



BATTERY SYSTEM

Introduction to the Global Battery Alliance

Meeting with the European
Commission

September 19th 2024

**GLOBAL
BATTERY
ALLIANCE**

BATTERIES POWERING
SUSTAINABLE DEVELOPMENT

The Global Battery Alliance is the global public-private platform to enable sustainable battery value chains by 2030

Vision

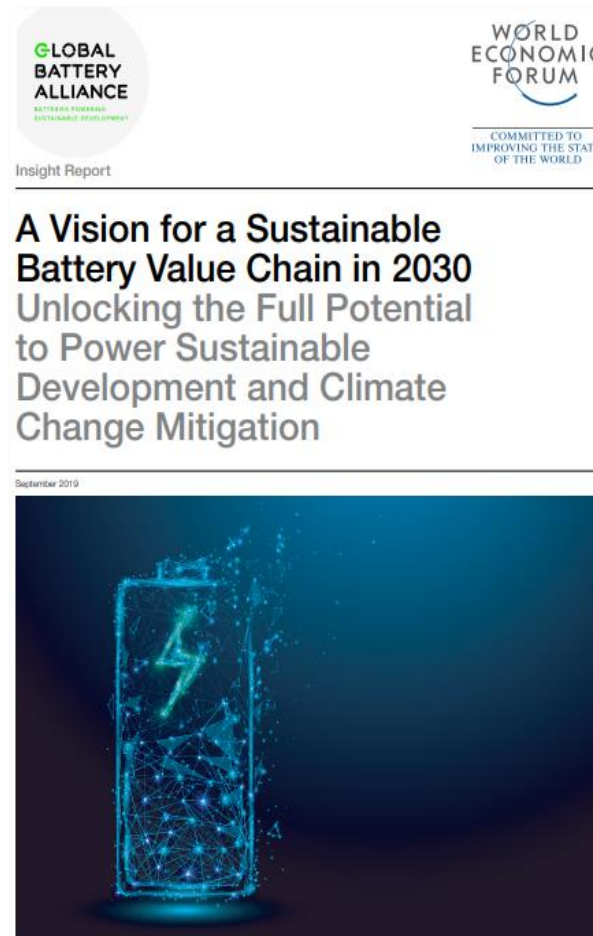
The GBA vision is that batteries power sustainable development towards three overarching outcomes:

1. Establish a **circular battery value chain** as a major driver to achieve the Paris Agreement
2. Establish a **low-carbon economy** in the value chain, create new jobs and additional economic value
3. **Safeguard human rights** and economic development consistent with the UN Sustainable Development Goals

Mission

- Establish trusted criteria, data, and benchmarks for a sustainable and transparent battery market
- Mobilize collective action to improve the environmental, social, and governance footprint across the value chain
- Communicate with one voice and with strong media visibility

Vision reports



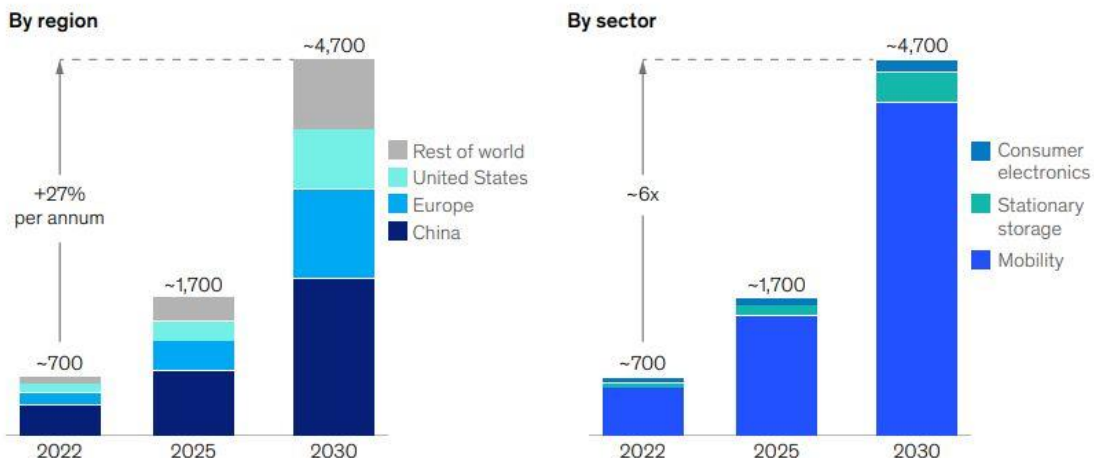
The multistakeholder governance of the GBA has been the principal contributor to our credibility and impact

Accelerated growth rendering the mission of the GBA even more urgent

Exhibit 1

Li-ion battery demand is expected to grow by about 33 percent annually to reach around 4,700 GWh by 2030.

Global Li-ion battery cell demand, GWh, Base case



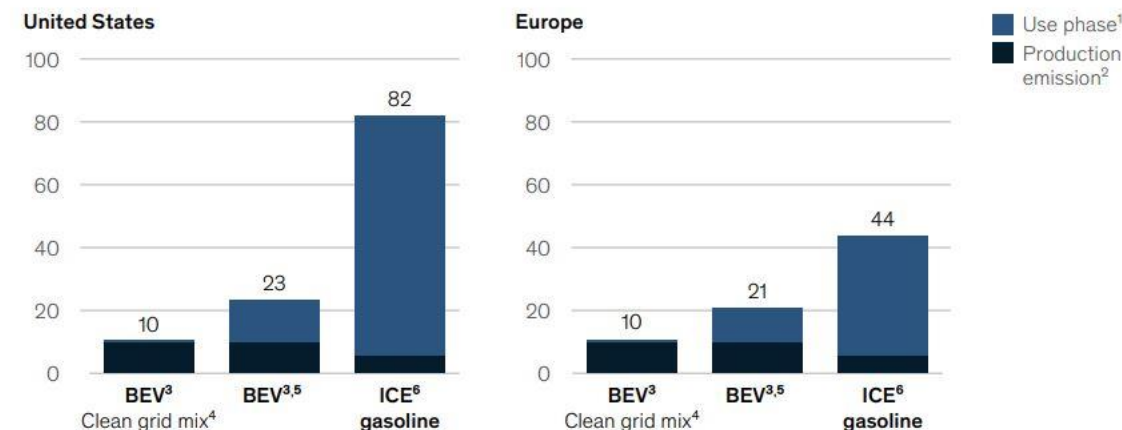
¹Including passenger cars, commercial vehicles, two-to-three wheelers, off-highway vehicles, and aviation.
Source: McKinsey Battery Insights Demand Model

²These estimates are based on recent data for Li-ion batteries for electric mobility, battery electric storage systems (BESS), and consumer goods.

The scale up of the global battery value chain will likely support about 18m jobs (new and existing) and could reduce cumulative road transport emissions from 2021 through 2050 by **70GtCO₂e**

Lifecycle emissions are lower with battery electric vehicles than internal combustion engine vehicles.

Lifetime CO₂e emissions by vehicle powertrain type, metric tons



¹Estimated use phase of 243,000 km.
²Production emission references global average vehicle C-segment.
³BEV models account for 10% charging losses.
⁴Clean grid perspective for use phase only; excluding additional emission savings by, eg, green steel and clean battery cathode/anode material.
⁵Estimated BEV average energy consumption of 15 kWh per 100 km and electricity generation according to European 2021 EU energy mix and US energy mix.
⁶509 g/mile of CO₂e emissions for average US ICE gasoline.
Source: McKinsey Center for Future Mobility, McKinsey Sustainability Insights

Potential for emissions savings **up to 90% by 2030** if concerted action is taken across the supply chain

Today **175 organizations** partner with the GBA towards developing the flagship battery passport and engaging in collective action towards ensuring sustainable battery value chains



Public organizations



NGOs and foundations



Technology Partners



Associations



Industry and business



The GBA community has developed 10 Guiding Principles for a sustainable battery value chain

Establish a circular battery value chain as a major driver to achieve the Paris Agreement



- 1 Maximizing the productivity of batteries in their first life
- 2 Enabling a productive and safe second life use
- 3 Ensuring the circular recovery of battery materials

Establish a low carbon economy in the value chain, create new jobs and additional economic value



- 4 Disclosing and progressively decreasing greenhouse gas emissions
- 5 Prioritizing energy efficiency measures and substantially increase the use of renewable energy as a source of power and heat when available
- 6 Fostering battery-enabled renewable energy integration and access with a focus on developing countries
- 7 Supporting high quality job creation and skills development

Safeguard human rights and economic development consistent with the UN Sustainable Development Goals



- 8 Immediately and urgently eliminating child and forced labour, strengthening communities and respecting the human rights of those employed by the value chain
- 9 Fostering protection of public health and the environment, minimizing and remediating the impact from pollution in the value chain
- 10 Supporting responsible trade and anti corruption practices, local value creation and economic diversification



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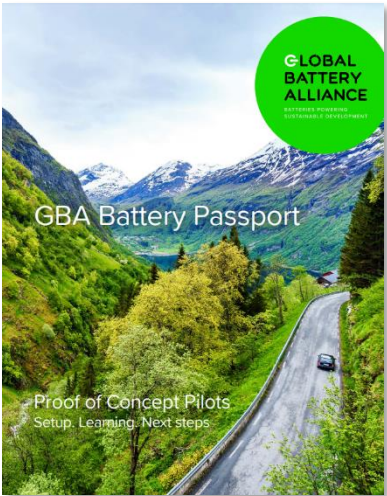
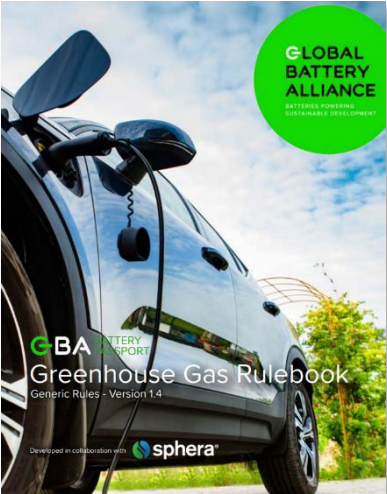
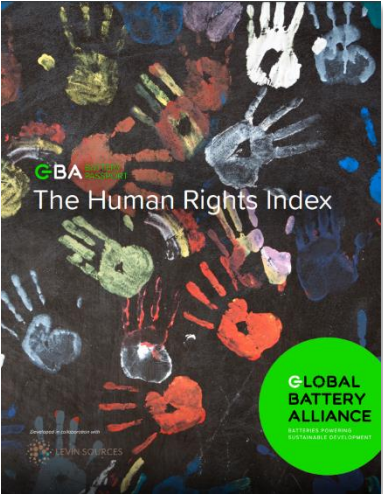
Our work – Critical Minerals,
Circularity and the Battery
Passport

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Our Work

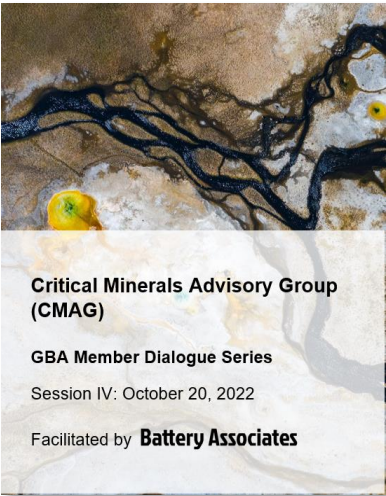
Battery Passport



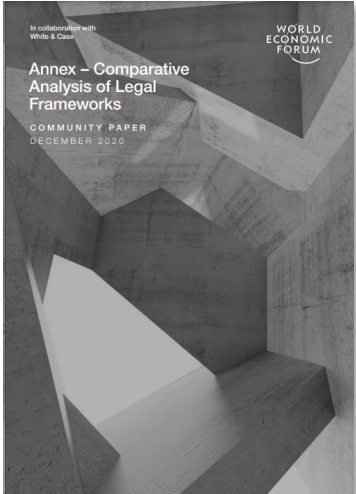
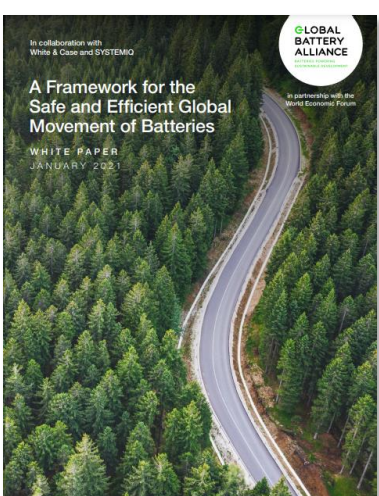
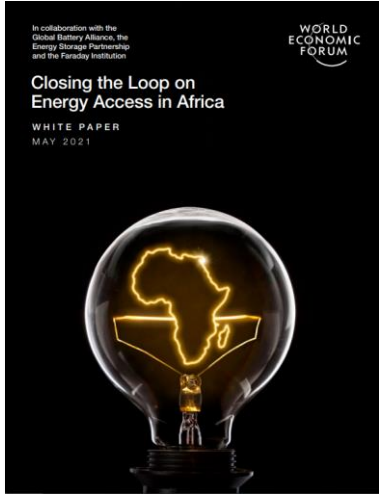
Cobalt Action Partnership



CMAG



Energy Access and Circularity



Vision of the Battery Passport



- Vision:** How does GBA expect battery passport to contribute to implementation of GBA Mission?
- Content:** How does GBA define ESG performance expectations and how to steer behavior via ESG score?
- Systems:** How does GBA position itself in technical and data aspect of battery passport ecosystem?
- Impact:** How does GBA achieve positive impact on value chain with the means it has at hand?
- Stakeholders:** Who should be involved to implement vision? How to interact with them?
- Roll-out:** How should GBA steer implementation of GBA battery passport?

Battery Passport Vision: Accelerate the scaling of sustainable, responsible, and circular battery value chains by:

1. Establishing a **global battery passport ecosystem**, including harmonized sustainability performance expectations for batteries
2. Making **company efforts** measurable, trusted and comparable
3. Tracking and rewarding **improvement actions** across the value chain with a comprehensive ESG score for consumers

Establishing trust, comparability and independent validation represent the unique value proposition of the GBA

Battery Passport by the GBA:

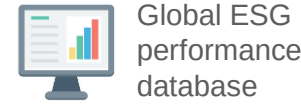
View of the wider Ecosystem

BP Template
and Rulebooks



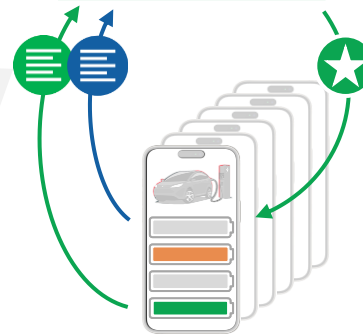
Rulebooks enhancement: based on quantified data GBA may not only run benchmarking but directly enhance its standards (establish thresholds, calibrate scoring coefficients, etc.)

Aggregation: GBA is to withdraw only rundowns of already verified sustainability data (plus elements of labeling) in aggregated way from multiple passports to analyze global ESG performance of BVC-s



Global ESG
performance
database

GBA Platform



ESG Score: aka GBA quality seal – a three dimensional performance score based on content and quality of reported ESG data (*issuance mechanism tbc*)

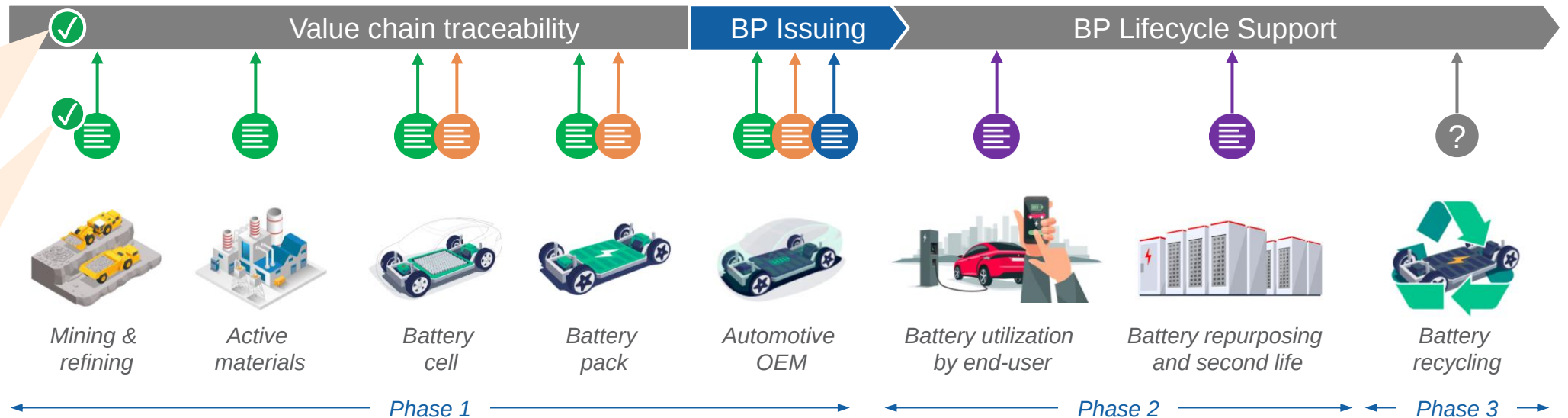


Environment

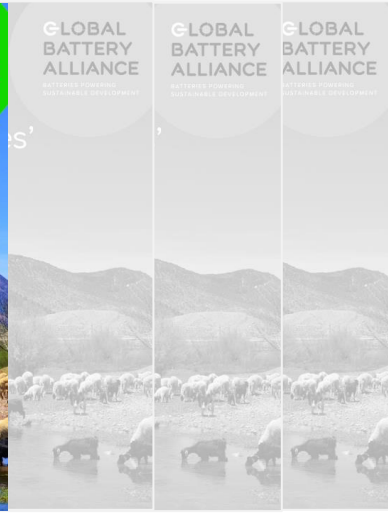
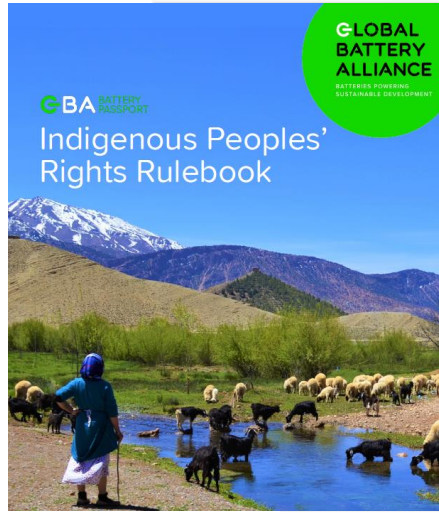
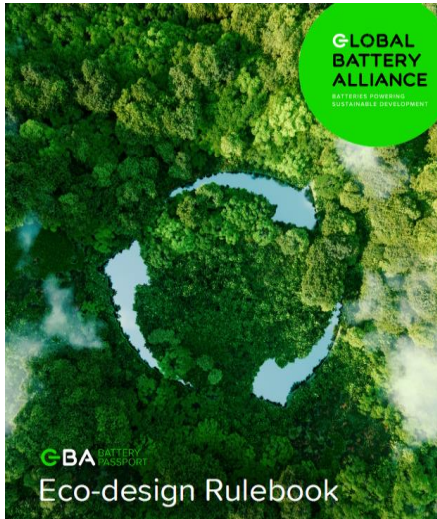
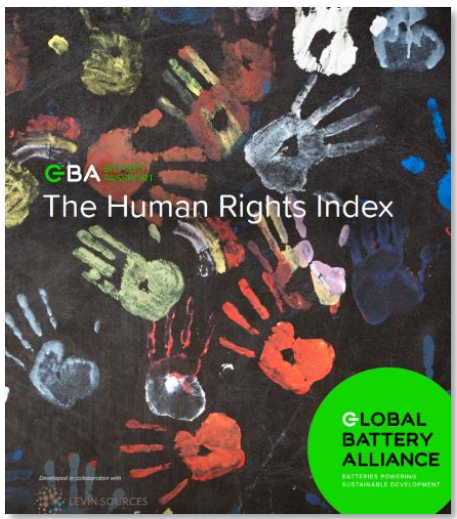
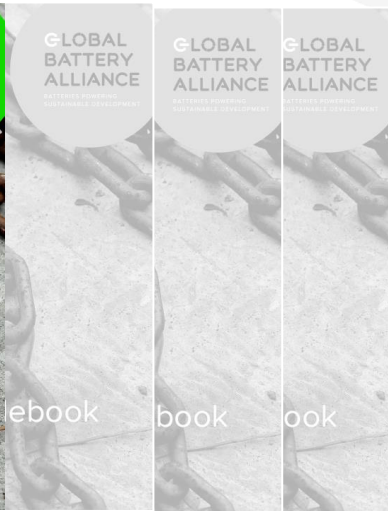
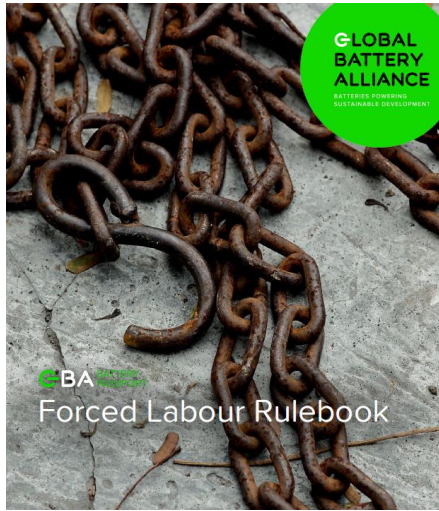
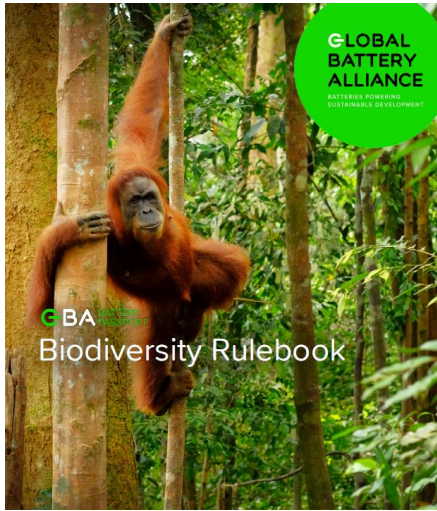
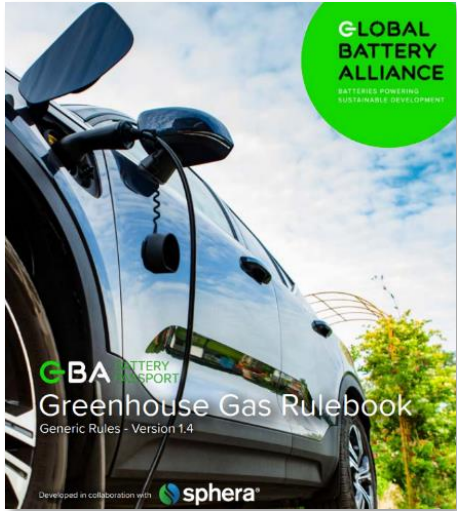
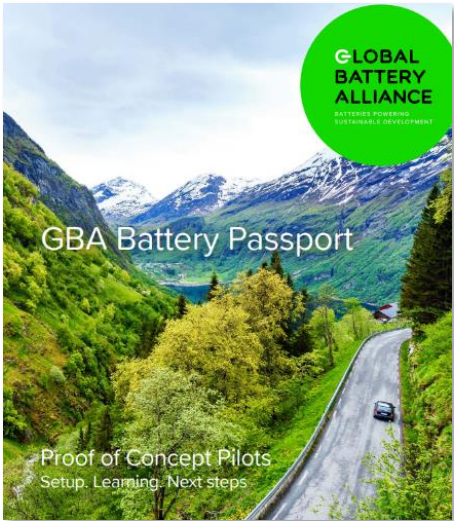
Social

Governance

Verification: on top of embedded tools of data verification 3rd-party verifier is expected to audit both
(1) companies inputs and
(2) aggregation correctness



We have developed an initial seven flagship pilot rulebooks: GHG, Human Rights, and Child Labor, Biodiversity, Forced Labour, Indigenous Peoples Rights and Circular Design



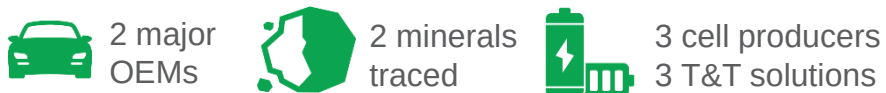
Our full framework will be developed sequentially according to the strategic roadmap, focusing on EU Batteries Regulation due diligence requirements and building on existing standards

Cross-cutting			Rulebook wave	Status	BP3.0 Next steps
Due diligence 1. Presence and quality of environmental & human rights due diligence and risk management systems			Published rulebooks	Restructured according to new BP rulebook logic	- Revisit comments from BP2.5 and MVP pilots - Review standard equivalency and global regulatory mapping
Environmental Energy and GHG 2. GHG emissions 3. Energy efficiency Environmental degradation 4. Pollution (air, water, soil, hazardous substances noise and vibration, plant safety) 5. Biodiversity loss Circularity 6. Material consumption/usage 7. Water management (usage, recycling, depletion) 8. Waste management (generation, recycling/reuse) 9. Circular design	Social & Economic Human rights 10. Child labor 11. Forced labor Workers' rights 12. Freedom of association and collective bargaining 13. Worker health and safety Community impacts and rights 14. Respect for Indigenous Peoples' rights 15. Community life	Governance Local economy 16. Diversity 17. Contribution to local economic development (payments to governments and local supplies and employment) 18. Engagement with artisanal and small-scale miners Product cost 19. Total cost of ownership (consumer) Compliance & good governance 20. Product quality and safety 21. Data security and privacy 22. Occurrence of corruption and bribery	Draft rulebooks BP 2.0 ESG issues corresponding to risk categories of the EU Battery Regulation	80 % drafts released for piloting Initial regulatory and standard equivalency mapping conducted	- Revisit comments from BP2.5 and MVP pilots - Review standard equivalency and global regulatory mapping - Identify members with expertise and interest in detailed contributions - Map out key international conventions and texts, validate issue scope and comprehensiveness with (core group of members) - Develop indicators against EU BR and standard equivalency - Develop intermediate and leading practices

Implementing standard equivalency and leveraging existing standards to meet performance expectations and qualify for an ESG score is a foundational design principles of the GBA Battery Passport

From successful Proof of Concept in 2022 to Minimum Viable Product in 2024

The world's first BP proof of concept (PoC)

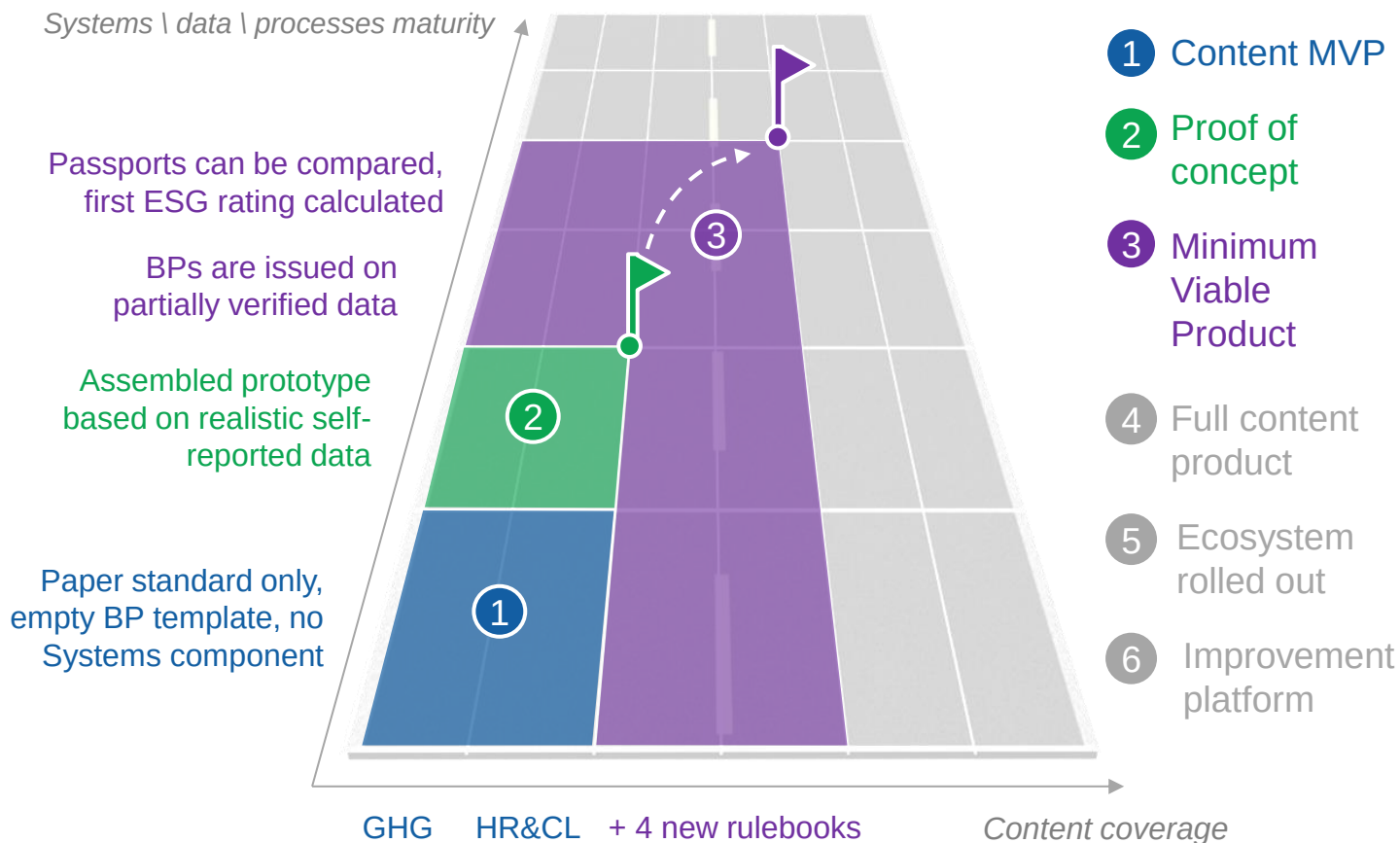


In 2022, we delivered Wave 1 PoC pilots:
3 separate pilots demonstrating the integration of material flow data with ESG performance **along the holistic (cradle-to-gate) value chain**

Passports, delivered by **independent but proved to be interoperable T&T solutions**, consisted of averaged HR&CL scores as well as battery (product) carbon footprint

Establishing the exact origin of mined materials for the first time **triggered immediate due diligence actions** for OEM

Based on progress in content development the GBA is running Wave 2 MVP pilots



GBA aims to continue testing rulebook reporting in parallel with Systems / Data components

Wave two pilot objectives and participants

Pilot 1	Pilot 2	Pilot 3	Pilot 4	Pilot 5	Pilot 6	Pilot 7	Pilot 8	Pilot 9	Pilot 10	Pilot 11	Extra	Extra
CATL	CATL			SAMSUNG SAMSUNG SDI	LG Energy Solution	CALB	EVE	SUNWODA 宁德时代	SUNWODA 宁德时代	SUNWODA 宁德时代	FARASIS	Gotion
RCS	CATL	Circular		GLASSDOME	CIRCULARISE	CIRCULARISE	宁德时代		MINVIRO	MINVIRO		MINVIRO
NIO		BYD		VOLVO	Renault Group				HAVEE			

- The GBA has established **11 separate pilot consortia** led by global battery manufacturers including Contemporary Amperex Technology Co., Limited (CATL), EVE Energy Co., Ltd , Farasis Energy, FinDreams Battery, LG Energy Solution, Samsung SDI, Sunwoda and CALB Group Co. Ltd., together representing over 80% of the global electric vehicle battery market share
- The second wave of pilots aims to enhance and accelerate the realization of the GBA vision of sustainable, circular and responsible battery value chains and is significantly expanding the scope of the 2023 proof of concept.
- Pilot participants will **report on seven rulebooks** developed by multistakeholder working groups convened by the GBA which set out harmonized sustainability performance expectations for seven key metrics including the previously tested Greenhouse Gas rulebook to calculate the battery carbon footprint, human rights and child labour indices and the newly developed rulebooks on Forced Labour, Indigenous Peoples' Rights, Biodiversity and Circular Design of batteries.
- Based on the reporting by value chain participants across the pilot consortia, **differentiated ESG scores will be issued**, a major steppingstone incentivizing companies to go beyond compliance in addressing sustainability risks and impacts along the value chain.

The pilots represent the **world's largest, pre-competitive effort by battery cell manufacturers to establish comparable battery passports** and represent a major milestone towards establishing a sustainable and transparent battery value chain by 2030

**Follow us,
join the GBA
and shape the Battery
Passport!**



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