

“Agriwastevalue” Project

Bio-based Products from Fruit Growing and Viticulture Residues

The exploitation of new, hitherto unused residues for the production of bio-based products is an important aspect in the development of a bio-based economy. In the new research project “Implemented zero-waste cascading valorization chain for the recovery of valuable natural products from agricultural residues” (or Agriwastevalue for short), PFI is collaborating closely with a consortium from various European countries (Netherlands, Belgium, France, and Switzerland). The goal is to create an innovative value chain for novel bio-based products in the areas of cosmetics, pharmaceuticals, dietary supplements, and the chemical industry with an almost hundred percent utilisation of the residues. This is to be demonstrated for the example of agricultural residues from fruit growing and viticulture.

Background: Creation of a New Value Chain for Strengthening the Overall Economy

The European cosmetics sector generate revenues of more than €77bn and is one of the largest worldwide. The market for dietary supplements is predicted to rise to €1.6bn by 2020. Increasing demand for natural bio-based active compounds requires the provision of new substances. At present, most of the active substances used in the production of cosmetics and dietary supplements are imported into Europe. Yet Europe actually offers a huge diversity of plants and residues which have hardly been investigated for their possible use in the production of bioactive substances. They could offer enormous potential for establishment of a new value chain for products in the areas of cosmetics, pharmaceuticals, dietary supplements, and the chemical industry. For example, residual substances from viticulture and fruit growing are currently either burned or used directly as compost. Not only are valuable substances then lost unused, but, in the case of combustion, additional pollutants are also formed. Development of possible uses of these residual substances would therefore have both economic and ecological advantages.

Goal: Utilisation of Fruit Growing and Viticulture Residues

The central starting point of the project is the creation of a new value chain for bio-based products from hitherto unused residual materials from fruit growing and viticulture for economic strengthening of the economic area of North-West Europe. The bio-based products are used in cosmetics, in dietary supplements, as well as in the pharmaceutical and chemical industries. The goal of the project is to utilise these residues in an innovative added value cascade. In a first step the biomass is to be inventoried and characterised in order to gain an accurate impression of the available biomass. This is followed by production and formulation of bioactive substances by innovative and environmentally friendly extraction processes. These steps are conducted by project partners in Belgium and France. The pre-treated biomass is then processed at PFI by thermochemical and enzymatic processes in order to recover the sugars present in the biomass in the form of hemicellulose and cellulose. Bioethanol and butanol are then produced from the sugar-containing substrate solutions by fermentation

processes. The lignin-containing biomass is left over after thermal and enzymatic treatment. This is chemically modified by other project partners in order to produce other bio-based products. Energy for the overall process is provided by the biogas generated from the residues along the entire value chain. At the end of the value chain the digestates from biogas production are to be used as fertilisers in fruit cultivation and viticulture. This closes the cycle. Fig. 1 shows a simplified schematic of the value chain.

This cascade-like utilisation permits generation of maximum added value from hitherto hardly used biomass and strengthening of an economic area.

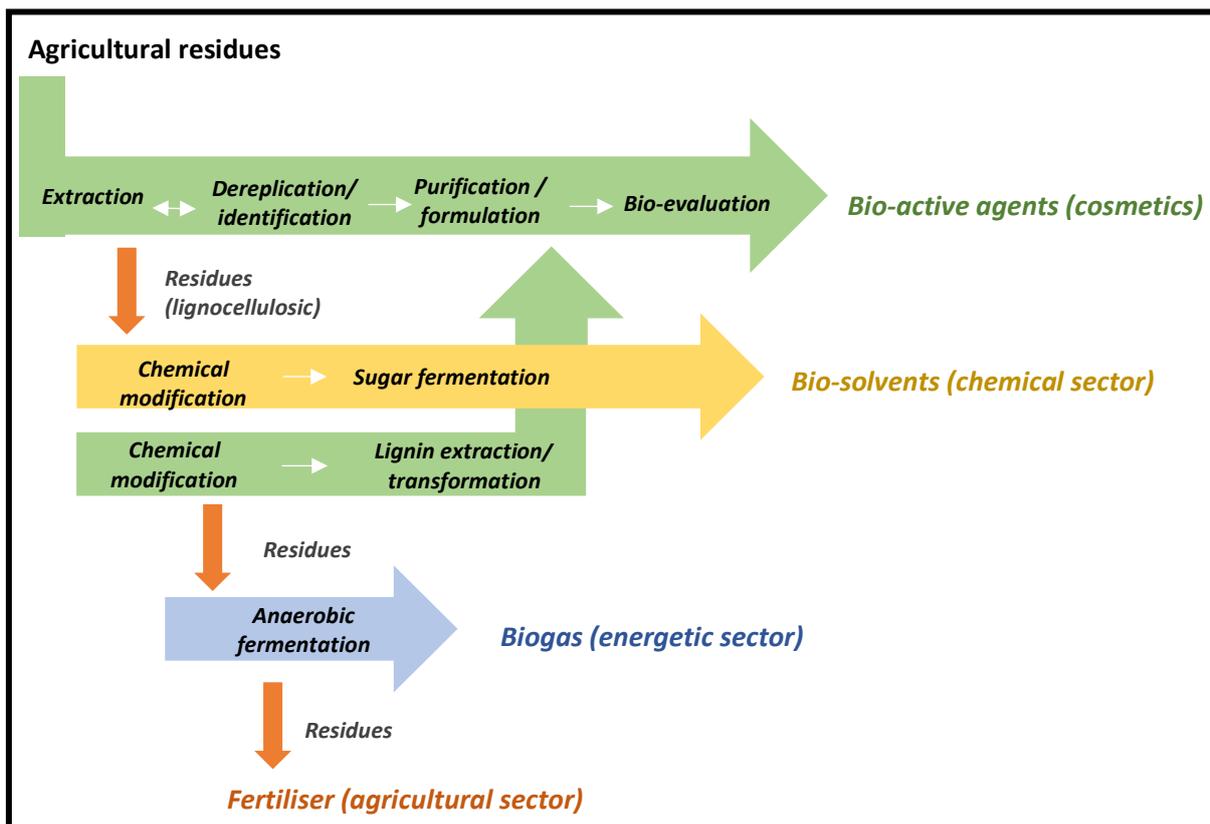


Fig. 1: Schematic of the value chain based on fruit growing and viticulture residues

The official kickoff meeting with all participating project partners took place in the course of an Interreg-Seminars in Lille (France) in January 2019. Here the individual steps to be undertaken during the next six months were discussed.



Fig. 2: Kickoff meeting in Lille with all project partners

Research within the Scope of the Interreg NWE Support Programme for European Territorial Collaboration for Economic and Social Empowerment of North-West Europe

The Agriwastevalue project started in October 2018 and has a duration of three years. It is the first PFI research project and also the first in Rhineland-Palatinate to be undertaken within the framework of the Interreg NWE research program. This research program is funded by the European Commission with the aim of establishing North-West Europe as a key economic region and also to create an attractive area to live and work. To this end some €370 m from the “European Regional Development Fund (ERDF)” will be invested in transnational research programs in Belgium, France, Germany, Ireland, Luxembourg, the Netherlands, Switzerland, and Great Britain. With the new research project, we can further intensify our expertise in the important research area of bio-economy and in addition further intensify collaboration within a network of leading research institutes and universities.

Further information:

Dr. Patrick Ballmann

Department of Biotechnology and Microbiology

Tel: +49(0)6331 24 90 557

E-Mail: patrick.ballmann@pfi-biotechnology.de

Funded by:



European Union
European Regional
Development Fund

In accordance with a decision
of the European Commission

