

The objective of NewWave is to transform existing fossil-based manufacturing lines into new bio-based ones. The new products must exhibit similar, or better, mechanical, physical, and chemical properties compared to the existing products, and must be non-toxic and recyclable. The Manufacturing Lines developed in the NewWave project will ensure these qualities.

MANUFACTURING LINE #4

MANUFACTURING OF NEW MODIFIED WOOD

What is it? The term “**modified wood**” describes the application of chemical, physical, or biological methods that are used to alter the cellular structure of the wood. It is also described as “wood that is processed by chemical treatment, compression, or other means, with or without heat, to acquire permanent properties quite different from those of the original wood.”

Modification processes lead to the enhancement of selected wood properties through chemical, biological, or physical agents. Several alternative treatments have recently become available, including both active and passive modifications.

The active modification changes the chemical nature of material through chemical, thermo-hygro-mechanical or enzymatic treatments. Conversely, the passive modification, like those investigated in the NewWave project, doesn’t change the chemical nature but rather deposits selected functional molecules using bulk impregnation or surface treatments. Consequently, various properties of wood are changed to different extents depending on the modification process and its intensity.

In NewWave, Partners focuses on the production of biobased alternatives for the current toxic and fossil-based preservation agents such as copper salts, organic biocide ingredients, and especially creosote.

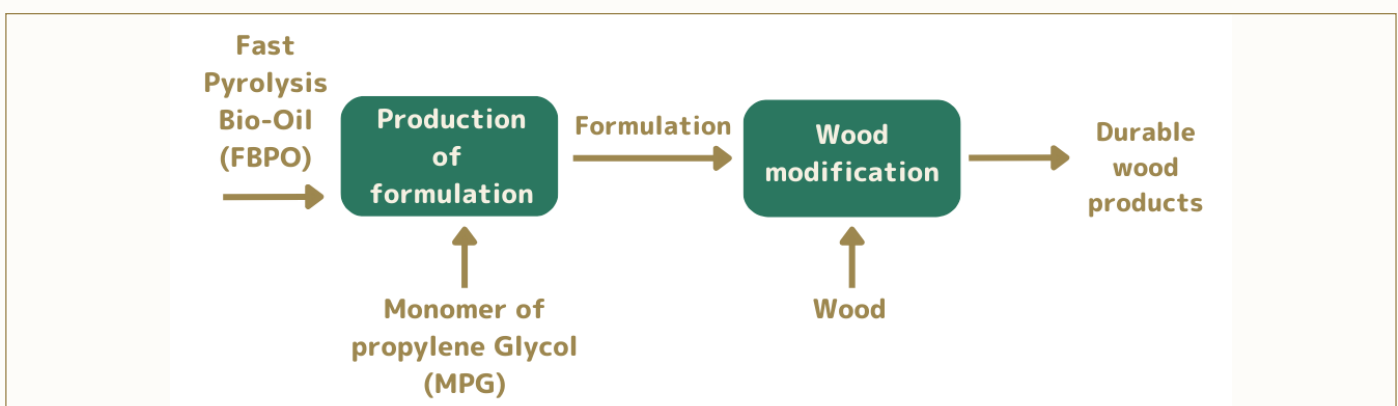


Diagram of manufacturing line #4

NewWave partners BTG, INNORENEW, and FORECO are testing new formulations based on FPBO and MPG for the modification of wood through impregnation. These formulations will result in an enhanced wood durability, weather resistance and enhance their dimensional stability.

In order to ensure the circularity of the process, chips of modified wood will be used to develop very durable and green wood panels. Circularity will be tested by reintroducing treated wood in the TCF process and make new formulations from that oil.

All new products will be extensively tested assuring their desired performance. Materials will be used for mock-up of the building envelope and used for demonstrations and disseminations of developed bio-based materials.



Samples of wood modified by FORECO and characterized at INNORENEW CoE

Partners involved

InnoRenew CoE is a Slovenian research centre focussing on new solutions and methods to make buildings and constructions more sustainable. Two main research areas are emphasised: 1) renewable materials modification for improved functionality, service life, and reduced environmental impacts; 2) restorative environmental and ergonomic design for improved human wellbeing.

Foreco Dalfsen B.V. (Foreco), innovators in timber, is a family owned firm in the field of timber products with a history of over 30 years. The company is active in the field of wood protection and sustainable development. Within several national and international networks the company has managed to make a significant contribution to the development of award-winning new technologies for wood protection and wood modification.

BTG Biomass Technology Group BV (BTG) is a private company of consultants, researchers and engineers specialized in sustainable energy production from biomass, residues and waste. BTG gradually focused its expertise on fast pyrolysis and pyrolysis oil applications. Nowadays significant effort is dedicated to the development of processes for the production of biofuels and bio-based products.



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