

Zero Emissions Ironmaking Process - Phase 1 of the Front End Engineering Design (FEED) Study for the

Publieke samenvatting / Public summary

Aanleiding

TATA Steel IJmuiden (TSIJ) is responsible for 7% of the Dutch National CO₂ emissions. In line with the Klimaatakkoord for 2030 and 2050 TSIJ is developing strategies to substantially reduce these emissions. Several technologies are under investigation. One of these technologies is Hlsarna. Hlsarna is a flagship programme to develop an innovative ironmaking process with reduced CO₂ footprint. TSIJ aims to demonstrate this technology at full scale producing a million tonne of hot metal annually by 2030. One of Hlsarna's unique features is being a "CO₂ capture ready" process. Due to the high CO₂ concentration (>85%) off-gas produced, the capture of CO₂ for storage or other uses is more efficient. TSIJ has been operating the Hlsarna pilot plant, with a capacity of 8 t/h of hot metal, since 2011; going through several campaigns in developing the ironmaking process. As a next step TSIJ plans to integrate CO₂ capture to the Hlsarna pilot plant. In this proposed project, the FEED study for such a CO₂ capture pilot unit will be conducted. This is a key step in realising a deep reduction of steelmaking CO₂ emissions (90%) which is TSIJ's vision for Sustainable Steel production.

Doelstelling

In order to de-risk the scaling-up of the technology a CO₂ capture plant should be built and integrated into the existing Hlsarna Pilot Plant. The primary purpose to build the capture pilot is to validate the

Projectinformatie / Project information

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Algemene informatie / General information

Penvoerder / Secretariat
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Publicaties en materialen / Publications and attachments

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technology readiness and use this as a test bed to learn how to effectively integrate and operate the capture plant and the ironmaking process. The proposed project work is a preparation for the pilot capture plant and aims to:

- Deliver the pre-FEED studies for the CO₂ capture plant
- Identify and shortlist technology suppliers of the CO₂ capture pilot plant that could provide key design and engineering data
- Establish a preliminary estimate of the CAPEX and OPEX
- Prepare for the pre-FEED work necessary for the capture plant – i.e. Hlsarna and On-site Tie Ins
- Identify possible routes to use the captured CO₂ in The Netherlands

This work at pilot scale supports the design of the CO₂ capture for the first industrial Hlsarna plant planned for 2027.

Korte omschrijving

The project is divided into 8 different work packages:

- (1.) Project Management: ensures the delivery of all deliverables within budget and on-schedule
- (2.) Development of the Basis of Design Document: is to define and establish the inputs and assumptions to the FEED study
- (3.) Pre-Engineering Study & Development of Technology Selection Criteria: is aimed to assess the critical components of the capture plant and develop their technology selection criteria
- (4.) CO₂ Market Study: is to assess the existing and future Dutch CO₂ markets
- (5.) Development and Formulation of the Invitation to Tender Document (ITD): is to develop the criteria for the selection process of the OEMs of the CO₂ capture pilot plant.
- (6.) Tender Assessment: is to evaluate the tender document submitted by OEMs and discussed and finalise the terms and conditions with the shortlisted FEED study contractor(s) in preparation for the work to be done in Phase 2
- (7.) Preparatory work for the OSBL FEED Package(s): to establish and assess the different options for the tie-ins to the Hlsarna and on-site utilities
- (8.) Regulatory and Permitting: is to gather information required for regulatory and permitting applica

Resultaat

The project should provide TSIJ the technical & financial info needed to underpin the final

investment decision of the CO₂ capture pilot plant by 2020. The construction and operation of this capture plant in combination with the Hlsarna ironmaking process is required to de-risk the next phase which is the industrial scale demonstration plant. The proposed project is therefore a crucial step for the necessary technology transition in IJmuiden. If the transition to Hlsarna + CC(U)S can be realized it will result in:

- Achieving the CO₂ emission targets
- A completely new heavy end asset base with superior economics safeguarding the global competitiveness of TATA Steel IJmuiden
- Strongly reduced environmental impact (CO₂ but also fine dust, dioxins, NO_x)
- Safeguarding high quality integrated steel production in the Netherlands for the next decades

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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