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**Research area: Product aims**

Raw materials // Wood

**Key words:**

Recovered wood, upgrading recycling, wood value chain, reverse logistic model, environmental impacts

**TITLE:****Cascading Recovered Wood (CaReWood)****Background/Problem area**

Wood products at the end of a life cycle are invariably chipped into particles. The two main end-uses for the recovered wood (RW) are particleboard manufactures and energy generation. The CaReWood consortium considers it a waste to grind all the wood into particles, because many of the wood products contain relatively large dimension timbers of originally good quality that would have a higher value than particles if their dimensions were maintained during recycling. The CaReWood project developed and evaluated techniques for converting large dimension RW into new, large dimension solid wood products to complement the solid wood currently used in the furniture, interior fitting and construction sectors.

The CaReWood consortium believes that the world's forests will not be able to adequately provide enough primary wood for the growing global resource demands without a significant improvement in resource efficiency of the whole value chain. The CaReWood project will significantly improve resource efficiency by demonstrating the potential of creating at least one additional life cycle for solid wood products.

**Objectives/Research results**

The overall objective of this project was to introduce an up-grading concept for recovered solid timber as a source of clean and reliable secondary wooden products for the European industry. Such a concept will further strengthen the market competitiveness and the sustainability of wood based products. The CaReWood project developed a business model for cascade use of wood recovered from building renovation and demolition, the furniture sector and the packaging and transport industries. The scientific and technological objectives of CaReWood included:

- present authoritative forecasts of volumes and qualities of post-consumer and post-industrial RW;
- design guidelines to facilitate future reuse;
- develop software supported reverse logistic models for recovery of wood;
- develop, demonstrate and evaluate the feasibility of up-grading solid RW technologies;
- adopt certification and labelling criteria to cascaded wood;
- evaluate the environmental impacts and socio-economic viability of wood cascading.

In the course of the project a number of prototypes had been prepared and exhibited that demonstrate the technical viability of the CaReWood process. The research has also focussed on developing scanning techniques for detecting contamination on the surfaces of recovered wood and modelling the potential recovery of clean wood lamellae machined from recovered wood streams. The models indicate that around 39% of the volume of recovered wood can be converted to clean, high-value, solid wood products.

**Application/Economic benefits**

The idea behind CaReWood was to look for opportunities to have a first step of recycling allowing a re-use of the material at the same stage of quality at least as for its first use, by keeping the largest possible dimensions in order to open new possibilities of end-uses.

From an environmental point of view, the increased recycling of recovered wood can be seen as a positive evolution because this increases the total volume of CO<sub>2</sub> stored in solid wood many years and longer periods as before.

Successful up-scaling and application of the CaReWood principles by the target industries will result in:

- New and viable business opportunities (in Europe and worldwide);
- Mitigation of climate change by longer storage of captured carbon in wooden materials;
- Safeguarding of resources in the biosphere;
- Higher societal acceptance of renewable raw materials and recycled products by public authorities and customers;
- Higher valorisation of LCA of wood products results, namely of the carbon footprint of recycled wood in the technosphere.

The results of this project were disseminated and exploited to different industrial branches in different way, either directly to the companies in conferences, symposia and on fairs.

**Period of time: 01.06.2014 – 31.05.2017**

**Remarks**

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