StoraEnso

Partner of Stora Enso

WOODCON

ZEB Laboratory
Trondheim, Norway

The Norwegian Zero Emission Building Laboratory (ZEB Laboratory) is a living office laboratory located in Trondheim, a Norwegian city often called "wood city" for its extensive use of wood in construction.

This full-scale laboratory functions as a living space uses as an office space and for educational purposes with real-life data. The knowledge gathered is used on an international level to support the advancement of zero-emission buildings on an industrial and competitive level. The knowledge gathered is applied on an international level to support the advancement of zero-emission buildings on an industrial and competitive level.

Partnering with WOODCON AS, the ZEB Laboratory integrates advanced building technologies and materials to achieve its ambitious environmental goals. A significant aspect of this project is the application of 525 m³ of Sylva™ kit of parts, which addressed critical structural and environmental challenges. The cross-laminated timber (CLT) used to make the walls has a very high load-bearing capacity while, at the same time, a very low carbon footprint, as verified by third-party environmental product declarations (EPD).

Together these qualities reduced the foundation requirements and overall material usage. This innovative application enhanced the Zeb Lab's embodied emissions performance and contributed to its zero-emission target.

Carbon footprint:

The Sylva kit generated 28 tonnes of greenhouse gases (CO_2e) to manufacture and 9 tonnes of CO_2e to transport. Compared to the 400 tonnes of carbon dioxide that the trees removed while they were growing and will store in for the lab, this is a small fraction. Choosing Sylva CLT elements instead of non-renewables avoided 600 tonnes of greenhouse gases. Source: SLU| NTM | EPD

The ZEB Laboratory achieved a ZEB-COM balance of -0.57 $kgCO_2/m^2$, meaning the building's renewable energy production compensates for its greenhouse gas emissions over its 60-year lifespan. Source.

Flexible/Adaptable

The ZEB Laboratory's adaptability is a core aspect of the building's design, allowing for the investigation and demonstration of new technologies in a full-scale office setting. This reduces risks for early adopters of zero-emission building designs. This flexibility allows for the exploration of different building configurations and types, making it a valuable resource for developing and testing innovative solutions.

Logistics

The transportation of the CLT elements were meticulously planned to minimize environmental impact with optimised load plans. Rail cargo facilitated the bulk of the transport, moving the prefabricated kit of parts from the mill to Brumunddal and by road for the last mile delivery from the train

Awards

The ZEB Laboratory has received numerous accolades for its advances in sustainable building including the State Award for Building Quality.

LEARN MORE

Did you know you can measure your building's carbon footprint too? Try it here: Carbon Calculator

ZEB Lab Campus

Wood City, Trondheim: We are building our cities with concrete. How do we change to wood?

The State Award for Building Quality to the ZEB Laboratory

General

Delivery year

2019

Building type

Office

Area (m²)

1,900

Storeys

4

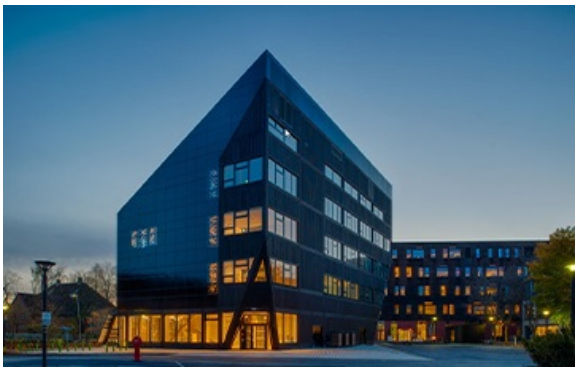

Photo credit: Woodcon/©M.C. Herzog

Products

Products and Services

Sylva™ CLT Walls

Product quality

NVI

Product volume (m³)

525

StoraEnso

Team

Partner of Stora Enso

Woodcon AS

Developer

NTNU/SINTEF the Research Council of Norway, and Enova

Architect

LINK Arkitektur

Structural Engineer

SINTEF

Main contractor

Veidekke Entreprenør

Specialist Timber Subcontractor

Woodcon AS

Timber Engineer

SINTEF

Others

Total construction development cost (€)

11,000,000