

Development and demonstration of a highly selective and cost effective terpene removal system for bi

Publieke samenvatting / Public summary

Aanleiding

Terpenes are a problem for biogas producers, as grid owners will refuse entry to the natural gas grid when more than a few ppm terpenes are detected in the renewable natural gas injected. The problems are related to the integrity of pipelines, safety at the upgrading plant and the fact that terpenes can mask the odor of natural gas, which is unacceptable for grid owners, as it may lead to safety risks. Moreover, the technology currently used by most biogas producers is removal of terpenes with activated carbon, which is a costly process. The degree of remaining adsorbent capacity is hard to monitor, which leads to an increased risk of an occasional slip of terpenes.

Doelstelling

The aim of this project is to develop a terpene removal system that reduces costs for biogas producers, prevents problems in the biogas production chain and gives insight in the valorization of terpenes. This technology is based on regenerative selective chemical absorption using affinity based extractants. The current methods available are costly and lead to additional safety risks.

Korte omschrijving

The TNO concept for terpene removal is using affinity based extractants, or host-guest chemistry. The terpene removal system aims at a broad-

Projectinformatie / Project information

Projectnummer / Project number
TEG0414003

Subsidiebedrag / Grant amount
€ 78.828,00

Algemene informatie / General information

Penvoerder / Secretariat
Nederlandse Organisatie voor
Toegepast-Natuurwetenschappelijk

Publicaties en materialen / Publications and attachments

- 02.03.2020

Eindrapport TEG0414003

Volg Topsector Energie op X / Follow Topsector Energie on X

@TSEnergie

spectrum solution, removing various of terpenes with one or, if necessary, a mixture of extractants. At low temperature the terpene (or the guest) is captured by the extractant (or the host). By raising the temperature the terpene is released again, and the solvent is returned for the next absorption step. TNO will optimize the solvent composition as well as the operational conditions. Specific aspects to address are the required extractants to capture the range of terpenes that can be present, capacity, and stability. This results in a conceptual process design of the terpene removal system. In combination with a techno-economic evaluation this serves as input for a system validation via small scale piloting. Frames will build a demonstration pilot scale installation that is going to be used to clean biogas at a location of Attero. A field trial is performed using a bleed stream from the Attero biogas production facility. A test campaign will be performed to determine the performance of the installation with real biogas. Design rules are esta

Resultaat

The result of the project is an innovative technology to remove terpenes from biogas. This technology will be piloted at small scale in an existing biogas upgrading plant of Attero. Design rules to scale up the technology will be defined that form a basis to implement the system at commercial scale.

De data in deze applicatie is afkomstig van de Rijksdienst voor Ondernemend Nederland (RVO) en wordt in samenwerking met de Topsector Energie ontsloten.

Voor meer informatie over de Topsector Energie, ga naar www.topsectorenergie.nl.

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