Success Story
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alpS – Centre for Climate Change Adaptation
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Attic Adapt 2050: on top of social housing innovative. fast and climate-friendlv attic extension

A systematic approach for timber based attic extensions facilitates densification of the post-war building stock (1950-1970). The example of social housing units in Vienna illustrates the potential for rapid and cost effective creation of new housing units. The massive application of timber provides positive impacts on climate protection by being both a renewable building material and a means to sequester carbon dioxide.

Room for urbanization – the potential of attic extensions

Urbanization is a fact. The growing population in our cities requires additional living space. While the available space is not growing with population numbers, the current strategy consists of looking for solutions to extend buildings and densify urban spaces. Attic extensions offer a great potential in this context: creating additional housing space while taking advantage of existing infrastructure.

In Vienna, attic extensions are particularly well established in refurbishments of late 19th century buildings in privileged city locations, where high real estate prices have made them attractive for investors. However, the densification potential of buildings from other construction periods has not yet been fully recognized. Especially the city's social housing buildings from the post-war era seem well suited for a systematic densification approach, due to their low housing density and standardized layout schemes. Within the research project Attic Adapt 2050 we study the feasibility of this approach and develop a prototype for standardized attic extensions on top of post-war social housing units in Vienna.

Modular construction – highly replicable urban densification

The essential objective of Attic Adapt 2050 is the development of a system for attic extensions on the identified typology of post-war buildings – based on industrially prefabricated timber elements with integrated renewable energy systems.

Fig. 1: prefabricated attic extension module
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The social housing building stock was investigated and then classified into different building

bmwfw Federal Ministry of Science, Research and Economy

bmvit Austrian Ministry for Transport, Innovation and Technology

types. Selected housing units were analysed in depth with respect to possible attic extension variants. The final target was a generalized building system that is applicable to a large number of buildings.

This feasibility study shows that prefabricated lightweight timber modules reduce on-site construction times and pose a cost-effective method to densify existing buildings. The concept can be applied to hundreds of buildings of similar type. This approach can be adapted to similar typologies of post-war housing units which can be found all over Europe.

The concept poses as a suitable and competitive solution for highly efficient refurbishment and densification in Vienna – and elsewhere.

Impact and effects

In order to estimate the potential number of attic extension projects and the socio-economic impact involved, we identified a total built-up area of 634,400m² of the relevant building stock. Approximately 1/3 of them have either never been renovated before or renovation was executed before 1996 – therefore being predestined for attic extensions in the context of upcoming refurbishment projects. Depending on the load bearing capacity of the building stock, one-story or two-story attic extension variants can be constructed, which leads to the following figures depicting the enormous extension potential:

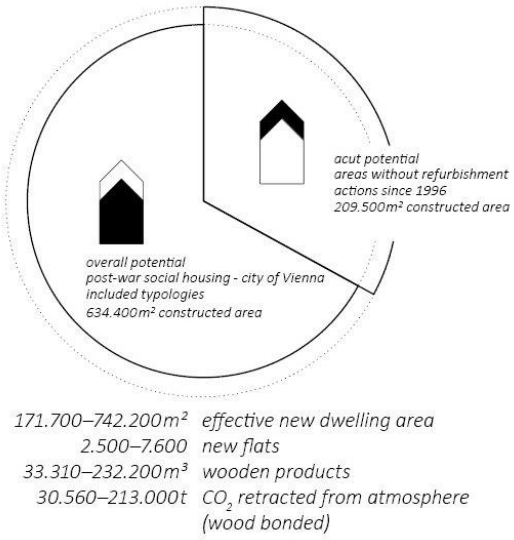

Fig. 2: urban densification potential
(© project consortium Attic Adapt 2050)

The described concept for urban densification poses a variety of advantages. Social mix is encouraged, living conditions can be improved and the value of the existing building stock can be enhanced. Using timber as a renewable building material provides positive impacts on climate protection. Prefabrication in combination with optimized building schedules can shorten erection times up to ten weeks while reducing costs up to 10% compared to on-site construction.

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