DEMETER
www.demeter-eu-project.eu

DEMONSTRATING MORE EFFICIENT ENZYME PRODUCTION TO INCREASE BIOGAS YELDS

The transition from an economy based on fossil resources to a bio-based economy is a must and should be realized sooner than anticipated at the moment. A drastic reduction in greenhouse gas emission is urgently needed as the goals set to limit global climate change are not being met. The conversion of biomass into energy sources (biofuels, biogas) and chemicals plays an essential role in this transition. To efficiently convert biomass and agricultural, industrial and municipal waste into fermentable sugars, chemical building blocks or bio-based materials, enzymes play an indispensable role.

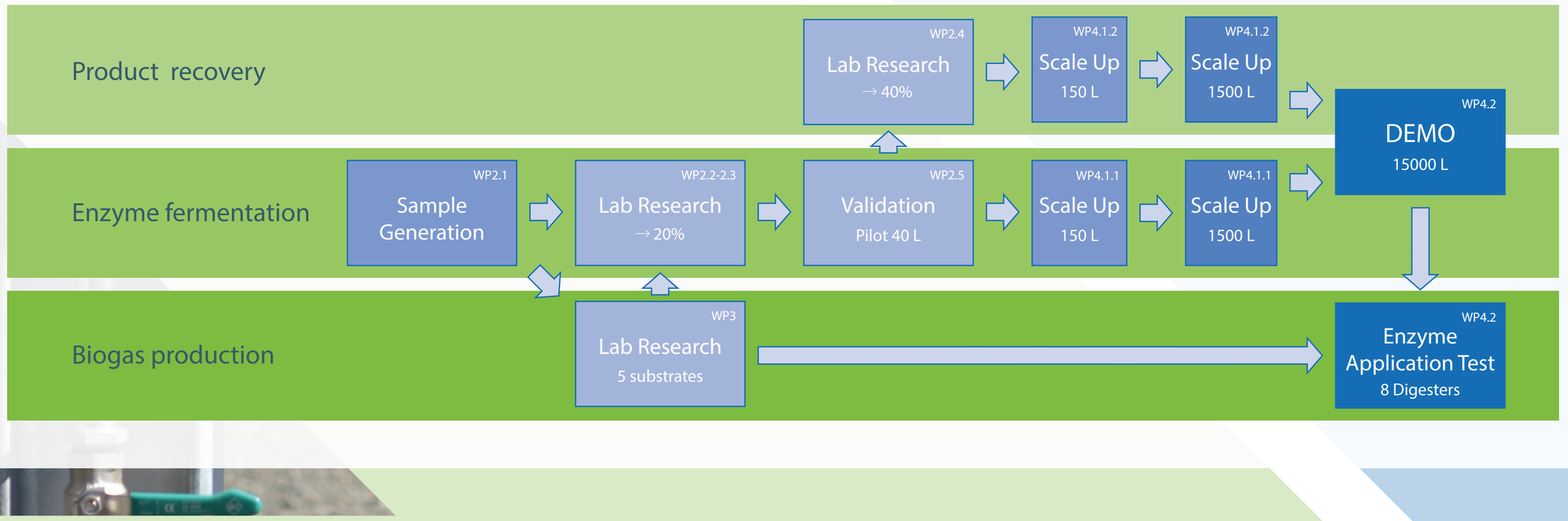
DEMETER OBJECTIVES

DEMETER aims at increasing the yield of the industrial fermentation process by at least 20%, improving the product recovery process by 40%, and reducing overall product costs by at least 15%, while increasing the productivity of the process. In addition, DEMETER will demonstrate the efficiency of the new enzyme produced in eight field trials in biogas plants throughout Europe.

THE DEMETER PROJECT

The project, funded in the frame of Horizon 2020 Public-Private Partnership Bio-Based Industries Joint Undertaking (topic BBI.D7-2015), will demonstrate a yield increase and cost reduction of the production process of a C1-based biogas enzyme as well as its positive effect on biogas production in Europe.

The project will increase the yield of the fermentation process at an industrial scale as well as the down-stream processing, reducing the cost of the end product and making the enzyme available for wide-spread application in biogas production throughout Europe. DEMETER's objectives are to increase the yield of this industrial fermentation process by at least 20%, improve the product recovery process by 40%, and reduce overall product cost by at least 15% while increasing the productivity of the process.



PROJECT PROGRESSES & UPDATES

During the first 18 months of activities, an improved fermentation process for enzyme production at lab-scale was developed by GIBV and transferred to partner BBEU for scale-up to pilot level. A Design of Experiment (DoE) approach has been applied to the fermentation process and the results have also been used to develop a mathematical model for the enzyme production. The results showed an optimized medium composition and conditions for the fermentations. The improved fermentation process to produce the enzymes for biogas applications has been successfully transferred to BBEPP, which showed an improved protein production yield of 35%. BBEPP has also compared different strategies to optimize the downstream process for enzymes purification.

Scale-up to 1500L has been performed and the recovery has been improved to >90%. DBFZ and OWS have performed laboratory tests in batch and semi-continuous scale for wet biogas fermentation processes and batch scale tests for dry fermentation processes.

PARTNERS

DuPont · Bio Base Europe Pilot Plant · MIAVIT · DBFZ · OWS · CiaoTech · BioMoer Duurzame energie

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