

DTU



Julian Christ, Holger Koss, Lisbeth M. Ottosen

Dansk Bioøkonomi Konference 2021

3D printing of bio-based concrete composites in constructions

Why 3D concrete printing (3DCP)?

- Increased **productivity** of the construction sector
- Realization of highly optimised constructions - **Material savings**
- **Safety** on construction sites
- **Architectural freedom** of buildings

COBOD printer



State-of-the-Art 3DCP

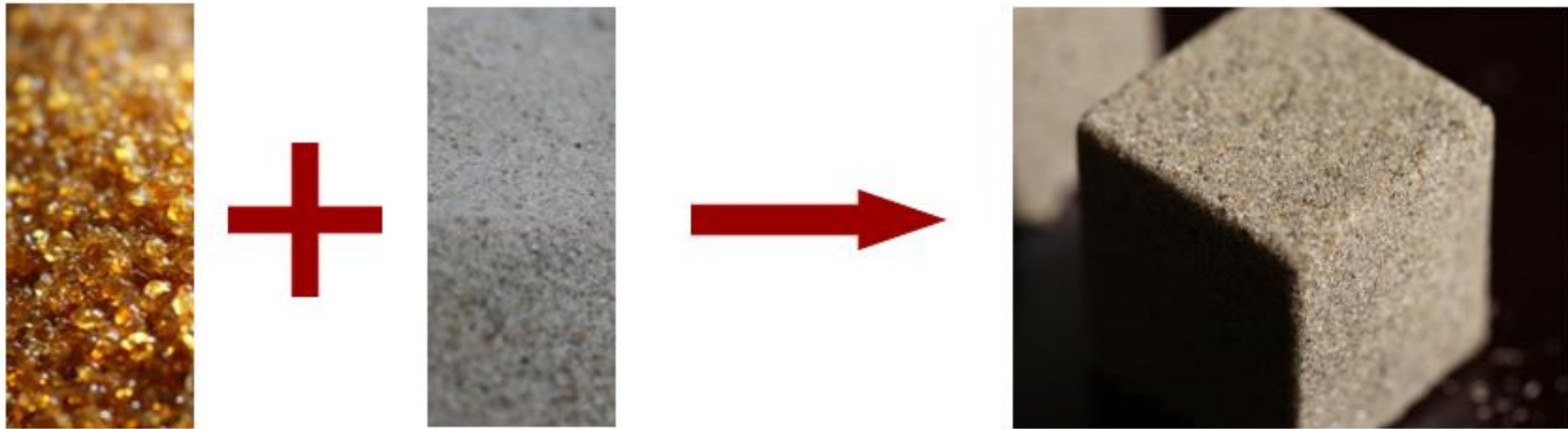
- High share of cement – high environmental impact through connected **CO₂-emissions**
- Flow properties of **cementitious material** are generally **not well suited for 3D printing**
- Largely seen **just vertical build up**



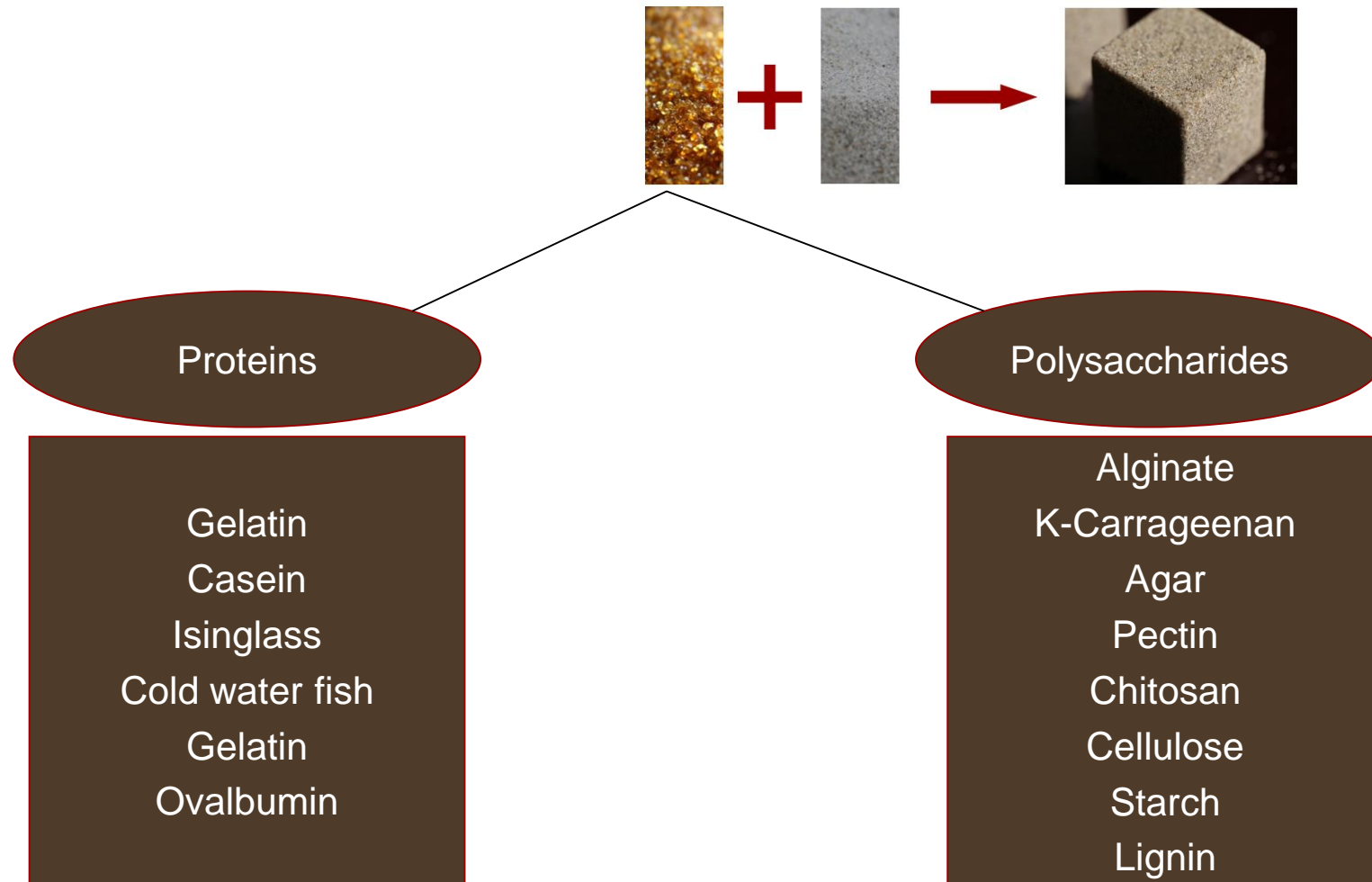
COBOD – first 3D printed house in Europe



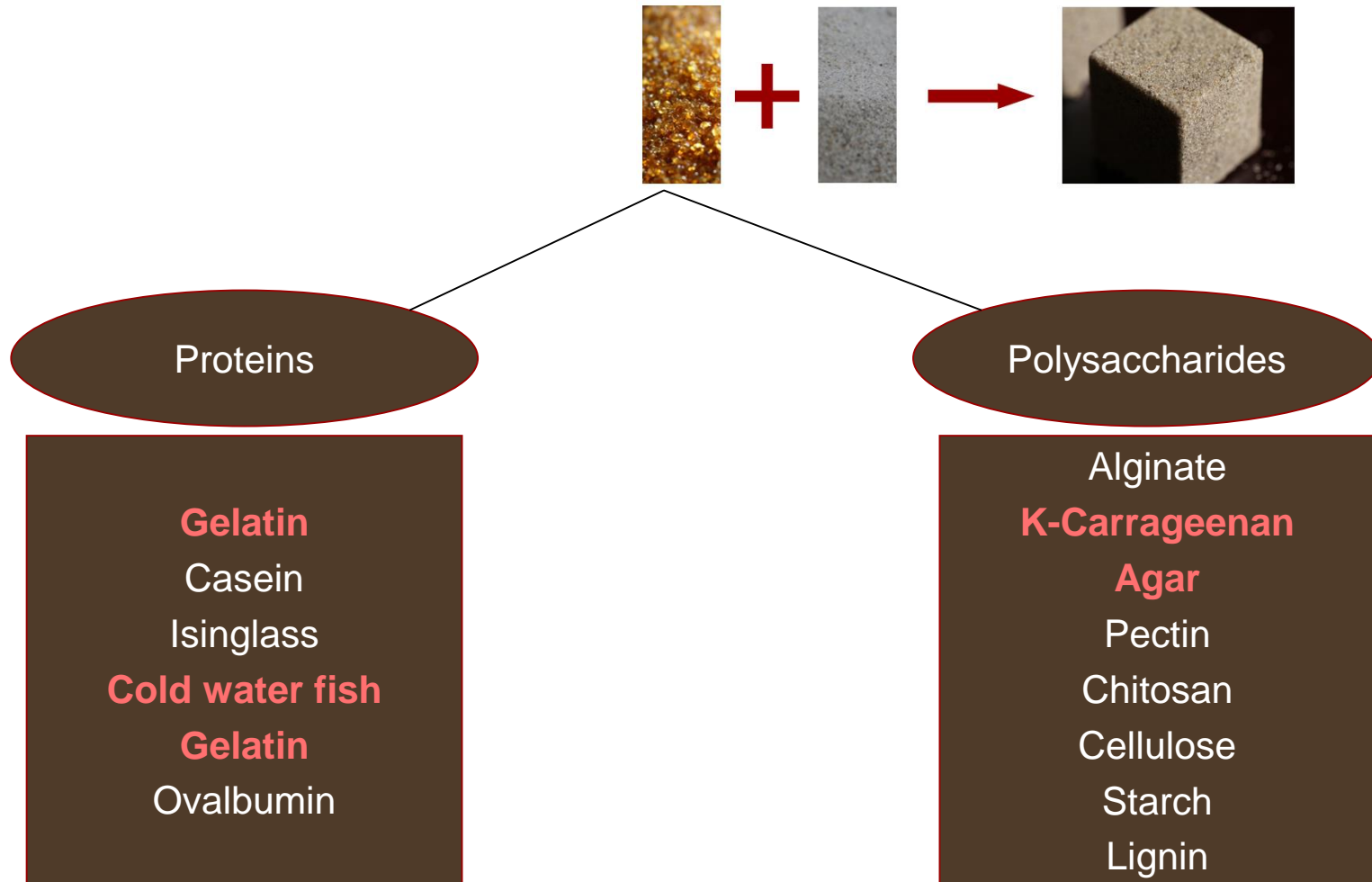
Bio-based concrete composites for 3D concrete printing



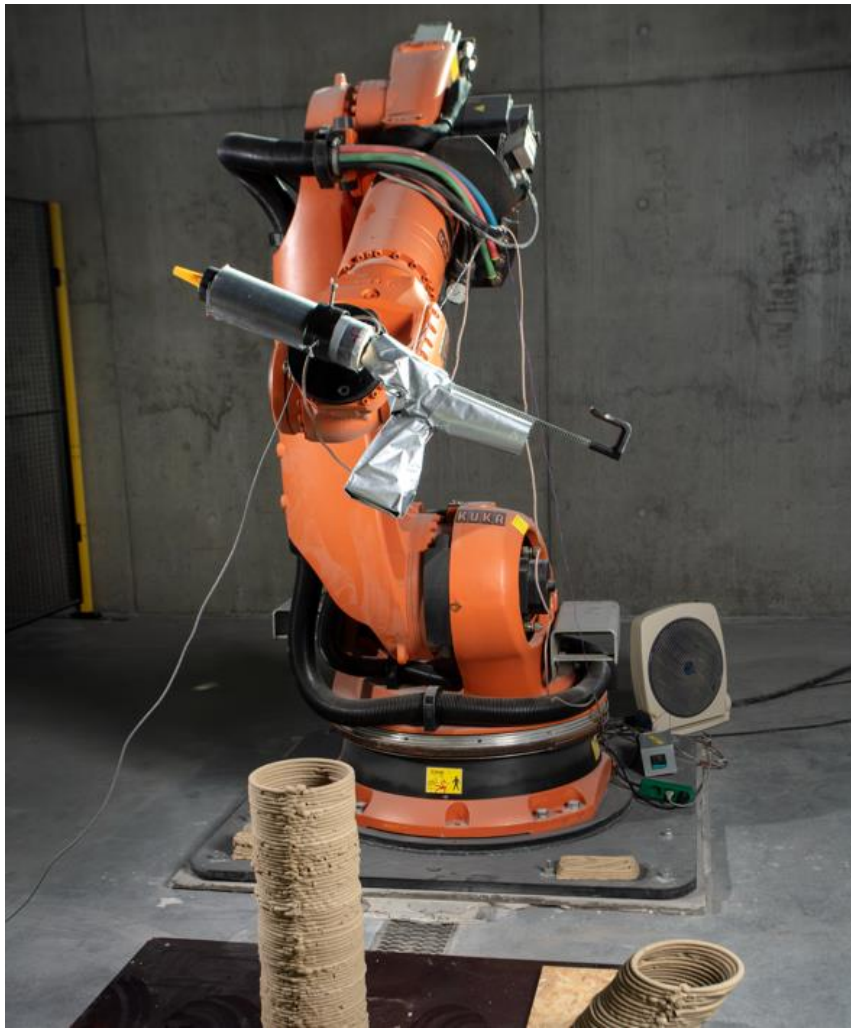
Bio-based binders



Bio-based binders



Print setup



Printing of bio-based composites



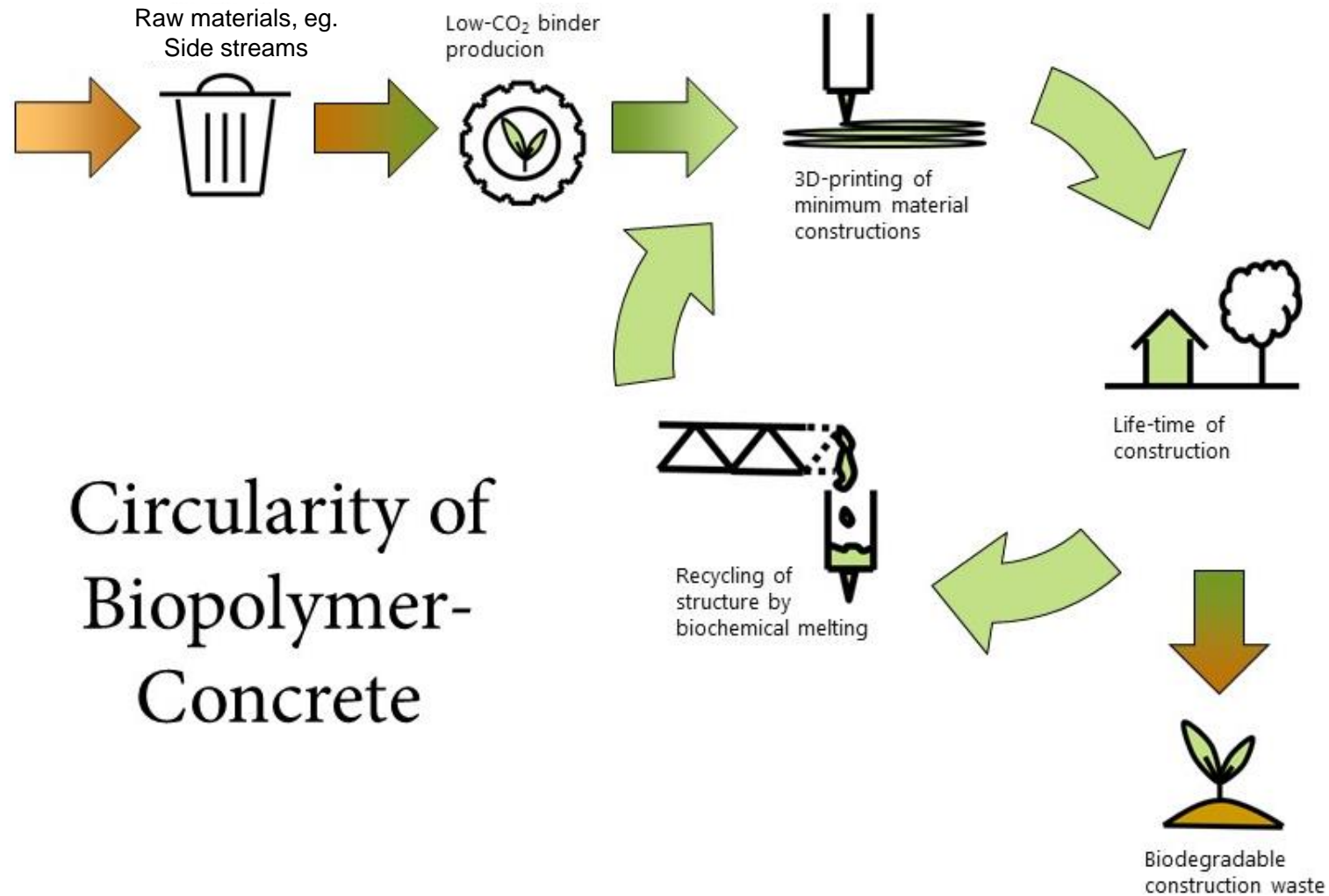
Printing of bio-based composites



Printing of bio-based composites



Vision



Circularity of Biopolymer-Concrete



PhD student:
Julian Christ

Supervisors:
Holger Koss
Lisbeth M. Ottosen

Funding: DTU Byg

THE VELUX FOUNDATIONS

VILLUM FONDEN ✕ VELUX FONDEN

Master students:
Madeleine Nielsen
Maria Husarcíková
Sander Leusink
Olivia Balenciaga Sanchez
Jonas Holmer Bigom
Oliver Kragelund Vittrup

Research/student assistants:
Marvin Geissler
Thor Engelsen

DTU

