

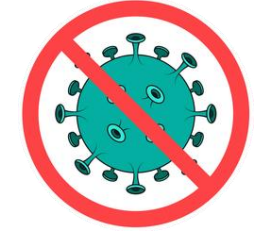
**WIC MEETING MARCH 3, 2021**

---

**Welcome to the WIC meeting!**



## Welcome to our digital WIC meeting!



A few game rules:

✓ Mute yourself but you can use camera



✓ Ask your questions in the chat



✓ You can use mic/cam in the question round



# AGENDA

---

## New members

10 – 10.30 AM : Presentation Sirris, HIMA, G&V and Everfuel

## Hydrogen in buildings

10.30 – 10.50 AM : Results project Hoogeveen (Jan-Jaap Aué, Hanze Groningen)

10.50 – 11.10 AM : Presentation BatHyBuild project (Jan Rongé, KU Leuven)

## Hydrogen in heavy duty

11.10 – 11.30 AM : Presentation development and production of heavy duty FC vehicles by Hyzon Motors Europe (Stefan van der Spek)

## General info

11.30 – 11.50 AM : News from the cluster

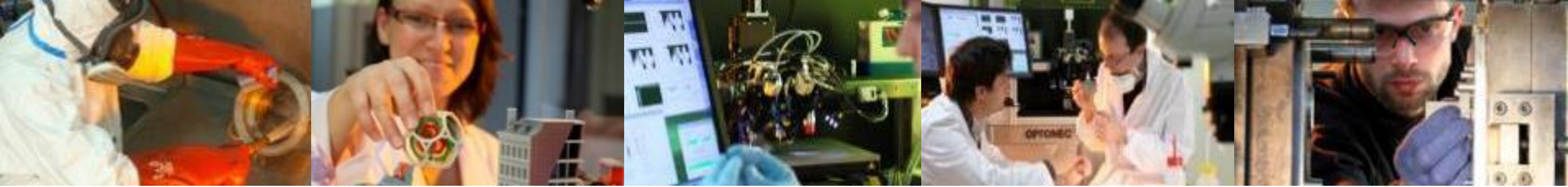
11.50 – 12 noon : Questions – news from cluster members

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# PRESENTATION NEW CLUSTER MEMBERS

---





# “Together, we innovate”

Sirris | Het collectief centrum van de Belgische technologische industrie

# Het collectief centrum van de Belgische technologische industrie

VERENIGING  
ZONDER  
WINSTOOGMERK

70 JAAR  
PRAKTISCHE  
ERVARING

CERTIFICATION  
ISO 9001  
BQA  
BQA\_QMS019\_C\_2017325

ISO GECERTIFIEERD

DE IP BLIJFT IN  
HET BEDRIJF

★ ★ ★  
1500  
TEVREDEN KLANTEN,  
ELK JAAR OPNIEUW

©sirris

# Wat doen we?

We helpen bedrijven om de juiste technologische keuzes te maken

en om hun innovatie projecten succesvol te realiseren.



# FACTS & FIGURES 2019

**1.396** INNOVATIE-PROJECTEN

VOOR



**1.322**

BEDRIJVEN



**75%**

KMO'S

**123**



COLLECTIEVE  
R&D-PROJECTEN



EURO  
INVESTERINGEN

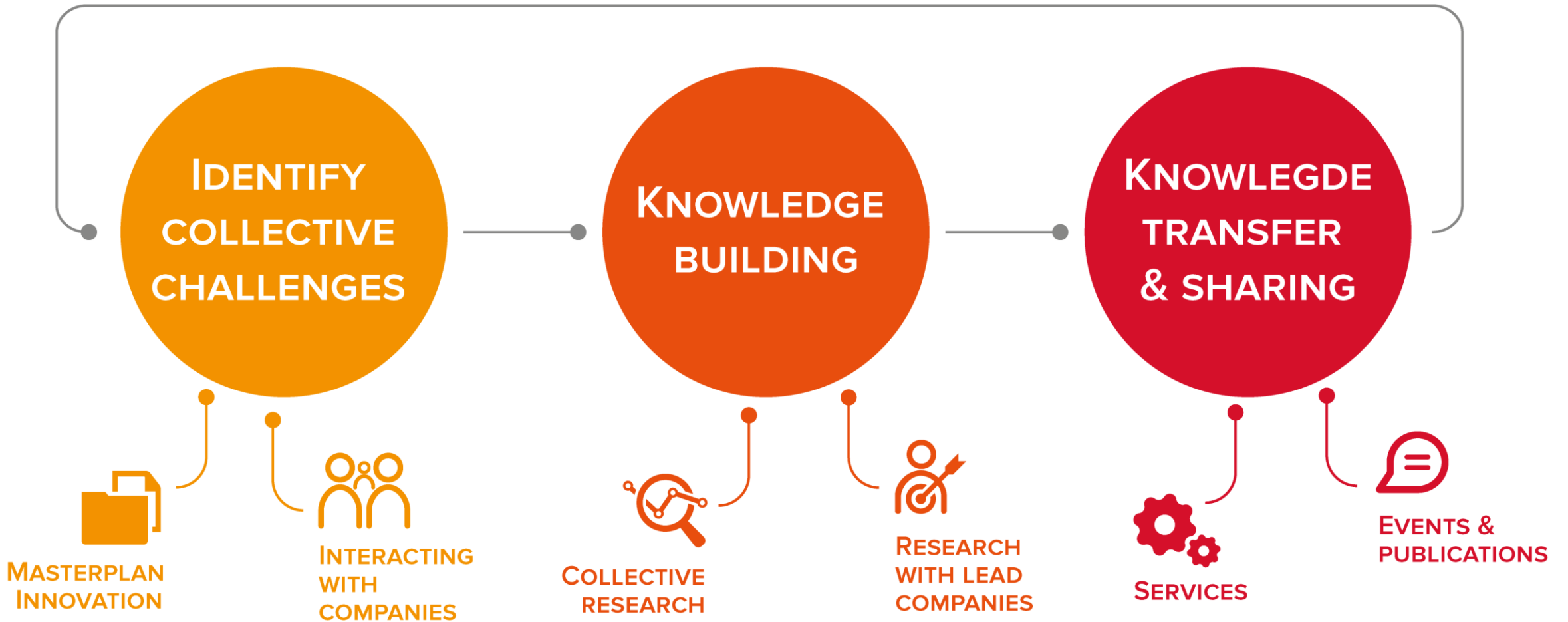
**1.294.000**



©sirris



# De Sirris waardeketen





**COMBINING THE POTENTIAL OF TECHNOLOGY WITH BUSINESS MODEL INNOVATION TO MAKE YOUR BUSINESS FUTUREPROOF**

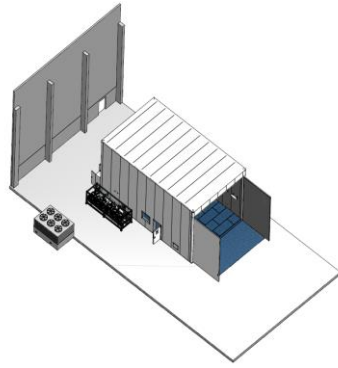
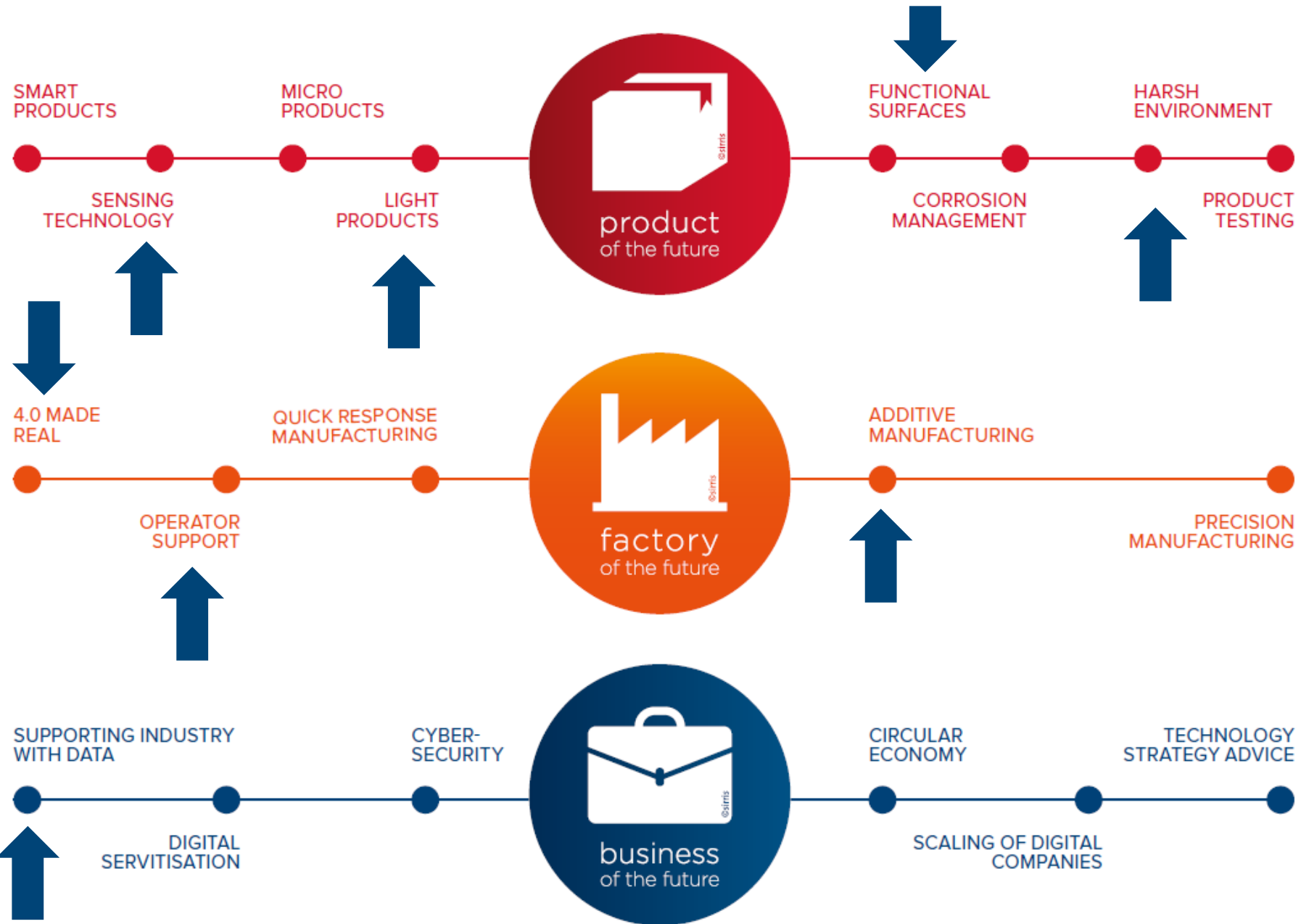
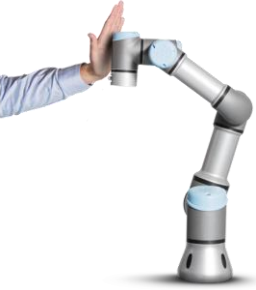
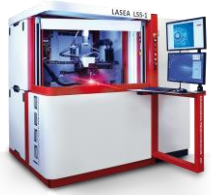


**HOW TO MAKE YOUR PRODUCT FUTUREPROOF? MAKE IT MICRO, LIGHT, SMART & CONNECTED!**

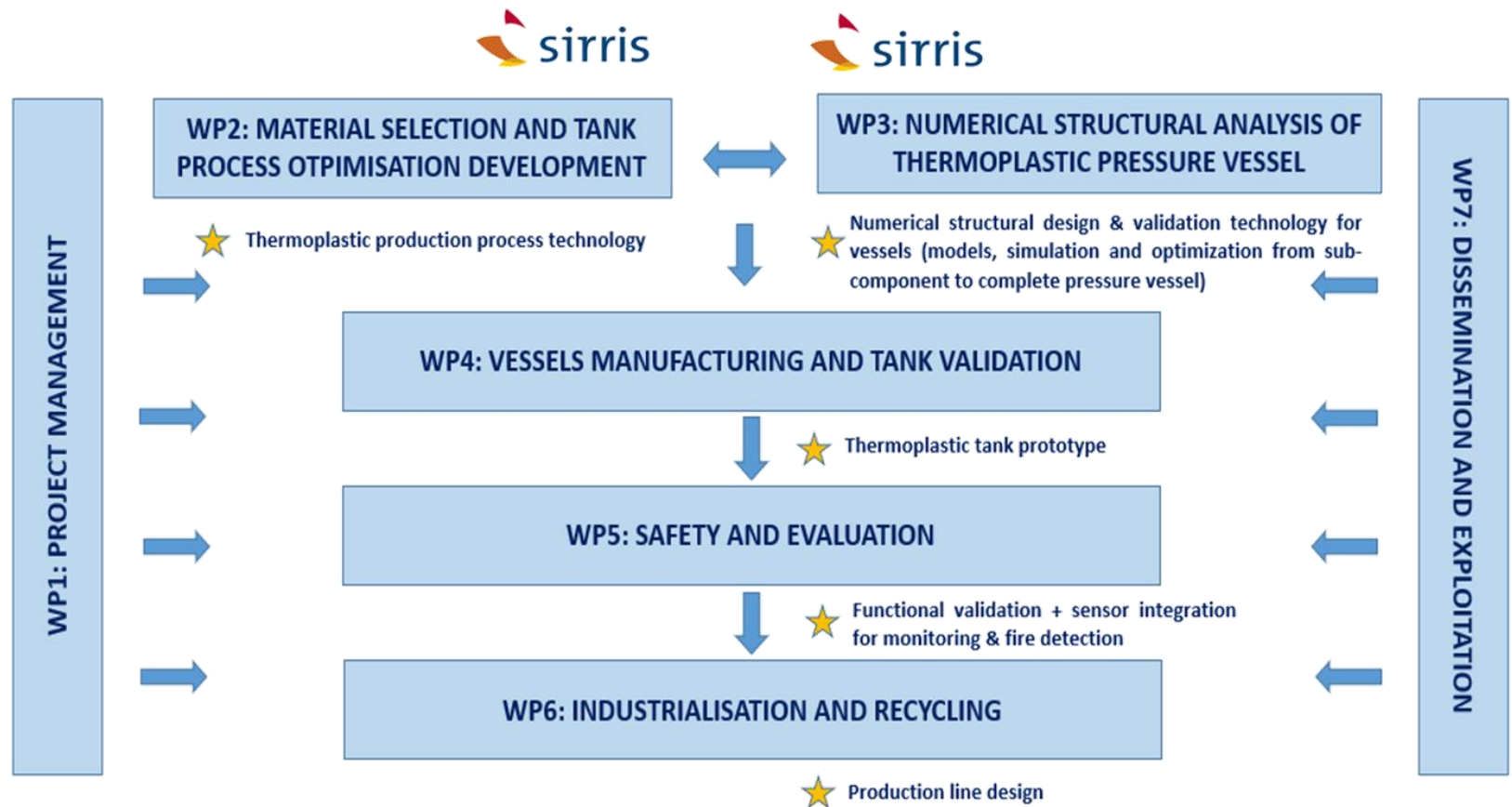
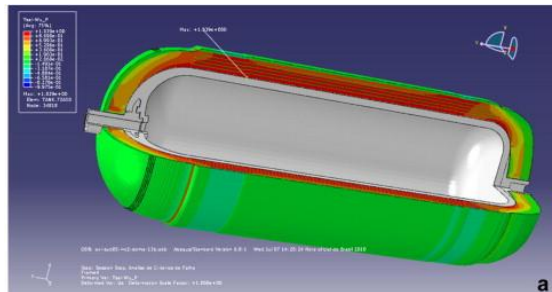
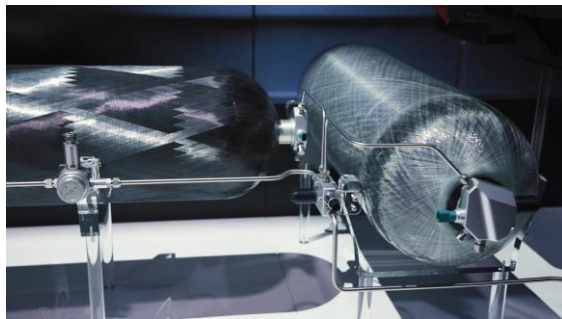


**HOW WILL DIGITAL MANUFACTURING AND INDUSTRY 4.0 IMPACT YOUR FACTORY IN THE FUTURE?**



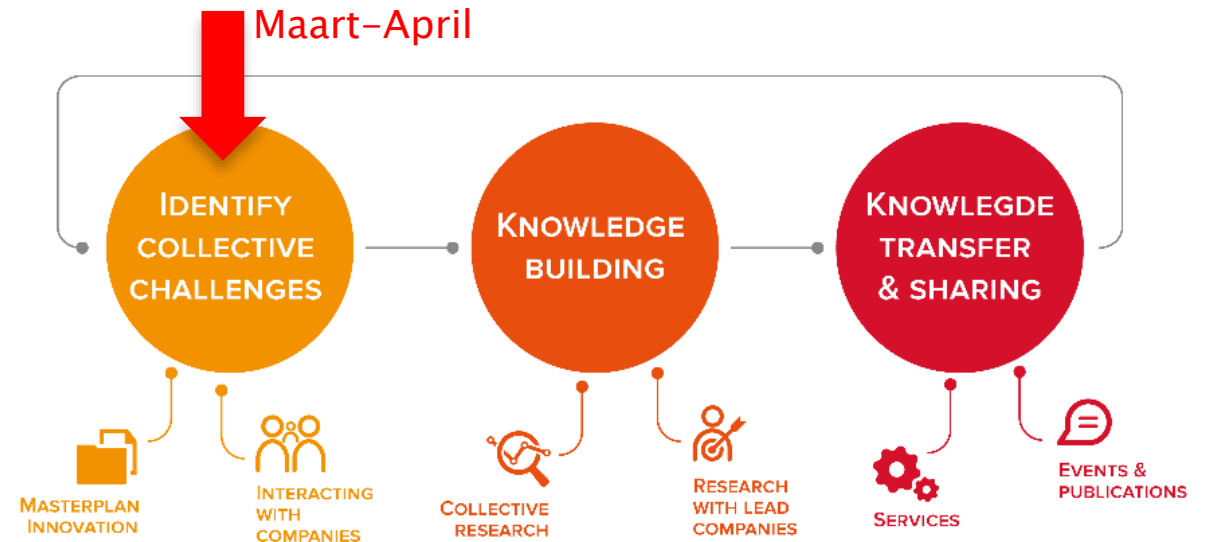
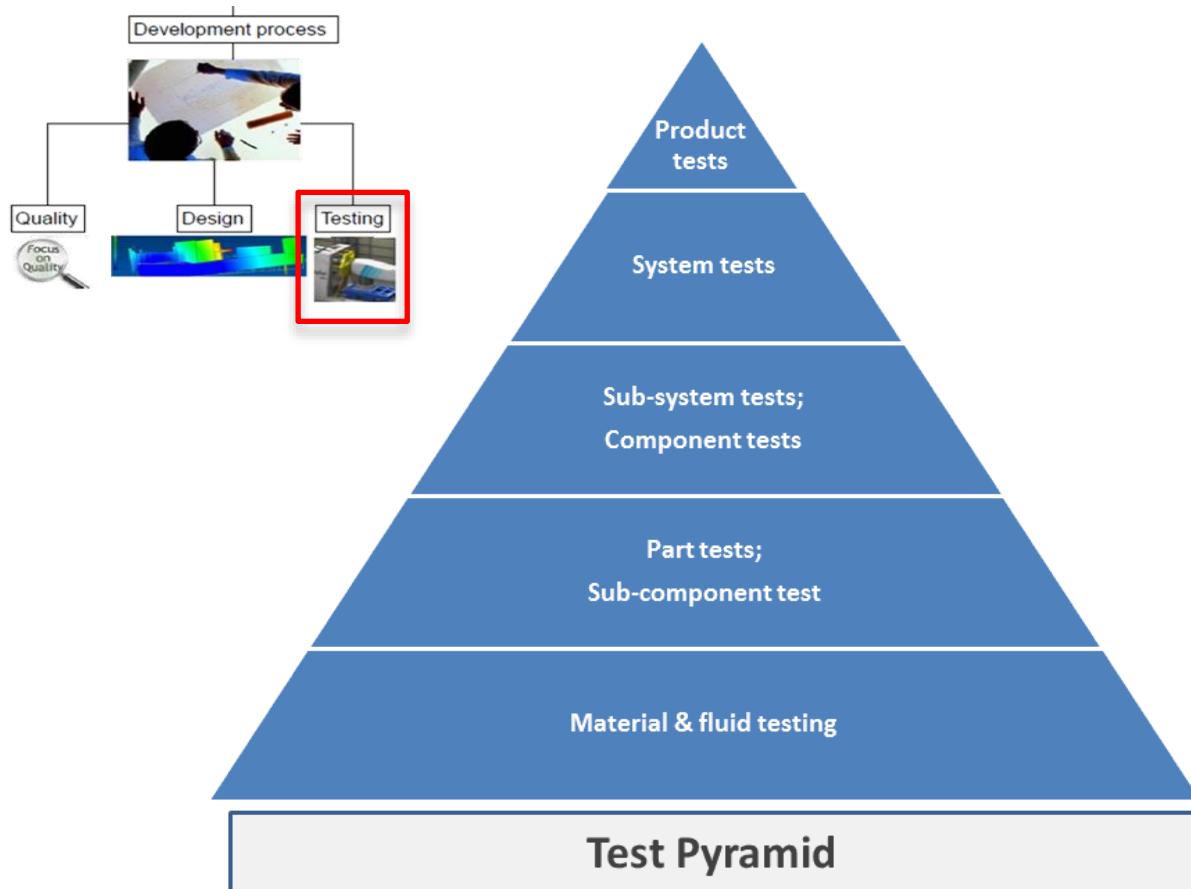


# Thermoplastic tanks Optimised and Recyclable



<https://thor-fch2.eu/>

# Lopende actie: collectieve TESTING uitdagingen in de Vlaamse H2 waardeketen?



- Fundamental research tests
- Prototype testing: DVT
- Accelerated lifetime tests (HALT)
- Certification testing

# Full system environmental (climatic) testing

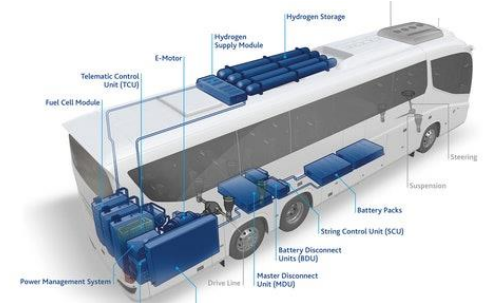
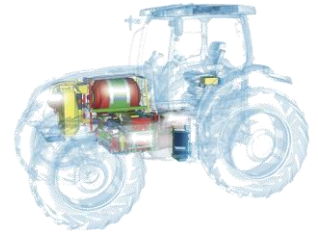
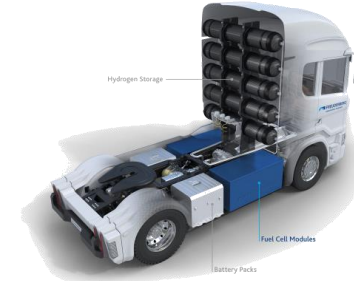
<https://sirris.be/climate-chamber-extreme-working-conditions-different-inustries>



-60°C/+60°C  
95% RH  
IR-heat  
Icing conditions



Functional testing



# Contacteer ons!



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[pieterjan.jordaens@sirris.be](mailto:pieterjan.jordaens@sirris.be) | +32 491 345382  
<https://www.linkedin.com/in/pieterjanjordaens/>  
[www.sirris.be](http://www.sirris.be)

[www.sirris.be](http://www.sirris.be) | [innovation@sirris.be](mailto:innovation@sirris.be)

FOLLOW US !



[blog.sirris.be](http://blog.sirris.be)



LinkedIn



YouTube

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# Smart Safety Solutions and Services

---

To protect plant/operations,  
people and the environment

---

Josse Brys

Country Manager  
HIMA Benelux B.V.

---





# HIMA: The leading Expert in Safety Solutions



- HIMA is German family-owned company
- Exists more than 110 years
- Worldwide active in 50 countries
- HIMA has more than 800 people dedicated to safety
- Over 40,000 safety systems installed
- R&D investment with 125 experts

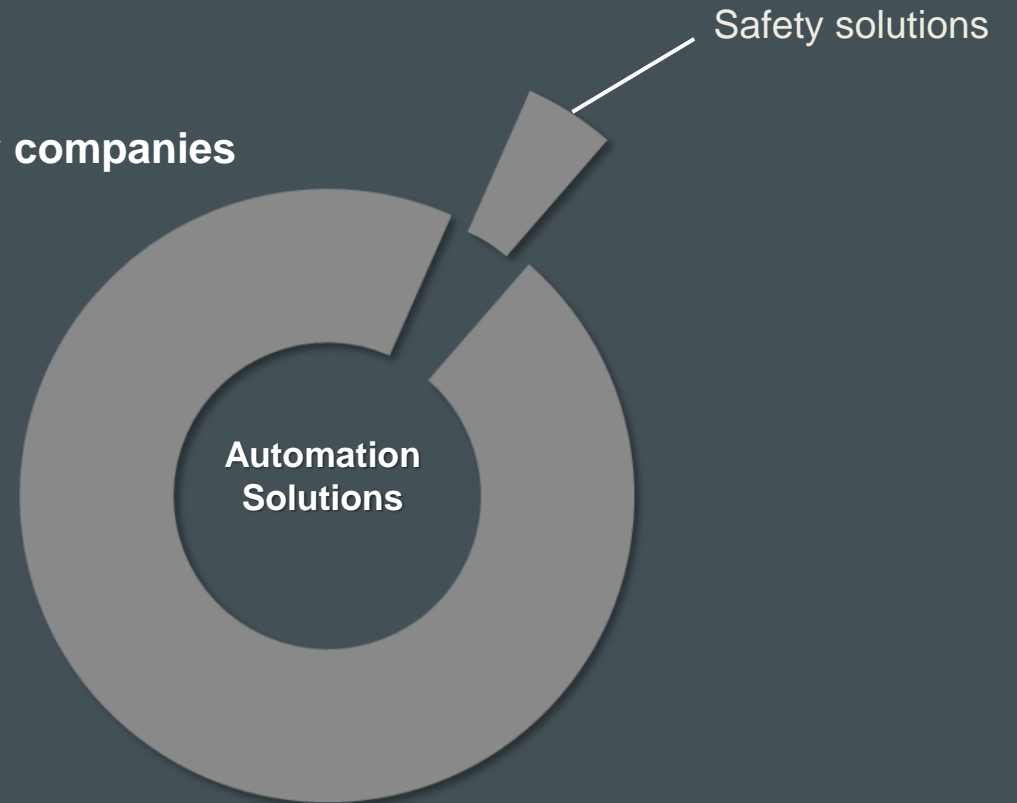


# What makes HIMA unique?

Safety is our DNA



Other companies

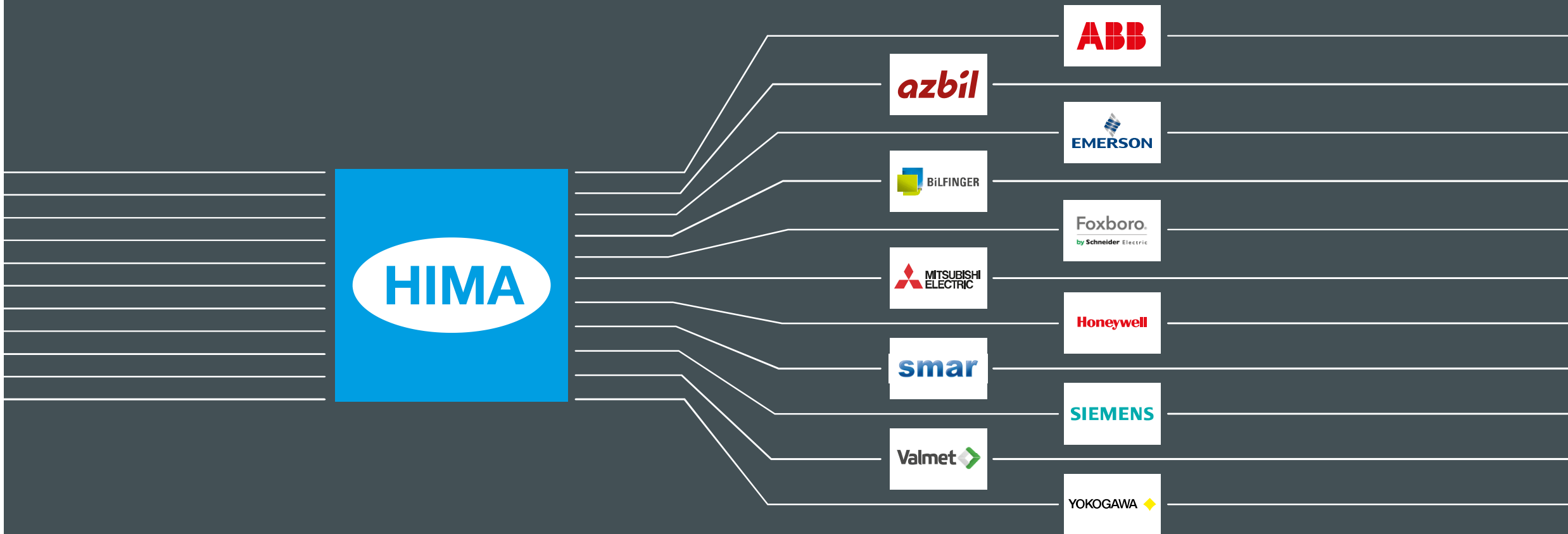


HIMA understands Safety better than any other company

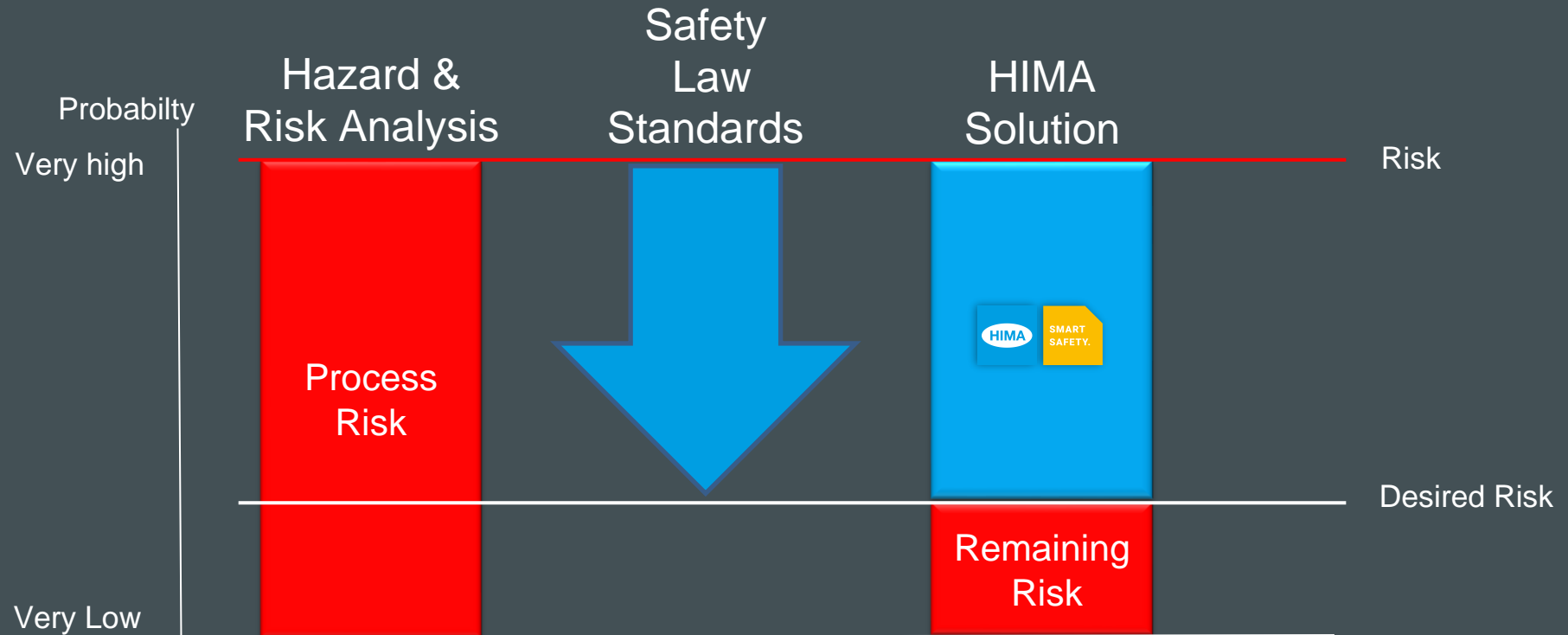
# HIMA Systems Integrate with any system



- HIMA security solutions run independently / separately from the control system



# HIMA: The leading Expert in Safety Solutions



**HIMA helps to reduce the risk in your process with an independent layer**

# HIMA: The leading Expert in Safety Solutions

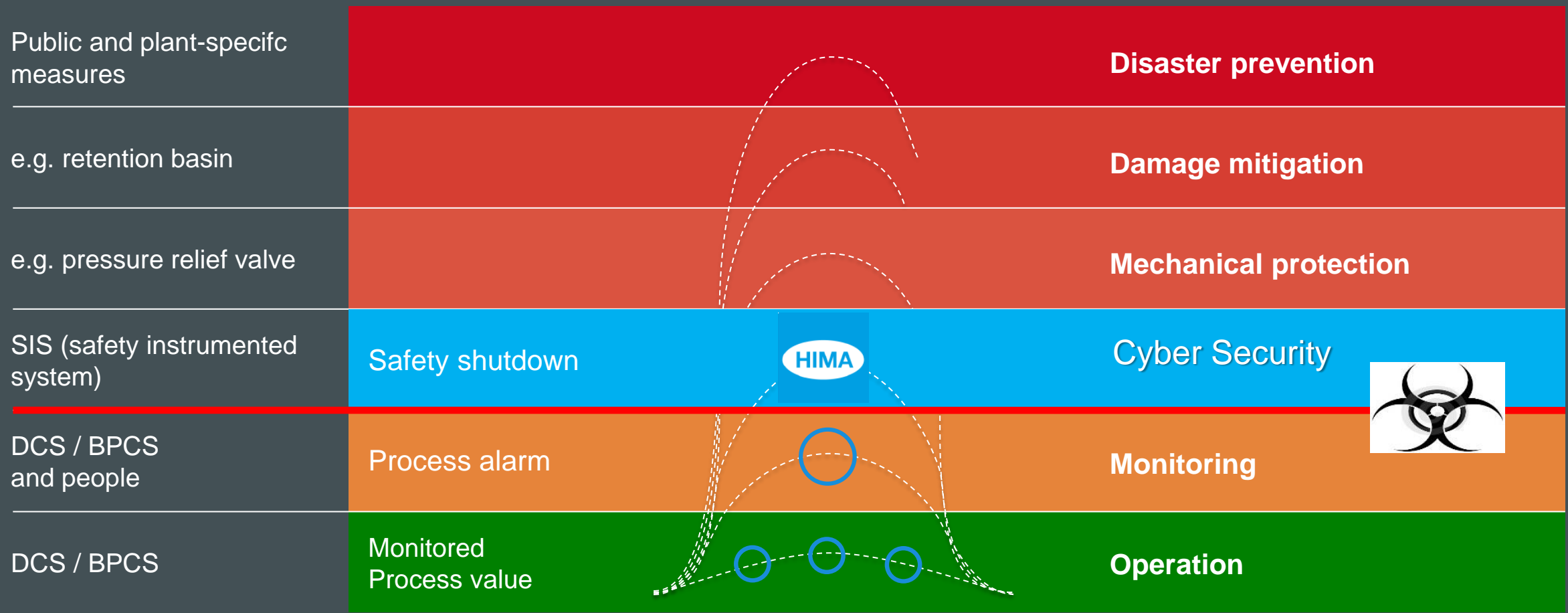


HIMA delivers smart safety solutions when:



- you need to get the highest safety and cyber security or
- it's a complex safety system that needs to react fast or
- the availability needs to be at the highest level , non-stop safety
- and a lifecycle of +20 years and the best 24/7 service or
- you need to get the highest safety on a small footprint

# HIMA safeguards your plant/operations



# Our Industries



## Process Industry

- Applications in the oil and gas industry
- Petrochemicals
- Chemicals
- Pharmaceuticals
- Energy
- Etc.



## Rail Industry

- Level crossings
- Railway signaling
- Power supply
- Rolling stock
- Automatic train control systems
- Etc.



## Logistics & Machine Safety

- Conveyors
- Elevators
- Cranes
- Cableways
- High bay storage
- Assembly and coating lines
- Etc.

# Our Industries

## Process Industry



Oil & Gas



Chemical



Pharma



Energy

## Our Safety Solutions



Turbomachinery Control



Burner Control System



Emergency Shutdown System



Fire & Gas System



High-Integrity Pressure Protection System



Pipeline Leak Detection System



# HIMA Services



## Safety Consulting

SIL Assessment support  
 Specifications (SRS)  
 Sizing and Architecture

## Safety Solutions

BMS/BCS  
 TMC  
 HIPPS  
 PMC  
 Wellhead  
 FGS  
 ESD

## Integration Concept

DCS Integration  
 Cyber Security  
 Definition and Delimitation

## Engineering & Project Management Manufacturing

Germany:  
 Manufacturing of HIMA Products  
 PEP, PQP  
 Engineering, Assembly, Testing  
  
Worldwide:  
 Engineering, Assembly, Testing

## Services

Application Site Services  
 SAT Procedure  
 Spare Part Recommendation  
 Solution Integration

# Hydrogen in Benelux



**ExxonMobil**

Antwerp & Rotterdam  
Hydrocrackers  
Hydrogen compressors

ESD  
TMC  
F&G  
Availability

**Nouryon**

Delfzijl  
Hydrogen production plant

ESD  
F&G  
HIPPS  
Availability

**TEIJIN**

*Human Chemistry, Human Solutions*

Teijin Aramid  
Hydrogen compressors safety

ESD  
F&G  
HIPPS  
Availability

# Pipeline leak detection system



## TAL Group Transalpine Pipeline

- Total length: 753 km
- From the Port of Trieste to the refineries in Central Europe
- Maximum pipeline elevation: 1,572 m
- Number of refineries supplied: 8

753 KM



TRIESTE

LIENZ

KARLSRUHE

Plöcken - Tunnel  
(7 km)  
950 m

Fabertauern - Tunnel  
(7,2 km)  
1550 m

Hahnenkamm - Tunnel  
(6,8 km)  
1100 m

Italia Österreich

Österreich Deutschland

# AllSeas: Pioneering Spirit



## Pioneering Spirit

- Customer: AllSeas
- Competing System performance was too slow



Pre-Engineering,  
Hardware & Software  
Engineering  
IFAT, Support



Netherlands, Rotterdam



11 HIMax Systems  
970 HIMax modules  
5300 Safety I/O



Software Training  
SER with 25000 events  
Operator Training Simulator



# INPEX: Ichthys Gas Fields Development Project



## Ichthys LNG

- Offshore & Onshore, Western Australia
- Customer: INPEX



FEED Study Prototyping  
Hardware & Software  
Engineering  
Remote IFAT, DVT  
Yard-support



Germany, Singapore,  
South Korea, Australia



25.000 Safety I/Os  
430 Cabinets



Onshore/Offshore  
Application  
Standard Application  
Software Libraries

# MOHO Nord Project



## Moho Nord

- Coast of Pointe Noire, Republic of Congo
- Customer: TOTAL



Pre-Engineering,  
Hardware & Software  
Engineering  
IFAT, Site Support



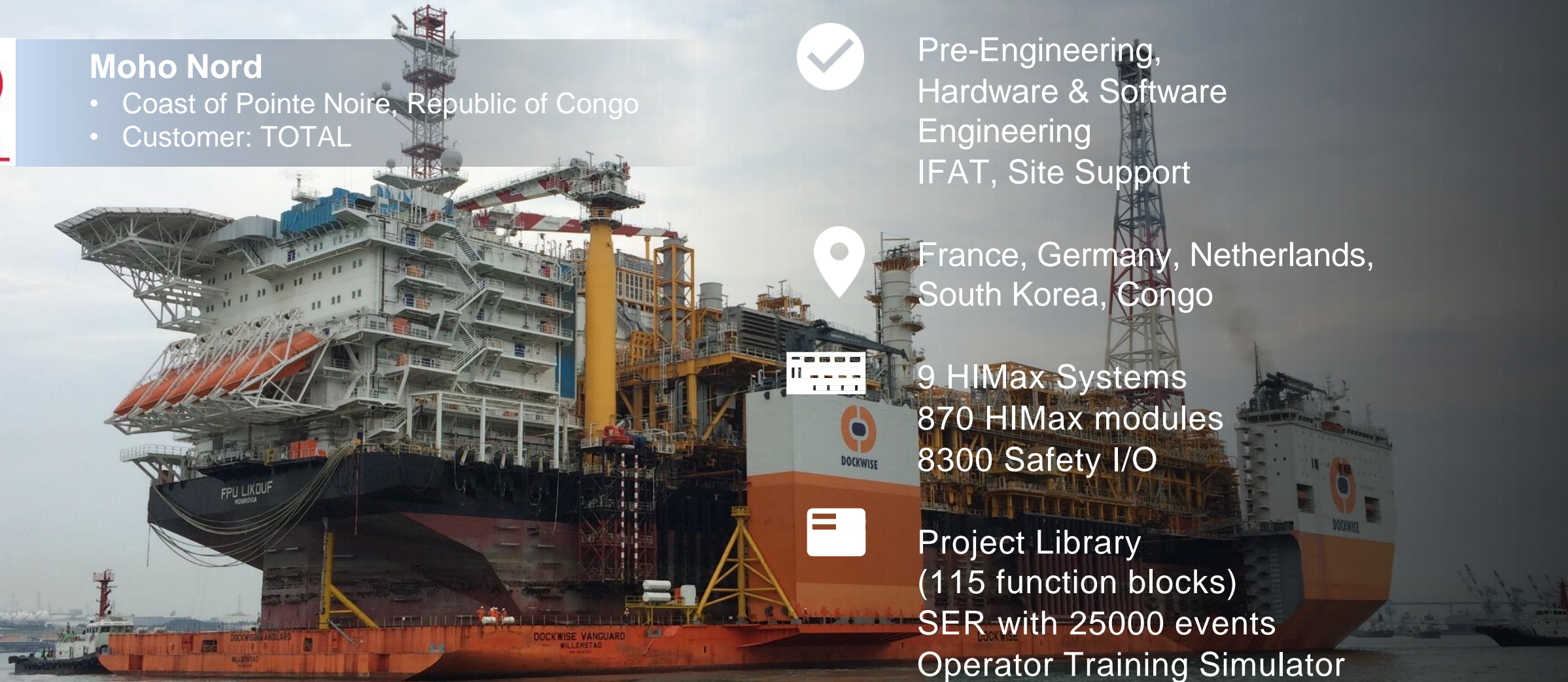
France, Germany, Netherlands,  
South Korea, Congo



9 HIMax Systems  
870 HIMax modules  
8300 Safety I/O



Project Library  
(115 function blocks)  
SER with 25000 events  
Operator Training Simulator



# Martin Linge Project



## Martin Linge

- Norwegian Continental Shelf
- Customer: TOTAL



Engineering HW & SW  
Prototyping HW & SW  
Hardware FAT, IFAT, SAT



Norway, Sweden, France, Germany,  
Romania, Poland, Singapore, South  
Korea, Australia

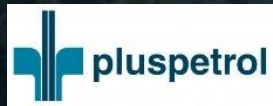


8000 hardwired I/O's  
35 System-, 52 Marshalling-, 10 ATEX  
certified Marshalling Cabinets  
470 redundant HIMax modules



Project Software Library (ESD, FGS)  
Backup HMI with 530 Graphics  
Operator Training Simulator

# Malvinas Migration Project

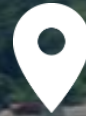


## Plus Petrol

- MALVINAS, Peru
- Customer: Pluspetrol



Engineering HW & SW  
Prototyping HW & SW FAT & IFAT



Peru



5800 hardwired I/O's  
32 PLC's  
HIMax modules



Project Software Library (ESD, FGS)  
DCS Integration  
Overall MOS-Integration

FEED and Migration Strategies  
Development Support



# The future of Safety



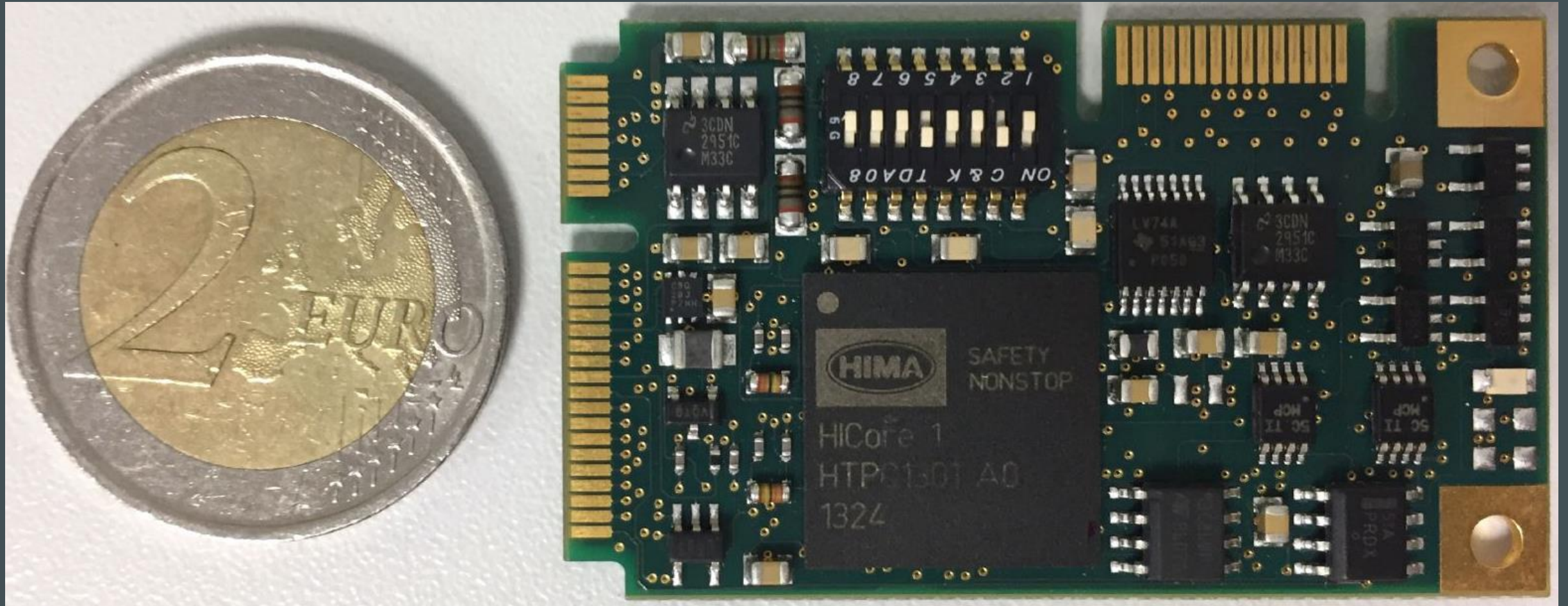
**Paving the way to Industry 4.0**  
The world's first complete safety technology on a single chip. Can be integrated into your product.

# Production line of Audi Germany

## KARIS PRO



# HIMA HiCore 1



# Life Cycle Services



- Life Cycle Management & Local 24/7h support team at HIMA Benelux in Breda for the Benelux

# Some of our customer in the Benelux



TOTAL



EVONIK  
INDUSTRIES



Air Liquide  
creative oxygen



AkzoNobel



The Chemical Company

ExxonMobil



INEOS



# Safety Solutions and Services



Thanks for your attention

Josse Brys

Country Manager  
HIMA Benelux B.V.

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+32 489 19 11 05



*“Aanbieder van innovatieve mobiliteitsoplossingen via een professioneel netwerk van tankstations met een duidelijke commitment naar duurzaamheid”*

*“Fournisseur de solutions de mobilité innovantes via un réseau professionnel de stations-service avec un engagement clair en faveur du développement durable”*

# G&V Energy Group

---

A 100% Belgian company



## G&V SERVICESTATIONS

32 Truck stations  
17 G&V Retail stations 4 Train stations  
16 CNG stations (ENORA)  
2 LNG stations (LNG Sol Belg)



## XL SERVICESTATIONS

124 Esso Retail stations  
16 Shell stations  
8 Total stations  
2 Q8 stations



**ENERGY GROUP**

## CAPS FUEL CARD

Network of  
+ 2000 service stations in  
BeNeLux & France



## XL ROC

26 Retail shops  
5 Carwashes





# ▶▶▶ Facts & Figures



**+200**  
Stations  
in ownership

Nr. **1**  
Independent BE player



Largest multibrand  
fuel network in  
BeNeLux & France



Group turnover 2019  
**957 Mio euros**  
Fuels 895 Mio euros  
Shops (XL ROC) 62 Mio euros

Nr. **4**  
Player in BE of  
petrol stations



**+300** Employees



# ▶▶▶ CAPS tankkaart

*KIES DE TANKKAART DIE BIJ JE PAST ...*



+2000 stations BeNeLux & France




Blue Corner Network Europe

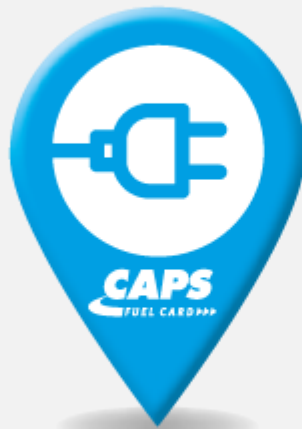
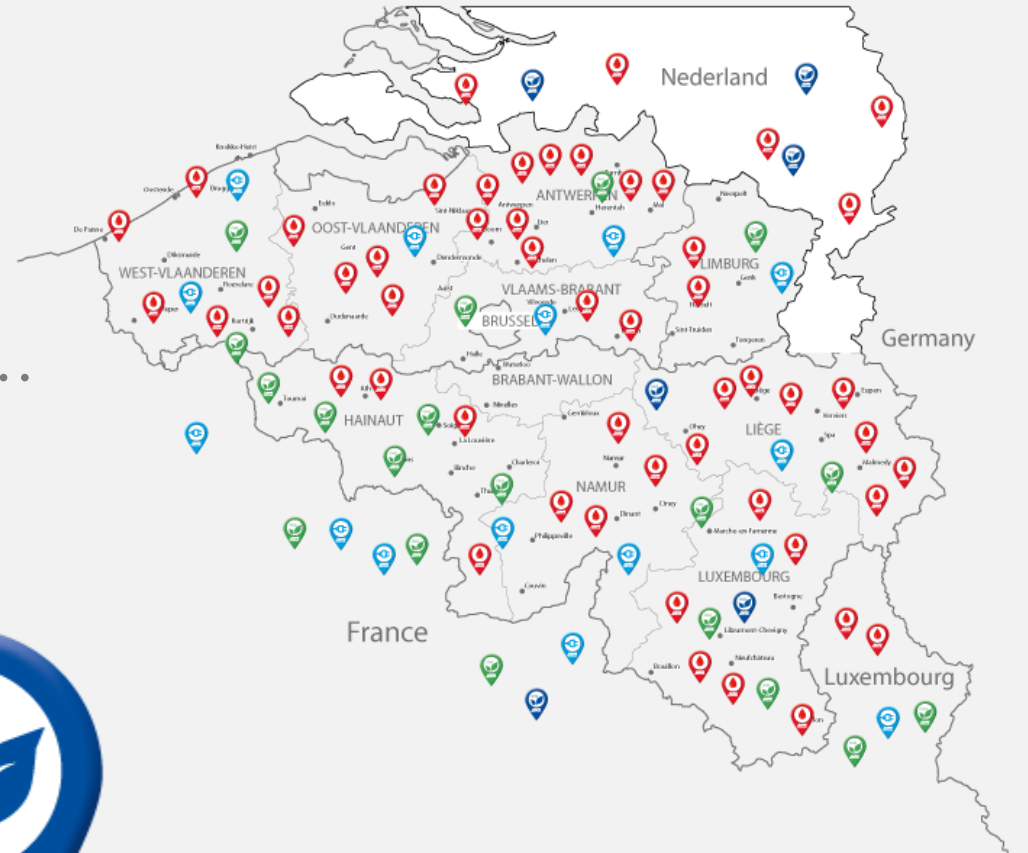


+18 000 stations in Europe + services



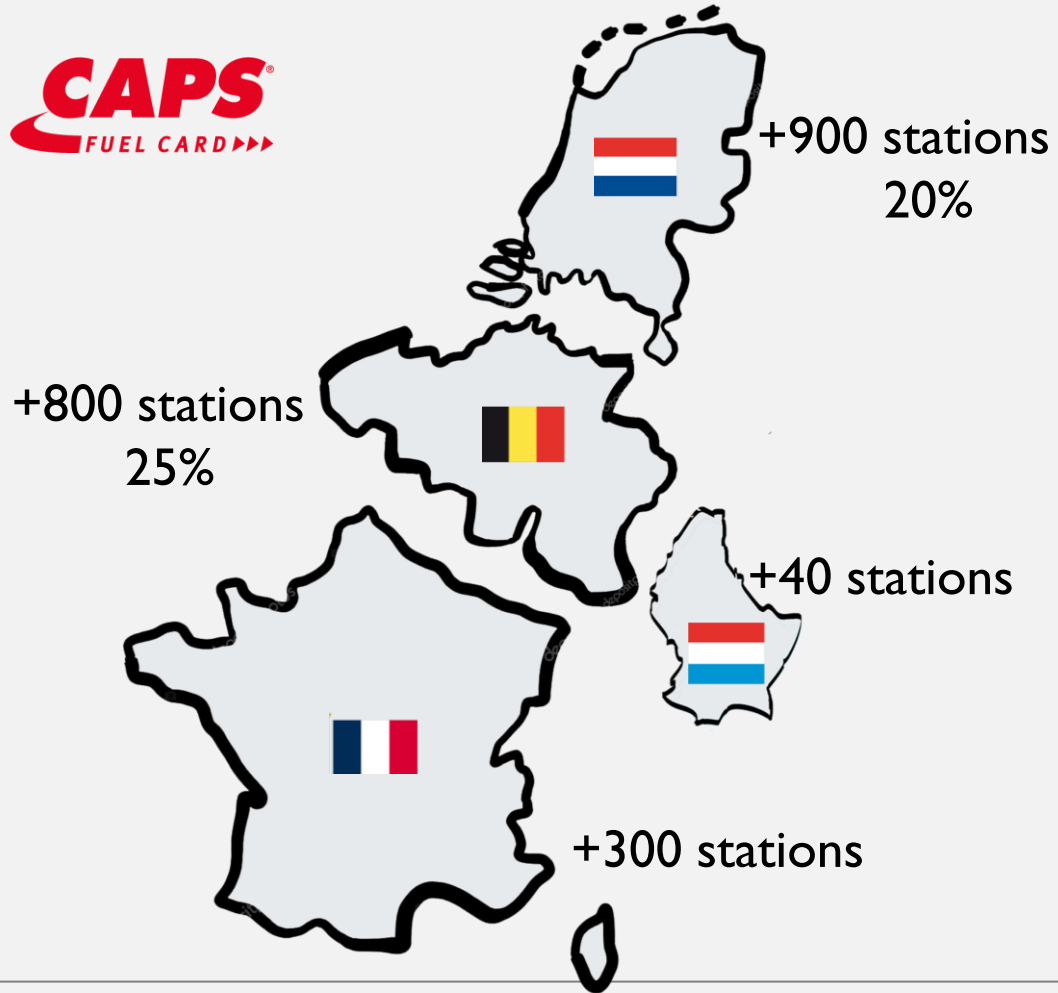
A 100% Belgian company 

ONS TANKNETWERK BREIDT UIT :  
Tank nu ook overal duurzame energie ...



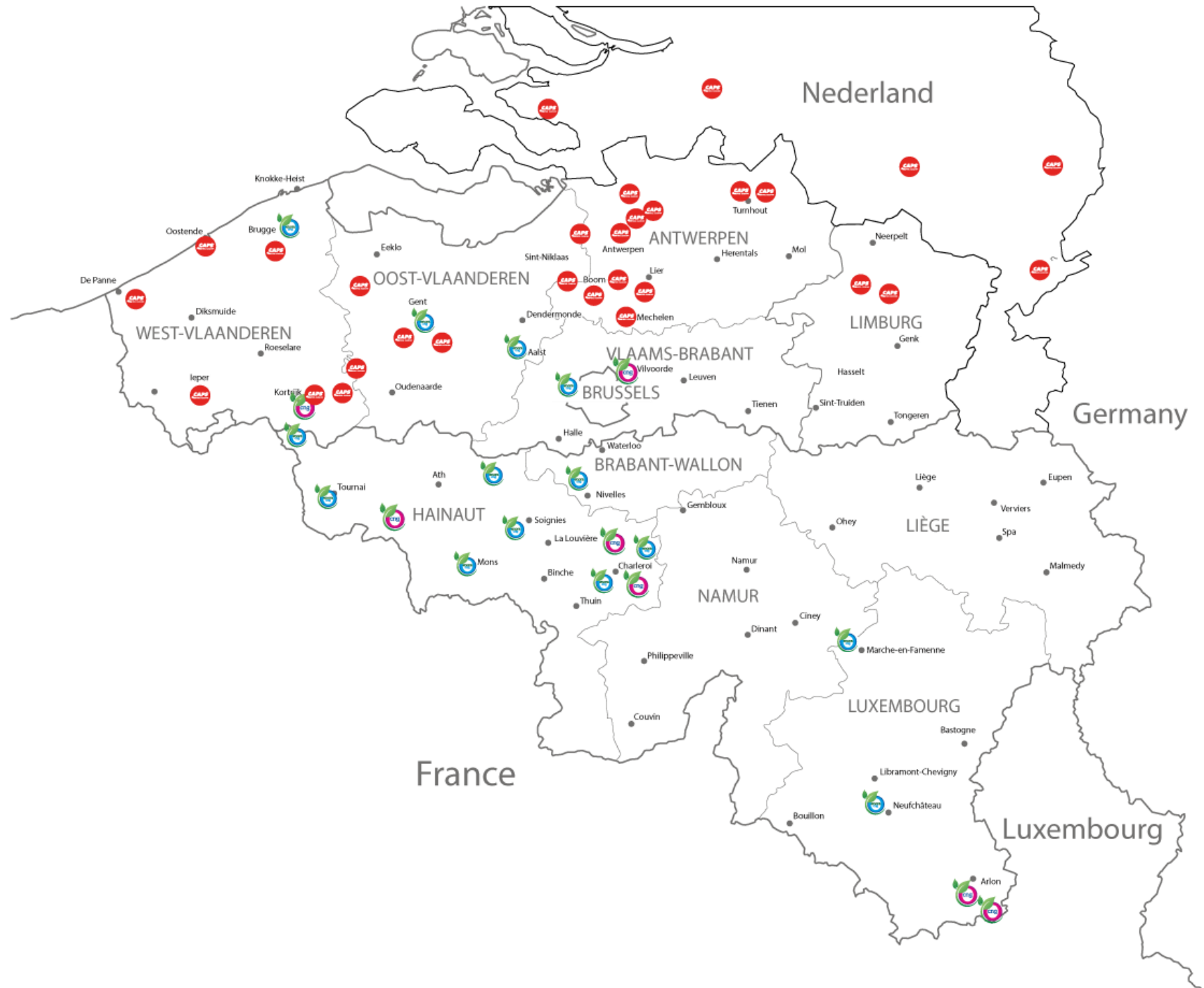


# Geographic coverage





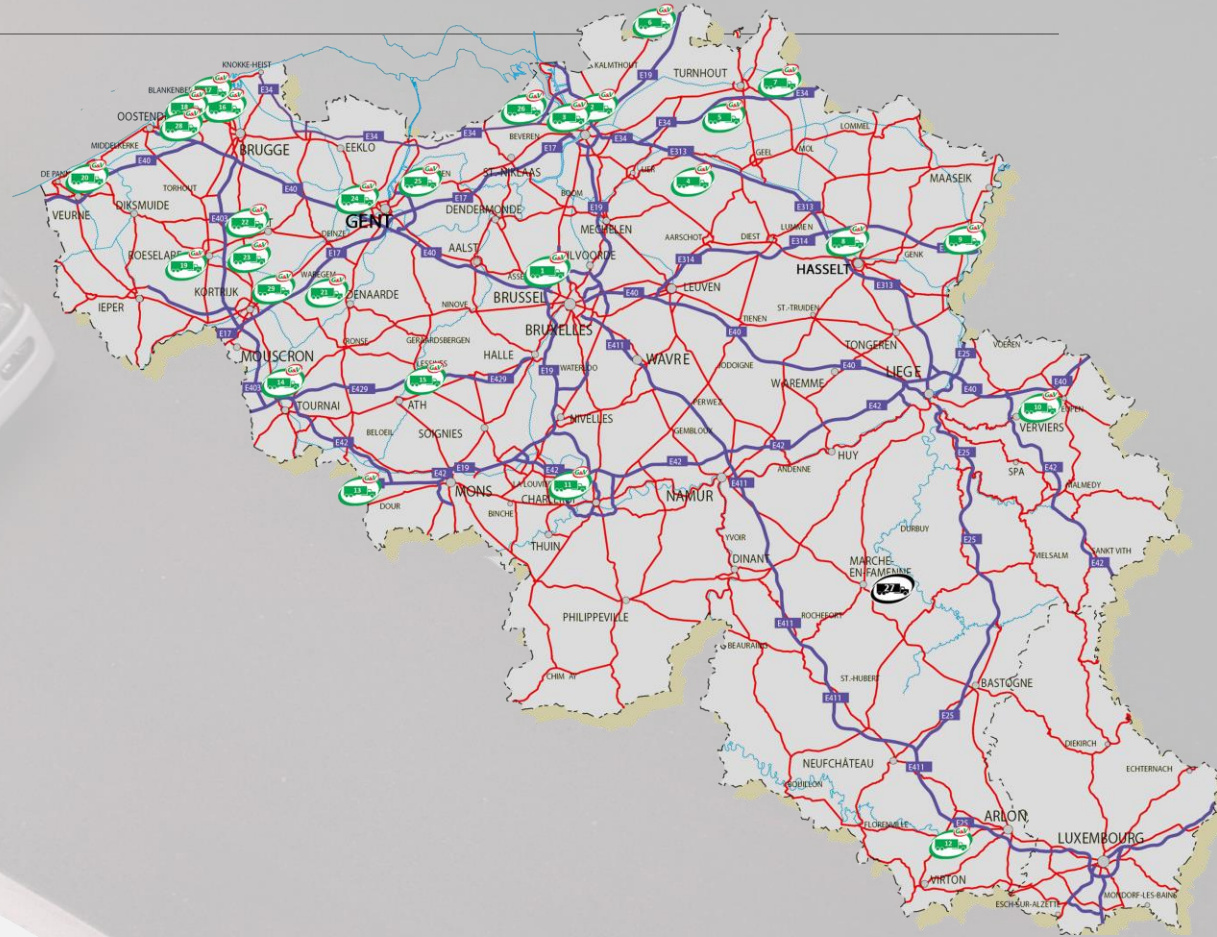
Partners





# Truck Network

- ▶ Camera surveillance
- ▶ Master slave pumps (120 lt)
- ▶ Ad Blue
- ▶ Red diesel
- ▶ Extensive network on all major transit roads and seaports



CNG  
+  
LNG



AdBlue



# ▶▶▶ LNG – Liquid Natural Gas

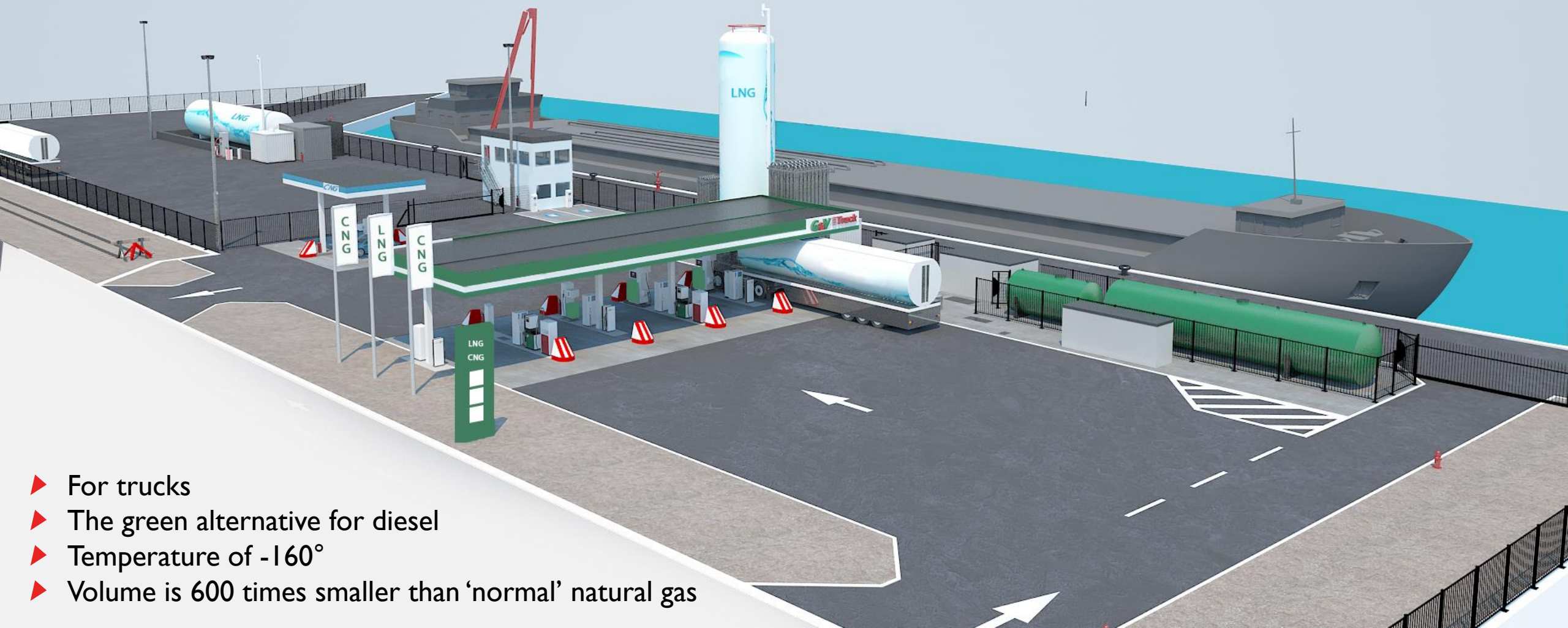
**LNG Solutions Belgium**  
Partnership Rolande & G&V



ROLANDE



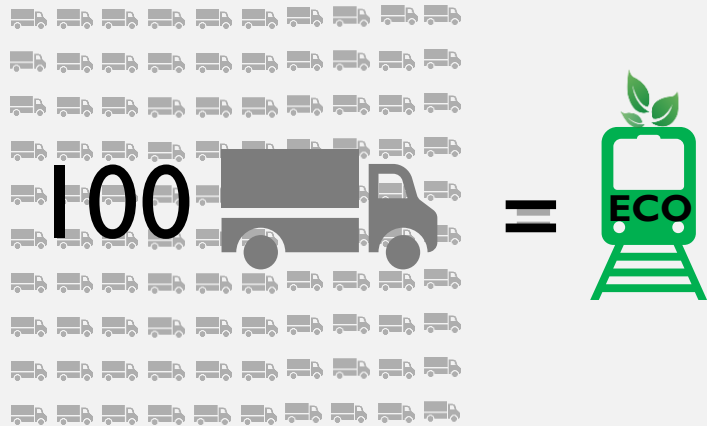
ENERGY GROUP



- ▶ For trucks
- ▶ The green alternative for diesel
- ▶ Temperature of  $-160^{\circ}$
- ▶ Volume is 600 times smaller than 'normal' natural gas

# ▶▶▶ Train network

- ▶ Port of Zeebruges
- ▶ Port of Ghent
- ▶ Port of Antwerp Left bank
- ▶ Port of Antwerp Right bank



## Logistic partners

- ▶ Lineas
- ▶ Crossrail Benelux
- ▶ Europort FR
- ▶ DB Cargo Belgium & Nederland
- ▶ HSL Belgium
- ▶ Infrabel
- ▶ Railtraxx
- ▶ RTB Cargo Belgium
- ▶ Rurtalbahn Cargo gmbh



Everfuel 

Q4



Q4 2020 earnings presentation

11 February 2021

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# Today's presenters



**Jacob Krogsgaard, Founder and CEO**

- Former co-founder and CEO of H2 Logic (founded 2003)
- H2 Logic acquired by NEL in 2015
- Large shareholder and SVP of NEL 2015-19



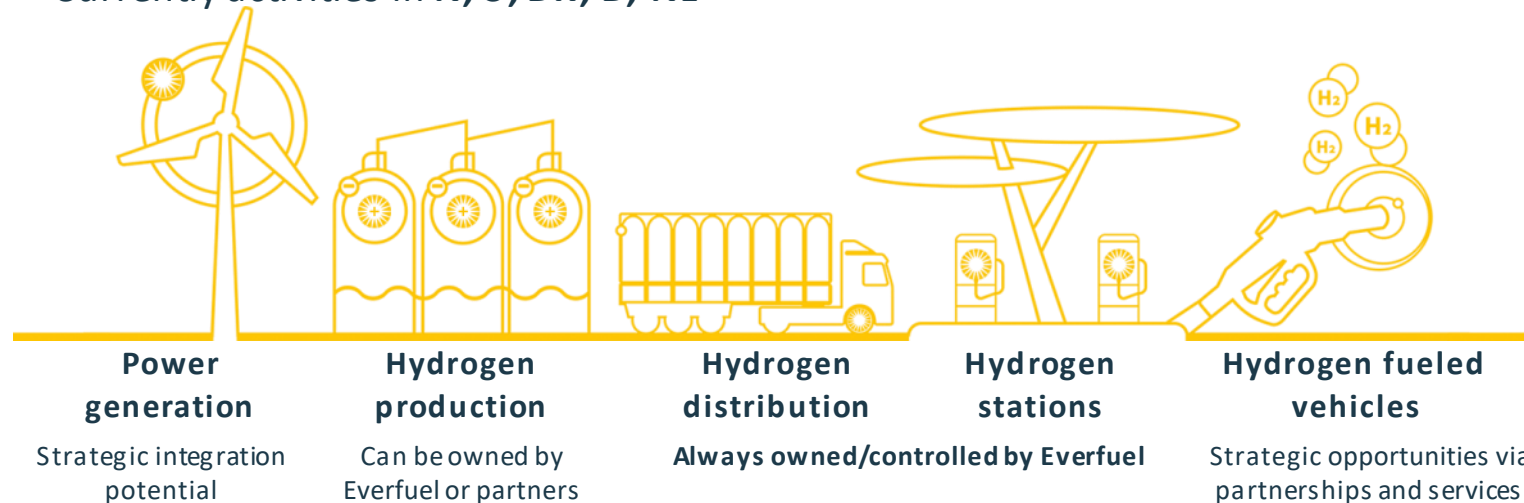
**Anders Bertelsen, CFO**

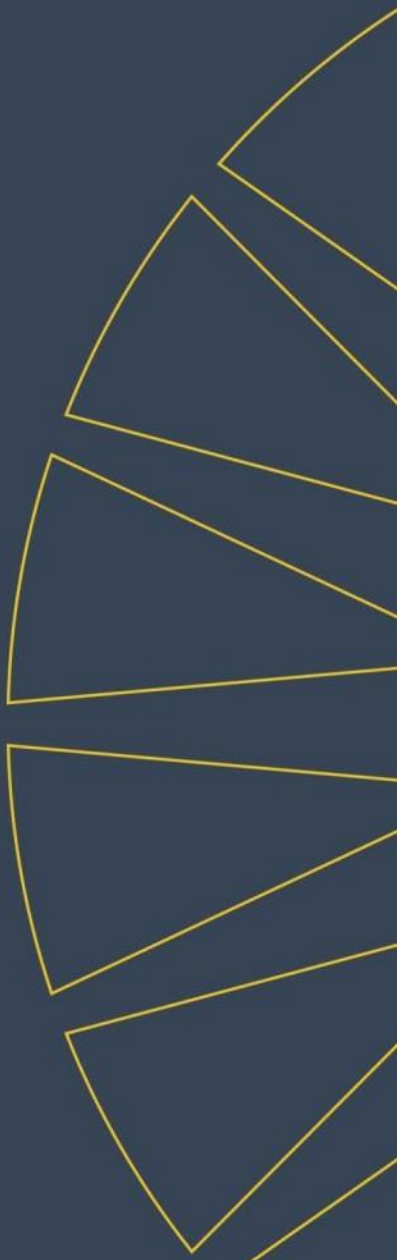
- Former CFO and acting CEO at AFRY Buildings Denmark
- Experience from Siemens Wind Power, SAP, Nobia and as an auditor with BDO

# Unlocking hydrogen at scale

## Everfuel at a glance

- Hydrogen is the new heavy-duty fuel – **100% clean and reaching diesel parity**
- The technology is proven and require a **dedicated fuel company** to commercialize green hydrogen
- Everfuel is **Europe's new integrated fuel company** – providing green hydrogen for larger vehicle fleets
- HQ in Herning, Denmark, listed as **EFUEL** on Euronext Growth Oslo.
- Everfuel is asset owner and operator of the complete H2 value chain. Currently activities in **N, S, DK, D, NL**





Everfuel News, 29 October

**Successful private placement raising EUR 27 million of growth capital at NOK 22 per share and subsequent admission to trading on Oslo Børs' Euronext Growth**



**Everfuel** 

# Key events

- Acquisition of two hydrogen fueling stations and distribution assets in Norway from Uno-X
- Purchase order for six hydrogen trailers designed exclusively to Everfuel specifications
- Agreement with Nel for joint development of the Norwegian hydrogen retail and truck fuel market and creation of Everfuel Norway retail AS
- EUR 20.7 million loan from EIB to scale and commercialize hydrogen fuel in Denmark and Europe
- Acquisition of Danish Hydrogen Fuel A/S (DHF), adding four hydrogen fueling stations in Denmark
- Award of contract for 20 MW alkaline electrolyser for green hydrogen production in Fredericia
- Year-end cash position of EUR 23 million
- Completed NOK 600/EUR 58.5 million multiple times oversubscribed private placement at NOK 125 per share in January 2021

# Operational review

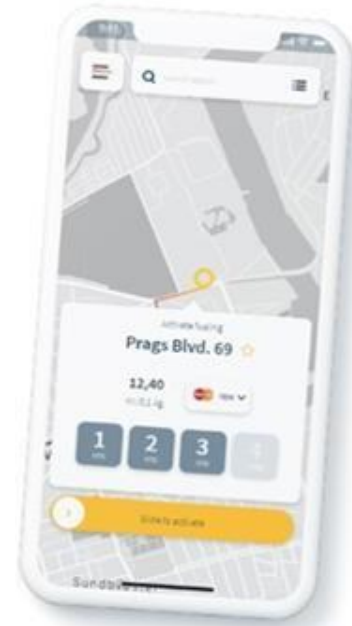


Everfuel 



# Scaling the distribution system

- **Everfuel App in testing now**
  - Expected beta-testing in Q1-2021 and full release during Q2-2021
  - New versions with further functionality will follow
- **Multi-year frame agreement with Hexagon Purus for supply of hydrogen trailers through 2025**
  - Designed exclusively to Everfuel specifications
  - Order for six hydrogen trailers for delivery in 2021
  - Adding to a previous order for two trailers, for delivery Q1-2021
  - The units will operate in Norway, Denmark and the Netherlands
  - Up to 80 MWh of mobile energy storage



# Fredericia electrolyser order a trigger for developing attractive EPC strategy

- **Awarded contract to Nel for the delivery of a 20 MW alkaline electrolyser for the HySynergy project**
  - EUR 7.25 million contract with delivery from late 2021
  - Total project budget EUR 20 million
  - Capacity up to 8 tons per day of green hydrogen and 10 tons of storage capacity when operational from mid-2022
- **Everfuel to execute EPC-work (engineering, procurement and construction), including storage and distribution facilities**
  - Leveraging existing in-house competencies
  - Developing specialized EPC capabilities for future own and external projects in response to expected growth in demand
  - EPC capabilities combined with project development and operator strategy gives Everfuel a competitive advantage.
  - Expected cost reduction gains on future Electrolyser projects
  - Cooperation and order of compressor from Howden



# Becoming Denmark's leading hydrogen fuel company

- Acquisition of Danish Hydrogen Fuel A/S (DHF) with four H2 Stations based on same technology as the Everfuel operated stations in Copenhagen
- Distribution agreement with Siemens Gamesa for green hydrogen from early 2021
- Contract with Ørsted for hydrogen offtake and distribution from 2MW electrolyser from end 2021
- MOU with Green Hydrogen Hub Denmark, a collaboration between Eurowind Energy, Corre Energy and Gas Storage Denmark, where Everfuel is the intended hydrogen mobility off-taker
- Everfuel positioned to supply green hydrogen produced in Denmark at competitive hydrogen fuel prices already in 2021
  - Focus on substantially increasing hydrogen sales, initially to taxis and light commercial vehicles, from existing stations and the new high-capacity station under construction in Copenhagen
  - Driver for growth and competence development to support roll-out of more intensive refueling for heavy-duty vehicles like trucks and buses



# Building a strong Norwegian position

- **Acquisition of H2CO AS from Uno-X with two hydrogen fueling stations and distribution assets**
  - To assume operation of stations at Hvam (near Oslo) and Åsane (near Bergen) in 1H 2021, pending COVID-19 restrictions
  - Final close of transaction is pending to seller delivering the stations approved and certified
- **Agreement with Nelfor joint development of hydrogen fueling for retail and trucking customers**
  - Invested NOK 26 million for 51% ownership of Nel subsidiary H2FuelNorway AS (H2Fuel), with call-right to acquire remaining 49%
  - Transaction closed in January 2021 and H2Fuel was renamed Everfuel Norway Retail AS
- **Everfuel Norway Retail won concession to establish a hydrogen station at Kjelsrud (Oslo)**
  - Experienced manager, who led the tendering process for the Kjelsrud site in Oslo, joined Everfuel as head of business development in Norway



# The Netherlands, Germany & Sweden

- **The Netherlands**

- Construction of the H2Station for bus refueling in Heinenord close to Rotterdam progressing as planned
  - Expected to be operational from late Q3-2021
  - Site prepared for upgrade to also allow for car and truck refueling
- Preparing for various project developments in the Netherlands
- Everfuel have appointed a hydrogen industry veteran in Q4-2020 as head of business development in the Netherlands

- **Germany**

- Everfuel has signed contract with an experienced hydrogen expert from Germany as head of business development in Germany
- Preparing various project developments in Germany




- **Sweden**

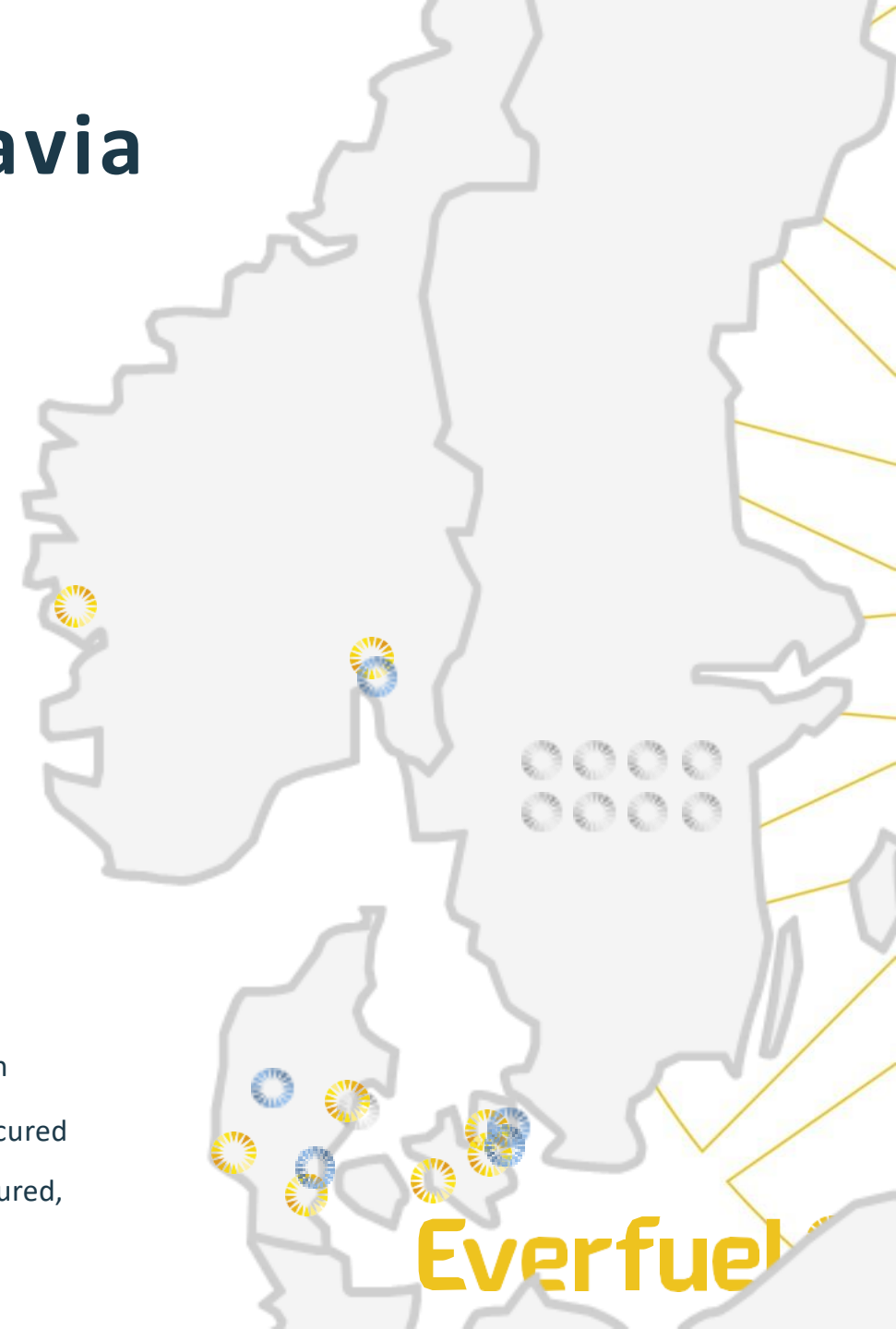
- Selection of locations for the first stations in the Nordic Hydrogen Corridor project in Sweden is expected to happen within some months



# Building critical mass in Scandinavia

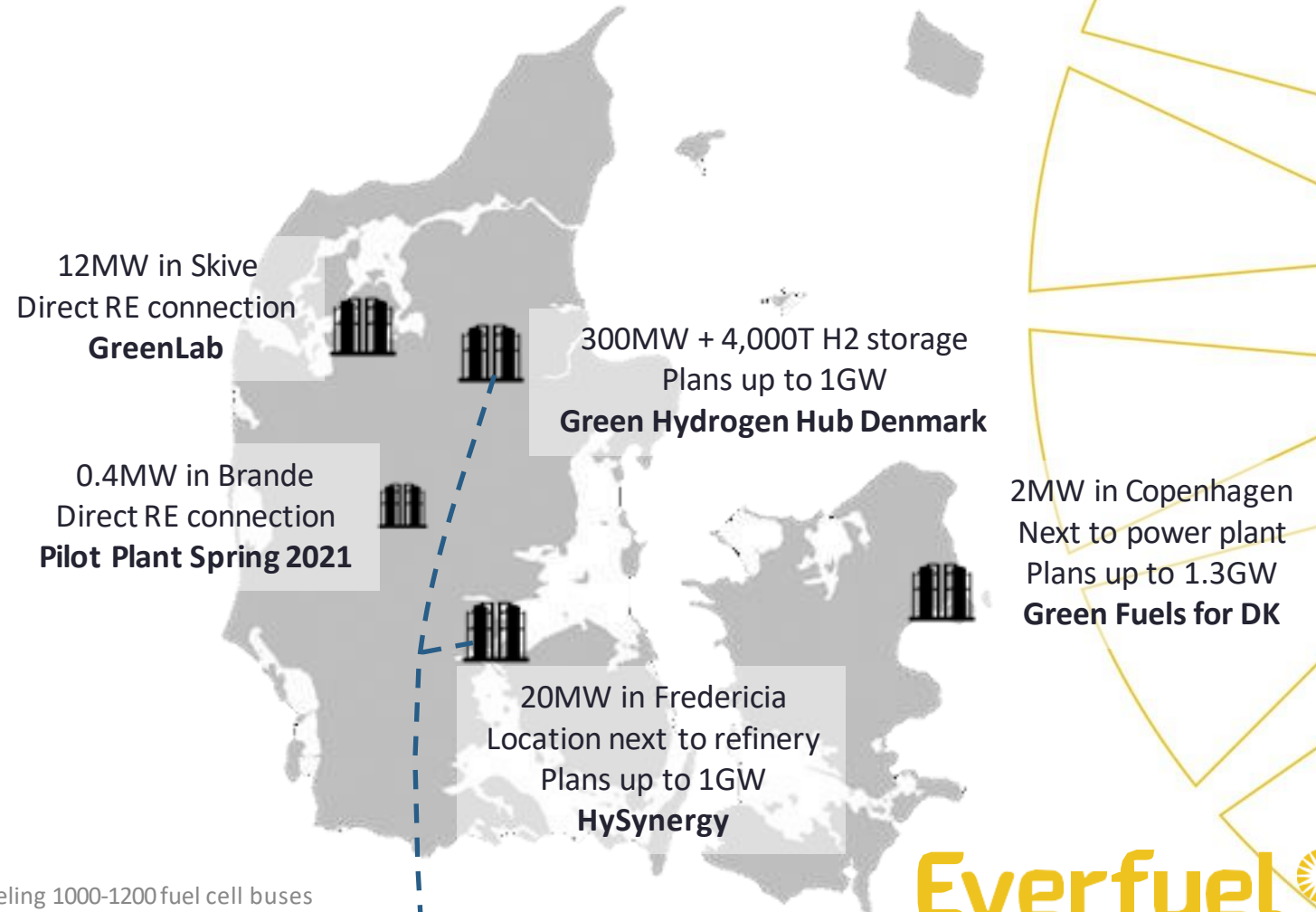
- **After Q4-2020 acquisitions Everfuel will:**
  - Operate 8 hydrogen stations
  - Secured sites for 5 additional stations
  - Secured funding for 9 stations where location is pending
- Set to become Europe's **second largest operator** of light duty hydrogen fueling stations with +20 units in operation from 2022 when adding activities outside Scandinavia
- To use network of stations to **accelerate the Everfuel business case** of optimizing the complete hydrogen value chain – *making yesterday's wind to today's fuel*

-  H2 fueling in operation
-  H2 fueling location secured
-  H2 fueling funding secured, final location pending



# Engaged in five strategic hydrogen production locations in Denmark

- **Ideal first market** to deploy commercial hydrogen production, distribution, fueling & PtX
  - 34MW<sup>1</sup> electrolyser capacity planned by 2022, growing to 600MW in 2025 and +3.3GW by 2030
  - Wind curtailment rising to ~8% of the total wind power capacity in 2020, equaling 1.4 TWh of curtailed power
- **Owner of Fredericia electrolyser** and distribution/mobility partner on remaining projects
  - 2 sites operational in 2021, 2 more from 2022
  - All commercial sites are prepared for further expansion
- Agreement to develop access to **substantial hydrogen storage** capacity and potential pipeline for later export to other regions
- Repeat approach to **scale in other EU countries** based on bankable business cases and partnerships



1) 34MW electrolyser capacity can produce up to 14 ton/day of hydrogen, fueling 1000-1200 fuel cell buses

# Financial review





# Income statement

- Financial results reflect that the company is in the initial stages of commercializing the green hydrogen value chain
- EBITDA was EUR -0.8 million for Q4-2020 and EUR -1.1 million for the full year
- Full-year EBITDA comparable to the adjusted EBITDA presented in January trading update

EUR '000	Q4 2020	Q4 2019	FY 2020	FY 2019
<b>Total revenue<sup>1</sup></b>	<b>271</b>	<b>97</b>	<b>1 048</b>	<b>170</b>
Cost of goods sold	-27	0	-97	0
Other operating expenses	-30	-97	-138	-97
Other direct cost	-31	0	-99	0
Salary and personnel cost	-426	-132	-1 011	-220
Other operating expenses	-556	-38	-812	-103
Depreciations and amortisations	-23	-1	-51	-1
<b>Operating Profit</b>	<b>-822</b>	<b>-171</b>	<b>-1 160</b>	<b>-252</b>
Financial income	591	0	591	0
Financial expenses	-11	-2	-17	-2
<b>Net financial items</b>	<b>580</b>	<b>-2</b>	<b>574</b>	<b>-2</b>
<b>Profit before tax</b>	<b>-242</b>	<b>-173</b>	<b>-587</b>	<b>-253</b>
Income tax expenses	0	38	76	56
<b>Profit for the period</b>	<b>-242</b>	<b>-135</b>	<b>-511</b>	<b>-198</b>

<sup>1</sup> Reflects revenue from hydrogen sales and other operating income, which includes grants and other funding received

# Positioned to invest for growth

- **Net proceeds of NOK 290/EUR 25.4 million from October private placement at NOK 22 per share**
- **Signed acquisition agreements totaling EUR 3.4 million in Q4-2020**
  - Some of which are closing in 2021
- **Additional NOK 600/EUR 58,5 million raised January 2021 private placement at NOK 125 per share**

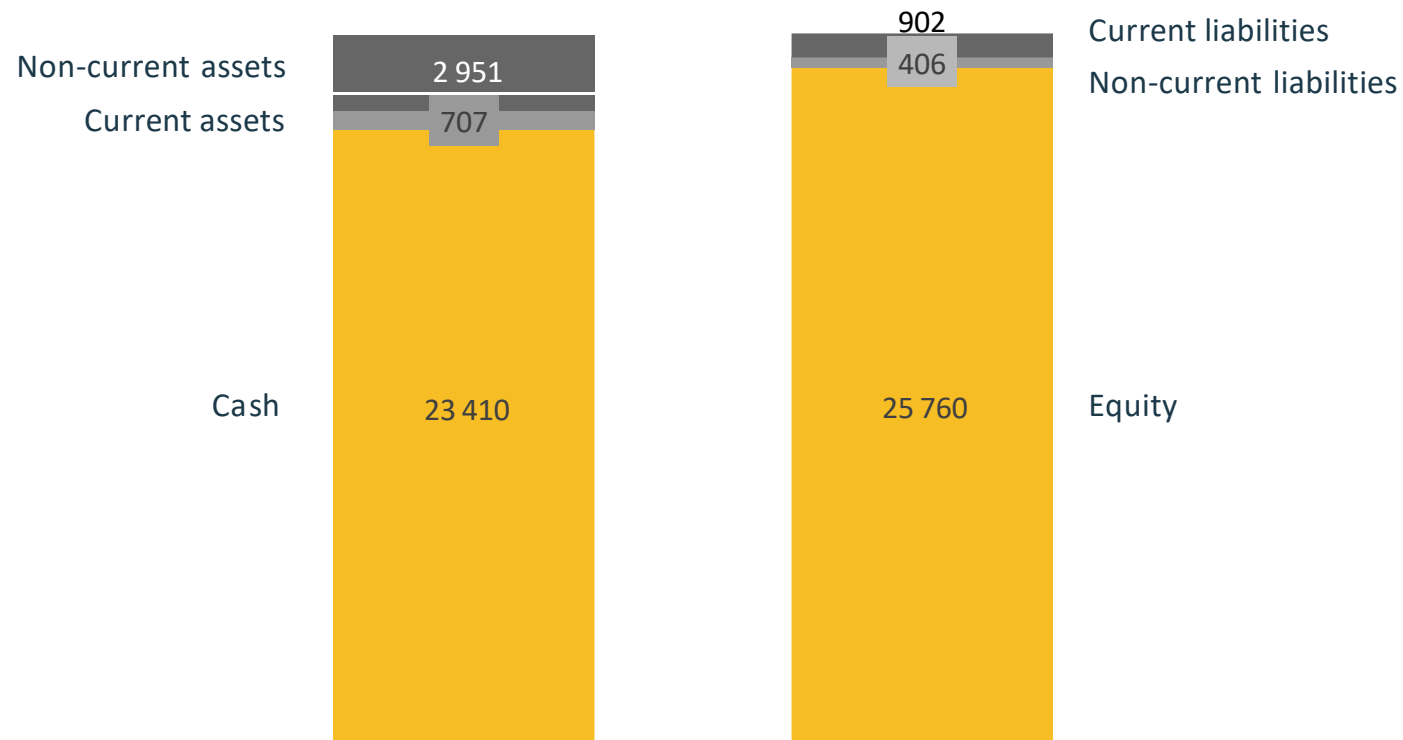
## Cash flow overview

EUR '000	Q4 2020	Q4 2019	FY2020	FY 2019
Cash flows from operating activities	-851	-975	-399	-260
Cash flows from investing activities	-1 717	-20	-2 814	-20
Cash flows from financing activities	25 377	1 027	25 809	1 027
<b>Change in cash and cash equivalents</b>	<b>22 809</b>	<b>32</b>	<b>22 596</b>	<b>747</b>
<b>Cash and cash equivalents at the end</b>	<b>23 410</b>	<b>814</b>	<b>23 410</b>	<b>814</b>

# Strong balance sheet supporting growth ambitions

## Balance sheet at 31 December

EUR '000



# Outlook

- **Scale-up of organization (~30% increased headcount in Q1-2021) and increased focus on App development, Helios and PtX engineering**
- **Build up of inhouse operation team with focus on high H2 Station availability. Prepare for increased sales from stations in the accelerated green restart post COVID-19**
- **Work systematically with vehicle OEM's and large fleet operators to establish large scale projects and contracts**
- **Increased attention to the maritime sector and potential increased H2 revenue from sales to PtX offtakers**

# Summary and Q&A

1

Everfuel is a **leading European green hydrogen fuel** company

2

Positioned to **capitalize on EUR multi-billion** hydrogen heavy-duty fuel market **now opening up** in Europe

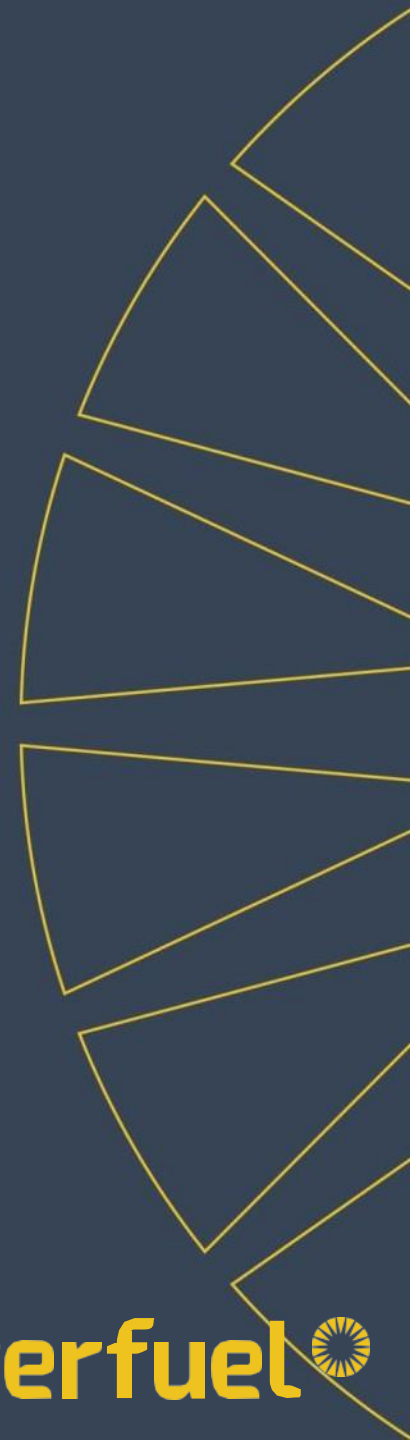
3

Firm **growth plan backed by proven execution capability** to unlock hydrogen at scale

4

Unique business model to secure **rapid growth, recurring revenues and solid profitability**

# Appendix



# Top tier team with proven execution capability

- Seasoned management team with combined 60 years of experience of developing and operating hydrogen and renewables projects and assets
- BoD with extensive green energy background provides strong support for growth strategy execution

## Management team



**CEO | Jacob Krogsgaard**  
Former co-founder and CEO of H2 Logic  
H2 Logic acquired by NEL in 2015  
Large shareholder and SVP of NEL 2015-19



**CTO | Uffe Borup**  
Former VP Technology in NEL from 2016 – 2019  
14 years solar start-up experience  
Ph.D Engineering from Aalborg University



**Sales director | Lars Jakobsen**  
Former Project Development Manager at NEL  
Project Department Manager at EUE in 2014-17  
M.Sc. Int. Business from CBS



**CFO | Anders Møller Bertelsen**  
Former CFO and acting CEO at Afry  
Experience from Siemens Wind Power, SAP  
Nobia and as an auditor with BDO  
HD, Accounting & Financial management from  
Aarhus University



**COO | Jeppe Hjuler Mikkelsen** Former  
Managing Director and COO of  
Connected Wind Services Danmark /  
Refurbishment  
M.Sc. Eng. Manufacturing from Aalborg  
University



**Business dev. Director | Nicolaj Rasmussen**  
Former Project Manager in NEL  
M.Sc. Tech. Based Business Development from  
Aarhus University and Harvard University



**Chairman | Mogens Filtenborg**  
Holds several board seats and is CoB  
of DEIF, Niebuhr Gears and HETA A/S  
Former board member of NEL ASA  
Former COO and CTO of Vestas and  
CEO of SKOV AS



**BoD member | Jørn Rosenlund**  
Senior Vice President – Fueling of NEL  
Former COO H2 Logic A/S  
MBA from Henley Management College



**BoD member | Martin Skov Hansen**  
CEO of Society of Lifestyle and Up & Up Capital  
Former partner at PwC  
M.Sc. in Auditing from Syddansk University

# Income statement

EUR '000 (Unaudited)	Q4 2020	Q4 2019	FY 2020	FY 2019
Revenue from hydrogen sales	29	0	69	0
Other operating income	242	97	979	170
<b>Total revenue</b>	<b>271</b>	<b>97</b>	<b>1 048</b>	<b>170</b>
Cost of goods sold	-27	0	-97	0
Other operating expenses	-30	-97	-138	-97
Other direct cost	-31	0	-99	0
Salary and personnel cost	-426	-132	-1 011	-220
Other operating expenses	-556	-38	-812	-103
Depreciations and amortisations	-23	-1	-51	-1
<b>Operating Profit</b>	<b>-822</b>	<b>-171</b>	<b>-1 160</b>	<b>-252</b>
Financial income	591	0	591	0
Financial expenses	-11	-2	-17	-2
<b>Net financial items</b>	<b>580</b>	<b>-2</b>	<b>574</b>	<b>-2</b>
<b>Profit before tax</b>	<b>-242</b>	<b>-173</b>	<b>-587</b>	<b>-253</b>
Income tax expenses	0	38	76	56
<b>Profit for the period</b>	<b>-242</b>	<b>-135</b>	<b>-511</b>	<b>-198</b>




# Balance sheet

EUR '000 (Unaudited)	31 Dec. 2020	31 Dec. 2019
<b>Assets</b>		
Patents, trademarks and other rights	187	0
<b>Total intangible assets</b>	<b>187</b>	<b>0</b>
Land and buildings	10	0
Plant and machinery	900	0
Other fixt. and fit., tools and eqp.	104	19
Assets under construction	1 210	0
Right-of-use assets	469	0
<b>Total property, plant and equipment</b>	<b>2 693</b>	<b>19</b>
<b>Other non-current assets</b>	<b>72</b>	<b>0</b>
<b>Total non-current assets</b>	<b>2 951</b>	<b>19</b>
Trade receivables	172	0
Other receivables	278	120
Corporation tax(asset)	0	70
Prepayments	12	136
Accrued grants	244	0
<b>Total receivables</b>	<b>707</b>	<b>325</b>
Cash at bank and in hand	23 410	814
<b>Currents assets</b>	<b>24 117</b>	<b>1 139</b>
<b>Assets</b>	<b>27 068</b>	<b>1 158</b>

EUR '000 (Unaudited)	31 Dec. 2020	31 Dec. 2019
<b>Equity</b>		
Share capital	98	80
Other paid-in capital	26 350	1 013
Retained earnings from income statement	-688	-213
<b>Total equity</b>	<b>25 760</b>	<b>880</b>
Provision for deferred tax	0	14
Lease obligations	406	0
<b>Total non-current liabilities</b>	<b>406</b>	<b>14</b>
Lease obligations, short-term	49	0
Trade payables	680	187
Payables to group enterprises	0	17
Other payables	45	60
H2Bus Consortium	40	0
Prepayments/accrued grants	89	0
<b>Total current liabilities</b>	<b>902</b>	<b>264</b>
<b>Liabilities</b>	<b>1 308</b>	<b>278</b>
<b>Liabilities and equity</b>	<b>27 068</b>	<b>1 158</b>

# Cash flow

EUR '000 (Unaudited)	Q4 2020	Q4 2019	FY 2020	FY 2019
Profit/loss before tax	-242	-172	-587	-253
Depreciation and amortization	23	1	51	1
Non-cash employee expense – warrant programme	35	0	35	0
Net exchange differences	-1	0	0	0
<i>Cash flows from operating activities before change in workingcapital and tax</i>	<b>-185</b>	<b>-171</b>	<b>-500</b>	<b>-252</b>
Change in inventories	0	0	0	0
Change in receivables	-339	0	-475	-252
Change in other provisions	0	0	0	0
Change in trade payables, etc	-397	-803	506	245
Corporation tax paid	70	0	70	0
<b>Cash flows from operating activities</b>	<b>-851</b>	<b>-975</b>	<b>-399</b>	<b>-260</b>
Purchase of intangible assets	-130	0	-189	0
Purchase of property, plant and equipment	-1 587	-20	-2 615	-20
Purchase of fixed assets	0	0	-10	0
<b>Cash flows from investing activities</b>	<b>-1 717</b>	<b>-20</b>	<b>-2 814</b>	<b>-20</b>
Reduction of lease obligations	-12	0	-28	0
Raising of lease obligations	35	0	483	0
Cash capital increase	25 354	1 027	25 354	1 027
Dividend paid	0	0	0	0
<b>Cash flows from financing activities</b>	<b>25 377</b>	<b>1 027</b>	<b>25 809</b>	<b>1 027</b>
<b>Change in cash and cash equivalents</b>	<b>22 809</b>	<b>32</b>	<b>22 596</b>	<b>747</b>
Cash and cash equivalents at the beginning	601	783	814	68
<b>Cash and cash equivalents at the end</b>	<b>23 410</b>	<b>814</b>	<b>23 410</b>	<b>814</b>



**Yesterday's wind  
Today's fuel**

H<sub>2</sub>

H<sub>2</sub>

H<sub>2</sub>

---

# Hydrogen in buildings

## Waterstofwijk Hoogeveen BatHyBuild

---

# Heating with Hydrogen

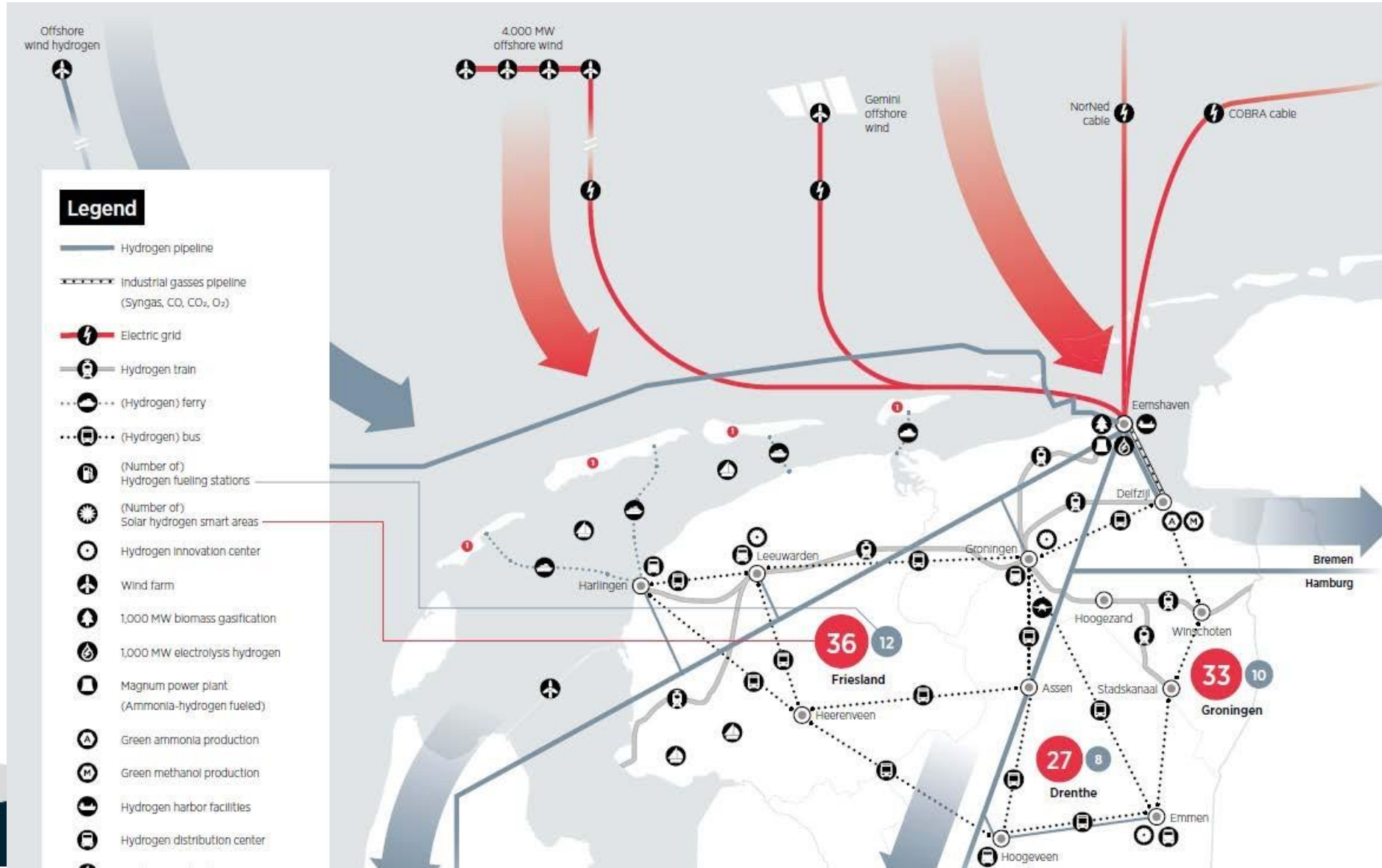
*a real case in Hoogeveen*

Dr. Ir. Jan-jaap Aué  
Professor Hydrogen Applications  
Hanze University of Applied Sciences  
[j.aue@pl.hanze.nl](mailto:j.aue@pl.hanze.nl)

**WATERSTOFWIJK HOOGVEEEN**



# The overall regional Hydrogen vision up to 2030



# A hydrogen hub in the North Netherlands

A solution for huge fluctuations between supply and demand



Eemshaven

De Rijp

From electricity...

...to hydrogen...

Electrolysis: separating water into hydrogen and oxygen

...to storage...

Underground gas storage Zuidwending  
Hydrogen storage in salt caverns

...to consumers

Methanation: CO<sub>2</sub> from the air reacts with hydrogen to form syngas which can be injected into the natural gas network

Blending H<sub>2</sub> into the natural gas network

Conversion into electricity

Hydrogen fueling stations

Houses

Transport

Industry





Ministerie van Infrastructuur en Milieu  
 Rijksdienst voor Ondernemend Nederland  
 SBE  
 NAM  
 Gasunie  
 Gasterra  
 energy valley  
 provincie groningen  
 HOLTHAUSEN GROUP

TNO innovation for life

SIEMENS

NAM

AkzoNobel  
Tomorrow. Antikera Today.

DNV-GL

CHEMPORT EUROPE

NUON

Resato



# Coalition of Hydrogen ambassadors Kick-off

12 September 2017



March 3, 2

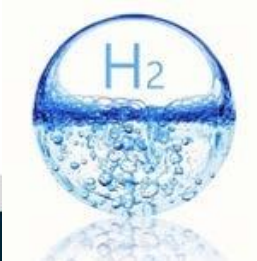
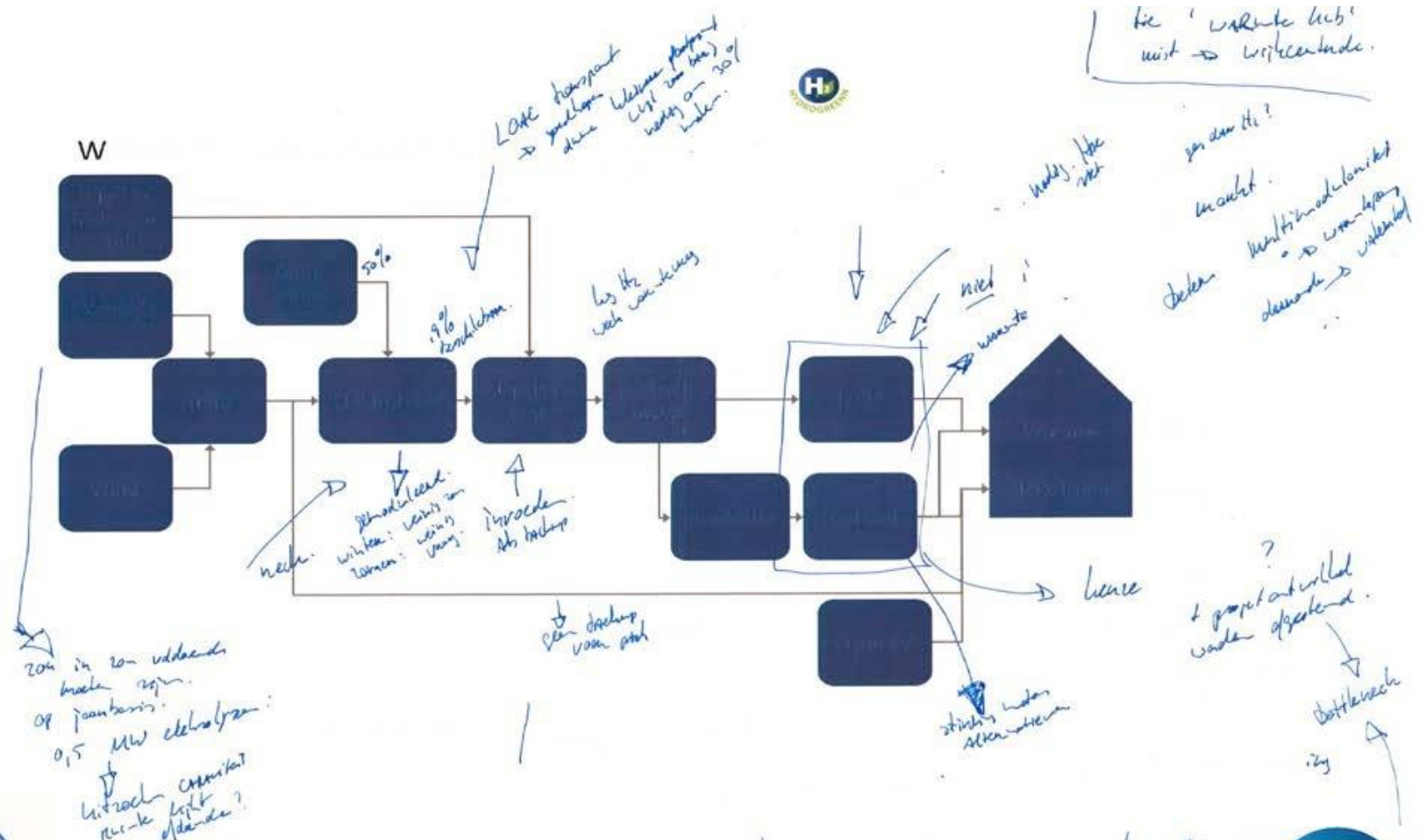
Page



# Hydrogreenn network



# Brainstorm Design sessions



15 februari '18  
elektrolyse als buffering.



## Consortium Waterstofwijk Hoogeveen



# Waterstofwijk Hoogeveen

Een blauwdruk voor waterstoftoepassing

## DOELSTELLING

De doelstelling is een blauwdruk te ontwikkelen voor de toepassing van waterstof in de woonwijken van Hoogeveen. Dit document is bedoeld als blauwdruk voor de realisatie van waterstofwijken.

## BESTAANDE WOONWIJZEN

De bestaande woonwijken zijn: Nijestad Oost, Nijestad West, Erlanden, Schutlanden West, Schutlanden Oost, Kattouw, NAM locatie Van Arle, Recreatieplas, RWZI, en de recreatieplas.

## BLAUWDRIJF

De blauwdrijf is een blauwdruk voor de toepassing van waterstof in de woonwijken van Hoogeveen. Dit document is bedoeld als blauwdruk voor de realisatie van waterstofwijken.

## DEMONSTRATIEWIJZEN IN NIJESTAD-OOST

De demonstratiewijzen in Nijestad-Oost zijn: Nijestad Oost, Nijestad West, Erlanden, Schutlanden West, Schutlanden Oost, Kattouw, NAM locatie Van Arle, Recreatieplas, RWZI, en de recreatieplas.

Bouw mee aan de waterstofketen van Hoogeveen

Plan de bouw van de waterstofketen van Hoogeveen met de nodige voorzieningen.

Als er sprake is van noodzakelijke objecten in de waterstofketen, wordt dat met een plan van de keten beschreven.

Hoogspanning

RWZI

Recreatieplas

NAM locatie Van Arle

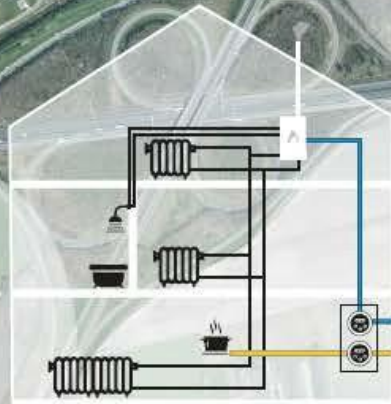
Nijestad Oost

Kattouw

Schutlanden West

Schutlanden Oost

Erlanden



WATER STOF WJK

# Project Management

## Project control

# Hydrogen Build Environment

## Society

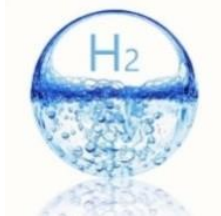
- Legal, Safety
- Public support
- Environment
- Societal BC

## Technology

- Boiler @home
- Fuelcell @home
- Infrastructure
- Measuring
- Storage & compression
- External Feed
- Conversion
- Power plant
- Plotplan
- testing
- Utilities
- Fall-back
- Control
- Safety

## Implementation

- Communication & public support
- Public Report
- Financing
- Market model



# timeline



## Waterstofwijk Hoogeveen

Implementatie Fase 1: Nijstad-Oost, nieuwbouw, 100% waterstof, 2021

Implementatie Fase 2: Erflanden, start ombouw 427 woningen, 2022

*Systeemfase 1: Externe aanvoer/opslag H<sub>2</sub>, middelste rij, 2021*

*Systeemfase 2: Locale productie H<sub>2</sub>, bovenste rij, 2023*

*Systeemfase 3: Aanvoer H<sub>2</sub>, onderste rij, via backbone, 2027*

# Main (generic) conclusions

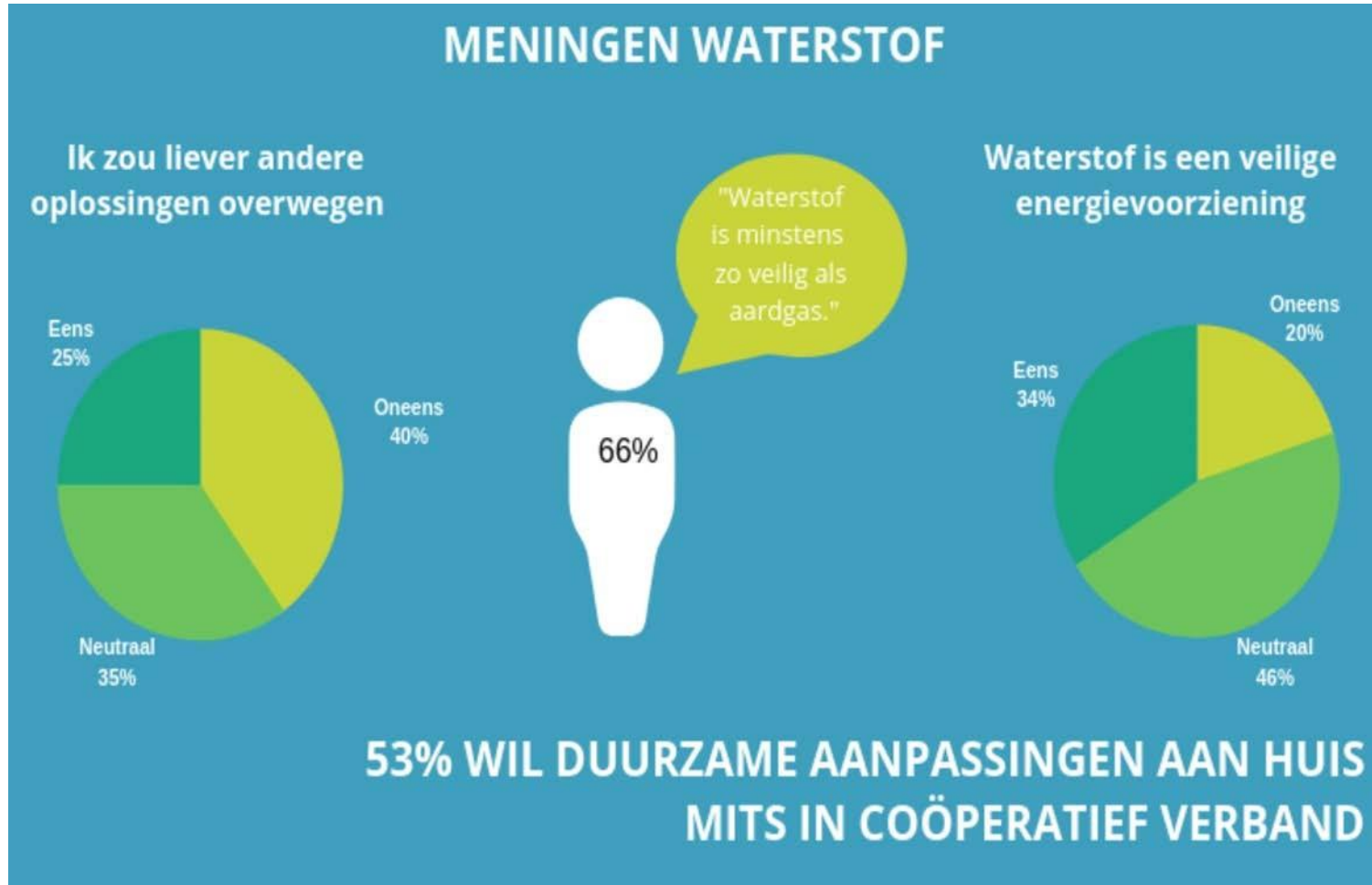
- Hydrogen is in specific cases an interesting addition to possible solutions for heat in the build environment against acceptable societal costs
- Safety issues are not significantly different from natural gas;
- Experiments needed : learning by doing on all levels;
- Integral problems need integral approach;
- Existing legislation can also offer solutions!
- Key for upscaling is production and industrialisation

# Public acceptance





# Public Acceptance



- Work on trust
- Access to (neutral) information
- Support cooperative movements

**14 mei 2019**  
**meeting for potential**  
**buyers**

**170 registered**  
**400+ visitors**



# Citizens involvement

- independent resident's council
- With support of Natuur en Milieu Federatie Drenthe
- Cooperation with 'Stad aan het Haringvliet'
- Involved in application for 'proeftuin aardgasvrije wijken'



# Societal Business Case (MKBA)

# Real Costs split into 3

Projection of Production prices

Transport & storage

Investments @Home

Costs before taxes, subsidies etc compared to alternatives and split into 'who is paying what'

# Condensing Boiler : rationale

## Installed base

- gasinfra
- Natural gas condensing boiler
- Installer networks
- Heating systems in place

## Costs

- little CAPEX
- Biggest change: other product on the bill

## technology

- low NOx
- No CO
- Scalable
- Combinations with hybrid heatpumps



# results

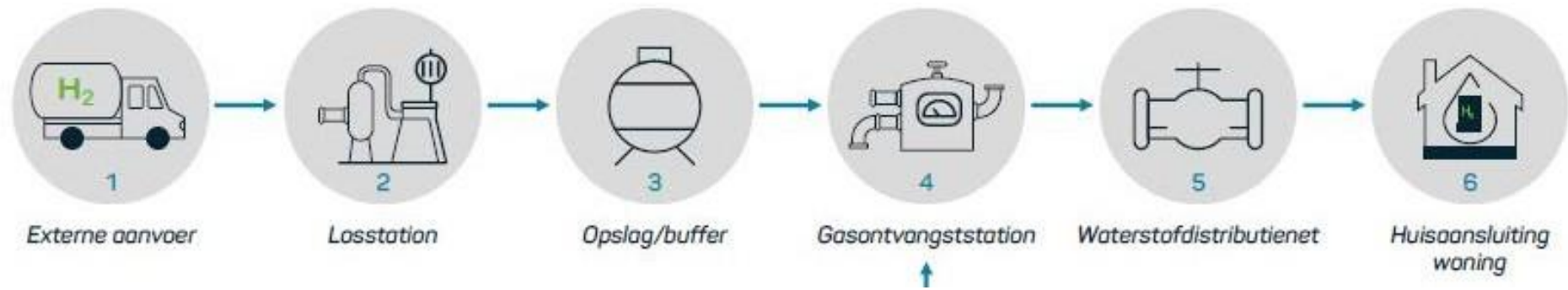
- Expanded knowledge on
  - Burning H<sub>2</sub>
  - H<sub>2</sub> appliance
- Endurance tests @ Entrance
  - Successfully completed
  - Lots of interest (and solutions) from 3rd parties
  - Installation guides, best practices etc
- OEM burner being developed by Bekaert
- Surprises:
  - low NO<sub>x</sub> (reduction: 60-80%)
  - white paper with DNV-GL



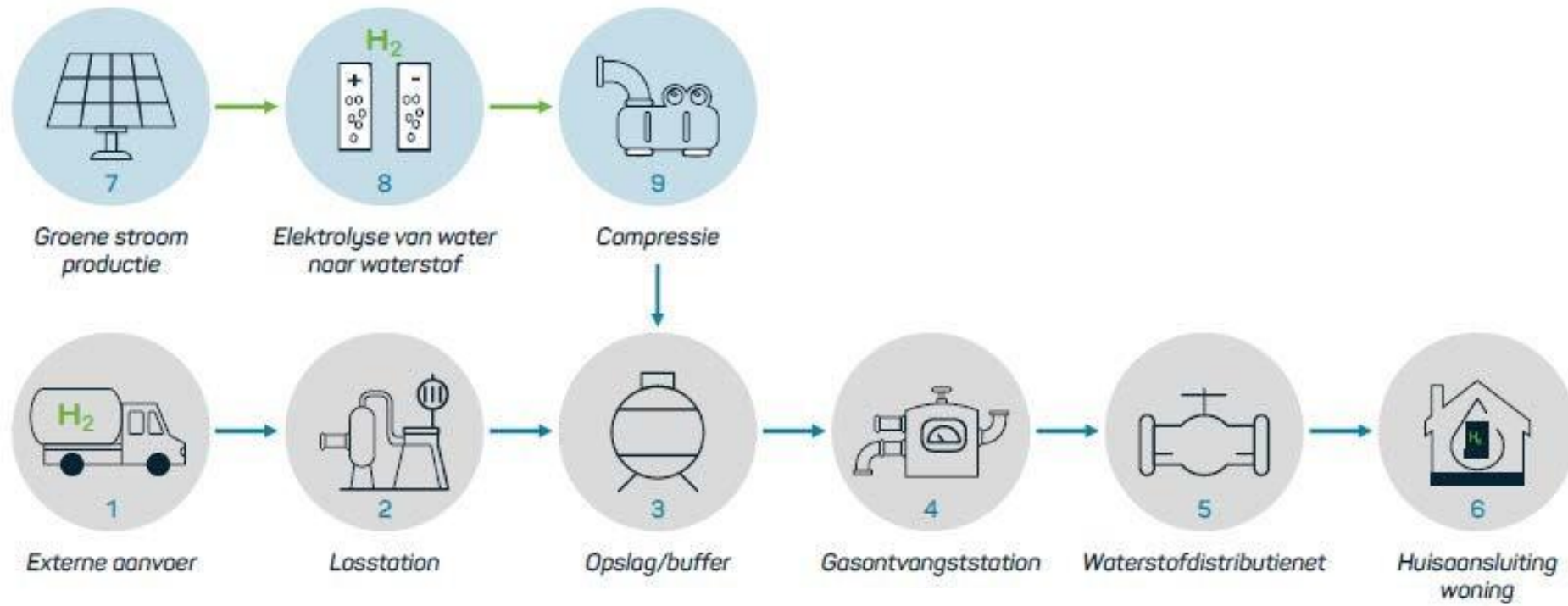




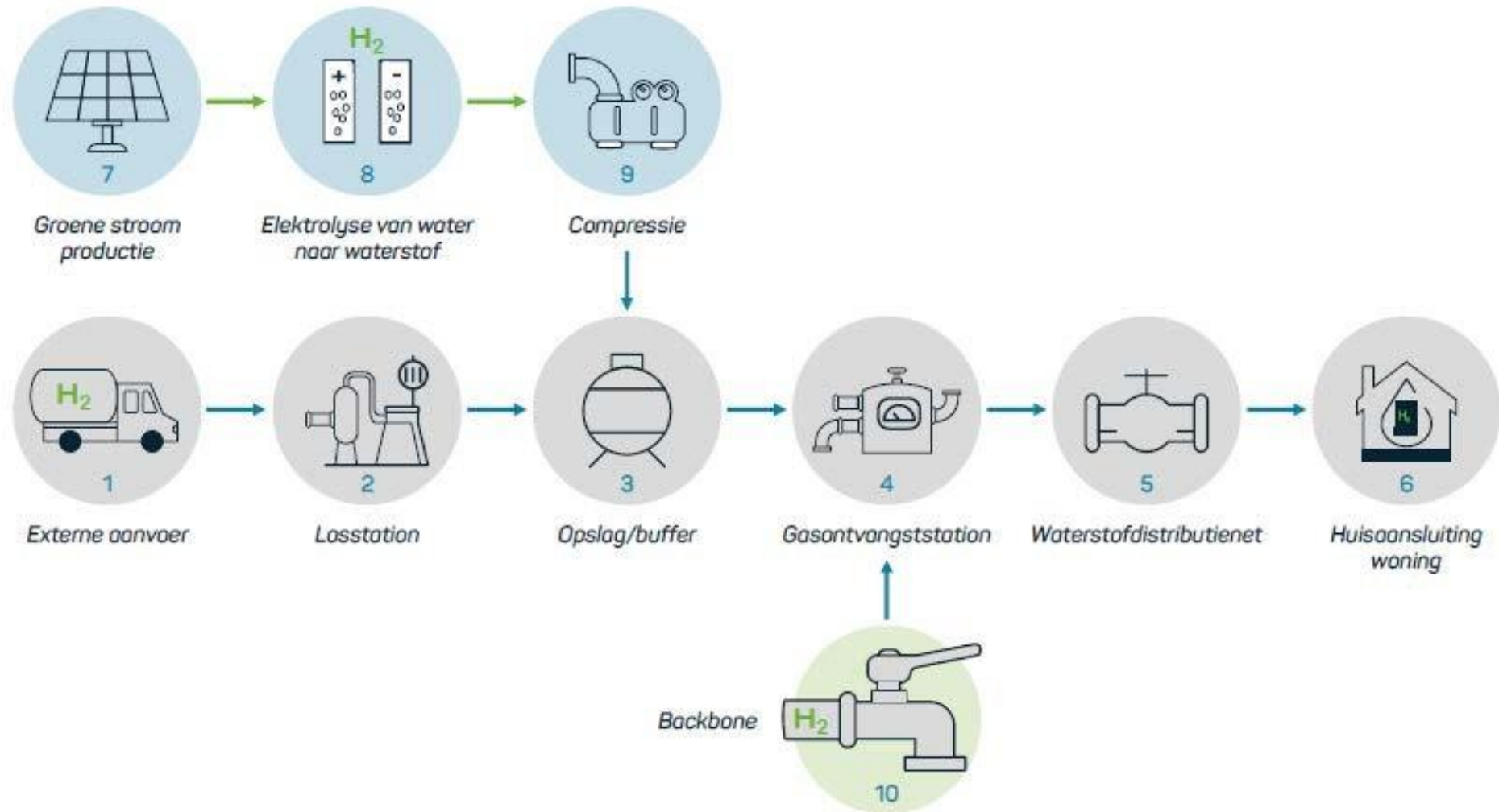
# Project system-phases (I) 2021



# Project system-phases (II) 2023



# Project system-phases (III) 2027



# Project implementation-phases

Fase 2: Erflanden  
Bestaand bouw  
6 woningen  
2023

Fase 3: Erflanden  
Bestaand bouw  
95 woningen  
2024

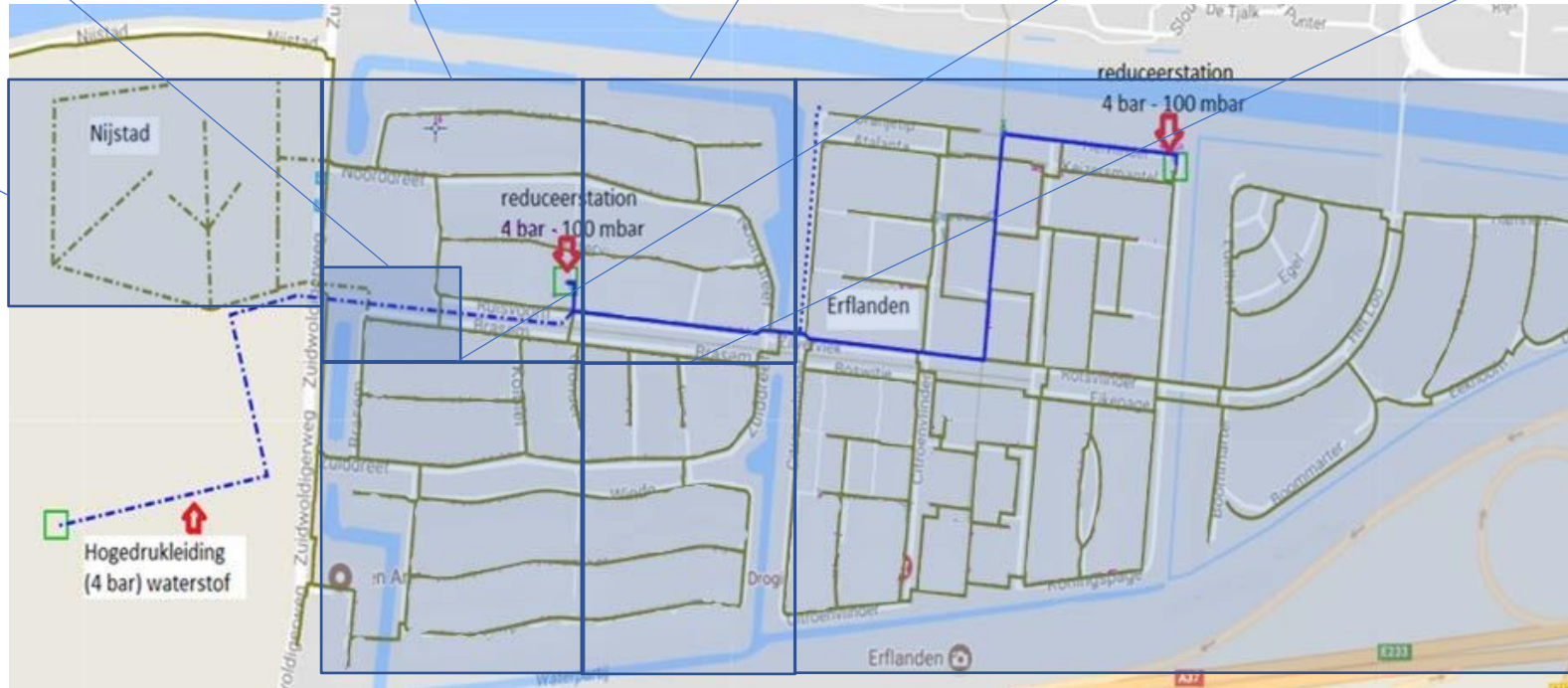
Fase 4: Erflanden  
Bestaand bouw  
193 woningen  
2025

Fase 5: Erflanden  
Bestaande bouw  
303 woningen  
2026

Fase 6: Erflanden  
Bestaande bouw  
418 woningen  
2027

Fase 1: Nijstad-oost  
Nieuwbouw  
80 woningen  
2021/2022

Fase 7: Erflanden  
Bestaande bouw  
> 420 woningen  
> 2028



# Public Report (Dutch)

<https://research.hanze.nl/en/publications/waterstofwijk-plan-voor-waterstof-in-hoogeveen>

<https://research.hanze.nl/en/publications/waterstof-in-de-gebouwde-omgeving-synthese-thematiek-waterstoflab>





# BatHyBuild

Bottom-up analysis of technologies for hydrogen in buildings

Jan Rongé (KU Leuven)

03/03/2021

**KU LEUVEN**



*fluvius.*  
Tot bij u

**ingenium**

# Aim of the study

Question:

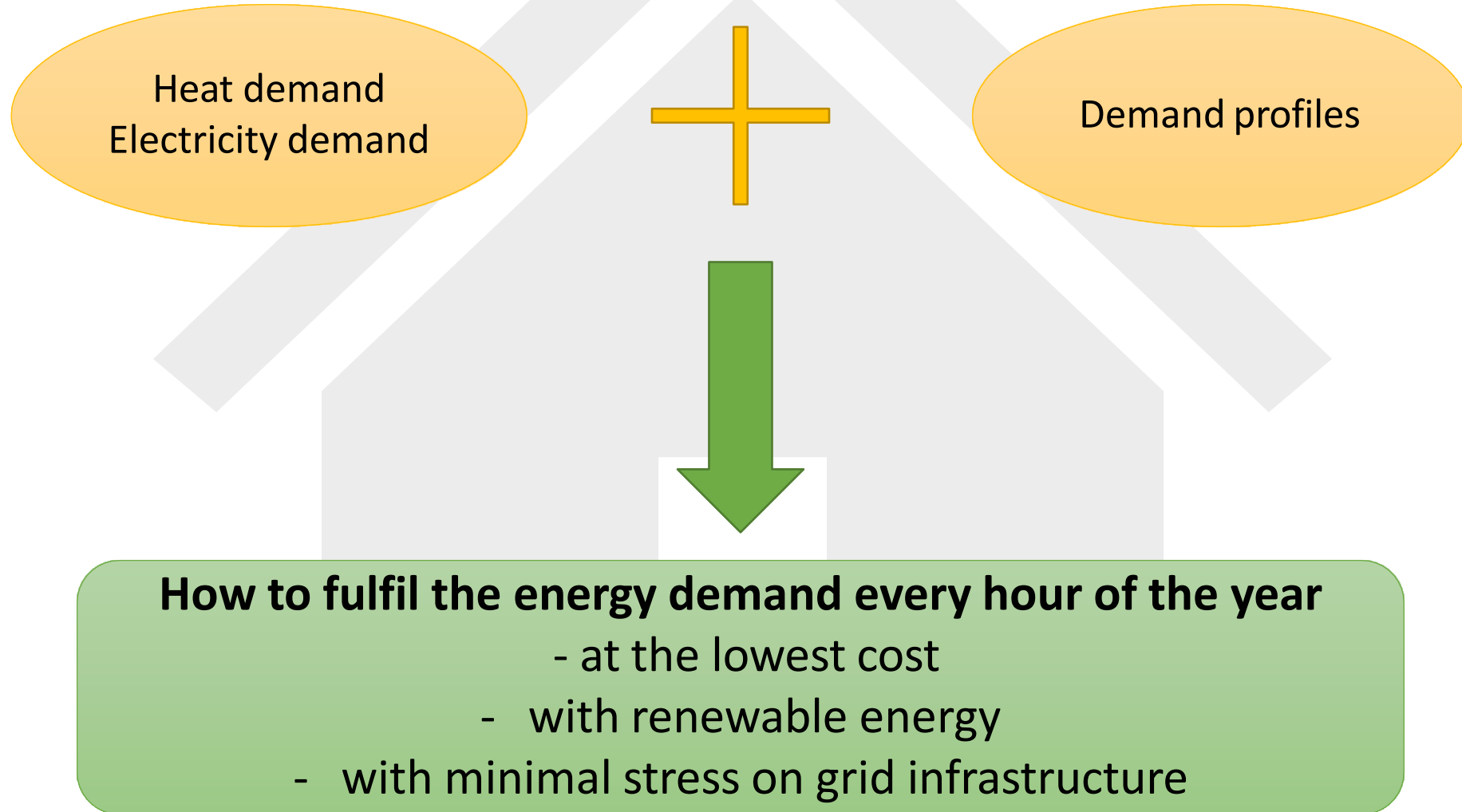
“Can hydrogen be useful in the built environment? If so, how?”

Input for

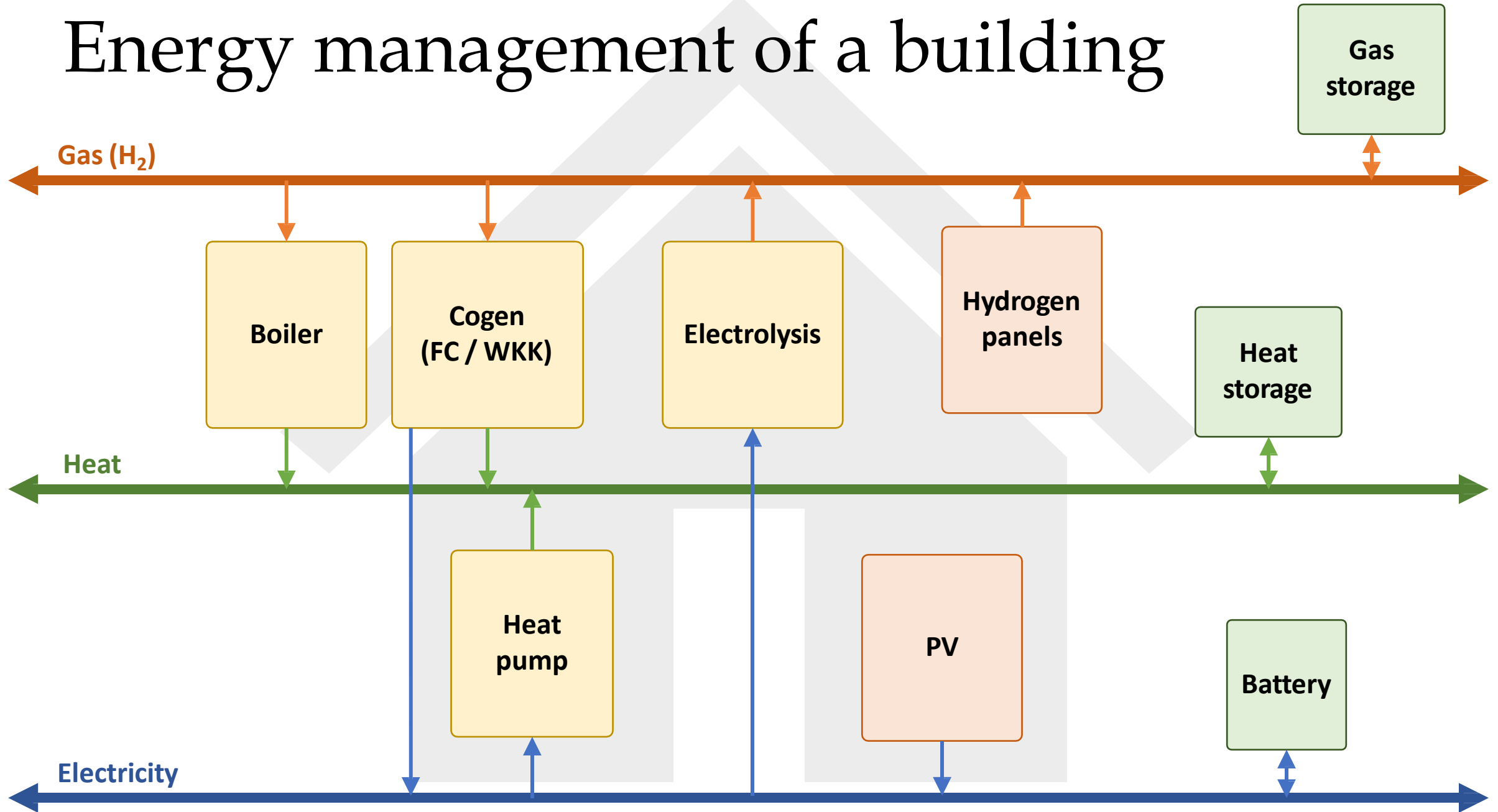
- pilot projects
- policy recommendations
- further studies



# Energy management of a building



# Energy management of a building

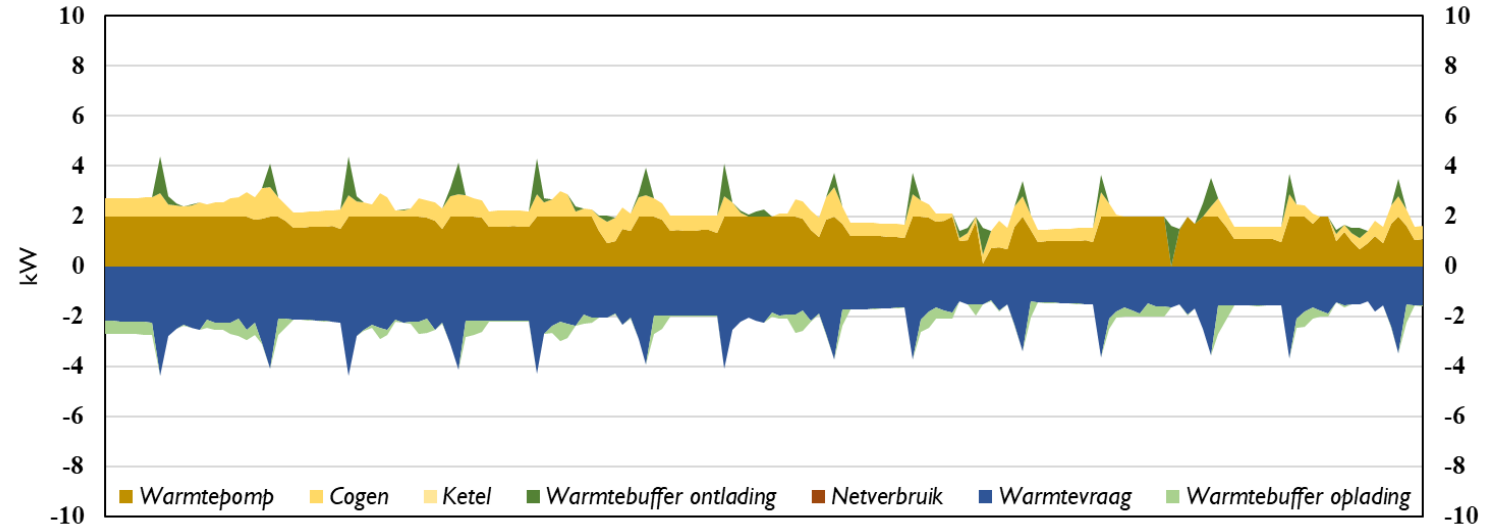


# Energy management of a building

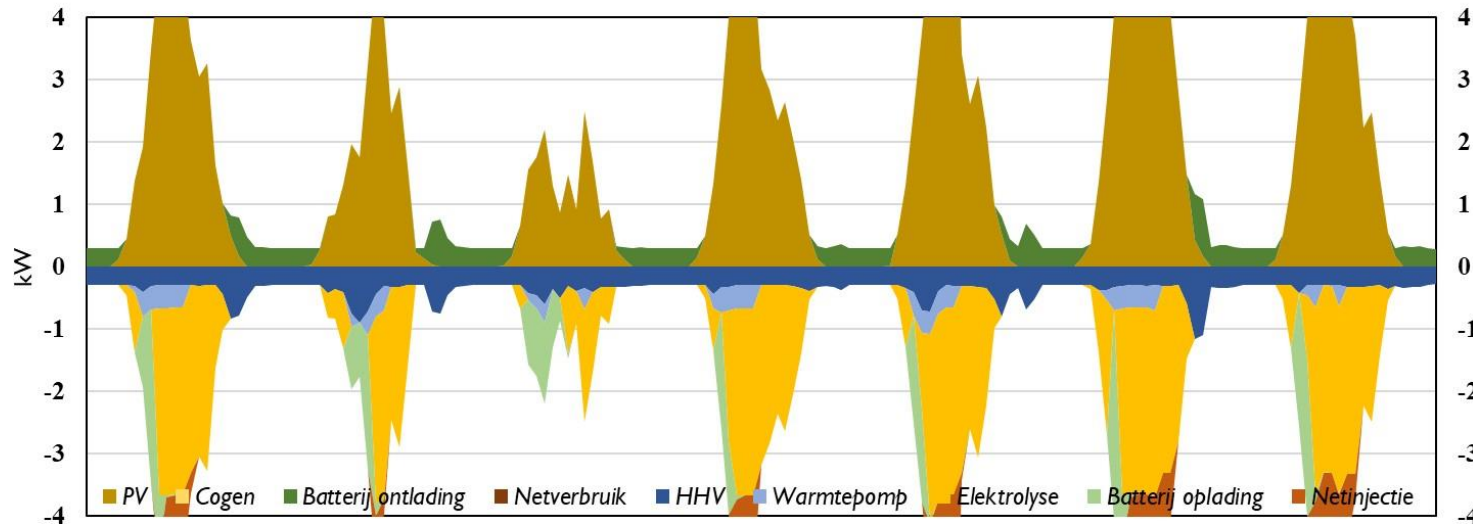
## Examples of resulting profiles

(9 MWh heat demand, heat pump + fuel cell, PV, electrolysis, battery, heat storage)

Warmte (januari)



Elektriciteit (juni)



# Model

- The model rests on important assumptions:
  - Hydrogen and electricity are **100% renewable**
  - **“Inifinite” supply** of green hydrogen is assumed via the gas distribution grid (import!)
  - Error bars refer to **optimistic / pessimistic scenarios** (technology development (cost, efficiency), energy price)
- Dozens of **contexts** were considered. Here, we provide a summary based on a few case studies:
  - Electricity demand is always 3 500 kWh/year
  - Hot water demand is always 2 800 kWh/year
  - Electricity prices are constant throughout the year
  - Scenarios are considered for **2050**. Some cases may however be interesting from 2030 onwards.

# Model

- There is (limited) consideration for e.g. influence of water temperature. However, hydraulic calculations are not fully taken into account.
- In the coming slides “**energy costs**” are shown: this is the total cost of gas, electricity, grid costs, CAPEX & OPEX of equipment, correction for remaining value
- Important assumptions (2050):

	Min	Base	Max
Electricity cost (excl. capacity tariff & VAT)	128 €/MWh	148 €/MWh	168 €/MWh
Hydrogen cost (LHV, excl. VAT)	80 €/MWh	90 €/MWh	110 €/MWh
Nominal COP heat pump (L-W)	4	5	6



A new house in a new neighbourhood



Renovation of an existing house



Renovation of an apartment complex

# 3 example scenarios

# New house

## All electric

- 5 MWh heat demand
- No gas grid

## Hydrogen boiler

- 5 MWh heat demand
- With gas grid

## Cogeneration

- 5 MWh heat demand
- With gas grid

# New house

## All electric

- 5 MWh heat demand
- No gas grid

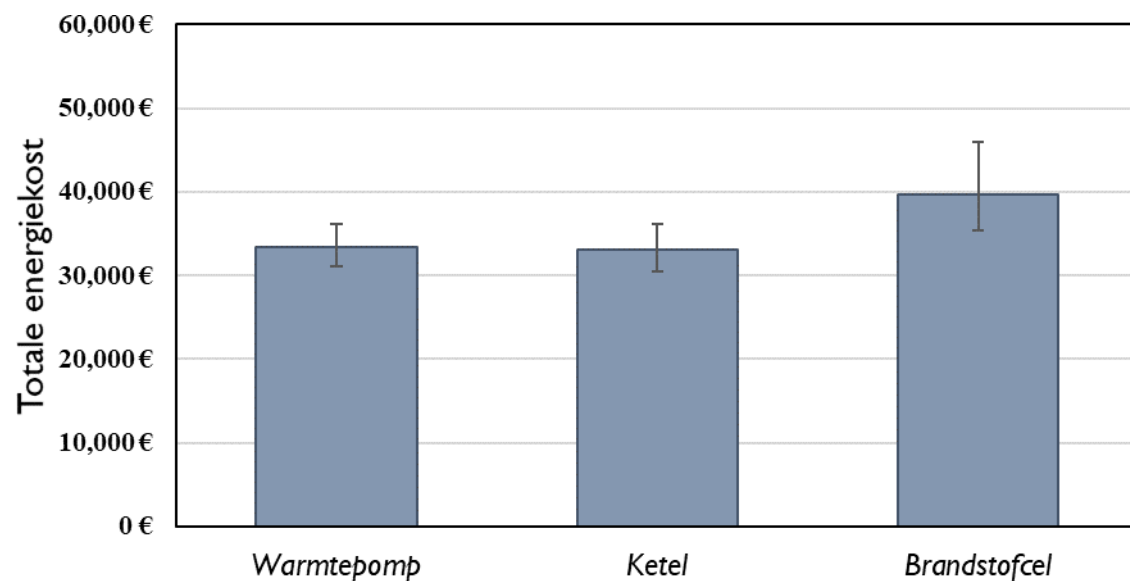
## Hydrogen boiler

- 5 MWh heat demand
- With gas grid

## Cogeneration

- 5 MWh heat demand
- With gas grid

### Energy costs (20 years)



### Notes on cogeneration:

- FC and CHP-burner have similar costs.
- The difference with heat pump becomes smaller with dynamic electricity prices



# New house

## All electric

- 5 MWh heat demand
- No gas grid

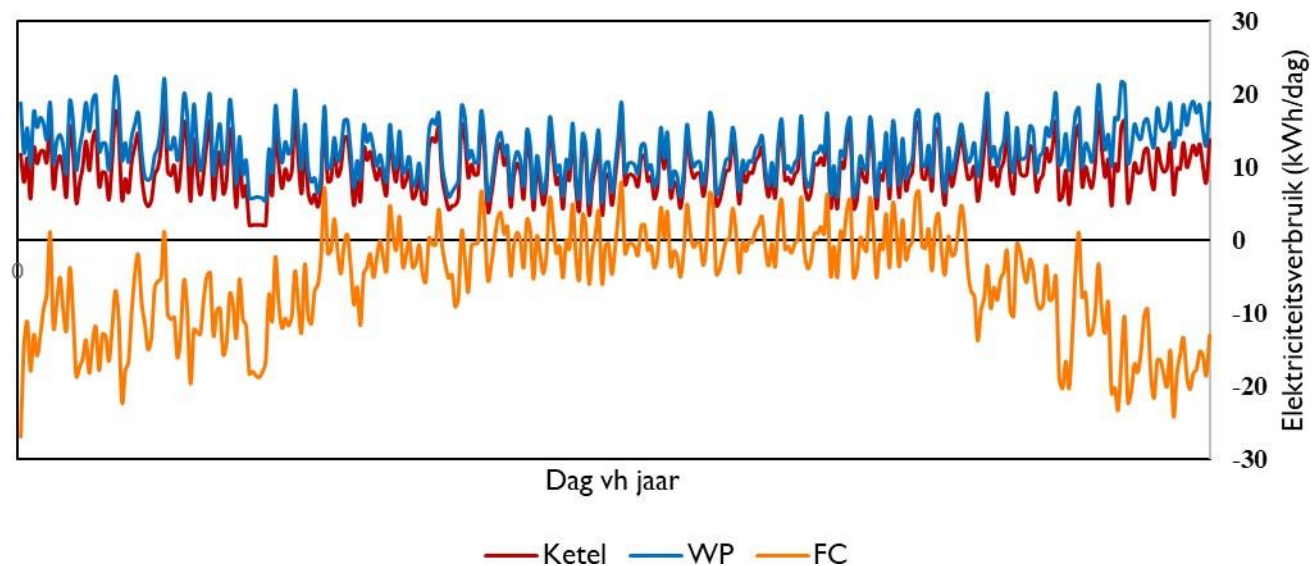
## Hydrogen boiler

- 5 MWh heat demand
- With gas grid

## Cogeneration

- 5 MWh heat demand
- With gas grid

### Grid electricity demand



# New house

## All electric

- 5 MWh heat demand
- No gas grid

- Low cost
- (Peak electricity demand is acceptable)
- No gas grid necessary
- Higher electricity demand in winter

## Hydrogen boiler

- 5 MWh heat demand
- With gas grid

- Low cost
- Gas grid needed: more suitable for existing neighbourhoods
- Lower electricity demand in winter

## Cogeneration

- 5 MWh heat demand
- With gas grid

- More expensive (ca. €400/year)
- Gas grid needed: more suitable for existing neighbourhoods
- Injection of green electricity during winter!

# Renovation

## Limited renovation

- 13 MWh heat demand
- No low temp. heating
- → *Hydrogen boiler*

## Maximum insulation

- 9 MWh heat demand
- No low temp. heating
- → *Hydrogen boiler*
- → *Heat pump + hydrogen boiler*

## Thorough renovation

- 9 MWh heat demand
- With low temp. Heating system
- → *Heat pump*

# Renovation

## Limited renovation

- 13 MWh heat demand
- No low temp. heating
- → *Hydrogen boiler*

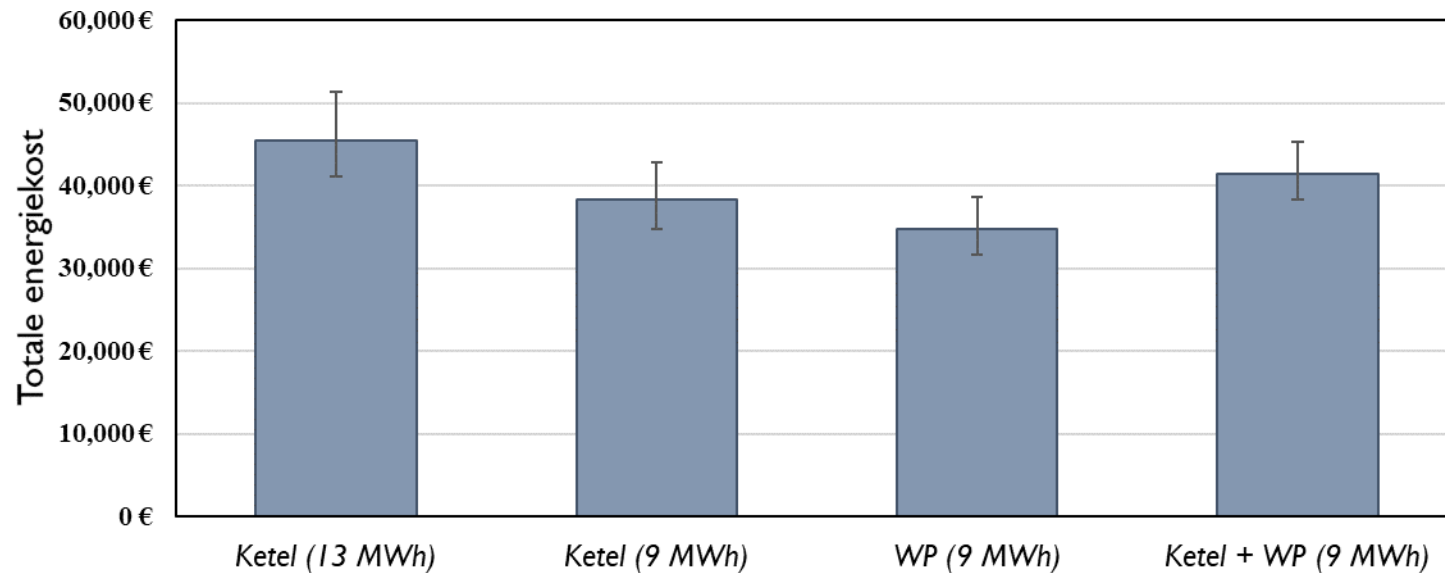
## Maximum insulation

- 9 MWh heat demand
- No low temp. heating
- → *Hydrogen boiler*
- → *Heat pump + hydrogen boiler*

## Thorough renovation

- 9 MWh heat demand
- With low temp. Heating system
- → *Heat pump*

## Energy costs (20 years)



# Renovation

## Limited renovation

- 13 MWh heat demand
- No low temp. heating
- → *Hydrogen boiler*

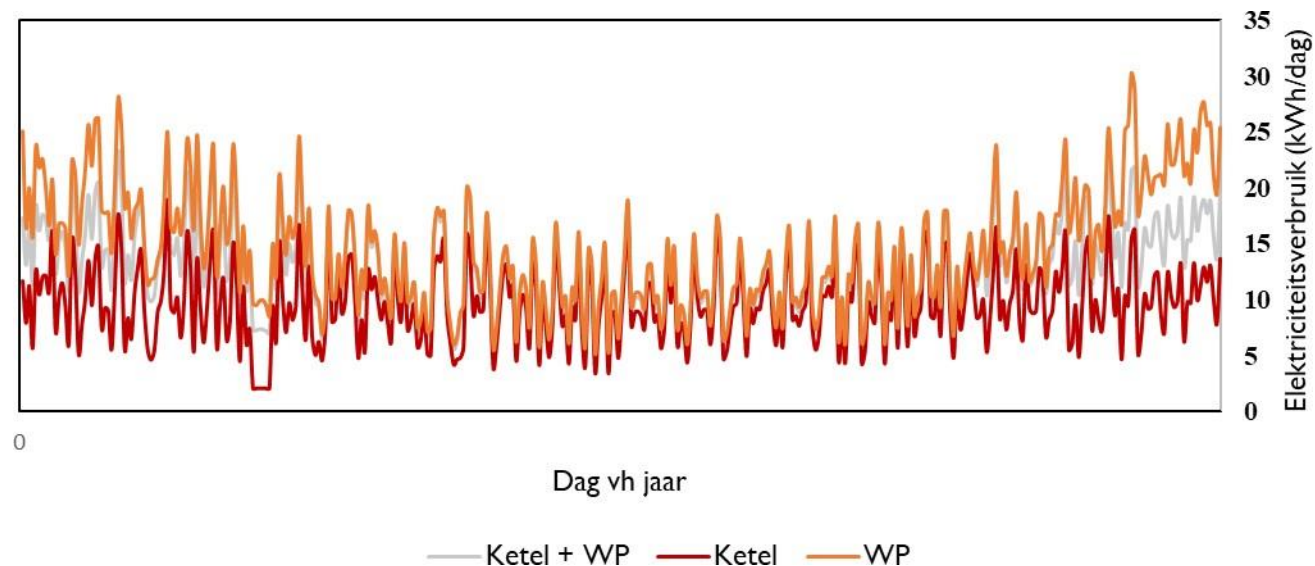
## Maximum insulation

- 9 MWh heat demand
- No low temp. heating
- → *Hydrogen boiler*
- → *Heat pump + hydrogen boiler*

## Thorough renovation

- 9 MWh heat demand
- With low temp. Heating system
- → *Heat pump*

## Grid electricity demand



# Renovation

## Limited renovation

- 13 MWh heat demand
- No low temp. heating
- → *Hydrogen boiler*

- Costly option (ca. €8000 higher energy costs compared to option 2)
- Lower renovation costs

## Maximum insulation

- 9 MWh heat demand
- No low temp. heating
- → *Hydrogen boiler*
- → *Heat pump + hydrogen boiler*

- Low cost option: only € 4000 higher energy costs compared to option 3 (but lower renovation costs)
- Benefit of hybrid heat pump unclear

## Thorough renovation

- 9 MWh heat demand
- With low temp. Heating system
- → *Heat pump*

- Lowest energy costs
- Low temp. heating required
- Much higher electricity demand in winter

# Apartment complex

## All electric

- 5 MWh heat demand
- Central heat pump

## Cogeneration

- 5 MWh heat demand
- Central heat pump + cogeneration
- 1 gas grid connection

## H2 boiler

- 5 MWh heat demand
- Central hydrogen boiler
- 1 gas grid connection

# Apartment complex

## All electric

- 5 MWh heat demand
- Central heat pump

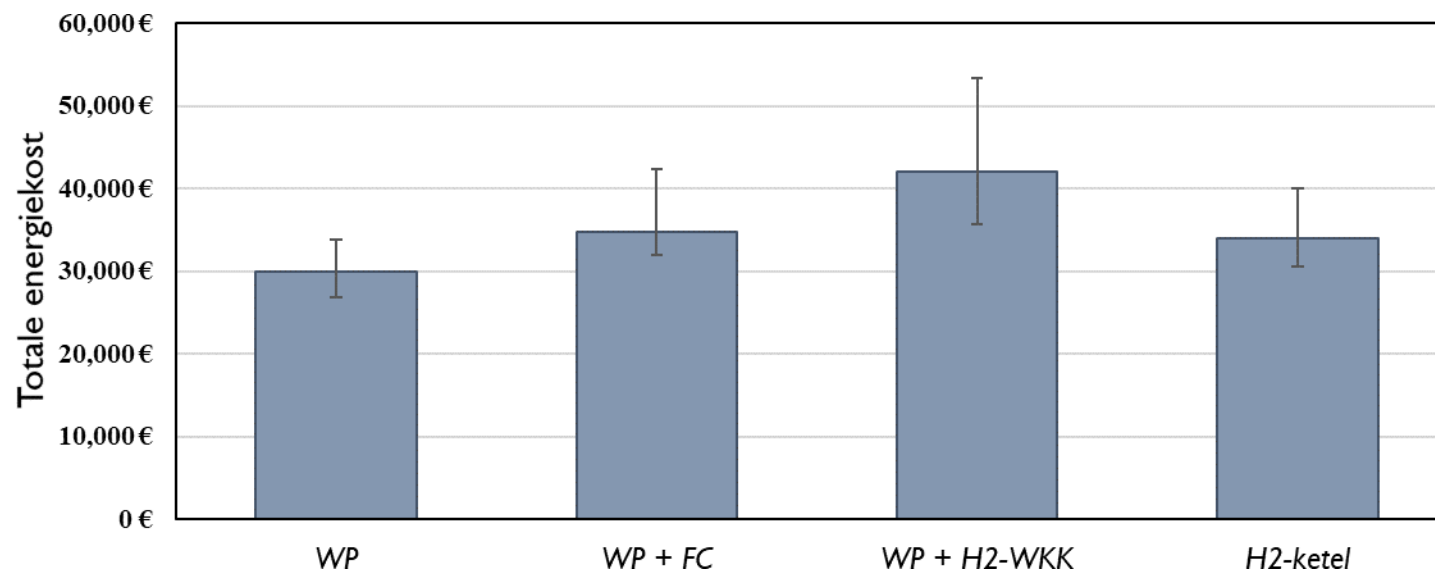
## Cogeneration

- 5 MWh heat demand
- Central heat pump + cogeneration
- 1 gas grid connection

## H2 boiler

- 5 MWh heat demand
- Central hydrogen boiler
- 1 gas grid connection

### Energy costs (20 years)





# Apartment complex

## All electric

- 5 MWh heat demand
- Central heat pump

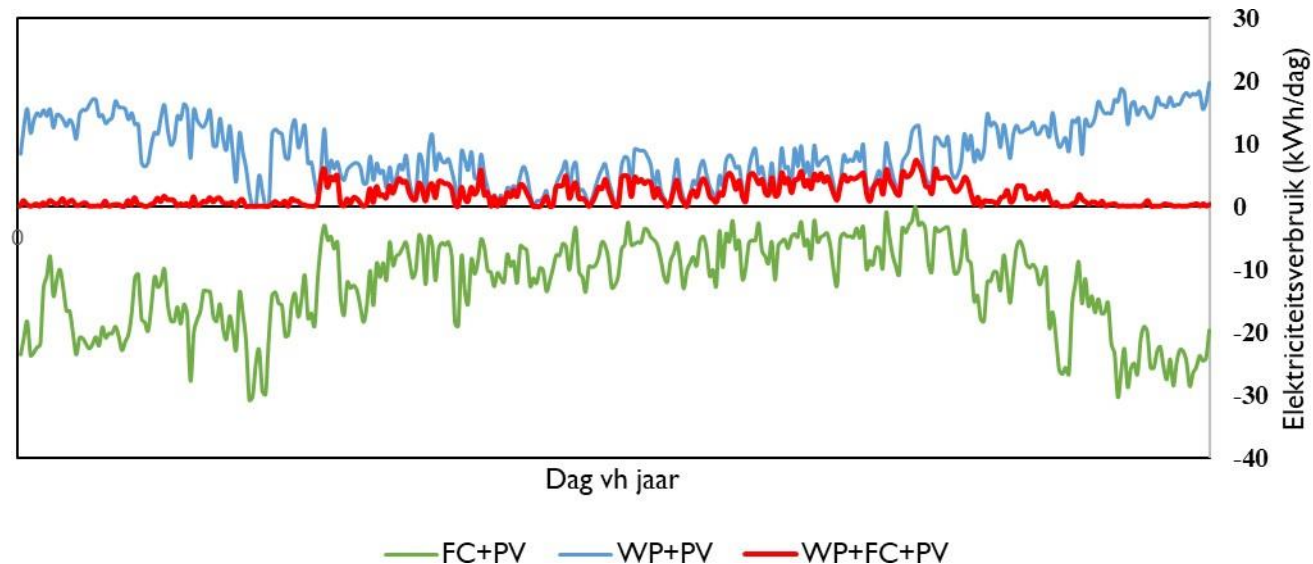
## Cogeneration

- 5 MWh heat demand
- Central heat pump + cogeneration
- 1 gas grid connection

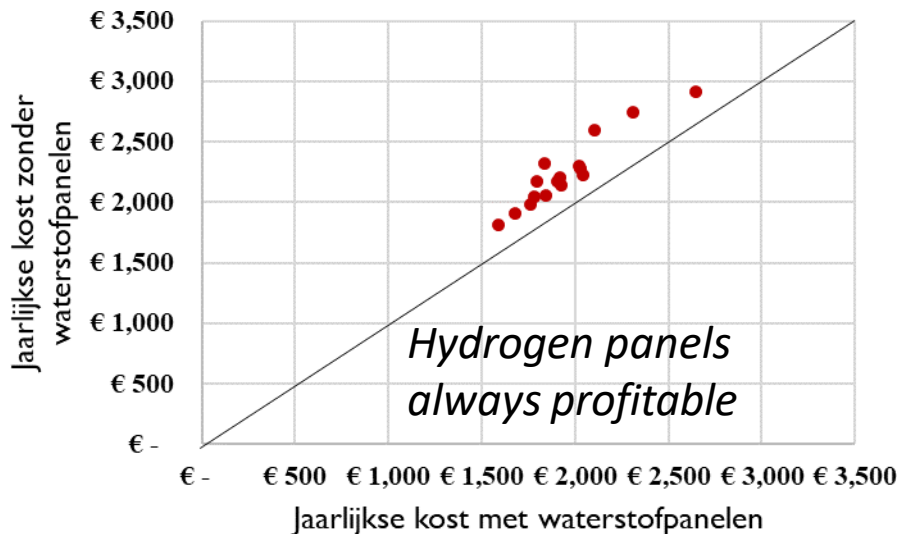
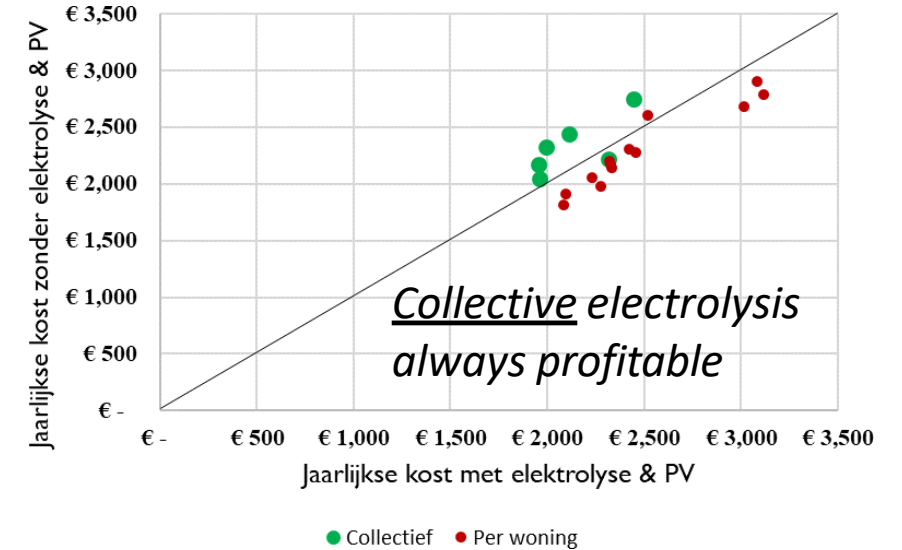
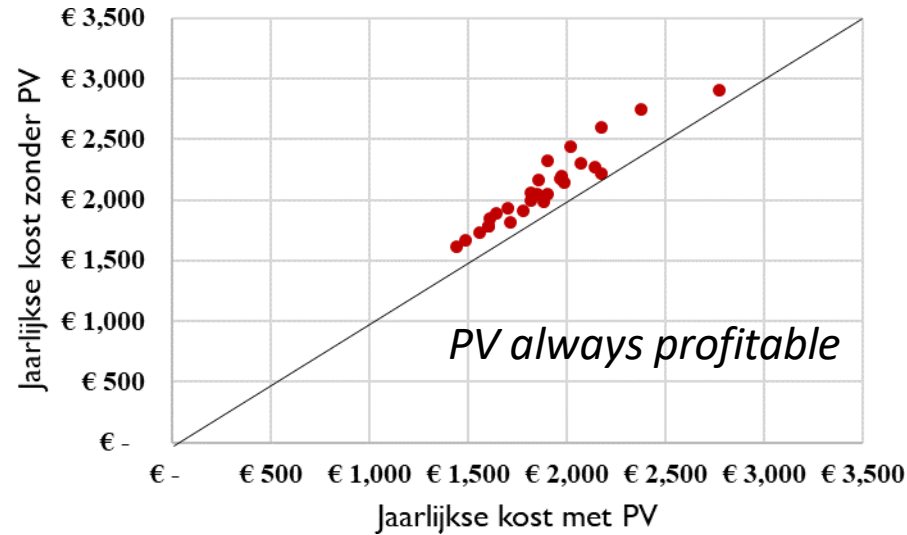
## H2 boiler

- 5 MWh heat demand
- Central hydrogen boiler
- 1 gas grid connection

### Grid electricity demand (per unit, incl. PV)



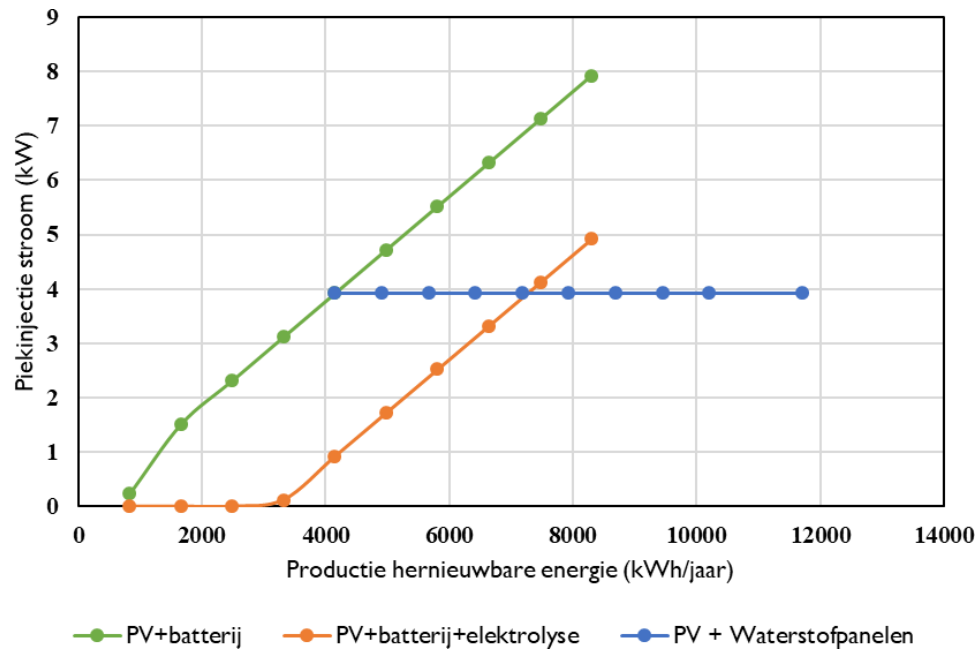
# Renewable energy production



Local renewable energy production is always a smart idea.

It is typically best to always install PV, also when hydrogen is produced.

# Renewable energy production



Hydrogen allows for much more local renewable energy production, without additional load on the electricity grid.

Households can be  
Consumer ☀️ Prosumer ☀️ Producer

# General conclusion

## All-electric seems more appropriate

- New neighbourhoods without district heating (→ no new gas grids)
- Thorough renovations with LT heating

## To be further investigated

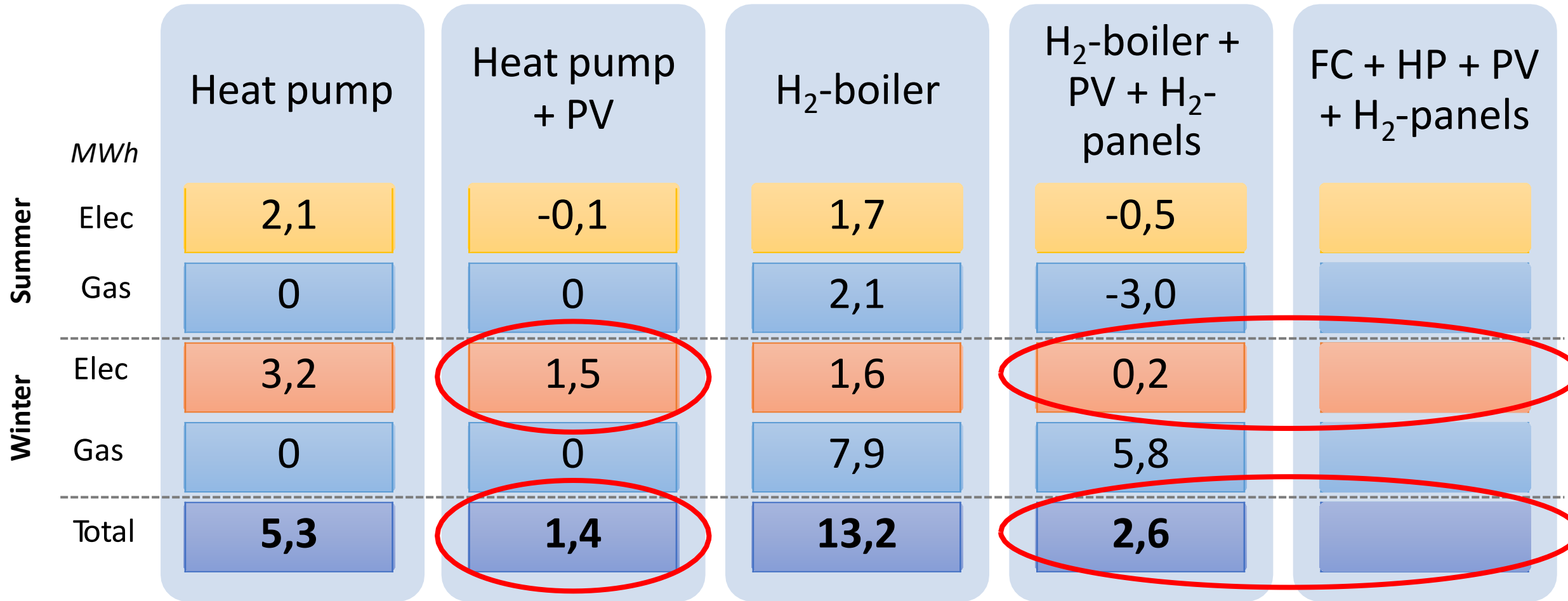
- New buildings in existing neighbourhoods
- District heating & apartments
- Cogeneration: higher cost for individual vs added value for the energy system

## Hydrogen seems more appropriate

- Renovations where LT heating is difficult
- Fast switching of many households to renewable energy when renovation is too slow (! insulation still desirable)

# Efficiency?

Grid energy demand per season,  
In a building with 9 MWh heat demand



The use of hydrogen requires **more primary energy input**, but **reduces stress on domestic renewable electricity production**. This assumes the import of renewable, low cost hydrogen.

# Final remarks

This study relies on many assumptions. It is a first step, and more investigations are required:

- Grid infrastructure? Capacity of electrical grid? Hydrogen backbone?
- Import green hydrogen?
- Role of gas-fired power plants?
- Domestic renewables production?
- Market prices, tariff structures?
- Boundary conditions of implementation?

# Recommendations

- 
- Insulation is always a good measure. Renovation efforts should increase.
  - Renewable energy is always a good measure. Hydrogen reinforces this.
  - All-electric is often a good choice.
  - In many cases, hydrogen is a valid option and potentially the best one.
  - More (top-down) research is needed towards the use of hydrogen in buildings.
  - Pilot projects are needed to investigate the boundary conditions.
  - Policymakers should develop a vision, with horizon 2050 and based on studies.

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# Development and production of heavy duty FC vehicles by Hyzon Motors Europe

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HYZON

Accelerating the energy transition

# Hydrogen Mobility

Company presentation March 2021



## Stefan van der Spek

Sales Manager Europe **E** stefan.vd.spek@hyzonmotors.com **M** +31 6 27308988 **P** +31 598 760 100

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# HYZON





# HOLTHAUSEN

## CLEAN TECHNOLOGY

### WORKING ON ZERO-EMISSION MOBILITY

Holthausen Clean Technology has been involved in hydrogen-electric and battery-electric vehicles for more than five years now.

We began as a developer, converting vehicles powered by fossil fuels to emission-free sustainable future with zero emissions. One example from our portfolio is the world's first hydrogen-powered sweeper.

## FROM R&D TO A RESPECTED MANUFACTURER

We have progressed in the meantime beyond the developer stage and have grown to become a fully fledged producer of hydrogen-electric and battery-electric vehicles. We specialize in supplying zero-emission trucks and commercial vehicles that we deliver all over the world from our production facility.

The experience that we have accumulated in developing and building various types of vehicles has given us a great deal of knowledge and professionalism.

These are key ingredients that we now have in-house for developing new types of vehicles that run on the cleanest energy source in the world: hydrogen.

We are ready and waiting to develop the customized power train you need so that your vehicle fleet will also be ready for a zero-emission future.



# First look at the first HYZON Motors Demo truck...

This is the HYZON Demo truck soon to be presented.

In this picture we have on the left side Carl Holthausen and on the right side Max Holthausen



# HYZON HyMAX-160



The HYZON HyMax-160 chassis is perfectly suitable for applications like box truck, refrigerator trucks or Refuse collecting vehicles and is completely zero emission.

#### Electric driveline

Electric motor type: HYZON-160-M  
 Motor power: 160 kW  
 Voltage system: 450 V  
 Battery pack: 70 kWh  
 Onboard-charger: 22 kW  
 Type of connection for charging: CCS / Type 2

#### Hydrogen driveline

Type Fuel Cell: HYZON-60-F  
 Power Fuel Cell: 60 kW  
 Cylinder pressure: 350 Bar  
 Standard amount of Hydrogen: 30 kg

#### Basic specifications chassis

Type chassis: HyMax-160  
 Minimal wheelbase: 3.900 mm  
 Type of gearbox: 6 speed automatic Allison gearbox  
 PTO: Possibility to be connected to the gearbox  
 Structure options: Box, RCV, Refrigerator, empty chassis

#### Options for HyMax-160

Remove 1 or add 1 extra cylinder: 5 kg per cylinder at 350 Bar  
 Extra Fuel Cell power: Can be adjusted by a minimum of 20 kW

# HYZON HyMAX-250



The HYZON HyMax-250 puller is perfectly suitable for national and international trailer transport...

#### Electric driveline

Electric motor type: HYZON-250-M  
 Motor power: 250 kW  
 Voltage system: 700 V  
 Battery pack: 140 kWh  
 Onboard-charger: 22 kW  
 Type of connection for charging: CCS / Type 2

#### Hydrogen driveline

Type Fuel Cell: HYZON-80-F  
 Power Fuel Cell: 80 kW  
 Cylinder pressure: 350 Bar  
 Standard amount of Hydrogen: 30 kg

#### Basic specifications chassis

Type chassis: HyMax-250  
 Minimal wheelbase: 3.800 mm  
 Type of gearbox: 12 speed automatic TraXon gearbox  
 PTO: Possibility to be connected to the gearbox

#### Options for HyMax-250

Remove 1 or add 1 extra cylinder: 5 kg per cylinder at 350 Bar  
 Extra Fuel Cell power: Can be adjusted by a minimum of 20 kW  
 Stronger motor: 450 kW motor

# HYZON HyMAX-450



The HYZON HyMax-450 puller is perfectly suitable for national and international trailer transport

#### Electric driveline

Electric motor type: HYZON-450-M  
 Motor power: 450 kW  
 Voltage system: 700 V  
 Battery pack: 140 kWh  
 Onboard-charger: 22 kW  
 Type of connection for charging: CCS / Type 2

#### Hydrogen driveline

Type Fuel Cell: HYZON-80-F  
 Power Fuel Cell: 80 kW  
 Cylinder pressure: 350 Bar  
 Standard amount of Hydrogen: 30 kg

#### Basic specifications chassis

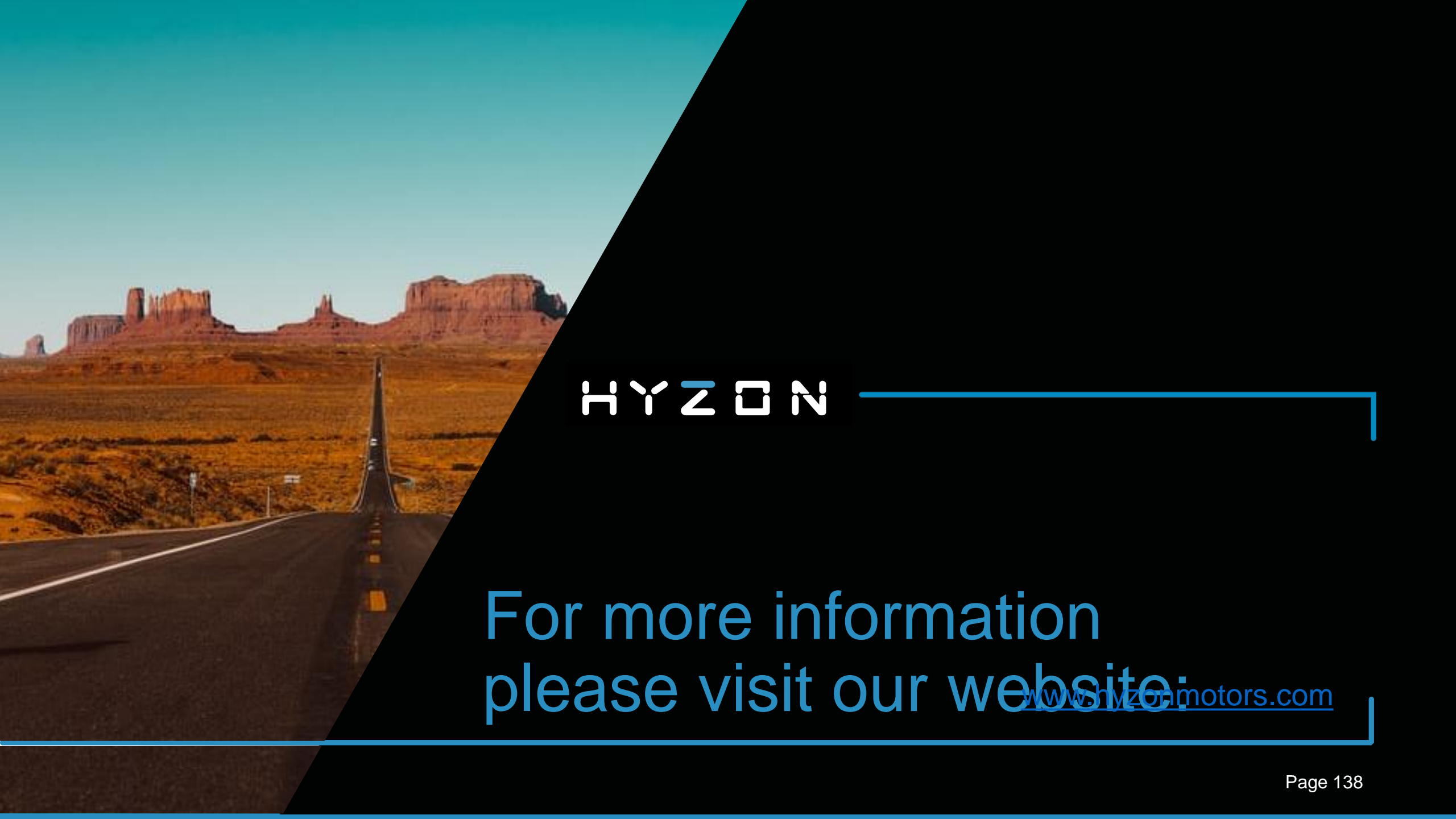
Type chassis: HyMax-450  
 Minimal wheelbase: 3.800 mm  
 Type of gearbox: 12 speed automatic TraXon gearbox  
 PTO: Possibility to be connected to the gearbox

#### Options for HyMax-450

Remove 1 or add 1 extra cylinder: 5 kg per cylinder at 350 Bar  
 Extra Fuel Cell power: Can be adjusted by a minimum of 20 kW







HYZON

For more information  
please visit our website: [www.hyzonmotors.com](http://www.hyzonmotors.com)

○ End of the presentation...

Thank you for your attention !

# Developments in the WIC

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- New WN team member: Samira Farahani
- (New )member info
- Working groups
- Networking & meetings
- News from the governements FL-B-NL
- Follow-up strategic plan for Flanders
- Overview FL/BE/EU funding

# NEW MEMBERS SINCE PREVIOUS MEETING NOV. 2020



# WORKING GROUPS

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## Policy



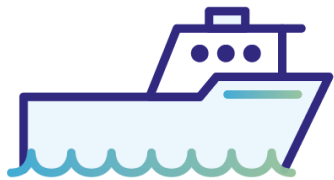
Evaluation & statements  
Related to EU or national legislation

## Mobility



Monitoring and facilitating H<sub>2</sub> refuelling stations in Benelux.  
Increase utilisation.

## Shipping



Development of H<sub>2</sub> pilots  
(coll. With De Blauwe Cluster)

## H<sub>2</sub> for the general public



Disclosing the world of H<sub>2</sub>  
to the broader public

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## MEMBER INFO & NETWORKING

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- **Product & Competence** form per partner
  - Soon available on cluster portal on WaterstofNet website
- **WIC Webinar**, next edition on 25/3, 16.00-17.30
  - Topics: EU organisations H<sub>2</sub>, CertifHy
  - Topic from cluster member tbc
- **Cluster meetings**, next on June 2
- **Meet & Greet**, April 22 (tbc)





# H2 NEWS FROM OUR GOVERNMENTS (FL/BE)

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## ➤ FL/B recovery budgets

- FL 125M€ mainly for H<sub>2</sub> IPCEI
- BE 95 M€ for hydrogen backbone

## ➤ Hearing on H<sub>2</sub> in federal parliament (02/03/2021):

- PoA, WN, Fluxys, Essencia, Febeg, Ad Van Wijk, Energyville
- <http://www.dekamer.be/media/index.html?language=nl&sid=55U1457>

## ➤ Online info session on ‘**Horizon Europe** “working programs”

- **March 16**, organised by EWI en NCP Flanders
  - Subscription via [www.ewi-vlaanderen.be/evenementen/horizon-europa-de-werkprogrammas](http://www.ewi-vlaanderen.be/evenementen/horizon-europa-de-werkprogrammas)
-



5 november 2020

## Cabinet visits March-April 2021

### Flanders

**Zuhail Demir** (N-VA), Environment & Energy (23/3)

**Hilde Crevits** (CD&V), Economy & Innovation & Employment

**Lydia Peeters** (Open VLD) Mobility & Public works

**Matthias Diependaele** (N-VA), Finances & Budget (15/3)

**Jan Jambon** (N-VA), Minister-president

### Federal

**Pierre-Yves Dermagne** (PS), Economy & Employment

**Zakia Khattabi** (Ecolo), Climate, Environment, Sustainable development & Green Deal (10/3)

**Tinne Van der Straeten** (Groen), Energy

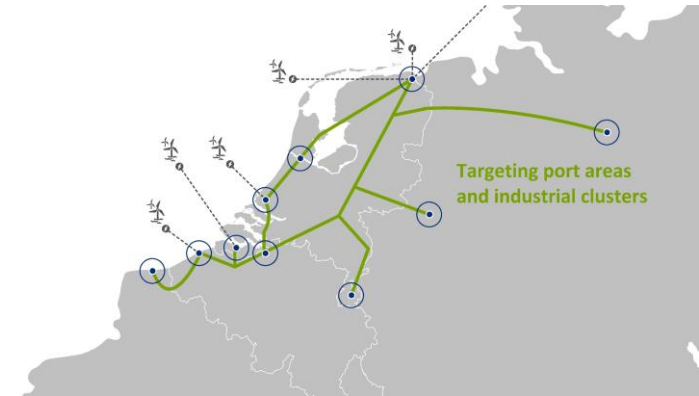
**Thomas Dermine** (PS), Recovery & Strategic Investments, Science policy

- “Nationaal Waterstof Programma”: to achieve the climate agreement (klimaatakkoord) goals for hydrogen in the Netherlands ([Nationaal Waterstof Programma · Nationaal Waterstof Programma](#))
  - The cross-sectoral hydrogen working group (CSWW), started in January 2021, is a temporary working group that will draw up the work plan for the National Hydrogen Programme (NWP) for the period 2022-2025, with a look at 2030.
  - Approach and timing:
    1. Q1 2021: Inventory and gap analysis - Inventory for completed, ongoing and new initiatives and activities; Identifying gaps in gap analysis.
    2. Q2 2021: formulating a work plan for the NWP for the period 2022-2025 with a view to 2030
  
- RVO
  - Horizon Europe starting events: 4-30 March 2021
  - Horizon Europe Kick-off event: **Date: 4 March 2021**; **Duration:** 10:30-12:00, **Location:** online **Language:** Dutch (more info: [Horizon Europe startevenementen | Topsector Energie](#))
  - **Registration for events via:** [Waldo \(andgage.io\)](#)

# H2 NEWS FROM OUR GOVERNMENTS (FL/NL)

## ➤ IPCEI

- Flanders: 11 proposals approved
- The Netherlands: 65 proposals eligible
- Germany: Planning: prenotification Q1-Q2 2021



# OVERVIEW EU/NL/B/FL FUNDING

Funding programme	Region	Submission deadline	Description	Website
MOOI	NL	<b>20/4/2020</b>	Research and development of the creation of flexibility in wind farms and the possibilities for offshore system integration in the form of energy consumption and energy conversion close to the source. Conversion to hydrogen plays an important role here.	<a href="https://www.topsectorenergie.nl/tki-nieuw-gas/subsidies/MOOI-regeling">https://www.topsectorenergie.nl/tki-nieuw-gas/subsidies/MOOI-regeling</a>
DKTI transport	NL	<b>6/4/2021</b>	Demonstration of climate technologies and innovations in transport or machinery, including through the use of hydrogen. Passenger cars are not eligible under the call.	<a href="https://www.topsectorenergie.nl/tki-nieuw-gas/subsidies/dkti-transport-regeling">https://www.topsectorenergie.nl/tki-nieuw-gas/subsidies/dkti-transport-regeling</a>
TSE	NL	<b>7/9/2021</b>	Would you like to investigate the feasibility of an innovative pilot or demonstration project that can cost-effectively reduce CO2 emissions by 2030? Then you can make use of the Top Sector Energy Studies Industry scheme.	<a href="https://www.topsectorenergie.nl/tki-nieuw-gas/subsidies/topsector-energiestudies-industrie">https://www.topsectorenergie.nl/tki-nieuw-gas/subsidies/topsector-energiestudies-industrie</a>
MIT (different programmes)	NL	<b>2/7/2021 10/9/2021</b>	If you, as an SME entrepreneur, want to work with others on innovation projects, the MIT scheme (SME innovation stimulation Region and Top Sectors) is suitable for this.	<a href="#">Mkb-innovatiestimulering Regio en Topsectoren (MIT)   RVO.nl   Rijksdienst</a>
CrossRoads2 Sustainable Energy	NL/VL	<b>1-30/4/2021</b>	CrossRoads2 Sustainable Energy is a project within the European program Interreg Flanders-Netherlands and aims to stimulate cross-border partnerships between SMEs in Flanders and the South of the Netherlands (Zeeland, North Brabant and Limburg).	<a href="#">Sustainable Energy   CrossRoads2</a>
ConnectSME	NL/VL	<b>1/9/2020- 31/12/2022</b>	This project is focused on the development and testing of technology in a real-life environment at six testing live-labs in the border region of the Netherlands / Flanders. The insights that arise here can lead to further refinements of the product and increased opportunities for commercialization.	<a href="#">ConnectSME - Grensregio</a>
Horizon Europe	EU	<b>Call announcement expected in April 2021</b>	The first work programmes are expected to be published by April 2021. It is possible that the work programmes for the European Research Council (ERC) and European Innovation Council (EIC) will be published earlier. The first calls will open once the work programmes have been published.	<a href="#">Horizon Europe   European Commission (europa.eu)</a>
LIFE	EU	<b>Call announcement expected in Spring 2021</b>	Financing climate, nature, and environmental projects	<a href="#">Calls for proposals   EASME (europa.eu)</a>

# SAVE THE DATES

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- **WIC Webinar**
  - March 25, 16.00-17.30
- **Cluster meetings 2021**
  - Wednesday 10.00-12.00 (virtual); 9.30-14.00 (real life)
  - June 2, Sept 8, Dec 8 ,
  - Locations to be defined (COVID!) ; **hosts are welcome!**  
(preferably where H<sub>2</sub> related activities can be visited)
- **Matchmaking Event organized by CrossRoads2 Sustainable Energy en ConnectSME**
  - Thursday 18 March, 14:10 – 16:00
  - What: short presentation of both projects followed by online matchmaking via [network.flux50.com](https://network.flux50.com)
  - For whom? companies with innovative project ideas who would like to collaborate with other SMEs and who also want to expand their network at the same time



# News from Cluster Members

## Questions & Comments?

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