Team case competition • Sustainability & strategy

Electric Vehicles & ESG: Building a Resilient Battery Supply Chain

A public-facing case-study reconstruction based on a team submission to the third KPMG ESG Case Competition and its presentation notes. The case considers how a hypothetical battery company can manage critical-mineral risks, circularity and ESG governance.

> Team project. This public case study summarizes the team's research and the topics covered in the accompanying presentation notes; individual task ownership is not assigned where the source does not establish it. Team identifiers, names and original deck are not published.

Business challenge

Battery producers face exposure to critical-mineral prices, geographically concentrated extraction, geopolitical uncertainty and environmental or social risks. The case examines lithium, nickel and cobalt as important materials in battery supply chains, while recognizing that different battery chemistries have different material requirements.

Critical mineral risk assessment

Mineral	Risks examined in the original case	Strategic concern
Cobalt	Concentrated mining, political and human-rights risks, environmental management.	Supplier diversification and responsible sourcing.
Nickel	Waste and tailings management, environmental and labor risks, export policy and geopolitics.	Environmental due diligence and supply continuity.
Lithium	Extraction economics, water and emissions impacts, refining concentration and trade frictions.	Cost, resource access and environmental performance.

The competition material reports that approximately 66% of 2023 cobalt mining was in the Democratic Republic of the Congo, citing IEA data. It is retained here only as a historical case input, not an updated statistic.

Resilient sourcing & risk management

Proposed action	Intended purpose
Diversify procurement and suppliers	Reduce reliance on one geography or counterparty; improve sourcing flexibility.
Financial risk management	Consider suitable futures or options to manage price exposure, subject to liquidity, basis risk and internal controls.
Data-driven monitoring	Track prices, industry developments and ESG risk signals; establish alerts and review procedures.

Proposed action	Intended purpose
Selective upstream investment and sourcing footprint	Evaluate supply security, geographic concentration, policy exposure and cost trade-offs.

The original team also emphasizes investment in recycling and green production as a longer-term complement to procurement diversification. These are case recommendations, not implemented operational results.

Circular battery value chain

Workstream	Proposed mechanism
Traceability	Use a shared information network, potentially blockchain-based, to improve coordination and traceability among manufacturers, distributors and recycling partners.
Battery monitoring	Use battery-management data and connected sensors to assess state of charge and health and estimate future recycling volumes.
Second-life applications	Inspect, test and classify retired batteries for applications suited to their remaining performance.
Material recovery	Evaluate pretreatment, separation and recovery processes for lithium, nickel, cobalt and other valuable materials.

The team assessed technical feasibility and economic considerations, including battery sorting cost, speed, consistency and recovery-process trade-offs. The case does not claim a deployed system, measured savings or validated investment returns.

Alternative chemistry & ESG framework

The case identifies lithium iron phosphate, sodium-ion batteries and emerging cathode materials as possible research and investment directions. Their suitability depends on application-specific performance, costs, supply conditions and technology maturity.

The proposed ESG framework covers environmental resource and process management, social indicators (product, supply chain, innovation and talent), and governance indicators (oversight, shareholder and financial controls, anti-corruption and related practices). The presentation uses the MSCI ESG rating methodology as an illustrative framework for materiality, exposure, risk management and governance assessment.

Implementation considerations include internal governance, risk identification and monitoring, effective communication, and the practical continuity of ESG goals. No independent ESG rating or real-world corporate implementation is claimed.

Sources & scope

- Third KPMG ESG Case Competition team presentation and accompanying presentation notes.
- International Energy Agency (IEA), mineral supply data as referenced in the original presentation.
- MSCI ESG Ratings methodology, as discussed in the original case.

Historical figures and findings are reproduced from the supplied project materials; this brief is not an independent verification or a live market update.