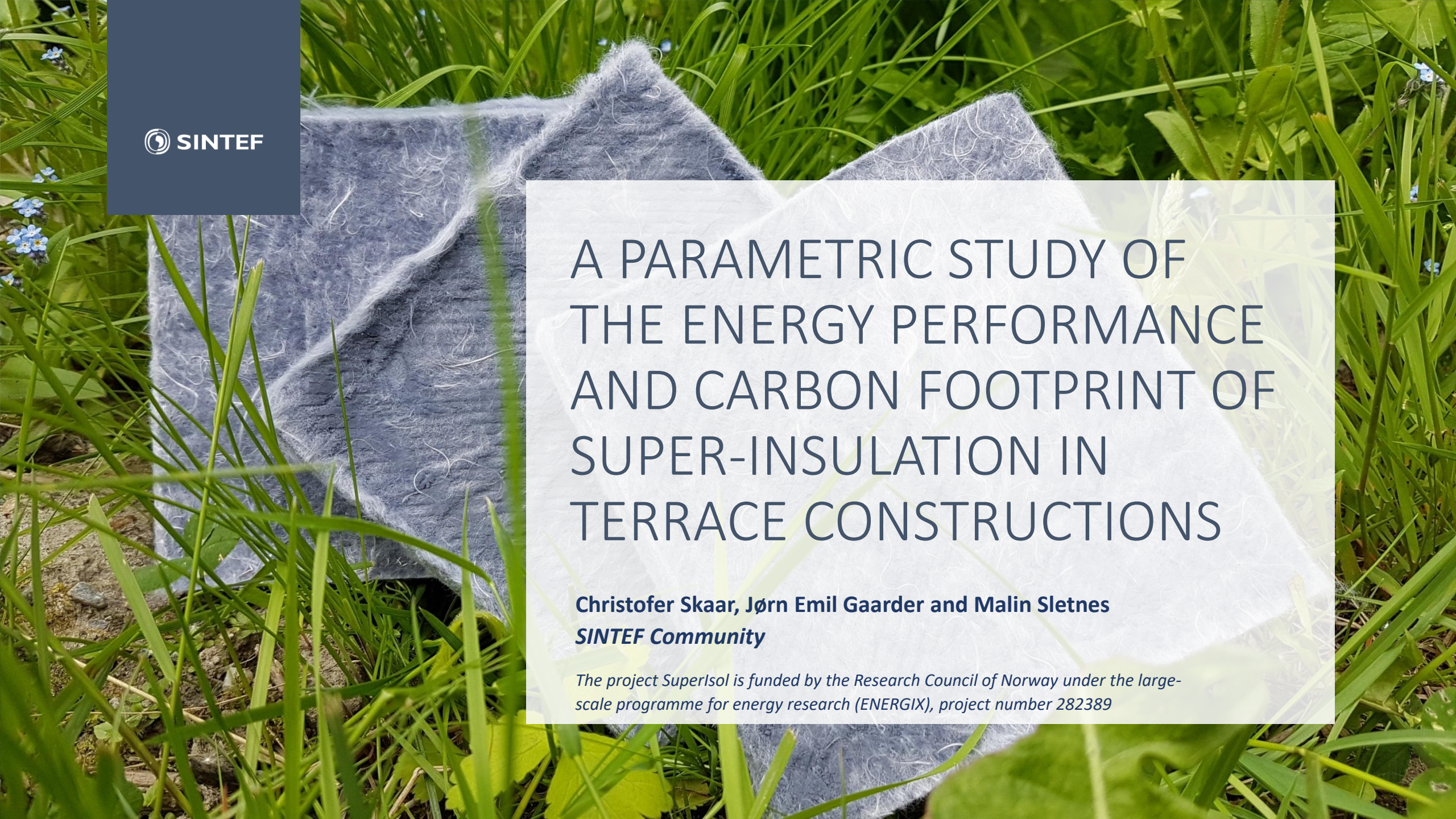

A PARAMETRIC STUDY OF THE ENERGY PERFORMANCE AND CARBON FOOTPRINT OF SUPER-INSULATION IN TERRACE CONSTRUCTIONS

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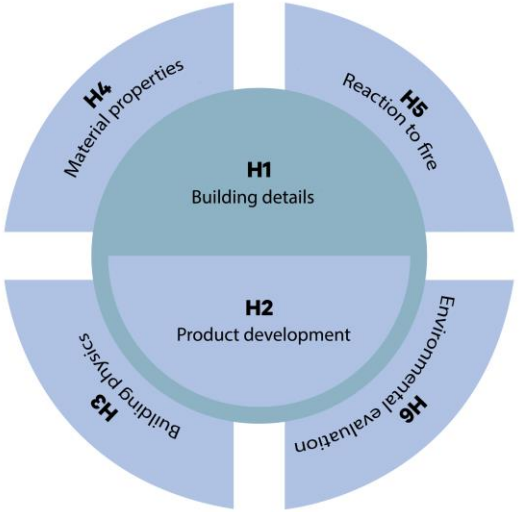
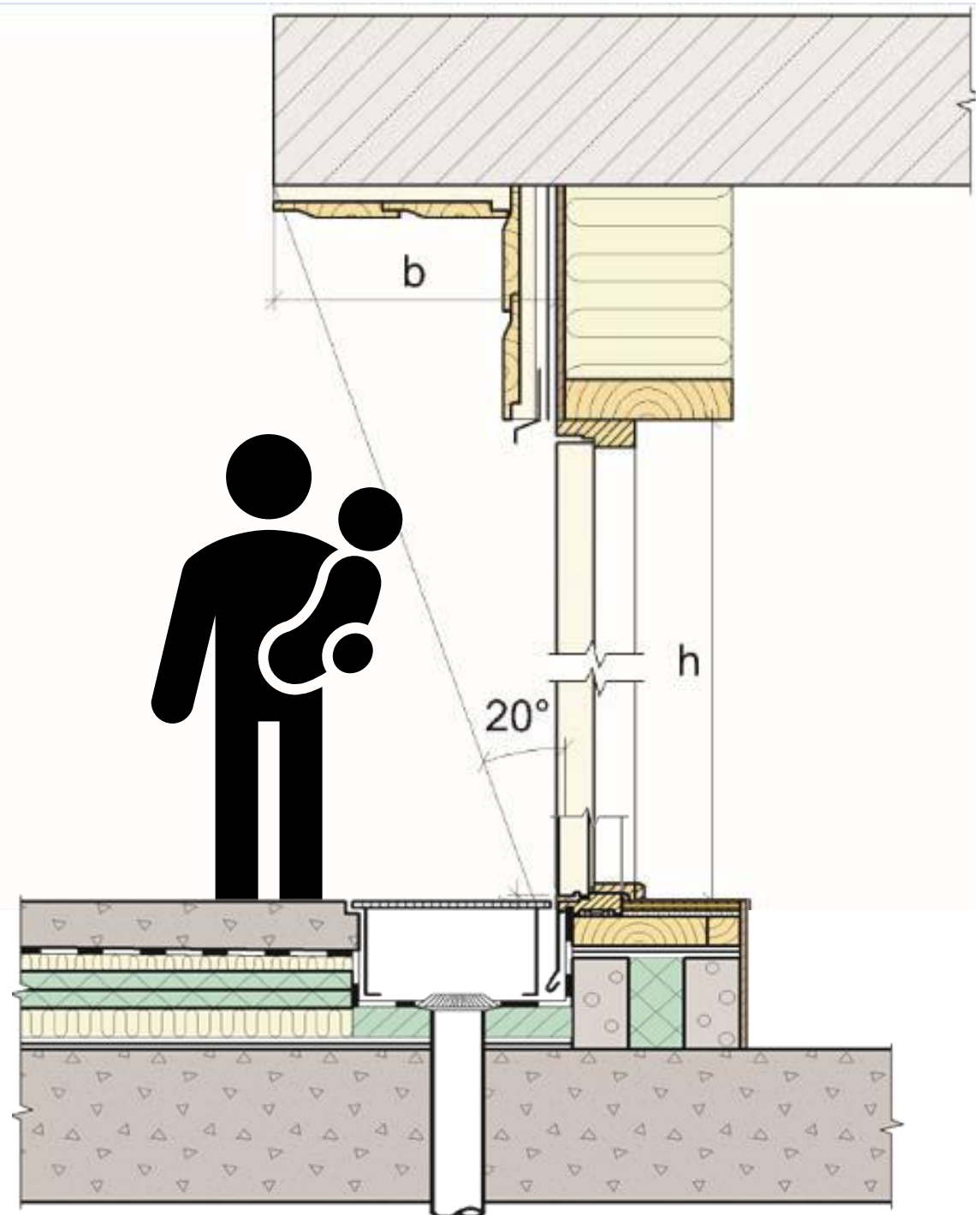
SINTEF Community

The project SuperIsol is funded by the Research Council of Norway under the large-scale programme for energy research (ENERGIX), project number 282389

The SuperIsol research project

New system solutions for superinsulation in Norwegian buildings



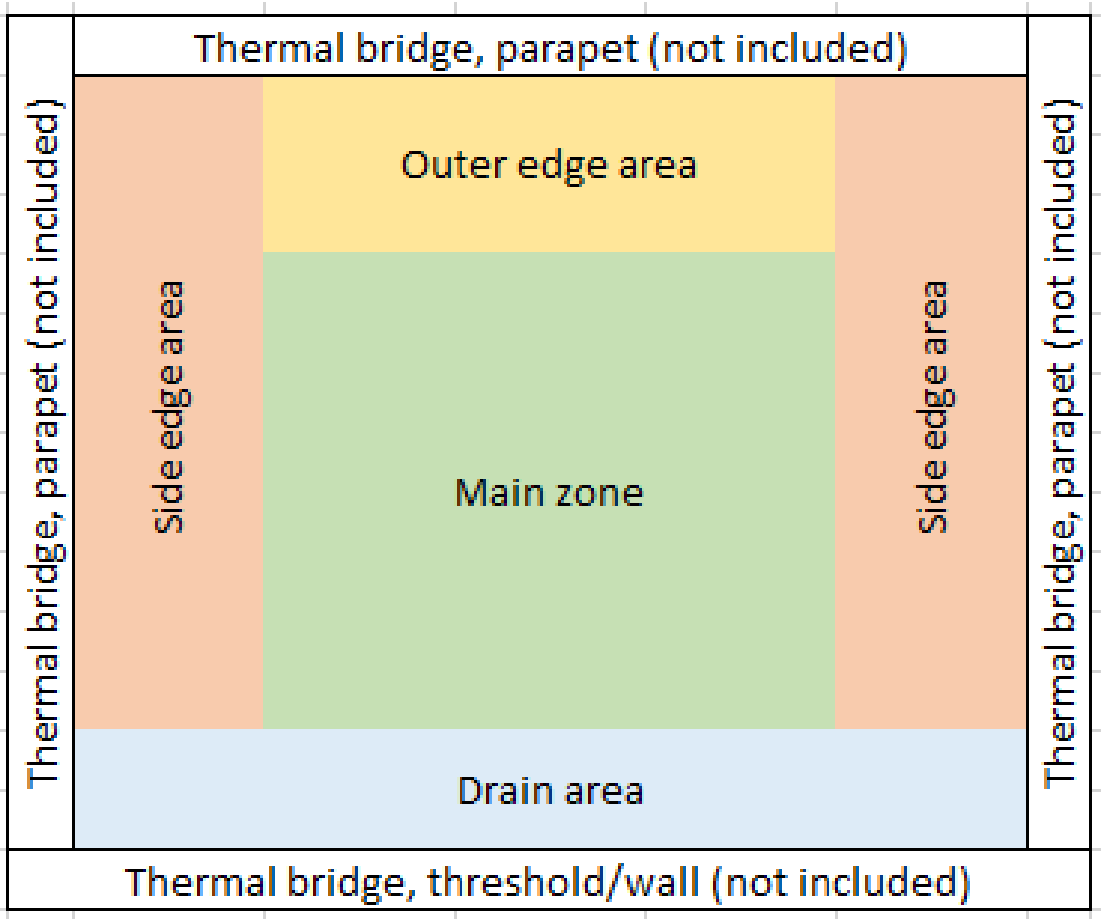


Roof-top terrace

Which parameters influence the energy performance and carbon footprint?

- Terrace dimensions
- Width of the aerogel edge
- Thickness of vacuum insulation panel (VIP) layer
- Slope of tapering
- Heat conductivity of VIP panels

Terrace construction



Base case, VIP

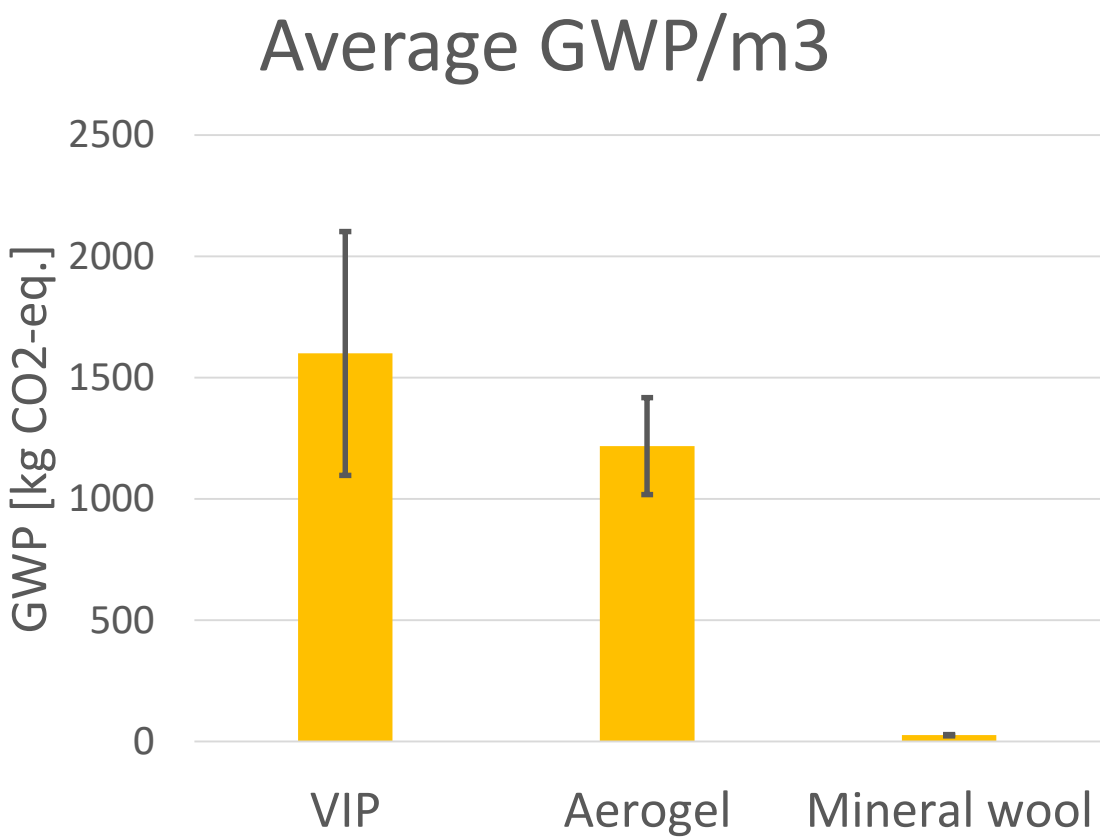
- Dimensions: 4m x 4m
- Edge: 600 mm
- VIP thickness: 60 mm
- Slope: 1:40
- VIP heat conductitity: 0.007 W/mK
- VIP volume: 0.52 m^3
- Aerogel volume: 0.44 m^3
- Mineral wool: 1.42 m^3

System boundaries

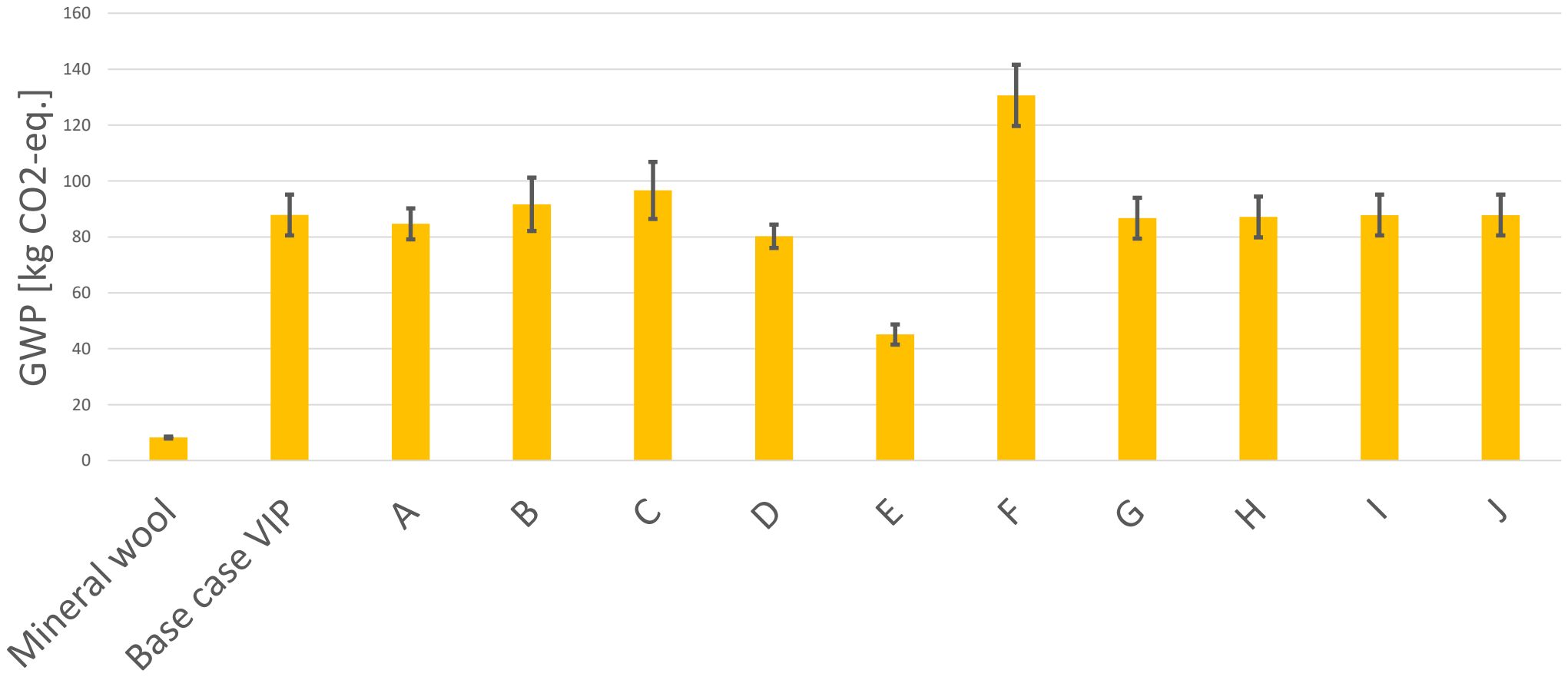
A1-3 Product Stage			A4-5 Construction Process Stage		B1-7 Use Stage							C1-4 End of Life				D Benefits and loads
A1: Raw Material Supply	A2: Transport to Manufacturer	A3: Manufacturing	A4: Transport to building site	A5: Installation into building	B1: Use	B2: Maintenance (incl. transport)	B3: Repair (incl. transport)	B4: Replacement (incl. transport)	B5: Refurbishment (incl. transport)	B6: Operational energy use	B7: Operational water use	C1: Deconstruction / demolition	C2: Transport to end of life	C3: Waste Processing	C4: Disposal	D: Reuse, recovery, recycling
x	x	x								x						

System boundaries according to EN 15978 and EN 15804

Carbon footprint of insulation

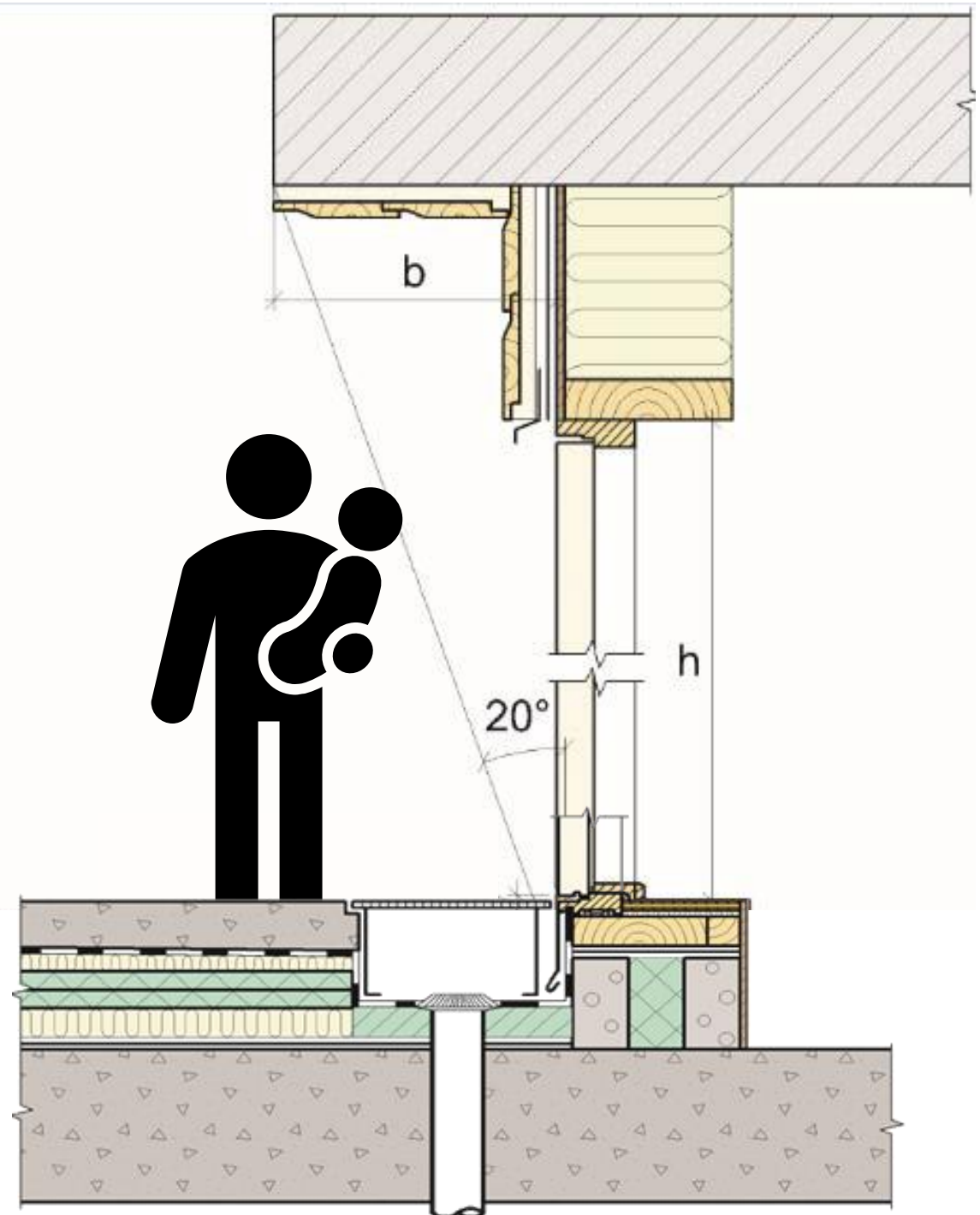


Carbon footprint per m^2 of construction (A1-A3)



Carbon footprint, including use stage

Carbon footprint, including use stage



Building context

How can super-insulation contribute to reducing the carbon footprint of a building?

Reduced floor height

↓

Reduced material consumption

Rough estimate in a 60-year perspective:
~0.2-1.2 m3 low carbon concrete per m^2 terrace

Final remarks

- Building context is required
  - Higher carbon footprint per m^3 material
  - Higher carbon footprint per m^2 terrace construction
  - But: Can contribute to reduced building height → reduced carbon footprint per m^2 building

- Further work:
  - Additional constructions
  - Verify building context estimate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Questions?

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Teknologi for et bedre samfunn