1. October 2024 – 2. October 2024

CRESTIMB
InCREased Service life of innovative TIMber Building systems (JC2023)

Stefania Fortino

VTT Technical Research Centre of Finland Ltd

Funded by the European Union

Grant agreement ID: 101094340

CRESTIMB

InCREased Service life of innovative TIMber Building systems

- **ForestValue theme: Sustainable Building Systems**
- **Duration**: 1.4.2024-31.3.2027
- **Coordinator**: VTT Technical Research Centre of Finland Ltd (Stefania Fortino)
- **16 partners from 7 countries**
  - *8 European RTOs*
  - *1 third country partner from Australia*
  - *7 European industries*

1. VTT TECHNICAL RESEARCH CENTRE OF FINLAND LTD (Finland)
2. NORWEGIAN UNIVERSITY OF SCIENCE AND TECHNOLOGY (Norway)
3. UNIVERSITY OF GALWAY (Ireland)
4. TRINITY COLLEGE DUBLIN (Ireland)
5. UNIVERSITY OF L'AQUILA (Italy)
6. UNIVERSITY OF LJUBLJANA (Slovenia)
7. ŁUKASIEWICZ RESEARCH NETWORK - POZNAŃ INSTITUTE OF TECHNOLOGY (Ł-PIT, Poland)
8. ŁUKASIEWICZ RESEARCH NETWORK – ITECH INSTITUTE OF INNOVATION AND TECHNOLOGY (Ł-ITECH, Poland)
9. UNSW Sydney (UNSW, Australia)
10. PUUTUOTETEOLLISUUS RY (Finland)
11. MOELVEN LIMTRE AS (Norway)
12. COILLTE (Ireland)
13. MEDITE SMARTPLY (Ireland)
14. Lamel legno Srl (Italy)
15. Rothoblaas Srl (Italy)
16. HARCO Ltd (Slovenia)

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https://forestvalue.org/

Kick-off meeting at VTT, Espoo, Finland, 23-24.5.2024

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Gaps of knowledge

- *Need to design innovative timber systems suitable for buildings with open spaces and increased service life*
- *Need to develop accurate models for creep in wood and lack of experimental and computational research on hardwood materials*
- *Need of a bridge between advanced scientific research and wood engineering practice*
- *Wood and wood-based products service life for the carbon footprinting regulations in EU Member States (current standards under revision until 2027)*

CRESTIMB objectives

- CRESTIMB aims to develop an **innovative timber system** suitable for **multi-storey buildings with open spaces**
- The long-term behaviour of the system components will be investigated with an **advanced numerical model for wood rheology** under variable indoor climates to ensure an **increased service life and the possibility of reuse**. The numerical analyses will be assisted by **experiments on softwood and hardwood** samples, as well as full size tests
- The analysis results will be made accessible through a **Data interface** by using the **VTT Modelling Factory environment** and applied in environmental assessment studies including **Life Cycle Assessment (LCA)**
- The **collaboration with CRESTIMB industrial partners** will help to deliver guidelines for innovative building systems both feasible and cost-effective

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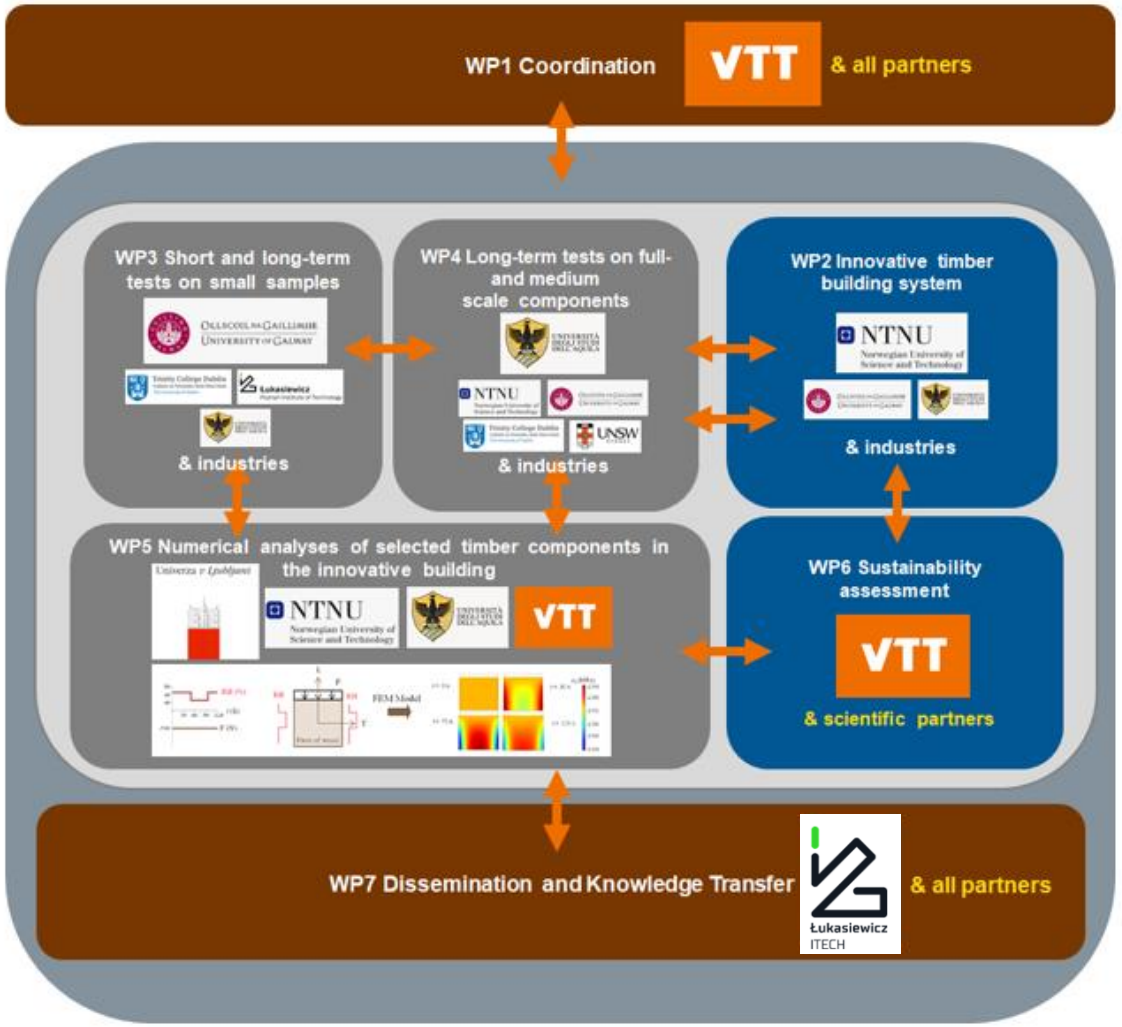
CRESTIMB WPs

No.	Work package title	WP Leader (Person, Organisation)	Partners involved
WP1	Coordination	Stefania Fortino, VTT	ALL
WP2	Innovative timber building system	Haris Stamatopoulos, NTNU (Deputy: F.Mirko Massaro, NTNU)	Galway, UNIVAQ, Moelven Limtre, Lamel legno, Rothoblaas, Coillte
WP3	Short and long term tests on small scale wood samples	Patrick McGetrick, Galway	Trinity, UNIVAQ, Ł-PIT, Lamel legno, Coillte, Medite Smartply
WP4	Long-term tests on full- and medium-scale components	Massimo Fragiacomo, UNIVAQ (Deputy: M. Sciomenta, UNIVAQ)	NTNU, Galway, UNSW, Coillte, Lamel legno, Moelven Limtre, Trinity
WP5	Numerical analyses of selected timber components in the innovative building	Tomaž Hozjan, Ljubljana (Deputy: Sabina Huč, Ljubljana)	VTT, NTNU, Galway
WP6	Sustainability assessment	Petr Hradil, VTT	Scientific partners
WP7	Dissemination and knowledge transfer	Dariusz Łukaszewski, Ł-ITECH	ALL

Collaboration among CRESTIMB WPs



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Transnational cooperation

- Some partners (UNIVAQ, NTNU, …) works in European expert groups for the development of **Eurocode 5 (CEN/TC250/SC5)**

- Some of the partners (VTT, NTNU, UNIVAQ, Ljubljana, …) carried out past activities on computational models for wood and development of timber buildings within several **Cost actions (E55, FP1402, CA20139, ...)**

- Some of the partners (VTT, NTNU, Galway, …) carried out past activities in WoodWisdom-Net and/or ForestValue1 projects **(WWNet ImprovedMoisture, WWNet+ DuraTB, ForestValue1 ClickDesign, …)**

- **Mobility and younger researcher training** is promoted in CRESTIMB utilising mechanisms such as the IRG travel bursary scheme, focused COST short term scientific missions (STSM), Erasmus+ and Ad futura programmes for international mobility.

- **CRESTIMB will offer an important career support for emerging academics** (e.g., associate professor Francesco Mirko Massaro, assistant professors Martina Sciomenta etc.).
  - At least 3-4 master students per year (NTNU), 5 doctoral and post-doctoral researchers (UNIVAQ, Galway) will work on the project.

- ***WCTE 2025 conference in Brisbane, Australia***

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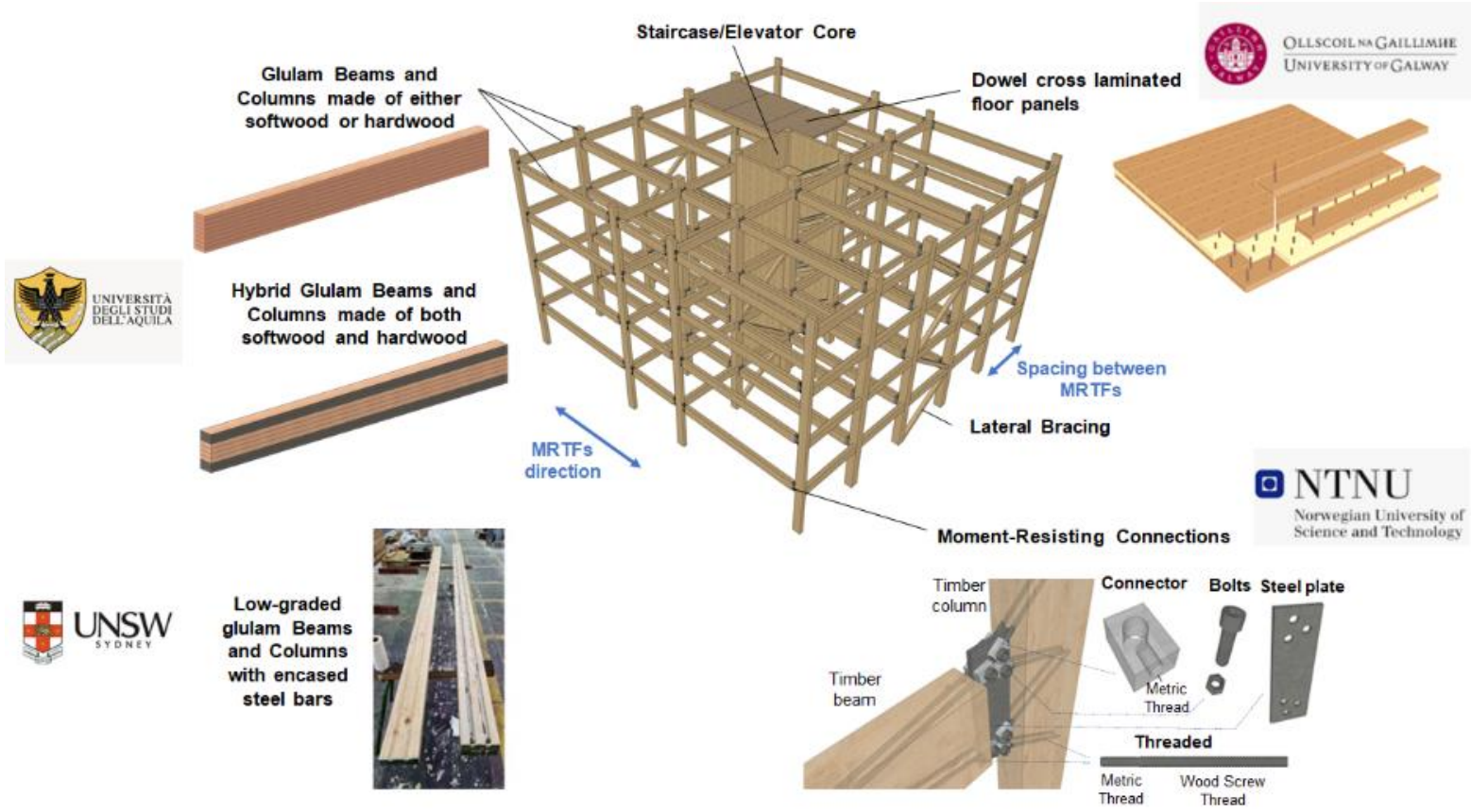
Proposed innovative timber building system

Moment-resisting frames made of **softwood or hardwood** glue-laminated timber with:

- **innovative beam-to-column connections**
- **dowel cross laminated floor panels**



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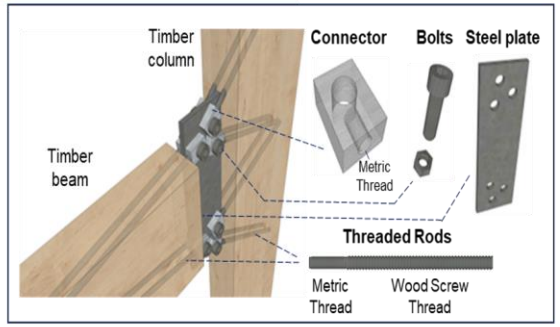
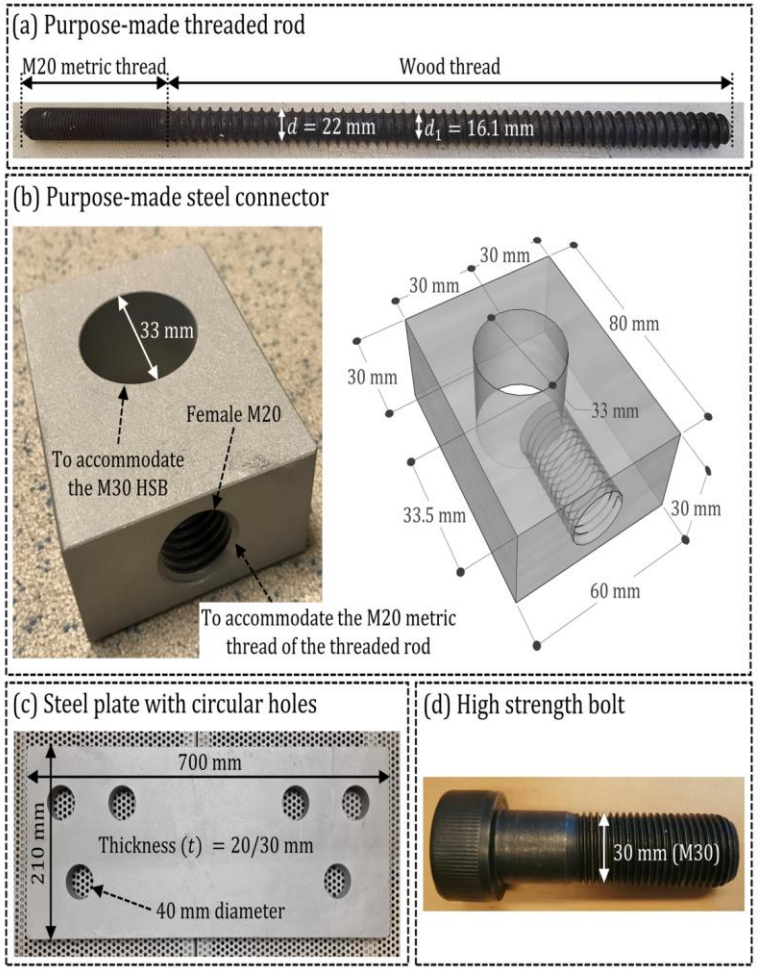
Innovative timber building system (WP 2)



Moment-resisting connection with screwed-in threaded rods

Details of the innovative connection



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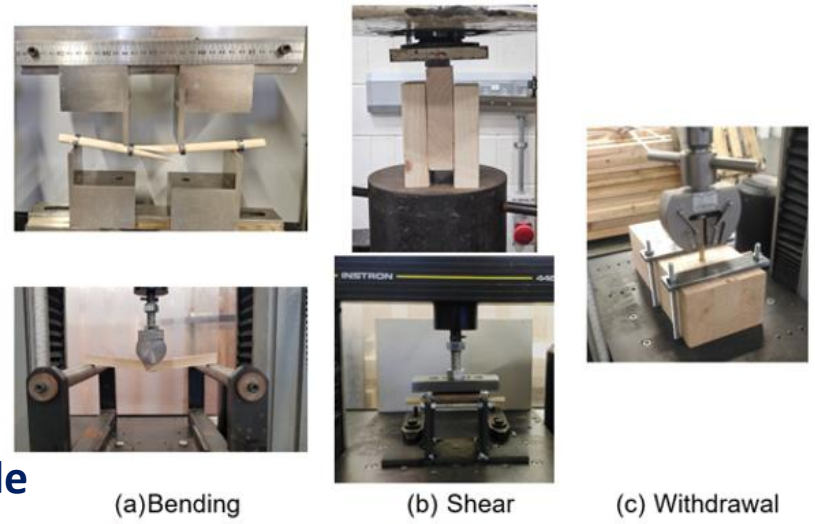
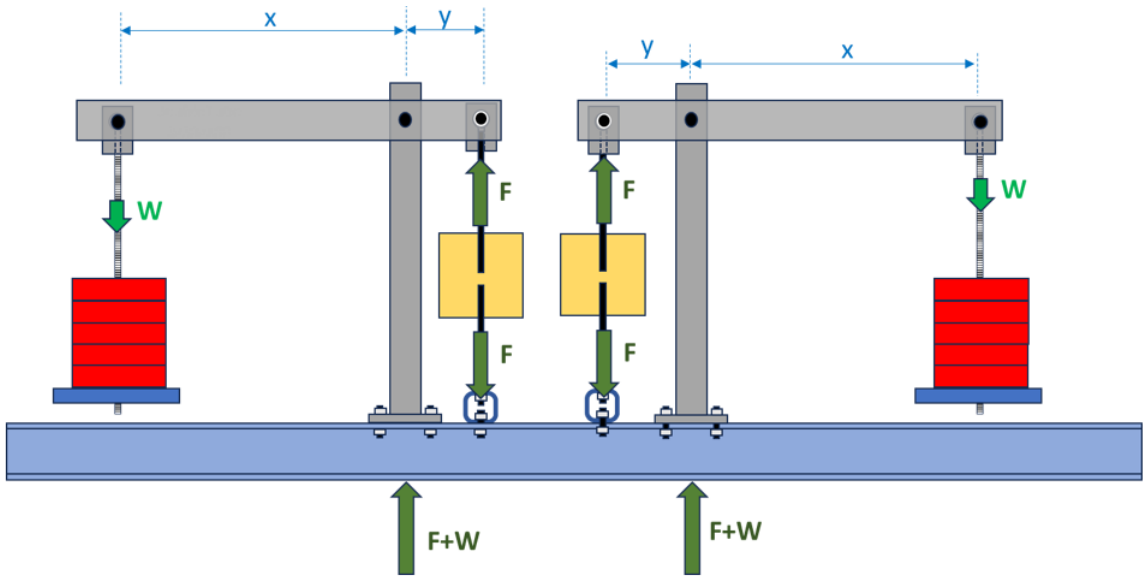
Short and long term tests (WPs 3, 4)

Tests on small scale wood samples



Long-term test of medium-size wooden components: concept for testing



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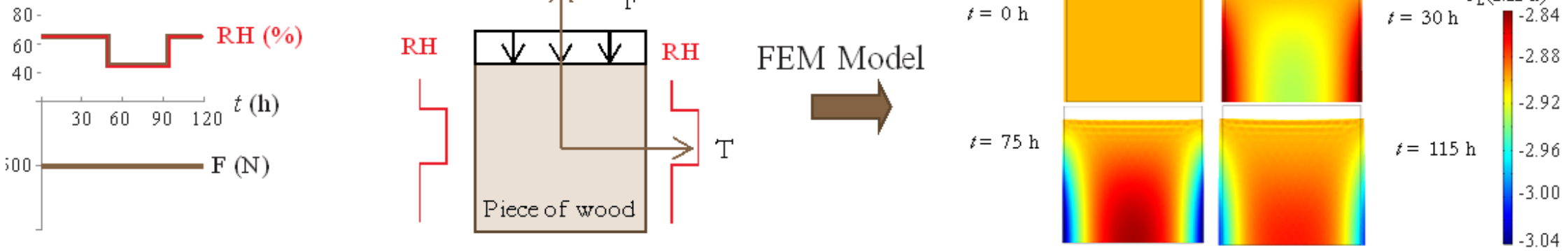
Numerical analyses of timber components (WP5)

The new rheological model for predicting the long-term behaviour of timber members in changing indoor conditions will include a mathematically correct description of irreversible (plastic) deformations in compression and tension in three anatomical directions. Shear deformations will also be accounted for.



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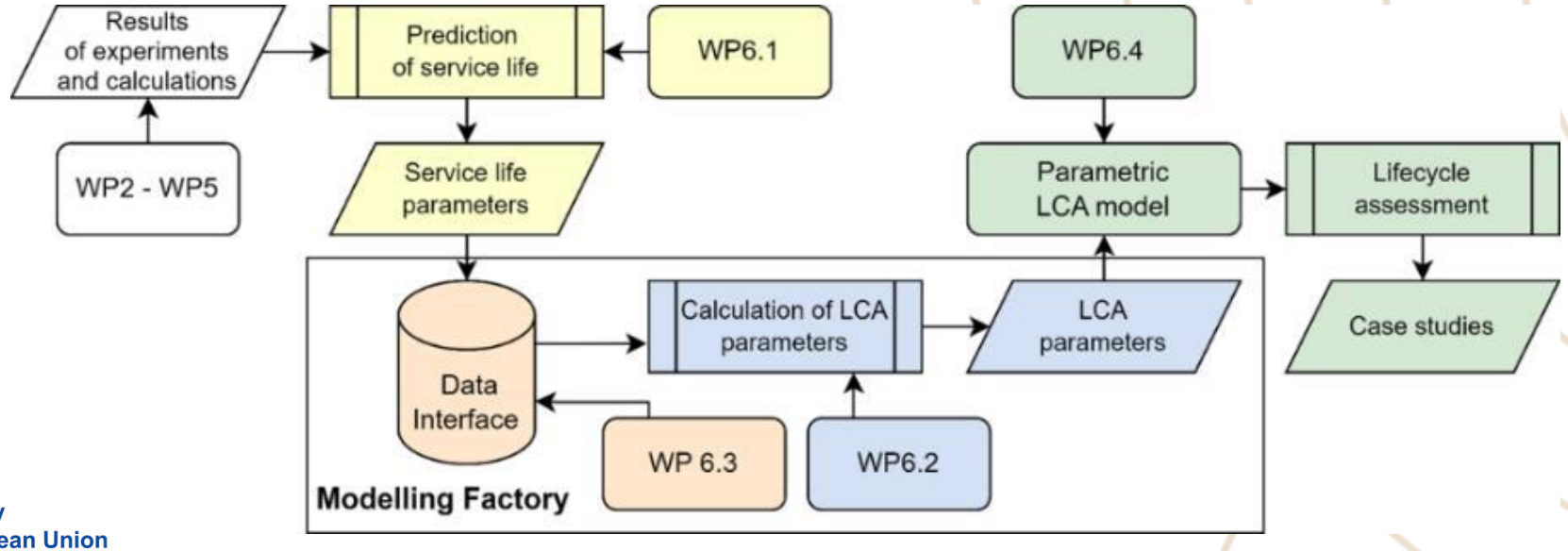
Sustainability assessment (WP6)

Studying effect of accumulated stresses and strains on the product service life	*Implementing the service life concept in the environmental assessment*	*Providing data interface for the service life datasets*	*Creating LCA case studies*



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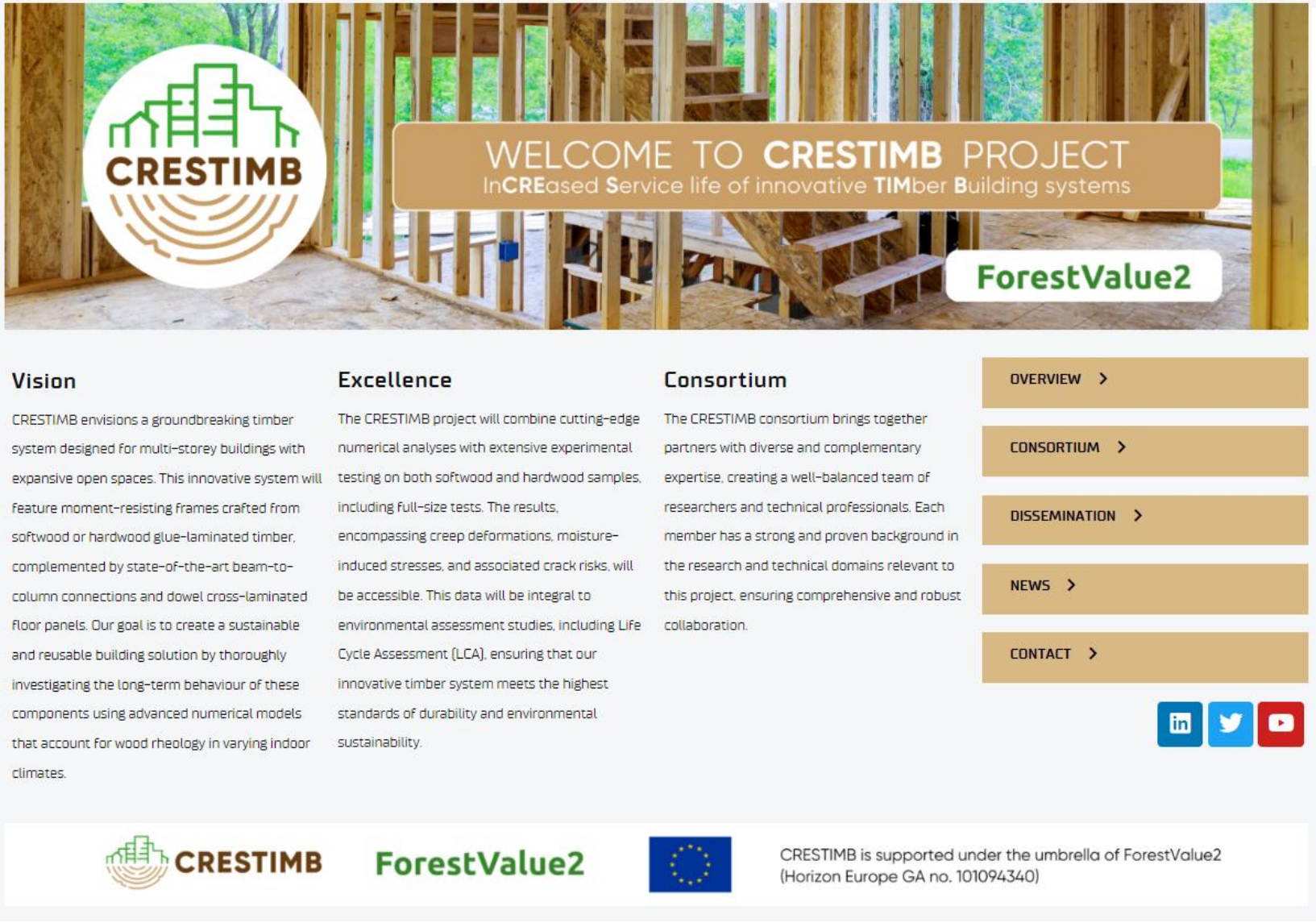
ForestValue2

Dissemination and knowledge transfer (WP7)

www.crestimb.com

Website publicly accessible by September 30th, 2024

Participation in workshops on open science



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Thank you!

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