



ROADMAP NORTH-WESTERN NL REGION

North-Western Region in Transition: Navigating Towards a Hydrogen-Driven Future

To realise its ambitious goals for the energy and hydrogen transition, the North-Western region needs more than 12,000 full-time workers each year between now and 2030. People with the right skills and knowledge in the right place at the right time. The manifesto **“Werken en Ontwikkelen 2030”** identifies six regional clusters where business, education and government work together to learn, work and innovate, thus creating a solid foundation. The fact that Noord-Holland received the European Hydrogen Valley Status in 2023 adds to the drive and urgency.

Noord-Holland received the European Hydrogen Valley Status in 2023

In 2023, the province of Noord-Holland received the European Hydrogen Valley Status, the Flevoland Hydrogen Valley (FLHY) platform was established in Flevoland and the province of Utrecht signed the **“Waterstof Utrecht”** covenant. The North-Western region is characterised by ambitions spanning the entire hydrogen chain: from green hydrogen production offshore and on land, import, storage and transit of green hydrogen in the Port of Amsterdam, hydrogen as a raw material for the Zaanstreek industry, heavy transport and mobility, aviation, agricultural applications and electricity production. The region will link into the hydrogen backbone.

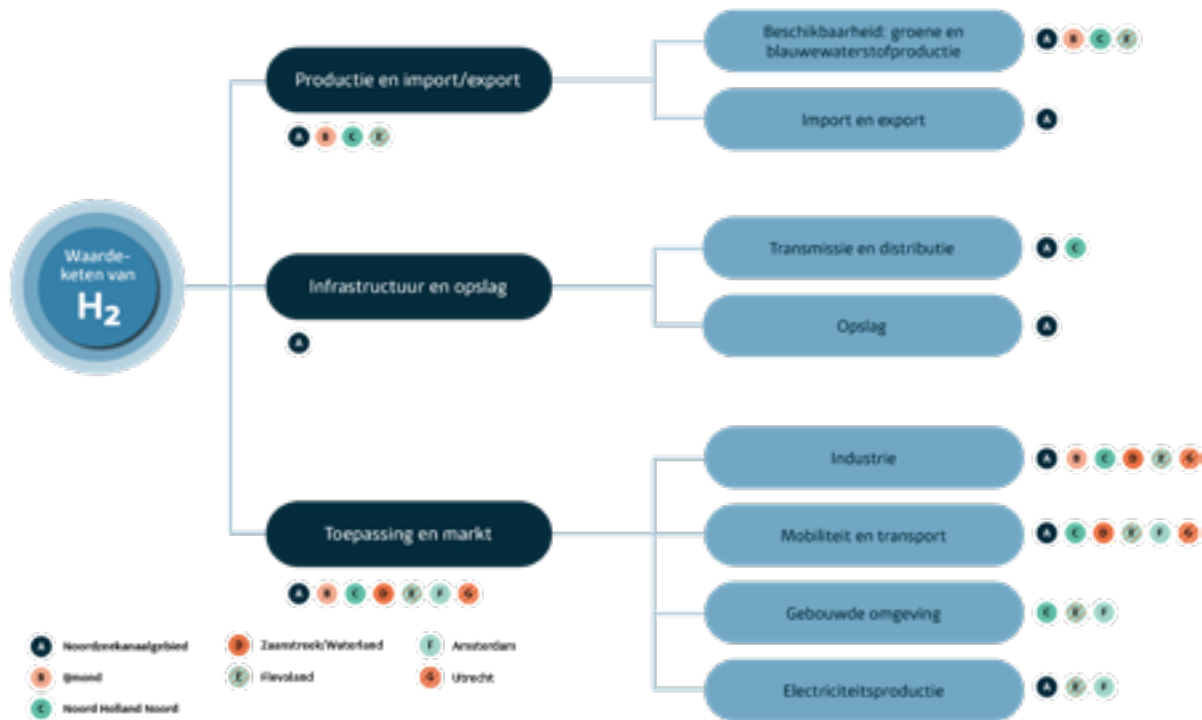
To do this breadth of activity and the required workforce justice, the roadmap distinguishes six clusters each with its own substantive focus:

- IJmond (steel production and offshore wind energy landfall),
- Green Chain Noord-Holland North (agriculture and offshore wind energy landfall),
- Zaanstreek/Waterland (food and manufacturing industries),
- Flevoland (transport, systems integration and agriculture),
- Green Tech Campus Amsterdam (built environment and mobility)
- Utrecht (mobility, safety and hydrogen as a raw material).

Six clusters of partnerships in the North-Western region, each with its own focus on the hydrogen transition



Knowledge and educational institutions, governments and businesses work together within these clusters in PPP constructions and development coalitions. A tight network of learning communities is formed. The number of transition initiatives: projects, partnerships, communities, lab facilities, campuses, etc., that have the potential to contribute to the fulfilment of the human capital agenda, is large and develops into the responsive infrastructure needed to help realise the dynamic agenda of the region.



The image visualises the elements of the value chain that the clusters concentrate on. The NZKG Programme Office operates across the full breadth of the value chain. Four of the seven clusters focus on the production and availability of green and blue hydrogen in the region. Each cluster works on hydrogen applications and the hydrogen market. Within this link of the value chain, the emphasis is on Manufacturing: H₂ as a raw material and H₂ as fuel. On a smaller scale, all clusters work on

H₂ for mobility, transport. The Built Environment is highlighted within the Amsterdam High Impact PPP 'Green Tech Campus', in NHN and Flevoland.

In the North-Western region, work is being done across the full breadth of the hydrogen value chain.

The region is developing rapidly

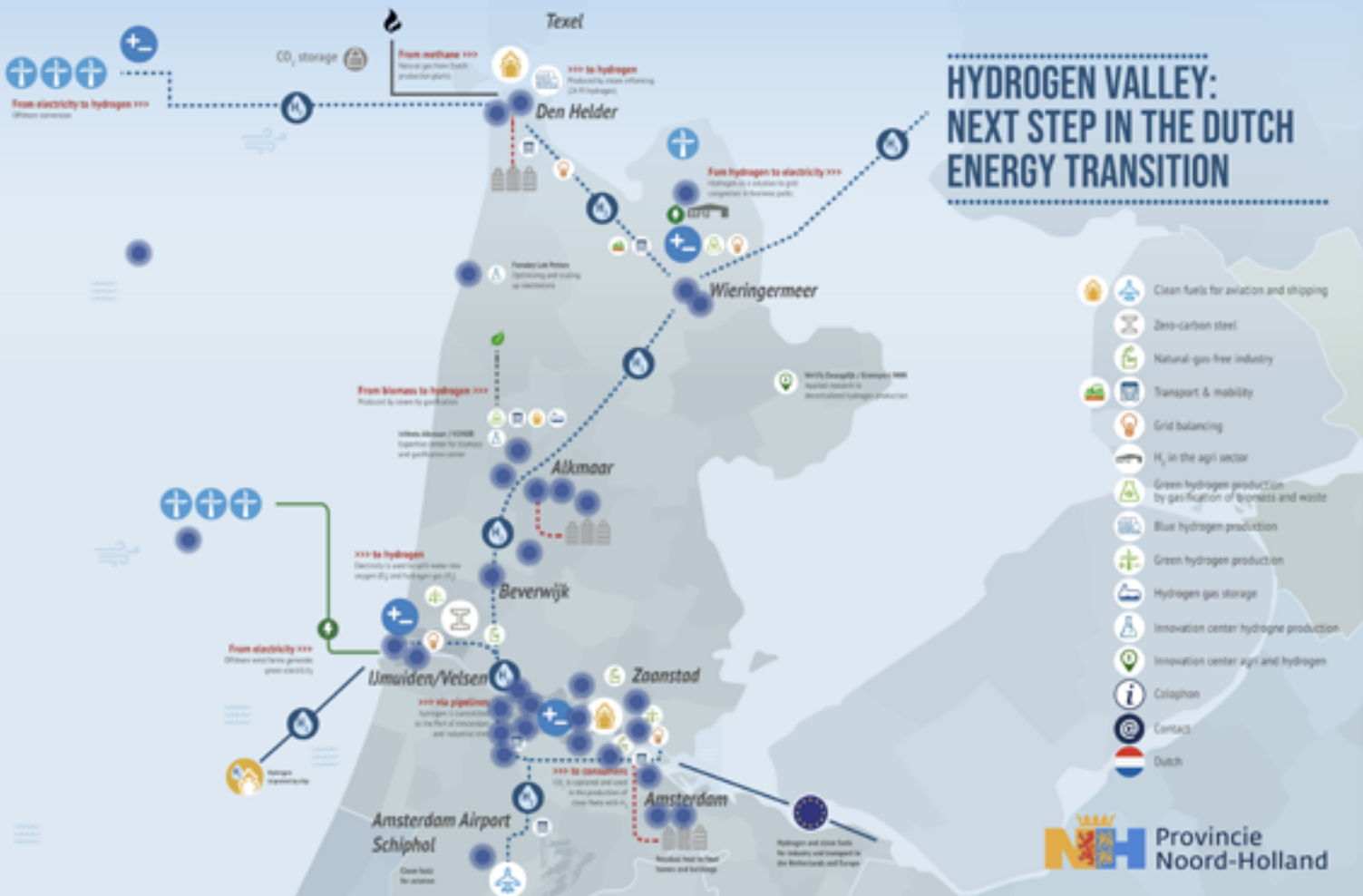
The tipping point for the implementation of the hydrogen transition is rapidly approaching. On 27 October 2023, King Willem-Alexander performed the starting action for the construction of the national hydrogen network in the Netherlands. By the end of 2026, according to the plan, the North Sea Canal area will be connected to this network. In the meantime, H₂avennet is being planned: an 8 bar, low-pressure hydrogen distribution network in the Amsterdam port area. At the same time, plans are being made for the construction of electrolysers, and there is research and testing regarding storage and transshipment of hydrogen in the Amsterdam Port Area. Moreover, work is progressing towards the transition to hydrogen in the manufacture and agriculture clusters and work is being done on applying hydrogen to various modalities for transport and mobility.



The big human capital challenge is to have sufficient well-trained people available on time from Den Helder, the Kop van Noord-Holland, the North Sea Canal area, the Port of Amsterdam to the Zaanstreek, Schiphol, the Amsterdam metropolitan region, and Flevoland up to Utrecht to accomplish this giant job.

Simone Maase, Liaison GroenvermogenNL, North-Western Region

This can only be achieved by working together. To quickly integrate new knowledge into educational offerings, to have the ability to deploy the pool of well-trained people together and to develop or share educational modules with each other. This means that the wheel won't need to be reinvented every time.



Ambitions and activities

The North-Western region is building a responsive infrastructure in which businesses and educational institutions (public and private), through Learning Communities and Field Labs, ensure that new and necessary knowledge is quickly applied in practice, and that this knowledge is integrated into flexible educational offerings and training for professionals.

Activities focus on:

- Developing Learning Communities for at least two of the identified clusters. Learning Communities accelerate the hydrogen transition through practice-oriented research and the continued development of innovation to TRL levels 7-9. The acquired knowledge is applied by companies and working professionals.
- Developing flexible educational and training offerings with a focus on vocational and higher professional education levels. Together with companies and private educators, Lifelong Learning programmes for working professionals are facilitated. In collaboration with the business community, educational modules for full-time vocational and higher professional education and academic education are developed and teachers and trainers are professionalised with regard to the theme of hydrogen where necessary.
- Physical setup of Lab facilities, which will subsequently work towards a regional lab infrastructure. Focus is placed on campus formation within the regional clusters and across clusters. At a national level, the region works with Make Hydrogen Work and the National Knowledge Platform.

'Leakage' of people in technology is a big problem: Can we keep these people enthused and retain them by exposing them to the major transitions in the region at an early stage?

Mark Denys, Director of Technology Transition at Tata Steel and Chair of the Advisory Committee of Manifest Work and Development 2030.

- Strengthening the regional ecosystem by creating coherence between existing and new initiatives at both regional and national levels. This can be done by connecting national growth funds such as LLL-catalyst, R&D and scaling programmes from GroenvermogenNL, PPS Katapult and JTF with one another during implementation.



Key stakeholders

The initiated movement is realised through the involvement of a large number of partners. This network is

broad and extensive. Below shows an overview of the parties currently engaged in the regional ambitions.

Businesses	HyCC, Hygro, Tata Steel, Stork, Vattenfall, Schiphol, Alliander, Argent Energy, KWR Water
Education	Vocational: Nova College, Regiocollege, Vonk, Horizon College, ROC of Amsterdam Flevoland, ROC Midden Nederland. Higher Professional: University of Amsterdam, HU University of Applied Sciences Utrecht, InHolland University of Applied Sciences, Windesheim University of Applied Sciences Academic: University of Amsterdam, Consortia such as AMCEL and AMOLF, TU Delft.
United business community and PPSs	Programme Agency North Sea Canal Area, HIPPS GreenChain NHN, Tech@Connect, HIPPS Green Tech Campus MRA, PPS Techport, HIPPS Circular and Digital, PPS Techlands, Amsterdam IJmuiden Offshore Ports, Zaanstad Maakstad.
Regional governments	Provinces of Noord-Holland, Flevoland and Utrecht, Councils of Amsterdam, Velsen, Beverwijk, Almere, Lelystad. The Development Company Noord-Holland North, ROM in West, AROM.
Private training providers	Tata Academy, Tatrix, InstallationWork, New Energy Coalition
Hubs, labs, centres	Techport Innovation Center, Energy Transition Campus Amsterdam, Tech@Connect, H ₂ in Agri, HvA Amstelcampus Fieldlabs FT

It's all a matter of combining forces

In realising the regional agenda, the North-Western region makes targeted use of the possibilities offered by various national and regional stimulation programmes. Through the use of the distinctive power of each programme, the entire agenda is accelerated.

- With **GroenvermogenNL**, we formulate and concretise the human capital agenda for the hydrogen and energy transition. The region develops flexible programmes and learning directions for education and business, aimed at young talent, working professionals, lateral entrants and teachers.
- With **Scaling PPS Vocational Education**, we realise and solidify the required generic basis for the public-private infrastructure. This is done through three approved PPS applications in the North-Western region.
- With the **LLL-Catalyst**, we focus on the professionalisation and flexibilisation of the public education infrastructure for the large and broad LLL task in the region. This development offers opportunities for active participation by businesses and partnerships that have concrete training needs for the energy and hydrogen transition. The Learning Communities and PPPs are collaborative structures for the anchoring of LLL offerings.
- With the approved projects from the **Just Transition Fund**, the region focuses on a flexible and resilient workforce through lifelong learning, sustainable and

inclusive employability, job guidance for job seekers, and attracting and retaining talent, specifically for the IJmond area.

- **European Hydrogen Valley Call 2024** will be opened at the beginning of 2024. The Programme Agency North Sea Canal Area, together with Development Company Noord-Holland North and their partners, will submit a proposal.



As the Liaison team of GroenvermogenNL actively works on a combined deployment of all these programmes in the region, a coordinated and powerful collaboration is achieved, leading to a win-win-win for all parties.

GVNL and HCA-GVNL

The hydrogen transition can only succeed if there are enough well-trained professionals and a sufficient influx of new talent. For this reason, GroenvermogenNL has established the human capital agenda. Businesses, knowledge institutions and governments together ensure an ecosystem that can meet this challenge. The ambition is realised through five pillars: regional investment programmes in six regions, a business programme for, among others, SMEs, the establishment of the Dutch Hydrogen Academy for national and international appeal, a national knowledge platform, and a dynamic knowledge agenda that fosters community formation and provides insight into current labour market developments.

More can be found at: <https://groenvermogen.nl/en/human-capital-agenda-energy-transition/>.

This Roadmap lays the foundation for the regional investment programme of the North-Western Netherlands region.



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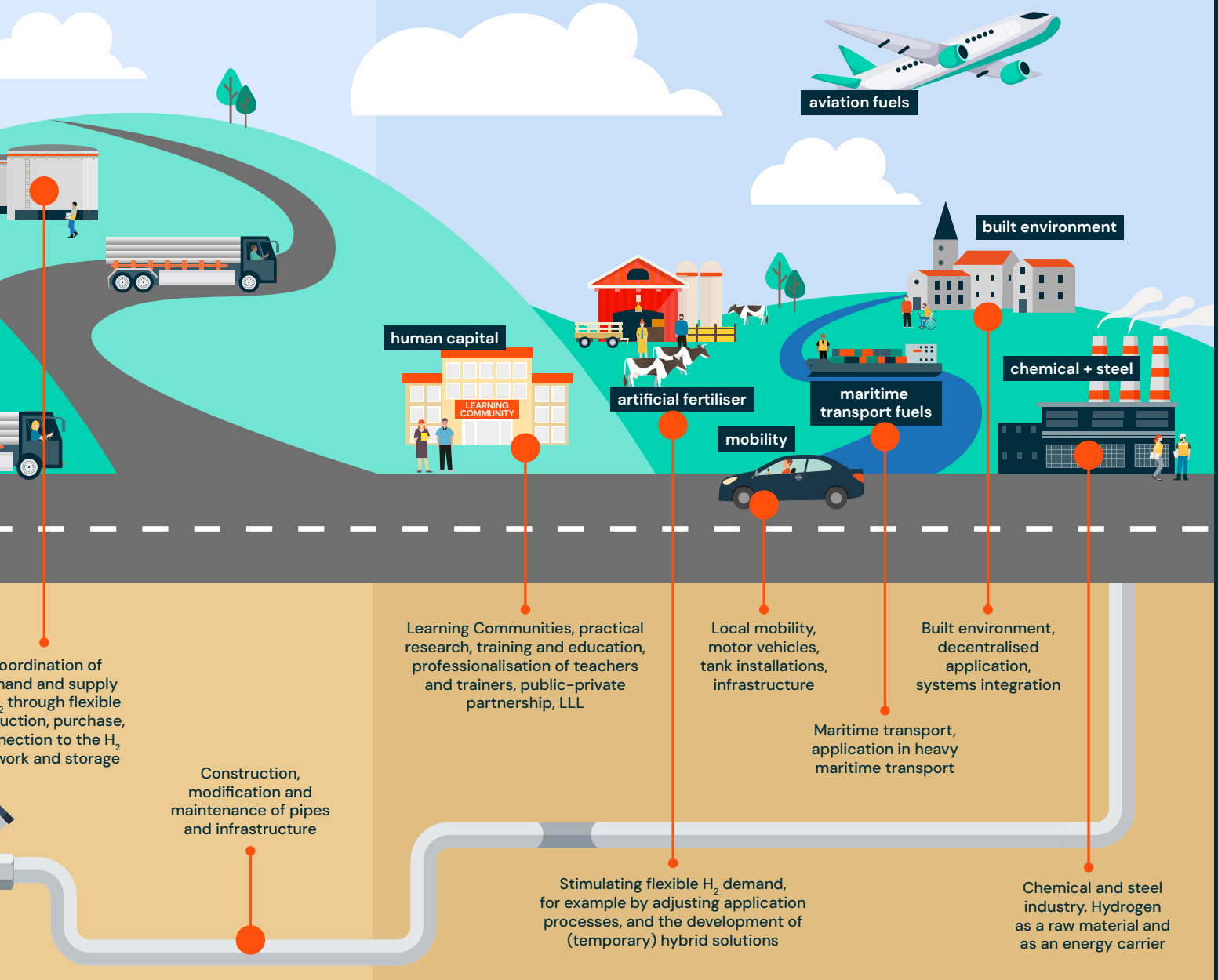
Credits

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CHAIN, SKILL VALORISATION, DUTCH HYDROGEN ACADEMY

+ Storage

Application



EDUCATION, INFLUX OF TALENTED YOUNG PEOPLE

HUMAN CAPITAL, COHESIVE HUMAN CAPITAL APPROACH, ENERGY TRANSITION