RECYCLE BC: BEYOND THE BLUE BOX
A Virtual Tour of Successful EPR System Design

PREPARED FOR ZERO WASTE WASHINGTON
OCTOBER 27, 2020
TOGETHER, WE CAN MAKE A DIFFERENCE
HISTORICAL CONTEXT

MATERIALS

LOCAL GOVERNMENT

SORTING AND END MARKETS
SIZE AND SCOPE OF BC

944,735 km²
364,764 mi²

71,362 mi²    Washington
98,466 mi²    Oregon
163,696 mi²   California
333,524 mi²
CURRENT CONTEXT

01 CHINA’S NATIONAL SWORD

02 SUPPLY AND DEMAND

03 LIMITING, STOCKPILING, LANDFILLING
"In fact, over the past decade, recycling levels have basically flatlined in Ontario. Even 30% of what we toss into our blue boxes ends up in landfills."
What we are hearing in the media:

<table>
<thead>
<tr>
<th>CITY</th>
<th>CHALLENGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lacombe, AB</td>
<td>Recycling cancelled</td>
</tr>
<tr>
<td>Calgary, AB</td>
<td>Landfill: (2k tonnes plastic)</td>
</tr>
<tr>
<td>Moose Jaw, SK</td>
<td>Reduced collection: plastic bags and clamshells</td>
</tr>
<tr>
<td>Saskatoon, SK</td>
<td>Reduced collection: plastic bags and coffee cups</td>
</tr>
<tr>
<td>Winnipeg, MB</td>
<td>Reduced collection: Polystyrene</td>
</tr>
<tr>
<td>Brandon, MB</td>
<td>Reduced collection: clamshells</td>
</tr>
<tr>
<td>Sarnia, ON</td>
<td>Landfill: 40% of recycling</td>
</tr>
<tr>
<td>Toronto, ON</td>
<td>Reduced collection: stand up pouches</td>
</tr>
<tr>
<td>Montreal, QC</td>
<td>Recycling plant closures</td>
</tr>
<tr>
<td>St. John, NB</td>
<td>No curbside, only unmanned depots</td>
</tr>
<tr>
<td>Halifax, NS</td>
<td>Landfill: film plastics</td>
</tr>
</tbody>
</table>
Recycle BC is a not-for-profit organization responsible for residential packaging and paper recycling throughout British Columbia.

Recycle BC ensures household materials are collected, sorted and responsibly recycled.

Our program is funded by 1,200 businesses that include retailers, manufacturers and restaurants that supply packaging and paper products to BC residents, shifting costs away from homeowners.
REGULATION

Environmental Management Act
• Effective May 2014 – requires producers of packaging and paper products to assume responsibility for end of life management of their products

BC Recycling Regulation
• Outlines producer responsibility for a number of material categories
• Schedule 5 defines these responsibilities for producers of packaging and paper

Recycle BC
• Represents obligated organizations and fulfills their requirements under the Regulation
  • Provides collection services
  • Processes material
  • Markets material to end-markets
• Program Plan outlines how those requirements will be met
PROGRAM PERFORMANCE:
2019 Program Recovery Rate

- 237,582 tonnes reported by stewards, + 0.8%
- 207,411 gross tonnes collected, + 0.3%
- 185,692 net tonnes collected*, + 0.9%
- 40.5 KG net collected per capita, + 1.3%
- 78.2% recovery rate*, = %
## PROGRAM PERFORMANCE: 2019 Material Specific Recovery Rate

<table>
<thead>
<tr>
<th>MATERIAL CATEGORY</th>
<th>RECOVERY RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper</td>
<td>83%</td>
</tr>
<tr>
<td>Plastic</td>
<td>46%</td>
</tr>
<tr>
<td>Rigid Plastic</td>
<td>56%</td>
</tr>
<tr>
<td>Flexible Plastic</td>
<td>22%</td>
</tr>
<tr>
<td>Metal</td>
<td>73%</td>
</tr>
<tr>
<td>Glass</td>
<td>87%</td>
</tr>
</tbody>
</table>

RESULT

-3.0%  
+4.0%  
+2.0%  
+3.0%  
+6.0%  
+9.0%
2019 End of Life Reporting

- Increased tonnes of PPP managed by recycling year-over-year (+4%).
- Increased tonnes of material managed by engineered fuel.
- Decreased the tonnes managed by disposal by 14%.
- More than 90% of collected material was managed by recycling.
1,186 Members representing:
• Food and consumer goods brand owners and manufacturers
• First importers
• Retailers (grocery, general merchandise, convenience, drug)
• Financial institutions (banks, credit unions, insurance companies)
• Restaurants
• Magazine publishers
• Nurseries & garden centres

RECYCLE BC MEMBERS

Contributed $500 Million since inception

$121 Million in program financing for 2020
CANADIAN STEWARDSHIP SERVICES ALLIANCE
<table>
<thead>
<tr>
<th>Program</th>
<th>Launched Year</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RECYCLEBC</td>
<td>2014</td>
<td>100% financed and operated by businesses</td>
</tr>
<tr>
<td>Multi-Material Stewardship Western</td>
<td>2016</td>
<td>Businesses pay up to 75% of municipal costs</td>
</tr>
<tr>
<td>MMSM Multi-Material Stewardship Manitoba</td>
<td>2010</td>
<td>Businesses pay 80% of municipal costs</td>
</tr>
<tr>
<td>Blue Box Program</td>
<td>2004</td>
<td>Businesses pay 50% of municipal costs</td>
</tr>
<tr>
<td>MHSW (household hazardous or special waste)</td>
<td>2008</td>
<td>100% financed and operated by businesses</td>
</tr>
<tr>
<td>ORANGEDROP</td>
<td>2017</td>
<td>100% financed and operated by businesses</td>
</tr>
<tr>
<td>Automotive Materials Stewardship</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
CSSA GOALS

1. Consistent/harmonized regulatory frameworks for recycling programs

2. Maximizing recovery of post-consumer materials
   - Better environmental performance
   - Producers need access to the materials to attain their sustainability goals

3. 100% compliance with all stewardship obligations in all supported programs
CSSA CAPABILITIES

- Designs, implements and supports EPR programs across Canada
- Largest and most experienced compliance solution provider in North America
- Primary interface to 3000+ program member businesses
- Team members located in Toronto, Vancouver, Ottawa and Halifax
CSSA AND RECYCLE BC

Harmonize the front and back office processes to deliver efficient and cost-effective services

Business processes and systems designed to support complete supply chain

1. Board and corporate governance
2. Producer registration and reporting
3. Financial and audit services
4. Costing, fee setting, regulatory reporting and analytics
5. Information technology and systems management
6. Communications and stakeholder relations
7. Project management office
DESIGNED WITH INTENTION
DESIGNED WITH INTENTION

ENVIRONMENTAL OUTCOMES

MATERIALS
HOMES
DEPOTS
PARTNERSHIPS
TECHNOLOGY
SEGREGATED COLLECTION OF MATERIALS

- Curbside Paper Containers
- Multi-family Paper Containers
- Depot Hart Return
- PG Recycling and Return Centre
- London Drugs (soft plastic and foam only)
MATERIALS COLLECTED AT DEPOTS ONLY

- Glass (in some communities)
- Plastic Bags
- Foam Packaging
- Other Flexible Plastic Packaging
PARTNERSHIPS

- LOCAL GOVERNMENT AND FIRST NATIONS
- WASTE COMPANIES
- DEPOTS
- TRANSPORTERS
- RECEIVING FACILITIES
- POST-COLLECTION PARTNER
- PRODUCERS
TECHNOLOGY AND INNOVATION

RESEARCH AND DEVELOPMENT

DATA TRACKING AND MEASUREMENT

SORTING SOPHISTICATION
Q & A
BREAK
RECYCLE BC COLLECTION STREAMS

**CURBSIDE COLLECTION**
Collection from households that set out materials individually for pick-up

**MULTI-FAMILY COLLECTION**
Collection from a central location in residences with five or more units

**DEPOT COLLECTION**
Residents drop off their materials
COLLECTOR AGREEMENTS

CURBSIDE AND MULTI-FAMILY
- Collect standard list of materials weekly or biweekly
- Deliver material to designated facility
- Per household annual payment rate
- 3% contamination requirement
- Service level failure credits and bonuses

DEPOT
- Collect standard material list – all materials or only materials designated for depots
- Per tonne payment rate
PROVINCIAL ACCESS

- 98.6% of households have access to depots
- 176 communities benefitting/participating in program (includes curbside and multi-family)
- 1,854,681 households serviced (includes curbside, multi-family and depot collection)
- 4,587,000 population served (includes curbside, multi-family and depot collection)
## CURBSIDE COLLECTION RATES

<table>
<thead>
<tr>
<th>Service Area Density (Households/Hectare)</th>
<th>Incentive Rate ($/HH/Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group 1 - Single Stream collectors using automated carts – 4%</strong></td>
<td></td>
</tr>
<tr>
<td>&gt; 2 HH/Hectare</td>
<td>$33.40</td>
</tr>
<tr>
<td>0.2-2 HH/Hectare</td>
<td>$35.40</td>
</tr>
<tr>
<td>&lt; 0.2 HH/Hectare</td>
<td>$37.40</td>
</tr>
<tr>
<td><strong>Group 2 - Single Stream collectors using other container types – 8%</strong></td>
<td></td>
</tr>
<tr>
<td>&gt; 2 HH/Hectare</td>
<td>$34.50</td>
</tr>
<tr>
<td>0.2-2 HH/Hectare</td>
<td>$36.65</td>
</tr>
<tr>
<td>&lt; 0.2 HH/Hectare</td>
<td>$38.80</td>
</tr>
<tr>
<td><strong>Group 3 - Multi-Stream collectors – 10%</strong></td>
<td></td>
</tr>
<tr>
<td>&gt; 2 HH/Hectare</td>
<td>$38.45</td>
</tr>
<tr>
<td>0.2-2 HH/Hectare</td>
<td>$40.65</td>
</tr>
<tr>
<td>&lt; 0.2 HH/Hectare</td>
<td>$42.80</td>
</tr>
</tbody>
</table>
## MULTI-FAMILY COLLECTION RATES

<table>
<thead>
<tr>
<th>Multi-Family Collector Type</th>
<th>Incentive Rate ($/HH/Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Stream Collectors – 8%</td>
<td>$18.30</td>
</tr>
<tr>
<td>Multi-Stream Collectors – 10%</td>
<td>$21.90</td>
</tr>
</tbody>
</table>
## DEPOT COLLECTION RATES

<table>
<thead>
<tr>
<th>Material Grouping</th>
<th>Categories</th>
<th>Depot in a Community Without Curbside/MF Collection</th>
<th>Depot in a Community With Curbside/MF Collection</th>
<th>Additional Incentive if Baled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper and Cardboard</td>
<td>Cat 1/Cat 2/Cat 3b</td>
<td>$80</td>
<td>$60</td>
<td>$110</td>
</tr>
<tr>
<td></td>
<td>Cat 1,2,3b</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Containers</td>
<td>Cat 3a/Cat 6/Cat 7</td>
<td>$130</td>
<td>$90</td>
<td>$110</td>
</tr>
<tr>
<td></td>
<td>Cat 3a,6,7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plastic Bags</td>
<td>Cat 4</td>
<td>$500</td>
<td>$500</td>
<td>$330</td>
</tr>
<tr>
<td>White Foam</td>
<td>Cat 5</td>
<td>$800</td>
<td>$800</td>
<td>$330</td>
</tr>
<tr>
<td>Coloured Foam</td>
<td>Cat 5</td>
<td>$800</td>
<td>$800</td>
<td>$330</td>
</tr>
<tr>
<td>Glass Containers</td>
<td>Cat 8</td>
<td>$90</td>
<td>$90</td>
<td>n/a</td>
</tr>
<tr>
<td>Other Flexible Plastic Pkg</td>
<td>Cat 9</td>
<td>$500</td>
<td>$500</td>
<td>$330</td>
</tr>
</tbody>
</table>
Incompatible Material Includes:

- Not accepted materials
- Unsortable Material
- Contaminated PPP
- Hazardous Materials

Miss-sorted Materials

- Comingled Glass
- Plastic Bags and Overwrap
- Foam Packaging
- Other Flexible Plastic Packaging

_Contamination Rate refers to:_
Not Accepted Materials; any material that is _not_ In-Scope PPP
WHY IS REDUCING CONTAMINATION SO IMPORTANT?

• The health and safety of all those handling materials throughout the supply chain
• Mitigating potential damages to facilities and machinery
• Improves the quality of materials, allowing access to more North American end-markets
• Supports provincial understanding of recycling options
• Reduces program costs by removing out-of-scope materials
• Promotes environmental integrity
CONTAMINATION REMEDIATION PLAN

• Promotion and Education (P&E)
• Monitoring
• Training
• Enforcement
• Tracking
CONTAMINATION RATES 2019

Not Accepted Material by Channel

<table>
<thead>
<tr>
<th>Valuation Type</th>
<th>% Not Accepted Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>MULTIFAM</td>
<td>6%</td>
</tr>
<tr>
<td>CURBSIDE</td>
<td>4%</td>
</tr>
<tr>
<td>DEPOT</td>
<td>2%</td>
</tr>
</tbody>
</table>

Not Accepted Material by Stream

<table>
<thead>
<tr>
<th>Stream</th>
<th>% Not Accepted Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS</td>
<td>8%</td>
</tr>
<tr>
<td>MS</td>
<td>6%</td>
</tr>
<tr>
<td>Depot</td>
<td>4%</td>
</tr>
</tbody>
</table>

Not Accepted Material by Container Type

<table>
<thead>
<tr>
<th>Container Type (Curbside Only)</th>
<th>% Not Accepted Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automat... Carts</td>
<td>10%</td>
</tr>
<tr>
<td>Single-Use Bags</td>
<td>8%</td>
</tr>
<tr>
<td>Bin with Lid</td>
<td>6%</td>
</tr>
<tr>
<td>Resident Provided Containers</td>
<td>4%</td>
</tr>
<tr>
<td>Boxes and Bags</td>
<td>2%</td>
</tr>
<tr>
<td>Boxes</td>
<td>0%</td>
</tr>
</tbody>
</table>
MARKETING COMMUNICATIONS
WHY IT WORKS

Role: Resident Promotion and Education

- Province-wide material list
- Province-wide depot network
- One post-collection system
- Common end markets

- 97% Residents aware of packaging and paper recycling program
- 73% Residents go out of their way to recycle
- 15 Million social media impressions in 2019
Get on Nature's Good Side
OPERATIONS SUPPORT AND DIGITAL
CENTRE FOR MATERIAL INTELLIGENCE
CENTRE FOR MATERIAL INTELLIGENCE

- Partnership between CSSA and Recycle BC

- 8,300 sq ft purpose-build facility designed to advance the science of recycling in BC and across Canada

- Two main purposes:
  - Material composition audit analysis
  - Studies and pilot programs
    - Support producers to make their material more recyclable
    - Design collection to minimize our impact
    - Inform and evaluate resident outreach activities
AUDIT OVERVIEW

- Conduct 1,800 audits per year
- Samples are taken from a randomized selection of collectors to statistically represent provincial collection

AUDIT RATIONALE

- Understand material composition
- Understand how material interacts with our system
- Determine collector contamination rates
- Provide feedback to collectors
- Inform resident education activities
AUDIT PROCESS
**RESEARCH EXAMPLE**

**reciChain Pilot with BASF**

- Innovative blockchain pilot project to improve circular economy and traceability of recycled plastics
- Combines the power of blockchain with a digital badge and loop count technology that enables the secured sharing of data among market participants
- Aims to improve the sorting, tracing and monitoring of plastics throughout the value chain.
POST-COLLECTION
OVERVIEW

POST-COLLECTION RESPONSIBILITES INCLUDE:

- Receiving of material after collection
- Transport of material to material recovery facility
- Sorting material into specific grades or types of materials
- Marketing of materials as commodities to end markets
- One province-wide system allows for economies of scale:
  - Create system to manage consistent materials
  - Investment in advanced sorting technology at select facilities
  - Quantities of material for sale to end markets
HISTORY

- System established for our program launch (2014)
- Partnership with Green by Nature EPR

- Network of facilities
  - 32 Receiving, Consolidation and Transfer Facilities.
  - 11 Pre-conditioning Facilities
  - 1 Container Recover Facility

- Term completion May 2020
- Important to go back out the market in a competitive tender process
POST-COLLECTION RFP

- Multi-year competitive tender and selection process
- Included market sounding and RFP process
- RFP focused on 5 key outcomes:
  - Investment in recycling infrastructure;
  - System efficiency with minimal redundancy;
  - Prioritization of local end-markets;
  - Clear and transparent business processes; and
  - Ongoing innovation and technology.
- GFL Environmental (GFL) responsible for management of the post-collection contract effective May 2020
HIGHLIGHTS

- Transition to GFL means enhanced environmental outcomes through:
  - $25 million investment in new sorting facilities
  - More paper staying local
  - Plastics continuing to go to Merlin Plastics, a BC end market
- Supports a local circular economy
FACILITY NETWORK

- Post-collection facility network:
  - 38 post-collection facilities
  - 36 Receiving Facilities
  - 2 Material Recovery Facilities
RICHMOND MATERIAL RECOVERY FACILITY

- Processing: multi-stream recycling
- 2 buildings: paper sorting, container sorting
- 3 weigh scales
- PAPER: Latest sorting technology, Ability to sort into multiple grades of paper
- CONTAINERS: Latest sorting technology, Ability to sort into multiple grades of containers and plastics

NEW WESTMINSTER MATERIAL RECOVERY FACILITY

- Processing: single and multi-stream recycling
- 2 weigh scales
- Latest sorting technology
- Ability to sort into multiple grades of paper
- Ability to sort into multiple grades of containers and plastics
ENVIROMENTAL PERFORMANCE

1. New technology, facilities and processing capability
2. Better sorting ability
3. Higher quality material bales (commodities)
4. Better ability to market materials in North America and more stringent international markets
5. Reduced reliance on overseas markets
6. Support a local circular economy
END MARKETS

RFP focused on 5 key outcomes:

• Investment in recycling infrastructure;
• System efficiency with minimal redundancy;
• Prioritization of local end markets;
• Clear and transparent business processes; and
• Ongoing innovation and technology.

PRIMARY END MARKETS (majority of material)

Plastic: BC
Paper: Pacific Northwest
Metal: North America
Glass: BC
STEEL AND ALUMINUM
Q & A
INCLUSION, RESPONSIBILITY AND COLLABORATION
FIRST NATIONS RECYCLING INITIATIVE

Led by Recycle BC, partnership between 10 stewardship agencies who are responsible for various products under EPR legislation in BC

- Supports First Nations in starting or improving recycling programs in their communities
- Provides education, resources, and funding associated with transporting material for recycling as part of organized collection events
GHG REPORTING

- Collect greenhouse gas emissions data from all collection and post-collection partners
- Completed the Climate Smart program and are ‘Climate Smart certified’
- Data will be published on our website in 2020 and included in the 2021 annual report
- First packaging and paper program in North America to provide a full accounting of the GHG impact of our operations
ORGANICS STUDY

- Research to determine the amount of packaging and paper collected and managed in organic waste collection programs
- Understand the role that organic waste collection could have long-term in the overall post-collection management of packaging and paper in British Columbia
- Organic Matter Recycling Regulation of BC (OMRR) currently undergoing a comprehensive review
OTHER FLEXIBLE PLASTIC PACAGING

- Collection of Other Flexible Plastic Packaging started in 2018
- Research and development project in partnership with Merlin Plastics
- Seeks to develop technology that will enable the recycling of Flexible Plastic Packaging
- Any material not capable of being recycled will be marketed as engineered fuel
KEURIG FLOW TESTS

- Keurig converted all their K-Cup® pods in Canada to a recyclable format by the end of 2018.
- Recycle BC worked with Keurig and our previous post-collection partners, Emterra Environmental and Merlin Plastics, to facilitate testing in the sorting and recycling facilities.
- RFID (radio-frequency identification) technology is used to track where their K-Cup® pods end up in the material sorting line.
- An average of 92% of empty polypropylene Keurig K-Cup® pods made it to the container lines at Emterra and Merlin.
BEYOND BRITISH COLUMBIA
BEYOND BRITISH COLUMBIA

• Working with brands and producers
  o Globally brands are committing to 100% reusable, recyclable, or compostable packaging by 2025 as a way to reduce their environmental impact
  o Producers want to understand:
    • How they can make their packaging easier to recycle
    • What infrastructure is needed to capture and recycle their packaging.
  o Recycle BC works with its stewards to help ensure their packaging can be effectively captured and recycled
BEYOND BRITISH COLUMBIA

• Working with Governments
  o Plastics has become a priority for governments
  o Working with our national partner – Canadian Stewardship Services Alliance (CSSA) – to leverage the experience and expertise learned in BC for other jurisdictions
    • Ontario’s Circular Economy Act
    • G7 Ocean Plastics Charter
    • Minister McKenna and Minister Heyman visit to our plastics processor Merlin Plastics
    • Local governments in Washington and Oregon State
    • Canadian Council of Ministers for the Environment (CCME)
BEYOND BRITISH COLUMBIA

• Working with other initiatives
  o New Plastics Economy
    • Recycle BC is a participant in the New Plastic Economy
  o Circular Economy Leadership Coalition
    • To make Canada a world leader in building a sustainable, prosperous, zero-waste, low-carbon-emitting Circular Economy that benefits the lives of people at home and abroad.
    • Recycle BC’s board chair is the Co-Chair of the CELC - John Coyne
CONTRIBUTING TO A CIRCULAR ECONOMY