



REFFIBRE: maximising the value from paper for recycling

Maximising the value per unit of paper for recycling is an important aspect of paper production. Especially as biomass price increase due to demand from sectors which are increasing their use of wood such as the energy and chemical sector. Obtaining maximum (economic) value per unit of paper for recycling may become a key factor for paper production to be profitable. In order to ensure long term profitability, the industry needs to focus on resource efficiency and create innovative products and value out of the waste streams from the main production line.



Figure 1. Recycled paper at use produced from recovered paper.

Paper and board are unique products being both the end products as well as the main raw materials in the next cycle; thereby creating a circular economy. Because of this circular nature, the paper and board industry in essence also has a direct impact on its own raw material when performing product and process development.

The REFFIBRE-project aims on finding the best options of the paper and board industry in the Circular Economy in Europe by utilising modeling tools to find the **Impact of Innovations** on this economy. The project is co-

funded by the European Union from FP7. REFFIBRE has started in November 2013.

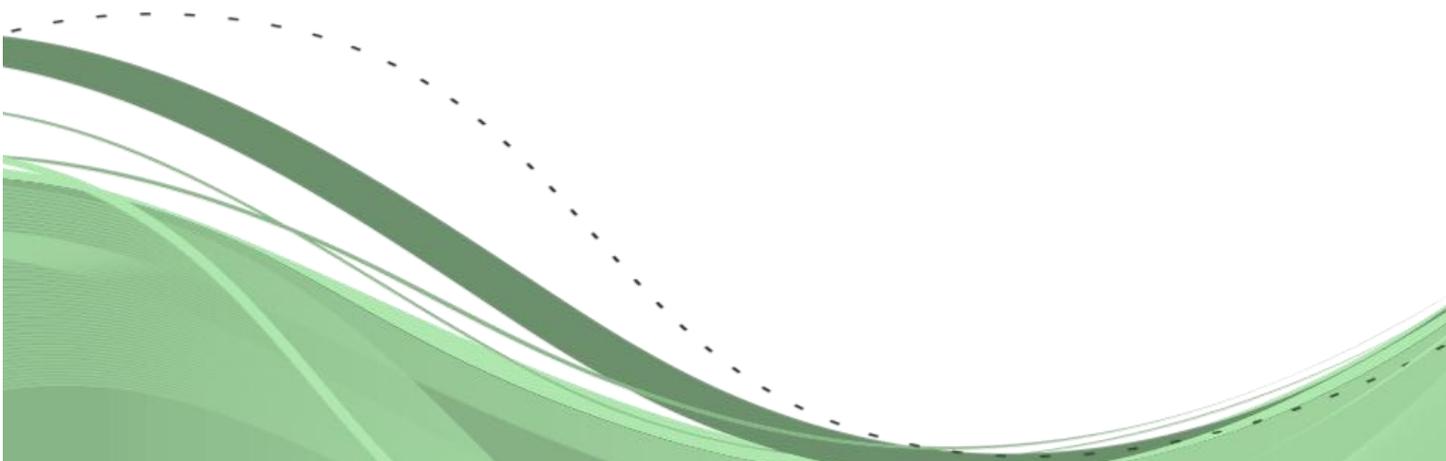




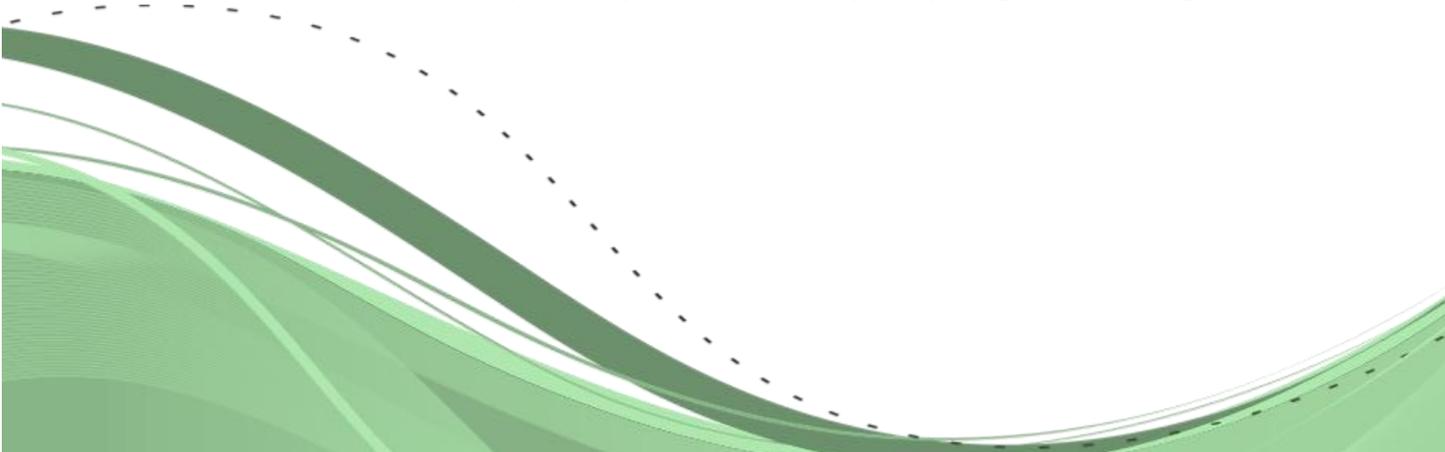
Figure 2. The REFFIBRE team with members of TUDA, CEPI, VTT, BUMAGA, PTS, ITENE, Alucha, Vrancart, Holmen and Utzenstorf Papier.

The modelling work

Currently, the impact of product or process development in the paper mill can to some extent already be determined for energy or material efficiency. However, the current tools are not able to incorporate impacts novel innovations make on the total value chain (or circle). The impact on e.g. the energy use outside of the paper mill or reduced quality in recycling needs to be considered better and optimized.

In REFFIBRE project PTS, TUDA, ITENE, CEPI and VTT combine their efforts to develop tools for the paper and board industry that can instantly provide the needed information regarding the impact of new production processes, raw material input and product innovations, as well as the influence on the recyclability of the end product. The tools will enable paper makers to consider innovations affecting profitability in the value chain.

Using parallel tracks, the project will start developing various tools to cover different parts of the value chain. Once the tools are developed, they will be tested by comparing the modeling results



of the environmental impact of various innovative concepts with the results from actual demonstration tests. These innovative concepts include fractionation of input materials and production of novel products from side streams.

By product testing

Reffibre partners work both on developing modelling tools as well as on identifying side stream valorisation options to maximise the value of paper for recycling. By working in groups of knowledge institutions (Bumaga, PTS, TUDA, VTT) and industrial partners (Utzenstorf Papier, Vrancart, Holmen, Alucha), potential valorisation options for side streams have been identified. A large matrix consisting of information regarding these options (to which streams do they apply, what are the investment costs, what is the market value of the end product etc.) has been constructed and evaluated. From this large matrix a shorter list has been proposed based on its potential for the industry and its technological readiness level. These options will be studied more closely using the modelling tools that will be developed in this project.



Figure 3. Recovered paper

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The results of both the modelling work as well as the pilot tests will be published later on the REFFIBRE webpage (www.reffibre.eu).

