An aerial photograph of Helsinki, Finland, at sunset. The city is densely packed with modern buildings, many featuring wood paneling. A large body of water is visible in the background, with the sun low on the horizon. In the foreground, a curved road and a canal with several boats are visible. The text "More wood!" is overlaid in large white letters.

More wood!

Sustainable transformation of cities – case Helsinki

Anri Linden, Unit Manager, Urban Environment Division, Detailed planning

Helsinki

16.6.2021



Helsinki's target is to be carbon neutral by 2035.

The most significant emissions generated in urban areas come from heat and electricity consumption and traffic. The emissions need to be reduced also holistically taking in to account the emissions of city structure, construction and maintenance.

Helsinki

Hiilineutraali Helsinki 2035 -toimenpideohjelma

Pormestarin esitys kaupunginhallitukselle



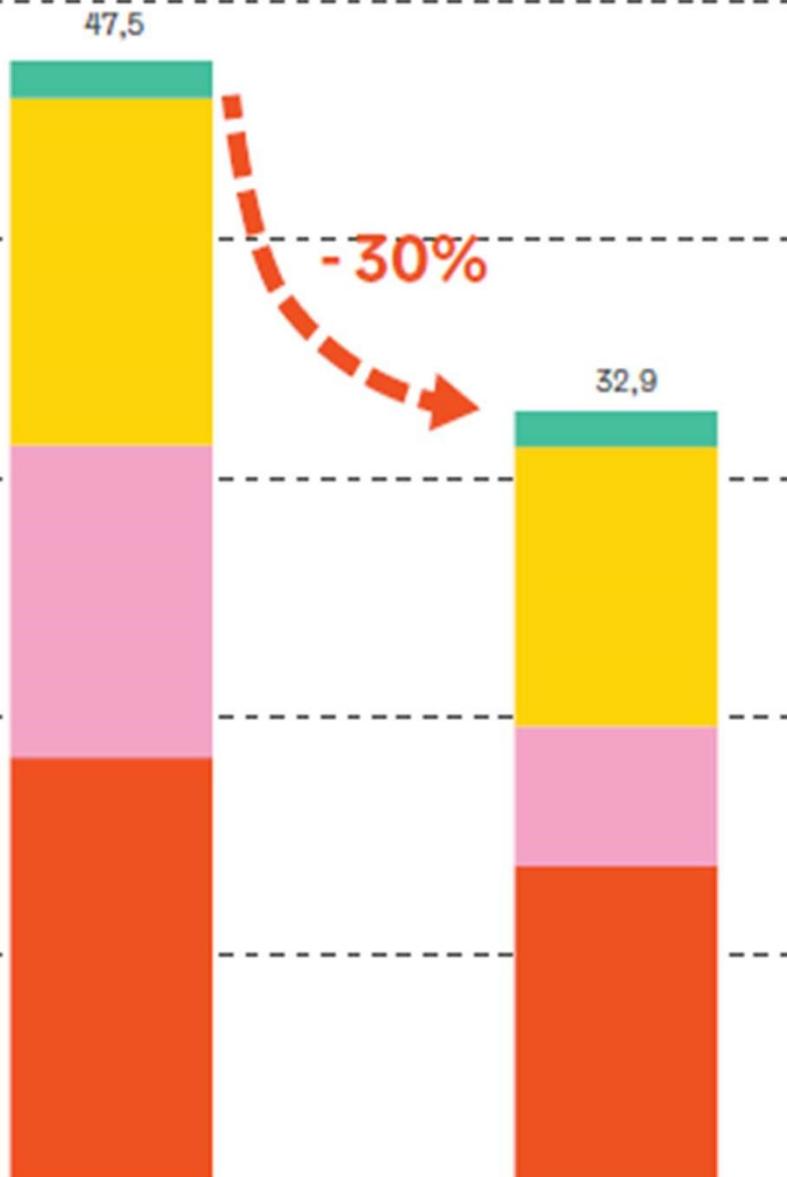
Carbon neutral Helsinki 2035 – action plan steers all building projects in Helsinki. The action plan affects also planning, plot release, building permits and control and the planning of green networks.

Why more wood?



Building construction industry needs the most low-carbon materials as possible and at the moment that is wood.

Using wood in building construction offers long term carbon storage. In wood construction the early stage emissions peak is significantly lower compared to conventional building and the life cycle emissions are also lower.

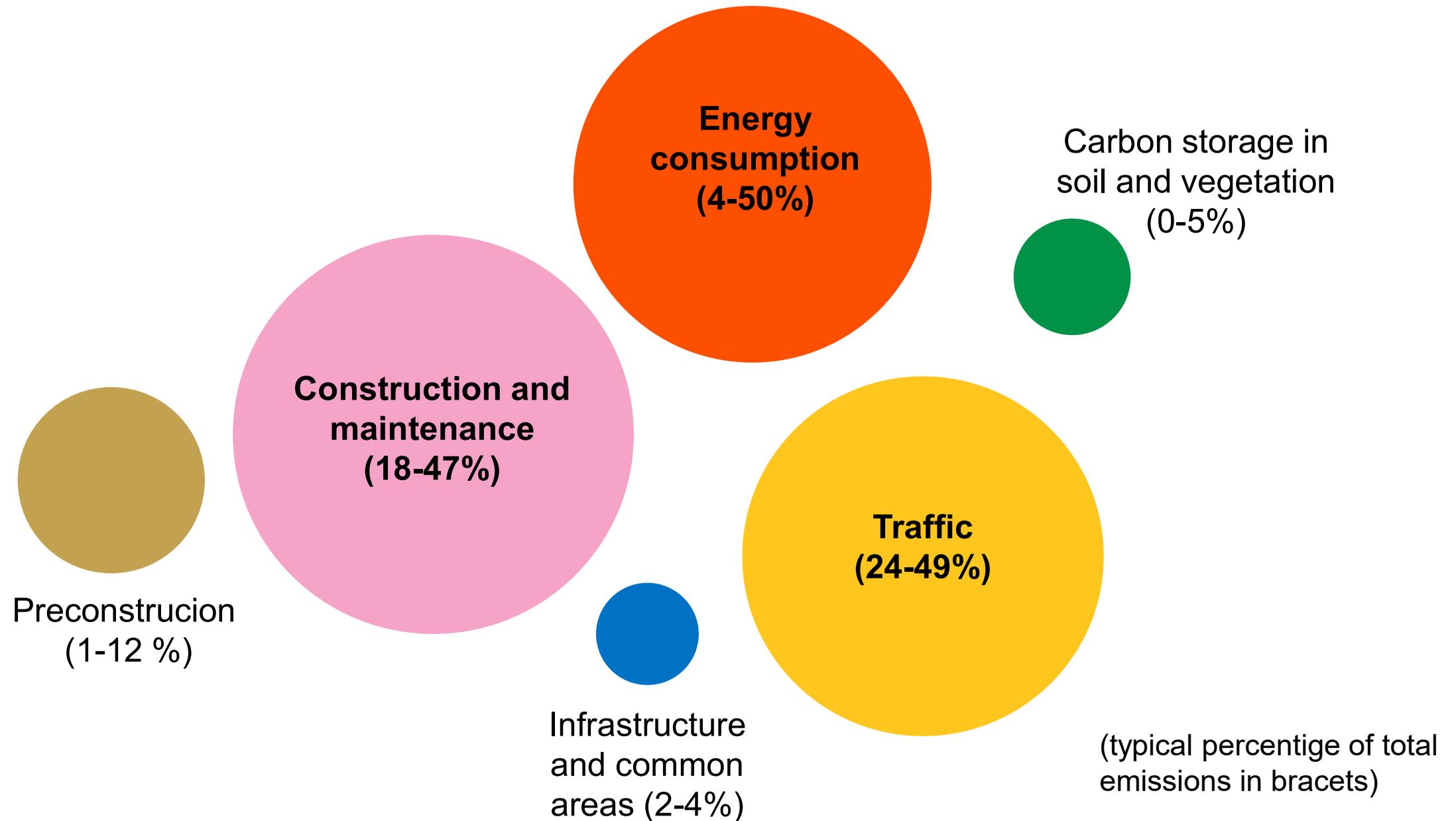


HAVA,
a tool for detailed planning:
(Helsinki detailed planning low carbon evaluation tool)

In detailed planning new tool to calculate life cycle carbon footprint and handprint

HAVA is clear, easy to use and an easily updatable method which steers in to low carbon or carbon positive solutions in detailed planning.

Detailed planning carbon emissions

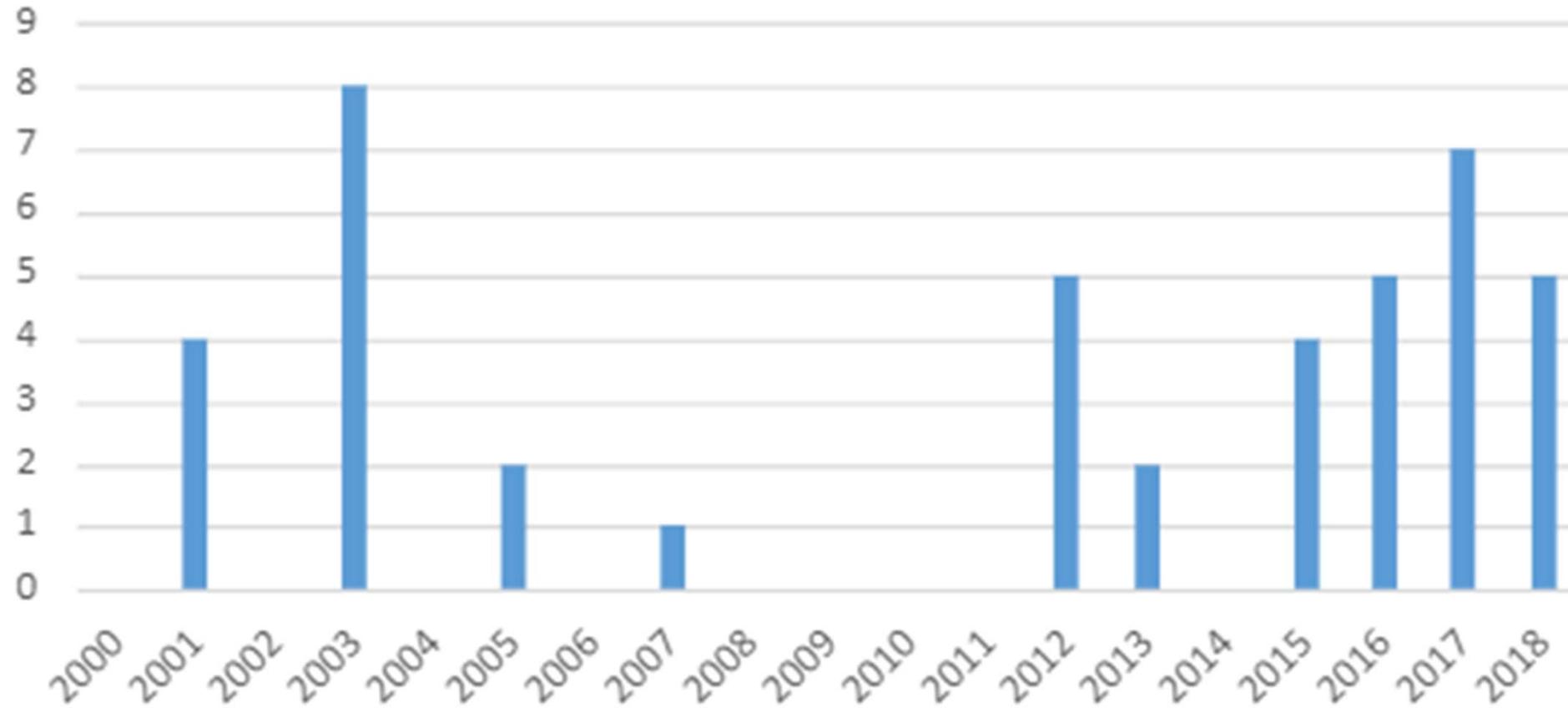


Existing wood?

Built so far

Completed wooden multistorey housing buildings in Helsinki 2000- 2018

amount



Vuosaari, Omenämäki

The first detailed plan which required wooden structure in multistorey housing came in to effect 20 years ago. Experimental building and not all were built with wooden structure. The one with wooden structure gained a prize and praise.



Myllypuro wooden village

Area almost finished for 2000 inhabitants.
Architecture competition was held in 2003 (Artto Palo Rossi).
Main idea is to bring building along living street and keep the gardens in their natural state. Mostly small houses with 2 floors.



Helsinki

Arkkitehtityöhuone Artto Palo Rossi Tikka Oy / Aaro Artto



Honkasuo

A wooden village for 2000 people started to be built around 2010. Betoniteollisuus ry (Confederation of Finnish Concrete Industries RT) made an appeal against the detailed plan with wood requirements, but the appeal did not succeed. The Judicial System assessed that requiring wooden building is justifiable for the positive impact on climate.



Helsinki

Kuninkaantammi

Kuninkaantammi is being built at the moment and in the detailed plan the focus is on climate change both in mitigation and adaptation. Energy efficiency, renewable energy, green roofs and rain gardens are required in the wooden quarters of Kuninkaantammi. There will be around 30 wooden apartment buildings. This will help wooden apartment blocks to become mainstream.



Comparing wood and concrete

Two almost identical apartment blocks, one made of concrete and the other of wood were compared in Kuninkaantammi. The building with a concrete structure had almost 40% higher carbon footprint than the one with wooden structure. The wooden building required more planning but was built faster. The wooden building was a little bit more expensive to build partly due to Finnish fire regulations which require sprinklers among other things.



Helsinki

Public buildings

Several wooden schools and day-care centres are being built in Helsinki. Lapinmäki was the first day-care centre with a massive wooden structure. In Hopealaakso day-care centre also the building cost was competitive.



photo:Puurakentajat



Helsinki

Residential examples

Helsinki residential construction service builds wooden apartment blocks for regulated production. In around twenty years it has built six projects with 441 housing units and 33 000 m2.



PUKINMÄKI, Eskolantie 2015, NBO Bostadspris 2016
Arkkitheitoimisto Matti Iiramo Oy



VUOSAARI, Omenmäki 2003-2007, Rakentamisen Ruusu prize
2007, Arkkitheitoimisto Helamaa ja Pulkkinen Oy

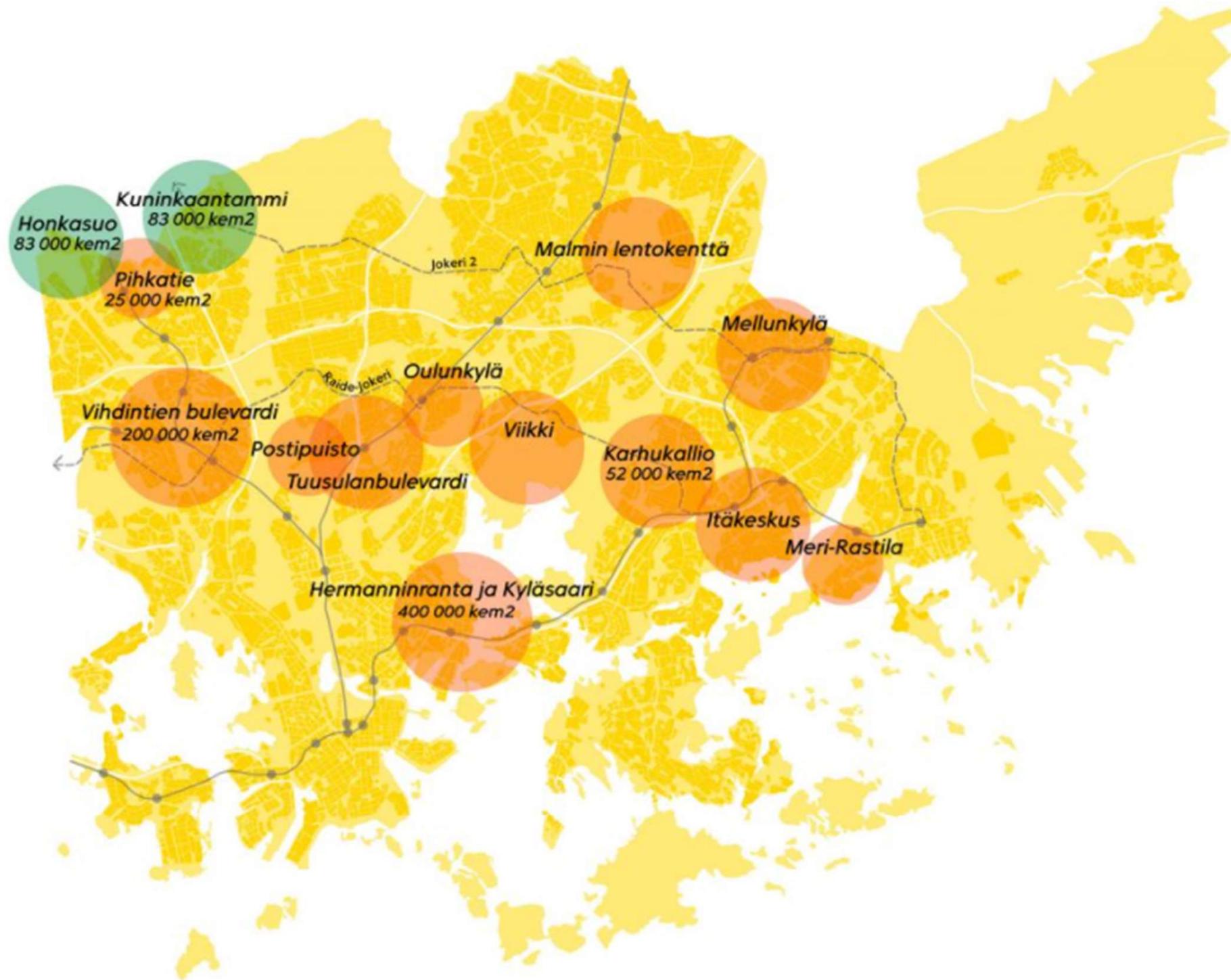


VIKKI, 65 asuntoa, 1997 woodprize 1998,
Arkkitheitoimisto Mauri Mäki-Marttunen Ky



JÄTKÄSAARI, Wood City, 2019
Anttinen Oiva Arkkitheidit Oy

Wooden future?



Wooden parkinghouse

A project with the purpose of developing a wooden parking garage that meets Finnish standards was launched in March 2020. Using wood in parking garages could help reduce the carbon footprint of construction while also increasing carbon pools. At the moment, there are no wooden parking garages in Finland taller than two floors, as building taller structures has not been possible due to the national fire safety standards. The project's parking houses are designed in Kuninkaantammi, Helsinki, and Kivistö, Vantaa. The parking garages will have green roofs to absorb storm waters and solar panels for producing electricity.



Urban renewal in wood?

Existing residential areas are being renewed and the focus is in three areas: Mellunkylä, Malmi and Malminkartano- Kannelmäki. Wooden building is very suitable in these areas for infill building, adding floors and restoration.

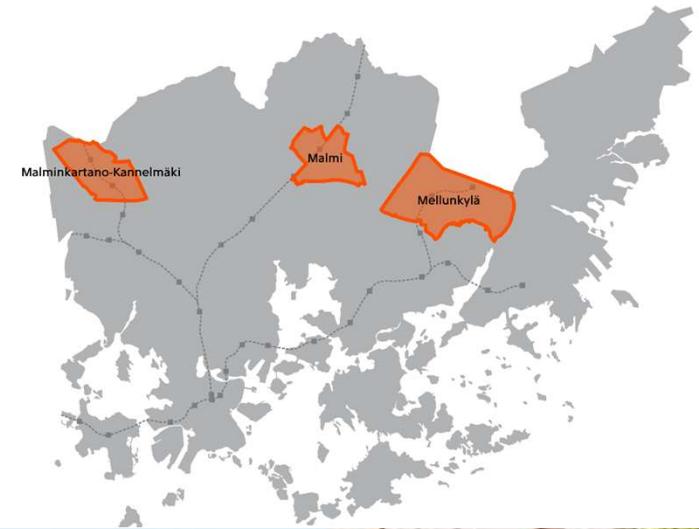


Image: Uusi Kaupunki

Wooden redevelopment and adding floors

Address: Karviaistie 12

Architectural competition to redevelop the outer shell of an existing building and adding two wooden floors.

90 new flats

Arkkitehtuuri- ja
muotoilutoimisto Talli Oy
Arkkitehtitoimisto A-Konsultit Oy



Masters thesis

Serial produced wooden apartment building

AsuMut Asumisen uudet muodot - Eheytyvät lähiöt -hanke



Ympäristöministeriö
Miljöministeriet
Ministry of the Environment



MASTER THESIS Serial Produced Wooden Apartment Building

STUDENT Marie Yli-Äyhö, M.Sc. (Tech.), BA (Arch.)

OHJAAJA Markku Karjalainen, Associate Professor,
D.Sc., M.Sc. (Arch.), Tampere University



STARTING POINT

Increasing wood construction in Helsinki:

- Climate targets
- Residents find wood material pleasant

Suburban development:

- AsuMut -project
- Mellunkylä as a development target

OBJECTIVES

Revitalization of suburbs

Development of series production of a timber-framed apartment building

WOOD FRAMED MODULES

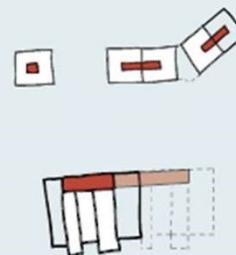


- Staircase
- Balcony element
- Bathroom element

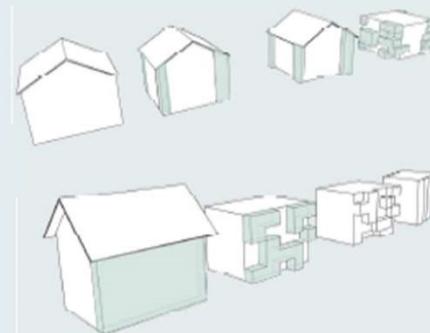
ADAPTIVE SPACE SOLUTIONS



MASS OF ONE OR MORE HOUSES



SEVERAL FACADE SOLUTIONS



Kontula Center

Ideas competition in 2020

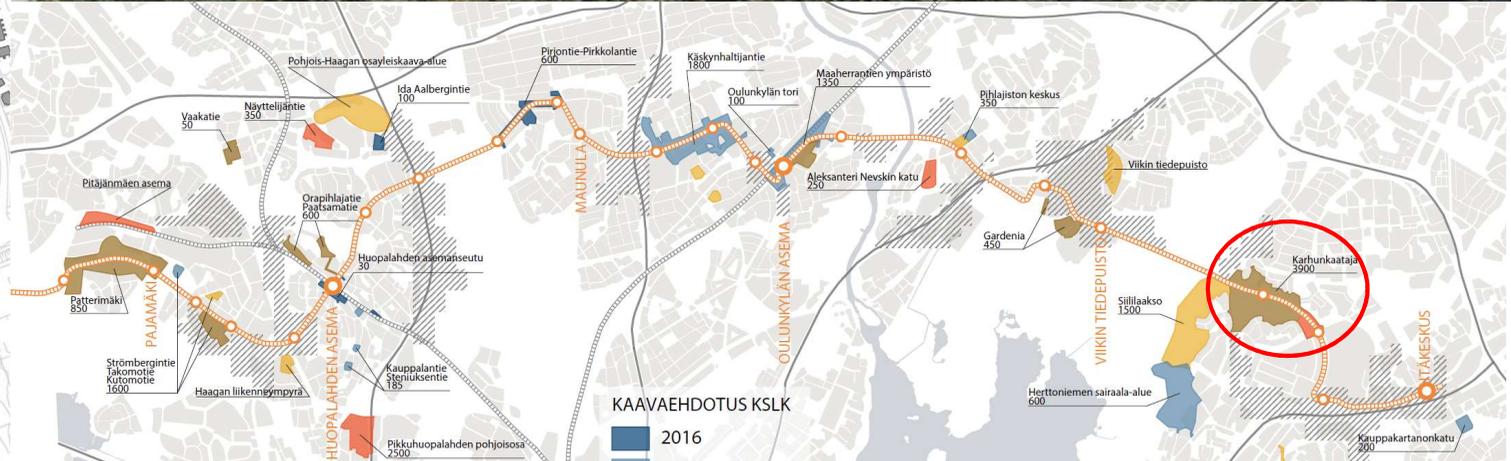
- Five Architectural offices invited
- Winner Architecture office OPUS with "VAELLUS"
- Flexible concept that allows a lot of diversity and phazing etc.
- Wood is used in residential building
- Honorary mentions: "Pioneria", Aarti Ollila Ristola Arkkitehdit Oy ja "REMIX", JKMM Arkkitehdit Oy



Karhukallio

Karhunkaataja is a new residential area for almost 3000 inhabitants in eastern Helsinki. Almost half of new building is required to be wooden among other low carbon requirements.

Tramline "Raide-Jokeri" has a stop right at the heart of the area.

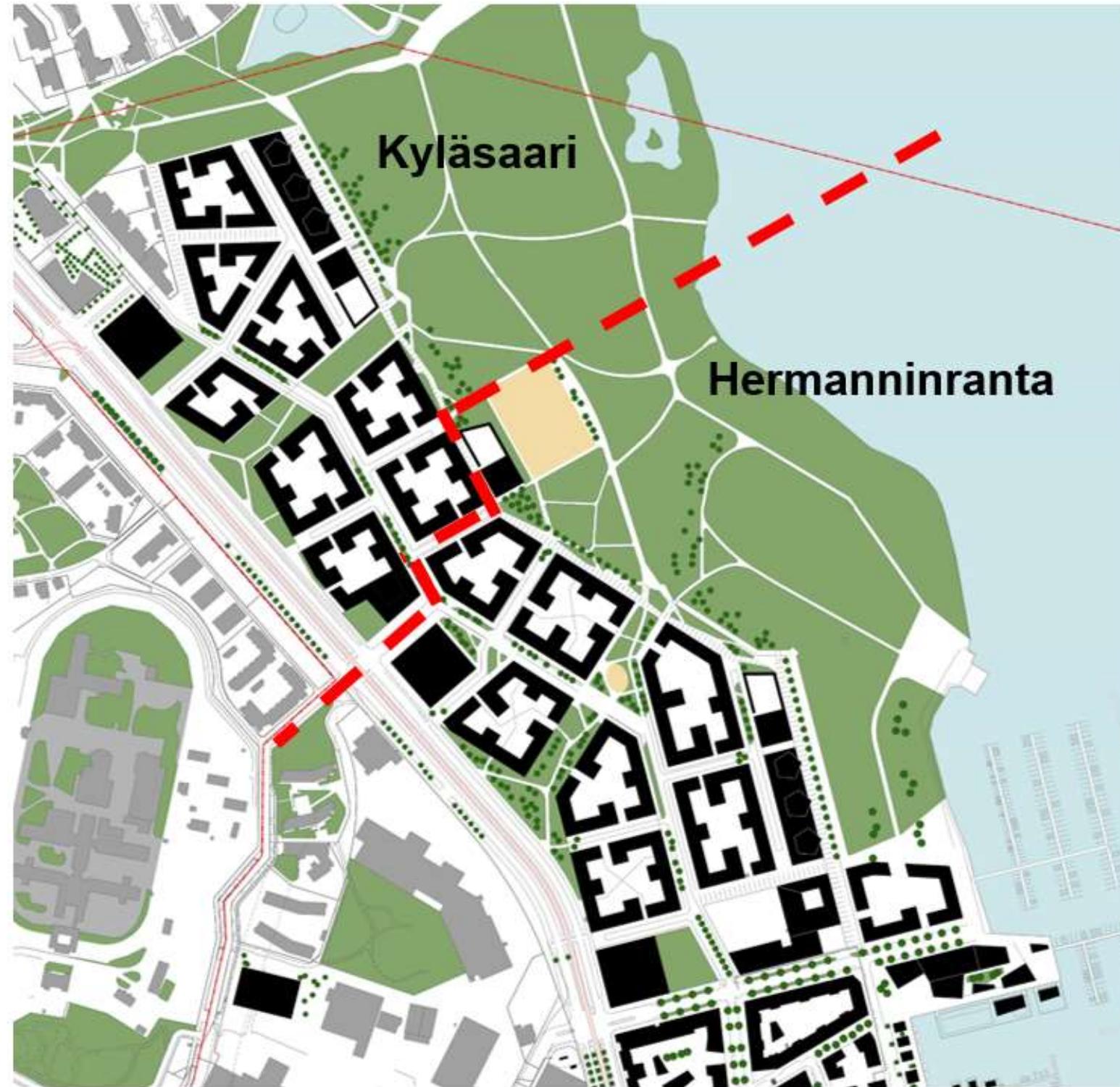


Hermanninranta

The goal is to study as broadly as possible the opportunities for wooden building in the areas of Hermanninranta and Kyläsaari.

There will be homes for 10 000 people with services and recreation.

Because of the foundation circumstances the blocks and streets need to be founded on a piled slab. Therefore the amount of concrete in the area is large and in order to compensate the carbon footprint building from the ground up will be mostly wood.



The impact of wooden building in city scape

The impact of wooden building in welfare and living conditions

The impact of wooden building in climate change mitigation

The readiness of wood industry

How will planning regulate building in wood

Things to consider in detailed planing

Helsinki

Technical requirements etc.



VEHREÄÄ ULKOTILAA PUUSTOLLA



HULEVESIPAINANTEET OSA IDENTITEETTIÄ



VEHREÄ JULKISIVU KAUPUNGILLE



Helsinki East Urban Center

International ideas competition
2019 – 2020

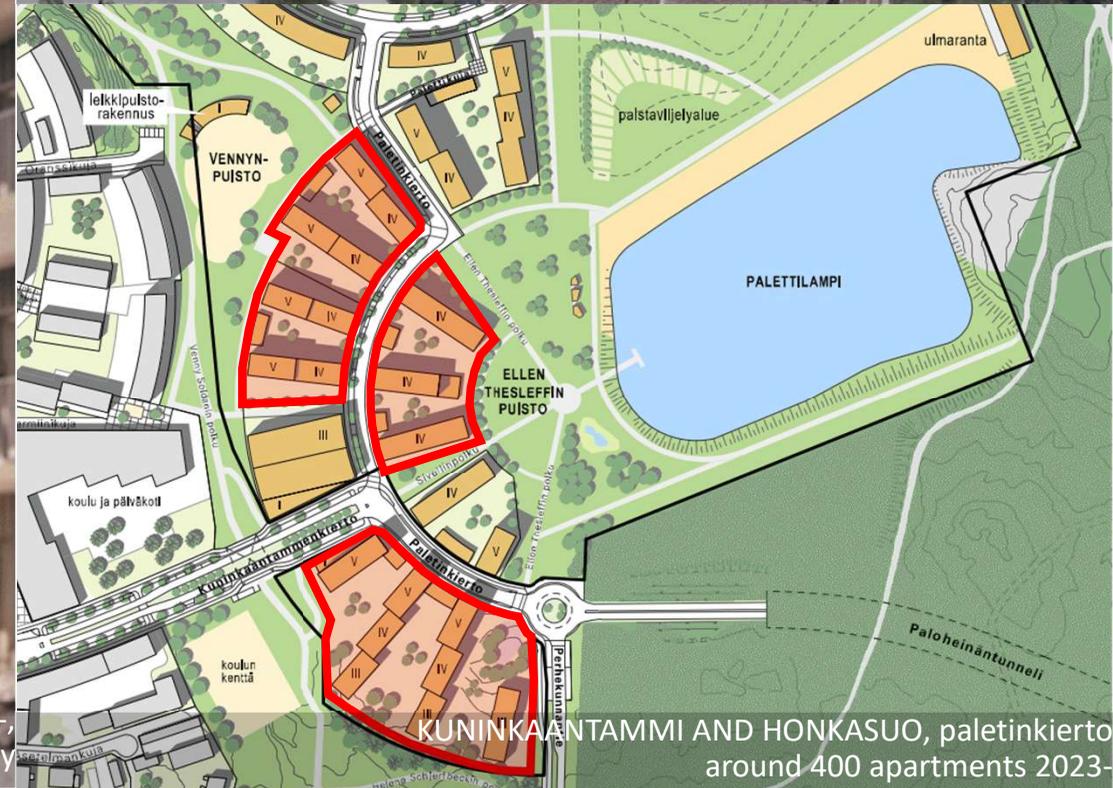
1. Prize “Jalan Jaloin”
2. Prize “ ITIS SITI”

Ambitious goals towards a more resilient city structure for the Centre of Eastern Helsinki. Wood as a building material, walkable city structure and existing excellent public transport infrastructure give a lot of potential for the future.



Residential examples

Helsinki residential construction service builds wooden apartment blocks for regulated production. In the next three years it will build 800 apartments with 60 000 m2 new wooden houses.



Carbon Neutral Helsinki 2035?

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Urban Environment Division

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<https://www.uuttahelsinkia.fi/en>

https://www.hel.fi/static/liitteet/kaupunkiymparisto/julkaisut/julkaisut/HNH-2035/Carbon_neutral_Helsinki_Action_Plan_1503019_EN.pdf