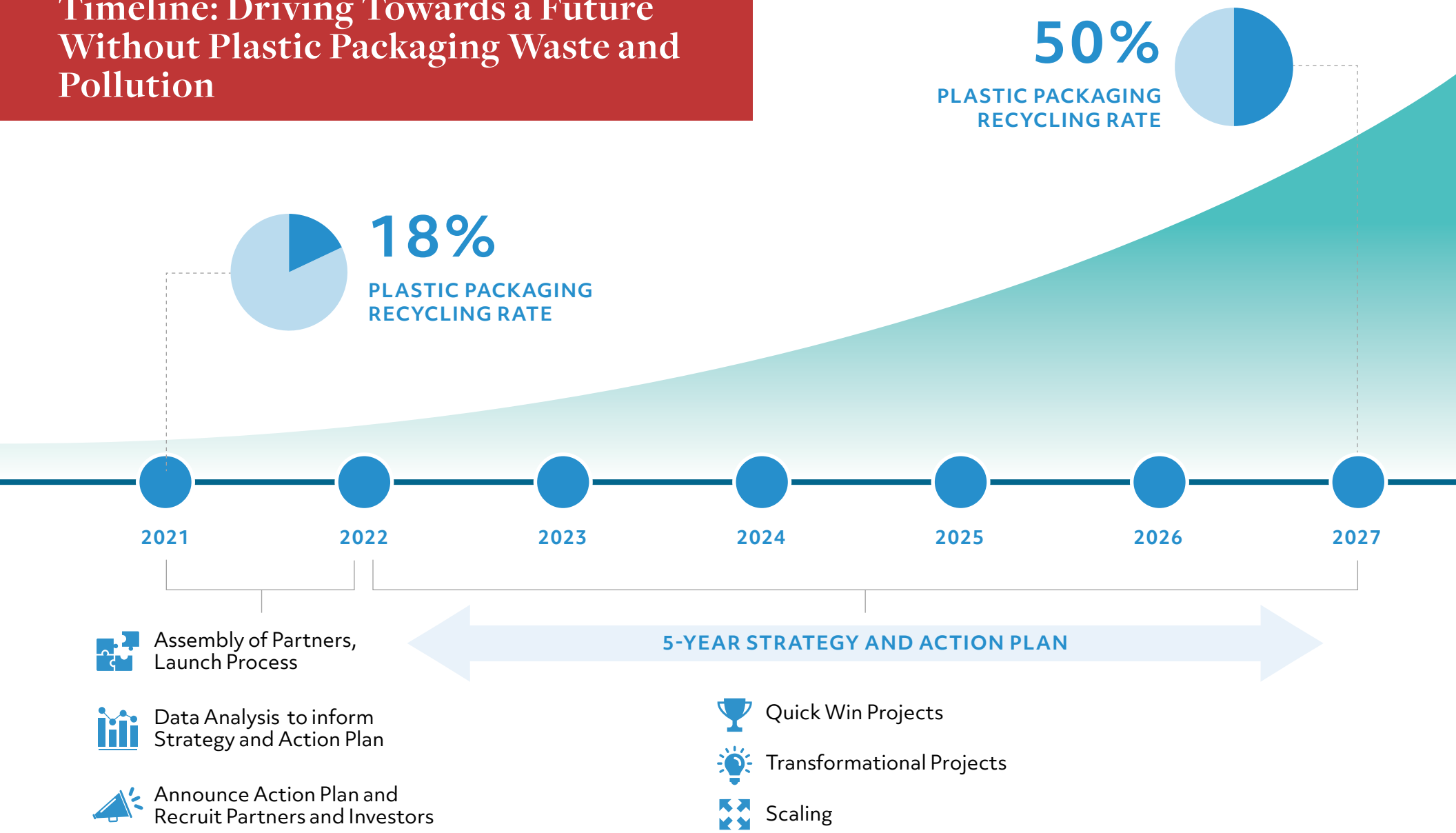
|---|---|---|
| **Objective 4: Conduct education and take policy action to increase recycling of prevalent plastic packaging.** | **1.0** Educate and advocate for policy action to expand plastic packaging collection through universal recycling in residential, multi-unit and commercial buildings across Great Lakes economic region. | **1.1** Policy Best Practices: Conduct program analysis to inform policy development framework for marketplace, balancing expansion with elimination of Canada and US Plastic Pact problematic packaging. |
| | | **1.2** Form State/Provincial Policy Workgroup to review analysis and framework, providing recommendations for consistent implementation across marketplace. |
| | | **1.3** Outreach: Develop report briefs and advocacy campaign for use with policy stakeholders. |
| | **2.0** Lead research efforts to influence policy change. | **2.1** Form a collaboration of education institutions, think tanks, and other research organizations to expand advocacy research. |
| | | **2.2** Use Circular Great Lakes platform as communication channel. |
| | **3.0** Build awareness of by-product synergies to enhance material marketplace exchanges across the region. | **3.1** Explore ways to promote by-product synergies in the bi-national Great Lakes region. |
| | | **3.2** Foster dialogue among groups (government to industry, industry to industry, etc.) sharing common objectives to break down barriers. |
| **Objective 5: Create scalable approach for balance of the marketplace.** | **1.0** Develop scaling roadmap. | **1.1** Publish external report on findings and value returned. |
| | | **1.2** Conduct roadmap for scaling with success factors, outreach campaign. |
| | | **1.3** Ongoing engagement to support scaling across the marketplace. |

# Timeline: Driving Towards a Future Without Plastic Packaging Waste and Pollution



# Next Steps And Call To Action

A circular economy, starting with valuable plastics, in the bi-national Great Lakes region is within our reach.

The strategic pillars and priority actions outlined above are ambitious, yet realistic, and will require all sectors and civil society to work together to close the loop for plastics and end plastic waste and pollution.

Following the release of this strategy and action plan, a series of working groups will be established to identify key projects and push them forward, with progress monitored and plans updated to reflect achievements.

Get involved as a corporate activation partner or a government, academic, or nonprofit knowledge partner, and help us build a resilient, robust recycling system and market for valuable plastics in the region.

Circular Great Lakes

VISIT CIRCULARGREATLAKES.ORG OR CONTACT MARK FISHER, PRESIDENT AND CEO, COUNCIL OF THE GREAT LAKES REGION AT MARK@COUNCILGREATLAKESREGION.ORG TO LEARN MORE.

# References


1 https://www.congress.gov/bill/116th-congress/senate-bill/1982/text/pl

2 https://www.uschamberfoundation.org/reports/creating-circular-economy-great-lakes-region

3 https://www.sciencedirect.com/science/article/abs/pii/S0025326X1630981X?via%3Dihub

4 https://www.frontiersin.org/articles/10.3389/fenvs.2017.00045/full

5 https://www.epa.gov/system/files/documents/2021-11/final-national-recycling-strategy.pdf

6 https://ccme.ca/en/res/strategyonzeroplasticwaste.pdf

# Glossary

**Container Deposit Policies/ Programs-** Also known as bottle bills, these programs require a minimum deposit be added to drink containers which is returned to consumers once the container is returned for disposal.

**Digital Watermarks-** A printed ID code placed on plastic packaging (usually visible using UV or near infrared light) for the easy identification of resin type or package type for the purposes of sortation and recovery.

**End-Market-** the final transaction in the life of a product. In the case of disposal and recycling, the end-market refers to the marketplace for materials recovered and grouped after a recovery and sorting process.

**Extended Producer Responsibility (EPR) Legislation-** a policy that puts the responsibility, financial or otherwise, on the producers of goods to properly recycle, treat, or dispose of said goods.

**Feedstock-** raw material to supply an industrial process. In this case, recovered plastic materials to supply post-consumer manufacturing.

**Flexible Plastic Packaging (FPP)-** a broad term to describe packaging made of thin plastic, this type of plastic is not typically accepted in curbside recycling programs.

**Landfill Bans-** a State/Provincial or local legislation that provides a restriction for the landfill disposal of certain items. Its purpose is to encourage harmful materials from entering the environment and encourage proper disposal of said materials.

**Material Recovery Facilities (MRFs)-** Facilities that sort single-stream recycled materials and prepare them in bales for end-market buyers.

**PET-** Polyethylene terephthalate, a plastic used commonly in bottles and containers, typically marked by a #1 inside the recycling "chasing arrows" insignia.

**Plastic Resins-** Polymers used or combined with other materials to create plastic products. The specific polymer type for plastic is represented by its chemical components (i.e.: PET = polyethylene terephthalate, HDPE = High Density Polyethylene.

**Post Consumer-** waste created from consumer goods once they have been used and disposed of. Post-consumer recycled materials are created from this waste stream and used to create new products.

**Roll Cart-** large Recycling receptacle ranging from 35 to 95 gallon size, with a flip top lid and two wheels.

**Streams (or Waste Streams)-** the flows of materials as they enter the recycling system. Single-streams contain all recycled materials in a commingled bunch while dual-streams or multi-streams are separated out by material.

**Tracers-** a method for improving accuracy of sorted recyclables. Additives included in a plastic resin or package during manufacturing help with product identification at a MRF or processing facilities. Identification can be done through mechanical or chemical processes depending on the added tracer.

**Virgin Materials-** unused raw materials that have not undergone any sort of processing.