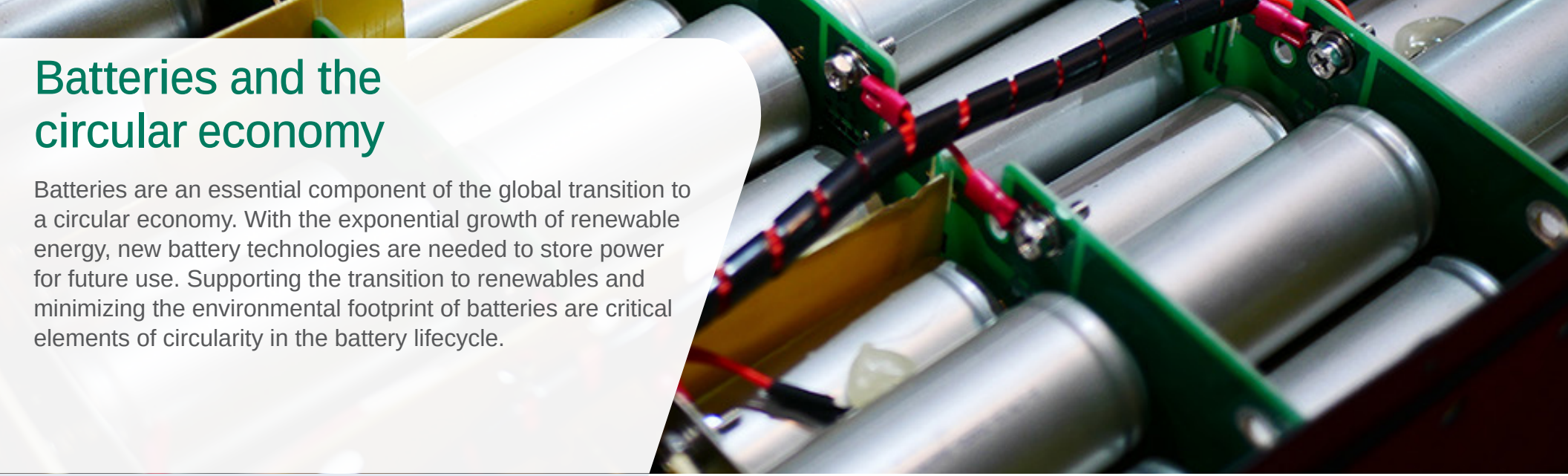
Increasing the Safety and Sustainability of Batteries

ERM

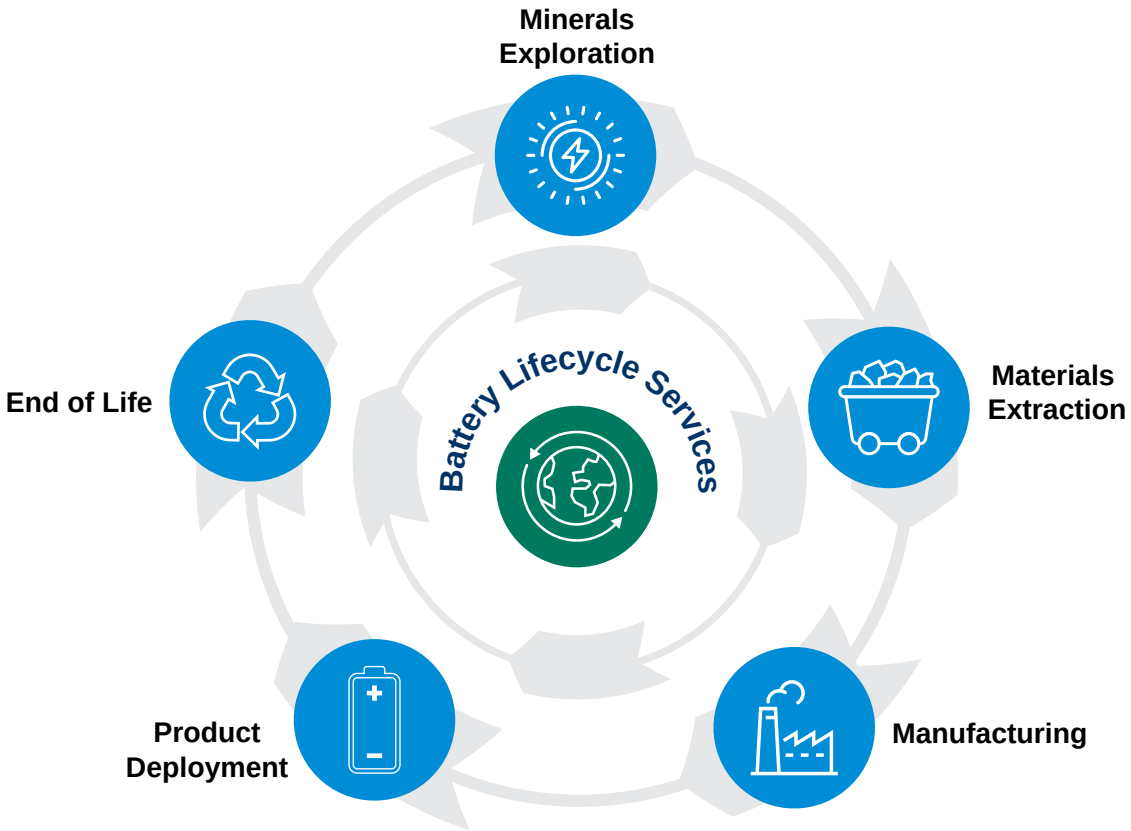


Batteries and the circular economy

Batteries are an essential component of the global transition to a circular economy. With the exponential growth of renewable energy, new battery technologies are needed to store power for future use. Supporting the transition to renewables and minimizing the environmental footprint of batteries are critical elements of circularity in the battery lifecycle.

ERM has the global insight and local expertise to help you mitigate the Environmental, Health, Safety, and Sustainability (EHSS) risks and opportunities at each stage in the battery lifecycle. Our vast project experience includes minimizing the impact of mining raw materials for batteries, reducing EHSS risks in the manufacturing process, advising on battery compliance and labeling for product deployment, and enabling efficient and safe recovery of resources from batteries at end of life.

ERM can help support your business at all stages of the battery lifecycle.



What we do

Our team is highly experienced across the mining, chemicals, manufacturing, research and development, and technology industries. ERM delivers high-impact results and solutions at all critical points in the battery lifecycle.

How ERM can help

Battery Lifecycle Services

- Supplier Due Diligence
- Supplier Auditing
- Lifecycle Assessment
- Carbon Footprinting
- Sustainability Reporting
- Sustainability Strategy
- Fire and Life Safety
- Industrial Hygiene
- Occupational Health and Safety
- Environmental, Health and Safety (EHS) Management Systems and Compliance Support Services

Minerals Exploration

- Concept to Feasibility Studies
- Gap Analysis, Fatal Flaw Studies and Due Diligence
- Operational Audits and Improvement Strategies
- Code Compliance Reports
- Expert Reports, Valuations and Specialist Advice

Materials Extraction

- Capital Project Delivery
- Construction Safety
- Impact Assessments
- Permitting
- Full Materials Disclosure

Manufacturing

- Battery Safety
- Robotics Safety
- Permitting
- Environmental Compliance (air, water, waste, chemicals)
- Data Visualization and Digitization

Product Deployment

- Product Labeling
- Product Compliance (REACH, RoHS)
- Product Safety Advisory Support
- EHS Compliance

End of Life

- Product Takeback, Program Development and Implementation
- Extended Producer Responsibility (EPR) Compliance
- Third-Party Recycler Due Diligence, Management and Verification

Project examples

With more than 50 years of experience in EHSS, ERM has a comprehensive understanding of the EHS industry issues facing your business. As you will see in the examples below, we have partnered with our clients along each step of the battery lifecycle to improve overall compliance, take products to market, and mitigate reputational and brand risks.

Battery Lifecycle Services

Social and Cultural Risk Assessment and Advisory Support

Summary: On behalf of a global battery manufacturing client, ERM provided National Environmental Policy Act (NEPA) support services for the U.S. Department of Energy Advanced Technology Vehicles Manufacturing (ATVM) Loan Program. Our client's submittal of the ATVM loan application triggered the requirement for an Environmental Assessment so the federal agency could understand the project, its alternatives, and the potential impacts to environmental, socioeconomic, and cultural resources. In addition, in coordination with the federal agency and the State Historic Preservation Office, ERM conducted a field survey to identify historic properties and potential impacts to significant cultural resources to support project approvals.

Benefits: ERM helped the client identify key environmental, safety, and social risks that could severely limit the realization of their investment value in new or expanding existing battery manufacturing assets. ERM's experienced multi-disciplinary team provided effective management, strategic support, and technical expertise on time and within budget to deliver on the project's objectives and streamline agency approvals.

Battery Lifecycle Services

Capital Project Delivery for Battery Recycling/Remanufacturer

Summary: ERM supported a lithium-ion (Li-ion) battery recycling and critical materials recovery/refining company with permitting and operational EHS requirements for the construction and operation of their first U.S. facility. ERM is also supporting the company's global expansion efforts by updating corporate policies and procedures to reflect their global operations with more than 20 new facilities planned to support Europe and Asia Pacific over the next five years. Additionally, ERM is working in partnership on site selection, due diligence, and stakeholder engagement for the company's newest facility plans.

Benefits: By harnessing our global regulatory and technical expertise, ERM supported the client in site selection, permitting, and construction efforts while fostering relationships with local regulators, involved stakeholders, the public, and non-governmental organizations. With each new location identified, ERM's costs for permitting support and stakeholder engagement are streamlined through cost-effective use of previously developed information that is applied to each local jurisdiction and permitting process.

Materials Extraction

Lithium Mining Study

Summary: Piedmont Lithium Limited is focused on developing its 100%-owned Piedmont Lithium Project in the historic Tin-Spodumene Belt in the King's Mountain district of North Carolina. ERM was contracted to deliver a mining study as part of a Preliminary Economic Assessment for a spodumene mine and concentrator with a target production of approximately 160,000–180,000 tonnes of 6% Li_2O concentrate per annum. The initial scope of work included a trade-off study between mining within or outside drainage channels, pit optimizations, production schedule, capital and operating cost estimates, simple pit design, evaluation of potential waste rock dump locations, and a cut-off grade estimate. ERM and Piedmont Lithium have worked collaboratively since 2015 to advance the development of the Piedmont Lithium Project from the concept stage to further development stages.

Benefits: ERM's work provided timely and accurate data entry to safeguard exploration planning, and strategies were monitored and adapted as new data became available. ERM helped to develop a database in accordance with industry best standards that was instrumental in delivering a maiden mineral resource, and has maintained the database on behalf of the client since 2018.

Manufacturing

Health and Safety Risk Assessment

Summary: ERM performed a health and safety risk assessment of a battery processing facility for a global Original Equipment Manufacturer to identify ways to prevent thermal events and mitigate potential battery fires. ERM's health and safety assessors conducted a comprehensive review of facility operations and processes, and then developed updated procedures and training to increase employee awareness and reduce battery fires.

Benefits: Thanks to new procedures and updated training, our client saw a significant reduction in the number of battery-related health and safety incidents at their facility, and leveraged these best practices to other locations across their operations.

Project examples

Manufacturing

Transboundary Movement of Batteries

Summary: A battery manufacturer identified 10,000 malfunctioning large energy storage alkali batteries that needed to be recovered and properly managed to end of life. Because the batteries were distributed across the globe, the legal and transboundary requirements of moving the batteries between countries for materials recovery and recycling were incredibly complex. ERM worked with the client to classify the batteries and develop regulatory roadmaps that mapped the regulatory interfaces with legal authorities, customs, border patrol, and specific Basel Convention / OECD issues.

Benefits: ERM's work identified potential roadblocks and mitigation strategies to avoid legal derailments to battery recovery in the different countries. Further, ERM's recommendations enabled the client to repatriate their malfunctioning batteries so that the metals content could be recovered, which covered the costs of the transport and recycling efforts. Estimated cost savings are $1,500/battery ($15M total) and time savings in the range of months to years per country for these batteries.

Product Deployment

Regulatory Support for Batteries under European Union Seveso Directive

Summary: ERM's technology client was concerned about potential business disruption in Sweden if the local regulatory authority challenged the client's interpretation of the Seveso Directive. The Directive regulates dangerous substances that could cause major accidents, as it relates to classification of batteries at the client's data center site. ERM supported the client in reviewing regional interpretation of the Seveso Directive and identifying other country-level precedence in the European Union. ERM also performed detailed calculations regarding materials content of batteries at the data center site and provided a rapid response to the regulatory authority for additional Seveso Directive reporting requirements.

Benefits: ERM's rapid response to the regulatory challenge helped the client fulfill their compliance obligation, mitigate further enforcement action, and avoid potential business disruption now and in the future. ERM's support has helped the client to extract the full value of their initial $100 million investment in the site by allowing to expand the site for its full potential use. The overall nearly $1 billion investment has significant positive impacts to local economy due to ongoing construction jobs and growth of the surrounding area as a high-tech hub. The classification as a non-Seveso site also saves the client over $200K per year operationally.

End of Life

Due Diligence on Battery Recyclers

Summary: On behalf of our technology client, ERM performed desktop assessments and in-person audits of multiple battery recyclers to assess their ability to handle batteries received from data centers safely and in compliance with legal requirements. These assessments were done in support of a large data center decommissioning effort, which resulted in a large volume of lead-acid batteries in need of recycling.

Benefits: ERM's assessors provided local compliance expertise to rapidly respond to the client's need to vet new vendors, understand their risks, and find the best option for recycling their batteries responsibly.

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5500+ employees

Served **50%** of Global Fortune 500 in past 3 years

50 year history

160+ offices

20,000+ projects each year

Contact: Lee Read, Partner

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