Massive wood construction in Europe on the example of CLT: history & outlook

European Forest Week, 05.11.2019

Richard Steindl – Stora Enso
"Everything is now produced from fossil materials, can be produced from wood tomorrow"
Stora Enso Wood Products: The leading provider of sustainable building solutions

Production capacity 5.6 million m³
4,000 employees

Global customer base
- Northern Europe: 21%
- Western Europe: 12%
- Central Europe: 8%
- Middle East and North Afrika: 4%
- China and South East Asia: 15%
- Japan: 9%
- Australia: 4%

21 European units:
- 20 saw mills
- 3 CLT mill
- 1 LVL mill
- 8 pellet mills
- 1 biocomposite mill

2800 customers
+21% points improvement in customer satisfaction since 2015 (NPS)

100% of wood is traceable and from sustainable sources

EUR 1.6 billion sales 2018
+5%* 2018 vs. 2017
* Comparable sales excl. Puumerkki

+49% Operational EBIT 2018 vs. 2017
ROOC 28.1% in 2018 (target > 20%)

www.storaenso.com
Megatrends drive the demand for renewable materials... 
...and there is pressure on the market to change

Labor-productivity growth in construction is lagging behind:

- World economy: 2.8% p.a.
- Manufacturing: 3.6% p.a.
- Construction: 1% p.a.

Construction is among the least digitalized sectors in the world.
There is a pressure on the construction market to change...

Construction is one of the most resource-intensive sectors in Europe:

Buildings are responsible for **39%** of end use energy related carbon emissions globally

- **28%**
  - Operational emissions
    - Heating
    - Cooling
    - Power
    - Equipment
- **11%**
  - Embodied emissions
    - Materials
    - Construction

worldgbc.org/embodied-carbon
Buildings of the future must be & will be cheaper and more sustainable

Timber solutions offer:

• Up to 70% faster construction time
• Up to 80% fewer truck deliveries on site
• Carbon emissions cut by up to 75% using wood
• safer and quieter construction
• Healthier indoor climate
Buildings of the future must be & will be cheaper and more sustainable

Timber solutions are:

- Showing good **thermal resistance** and insulating properties
- as **strong** as steel and concrete
- 5x **lighter** than concrete
- Cost **competitive**
- not only reusable but also renewable
The idea of CLT (Cross Laminated Timber)

Original Aim - adding value: utilisation of side boards (regarded as fall-out, ~ 15% of total crop) for timber engineered products.

Situation Nowadays: utilisation of main and side boards for CLT production.

Scource: Prof. Schickhofer; TU Graz
History & outlook of CLT general

Source: Schickhofer, et al.; TU Graz

- 2007: Start of SE CLT
- ~1.25 Mio m³
Statements around CLT general

- Hot spots of production in Europe → Austria & Germany
- Need of new apartments in Germany

Source: https://www.holzkurier.com/holzprodukte/201910/vollgas.html
Statements around CLT general

• Clear trend to show timber

• Challenge: wood supply just fits the need for good visibility

• Opportunity: introduction of new species for CLT – possibilities for hardwood?
Statements around CLT general

• **Main drivers for growth** of CLT consumption in Europe:
  1. CLT is easy to build with: it is a flat, massive and big size element, which allows design like concrete but with several notable advantages (renewable, sustainable, lighter, faster,…)
  2. it's not a substitute for existing timber products but opens new markets (high-rise buildings)
  3. practical use of significant amounts of waste wood (side boards)

• **Challenges** of increased use of wood in the construction sector
  1. lack of capacity of small and medium-sized construction companies to realize multi-storey timber construction
  2. lack of standardization within timber construction
  3. Long lead times from CLT-suppliers during high season
  4. shortage of skilled workers due to a lack of training & education opportunities for architects and planners in timber construction
...some highlights

- Single family homes
- Extensions
- Schools
- Offices
- Public buildings
- Special buildings
- Hotels
- Multi-story residence buildings
This building grows back

17 min
to grow equal amount of trees in the Swedish forest on a summer day

Trummens Strand
Växjö, Sweden

Picture: FOJAB architects
CLT - Trummens Strand, Växjö, Sweden
One of the largest wooden building projects in the Nordics
The wood used removed 1,500 tonnes of CO$_2$ from the atmosphere..and it equals annual emissions of over 500 passenger cars.
CLT & GL - International House, Sydney, Australia
Setting new sustainability benchmark
6,000 m³ CLT
Australia’s tallest and largest engineered-timber office

> 2 hours
to grow equal amount of trees in the Austrian forest on a summer day

25 King St
Brisbane, Australia
Picture: Lendlease
CLT & GL - 25 King Street, Brisbane, Australia 2018
Australia’s tallest engineered timber office

GIFA
14921 m²
10 Storeys
6.545m³ CLT & Glulam
Modular CLT - Puukuokka, Jyvaskyla, Finland 2015
Finalist of the Mies van der Rohe Award
Modular CLT - Puukuokka, Jyvaskyla, Finland 2015
Finalist of the Mies van der Rohe Award
The wood used removed 5,700 tonnes of CO₂ from the atmosphere...

...and it equals 40 million car kilometres

Üstra-Siedlung
Hannover, Germany
Industrialized process
Prefabricated facade elements
Thank You

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