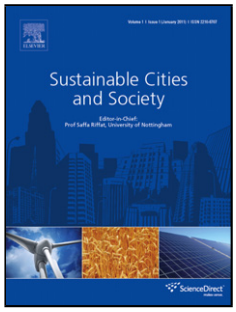

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"THE CONTRIBUTION OF WOOD-BASED CONSTRUCTION MATERIALS FOR LEVERAGING A LOW CARBON BUILDING SECTOR IN EUROPE"

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Highlights:

- Recent data for wood construction quotas around Europe were compiled and included into modelling
- Recent growth rates in consumption of engineered wood products were used for analysis of market trends
- GHG inventories for specific engineered wood products were used for modelling
- A review of effective wood product policies implemented in varying EU member states was conducted and used for identifying an effective policy mix

ABSTRACT:
Increasing the use of engineered wood products in the European Union can contribute to leveraging a shift towards a more emission-efficient production of construction materials. Engineered timber products have already been substituted for carbon and energy intensive concrete and steel-based building constructions, but they still lack the capacities and market demand to be more than just a niche market.
However, in the post-crisis period after 2008 the consumption of engineered wood products began rising in Europe. In this paper we analyse options for the future development of engineered wood products taking into consideration policy barriers and technical and environmental potentials for accelerating market introduction as part of a comprehensive scenario approach. For the European building sector we assessed an achievable potential for net carbon storage of about 46 million tons $CO_{2\text{-eqv.}}$ per year in 2030. to unlock this potential a bundle of instruments is necessary for increasing the market share for engineered wood products against the backdrop of existing policy instruments such as the gradual introduction of stricter rules for carbon emissions trading or more incentives for the voluntary use of innovative wood construction materials.

KEYWORDS: engineered wood products, policy drivers, scenario modelling, potential GHG emission savings

1 INTRODUCTION

The European building sector represents a significant material stock for wood-based construction materials.
In the 1950s and 1960s, 5,200 [1000 m^3] of conventional wood-based construction materials (mainly sawn wood) were consumed on average every year. Between 1990 and 2010 this number was 6,400 [1000 m^3]. The increased use of solid wood and timber panel constructions began to expand at the end of 1980s in the western European countries, such as the UK, Austria, Italy and Germany. In the last two decades the technical innovations of engineered timber products and their production processes, as well as the newly adopted building regulations e.g. fire protection regulations, have facilitated growth in the construction of multi-storey buildings made of wood. At the same time, the overall construction of and permits for new buildings decreased significantly after the financial crisis in 2007 (Eurostat, 2015; UNECE/FAO, 2013). In the decade from 2000 to 2010 the number of building permits were 1.7 to 2.5 times higher than in 2010 and even faced a further decrease of around 10 % in the five years up until 2015 (Eurostat 2015; Dol and Haffner 2010). A related market demand for wood-based construction materials, such as engineered wood products (EWP), in the building sector is expected for the construction of new residential buildings (one and two-family houses, multi-family houses and other types of dwellings) and for energetic renovation and retrofitting of old buildings, i.e. within urban built infrastructures (Weimar and Jochem, 2013). The construction of new residential buildings in the coming decades was therefore chosen as the main focus of the subsequent analysis. Considering the expected climate effectiveness of wood construction in residential buildings, both the retrofitting and the new constructions are regarded as a way to meet the European climate targets of decreasing CO_2 emissions by 88 - 91 % by 2050 as indicated in the scenarios of Boermans et al. (2012). In fact, in terms of the total production volume of EWP, the ecological construction industries have been able to maintain constant growth rates of 2.5% to 15 %, for example, in the production of wood fibre insulation boards (WFIB), cross-laminated timber