Improving on nature- Making wood better

Improving wood properties for a sustainable future

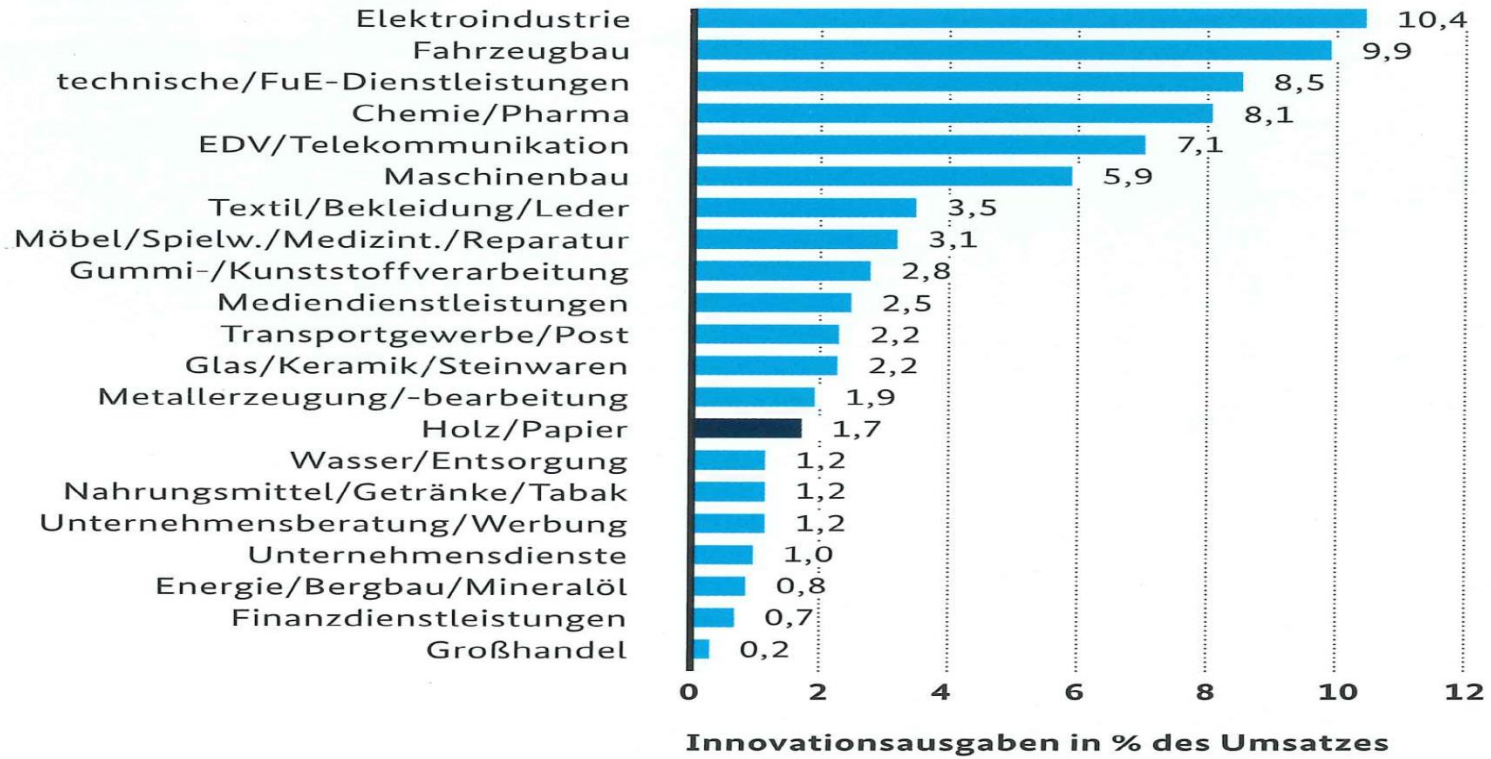
Holger Militz

My own background…

- Wood Science MSc/ Diploma University Hamburg 1987
- Researcher at TNO Timber Research Netherlands 1987-1990
  - Areas: wood technology/ wood drying/ wood preservation
- Founder and Head of SHR Timber Research (NL) 1990-2000
  - PhD „Improvement of impregantion of spruce wood“
  - Part-time professor „Wood Science“ at University Wageningen
- Professor „Wood Biology and Wood Products“ University Göttingen
  - Areas: wood technology, wood quality, wood composites, wood preservation/ protection/ wood modification

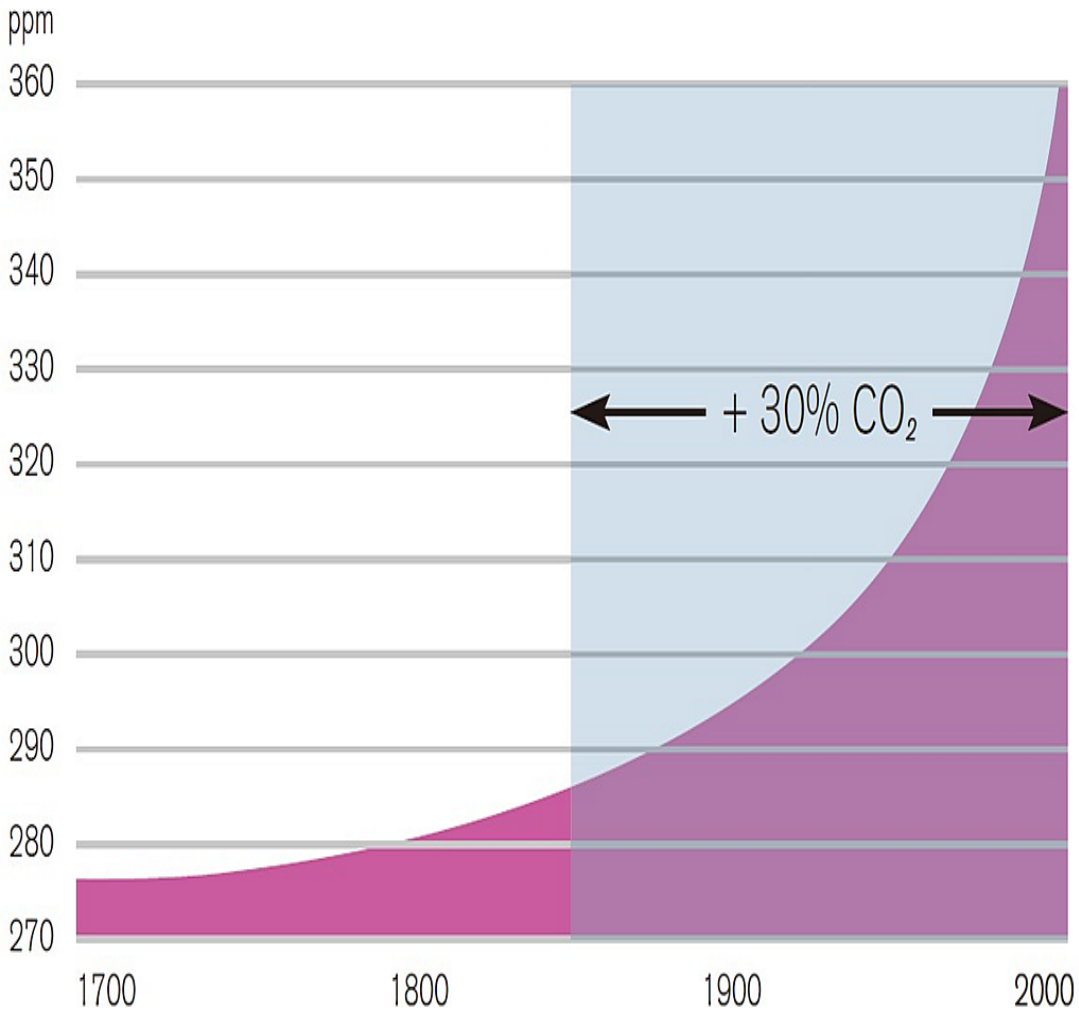
Wood research is needed to solve the main challenges of mankind!

Innovation in different sectors (% of turnover, 2015)



Quelle: ZEW/ISI (2017): Mannheimer Innovationspanel, Befragung 2016

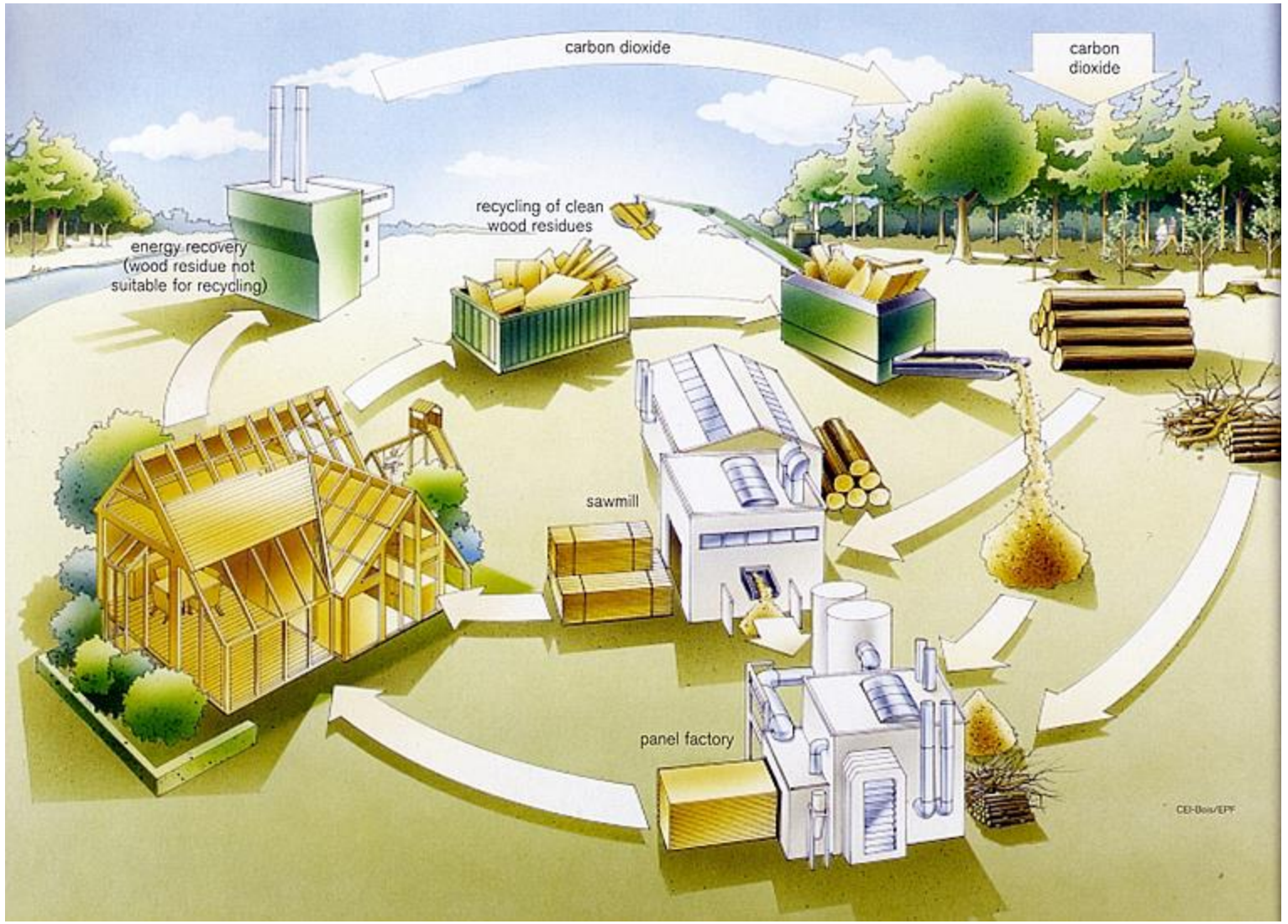
Main challenges…



http://www.europeanwood.org.cn/en/carbon-sink-climate

Long term carbon storage in wood products

Cascading wood and wood products

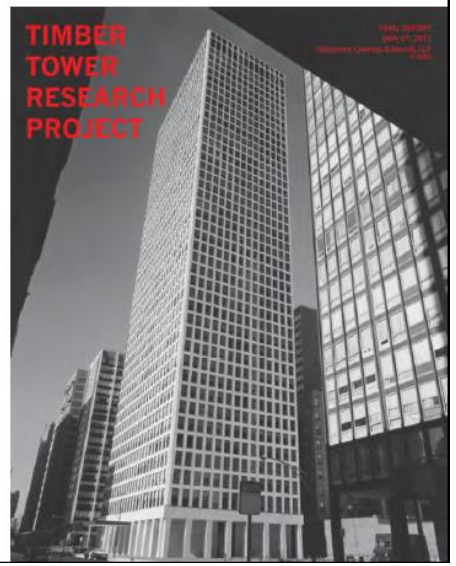


Wood use nowadays…

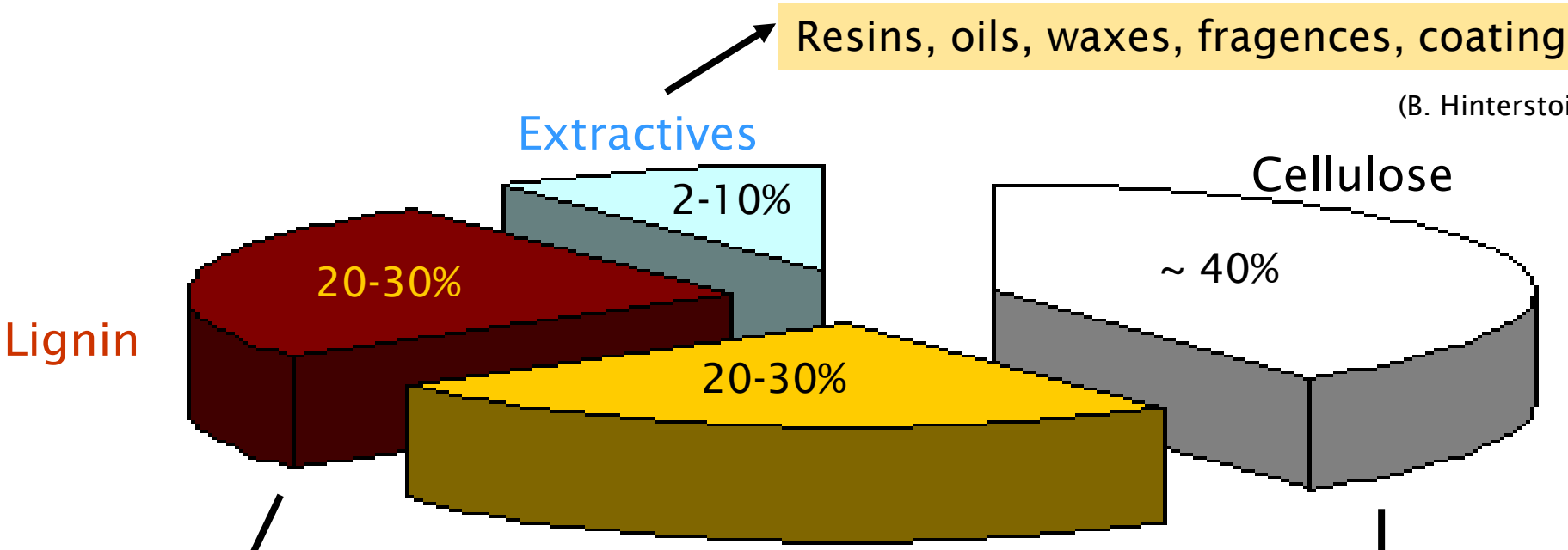
Wood use nowadays and in the future…

Immer mehr in die Höhe:
Schweden, Norwegen, Österreich, USA . . .

Vienna: 84 m high, 24 storage



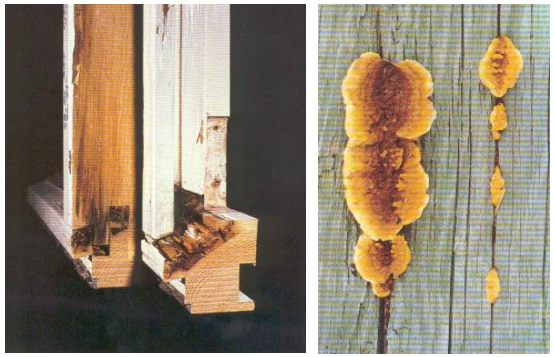
Wood use as resource for bio-economy



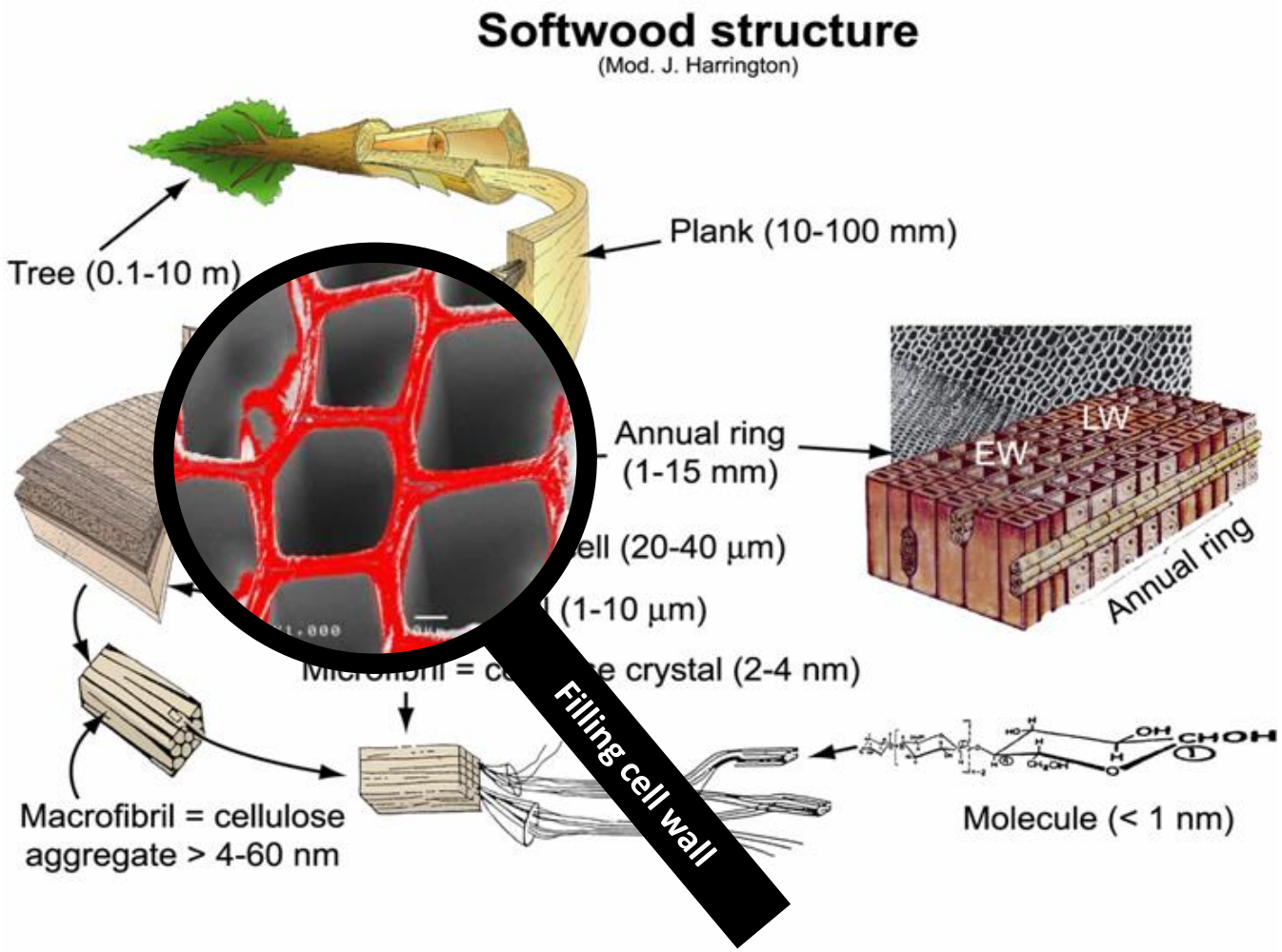
Wood: usable for nearly everything…

How to store CO2 as long as possible?

- Use wood indoors (no degradation by weather, fungi..)
- If to be used under outside/ natural weathering conditions:
  - Design products in adequate way..
  - Durable wood species (durability class 1-2)
  - Biocides
  - Wood modification!



What is wood modification?



Wood modification technology

- Heat treatment
- Acetylation (Accoya)
- Furfurylation (Kebony)
- Silicone/Silane
- Oil / Wax/ Parafins
- UF resin (China)

→ On the market
production capacity

- Melamine resin
- DMDHEU (Belmadur)
- PF resin

→ Production capacity
Planning phase/ built

- Chitosan
- Extractives
- Sorbitol/ CA

→ Research activities

Challenges: “from idea to commercial applications”

(PhD defense Stig Lande 2008/ ECWM 2009 Militz, Lande)

- Basic research
- Raw materials
  - Chemical reactions
  - Process parameters

- Upscaling technology
- Material interactions
- Quality control
- Market requirements

- Market
- Economy
- Intellectual properties

What is needed…

- A wood industry what is innovative and future oriented..
- Good funding structure of R&D for SME
- Good research infrastructure
  - Research institutes
  - Universities
- Good educated young people who face the challenges!