HY NORTH
Connect to Invest

The Northern Netherlands Home of Hydrogen

2024

HYDROGEN VALLEY NEXT GENERATION

The Northern Netherlands' unique combination of strategic location and access to the North Sea, abundant renewable energy resources, pioneering projects, strong educational and research institutions, supportive government and policies, and a comprehensive hydrogen ecosystem firmly establishes it as the Hydrogen Valley Next Generation.

The region's visionary leadership and successful case studies further solidify its position as a continental leader in the hydrogen economy, making it the ideal destination for hydrogen-related investments and collaborations and cooperations.

The Northern Netherlands Home of Hydrogen

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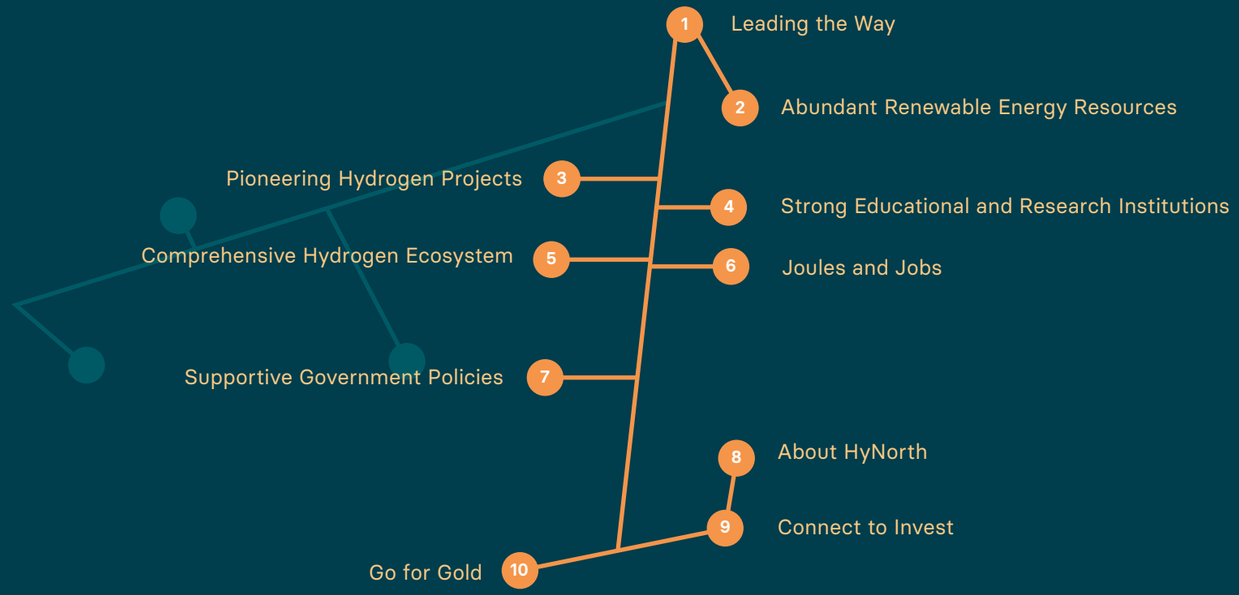
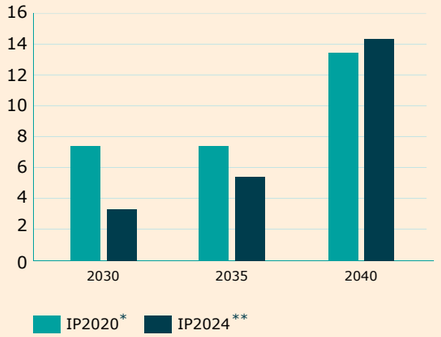


NORTHERN HYDROGEN ECONOMY: DEMOGRAPHIC AND STATISTICAL OVERVIEW

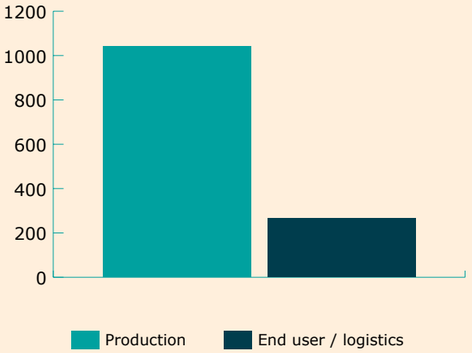
Demographic and Statistical Overview

Province	Population x 1000	Surface area km²	Employment x 1000	GDP (billion euros)	Installed capacity MW	
					Solar	Wind
Groningen	596	2959	317	32,6	1600	871
Fryslân (Friesland)	660	5748	338	25,5	1221	619
Drenthe	502	2680	250	18,4	1607	271
The Netherlands	**18000**	**41543**	**11683**	**948,5**	**23943**	**6812**

Planned Electrolysis Capacity in GW

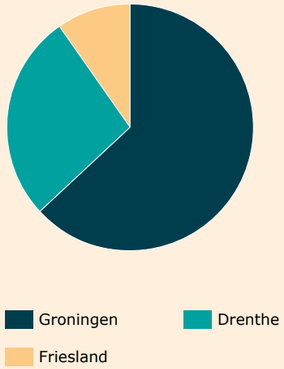


Capacity 2028 (ktons/year)



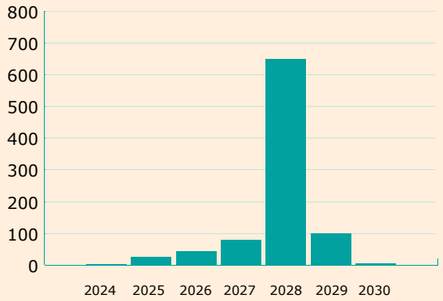
* IP2020 = Investment Plan for Hydrogen in the Northern Netherlands 2020
** IP2024 = The 2024 updated version of the Investment Plan for Hydrogen in the Northern Netherlands

% of projects per province IP2024

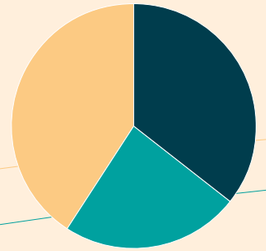


Groningen
Drenthe
Friesland

Commissioning of new electrolysis projects IP2024 (in MWe)

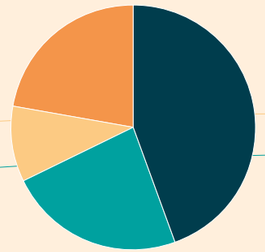


% distribution by value chain position IP2024



Production
Logistics
End user

% Distribution by phase IP2024, all projects



Concept
Investment decision
Implementation
Operational

LEADING THE WAY

1

Strategic Location and Infrastructure

The Northern Netherlands, comprising the provinces of Groningen, Friesland, and Drenthe, is strategically located, facilitating the development of the Hydrogen Valley Next Generation based on the foundation of the first Hydrogen Valley of Europe.

The region boasts advanced energy, logistical and knowledge infrastructures, supporting the construction and integration of offshore wind energy into the energy system via hydrogen production.

The Eemshaven is a major European energy node, generating and transmitting more than 30% of the Dutch electricity supply with an ever increasing renewables share due to the offshore wind connection and interconnectors.

The availability of the EET Eemshaven LNG import terminal offers the foundation to enter the next phase of the energy transition. The location of this terminal will in future enable import and transport of hydrogen and derivatives making it available to the market. The Eemshaven will become the starting hub of the Dutch hydrogen backbone which is connected to the European hydrogen backbone. The Hydrogen backbone benefits from the Hydrogen storage facilities and services of HyStock which can guarantee uninterrupted supply of (green) Hydrogen to users such as chemical industries in Delfzijl, Veendam and Emmen. This unique asset base provides excellent access to hard to abate sectors in the Dutch and German Hinterland.

ABUNDANT RENEWABLE ENERGY RESOURCES

2

The Northern Netherlands is rich in renewable energy resources, essential for producing green hydrogen. The region has significant wind energy capacity, both onshore and especially offshore, and is rapidly expanding its solar energy infrastructure.

Hydrogen Valley Next Generation

These renewable sources provide a sustainable and constant supply of electricity necessary for producing domestic green hydrogen through electrolysis. This domestic regional production will benefit from the envisioned large scale Hydrogen production in the Eemshaven from NortH2, Engie and RWE. It will also benefit the significant hydrogen production in Delfzijl with EURUS, HyCC, Lhyfe and others.

PIONEERING HYDROGEN PROJECTS

3

To establish a leading European Hydrogen Valley, the hydrogen chain is being developed using the 'Hub-and-Spoke' model. In the three northern provinces, approximately ten hubs have been identified where the demand and/or supply of hydrogen is being developed.

HYHUB DELFZIJL

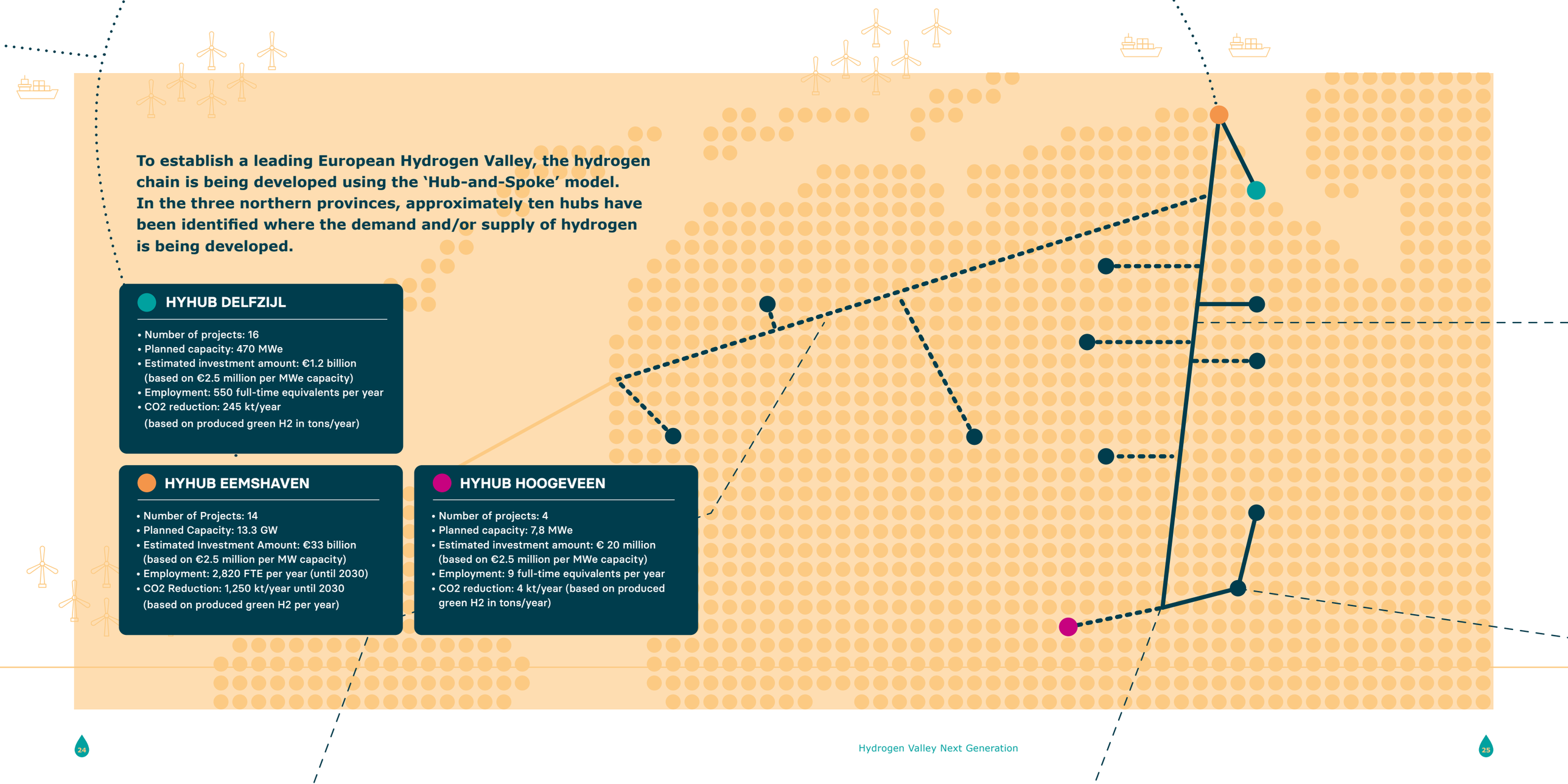
- Number of projects: 16
- Planned capacity: 470 MWe
- Estimated investment amount: €1.2 billion (based on €2.5 million per MWe capacity)
- Employment: 550 full-time equivalents per year
- CO2 reduction: 245 kt/year (based on produced green H2 in tons/year)

HYHUB EEMSHAVEN

- Number of Projects: 14
- Planned Capacity: 13.3 GW
- Estimated Investment Amount: €33 billion (based on €2.5 million per MW capacity)
- Employment: 2,820 FTE per year (until 2030)
- CO2 Reduction: 1,250 kt/year until 2030 (based on produced green H2 per year)

HYHUB HOOGEVEEN

- Number of projects: 4
- Planned capacity: 7,8 MWe
- Estimated investment amount: € 20 million (based on €2.5 million per MWe capacity)
- Employment: 9 full-time equivalents per year
- CO2 reduction: 4 kt/year (based on produced green H2 in tons/year)



The Northern Netherlands is home to a multitude of pioneering hydrogen projects that set it apart as a leading region

Europe’s First Hydrogen Valley

HEAVENN (H2 Energy Applications in Valley Environments for the Northern Netherlands). This project is one of Europe’s largest green hydrogen initiatives, integrating production, storage, and distribution.

Hydrogen production Park Eemshaven

Here the energy giants RWE, Engie and Equinor are engaged in realizing world class electrolyser systems of several Gigawatts combined with the ambition of the NortH2 projects the Eemshaven will become a strong force in the Hydrogen supply to NW Europe.

NortH2

An ambitious project aimed at producing green hydrogen using offshore wind energy, with the potential to significantly scale up hydrogen production.

Mobility

OV Bureau Groningen-Drenthe/Qbuzz

Approximately 30 Hydrogen-Powered buses are operating in the provinces of Groningen and Drenthe, providing public transport services.

Holthausen

A ‘veteran’ builder of hydrogen powered vehicles for heavy transport and other specialist applications.

Resato

State of the Art specialist developing and construction newest generation Hydrogen Refuelling Stations. Combined with its Resato Academy to educate and train professionals for the Hydrogen future.

Green Planet

A futuristic state of the art multifuel fuelling station providing all renewable and traditional fuels to passenger and heavy transport vehicles. Hydrogen can be fuelled at 350 and 700 bar at high pressure and high speed.

HyStock

Development of Underground Hydrogen Storage in Salt caverns directly connected to the Dutch and European Hydrogen Backbone.

Hydrogen Valley Airport

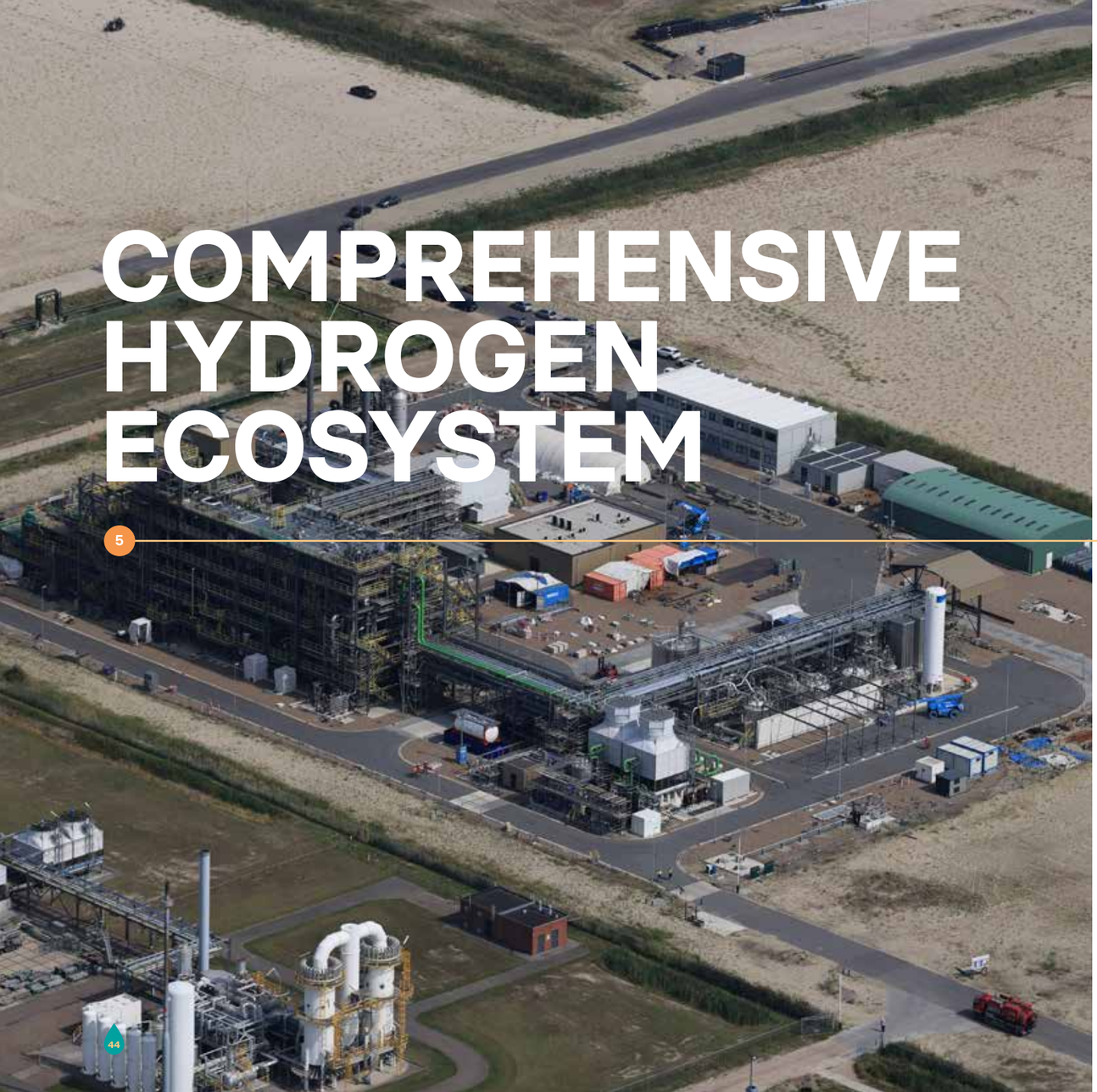
Groningen Airport Eelde with its NXT Airport concept to become an innovation and demonstration hub for Hydrogen applications in aviation: both landside and airside.

Hydrogen Valley Next Generation

4

STRONG EDUCATIONAL AND RESEARCH INSTITUTIONS

The region hosts leading educational and research institutions like the University of Groningen and Hanze University of Applied Sciences. These institutions offer specialized programs in hydrogen technology and collaborate with industry leaders to drive innovation. Research and innovation hotspots like the Entrance and the Hydrogen Valley Campus Europe in collaboration with New Energy Coalition further reinforce the region’s commitment to advancing hydrogen technology.



COMPREHENSIVE HYDROGEN ECOSYSTEM

5

The Northern Netherlands has developed a comprehensive hydrogen ecosystem that covers the entire value chain—from production and storage to distribution and end-use applications. This integrated approach ensures efficiency, scalability, and the ability to meet the growing demand for green hydrogen across various sectors, including industry, transport, and residential. A dedicated plan of six points has been built to enable the hydrogen ecosystem development.

6

JOULES AND JOBS

By leading in hydrogen technology, the Northern Netherlands not only contributes to significant reductions in CO2 emissions but also drives economic growth.

The hydrogen economy creates new jobs, attracts investments, and establishes the region as a center of excellence in renewable energy.

The Northern Netherlands has a large group of small and medium enterprises with high potential in hydrogen developments.

SUPPORTIVE GOVERNMENT POLICIES

7

The Dutch government, along with regional authorities, provides robust support for hydrogen initiatives through subsidies, grants, and favorable policies. The Northern Netherlands benefits from both national and European Union funding dedicated to green hydrogen projects, ensuring a conducive environment for growth and innovation.

About HyNorth

8

HY NORTH
Connect to Invest

HyNorth is the central organization which drives the development of the Northern Netherlands Hydrogen ecosystem. The service delivery is built on two cornerstones: Connect to Invest!

Partners

HyNorth was established with the cooperation of:

Connect to Invest

9

Connect

Hydrogen connects. HyNorth wants to challenge current and potential investors in the hydrogen economy over the spectrum of startups to scale ups to mature industries. Please reach out to us to demonstrate the opportunities.

Invest

The successful and long term perspective of Hydrogen can only become reality when investments in the Hydrogen Value chain are realized. HyNorth invites you to connect to us to investigate business opportunities to built and maintain the Hydrogen value chain.

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Connect

If you would like to discuss your hydrogen opportunities and ambitions in Northern Netherlands, please contact us at connect@hynorth.nl

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Colophon

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We extend our gratitude to all contributors and partners who provided valuable perspectives.

The Northern Netherlands: Home of Hydrogen, November 2024

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