Canadian Battery Association

Stewardship Program for Lead Batteries

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October 10, 2022

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Executive Summary

The Canadian Battery Association (CBA) has operated a Stewardship Program in Canada since 2011. As of January 1, 2022, the CBA's Stewardship Program will account for approximately 95% of the LAB's sold in Canada. The remaining 5% of unaccounted sales are sold in BC as a LAB within a new product – eg boat, motorcycle etc., or the LAB that is imported directly from the USA or Asia by commercial operations without a Stewardship Program as required by Provincial Extended Producer Responsibility regulations.

Every year, there are approximately 180,000,000 kg of lead batteries sold in Canada. Approximately 85% of the lead batteries are sold to consumers for use in vehicles and commercial trucks. The remaining 15% are motive lead batteries used in forklifts and other mobile applications and stationary lead batteries used for energy storage and power backup. The motive and stationary batteries are business-to-business commercial transactions.

The members of the CBA provide a reverse-distribution recovery program for consumer lead batteries and a business-to-business recovery program for commercial lead batteries. Used consumer and commercial lead batteries will be transported to the distribution warehouses for assessment and the waste lead batteries will be bulk transported to smelters for recycling and then the lead and plastic is set for remanufacturing into a new lead battery.

Lead batteries in Canada are part of a North American wide circular economy. The recovery and recycling rates for lead batteries is virtually 100% and the time to remanufacture a new lead battery is approximately 100 business days from when a consumer drops an unwanted battery at a return collection facility.

The CBA's collection network has a network of over 1050 retail return collection facilities that cover the urban and rural parts of Canada and there are 120 warehouse facilities operated by CBA members that collect industrial batteries from commercial operations. Go to www.recyclemybattery.ca to find the closest return collection facility or download the Recyclepedia app for iPhone or Android.

Because of the stable commodity price for recycled lead, the CBA does not require a visible eco-fee on the purchase of the lead battery. The demand for lead provides sufficient economic incentive to recover the lead batteries in urban and rural areas. Remote communities present a difficult challenge as batteries can become stranded and the CBA has developed a Remote Community Program that recovers lead batteries collected in remote communities.

1 Introduction

The Canadian Battery Association (CBA) has developed a National Stewardship Program that recovers all types of lead batteries from coast to coast to coast.

Lead batteries are the most recycled product in Canada with virtually 100% of the lead batteries recovered, processed, and made into new lead batteries.

The lead battery industry has achieved a circular economy for its products and the following document, and its Appendices outline the CBA's Stewardship policies, their implementation, and metrics across Canada.

1.1 Regulatory Requirements

All aspects of the manufacturing, transportation, storage and recycling of lead batteries are governed by a variety of Federal and Provincial regulations.

The Federal Acts and Regulations focus primarily on the movement of Dangerous Goods and Hazardous Wastes. The primary Federal Acts are:

- The Canadian Environmental Protection Act and its regulations
- The Transportation of Dangerous Goods Act and its regulations

There are also a variety of Provincial Acts and regulations that related to Extended Producer Responsibility (EPR) and the management of hazardous wastes.

The primary purpose of this document is to outline the EPR activities carried out by the CBA and meet the variety of EPR regulatory requirements.

Contact the CBA at admin@canadianbatteryassociation.ca if you would like more information on the different Provincial regulations and requirements.

1.2 Lead Battery Use in Canada

Lead batteries are important in the daily lives of Canadians, and their batteries are used to:

- Start internal combustion engines such as vehicles, buses, boats, recreational vehicles, trucks etc.
- Provide motive power for forklifts, scooters, and carts
- Provide energy storage and UPS solutions for computers, telecommunication systems, safety systems (e.g., emergency lighting, fire alarms), data centres and alternative energy applications

Lead batteries range in size from less than 1 kg in small medical and emergency systems to 17 kg in an average passenger battery to thousands of kilograms in commercial applications like forklifts and emergency backup systems for data centres or alternative energy applications.

Because of the wide range of applications, the CBA's stewardship program focuses on two categories of lead batteries:

Category	Size (kg)	Typical Application
Consumer Batteries	5 – 35	Starting Internal Combustion engines in vehicles, trucks, motorcycles, boats etc Auxiliary batteries in EV vehicles
Commercial Batteries	1 – 5,000	Emergency back-up including Small Sealed Lead Acid (SSLA) batteries Electric forklifts and golf carts Grid and power supply batteries

The average life span of a lead battery varies depending on their design, application, and maintenance. Vehicle and commercial truck batteries are designed to last approximately 60 months in Canada's harsh weather conditions. Motive batteries (e.g., used in forklifts, golf carts) are the same chemistry but a different design and are expected to last 7 years while Stationary batteries that typically serve as emergency or reserve power can last for up to 20 years.

Approximately, 85% of lead batteries sold in Canada are consumer batteries for vehicle and commercial truck applications. The remaining 15% are for commercial applications.

1.3 Population Distribution in Canada

One of the key challenges of a Stewardship Program is to provide accessibility to the consumer – especially in rural and remote communities.

The population of Canada in 2021 according to Statistics Canada was just under 37 million people and approximately 88% of the Canadian population live in cities, towns, or Regional Municipalities with a population greater than 1,000 people.

One of the challenges of a product stewardship program will be providing recovery services to the rural and remote communities of a Province and the CBA has developed an Accessibility Policy that defines service for consumer lead batteries that is applicable to Canada – see Section 4.1

2 Program Administration

2.1 The Canadian Battery Association

The Canadian Battery Association (CBA) is a Federally registered Not-for-Profit Industry Association. The CBA's Registration number with Industry Canada is 759912-9.

In 2022, the CBA members accounts for more than 95% of the lead battery distribution and sales in Canada and virtually 100% of the lead recycling and processing.

As an Industry Association, the CBA does more than Stewardship programs and the CBA works on other National and International initiatives with the Canadian Standards Association, Underwriters Laboratories Canada, Battery Council International, Eurobatt and the International Lead Association.

The CBA membership includes national and regional distributors, smelters and recyclers that are signatories to the CBA's Stewardship Plan. Retailers such as new car dealers are also registered as signatories to the CBA's Stewardship Plan. The members of CBA are signatory to this Stewardship Plan are listed at https://canadianbatteryassociation.ca/members/

Retailers of lead batteries that obtain their aftermarket lead batteries from members of the CBA are not required to register with the CBA's Stewardship Program because their distributors have assumed their stewardship obligations on their behalf. However, importers of products into Canada that contain a lead battery (e.g., vehicles, motorcycles, boats, etc.) are obligated under the various Extended Producer Responsibility regulations.

2.2 Program Goals, Objectives, and Principles

The goals of the Canadian Battery Association's Stewardship Program are:

- Provide a program that is convenience to consumers, retailers and customers of lead batteries
- Provide a stewardship program from coast to coast to coast that meets the regulatory requirements of Provincial, Territorial and Federal Governments
- Promote the safe recovery, storage, and transportation of new, used and waste lead batteries.

The principles of the CBA Stewardship Program are:

- Integrate the Stewardship Program into the recycling initiatives of CBA members where possible
- Develop solutions that can be implemented across Canada including rural and remote communities
- Do not interfere with the free market for the sale and collection of new, used or waste lead batteries
- Use reverse-distribution systems to minimize transportation costs and ecological footprints
- Develop solutions that meet corporate, social, environmental, and economic goals of its members and regulatory agencies

2.3 Organization Structure and Governance

The CBA is managed across Canada by its Executive Director. The Executive Director is responsible for the:

- administration of the CBA
- preparation and implementation of the Stewardship Plan,
- development and implementation of programs that support the lead battery industry.

The administrative and implementation functions of the CBA include:

- development and updating of the CBA's Stewardship Plan
- preparing reports for regulatory agencies, Board of Directors, and stakeholders
- preparing the communication materials for distribution
- overseeing budgets and developing strategies and actions designed to meet Performance Measures (see Section 6).
- undertaking stakeholder consultation and managing the BC Steering Committee
- assisting CBA members to meet all Federal and Provincial regulatory requirements for the safe collection, storage and transportation of lead batteries
- resolving disputes and investigating complaints

The CBA has a simple governance model. The Executive Director provides all the management and operational programs for the CBA. The CBA's Board of Directors oversees the Executive Director and is comprised of the members that represent manufacturers, distributors, and smelters in Canada.

For a list of the current Board of Directors go to https://canadianbatteryassociation.ca/about/

2.4 Accountability and Transparency

The CBA provides accountability and transparency through a variety of mechanisms. The primary mechanism is the Financial and Non-Financial Audit of the Stewardship Program. These audits are published on the CBA website https://canadianbatteryassociation.ca/annual-reports/ and are available to the CBA's members and the public.

In addition, the CBA has become an active supporter of the Recycling Council of BC (RCBC), the Coast Waste Management Association (CWMA), the Recycling Council of Alberta (RCO) and the Manitoba Association of Rural Recyclers (MARR).

In addition, the CBA participates in conferences, forums, and recycling programs that further the awareness of the CBA and the recycling of lead batteries.

2.5 Financing Mechanism

The development, implementation, and administration of the CBA's Stewardship Program for lead batteries will be borne by the members of the CBA through annual fees.

The membership fee will be reviewed each year and approved by members at the CBA's Annual General Meeting.

The CBA will maintain a Contingency Fund that will grow over the years to approximately one year's operating budget.

Consumers will not be charged an environmental handling fee (eco-fee) at the retail level. Eco-fees are not required because the demand for recycled lead provides sufficient value for the industry to collect, transport and recycle lead batteries in urban and rural parts of Canada. However, manufacturers of automotive lead batteries levy retailers with a $20 core charge if end-of-life lead batteries are not returned to the manufacturer. Retailers will add the manufacturer's core charge to a sale if the customer does not give the old battery back to the retailer. The core charge of $20 approximates the commodity value of lead in the battery.

The current commodity price of lead is $2000 USD per tonne on the London Metal Exchange. An average vehicle battery weighing 17.5kg has approximately 9kg of lead valued at close to $20 CDN per battery. Because automotive lead batteries have a 5-year life expectancy, there is a significant demand by manufacturers to smelt old lead batteries to manufacturer new automotive batteries. The demand for old batteries by manufacturers drives the commodity value for recycled lead.

Because of the significant commodity value of lead, there is an active industry of secondary lead recyclers that pursue the collection and recycling of lead batteries in Canada.

For more information about the financing mechanism for lead batteries, go to :
https://canadianbatteryassociation.ca/download/cba-policy-producer-pays-the-cost/

3 Product Life Cycle Management

3.1 Product Life Cycle Management

Lead batteries are the most recycled product in Canada because the manufacturers have established a reverse distribution transportation network throughout the products life cycle.

The lead battery technology is simple with three basic components that are all recyclable. The following sections outline the fate of the lead batteries, and the numbers are taken from studies conducted by Battery Council International https://batterycouncil.org/page/Battery_Recycling

3.1.1 Lead

The primary component of a LAB is lead and the recycling of lead batteries is essential for the battery industry as there is not sufficient virgin lead to supply the lead battery market.

Each cell of a lead battery contains electrodes of elemental lead (Pb) and (PbO_2). Small amounts of antimony, tin, calcium, or selenium are usually alloyed in the electrode to add strength and simplify manufacture. The lead electrodes, battery posts and lead oxide are used to manufacturer lead for new grids, parts, and lead oxide.

The recovered lead in Canada is separated from the other battery constituents and put through one of the four permitted smelters in Canada. The smelter recovers >99% of the lead that is then sent to the manufacturer to be made into new lead batteries.

3.1.2 Electrolyte

Sulphuric acid is the electrolyte within the battery. The dilute sulphuric acid recovered from the end-of-life lead battery is reused and recycled in a variety of processes:

1. Filtered and used on site: Acid is drained from the used batteries and filtered to remove any particles. This filtered acid is then used in the Waste-Water Treatment Facility at the smelter.
2. Crystallized: Acid is put through a Crystallizer and in the process turned into Sodium Sulphate. The Sodium Sulphate is sold to manufacturers of glass, detergents etc.
3. Sold to Third Parties: The drained Acid is sold without any recycling or refining, to third parties. For example, to Tanneries.
4. Neutralized: The Acid is neutralized using Caustic Soda into a Non-hazardous waste that can be disposed of safely.
5. New Filter Process – (Experimental): The drained Acid can be filtered using a new process whereby the Acid can be re-used in the manufacture of new batteries.

3.1.3 Casings

Most lead batteries have a plastic polypropylene outer casing while some commercial UPS batteries have a clear acrylic casing.

The casings are recovered by the battery breaker and recycled into new cases for lead batteries.

4 Stewardship Policies

To help guide the stewardship of lead batteries in Canada, the CBA has developed a variety of policies that form the basis of its stewardship program for lead batteries.

The full list of the CBA's stewardship policies for lead batteries can be found at : https://canadianbatteryassociation.ca/download-category/cba-stewardship-policies/

4.1: Accessibility

The purpose of this policy is to define the EPR regulatory requirement to provide "reasonable accessibility" in communities across Canada so that the consumer with a lead battery has reasonable and free access to collection facilities or collection services.

Lead batteries are a common consumer product, and the average community will generate about 5kg/person/year. However, because lead is toxic and a biocumulative neurotoxin there is a desire to provide consumers with a high level of access to prevent lead from entering landfills or the environment.

Determining reasonable accessibility is not just a challenge for the CBA and other Stewardship Programs in Canada. Public service agencies such as hospitals, law enforcement and other government agencies are challenged with the reality of Canada's geographic size and population distribution when providing adequate services in a cost-effective manner.

The CBA developed a policy framework to help determine "reasonable levels of accessibility" for lead batteries in Canada. The purpose of the policy was to develop an accessibility framework based on criteria and targets to determine:

- "reasonableness" for consumers to drop off lead batteries
- measure each community's accessibility on a Province-by-Province basis using the accessibility framework
- identify communities that do not have "reasonable" accessibility.

For consumers with special needs and require lead batteries for their motorized mobility should call their retailer in the event of an emergency for repair or replacement of the mobility battery. In addition, a spare battery and a charging system is recommended for those dependent on battery powered mobility.

Reasonable accessibility for any product or service is a complex balance between public expectations, regulatory requirements, and cost. See Section 5.3 to see the Accessibility targets for a Province and for more information about the policy, go to the CBA's Policy on Accessibility.

4.2: Managing Lead Batteries in Remote Communities

Accessibility in remote communities is different than in rural and urban communities because of a variety of factors including:

- seasonal transportation corridors (winter roads on muskeg and frozen lakes, summer barges to the Arctic, etc.)
- lack of retailers, recycling infrastructure and equipment, and
- long distances to recycling infrastructure

As a result of the logistical challenges with remote communities, the CBA's Accessibility Framework will identify remote communities so that individualized collection and transportation programs for these communities can be developed on a case-by-case basis.

To provide technical and logistical support to remote communities, the CBA has partnered with other Stewardship Agencies and First Nations to develop transportation strategies in northern Manitoba through the MB Winter Road Initiative and in British Columbia in partnership with the Indigenous Zero Waste Technical Advisory Group (IZWTAG).

The development and implementation of a recycling program for lead batteries in a remote community is technically challenging and the CBA's policy document Managing Lead Batteries in Rural and Remote Communities provides the methodology for successfully recovering lead batteries in rural and remote communities.

4.3: Producer Paying the Cost

The purpose of the CBA's Producer Paying the Cost policy is to ensure that the circular economy for lead batteries is maintained so that the service providers that collect and process lead batteries at end-of-life are viable and sustainable across all communities in Canada.

One of the central tenants of Provincial EPR regulations is that the Producer is responsible for managing the costs associated with the proper transportation and recycling of end-of-life products from consumers. As such, the CBA must ensure that there are no financial barriers for consumers to manage and recycle a lead battery at end of life.

Currently, lead batteries are the most recycled stewarded product in Canada because the lead batteries have a positive value at end-of-life due to a manufacturers' "core charge" on aftermarket vehicle lead batteries.

The "core charge" is equivalent to a deposit/refund system set by the Manufacturer to ensure the lead batteries are returned to distributors and processors for recycling and re-manufactured into new lead batteries.

Not all lead batteries have a "core charge"; however, the volumes of aftermarket automotive lead batteries are sufficiently large to create a stable market for lead.

The manufacturers' "core charge" has:

- created a stable value that drives the collection, transportation, and processing of lead batteries at end-of-life
- developed an effective and efficient return to retail model that utilizes a reverse distribution network across Canada
- eliminated the need a consumer Environmental Handling Fee (EHF).

A more detailed description of the mechanics of the core charge and its application in communities across Canada is summarized in the CBA's Producer Pays the Cost Policy.

4.4: Financial Reporting

The purpose of this policy is to detail the Federal, Provincial, and organizational financial reporting requirements of a not-for-profit organization.

Most EPR regulations require Stewardship Programs to provide financial reporting to ensure consumers, Producers and stakeholders can evaluate the effectiveness of the Stewardship Program.

The CBA's Financial Reporting Policy is designed to meet the Federal, Provincial and organizational financial reporting requirements of the Canadian Battery Association.

4.5: Abandoned Waste, Littering and Hoarders

It is the policy of the CBA that under Provincial EPR regulations, the CBA's responsibility starts when the consumer drops off a lead battery at an "official" recycling depot.

Once a lead battery is dropped off at an official recycling depot, it is the duty of the CBA to ensure that the lead batteries are stored, transported, and recycled responsibly and the CBA's responsibility stops when products are turned into commodities and sold in legal trade.

Even though the CBA is not responsible for the clean-up of abandoned products, litter and hoarders, the CBA is prepared to work with:

- Governments that want to reduce the incidence of littering and abandoned waste
- Property owners like marinas that want to recover the batteries littered by irresponsible consumers
- Local Governments that need help cleaning up the batteries left by hoarders.

For more information about the CBA's policy on abandoned waste, littering and hoarders, go to https://canadianbatteryassociation.ca/download/cba-policy-littering/

4.6: Emergency Response

The Canadian Battery Association has completed an Emergency Response Protocol (ERP) for the Province of British Columbia in partnership with other Stewardship Programs.

The ERP conforms to with BC Emergency Management System (BCEMS) and the role of the Stewardship Programs in the Protocol is to support Local Government, Emergency Management BC and the Emergency Response professionals that are responding to and cleaning-up after a declared emergency.

To support the BCEMS, the CBA has prepared a summary of the technical and regulatory information regarding lead batteries as a reference manual for emergency responders. In addition, SABC will provide a contact for the responders to provide technical and logistical support.

The CBA will continue to work with Local Government and the other Stewardship Programs to maintain and update the Emergency Response Protocol.

5 Performance Measures

The CBA's programs performance will be measured and publicly reported at : https://canadianbatteryassociation.ca/annual-reports/

The following sections summarize the different performance indicators and targets used by the CBA.

5.1 Recovery Rate

One of the key performance indicators for lead batteries is its Recovery Rate. Recovery rate is simply calculated by the weight of lead batteries recovered divided by the weight of the lead batteries sold in a jurisdiction.

After 10 years of data collection, the CBA has an accurate and verifiable understanding of lead battery sales and recovery weights.

Sales and recovery weights and the method of calculating recovery rates has been audited by a variety of accounting firms over the past 10 years and are available at https://canadianbatteryassociation.ca/annual-reports/.

5.1.1 Sales

Within Canada, the CBA members account for an estimated 95% of sales of lead battery in Canada. The remaining portion of lead batteries are sold via the internet, commercial B2B, and included in products such as heavy equipment, buses, boats, ATVs, motorcycles etc.

In total, there are approximately 181M kg of lead batteries sold in Canada every year by the members of the CBA and the national average for lead battery sales is 4.7kg/person/year.

Consumer batteries (mainly automotive lead batteries) account for about 87% of the lead battery sales and about 85% of the consumer batteries are aftermarket automotive lead batteries distributed by CBA members. The remaining 15% of consumer batteries are sold in new vehicles, boats, motorcycles or over the internet.

Commercial batteries (e.g., forklift, golf cart batteries, UPS and energy storage) batteries are also included in the CBA's stewardship plan and account for about 13% of lead batteries sold in Canada. The commercial lead batteries are primarily sold to commercial operations for use in a variety of industrial applications.

For sales records of lead batteries by Province, go to :
https://canadianbatteryassociation.ca/2021-sales-data/

5.1.2 Collection & Recovery

Just over 70% of lead batteries sold by CBA members are recovered by their distributors primarily through a reverse distribution system between distributors and their retail and commercial customers.

Approximately 15% of lead batteries are recovered by metal and automotive recyclers in an end-of-life vehicle and the remaining 15% are recovered by private recyclers and smelters that share data with the CBA.

Accurate recovery data is important because there are several stewardship performance metrics that will be calculated with the data and the methodology for calculating theses performance metrics is subject to an independent audit by MNP consultants.

The Recovery Rate is calculated based on the kilograms of lead batteries sold vs. the kilograms of lead batteries recovered for recycling.

$$\textit{Recovery Rate} = \frac{\textit{Weight Transported for Recycling}}{\textit{Weight Sold}}$$

The 2021 program Recovery Rate for lead batteries in Canada was >99%.

The high recovery of lead batteries in the reverse distribution network is the result of a high "core charge" by the Manufacturers and the core charge is designed to ensure that the lead is returned to the Manufacturer to produce new lead batteries.

For more information about the core charge for lead batteries go to :
https://canadianbatteryassociation.ca/download/cba-policy-producer-pays-the-cost/

If the Manufacturers' remove the core-charge and commodity prices drop, the CBA will establish a deposit-refund system that will achieve a similar level of recovery as the current reverse-distribution system.

5.1.3 Diversion From Landfill

One of the primary goals of the Extended Producer Responsibility (EPR) regulations is to divert lead batteries from landfill.

Since 2014, the CBA has participated in a variety of Waste Characterization Studies with other Stewardship Agencies in British Columbia to establish landfill diversion methodology and estimates of landfill diversion rates.

To date, the Waste Characterization Studies have analyzed over 640 samples from Single Family, IC&I and Multi-Family waste streams.

Go to https://canadianbatteryassociation.ca/download/lead-battery-waste-diversion-studies/ and download the review the Tetra Tech landfill diversion report.

The results of the study show that approximately 98% of all lead batteries are diverted from landfill and that virtually no lead batteries are found in the family and multi-family waste stream. Occasionally lead batteries are found in the IC&I waste stream and to date, all of those lead batteries were original OEM lead batteries embedded in a product and not brands sold by CBA members.

5.2 Awareness

Unlike most Stewardship Programs, consumer awareness is not a driving factor in the product recovery rate for lead batteries. The overwhelming determinant in assuring a high recovery rate is the residual commodity value of the lead.

There are two factors that drive the value of lead at end-of-life. The first is the London Metal Exchange (LME) for lead and the second is the core charge for aftermarket automotive batteries set by the manufacturers. While the price of the LME and the manufacturers core charge are interrelated, the high residual value drives the recovery rate for lead batteries that is virtually 100%.

For these reasons, the CBA will not set a Consumer Awareness target; however, the CBA will actively promote awareness through the programs listed below.

5.2.1 Consumer Awareness Studies

In 2008, Ipos-Reid conducted an awareness survey in BC to gain a baseline consumer awareness survey of the public to industry-led product stewardship programs. The 2008 study found that 62% of the respondents were familiar with the recycling of lead batteries.

Since 2013, the CBA and the other members of the Stewardship Agencies of BC have contracted with Insights West for a bi-annual Consumer Awareness Study for stewarded products and the most recent results are published at:

https://canadianbatteryassociation.ca/download/consumer-awareness-studies-for-lead-batteries/

The results of the Insights West studies produced similar results to the 2008 study and after 8 years of study, there are three important conclusions:

1. Approximately 6% of surveyed consumers have unwanted lead batteries confirming the assertion that a high percentage of consumers replace their lead batteries at a mechanical repair shop by a licensed auto technician or for those DIY consumers, the old battery was exchanged when purchasing a new battery
2. Over 80% of consumers that use lead batteries thought the program was very and somewhat convenient and over 90% had trust that the lead batteries would be safely/ responsibly recycled
3. The Consumer Awareness results for lead batteries were similar to the results for the Used Oil and Tires Stewardship Programs confirming the assertion that for the most part, consumers have their vehicles serviced at a service shop by a licensed technician

The CBA will continue to participate in the Consumer Awareness studies conducted by the Stewardship Agency of BC to observe trends in consumer awareness for lead batteries.

While it is important to have the general public aware of the Stewardship Program for lead batteries, there are other factors that result cause the high Recovery Rate for lead batteries. For these reasons, there is no Performance Targets for Consumer Awareness in the lead batteries Stewardship Program.

5.2.2 Outreach

Over the past five years, the CBA has developed a variety of tools in both written and electronic format that promote the safe collection, transportation, and recycling of lead batteries.

5.2.2.1 Consumer Outreach

The most recent Consumer Awareness survey noted that over 80% of consumers look online to get information about the safe and responsible recycling of lead batteries.

To provide recycling information to consumers, the CBA has developed a variety of websites to provide information to the consumer regarding the management of the Stewardship Program and the Return Collection Facilities for lead-acid batteries.

The primary interface with the consumer is through the CBA's 1-800 number (1-855-216-3664), two websites to distribute information to the consumer as well as social media on Linkedin.

The websites are:

- www.canadianbatteryassociation.ca (overview of CBA and its Programs)
- www.recyclemybattery.ca (directory of return collection facilities)
- https://www.linkedin.com/company/canadian-battery-association/ (current information about CBA and its members)

In addition, the CBA participates with provincial recycling agencies to promote the safe recycling of lead batteries. Currently, the CBA supports the Recycling Council of BC's Recycling Hotline; Recyclepedia and Recyclepedia for smart phones to provide a "one-stop shop" consumer outreach program for recycling information for lead batteries.

5.2.2.2 Commercial Outreach

The members of the CBA distribute more than 95% of all new aftermarket lead batteries to commercial operations. This allows the direct marketing of recycling information directly to the IC&I sector that generate about 13% of lead batteries at end-of-life.

In addition, the CBA has prepared technical and recycling information that can be used by its members to educate their staff and their IC&I customers on the safe collection, storage and transportation of lead batteries to ensure compliance with the Federal Transportation of Dangerous Goods and the Provincial Hazardous Waste regulations. CBA members promote the Stewardship Program as part of sales and service to their commercial customers.

Finally, the CBA will continue to work with distributors and commercial operations to develop company specific programs to promote the safe collection, storage and transportation of lead batteries.

5.2.2.3 First Nations Outreach

The CBA has initiated several outreach programs for remote First Nation communities. Starting in Manitoba in 2015, the CBA along with other Stewardship Agencies have developed a winter road backhaul program that recovers lead batteries and other stewarded products from remote northern communities in Manitoba.

Subsequently in 2022, the CBA has partnered with the Indigenous Zero Waste Technical Advisory Group in British Columbia to provide First Nations with the technical information necessary to collect and prepare lead batteries for transport.

In addition, the CBA is starting work in the small and remote communities in the Yukon Territory.

The CBA has developed and published a manual on the Management of Lead Batteries in Rural and Remote Communities that is used across the provinces and territories where possible.

5.3 Accessibility

Accessibility to the recycling infrastructure for consumers and commercial operations is an important factor to maintain a high Recovery Rate for lead-acid batteries.

There are three primary mechanisms that recover lead batteries in Canada. The first and most important is the use of reverse distribution by the distributors of lead batteries. Distributors collect used lead batteries from their customers at the same time they are dropping of new batteries or doing a service visit to a commercial customer. This efficient reverse distribution system accounts for approximately 70% of the lead batteries recovered in Canada.

The second collection method is the establishment of Return Collection Facilities (RCFs) in Urban and Rural locations provide free access to the public that want to recycle their lead batteries. The lead batteries collected in the RCFs are picked up by the distributors of lead batteries through their reverse distribution network.

The third collection method is through many private non-ferrous recyclers throughout Canada that will collect lead batteries from consumers and commercial operations. The private network of lead battery recycling accounts for 30% of the lead battery recovery in Canada.

The hierarchy of collection for a community is summarized in the table below. The main priority is for lead batteries to be collected at a retailer so that the efficient reverse distribution system can be applied.

The second priority are for batteries to be collected by automotive and metal recyclers because they have the infrastructure to safely store and prepare the lead batteries for transport.

The third priority is for lead batteries to be collected by First Nations or Local Governments in smaller or remote communities that do not have retailers or recyclers.

The last option is for those very small communities that do not have retailers, recyclers, or government services. In these communities, the CBA will work with the community group to collect and remove the lead batteries from the community in the most efficient manner.

<table>
<tr><th colspan="5">Lead Battery RCF Accessibility Hierarchy</th></tr>
<tr><td rowspan="2">Hierarchy of Service Providers</td><td>Amenity Dense</td><td>Amenity Sparce</td><td>Amenity Scarce</td><td>Remote Communities</td></tr>
<tr><td>Reasonable Accessibility Obligation</td><td>Reasonable Accessibility Obligation</td><td>Possible Accessibility Obligation</td><td>Commitment to Accessibility</td></tr>
<tr><td rowspan="2">Retailer</td><td>1st Priority</td><td>1st Priority</td><td>1st Priority</td><td>1st Priority</td></tr>
<tr><td>Not Enough Retailers</td><td colspan="3">No Retailer Option</td></tr>
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<tr><td rowspan="2">Private Recycler</td><td rowspan="2">2nd Priority</td><td>2nd Priority</td><td>2nd Priority</td><td>2nd Priority</td></tr>
<tr><td colspan="3">No Private Recycler Option</td></tr>
<tr><td></td><td></td><td>↓</td><td>↓</td><td>↓</td></tr>
<tr><td rowspan="2">FN / Local Government</td><td rowspan="2"></td><td rowspan="2">3rd Priority</td><td>3rd Priority</td><td>3rd Priority</td></tr>
<tr><td colspan="2">No Government Option</td></tr>
<tr><td></td><td></td><td></td><td>↓</td><td>↓</td></tr>
<tr><td rowspan="2">Community Group</td><td rowspan="2"></td><td rowspan="2"></td><td colspan="2">Community Group RCF</td></tr>
<tr><td colspan="2">No Community Group -> No Accessibility Options</td></tr>
</table>

For more information about the CBA's Accessibility Policy and how to calculate Accessibility Targets for lead batteries, go to:
https://canadianbatteryassociation.ca/download/cba-policy-accessibility/

The main Key Performance Indicator for a Province or Territory is to set Accessibility Targets and calculate the Population Served. For most provinces, the Population Served will exceed 99% and that data is available for most provinces upon request.

5.4 Generation, Storage and Transportation

Because the storage and transportation of new, used and waste lead batteries are heavily regulated by both Federal and Provincial regulations, the CBA has implemented The Management of Recyclable Lead Batteries - Collection, Storage & Transportation in Canada.

Copies of the regulated requirements in Canada is available from the CBA by request to tdg@canadianbatteryassociation.ca.

Each of the distribution warehouses operated by a CBA member are included in the online regulatory training programs sponsored by the CBA. The training programs are designed to provide education and information to CBA members so that they comply with all Provincial and Federal laws, and they have an appropriate Operational, Contingency and Closure Plans to respond appropriately to spills and emergencies.

5.4.1 Generation, Storage and Transportation

New, used and waste lead batteries are considered a Dangerous Good under the Federal Transportation of Dangerous Goods Regulation and waste lead batteries are considered a hazardous waste by many provincial Hazardous Waste Regulations.

To ensure compliance to Federal and Provincial regulations, the warehouses will need to abide by the following requirements:

- **Generation**: Distribution warehouses that generate waste lead batteries may be required to have a Generator Registration Number.
- **Storage**: Distribution warehouses maybe limited by Provincial permit the volume of waste lead batteries in their warehouse.
- **Transportation**: In many Provinces, hazardous waste manifests will be required waste lead batteries within a Province. All transboundary shipments of >1,000kg of waste lead batteries must be manifested as required by the Cross-border Movement of Hazardous Waste and Hazardous Recyclable Material Regulations under the Federal Canadian Environmental Protection Act (CEPA).
- **Processing**: Facilities that actively process and recycle lead batteries will be required to be registered as a Hazardous Waste Facility under most Provincial jurisdictions.

For more detailed information on the different regulatory requirements, go to:
https://canadianbatteryassociation.ca/regulatory-requirements/

5.4.2 Training and Education of Employees

The collection, storage and transportation of lead batteries pose a variety of environmental, health, and safety hazards and employees will have a variety of training and education requirements. For example, all drivers of new, used or waste lead batteries must have a valid Transportation of Dangerous Goods Class 8 Certificate.

The training and education are the responsibility of the individual CBA member; however, the CBA will help members prepare training and education materials as part of its Environmental Management Program.

In addition to TDG, the CBA has developed a WHMIS 2015 training program, blood lead management for workers, contingency and emergency response, and li-ion risk assessment protocols.

Finally, the CBA has participated in the development of the Manitoba Environmental Industry Association's Safety First program that brings technical and practical training to rural and remote communities that are collecting and preparing lead batteries for transport.

For more information about the CBA's training programs, email us at:
tdg@canadianbatteryassociation.ca.

5.4.3 Compliance of Distribution & Transportation Systems

As part of the CBA's ongoing commitment to the stewardship of lead batteries, the CBA routinely offers webinars to distribution managers and supervisors regarding the regulatory requirements related to the storage, distribution, and transportation of lead batteries in Canada.

In addition, the CBA provides technical support and regulatory interpretation to its members as well as ongoing regulatory liaison with Federal and Provincial regulatory officials.

5.5 Residuals Management

Lead batteries are one of the most recycled products sold today in Canada. End-of-life lead batteries are needed by battery manufacturers to ensure they have a supply of lead to manufacturer new batteries. This section describes the fate of the lead batteries once they have been recovered by a CBA member.

5.5.1 Reuse

Some lead batteries that are no longer wanted by the customer can be refurbished – especially the commercial lead batteries.

To maximize the reuse of lead batteries, the CBA has worked with BC Ministry of Environment's Hazardous Waste group to differentiate a "used" from a "waste" lead battery. The new definition encourages CBA members to refurbish used lead batteries rather than declaring lead batteries a "hazardous waste" at the end of the battery's "primary use". Approximately 10 to 15% of automotive lead batteries can be refurbished and resold as a used battery and large forklift batteries can have a higher level of reuse.

In addition, the CBA has developed a protocol for the refurbishing of the large forklift batteries that have been declared a hazardous waste. The Protocol for Refurbishing and Delisting "Waste" Lead-Acid Batteries and a copy of the Protocol is available from the CBA by emailing info@canadianbatteryassociation.ca.

5.5.2 Recycling

For used lead batteries that cannot be refurbished, they will be declared a Hazardous Waste at one of the distribution warehouses and most of waste lead batteries are send to one of the 4 smelters in Canada or exported to South Korea or the USA.

In Canada, the Canadian Environmental Protection Act (CEPA) and its regulations only allows the export of waste lead batteries to an OECD country or the United States under a valid export permit to ensure compliance with the Basel Convention.

All recovered lead batteries collected by CBA members are sent to smelting facilities that have valid permits and/or approvals as required by the appropriate jurisdiction. The recycling requirements and emission levels for recyclers and smelters are set by Provincial or State governments as part of their permit/approval processes for the recycling and smelting facilities.

Contact the CBA if you would like more information at info@canadianbatteryassociation.ca about the end-fate of lead batteries collected in Canada.

As part of the recycling process, the processors break the battery into its three basic components. Battery Council International provides the following information on how a battery is recycled.

Material	Description	Fate
Metals	99% of lead is recovered during the smelting process	Lead ingots are sold as a Commodity on the open market.
	1% of lead from the smelting process in not recovered and is contained in dross – a waste from the smelting process	Private Landfill
	Antimony and Calcium are used to provide strength within the lead plates	Remain as an alloy of the lead after smelting.
Electrolytes	Sulphuric Acid is recovered and sold as an input to another manufacturing process.	Reused or sold as a commodity.
Plastics	The Polypropylene Case that provides structure to most batteries. Stationary batteries have a clear casing made of Acrylic. Within each battery, Plastic Separators are used to Isolate the Positive and Negative plates in a cell.	About 70% of the plastic is recycled and used to make new battery casings. Acrylic casings are not recyclable and are burned for energy recovery. The Plastic Separators are burned at the smelters for energy recovery and creating an oxygen free environment during the smelting process.

The Performance Measure for the CBA Stewardship Plan is that all lead batteries will be recycled at permitted locations in Canada and OECD countries and any exports must be compliant with the requirements of CEPA.

The CBA Stewardship Plan does not have any Performance Measures or Targets regarding the recycling of lead batteries to the Pollution Prevention Hierarchy (PPH), because lead batteries are purchased as a commodity within a "Free Market" by processors and the CBA cannot dictate Vendor Qualifications or set Performance Criteria on the smelters.

In addition, because the CBA does not own or control the recycling process at the smelters through Vendor Qualifications, the non-financial audit cannot be extended to the evaluate the effectiveness of the smelters recycling processes.

5.5.3 Landfill Diversion

The objective of the CBA's Stewardship Program is to divert 100% of the lead batteries from landfills. To validate this objective, the CBA lead the development of the Waste Characterization Tool to determine the quantity of Stewarded Products in landfills.

Since 2014, the Stewardship Agencies of BC (SABC) has worked with Local Governments to determine the occurrence of lead batteries and other stewarded products in the Municipal and IC&I waste streams.

As of August 2022, there have been 14 studies in both rural and urban communities and 641 samples from residential and IC&I sectors.

The results of the studies demonstrate that the landfill diversion rate for the residential sector was virtually 100% and the overall landfill diversion rate was 97.9% because 4 lead batteries totaling 7.67kg have been recovered from the IC&I sector.

For more information about the waste characterization studies and the calculation of the landfill diversion rate for lead batteries go to:
https://canadianbatteryassociation.ca/download/lead-battery-waste-diversion-studies/.

6 Program Management

6.1 Program Efficiency

In addition to the CBA's the reverse distribution recycling system established by its members, the CBA has partnered with other Stewardship Agencies to improve operational and program efficiency.

There are three notable partnerships that have helped the CBA reduce costs and increase accessibility:

6.1.1 Stewardship Agencies of BC

The CBA is an active participant in the collaborative group called the Stewardship Agencies of BC (SABC). SABC brings together the different Stewardship Agencies in a forum to work on issues that are common to all Stewardship Programs.

In 2022, SABC published a policy document on Accessibility and is currently working on a protocol for Emergency Response and improving communication with Local Governments.

For more information about SABC and these initiatives, go to www.bcrecycles.ca

6.1.2 Rural and Remote First Nations

In 2018, ten stewardship programs in Manitoba started developing a backhaul strategy for First Nations in northern communities.

Despite the pandemic that impacted northern communities, the backhaul program has expanded to 7 communities with more communities added every year.

To date, approximately 20,000kg of lead batteries have been recovered by the northern Manitoba backhaul program along with household hazardous waste, used oil, tires, electronics and printed paper and packaging.

Based on the success of the northern Manitoba backhaul program, the CBA has signed a Memorandum of Understanding with the Indigenous Zero Waste Technical Advisory Group (IZWTAG) to help recover lead batteries rural and remote First Nations in British Columbia.

To support these and future projects in Canada's rural and remote communities, the CBA has prepared a report on the Management of Lead Batteries in Rural and Remote Communities.

6.2 Quality of Service

To track customer satisfaction, the CBA has integrated into the consumer awareness program an estimate of community and partner satisfaction, number and nature of complaints, number and nature of service disruptions.

To date, there have not been any complaints about the CBA's Stewardship Program.

The Quality of Service results in the Consumer Awareness studies will be reported in the CBA's Annual Report to the Ministry of Environment.

6.3 Management Performance

To ensure the CBA is accountable to regulators, members and stakeholders, the CBA will be subject to a variety of audits and reports.

6.3.1 Financial Audit

The CBA undergoes an annual Financial Audit by Scott Kelday. Mr Kelday is a CPA in Toronto and has prepared the CBA's Auditor's Report since FY 2016.

The CBA's Audit Report is presented to CBA Members at their Annual General Meeting and the Audit Report is available upon request.

6.3.2 Non-Financial Audit

The CBA has undergone a number of Non-Financial Audits (NFA) since 2013. The 2022 NFA was completed by MNP consultants and was posted on our website in July, 2020.

The purpose of the non-financial audit is to verify the key performance indicators of the CBA's Annual Stewardship Program Report. The key elements include auditing of:

- Number of Return-Collection Facilities operated by the CBA
- Recovery Rates by CBA members and Product Diversion Rates
- Recycling location of recovered lead batteries.

6.3.3 Reporting

The CBA will publish on its website:

- The Stewardship Plan for Canada
- Annual reports for regulatory compliance
- Results of its stakeholder consultations
- Policies, Procedures and Manuals
- Consumer recycling locations

The CBA's Annual Report for each Province will include:

- A description of the CBA's educational materials and strategies used in the previous calendar year and changes proposed for the current calendar year
- The location of the CBA's return collection facilities in urban and rural areas and any changes in the number and location of collection facilities from the previous report and proposed changes in the current calendar year
- The number of activities and events to recover LABs from remote communities and locations and proposed activities and events for the current calendar year
- Efforts taken by the CBA to reduce environmental impacts throughout the product life cycle and to increase reusability or recyclability of lead batteries at the end of the product's cycle
- A description of how the recovered product was managed in accordance with the pollution prevention hierarchy and proposed projects to improve operational efficiency
- The total amount of the product sold and collected by the CBA members will be used to determine the CBA's Recovery rate
- A comparison of the approved plan's performance for the year with the performance requirements and targets in the Recycling Regulation and the CBA's approved plan.

7 Priorities for Next 5 Years

The CBA has accomplished several goals in the first ten years of its Stewardship Program in Canada. Notably, the CBA has:

- Maintain the comprehensive network of Return Collection Facilities that provide easy access for consumers in urban and rural communities
- Expand the program to serve remote communities and First Nations
- Undertake Consumer Awareness Surveys and Waste Characterization Studies to provide input to the Stewardship Program for lead batteries.

The CBA plans to build on the progress in the first 10 years and the CBA's Board of Directors have set a number of Program priorities for the next five years.

Appendix 1: Summary of Key Performance Measures for Lead Batteries in Canada

Key Performance Category	Target / Report	Metric
Sales	Report	Consumer: kg Commercial: kg Total: kg Verified by NFA*
Recycled	Report	Total: kg Verified by NFA*
Collection Rate	Target >90%	Collection Rate: % Verified by NFA*
Collection by Regional District/ Jurisdiction (if applicable)	Report	See Table in Annual Report
Sales per Capita	Report	kg/person/yr1
Recovery per Capita	Report	kg/person/yr1
Landfill Diversion Rate	Report	Residential: % IC&I: %
Total number of Return Collection Facilities (RCFs) in the Jurisdiction	Report	Total Number of RCFs: See Table for details by jurisdiction Verified by NFA*
Total number of RCFs by Regional District/Jurisdiction	Report	See Table for list of RCFs by city or jurisdiction
Communities with Return-to-Retail Accessibility	Target: <5km	Average Distance: km See Table in Annual Report for details
Communities with metal or local government recycling options	Target: <10km	Average Distance: km See Table in Annual Report for details
Small & Remote Community with no Recycling Options	Report	Report on communities in a jurisdiction that require special programs
Remote Locations	Report	Report on programs to recovery lead batteries from Remote Locations
Sensitive Areas (e.g., marinas)	Report	Report on programs to recover lead batteries in sensitive areas
Percent of population served using CBA Target	Target: >99%	Calculate % of Population Served using Accessibility model
Use of Permitted Processing Facilities	Target: 100%	% of lead batteries sent to Permitted Facilities.
Adherence to International Hazardous Waste Commitments	Target: 100%	% compliance to International Requirements.
Value per lead batteries in Small Communities	Report	$/battery in small rural communities