Black birds - Combined thermochemical and catalytic processing adapted for the production of high-va

Publieke samenvatting / Public summary

Aanleiding

The “Black Birds” project will apply the “adaptive radiation” concept to the valorization of lignin from different biorefinery processes into a portfolio of products with different niche applications. The gasification of new bio-based feedstocks could require new feeding methods and result in different compositions of the producer gas. The sorption technology developed in the previous “Green Birds (TEBE113008)” and “Blue Bird” (TEBE115001) projects will also be adapted to be applied in different phases of upgrading the producer gas. Finally, this 22-month innovation project will take a step forward in the implementation of co-production of chemicals applied to bio-SNG production by upscaling some of the novel co-production technologies in preparation of pilot scale test.

Doelstelling

The implementation of these new technologies for the recovery of high-value compounds from gas will eventually result in an overall decrease of the production cost of bio-SNG by simultaneous tackling 2 factors: use and valorization of a low-cost by-product (in this case, lignin from biorefinery processes) and increase of the value of the bio-SNG process by the harvesting of ethylene (catalytically converted to aromatics) and the subsequent recovery of the bio-aromatics co-product. Catalytic conversion of ethylene to BTX generates a liquid product, thus overcoming the logistics of ethylene

Projectinformatie / Project information

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Algemene informatie / General information

Penvoerder / Secretariat
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Publicaties en materialen / Publications and attachments

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(gas) transport while keeping the value as aromatics. The research and demonstration tasks will be complemented by a cross-cutting techno-economic and market analysis of the overall process.

Korte omschrijving

The research plan will be applied to 4 main areas: 1. Valorization of lignin side-stream from Avantium's novel Zambezi process through thermochemical conversion (gasification and/or combustion) into heat/power, fuels and green chemicals. This lignin will be compared with 2 benchmark lignin materials (kraft- and steam explosion lignin). 2. Further optimization and fine-tuning of the catalytic conversion (ethylene aromatization) and chemical absorption/adsorption technologies developed by ECN and Avantium for the production and harvesting of aromatics (bio-BTX) and the upgrading of gasification producer gas. 3. Upscaling of the technologies to ~ 1 Nm3/h feed gas. The upscaling includes the application of sorbents and catalysts using industrially relevant procedures. 4. Study of suitable applications of the bio-BTX product, with focus on the production of polymers. The feasibility of this route will be proven by producing monomers from bio-BTX from gasification.

Resultaat

In close cooperation with the end-users, the BTX samples produced in the project will be tested against market specs and if possible initial test products will be made for validation and as demonstration of this new technology.

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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