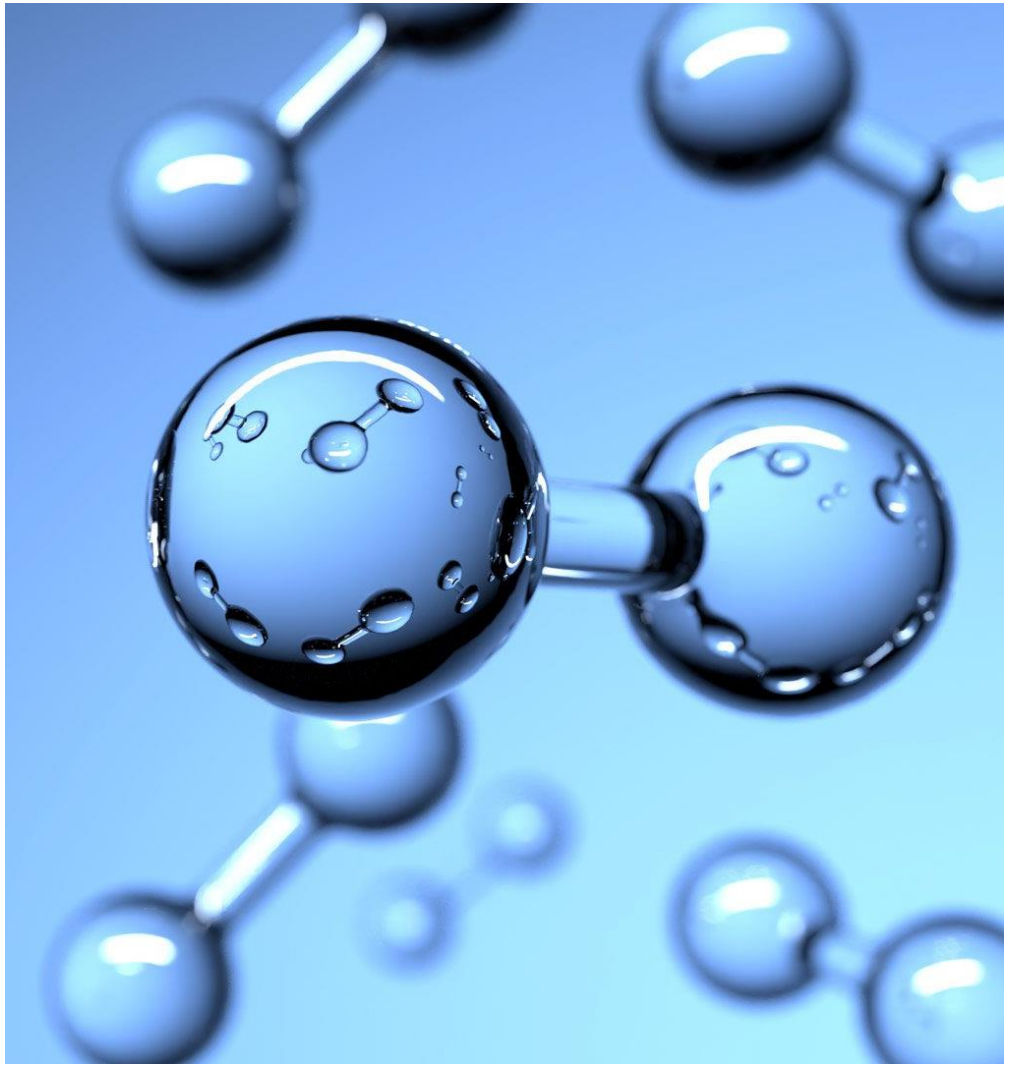
Netherlands

Strategy to transition to a low-carbon energy system: green hydrogen in the Netherlands



Paulina Chromik
Embassy of the Kingdom of the Netherlands in India

Hydrogen and the Netherlands

The Netherlands has recognised hydrogen as an essential energy carrier for fuel and feedstock, covering all sectors. Together with governments, business and knowledge institutes, we're partnering up for clean energy.

Why?

- Decarbonisation
- Energy security
- Energy hub-function
- Business opportunities

Netherlands

Drivers for hydrogen in NL

Hydrogen production and demand

Large existing H2 market is basis for further decarbonization of industrial clusters & transport

Ambition: Electrolyzer capacity 3-4GW in 2030

Large Offshore wind potential

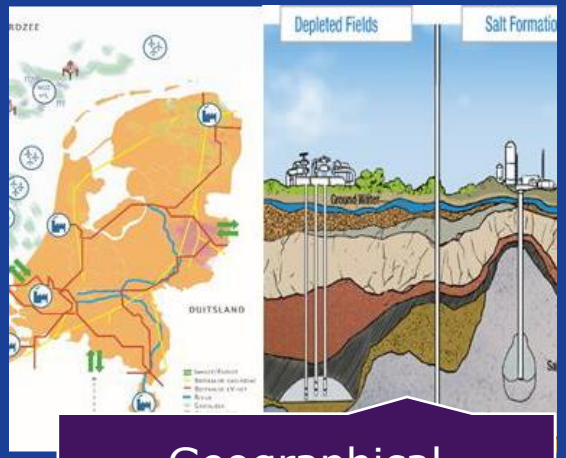
Synergies between offshore wind energy and hydrogen production

Up to 21 GW of offshore wind capacity by 2030

Existing gas & ports infrastructure

Repurposing of natural gas grid for hydrogen; already over 1000km of dedicated H2 pipeline (NL-BEL-FRA)

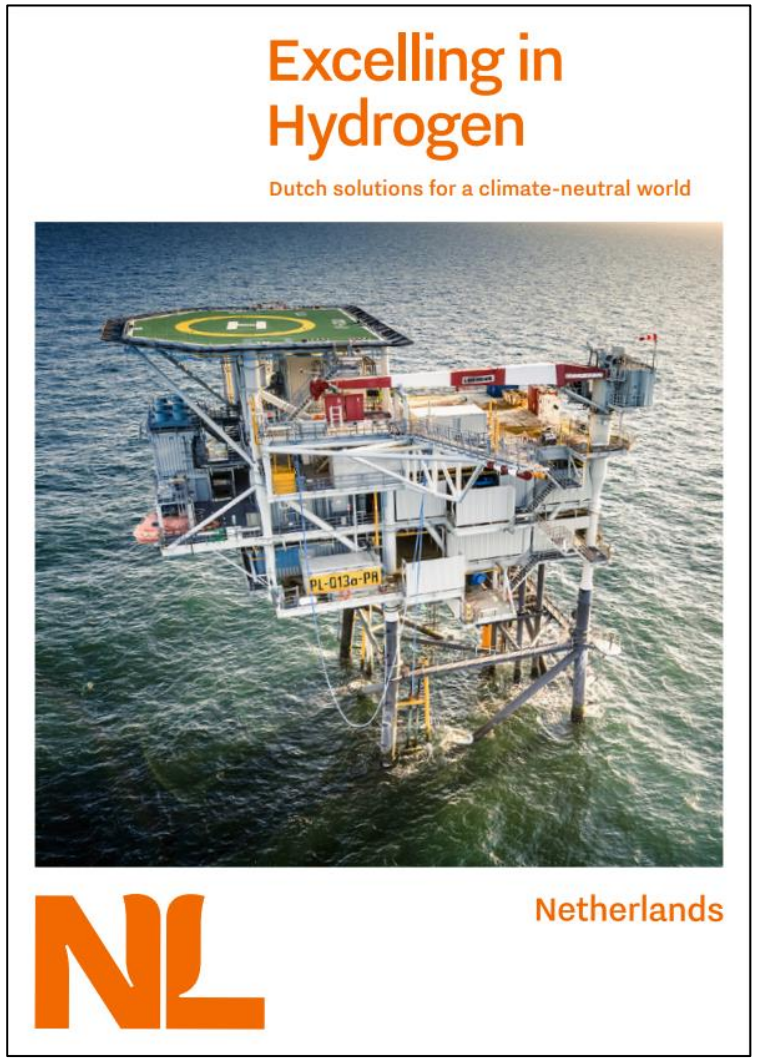
Ports as hydrogen- hubs for NW-Europe



Geographical conditions

Hydrogen for the underground storage of renewable energy in salt caverns

Overview of the H2 organisations in NL

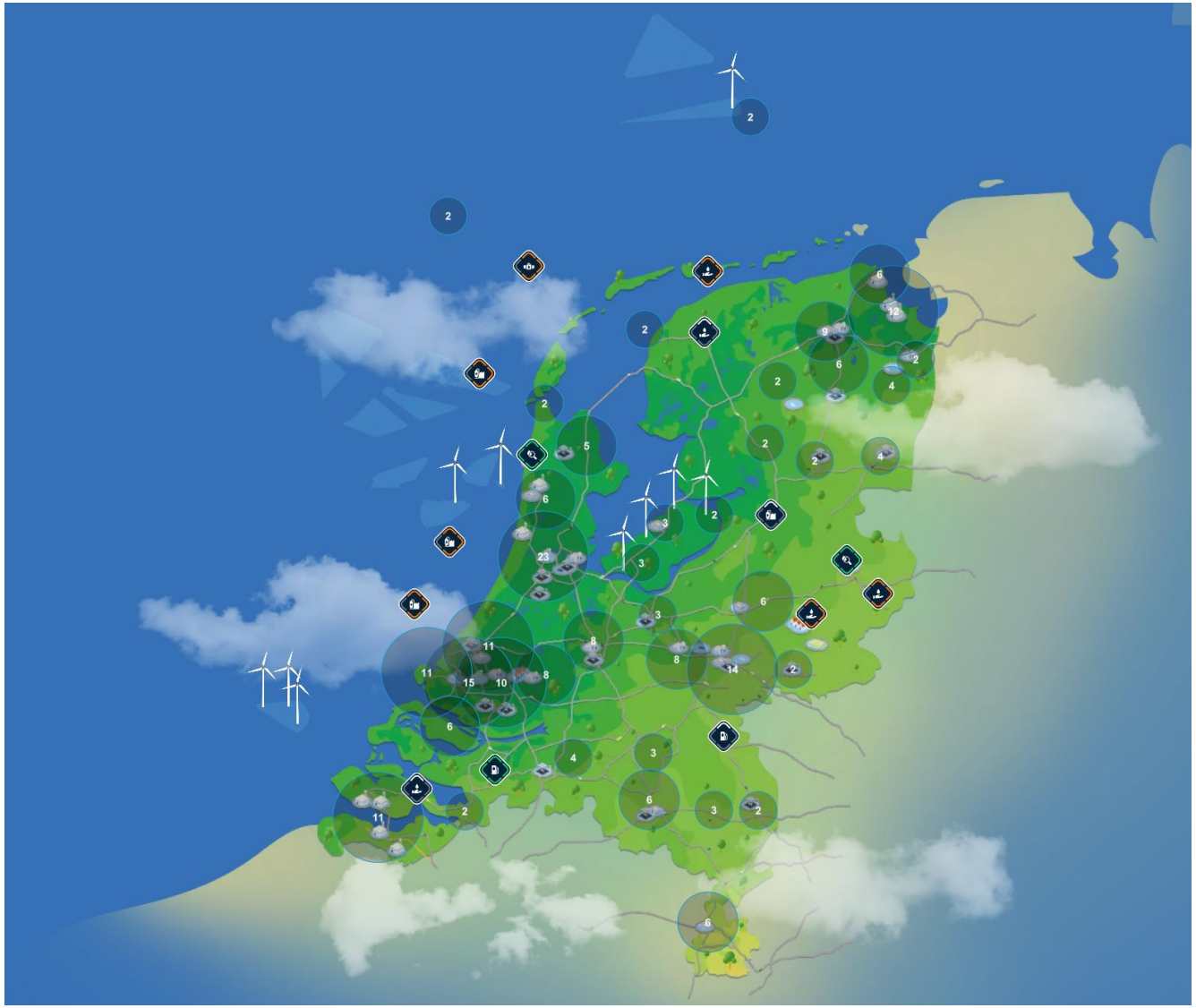


MORE THAN 150 HYDROGEN ORGANISATIONS

Overview of the H2 projects in NL

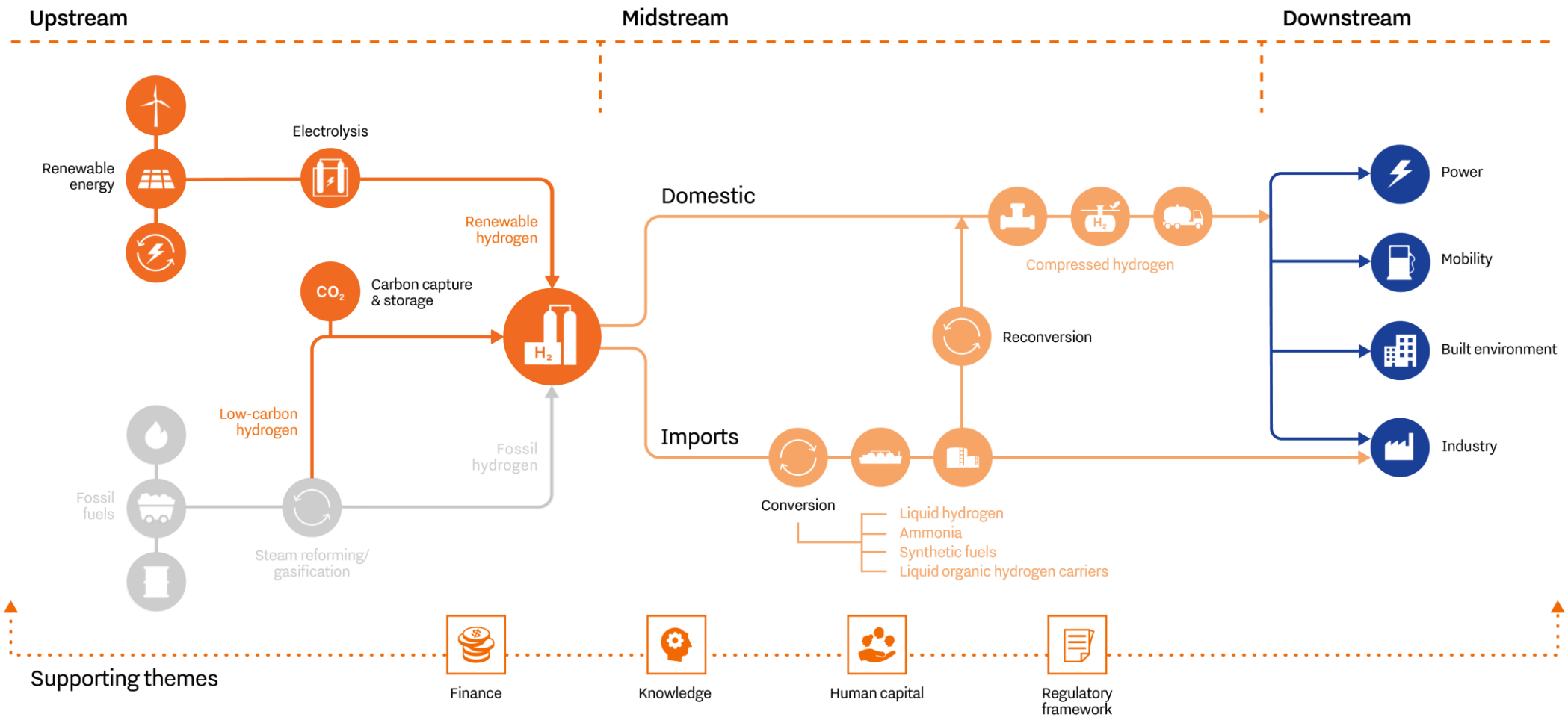
Interactive map with overview of over 200 hydrogen projects in NL and their status

[Missie H2 & TKI Waterstofkaart]



Netherlands

Hydrogen value chain



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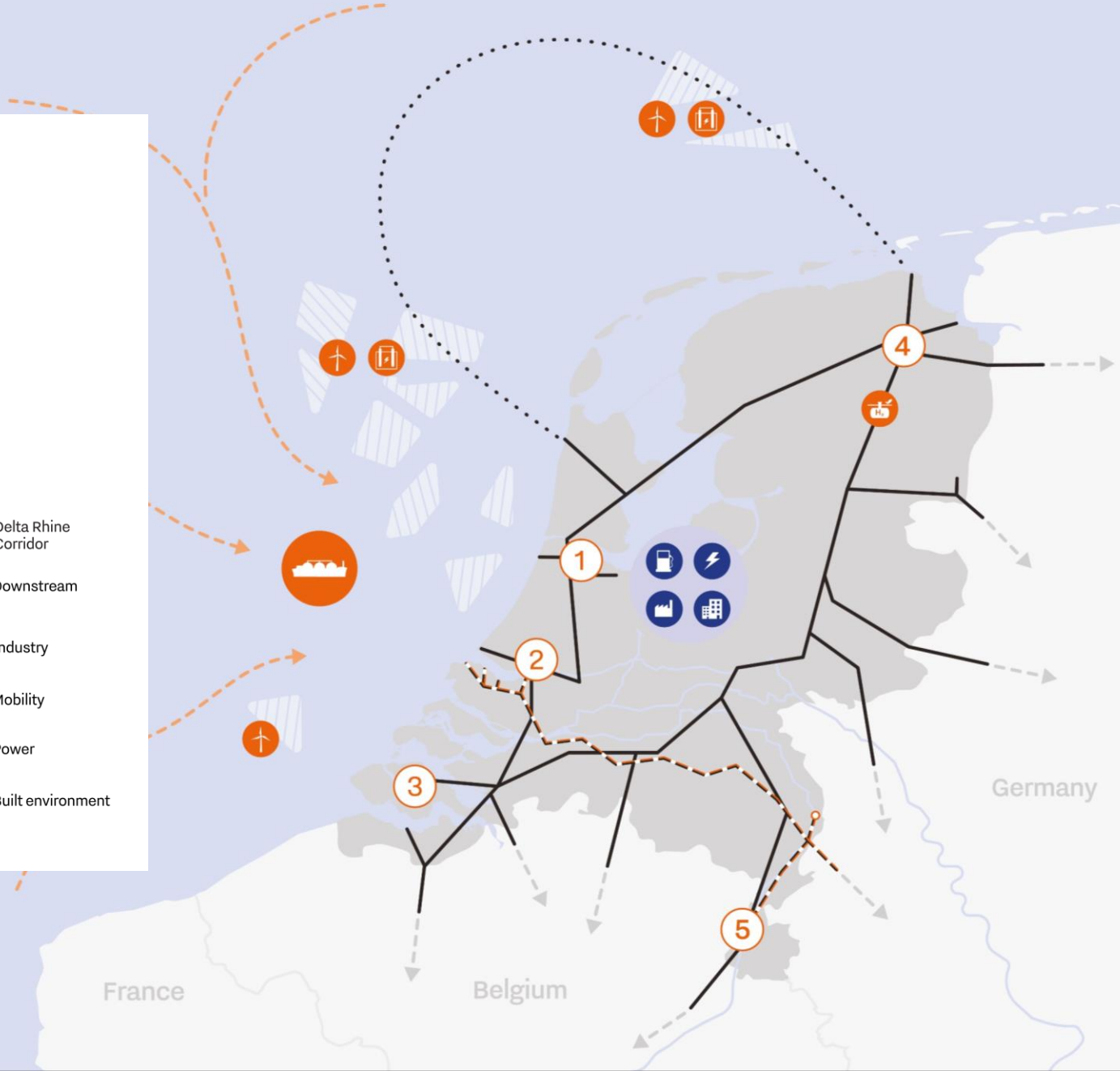
Hydrogen value chain



Netherlands

National Hydrogen Strategy 2020

30 March 2020 sent to the House of Representatives of the Dutch Parliament
https://www.government.nl/documents/publications/2020/04/06/government-strategy-on-hydrogen

Highlights

- Systemic role of clean hydrogen recognized in a zero-carbon energy supply.
- NL unique start position for clean hydrogen.
- Use strong momentum: adequate funding & regulation.
- Opportunities for companies and regions.
- International strategy: accelerate scaling-up.
- Policy agenda with 4 pillars.
- Joint public-private partnership:
  National H2 Program

www.nationaalwaterstofprogramma.nl

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Dutch Policy Agenda: 4 pillars

Legislation & Regulation

- Use of existing gas grid.
- Market regulation and tasks for network operators.
- Guarantees of Origin's & certification.
- Safety.
- Regulations for e.g. location of electrolyzer.

Cost reduction & Scaling up H_2

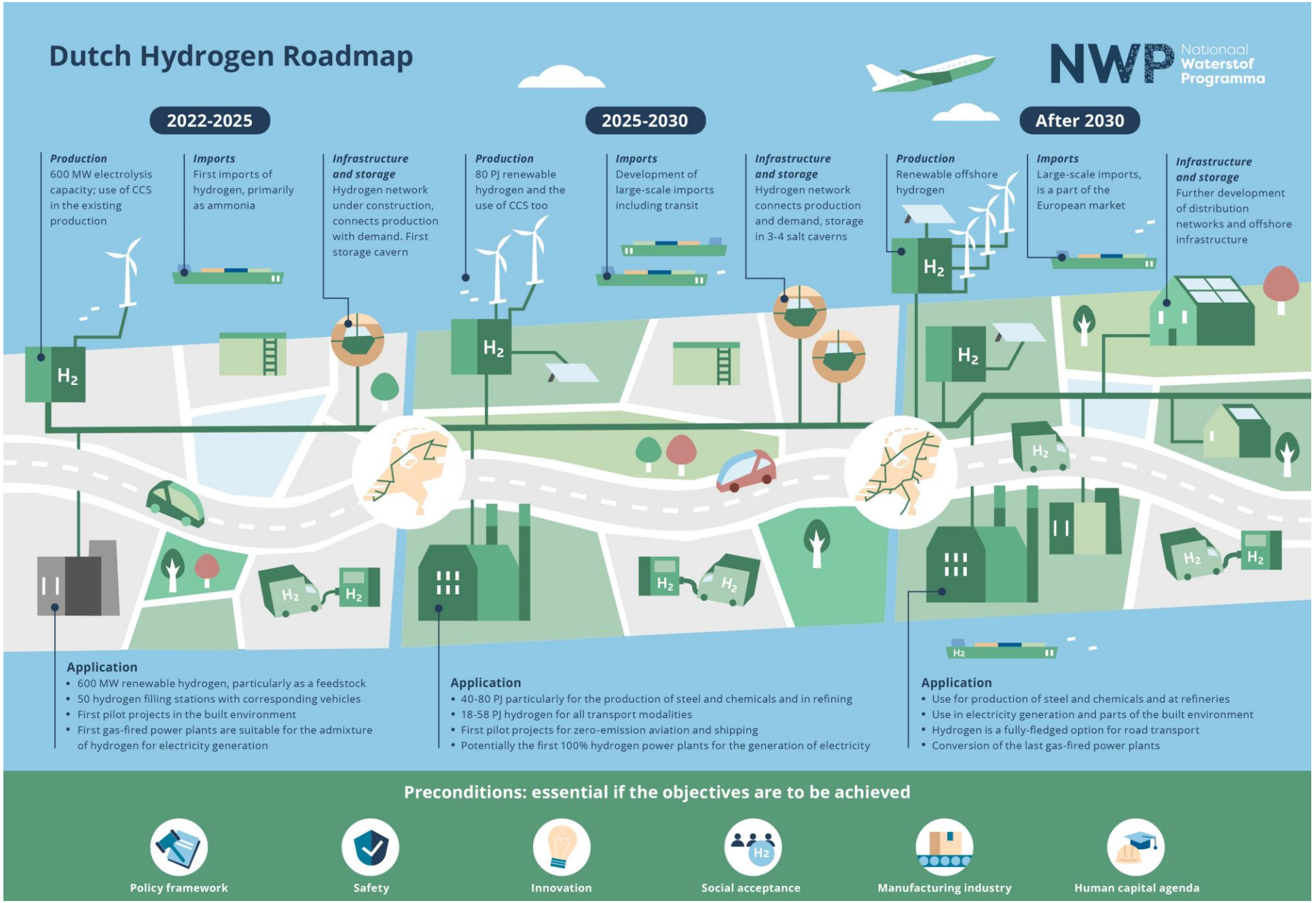
- Support for research, scaling up and rolling out.
- Linking hydrogen to offshore wind energy.
- Evaluation of blending requirements.

Sustainable end use

- Ports and industry clusters.
- Transport.
- Built environment.
- Electricity sector.
- Agricultural sector.

Supporting policy

- International Strategy (IPCEI, Penta-lateral Forum, North Sea cooperation, bilateral cooperation, EC).
- Regional policy (RES).
- Research and Innovation.


Dutch Hydrogen Roadmap
NWP Nationaal Waterstof Programma
2022-2025
2025-2030
After 2030
Production
600 MW electrolysis capacity; use of CCS in the existing production
Imports
First imports of hydrogen, primarily as ammonia
Infrastructure and storage
Hydrogen network under construction, connects production with demand. First storage cavern
Production
80 PJ renewable hydrogen and the use of CCS too
Imports
Development of large-scale imports including transit
Infrastructure and storage
Hydrogen network connects production and demand, storage in 3-4 salt caverns
Production
Renewable offshore hydrogen
Imports
Large-scale imports, is a part of the European market
Infrastructure and storage
Further development of distribution networks and offshore infrastructure
H2
Application
600 MW renewable hydrogen, particularly as a feedstock
50 hydrogen filling stations with corresponding vehicles
First pilot projects in the built environment
First gas-fired power plants are suitable for the admixture of hydrogen for electricity generation
Application
40-80 PJ particularly for the production of steel and chemicals and in refining
18-58 PJ hydrogen for all transport modalities
First pilot projects for zero-emission aviation and shipping
Potentially the first 100% hydrogen power plants for the generation of electricity
Application
Use for production of steel and chemicals and at refineries
Use in electricity generation and parts of the built environment
Hydrogen is a fully-fledged option for road transport
Conversion of the last gas-fired power plants
Preconditions: essential if the objectives are to be achieved
Policy framework
Safety
Innovation
Social acceptance
Manufacturing industry
Human capital agenda

Policy letters sent to the Parlament – June ‘23

1. **Overview of Policy Instruments to Stimulate Hydrogen**
   - **€9 billion reserved for H2** from the Climate Fund
     - In 2024 €1 billion for electrolysis and €300 million for import via H2 Global
   - Announcement of **quota obligation** in industry and mobility in line with RED (42% RFNBO in industry and 1% RFNBO in mobility in industry)
   - **Enabling environment:** preferred location assignment for large electrolysers, faster permitting, etc
   - New ambition: **8GW electrolysis in 2032.**
2. **Energy Diplomacy and Hydrogen Imports**
   - NL is preparing to import hydrogen (derivatives) on a large scale with certifications, infrastructure, safety protocols, etc.
   - Development of corridors with EU countries: Spain, Portugal and Scandinavian countries. Outside EU: Us, Canada, Middle East, Africa, South America and Australia
   - Cooperation with neighbor countries: Germany and Belgium (infrastructure interconnections, H2 Global)

Draft National Plan Energy System – July 2023

- **15-20 GW electrolysis in 2040**
- **>2035**, large scale **offshore** electrolysis
- Large potential **offshore wind** at the North Sea. **Target: 20 GW by 2030 & 70 GW by 2050**

WORLD HYDROGEN 2024

SUMMIT & EXHIBITION

13-15 MAY 2024

ROTTERDAM AHOY, NETHERLANDS

I would love to continue the conversation.

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Thank you!

follow us