THE ROLE OF PULP AND PAPER INDUSTRY IN THE EUROPEAN TRANSITION TO LOW CARBON ECONOMY

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ABSTRACT

The pulp and paper industry (PPI) is responsible for about 2% of global industrial emissions, and it is the fourth most energy intensive industry in Europe. The energy intensive production processes and the increasing demand on the products, especially paperboard, urge the sector to act. The PPI has several possible pathways towards higher sustainability and a low carbon economy. This paper evaluates these routes from two viewpoints: firstly, how do they affect the PPI, and secondly, what could the role of thePPI be in the transition towards a more sustainable Europe. The study is made using statistics, scenarios, mill data, and previous modelling results.

New mills improve the sector's energy efficiency by adopting new, efficient technologies, but energy efficiency has significantly improved in existing mills as well along with smaller improvements in the processes. The PPI is a large user of biomass energy as the mills utilize residual biomass for energy generation. Fossil fuels still have a notable role in the energy mix of the sector despite the large share of bioenergy, and fuel switch is an important means to reduce fossil-based emissions. Biomass energy hasa notable role in the society's struggle to reduce fossil fuel use. Some pulp and paper mills produce excess biomass energy and can have a role in reducing fossil fuels use also outside the mill gates. As large users and producers of energy, the PPI units can contribute to balancing the electricity markets. Rapidly increasing amount of intermittent renewable energy, such as wind energy, requires demand side-management, which already acts as an additional income in some mills.

Novel added value products are in the core of the sector's development. These make use of the existingside streams such as biomass residue, lignin, tall oil, and sludge. The future pulp and paper mill will be a biorefinery producing, along with the main products, for example textiles, pharmaceuticals, cosmetics, or composite materials. This is likely to require company collaboration; process and business integration with companies developing the new products. Carbon dioxide (CO_2) capture and utilization or storage(CCUS) offers many benefits when applied to bioenergy production. It is an opportunity to reduce emissions and even make the mill a carbon sink. Captured CO_2 can be used to produce renewable hydrocarbons, such as fuels or chemicals, to substitute for the currently used fossil ones.

The PPI has the obligation to transform, but it is also a possibility. A fossil fuel-free and energy efficient mill with a widening product portfolio can both success and contribute to the environmental targets.

Keywords: Carbon capture and utilisation or storage CCUS, Climate targets, Decarbonization, Energy intensity, Sustainable production