



BATTERIES: RECYCLING AND SAFETY GO HAND IN HAND

March 19, 2019 Tim Warren, Regional Account Manager

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Agenda

- 1. Batteries in the waste stream the Good, the Bad and the Ugly
- 2. Call2Recycle's role in battery recycling
- 3. Understanding battery safety risks
- 4. Advancing safety in battery recycling





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Batteries: The Good & The Bad (and Ugly?)

- 1. More than 3 billion batteries sold annually in the US (USEPA) 80% single use; 20% rechargeable
- 2. Battery Chemistries continue to evolve in the marketplace:
 - Rechargeable batteries: Li-Ion now powers most consumer products; NiCd has been replaced.
 - All Rechargeable batteries (NiCad, Ni-MH, Li-ion and SSLA) are readily recyclablemature/viable and mostly North American markets (but global for some chemistries)
 - Environmental concerns for EOL management (cadmium, lead) have been largely replaced with safety concerns (Lithium Ion).
 - Alkaline batteries are becoming more recyclable. However, they are also being replaced in the market by Lithium Primary/single use lithium (9V, AA, AAA, C, D and coin cell) that are more expensive to recycle than alkaline.



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Batteries: The Good & The Bad (and Ugly?)

- 3. Issues with batteries are pervasive and, in fact, increasing:
 - Increasingly, rechargeable batteries are embedded in products, the removal of which is difficult, increasing safety risks and proper reuse and recycling.
 - Because of sheer volume of battery sales, we see more rather than less "damaged, defective and recalled (DDR)" lithium batteries in the waste stream.
 - The energy density (power per gram) continues to rapidly increase, creating more powerful yet smaller batteries, making them harder to identify and potentially more of a safety risk.
 - Batteries heavily rely on small amounts of scarce natural resources mined under less than ideal conditions.
 - Local government information on battery recycling may be out of date or incomplete.



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Call2Recycle's Role in Battery Recycling

- Not-for-profit, industry-funded battery stewardship organization operating in the US and Canada.
 - 1st household battery recycling program in the US.
 - Founded by battery manufacturers in 1994 to deal with emerging state and federal regulation.
 - More than 300 product and battery manufacturers fulfill state, provincial and federal recycling requirements through Call2Recycle.
- Operate a reliable, cost-efficient and customer-focused national recycling network.
 - More than 16,000 collection partners, including 6,500 local government sites
 - 86% of US population lives with 10 miles of an active Call2Recycle dropoff collection site
 - More than 115 million lbs. of batteries collected since 1994.
- RBRC = Call2Recycle



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Call2Recycle's Role in the Carolinas

- Stewardship program fulfills state laws for recycling SSLA/Pb batteries, as well as the federal Mercury-Containing and Rechargeable Battery Act.
- 670 + active collection locations
- 77% of South Carolinians and 84% of North Carolinians live within 10 miles of an active Call2Recycle drop-off location.
- Nearly 4.8 million lbs. of batteries recycled from the Carolinas through the Call2Recycle program. (1.8M+ from SC and 2.9M+ from NC)

	2015	2016	2017	2018
SC	72,000	82,000	67,000	49,000
NC	313,000	243,000	195,000	166,000

Call2Recycle Battery & Cellphone Collections (lbs)

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Understanding Battery Safety Risks

- Design (Batteries with Products) "spontaneous" combustion of a battery in a product. TYPICALLY involves the design relationship of the battery with the product.
- Abuse (Batteries Removed from Products) some batteries were not designed to be replaced by consumers. Off-the-shelf replacement batteries jeopardizes safety.
- **Shipment** (Batteries in Transport) when transported at end-of life, improperly packaged batteries (e.g., exposed battery terminals) can create friction or a short circuit causing a fire.



Understanding Battery Safety Risks

- **Storage** (Batteries Waiting for Management) occurs when material is stored with other flammable material and is exposed to the elements.
- Disposal (Including Recycling) difficulty in identifying and separating batteries or products with batteries. Shredding, crushing, puncturing or otherwise causing damage to a lithiumbased battery create fires.





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Education is key

- Charge Up Safety ™. Education campaign directed at employees, collection sites, battery sorters, consumers and other like-minded organizations to increase safety and reduce battery related incidents.
- Avoid the Spark... Be Battery Safety Smart ™. 2018 campaign in San Francisco Bay area counties aimed at heightening consumer awareness on battery safety and related issues. Materials available for nationwide use at <u>www.avoidthespark.com</u>







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- Required safety training for program participants. Tools to train staff (terminal protection graphics, training presentations).
- Increased Auditing / Monitoring. Non-compliant collection sites are suspended from program and can be reactivated with safety training.
- Innovative, safe & compliant recycling solutions.
 - Flame retardant box (FRB)
 - Damaged, defective, recalled lithium battery kits





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- Flame retardant box (FRB)
 - Patent pending flame retardant box liner.
 - Third-Party Tested Extensive testing by independent laboratory (withstood up to 1,100 degrees F).
 - Containment Prevents flames & heat from spreading outside the shipping container.
 - Recyclable & Reusable Made of polyester material manufactured from used plastic bottles and can be reused multiple times.









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- Damaged, defective recalled lithium battery kits
 - Specially designed kits to safely handle damaged or swollen lithium batteries – which cannot be placed in a regular Call2Recycle collection kit.
 - US Special Permit allows up to 4.4 lbs. (2kgs) of lithium cells 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.







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What Can You do?

- Designate a Storage Area. Determine where and how collected batteries will be stored at your facility
 - Isolate away from other materials (i.e., recyclables = fuel)
 - limit exposure to the elements (i.e., extreme temperature, rain, etc.).
- Develop Standard Operating Procedures.
 - Used Batteries. Identify the battery, terminal protection, take to the storage area, add to correct storage container.
 - Damaged or Defective Batteries. Isolate the battery (i.e., kitty litter or sand in its own container), ship using US DOT approved DDR container and process. Call2Recycle has DDR kits available to isolate, transport and recycle these batteries separate from other chemistries.
- Train Employees. Train, train and train again. Use visuals to show examples of what to look for and review SOPs, and then train again. Resources available at www.call2recycle.org/safety-training.
- Update your website and consumer materials on batteries



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What Can You Do?

• Partner with a trusted, reliable and compliant organization that can customize a solution to meet your local needs.

Let us know how we can help!





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Leading the charge for recycling.[™]

thank you!

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