ÖKONFLEX: AN IT-TOOL FOR CONFIGURING WOODEN HOUSE CONSTRUCTIONS

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ABSTRACT: Market requirements for wooden houses are characterized by high requirements in terms of energy efficiency and technology, sustainability and economic efficiency, but also meeting high client expectations in terms of housing quality. Optimizing these factors in the planning stage with respect to the use, the expectations and possibilities for the building owner often seems an impossible undertaking, because it's hardly possible to communicate up-to-date market information at this initial stage. Interdependencies between desired needs and impacts in the realms of ecology, energy, technology and housing quality come into play and must be considered. The objective of this IT-project is to develop an assessment tool similar to the ones in the automotive sector which takes client desires into account, such as in environment parameters and requested housing quality criteria. This so-called "Wooden House Configurator" integrates the various interdependencies between individual impact factors (ecology /economy /energy /technology /housing quality) and aims at displaying them in a comprehensible manner for both planners and clients. This IT-tool allows clients to test building details in terms of their impacts relative to ecology, energy balance, etc. The multiple possibilities provided by the configurator allow the client to perceive which measures contribute to an improvement or increase in building quality in the areas listed. Besides timber technological developments, the users of this configurator are also informed about optimized energetically and ecologically reasonable timber house building technique for the requested building type. The integration of sophisticated building technology elements (e.g. solar and photovoltaic technology, passive house technology, ventilation systems, energy generation systems, energy storage systems, etc.) provides a huge optimizing potential in timber construction. The currently developed "Wooden House Configurator" offers users/clients the possibilities to configure a wooden house without technical expert knowledge in terms of size, aspect, ecology, economy and energy efficiency. Moreover, clients find useful information on terminology, timber building systems, building elements and building element combinations, as well as the quality of the individual materials used. For the timber construction companies the configurator facilitates client contact and offers information about their building needs and desires. This IT-tool also serves as an interface for timber construction companies to other building professionals and companies to optimize cooperation, standardize procedures to increase added value and competitiveness. Apart from the advantages of the configurator mentioned, upon building completion the entire data set (building structures, energy certificate, etc.) is accessible and available for the planner and client alike and serves as a "building certificate".

KEYWORDS: wooden house, configurator, energy standards, building certificate

1 INTRODUCTION

Crucial success factors in timber construction are the realms of ecology, energy efficiency and quality of life, which are closely connected to wood as a building material. Each of these realms constitutes a current trend potential. They are increasingly published together with their technical and economic aspects in the media. With the help of the "Wooden House Configurator" various construction elements can be combined and/or exchanged.

With the help of supporting literature the terminology, the quality of the materials used and how they impact each other are conveyed by this program.

2 PROJECT DESCRIPTION

The caption "Design your own wooden house" provides a platform supported by leading timber construction companies in Tyrol (Austria) for the users to design their own house. A choice of various energy standards and ecological aspects for putting together an optimal wooden house is provided.

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Figure 1: *Example of an individually configured house*

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3 CONCLUSIONS

The users are given the following possibilities for designing their own wooden house:

➢ Building: - building technique (timber frame, solid wood)

 - building type (energy standards)

 - location, aspect, (detached, terraced house, semi-detached house, addition of extra floor or an annex)

 - shape (rectangular, L-shape, with or without basement), size of living area

 - facade (wood or plaster)

 - building technology (heating, water and air management)

➢ Storeys: - number of storeys, wall elements, floor elements, roof construction, doors, terraces, partition walls, glass fronts

➢ Shape of roof: - flat roof, shed roof, gable roof, hip roof

In addition to the entered data users are also provided with the heating demands and the ecological standard of the building. Moreover, timber construction companies in the vicinity are displayed that can be contacted for extra information. Users are given the possibility to get specific information about sustainable building standards, building technology, the building material wood and the individual construction layers of wall, floor and roof elements. This IT-tool can also be used by people with little technical knowledge due to its simple selection criteria menus.