



# NoAW - NO AGRICULTURAL-WASTE: INNOVATIVE APPROACHES TO TURN AGRICULTURAL WASTE INTO ECOLOGICAL AND ECONOMIC ASSETS

The NoAW project aims at finding new solutions for up-cycling unavoidable and continuously generated by-products from agriculture. NoAW is transforming straw residues, manure and winery wastes into eco-friendly bioplastics, biofertilizer and biogas by applying the circular economy principle and a cascading approach on already existing material streams.



## VALUE BEYOND ANAEROBIC DIGESTION

CASCADING VALORISATION OF AGRICULTURAL RESIDUES HAS BEEN DEVELOPED IN THE PROJECT:

**ENZYMATIC AND WET EXPLOSION** OF LIGNO-CELLULOSIC RESIDUES CONVERTING LIGNIN INTO CELLULOSE FOR BETTER PERFORMANCE,

**ADVANCED PILOT PLANT** OF 2-STEPS ANAEROBIC DIGESTION PRODUCING BIOGAS, VOLATILE FATTY ACIDS (VFA) AND FERTILIZING DIGESTATES,

UTILIZATION OF THE VFA BY BACTERIA CONSORTIA TO **PRODUCE A NATURALLY BIODEGRADABLE BIO-POLYESTER (PHA)**,

**ELECTRO-MICROBIAL UPGRADING OF BIOGAS INTO BIOMETHANE** TO BE USED IN AUTOMOTIVE SECTOR OR TO BE INJECTED INTO THE NATURAL GAS GRID,

TOOLS FOR SOUND USE OF **DIGESTATE AS FERTILIZER** OF ARABLE CROPS.

## EXAMPLES OF KEY INTERMEDIARY RESULTS

To lower the environmental and the economic costs of naturally biodegradable materials, lignocellulosic fillers obtained from dry grinding of vine shoots are incorporated into a PHBV matrix. Other sustainable building blocks are also developed in the NoAW project by using agricultural by-products, which can be used in eco-friendly packaging productions, such as BPA free epoxy prepolymer based on condensed tannins from vine shoots and succinic acids from vegetable wastes.

BPA free resins



Examples of produced film: neat PHBV and

PHBV filled with 10% of Vine Shoots particles



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## FEASIBILITY

The up-coming work in the NoAW will focus on the intermediate scaling-up steps, the demonstration in real life conditions and the development of a robust business plan.



### Project partners and stakeholders

NoAW project has developed data management and multi-criteria evaluation tools that enable the assessment of stakeholders' preferences and of the environmental impact of new processes, while considering the regional and seasonal differences.

The NoAW project enforces linkage between practitioners, industrial and economic actors via a Knowledge Exchange Stakeholder Platform. The collaboration with the Chinese project partners and an Asian mirror platform allows the project to expand beyond the European Union.

### Future impacts of NoAW's achievements

- reduction of the effect of global warming
- reduction of plastic pollution
- new income streams
- employment opportunities in rural areas
- inspiration of future generation of farmers, agronomists or food actors to reshape the agro-food supply chains for better profitability and sustainability

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