

## Sustainability development in European massive wooden buildings: Establishing sustainable parameters for European law

In recent years, the European building directives have guided the national building regulations of EU member states towards lower levels of energy consumption, foremost, for the reduction of harmful Green House Gas (GHG) emissions such as carbon dioxide (CO<sub>2</sub>). Lowering carbon and other GHG emissions, is of very crucial importance in the process of slowing down climate change effects. This fact has already led to the greatest switch towards renewables in the energy production ever experienced in the history of the EU. For example, biofuels and biomass energy products have developed to 11.5 % of overall energy production in Germany thus substituting a major part of nuclear energy. The theory behind this successful technique is, simply described: the process of capturing airborne carbon. CO<sub>2</sub> coming from the atmosphere is used by plants as energy. The emissions from these hydrocarbons are simply emitted back into the cycle without producing new carbon emissions. Plants enable this highly effective process by their photosynthesis capability. The same method should be utilized for construction purposes.

The construction and operation of buildings contributes to GHG emissions to a fraction of roughly 1/3 of all emissions (beside transport and industry). Thus, it is very crucial to include the assessment of buildings and their particular life-cycle to the equation. Although it is clearly that the operational life-cycle phase attributes to the highest emissions, but the construction, maintenance and demolition phases contribute considerably. Most of the GHG emissions are caused in the production phase of the latter three. Especially concrete, steel and foamed insulation hold extremely high Global Warming Potentials (GWPs) due to very high primary energy inputs and GHG emissions during the production. Depending on the particular energy sources, the construction phase can contribute to global warming in levels up to 25% of the entire life-cycle of the building assessed. Only one building product group is really capable of lowering these harmful GHG emissions substantially, namely wood!

Solid wooden and especially log structures are natural carbon carriers. The trees capture carbon from the atmosphere and hold it in place for the duration desired. After the life-span of the building has expired, the carbon can be fully re-cycled for a variety of purposes. Solid wood log structures may very well represent the most environmental friendly way of constructing buildings. The carbon capture capability of these buildings must, however, be taken into account in the national and European building codes to a basic extent. Currently, a rather narrow minded approach is being applied by some European nations, looking only at U-Values and thermal losses.

Based on research conclusions appended to this statement, we the signatories, propose the following:

1. The impact of the entire life cycle of buildings (from cradle to grave) should be considered in directives guiding construction within the EU and in the national regulation of the various EU member states. The calculation principle of a building's total heat requirement should also be broadened to include the energy demand arising from material production (primary energy), construction process and demolition as already being done in some member states.
2. When calculating the energy requirement, it must also be taken into account that the U-Value requirement of a single structural element cannot rule out a building type that uses resource efficient materials, but have weaker thermal insulation properties. In connection with such structural elements, the carbon sink properties of the material must be figured in a compensation method.
3. All EU member states should be able to meet the set heat requirements with the help of optimized structural elements and the ecological control of the building technology.
4. All construction materials should have a mark of origin and place of departure.

When the above-mentioned basics are taken into consideration, the GHG emissions caused by the construction, operation and demolition of buildings can be considerably reduced. Further tightening of the U-value requirements, on the other hand, would probably not yield a positive outcome. By promoting sustainable construction and utilising materials that act as with carbon capture properties, we can replace energy-intensive construction materials and optimize sustainable constructions. This may only bear true significance after the same review methods are employed in all EU member states, however. The proper marking of origin guarantees that the construction material has been regulated in a reliable way.

Cologne, February 19<sup>th</sup> 2014



*Esko Rintamäki*  
Director of the board,  
Finnish Log House  
Industry Association



*Ferdinand Lienbacher*  
President,  
Deutscher Massivholz - und  
Blockhausverband e.V.



*Bernd Fuchs*  
President,  
Gütegemeinschaft  
Blockhausbau e.V.



