March 2025

THE U.S. DOMESTIC BATTERY MANUFACTURING INDUSTRY

Producers of Industrial and Automotive Starter Batteries

POLICY RECOMMENDATIONS FOR THE 119TH CONGRESS

Prepared by Battery Council International,
the leading trade association for the battery industry

BATTERY COUNCIL INTERNATIONAL
SINCE 1924

Executive Summary

Introduction

The industrial and automotive low-voltage battery industry is vital to the U.S. economy and to national security. These batteries are used for starting internal combustion engines, forklifts, aircrafts, and other essential applications. Every U.S. citizen and business relies on a low-voltage battery, made right here at home, every day. The American battery industry's products also provide distinct power advantages for the U.S. military's mission-critical applications which strengthens our domestic security.

U.S. battery companies have a 125+ year track record of delivering reliable power to the American people. But global threats have put the industry at risk. Congressional support is key to driving continued innovation, global leadership, and growth in this critical industry.

The foundations of the industry depend on batteries made with lead, a domestically abundant material that complements new and emerging applications. This ensures the nation's future energy storage needs are met reliably, safely, and with domestic production sources. All battery technologies are necessary, and a truly multi-chemistry approach using the right product to solve each problem will deliver results.

A strong future for America depends on a strong domestic battery industry. BCI can assist Congress to achieve this shared goal. **Our organization's most urgent recommendations are as follows:**

Manufacturing

1 Maintain Section 45X Advanced Manufacturing Provision

Ensure the existing Section 45 provision remains in place as a tool for domestic battery manufacturers to protect and grow their operations.

2 Remove Tax Penalties for Domestic Battery Production

Eliminate punitive excise taxes on strategic battery raw materials to support domestic battery manufacturing by passing the USA Batteries Act.

Department of Energy

3 Support Key DOE Programs

Support programs within the Department of Energy that help spur innovation and growth in domestic battery technologies, including research and development as well as partnership with national laboratories.

Safety

4 Set Workplace OSHA Regulations Based on Real-World Results

Increase collaboration between the Department of Labor and BCI experts to develop workplace safety regulations that are feasible and based on the best available real-world data.

5 Keep Workers Safe and Protect Domestic Supply Chains

Support the EPA's labeling initiative to facilitate collection and sorting improvements for safer battery recycling.

BCI and Member Overview

BCI Member Profile

BCI is comprised of more than 160 individual member firms around the world, with the majority based in the U.S. Our members are battery manufacturers and recyclers, suppliers of raw materials and equipment, and marketers, retailers, and distributors. They include all types of companies from family-owned companies to publicly-traded, multinational firms.

BCI holds a unique position at the center of the battery ecosystem. **Our members touch every part of the battery supply chain and span multiple battery chemistries.**

BCI Member Locations (U.S.)

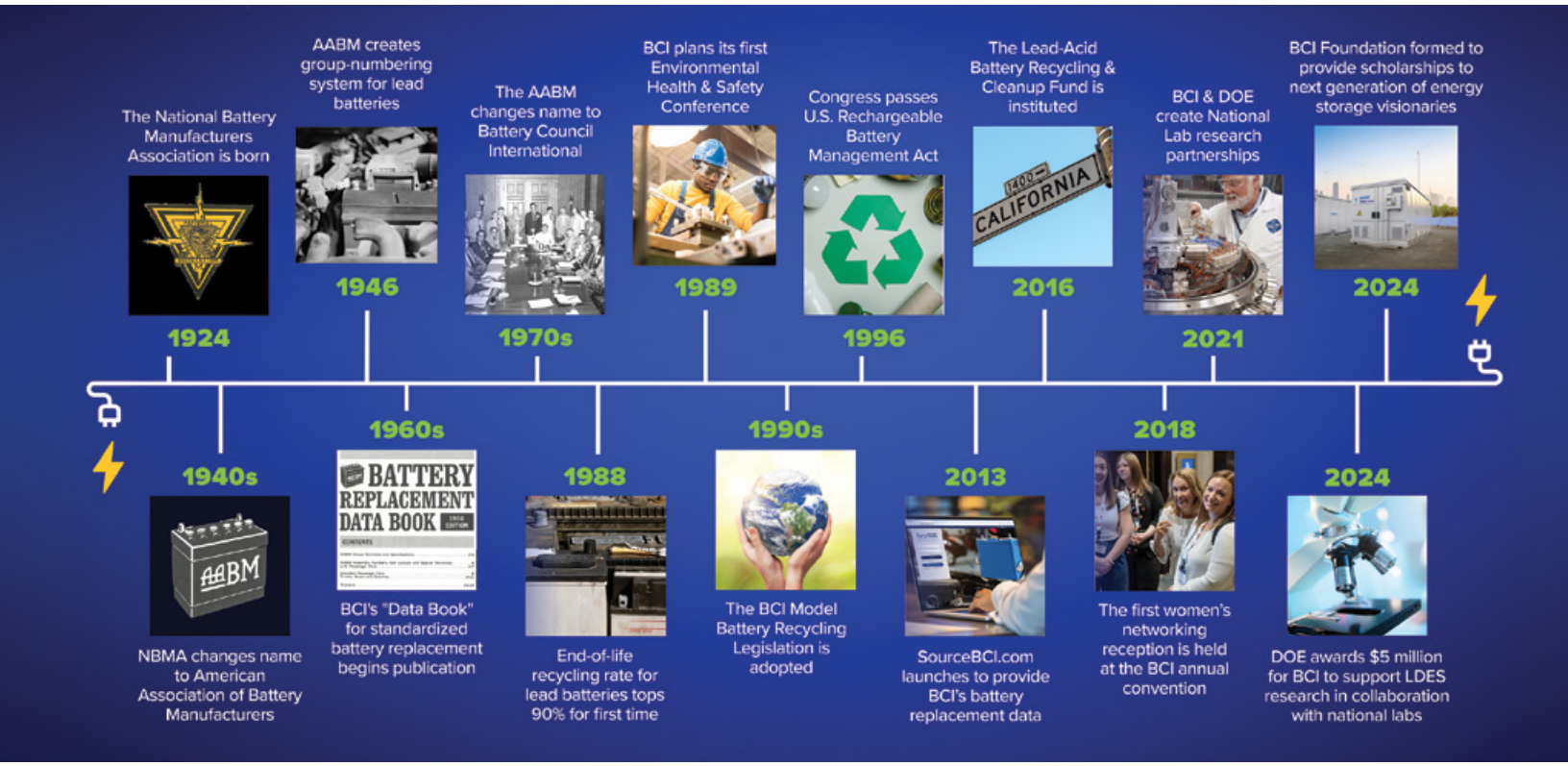
BCI's members have on-shore facilities, hire workers, and pay taxes here. Many have been operating in the U.S. for more than 125 years, and never left. Collectively, members represent the majority of the incumbent battery supply chain in North America – and a significant share of the industry's global footprint.

BCI History: 100 Years of Thought Leadership

BCI celebrated its 100th anniversary in March 2024. A century of expertise helps our organization collaborate on practical policies that result in real-world improvements for growth, safety, sustainability and scientific innovation.

160 Member companies

Supports **+106K** U.S. jobs



A Message from the BCI President

BCI Stands Ready to Support Congress

Dear 119th Congress,

Batteries are a cornerstone of the modern American economy. The domestic battery industry directly supports $10 trillion in economic output (21% of the U.S. economy), some 54 million jobs depend on batteries, and every American uses batteries in their everyday life.

The future is bright: The U.S. Energy Information Administration estimates that nationwide grid-connected battery energy storage capacity doubled in just a single year in 2024. But there are serious barriers to meet additional demand. Battery Council International (BCI) asks Congress to work with America's home-grown battery industry to help it better prepare for the future and to compete in the global market.

New and existing legislation must support continued innovation – the essential pathway to achieve global leadership and to build a diversified, reliable and cost-effective energy storage landscape. BCI advocates for a multi-chemistry battery ecosystem, built on the proven success of the domestic lead battery industry. For over 125 years, lead batteries have been the bedrock of battery manufacturing in the United States, and will remain so for the foreseeable future. Thanks to industry-led research, technological innovations holds the promise for groundbreaking advances and industry growth.

For the U.S. to enjoy continued economic progress and national security, Congress must address these significant challenges:

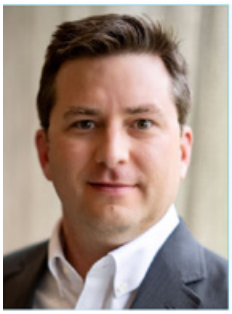
- Regulatory regimes must support American manufacturers, not impose unnecessary burdens and barriers.
- Government must promote America's global leadership and competition by buttressing industry against foreign governments that provide significant financial backing to U.S. competitors and turn a blind eye to environmental, health and safety standards.
- Supply chain issues and access to critical battery minerals are a serious threat that can be addressed through diversified battery technologies.

BCI is confident that a level playing field will allow battery manufacturers with U.S. facilities and our economic allies to remain global leaders. We support the continued commercialization of next-generation lead, sodium, flow, and other battery technologies. These new technologies will provide growth and smartly diversify supply chains.

In 2024, BCI marked its 100th anniversary. Over the last century, our association has witnessed extraordinary innovation, driven safety standards forward, and fostered industrial standardization and competition to serve the American public.

BCI has long sought to partner with government leaders to achieve the great promise of batteries. We're ready to assist Congress in building a bright economic future together.

Roger Miksad
President and Executive Director
Battery Council International



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1. Maintain Section 45X Advanced Manufacturing Provision

The Section 45X Advanced Manufacturing Production Tax Credit (45X) has been a significant tool for domestic manufacturing across the United States. This tax credit has been critical to the growth of the domestic battery manufacturing sector. The loss of the 45X provision would meaningfully increase tax burdens on domestic battery companies and put U.S. firms at a competitive disadvantage globally.

Keeping 45X in place is deeply rooted in the fact that it narrowly focuses on companies that have already invested in the United States and have an existing domestic manufacturing footprint. The domestic battery industry has been producing battery technologies for more than 125 years and have resisted pressures to move operations overseas where costs and labor would be less expensive. This provision provides these companies and the broader industry with incentives and resources to expand operations, grow the workforce, and strengthen the resiliency of their supply chain.

Additionally, 45X has provided companies with the ability to modernize operations and grow their domestic footprint, while ensuring the domestic battery industry remains globally competitive, especially as other countries have prioritized growing their own battery sectors.

Ending 45X would be a tremendous setback for domestic manufacturing priorities that have been strongly supported by Congress and President Trump. Any reversal of 45X would have a significant impact on our member companies and the domestic battery manufacturing sector.

BCI Recommendation

Maintain the Section 45X Advanced Manufacturing Provision.

2. Remove Tax Penalties for Domestic Battery Production

Lead batteries have been produced domestically for more than 125 years and remain critical to the domestic economy. Yet, the Infrastructure Investment and Jobs Act signed into law in 2021 included a provision that imposed taxes on three essential raw materials used in the production of lead batteries – lead oxide, antimony and sulfuric acid.

This tax only applies to domestic manufacturers, increasing manufacturing costs only in the U.S., and creating a give-away to foreign imports. These taxes directly counter the policy goal of Congress to support battery production, and directly negate incentives offered through other programs.

The domestic battery industry needs support from Congress in eliminating these taxes. Policymakers in the House of Representatives, led by Rep. Dan Meuser (R-PA), introduced in the last Congress the USA Batteries Act, which would rescind the excise taxes on lead oxide, antimony and sulfuric acid.

BCI Recommendation

As noted by Congressman Meuser on Jan. 22, 2025, before a House of Representatives Ways & Means Committee hearing, "the USA batteries Act is a bill that would repeal a tax... on domestic manufacturers" and that previous policies "gave advantages for the foreign battery manufacturers."

BCI urges Congress to act quickly on the recommendations of Republicans like Congressman Meuser to remove punitive taxes on U.S. battery firms.

3. Support Key DOE Programs

The DOE is critical to battery research and American leadership in innovation. To innovate and improve, all battery chemistries rely on scientific discoveries that are made possible by the preeminent researchers at institutions like the National Laboratories.

DOE opportunities directed to both domestic lead battery manufacturers and recyclers would help protect vital elements of the U.S. industrial base, and boost production of traditional starting, lighting and igniting car batteries, forklift batteries, and others vital for U.S. transportation and industry.

By strengthening strategic partnerships with energy storage technology companies and manufacturers, the Department of Energy and its national laboratories can provide transformative capabilities in science. The national laboratories are uniquely suited to complement industry capabilities to harness new innovations such as AI for public good. Unique, world-leading scientific user facilities at the national laboratories generate scientific data that is unavailable anywhere else in the world.

BCI urges Congress to:

- Accelerate production of next-generation batteries to meet the growing demand for domestic energy storage.
- Ensure the U.S. battery industry is globally competitive.

BCI Recommendation

Support continued collaboration between private industry leadership and the DOE national labs and other subject matter experts to drive domestic energy storage advancement through strong research and innovation.

Photo Credit: R. Fenner, Argonne National Laboratory

4. Set Workplace OSHA Regulations Based on Real-World Results

BCI strongly believes that regulatory certainty is the best way to empower employers to establish robust programs that protect employees. That requires regulations be implemented in a thoughtful and feasible way, as required by statute, and based on real-world exposure scenarios.

The U.S. lead battery industry possesses the nation's deepest pool of Environmental, Health and Safety professionals with expertise in the mitigation of lead exposure. For nearly 30 years, BCI has worked cooperatively with the Occupational Safety and Health Administration (OSHA) on voluntary safety programs, worker training and rulemaking.

As such, the U.S. battery industry's experts are ready to assist Congress in evaluating and understanding real-world lead exposure control and worker protection measures.

BCI member companies are experts on safety, with a long history of responsibly managing the unique chemicals used in batteries. Since 1997, BCI-member battery manufacturing and recycling companies have voluntarily implemented the world's premier program to achieve employee occupational health goals for lead. These industry-led standards are significantly more protective than those currently required by OSHA. To date, the program drives reductions in worker blood lead levels and continuous improvement across the battery industry.

Regulations based on non-occupational exposures or academic modeling exercises do not accurately represent real world conditions that involve TCE, lead, and other materials. With respect to the pending revisions to the Lead Standard, OSHA should consider setting health-based standards that:

- Simultaneously protect workers and allow businesses to develop effective programs to meet those standards.
- Avoid intrusive requirements dictating plant management, such as reduced air-lead levels; these are neither feasible nor protective. Note: Air emissions from U.S. lead battery production and recycling are each less than 1% of total U.S. lead emissions.
- Avoid unnecessary and unproven workplace mandates that do not meaningfully protecting workers; these are less effective than practical real-world solutions.

BCI Recommendation

Congress should work with the Department of Labor to develop workplace safety regulations that are feasible and based on the best available real-world data.

5. Keep Workers Safe and Protect Domestic Supply Chains

The foundation of a successful battery recycling industry is a consistent, safe, and reliable flow of recyclable materials. The U.S. lead battery industry has an established and sustainable circular economy approach.

Annually, North America's battery recycling network collects more than 8 billion pounds of spent lead batteries (the most of any battery chemistry). Furthermore, lead batteries are the most recycled product on the planet, and they have been for over 30 years.

Currently, the long-established spent-battery recycling supply chains are under threat from improper labeling and sorting, which allows non-lead batteries into the lead battery recycling stream. The introduction of lithium-ion batteries to lead battery recycling facilities has created:

- Serious life-safety issues.
- Concerns over the quality of recycled materials for manufacturing new lead batteries.
- Damages to recycling facility equipment.

A 2021 report from the U.S. EPA found that, between 2013 and 2020, more than 240 fires associated with lithium-ion batteries entering the wrong waste disposal and recycling streams were reported at recycling facilities.

In response to growing concerns over facility fires and to encourage recycling of critical materials, the Infrastructure Investment and Jobs Act (Bipartisan Infrastructure Law) directed EPA to issue voluntary "Battery Collection Best Practices" and "Battery Labeling Guidelines."

A lithium battery explosion in a lead battery recycling facility.

BCI supports these efforts and believes EPA should further use its existing authority to adopt a national labeling standard consistent with the existing requirements for lead batteries under The Mercury-Containing and Rechargeable Battery Management Act; Public Law 104-142.

However, the U.S. should not make the mistake of overreaching on labeling mandates, similar to the European Union. Labels are necessary for sorting and consumer education. However, cost-prohibitive mandates such as carbon disclosures, blockchain tracing, and other proposals are unnecessary.

BCI Recommendation

BCI supports labeling legislation to facilitate uniform collection and sorting improvements for safer battery recycling and to ensure the continued availability of materials through our domestic supply chains. Additionally, BCI supports EPA using existing authorities to adopt a national labeling standard.

U.S. Battery Industry Impact

Industry Overview

Batteries touch nearly every aspect of our lives. Domestically manufactured batteries are critical to industries ranging from telecommunications to warehouse logistics to transportation.

As new technologies and applications emerge, U.S. battery companies are continuously evolving to meet these opportunities.

The industry has a long history of safety, environmental stewardship and worker protections. BCI has partnered with policymakers to establish industry-led safety and environmental standards. Our organization also believes responsible innovation and fair competition will advance battery technology and provide the best path to long-term growth.

Topics In This Section

- Economic Impact
- Technology and Chemistry
- Innovation
- Domestic Supply Chain
- Industries Served
- Safety

Economic Impact

The economic impact of the U.S. battery industry cannot be underestimated.

Independent economic analysis and research firm EBP US released a report in 2025 that estimated the U.S. battery industry powers $10 trillion worth of domestic industrial economic output annually. In addition, about 54 million U.S. jobs are related to or reliant on the battery industry.

U.S. lead battery manufacturers contribute roughly $3 billion in tax revenue annually. Domestic lead battery manufacturers are a significant driver of jobs and economic growth. These companies and their supply chains provide more than 106,000 U.S. jobs and offer better wages than other private sectors jobs.

The U.S. government depends on batteries, too. There is roughly $7.5 billion in annual demand for domestically produced batteries used in government and defense applications.

In addition, downstream economic impact comes from industries like transportation, telecommunications, and alternative energy. "Batteries are a ... small component of a much bigger product, but they are a ... necessary component," EBP wrote.

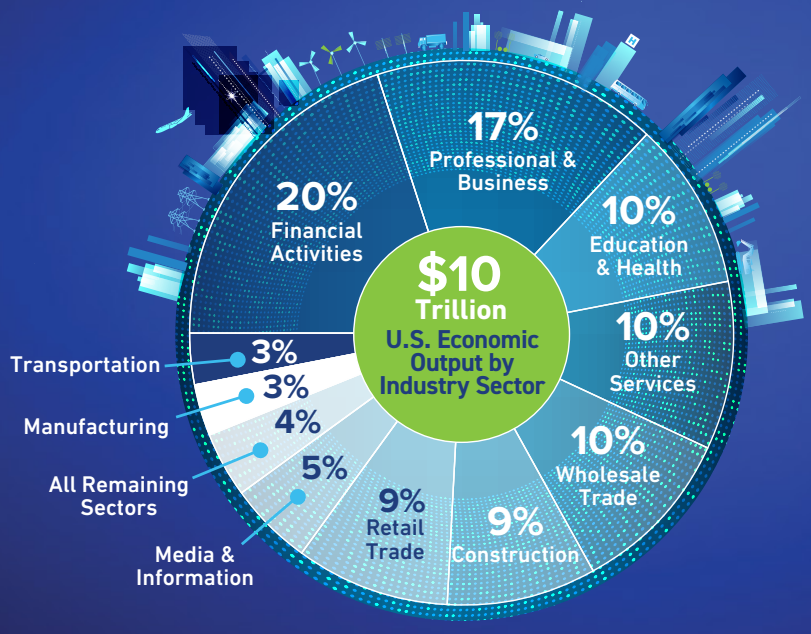
Over 54 Million U.S. Jobs

are reliant on the battery industry.

Compared to other private sector jobs, average salaries in the lead battery industry are:

65% higher for recycling workers

56% higher for mining workers



The average American household relies on

+3 lead batteries for everyday use.

Since BCI's formation in 1924, our industry has produced

+3 BILLION car batteries.

Technology and Chemistry

America's battery industry continues to be a global leader in driving the cutting edge of battery technologies. Currently, there is no single battery technology for all applications. Meeting the nation's energy storage needs will require a multi-chemistry approach and a variety of products.

For over 125 years lead batteries have been the dominant choice for energy storage. Lead batteries have undergone generations of innovation and improvement, and they remain the foundational technology for powering automobiles, data centers, defense applications, and other sectors. The steady improvements in these batteries make them very relevant to the current energy storage marketplace.

Primary Battery Chemistries

Pb
Lead

A lead battery is a rechargeable battery that uses lead, sulfuric acid and water to produce electricity through a controlled chemical reaction. This chemical reaction is what causes the battery to produce electricity. Then, this reaction is reversed to recharge the battery. Lead batteries are used across a wide range of industries and applications from transportation to communication networks.

Flow

A flow battery is a rechargeable battery well-suited for long-duration energy storage. An electrolyte flows through electrochemical cells from one or more tanks. Capacity can be increased simply by increasing the quantity of electrolyte stored in the tanks. Chemistries can vary widely, but all flow batteries are uniquely scalable.

Na
Sodium

Sodium-ion batteries are rechargeable batteries that generally work by exchanging sodium ions between the positive and negative poles. Sodium salt is the main component of the electrode material and readily available. A newer battery chemistry, sodium-ion batteries are a potential alternative to lithium-ion batteries. Some applications being explored for sodium-ion battery applications include low-voltage automotive and grid storage.

Li
Lithium

Lithium-ion batteries offer low weight and high energy density. There is no single-chemistry lithium-ion battery, and cathodes can consist of cobalt, manganese, nickel and iron, each with different characteristics and electrochemical performance. The demand for the energy density of lithium-ion batteries continues to out-pace the supply of raw materials – coming mostly from foreign suppliers.

Ni
Nickel

Nickel Cadmium and Nickel Metal Hydride batteries use nickel oxide hydroxide for the cathode, and either metallic cadmium or hydrogen as the anode and an alkaline solution of sodium or potassium hydroxide for an electrolyte. Ni batteries have a long cycle life and good high-rate performance.

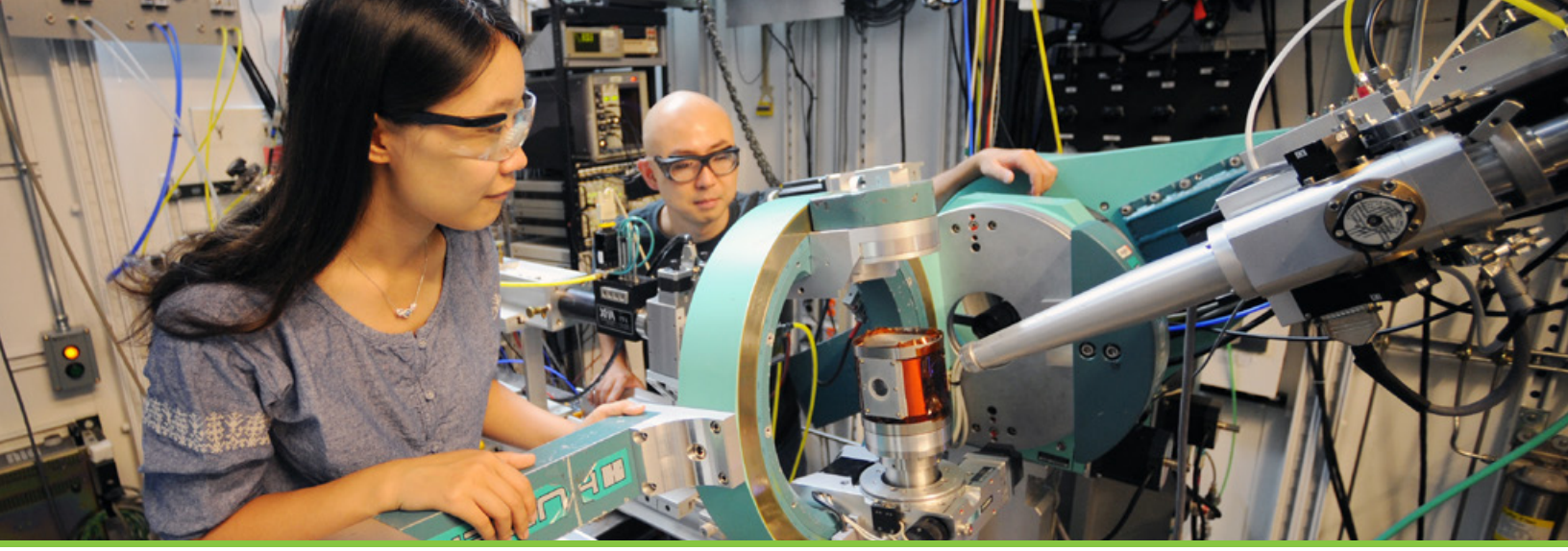


Photo Credit: R. Fenner, Argonne National Laboratory

Innovation

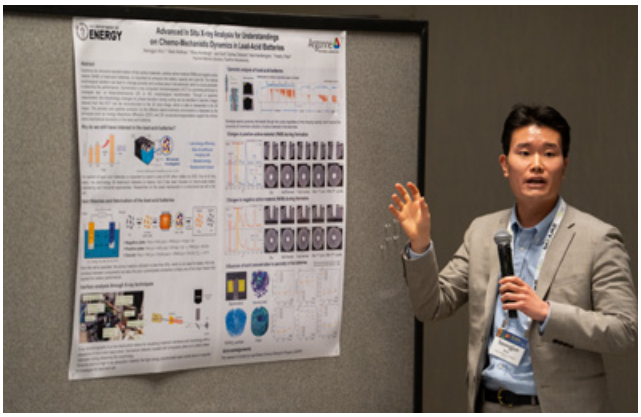
BCI and its members drive the evolution of battery technology through innovation. Within existing battery chemistries, advanced lead batteries have seen a 50% increase in battery life over the last 20 years. U.S. battery manufacturers are also furthering newer chemistries, like lithium, nickel, sodium, and flow batteries.

National Lab Collaborations

BCI has direct relationships with national labs that specialize in electrochemistry. Their staff and equipment bring technical expertise to the equation that are unparalleled in the private sector:

- In 2024, the Department of Energy (DOE) awarded $5 million to BCI to form an industry consortium focused on long-duration energy storage (LDES) research in collaboration with three national labs. The goal is to develop new lead battery technology that can support 10+ hours of storage with the goal of reaching a cost of just $0.05/kWh of storage by 2030.
- Building on an existing partnership with the National Laboratory system, BCI and its members have formed numerous pre-competitive research consortia with Argonne National Laboratory, Pacific Northwest National Laboratory, Sandia National Laboratory, and Oak Ridge National Laboratory, as well as numerous academic institutions.
- Beyond its lead and lithium workstreams, BCI also operates a Flow Battery Industry Group dedicated to this uniquely scalable technology. This industry group was separately awarded a DOE grant in 2024 to continue its research.

These collaborative efforts are critical, yet industry-funded programs need deeper support to match the progress being made elsewhere in the world.



BCI fosters battery innovation and research through the annual Battery Poster Showcase open to student researchers.

Domestic Supply Chain

BCI member companies designed and built the blueprint for an economically viable, sustainable circular economy for batteries. The systems development by domestic lead battery manufacturers and recyclers can and should be applied to new battery chemistries, like lithium.

Today, 99% of spent lead batteries in the U.S. are recycled, thanks to statutory and regulatory frameworks built through collaboration between industry and policy makers that encourages and facilitates safe recycling, and a nationwide collection network developed over four decades. Recycling lead batteries in North America provides more than 85% of the metals needed to manufacture new batteries each year. The result is unparalleled domestic security, ensuring that energy storage manufacturing is better insulated from global disruptions.

In contrast, the supply chain of lithium batteries is heavily reliant on foreign imports of both raw materials and finished cells and batteries. Last year, China accounted for about 70% of imported lithium-ion cells and batteries – but roughly 83% of those Chinese imports went for non-EV uses such as stationary storage backups, according to Wood Mackenzie, a leading global provider of data and analytics solutions for the renewables, energy, and natural resources sectors. Furthermore, Chinese companies supply 80% of the world's battery cells to other firms that assemble these parts into usable products.

It is important to reduce reliance on imported lithium batteries, cells, and critical minerals both through domestic lithium supply and diversifying battery chemistries. Building domestic supply chains for lithium batteries will take time, and the domestic supply chain for lead batteries can help meet America's growing energy storage needs in a sustainable way with a supply chain free from offshore disruption.

Industries Served

- **AUTOMOTIVE –** Automotive batteries are the most familiar energy storage product for most Americans. That includes traditional 12-volt lead batteries used for starting, as well as lithium power supplies for EV drive trains. More modern vehicle electronics may also require a 48-volt system to support high-tech conveniences.

- **AEROSPACE & DEFENSE –** Batteries are a critical component in all aviation missions, from military tactical operations—including warfare and supply deliveries to military bases—to providing reliable power for aircrafts, from starting and in-flight operations to safely landing.

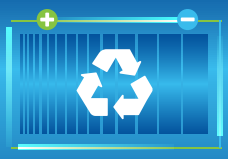
- **TELECOM, DATA CENTERS & CRITICAL SYSTEMS –** Battery backups provide uninterruptible power supplies. They safeguard data centers, critical telecommunication infrastructure and systems, and emergency responder systems.

- **POWER GRID & ENERGY STORAGE –** Batteries provide a measure of reliability to intermittent power by allowing storage of excess energy. This includes batteries for residential use, microgrid storage systems for industrial use, and long-duration grid storage.

- **INDUSTRIAL LOGISTICS –** Batteries power forklifts and lift trucks, providing cost-effective operation, as well as a lower carbon footprint than combustion engine alternatives. Currently, more than two-thirds of all forklifts use some kind of battery power.

- **MOBILITY & POWER SPORTS –** Batteries provide critical personal freedom for millions of individuals with physical mobility limitations who rely on wheelchairs or motorized scooters. Batteries also power off-road ATVs, watercraft and other vehicles.

- **SPECIALIZED TRANSPORTATION –** Batteries are also critical components in a variety of heavy duty trucks, farming and mining equipment, watercraft, locomotives, and other vehicles that are critical to moving goods and people around the world.



Lead batteries are the most well-established type of rechargeable batteries.They are ubiquitous in applications including transportation, industrial, and uninterruptible power supply systems. Lead batteries are:

- A cost effective and reliable technology
- Domestically manufactured and supported by a secure supply chain
- Highly sustainable with a 99% recycling rate
- A model for a highly successful circular economy

Safety

Across its 100-year history, BCI has prioritized industry-led standards to ensure battery companies remain good partners with their local communities and their workers.

Since 1997, BCI members have voluntarily met employee blood lead targets that are more restrictive than those required by the federal standards under the U.S. Occupational Health and Safety Administration. Also, the U.S. lead battery manufacturing and recycling sectors each contribute less than 1% to nationwide lead emissions, despite processing 97% or more of all lead used nationwide (piston aircraft emit 75%+). The ongoing work of BCI's Environmental Health and Safety Committee aims to ensure that our members continue to meet the highest standards in many areas:

- Acceptable methods of waste disposal
- Occupational lead exposure
- Materials handling and packaging standards
- Product safety education programs

As with any energy product, there is the potential for harm if those products are mishandled. BCI has deep and respectful relationships with OSHA, the U.S. Department of Transportation, the U.S. Department of Energy, and the U.S. Environmental Protection Agency. Our organization supports practical regulations that keep our workers and our communities safe, without undue costs or administrative burdens on our members.

17 EHS Conferences

BCI hosts the Environment, Health, and Safety (EHS) Conference biennially to share industry advancements and updates.

#1 Most Recycled

99% of lead batteries are safely recycled.

1st Voluntary Blood Lead Program

For more than 25 years, the industry has continuously aimed for blood lead level targets that are lower than regulations required.

Connect with BCI

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Resources

BCI's Industry Statistics Program

The BCI Statistics Program is the leading source for automotive and industrial battery shipment volumes and is the only North American source of battery shipment volumes based on data provided by battery manufacturers.

Vehicle Battery Replacement data

BCI is the definitive source for replacement battery fit and fitment, supplying 85 years of data for more than 160,000 vehicles. For every mass market automobile, BCI has standardized a recommended replacement battery using the BCI Group Size system, based on the battery that originally shipped with the vehicle.

BCI EHS Conference

The BCI EHS Conference is the largest meeting of lead battery manufacturing and recycling industry EHS professionals in the nation. Attendees gain extensive opportunities for learning and networking for EHS and safety professionals, with a two-day agenda full of comprehensive educational presentations, panel discussions and peer-to-peer sharing.