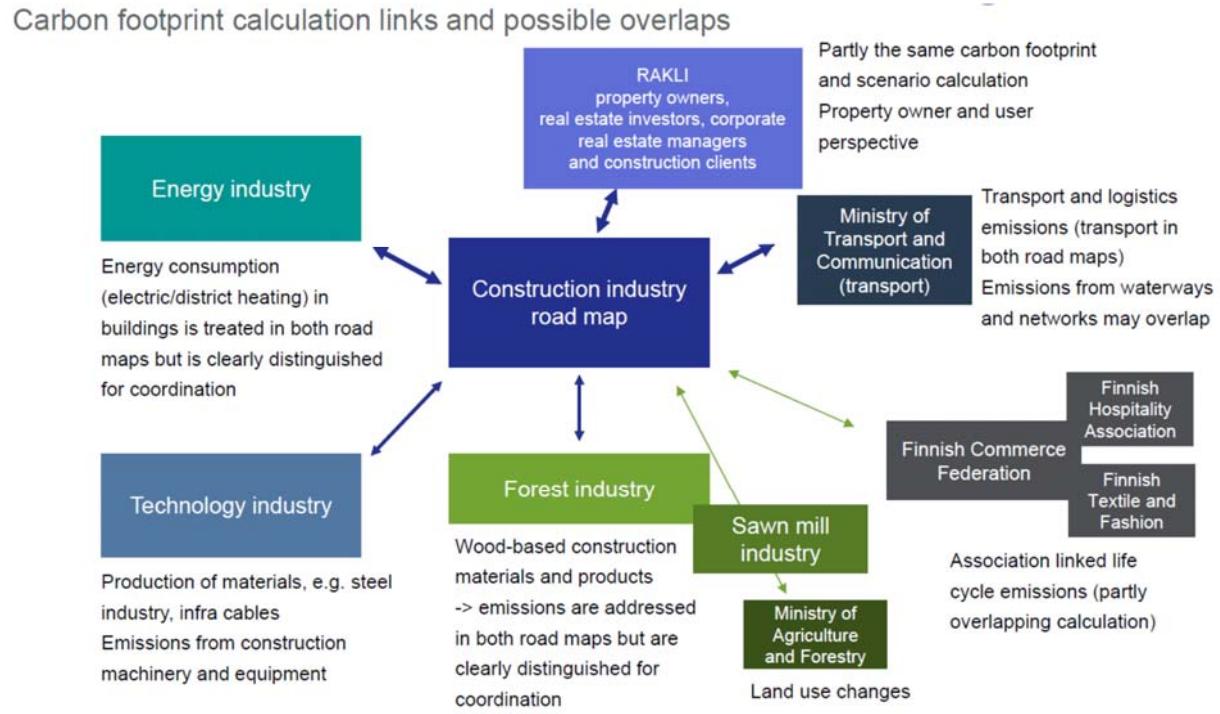
Low carbon road map of construction industry

Starting points

Finland aims for carbon neutrality in 2035 and carbon negativeness quickly thereafter. As part of the industry-specific road maps according to the Government Programme, Confederation of Finnish Construction Industry RT, together with its stakeholders, developed a road map towards a low-carbon environment. The built environment has a very broad social and economic importance. Approx. 83% of our fixed capital base consists of buildings and infrastructure. The real estate and construction sector accounts for 15% of our GDP and employs over 500,000 people.

The energy use and climate impacts of the built environment and construction are also significant. The built environment takes more than a third of the energy consumed by Finns and accounts for about a third of the climate emissions from Finnish consumption. At present, most of the sector's emissions are generated by operational energy consumption. In addition to industrial sector, the built environment is one of the most important CO_2 emission producers and its role in mitigating climate change is undeniable.



Sector connections of construction industry's roadmap.

For the first time, the annual carbon footprint of construction and the built environment, emission reduction methods and their conditions as well as scenarios for the future until 2050 have been established in the

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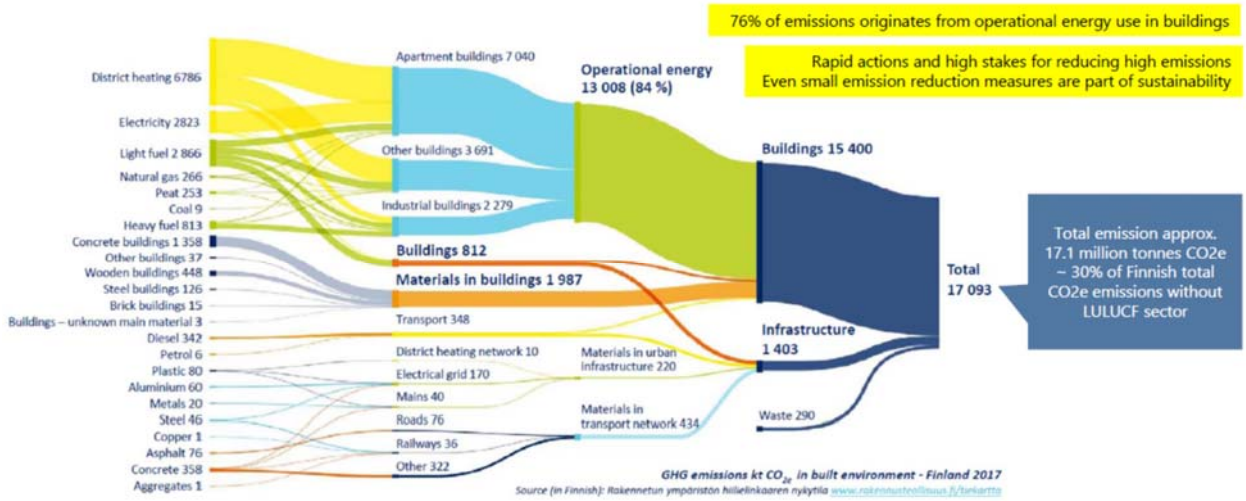
roadmap work of the construction industry. The aim has been to identify the main emission reduction areas, low-carbon measures and key uncertainties. The report also assessed how the overall reform of the Land Use and Building Act, which will enter into force in 2021–2022, as well as the related life cycle aspect of construction and low carbon assessment, could be linked to broader roadmap work in the future. In particular, the review will include possible overlaps with existing legislation (e.g. EU emissions trading, energy efficiency of buildings). It has also been essential to identify the different sector connections.

Current state of the carbon life cycle of the built environment

According to the current state analysis of greenhouse gases in the built environment, operational energy consumption in buildings accounts for as much as three quarters of the annual carbon footprint of the entire built environment in Finland. Half of the last quarter of emissions originates from building materials and the other half from construction site operations and transports, among other things.

To achieve rapid emission reductions, the most important factor is to reduce the energy consumption of the current building stock by means of various ways of improving energy efficiency and to develop its energy sources to be less carbon intensive.



Carbon footprint of the life cycle of the built environment (kt CO_2e); the total result of the calculation (including energy emissions from the operating phase).

Road map for low carbon construction and built environments

"Reducing energy consumption and emissions of the existing building stock has the biggest potential. The release of low-emission energy for other uses is the carbon handing out of the real estate and construction sectors to energy-intensive industries."

In the built environment and construction, emissions will be reduced by 66% by 2035. The identified technology leaps can then achieve a reduction of up to 80%. By 2050, there will be a chance to achieve nearly carbon neutrality and reduce emissions by 95%.

In the built environment, no less than 76% of emissions are generated by energy consumption during the use of buildings. Reducing the energy consumption of existing buildings, for example through energy renovations

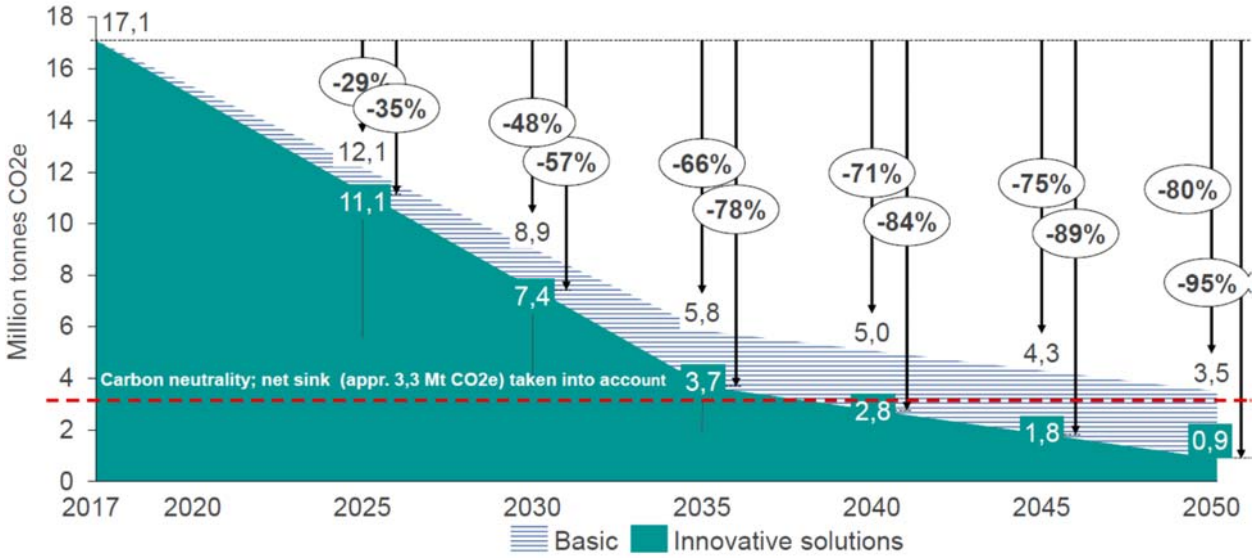
and the renewal of heating and its form of energy, has the biggest emission reduction potential. The release of low-emission energy for other uses is a carbon hand extension to energy-intensive industries.

In infrastructure construction, the essential emission reduction potential can be found especially in site operations, regional use of aggregates that reduce transport needs, and the use of recycled materials. The majority (90%) of the emissions are already being solved at the planning stage, so the effects of the design and construction that are now taking place extend to the life cycle of a well-built environment. The public sector and procurement have the most significant role to play in these decisions and choices.

Electrification and the transition to biofuels play an important role in reducing emissions from site operations.

As far as the construction phase is concerned, the technological development of construction materials such as cement and steel production is of great importance. The differences in emissions between different materials are less than per mill class estimated at the building level.

The achievement of the highest emission reductions requires decisive action by all parties, including the public sector. The state must reform the sector's low-carbon regulation in a coherent manner and in such a way that the requirements are feasible. Municipalities must take into account not only the emissions effects of transport due to the land use and town planning (buildings and infrastructure), but also the additional emissions effects related to feasibility of construction. Public actors in their procurement must place emphasis on low carbon in a material and technologically neutral manner and as predictable way as possible.



Development of the carbon footprint of the construction industry and the built environment in the 2017-2050 basic and innovative solutions scenarios.

The baseline scenario for scenario calculation in the following illustration describes the emission reductions that occur if the building material distribution remains the same as it is now, and the currently known operating environment, its norms and plans are implemented. The Innovative Solutions scenario describes the potential for emission reduction in a situation where resources are almost limitless. If the conditions for the implementation of the Finnish renovation strategy 2050 exist, a significant emission reduction can also be achieved through its implementation in the baseline scenario (-24% compared to the current situation in 2035).

The striped part of the image shows the ranges of emissions targets for the construction industry and the built environment, based on the scenarios. The range of emissions targets for the construction sector and the built environment as a percentage of the current level is shown for 2025, 2030, 2035, 2040, 2045 and 2050. These

percentages will provide a range and magnitude for the preliminary emission targets for the sector and the built environment in the coming years. The objectives and measures will be specified in the industry stakeholder dialogue starting in autumn 2020.

Post-road map work: carbon neutrality dialogue

The second phase of road map work will be a carbon neutrality dialogue between the various stakeholders in the real estate and construction sectors. Its aim is to implement the proposals for measures based on the results of roadmap work into practical actions in the coming years. The four themes of the dialogue work are land use planning and urban development, ownership and use of real estate, infrastructure, and materials' use and construction sites. The work will start in autumn 2020 with the gathering of interest groups. The implementation of the value chain dialogue will begin in late 2020. The results will be published in early 2021.

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