

Tall wood buildings – Danish perspective



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A growing business:

Almanac Market Data

Engineered wood market to reach \$41.3 billion globally by 2022

By **Robert Dalheim** February 09, 2017 | 1:18 pm EST

PORTLAND - A new report from market research firm Allied Market Research (AMR) projects that the global engineered wood market is estimated to reach \$41.273 billion by 2022, growing at a compound annual growth rate (CAGR) of 24.8 percent from 2016 - 2022. North America and Europe, being the developed markets, account for nearly 70 percent of global engineered wood production, while still maintaining high CAGRs.



Technological development:

Cross-Laminated Timber (CLT) as supporting structure in tall buildings

CLT – plywood on steroids...



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Wood





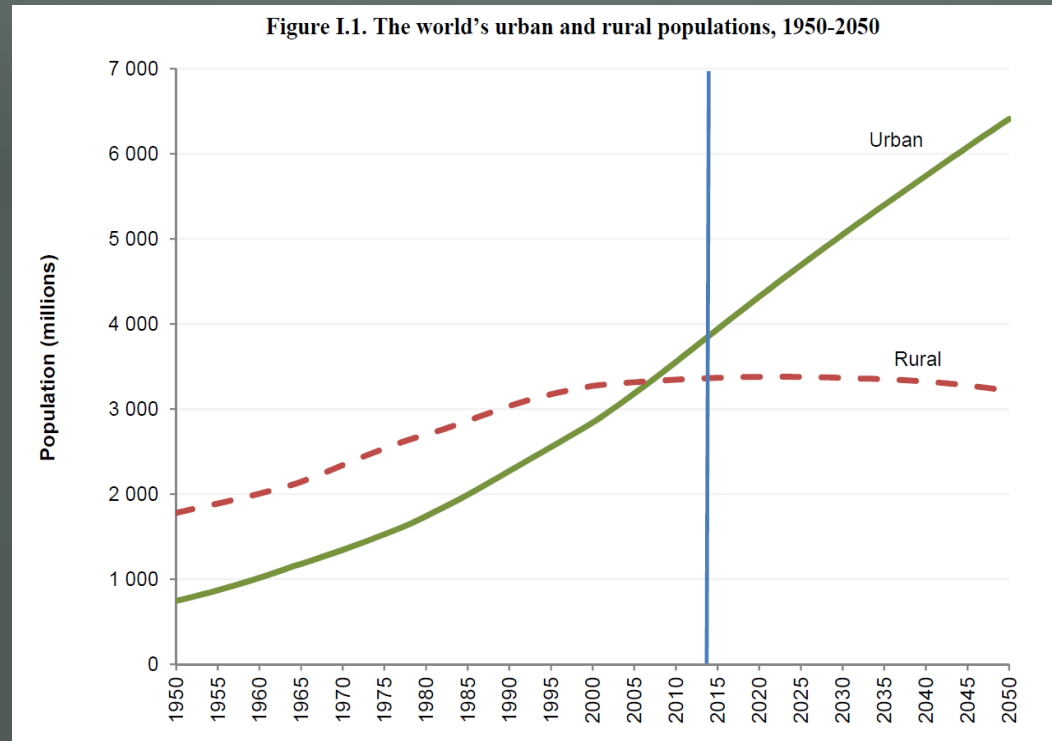
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Why tall wood buildings?

Population growth in cities...



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United Nations, Department of Economic and Social Affairs, Population Division (2015). *World Urbanization Prospects: The 2014 Revision, (ST/ESA/SER.A/366)*.

..also in Denmark...



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Copenhagen

- 100.000 new inhabitants over next 10 years
- 45.000 new homes needed

Aarhus

- 50.000 new inhabitants over next 10 years
- 20-25.000 new homes needed



..large environmental effect



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Globally, buildings account for:

- 40% of total energy consumption
- 40% of total resource consumption
- 30% of total emission of greenhouse gasses



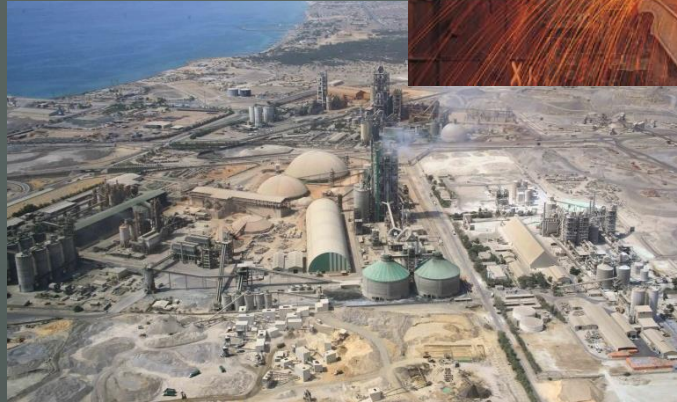
Gigantic CO₂-bill if demand is covered by concrete and steel



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Emission from production of 1000 kg:

- Steel: 1900 kg CO₂
- Concrete: 87 kg CO₂



Buildings for CO₂ storage



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Emission from production of 1000 kg:

- Steel: 1900 kg CO₂
- Concrete: 87 kg CO₂

Wood stores CO₂ as it grows

- Wood: -1700 kg CO₂ (pr. 1000 kg wood)



No focus on energy consumption in construction phase



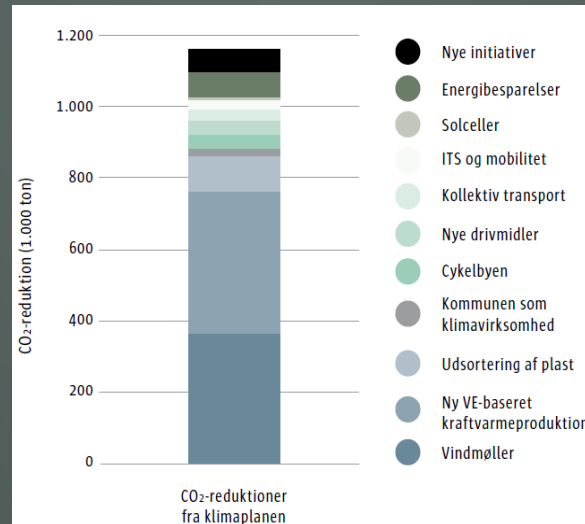
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Intense focus for 50 years on lowering CO₂ emissions from buildings use phase

E.g. Climate strategy for Copenhagen Municipality

CO₂-neutral in 2025.

No focus on building materials.



Significance of choice of materials

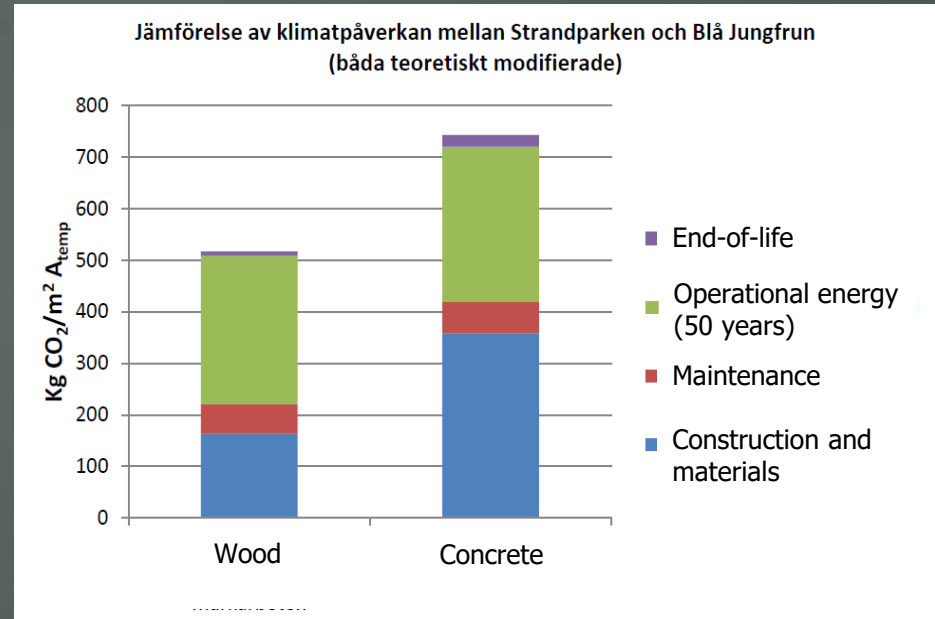
- For the life cycle of a building



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Swedish LCA:

- Construction and materials has same environmental impact as 50 years of use for a modern low-energy building
- Significant reduction of CO₂ emissions by choosing wood as building material
- Time to focus on CO₂ emissions from construction phase



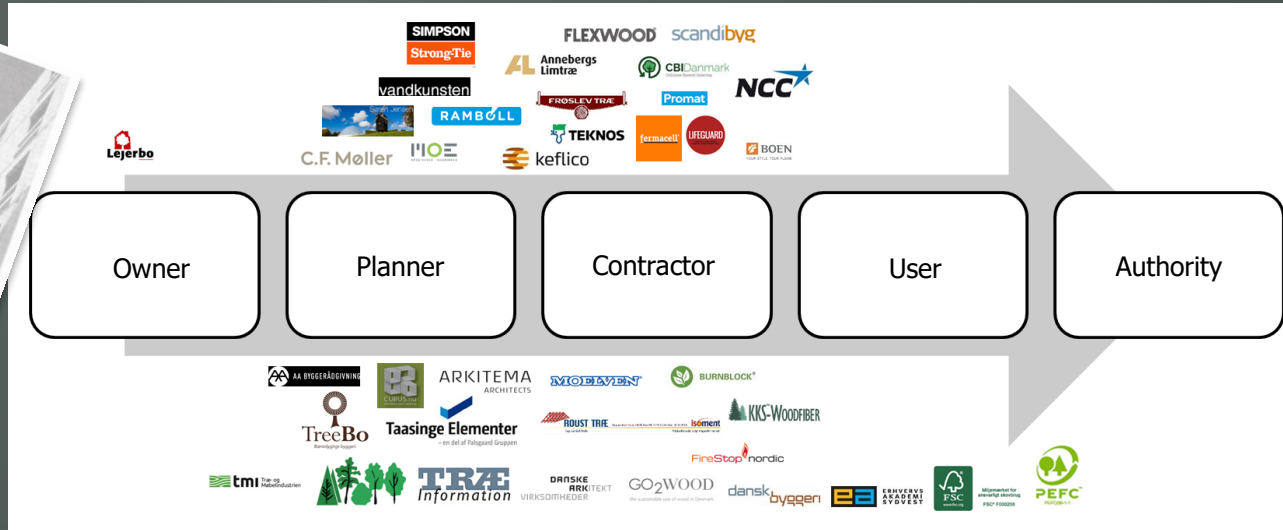
Data fra:
Byggandets Klimatpåverkan,
Livscykelberäkning av klimatpåverkan för et
nyproducerat energieffektivt flerbostadshus
med massiv stomme av trä, Sveriges
Byggindustrier, 2016

Network for tall wood buildings in Denmark

Goal: Wood should be a natural choice of material for tall buildings for the Danish building industry



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Challenges for tall wood buildings



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Wood burns



Law



Little experience



Tradition



Insurance



Economy(?)

Possibilities for tall wood buildings



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Lighter buildings – more storeys,
less impact on underground



Environmental benefits and
CO₂ reductions



Easier construction



Enhanced indoor climate



Enhanced precision

Possibilities for tall wood buildings



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Reduced number of deliveries



Reduced dust



Faster construction



Economy(?)



Architectural possibilities



Long delivery time for concrete elements

In conclusion...



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- Wood is the future!
- Population growth → large demand for new buildings
- Large CO₂ emissions from production of traditional building materials
- Building with wood causes large reductions in CO₂ emissions
- Focus on energy consumption in construction phase needed

Thank you!



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