

Sustainable biobased products for the construction industry

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.



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1. UPDATES FROM THE MANUFACTURING LINES

BTG has completed the fractionation of Fast Pyrolysis Bio-Oil (FPBO) in their pilot-scale fractionation unit. Fractionation of FPBO yields a pyrolytic lignin and pyrolytic sugar fraction, which are used in the Manufacturing Lines as raw material to produce various intermediates, chemicals, and products.

FPBO and pyrolytic sugar feeds were hydrogenated to produce polyols. Samples of these polyols were shipped to AEP Polymers to undergo analytical testing and further characterization. The FPBO derived polyols will be used in the production of various polyurethanes systems in Manufacturing Line #1.

Samples of pyrolytic sugar and purified sugars have been sent to the University of Groningen. The University of Groningen performed extensive analysis on these samples and tested them as a feed for the production of HMF in the Manufacturing line #2.

Samples of lignin and mono-phenols have been shipped to FORESA Tech to undergo extensive analysis, characterisation and resin reactivity testing. Selected lignins and mono-phenols will be used in the production of resins applied in the manufacturing of various engineered wood panels in Manufacturing line #3.

For Manufacturing line #4, BTG produced 19 on FPBO based formulations for wood



Picture of pyrolytic lignin and the solid lignin pastilles.

modification. After a first evaluation, selected formulations were sent to and tested by FORECO and INNORENEW in order to continue the selection of the best performing formulations to treat wood and enhance the durability.

In particular, INNORENEW characterized formulations based on FPBO prepared by BTG in terms of pot life, viscosity, and curing behaviour among others.

After the impregnation process performed by FORECO in the bench-scale reactor samples were characterized with a multi-sensor approach.

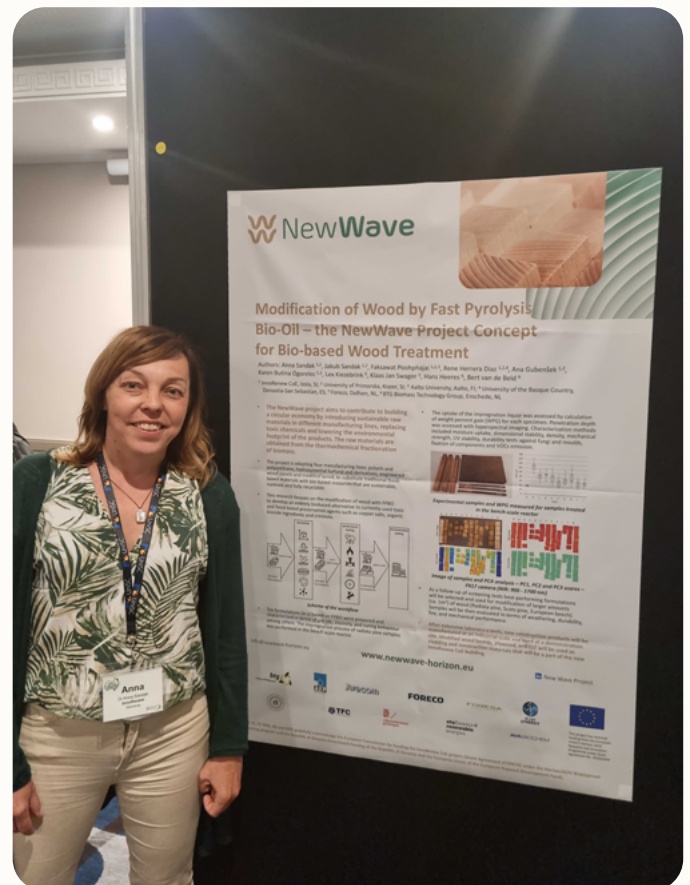
The evaluation included monitoring of the penetration depth, moisture uptake, dimensional stability, density, mechanical strength, UV stability, durability tests against fungi and moulds, fixation of components and VOCs emission.



2. LIFE CYCLE AND COST ANALYSIS

INNORENEW also prepared design of two buildings (from biobased and conventional building materials) and supported BLUE SYNERGY with data necessary to perform LCA of products developed in the frame of the NewWave project.

BLUE SYNERGY has performed a literature review of LCA, costs and techno-economic analysis of existing solutions, similar to NewWave. Relevant information of benchmarks has been identified and analysed to be used in future LCA and LCC analysis of NewWave's products. The Stage 1 of LCA methodology has been started, definition of system boundaries and goal and scope is in progress with the technical partners of the project.



Anna Sandak (INNORENEW) at the IRG Conference

3. DISSEMINATION AND COMMUNICATION

In the course of last year, the NewWave website and LinkedIn page went online, you can follow them to keep track of the latest updates.

In this period, project partners also attended some relevant events, like the European Biomass Conference and Exhibition, the

Woodrise 2022 conference (Portoroz, Slovenia) and IRG54 (Cairns, Australia).

A series of factsheet detailing the NewWave Manufacturing lines was released, you can retrieve them in the “Resources” menu of the project website.



Bert van de Beld (BTG) at the EUBCE 2023






Giulio Poggiaroni (ETA-Florence) at the EUBCE 2023

NewWave

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