



HOW DIGITAL PRODUCT PASSPORTS CAN ENHANCE WASTE WOOD VALORISATION AND CIRCULARITY IN THE EU

Nwamaka Ikenze and Vasileios Rizos

SUMMARY

Because of wood's role as a renewable resource, efficient waste wood utilisation is key to a climate-neutral, sustainable and competitive Europe. Leveraging waste wood as a sustainable resource is central to meeting Europe's rising demand for wood-based products without compromising forests, biodiversity and the climate through virgin wood harvesting. To advance the circular economy and transform waste wood valorisation to meet future demand, digital product passports (DPPs) are an important digital tool for improving waste wood flows.

This CEPS In-Depth Analysis explores the challenges and opportunities for advancing waste wood valorisation and the circular economy using DPPs. After consulting with experts, some of the challenges and opportunities identified include data availability, access and integration; harmonised DPP content; limited stakeholder capacity; and the costs of implementing DPPs.

Drawing on these challenges and opportunities, the analysis makes three recommendations for using DPPs to improve waste wood valorisation as an initial starting point for formulating supportive policies at the EU level. These are, respectively, introducing harmonised DPP requirements inspired by existing initiatives, providing effective support and guidance on how to fulfil DPP obligations and identifying solutions to improve valorisation for legacy products.



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1. INTRODUCTION

Digital product passports (DPPs) are *the* key instrument to drive transparency and circularity across supply chains (European Commission 2022;2020), described as ‘vessels for data and information sharing’ (Jensen et al., 2023, p.245). DPPs are essentially a digital tool allowing for the collection of quantitative and qualitative product-related data from actors across all supply chain stages, from material extraction to product manufacturing and use (Çetin et al., 2023; Götz et al., 2022). Consolidating these data and making them available to supply chain actors – but also to consumers – should enable better and more sustainable management of products throughout their lifecycle, lead to more informed consumer choices and fuel novel forms of supply chain collaborations (Götz et al., 2022; Jensen et al., 2023). The [Ecodesign for Sustainable Products Regulation](#) (ESPR) is the primary legislative framework for introducing DPPs for different product groups, except for some sectors where there is already an established legal framework (i.e. batteries¹ or construction products).

Used as a raw material feedstock in a variety of industries (e.g. furniture, construction, paper and pulp), wood is one of the materials for which transparency challenges persist (Steinwender et al., 2024). Throughout the various manufacturing stages of products containing wood and depending on the specific application, different substances may be used that restrict subsequent opportunities for valorising the material (Besserer et al., 2021). A lack of knowledge about these substances restricts valorisation opportunities, contributing to a large share of waste wood ending up in incinerators (Ikenze et al., 2024). For wood-based products coming from the furniture and construction industries this challenge is expected be addressed through DPP requirements under the ESPR and the [Construction Products Regulation](#) (CPR).

While DPP coverage for wood-based products from the furniture and construction industries is likely to expand significantly over the coming years due to EU legislative developments, existing pilots can provide useful insights about prospective implementation challenges and opportunities. In this paper we explore these areas through desk research and perspectives collected in the context of the EU-funded [Wood2Wood](#) project².

¹ For an overview of upcoming DPP requirements for batteries and prospective challenges and opportunities see Rizos and Urban (2024).

² Wood2Wood supports waste wood valorisation and circularity through use of sorting techniques, upcycling technologies and the use of a DPP for wood waste coming from construction & demolition (C&D) and furniture waste.

2. DPPs – ENABLERS FOR IMPROVING PRODUCT TRANSPARENCY, TRACEABILITY AND SUSTAINABILITY

In the EU, the DPP has been introduced as part of the new EPR to boost transparency across product value chains and to promote more circular and sustainable practices by providing access to digital product information. Under the EPR, DPPs will be gradually introduced for priority product groups, such as furniture, on the EU market based on the applicable sectoral legislation. Information requirements will be set via delegated acts under the EPR on a product-by-product basis or horizontally for groups of similar products (European Commission, 2025). However, the EPR also takes a standards-based approach and conformity will be presumed for products adhering to relevant harmonised standards (Article 41). Regarding the technical environment for DPP implementation, the European Commission has launched a standardisation request to streamline requirements for DPP data, including data processing, exchange, and formats; data storage, archiving, and persistence; data authentication, reliability and integrity; and application programming interfaces (APIs) for life-cycle management and DPP searchability (see European Commission, 2024). For non-priority products not falling within the scope of a delegated act, the EPR also gives the option for economic actors to submit self-regulation measures to the Commission (Article 21).

For construction products which may be wood-based, the new CPR lays down harmonised rules for marketing new and used construction products in the EU and features DPP requirements for all information on construction products. This includes declaring performance and conformity details, as well as safety information and instructions on how to use the product. Under the new CPR, the Commission will adopt delegated acts to set up a DPP system for construction products which will be compatible with the DPP system set up under the EPR (Article 75). The CPR also adopts a standards-based approach to DPP data systems which is also aligned with the EPR (Article 77(1)(d)).

Together, the EPR and CPR establish an EU-level framework which lays the groundwork for DPP implementation across various product categories. However, there is still the need to explore options and refine requirements through harmonised standards and delegated acts for wood-based product DPPs. Doing this would help to unify the diverse approaches and data needs of various stakeholders along wood sector value chains (see Steinwender et al., 2024; Jansen et al., 2022; van Capelleveen et al., 2023).

Indeed, alongside the [Wood2Wood](#) project, there are a range of existing initiatives related to DPPs across sectors which highlight a diversity of approaches. [DigInTraCE](#), another EU-funded project focused on wood furniture (among other waste streams), aims to embed dynamically updated DPPs in an innovative traceability platform based on

a suite of tracking, sensing, and sorting techniques. The EU-funded [CIRPASS-2](#) project aims to pilot DPPs in real life settings for construction and other value chains. In the furniture sector, the [APPEND](#) project, funded by Vinnova – Sweden’s Innovation Agency – aims to design, develop and validate a DPP prototype.

3. CHALLENGES AND OPPORTUNITIES FOR WASTE WOOD VALORISATION USING DPPs

This section outlines the various considerations, challenges and opportunities for waste wood valorisation using DPPs based on a series of semi-structured interviews conducted in March and April 2025 with nine wood-sector experts from academia, research institutes and trade associations (see Annex I).

3.1. DATA CHALLENGES

During the interviews experts raised several data challenges related to DPP implementation for wood-based products, including challenges around data availability, managing data access and data structures. In terms of data availability, experts noted limited availability as a fundamental challenge for wood-based product DPPs. A lack of stakeholder readiness throughout the value chain was identified as a key reason for this challenge.

According to experts, there is often resistance to change due to concerns about the investments needed for new technologies and the processes for implementing traceability (e.g. blockchain). At the same time, experts also considered that there could be limited data availability due to economic actors' unwillingness to share sensitive data, particularly without assurances over who would ultimately have access to the data and for which particular purposes.

Experts suggested that concerns about data sharing could be alleviated by managing data access to ensure data security and integrity. Proposed options for managing data access include using authenticated user profiles, which reflect different categories of users. These categories could include professional users (e.g. producers, transporters, compliance or certification bodies) who may modify the data, and 'simple' users (e.g. end consumers) with view-only privileges. Adopting this approach would appropriately limit both data access to appropriate users and users' actions (i.e. editing vs. viewing).

The consulted experts also suggested a need to develop harmonised basic blueprints and support tools at the EU level in terms of the high-level data aspects of wood-based product DPPs. These would clearly specify basic data security and data management requirements and options but would leave open more lower-level choices related to, for example, programming language. These harmonised rules would specify how data is transmitted, stored and controlled, such as with the use of blockchain technologies to ensure data security, integrity, and transparency (Liu et al., 2022). This is particularly important, as it would help to prevent potential DPP fraud, for example with respect to existing stocks of unmarked, untraceable wood products.

The experts argued that these EU-level blueprints could help harmonise various other aspects related to DPP formats and systems, including data structure options. Experts noted the benefits of implementing a blend of basic tabular databases to store large volumes of data and ontologies which better capture complex relationships between product features, characteristics and the various data categories. The importance of scalability was also highlighted.

The experts also highlighted challenges related to data integration and interoperability, stressing the importance of basic standards on information architecture and the importance of working with data generators during the development of DPPs to identify and accommodate the various data types and sources. This is particularly important for existing, non-uniform data forms across industries, which pose a challenge for integration and interoperability. At the same time, experts emphasised opportunities to leverage existing data practices in DPP implementation. For example, experts noted an opportunity to integrate DPPs with established Building Information Modelling (BIM) workflows which feature digital twins for buildings and their characteristics (Atta et al., 2021; Bertin et al., 2020). This would allow for the elaborate resource management of buildings throughout their life cycles, with product-level data feeding into building-level models. More generally, DPPs could support passports at other scales and in later life cycle stages, allowing for information to be nested across different scales (e.g., material-, product- and building-scales) (Çetin et al., 2023).

It should be kept in mind that basic requirements for DPPs are set out under the ESPR which sets out a standards-based approach to data and DPPs' technical design and operation (Articles 10-12, Article 41(2)). Similarly, the DPP system for construction products that will be set up via delegated acts under the new CPR will address these considerations and will be compatible and interoperable with the DPP system under the ESPR – all without compromising interoperability with BIM workflows (CPR, Article 75(2), Article 78). Like the DPP system under the ESPR, the DPP system under the new CPR will also reflect a standards-based approach (CPR, Article 77(1)(d)).

3.2. ENABLING VALORISATION THROUGH DATA

Although significant data challenges associated with DPP implementation for wood-based products have been identified, the consulted experts recognised an opportunity to enable and influence actors' valorisation behaviours throughout product life cycles through information availability – but only if the various data challenges can be overcome. Indeed, DPPs for wood-based products offer opportunities to influence the behaviour of consumers, recyclers and others by addressing shortages of relevant information for valorisation (see Rusch et al., 2022). For example, DPPs could help lower economic barriers to waste wood valorisation and stimulate waste wood markets by

helping to inform decision-making related to waste wood handling, by providing for streamlined, data-driven sorting of end-of-life wood, and by facilitating the better identification of valuable waste streams. DPPs for wood-based products also provide an opportunity through integrated data to increase both value chain cooperation and more collaborative valorisation efforts (Plociennik et al., 2022).

To enable consumers to engage in valorisation and to make sustainable choices, experts stressed the need to maximise consumers' awareness and engagement with wood-based product DPPs. They suggested that consumers should have easy access to DPP data through apps or web-based platforms, accessed through a QR code, RFID, NFC tag or a similar physical marking. In line with this, under the ESPR, the Commission will set up and manage a publicly accessible web portal which will allow stakeholders to access DPP information in a manner consistent with their access rights (Article 14).

Experts also stressed that integrating deep learning and virtual tools into consumer behaviours and routines around the use of DPPs could create opportunities to promote valorisation and circularity – even for legacy products which do not have DPPs. Indeed, there is a need to acquire data to support passports for existing products that are already on the market (Honic et al., 2021). For example, experts mentioned pilot scanning technologies which would allow for the visual recognition of basic product categories for products without DPPs. Using these technologies, consumers would be able to access basic information about the product category based on data drawn from DPP databases for specific products in that category.

For when products reach the end-of-life stage, experts also highlighted tools to address legacy wood-based products which do not have DPPs, including various sensing techniques integrated into waste wood sorting systems. Indeed, addressing legacy products is essential for minimising the risk that reliance on DPPs for new products may lower the capacity to manage existing stocks or untraceable wood products by reducing long-term incentives to invest in end-of-life characterisation techniques (see Çetin et al., 2023).

3.3. CONSIDERING HARMONISED CONTENT FOR WOOD-BASED PRODUCT DPPs

Harmonising basic content options and requirements for wood-based product DPPs at the EU level is key for achieving improved waste wood valorisation. Harmonised EU standards aligning the requirements for both new and valorised wood-based products are important for reducing regulatory fragmentation and encouraging coherence and consistency across policy instruments and national schemes (see Götz et al., 2022).

According to the interviewed experts, three categories of data linked to a unique identifier should be prioritised in future DPPs: product characteristics, sustainability data

and circularity-relevant information. Product characteristics, such as composition and presence of additives, wood type, and any treatments undergone (e.g. addition of any adhesives, preservatives etc.) are important for identifying viable valorisation pathways, for example. The same is true for technical properties such as bending strength and the durability class for wood-based building products. Sustainability data relating to material and product origin (to ensure sustainable sourcing), environmental impact, life cycle emissions, energy consumption, resource usage, by-products, certifications and compliance documents, the product's average lifespan, and lifecycle metrics such as durability, reparability and recyclability could all help producers distinguish themselves on the market and could enable consumers to make more sustainable purchasing choices. Finally, circularity-relevant information such as repair, recycling and other end-of-life handling instructions, information on the right to repair, environmental hazards and risks associated with improper end-of-life handling or disposal could enable and encourage valorisation and proper end-of-life handling. According to the experts, this information could also be integrated into active Extended Producer Responsibility schemes.

Experts also emphasised the need for DPPs to feature dynamic information which reflects events and changes in the products throughout their life cycles in real-time. This is particularly important because wood products may change significantly over their lifetimes due to use, exposure and aging. Dynamic data could include modification and repair history, the product's current location and key dynamic product characteristics, such as information about humidity exposure and wear due to loading. Experts noted several pilot attempts to address the challenge of dynamic product characteristics with the use of dynamically updated, sensor-based DPPs which rely on sensors integrated directly into products.

Notably, much of this information is either part of mandatory minimum information requirements under the ESPR or may be included as appropriate in information requirements under ESPR delegated acts. The latter categories of information include information on the product's performance, such as reparability and durability scores; maintenance and repair instructions for consumers and other actors; information for treatment facilities on disassembly, reuse, refurbishment, recycling or disposal at end-of-life; and other information that could influence sustainable product choices for consumers or the way the products are handled to facilitate their appropriate use (Article 7 ESPR).

Similarly, under the new CPR, DPPs will include information on product requirements related to safety, the environment and performance; information relating to instructions for use, including maintenance information and recommendations for product repair,

reuse, remanufacturing, recycling and disposal; and technical documentation, including related to environmental sustainability performance (Article 76(2) CPR).

In setting harmonised content standards, experts suggested that there is an opportunity to draw on existing harmonised data approaches at the Member State level. In Sweden, for example, there are extensive existing web-based product data templates and product catalogues which have already been adopted by producers in wood-based product industries. There are also several diverse sector-specific and cross-sector approaches across Europe which could be used as inspiration for a fully unified approach (see Çetin et al., 2023).

Experts also stressed the importance of maintaining flexibility in specifying DPP content requirements, allowing for additional data fields resulting from new innovations or unforeseen information needs. Such flexibility would also help to accommodate stakeholders' diverse data needs and lower the administrative burden of implementing DPPs, allowing implementation at smaller scales to be both iterative and case specific (Jensen et al., 2023).

A final but essential consideration in setting content requirements is the varying potential of different data points such as wood type or treatment history for underpinning successful waste wood valorisation. Further research is needed to identify which data points can most effectively support valorisation efforts, taking account of diverse product, sustainability and circularity data needs across stakeholders to align content requirements to the complexities of wood product value chains (Chatzipavlidis et al., 2024).

3.4. LIMITED STAKEHOLDER CAPACITY

During the interviews, limited user capacity stemming from limited technical knowledge and limited knowledge of how to use DPP apps was identified as a barrier to influencing actors' valorisation behaviours using DPPs. Options to address this challenge include developing manuals, demonstrations and informational campaigns. Experts similarly highlighted the need for training data generators, as data input errors could compromise the integrity of data contained in DPPs.

There is a particular need for capacity building through comprehensive training and support for small and medium-sized enterprises (SMEs). In the furniture industry, while there are some established traceability practices, these practices have not historically been digitised or applied to the entire lifecycle (Steinwender et al., 2024). A progressive or phased approach could be instrumental for ensuring stakeholder readiness for DPP implementation for this reason. In fact, the ESPR requires the Commission to allow

sufficient time to ensure compliance with any requirements set out in delegated acts under the ESPR, particularly considering the needs of SMEs (Article 4(4)).

3.5. COST CONSIDERATIONS

Challenges related to the costs of implementing DPPs were discussed during the interviews. Significant investment from stakeholders will be required to develop and give appropriate training for data generators and managers, to maintain digital infrastructures and to adopt appropriate technologies. In particular, DPPs for wood-based products require permanent markings to be affixed to products which would be long-lasting – even after heavy use. Experts emphasised the need for marking approaches which would not be prohibitively time-consuming or costly to apply during the production process.

While these various costs pose challenges, setting EU-level requirements may level the playing field, especially for SMEs (see Steinwender et al., 2024). This may be particularly so considering the ESPR requirement to give special consideration and support to SMEs (Article 22). Digitalisation also offers a chance for increased value creation for these smaller producers (Ranacher et al., 2023). Moreover, DPPs may also offer an economic advantage for stakeholders by providing an opportunity to distinguish themselves through their sustainability credentials.

Table 1 below provides a list of the key challenges and opportunities as identified and discussed above.

Table 1. Key challenges and opportunities for waste wood valorisation using DPPs

<i>Challenges</i>	<i>Opportunities</i>
• 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.	• 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.

• 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.	• 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.
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Source: Authors' own elaboration.

4. CONCLUSIONS AND POLICY RECOMMENDATIONS

DPPs have been heralded as *the* key policy tool to drive transparency across supply chains and enable higher levels of circularity through the improved availability of product-related data. For wood-based products used in the construction and furniture industries, DPP requirements will be introduced over the coming years through delegated acts prepared in the context of the CPR and the ESPR. The emerging DPP pilot cases for these products – including the [Wood2Wood project](#) – can provide useful lessons for upcoming policy developments.

Combining interview data and literature evidence, we find that harnessing the data collection and sharing possibilities of DPPs can provide critical information to actors making decisions about how wood-based products are used and ultimately support the development of markets for these products.

In the consulted experts' view, DPPs for wood-based products should prioritise three key data domains: product characteristics, sustainability data and circularity-relevant information. The sharing of such data among supply chain actors can help break silos across supply chains and stimulate new forms of cooperation. Consumers can also be motivated to adopt more sustainable practices and purchasing behaviours, so long as accessing DPPs does not entail complicated steps.

At the same time, effectively implementing DPPs for wood-based products is dependent upon overcoming supply chain actors' current reluctance to share data. This reluctance is perpetuated by data security concerns but also by the perception that such processes will have high investment costs. SMEs in the two sectors are particularly sensitive to these data demands and may require additional guidance and support to adapt. The risks that companies will be faced with duplicated requirements or with a variety of different national schemes need to be avoided. This can only be done with clear EU requirements and standards.

Based on our analysis we provide the following recommendations:

R1. Introduce harmonised DPP requirements inspired by existing initiatives

As new DPP solutions emerge across the EU, it is important to set clear and harmonised requirements for both new and valorised wood-based products based on established standards. Such standards would benefit from the existing harmonised data approaches at the Member State level. The requirements should also be aligned with other information sharing rules stemming from the overall policy mix to avoid duplication and confusion for companies.

R2. Provide support and guidance on fulfilling DPP obligations

As has been seen in DPP implementation in other sectors (e.g. batteries³), rolling out various DPP requirements can be challenging for companies – and especially for SMEs – which are particularly restricted by limited capacities. This means that DPP requirements for wood-based products should have realistic implementation timelines and targeted support for SMEs. Consolidating knowledge produced through EU-funded DPP pilots (such as about structures and formats for data sharing) and disseminating this knowledge through manuals and guidance documents can support this.

R3. Identify solutions for improving the valorisation of legacy products

While DPP requirements will soon apply to new wood-based products, there also need to be realistic solutions for legacy products that are already on the market. Digital innovations can contribute to this and should be supported further by dedicated EU funding programmes. Examples include scanning technologies which would allow for visual recognition of basic product categories.

³ See: Rizos and Urban (2024).

5. REFERENCES

- Atta, I., Bakhoun, E.S. and Marzouk, M.M. (2021), '[Digitizing material passport for sustainable construction projects using BIM](#)', *Journal of Building Engineering*, Vol. 43.
- Bertin, I., Mesnil, R., Jaeger, J.-M., Feraille, A., and Le Roy, R. (2020), '[A BIM-Based Framework and Databank for Reusing Load-Bearing Structural Elements](#)', *Sustainability*, Vol. 12, No. 8.
- Besserer, A., Troilo, S., Girods, P., Rogaume, Y., and Brosse, N. (2021), '[Cascading recycling of wood waste: A review](#)', *Polymers*, Vol. 13, No. 11.
- Çetin, S., Raghu, D., Honic, M., Straub, A., and Gruis, V. (2023), '[Data requirements and availabilities for material passports: A digitally enabled framework for improving the circularity of existing buildings](#)', *Sustainable Production and Consumption*, Vol. 40, pp. 422-443.
- Chatzipavlidis, A., Lekawska-Andrinopoulou, L., Chatziioannou, K., Tsimiklis, G. and Amditis, A. (2024), '[Unlocking Circular Innovation: Defining Integral Content for Digital Product Passports in the Wood Value Chain for Optimal Upcycling and Valorization of Wood By-products](#)', 11th International Conference on Sustainable Solid Waste Management, Rhodes, 19–22 June.
- European Commission (2020), '[A new circular economy action plan: For a cleaner and more competitive Europe](#)', COM(2020) 98 final, Brussels, 11 March.
- European Commission (2022), '[Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on Making Sustainable Products the Norm](#)', COM(2022) 140 final, Brussels, 30 March.
- European Commission (2025). '[COMMUNICATION FROM THE COMMISSION Ecodesign for Sustainable Products and Energy Labelling Working Plan 2025-2030](#)', COM(2025) 187 final, Brussels, 16 April. European Commission.
- European Commission (2024), '[COMMISSION IMPLEMENTING DECISION on a standardisation request to the European Committee for Standardisation, the European Committee for Electrotechnical Standardisation, and the European Telecommunications Standards Institute as regards digital product passports in support of Union policy on ecodesign requirements for sustainable products and on batteries and waste batteries](#)', C(2024)5423, Brussels, 31 July.
- Götz, T., Berg, H., Jansen, M., Adisorn, T., Cembrero, D., Markkanen, S., and Chowdhury, T. (2022), '[Digital product passport: The ticket to achieving a climate neutral and circular European economy?](#)', University of Cambridge Institute for Sustainability Leadership (CISL) and the Wuppertal Institute, Cambridge.
- Honic, M., Kovacic, I., Aschenbrenner, P., and Ragossnig, A. (2021), '[Material Passports for the end-of-life stage of buildings: Challenges and potentials](#)', *Journal of Cleaner Production*, Vol. 319.

Ikenze, N., Rizos, V. and Nipius, L. (2024), [Improving waste wood circularity in the EU: Classification frameworks and policy options](#), CEPS In-Depth Analysis, CEPS, Brussels, 12 November.

Jensen, S. F., Kristensen, J. H., Adamsen, S., Christensen, A., and Waehrens, B. V. (2023), [Digital product passports for a circular economy: Data needs for product life cycle decision-making](#), *Sustainable Production and Consumption*, Vol. 37, pp. 242–255.

Liu, J., Liu, Z., Yang, Q., Osmani M., and Darmian P. (2022), [A Conceptual BC Enhanced Information Model of Product Service Systems Framework for Sustainable Furniture](#), *Buildings*, Vol. 13, No. 1.

Plociennik, C., Pourjafarian, M., Nazeri, A., Windholz, W., Knetsch, S., Rickert, J., Ciroth, A., Precci Lopes, A. do C., Hagedorn, T., Vogelgesang, M., Benner, W., Gassmann, A., Bergweiler, S., Ruskowski, M., Schebek, L., and Weidenkaff, A. (2022), [Towards a Digital Lifecycle Passport for the Circular Economy](#), *Procedia CIRP*, Vol. 105, pp. 122–127.

Ranacher, L., Stocker, R., Riegler, M., Schwarzbauer, P., and Hesser, F. (2023), [Digitalization of small and medium sized sawmills in austria: a survey about business processes](#), *European Journal of Wood and Wood Products*, Vol. 81, pp. 267–280.

Rizos, V., and Urban, P. (2024), [Implementing the EU Digital Battery Passport: Opportunities and challenges for battery circularity](#), CEPS In-Depth Analysis, CEPS, Brussels, 7 March.

Rusch, M., Schöggel, J.P., and Baumgartner, R.J. (2022), [Application of digital technologies for sustainable product management in a circular economy: A review](#), *Business Strategy and the Environment*, Vol. 32, Special Issue, pp. 1159–1174.

Steinwender, A., Gallina, V., Litvyak, O., Lampoltshammer, T. J., Bachlechner, D., and Schlund, S. (2024), [From Analogue to Digital Product Passports in the Furniture Industry](#), *IFAC-PapersOnLine*, Vol. 58, No. 19, pp. 229–234.

van Capelleveen, G., Vegter, D., Olthaar, M., and van Hillegersberg, J. (2023), [The anatomy of a passport for the circular economy: a conceptual definition, vision and structured literature review](#), *Resources, Conservation & Recycling Advances*, Vol. 17.

6. ANNEXES

6.1. ANNEX I: INTERVIEWEES' AFFILIATIONS AND POSITIONS

Interview Number	Affiliation	Interviewee Position
1	Research Institute	Technical Manager
2	Research Institute	Senior Researcher
3	Research Institute	Project Manager
4	Research Institute	Senior Researcher
5	Industry Association	Managing Director
6	Consultancy	Senior Account Manager
7	Academia	Professor
8	Research Institute	Senior Researcher
9	Industry Association	Digitalisation Manager

6.2. ANNEX II: QUESTIONNAIRE USED FOR THE INTERVIEW CONSULTATION

- 1) What considerations are important in determining the appropriate content or data for wood-based product DPPs?
- 2) If the EU moves towards a mandatory DPP for wood-based products, what content and data should such a DPP contain for best valorisation potential? Which categories of data should be prioritised to support the best valorisation potential while ensuring that that these categories of data can be properly collected and verified across supply chains?
- 3) How far do you think the EU should go in terms of setting the DPP requirements? Which principles should be horizontally applied to avoid fragmentation of available solutions while leaving room for innovation?
- 4) What considerations are important in determining the appropriate format or system for DPPs for wood-based products. In your view, what format or system should be adopted for wood-based product DPPs?
- 5) Are you aware of any recent technological developments in the area of DPPs? Are there particular technologies you foresee playing a critical role in the implementation of DPPs for wood-based products?

- 6) Are you aware of any existing DPP initiatives, especially focused on wood-based products? To your knowledge, what challenges and successes have these initiatives seen?
- 7) What opportunities for waste wood valorisation do you foresee with the move toward DPPs for wood-based products?
- 8) What challenges for waste wood valorisation do you foresee with the adoption of DPPs for wood-based products?
- 9) Beyond the DPP, what other challenges (policy, market, economic, societal) do you foresee for scaling up wood valorisation in the EU?

WOOD2WOOD PROJECT INFORMATION

This report has been prepared as part of the EU-funded [Wood2Wood project](#) which aims to leverage waste wood as a sustainable resource to meet Europe's rising demand for wood-based products while also combating deforestation, biodiversity loss, and emissions tied to virgin wood harvesting. Over its four-year duration, the project will advance the circular economy and transform waste wood valorisation to meet future demand by turning construction and demolition (C&D) and furniture waste wood into valuable wood-based products through cutting-edge technologies and digital tools for efficient waste wood processing. The project will facilitate effective implementation of its technological innovations through development of a supportive framework focused on policy, the market, skills development, and standardisation. This report forms a part of the Wood2Wood supportive framework, paving the way for improved waste wood circularity in the EU through recommendations for harmonisation of waste wood classification and policy options to support waste wood valorisation.

PROJECT PARTNERS



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