

BYPROVAL: New Joint Project with Celabor

# Material and Energetic Valorization of Residual Biomass

***PFI Biotechnology and the Celabor Research Institute are continuing their successful cooperation. The new joint project bears the title «New Valorization Pathway for Fruit/Vegetable Waste by a Combination of Extraction and Biogas» or «BYPROVAL» (BYPROduct VALorization) for short. The focus is on non-marketable waste from products such as carrots, potatoes, sugar beet, apples, press cakes from vegetable oil production, cucumber stems and leaves, and many others. The objective is to develop new added-value chains for existing biogas plants through combination of extraction and biogas production.***

Large quantities of non-marketable products accumulate in the food industry. This is often due to an unattractive external appearance: many a carrot or many an apple is simply not appealing enough to be offered for sale. These residual products have hitherto been used as animal feed or fertiliser.

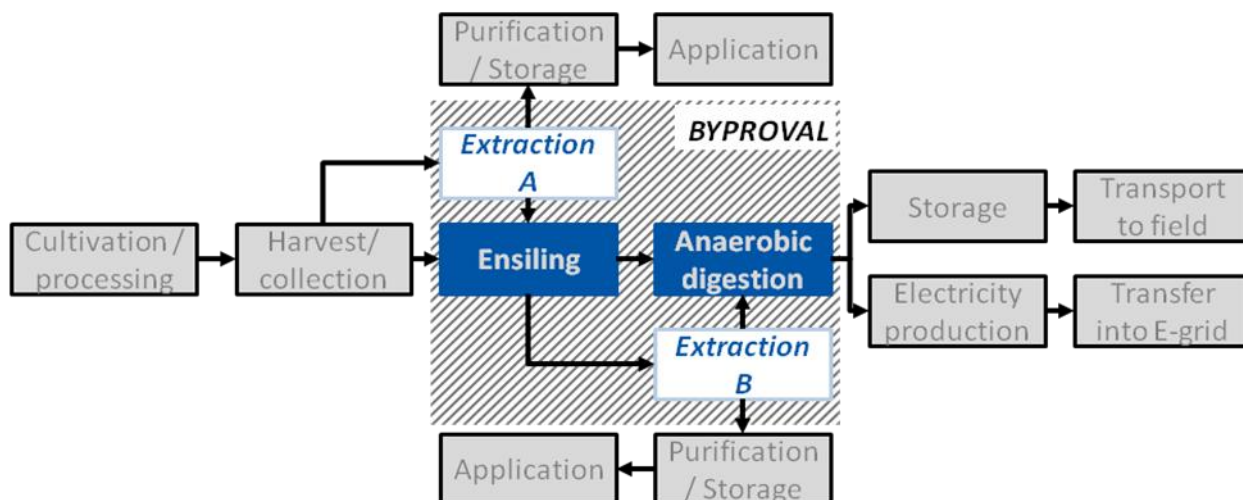
However, their disposal is not always possible in some regions and is subject to increasingly stringent legal requirements. Other methods of utilisation or disposal so far remain uneconomical.



The BYPROVAL project takes a regionally specific look at the products concerned and the potential that exists for their profitable utilisation. Criteria to be considered in the evaluation include the quantities produced and the possible isolation of secondary products by extraction and use for biogas generation. The underlying idea here is to exploit beneficial synergies. For example,  $\beta$ -carotene isolated from carrots could be supplied to industry. The waste heat from a biogas-fired cogeneration power plant could be utilised in the extraction process. The sanitised residue could then be fed to the biogas plant and ultimately transformed into electricity and heat. Figure 1 shows how the project fits into the existing value chain.

The processes and procedures involved should be optimised to attain the best possible outcome. This possibility of waste valorization is of interest to biogas plant operators. Although it may be necessary in individual cases to examine the legal conditions governing use of a particular substrate, the starting material is favourably priced and does not compete in any way with food production.

Apart from their use for power generation, the materials also hold promise of additional profit from possible sales to the food supplement, cosmetics, or pharmaceutical industry. Which substance can be isolated at what time has to be ascertained on the basis of the starting material. The goal of the project is to outline possible valorization pathways and establish assessment criteria in order to weigh up the various added-value potentials.



**Fig. 1: Positioning von BYPROVAL in the added-value chain of an agricultural biogas plant. It is necessary to examine whether extraction before (Extraction A) or after ensilation (Extraction B) yields better results. Synergy effects between extraction and ensilation should be identified and evaluated.**

The project is being conducted in cooperation with the Belgian Research Institute Celabor. [Celabor](#), based in the Walloon Region of Belgium, is a scientific and technical services centre in the Petit-Rechain industrial park located in the vicinity of Verviers. The institute offers scientific and technical support for companies in the agri-food, environmental, packaging, paper, and textiles sectors.

IGF Project No. 152 EN of the Test and Research Institute Pirmasens is funded by the German Federal Ministry of Economics and Energy through the German Federation of Industrial Research Associations (AiF) within the IGF programme for promoting industrial cooperative research and development in accord with a resolution passed by the German Federal Parliament. We would like to take this opportunity to express our thanks for this funding.

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## BYPROVAL project information

Title: « New Valorization Pathway for Fruit/ Vegetable Waste by a Combination of Extraction and Biogas Production »

Duration: 01.01.2016 – 31.12.2017

Project partner:



Funding agencies:



Gefördert durch:

