Digital Product Passports: Policy Lessons from the Wood Waste, Battery, and Textile Sectors

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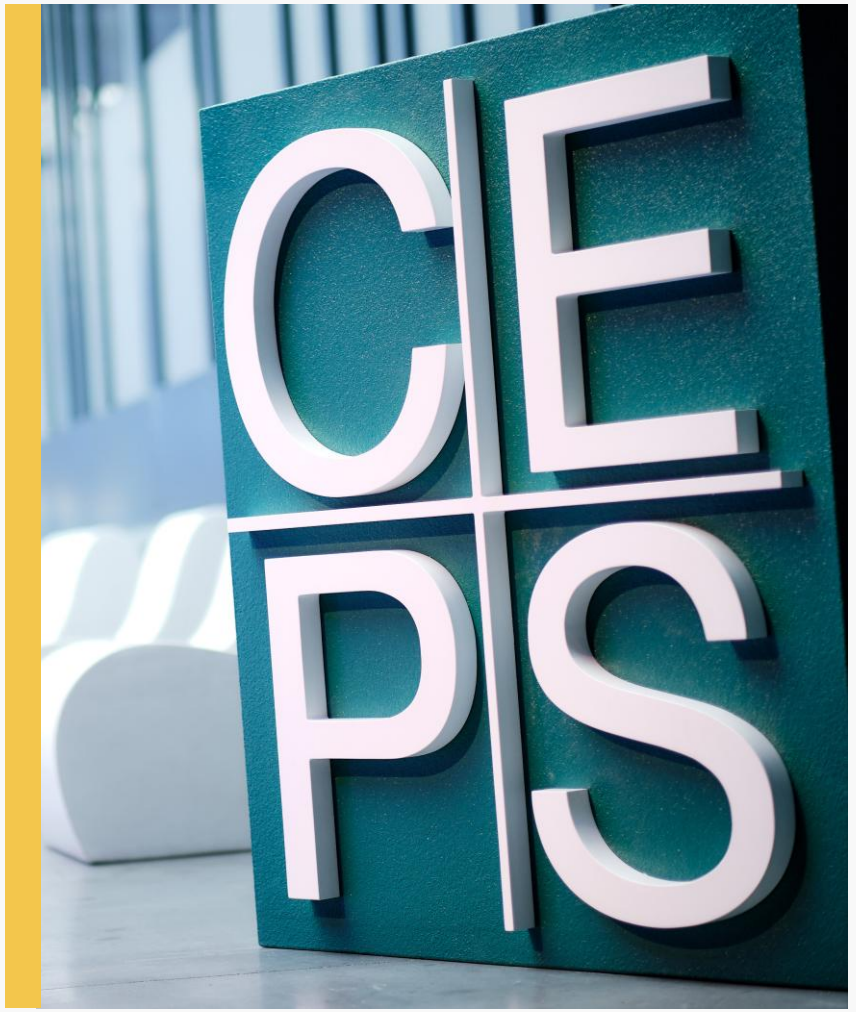


CEPS involvement in Horizon projects on the digital product passport

- BATRAW: Recovery of Critical Raw Materials from Electric Vehicle Batteries

- W2W: A Wood-to-Wood Cascade Upcycling Valorisation Approach

- PESCO-UP: Textile fibre recycling from mixed streams

The Digital Battery Passport and implications for companies

The new EU Battery Regulation: key requirements and timeline

Requirements	Approximate timeline
Sustainability and safety	
Carbon footprint declaration	2024
Carbon footprint performance class	2026
Carbon footprint threshold	2027
Minimum recycled content rates (cobalt, lead, lithium and nickel)	2030, 2035
Supply chain due diligence	2024
Labelling and information requirements	
Date of manufacture, chemistry, critical raw materials	2027
Battery passport (QR Code)	2026,2027

Implementation challenges arising from the battery passport

Challenges

- Practically challenging to collect data from the multitude of companies involved in the various life cycle stages of batteries
- General reluctance to share data due to confidentiality concerns and lack of trust between battery supply chain actors
- Lack of knowledge about the need for building transparent battery supply chains and the upcoming EU Batteries Regulation requirements
- Unclarity concerning the access rights to certain types of data
- Lack of standards to ensure interoperability of data shared among global supply chain actors
- Difficult to assess the reliability and validity of collected data (e.g. on carbon footprint)
- Unclear responsibilities for meeting the battery passport requirements
- Complex to consolidate all required carbon footprint data and produce comparable results

Source: Rizos, V., & Urban, P. (2024a)

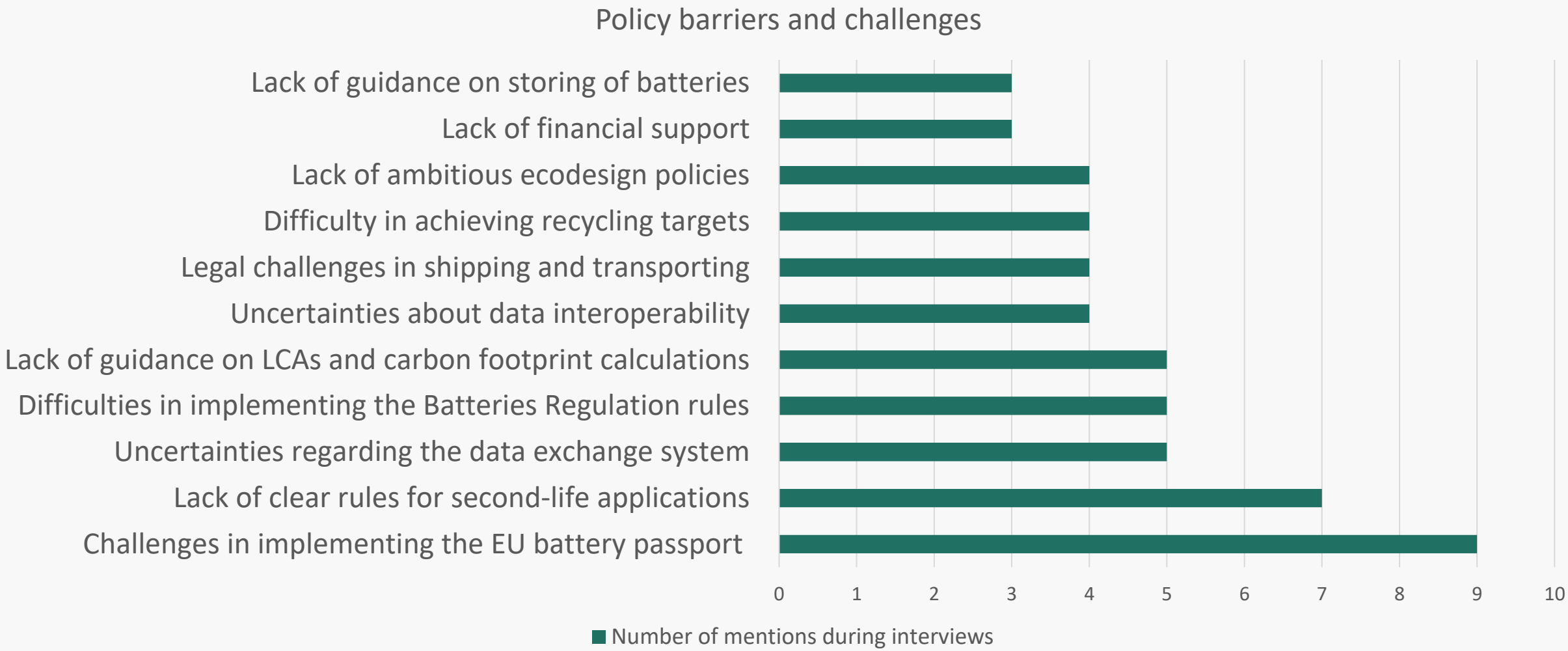
Opportunities arising from the battery passport

Opportunities

- Develop a better picture of the carbon footprint of battery manufacturing operations
- Test the capabilities of the battery passport tool to then design similar requirements for other products groups
- Support battery recycling through better clarity about the batteries' content and state of health
- Support second-life applications through having access to key battery durability parameters
- Increase consumers' awareness of the environmental impacts of batteries and of their consumption choices
- Support more eco-conscious decisions by consumers
- Develop a level playing field that rewards actors adopting higher sustainability standards
- Provide a form of reassurance about responsible sourcing through due diligence requirements in the battery passport

Source: Rizos, V., & Urban, P. (2024a)

Barriers and challenges emerging from the EU policy framework on batteries



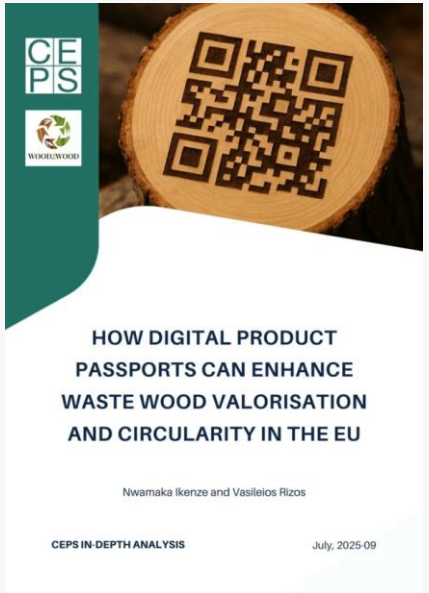
Source: Rizos, V., & Urban, P. (2024b)

Digital product passports for DPPs for wood-based products

Implementation challenges

Challenges

- Reluctance by value chain actors to share sensitive data due to data security concerns limits data availability.
- Existing non-uniform data structures pose challenges for data integration and interoperability.
- Investment is needed to build sufficient DPP implementation capacity, especially where existing digital practices are limited.
- Costs of DPP implementation pose adoption challenges, especially for SMEs
- Changes in wood-based products due to use, exposure, aging, maintenance or repair create a need to develop dynamic DPPs.
- Lack of information for existing wood-based products already in circulation without DPPs limits valorisation opportunities for these products.
- Diverse informational needs throughout complex wood-based product value chains pose challenges for harmonising DPP content requirements.



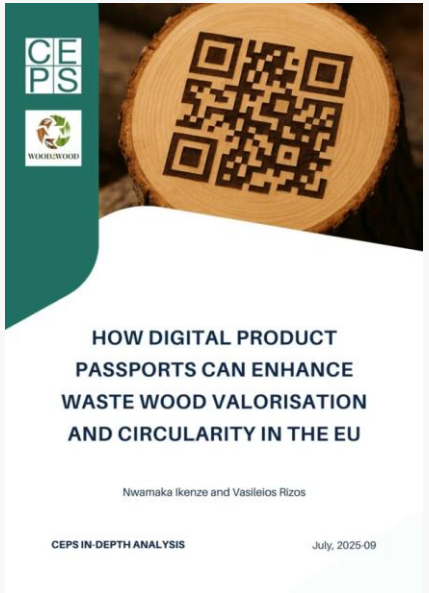
Source: Ikenze A. & Rizos, V. (2025)

Opportunities

Opportunities

- Lower economic barriers to valorisation by providing information for the streamlined and data-driven identification, sorting and handling of valuable waste streams.
- Enable consumers to make sustainable choices and engage in valorisation through accessible DPPs.
- Provide information for existing wood-based products that are already in circulation but without DPPs, using deep learning and sensing technologies integrated into DPP routines.
- Economic actors could use DPPs to distinguish themselves in terms of sustainability credentials, product characteristics and circularity.
- Increase cooperation throughout the value chain to foster valorisation.

WOOD2WOOD



Source: Ikenze A. & Rizos, V. (2025)

Digital product passports for textile products

Implementation challenges

Challenges

- The lack of digitisation in the textile industry: many companies (especially SMEs) in the value chain lack digital readiness, a lack of suitable IT systems, data collection schemes, and related skills.
- Complex textile supply chains in a global network of many different players make supply chain relationships opaque and difficult to track.
- Confidentiality concerns and a low willingness to share data.
- The lack of harmonized data and IT systems leads to interoperability issues. The data quality and accuracy also often do not meet the input requirements for different actors like recyclers.
- Lack of harmonised data standards and uncertainty on upcoming DPP requirements.
- The cost factor: Many companies report that the DPP would be both an administrative and a financial burden to them, at least in the short term.
- Companies across the supply chain often have low awareness on DPP-related issues and the need for eco-design, data sharing etc.

Source: Urban et al. (forthcoming)

Opportunities

Opportunities

- DPPs can significantly support sorting, repair, and recycling processes (data on fibre composition and contaminants like dyes, coatings, additives are relevant for EoL decision-making).
- DPPs can reveal environmental and social hotspots along the supply chain, supporting decision-making on sourcing, pricing, etc.
- DPPs could help tackle data gaps and improve data quality. Current data collection and sharing uses different formats and systems, so a harmonised DPP structure could also improve the interoperability of data and systems.
- DPP policy requirements incentivise traceability and help create demand for recycled textiles.
- Traceability supports reverse logistic operations, take-back schemes and offers novel business opportunities if extended to the use phase. E.g. data on consumer behaviour can support renting, repairing or reselling textiles.

Source: Urban et al. (forthcoming)

Cross-cutting policy insights

- Lack of stakeholder readiness emerged as a key cross-cutting challenge
  - Need to provide continuous support and guidance on fulfilling DPP obligations
- Unclarity concerning the data formats and access rights
  - Define clear data that reflect realities across the value chains of different product groups
- Challenging to collect data from the multitude of companies involved in the various life cycle stages of different products
  - Support data sharing with parallel initiatives and projects (e.g. platforms for sharing best practice examples of DPP initiatives)

Sources

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