



# Carbon footprint of wood as a construction product – Norwegian practice and research

*Presentation at 60<sup>th</sup> LCA Discussion Forum  
“Environmental use of wood resources”*

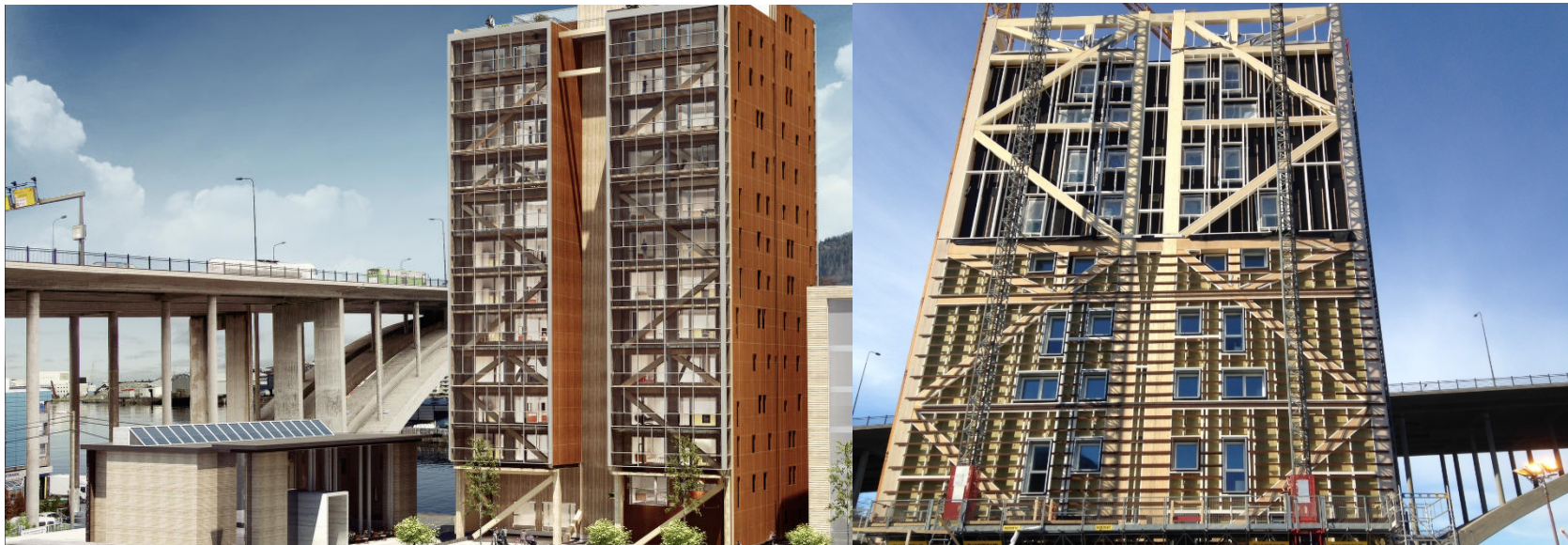
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## Carbon footprint in practice - Example: «Treet - the tallest wood building in the world»

Simplified, the reduced GHG-emissions from carbon storage in wood is eq. to 10 million cars driving the distance of the bridge (Godø, 2015-04-01).



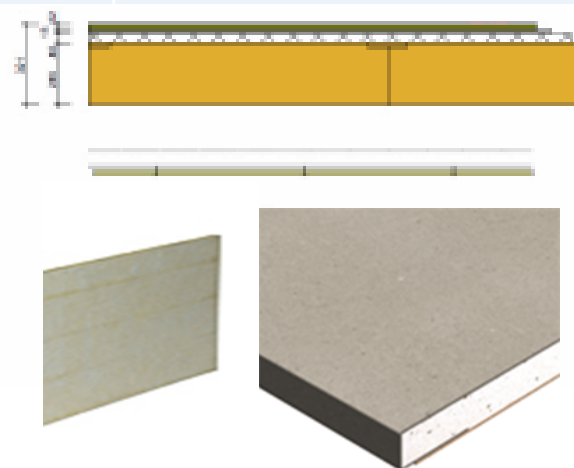
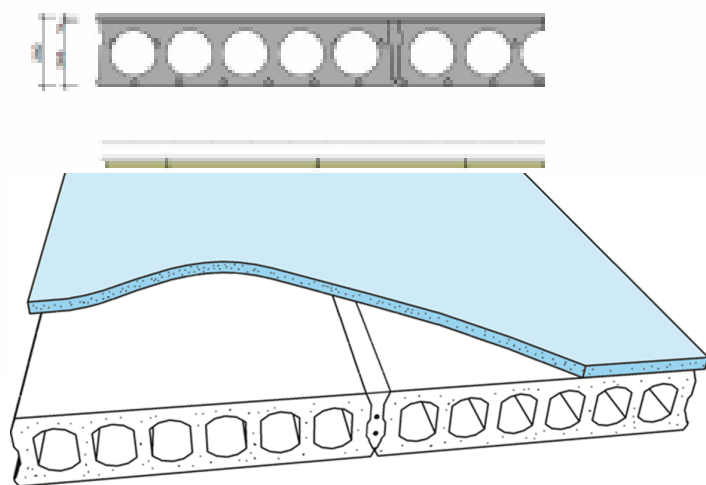
# Carbon footprint in practice - Example: “Åsveien upper secondary school”



Illustrations: Eggen Arkitekter

# Functional equivalent comparison of flooring options

	Concrete	Timber
Core material	265 mm concrete hollow element	245 cross-laminated timber
Additional materials	15 mm screed	22 mm particleboard 13 mm gypsum board 40 mm acoustic floor board
Fire	EI60	EI60
Carbon footprint kg CO <sub>2</sub> -eq.	123	55



Source: Eggen arkitekter



# Carbon footprint of buildings – current common practice

- Some simply only account for biogenic carbon storage
- More common to only account cradle to gate emissions with instant oxidation of biogenic carbon
- Maintenance and replacement where relevant
- Data from EPDs or ELCD
- Scope of building elements and comparisons varies



# Carbon footprint research example – light weight timber construction



Wood building  
weights 1/3 of steel  
and concrete  
solution

Reuse or reduced  
use of foundation  
have large carbon  
footprint reduction  
potential

Tellnes et al. (2014)



# Research on carbon footprint of wood products

Not only sound and fire for functional equivalent, weight and volume and thus including the whole building is important for comparison.

Research highlights importance of biogenic carbon, but there is a lack of consensus. Important to be transparent in environmental product declaration (EPD) for wood products.



# Standardisation effort – merging practice and research

There is an ongoing work to make a Norwegian standard for carbon footprint of buildings based national practice and

*EN 15978 Sustainability of construction works - Assessment of environmental performance of buildings - Calculation method*

Largest standardisation committee in Norway with many stakeholders

For materials, specific data representativeness requirements and scope of materials to be included are important.

BREEAM-NOR classification system for sustainable buildings was recently revisited and was based on the principles of the coming standard





# Conclusions

Several innovative uses of wood products in buildings have shown to be beneficial for reducing carbon footprint, however there is little use of standards at building level.

Practice is moving towards compliance with EN 15978 and revised BREEAM-NOR and national standard for carbon footprint will push this forward

The low weight of wood could have a large reduction potential if it reduces the need for concrete foundation



Thank you for your attention!

Questions?





# References

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Tellnes, L.G.F., Kristjansdottir, T.K., Eide, S. & Kron, M. (2014) Assessment of carbon footprint of laminated lumber elements in a six story housing – comparison to a steel and concrete solution. Proceeding to World Sustainable Building conference October 28-30, 2014.