

Downstream Isolation of high-value Components

Publieke samenvatting / Public summary

Aanleiding

The CO₂ footprint of the downstream separation technologies at FrieslandCampina, Corbion, Biota, Shell and Recell Group can be significantly lowered by using innovative technologies. Current production trains at these end-users produce a lot of material waste and use a lot of solvents (including water) which then must be purified or recovered. These purification and recovery steps in turn also use a lot of energy and materials. The motivation of the Downstream ISolation of high-value Components (DISCO) project is to improve this. We will evaluate current production trains and develop innovative production trains by using cutting edge, tailor-made technologies, some of which were developed in earlier RVO and TKI E&I PPS Toeslag projects (e.g., TenMip, EEMBAR, STNF, ISRO, SiC membranes, COSMOS, Cellu-U-Value, etc.). Put together, the results of this project are to lower material use and increase energy-efficiency, resulting in a significantly lower CO₂ footprint.

Doelstelling

The objective of this 2.5-year project is to increase the energy efficiency of production and lower material use of the process trains at the end-users FrieslandCampina, Recell Group, Biota, Shell and Corbion. These production trains have multiple separation steps. At each step, technologies will be significantly improved to enable a stepwise advancement in energy efficiency and lowering material cost. The separation technologies along the production train that will be tuned and integrated in order to reach this objective include nanofiltration membranes, electrodialysis, ion exchange, and CO₂

Projectinformatie / Project information

Projectnummer / Project number

TKITOETKI2020_EI_DISCO

Subsidiebedrag / Grant amount

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Algemene informatie / General information

Penvoerder / Secretariat

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switch. This project objective will directly contribute to the TKI Energy & Industry objectives by making it possible to lower the CO₂ footprint of these innovative production trains by 50% in 2030. This project should make a 0,27 Mton of CO₂ eqv/year. This represents approximately 2% of the total reductions that the Netherlands Industry committed to in the Climate agreement. Furthermore, these technologies can be applied to other markets, making the potential impact even greater.

Korte omschrijving

In this project, there are nine work packages. The first and overarching work package aims to bring together the technical management of the other working packages and monitor and evaluate the impact on society. Societal impact evaluation of the project and the technical impact of the production trains will be performed as well by means of a techno-economic analysis. Four work packages are dedicated to the production trains of each end-user (product recovery at dairy plants at FrieslandCampina, glucose purification at Recell Group, purification of propionic and lactic acid at Corbion, recovery of organic acids and fertilisers from vegetable fermentation streams at Biota). These innovative production trains will be designed and evaluated using models, lab experiments and adding technology prototypes. The four production train work packages are supported by four work packages dedicated to improving the individual separation technologies. In these technology-oriented work packages, the individual technologies (nanofiltration membranes, ion exchange, electrodialysis and CO₂ switch) are evaluated and developed to better next generation technologies.

Resultaat

The technologies used in these (new) production trains include+ nanofiltration (NF) membranes, electrodialysis (ED), ion exchange columns (IX) and CO₂ switch. The technologies are the base upon which the production trains and also the DISCO project are designed. The insights gained from the experimental testing by our research partners (KWR, TU Eindhoven) will be used to improve the

technologies by the technology developers in the project (VITO, TNO, Water Future, UTwente and Greencore) in order to offer scaling-up of next generation technologies. Furthermore, a techno-economic tool and computer modelling of the production trains will find the most efficient design.

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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Voor meer informatie over de TSE / Energie-Innovatie regelingen die RVO aanbiedt, ga naar www.rvo.nl/tse.