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Research area: General aims

Resource saving

Key words:

Resource-efficiency, Value chain, Paper for recycling, Life Cycle Assessment, Paper design models, Process models, Analytical tools, By-products

TITLE:

Tools for Monitoring and Assessing Resource-efficiency in the Value Chain of process Industries (REFFIBRE)

Background/Problem area

Paper and board are unique products being both the end products as well as the main raw materials for the next cycle; thereby creating a circular economy. In order to ensure long term profitability, the industry needs to focus on resource efficiency and creating innovative products and value out of the streams discarded from the main production line due to resource efficiency reasons.

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

Objectives/Research results

The main aims of this project are to develop tools and knowledge needed for the ecodesign of the resource efficient paper- and packaging material production chains. Industrial applications investigated in this project are based on paper for recycling and waste fractions from the processing. In addition to paper as the main outcome of paper industry processes also so called "by-products" are in focus. The main scientific and technical objectives of the project are:

- Objective 1: Develop methodologies and models for environmental and economic assessments (Life Cycle Assessment & techno-economic analysis of the value chains).
- Objective 2: Develop methodologies and tools for eco-designed paper production (paper production design models).
- Objective 3: Develop process modelling tools and innovative analytical tools to control production in multi-product mill concept (physical process models, analytical tools and novel by-products).
- Objective 4: Integrate and validate tools to the practical guide for decision makers and control systems for multi-production units (multi-product mill concept cases). The validation will be based on several demonstrators carried out by five industrial partners taking part in the project.

Application/Economic benefits

These results will also contribute to the European objective for reducing greenhouse gas emissions by 80 % until 2050 compared to the level of 1990. The results of this project will help to create the conditions that will enable complete value chains of paper and board industry, converting industry and end users, to

- 1) decrease their overall waste production and improve resource efficiency,
- 2) increase competitiveness and
- 3) approve with a standardised way that the final impact on the environment is reduced..

Period of time: 01.11.2013 – 31.10.2016

Remarks

The RTD project REFFIBRE is being funded by the European Commission (Seventh Framework Programme) and coordinated by VTT Technical Research Centre of Finland in cooperation with 4 European research institutes for paper technology (Technische Universität Darmstadt Germany; Papiertechnische Stiftung, Germany; Instituto Tecnológico del Embalaje, Transporte y Logística, Spain; Bumaga BV, The Netherlands), the Confederation of European Paper Industries (CEPI) and 4 industrial partners (S.C. Vrancart S.A. Adjud, Romania; Alucha SL, Spain; Papierfabrik Utzenstorf AG, Switzerland; Holmen AB, Sweden).