Hydrogen Market in The Netherlands

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Moving towards 2030 and 2050 with hydrogen

The earth has warmed up by 1°C since 1850

Global warming

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
- 80-100% 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

Wind turbine generating hydrogen
ISPT Hydrohub MW test centre
Hydrogen refuelling station network North of the Netherlands
20 Hz buses Province of Groningen
G2I Next Hydrogen plant including a hydrogen fuel station
20-40 MW Electrolyser Green power into H2 in 2024
Element 1 Gasunie / Tennet / Thyssengas power-to-gas plant
Green hydrogen value chain with Engie towards a 100 MW electrolyser
Hydrogen storage in salt caverns
Magnum power station First turbine on hydrogen (1.700,000 households)
100 MW Electrolyser
Ijmuiden Ver Windfarm, possible onshore electrolysis
h-vision Large scale switch to hydrogen for power stations and chemical processes. Capture and storage of CO2
Magnum power station All three turbines on hydrogen, >2 million homes supplied with power

North Sea
Wind Power Hub
An island where power from offshore wind farms is partially converted into hydrogen that is piped onshore

National hydrogen transport network
H2-pipeline connects major industrial areas Eemshaven, Ijmuiden, Rotterdam, Chemelot, Zeeland and the Ruhr area

Further deployment H2 - and CO2 network Zeeland

The energy transition requires new forms of infrastructure and intelligent use of existing networks. Gasunie wants to invest in new infrastructure for renewable gases such as hydrogen.

Hydrogen is a clean energy carrier. H2 combustion yields only water vapour.
Drivers for Hydrogen (in The Netherlands)

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

Extensive on/offshore gas infrastructure, world class gas and offshore know-how
Infrastructure Initiatives

- Large-scale offshore wind integration beyond 2030
- Creating hydrogen backbone through partial conversion of existing natural gas network
- Exploring an integrated energy infrastructure including electricity, hydrogen, and methane
Industry Renewable H₂ Initiatives; Electrolysis

Ørsted Reveals Dutch Offshore Wind + Hydrogen Pitch (March 14, 2019)
As part of its proposal to the Dutch government, Ørsted has already taken the final investment decision on the project and is working to establish green hydrogen projects based on power from its Dutch offshore wind farms.
H-Vision: decarbonisation of natural gas and refinery gases for hydrogen as fuel/feedstock

Hydrogen-to-Magnum: zero-emission dispatchable power from a hydrogen fueled power plant
Industry Low-Carbon H\(_2\) Initiatives (CC(U)S) (2/2)

Carbon from waste gasification, and hydrogen for methanol

Use of steel industry off-gases to produce naphta (green chemicals)
European Hydrogen Backbone
Key Elements of EU Hydrogen Strategy

• EU Hydrogen strategy in 2020 (priority new EC)
• Ambitious targets for clean hydrogen market: blending in gas grids/industry, transport
• Common standards, guarantees of origin (CertifyHY), flexible and hybrid market regulation
• Build strong EU presence in clean hydrogen value chain
• Boost EU clean hydrogen R&D (Mission Innovation)