

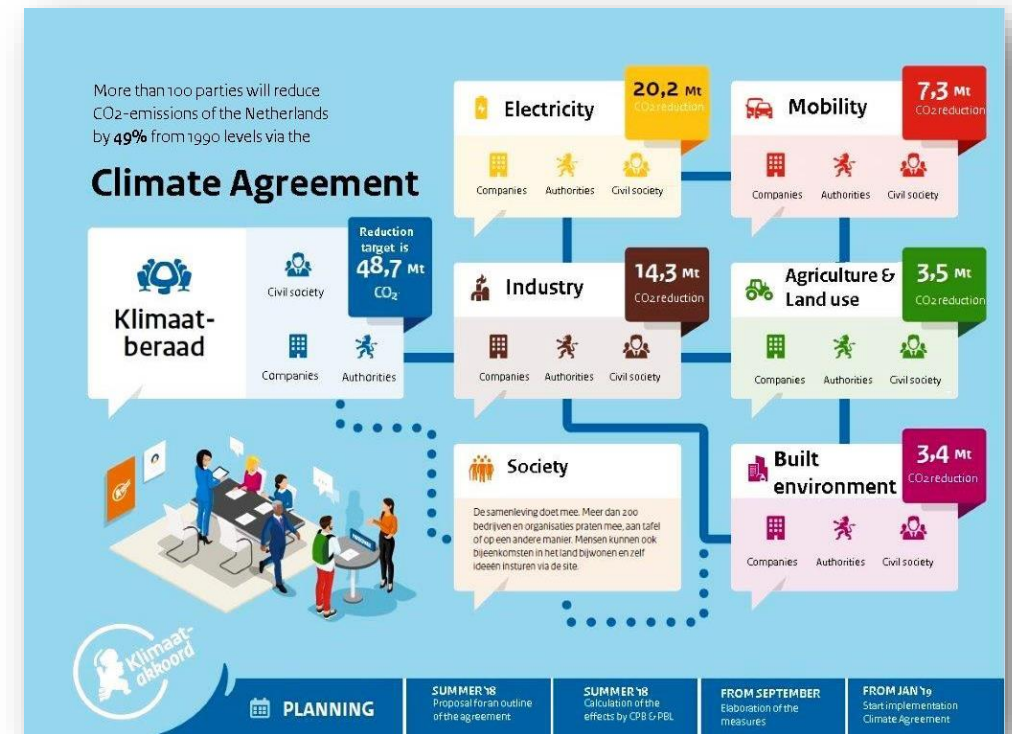


Hydrogen - A common *element* of our energy future?

- Momentum currently behind hydrogen is unprecedented, with more and more policies, projects, and plans by governments and companies in all parts of the world
- Hydrogen can help overcome many difficult energy challenges
 - ***Integrate more renewables***, including by enhancing storage options and tapping their full potential
 - ***Decarbonise hard-to-abate sectors*** - steel, chemicals, trucks, ships, and planes
 - ***Enhance energy security*** by diversifying the fuel mix and providing flexibility to balance grids
- But there are challenges: ***costs*** need to fall; ***infrastructure*** needs to be developed; ***cleaner hydrogen*** is needed; and ***regulatory barriers*** persist.

The Dutch Climate Agreement

- 49% CO₂ reduction in 2030 (48.7 Mton)
- 84 TWh of renewable electricity by 2030 (70 % of the mix)
- SDE subsidy scheme for CO₂ reduction techniques
- Phasing out coal in power plants by 2030
- CO₂ levy in industry above ETS
- All new cars in 2030 electric
- Prominent role for hydrogen:
 - **3 – 4 GW** of electrolysis capacity by 2030; **500 MW** by 2025
 - In 2025: 50 tank stations, 15.000 FCEVs en 3.000 heavy duty vehicles
 - Pilot projects to enable use of hydrogen for **urban heating** by 2030
 - Until 2030, the government will contribute €30-40 million extra **subsidy** annually for demonstration projects (DEI+)





National Hydrogen Strategy 2020

- 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 programme
- Financial support: € 70 mln subsidy (DEI+ & new upscaling instrument) + SDE++ for green and blue hydrogen production

Policy Agenda



Legislation & Regulation

- Use of existing gas grid
- Market regulation and temporary tasks for network operators
- GoOs & certification
- Safety
- Location of electrolyzers



Cost reduction & Scaling up H2

- Support schemes for research, scaling up and rolling out (temporary operating cost support)
- Linking hydrogen to offshore wind energy
- Evaluation of blending obligation



Sustainability of final consumption

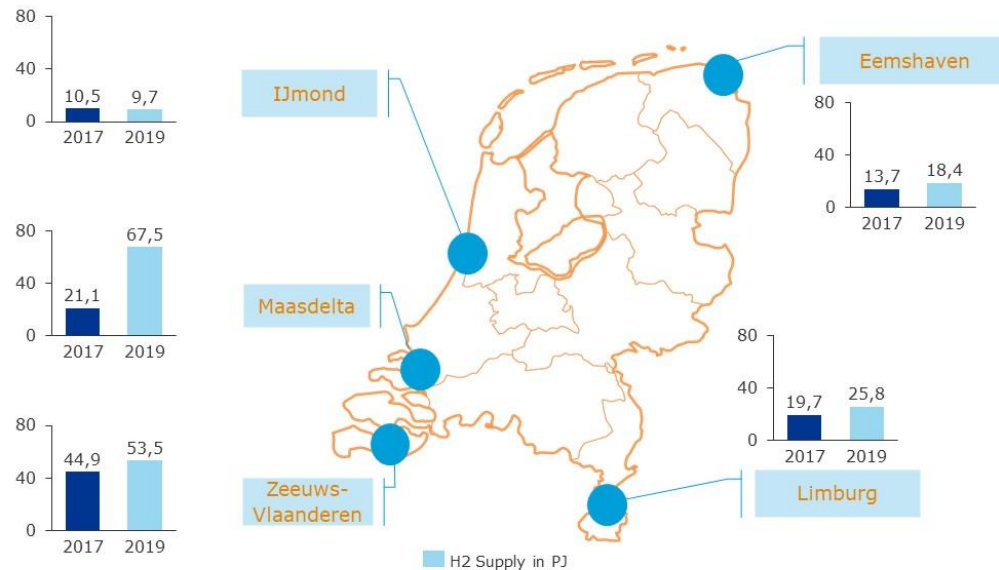
- Ports and industry clusters
- Transport (including synthetic fuels, REDII)
- Built environment (alternative to natural gas)
- Electricity sector
- Agricultural sector



Supporting and flanking policy

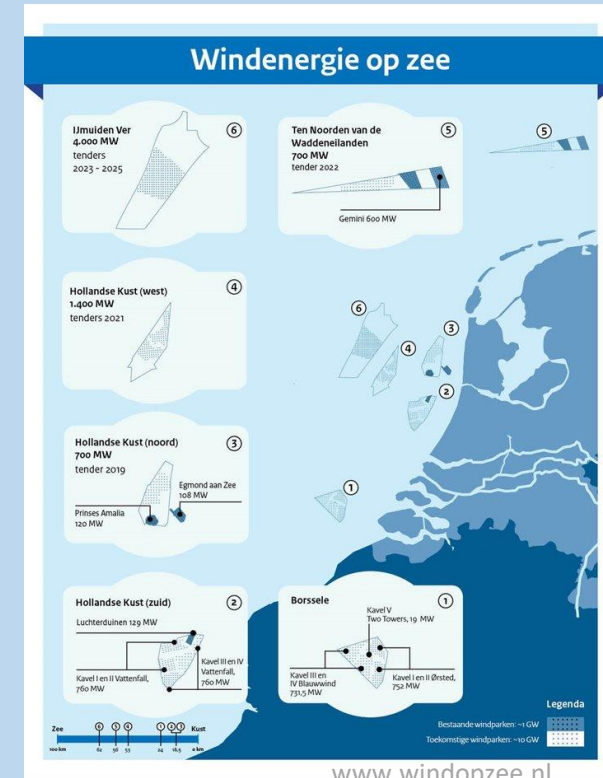
- International Strategy (IPCEI, Pentilateral Forum, North Sea cooperation, bilateral cooperation, EC)
- Regional policy (link to regional energy strategies)
- Research and Innovation

Drivers for Clean Hydrogen in The Netherlands



Source: DNVGL (2019) Filling the data gap: an update of the 2019 hydrogen supply in the Netherlands

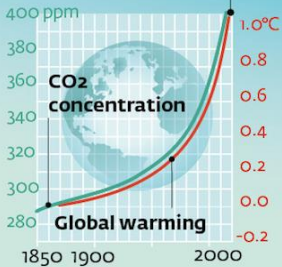
Existing hydrogen production, 175 PJ per year
(10% of national natural gas consumption used
in SMR)



Large offshore wind potential, 11.5 GW in 2030;
>> 40 GW possible

Moving towards 2030 and 2050 with hydrogen

The earth has warmed up by 1.1°C since 1850

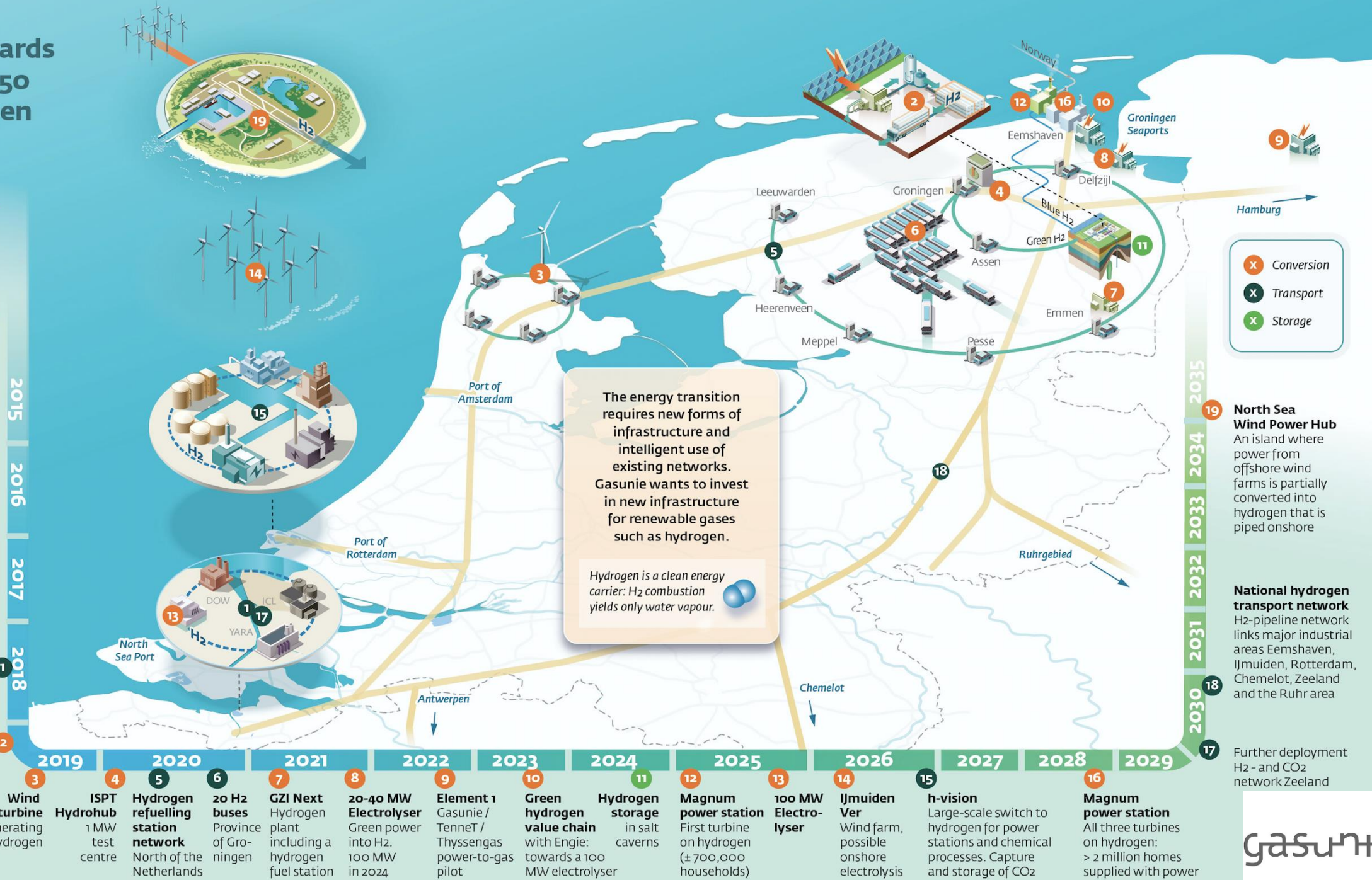


If we do nothing the global temperature will rise by another 4°C by 2100

22 April 2016 Paris Agreement
Global warming set at a max. 2°C. This requires CO2-reductions in the Netherlands of:
• 40-50% by 2030
• 85-100% by 2050
Hydrogen as a fuel and as a raw material can help to achieve CO2-reduction targets

Hydrogen pipeline
Linking hydrogen industries in Zeeland and the Delta region

Pilot project HyStock
Converting solar energy into hydrogen in Zuidwending



Project goals HY3

- Analyze the feasibility of a **transnational green hydrogen** infrastructure in the border area of the Netherlands and North Rhine-Westphalia
- Examine the **potential of GHG-reduction** and increase of the renewable energy deployment in the industry sector by a transnational green hydrogen infrastructure
- Examine **possible business cases** for future green hydrogen infrastructure by using transnational (Dutch-German) hydrogen production and existing transportation and storage facilities
- Examining **industrial interest** in green hydrogen infrastructure and potential **field of applications** as well as potential synergies with hydrogen applications in other sectors
- Describing the existing **regulatory framework** in the context of green hydrogen production, transport, storage, trading and usage and examining the framework that would be needed to establish transnational green hydrogen infrastructure as well as respective business cases

Die Landesregierung
Nordrhein-Westfalen



Bundesministerium
für Wirtschaft
und Energie



Ministerie van Economische Zaken
en Klimaat



Government of
the Netherlands

European Hydrogen Backbone

