



Battery Stewardship Breakout Session

Suna Bayrakal, Ph.D.
Product Stewardship Institute, Inc.
OKRA Conference 2020 | October 8



Product Stewardship Institute

National Non-profit Building the capacity for product stewardship and EPR in the U.S. to reduce the health & env'l impacts of products across their lifecycle for **20 years**



Members from
47 **state** gov't agencies
hundreds of **local** gov'ts

> 100 **Partners** representing
producers, recyclers, waste management,
retailers, NGOs, academics, international gov'ts

PRO
TEV
IST

product categories



batteries



electronics



paint



hhw



packaging



pesticides



pharmaceuticals



thermostats



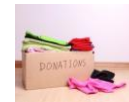
mattresses



medical sharps



fluorescent
lamps



textiles

product categories



phone books



solar panels



used motor oil



gas cylinders



auto switches



radioactive
devices



appliances
with
refrigerants



carpet



tires

+ *framework legislation*

Battery Types + Products + Components



Single-Use (Primary) Batteries

Battery Chemistry	Characteristics and Common Uses	Components
Alkaline	Toys, flashlights, remote controls, digital cameras, handheld games, portable music players, etc.	• Zinc, manganese, case metals, the electrolyte (KOH), ferromanganese, and steel can be recovered and resold. • Those made before 1996 may contain mercury.
Zinc-carbon, Zinc-air, zinc-chloride	Least expensive primary batteries; common in low power devices such as remote controls, hearing aids, toys.	• Zinc, manganese, and case metals, and the electrolyte can be recovered and resold. Zinc mining has significant environmental impacts.
Lithium Primary	Very long-lasting; used for implantable electronic medical devices, cameras, and calculators.	• Lithium is potentially flammable. It can also be recovered and resold.
Mercuric Oxide and Mercury Containing	Old hearing aids (mercury not used in US batteries since 1990s), novelty items from outside the U.S.	• Mercury is toxic.

Battery Types + Products + Components



Rechargeable Batteries

Battery Chemistry	Characteristics and Common Uses	Components
Nickel-Cadmium (Ni-Cd)	Power tools, toys, cameras, cordless phones, and two-way radios	• Cadmium is toxic to humans and animals. • 99.9 percent pure cadmium is recoverable for reuse in new Ni-Cd batteries. • The European Union banned the use of nickel and cadmium in power tools in 2017 owing to significant environmental impacts.
Nickel-Metal Hydride (Ni-MH)	High drain devices (e.g., digital cameras, consumer electronics, power tools) with high capacity.	• Nickel, iron, and other metals can be recovered and resold. • Production of pure nickel has significant environmental impacts.
Lithium-Ion (Li-ion)	Portable consumer electronics (cell phones, laptops), power tools, cameras, and electric vehicles.	• Lithium is potentially flammable • Cobalt, nickel, iron, and other metals can be recovered and resold.
Small Sealed Lead Acid (SSLA/Pb)	Uninterrupted power supplies (UPS), home security systems, and children's riding toys.	• Lead can be recovered and resold.



Battery Type Guides

- Call2Recycle – Battery Recycling Guide available on [What Can I Recycle?](https://www.call2recycle.org/what-can-i-recycle/) Page [https://www.call2recycle.org/what-can-i-recycle/]
- [Avoid the Spark: Battery Identification Guide for Common Household Batteries](https://dec.vermont.gov/sites/dec/files/wmp/SolidWaste/Documents/Universal-Recycling/Battery-I.D.-Guide%20%28002%29.pdf)
[https://dec.vermont.gov/sites/dec/files/wmp/SolidWaste/Documents/Universal-Recycling/Battery-I.D.-Guide%20%28002%29.pdf]



Why Recycle?

1. **Billions of batteries** are purchased every year and use of batteries is growing
2. The vast **majority of batteries end up in landfills and waste-to-energy** facilities.
 - Squanders **natural resources** + energy
 - Missed opportunity to create **recycling jobs**
 - Can result in groundwater + air **contamination** from toxic materials
3. **Only ~ 12-15% of rechargeable batteries**, and a much smaller % of single-use batteries, are being **recycled** in the U.S. + many **batteries are contained in products** that are not recycled
4. Lithium ion batteries can **catch fire** in the trash causing damage and posing hazards to waste workers + others



Battery Management: Laws + Voluntary Programs



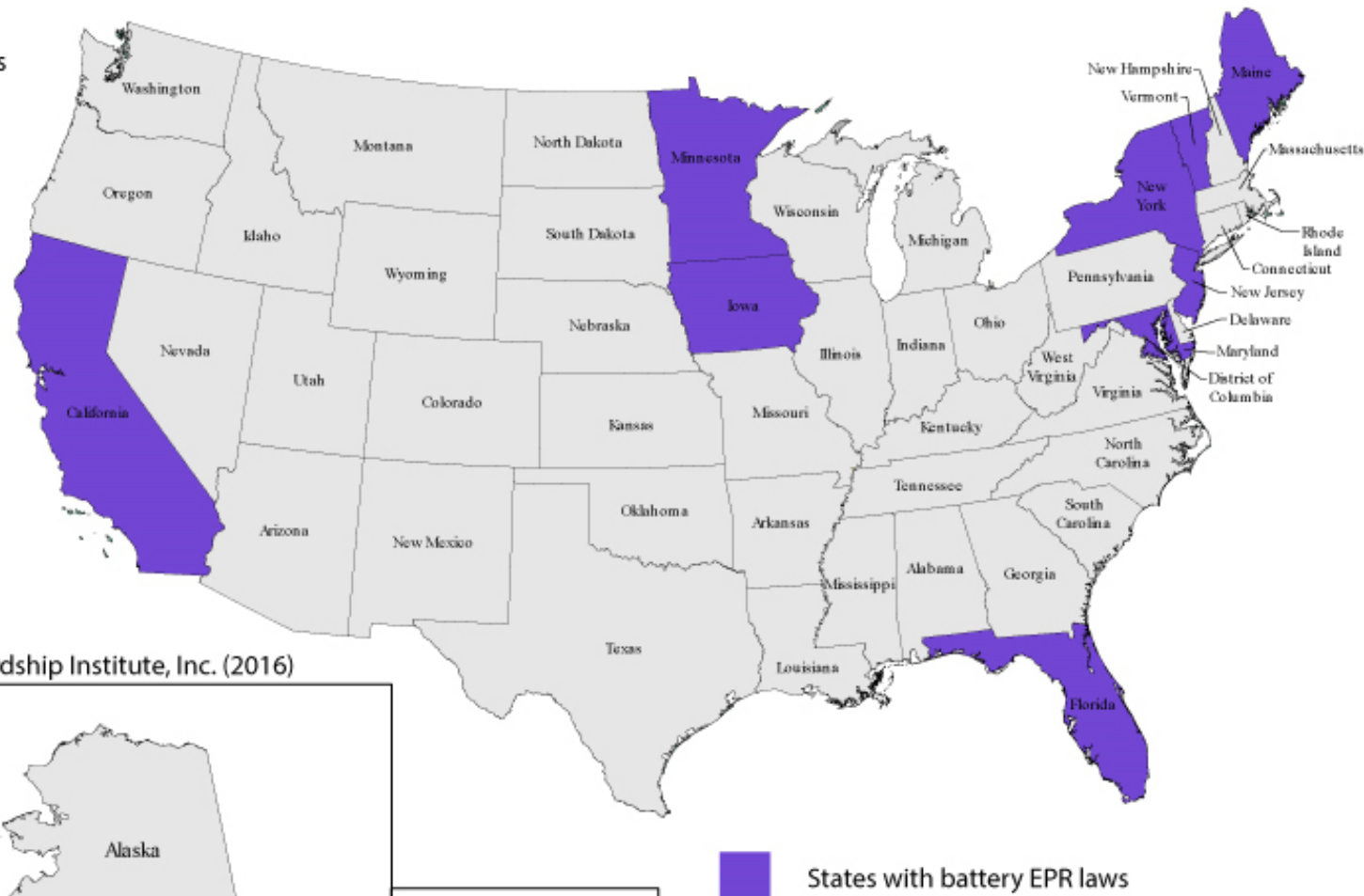
Voluntary Programs

1. Call2Recycle is the only industry-funded program in North America for recycling **rechargeables**
2. No national industry-funded program for **single-use** batteries in the U.S.

Laws

1. U.S. Battery Management Act of 1996 – **removed regulatory barriers to encourage recycling** of rechargeable batteries
2. Product Stewardship Laws provide sustainable **funding for battery recycling**
– 9 states with rechargeable laws, 1 state with primary/single-use law

Product Categories
-Rechargeable batteries
-Primary batteries



Source: Product Stewardship Institute, Inc. (2016)



EPR Laws



**PRODUCT
STEWARDSHIP
INSTITUTE**



Battery Management: Collection + Storage Best Practices

- Designate a collection and storage area that will ensure that batteries are:
 - **Isolated** and away from other materials
 - Not exposed to **extreme temperatures**, rain, etc.
- Establish and train employees on procedures to:
 - **Manage used batteries** – identify battery, protect terminals, add to correct collection/storage container
 - **Address damaged or defective** batteries by isolating the battery (i.e., kitty litter or sand), ship using US DOT approved container
 - Respond to **battery fires** – isolated a battery on fire from all other materials and soak with water
- Use a reliable recycler who will properly manage batteries





Battery Management: Other Best Practices

Collection

1. Recruit retail and other locations to serve as collection sites and increase convenience
2. Engage and check-in with collection sites

Education

1. Conduct **education + outreach** campaigns and evaluate campaign **effectiveness**
2. Consider **merging messaging** for battery recycling with messaging that promotes proper management/recycling of a broad range of materials
3. Use municipal websites, social media, local radio ads/newspaper ads, newsletters, direct mailings, and signage (at facilities + retail), to highlight to residents the **environmental/public health** benefits of recycling batteries + **where to recycle**.

Where to Recycle

- **Call2Recycle Collection Sites** [<https://www.call2recycle.org/locator/>] – drop off old batteries for free at convenient locations and collection events
 - Public agencies
 - Retailers (including The Home Depot, Lowe's, and Staples)
 - Businesses
 - Municipalities
- **Tulsa** - The Metropolitan Environmental Trust (MET) - <http://metrecycle.com/batteries/>
- **Oklahoma City** - <https://www.okc.gov/departments/utilities/recycling/beyond-the-bin>
- **Keep Oklahoma Beautiful** Recycle Directory - <https://www.keepoklahomabeautiful.com/what-we-do/recycle-directory.html>
- **Earth 911** [https://search.earth911.com/?utm_source=earth911-header]



Additional Resources



- **PSI**
 - ✓ [Batteries Product Page](https://www.productstewardship.us/page/Batteries)
[https://www.productstewardship.us/page/Batteries]
 - ✓ [On-Demand Webinars](https://www.productstewardship.us/page/Webinar-Recordings)
[https://www.productstewardship.us/page/Webinar-Recordings]
 - ✓ Battery Stewardship Briefing Document (available to PSI Members+Partners)
- [Call2Recycle](https://www.call2recycle.org/) [https://www.call2recycle.org/]
- **U.S. Environmental Protection Agency** [Universal Waste Page](https://www.epa.gov/hw/universal-waste)
[https://www.epa.gov/hw/universal-waste]

Discussion



Thank You!

Suna Bayrakal

Director of Policy & Programs

617.236.4886

suna@productstewardship.us

www.productstewardship.us

