

# The circular economy of Li-ion batteries for electric vehicles

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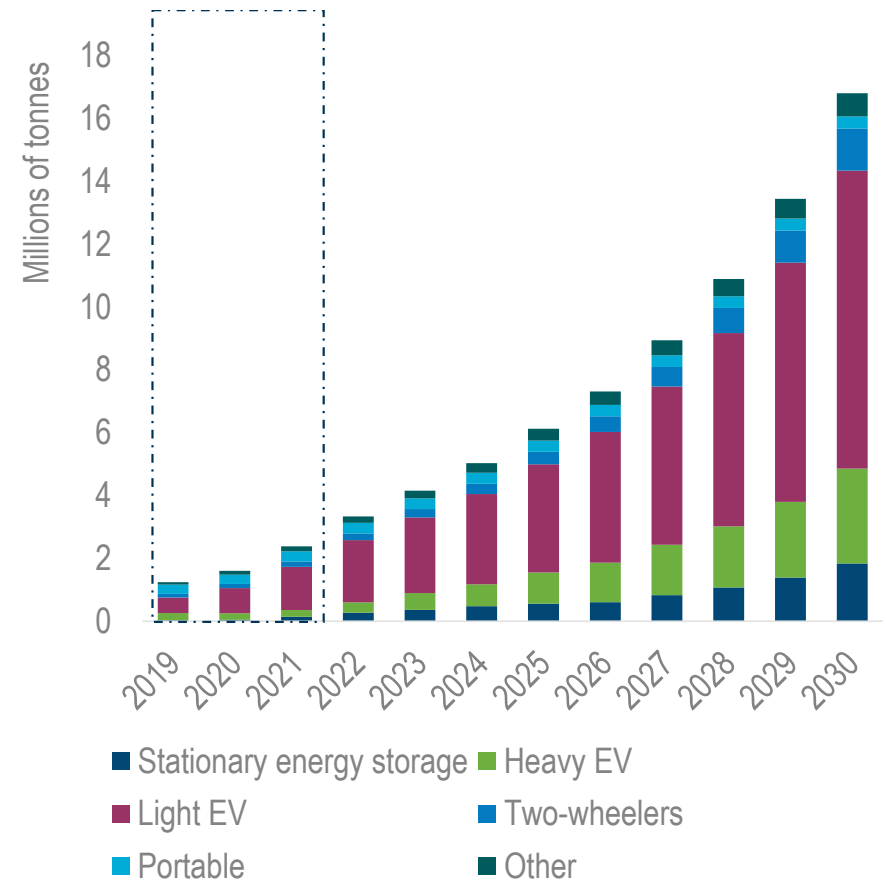
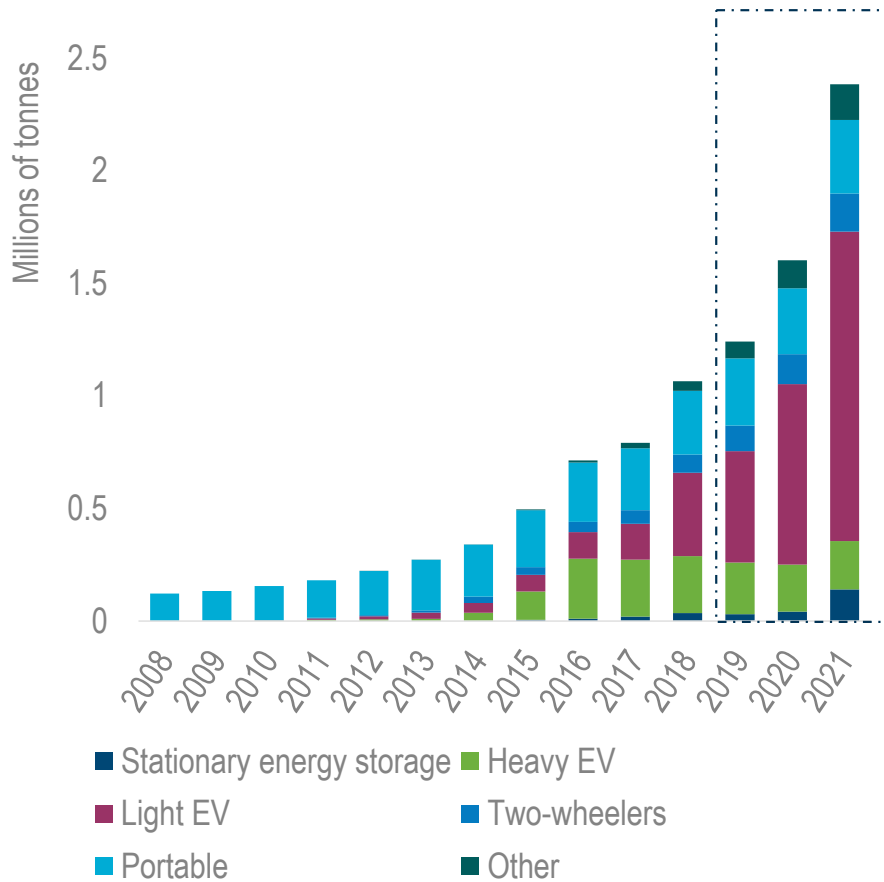
WTO Trade and Environmental Sustainability Structured Discussions  
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# Sales of lithium-ion batteries (LIB) are increasing exponentially ...





... requiring an increasing **supply of raw materials** and solutions to prevent **health and environmental hazards** from waste LIB

Reliable supply of these materials crucial for the development of EV industry

**79%** of global **cobalt** and **59%** of global **nickel** supply come from countries with **export restrictions**

**70%**

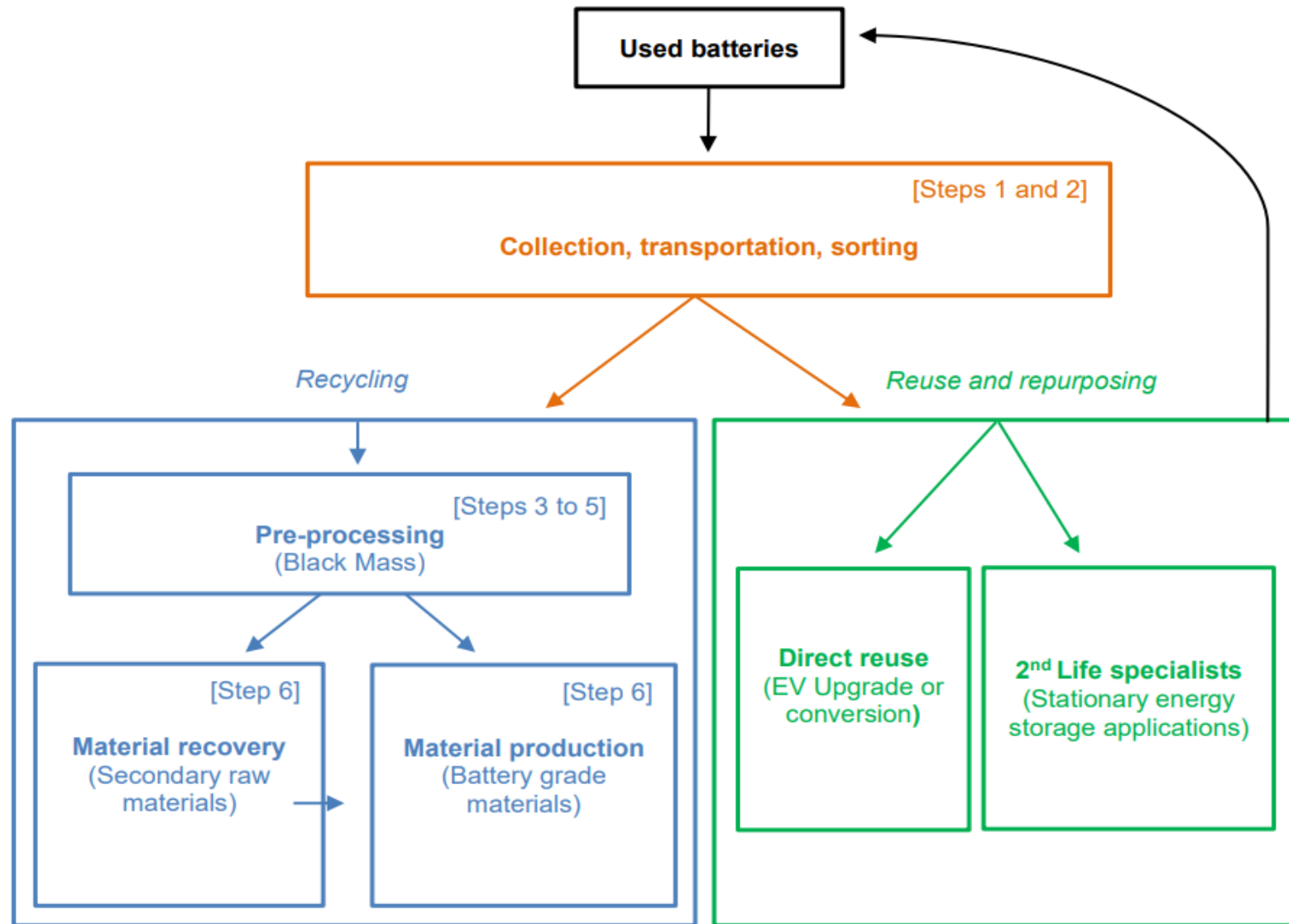
of **hazardous waste** in landfills comes from **e-waste**

- > LIB recycling is a nascent industry
- > While most LIB waste today from personal devices, EV battery waste increasing

Reuse and recycling of LIB are central to the development of the electric vehicle industry and hence to the green transition

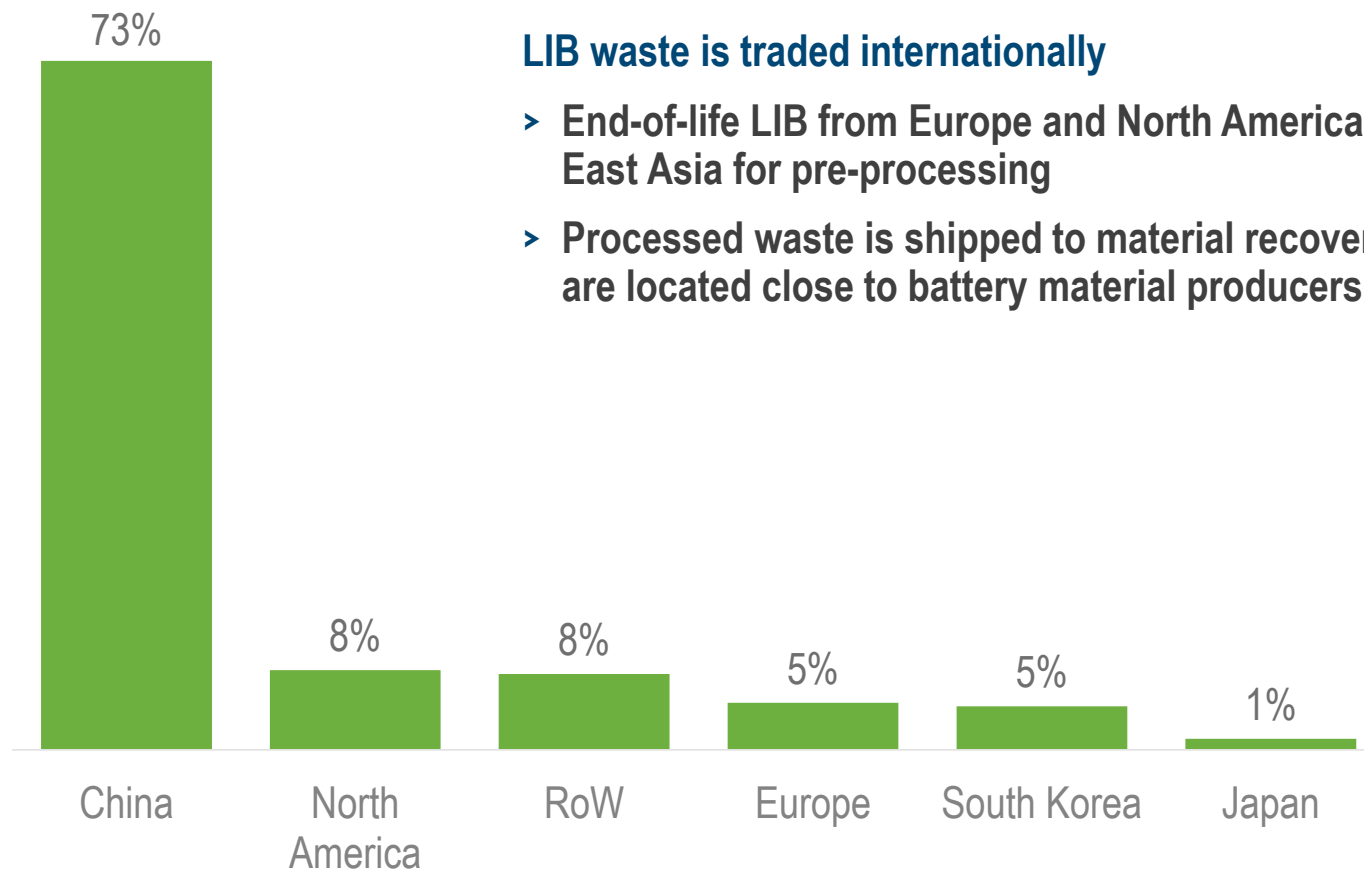


# Recycling and reuse of LIB





## Global LIB recycling capacity currently concentrated in China ...



### LIB waste is traded internationally

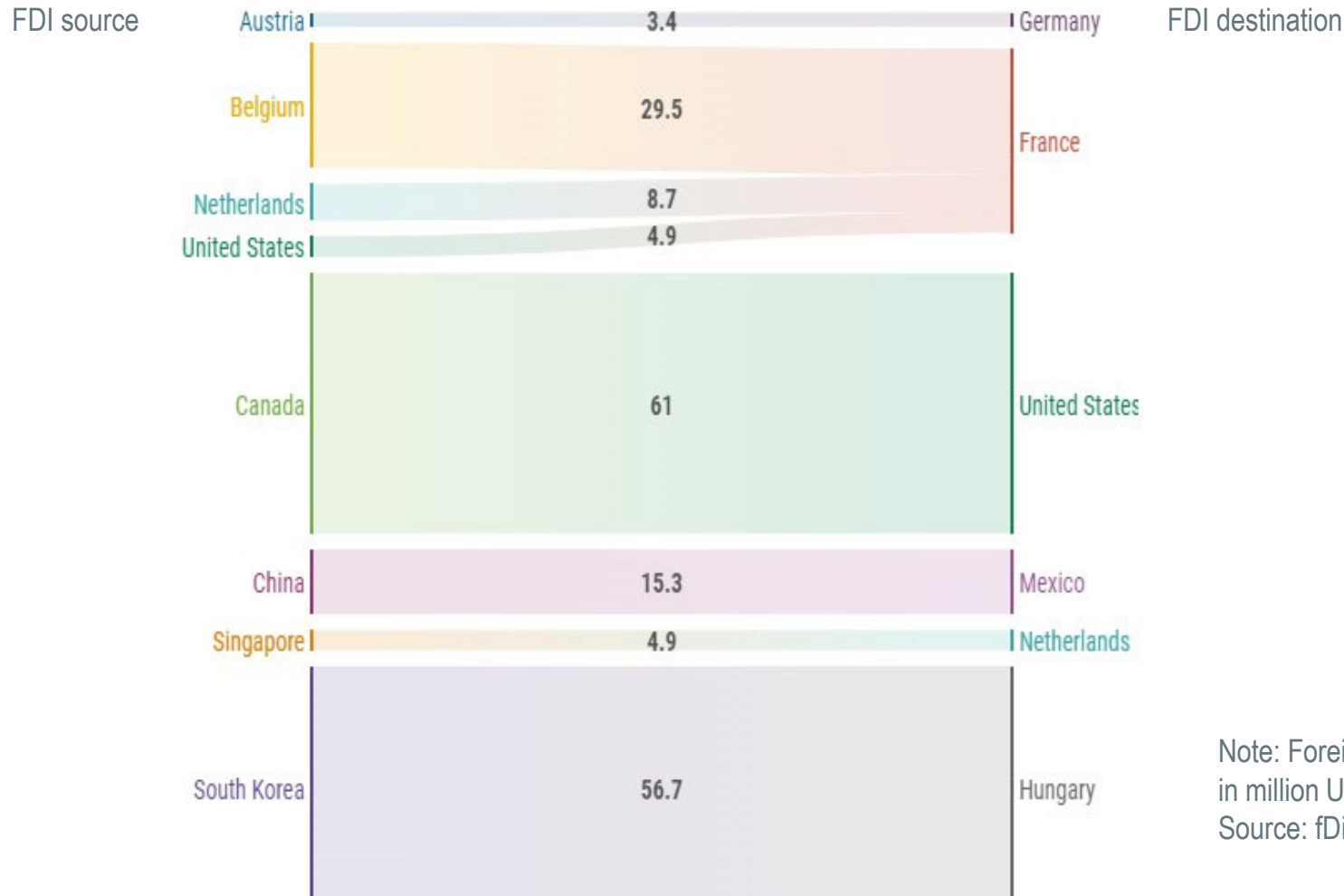
- > End-of-life LIB from Europe and North America are shipped to South East Asia for pre-processing
- > Processed waste is shipped to material recovery installations that are located close to battery material producers (China, South Korea)

Source: Circular Energy Storage Online

Note: Estimates for 2020. Rest of the World (RoW) comprises Australia, India, Indonesia, Malaysia, Mexico, the Philippines and Singapore.



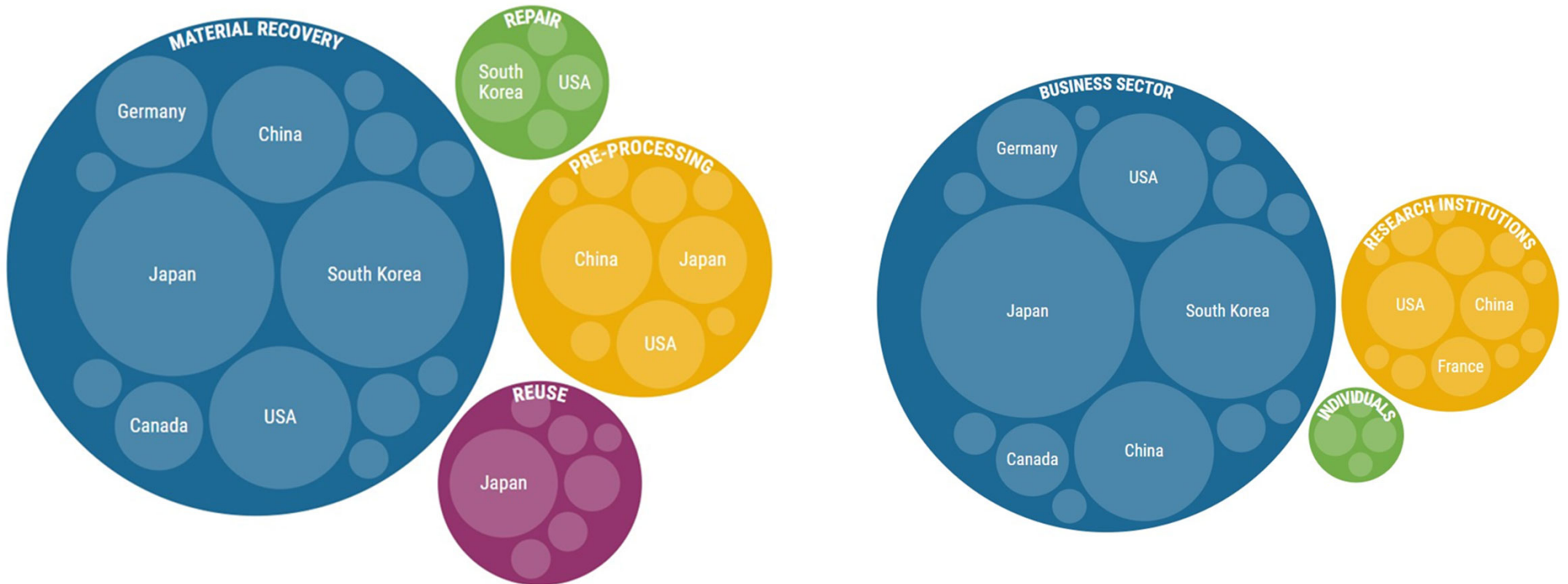
# But new investments expand that capacity in Europe and N.America



Note: Foreign direct investment from 2017 to 2021, in million USD.  
Source: fDi Markets



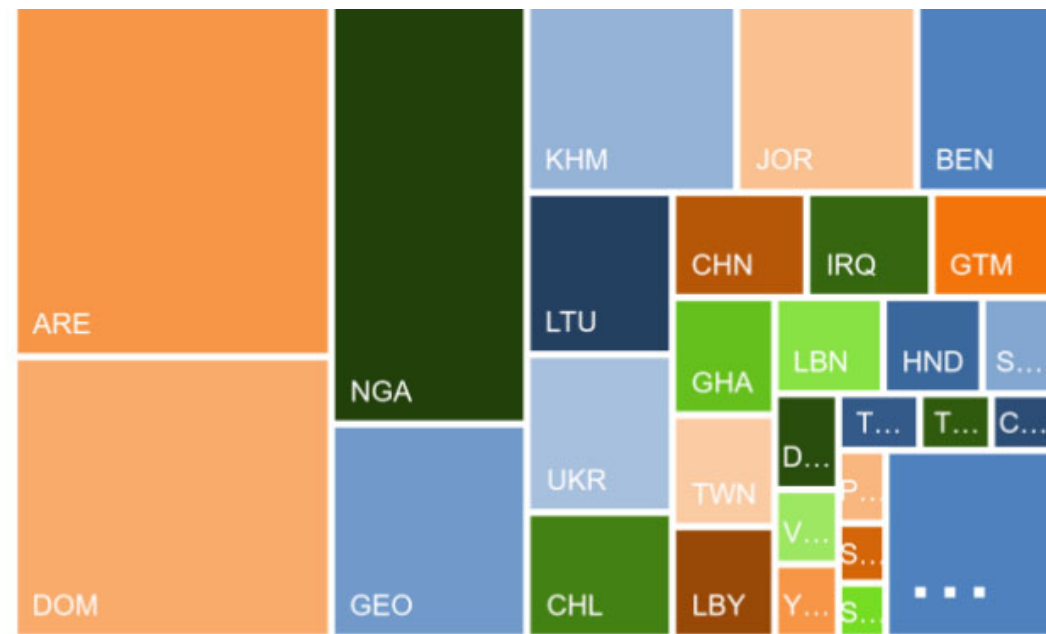
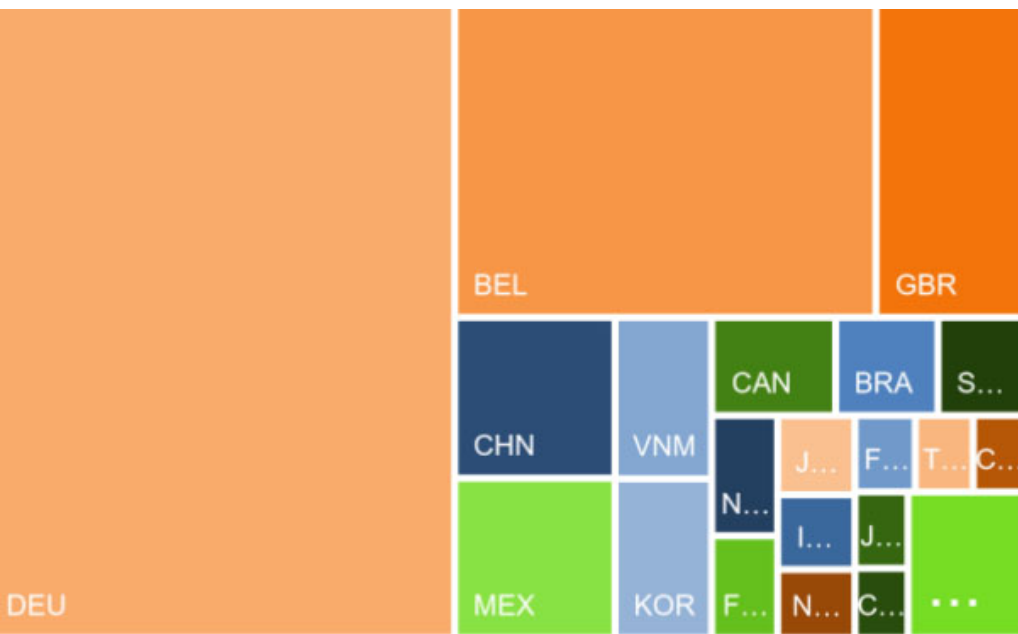
# Innovation in LIB recycling by recycling stage and applicant type, 2017-2020







# International trade will continue to be important for the circular economy of EV batteries





## Policies affecting LIB trade flows

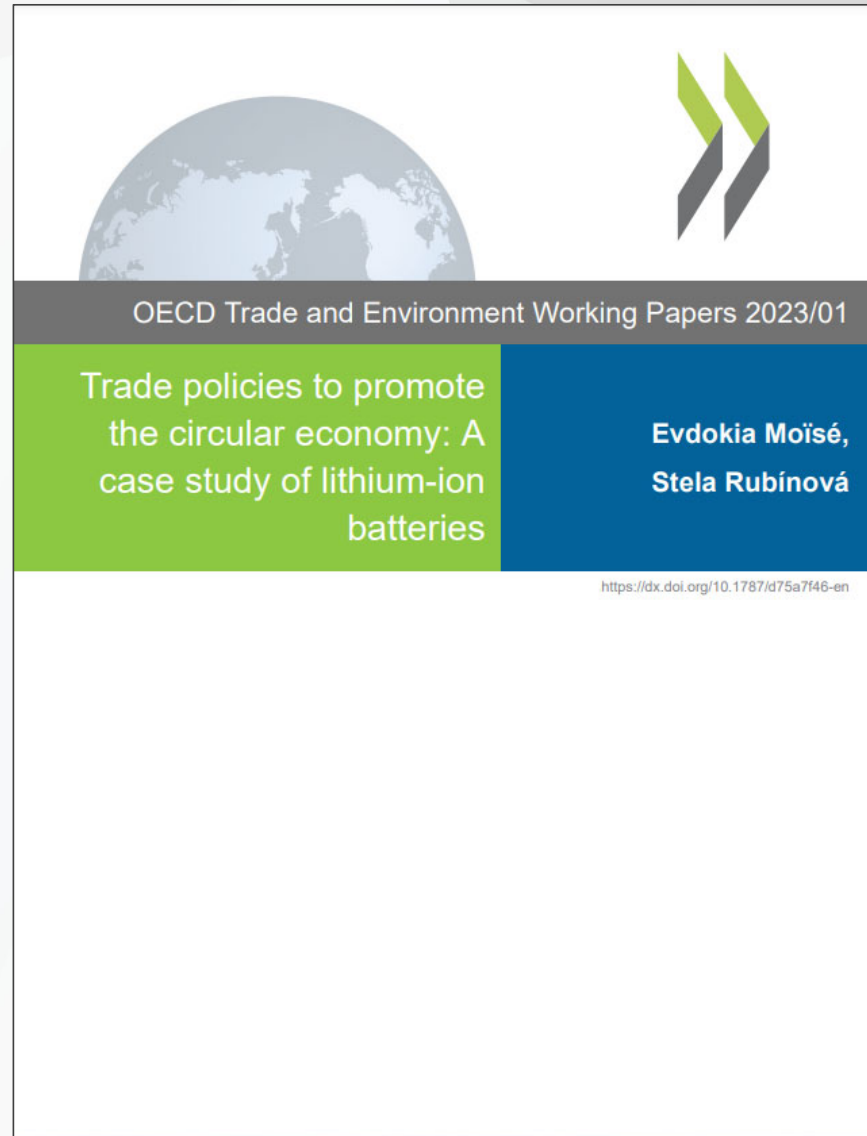
- Status of EoL LIB (waste ? or not ?) define transport regulation, traceability and control procedures at the border
- Rules of origin – special considerations on recovered materials
- Standards for battery design – harmonization while preserving innovation
- Labels and traceability – “battery passports”

## Policies to promote circularity of LIB

- Consistency of regulations applied to transportation and storage safety of hazardous materials
- Administrative procedures at the border : pre-consent mechanisms; risk assessment; digitalization of PIC procedures
- Government incentives to promote LIB circularity
- Extended producer responsibility

# Thank you

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The image shows the cover of the OECD Trade and Environment Working Papers 2023/01. The cover features a globe on the left and a stylized logo on the right. The title is "Trade policies to promote the circular economy: A case study of lithium-ion batteries" and the authors are "Evdokia Moïsé, Stela Rubínová". A DOI link is provided at the bottom right of the cover.

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Trade policies to promote the circular economy: A case study of lithium-ion batteries

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