POTENTIAL AND BARRIERS FOR REUSING LOAD-BEARING BUILDING COMPONENTS IN FINLAND

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ABSTRACT

The European Waste Framework Directive, as set forth by the European Union in 2008, introduced a waste hierarchy that prioritizes reuse of waste over recycling whenever technically feasible and financially possible. In the field of construction, life cycle analyses on different materials have shown that reuse of structures possesses a remarkable carbon saving potential. This is the main asset that reuse has over virgin and recycled materials, although many other opportunities have also been recognized. Nevertheless, reuse has not gained ground in Western industrialized societies such as Finland. The barriers hindering reuse have been documented in the literature and they include cost, quality, quantity, perception and trust, among others.

In this study, a panel of experts working within construction and recycling industries, research and administration was surveyed about the reuse potential of prefabricated load-bearing components made of different materials in the Finnish context. In addition, the panellists were requested to identify the main barriers obstructing the reuse of the aforementioned components. The materials include concrete, steel and timber, which cover the majority of contemporary construction in Finland. The respondents evaluated that prefabricated steel has the highest reuse potential and concrete the lowest. The future potential of timber was seen as nearly equal to the potential of steel. In general, columns and beams were estimated to have better reuse potential than floor slabs and roof trusses. The potential of sandwich panels was evaluated to be the lowest.

The survey answers point out a number of issues that need addressing in order to enable reuse of components in large scale and in industrial construction. These results may not only have implications for recycling but for the technologies used in new construction as well. Especially prefabricated concrete was seen to be burdened by not being designed for deconstruction. However, it is the lack of an established practice that seems to be the main barrier for reusing steel and concrete. Technological constraints and physical properties may nonetheless delimit the utilization of some components. As for timber, its nature as a biodegradable material seems to form the main handicap for reuse, restraining the demand. Remarkably, cost of reuse was not seen to be among the most significant barriers, unlike other studies suggest.

Key words: reuse, recycling, waste, sustainability, resilience, survey