

Applying cascading and substitution principles for a careful resource use in wood-based construction products

M. Sc. Anna Wagner

Technical University Munich

Department of Civil, Geo and Environmental Engineering

Chair of Timber Structures and Building Construction

Online conference, 08. September 2021



LCM
2021

Agenda

1. General Background
2. Research question
3. Method
4. Results
5. Discussion and conclusion

Background – Current use of wood based products

Recycling paper – **circular use**



Wooden construction products – **linear use**



<https://bit.ly/3g2ldpS>



<https://bit.ly/3g4U7PX>

Background – Basic Work Requirement 7 of Construction Product Regulation

BWR 7 Sustainable use of natural resources

*“The construction works must be designed, built and demolished in such a way that the **use of natural resources is sustainable** and in particular ensure the following:*

- ***(a) reuse or recyclability of the construction works, their materials and parts after demolition;***
- *(b) durability of the construction works;*
- *(c) use of environmentally compatible raw and secondary materials in the construction works.”* ^[1]

^[1] European Construction Product Regulation

Research questions

- How is a circular use of wooden resources in construction products characterised?
- Which concepts and criteria are necessary to be defined and applied for a circular wooden resource use in construction products?
- What principles and measures should be considered during the development of wooden or wood based construction products to fulfil BWR7a ?

Method – Taking a close look at cascading wooden construction products

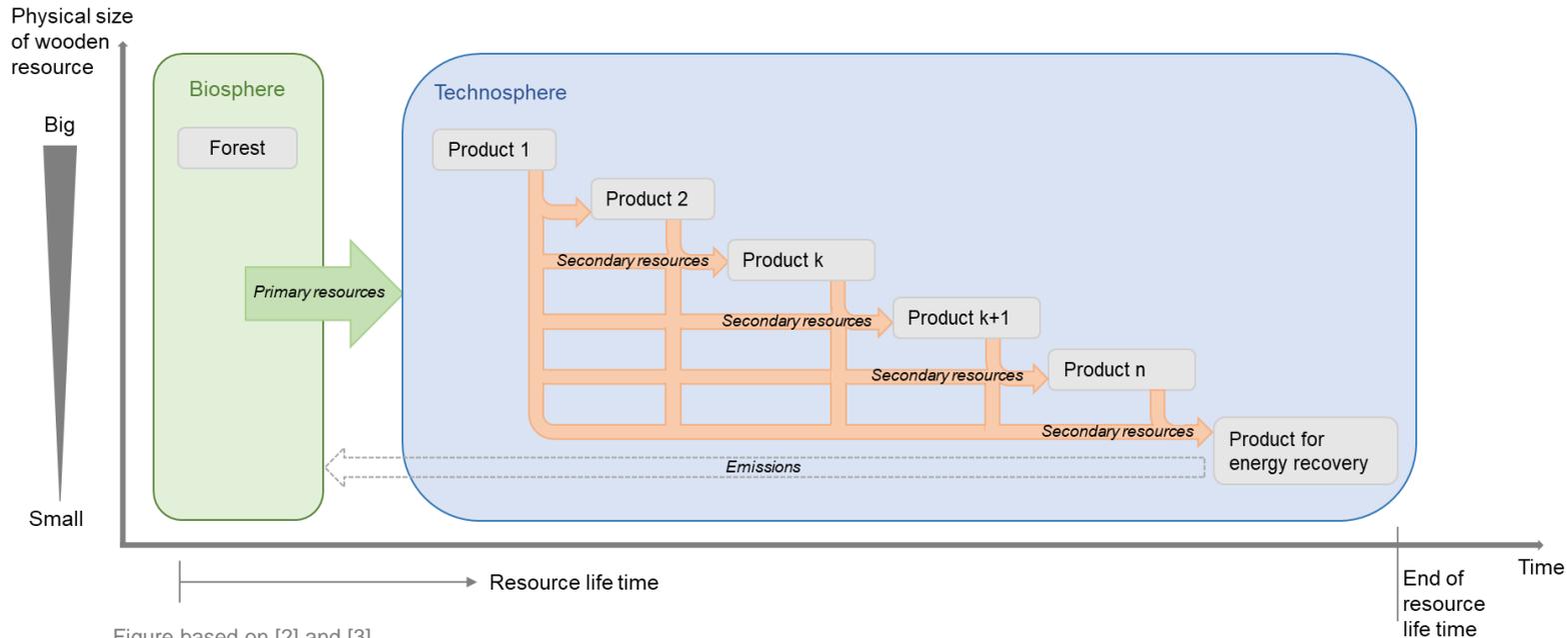


Figure based on [2] and [3]

Method – Communication sheet



Communication sheets

= **General guideline** to support decision making during the development of circular wooden and wood-based construction product

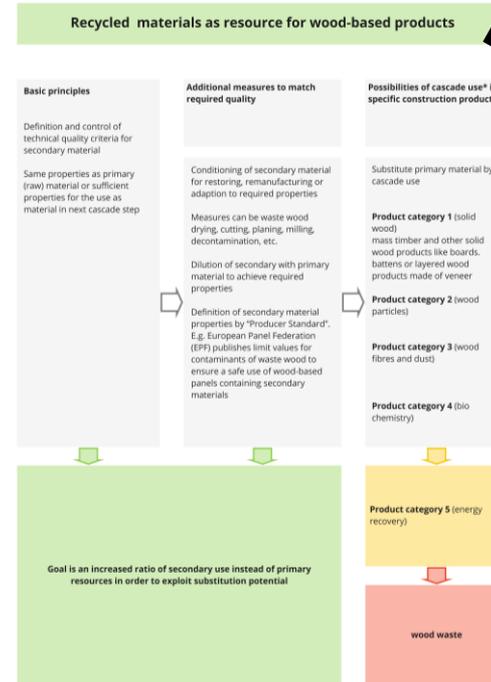
Structure and Content

- Topic
- Goal
- Basic principles
- Additional Measures
- Possibilities of cascade use

Results – Communication sheets as general guideline



Recyclability of wood-based products and components



Recycled materials as resource for wood-based products

Discussion and conclusion

Research questions:

- How is a circular use of wooden resources in construction products characterised?
- Which concepts and criteria have to be defined and applied to enable a circular wooden resource use in construction products?
- What principles and measures should be considered during the development of wooden or wood based construction products to fulfil BWR7a ?

References

- [1] Directive 89/106/EEC: Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9. March 2011. Laying down harmonised conditions for the marketing of construction products and repealing. Official Journal of the European Union.
- [2] Höglmeir (2015): Holznutzung in Kaskaden: Ansätze zur Potentialanalyse und zur Weiterentwicklung der ökobilanziellen Bewertung. Dissertation. Technical University Munich. Fakultät Wissenschaftszentrum Weihenstephan für Ernährung, Landnutzung und Umwelt, Lehrstuhl für Holzwissenschaft
- [3] Sirkin, ten Houten (1994): The Cascade Chain. A Theory and Tool for Achieving Resource Sustainability with Applications for Product Design. Resources, Conservation and Recycling, 10 (1994) 213-277. Elsevier Science B.V.
- [4] Schmidt (2015): Holzschutz. Bauliche Maßnahmen GK0. Holzbau Handbuch, Reihe 5, Teil 2, Folge 2, Informationsdienst Holz. Holzbau Deutschland-Institut e.V.

Thank you for your attention!