EUROPEAN FOREST INSTITUTE

Wood-based products in climate change mitigation

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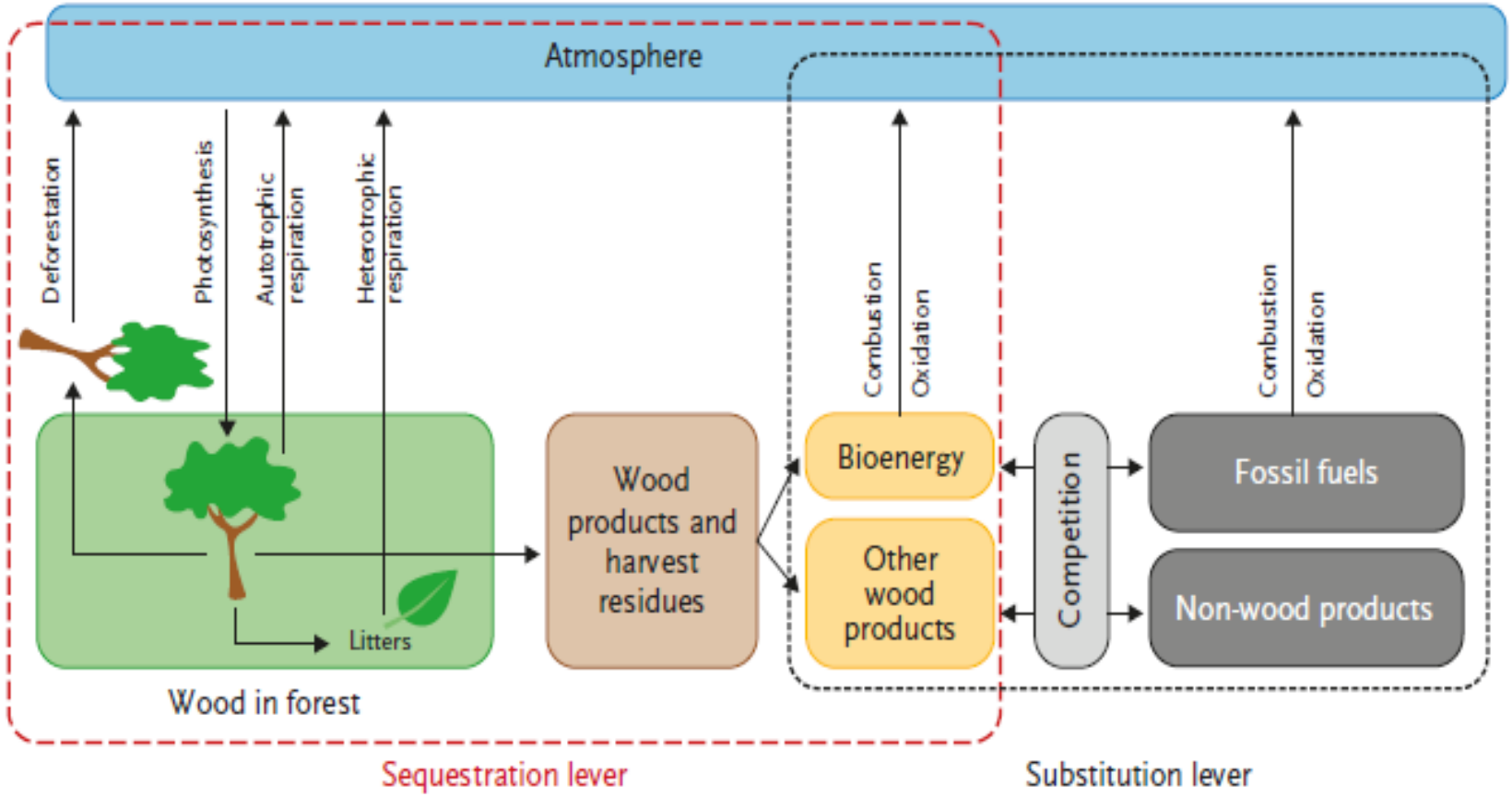
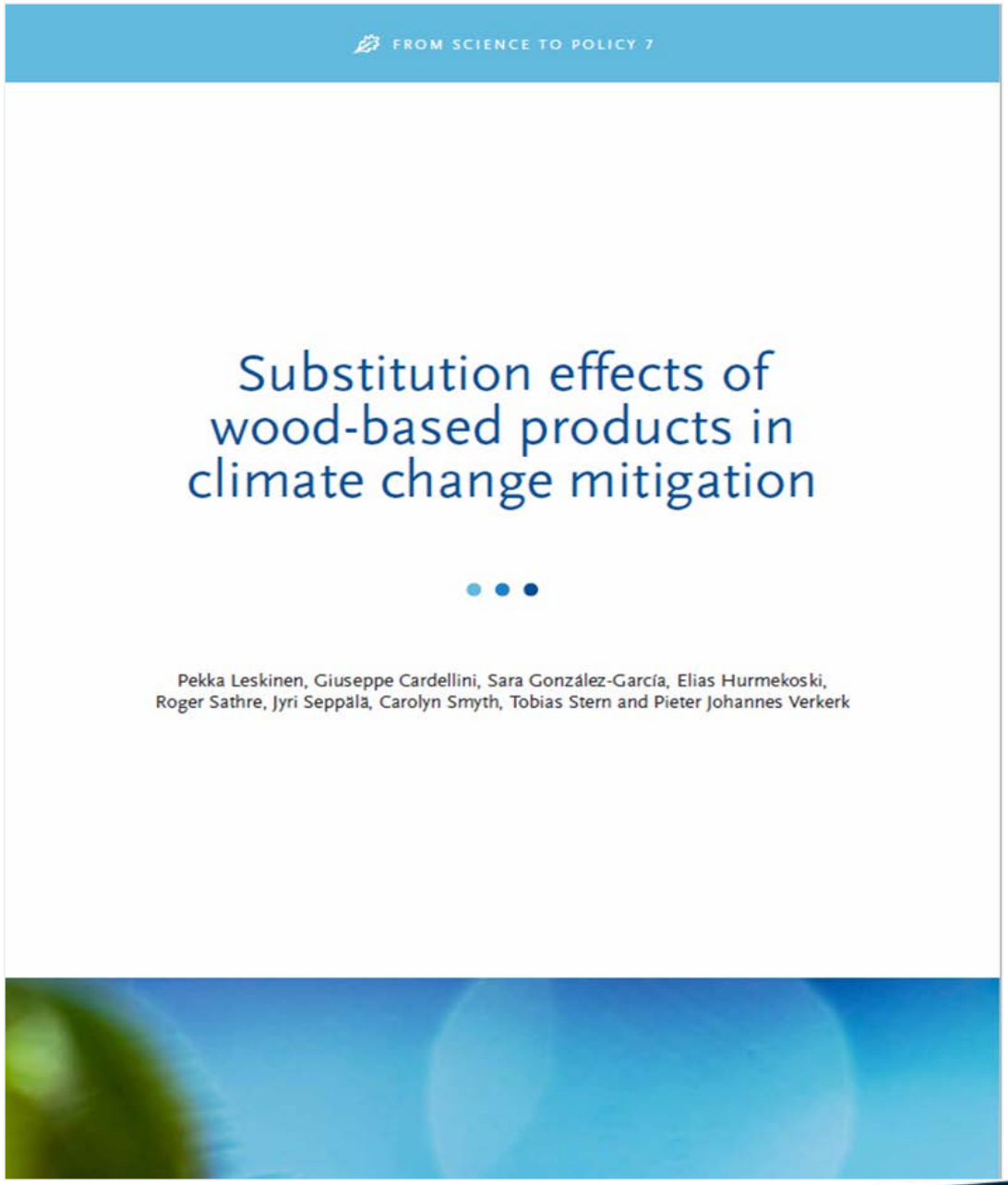
Carbon stocks and flows (Nabuurs et al.)



Substitution is about technosystem emisssion of wood-based products compared to non-wood products.


FROM SCIENCE TO POLICY 7
Substitution effects of wood-based products in climate change mitigation
Pekka Leskinen, Giuseppe Cardellini, Sara González-García, Elias Hurmekoski, Roger Sathre, Jyri Seppälä, Carolyn Smyth, Tobias Stern and Pieter Johannes Verkerk

Aims

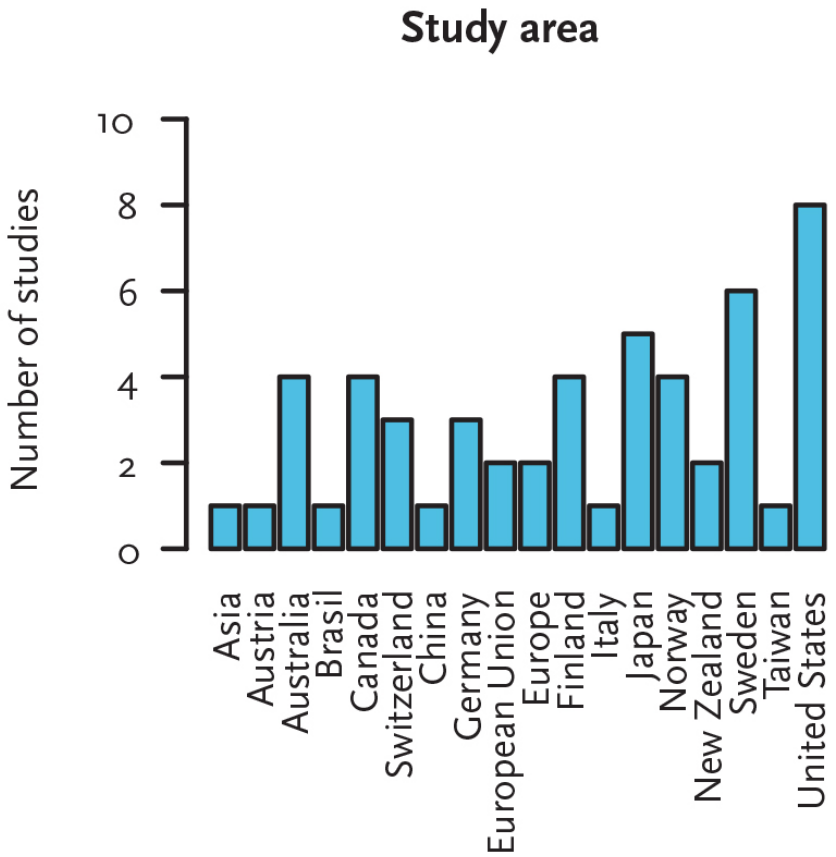
Review current scientific knowledge of GHG substitution effects of wood-based products.

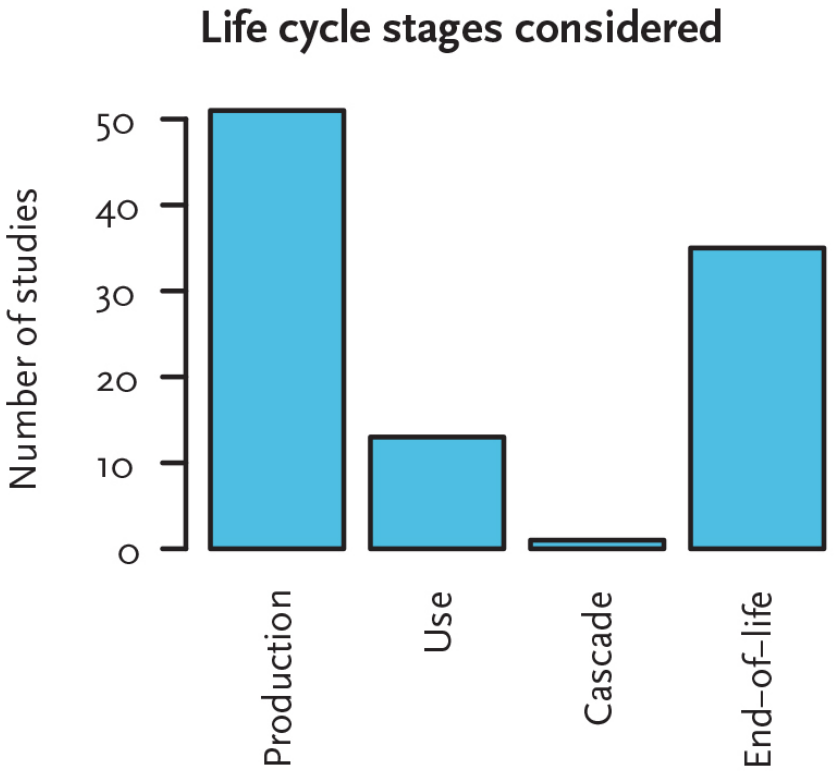
- **Defining and assessing** GHG substitution factors of wood products
- **Magnitudes** of GHG substitution effects of wood-based products
- **Upscaling** substitution factors from product level to market level
- **Scale of overall substitution benefits** at market level
- Applying substitution factors **in decision making and policy planning**

PublicDomainPictures; Pixabay

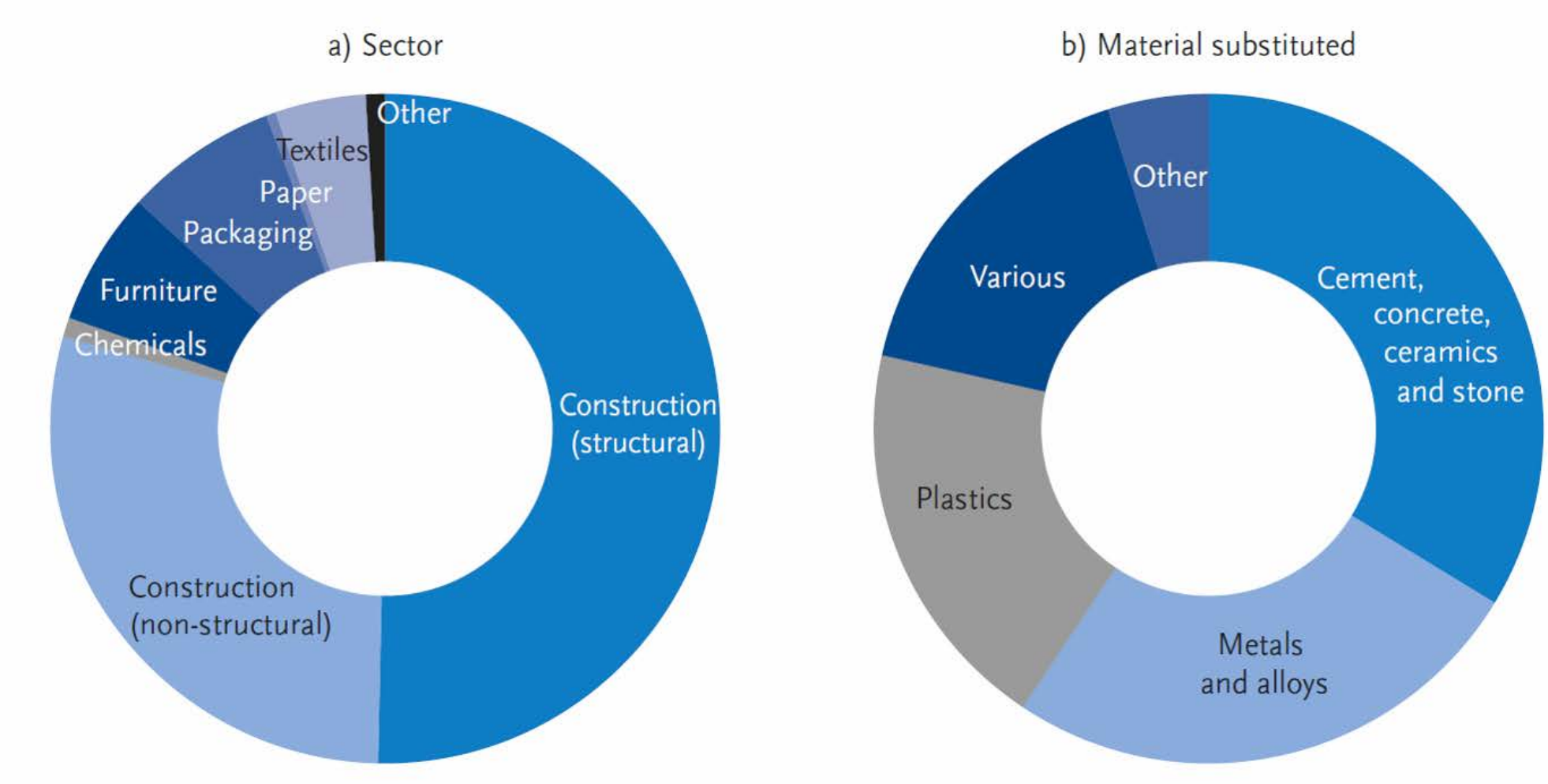
Results

51 studies: 433 separate substitution factors





Sectors and materials

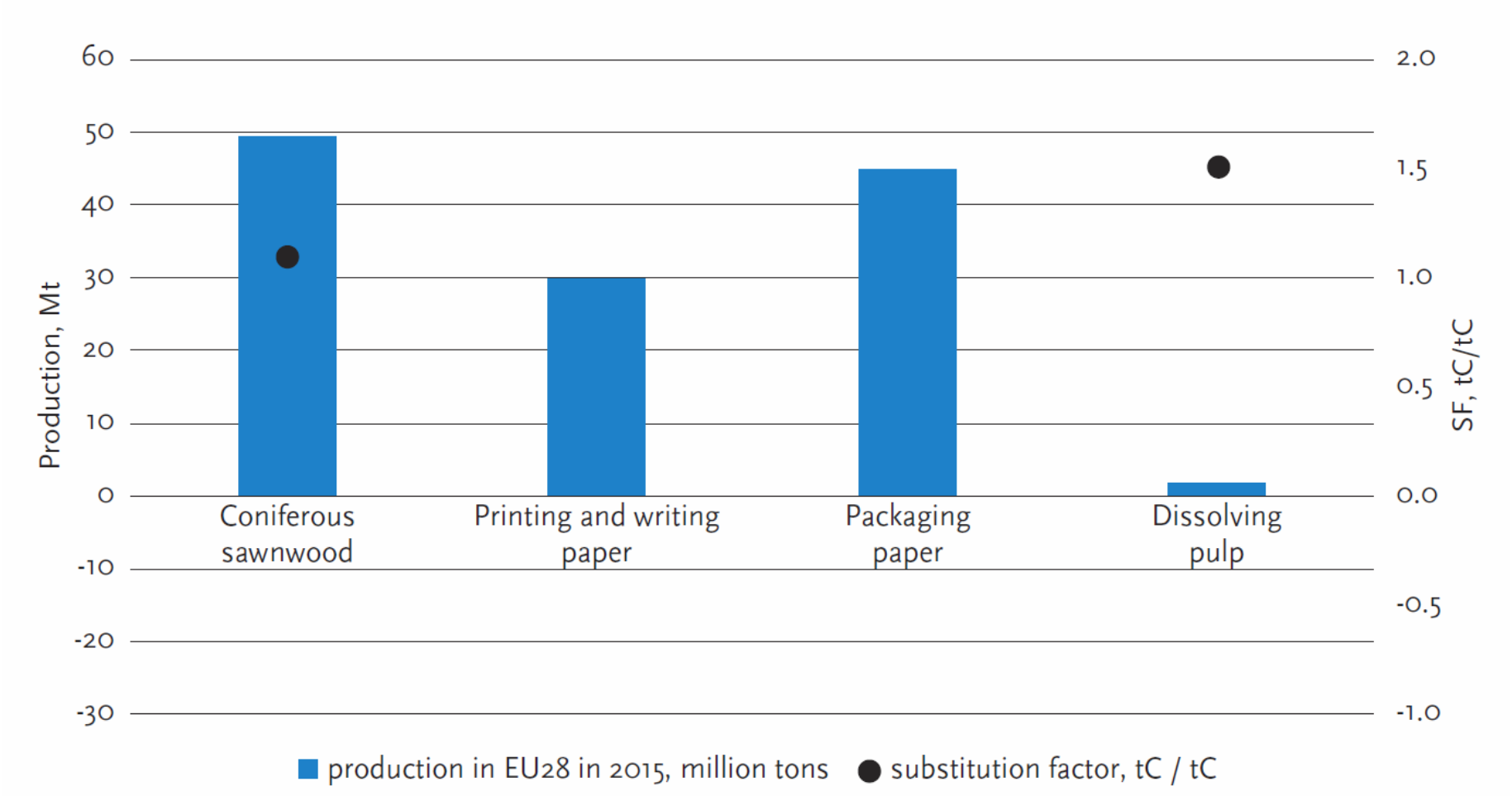


Average substitution effects

Product categories	Average substitution effect kg C / kg C wood product	Average substitution effect kg CO2 eq. / kg wood product
Structural construction	1.3	2.4
Non-structural construction	1.6	2.9
Textiles	2.8	5.1
Other product categories	1 – 1.5	1.8 – 2.7
Average across all product categories	1.2	**2.2***

*** 95% of the substitution factors between [-1.3, 9.3]**

From products to market level



Life Cycle Assessment is key

Emissions of a product depend on all life cycle stages:

- **Production**
- **Use and maintenance**
- **Cascading** effects of recovery of materials from end-of-life products
- **End-of-life**

All can be important and should be taken into account!

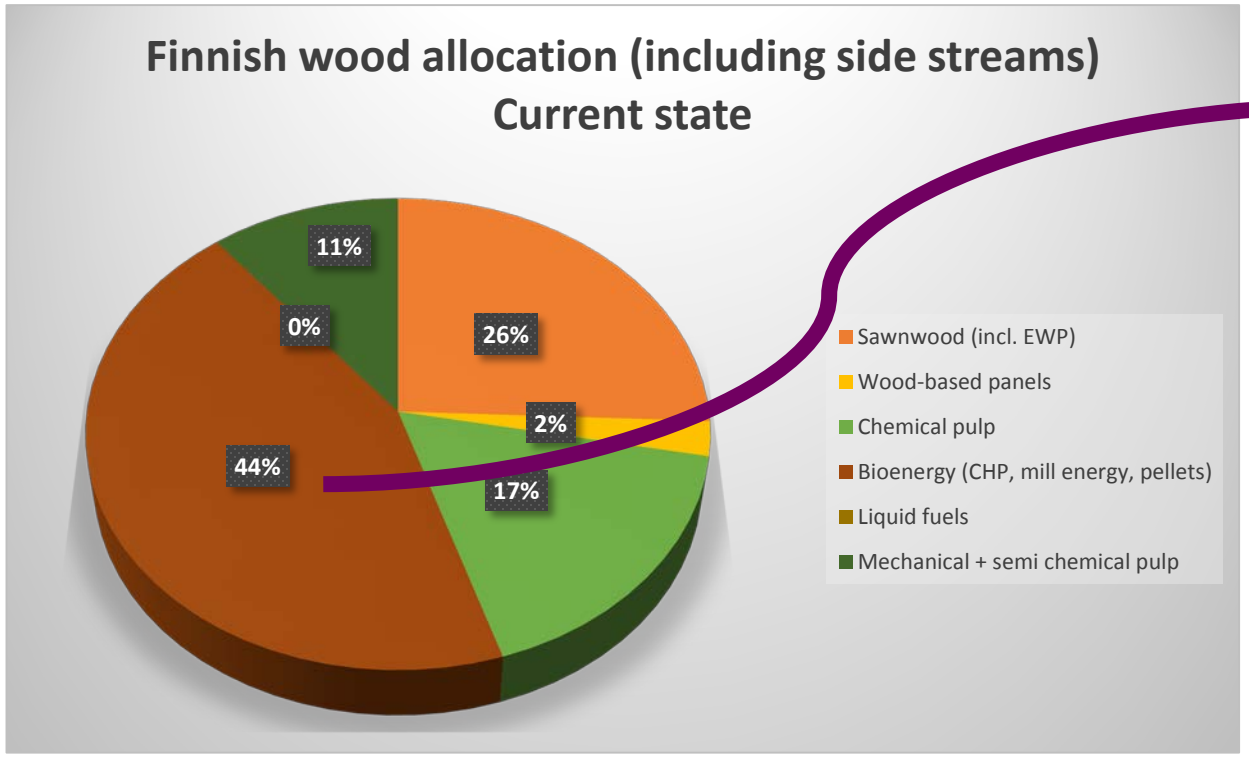
Role of circularity in bioeconomy: Case textiles (Lauri Hetemäki)

- Bioeconomy alone is not enough, but the recycling and circularity has to be built already at the design states of new products and businesses

- **Textile industry** is a big sector, in which recycling is in a bad shape, or it does not even exist

- Circular bioeconomy requires that those businesses, like forest industry, which are entering the sector, have to start to establish recycling institution, together with customers and policy makers *(c.f. paper recycling)*

Climate change mitigation through product substitution: Participative backcasting on the uses of wood in Finland (Janni Kunttu)

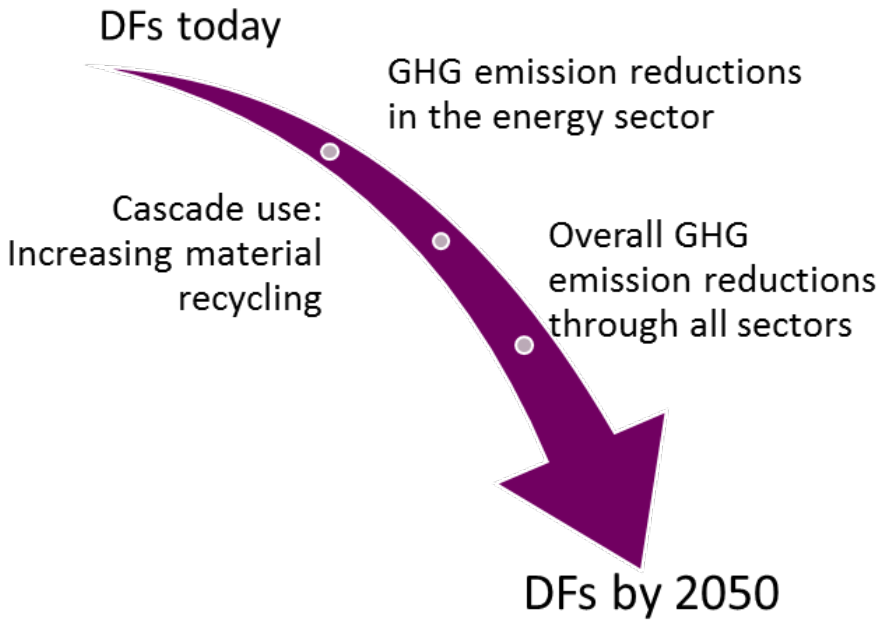


- Sidestreams are mostly used for energy *to date*
- **How to allocate wood flows for high DF material uses in the future?**

- Technical development (energy efficiency, alternative energy sources) is one driver in this transition

Climate change mitigation through product substitution: Participative backcasting on the uses of wood in Finland (Janni Kunttu)

- Future GHG **emission reductions** and increasing use of **recycled** materials
- **Technical constrains** for 'DF maximising wood utilisation patterns'
- **Market viability** and strategy development



Key messages

1. Use of wood and wood-based products is associated with **lower fossil and process-based emissions** when compared to non-wood products

2. Substitution factor is **not sufficient** to guide policy making – needs a holistic approach

3. **Resource-efficiency and minimizing material waste** should be simultaneous policy target with climate mitigation

4. **Lack of knowledge on climate impacts of emerging forest products** – textiles, packaging, chemicals

5. **Existing product portfolios can be improved to have better mitigation impacts!**

shock - Fotolia


1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
5 GENDER EQUALITY
6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY
8 DECENT WORK AND ECONOMIC GROWTH
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
10 REDUCED INEQUALITIES
11 SUSTAINABLE CITIES AND COMMUNITIES
THE GLOBAL GOALS
For Sustainable Development
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
16 PEACE AND JUSTICE STRONG INSTITUTIONS
17 PARTNERSHIPS FOR THE GOALS

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Thank you!

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