Demonstration project recycling of waste-tyres to recovered carbon black and circular chemicals

Publieke samenvatting / Public summary

Aanleiding

The global economy generates vast amounts of waste every day. At the same time, to reduce industrial emissions, society needs to transition to a sustainable circular economy, in which circularity and limiting emissions play a crucial role. Technological solutions are required to utilise waste as a circular feedstock for industry. End of Life Tyres (ELT) have proven to be challenging to recycle at large scales, yet they are generated annually in vast amounts. The lack of suitable, high-volume (circular processing) applications means half of Europe's ELTs are incinerated every year, generating large volumes of emissions. With the right technology, ELTs can be converted into 1) the circular chemicals Recovered Carbon Black (rCB), Circular Naphtha, recycled steel and 2) advanced biofuels. Carbon Black is an essential component of tyres. Due to lengthy safety approval processes and the (historic) slow uptake of sustainability as a product requirement among car tyre manufacturers; tyres have been made with 'virgin' Carbon Black made by burning fossil fuels; and so adoption of rCB as a reinforcer for car tyres has been slow and based on small-scale production.

Doelstelling

For 14 years, Circtec has developed its recycling technology to produce high-quality rCB, circular naphtha & advanced biofuels at industrial scale. This demonstration project's objective is to build and operate a demonstration rCB, naphtha, steel and biofuel production plant in Delfzijl, where the

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Algemene informatie / General information

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Publicaties en materialen / Publications and attachments

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innovative pyrolysis technology and refining steps are demonstrated. This plant will be a scaled-out version of Circtec's pilot plant in Poland. It is the first plant world-wide with a recycling capacity of 36,000 tonnes of ELT chip per year to the multiple high-value circular products that are accepted by end-users. After demonstration, the plant will be expanded, within 2 years, to a flagship plant, processing 180,000 tonnes of ELT chip per year. The purpose is to demonstrate the circularity and CO2 emissions saving potential of this innovative technology at scale, and the application and acceptance of rCB by car tyre manufactures as a substitute for virgin CB. Full capacity 'take or pay' off-take agreements for the products for both this demonstration plant and the future flagship plant are signed.

Korte omschrijving

Now that all permits have been secured, offtake contracts signed, the engineering designs completed and the EPCM contractor appointed for both the demonstration project and the flagship plant expansion, the financing for the demonstration plant can be completed. Financial close is expected in September 2023. Final engineering activities and EPCM will be performed by an experienced engineering party. Construction is expected between September 2023 and December 2024. Commissioning starts in October 2024 and the demonstration period is expected between January 2025 to July 2025. In this period, the technology and production volumes will be demonstrated and optimized and required personnel for the demonstration plant will be recruited and trained.

Resultaat

The result of this demonstration project will be an innovative demonstration plant in Delfzijl for recycling of waste tyres to circular products (16,091 tonnes rCB + 3,060 tonnes naphtha + 432 tonnes steel and 11,016 tonnes biofuels/year). It is a first-of-a-kind plant and a showcase for the circular economy. The products will be sold into the value chain of car tyre manufactures, the chemical industry and the shipping industry. Compared to the

fossil alternative, this demonstration project will prove: - its circular potential: converting 36,000 ton per year of ELT chips into valuable circular chemicals (64% of product share) & advanced biofuel for the Netherlands' shipping sector (which will be mandated to used renewable fuels by law from 2025). - its innovate process design & application: high-end rCB with tailored specification that complimentary to virgin CB and now accepted by the (OEM tyre) market and refined/upgraded pyrolysis oil to circular naphtha and marine advanced biofuel. - its GHG saving potential: 228,000 t CO2 eq saved in one year by 2030. The most advanced, largest and most GHG-reducing plant of its type globally.

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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