

Clean Hydrogen
Partnership



Co-funded by
the European Union

This project has received funding from the Fuel Cells and Hydrogen 2 Joint Undertaking (now Clean Hydrogen Partnership) under Grant Agreement No 875090. This Joint Undertaking receives support from the European Union's Horizon 2020 research and innovation programme, Hydrogen Europe and Hydrogen Europe Research.

THE ENGINE OF THE HOME OF THE FUTURE



EHRIN, February 28 and 29, Hannover Germany

Kees Boer

Municipality of Hoogeveen

EHRIN

Interreg
North Sea



Co-funded by
the European Union

WATER
STOF
WIJK



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HEAVENN

Het demonstratie-project is mede mogelijk gemaakt door ondersteuning vanuit de Rijksdienst voor Ondernemend Nederland (RVO), Project nr. TWA2018013 project 'WATERSTOFWIJK HOOGEVEEN', onderdeel Regeling nationale EZ-subsidies: §4.2.8 Pilots Waterstof.



Rijksdienst voor Ondernemend Nederland

PAW Programma Aardgasvrije Wijken

MEER KLIMAAT

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Proeftuin Erflanden

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European Regional Development Fund



EUROPEAN UNION



Regio Deal

Zuid- en Oost-Drenthe

provincie Drenthe



GREEN HYDROGEN, THE ENGINE OF THE HOME OF THE FUTURE

Hoogeveen wants to show that green hydrogen can make an important contribution to make a part of the Dutch housing stock natural gas-free, with:

- reuse of the existing natural gas network
- a new hydrogen central heating boiler.

With this pilot we contribute to the knowledge in the Netherlands for the possible upscaling of hydrogen in the built environment after 2030.

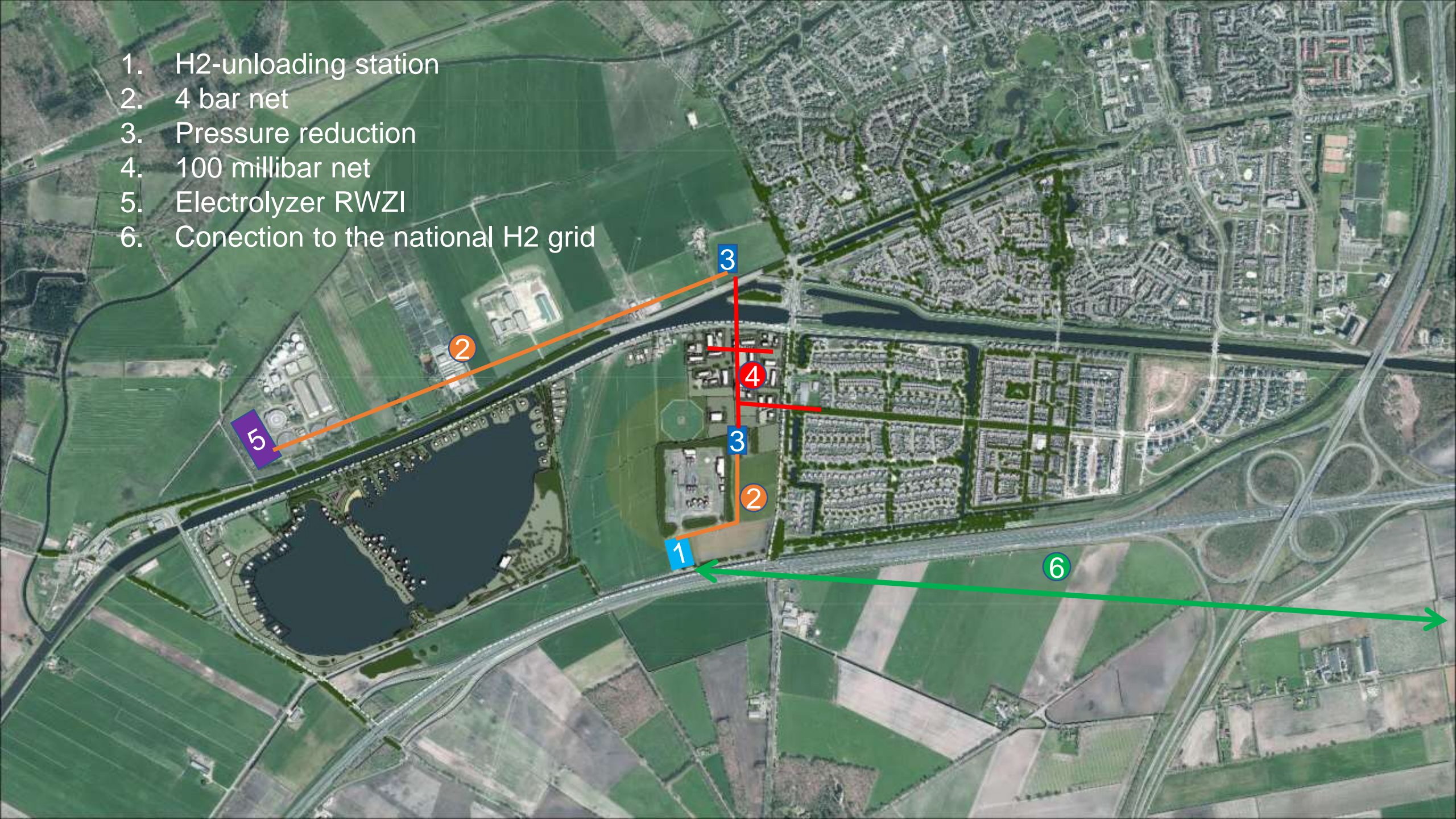
CONSORTIUM WATERSTOFWIJK HOOGEVEEN



Hydrogen District Hoogeveen

1. Realizing the hydrogen network
2. Connecting 100 new-build homes in Nijstad-Oost
3. Conversion of 427 homes in the existing Erflanden district from natural gas to hydrogen, by reusing the existing natural gas network and replace the natural gas boilers with hydrogen boilers.

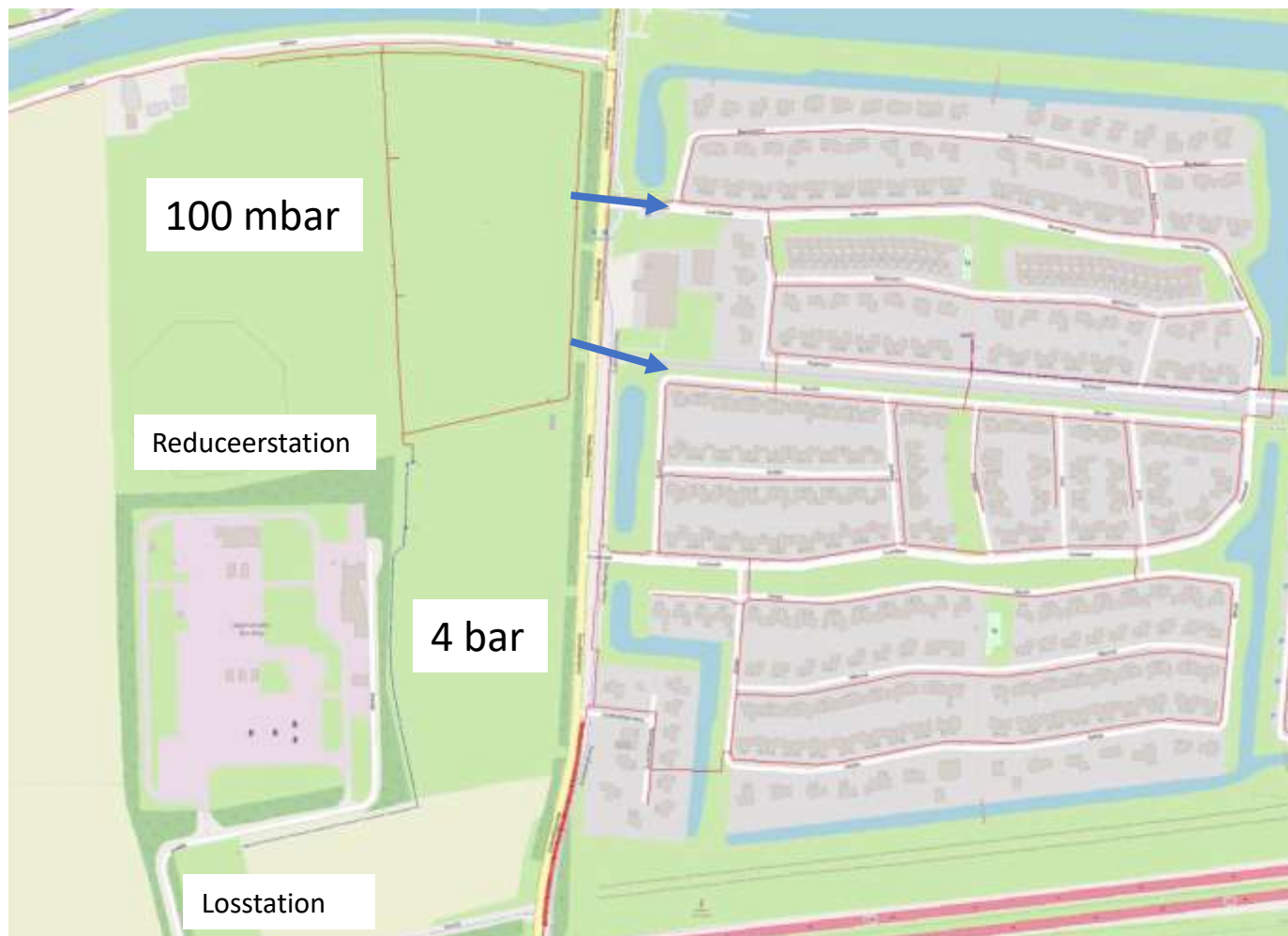
1. H2-unloading station
2. 4 bar net
3. Pressure reduction
4. 100 millibar net
5. Electrolyzer RWZI
6. Connection to the national H2 grid



System and conversion phasing

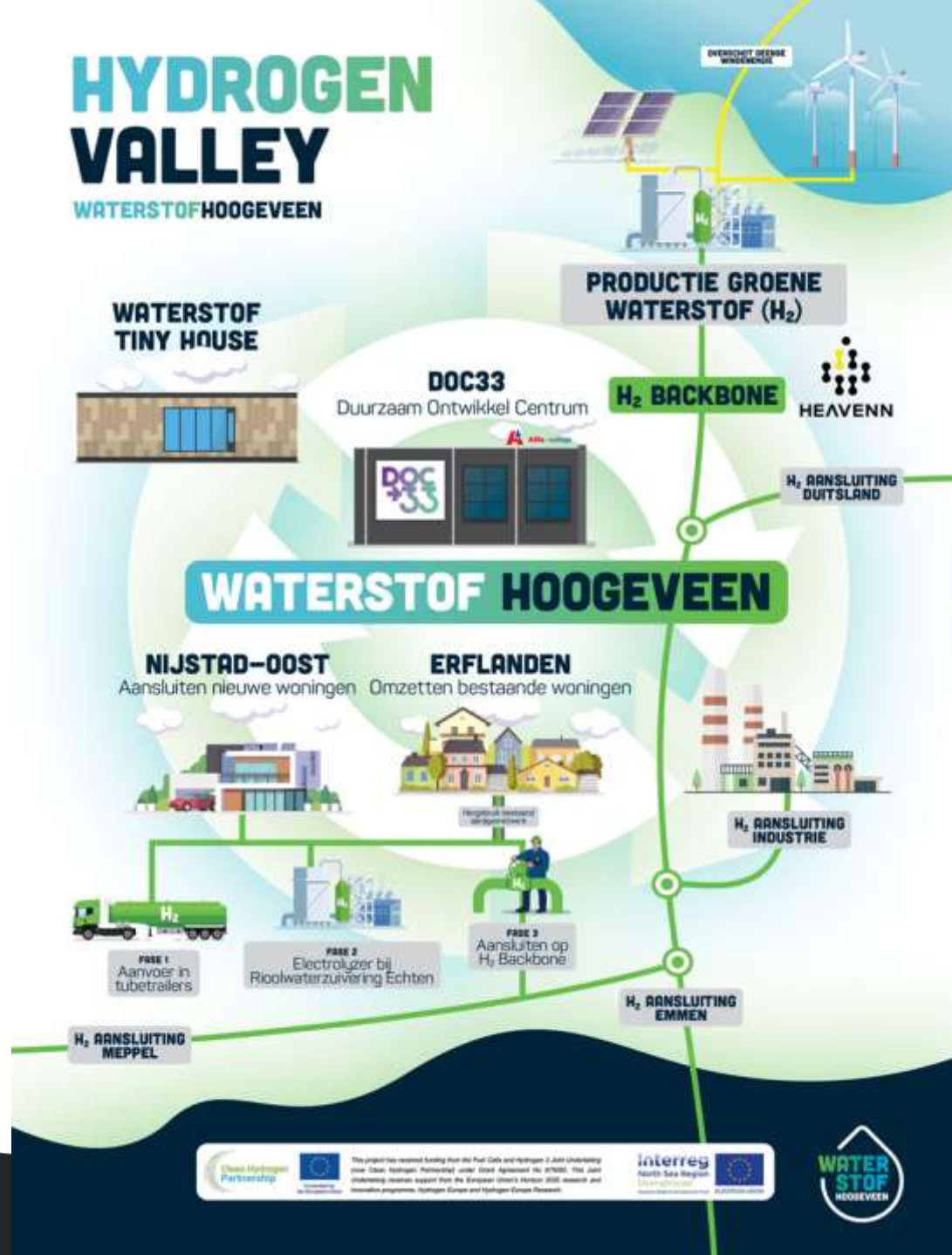


Waterstofnet



HYDROGEN VALLEY

WATERSTOFHOOGVEEN



WATERSTOF HOOGVEEN

NIJSTAD-OOST
Aansluiten nieuwe woningen

ERFLANDEN
Omzetten bestaande woningen

H₂ AANSLUITING INDUSTRIE

H₂ AANSLUITING MEPPEL

H₂ AANSLUITING EMMEN

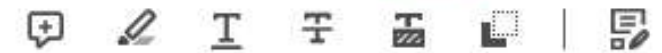
Expected activities in the home

- replace boiler
- replace gas meter
- pressure testing
- H2 sensors



LET OP!

DEZE WONING WORDT
VERWARMD MET WATERSTOF.



Ruikt u gas, gaat een waterstofsensoren af
of heeft u geen gas, bel RENDO:

0800-9009

Vertel erbij dat u in een
waterstofwoning woont

OVERIGE STORINGEN

aan de waterstof installatie
of CV-ketel, bel Van Dorp:

0528-279158

Vertel erbij dat u in een
waterstofwoning woont



De waterstof cv-ketel

- 24/28kW CW4 100% waterstof cv-ketel (veldtest toestel)
- Vergevoerd stadium van ontwikkeling
- Geassembleerd op nieuw ontwikkelde productielijn met end of line test

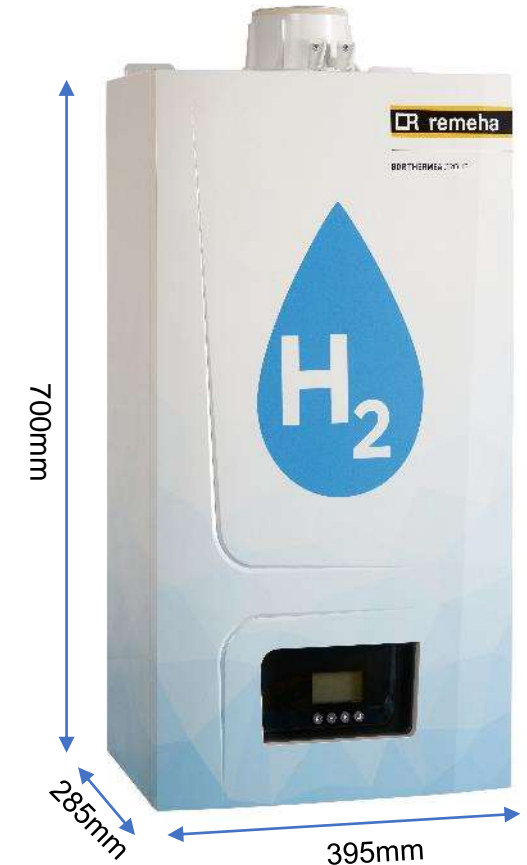
Gelijkenissen aardgasketel

- Afmetingen
- Gasvoordruk (20-30mbar)
- Comfortsoftware
- Prestaties en rendement
- Bruikleenovereenkomst
- Twee jaar na plaatsingsdatum

Afwijkingen aardgasketel

- Ketel verzegeld
- Vlamterugslagbeveiliging ingebouwd
- H₂-lekdetectiesensor
- Extra veiligheidssoftware
- Geen CO₂ uitstoot

CR remeha



Waterstof in combinatie met warmtepomp



Hybride
warmtepomp



Tot 70% gas reductie



Positioning



A solution that is safe, comfortable and affordable;

A solution that must be taken into account;

A solution that keeps options open;

A solution that creates space for gradualness;

A solution with opportunities after 2030?

Public support



Residents Council Hydrogen Erflanden

- Independent residents council
- Independent project leader employed by the residents



Involving the residents

- Working groups with professionals and residents
- Collecting feedback: what is important for the resident?
- Translating feedback to the project and thus safeguarding the interests.





IN HET WATERSTOF TINY HOUSE

remeha

remeha

Regio Deal
Zuid- en Gest-Drenthe
IN BRICCO WAAR HET HOOG
WISSEN WERKEN EN LEVEN

ITC

EN IS BRICCO WISSELIJK GEMAKT DOOR

AIA, AGC, DASSI, etc.

WATERSTOF TINY HOUSE
IN BRICCO WISSELIJK GEMAKT DOOR

AIA, AGC, etc.



Hydrogen testnetwork EnTranCe, Hanze University Groningen

RENDO, Cogas
en BAM Energie
& Water

Test network H2: a learning and safe environment for practical experience with hydrogen in the built environment in the field of safety, management and maintenance.



Implementation



Partners



Hydrogen network including the H2 meter



Hydrogen discharge station



Hydrogen receiving station



Energy supplier



Hydrogen boilers









Progress

- 12 homes on Brasem and Noorddreef are in the picture for conversion to hydrogen
- Conversion to hydrogen from April 2024.
- Kitchen table conversations:
- Electrical conversion including transition to induction cooking (customization possible).
- Advice and offer Hybrid heat pump (from Dorp and Remeha)
- Conversion to electric cooking has been carried out.
- Help with a defective current natural gas boiler to bridge the period until April.
- Development of hydrogen training at DOC33, training starts in March

Challenges: time

- Absence of regulation requires tailor-made solutions together with the central government, which takes time → Green deal with the national government to solve all the obstacles we encounter in the realization of the hydrogen pilots.
- “Temporary exception order” from the Netherlands Authority for Consumers and Markets (ACM): Affordable, reliable and safe hydrogen energy system to protect the residents.
- Local production of hydrogen and eventually the connection to the national grid is necessary for scaling up to 200 homes and more

Temporary exception order ACM

The regional gas grid operator is responsible:

- Safety and Transport of Hydrogen
- Affordability
- Contract, duration and end of the pilot
- Guarantee of supply
- Supplier of last resort
- Fall Back Protocol
- Liability for conversion and maintenance
- Information obligation from the Civil Code
- Obligations as in the Gas Act
- Pilot Agreement

Challenges: finance

Basic project principles residents

- Price guarantee for a period of 15 years.
- “Not More Than Usual” principle (government policy)
- The use of hydrogen may not cost more on average than a comparable situation with a natural gas boiler. Or “all electric” for new houses.

Challenges: finance

Due to the energy crises, the cost of hydrogen has risen sharply

Ensuring that the project can continue by:

- request for additional funding for phase 1 (100 new and 6 existing homes): €4,3 mln granted for 15 years (Ministry of Economic Affairs)
- Making the project smaller for the existing neighborhood from 427 homes to 100 for the time being, so that the project can be carried out within the existing subsidy

Challenges: public support

- The conversion to H2 of the existing homes is depending on the voluntary participation of the residents.
- That is why a phased approach has been chosen.
- The success of the first phase is the basis for the next.
- No guarantee for realization of the entire project.

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**WATER
STOF
WJK**