

PUBLICATION

Grappling with Safe Battery Handling and End-of-Life Concerns in the EV Revolution

Authors: Elizabeth Haskins, Noelle E. Wooten

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Safe handling of electric vehicle (EV) batteries is in the forefront of the news this hurricane season due to the increased risk of battery fires following saltwater intrusion from storm surges, and states are beginning to seriously grapple with the question of whether and how to regulate safe handling and end-of-life management of this new technology.

Two policy solutions to the safe handling and end-of-life management of EV batteries are developing at the state level in the U.S. The first is a core exchange program with producer take-back. This approach was considered in California, modified into a "responsible end-of-life management" program encouraging reuse, repair, and recycling and funded by battery suppliers, and ultimately vetoed by the California governor. The second is an extended producer responsibility (EPR) program, which New Jersey recently enacted into law and will be developing in the coming years.

The federal government has largely focused on developing a domestic source of critical materials for EV batteries, including grants and tax incentives designed to boost EV battery recycling capabilities in the U.S. Proponents of battery recycling note that a circular battery economy would reduce the environmental impacts of EVs by reducing the emissions, forced labor, and land and water use impacts from mining the critical minerals required by EV batteries, and could help to meet anticipated supply gaps with recovered EV battery materials.

Background

Lithium-ion batteries are the most commonly used EV batteries in the United States today, and most of these batteries are either a nickel, manganese, and cobalt (NMC) blend or a lithium-iron-phosphate (LFP) blend. NMC batteries have a longer driving range by weight (a higher energy density) but a greater likelihood of oxidization – i.e., catching on fire – if shorted. NMCs also require more expensive materials to produce than LFPs, but may be more likely to be recycled at the end of their lifecycle as a result of this higher materials value.

Despite the variations in materials, the U.S. Environmental Protection Agency (EPA) has determined that most lithium-ion batteries on the market today are likely to be hazardous waste when they are disposed of due to their ignitability (D001) and reactivity (D003) characteristics. EPA has asserted that fires at a lithium-ion battery's end of life are common, and mismanagement and damage to batteries make fires more likely.

State Actions

New Jersey

In January 2024, New Jersey became the first state to pass an EPR law specific to EV batteries. The [Electric and Hybrid Vehicle Battery Management Act](#) requires EV battery producers to create battery management plans and submit them to the state's Department of Environmental Protection (NJ DEP) for approval. Starter batteries and batteries used in products for industrial applications are exempt from the law's requirements.

Under the new law, EV battery producers must register with NJ DEP by January 8, 2025. Battery producers must also begin submitting annual reports to NJ DEP on January 8, 2026, which detail the number of EV batteries sold, offered for sale, or distributed in the state by the producer.

NJ DEP must conduct a needs assessment on the availability of EV battery recyclers and related infrastructure by July 2025. Within 18 months of completion of this needs assessment, NJ DEP must adopt implementing regulations for the battery management plans that will then need to be submitted by each battery producer within 180 days of adoption of the regulations.

The battery management plans must provide for producers to be responsible for the collection and management of the producer's used EV batteries that are offered to the producer for take-back by the current battery owner. The plan may include a complete vehicle take-back program, a battery take-back program, or any other such program approved by NJ DEP. However, the battery management plan must include, at a minimum:

- methods that will be used to accept and transport the used EV batteries or complete vehicles offered to the producer, including proposed collection services, and the role of vehicle recyclers and authorized EV battery recyclers;
- processes and methods that will be utilized to remanufacture, repurpose, or recycle EV batteries that have reached the end of their service life and a plan for final disposal of such batteries in accordance with environmentally sound management practices;
- a strategy for informing EV owners, repair facilities, and dismantlers about the requirement to properly manage EV batteries, the environmental impact of the improper handling or disposal of used EV batteries, and the mechanisms for the management of EV batteries that are available pursuant to the plan;
- the means that will be used to implement and finance the battery management plan (and when a producer is required to provide for the management of used EV batteries, the costs of such financing must be borne by the producer of that EV battery); and
- any other information, policies, or procedures NJ DEP deems appropriate.

California

In 2019, the California Environmental Protection Agency convened an advisory group to identify potential policies to address the management of lithium-ion EV batteries, resulting in a [final report](#) that was issued in March 2022. The final report supported two policy proposals for safe handling and end-of-life management of EV batteries. One, which most of the advisory group supported, was a core exchange and product take-back program. This policy was proposed in an original version of California SB 615 in 2023. However, the bill was ultimately amended to align more closely with the advisory group's second policy proposal – a producer take-back policy, where the auto manufacturer would be responsible for ensuring proper repurposing, reuse, or recycling of its EV batteries by a licensed facility. SB 615 would have created a "responsible end-of-life management" program encouraging reuse, repair, and recycling and funded by battery suppliers, but the law was vetoed by the California governor in September 2024. In Governor Newsom's [veto message](#), he expressed agreement with the intent of the bill but concern with the burden it would place on the state's Department of Toxic Substances Control to implement and enforce the bill's requirements. Governor Newsom encouraged the legislature to explore an EPR model instead.

Federal Actions

As noted above, EPA has determined that most lithium-ion batteries should be handled as hazardous waste at disposal due to their ignitability (D001) and reactivity (D003) characteristics. In 2021, EPA issued a [report on fires](#) caused by lithium-ion batteries in the waste management process. In 2023, EPA announced that it is

[developing a proposed rule](#) to add new universal waste standards specially tailored for lithium batteries. The goal would be to improve safety and reduce fires from end-of-life lithium batteries while promoting recycling. Proposed rules are slated to be released mid-2025.

Most federal activity in this space, however, has focused on developing a domestic source of critical materials for EV batteries, including by providing grants and tax incentives designed to boost EV battery recycling capabilities in the U.S. This is a result of statutory directives and funding flowing from the 2021 bipartisan Infrastructure Investment and Jobs Act (IIJA) and the 2022 Inflation Reduction Act (IRA).

- The IIJA directed the U.S. Department of Energy (DOE) to establish a task force to develop an "extended battery producer responsibility framework" to address battery design, transport, and recycling.
- The IIJA provided grants for EV battery recycling and second-life programs. Most recently, in September 2024, DOE selected 25 projects for \$3 billion of federal IIJA funding for projects that will retrofit, expand, and build new domestic facilities for battery-grade processed critical minerals, battery components, battery manufacturing, and recycling.
- The IRA updated the Section 30D tax credits for EVs by establishing a \$3,750 tax credit for 2024 vehicles that (in addition to meeting a percent manufacture or assembly in North America requirement) have 50% of their critical battery minerals either: (i) extracted or processed in the U.S. or any country with which the U.S. has a free trade agreement, or (ii) recycled in North America. This will increase to an 80% requirement by 2029.
- The IIJA requires EPA to develop battery collection best practices and battery labeling guidelines by September 30, 2026. EPA is currently developing a report to Congress on the best practices for collection of batteries to be recycled that will be published in 2024. After the publication of this report, EPA will convene cross-industry working sessions (there is an [anticipated working session](#) between December 2024 and March 2025 for labeling and collection of EV batteries) in order to develop: (i) a best practices toolkit with guidance, tools, templates, and training materials for state, Tribal, and local governments to use when implementing battery collection and recycling programs, and (ii) a set of voluntary labeling guidelines for various battery chemistries and types. The toolkit and voluntary labeling guidelines would be finalized by 2026.

Recent Litigation

In September 2024, SK Battery America Inc. reached a \$31 million settlement to resolve claims brought by a recycling center which caught fire after allegedly receiving hundreds of charged lithium-ion battery scraps from the factory. The recycling center was not licensed to accept hazardous lithium-ion battery waste and was unaware that the battery scraps were in the facility's recyclable materials. The Georgia Environmental Protection Division fined SK Battery \$33,000 for mishandling the lithium-ion batteries, and the county has also sued SK Battery for damages related to the fire, which took days to extinguish.

Where Do We Go From Here?

Left unmanaged, when EV batteries come to the end of life, their "green" benefits will fade. Responsible end-of-life management is essential. In the absence of responsible management, EV batteries that end up in landfills can release problematic toxins, including heavy metals. And recycling EV batteries can be a hazardous business, potentially resulting in fires and releasing toxic fumes. The solutions are not simple. Batteries differ widely in chemistry and construction, making it difficult to create safe and efficient recycling systems. The reality remains that it is often cheaper to manufacture EV batteries with freshly mined metals than to use recycled materials. With proper resources, incentives and encouragement, this reality will change and must change for the EV revolution to succeed. And, if past solutions for electronic waste serve as a predictor, battery producers will need to become proficient in tracking and following a patchwork of local, state, and federal laws regulating end-of-life management of EV batteries to succeed in the EV battery space.

If you have questions regarding hazardous waste disposal or compliance with EV battery regulations, please reach out to [Elizabeth Haskins](#), [Noelle E. Wooten](#), or any member of Baker Donelson's [Environmental Group](#).