

## CASE STUDY

### Project

Report on Carbon Footprint Limits for Common Building Types, commissioned by the Finnish Ministry of Environment.

### Location

Finland

### System boundary

A1 – A3

A4

B4

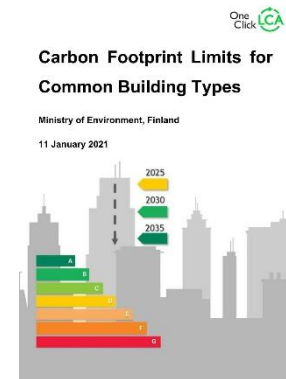
B6

C1 – C4

### Origin of data

[One Click LCA](#), commissioned by the [Ministry of the Environment](#)

## CARBON FOOTPRINT LIMITS FOR COMMON BUILDING TYPES



### Solutions:

Examined scenario	Additional information
Ground source heat pump	Using a ground source heat pump for the entire heat and cooling supply
Energy class	Achieving energy class A (scenario considers only differences in energy consumption)
Concrete with recycled binders in cement	Using concrete that uses 40 % alternative binders
Stud frame timber structure	Using stud frame timber structure
CLT Structure	CLT Structure

## Impact assessment

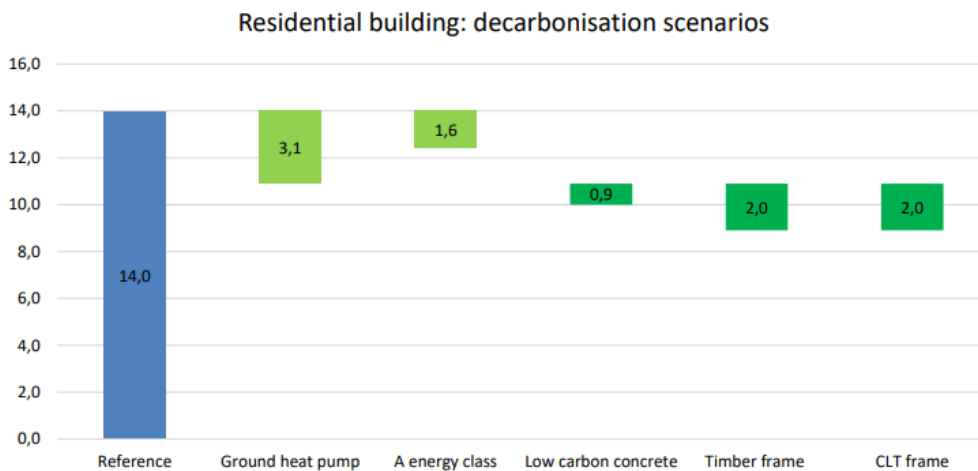
### Global Warming Potential (GWP)

The report focuses on five building types, including multi-family residential buildings, and examines five strategies to reduce emissions, considering both material and energy consumption. The selected strategies were considered to have both high applicability and emission reduction potential. The baseline in each case, was considered to be an equivalent building made of precast concrete elements and with an average energy consumption performance. The examined scenarios were the following:

- Using a ground source heat pump for the entire heat and cooling supply
- Achieving energy class A (scenario considers only differences in energy consumption)
- Using concrete that uses 40 % alternative binders
- Using stud frame timber structure
- CLT Structure

More information on the study can be found [here](#)

The maximum reduction that could be achieved with the examined measures was 36 % from the business-as-usual cases. The combination energy class A and concrete with 40 % alternative binders achieves an 18 % reduction, where ground heat source pump combined with low carbon concrete managed a 28 % reduction from business-as-usual case. Unit in graph is kg CO<sub>2</sub>-eq/m<sup>2</sup>/a.



## Other Hotspots

Additionally, timber and CLT frames entail some additional environmental benefits which are not commonly included in LCAs and which are known in the Finnish construction sector as “Carbon Handprint”. Such benefits include temporary storage of carbon in wooden elements (biogenic carbon) and energy recovery potential from wood-based product incineration. Unit in graph is kg CO<sub>2</sub>-eq/m<sup>2</sup>/a.

