



HyWay27

Martin van Agteren – 3 December 2021

The research is carried out in 2020/2021 by several Dutch organisations and managed by:



Ministerie van Economische Zaken
en Klimaat



gasunie
crossing borders in energy

The key questions and conclusions of HyWay 27











Study topics and conclusions

	Key questions	Conclusions
1	Do we need a transmission network for hydrogen, and if so, when?	<ul style="list-style-type: none">• In a climate-neutral economy, a pipeline-based hydrogen transport network is needed to efficiently connect consumers to suppliers of zero-carbon hydrogen and hydrogen storage facilities.• To achieve the ambitions for 2030, in the coming years transmission capacity aimed at facilitating the first large hydrogen projects will be needed. Transmission demand will also arise as a result of the need for storage.
2	Can the existing natural gas network be used for hydrogen transmission, and if so, would that be desirable?	<ul style="list-style-type: none">• The existing natural gas network can be used to accommodate the interregional transmission flows that are expected in the long term: key pipelines can be freed up entirely and repurposed for hydrogen transmission.• Reusing existing natural gas grids is more cost-effective than laying new pipelines for hydrogen transmission. A transmission network connecting all industrial clusters to producers and storage locations requires an investment of around €1.5 billion.
3	What government intervention will be required to create a transmission network for hydrogen?	<ul style="list-style-type: none">• The refurbishment of transmission networks requires a government intervention because investments involve a high risk of slow capital recovery due to slow uptake while also being strongly linked to the development of the hydrogen supply chain as a whole.• Our advice is to decide in principle to use part of the existing natural gas networks for the transmission of hydrogen. To achieve the 2030 ambitions, it is necessary to initiate decision-making now.

Hydrogen transport is safe, some measures are needed

Summary of measures needed to ensure safe hydrogen transmission

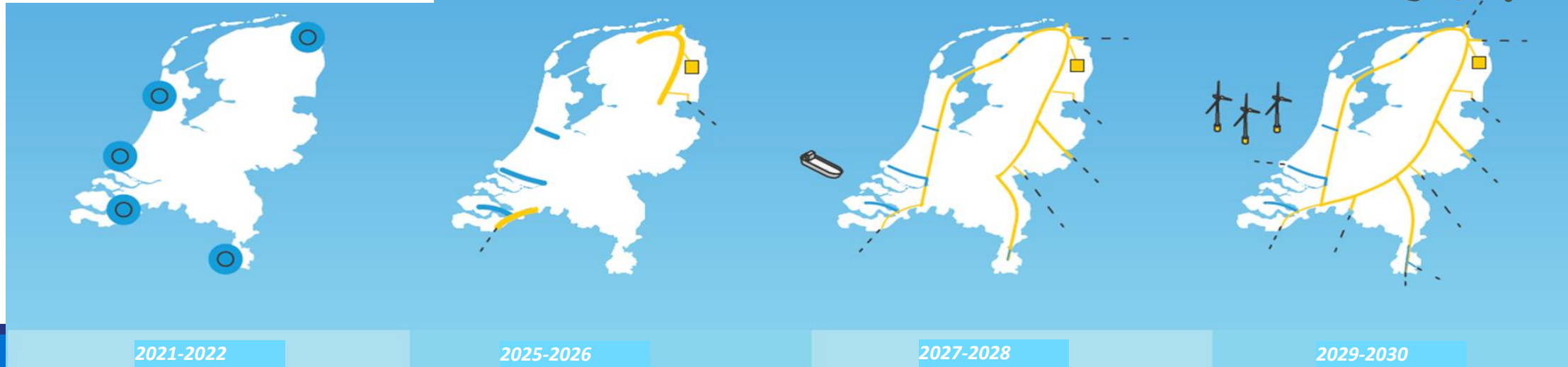
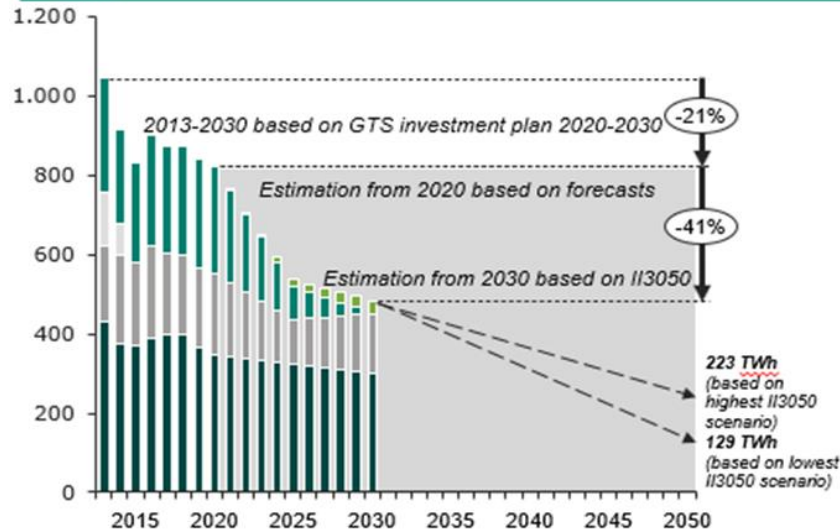
Source: Gasunie, Bilfinger Tebodin, AVIV, DNV GL¹

Focus point	Measure	Type
1. Leak susceptibility	1A Replacing and/or reconditioning valves on account of possible leakage	
	1B Replacing other leak-prone parts (except for valves)	
2. Contaminations	2A Cleaning existing pipelines	
3. Lower (energy) density	3A Configuring or replacing metering equipment to bring it into line with flow speed and gas composition	
	3B Adding compressors (in the long term) on account of the incompatibility of existing compressors	
4. Defect growth	4A Mapping maximum operating pressures, changing operational procedures, and creating pipeline files	
	4B Developing and changing procedures for inline inspections	
5. Ignition risk	5A Training technicians to handle hydrogen	
	5B Changing pipeline modification procedures	
	5C Procuring safe electronic metering equipment for management and maintenance	



The development of the hydrogen backbone by using existing pipelines

Forecast of falling transmission volumes in the natural gas grid
 (in TWh, 2013-2050). Source: Gasunie, I13050



2021-2022

2025-2026

2027-2028

2029-2030

The Hyway27 report is available (also ENG/GER) and can be obtained at:
<https://www.hyway27.nl/actueel/hyway-27-realisatie-van-het-landelijk-waterstofnetwerk>



Contact

Martin van Agteren
Asset manager H2 Backbone
M.H.van.Agteren@Gasunie.nl

or Eddie Lycklama à Nijeholt
Project director H2 Backbone
E.Lycklama@Gasunie.nl