Supporting Information

Toward sustainable lithium-ion battery industry: an integrated approach to the trilemma

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Table S1. A typology of governance paradigms for sustainable LIBs

Paradigm	Core Driver	Representative Policy Tools	Typical Region
Administrative regulation & capacity-driven	Achieving environmental goals and resource security through administrative licensing and capacity control.	EPR, recycler "whitelist" system, mandatory recovery rates and energy consumption standards.	China
Market access & information-driven	Shaping a green single market by setting product sustainability thresholds.	Digital Battery Passport, mandatory carbon footprint declaration & supply chain due diligence, phased recycled content targets.	EU
Investment incentive & security-driven	Ensuring supply chain security and guiding industrial reshoring via public investment and trade rules.	Large-scale direct investment in recycling/material processing, subsidy restrictions targeting entities from specific nations, fragmented state-level recycling legislation.	USA