

Call2Recycle, Inc.

Changing habits. Inspiring action.™

Safe Battery Collection & Recycling

Sustainable Material Management Web Academy

USEPA

Carl E. Smith, CEO / President

March 22, 2018

How We Are Funded

1. 300+ product and battery manufacturers pay a fee based on sales (in weight) by chemistry into the marketplace.
2. All fees must be approved by a Board of Directors whose majority are battery manufacturers (stewards) including Panasonic, Sony, Energizer & Duracell. Fees have been frozen since 1/1/16.
3. Call2Recycle® program manages 30,000 collection sites, educational efforts, reverse logistics and collections based on these fees.
4. In 2017, the program introduced fee-based services for specialty operations (e.g., online box sales, DDR kits).



What Are Our Responsibilities?

Program Management Services

1. **Reverse Logistics Management.** Manage collection, pick-up, transport, sorting and processing.
2. **Education & Promotion.** Beyond educating consumers, collection sites and businesses on why and how to recycle, we convince opinion leaders that we do things right.
3. **Administration & Performance Reporting.** Regulatory submittals, voluntary reporting, certifications, downstream verification, etc.
4. **Customer Service.** Inbound and outbound call center that manages 10,000 inquiries per month.



Our Third-Party Credentials

Permits and Certifications

1. **USDOT Special Permit 14849.** Allows the management of small quantities of batteries in our patented box.
2. **USDOT Special Permit 16563 for DDR Batteries.** Supports collection, transport and disposal of damaged, defective and recalled lithium-based batteries.
3. **R2 / OHSAS 18001 / ISO 14001 Certifications.** Affirms the integrity and diligence of our quality control processes and systems.
4. **Certification of E-Steward Qualification.** Affirms our commitment that waste batteries aren't disposed in third world countries.



Types of Lithium-Based Batteries

- Lithium-based batteries are not the only batteries that could cause safety issues; other rechargeable chemistries must be uniquely handled to comply with USDOT regulations.
- Two distinct lithium-based battery types: Primary: lithium metal and Rechargeable: lithium ion.

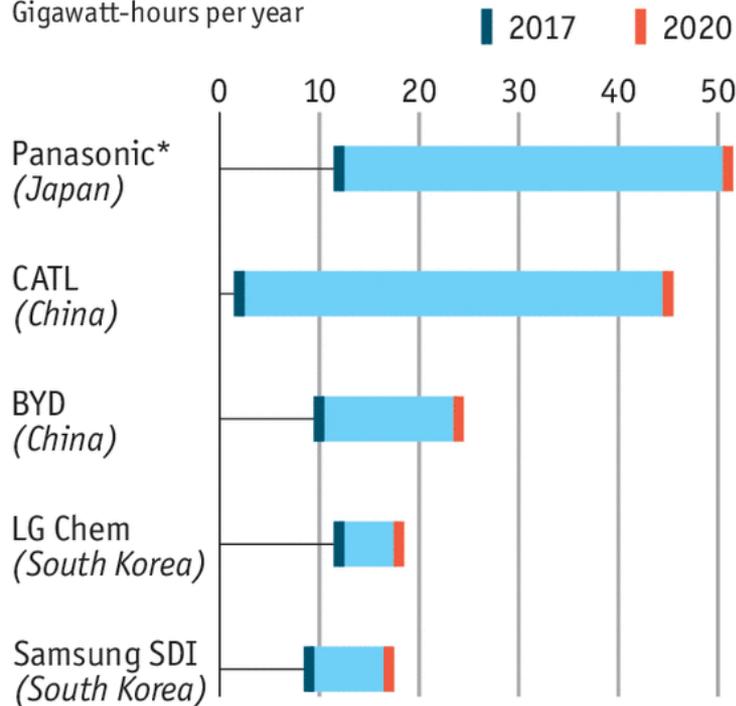
Attribute	Lithium Primary	Lithium-Ion
Sub-chemistries	CR, Lithium Iron Sulfide, Non-Consumer Uses	NCA, NMC, LCO, LMO, LFP, LTO, Coins
Primary Uses	AA/AAA, Medical Devices, Security, Back-up Power	EV, Grid Storage, Electronics, E-Bikes, Power Tools



The Dynamic Lithium Battery Market

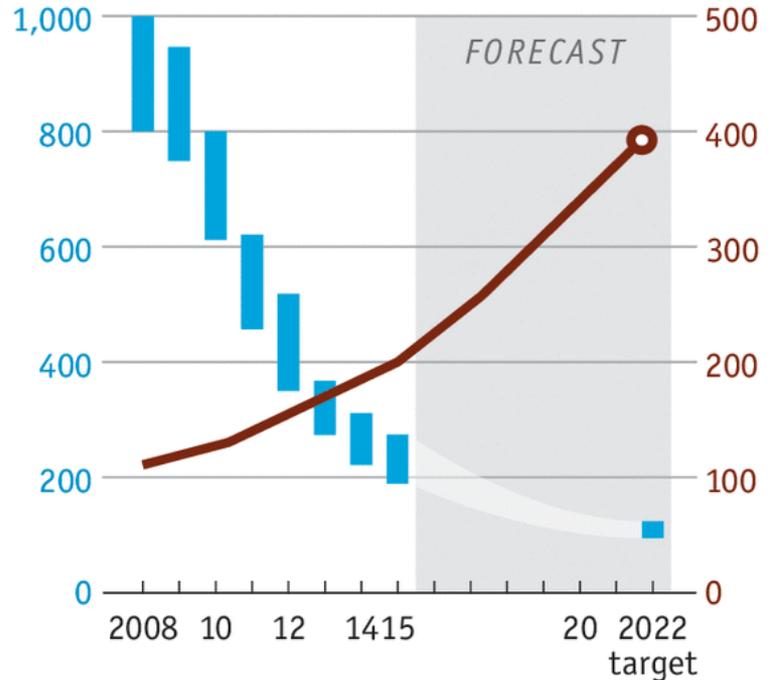
Electric dreams

Manufacturing capacity
Gigawatt-hours per year



Sources: Cairn ERA; US Department of Energy

Battery cost
Worldwide, \$/kWh



Battery energy density
Watt-hours per litre

*Includes Tesla gigafactory

onomist.com

5.6 Billion Lithium Ion Cells Sold in 2016



Changing Landscape for Lithium Ion Batteries

Over the Last Three Years...

1. **Cobalt Prices.** Over the last three years, the price for cobalt (LME) has tripled to \$34 / pound.
2. **Nickel Price / Use.** One key formulation has upped the presence of nickel, whose price is much more stable.
3. **How Do You Know?** You often don't. Tesla = nickel. Apple = cobalt.
4. **Reconditioning.** The more lucrative market is reconditioning Li-Ion where prices can be 10x better than when recycling.
5. **“Damaged, Defective & Recalled (DDR).”** Increasingly, Li-Ion are damaged, making them more dangerous and requiring special treatment.



Our “DDR” Solution

	Small Kit	Large Kit
Kit		
Kit Contents	<ul style="list-style-type: none"> • Overpack box • Metal can with affixed labeling • Metal lid and locking ring • Vermiculite • Tape • Plastic bags • Permit and caution labels • Return shipping label • Instructions 	<ul style="list-style-type: none"> • Overpack box • Metal bucket with affixed labeling • Metal lid and locking ring • Inner box • Vermiculite • Tape • Plastic bags • Permit and caution labels • Return shipping label • Instructions
Note	<p><i>US & Canadian Special Permit allows for no more than 4.4 lbs. (2kgs) of lithium cells and batteries to be contained in a single package. However, a single cell or battery may be shipped within one package provided the cell or battery has a mass of 5 kg or less.</i></p>	

What Do We Do With Li-Ion Batteries?

Lithium Ion Batteries Generated in the US

1. Sorters.

- Battery Solutions, Howell, MI
- INMETCO, Ellwood City, PA
- Battery Solutions, Mesa, AZ
- Wistron GreenTech, McKinney, TX

2. Processors.

- Glencore / Xstrata, Sudbury, ON
- Toxco / Retrieval, Trail, BC
- UMICORE, Hoboken, Belgium
- SungEel Hitech, South Korea
- Recycling Coordinators, Akron, OH
- Retrieval Technologies, Lancaster, OH



How Can You Identify a Lithium-Based RECHARGEABLE Battery?

Rechargeable (Lithium Ion)

- It **MAY** be Marked “Rechargeable”
- It **MAY** Have a Battery Chemistry Name (Lithium Ion) or Abbreviation (LI-ION, Li-ion, LiPo (lithium polymer); Button/coin Cell (LIR#####)
- It **MAY** Just Have Battery Seal or Other Mark
- Or **MAY** Not!



Recycling Lithium-Based Batteries

Four Important Lessons

- 1. A Spent Battery Isn't.** Used lithium batteries can often maintain 80%+ of their original charge.
- 2. Don't Remove Non-Removable Batteries.** Lithium polymer batteries, without hard cases, are susceptible to damage.
- 3. Tape or Bag.** The positive terminal must be protected either by tape or place in a clear and sealable bag.
- 4. Curbside Is Seldom Wise.** While some municipal governments have effective programs to mitigate safety issues, most do not. Find a dedicated collection container / site.



The *Charge Up Safety*TM Campaign

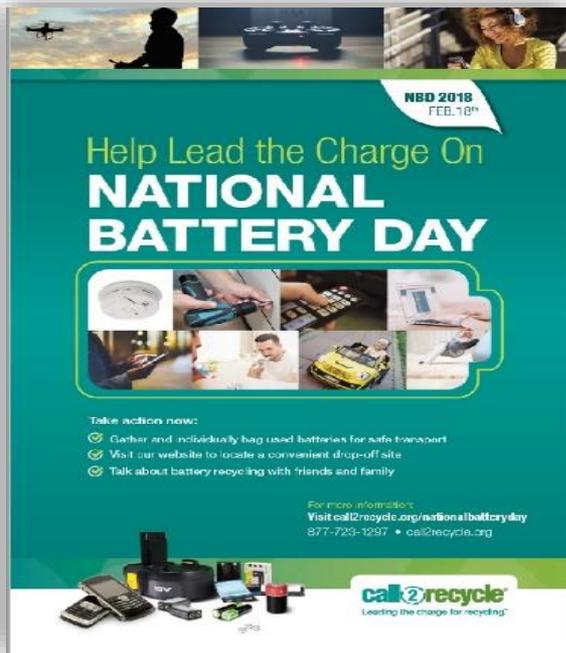
Four Main Objectives

1. **Foster Employee Leadership.** Improve our knowledge, culture and commitment to safety to enable us to serve as leaders and influencers with customers.
2. **Improve Collection Site & Sorter Performance.** Increase visibility, accountability and behaviors surrounding safe handling, storage and transport of batteries.
3. **Drive Consumer Awareness.** Improving the visibility and knowledge of safe practices.
4. **Engage Stakeholders.** Build relationships with other like-minded organizations to influence public and government debate on relevant safety issues.



Charge Up Safety™: Consumer Education

- Safety Video.
- Safety Portal.
- Consumer Outreach Events.



NBD 2018
FEB. 18th

Help Lead the Charge On NATIONAL BATTERY DAY

Take action now:

- ✓ Gather and individually bag used batteries for safe transport
- ✓ Visit our website to locate a convenient drop-off site
- ✓ Talk about battery recycling with friends and family

For more information:
Visit call2recycle.org/nationalbatteryday
877-723-1297 • call2recycle.org

call2recycle
Leading the charge for recycling.



SAFETY

Safety is a core tenet of the Call2Recycle® program and is reflected in every aspect of our daily operations. We are committed to the safety of the employees, collection sites, transporters, industry stewards, sorters and processors involved in the used battery collection and recycling process. As the premier North American battery recycling program, Call2Recycle is continually improving its safety policies and best practices to ensure we protect both people and the environment.

We invite you to join us and **Charge Up Safety** in your recycling efforts! This safety portal shares our best practices and resources on how to improve recycling safety, whether you are a large business, municipality, retailer, community center or consumer. Test your knowledge with our safety training lesson. Find out why damaged batteries require special packaging. Download our collection site guidelines. Get ready to charge up the safety of your recycling!

- Collections & Shipping**
Learn about the essential aspects of handling, collecting and shipping used household batteries, whether you are shipping in boxes or bulk.
[LEARN MORE](#)
- Safety Training**
Test your safety knowledge, including how to bag and tape batteries, what containers are acceptable and what mistakes to avoid in preparing batteries for shipping.
[LEARN MORE](#)
- Damaged, Defective & Recalled Batteries**
Find out what to do with your damaged, defective or recalled batteries, which require special packaging requirements.
[LEARN MORE](#)
- FAQs & Resources**
Charge up your recycling safety by reading common safety questions and visiting links to other safety resources.
[LEARN MORE](#)



Battery Safety University
Battery Prep 101

call2recycle
Leading the charge for recycling.

0:02 / 3:39

YouTube



Charge Up Safety™: Site Education

- Shipping Guidelines.
- Required Safety Training.
- Stakeholder Engagement.



Group	Number of Sites Trained	% Compliant
Traditional "Free" Collection Sites (Includes Best Buy, The Home Depot, Lowe's, Sears/Kmart, Staples, Stewards, Muni's, etc...)	12,559	85% compliant
Fee-based Collection Sites (Sites purchasing boxes via eCommerce or through a contractual arrangement)	5,980	75% compliant
TOTAL	18,539	82% compliant sites



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thank you!

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