TKI NIEUW GAS
Topsector Energie

Hydrogen Policy, Innovation and Projects in the Netherlands

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Contents

- Hydrogen Strategy of the Dutch Government
- Innovation Strategy for Hydrogen
- Examples of Hydrogen Projects

Important milestones for hydrogen in The Netherlands

- June 2019: **Climate Agreement** (-49% in 2030, carbon neutral in 2050)
- January 2020: Release of **Innovation Roadmap** for hydrogen ('Hydrogen for the Energy Transition')
- March 2020: Release of **Government Strategy** on hydrogen

And recently many important European announcements incl. hydrogen:

- European Green Deal
- Economic Recovery Plan (Next Generation EU)

Why does the NLs have so much interest in hydrogen?

- Excellent infrastructure: harbours, electricity and gas infrastructure, roads, railways, well-connected to Europe
- High demand: energy intensive industry concentrated in five main industry clusters
- Huge production potential for offshore wind on the Northsea
- Excellent knowledge infrastructure with universities, research institutes and consultants
- …

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1. Government Strategy

Government Strategy on Hydrogen (1) – Philosophy

- Need for hydrogen for full decarbonisation
- Systemic role of hydrogen
- Green and blue hydrogen in many markets/applications
- Opportunities for companies and innovation community
- Strong need for international collaboration

Government Strategy on Hydrogen (2) – Policy agenda

1. Legislation & regulation

   Infrastructure, role of network operators, certification, safety

2. Cost reduction & scaling up green hydrogen

   Support schemes, linking hydrogen and offshore wind, blending obligation

3. Sustainability of end use

   Ports and industry clusters, mobility, built environment, electricity sector, agriculture

4. Supporting and flanking policy

   International strategy, regional policy, research and innovation

➔ Hydrogen Programme (to be established)

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2. Hydrogen Innovation Roadmap

Innovation Roadmap for Hydrogen (1) – background

Outlines of a Hydrogen Roadmap: 2018

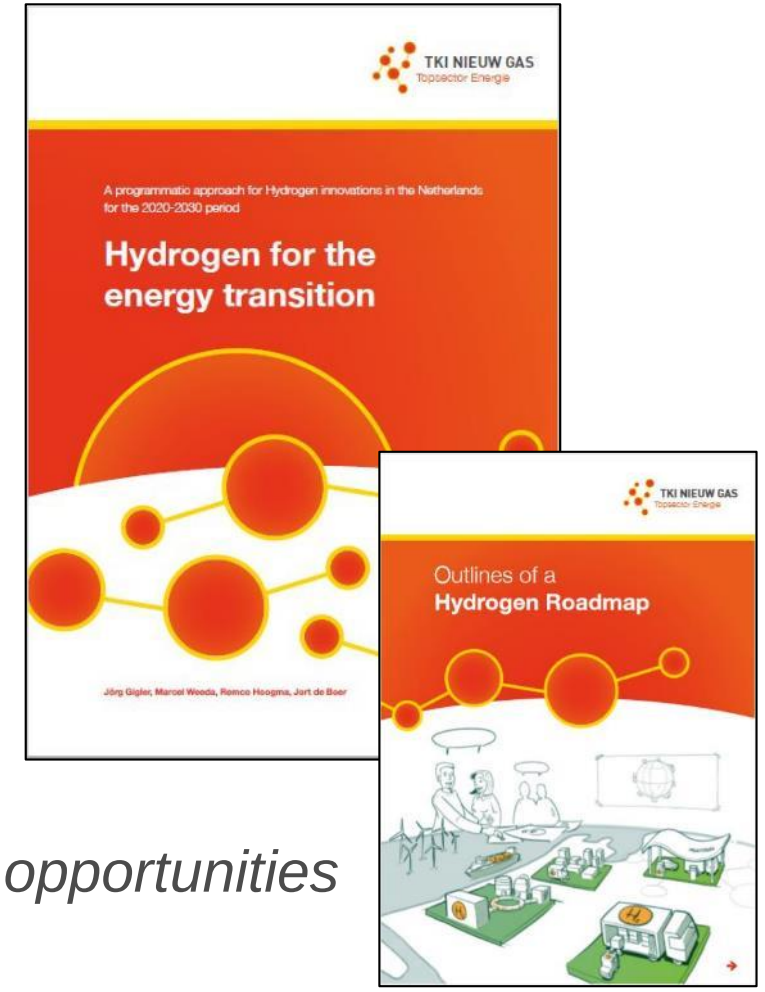
informative document on hydrogen, sketching innovation needs

Hydrogen for the Energy Transition: 2020

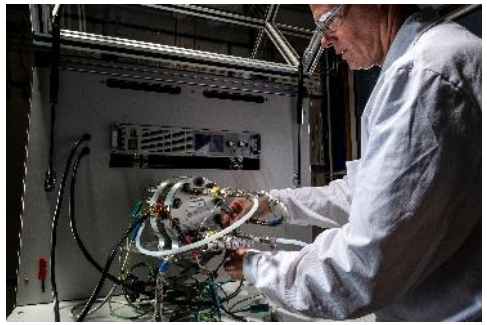
describes innovation strategy for the Netherlands

Process:

Timeline of about 1 year, many stakeholder discussions, ample opportunities to provide input



Innovation Roadmap for Hydrogen (2) – strategy



1. From vision to <u>policy making</u>

2. <u>Demonstration</u> in practical projects with real-world applications (pilots, demos, implementation)

3. Creating the required <u>conditions</u>

4. Research for the longer term <u>(R&D > 2030)</u>

5. <u>Supporting and accompanying activities</u> for implementation

Policy, legislation, infrastructure, safety, standards, quality issues

workforce, education, training, communication, acceptance

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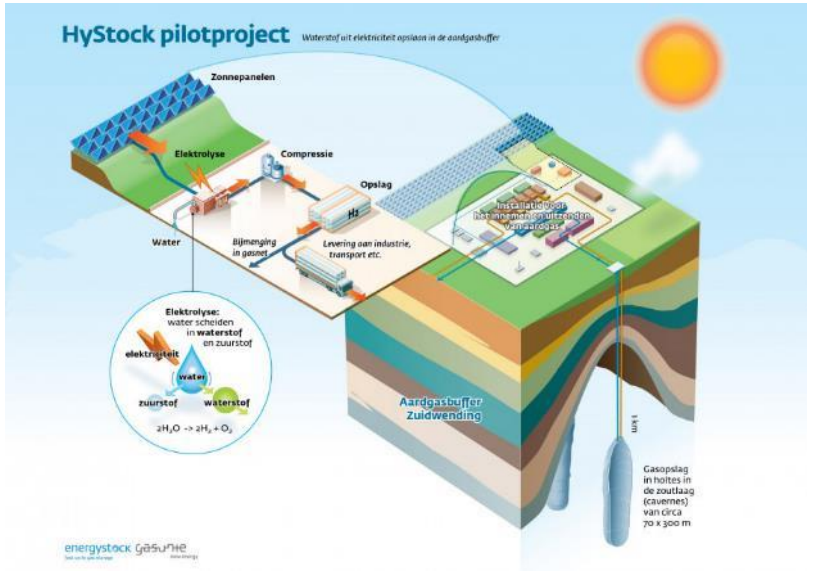
3. Hydrogen Projects



DJewels

Realisation of a 20 MW Electrolyser in Delfzijl

Operated by Nouryon and Gasunie, it will provide 3,000 tons of green hydrogen per year, reducing CO2 emissions by up to 27,000 tons per year in combined activities with BioMCN.

Category:	production of hydrogen
Capacity:	20 MW > 60 MW
Process phase:	FID in 2020
Project period:	2020 -
Project costs:	16 M subsidy
Contact:	info@hinicio.com

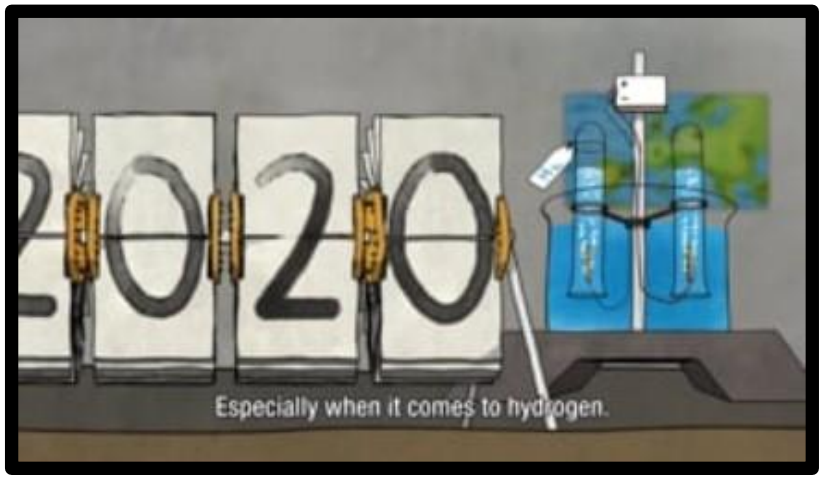
Partners:

Nouryon gasunie crossing borders in energy BioMCN McPhy Driving clean energy forward Hinicio DE NORA

HEAVENN

H_2 Energy Applications in Valley Environments for Northern NL

The projects support focus on sectoral integration: the large-scale production of green hydrogen as a raw material for industry, the storage, transport and distribution of hydrogen and its application for energy supply for both industry and the built environment and in mobility.



Category:	production H_2 in Energy Valley
Capacity:	30 subprojects
Process phase:	execution
Project period:	2020 - 2025
Project costs:	90 M
Contact:	New Energy Coalition

Partners:

HyStock

A 1 MW P2G Installation with Large-scale Energy Storage

Converting sustainable electricity into hydrogen for transport and industry at the site of EnergyStock storage facility. The EnergyStock facility is ideally situated for this project thanks to buffer capacity and connection with the main gas and electricity infrastructure.

Category:	storage, production
Capacity:	1 MW
Process phase:	commissioning
Project period:	2018 - 2020
Project costs:	EU subsidy
Contact:	info@energystock.com

Partners: energystock fast cycle gas storage, ebn, Nouryon, ECN, TNO innovation for life

In conclusion

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- Dutch Government strategy is in place, supported by Europe
- Innovation strategy is in place with full European Support
- Many projects are being executed or are ready for demonstration and implementation – from paper to projects!

We have only just started and a huge joint international effort is necessary to realise the curcial role that hydrogen can play in the energy transition

Thank you for your attention!

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Downloads:

- Government Strategy on Hydrogen

https://www.topsectorenergie.nl/sites/default/files/uploads/TKI%20Gas/nieuws/Hydrogen-Strategy-TheNetherlands.pdf

- Hydrogen for the Energy Transition – Innovation strategy (2020)

https://www.topsectorenergie.nl/sites/default/files/uploads/TKI%20Gas/publicaties/7017-TSE%20Programmatische%20Aanpak%20Waterstof_EN-web.pdf

- Overview of Projects

https://www.topsectorenergie.nl/sites/default/files/uploads/TKI%20Gas/publicaties/Overview%20Hydrogen%20projects%20in%20the%20Netherlands%20versie%2014mei2020.pdf

- Outlines of a Hydrogen Roadmap (2018)

https://www.topsectorenergie.nl/sites/default/files/uploads/TKI%20Gas/publicaties/20180514%20Roadmap%20Hydrogen%20TKI%20Nieuw%20Gas%20May%202018.pdf