

NERO – the woody North

Wood for Zero.

Nordic countries have long traditions of building wooden houses. This year 2020 all new buildings in EU have to be nearly zero energy buildings (nZEB).

Within the Horizon2020 NERO project, we are studying seventeen Nordic wooden buildings, for wider market uptake and as a tool for national and EU wide decision making. Some of these buildings are completed while others are under construction. We will develop and demonstrate technical solutions, which will reduce the costs of new wooden nZEB buildings compared to the current structures.

What for?

The City of Kouvola in Finland has rapidly adopted the national nZEB concept. As a backbone to the city's building plans in the private sector, prefabricated wooden buildings can provide a solid solution to achieving nZEB requirements in a cost-effective manner.

In the City of Växjö, the NERO project will be one of the measures helping to reach the 2030 zero fossil carbon dioxide emissions target. In Estonia the manufacture of wooden buildings has developed to be one of the key industries with 140 enterprises, supplying around 85-90% of the housing stock. In Norway, SINTEF has pointed out that the NERO project provides an excellent opportunity to contribute through past experience and acquiring new knowledge in wooden structures and nearly zero emissions buildings.

Evaluating the results so far

Some of the detailed summaries are now being completed and can be found on the NERO webpage under the title "General materials".

Today, as country specific results in Finland different technical solutions and energy performance levels, all affecting the investment costs, has been compared as life cycle costs.. Referring to calculated energy to measured energy used represent, for 20 years use, the energy costs rise on the average from 6-8% to 15% of the LCC. To bring the consumption of energy under control, to find the more cost effective and technical solutions for energy efficiency affecting the energy consumptions and costs are one of the key element for cost reduction in Finland.

The techno-economic aspects focus on construction process times, procurement processes, and general project management. The NERO demonstration Finnish project is the beginning of a new industrialization process in the Finnish construction business.

Växjö Kommunföretag in Sweden has focused on wood-



"Vallen Norra A" is a 9-floor apartment building in Växjö, Sweden. Completed in 2015. Greenhouse gas emissions (GHG) and embodied energy (CED) studied in NERO.



Finnish 4-section wooden day care center "Lehtomäki" in Kouvola Finland. Completed in 10.2018. National nZEB building (class A), with geothermal heat and PV panels.

frame residential buildings. The optimal cost analysis is showing that the insulation thicknesses required to achieve nZEB energy levels are considerably higher than those applied in the current Swedish building code. The Swedish results of the life cycle analysis show that wood-based building systems give lower primary energy use as well as reduced carbon emission compared to non-wood alternatives.

Tallinn University of Technology has worked on cost reduction for new nZEB wooden buildings. Their recommendations in NERO focused on efficient heat source, compact building volumes, well-insulated and airtight building envelopes and specifics for ventilation systems.

Sintef compared the improvements of energy efficiency and reduction in greenhouse gas emissions, from national TEK17 requirements to the NERO Norwegian demo. It was found that profitability on a 20-year perspective depends on the heating system energy efficiency. ●

<https://www.neroproject.net/>