

Canadian Battery Association Annual Report to the Director

2016 Calendar Year

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Executive Summary

The New Brunswick 2016 Annual Report summarizes the second complete year that a Stewardship Plan has been in effect in New Brunswick for lead-acid batteries.

The data and information presented in the Annual Report includes the individual results from each of the Maritime Provinces as well as the aggregate results for the Maritimes. Because of the close proximity of the three provinces, the Maritime Provinces are essentially a sales and recycling region for lead-acid batteries and the data from one Province cannot be looked at in isolation of the other Maritime Provinces.

The following table summarizes the Stewardship results in 2016

Products within plan	All lead-acid batteries sold in New Brunswick
Program website	www.canadianbatteryassociation.ca and www.recyclemybattery.ca

Topic	Summary
Public Education Materials and Strategies	<ul style="list-style-type: none"> • Phone and web based recycling information is available to the public through www.recyclemybattery.ca; • Completion of the National Recyclepedia phone App for the public to identify Return Collection Facilities for lead-acid batteries;
Collection System and Facilities	<ul style="list-style-type: none"> • CBA members visit thousands of retailers and IC&I customers in the Maritime Provinces as part of their reverse distribution system of dropping off new and collecting used lead-acid batteries (LABs); • Distributors impose a core charge of \$15 on most automotive batteries to promote the return of LABs from the retailer; • There are 24 Return Collection Facilities for the public in New Brunswick and 7 warehouse operations for recycling of IC&I batteries located in Nova Scotia and New Brunswick; • The CBA has created table of Return Collection Facilities (RCFs) by Community to identify gaps in rural recycling options for the public – see Appendix 1;
Pollution Prevention Hierarchy and Product / Component Management	<ul style="list-style-type: none"> • all LABs collected by CBA members were sent to permitted smelters for recycling resulting in 100% compliance with Basel Convention regarding the shipment of hazardous waste to non-OECD countries; • Lead-acid batteries are 100% recyclable with: <ul style="list-style-type: none"> ○ 99% of lead in LABs recovered in smelting process and the 1% dross can be further refined in a primary lead-smelter; ○ 100% of electrolyte (H₂SO₄) is reused in other production processes; ○ 30% of plastic battery casings used for energy recovery and creating anoxic conditions during the smelting process; ○ 70% of plastic LAB casings recycled into new LAB casings.

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Topic	Summary
Product Sold and Collected and Recovery Rate	<ul style="list-style-type: none"> • 6.9M kg of LABs sold in the Maritimes in 2016 by CBA members– >95% market share; • In 2016 the recovery rate for lead-acid batteries for the Maritime provinces as a region was: <ul style="list-style-type: none"> ○ 68% of automotive batteries; ○ 39 % of motive batteries and ○ 2% of stationary batteries. • The recovery rate was calculated by dividing the volume of batteries recovered by the volume of batteries sold by CBA members in the Maritimes; • 35% of LABs sold in New Brunswick are recovered by private recyclers outside the CBA’s stewardship program.
Summary of Deposits, Refunds, Revenues and Expenses	<p>The CBA does not charge an Eco-Fee to the consumer.</p>

1.0 Program Outline

About the Canadian Battery Association

The Canadian Battery Association (CBA) was established in 1970 by the Canadian Manufacturers of lead-acid batteries (LABs) and in 2016 the Association focused on the establishment of a National Stewardship Program for LABs.

The CBA is now the National Stewardship Agency in Canada for LABs with approved Stewardship Programs in Prince Edward Island, New Brunswick, Manitoba and British Columbia.

Membership

The signatories to the CBA’s Stewardship Program in New Brunswick are summarized at <http://canadianbatteryassociation.ca/index.php/new-brunswick>. The Distributors of LABs have assumed the stewardship obligations on behalf of the retailers that sell lead-acid batteries in New Brunswick.

Stewarded Products

The CBA Stewardship Program focuses exclusively on three types of LAB. The Starting, Lighting and Ignition (SLI) batteries are the most common LAB sold in Canada representing about 90% of all LAB sales. An automotive battery is a typical SLI battery. The remaining batteries are motive and stationary LABs and are used in commercial applications such as forklifts and UPS systems for energy storage and emergency electronic and lighting applications.

Collection Approach

There are three factors that influence how LABs are recovered and recycled. First and foremost, LABs have a value at the end-of-life due the inherent value of

the lead. Secondly, most consumer and all commercial LABs are replaced at a commercial facility by a licensed technician. Thirdly, most CBA members have core charges on retailers and contracts with smelters that require a constant supply of recyclable LABs. As such, the CBA members utilizes a 'reverse distribution' system where distributors drop off new batteries at retail and pick up the used batteries that are eventually returned to the smelters for recycling.

Accomplishments in 2016

In addition to developing and implementing the Stewardship Program and data base for the Maritime Provinces, key accomplishments in 2016 were:

- Working with the Local Government to complete the characterization of 100 samples of residential and IC&I waste. This information gives the CBA information on the likelihood of lead-acid batteries being landfilled.
- Development of a National Recyclepedia phone App that will help the public find a Return Collection Facility for lead-acid batteries;
- Implementing a clear definition of when a LAB becomes a "Hazardous Waste" thus promoting the refurbishment and reuse of used LABs;

2.0 Public Education Materials and Strategies

The CBA's communication strategies recognize that the majority of end-of-life lead-acid batteries (LABs) are installed, maintained and eventually removed by qualified technicians. Consequently, the education materials and strategies have a different emphasis when compared to other "consumer" products.

The CBA has three communication strategies:

- 1) Consumers. The CBA operates and maintains its website www.recyclemybattery.ca that lists the return collection facilities that will take LABs from the public. In 2016, the CBA's website had 91 visits from New Brunswick.
- 2) CBA Members: 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 LABs. These education materials focus on compliance to Federal and Provincial regulations that pertain to the safe collection, storage and transportation of lead-acid batteries.
- 3) Retail Stores: The manufacturers and distributors of lead-acid batteries are the primary mechanism to communicate to the retailers of lead-acid batteries. Retailers are highly motivated to return lead-acid batteries to the distributor through the reverse-distribution system because of the \$15 core-charge on lead-acid batteries.

3.0 Collection System and Facilities

The majority of lead-acid batteries recovered were collected in a reverse distribution system between the CBA member and their retail and IC&I customers. CBA members deliver new lead-acid batteries to retail and IC&I customers and pick up the used lead-acid batteries at the same time.

The CBA has identified 24 Return Collection Facilities (RCFs) in New Brunswick for the recovery lead-acid batteries from the public – see Appendix 1. The majority of the RCFs for the public are retail locations. Go to www.recyclemymybattery.ca to access the list of RCFs available to the public.

Appendix 1 also summarizes the communities in New Brunswick that do not have an official Return Collection Facility.

In addition, there were 7 warehouse operations in the Maritime Provinces that refurbish and recycle industrial lead-acid batteries. Go to <http://recyclemymybattery.ca/industrial-batteries> for a listing of the warehouse locations that will take industrial batteries.

4.0 Product Environmental Impact Reduction, Reusability and Recyclability

For the past 5 years, the CBA worked with Provincial government's Hazardous Waste groups to clearly define when a "used" lead-acid battery becomes a "waste". In 2015, the new policies were completed that will promote the refurbishing of used lead-acid batteries rather than declaring lead-acid batteries a "hazardous waste" at the end of the battery's "primary use".

The new policy clearly defines that a lead-acid battery is declared a "Hazardous Waste" at the distribution warehouse after the batteries have been sorted and tested. Approximately 10 to 15% of used lead-acid batteries can be refurbished and resold under this policy.

In 2016, the CBA continued with their project on identifying lead-acid batteries in the Municipal waste stream. The CBA has participated in over 300 Waste Characterization samples of municipal and IC&I waste to determine the volume of lead-acid batteries in the municipal waste stream and to date, only on small sealed lead-acid battery has been recovered from these studies. In 2017, the CBA will be collating the data to determine a diversion rate based on the samples collected in the municipal waste stream.

5.0 Pollution Prevention Hierarchy and Product / Component Management

All recovered LABs that cannot be refurbished are sent to recycling and smelting facilities in Canada and the USA. The primary and secondary smelters in Canada and the USA have valid permits and/or approvals. The recycling requirements and emission levels for recyclers and smelters are set by Federal, Provincial and State governments as part of their permit/approval processes for the smelter.

Go to www.recyclemybattery.ca and click on the video that details the smelting process for waste lead-acid batteries.

Battery Council International provides the following information on how the average lead-acid 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 secondary smelting process is not recovered and is contained in dross. Dross can be sent to primary smelters for further processing.	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.	Recycled and sold as a commodity.

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Plastics	<p>The Polypropylene Case that provides structure to most batteries.</p> <p>Stationary batteries have a clear casing made of Acrylic.</p> <p>Within each battery, Plastic Separators are used to Isolate the Positive and Negative plates in a cell.</p>	<p>About 70% of the plastic is recycled and used to make new battery casings.</p> <p>Acrylic casings are not recyclable and are burned for energy recovery.</p> <p>The Plastic Separators are burned at the smelters for energy recovery and creating an oxygen free environment during the smelting process.</p>
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6.0 Product Sold and Collected and Recovery Rate

The members of the CBA account for about 95% of the lead-acid batteries sold in the Maritime Provinces. An embedded lead-acid battery within a new product (i.e., boat, motorcycle, tractor etc) is the most common method of bringing a lead-acid battery into New Brunswick outside the CBA’s Stewardship Plan. The volume of sales outside the Stewardship program is estimated to be less than 5% of total sales.

2016 Lead-Acid Sales & Recovery Data for the Maritime Provinces

Automotive Batteries	NB	NS	PEI	Maritimes	Canada
Sales(kg)	4,200,000	2,368,000	382,000	6,970,000	134,258,000
Sales(kg) / Capita	5.595	2.506	2.605	3.776	3.731
Recovery(kg)	2,162,000	2,528,000	49,000	4,739,000	92,792,000
Recovery(kg) / Capita	2.866	2.675	0.334	2.567	2.579
Recovery Rate	51%	107%	13%	68%	69%

The sales data for lead-acid batteries are skewed to the Province of New Brunswick because of 5 of the 7 distribution warehouses are located in Moncton and Dieppe; however, with new warehouses opening in Nova Scotia in 2016, the recovery rate in New Brunswick declined from 2015 but increased in Nova Scotia. The significant change in recovery rate in New Brunswick and Nova Scotia demonstrates the need to consider sales and recovery on a regional “Maritime” scale.

Used LABs are recovered by CBA members through a reverse-distribution collection system where new LABs are dropped off at the retailer by the distributor and used lead-acid batteries are picked up at the same time. The used LABs are taken back to the distributor’s warehouse where the batteries were recharged, refurbished or declared a

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“waste”. The Maritime Provinces have 7 distribution warehouses – 5 in Moncton/Dieppe and 3 in Dartmouth.

In the Maritimes, CBA members recovered just over 5.4Mkg of lead-acid batteries for an overall recovery rate of 68% of CBA sales. The recovery rate in the Maritimes equals the National recovery rate and the private recyclers account for the remaining 35% of the recovery.

All waste LABs recovered by CBA members were shipped to smelters in Canada or the USA. No waste batteries were shipped to brokers in the USA that could then ship to a non-OECD country and violate the Basel Agreement.

7.0 Summary of Deposits, Refunds, Revenues and Expenditures

The Canadian Battery Association does not charge eco-fees at the point of sale.

8.0 Plan Performance

Stewardship Plan	Results	Strategies for Improvement
<p>1. Awareness</p>	<p>69% of All Respondents*</p> <p>78% of Respondents that have Lead-Acid Batteries*</p> <p>80% of Respondents that have Unwanted Lead-Acid Batteries*</p> <p>*2016 BC Survey by Insights West</p>	<p>Continue to use the website www.recyclemybattery.ca to direct the public to an appropriate Return Collection Facility.</p> <p>Promote the National App for Smart Phones that will direct the public to an appropriate Return Collection Facility in New Brunswick.</p> <p>Develop a “Call Centre” for the public for lead-acid battery information in New Brunswick.</p>
<p>2. Accessibility:</p> <ul style="list-style-type: none"> • 30 minutes in Urban Areas; • 45 minutes in Rural Areas 	<ul style="list-style-type: none"> • 24 Return Collection Facilities (RCF) – see www.recyclemybattery.ca; • 7 warehouse operations in the Maritimes that link to the IC&I sector; • Summary of RCFs in each Community – See Appendix 1 	<p>Serviced and underserved communities were identified in 2015 - see Appendix 1.</p> <p>Add 10 new RCFs in rural underserved NB communities in 2017.</p> <p>Work with the Eastern Recyclers Association and increase the number of designated Return Collection Facilities for rural areas on the recycling websites and phone apps.</p>

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Stewardship Plan	Results	Strategies for Improvement
3. Recovery Rate	- 68% recovery for all CBA automotive type batteries;	- continue to develop agreements with private recyclers (metal recyclers) to provide their data to the CBA in return for support in the awareness of battery recycling and any EH&S issues arising from the recycling of dangerous goods and hazardous wastes.
4. Generation, Storage and Transportation – 100% compliance with Federal and Provincial laws.	- developed compliance and emergency response program for recyclers.	- expand the CBA’s Environmental Management System for lead-acid batteries to recyclers in New Brunswick.

Appendix 1: Summary of Return Collection Facilities in New Brunswick

Community	Province	Population	RCFs
Saint John	NB	69,661	2
Moncton	NB	61,046	1
Fredericton	NB	47,560	2
Riverview	NB	19,128	1
Miramichi	NB	18,508	1
Edmunston	NB	17,373	1
Dieppe	NB	14,951	1
Bathurst	NB	12,924	1
Rothsay	NB	11,947	1
Atholville / Campbellton	NB	9,035	1
Oromocto	NB	8,932	1
Shediac	NB	6,053	1
Grand Falls	NB	5,706	1
Sackville	NB	5,558	0
Woodstock	NB	5,254	1
Grand Bay-Westfield	NB	5,117	0
Tracadie Sheila	NB	4,933	1
St. Stephen	NB	4,817	1
Beresford	NB	4,351	0
Sussex	NB	4,312	1
Hampton	NB	4,292	0
Caraquet	NB	4,169	0
Dalhousie	NB	3,512	0
Shippagan	NB	2,603	0
Bouctouche	NB	2,423	0
Saint-Quentin	NB	2,095	0
Saint Andrews	NB	1,889	0
Florenceville-Bristol	NB	1,639	0
St. George	NB	1,543	0
Lamèque	NB	1,432	0
Saint-Léonard	NB	1,343	0
Richibucto	NB	1,286	0
Nackawic	NB	1,049	0
Hartland	NB	947	0