

Techno-Economic Feasibility Study for the BGR CCS project

Publieke samenvatting / Public summary

Aanleiding

The Eneco Bio Golden Raand (BGR) biomass facility, situated near Delfzijl, converts contaminated waste wood chips (B-wood) into energy, primarily green steam for the local industrial steam network in Chemiepark Delfzijl. Eneco intends to transform BGR into a carbon negative steam facility by capturing and permanently storing the biogenic CO₂ from the flue gas and integrating electrified flexible steam production, contributing to meet carbon neutrality targets in due time. Several technical challenges are however to be tackled before Eneco can commit to the FEED phase, including the high energy consumption of the capture installation, any potential environmental impacts, and the integration of flexible steam production. Eneco performed two preliminary feasibility studies, one on the CO₂ capture, compression and liquefaction facilities, and one of the integration of an E-boiler and thermal energy storage. The outcomes of these studies will together form the basis for this TSE industry study that will be carried out in preparation of a fully integrated demonstration project for transforming BGR into a flexible, net-carbon negative steam supply facility.

Doelstelling

The study aims to tackle the challenges by yielding all technical, environmental and economic knowledge that is necessary for decision-making on this technically integrated demonstration project. To achieve this, the feasibility and environmental impact of integrating several innovative

Projectinformatie / Project information

Projectnummer / Project number
TESN25-03859034

Subsidiebedrag / Grant amount
€ 909.688,00

Algemene informatie / General information

Penvoerder / Secretariat
Eneco Heat Production & Industrials B.V.

Volg Topsector Energie op X / Follow Topsector Energie on X

@TSEnergie

technologies, including far-reaching heat recovery solutions on the CO₂ capture facilities, will have to be assessed. The study's content, approach, size, and scope aligns with the objective of Program Line 1 Top Sector Energy Studies: CO₂-reducing measures other than hydrogen and green chemistry. The study also contributes to the ambitions of the Dutch Government to achieve negative emissions as per the Carbon Removal Roadmap (March 2025).

Korte omschrijving

The study will be carried out in four work packages. The first work package concerns the pre-FEED engineering studies of the CO₂ capture facilities. This starts with a review and optimization of the current design and an assessment of innovative heat recovery and management integrations to update the design after which the rest of the engineering work is done in preparation of the FEED. When the technical design for the capture plant is updated, environmental impact studies will be carried out in work package two after which mitigation measures might be integrated where needed. The third work package explores how electric steam facilities with storage could be integrated to deliver the missing flexible steam supply while also maintaining the stability of the steam network. For this, a dedicated model will be built to disclose the specific network needs and inform asset design specifications and dimensions. All technical insights will be economically validated in work package four that will also generate insight in the life-cycle impacts of the project. Eneco will partner with engineering companies to carry out the studies and will provide financial and in-kind resources.

Resultaat

The overall result of this project is a report integrating all techno-economic insights needed for the further development and realization of the demonstration project, in particular with respect to the integration of innovative concepts into the design. This will inform decision-making on subsequent stages such as investments in FEED to

eventually take a Final Investment Decision. In addition, if the results of the project turn out positive, this could be a blueprint to be replicated to other carbon capture facilities and steam and heat networks to enhance energy-efficiency while also adding fossil-free flexibility to the systems.

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.