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EXPERTISES

Feasibility study for a hydrogen transport infrastructure project at the port of Dunkerque

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CFP ZIBAC – First hydrogen transport infrastructure for the Dunkirk Industrial Ecosystem

NaTran conducted, between January and June 2023, a feasibility study for a hydrogen transport network in the Dunkerque port and industrial area. This document summarizes the study's findings.

The study followed a market "Open Season" — a call for expressions of interest — aimed at confirming the economic viability of the proposed hydrogen pipeline infrastructure. This transparent and non-discriminatory process was open to all interested parties from September 19 to November 18, 2022. Eleven companies expressed their interest in participating.

The feasibility study determined a design and route of approximately 10 km connecting production sites with consumption sites that had expressed interest in the infrastructure. The route was optimized to minimize complex crossings, reduce environmental impacts, and address human safety considerations while respecting pipeline right-of-way constraints.

The study also evaluated the costs of hydrogen transport and identified all associated risks, including technical challenges (such as crossings), environmental impacts, permitting, and scheduling considerations.

Project overview

This project concerns a pure hydrogen transport infrastructure, consisting of a network of new pipelines of varying diameters and associated facilities (delivery and/or injection stations) over a total distance of approximately 10 km in its initial operational phase. The infrastructure will be operated and supervised by NaTran teams, responsible for operation, maintenance, and safety. This first network may be extended in future phases to connect additional hydrogen producers or consumers with less mature projects, or to link a future import terminal.

Design principles for the transport infrastructure

The proposed transport infrastructure is designed in compliance with applicable hydrogen transport regulations. The new steel pipelines will be buried and will be inspectable using specialized pipeline inspection tools (pigs).

Sizing and maximum operating pressure

Network simulations and technical studies conducted during the feasibility study defined the sizing of the main backbone pipeline, including pipe diameters, as well as the maximum operating pressure under all scenarios for ecosystem development.

The network will have limited operational flexibility to handle temporary imbalances. Maintaining operations within the defined margins will require high responsiveness from shippers, and consequently from both producers and consumers.

Hydrogen specifications

NaTran proposes to tentatively adopt the hydrogen specifications defined by EASEE-gas. In parallel, ongoing work within the CEN (European Committee for Standardization) is expected to finalize an approved technical specification.

The specifications proposed by NaTran may evolve based on technical advances in the hydrogen sector, outcomes from CEN, and emerging regulatory requirements.

Route feasibility

The feasibility study defined a route of approximately 10 km connecting the production and consumption sites that expressed interest in the infrastructure. The route was optimized to minimize complex crossings, reduce environmental impacts, and limit human safety risks while respecting pipeline right-of-way constraints.

Key technical challenges at this stage include certain crossings of structures and basins within the port area. Subsequent studies will confirm the preferred crossing methods among those evaluated during the feasibility study.

The density of the port area and the presence of numerous existing networks also represent significant technical risks and potential cost variability, as several crossings of different structures will be required over a short distance.

Environmental considerations are also critical, with the presence of ZNIEFF protected areas, wateringues, wetlands, and nearby compensatory environmental zones.

Administrative procedures

All procedures, applications, and administrative requirements necessary for the construction and operation of the infrastructure have been identified.

Planning

The feasibility study enabled an estimation of the provisional commissioning date for the infrastructure project. The investment decision will depend on the signing of contracts with clients. Once the investment decision is made, the application for construction and operation authorization will be submitted to the authorities. Faster processing of this authorization by the administration could shorten the commissioning timeline through coordinated actions among all stakeholders in the hydrogen ecosystem.

Cost estimate

The feasibility study provided a preliminary calculation of the implementation costs (CAPEX and OPEX) for the hydrogen transport network at the Port of Dunkirk.

Based on the proposed tariff model and assumptions, the study estimated the caost of tranporting hydrogen for clients from an entry point to an exit point.

RÉSUMÉ

Between January and June 2023, NaTran conducted a feasibility study for a hydrogen pipeline transport network in the Dunkerque industrial and port area. Following an Open Season that confirmed market interest, the study defined an optimized route of approximately 10 km and assessed costs, risks, as well as technical, environmental, and regulatory constraints. The results confirm the project's feasibility and lay the foundation for a structured, expandable network that will be essential for the development of a low-carbon hydrogen sector in the region.

Ce document est diffusé par l'ADEME

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