

2040 Sustainable Battery Vision

Global Forum for Sustainable Batteries

To support a sustainable supply chain, the Global Forum for Sustainable Batteries, a worldwide network of nonprofit leaders, experts, and advocates committed to transportation electrification and mining justice, developed this 2040 Sustainable Battery Vision. The intent is to guide policy makers, organizations, companies, and the general public in the key elements of what a truly sustainable battery should be by 2040. For more details and a list of signatories, please [click here](#).

SOURCING OF RAW AND RECOVERED MINERALS AND MATERIALS

By 2040, a sustainable battery is one that...

HAS CLEAN & RESOURCE EFFICIENT SOURCING

- Uses minerals and materials extracted or recovered through processes and technological innovations that maximally avoid inefficient resource use (including land, water, air, and biodiversity, among others) and environmental harm
 - And that prioritizes the preservation and regeneration of ecosystems, biodiversity, and other environmental needs while respecting planetary boundaries
- Uses minerals and materials extracted or recovered from fossil-free smelting and refining technologies, to the maximal extent possible
 - And that prioritizes recycled minerals and materials over newly extracted ones

HAS CLEAN &
RESOURCE EFFICIENT
SOURCING

RESPECTS RIGHTS

- Uses extracted or recovered minerals that are sold and/or traded in adherence with international human rights law and frameworks, including women's and children's rights, gender equality and protections, and labor rights, among others
- Respects Indigenous Peoples' rights and receives Free, Prior and Informed Consent (FPIC), including their right to determine the process and withhold consent if necessary
 - While consultation and consent are also required for non-Indigenous communities, including in the exploration / development phase

RESPECTS RIGHTS

HAS A FAIR DISTRIBUTION OF BENEFITS

- Uses minerals and materials whose extraction or recovery contributes to the economic development of mineral-producing countries, including community and economic benefits such as equity, revenue-sharing, co-governance arrangements, and/or fair tax policies, all resulting from a robust consent process
- Uses minerals whose extraction has not adversely impacted governance and the rule of law, such as through corruption, bribery, tax evasion, and policy capture
- Uses materials from mining operators that have robust and enforceable plans for post-closure cleanup and post-mining transition that avoids foreclosing other viable land uses and economic wellbeing on the site

HAS A FAIR
DISTRIBUTION OF
BENEFITS

BATTERY MANUFACTURING

By 2040, a sustainable battery is one that...

IS DESIGNED FOR CIRCULARITY, DURABILITY AND REPAIRABILITY

- Is designed to enable repairability, incorporating features that facilitate safe battery health diagnostics, maintenance, and component replacement to extend overall lifespan and multiple uses
- Is designed to enable easier and safe disassembly, maximizing material recovery
- Meets minimum reliability requirements per UN Global Technical Regulations (GTR) standards
- Is designed for reuse and repurposing before recycling and disposal, including fair and equitable access to necessary information for decision-making on a second life

IS DESIGNED FOR
CIRCULARITY,
DURABILITY AND
REPAIRABILITY

HAS CLEAN AND RESOURCE EFFICIENT MANUFACTURING

- Is produced through optimized, resource-efficient manufacturing processes with minimum environmental harm and maximally reduced toxics and that improve as new technologies and processes are developed
- Is produced using only fossil-free energy sources not involving carbon offsets
- Is produced with increasingly higher proportions of recycled content as new technologies and processes develop, without discouraging repurposing, repair and reuse of first-use batteries
- Is produced to maximize material efficiency and energy density of batteries as a means of reducing mineral demand on a battery-by-battery level
- Is manufactured by a company that by written corporate policy prefers circular sourcing to newly mined materials

HAS CLEAN AND
RESOURCE EFFICIENT
MANUFACTURING

RESPECTS RIGHTS

- Is produced with respect for and adherence to local communities and international human rights standards, including women's and children's rights, gender equality, and labor, among others

RESPECTS RIGHTS

HAS A FAIR DISTRIBUTION OF BENEFITS

- Contributes to the economic development of communities affected by the manufacturing processes, such as through community and economic benefits
- Does not adversely impact governance and the rule of law through its manufacture, such as through corruption, bribery, tax evasion, and policy capture

HAS A FAIR
DISTRIBUTION OF
BENEFITS

BATTERY VALUE CHAIN TRACEABILITY

By 2040, a sustainable battery is one that...

- Features traceable components and materials, providing fair and equitable access to information on material sourcing, battery composition and accurate and reliable state of health, capacity, history of use (including hazardous substances, safe handling, dismantling, and repair manuals), greenhouse gas footprint data, and adherence to human rights, labor, and environmental and governance standards across the value chain
- Has been produced by a company that has undertaken full human rights due diligence in line with all social and environmental risks as defined by the Organisation for Economic Co-operation and Development (OECD) and UN Guiding Principles on Business and Human Rights (UNGP) and according to national regulatory/legislative frameworks on mandatory human rights due diligence, through its full value chain, including in upstream mining operations
- Has materials (mined, smelted and refined) that have been verified under the Initiative for Responsible Mining Assurance (IRMA) or certified under a similarly strict multi-stakeholder scheme

TRACEABILITY

BATTERY END-OF-LIFE

By 2040, a sustainable battery is one that...

BATTERY REPAIR

- Has easily accessible information about repairability, and is safely repaired when needed

BATTERY REPAIR

BATTERY REUSE, REFURBISHMENT AND REPURPOSE

- Where applicable, has reliable, accurate and accessible information to evaluate and use the battery for its next best use after removal from a vehicle, before recycling or disposal

BATTERY RECYCLING

- Is recycled in facilities with maximally avoided pollution and environmental harms, and that improve as new technologies and processes are developed
 - As well as protections for community health and access to information by communities to facility data impacting their health
- Is efficiently recycled with maximally avoided environmental harms only when all other uses have been exhausted, to enable the recovery of up to 100% of minerals and materials for the energy transition for use in the same or equivalent applications
- Can be exported to countries that have the capacity to safely repair and reuse components before recycling them, but only if the battery and its material can meet stringent safety and environmental standards

RESPECTS RIGHTS

- Is repaired, reused or recycled with respect for local communities and adherence to international human rights standards, including women's and children's rights and labor rights, among others

BATTERY REUSE,
REFURBISHMENT AND
REPURPOSE

BATTERY RECYCLING

RESPECTS RIGHTS