

# LIFE11 ENV/LU/0854 Factory of the future

\*

## Demonstration of the production of wood panels with near-zero environmental footprint

\*

### Reduce the carbon footprint

\*

The issues of climate change and the depletion of fossil fuels stocks have induced several industrial sectors to develop new methods to produce goods in a more sustainable way. Modern production techniques are associated to decisional tools such as the life cycle assessment, which allows them to optimise the use of resources, the energy consumption and the waste management.

The demand for thermal energy of the European industrial sector represents about 28% of the total energy demand of Europe and 21% of the CO<sub>2</sub> emissions.<sup>1</sup> During the last decades many improvements were made regarding energy efficiency, but more progress can be achieved considering the potential of current and future technologies.

A major concern of the European energy policy is to increase the share of renewable energies. As regards this situation, the wood energy potential is attracting the interest of the major wood suppliers of the world and today wood biomass accounts for about half of the total renewable energy supply.<sup>2</sup>

Within this frame, wood products' manufacturers must ensure that their production sector adapts to climate change and protects forests, that it supplies renewable and competitive forest products and that it achieves and demonstrates sustainability.<sup>3</sup>

The firm of Kronospan needs a high amount of energy for its processes including large quantities of heat for some phases of the wood-based panel production (e.g. hot pressing). Its generation implies high costs in terms of fossil fuels, emissions and energy efficiency.

The project "Factory of the Future" aims at combining several best practices in order to achieve a production facility with an extremely low carbon footprint. This encompasses an extremely low consumption of energy and water from non-renewable sources, and very little GHG emissions. Concretely, the aim is to:

- Cut the current use of fossil fuels for thermal energy by 90%;
- Cut over 80% of the current carbon dioxide (CO<sub>2</sub>) emissions from fossil fuels;

The carbon footprint (CF) – also named Carbon profile - is the overall amount of CO<sub>2</sub> and other greenhouse gas (GHG) emissions associated with a product, along its supply-chain and sometimes including from use and end-of-life recovery and disposal. Causes of these emissions are, for example, electricity production in power plants, heating with fossil fuels, transport operations and other industrial and agricultural processes.<sup>4</sup>

---

<sup>1</sup> <http://www.einstein-energy.net/>

<sup>2</sup> UNECE\_Forest Products Annual Market Review

<sup>3</sup> The European Forest Sector Outlook Study II - 2010-2030

<sup>4</sup> <http://lct.jrc.ec.europa.eu/pdf-directory/Carbon-footprint.pdf>

Kronospan is using two different approaches in order to reduce the carbon footprint of its products:

- Increase of the amount of biomass for thermal energy production;
- Increase of the total energy efficiency.

Up to today the following actions have been implemented:

- Improvement of the energy consumption of the MDF dryer using heat from biomass combustion. The use of biomass for heat generation passed from 65% to 75% of the total fuel (natural gas + wood biomass) thanks to a better preparation of the biomass before combustion, including drying and screening;
- Works of insulation and cleaning to improve the efficiency of the installations: the area surrounding the OSB pre-heater is cleaned every week, the regular maintenance of the plates of the heat exchanger is made by a specialized team. In December 2012 the cooling circuit was filled to 1/3 of chemical agent to prevent the freezing of the piping system of the heat exchanger.
- Improvement of the burners' settings of the boiler – implies less natural gas consumption;
- Improvement of the dust burner of the boiler – natural gas consumption was reduced by 2/3;

## Next steps

Considering the objective to use only 10% of fossil fuels (natural gas) for the thermal energy demand, two main strategies could be followed:

- The first one is the installation of a Combined Heat and Power (CHP) plant to simultaneously produce electricity and heat.
- The second one implies the adaptation of the wood production residues and lower wood qualities to the existing wood dust burners.

These two options do not exclude each other and the engineering plans were prepared and presented to the technical manager of Kronospan.

In addition to the technical modifications, the resources consumptions and the emissions induced by the modified production process will be monitored. The tests are planned at regular intervals and are based on international norms and certifications. The aim of testing the panels is to ensure that the products that are produced in the firm are compliant with all the European standards.

Furthermore, CRP Henri Tudor will perform a Life Cycle Assessment (LCA) and Carbon Footprint studies on Kronospan's OSB and MDF products and production site.

LCA is an internationally standardized method (ISO 14040, ISO 14044) for the evaluation of the environmental burdens and resources consumed along the life cycle of products; from the extraction of raw materials, the manufacture of goods, their use by final consumers or for the provision of a service, recycling, energy recovery and ultimate disposal.<sup>5</sup>

This action has started in August 2012 and will continue until March 2015.

---

<sup>5</sup> <http://lct.jrc.ec.europa.eu/pdf-directory/Carbon-footprint.pdf>