

Hyscaling

Publieke samenvatting / Public summary

Aanleiding

In 2030 the Dutch industry clusters use green hydrogen at scale. By this time the Dutch manufacturing industry is key supplier to a 1000 M€/a electrolyzer market, achieved by the European ambition of installing 40 GW electrolyzer capacity by that year. The Netherlands, with its extensive hydrogen grid and underground gas storage, industry clusters close to potential low-cost offshore wind and a strong high-tech industry, has capitalized on this ambition. Cost reductions throughout the supply chain have made green hydrogen a competitive energy carrier for industrial and commercial applications. Today however, such quantities of electrolyzers cannot be supplied cost effectively and efficiently. Green hydrogen scale-up requires (a) lowering total system costs, (b) improving durability of the stack and (c) increasing efficiency. HyScaling brings together a strong industrial consortium to address all three aspects in a coherent way. It lines up the Dutch high-tech industry towards electrolyzer production and subsequent new export products. Embedding in the Hydrohub Innovation Program connects the project to a strong end-user base and experimental facilities.

Doelstelling

The specific objective of HyScaling is to achieve 25-30% cost reduction for levelized cost of hydrogen compared to the state-of-the-art by bringing the HyScaling innovations to full implementation and roll-out by 2030. In HyScaling novel hardware, low-cost manufacturing processes, optimized integrated system designs and advanced

Projectinformatie / Project information

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MOOI42010

Subsidiebedrag / Grant amount

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Algemene informatie / General information

Penvoerder / Secretariat

Stichting Ispt

Publicaties en materialen / Publications and attachments

- 23.11.2022

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Voortgangsrapportage 1

- 26.07.2023

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Voortgangsrapportage 2

- 10.04.2026

Eindrapport MOOI42010

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operating and control strategies are developed that all contribute to the overarching target. HyScaling aims to establish a Dutch electrolyzer industry. More than half of the consortium partners aim to enter the market by making their innovations into products. These include novel components, electrolyzer stacks and complete systems (stack & BoP). Some members aim at commercialization before the project end (e.g. Ionbond coatings, Veco electrodes). The shoulder-to-shoulder partnering in HyScaling increases trust between the parties, increasing the chance of success in the future market arena.

Korte omschrijving

HyScaling is pragmatic, fast-moving and goal-oriented and with a Dutch open-innovation spirit. Start-ups, SME's and industry bring specific competences and high-potential technologies in a progressed stage to the project, expected to deliver results early on. Academia and institutes strengthen the delivery with solid science. The work is coordinated by an experienced team from ISPT and TNO together with industry leads in specific areas. The project is carried out in three phases: • M1 – M12 – Discovery phase – Results 1 & 2: get solid ground on market and product requirements; screening and selection of novel materials. • M12 – M30 – Validation phase – Results 3 & 4: selected materials are integrated in small test units for performance and duration testing. System optimization across use cases is done for design and manufacturing strategies. • M24 – M36 – Implementation phase – Result 5: application testing on full-stack systems for Alkaline and PEM is done at Hydrohub MegaWatt Testcenter. Result 6: concrete business plans are developed building on social research and market analysis.

Resultaat

HyScaling concrete deliverables are assembled into 6 main results: 1. Use cases: 4-5 use cases are fully expanded, with scope, technology baseline and cost-models to assess progress beyond state-of-the-art and cost reduction potential. 2. Component and stack performance optimization: identification of the

best performing innovative components and materials for alkaline and PEM electrolysis: focused on performance and manufacturability. 3. Advanced Alkaline Electrolyzer development: use-case focused optimized novel components, stack designs for increased manufacturability and innovative system designs reaching lower hydrogen cost in 2030. 4. Advanced PEM Electrolyzer development: novel membranes, electrodes, catalysts for higher performance and durability, advanced stack and system designs leading to even lower hydrogen cost in 2030. 5. Validation scale: performance and scalability of innovations demonstrated in full-stack prototypes for alkaline and PEM at TRL 6. 6. Action Plan: analysis of public support, human capital, legal, barriers and identification of robustness of the supply chains and business cases result in Action Plans towards full roll-out and implementation by 2

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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