



Biobased binders in construction

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Vision: The Transition To Biobased Construction Buildings as carbon sinks

CO2-e from materials and construction in DK

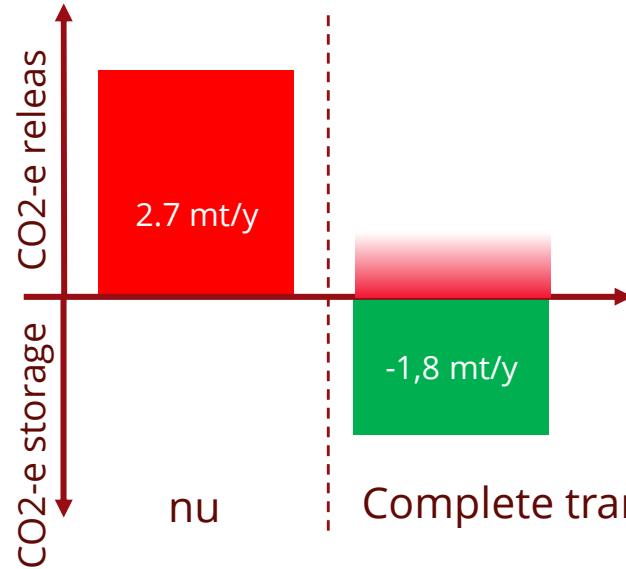


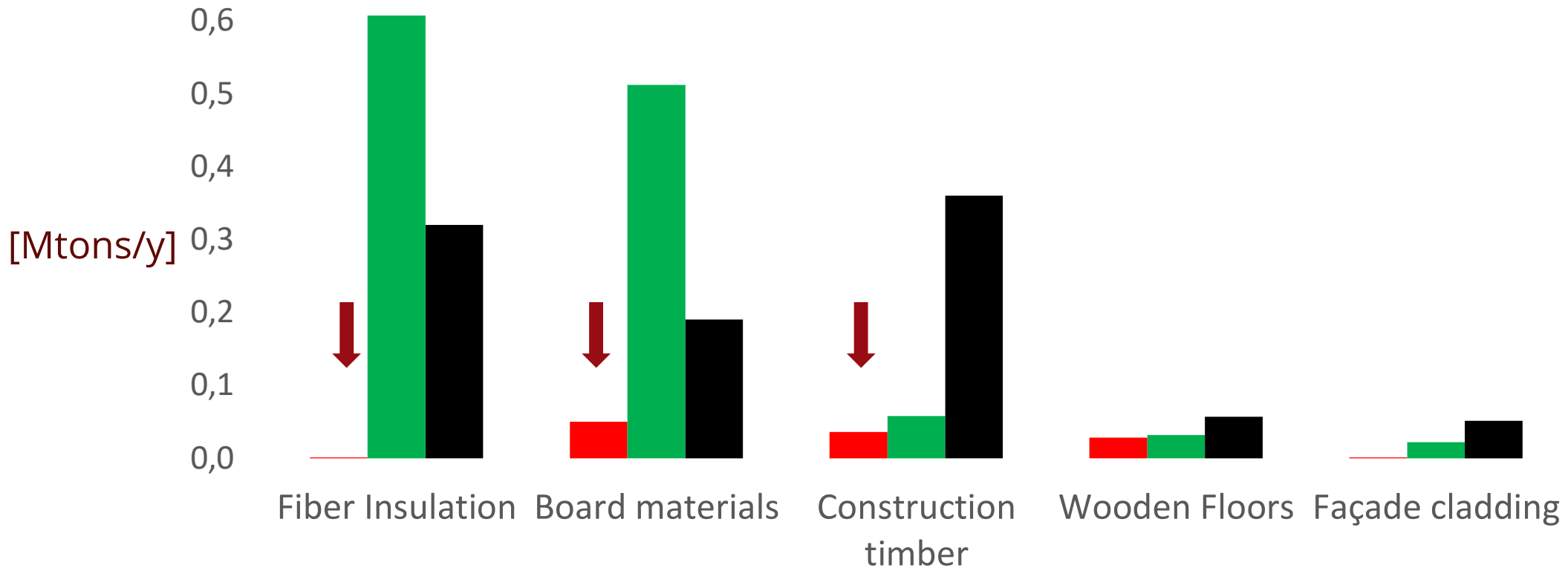
photo: Feldballe friskole (Henning Larsen architects)

Sources:
Klimapartnerskab for bygge- og anlæg, 2020
Rasmussen et al., (BUILD), 2022

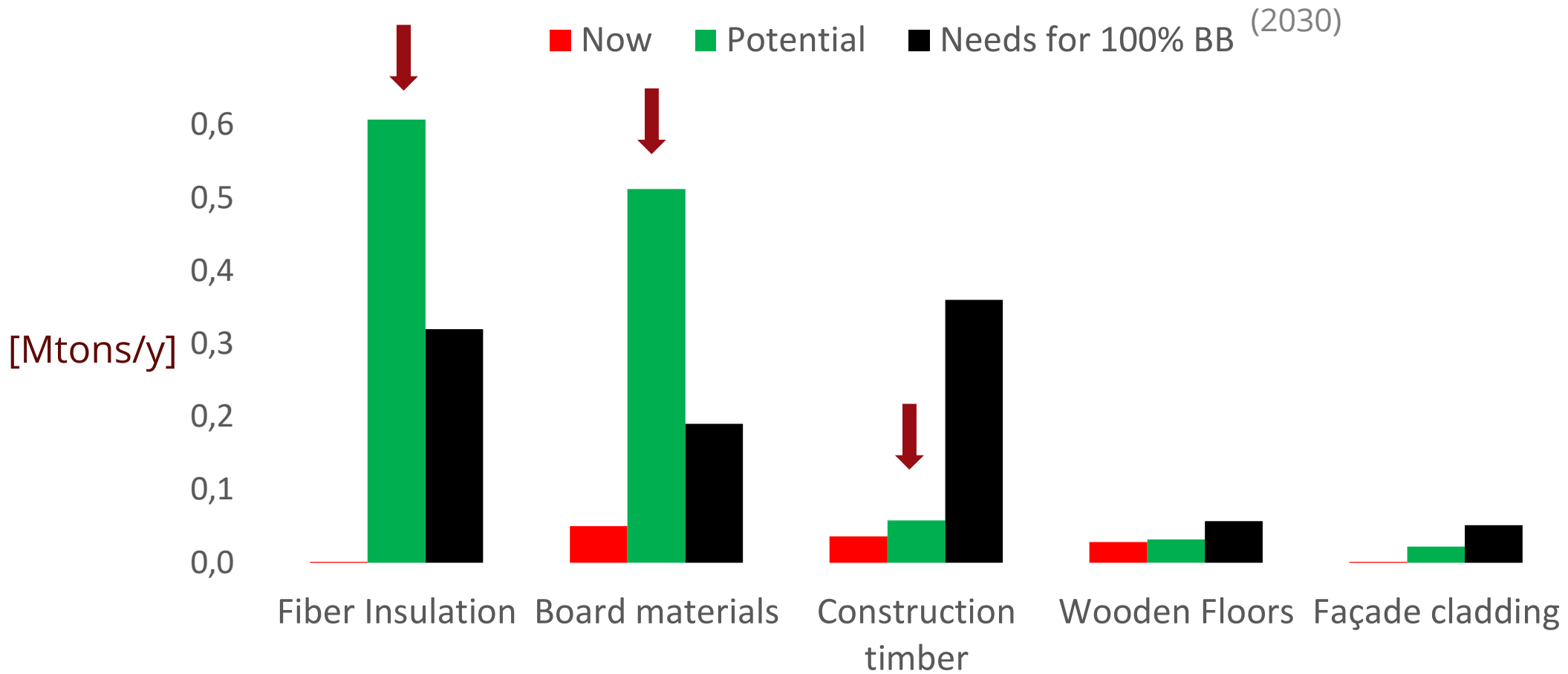
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Biobased resources in DK

■ Now ■ Potential ■ Needs for 100% BB ⁽²⁰³⁰⁾

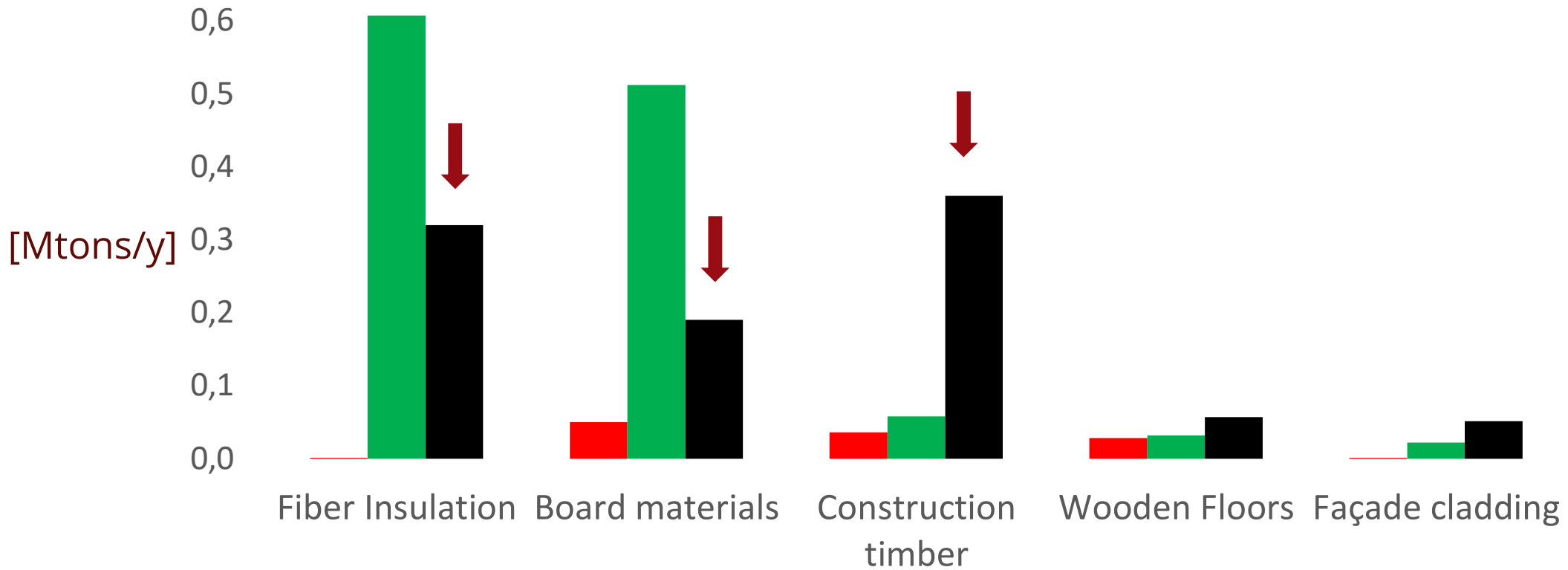


Biobased resources in DK



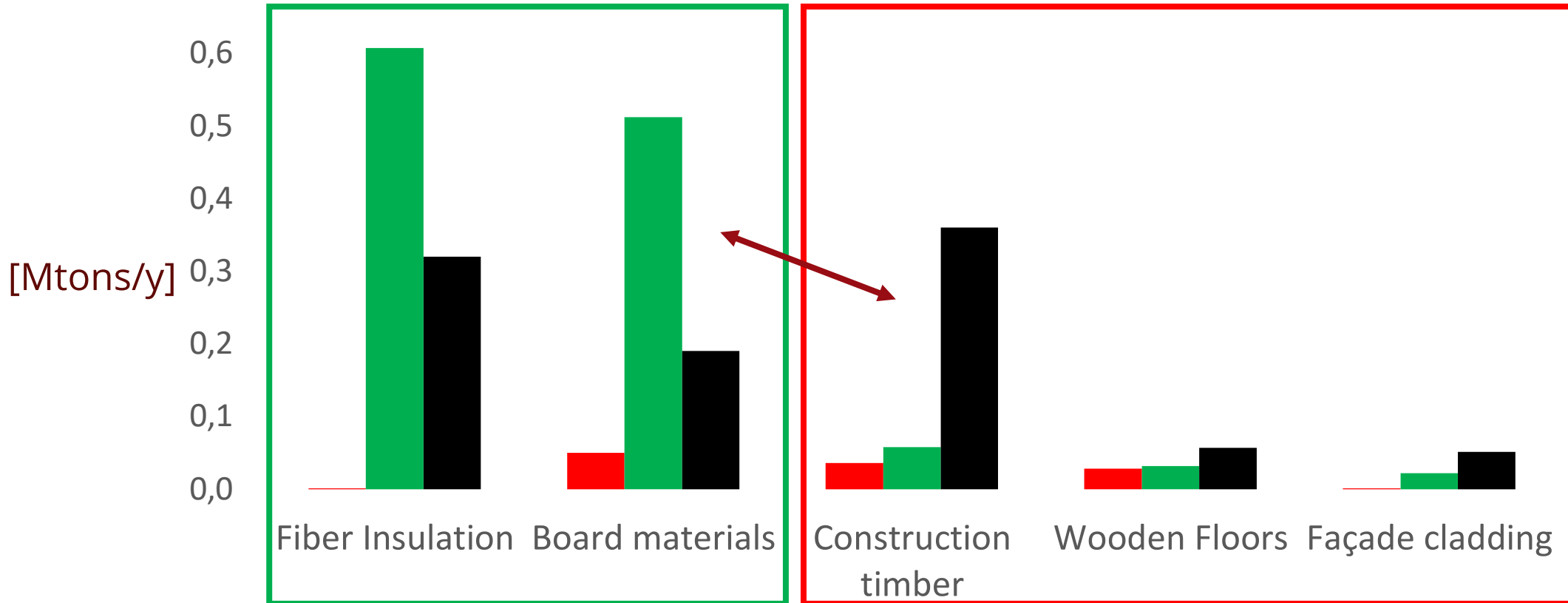
Biobased resources in DK

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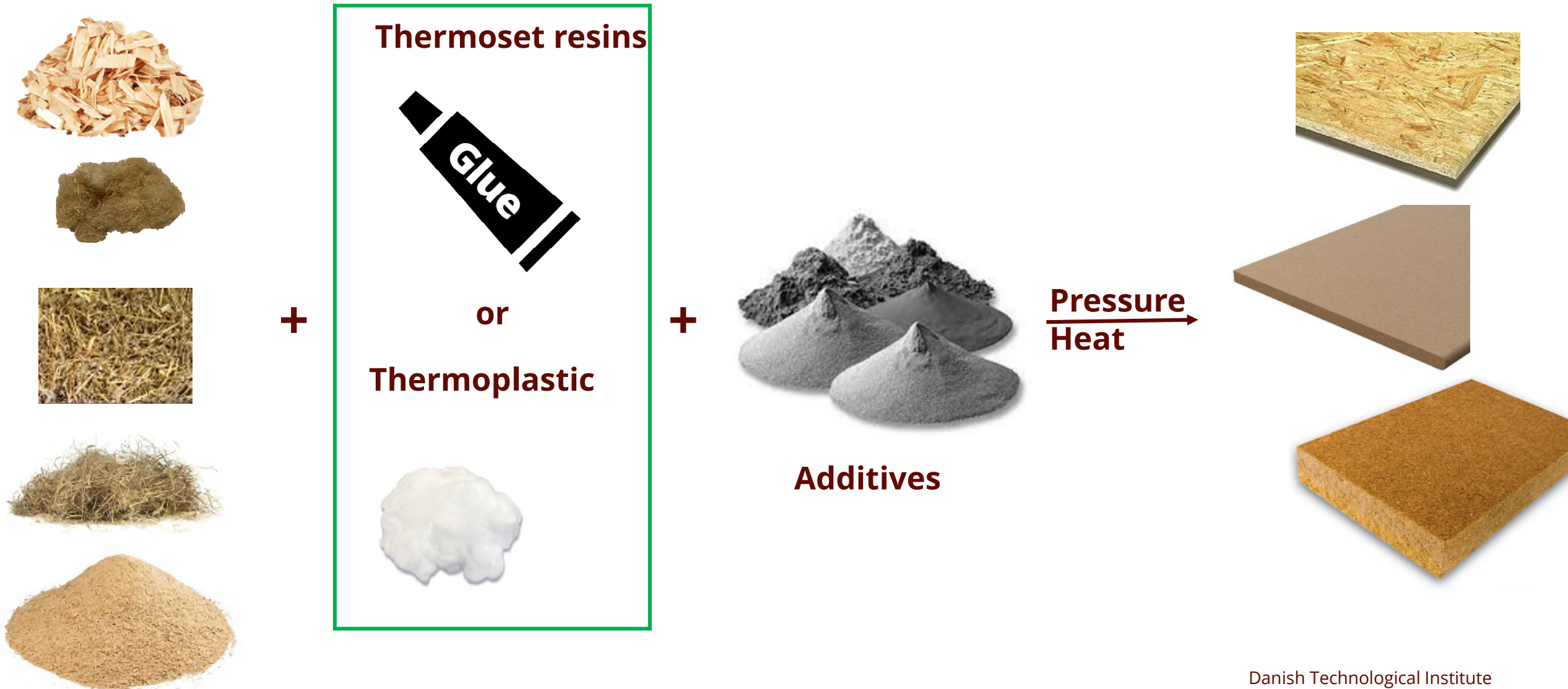
Biobased resources in DK

■ Now ■ Potential ■ Needs for 100% BB ⁽²⁰³⁰⁾



- Great potential (and need) for "fiber-based" construction materials
- Increasing demand for binders

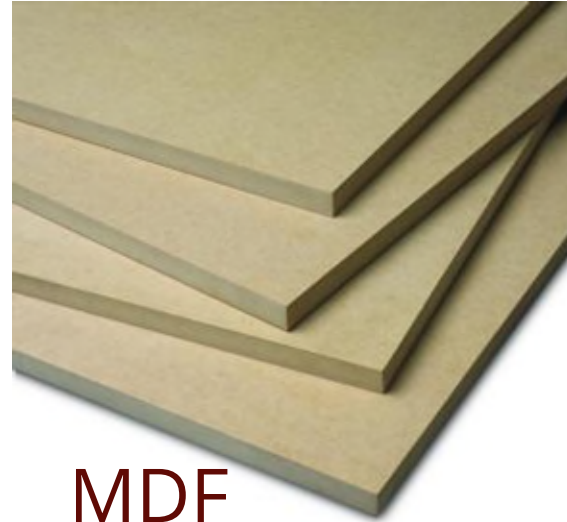
Fabrication of biobased composites



Wood-based panels:



Particle boards
~50%



MDF
~20%



Plywood
~5%



OSB
~10%



Soft boards/insulation batts
~8%

EU anual production [2022, EPF]

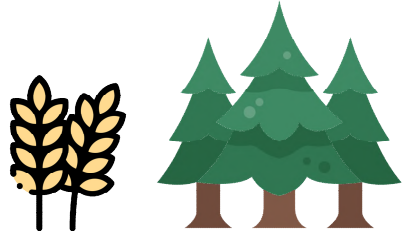
60 m. m³ -> 4 m. ton of binders

~50% used in construction, ~50% for furniture

Future of biobased construction:

x 4-6 need -> 16-24 m. tons of biobased binders

What biobased building bloks?

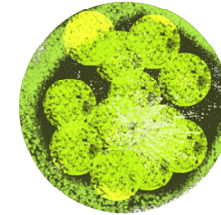
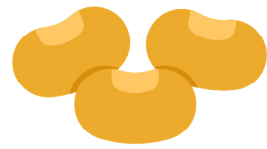


Lignin

From wood pulping
~17 MT/y in EU

+Underutilized resource

+Commercial binders
emerging
(wood adhesives)



Proteins

Carbohydrates

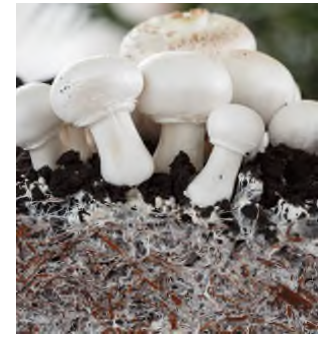
Bio-oil

~22 MT/y oilseeds
import in EU

÷Competes with food&feed & established demand
+New sources emerging (grass, microalgae)

+Commercial binders
available
(wood adhesives)

+Commercial binders
available
(bioplastics: PLA, PHA,
bio-molecules: polyols for PU
and epoxy-resins)



Mycelium

Questionable
scalability

Untested
potential

Summary

- Biobased binders are a big part of the transition to more sustainable construction, enabling fiber-based biocomposites
- Few biobased binders are available, most are partially biobased, and the price remains high
- Feed stock for current biobased binders often compete with food, feed & rising demand for biomass
- Increased output needs large investments in biorefinery infrastructure.
- Situation is improving, but not fast enough.

Thank you!
And let's reconnect:

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