

HyChain 3

Publieke samenvatting / Public summary

Aanleiding

For hydrogen from water electrolysis to play a central role in the future energy system, significant scale-up will be required. It is projected that the Netherlands needs to produce a total of 14 Mton H₂/year, more than 22 times the current domestic demand and a quarter of global industrial H₂ consumption (Gigler & Weeda, 2018- "Contouren van een Routekaart Waterstof"). Carbon-neutral H₂ production (e.g. green H₂ from water electrolysis), is still prohibitively expensive, which makes meeting the demand with green hydrogen an enormous challenge. For this reason alternative H₂ production methods (inside and outside the Netherlands) are included in this study as well. We aim to understand: How will the full hydrogen value chain to deliver the lowest cost, carbon-neutral hydrogen to Dutch industry develop in the near future, and what barriers and bottlenecks stand in the way?

Doelstelling

The aim of HyChain 3 is to create that central repository. The technology assessment will deliver a key source of knowledge for both the HyChain program as well as other hydrogen-related R&D in the Netherlands. This project is an important supporting initiative for the entire Top Sector Energie community, the results of which will be more widely applicable. The main research questions for this project include: ? What are the main technologies in the full value chain of hydrogen generation, conversion, storage, and transportation? ? What parameters (social, economical, technological, and environmental) will determine the future use of these technologies in

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the value chain? ? How do the technologies score on each of these parameters?

Korte omschrijving

In this project, the participants will define a set of environmental, social, economic, and technological indicators to assess the hydrogen supply chain technologies and make a template for fact sheets on the technologies. Alignment with HyChain 1 and 2 will be done to secure that a homogeneous dataset is built that is suitable to support decision making and answers also the needs of other projects. ECN/TNO, Frames, and TU-Delft will work together to gather extensive information on the technologies through interviewing the participating consortium industry partners and other unaffiliated industries. This information will be supplemented with additional desk research for data collection from literature as well as from vendors and technology providers to fill remaining knowledge gaps. Finally, the data collected will be consolidated into a public report of technology fact sheets and a database that can be used to compare the options on the basis of a wide variety of criteria.

Resultaat

The results of this project include two main deliverables. The first is a public database of hydrogen production, conversion, transportation, and storage options and technologies including key characteristics of these technologies and environmental, social, economic, and technological parameters such as CO₂e emissions, typical CAPEX and OPEX numbers, TRL levels and existing and projected learning curves for the technologies, etc. The second main deliverable is a public report of fact sheets on each of the explored technologies with documentation on the database. Additional deliverables will be included with this project, such as flow diagrams used to provide further insight into the cost structures of certain technologies.

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.