LIFE11 ENV/LU/0854 Factory of the future

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

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Reduce the water footprint

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Water is a valuable but fragile resource. To secure a high quality of life for the world's population, significant amounts of clean water are required. The industry sector is both a large consumer and a larger polluter of water. The extraction and cleaning of water is an energy intensive process, and it is thus necessary to limit its consumption as much as possible.

In 2002 Professor Arjen Hoekstra created the concept of water footprint, which is an indicator of the direct and indirect use of freshwater from consumers and producers.
The water footprint of a product was defined as the volume of freshwater used to produce the product, measured over the full supply chain.[1]

Kronospan is using three different approaches in order to reduce the water footprint of its products:

- Increase the efficiency of the water distribution system;
- Implement water recovery and recycling from the production process;
- Implement the collection and storage of rainwater, to be used in the production process where lower water quality is required.

The aim of these measures is to reduce the water footprint of Kronospan's production line as far as possible. The final aim is to reduce the town water use by 70-75% (referred to 2010 values). In figure 01 it is possible to see a computation of the final objective of Factory of the Future with regards to the water consumption for the production process.

Up to today the following actions have been implemented:

- Implementation of water flow meters, which allows us to identify and repair the water losses. The water losses were identified thanks to the installation of ten electromagnetic flow meters that allowed the environmental manager of Kronospan to keep track of the daily flow of water in the piping system. This made easier to identify and repair the losses of water due to damaged pipes (e.g. from icing of water in winter) and to save an important quantity of town water.
- Development of the use of the condensate from the production process. The heat exchangers that recover thermal energy from the production process are also sources of condensation water. The estimated amount of water that can be saved is about 30 000 m^3/year. Kronospan engineers will design capturing and storage units for this water. The dimensioning of both units must be determined, and will depend mostly on the required storage time (and hence amount of stored water).
- Development of the rain capturing units on the roof of the buildings of the production site. CRP Henri Tudor experts determined the potential quantity of rainwater available and

[1] Arjen Y. Hoekstra (ed.) (2003) Virtual water trade: Proceedings of the International Expert Meeting on Virtual Water Trade, Delft, the Netherlands, 12—13 December 2002, Value of Water Research Report Series No. 12, UNESCO-IHE, Delft, the Netherlands

storable on-site. The capacity of the storage facilities depends on the amount of expected rainfall, on the usage rate of rainwater and on the required quality of the captured rainwater (pollution, micro-organisms etc). In total, we estimate that 127 000 m^3/ year of town water could be saved thanks to the substitution with rainwater.

Next steps

- Following the first sizing and design accomplished during the preparatory actions of the project, the experts of Kronospan and CRPH Tudor will proceed with the parameterisations and installation of the equipment.
  - Insulation of the piping system in order to prevent the icing and braking of the pipes)
  - Rain water collection system from roof surface and storage system
  - Condensate water collection from OSB drying process and storage tanks
- Following the first phase of water collection the project partners will assess the quality of the collected water and decide its final utilisation
  - Town water will only be used for steam generation, and its consumption will be minimised by including recycled condensation water and by decreasing water loss during steam generation. For applications which require lower water quality, captured rain water will be used.

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

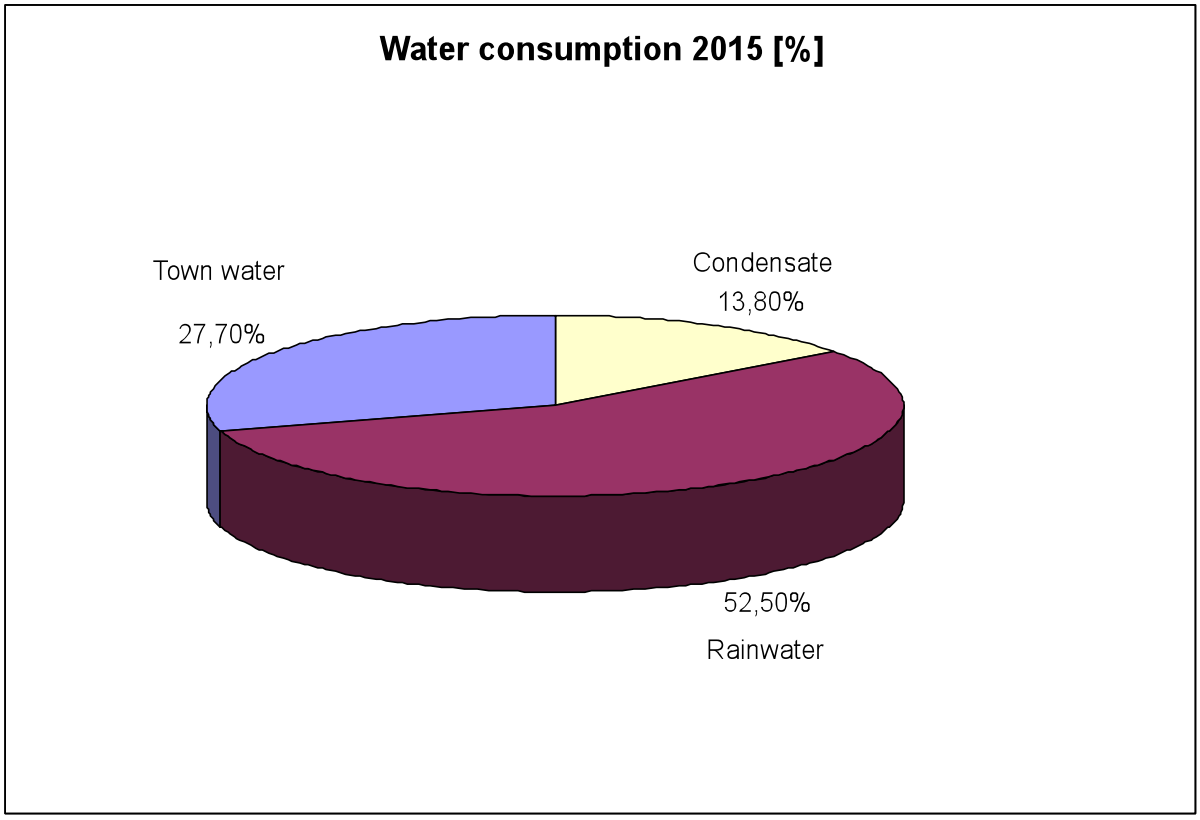

Fig. 01: Source of the water used in the production process in 2015 (computation)