IMPRESSIV

Publieke samenvatting / Public summary

Aanleiding

Due to global shift toward a circular plastics economy, there is a growing demand for high-quality recycled technical plastics. Current plastic sorting and recycling processes still result in the loss of valuable resources and thus maintain the dependency on virgin raw materials. This is caused by the fact that current technologies still leave behind a significant residual fraction containing valuable plastics such as polycarbonate (PC) and PC/ABS blends that is downcycled, incinerated or even land filled. Conventional mechanical and chemical recycling methods often struggle to generate a high quality recyclate, as the material is aged and they are typically contaminated with legacy additives. With IMPRESSIV, we aim to further develop a future-proof recycling technology capable of selectively removing legacy additives and other contaminants to recover high-quality recycled PC (rPC). Overall, the project supports the sustainability goals by reducing the demand for virgin raw materials, lowering CO2 emissions, and promoting the circular use of plastics also outlined as the subsidy objectives.

Doelstelling

The IMPRESSIV project focuses on developing a future-proof recycling concept for PC-rich plastic waste, using TNO's Möbius dissolution-based recycling technology. Together with our key partners, who provide realistic feedstock, support pre-sorting and filtration and evaluate the recovered materials. We aim to develop a scalable process that enables the removal of legacy additives and contaminants, resulting in high-quality recycled PC.

Projectinformatie / Project information

Projectnummer / Project number
EKOOCP25-03855536
Subsidiebedrag / Grant amount
€ 424.797,00

Algemene informatie / General information

Penvoerder / Secretariat
Nederlandse Organisatie voor toegepast-natuurwetenschappelijk onderzoek TNO

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The project therefore closely aligns with the subsidy goals: - Efficient use of raw materials: keeping end-of-life PC for re-use - Reducing ecological footprint: partially avoid the need for fossil based feedstock and to avoid the use of chlorinated solvent to produce virgin grade PC - Reduction of CO2 emissions: the recycled PC is expected to have a lower footprint then virgin grade PC

Korte omschrijving

The IMPRESSIV partners will source end-of-life polycarbonate sheets as a primary case as well as PC-rich waste from WEEE as a secondary case. These waste streams will then be processed up to TRL5 using a solvent-based recycling technology to recover purified PC. The recycled PC will then be recompounded according to specifications of an end user for re-use. The specifications reached will be compared to the requirements for different end uses. Finally, the feasibility of further scaling up this process will be assessed.

Resultaat

The following main deliverables will be generated in IMPRESSIV: • Definition of quality parameters for waste feedstock and recovered polymer matching requirements for use in different application fields. • Development, demonstration and scale-up of a solvent-based recycling process for removal of additives and contaminants from PC-rich waste, End-of-Life Polycarbonate (EoL PC) sheets and WEEE (Waste of Electrical and Electronic Equipment), resulting in processing of a test sample at kg-scale for the primary use case (EoL PC sheets). • Assessment of this solvent-based recycling process to produce the highest product quality relative to the sustainability impact and costs. • Chemical analysis and measurement of mechanical properties as well as visual aspects and stability of rPC polymer obtained by the solvent-based recycling. • Overview of limitations and opportunities for the PC recovery system from EoL PC sheets and WEEE.

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**.