El bosc, primer recurs de l'economia verda
PECT Projecte d'especialització i competitivitat territorial

CTFC

Operation: VALORIZATION OF WOOD

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Unió Europea
Fons Europeu de Desenvolupament Regional

Generalitat de Catalunya

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We are entering the age of wood...

Wood is the new concrete!

Wood is the material of the 21st century!

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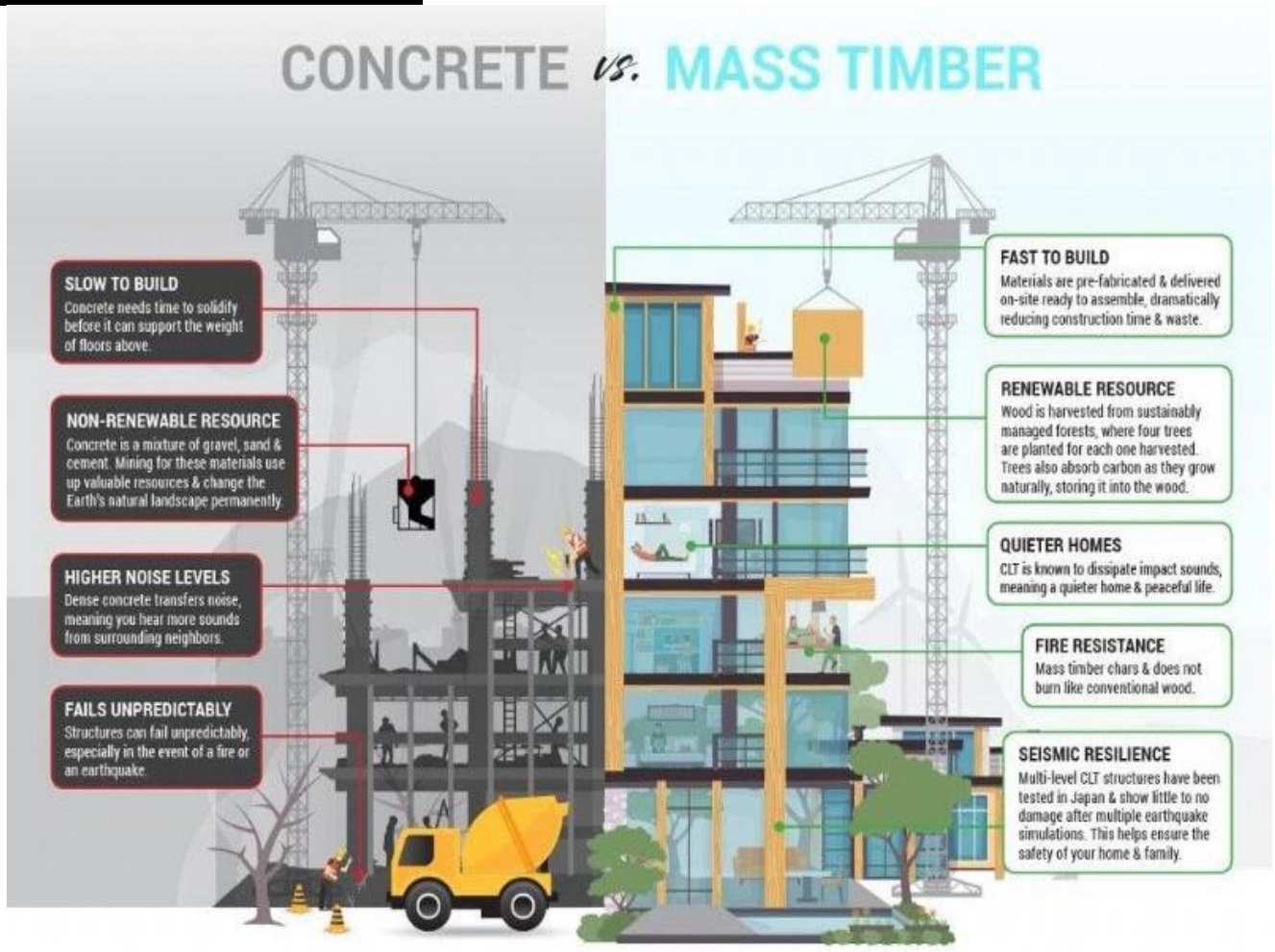
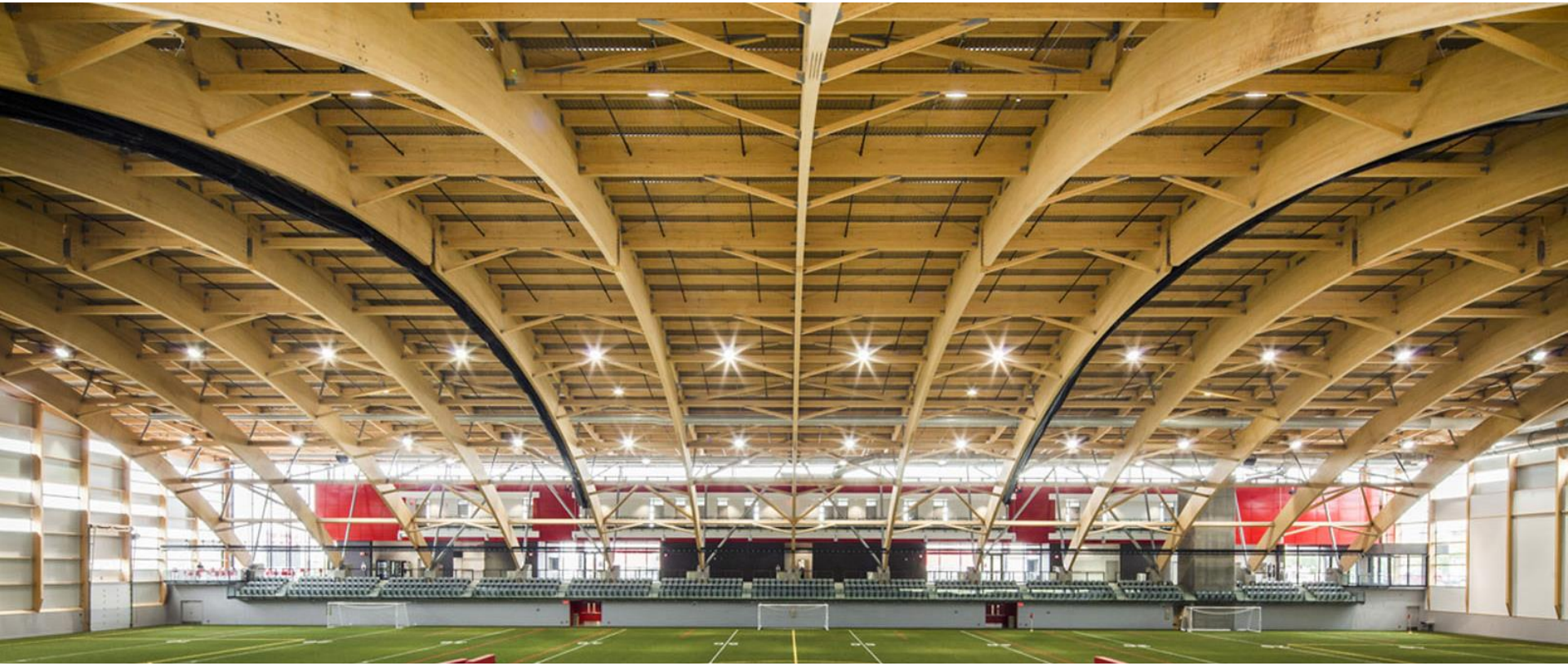


It seems that a shift in focus is beginning
In the construction sector

The use of wood has increased significantly over the last years



Telus-Université Laval Stadium 100 x 60 m
Quebec – Canada (2011)
Coarchitecture; ABCP, HCMA Architecture & Design

Sports complex

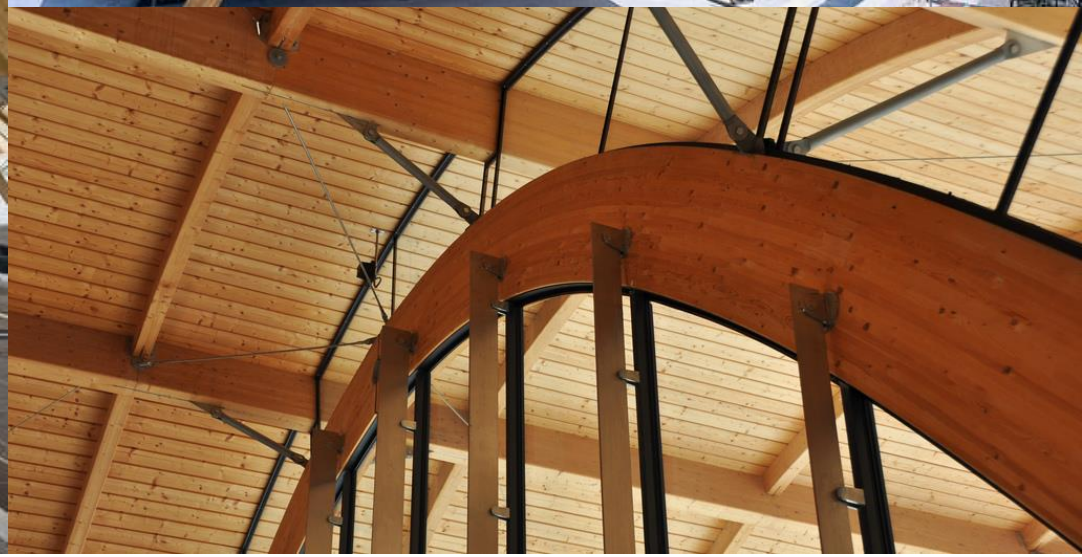
We can find wooden buildings with very varied characteristics and for diverse purposes around the world

Innovative use of wood in buildings around the world

Advanced Training Center: Glice Hockey Elite Center
Davos - Switzerland (2018)

Sports complex

Innovative use of wood in buildings around the world



Bodegas Protos headquarter
Peñafiel – Castilla y León (2008)
Rogers Stirk Harbour + Alonso Balaguer Partners

Wine cellar

Innovative use of wood in buildings around the world

Poliesportiu del Turò de la Peira
4.430 m2
Barcelona – Catalunya (2018)
Anna Noguera & Javier Fernández

Sport complex

Innovative use of wood in buildings around the world

Fabra I Coats / 4 floors /46 apartments
Barcelona – Catalunya (2018 - 2019)
Roldán + Berengué Arquitectes

Rehabilitation
Industrial building XIX century
Adapted to housing use

Innovative use of wood in buildings around the world

Escola La Canaleta
Vilaseca – Catalunya (2014)
2260mm Arquitectes

Nursery school

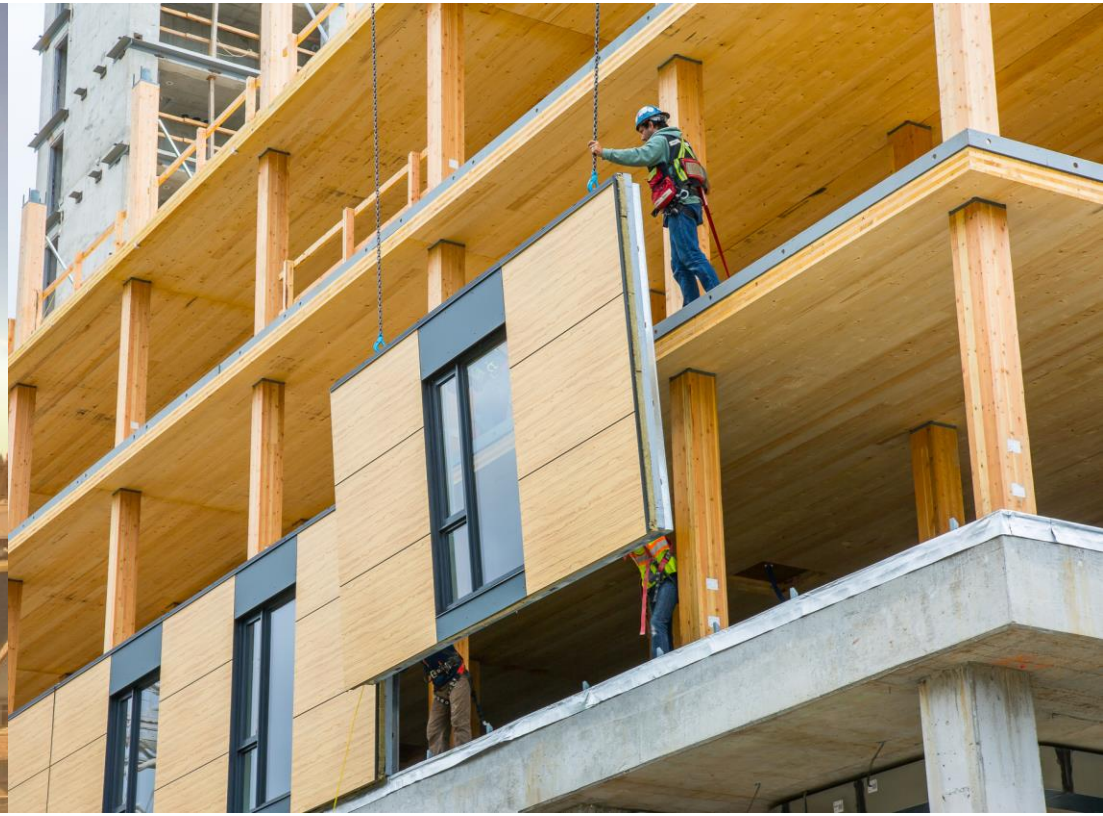
Mid-rise buildings, high-rise buildings even skyscrapers…

Innovative use of wood in buildings around the world

T3 Building / 7 floors / 23 m
Minneapolis – USA (2018)
Michael Green Architects

Office building

Innovative use of wood in buildings around the world



Brock Commons Tallwood House/ 18 floors / 53 m
University of British Columbia
Vancouver - Canada (2016 - 2017)
Acton Ostry Architects Inc

Student residence building

https://www.youtube.com/watch?v=GHtdnY_gnmE

Innovative use of wood in buildings around the world

Dalston Lane / 9 floors / 32 m
London - UK (2013)
Waugh Thistleton Architects

Residential building

Innovative use of wood in buildings in Catalonia

Cavallers street/ 6 floors / 20 m
Lleida – Catalunya (2014)
Ramón Llobera Architect

Residential building

Innovative use of wood in buildings in Catalonia

35 apartment building/ 6 floors / 22 m
Barcelona – Catalunya (2017 - 2018)
Elisabet Capdeferro i Ramon Bosch

Residential building

Innovative use of wood in buildings in Catalonia

Tallest building in Spain

Cooperativa d'habitatge La Borda / 7 floors / 25 m
Barcelona – Catalunya (2017 - 2018)
Lacol

Residential building

Innovative use of wood in buildings in Catalonia

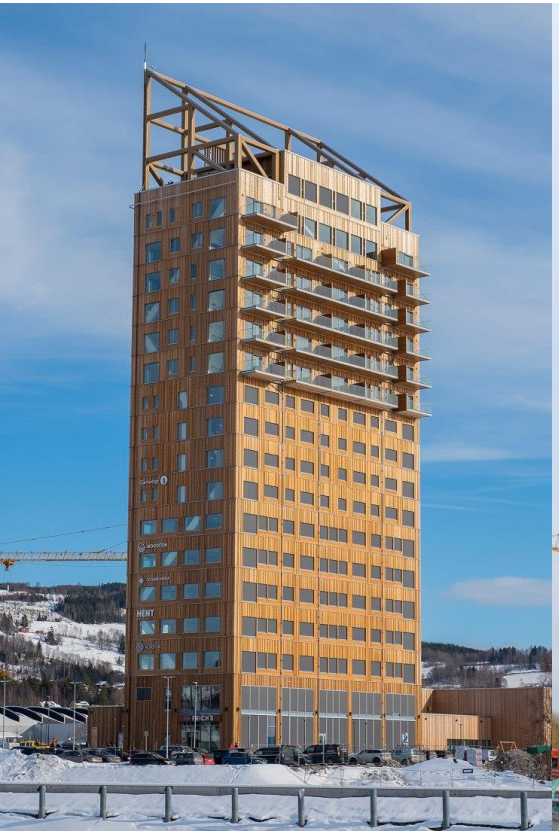
In construction

It will be the largest residential timber complex in Spain

85 apartment building/ 6 floors / 23 m
Barcelona – Catalunya (2017 - 2018)
Peris-Toral Architects

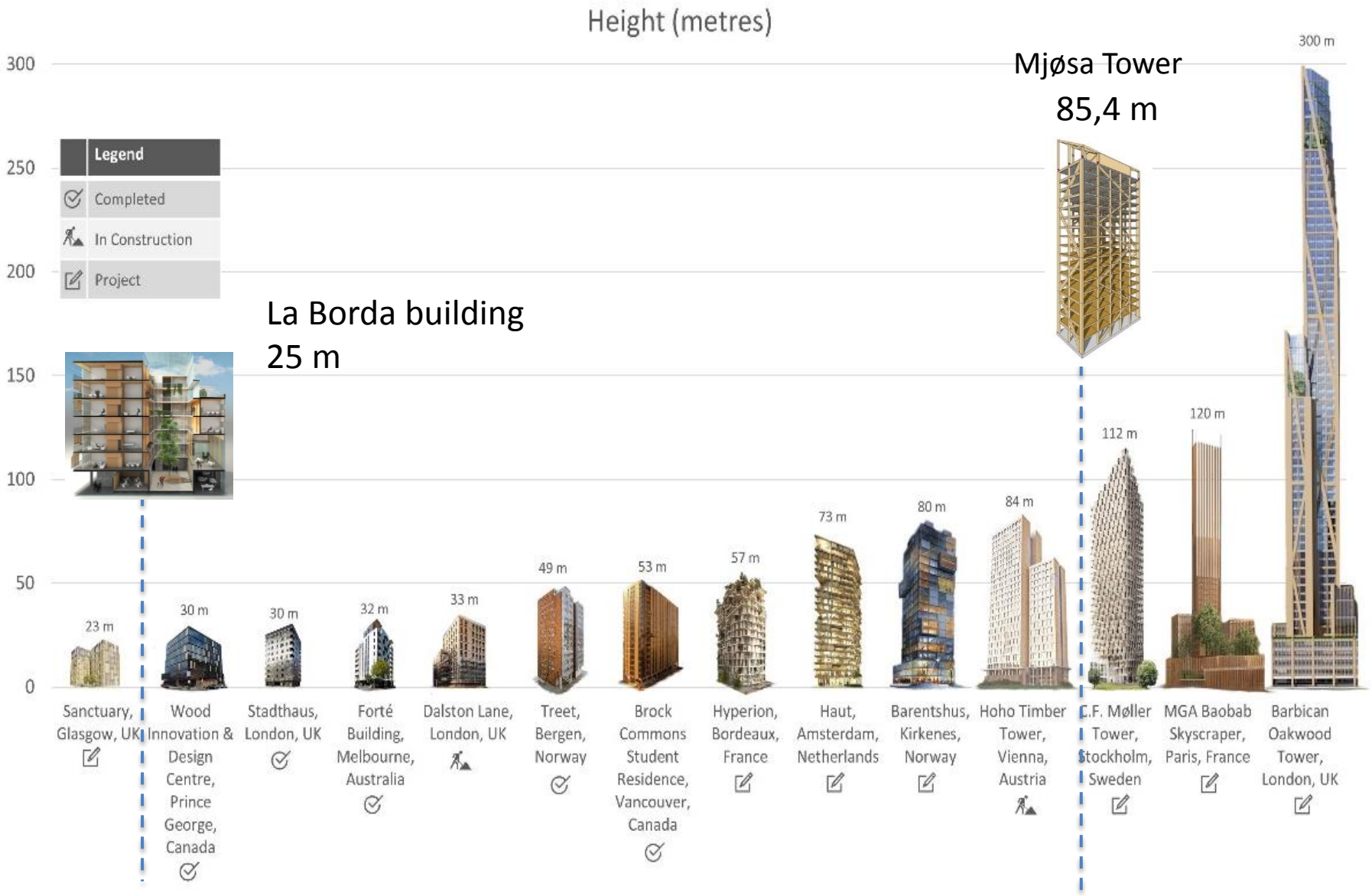
Social housing building

Innovative use of wood in buildings around the world



Mjøsa Tower / 18 floors / 85.40 m
Brumunddal - Norway (2019)
Voll Arkitekter

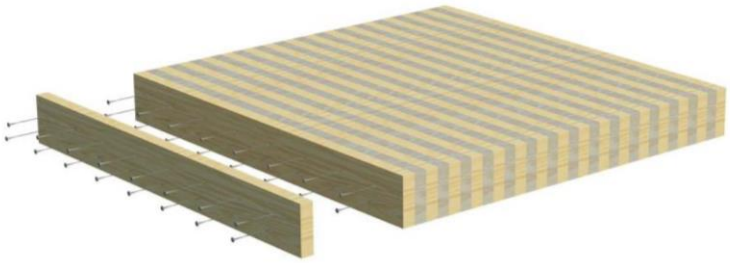
The world`s tallest wooden building



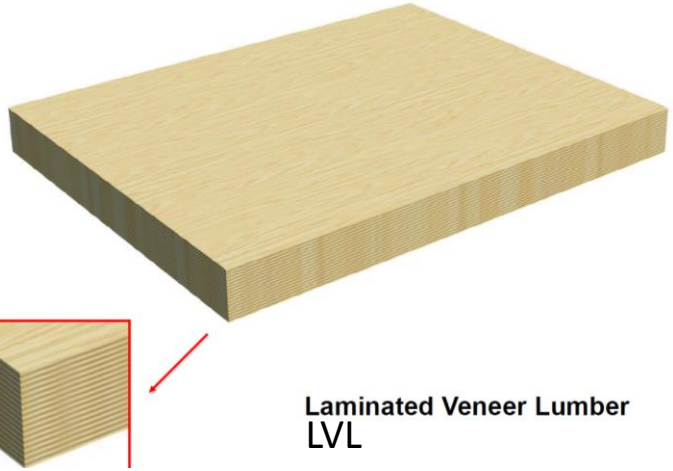
Engineers in Japan have projected a 350 m high building

Engineered timber products/ Mass timber

Wood has taken a technological leap, it is no longer just a traditional material

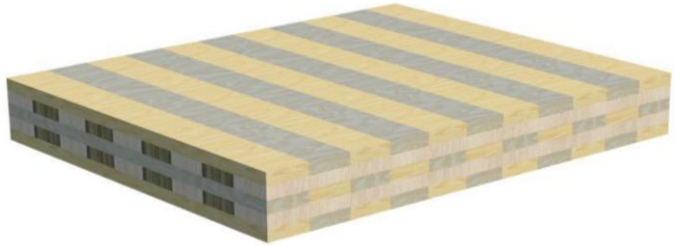


Nail Laminated Timber

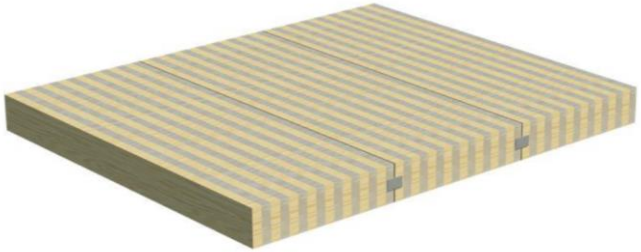


Laminated Veneer Lumber
LVL

DLT Dowel Laminated Timber



Cross Laminated Timber
CLT



Glue Laminated Timber
GLULAM

There are several high-quality timber based products for the construction industry

Engineered timber products/ Mass timber

Laminated Veneer Lumber panels
LVL

Cross Laminated Timber panels
CLT

Glue Laminated Timber beams
GLULAM

CLT: structural two-way spanning solid wood panel used in slabs and structural walls
LVL: with the same principle of CLT but with thinner layers
Glulam: manufactured from layers of parallel timber lamellas is used for beams and columns

Their high performance makes them the "star products" of mass timber for structural elements. Their use are spreading all over the world.

Engineered timber products/ Mass timber

Cross Laminated Timber
CLT

CLT: structural solid wood panel created by cross-layering, gluing and pressing planks of wood resulting in solid panels used in slabs and structural walls.
Dimensional stability
Limited shrinkage
Bi-directional span

Engineered timber products/ Mass timber

Cross Laminated Timber
CLT

CLT: structural solid wood panel created by cross-layering, gluing and pressing planks of wood resulting in solid panels used in slabs and structural walls.
Dimensional stability
Limited shrinkage
Bi-directional span

Engineered timber products/ Mass timber

Cross Laminated Timber
CLT

The CLT is a product that offers great advantages for construction sector. Therefore, promoting the manufacture of CLT with local wood is the main purpose of this operation.

So, where we are?

- Growing acceptance of the use of wood in construction by technicians, specifiers, builders and general public.

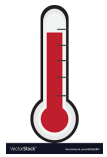
- The properties and advantages of the use of wood are increasingly valued, especially those related to the environmental impact.

  However, the lack of locally produced CLT penalises its carbon footprint.

- Some technical aspects continue to generate doubts and mistrust.

Fire behaviour

Thermal behaviour



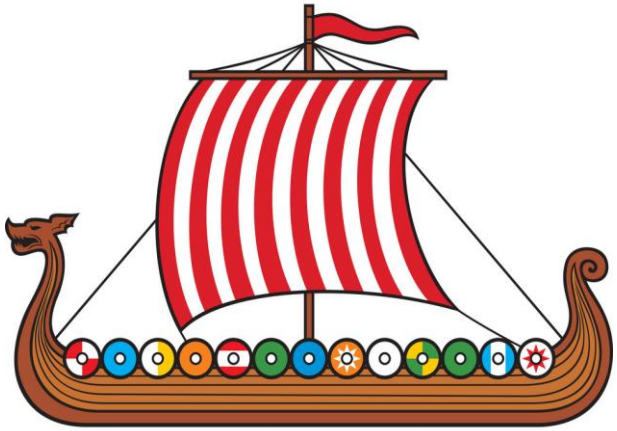
Renewable resource

Durability

Specific actions to achieve the goals

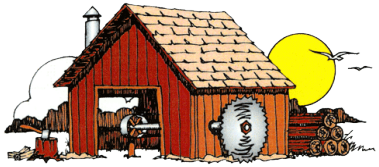
1. Innovation in the model of sourcing of wood products to reduce the dependence on the imports

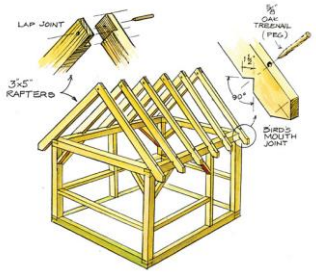
- Conduct meetings with wood warehouses and importers to define commercial qualities and prices.
- Brokerage between commercial agents, importers, warehouses and sawmills on certain batches of local wood.



Propose a change of model to reduce dependence on imported wooden products

Specific actions to achieve the goals





Local wood

Foreign wood

Primary
Wood processing sector

Low added value products

Packaging
Wood fuel

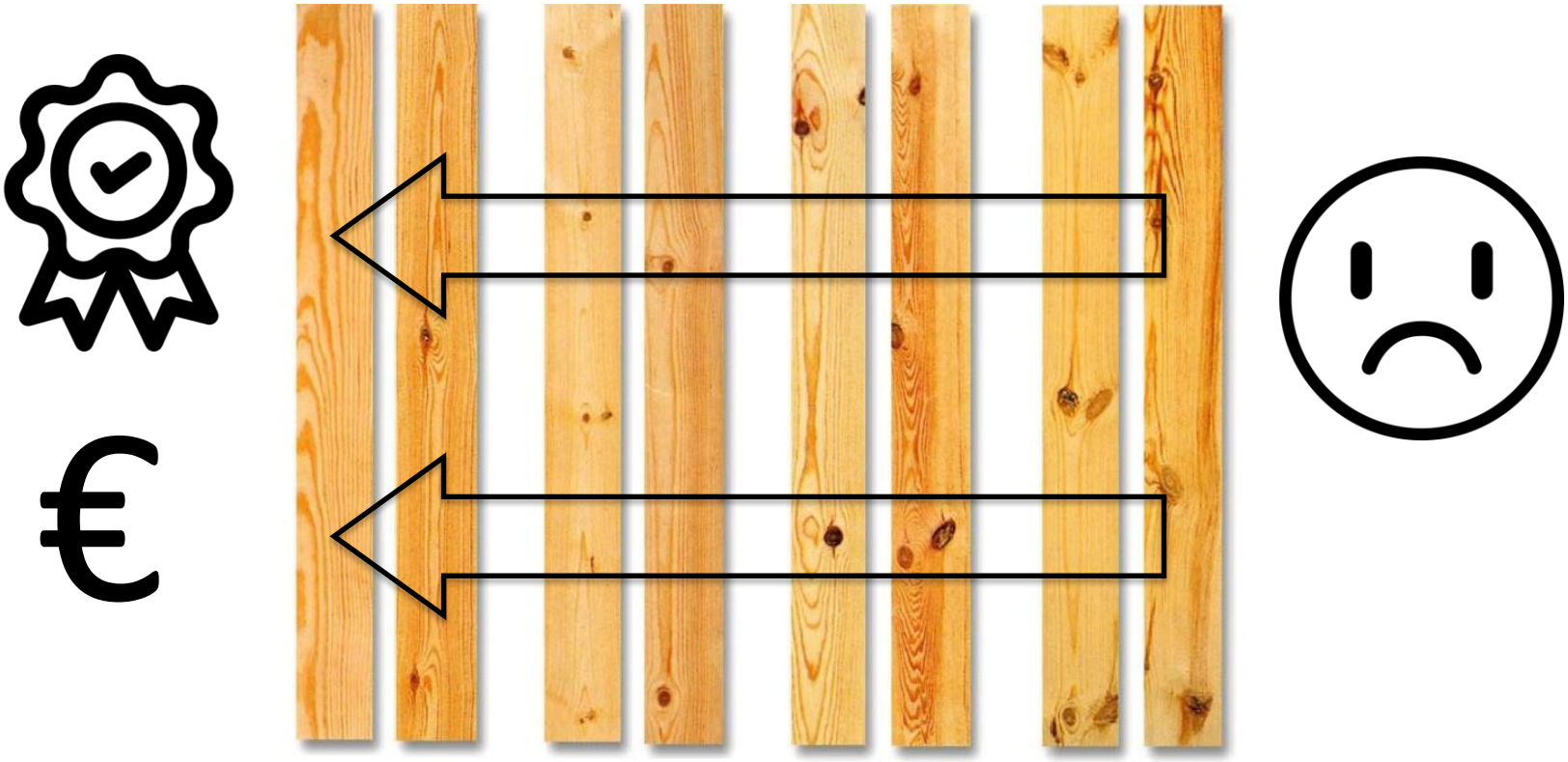
Secondary
Wood processing sector

High added value products

Warehouses
Carpentry
Furniture
Structural timber

Specific actions to achieve the goals

No Wood grading no added value



Actions to mobilize more local wood and generate products with more added value

Specific actions to achieve the goals

2. Improvements in the processing and distribution of wood products.

The goal of the action is to saw, dry and grade several batches of non-structural local wood to analyze the **costs**. In addition, the transportation costs to the warehouses will also be studied. **The aim is to do an economic analysis** and publish the results.

Specific actions to achieve the goals

2. Improvements in the processing and distribution of wood products

Main local species with optimal properties for timber products

Black pine *(Pinus nigra)*
Scots pine *(Pinus Sylvestris)*
Mountain pine *(Pinus uncinata)*

Specific actions to achieve the goals

3. Promoting the use of local wood and advanced construction solutions among specifiers

Production of technical and informative material to train and sensitize prescribers

Information leaflets and technical documentation

Specific actions to achieve the goals

3. Promoting the use of local wood and advanced construction solutions among specifiers

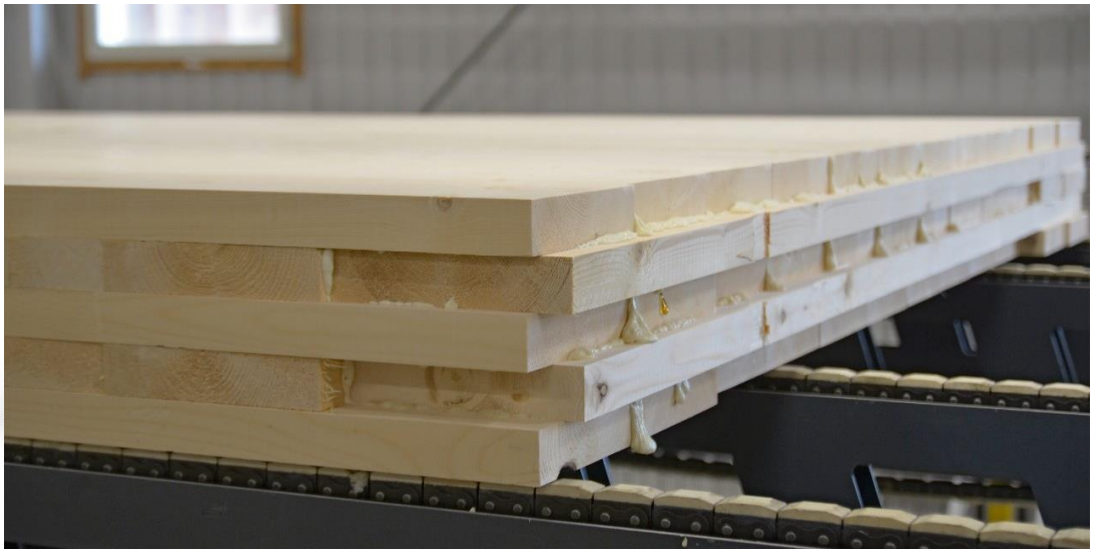
Production of technical and informative material to inform and sensitize prescribers.

Informative videos and publications in social networks

Specific actions to achieve the goals

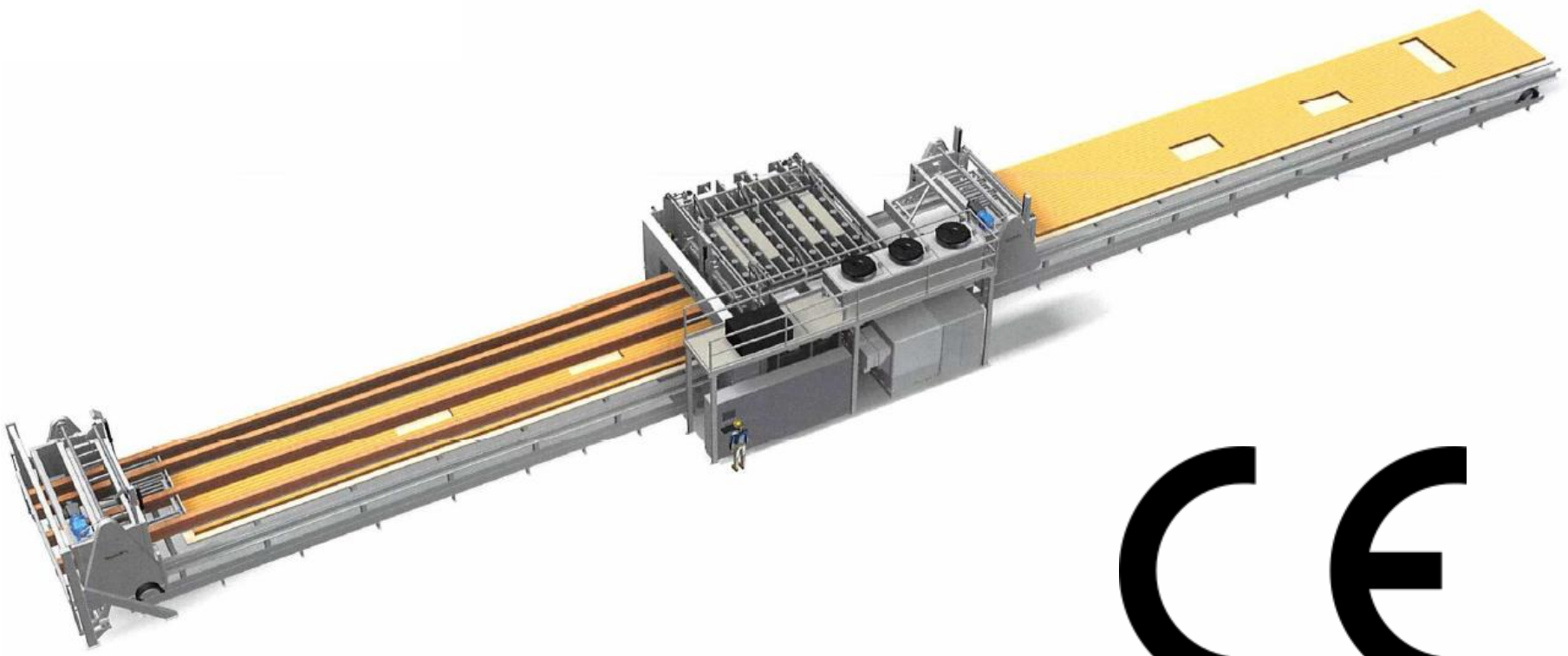
4. Consolidation of the CLT made of Pyrenean wood as a high-performance product

The action consists on the **standardization** of the Cross Laminated Timber panels, the **implementation of a factory production control** and the development and production of **prototype panels**.



Specific actions to achieve the goals

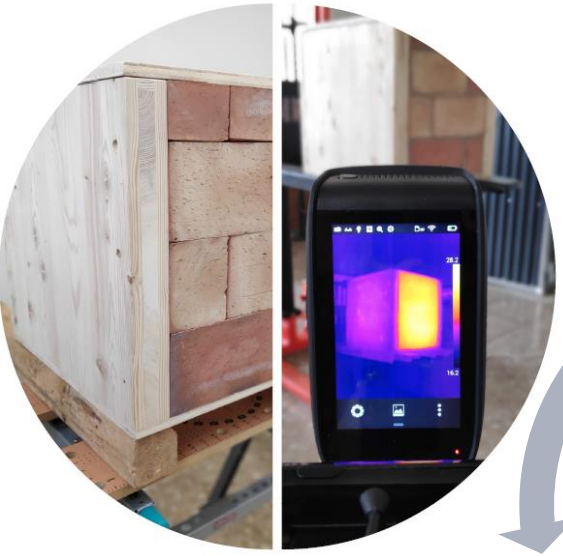
Standardization and factory production control are compulsory to reach the **CE** marking and meet the market requirements



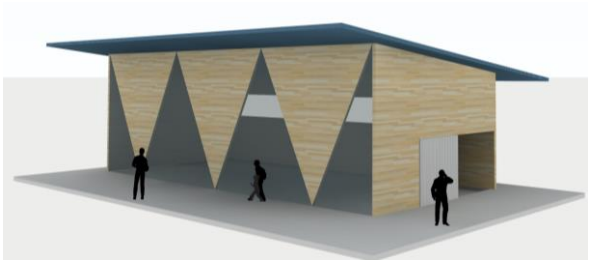
CE

Specific actions to achieve the goals

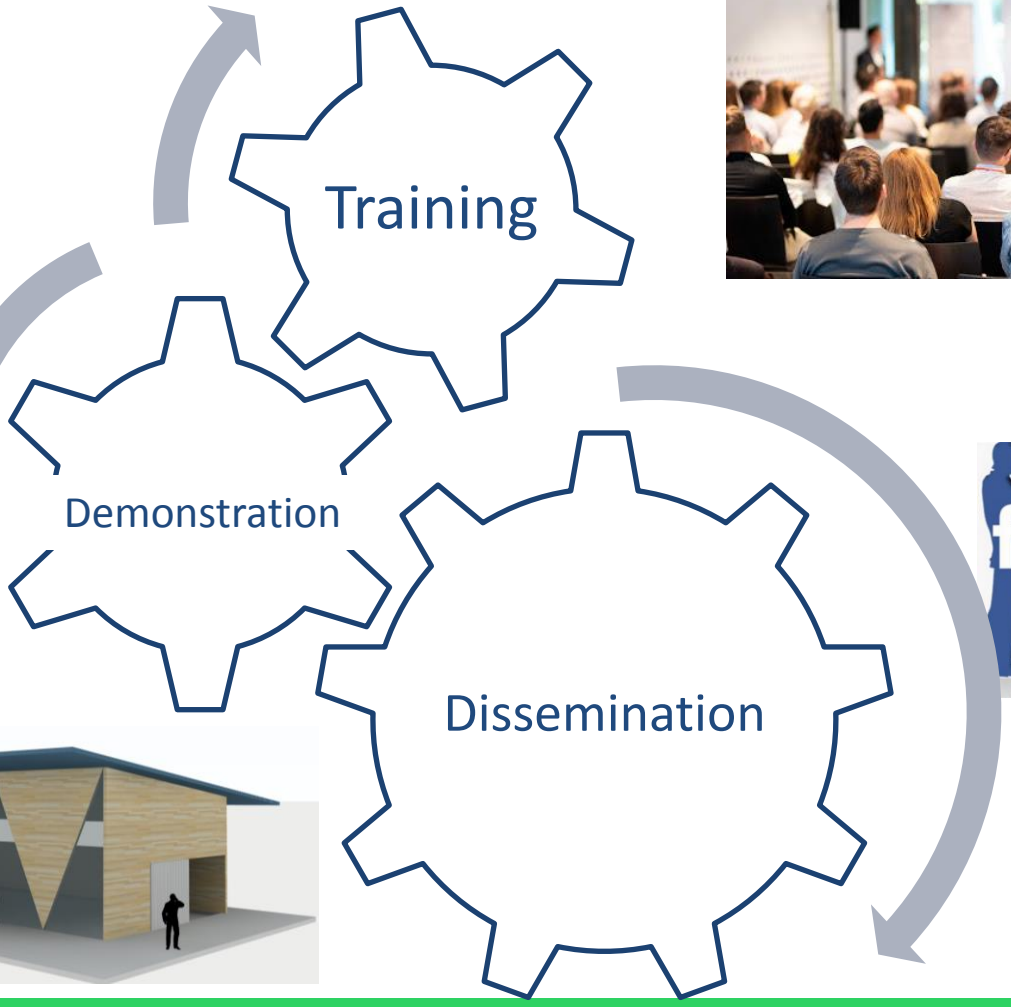
5. Promotion of CLT as a sustainable alternative to conventional building materials



Testing



Prototypes



Specific actions to achieve the goals

5. Promotion of CLT as a sustainable alternative to conventional building materials

-Training actions aimed at prescribers, consultants and stakeholders in timber construction and **CLT**.

-**Comparative studies** of properties of construction elements in CLT and conventional materials.

-Launch of a **technical support office** for the public sector (Lleida area) for the development of projects in **CLT**.

-Support to the promotion of the construction of **social housing with CLT**.

Thanks

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