Onsite demo plant design of PHBV biomass based on paper waste

Publieke samenvatting / Public summary

Aanleiding

The circular transition will have a significant impact on how we make our necessary materials and how these materials can be used as efficiently as possible. Aside from reducing CO2 emissions, it is important to ensure that the raw materials are biodegradable and do not result in accumulation of microplastics in the environment.
Polyhydroxyalkanoates (PHAs) are a unique class of compounds that can be synthesised by micro-organisms from natural feedstocks and waste streams, possess good properties, and are degradable at ambient temperatures and in all natural environments. Paques Biomaterials B.V. is able to generate PHBV from various sources of wastewater with their innovative and proven methodology. This project will aim at the first steps of the production process where waste streams are fermented into VFAs, and the production of PHBV biomass using bacteria cultures. This concept has been proven to work on a pilot and small demo scale, but in order to meet the demand in the market and become economically interesting, a scale-up is necessary.

Doelstelling

Paques Biomaterials is aiming to set up an industrial plant for the production of PHBVs from wastewater on the short term, while paving the road to more industrial plants at different locations in the future. The knowledge gained will be safeguarded in a general design and engineering roadmap to set up future plants at companies that have wastewater

Projectinformatie / Project information

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Algemene informatie / General information

Penvoerder / Secretariat
Paques Biomaterials B.V.

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streams that can form the basis for a PHBV biomass production facility. Regulatory compliance aspects must be addressed to ensure future commercialization, and an environmental footprint study is needed to determine the specific chain included in this project. The goal of project partner ESKA is to use their waste stream as economically as possible.

Korte omschrijving

The project is divided into 3 work packages: basic design on-site demo facility, test product-market combinations, and project & business case. Engineering studies will be sub-contracted to companies specialised in specific fields. Paques Biomaterials will be active in all activities of this project, even when performed by external parties, to ensure that all activities come together into an engineering roadmap. Paques Biomaterials will perform PHA biomass extrusion tests to produce and validate materials for specific applications. To ensure consistent productprocess quality, research will be done by testing a twin screw extruder at suppliers. To validate the footprint of the PHA biomass products, an LCA study will be performed. The activities also include the necessary legal compliance and the making of a business case for on-site demo facility. Based on a positive confirmation of the predicted business case and this environmental study, the project will move forward towards implementation.

Resultaat

The result of this project will be an engineering roadmap towards full scale plants that consistently produce PHBV biomass. This roadmap will be based on concrete cases as validation and will include the design and set-up of the first on-site demo facility plant and the underlying business case. ESKA and Basilisk are key outsourcing partners for the project, and the results are intended for follow-up steps towards the goal of realizing an industrial plant for the production of PHBVs from wastewater at the facility of ESKA.

De data in deze applicatie is afkomstig van de Rijksdienst voor Ondernemend Nederland (RVO) en wordt in samenwerking met de Topsector Energie ontsloten.
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