

HB 833 - PHI - FAV - Commission to Advance Lithium

Uploaded by: Allyson Black-Woodson

Position: FAV

February 24, 2026

Support – House Bill 833 Commission to Advance Lithium-Ion Battery Safety in Maryland - Reestablishment

Potomac Electric Power Company (Pepco) and Delmarva Power & Light Company (Delmarva Power) support **House Bill 833 Commission to Advance Lithium-Ion Battery Safety in Maryland - Reestablishment**. The legislation reestablishes the Commission to advance lithium-ion battery safety in Maryland. The Commission is required to study and make legislative, regulatory, programmatic, or other recommendations related to best practices and guidelines for lithium-ion batteries. By December 1, 2026, the commission must submit an interim report on the progress and status of the commission to the Legislative Policy Committee. By December 1, 2027, the commission must report its findings and recommendations to the Governor and the General Assembly.

Pepco and Delmarva Power are constantly evaluating new technologies and services to build a smarter, reliable energy grid to withstand the impacts of climate change and ensure our customers have reliable service. Energy storage systems provide benefits to the electric grid and utility customers by enabling the transition to a clean grid with distributed renewable resources. Additionally, energy storage systems create system efficiencies that can reduce costs and save money for utilities and customers, bolster grid reliability and resilience, improve system capabilities to withstand shocks and stressors and promote economic development and job creation in Maryland communities.

Pepco and Delmarva Power appreciate the value that the Commission to Advance Lithium-Ion Battery Safety in Maryland has provided to help bring stakeholders together and work collaboratively to ensure that the increased usage of batteries in the clean energy transition occurs in a safe and well thought out manner, using best practices and incorporating lessons learned. Pepco and Delmarva Power appreciate the inclusion of a member of a public utility on the Commission to further enhance our learnings as we continue to envision battery storage as a technology to bring benefits to our customers. For the reasons stated, Pepco and Delmarva Power respectfully request a favorable report on House Bill 833.

Pepco Holdings, the parent company of Pepco, an electric utility serving Washington, D.C., and suburban Maryland; Delmarva Power, an electric and gas utility serving Delaware and portions of the Delmarva Peninsula; and Atlantic City Electric, an electric utility serving southern New Jersey. Anthony and his team are responsible for guiding the company's delivery of reliable and excellent service to more than two million customers in the Mid-Atlantic. Pepco Holdings is a subsidiary of Exelon Corporation, one of the nation's leading energy services companies.

HB0833-ET_MACo_SUP.pdf

Uploaded by: Charlotte Fleckenstein

Position: FAV



House Bill 833

Commission to Advance Lithium-Ion Battery Safety in Maryland – Reestablishment

MACo Position: **SUPPORT**

To: Environment and Transportation Committee

Date: February 24, 2026

From: Dominic Butchko and Charlotte Fleckenstein

The Maryland Association of Counties (MACo) **SUPPORTS** HB 833. This bill renews the Commission to Advance Lithium-Ion Battery Safety in Maryland, extending its charge to evaluate policy challenges and solutions regarding battery safety.

In 2024, MACo helped lead the effort to establish this Commission in response to strong county concerns about the increasing incidence of lithium-ion (LI) battery failures. As Maryland's economy and daily life become more electrified, LI batteries are embedded in a rapidly expanding range of consumer products. While individual failure rates may be relatively low, the growing volume of batteries in circulation increases overall exposure and the potential for incidents affecting public safety and local response systems. Counties appreciate the Commission's work to-date and agree that the policy and implementation work remains ongoing.

HB 833 extends the Commission's charge with making legislative, regulatory, programmatic, and other recommendations related to LI battery safety. The scope of this mission remains broad and includes:

- Best practices, standards, and guidelines:
 - To prevent, detect, and suppress lithium-ion battery fires in consumer, transportation, and utility applications;
 - To prevent, detect, and suppress lithium-ion fires at recycling facilities; and
 - For reusing, recycling, and decommissioning lithium-ion batteries;
- The viability of extended producer responsibility for lithium-ion batteries;
- Training, education, and other information to better inform the public regarding lithium-ion battery safety; and
- Any other global issues the Commission may consider useful for enhancing the safety and reuse of batteries in the state.

By re-empowering the Commission to develop clear, actionable recommendations, HB 833 will better position Maryland to protect residents, first responders, and public infrastructure as LI battery use continues to expand. As such, MACo urges a **FAVORABLE** report on HB 833.

Delegate Boyce Written Testimony - HB 833.pdf

Uploaded by: Delegate Regina T. Boyce

Position: FAV

REGINA T. BOYCE
Legislative District 43A
Baltimore City

Environment and
Transportation Committee

Subcommittees

Energy

Chair, Natural Resources and
Open Space



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The Maryland House of Delegates
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THE MARYLAND HOUSE OF DELEGATES
ANNAPOLIS, MARYLAND 21401

February 20, 2026

**Testimony in Support of HB 833
Commission to Advance Lithium-Ion Battery Safety in Maryland – Reestablishment**

HB 833 reestablishes and extends the work of the Commission to Advance Lithium-Ion Battery Safety in Maryland. The bill extends the Commission through 2028 and updates its membership to reflect the growing scope of lithium-ion battery use and the challenges.

HB833 builds from the **original legislation, HB468/SB532, passed in 2024** that established the Commission, its members, and research requirements.

The [Commission to Advance Lithium-Ion Battery Safety in Maryland's final report](#), submitted November 25, 2025, recommends extending the duration of the Commission to allow for further research and review of:

- Increasing risks from batteries at the Port of Baltimore, roads, rail, and tunnels throughout Maryland
- Impacts of battery fires and risks on insurance providers and insurance coverage availability
- Existing waste classifications impacting the ability to recover and recycle batteries
- Integration of pending federal regulations and third-party standards

The bill adds four representatives from the Land and Materials Administration, the Maryland Port Administration, the ocean freight shipping industry, the property casualty insurance industry, and the commercial insurance industry.

Extending and expanding the Commission allows for further research and recommendations to protect public safety, support first responders, safeguard critical infrastructure, and promote environmental responsibility.

Thank you for your consideration, and I urge a favorable report on HB 833.

Sincerely,

A handwritten signature in blue ink that reads "Regina T. Boyce".

Regina T. Boyce

HB0833_FAV_NWRA_Comm. Adv. Lithium-Ion Battery Saf

Uploaded by: Drew Vetter

Position: FAV

Collect
Recycle
Innovate



**National Waste
& Recycling Association**SM

House Environment and Transportation Committee
February 24, 2026

House Bill 833 – *Commission to Advance Lithium-Ion Battery Safety in Maryland – Reestablishment*

POSITION: SUPPORT

The Maryland chapter of the National Waste and Recycling Association (NWRA-MD) is a trade association representing the private solid waste industry in the State of Maryland. Its membership includes hauling and collection companies, processing and recycling facilities, transfer stations, and disposal facilities. NWRA-MD and its members **support** House Bill 833.

House Bill 833 reestablishes the Commission to Advance Lithium-Ion Battery Safety in Maryland with an updated membership, including representatives from industry, government, first responders, insurers, and recycling stakeholders.

The problem of lithium-ion battery fires in waste and recycling facilities has become a major safety and operational challenge for the industry. As these batteries are used in an ever-wider array of consumer devices, from phones and laptops to e-bikes and vape pens, many end up improperly discarded in regular recycling and trash streams, where sorting equipment can crush or damage them and trigger fires. Industry reporting and research estimate that more than 5,000 fires occur annually at recycling facilities alone, with an average of around 18 fires per materials recovery facility (MRF) each year, and that MRFs are frequently the hardest-hit segment of the waste system. Publicly documented waste and recycling facility fires in the U.S. and Canada grew to record levels in recent years, with hundreds of incidents reported annually, and many more likely going unreported. These fires not only pose serious risks to workers and emergency responders but also cause costly disruptions, destroy equipment, and increase insurance and operating costs for facilities.

NWRA has been actively working to reduce lithium-ion battery fires in the waste and recycling system by focusing on industry guidance, partnerships, and public education. NWRA has joined with organizations, such as the Recycled Materials Association and the Solid Waste Association of North America to release practical guides that help MRFs identify, handle, and manage lithium-ion batteries safely as they enter recycling streams, with recommendations on operations, employee training, storage, and emergency response to minimize fire risks. The Association also issues joint policy statements and supports take-back programs and proper disposal practices to keep batteries out of curbside waste where they can ignite, while planning national public awareness campaigns to educate consumers about safe battery disposal and collection options.

The report issued by the Commission in November 2025 provided Maryland with the first comprehensive examination of lithium-ion battery risks, including consumer use, transportation, utilities, and recycling. That report identified gaps in current practices and offered thoughtful recommendations for improving safety and informing public policy.

NWRA-MD supports continuing to bring all impacted stakeholders together to examine this issue and make recommendations on how to address it. Additionally, NWRA-MD thanks the bill sponsors for including us on the task force and requests a favorable report for House Bill 833.

For more information:

Andrew G. Vetter
J. Steven Wise
Christine K. Krone
410-244-7000

Visit our website www.wasterecycling.org

BGE_FAV_ENT_ House Bill 833 – Commission to Advanc

Uploaded by: Dytonia Reed

Position: FAV



Position Statement

Favorable
Environment and Transportation
2/24/2026

House Bill 833 – Commission to Advance Lithium-Ion Battery Safety in Maryland – Reestablishment

Baltimore Gas and Electric Company (BGE) supports *House Bill 833 – Commission to Advance Lithium-Ion Battery Safety in Maryland – Reestablishment*. *House Bill 833* would re-establish the Commission to Advance Lithium-Ion Battery Safety and would require the Commission to report its findings and recommendations to the Governor and the General Assembly on or before December 1, 2027.

Energy storage is an essential part of BGE's commitment to supporting Maryland's clean-energy goals and strengthening the resilience of the electric grid. Storage technologies help integrate distributed renewable energy, enhance grid reliability, improve system efficiency to reduce costs for customers, and support economic development across Maryland.

Re-establishing the Commission to Advance Lithium-Ion Battery Safety will bring together the necessary stakeholders to ensure that the rapid growth in battery use occurs safely, incorporates best practices, and reflects lessons learned as Maryland transitions to cleaner energy resources.

BGE has already completed two battery energy storage projects in Chesapeake Beach, which have improved reliability in southern Anne Arundel County and parts of Calvert County under Maryland's Energy Storage Pilot Project Act. These facilities support customers during peak winter demand and demonstrate the valuable role that storage can play in our energy system.

BGE appreciates the bill's inclusion of a public utility representative on the Commission, which will help ensure that operational expertise and customer needs inform the Commission's work. We also look forward to continued collaboration with local communities and emergency management partners to educate customers about both the benefits of battery storage and the safety measures that accompany these technologies.

For these reasons, BGE respectfully requests a favorable report on House Bill 833.

BGE, headquartered in Baltimore, is Maryland's largest gas and electric utility, delivering power to more than 1.3 million electric customers and more than 700,000 natural gas customers in central Maryland. The company's approximately 3,400 employees are committed to the safe and reliable delivery of gas and electricity, as well as enhanced energy management, conservation, environmental stewardship and community assistance. BGE is a subsidiary of Exelon Corporation (NYSE: EXC), the nation's largest energy delivery company.

John Haysbert | Brittany Jones | Guy Andes | Dytonia Reed | 410.269.5281

Testimony SUPPORT HB0833.pdf

Uploaded by: Emil Nusbaum

Position: FAV



February 20, 2026

The Honorable Chair Marc Korman
Honorable Vice Chair Michele Guyton
House Environment and Transportation Committee
Room 251
Maryland House of Delegates

RE: HB0833 – SUPPORT – Commission to Advance Lithium-Ion Battery Safety in Maryland – Reestablishment

Dear Chair Korman, Vice Chair Guyton, and Members of the Committee,

The Automotive Recyclers Association (ARA) appreciates the opportunity to provide the following testimony in support of House Bill 0833 (HB 0833), which is legislation supporting the reestablishment of the Commission to Advance Lithium-Ion Battery Safety in Maryland.

As a member of the Commission, and having had the privilege to serve as Chair, the Commission worked diligently to fulfill its initial mandate. It produced a thorough Final Report to the General Assembly investigating the risks associated with lithium-ion battery fires. The findings and recommendations in that report serve as a foundational starting point, identifying cross-sector risks and formalizing recommendations consistent with national best practices. This work provides an important resource to advance both public policy and public safety.

During the Commission's initial term, several areas were identified as warranting additional study. Reestablishing the Commission will allow for further examination and recommendations related to battery-initiated risks within Maryland's transportation network, impacts within insurance markets, and the incorporation of emerging best practices and federal regulations.

For these reasons, ARA respectfully requests that the Committee support the passage of HB 0833.

Respectfully Submitted,

Emil Nusbaum
Vice President of Strategy, Government and Regulatory Affairs
Automotive Recyclers Association (ARA)
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Manassas, VA 20110
571-208-0428 Ext. 4
emil@a-r-a.org

HB 833 - MoCo DEP - (GA 26) FAV.pdf

Uploaded by: Garrett Fitzgerald

Position: FAV



Montgomery County

Office of Intergovernmental Relations

ROCKVILLE: 240-777-6550

ANNAPOLIS: 240-777-8270

HB 833

DATE: February 24, 2026

SPONSOR: Delegate Boyce

ASSIGNED TO: Environment and Transportation

CONTACT PERSON: Garrett Fitzgerald (garrett.fitzgerald@montgomerycountymd.gov)

POSITION: Support (Department of Environmental Protection)

Commission to Advance Lithium-Ion Battery Safety in Maryland - Reestablishment

The bill would extend the work of the Commission to Advance Lithium-Ion Battery Safety in Maryland (the Commission). Established following the passage of House Bill 468 and Senate Bill 532 in 2024, the Commission was charged with studying and making recommendations related to several battery safety issues including: best practices and standards to prevent, detect and suppress lithium-ion battery fires in consumer, transportation and utility applications and recycling facilities; best practices and standards for reusing, recycling, and decommissioning lithium-ion batteries; the viability of extended producer responsibility requirements for lithium-ion batteries; training and education for first responders and the public; and other related issues.

The Commission completed a final report on November 25, 2025, summarizing its findings and recommendations related to the aforementioned issues. That report also included a recommendation to extend the Commission's mandate for an additional two years to enable further study of certain complex and emerging issues such as: battery risks at the Port of Baltimore, roads, rail and tunnels throughout Maryland; impacts of battery risks on insurance providers and insurance coverage availability; Maryland's current waste classifications for lithium-ion batteries and how they affect collection, storage, and recycling as well as how this could be better addressed in the permitting and regulation of solid waste facilities; and the integration of pending federal regulations and emerging third-party standards.

Montgomery County staff have participated as members of the Commission to date and support the recommendation to extend the Commission to further study and develop recommendations related to these important issues.

The Montgomery County Department of Environmental Protection respectfully requests that the Environment and Transportation Committee issue a favorable report on House Bill 833.

MDE HB 833 SUP.pdf

Uploaded by: Jeremy D Baker

Position: FAV



**The Maryland Department of the Environment
Secretary Serena McIlwain**

House Bill 833

Commission to Advance Lithium-Ion Battery Safety in Maryland - Reestablishment

Position: Support
Committee: Environment and Transportation
Date: February 24, 2026
From: Jeremy D. Baker, Director of Government Relations

The Maryland Department of the Environment (MDE) **SUPPORTS** HB 833.

Bill Summary

HB 833 would reform the Commission to Advance Lithium-Ion Battery Safety in Maryland with an altered membership and mandate, and require the Commission to report its findings and recommendations to the Governor and the General Assembly on or before December 1, 2027. The commission would continue evaluating best practices for fire prevention, detection, and suppression during the reuse, recycling, and decommissioning of batteries. It would also investigate the feasibility of implementing extended producer responsibility programs for lithium-ion batteries. Furthermore, the Commission would develop training and educational resources to improve battery safety awareness for both the public and first responders. Finally, it would explore any global developments that could help the state enhance the safety and reuse of batteries.

Position Rationale

Lithium-ion batteries power a vast array of modern products and have provided incredible benefits. The technology is found in many consumer products, e-mobility devices, and, in larger formats, batteries utilized for grid stabilization and vehicle transportation functions that are integral to Maryland's clean energy transition. The widespread use of batteries requires us to develop defined management practices, resources, and educational support, particularly for their end-of-life stage. Lithium-ion batteries are generally very safe to use, there were still approximately 430 fire incidents at material recycling facilities nationwide attributed to battery fires in just the last year. With significant investment slated for Maryland's recycling infrastructure resulting from the establishment of the Packaging and Paper Products Extended Producer Responsibility program, it is imperative the State define plans to best manage this material because battery fires put those future investments at risk.

MDE's Land and Materials Administration (LMA) staff lead the Association of State and Territorial Solid Waste Management Officials (ASTSWMO) Sustainable Materials Management (SMM) Taskforce, and is developing a nationwide guide on lithium-ion battery management. Establishing the Commission and ensuring a leading role for MDE would greatly encourage the development of sensible, cost-effective, and environmentally sound policy for the state.

Accordingly, MDE asks for a **FAVORABLE** report for HB 833.

Contact: Jeremy D. Baker, Director of Government Relations
Cell: 240-548-3321, Email: jeremy.baker@maryland.gov

2026 MD HB 833 - Testimony in Support by Justin Sh

Uploaded by: Justin Short

Position: FAV



Recycled Materials
Association

Tuesday, February 24, 2026

Delegate Marc Korman, Chair
House Environment and Transportation Committee
250 Taylor House Office Building
Annapolis, Maryland 21401

Re: Support of HB 833: Commission to Advance Lithium-Ion Battery Safety in Maryland – Reestablishment

Chair Korman and members of the House Environment and Transportation Committee,

My name is Justin Short, and I am in support of HB 833 as Assistant Vice President of State Affairs for the Recycled Materials Association (ReMA), as the representative of a battery recycling trade group on the Commission to Advance Lithium-Ion Battery Safety in Maryland from 2024 to 2025, and as a constituent of Montgomery County. ReMA represents 1,700 companies across the entire recycled materials supply chain that play a critical role in providing materials to America's manufacturing industries, including battery, electronics, metals, paper, plastics, residential, and tire recyclers.

The Commission served an essential role in bringing public and private stakeholders together to explore the challenges that have developed as lithium-ion and other rechargeable batteries have become part of everyday life. However, the scope of the challenges that we were identifying only continued to grow during the Commission's original term.

Persistent battery risks at the Port of Baltimore and other infrastructure sites necessitate continued collaboration. Ongoing challenges are further complicated by shifting insurance availability, rising provider costs, and new third-party standards. Additionally, several new proposals for the Commission's duties were introduced too late in the original term for a full discussion. These are critical issues for public safety as well as the continued safe operations of the recycled materials industry that the Commission did not have time to fully explore. As other states look to create their own groups to explore battery-related challenges, the Commission can serve a role in interstate collaboration by assisting those groups and gain additional insights into the process.

The majority of ReMA's more than 1,700 member companies, regardless of their location or commodities recycled, have been greatly impacted by lithium-ion batteries entering non-battery recycling streams; battery and electronics recyclers have been hurt by the loss of valuable products and materials that could have been reused, repaired, refurbished, repurposed, or recycled. The recycled materials industry continues to feel growing anxiety over the dangers that batteries of all sizes and formats present to their operations when not collected and managed properly.

ReMA's own Battery Policy Work Group was formed in 2024 with representatives across our membership to develop policy guidelines on how to address the end-of-life management of batteries, and while we have developed public Positions on Non-Embedded Small and Medium Format Batteries as well as Propulsion Batteries, we are only beginning to explore the scope of challenges presented by embedded batteries that are not easily removed from the products they power.

As the recycled materials industry continues to explore solutions to end-of-life battery collection and management issues, we hope that the General Assembly will choose to continue their own efforts to advance battery safety in Maryland. By aligning our industry's technical expertise with the State's legislative goals, we can build a safer, more circular economy for all Marylanders. We look forward to our continued dialogue on these critical issues.

Sincerely,

Justin Short
AVP of State Affairs
Recycled Materials Association
1250 H Street NW, Suite 400
Washington, DC 20005
(202) 662-8508
JShort@RecycledMaterials.org

<https://www.recycledmaterials.org/>

<https://www.recycledmaterials.org/advocacy-compliance/policy-and-position-statements/>

[ReMA Position on Non-Embedded Small and Medium Format EOL Battery Management](#)

[ReMA Position on Propulsion Battery EOL Management](#)

Maryland Recycling Network - Favorable - HB0833 -

Uploaded by: Kitty McIlroy

Position: FAV



February 24, 2026

To: Maryland House Environment and Transportation Committee

Re: HB0833 - Commission to Advance Lithium-Ion Battery Safety in Maryland – Reestablishment

Favorable

As current President of the Maryland Recycling Network (MRN), I am writing in support of HB 833. I bring my experience managing electronics recycling contracts, including lithium-ion battery recycling, over the last 12 years at the Northeast Maryland Waste Disposal Authority. I am not speaking on behalf of the Authority.

Maryland Recycling Network members include public recycling and sustainability managers, private sector and non-profit recyclers and individuals who support recycling. We promote sustainable reduction, reuse and recycling (the 3 "R's") of materials otherwise destined for disposal and the purchase of products made with recycled material content. We achieve these goals through education programs, advocacy activities to affect public policy, technical assistance efforts, and the development of markets to purchase recycled materials and manufacture products with recycled content.

We have direct experience operating recycling and composting programs in the private sector and municipal government level. We know the ins and outs of recycling in Maryland. Our experience informs our comments.

We thank Delegates Boyce and Stein for sponsoring this bill, especially Delegate Boyce for being an original sponsor of HB 468, which passed in 2024, to establish the Commission to Advance Lithium-Ion Battery Safety in Maryland. I am a Member of that Commission on behalf of Maryland Recycling Network.

The law establishing the Commission charged the Commission with conducting a comprehensive study for the purpose of making legislative, regulatory, programmatic, or other recommendations regarding:

- Best practices, standards, and guidelines to prevent, detect, and suppress lithium-ion battery fires in:
 - Consumer and transportation applications
 - Utility applications, including a review of the National Fire Prevention 855 Standards for Grid Scale Storage and Safety

Maryland Recycling Network
c/o Mariner Management • PO Box 1640 • Columbia, MD 21044
Phone: (443) 741-8740 • www.MarylandRecyclingNetwork.org

- Preventing, detecting, and suppressing lithium-ion fires at recycling facilities
- Reusing, recycling, and decommissioning lithium-ion batteries
- The viability of extended producer responsibility for lithium-ion batteries
- Training, education, and other information to better inform the public and first responders regarding lithium-ion battery safety
- Any other global issues the Commission may consider useful for enhancing the safety and reuse of batteries in the State.

The Commission's membership comprised a diverse set of experts that provided technical, public safety, environmental, and operational expertise throughout the Commission's work.

Our Commission did also provide a comprehensive set of recommendations in a [68-page Final Report](#), dated November 25, 2025.

We feel that the Commission has done great work with establishing these initial recommendations, however, per Key Legislative Recommendation #7 (page 6 of the Final Report), a re-establishment and extension would allow us to continue research and recommendation on the following areas:

- Battery risks at the Port of Baltimore, roads, rail and tunnels throughout Maryland
- Impacts of battery risks on insurance providers and insurance coverage availability
- Maryland's current waste classifications for lithium-ion batteries and how they affect collection, storage, and recycling as well as how this could be better addressed in the permitting and regulation of solid waste facilities; and
- The integration of pending federal regulations and emerging third-party standards

Additionally, we feel that there is need for additional subject matter experts to be added to the Commission (per Section 7.2 of the Final Report), including representatives from the Maryland Port Administration, the Maryland Department of the Environment (Land and Materials Administration), the Maryland Department of Transportation, commercial vehicle shippers, and representatives from the property casualty and commercial insurance industries.

For reference, the Commission report and supporting materials have been posted on the Office of the State Fire Marshal's website, located below:

https://mdsp.maryland.gov/firemarshal/Pages/%E2%80%8BHB468_Commission_Advance_Lithium-Ion_Battery_Safety_Maryland.aspx

Please also see the attachment to this testimony for further background and concern regarding lithium-ion battery thermal runaway events and fires.

We strongly urge passage of HB 833. Thank you for your consideration.

Sincerely,

A handwritten signature in cursive script that reads "Kitty McIlroy".

Kitty McIlroy
President
Maryland Recycling Network

The Maryland Recycling Network stands ready to serve as a sounding board and resource for legislators and others interested in pursuing our mission. Please do not hesitate to contact MRN via email phoustle@marylandrecyclingnetwork.org, phone 301-725-2508 or mail - MRN, PO Box 1640, Columbia MD 21044 if you have any questions or would like additional information regarding the above.

Health and Safety Specific Information Regarding Lithium-Ion Batteries

Lithium-ion batteries are found in a variety of small to medium format electronic products including hearing aids, cell phones, e-bikes, scooters, laptops, tablets and vaping devices, in addition to large format products such as electric vehicles and stationary battery energy storage systems (BESS)/ battery storage power station or battery energy grid storage (BEGS).

When punctured or otherwise compromised, a chemical reaction can cause a fire or explosion. Chemical reactions during the fire make them burn longer and hotter and make them difficult and hazardous to extinguish. They escalate much faster, are prone to reignition and can burn for days.

Lithium-ion battery management is one of the most pressing issues, if not the most pressing issue, in the solid waste management and recycling industry right now.

Battery fire incidents have been exponentially increasing in Maryland and across the country and world. We've already seen fires at collection sites, MRFs and on solid waste trucks in Maryland. Battery fire incidents severely impact and endanger site staff, capital infrastructure like MRFs, transfer stations, waste facilities and landfills, collection trucks/drivers, other processing equipment, insurance rates (limiting capability to even be insured), in addition to first responders, who continue to receive more and more call outs due to battery fires. We need to protect our essential workers, first responders, and recycling infrastructure here. Re-establishing this Commission will help us do that.

The solid waste management sector is already consistently ranked as one of the most dangerous, deadliest labor sectors in the United States:

“Waste and recycling collection was fourth deadliest occupation in 2023...The latest Bureau of Labor Statistics data showed an increase in the rate of fatalities for the refuse and recyclable materials collection occupation. The number of fatalities in MRFs also increased... Waste and recycling jobs remain a potentially hazardous occupation, despite ongoing efforts to get out of the top 10 deadliest job category by investing in more safety training and technology for vehicles and facilities. The only occupations that had higher fatality rates in 2023 were logging, fishing and hunting and roofing...Solid Waste Association of North America CEO Amy Lestition Burke said in [a statement](#) that the organization was “very disappointed” in the results. “This data reinforces the need for safety improvements. The individuals who collect waste and recycling are making communities livable and sustainable. We all have a role to play to protect these everyday heroes.. “The increase in solid waste collection worker fatalities is concerning, and occurred from coast to coast and at small haulers, the large publicly traded companies, and local governments,” said David Biderman, a safety consultant and former SWANA CEO, in an emailed statement that also noted this was one of the

highest rates in years. “There are a wide variety of contributing factors to these tragic incidents. We know what these factors are, and need to address them.”¹

“Solid waste collection workers are still on the list of the ten most dangerous jobs. From the truck itself to the collected garbage (*lithium-ion batteries*, syringes, glass, and chemicals: MSW has a lot of unexpected hazards in store), from distractions like mobile phones to bad weather conditions, from pedestrians to other drivers: The sources of danger are manifold. And more waste means more risks... Safety campaigns and awareness have an effect...SWANA will continue leading industry efforts to reduce them even further and fulfill our Strategic Plan goal of getting solid waste collection workers off the list of the ten most dangerous jobs.”²

Unfortunately, many people put these batteries in their recycling and trash bins. A recent National Solid Waste & Recycling Association (NWRA) [report](#) estimates more than 5,000 fires a year at recycling and waste facilities and in collection trucks. While many recycling processing facility fires can be quickly contained, several facilities have been damaged so badly they had to be closed and rebuilt. The loss to the facility owner can be more than \$50 million dollars. In addition, local recycling programs relying on those facilities are forced to scramble to find new processing facilities for their recyclables. Insurance companies are also [backing away from insuring](#) these types of solid waste and recycling facilities due to fire concerns.

The Commission will continue to study the severe human health and safety issues from toxic chemical battery flammable gas, smoke, fire and explosion incidents (which can be fatal, even from inhalation). This Commission will also continue investigating increased public education, comprehensive protocols with local fire departments, heat spot and fire detection and suppression equipment, as well as report on [emerging technologies and industries](#) transitioning away from liquid state to solid state electrolyte-based batteries, which are less susceptible to fires. These efforts will ensure that these batteries, so essential to so many products, can continue to be useful without causing fires and destabilizing our critical infrastructure.

Additionally, the Solid Waste Association of North America (SWANA), the National Waste & Recycling Association (NWRA), and the Recycled Materials Association (ReMA) released a joint "Guide for Developing Lithium-Ion Battery Management Practices at Materials Recovery Facilities" to offer practical steps for materials recovery facilities (MRFs) to better identify, manage, and respond to improperly discarded lithium-ion batteries. The guide is available [here](#). But the best guide is keeping them out of the recycling stream and the trash. After all, the most effective education and

¹ https://www.wastedive.com/news/waste-recycling-worker-fatality-rate-2024/735975/?utm_source=Sailthru&utm_medium=email&utm_campaign=Newsletter%20Weekly%20Roundup:%20Waste%20Dive:%20Daily%20Dive%2012-21-2024&utm_term=Waste%20Dive%20Weekender

² [Workplace safety: Getting waste collection off the list of the most dangerous jobs | WMW](#)

enforcement efforts to improve our recycling programs come to naught if the collection truck or processing facility burns down.

A survey of our members reported fires on tipping floors at recycling processing facilities, fires in trash collection trucks, fires at waste transfer stations and landfills, and even overnight fires in separately collected and stored electronics containment areas for electronics recycling contracts. Fortunately, none of these events caused serious damage. However, a [2022 fire](#) at a recycling processing facility in York, Pennsylvania, which is used by some Maryland communities, caused it to shut down.

Additionally, WM's three recycling facilities in Maryland (including the MRF in Elkridge, MD) reported the following:

- 30-40 small scale battery fires (smoke fires) in 2025
- 5-7 medium sized incidents in 2025

Additionally, there were 245 fires reported across 64 waste facilities (during 2013–2020) caused or likely caused by lithium-ion batteries. Affected facilities included MRFs (Materials Recovery Facilities), solid waste trucks, landfills, transfer stations, public drop-off points, and electronics and battery recyclers. 78% of MRFs required emergency response for fires, with 43% facing monetary impacts. Lithium-ion battery fires are increasing due to the rise in portable, chargeable electronics and electric mobility such as scooters, bikes and vehicles. For full details, please see the [EPA's Lithium-Ion Battery 2021 Report](#).

THE FACTS

An overheating battery can go from from 212°F to 1,800°F in the blink of an eye. (Source: [Clemson University](#).) When batteries ignite, they can throw off flames reaching temperatures of over 2000°F. (Source: [National Institute of Standards and Technology](#).)



250+
FIRES IN 7
MONTHS

In the first seven months of 2025, there were more than **250 fire incidents at waste and recycling facilities across the U.S. and Canada**—more facility fires than any other period on record. (Source: [Ryan Fogelman](#))



\$22
MILLION PER
FACILITY

Catastrophic losses caused by fires at waste processing facilities have **risen 41% in the last five years**, with the average catastrophic loss causing \$22 million in damage. (Source: [Recycle.com](#))



89+
DEATHS IN
THE US

Since 2020, there have been at least **89 deaths** directly related to **lithium-ion battery incidents** in the United States, nearly a 50% increase from 2015-2019! (Source: [UL Solutions](#))

Maryland Recycling Network
c/o Mariner Management • PO Box 1640 • Columbia, MD 21044
Phone: (443) 741-8740 • www.MarylandRecyclingNetwork.org

Source: [Safe Battery Disposal](#)



EXTREME HEAT

When a battery overheats, it can jump from 212°F to 1,800°F in a second—and produce flames as hot as 2,000 °F! (Sources: [Clemson University](#); [National Institute of Standards and Technology](#).)



TOXIC GAS

As lithium battery fires burn, they release toxic gasses like hydrogen fluoride and carbon monoxide. If inhaled, these fumes can lead to trouble breathing, eye and skin irritation, and in some cases, even death.



LONGER BURNING

Battery fires don't just burn hotter—they burn longer, too. These fires are extremely difficult for firefighters to put out, and they can quickly reignite without a moment's notice.

Source: [Facts — Safe Battery Disposal](#)

Increased Fires in the U.S. Waste Stream

- **Fires are increasing across waste industry (EPA report)**
- **State, Tribal and local governments (ASTSWMO Survey)**
 - High costs for safe handling
 - Hard to recycle: vapes, embedded batteries
- **Fires at U.S. material recovery facilities**
 - 5,000 fires annually across 300 MRFs ([NWRA](#) estimate)
 - More than 1% of MRFs experience a catastrophic loss every year
 - MRF property insurance rates increased 10-50x from 2017 – 2023



Photo credit: Hai Nguyen (Oakland, CA)

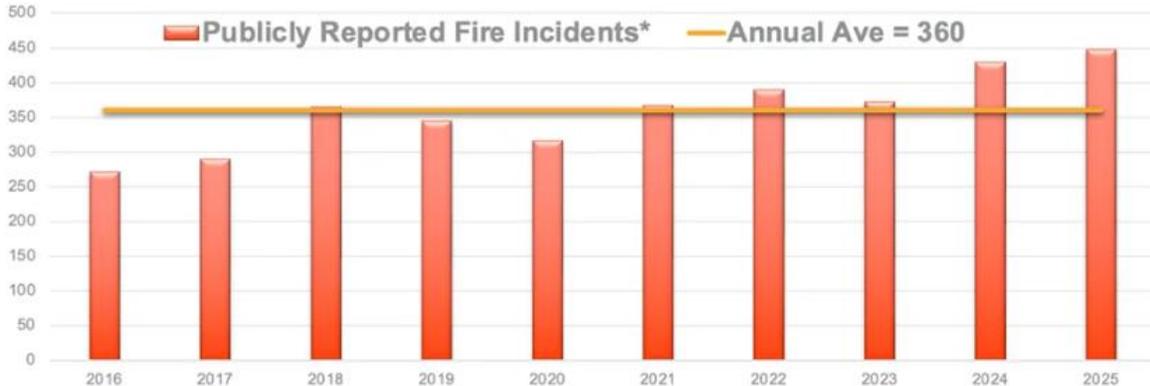


Slide from 1/27/26 EPA Virtual Roundtable Meeting

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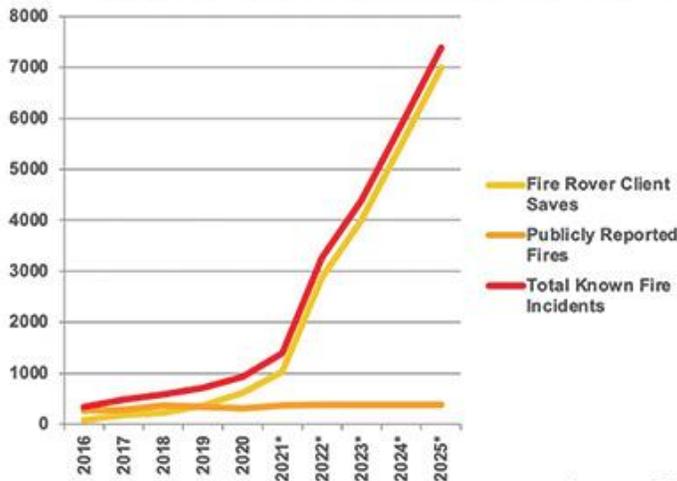
ANNUAL REPORTED WASTE & RECYCLING FACILITY FIRES US/CAN 2016 - 2025



Source: Ryan Fogelman, rfogelman@firerover.com

As of January 2026, [“this year was the worst on record for publicly reported fires since I began consolidating and sharing the data in 2016. We finished the year with 448 publicly reported waste and recycling facility fires in the U.S. and Canada, which is more than last year’s record of 430 fire incidents and nearly 25% above the annual average of 360 fire incidents.”](#)³

WASTE & RECYCLING FACILITY FIRES US/CANADA ACTUAL & FUTURE TRENDS



Source: Ryan Fogelman, rfogelman@firerover.com

“Then came the lithium-ion battery threat that revealed itself in 2018 in the form of increased fire incidents across the globe... This problem is not going away. In fact, the number of lithium-ion batteries forecasted to enter the waste and recycling streams is

³ [January Fire Report](#), Date Accessed: February 15, 2026.

only growing along with hotter and dryer environments, which leads to a breeding ground for increased fire incidents... The goal is not just to catch a fire when there are flames, but also to understand that there are situations where hot spots can be cooled before they flame. The goal is to set the tripwire as early in the process as possible. This can be done through top-grade thermal detection in combination with smoke, optical flame detection, and advanced data analytics—all coupled with a highly trained agent who is able to weed through false positives to fight only the incidents that need fighting... 2022 was (and 2023 is forecasted to be) the worst year for reported fire incidents ...we are heading down a path where investments in solutions like the Fire Rover are considered 'critical' to successfully responding to the fire hazards that continue to hit our waste and recycling streams. We need a funding mechanism like the government or the battery manufacturers to help pay for the costs they have created... Investing in proper equipment for the fire department to use onsite can be a huge timesaver and lifesaver. Even going as far as having attached and rollout hoses so the firefighters can immediately start applying suppressant to the affected area can make a huge difference”

Source: [Keys to Building a Successful MRF: Before, During, After - Waste Advantage Magazine](#))

Lastly, videos of lithium-ion battery caused fires are provided below for reference:

- <https://youtu.be/8nz5ijXcckI?si=HqCA9p0OxftZ4KXK>
- <https://youtu.be/Vudxuqjscho?si=UspX6BmIM9rmeo5A>
- [Video: How quickly a battery fire can start - Inside Waste](#)

2026_MaGIC_HB833_Lithium_FAV.pdf

Uploaded by: Lindsay Thompson

Position: FAV



Date: February 24, 2026

HB 833 - Commission to Advance Lithium-Ion Battery Safety in Maryland – Reestablishment

MaGIC Position: **SUPPORT**

Committee: EEE

The Maryland Green Industries Council respectfully submits this testimony in **support** of House Bill 833. Our member companies include landscape professionals, lawn care providers, arborists, and allied businesses. These businesses are facing increasing pressure to transition to electric lawn and landscape equipment powered by lithium-ion batteries. Ensuring the safe use, storage, transportation, and recycling of these batteries is therefore essential to both worker safety and public confidence in this technology.

HB 833 re-establishes the Commission to Advance Lithium-Ion Battery Safety in Maryland, directing it to study and recommend best practices to prevent, detect, and suppress lithium-ion battery fires, including those used in consumer and transportation applications and at recycling facilities. This comprehensive review is critical as electric outdoor power equipment becomes more common.

For the green industry, battery safety is not theoretical, it is operational. Crews routinely transport and charge multiple batteries daily in trucks, trailers, and maintenance facilities. While lithium-ion technology has advanced significantly, safe handling protocols, consistent charging standards, and clear end-of-life management guidance remain vital. The Commission's work to integrate federal regulations, emerging industry standards, and best practices will help ensure that contractors and homeowners alike use these products safely and responsibly.

Adoption of electric equipment by Maryland green industries businesses depends on confidence that battery systems are safe throughout their lifecycle. HB 833 directly addresses these concerns by examining reuse, recycling, and decommissioning of lithium-ion batteries and by improving public and first responder education.

The Green Industries Council also appreciates the bill's broad and balanced Commission membership, which includes fire safety experts, recycling professionals, insurance representatives, and industry stakeholders. We would welcome specific involvement from lawn, landscape and arborist professionals. This inclusive structure will ensure that recommendations reflect real-world conditions faced by contractors and equipment users, while also strengthening coordination with emergency responders and safety officials.

HB 833 provides the thoughtful, proactive framework needed to protect workers, businesses, and the public while supporting the responsible growth of electric lawn equipment technologies.

For these reasons, the Maryland Green Industries Council respectfully urges a **favorable report** on House Bill 833.

118 Dundee Ave ■ Chester, MD 21619 ■ Phone: 443-262-8491 ■ E-mail: lindsay.mdag@gmail.com

Frederick Area Landscape Contractors and Nurserymen ■ Landscape Contractors' Association, Inc. MD, DC, VA ■ Maryland Arborist Association
■ Maryland Association of Green Industries ■ Maryland Nursery, Landscape, and Greenhouse Association
Executive Director, Lindsay Thompson

HB0833 (SB0553) - FAV - Commission to Advance Lith

Uploaded by: Megan Outten

Position: FAV



Maryland

Energy Administration

TO: Chair Feldman, Vice Chair Kagan, and Members of the Education, Energy, and Environment Committee

FROM: MEA

SUBJECT: HB 833 - Commission to Advance Lithium-Ion Battery Safety in Maryland - Reestablishment

DATE: February 24, 2026

MEA Position: FAVORABLE

The Maryland Energy Administration (MEA) respectfully submits this letter in support of Senate Bill 833.

Senate Bill 833 reestablishes the Commission to Advance Lithium-Ion Battery Safety in Maryland with an altered membership and mandate. This includes adding representatives from the Maryland Port Administration, the ocean freight shipping industry, the property casualty insurance industry, commercial insurance industry, and representatives from the Land and Materials Administration.

The Commission to Advance Lithium-Ion Battery Safety was established in 2024 to study and make recommendations regarding best practices and guidelines to prevent, detect, and suppress lithium-ion battery fires in utility applications. The Commission additionally provided education and training to better inform the public regarding lithium-ion battery safety.

As Maryland continues to advance its electrification goals, lithium-ion batteries have become increasingly critical to the State's clean energy transition. With the growth comes a corresponding need for renewed and expanded stakeholder engagement to address emerging challenges and opportunities.

Evolving issues and challenges warranting further coordination include the safe collection, storage, and recycling of lithium-ion batteries; addressing perceived and real safety risks at the Port of Baltimore and across Maryland's roads, rails, and tunnels; and evaluating emerging third-party standards on battery technology.

Reestablishing this Commission will bring Maryland's stakeholders together to proactively examine these new and evolving questions and challenges. Doing so will help ensure that the continued usage of batteries in the clean energy transition occurs in a safe and well thought manner, using best practices, and incorporating lessons learned.

For these reasons, MEA urges the committee to issue a **favorable report**.

Our sincere thanks for your consideration of this testimony. For questions or additional information, please contact Megan Outten, Policy manager, at megan.outten@maryland.gov or 443.842.1780.

Suppa- White paper v.2.2026.pdf

Uploaded by: Ralph Suppa

Position: FAV

Incident Response: Engineering Safety, Tactical Resilience, and Environmental Responsibility for EVs and Battery-Related Incidents.

By Ralph Suppa, Fire Captain & CEO, Cervitas Solutions

(On behalf of Cervitas Solutions – Engineering Safety and Training for Modern Response)

Executive Summary

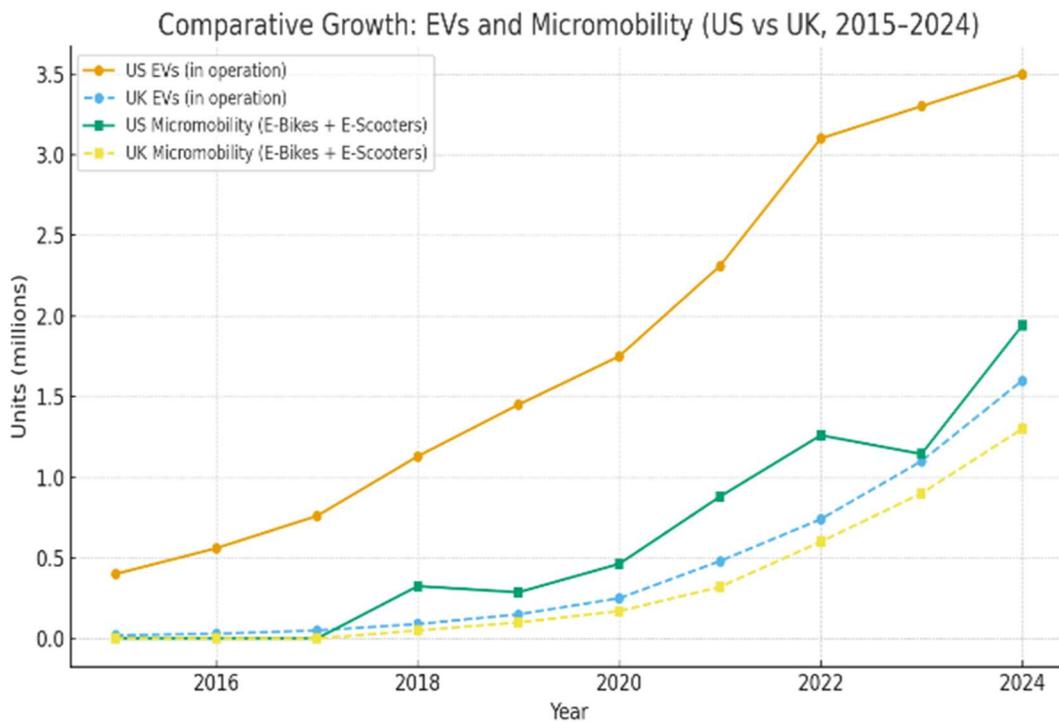
This white paper turns current research and real incidents (Surprise, Sacramento, Morris, Moss Landing, Los Angeles, Maryland) into street-ready tactics for firefighters, company officers, chiefs, trainers, policymakers, and industrial safety teams. Battery-powered everything is already here. It is not just outrunning the fire service, but also outpacing standards and regulations. EVs, BESS, e-bikes, portable power packs, battery-powered tools, and forklifts are driving incidents that result in high-toxicity plumes, stubborn re-ignition, structural compromise, and contaminated runoff. The need to act is immediate.

H.R. 973 (Abbreviations and Acronyms on Table 1) compels the CPSC to issue a binding federal rule within 180 days establishing UL 2271, UL 2849, and UL 2272 as the compliance baseline for e-bike and e-scooter batteries and systems. Future UL updates will auto-adopt and full CPSA enforcement (recalls/penalties) stand behind it. For industry, this shifts immediate responsibility to manufacturers, importers, and retailers to certify products and tighten charging, storage, and repair practices. Hence, directly reduces ignition risk, thermal propagation, and responder exposure. Standards for EVs are in the works as well.

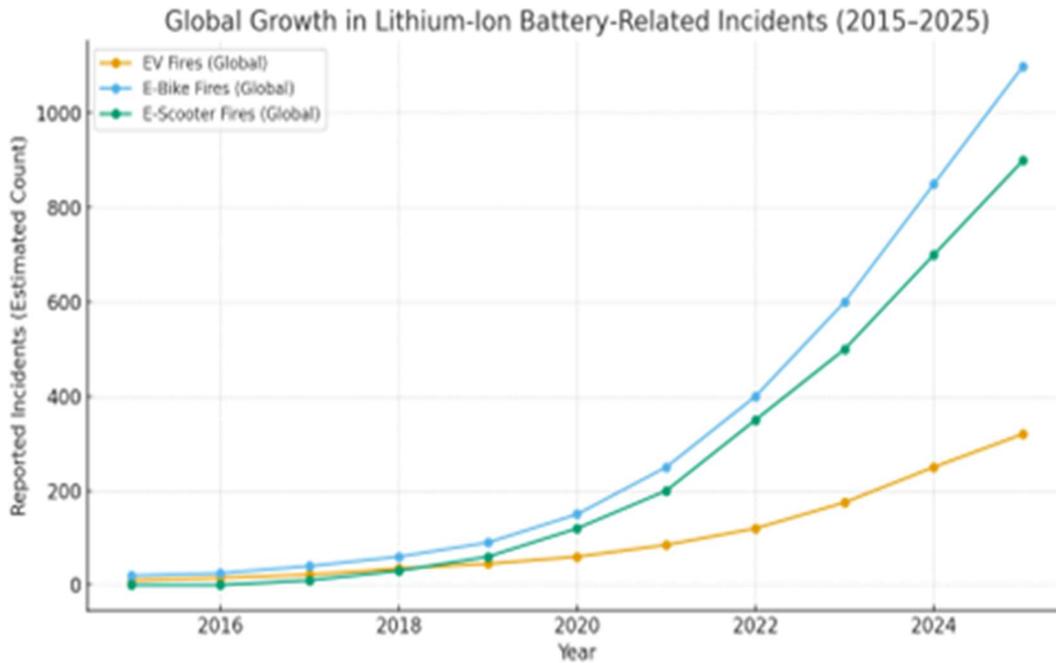
Cervitas closes the gap between the lab, the street, and industry. We break complex battery science into digestible, practical plays by spotting off-gassing cues, deciding when to cool vs. contain, fire suppression tactics, medical response, integrating air/water monitoring, controlling runoff, and using structured decision-making to protect crews, workers, and communities. We are working with medical clinicians to develop treatment plans for exposures. **The result: safer operations, fewer surprises, fewer injuries to responders, better environmental stewardship, expertise in navigating current and future regulatory guidelines, and faster recovery.** If your agency, department, or facility needs practical, evidence-based lithium-ion response training you can use tonight, Cervitas is the answer.

1. Introduction – The Global Electrification Paradox

By 2025, the world's roads carried approximately 58 million plug-in electric cars, with 2025 sales alone surpassing 17 million. That is over one-fifth of all new cars sold that year (IEA, 2025). At the same time, micromobility surged globally as cities adopted e-bikes and e-scooters at scale. With this rapid growth comes a parallel rise in battery-related incidents. Globally, researchers have verified roughly 511 traction-battery fires in passenger EVs between 2010 and mid-2024. This is rare compared with the overall fleet but operationally significant for responders (EV FireSafe, 2024). In the UK alone, 211 e-bike and e-scooter fires were recorded in 2024 (OPSS, 2025). **New York City has reported more than 800 lithium-ion fires, resulting in over 30 deaths and 400 injuries since 2022 (FDNY, 2024).** Every lithium-ion system, whether a sedan pack, a transit bus module, or a scooter battery, combines a flammable electrolyte, reactive materials, and a dense energy storage capacity. When damaged, defective, or overheated, these systems can release intense heat, and explosive and toxic off-gases. The health risks associated with exposure to these gases are decreased lung function, heart rhythm disturbances, renal issues, lung scarring, and far more; we are still discovering. This turns the response environment into a combined thermal, chemical, and environmental hazard zone (FSRI, 2024). With battery technologies and deployment outpacing codes and standards, agencies worldwide must adopt a proactive stance built on targeted training, interagency collaboration, and engineering literacy (NFPA, 2024).



Sources: US DOE, Argonne, BTS, eCycleElectric, NABSA, SMMT, DfT, and Zap-Map (2025). UK micromobility values are indicative estimates from OPSS and DfT trends. Dashed lines denote UK data.



Sources: EV FireSafe Global Database (2024), OPSS (UK, 2023), IEA Global EV Outlook (2023), FDRY/US CPSC datasets. Values represent modeled estimates for global trend visualization.

2. Tactical Complexity and the OODA Loop

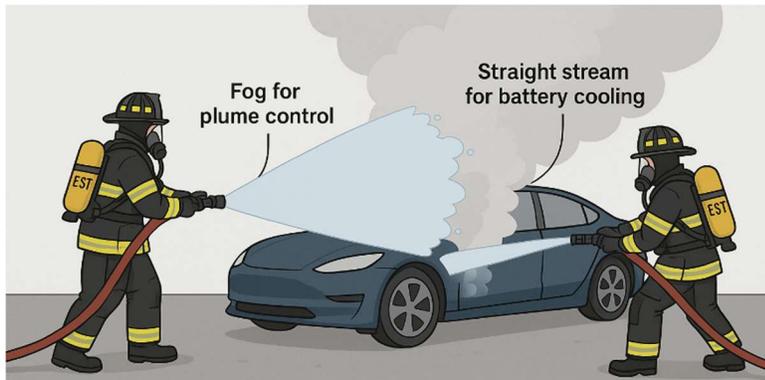
Dynamic hazards require dynamic decision-making. The **OODA Loop**—Observe, Orient, Decide, Act provides a mental framework for adapting to rapid changes on scene (Boyd, 1987).

- **Observe:** Identify if this fire or rescue involves batteries, look for markings, branding, and no exhaust piping on vehicles. If batteries are involved, observe for the signs of audible venting, white vapor, off-gassing, loud pops, hissing, or deformation showing thermal runaway is in progress.
- **Orient:** Assess the vehicle, BESS, or battery-powered equipment. Find the battery location, and try to see SoC (if possible); establish exposures, taking into account wind direction and runoff paths.
- **Decide:** Determine whether suppression, isolation, or controlled burn is safest.
- **Act:** Implement a coordinated, multi-line approach while maintaining atmospheric monitoring.

Crews must continue the OODA loop process and continually evaluate using situational awareness. The tighter you can tighten the loop, the sooner you can apply the right tactics and mitigate the situation. This is what makes the OODA loop approach crucial to incident success. Crews have to remain on air throughout the incident and be ready to use SCBA immediately. If

the EV's batteries are not involved and only the cabin is affected, crews should use standard tactics. If batteries are involved, off-gassing often precedes deflagration by seconds or minutes, making readiness essential (FSRI, 2025). Given the gas's composition, the explosion risk is much higher than that of a combustion engine. Firefighters must recognize that, in these incidents, 'white smoke' is not always steam. The gases in the vapor cloud will often hang low to the ground, unlike steam, which rises. Another important change in thinking is that the gases are invisible, and some particulates are too small to see; therefore, **clear air may not be clean air**.

Figure 2.



Runoff control should begin early. Tarps, booms, or vacuum systems can reduce contamination. The pollution concern stems from the cathode material in batteries, which can contain cobalt, manganese, and, far worse, nickel. When life risk is mitigated and infrastructure isolated, **allowing controlled burn** may be the most environmentally responsible option (EPA, 2025). When considering a controlled

burn, assess critical infrastructure and exposure risks.

3. Chemistry and Thermal Runaway Mechanisms

Lithium-ion cells comprise an anode (usually graphite), cathode (lithium metal oxide), and a flammable electrolyte (often a mixture of ethylene carbonate with other carbonates). Ethylene carbonate is a waxy solid under operation of lithium batteries, so other carbonates are added to reduce viscosity. When a separator ruptures due to mechanical impact, overcharging, or an internal short, the exothermic reaction sequence known as **thermal runaway** begins (Gallagher, 2024).

The process unfolds in stages:

1. **Initiation:** Internal short raises cell temperature to $\sim 120^{\circ}\text{C}$, decomposing the solid-electrolyte interface.
2. **Propagation:** Adjacent cells absorb the heat, reaching self-heating thresholds around $180\text{--}200^{\circ}\text{C}$.
3. **Gas and Flame Ejection:** Flammable gases and toxic vapors (HF, H_2 , CO, HCN) are released; ignition follows if



oxygen is available (FSRI, 2024).

Figure 1. CEP forensics image.

Recent UL studies reported hydrogen fluoride concentrations of 50–200 ppm in EV fires, well above the 30 ppm IDLH threshold (EPRI, 2025). These gases compound toxicity: CO binds to hemoglobin, reducing oxygen transport, while HF causes deep-tissue burns and systemic calcium depletion. This can lead to EKG changes and lung damage. (CTIF, 2023). Because HCN interrupts cellular oxygen use by binding to cytochrome c oxidase, victims may appear to have adequate arterial oxygen levels. At the same time, their tissues are effectively starved, a silent and insidious threat in a battery involved event. Exposure of first responders or civilians to the toxic gases results in a compounded interest of toxicity. This causes acute and long-term issues, many of which are still being discovered. The fire service and EMS services need to be ready to tackle not only fire but also exposure to these toxic gases for civilians, as well as their members.

4. State of Charge and Regulations

A battery's **State of Charge (SoC)** influences both volatility and the likelihood of re-ignition. Testing by Vora and Hogrefe (2024) showed that 90–100% SoC modules release up to 60% more energy than 50% SoC units. Fully charged packs sustain combustion longer, with higher HF concentrations during venting. They also have a more violent reaction and energy release. To combat this, most batteries are to be transported at <30% SoC. This reduces the risk of a violent reaction. There is a lower chance of thermal runaway at 50% or less SoC, but the risk of VCE increases if abuse occurs and the lithium-ion battery enters thermal runaway. Generally, the higher the SoC at the onset of thermal runaway, the greater the likelihood of ignition.

Responders should request telemetry data from manufacturers or fleet systems when possible. Understanding SoC informs cooling duration and post-incident observation time (EPRI, 2025).

Regulatory Snapshot: Strong on Fire, Thin on Toxic Plume

FAA/TSA/PHMSA policy does a good job of addressing the fire aspect of lithium-ion incidents: it mandates carry-on rules for spares, watt-hour limits, cargo-aircraft-only for cells at ≤30% SOC, and operator guidance that pairs halon for knockdown with aggressive water cooling to arrest thermal runaway. These frameworks do not fully address the toxic plume that accompanies venting cells: superheated aerosols and gases (e.g., HF, H₂, CO, VOCs, metal oxides, ultrafine particulates) that can migrate through cabins, overhead bins, and ductwork, creating exposure risks long after the visible flame subsides. In practice, crew checklists emphasize suppression and containment but offer limited guidance on plume characterization, exposure thresholds, air-handling strategies, post-event monitoring, or medical follow-up for passengers/crew, and virtually no guidance for ground responders receiving the aircraft or handling a damaged pack during diversion/turnaround. The operational gap is clear: fire is controlled, exposure is assumed acceptable. Our recommendation: integrate plume-aware tactics (directed ventilation,

time-weighted exposure controls, post-event air sampling, HF indicator protocols), PPE guidance for cabin/ARFF/EMS, effective PPE decontamination, and chain-of-custody packaging for hot/compromised batteries to align aviation practice with modern battery hazard science.

5. Environmental and Engineering Considerations

Environmental protection is now integral to tactical command. Lithium-ion fires produce runoff rich in **fluoride ions, cobalt, manganese, nickel, and organic solvents**. During the 2023 Luton Airport car park fire, UK environmental agencies recorded fluoride levels exceeding drinking water limits by a factor of 200. Although an EV did not start the fire, it caused numerous EVs to burn and be destroyed. There were also significantly high levels of heavy metals in firefighting runoff. (Bedfordshire FRS, 2024).

At **Moss Landing, California (2025)**, multiple BESS fires forced evacuations due to HF plumes and contaminated water discharge. The County of Monterey (2025) identified persistent fluoride ion contamination downstream.

The **Fire Research Authority (2024)** analysis of NFPA 855 recommends installing **Combustible Concentration Reduction (CCR)** systems and explosion-relief panels for BESS facilities. However, mobile applications (EVs, buses, RVs) lack equivalent requirements, necessitating local protocols for containment and runoff control.

6. Case Studies and Lessons Learned

Surprise, Arizona (APS McMicken ESS Explosion, 2019)

Responder injuries following deflagration caused by accumulated hydrogen and toxic gases.

Crews who responded to this incident were alerted to a 'brush/ grass fire' by a civilian. What they encountered was far from that; a BESS had an incident. It is important to note that the crews operated tactfully and were the first to have this experience in the US. I applaud them for sharing their experiences to help us all learn. UL FSRI (2020) determined that off-gassed hydrogen and CO accumulated inside the BESS enclosure. Although gas monitor readings were elevated, the decision was made to proceed with a further investigation. Opening the door created the proper mixture of explosive gases. They had a deflagration that injured four firefighters. Key findings emphasized remote gas sampling, use of risk-benefit analysis, and the OODA loop for making tactical decisions, command-level standoff, and cross-agency communication with utilities.

Sacramento, California (Tesla Crash and Battery Event, 2025)

Low-lying vapor exposure highlights the need for perimeter and SCBA discipline.

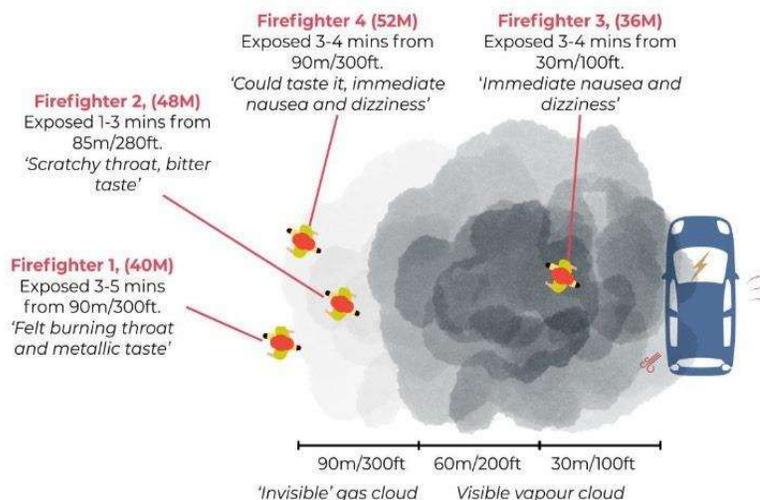
Following a crash involving a Tesla Model S versus a tree. The patient had to be extricated using hydraulic rescue tools. Post-incident, while the vehicle was being moved onto the tow truck, it began to exhibit signs of thermal runaway. The firefighters were no longer wearing their protective breathing apparatus and were immediately consumed by the vapor cloud. The firefighters observed a dense, white vapor drifting across the roadway. Four members experienced metallic taste and throat irritation; subsequent tests indicated exposure to HF, CO, and HCN due to off-gassing (KCRA, 2025). The department's internal report reiterated that **vapor does not equal steam** and reinforced the use of SCBA until the atmosphere is confirmed safe. Do not be blind to the fact that "confirmed safe" is a constant; this again shows the need for the OODA loop and ongoing assessment.

Figure 4. (EvFireSafe, 2025).

ELECTRIC VEHICLE COLLISION AND OFF-GASSING CAUSING RESPIRATORY INJURIES TO FIREFIGHTERS



Electric vehicle high speed collision with tree, no thermal runaway at time of incident, battery began off-gassing quickly and unexpectedly during recovery operations while being loaded onto tow truck. Five firefighters were exposed to vapours; all were hospitalised, with only one back on duty.



Incident occurred on 11th April 2025, all firefighters showed symptoms immediately and were hospitalised within 1 hour of exposure.

As of 28th September 2025, firefighter ongoing symptoms include:

- Reduced lung function (<82%)
- Sinus infection
- Elevated heart rate & tachycardia
- Mouth blisters turned into lesions
- Renal problems
- High concentrations of sulfur, phosphorus & lithium in blood tests

Source: Sacramento Fire Department
Prepared by evfiresafe.com and evfiresafe.training

Morris, Illinois (Lithium Battery Warehouse Fire, 2021)

EPA-managed HF monitoring underscores environmental coordination.

More than 100 tons of discarded batteries ignited in a warehouse. The EPA's On-Scene Coordinator deployed mobile HF monitors and coordinated public evacuation (EPA OSC, 2021). The incident became a national model for integrating environmental science into tactical operations.

Moss Landing, California (Vistra/PG&E BESS Fires, 2025)

Prolonged operations reveal long-term particulate and fluoride contamination risks.

Across three operational periods, responders addressed recurring thermal runaways at a 300-MW BESS facility, continuous HF monitoring and sample collection guided evacuation zones. Post-incident analysis confirmed runoff contamination, illustrating the importance of environmental liaisons within unified command (County of Monterey, 2025).

Los Angeles, California (7th Street Battery Fire Blue Sheet, 2025)

Overhaul contamination and PPE integrity—critical lessons for post-fire decontamination.

The Los Angeles City Fire Department (2025) documented persistent HF residue on PPE after overhaul. Despite gross decontamination, follow-up sampling detected fluorides within turnout fibers. Recommendations included double-washing, separate transport of contaminated gear, and tracking personnel exposure.

Maryland Incidents (DOD Contractor & RV Explosion, 2025)

Responder injuries and contamination emphasize persistent HF exposure risk.

A DOD contractor prototype battery fire released HF that affected a pump operator stationed outside and off-air, resulting in decreased lung capacity and prolonged recovery. Months later, a recreational vehicle equipped with aftermarket batteries exploded while crews were taking initial actions. Crews' PPE tested positive for HF residues. Both incidents reaffirm the need for **new tactics for these incidents, PPE testing, medical monitoring, and specialized decontamination** procedures (Cervitas Field Records, 2025).

7. Responder Preparedness and Tactical Readiness

A modern response requires deliberate preparation across three domains: **training, equipment, and SOP integration**.

Training and Simulation

FSRI (2025) testing shows EV fires can reignite hours, days, weeks, or even months after extinguishment, with the longest interval being 8 months after the initial incident. Training evolutions must incorporate delayed re-ignition scenarios, air-monitoring practice, thermal imaging, and OODA-based tactical exercises. Cervitas programs emphasize multidisciplinary training that combines hazmat, suppression, and environmental units.

Equipment and PPE

Thermal imaging should be used continuously for hotspot monitoring, with the understanding that if you do not have a clear view of the battery, you could get a false 'cold' reading. Make sure you know the limitations of the TIC. Minimum flow rates of 400–600 gpm per line are recommended for battery pack cooling (UL FSRI, 2025). Crews must maintain SCBA use, including during EV or lithium-ion battery incidents. If there is an active fire or signs of thermal runaway, crews must go on air within 300 ft of the incident, whether preparing for a rescue or executing firefighting tactics. SCBA should remain on and ready to use until monitoring confirms a safe atmosphere or crews are outside of the 300 ft hot zone. HF and HCN often linger after visible flameout. Remember, clear air is not clean air.

Extra cleaning protocols are essential: gross rinse, double wash, and isolation. Cervitas advocates annual PPE HF-residue testing for departments engaged in EV and battery responses.

Standard Operating Procedures

Departments should embed OODA-based decision trees into SOPs:

1. **Observe:** Identify off-gas color, components of gas, vapor behavior, and wind direction.
2. **Orient:** Determine battery location, SoC if possible, and access points. Exposure risk for toxic plumes and fire spread.
3. **Decide:** Choose suppression vs. isolation vs let it burn.
4. **Act:** Assign handlines, establish runoff control, and maintain monitoring.

Pre-plans should include tow-yard holding procedures, runoff containment methods, and debrief templates for sharing with JOIFF, IAFC, IAFF, and global networks.

8. The Caution Against EV Fire Blankets

In recent years, electric vehicle (EV) fire blankets have been marketed as a way to contain lithium-ion fires. However, based on current field evidence, scientific data, and risk analysis, IAFF and IAFC do **not recommend using EV fire blankets as a primary tactic in lithium-ion incidents**. The operational use of them is limited and increasingly cautious; it is a tool to be used when the situation calls for it, but as we have shown, this goes back to using the OODA loop and making real-time decisions. It might be very useful to use a blanket to suppress the fire to move it from a single-family garage or a parking structure to move it from exposure or critical infrastructure.

Fire blankets are often promoted for their ability to suppress flames and contain smoke, but in EV battery incidents, they may create more problems than they solve. Specifically, these blankets risk trapping flammable gases such as hydrogen, carbon monoxide (CO), hydrogen cyanide (HCN), and hydrogen fluoride (HF) beneath the surface of the blanket. If those gases

reach explosive concentrations, responders could face a delayed deflagration or vapor cloud explosion (VCE), particularly during removal or venting efforts.

Furthermore, EV fire blankets may interfere with thermal imaging and delay recognition of hotspots or reignition events. Given that lithium-ion battery packs can reignite days or even months later (FSRI, 2025), maintaining visibility and access is critical. Covering an EV may compromise both firefighting tactics and atmospheric monitoring, hindering safety and situational awareness.

The International Association of Fire Fighters (IAFF) and the International Association of Fire Chiefs (IAFC) echo concerns regarding overreliance on unventilated containment tools. In its operational guidance, the IAFC stresses the importance of controlled ventilation, real-time gas monitoring, and fire-ground decision-making rooted in chemistry and risk modeling not product marketing (IAFC, 2024).

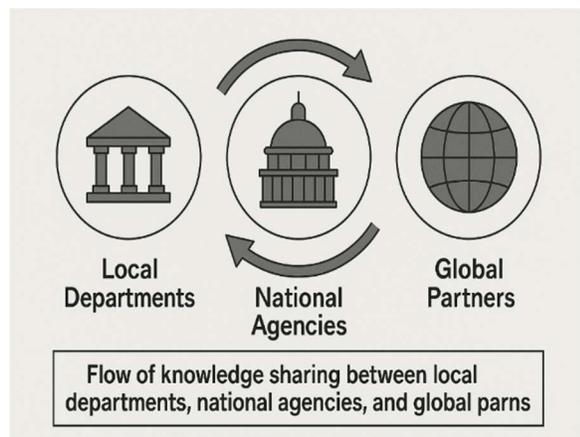
As of 2025, lithium-ion vehicle incidents remain high-risk but low-frequency. This may tempt municipalities and industry partners to pursue “quick fix” tools, such as EV fire blankets. However, the blankets may introduce new hazards rather than mitigate existing ones. In short, the risks of gas collection, potential ignition, reduced visibility, and a false sense of containment are too great.

Until further peer-reviewed field testing and incident data support their safe use, Cervitas Solutions does not recommend EV fire blankets as a standard tactic.

9. Information Sharing and Standardization

While NFPA 470, 800, and 855 establish foundational guidance, local implementation remains inconsistent. Departments often withhold after-action data, perpetuating knowledge silos.

Cervitas addresses this gap by distributing quarterly **Safety Letters** to partner agencies and contributing to the **JOIFF Shared Learning Summit and Webinars**, ensuring that global lessons translate into local practice (Cervitas, 2025).



FSRI and USFA emphasize open-source AAR sharing as a leading indicator of safety culture (USFA, 2025). The success of international networks like JOIFF demonstrates that structured collaboration prevents repeated tragedies. Failure to share lessons learned will result in more responders getting injured or killed.

Reporting all near-misses and eliminating silos will save lives and reduce injuries among responders.

Figure 5. (Cervitas, 2025).

10. Conclusions and Recommendations

Lithium-ion incidents pose a multidimensional hazard that requires engineering insight, tactical discipline, and continuous learning. Evidence from FSRI (2024-2025) and field incidents reveals recurring themes:

1. **Protocols and Preparedness** – Implement specific SOPs for EV/ Lithium-ion battery/BESS incidents, including OODA-loop integration, full SCBA use, and runoff control.
2. **Training and Exercises** – Incorporate re-ignition and toxic-vapor scenarios into hands-on evolutions. Practice pulling at least two handlines even with smaller crew sizes. Train for EVs to go into thermal runaway in rescue scenarios to have plans in place for when it happens.
3. **PPE and Health** – Mandate testing for metals, VOCs, and HF-specific in PPE, enhanced decontamination and cleaning. SOPs for immediate gross decontamination and proper bagging of gear after a fire. Implement additional post-cleaning testing of the gear beyond a wipe test, following traditional cleaning. This is to see what is released when gear is exposed to heat and flames after cleaning.
 - a. Protocols for exposures to these toxins, working with toxicologists, pulmonologists, and other healthcare clinicians to help achieve the best outcomes for patients and first responders. Examples include not just first-line emergency treatments but also gathering baseline bloodwork for heavy metals, baseline EKGs, and lung function testing.
4. **Monitoring and Data Sharing** – Use of thermal imaging camera and gas detection for HF, CO, VOCs, and HCN. Share AAR data via JOIFF, IAFF, global partners, and IAFC.
5. **Environmental Stewardship** – Recognize when “let it burn” may minimize contamination, guided by EPA metrics.

The fire service stands at a crossroads between tradition and transformation. Tactical resilience demands humility and curiosity, qualities that drive Cervitas’ mission to bridge research and practice.

11. Call to Action

I invite departments, industry partners, healthcare facilities, and government agencies to collaborate to advance readiness for lithium-ion and battery incidents. Through accredited training, JOIFF-aligned outreach, and custom scenario development, Cervitas delivers the expertise needed to **protect responders, improve outcomes for those exposed, preserve the environment, and prepare for the future.**

To connect with Cervitas or schedule training:

✉ suppa@cervitas.com 🌐 www.cervitas.com

Acknowledgements:

First and foremost, I would like to thank K. Brianna Suppa for her steady support, honest feedback, and constant encouragement throughout the process of developing this work. Her willingness to listen, challenge my thinking, and keep our family grounded made this project possible.

I am deeply grateful to Prof. Paul Christensen for his tireless research and generous guidance, and to Eric Van Gieson for his mentorship, insight into emerging risks and the broader implications for responder health and safety. I would also like to thank Robert “Bobby” Salvensen, Chief Michael O’Brian, Chief Robert Rezende, Chief Craig Blake, and Jeffrey Severance for their operational wisdom, critical review, and for repeatedly asking the hard questions that made this paper better and more practical for the field.

My, thanks to Edward “Ed” Sullivan and Kees Kappetijn for their perspectives on industrial risk, planning, and international collaboration.

Finally, sincere thanks as well to my team at Cervitas: Vincent Nicolas, J. Chris Cain, Adam Mueller, Kregg and Lauren Derry for their support, encouragement, hard work and for constantly pushing these ideas forward into real-world training and application. Each of these individuals has, in their own way, helped shape the ideas and recommendations in this paper. Any errors or omissions that remain are mine alone.

Table 1:

| Abbreviations and Acronyms | | | |
|-----------------------------------|--------------------------------------|------------|--------------------------|
| AHJ | Authority Having Jurisdiction | HCN | Hydrogen Cyanide |
| APS | Arizona Public Service | HF | Hydrogen Fluoride |

| | | | |
|-------------|--|----------------|--|
| ARFF | Aircraft Rescue and Firefighting | IAFF | International Association of Fire Fighters |
| BESS | Battery Energy Storage System | IAFC | International Association of Fire Chiefs |
| BMS | Battery Management System | IDLH | Immediately Dangerous to Life or Health |
| CO | Carbon Monoxide | JOIFF | Joint Oil Industry Fire Forum |
| CPSC | Consumer Product Safety Commission | NFPA | National Fire Protection Association |
| CPSA | Consumer Product Safety Act | NRTL | Nationally Recognized Testing Laboratory |
| CTIF | Intl Assoc. of Fire & Rescue Services | OODA | Observe–Orient–Decide–Act |
| EKG | Electrocardiography | PAH | Polycyclic Aromatic Hydrocarbon |
| EMS | Emergency Medical System | PHMSA | Pipeline and Hazardous Material Safety Administration |
| EPA | Environmental Protection Agency USA | PPE | Personal Protective Equipment |
| EPRI | Electric Power Research Institute | SCBA | Self-Contained Breathing Apparatus |
| EV | Electric Vehicle | SoC | State of Charge |
| FAA | Federal Aviation Administration | TSA | Transportation Security Administration |
| FDNY | Fire Department of New York | UL | Underwriters Laboratories |
| FRS | Fire and Rescue Service (UK) | UL 2271 | Batteries for Light EVs (LEV) |
| FSRI | Fire Safety Research Institute | UL 2849 | e-Bike Electrical Systems |

| | | | |
|-------------|-----------------------------------|------------|----------------------------------|
| H.R. | U.S. House bill | VCE | Voltage Collector-Emitter |
| VOC | Volatile Organic Compounds | | |

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Testimony in support of HB0833 - Commission to Adv

Uploaded by: Richard KAP Kaplowitz

Position: FAV

HB0833_RichardKaplowitz_FAV
02/24/2026
Richard Keith Kaplowitz
Frederick, MD 21703

TESTIMONY ON HB#0833 – FAVORABLE

Commission to Advance Lithium-Ion Battery Safety in Maryland – Reestablishment

TO: Chair Korman, Vice Chair Guyton and members of the Environment and Transportation Committee

FROM: Richard Keith Kaplowitz

My name is Richard K. Kaplowitz. I am a resident of District 3. I am submitting this testimony in support of HB#0833, Commission to Advance Lithium-Ion Battery Safety in Maryland – Reestablishment

My daughter-in-law, a career firefighter, has discussed the problems first responders have with fires caused by lithium-ion batteries. The National Fire Protection Association discusses *Lithium-Ion Battery Safety* ¹

Lithium-ion batteries are increasingly found in devices and systems that the public and first responders use or interact with daily. While these batteries provide an effective and efficient source of power, the likelihood of them overheating, catching on fire, and even leading to explosions increases when they are damaged or improperly used, charged, or stored.

Lithium-ion battery fires are a rapidly growing safety hazard in Maryland, with dozens of incidents reported annually involving e-bikes, scooters, and consumer electronics, particularly in Montgomery County. These fires often cause significant property damage (up to \$500k+), injuries, and dangerous, toxic smoke. ²

- **Rising Incidents:** A dedicated [Maryland State Fire Marshal dashboard](#) has tracked numerous incidents since April 2023,, with over 50+ reported statewide by late 2024.

The rise in incidents demands an accelerated response in Maryland to protect both our first responders and our residents. To accomplish that aim this bill will reestablish the Commission to Advance Lithium-Ion Battery Safety in Maryland with an altered membership and mandate; and requiring the Commission to report its findings and recommendations to the Governor and the General Assembly on or before December 1, 2027.

The report that will be required will assist the General Assembly in creation of legislation that will address the identified findings and recommendations.

I respectfully urge this committee to return a favorable report and pass HB0833.

¹ <https://www.nfpa.org/education-and-research/home-fire-safety/lithium-ion-batteries>

² Google AI Search "lithium-ion batteries fires in Maryland"

Letter of Support for HB0833.pdf

Uploaded by: S P

Position: FAV

MIKE MCKAY
Legislative District 1
Garrett, Allegany, and Washington Counties



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THE SENATE OF MARYLAND
ANNAPOLIS, MARYLAND 21401

Joint Committees
Administrative, Executive,
and Legislative Review
Children, Youth, and Families
Program Open Space and Agricultural
Land Preservation

Williamsport Office
2N Conococheque Street
Williamsport Town Hall
Williamsport, Maryland

February 19, 2026

RE: Fire/EMS Coalition Support for HB0833

Dear Chair Korman, Vice Chair Guyton, and Members of the Committee,

The Fire/EMS Coalition would like to express their support for **House Bill 833: Commission to Advance Lithium-Ion Battery Safety in Maryland - Reestablishment**. This bill will reestablish the Commission to Advance Lithium-Ion Battery Safety in Maryland with an altered membership and mandate; and require the Commission to report its findings and recommendations to the Governor and the General Assembly on or before December 1, 2027.

The Fire/EMS Coalition supports House Bill 833.

Sincerely,

A handwritten signature in cursive script, appearing to read "Mike McKay".

Senator Mike McKay
Representing the Appalachia Region of Maryland
Serving Garrett, Allegany, and Washington Counties

Voting Organizations:

Maryland Fire Chief's Association (MFCA)
Maryland State Firefighter's Association (MSFA)
State Fire Marshal (OSFM)
Maryland Fire Rescue Institute (MFRI)
Maryland Institute for Emergency Medical Services System (MIEMMS)
Metro Fire Chief's Association
Professional Firefighters of Maryland

Our Mission Statement

The Maryland Fire/EMS Coalition unites Republicans and Democrats in support of fire/emergency services legislation that benefit all first responders. Becoming a member does not require taking positions on legislation; rather Coalition members are asked to offer support in a way that best benefits fire/emergency services in their respective Legislative Districts.

HB 833-Commission to Advance Litium-Ion Battery Sa

Uploaded by: Andrea Mansfield

Position: FWA



Towing & Recovery Professionals of Maryland

P.O Box 905 * Huntingtown, Maryland 20639

410-414-5406 * 1-800-244-0102 * Fax 410-414-5408

MEMORANDUM

TO: The Honorable Marc Korman, Chair and Members of the Environment and Transportation Committee

FROM: Vince Flook, President, Towing & Recovery Professionals of Maryland
Will Cain, 1st Vice President, Towing & Recovery Professionals of Maryland

DATE: February 24, 2026

RE: **HB 833 Commission to Advance Lithium-Ion Battery Safety in Maryland - Reestablishment**

POSITION: **SUPPORT WITH AMENDMENTS**

The Towing Recovery Professionals of Maryland (TRPM) SUPPORT HB 833 WITH AMENDMENTS. This bill reestablishes the Commission to Advance Lithium-Ion Battery Safety in Maryland (Commission) to continue its research and review in several new areas.

Towing companies are on the front line providing a public service clearing and cleaning roadways when accidents occur. Their jobs can be dangerous and increasingly, so when an electric vehicle is involved. These vehicles do not have conventional transmission systems and must be towed in specific ways to avoid electrical issues, overheating, and damage to the battery pack. The batteries themselves also pose risks and must be handled in a certain manner with protective equipment.

The Commission's scope is being expanded to include the research and review of "Battery risks at the Port of Baltimore, roads, rail, and tunnels throughout Maryland." Considering the potential risks of towing electric vehicles in these areas, TRPM respectfully requests the bill be amended to add "ONE REPRESENTATIVE OF THE TOWING AND RECOVERY PROFESSIONALS OF MARYLAND."

For these reasons, TRPM SUPPORTS HB 833 WITH AMENDMENTS and urges the Committee to add a TRPM representative to the Commission's membership.

RJR-(MTC.MASFMA) House Bill 833.Senate Bill 553-Co

Uploaded by: Brandon Sands

Position: FWA



Delegate Marc Korman, Chair
Delegate Michele Guyton, Vice-Chair
House Environment & Transportation Committee
250 Taylor House Office Building
Annapolis, Maryland 21401

Re: House Bill 833/Senate Bill 553: Commission to Advance Lithium-Ion Battery Safety in Maryland – Reestablishment – Favorable with an Amendment

February 24, 2026

Dear Chairman Korman, Vice-Chair Guyton, and Committee Members:

On behalf of the Maryland Turfgrass Council (MTC) and Mid-Atlantic Sports Field Management Association (MASFMA), we write this letter in support of the re-establishment of the Commission to Advance Lithium-Ion Battery Safety in Maryland, through the passage of House Bill 833/Senate Bill 833.

The Maryland Turfgrass Council (MTC) is a non-profit organization that represents all areas of the turf industry including golf, sports turf, sod producers, landscape, lawncare and commercial vendors and suppliers. The Mid-Atlantic Sports Field Management Association (MASFMA) is a non-profit organization that is composed of sports turf field managers and workers from Maryland, Delaware, Washington D.C., and Northern Virginia. Once again, MASFMA has partnered with Maryland Turfgrass Council (MTC) this year to bring a more unified front from all aspects of our industry.

As written, House Bill 833/Senate Bill 533, re-establishes an inclusive cross-section of various state stakeholders to study and recommend best practices and guidelines for lithium-ion battery safety in the State of Maryland. This commission will be tasked with developing legislative and regulatory recommendations regarding best practices, standards, and guidance relating to the reuse/recycling, training, education, and general means to enhance public safety of these batteries.

For both MTC and MASFMA, we recognize the growing environmental, economic, and safety concerns that continue to escalate regarding the use of these batteries throughout our daily lives and professions. As our industry transitions away from traditional fossil-fuel dependency, due to either government policy or company philosophy, we have the inherent duty and responsibility to ensure that we are advancing these changes in a manner that is protecting both our environment as well as our employees and the general public.

In prior sessions, MTC and MASFMA have testified in Annapolis that the State is nearing a tipping point of outpacing current (and experimental) technologies to meet new environmental goals for the

State. For instance, in our profession, the batteries from the electric equipment are both costly to purchase and there is no real disposal system in place for all the batteries outside of putting them in the landfill which can lead to them cracking and leaking and further contaminating the ground water.

While it is laudable for Maryland to advance more sustainable energy methods, we cannot afford to ignore the potential dangers and environmental risks these alternatives may produce. The re-establishment of this new commission is another positive step forward for the State to ensure it's moving in a direction that considers all of these factors and various industries that are impacted by this technology. For these reasons, we humbly request a modest amendment to the bill to include a member of our industry be represented on the Commission.

MTC and MASFMA support House Bill 833/ Senate Bill 553 and respectfully request this committee to give this legislation a FAVORABLE report, which includes our friendly amendment (see below).

Thank you,



Logan Freeman
President, MTC



Clint Steele
President, MASFMA

Proposed Amendment Language:

(1) Page 2, line 28, strike "and" and insert, "(xvii) ONE REPRESENTATIVE OF THE MARYLAND TURFGRASS COUNCIL; AND"