

July 11, 2022

The Honorable Michael Regan
Environmental Protection Agency
1200 Pennsylvania Avenue
Washington, DC 20460

RE: RFI Development of best practices for collection of batteries to be recycled and voluntary battery labeling guidelines; EPA-HQ-OLEM-2022-0340

Dear Administrator Regan:

The undersigned organizations are pleased to submit comments in response to U.S. Environmental Protection Agency's (EPA) request for information (RFI) on the Development of Best Practices for Collection of Batteries to be Recycled and Voluntary Battery Labeling Guidelines. We support solutions that will accelerate the safe management of batteries including proper labeling.

Introduction

We appreciate EPA's increased focus on the hazards that batteries pose in the waste & recycling stream, including the July 2021 report (An Analysis of Lithium-ion Waste Fires in Waste Management and Recycling) and the October 2021 virtual workshop. As the RFI accurately notes, "batteries can start fires throughout the municipal waste management system, in transportation and at transfer stations, to materials recycling facilities...."

These hazards are increasing as the number of discarded lithium-ion batteries increases and are placed improperly in curbside residential waste or recycling collection containers or bags. According to data collected by FireRover, a leading fire prevention company active in the waste & recycling industry, May 2022 saw the highest number of reported fires at waste & recycling facilities in the seven years that the company has tracked this data.¹ Further, according to FireRover, 2022 is likely to have more reported fires than any of the past seven years.

In addition, lithium batteries within larger consumer products are posing significant fire hazards at recycling and metal processing facilities. The rapidly increasing number of items such as cellphones, mobilization devices like scooters, and white goods that are readily found in WiFi-connected homes, and the rapidly growing number of electric vehicles that Americans drive present fire hazards at recycling facilities.

These fires are a threat to facility workers and operations. Importantly, the increasing frequency of these fires is starting to threaten EPA's ambitious National Recycling Strategy. While a substantial percentage of the reported fires occur at materials recovery facilities (MRF), the

¹ Fogelman, Ryan, *Waste and recycling fire season has officially started, May 2022 sees most fires ever*. Waste360 (June 23, 2022). <https://www.waste360.com/landfill/waste-and-recycling-fire-season-has-officially-started-may-2022-sees-most-fires-ever>

numbers are increasing at scrap metal processing and transfer station facilities as well. When a fire occurs, it can disrupt processing operations for hours, days, or longer.

In some cases, fires have completely destroyed these essential facilities. In September 2016, the Shoreway Environmental Center was destroyed by a fire that was caused by a lithium-ion battery.² The Shoreway recycling facility was out of service for more than 4 months. In Plano, Texas, a MRF operated by Republic Services burned to the ground in December 2016 and was out of service for two and a half years, leading to increased costs for the city as recyclables were transported to Garland, Texas.³ Sometimes valuable recyclable materials may be sent to landfills or waste-to-energy facilities for disposal because there is not a nearby MRF available to accept these materials. For example, when American Waste Control's Mr. Murph caught fire from a discarded lithium-ion battery in April 2021, the city of Tulsa, Oklahoma's recyclables were sent to a waste-to-energy facility for nearly a year while the facility was reconstructed.⁴

As EPA seeks to implement the National Recycling Strategy and increase participation in recycling programs and expand the amount of recyclables diverted from disposal, the increasing frequency of these fires poses a major threat. According to Doug Kobold, the Executive Director of the California Product Stewardship Council, *"Every (Materials Recycling Facility) MRF, pretty much, in California is experiencing fires, if not on a daily basis, on a weekly basis. We're on the fringe of losing our recycling infrastructure that we've built over several decades to try and recycle this stuff."*⁵ This is consistent with our members' experience.

In addition, because these waste & recycling facilities continue to have fires on a frequent basis, some facilities are having difficulty obtaining insurance or premiums are increasing substantially.⁶

The undersigned organizations urge EPA to move expeditiously to develop labeling guidelines for batteries and communication materials for battery producers, state and local governments, and others.

How do state, tribal, and local governments, including U.S. territories and the District of Columbia, handle battery collection and recycling?

Solid waste and recycling management practices vary across the country and community by community. Similarly, there is no one single description for how state, tribal, and local governments handle battery collection and recycling. Understanding this variability is important

² Carleton, Audrey, *Lithium battery fires are threatening recycling as we know it*. Vice (Feb. 1, 2022) <https://www.vice.com/en/article/xgdvpk/lithium-battery-fires-are-threatening-recycling-as-we-know-it>

³ Samuels, Kelsey, *Republic services rises from the ashes*. Plano Star Courier (April 9, 2019) https://starlocalmedia.com/planocourier/republic-services-rises-from-the-ashes/article_10961714-5af2-11e9-bc03-3be8e3bbfa8b.html

⁴ Schlotthauer, Kelsy, *Tulsa recycling back on track; Mr. Murph 2.0 makes hard-fought recovery following April fire*. TulsaWorld (March 6, 2022) https://tulsaworld.com/news/local/tulsa-recycling-back-on-track-mr-murph-2-0-makes-hard-fought-recovery-following-april/article_a3e05010-9bd7-11ec-b881-17ed9c9229be.html

⁵ Carleton, *Lithium battery fires*.

⁶ Karidis, Arlene, *MRF fires threaten insurance policies*. Waste360 (Jan. 10, 2019). <https://www.waste360.com/safety/mrf-fires-threaten-insurance-policies>

when designing best practices for management. With that in mind, all local, state, territorial, and tribal programs need to ensure that batteries of any chemistry are not placed into curbside recycling.

Battery collection and recycling is generally handled similar to other household hazardous waste (HHW). It is not regularly collected at the curb in residential waste or recycling bins/carts. Regular curbside collection of batteries in a separate container does exist but is resource intensive and is limited in its use. More common are certain days during the year when batteries can be collected at the curbside in a separate container. Generally, however, batteries are collected at drop-off sites. These can be for all HHW materials or especially for batteries and electronics. Some communities have permanent drop-off sites that residents can access regularly, while others have them open on a more limited basis, perhaps only once or twice a year. For example, the District of Columbia provides drop off services at its Benning Road transfer station for “covered electronic equipment” (including batteries) on Saturdays and on the Thursday before the first Saturday of each month.⁷ It also provides drop off services at a number of different locations throughout the District during the summer.⁸

Certain battery chemistries can also be dropped-off at select retailers who offer this service, which may be voluntary or required by law. Websites such as call2recycle.org and earth911.com can help consumers identify these retailers in their area, should they exist. For communities without battery collection and recycling options provided, these are often the only options available. Another option is to mail-in batteries using special shipping containers purchased by the consumer, with the most common option being provided by Call2Recycle. The smallest battery and cellphone recycling kit listed is currently \$45⁹.

Once collected, these batteries must be sent either to a facility that can recycle the batteries or disposal facility depending upon battery chemistry and accessibility to recycling and disposal options. Just as with collection, recycling and disposal is variable by community across the United States.

What barriers are state, tribal, and local governments, including U.S. territories and the District of Columbia, facing regarding battery collection and recycling?

The dominant concern for state, tribal, and local governments regarding battery collection and recycling is the fire hazard posed by lithium-ion batteries, especially when improperly recycled or disposed by the public. The epidemic of fires at waste and recycling facilities is driven, at least in part, by the increased use of these batteries by consumers. When these batteries end up in curbside recycling and waste containers, they pose a clear and present danger to workers and to our waste and recycling infrastructure. Ensuring that all batteries are managed properly and safely is of primary concern, but barriers exist throughout the collection system.

The first barrier is consumer confusion regarding how batteries should be managed at their end-of-life. Belief that batteries can be placed in curbside recycling along with other regularly

⁷ <https://doee.dc.gov/node/1117961>

⁸ Ibid.

⁹ <https://www.call2recycle.org/store/> (July 8, 2022)

recycling materials is a major barrier, reinforced by labeling that includes the triangle chasing arrows symbol.

This confusion is compounded by the different types of battery chemistries and recommendations that they be handled differently. Rechargeable batteries can be nickel cadmium (Ni-Cd), lithium ion (Li-Ion), small sealed lead acid (SSLA/Pb), nickel metal hydride (Ni-MH), or nickel zinc (Ni-Zn), while single use can be alkaline or lithium primary. These chemistries have different risks and consumers are asked to identify them and handle them differently in many instances. Requiring different management for items that the average consumer sees simply as “a battery” is another barrier. Additionally, if a battery is embedded within a product, the consumer may have an even more difficult time understanding how to dispose of it. As more and more products embed batteries, and especially products that previously did not commonly do so, this will lead many consumers to not even recognize that the product needs to be handled differently.

Once a consumer determines the correct way to handle the battery at its end-of-life, the next barrier is access to a proper recycling or disposal option. As mentioned previously, most consumers only have the option to drop-off their batteries, either at a community-run site or at a retailer. Again, these sites might not always be open and may not be convenient to access, particularly for many Americans that do not have personal vehicles. There are also concerns that fire hazard concerns could lead some drop-off sites to stop accepting batteries, exacerbating the lack of access.

Recycling options are often determined based on access to processors for that item and batteries are no different. There are currently limited options for facilities that can recycle batteries in the United States, driving up costs, especially for those areas of the country furthest away from such a facility. The patchwork infrastructure for battery processing and recycling is another barrier to be addressed.

Do state, tribal, and local governments, including the U.S. territories and the District of Columbia, find common problems at battery collection? What existing best practices have been developed to address these common issues? How have these best practices increased safe battery recycling?

Battery collection is not as easy as curbside waste and recycling collection; therefore, it is a significant challenge to persuade consumers to put in the extra effort that is necessary to dispose of them properly. In many cases, this is due to a lack of public education about how to handle batteries at their end-of-life along with a lack of understanding about the danger mismanaged batteries pose. Consistent education efforts to the community on these messages have been successfully done in some communities, but the development of education materials that can be adapted and used throughout the United States would be one way to address this problem. Of course, federal funding to pay for this campaign would also help to address the lack of resources that limit most communities from doing such valuable outreach.

Lack of resources also limits most communities from offering curbside battery collection either on an ongoing basis or as a special event. As many haulers face a variety of challenges to continue collection of regular waste and recycling,¹⁰ while also managing bulk waste, green waste, and organics, separate battery collection may be beyond their current capabilities. Therefore, most communities must rely on a drop-off model, whether it is run by the local government entity or is at retail locations. For community-run drop-off, the lack of resources to keep these sites open regularly or to open more of them to increase access, is an ongoing problem. Relying on retailers to handle collection may mean that many consumers will not have access within their communities.

At the collection sites, best practices on managing batteries would be useful to develop and make widely available. This could include information on how to properly manage and dispose of lithium-ion batteries (LIB), respond correctly in case of a fire, and manage a fire if one does break out. The National Waste & Recycling Association (NWRA), the Institute of Scrap Recycling Industries, Inc (ISRI), and the Solid Waste Association of North America (SWANA) have developed a *Guide for Developing Lithium Battery Management Practices at Materials Recovery Facilities* that, while specifically for MRFs, can be used as an example for best practices for collection facilities in general.¹¹

What problems have battery collection facilities encountered when handling and processing batteries?

Even when taken to an appropriate battery collection facility, fires remain a risk. The advantage is that such a facility will be handling and storing the batteries in such a way to minimize the risk of the fire starting and from spreading, unlike in a landfill, MRF, transfer station, or in a collection vehicle. Regardless, this is still an ongoing concern for any facility that collects batteries in bulk.

Development of guidance for battery collection facility staff to identify batteries by chemistry, separate and handle appropriately, and how to handle in case of damage or fire would be useful to help minimize the risk of catastrophic fire. Education for those handling the batteries would be useful for many communities that manage their own battery collection. One would assume that a modified form would also be useful for retail drop-off location staff as well.

Explain how local governments, retailers, and others collect discarded batteries at drop off, store them, and then ship them somewhere.

As outlined in response to the previous question about how state, tribal, and local governments, handle battery collection and recycling, there are different practices that vary based on location and other factors. At community drop-off locations, the consumer or a staff attendant may

¹⁰ Many haulers are experiencing labor shortages and supply chain problems limiting their ability to provide curbside collection on a regular basis. P. Burns, *Multiple N.J. towns facing trash pick-up delays from single company* (July 8, 2022) <https://whyy.org/articles/nj-towns-trash-pick-up-delays-republic-services/>

¹¹ Guide for Developing Lithium Battery Management Practices at Materials Recovery Facilities. https://swana.org/docs/default-source/safety-documents/mrf-lithium-battery-guidance.pdf?sfvrsn=2fa340ea_6

separate out the batteries by chemistry. At a retail location, this is more likely down downstream. Storage is going to vary based upon battery chemistry, with lithium batteries requiring more careful handling. This requires storing them in a manner and location that will minimize the chance of a thermal event and keep any resulting fire from spreading to other materials.

Shipment of the batteries will vary by chemistry, battery condition, and processor requirements. There may also be U.S. Department of Transportation requirements associated with shipment as well.

What are the concerns and challenges with battery recycling faced by each entity in the battery recycling chain?

Fire from the batteries is the greatest concern and challenge as the batteries move through the waste and recycling collection stream. There are several points, from collection to transfer station to material recovery or metal recycling facilities, for fires from the batteries to occur.

Local governments and industry are increasingly concerned about collecting discarded batteries due to the substantial risks posed by fires associated with lithium-ion batteries, and the increased frequency of fires at solid waste and recycling facilities associated with them.

Batteries that are improperly put into curbside waste or recycling pose a risk to the collection trucks and drivers, with numerous incidents already recorded. These vehicles are a vital part of a community's waste management program, and the loss of one or more to fire from a mishandled battery can have serious repercussions.

Similarly, a fire that occurs at a transfer station or a MRF is also disruptive on an even more massive scale. A community's entire waste and recycling management program can be disrupted for months or years by a catastrophic fire. Even smaller fires cause issues and are leading to facilities being unable to remain properly insured due to the growing risk. The same goes for metal recycling facilities or any other entity that handles batteries, whether intentionally or not.

Of course, while property damage is harmful to the Nation's waste and recycling infrastructure, it should also be noted the risk that such fires pose to the lives of workers, firefighters, and the general public. There are real health and safety concerns associated with poor end-of-life battery management that must be acknowledged and which add urgency to these efforts.

Communication Materials for the Public

As EPA notes, there have been a number of efforts to inform the public about safe battery management. These include Minnesota's – *Be Our Battery Hero*; Larimer County, Colorado's *Be Alert! Divert Hidden Batteries*; and Call2Recycle's *Avoid the Spark* campaign. Nassau County in New York recently issued "Lithium Ion Battery Safety for Consumers" guidelines in

response to a growing number of fires in that county attributed to these batteries.¹² Only a small portion of those guidelines were dedicated to the proper disposal. In addition, the issues of dead batteries causing fires was taken on by the UK's Environmental Services Association (ESA) "Take Charge"¹³ campaign which featured zombie batteries that come back to life. Despite this campaign, fires have continued at recycling facilities in the UK.¹⁴ We support campaigns that clearly convey the fire risk and that these batteries are not "dead."

While these education campaigns may be successful when they are launched, unless communications are continuously reinforced, public behavior will likely revert to pre-campaign levels. As such, while it is imperative that information be shared, it is essential that it be repeated on an ongoing basis. Campaigns such as the National Forest Service's Smokey Bear who exhorted us to prevent wildfires and Woodsy Owl who reminded us to give a hoot and not pollute are examples of successful campaigns that have weathered the test of time.

The public should receive information multiple times. First, the product itself should guide purchasers on the appropriate handling of the spent battery through labeling and packaging information. Second, retailers and municipalities should provide information on convenient locations to drop-off the spent batteries. Last, general information campaigns should regularly remind the public to never put batteries in their recycling bins.

How should batteries be managed?

Mismanagement of lithium batteries has led to an alarming number of fires at recycling facilities across the country jeopardizing household recycling viability. Indications that lithium batteries are recyclable causes the public to believe that they can put the batteries in their curbside recycling bin. The sheer number of batteries being improperly disposed of shows that current labeling practices do not work. This glut of batteries in the curbside recycling stream has had a real impact. The damage to lithium batteries that can occur from physical impact, exposure to certain temperatures, or thermal runaway chain reactions, for example, poses significant risks for a fire and/or explosion hazard. As a result, fires have become routine over the past few years. Additionally, as noted earlier, lithium batteries within consumer products such as cellphones, cordless tools and devices, vape pens, laptops, other electronics, washers and dryers, refrigerators and even automobiles can cause fires at recycling facilities. The number of products that pose such risks is growing.

With the increasing number of lithium batteries being produced and utilized in the growing number of consumer items, this problem is anticipated to get worse. These batteries are small and lightweight and store lots of power. They enter the curbside recycling or waste streams

¹² Carolyn Gusoff, *Nassau County fire officials issues warnings and advice on how to properly charge lithium ion batteries* (June 21, 2022) <https://www.cbsnews.com/newyork/news/nassau-county-fire-officials-issues-warnings-and-advice-on-how-to-properly-charge-lithium-ion-batteries/>

¹³ Environmental Services Association, *Consumers urged to join fight against "zombie batteries" in bid to tackle recycling and waste fires* (Oct. 26, 2020).

http://www.esauk.org/application/files/8216/0370/8461/Take_Charge_PR_National_release.pdf

¹⁴ <https://www.cbsnews.com/newyork/news/nassau-county-fire-officials-issues-warnings-and-advice-on-how-to-properly-charge-lithium-ion-batteries/> (June 30, 2022).

mixed with tons of materials, are placed in hot temperatures and under significant compression as they are hauled to processing facilities, which then expose the batteries to more pressure and prodding machines creating a volatile situation. The only way to identify and detect these batteries is visually. Therefore, there is no easy method to screen the batteries out of the incoming loads and so these batteries are essentially invisible. Commingling with recyclables, consisting of plastic and paper that provides a significant quantity of readily combustible material, magnifies the problem.

Because of the risks that batteries pose in curbside recycling and to a lesser degree in household waste, batteries are best managed at dedicated drop-off sites. In order for battery collection to be effective, it needs to be convenient and safe. EPA should consider including convenience standards for battery drop-off locations as part of its best practices.

However, it should be understood that the drop-off sites inherently pose fire risk as well. For example, Hennepin County, Minnesota ended its battery recycling program because of fires.¹⁵ Therefore, to ensure success of programs, EPA should provide guidance on how to safely provide convenient and safe drop-off opportunities. This could include having fire safe containers for collection, providing rolls of baggies or tape on the container in case consumers forgot to tape or bag their batteries, and providing clear instructions on the battery collection container at the drop-off location on how to safely recycle.

What should be the goals of developing voluntary labeling guidelines for batteries?

The challenge before EPA encompasses more than just encouraging consumers to properly direct used batteries for recycling. Because each battery chemistry family will have different recycling techniques and facilities, the cross-contamination of recycling streams can lead to safety hazards, increased processing costs, and reduce the quality of recovered materials. EPA must therefore consider how best to ensure that consumers and collection network participants have the information and opportunity to direct each type of battery to the right collection stream.

What information should be included on the label to achieve these goals?

As evidenced by the ESA battery campaign, this issue is not isolated to the United States – it is a worldwide issue with fires occurring at recycling facilities around the globe. Labeling, by itself, will not solve the issue with battery fires. However, appropriate battery labeling is part of the solution and could reduce the frequency of future fires.

Battery labels should have a consistent and simple marking (e.g., a color coded) across all battery chemistries to encourage and aid appropriate handling which should, at a minimum, address three primary goals – in descending order of priority:

1. Inform and educate consumers to keep batteries out of the trash and curbside recycling, and direct batteries to dedicated battery recycling networks where available.

¹⁵ MPR news staff, *E-cigarette fire risk leads Hennepin Co. to curb battery recycling* (Oct. 30, 2019). <https://www.mprnews.org/story/2019/10/30/ecigarette-fire-risk-leads-hennepin-co-to-curb-battery-recycling>

2. Provide consumers and recycling network employees human-readable information to enable sorting of used batteries among major chemistry families (e.g., Pb, Li-ion, Ni-Cd, Ni-MH, and Li-metal).
3. If appropriate within a chemistry family, inform recyclers of the unique features, components, and/or constituents for recovery (e.g., cathode material).

EPA should review existing voluntary industry standards to inform their approach to developing consumer-facing recycling symbol intended to address these priorities. One standard on consumer-facing recycling symbols EPA should consider is IEC 62902. Other industry standards, such as SAE standards J2984 and J2936 can also provide examples. EPA should also review whether the label should restrict the use of the triangular chasing arrows in situations where recycling is not available (as suggested by the FTC's Green Guides) or develop guidelines to clarify its use. Even though it is not true, the chasing arrow symbol has been interpreted by some to mean "acceptable in curbside recycling." Stakeholders should recognize that the use of that symbol may not reflect their intentions in certain circumstances. We strongly encourage more consistent guidelines and application of the chasing arrows symbol.

Battery labeling best practices should also consider safety and health concerns. In addition to the recycling marking described above, additional safety and hazard information should be included to inform users and recyclers of necessary storage requirements, fire-hazards, and other information. CPSC and OSHA labeling standards for consumer and workplace batteries respectively may provide the necessary information, but adoption of these labeling schemes for batteries other than lead batteries is not widespread. (See, e.g., *OSHA Interpretation Letters*: <https://www.osha.gov/laws-regs/standardinterpretations/2021-06-23> and <https://www.osha.gov/laws-regs/standardinterpretations/2015-12-15>). For batteries not subject to mandatory CPSC or OSHA labeling, EPA should evaluate potential guidance on information that should be included.

EPA should also consider requiring the label on the product rather than just with packaging. In addition, the labels should be readily accessible to the public.

Scope of batteries collection best practices

While most fires are the result of mismanagement of consumer lithium batteries, we recommend that the best practices should include all sizes and chemistries. This would also include best practices specifically designed for the larger consumer product items such as white goods in which such batteries are contained.

While most of these comments are focused on the smaller lithium batteries, this group strongly believes that larger batteries such as those in electric vehicles pose just as high, if not greater, risks that must be addressed. We urge EPA to proceed with a parallel track in this effort to appropriately address the dangers associated with these larger batteries.

Therefore, we urge EPA to consider the impacts of batteries of all sizes and chemistries in developing both the best practices as well as for the labeling guidelines.

We stand ready to assist you and thank you for your consideration.

Yours truly,

Battery Council International
Global Electronics Council
Institute of Scrap Recycling Industries
National Waste & Recycling Association
Solid Waste Association of North America