From Composite to Product

Publieke samenvatting / Public summary

Aanleiding

One especially promising feedstock is a biopolymer recently coined Kaumera (previously known as ALE, or NEO-alginaat). The potential market size of Kaumera in the Netherlands is around 125.000 ton / year. Kaumera is produced by bacteria in the Nereda® wastewater treatment process. In RvO-project TEBE117002 (WASCOM) we showed Kaumera can be used to bind cellulose fibres together to yield a composite material. This material combines a biobased and fully biodegradable nature with interesting material characteristics. The cellulose fibres used in WASCOM originated from retrieved toilet paper, yielding a biobased composite entirely made from wastewater. The biobased Kaumera-cellulose-composite material can replace fossil-based and energy-intensive composite materials such as glass fibre-polyester in (amongst others) the building and construction sector. Finding an application in the building and construction sector which exploits the technical, social, market and legal possibilities of the Kaumera-cellulose-composite, will lead to a more circular society.

Doelstelling

The goal of COMPRO is to find the best application of the previously developed Kaumera-cellulose-composite material in the building and construction sector. To become a success, the application should: -maximally exploit the unique technical characteristics of the Kaumera-cellulose composite(e.g. biodegradability, stiffness, non-flammability); -be socially embraced; -fit neatly within (international) market demands; -fit within legal constraints. By fulfilling the above

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requirements, the Kaumera-cellulose composite material can replace fossil-based and energy intensive composite materials, such as glass fibre – polyester composites. Next to a smaller dependence on fossil resources, the Kaumera-cellulose composite will lead to energy savings in production compared to traditional composites. The lighter weight of the Kaumera-cellulose composite compared to traditional composites can furthermore save energy during the service lifetime of the product.

Korte omschrijving

To find the best application of the Kaumera-cellulose composite, the following activities are planned: - Identify the technical possibilities, with respect to: WP1: optimisation of Kaumera formulation WP2: optimisation of Kaumera-cellulose-composite production process WP3: characterisation of the Kaumera-cellulose material properties - identify social, market and legal possibilities for the Kaumera-cellulose-composite (WP4) - combine technological (WP1-3), social, market and legal insights (WP4) to design threeprototypes (WP5) - build prototype(s) from Kaumera-cellulose composite for the building and construction sector(WP5) - perform field tests to test technical, social and environmental performance of these prototypesin real life (WP6) - perform project management and dissemination activities (WP7) The COMPRO consortium covers the entire knowledge chain. Delft University of Technology is world leading expert on Kaumera, AMS Institute closes urban waste loops in a social way with involvement of all stakeholders, ChainCraft explores ways to commercialise Kaumera, NPSP produces biobased composite materials, and BAM Infraconsult designs and builds sustainable infrast

Resultaat

The envisioned results of COMPRO are: - the design of three prototypes for the building and construction sector made from Kaumera-cellulose-composite. These prototypes will exploit the technical, social, market and legalpossibilities of the Kaumera-cellulose-composite. The prototypes will be

biobased and fullycircular, as their components are derived from wastewater. - building of one or more prototype(s), depending on the size of the designs. - field tests of the prototype(s), to assess the technical, social and environmental performancein real life - a concise LCA on the prototype(s). The prototype(s) will be used to obtain purchase guarantees from BAM Infraconsult or other end-users, allowing further scaling up. COMPRO will strengthen the Dutch knowledge economy and create a more circular society. A high-value, biobased, circular product made from Kaumera-cellulose-composite will further enhance the international relevance of the Dutch materials and water sector.

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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