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Europe goes green

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Abstract

At the UN-Paris conference in 2015 countries accepted the challenge to fight Green House Gas emissions (GHG) during the next decades in an attempt to stop global warming. In Europe the aim is that all future new buildings aim at nearly zero-energy consumption and be highly material efficient whilst the existing building stock will be refurbished at a rate of 2% annually. Numerous international scientific studies have found that timber-framed buildings result in lower GHG emissions than their steel and concrete counterparts. For green building construction (relative) new timber products and connection methods conquer the market such as Cross Laminated Timber products. CLT products allow fast and cost effective execution of the building while structural limitations and disadvantages of the traditional timber frame construction are overcome. Examples of multi-storey timber structures are presented. These steps forward were ministered by the development of innovative timber fastener connections like self-tapping screws and reinforced dvw tube connections.

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Keywords: timber structures; GHG; sustainability; CO_2;CLT;Connections; dvw;

1. Introduction

Step by step the issue of global warming is being recognized as a potential thread for human living conditions on Earth. A key parameter in this struggle to get control over the greenhouse gas emission known as the CO_2, increasing share of renewables and improving energy efficiency. "Sustainable development is the need of the day so that we can conserve and keep our resources for our future generations. All the ill effects that we see today – effects like global warming etc. are the effects of our ruthless exploits of our natural resources which we have consumed at such alarming

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rate that some of it is depleted or is on the verge of becoming extinct. Sustainable development means development or creating assets by consuming the least resources", [1].

2. European Position

In March 2011, the European Commission published a Communication entitled “A Roadmap for moving to a competitive low carbon economy in 2050”, [2]. This Roadmap builds on the Europe 2020 flagship initiative for a resource-efficient Europe as part of a series of long-term policy plans in areas such as transport, energy and climate change. The Communication sets out key elements that should shape the EU's climate action helping the EU become a competitive low carbon economy by 2050. The Europe 2020 Strategy for smart, sustainable and inclusive growth includes five headline targets that set out where the EU should be in 2020. One of them relates to climate and energy; Member States have committed themselves to reducing greenhouse gas emissions (GHG) by 20%, increasing the share of renewables in the EU's energy mix to 20%, and achieving the 20% energy efficiency target by 2020. The EU is currently on track to meet two of those targets, but will not meet its energy efficiency target unless further efforts are made. The document describes the cost-effective pathway to reach the EU’s objective of cutting greenhouse emissions by 80-95% of 1990 levels by 2050 in order to keep climate change below 2°C. The EC Roadmap 2050 also points to the role of the built environment in achieving the 80% reduction target.

The built environment provides low-cost and short-term opportunities to reduce emissions, first and foremost through improvement of the energy performance of buildings. The Commission's analysis shows that emissions in this area could be reduced by around 90% by 2050, a larger than average contribution over the long-term. This underlines the importance of achieving the objective of the recast Directive on energy performance of buildings that new buildings built from 2021 onwards will have to be nearly zero-energy buildings. This change the situation considerably, Fig. 1.

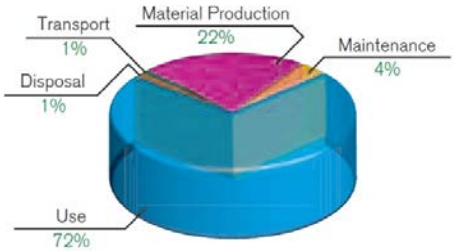

Fig. 1. Energy use across the life-cycle of a house, [6].

Today, new buildings should be designed as intelligent low- or zero-energy buildings. The extra cost of this can be recovered through fuel savings. A greater challenge, however, is the refurbishment of the existing building stock, and in particular how to finance the necessary investments. Wood and wood-based products have a specific role to play in this context. There is a strong development potential for wood-based constructions in structural and non-structural applications, both for new buildings as for renovation purposes.

In the explanatory memorandum to this EU-commission proposal as mentioned in [3], the EC states that "In addition to the opportunities directly linked to forestry and agriculture, there are potential mitigation benefits in the related industries (e.g. pulp and paper, wood processing) and renewable energy sectors if agricultural land and forests are managed for production of timber and energy. Whilst carbon is stored in trees and in other plants and soils, it can also be stored for several decades in products (e.g. construction wood). Industry and consumer oriented policies can make an important contribution to increasing the long term use and recycling of wood and/or the production of pulp, paper and wood products, thereby replacing more emission-intensive equivalents (e.g. concrete, steel, plastics made from fossil fuels). (...) Studies show that for each ton of carbon in wood products substituted for non-wood products an average greenhouse gas emission reduction of approximately two tons of carbon can be expected”. As mentioned in [3], the woodworking industry welcomes this legislative proposal as it puts the EU in the driver’s seat in the implementation of a realistic policy of emission reductions and towards closing the accounting CO_2 savings and emissions from forest related industry welcomes the move from the EC to start implementing the accounting for