

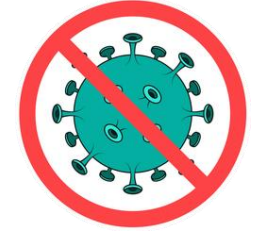
**WIC MEETING JUNE 2, 2021**

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**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

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## New members

10.00 – 10.40 AM : Presentation new members: Bureau Veritas, Ziero, Inovyn, SEA Tank Terminal, John Cockerill, Air Products

## Hydrogen in logistic & transport applications

10.40 – 11.00 AM : Powering the future @ Plug Power (Devon Hyver)

## Guest speaker

11.00 – 11.20 AM : Hydrogen developments in the Netherlands (Jörg Gigler)

## General info

11.20 – 11.40 AM : News from the cluster

11.40 – 11.50 AM : News from cluster members

11.50 – 12.00 AM : Q&A

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# PRESENTATION NEW CLUSTER MEMBERS

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BUREAU  
VERITAS

inovyn  
An INEOS company

ZIERO

SEA-Tank Terminal

AIR  
PRODUCTS



John  
Cockerill

# **Presentations**



BUREAU  
VERITAS

2021 | INTRODUCTION

# WATERSTOF INDUSTRIE CLUSTER MEETING

A GLOBAL LEADER IN TESTING,  
INSPECTION & CERTIFICATION SERVICES

# SUMMARY

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## 01

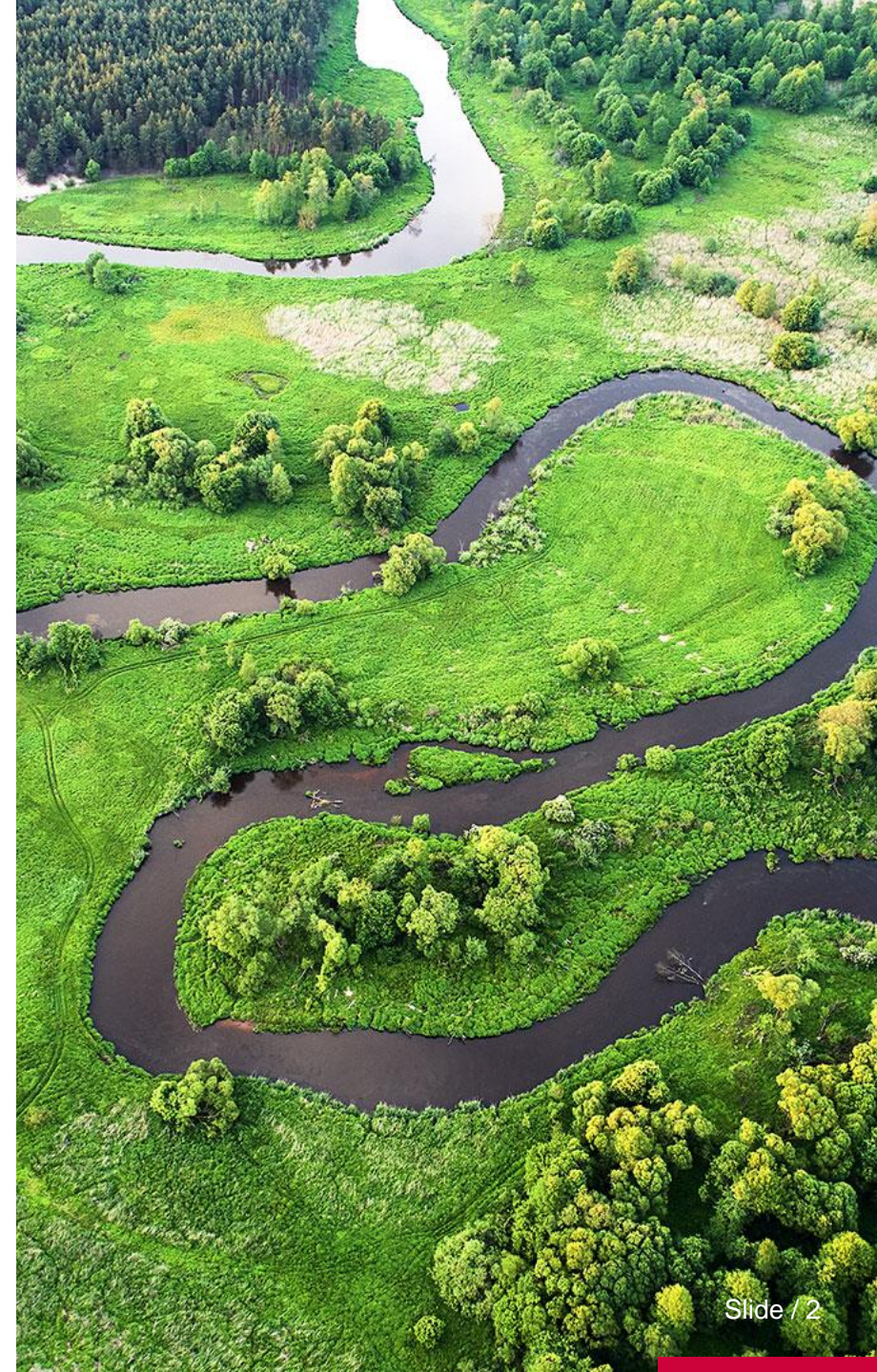
**BV**  
AT A GLANCE

## 03

**ACTIVITIES**  
& ORGANIZATION

## 02

**SUSTAINABILITY AS A SERVICE**  
& CSR AS A COMMITMENT



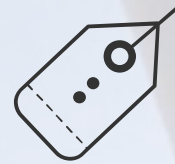


**BV**  
**AT A GLANCE**



# A LEADER OF THE TEST, INSPECTION AND CERTIFICATION MARKET

**CONTROL**  
costs



**PROTECT**  
brands

**REDUCE**  
risks



**FACILITATE**  
trade



**ACCESS**  
global markets



**OBTAIN**  
licenses



EXPERTISE

INDEPENDENCE

IMPARTIALITY

INTEGRITY

# KEY FIGURES



**€4.6**

**billion**

revenue in 2020

**75,000**

employees



**400,000**

clients

More than  
**1,600**

offices & laboratories  
in 140 countries



CERTIFICATION  7%

BUILDINGS & INFRASTRUCTURE  29%

INDUSTRY  21%



13%  CONSUMER PRODUCTS

8%  MARINE & OFFSHORE

22%  AGRI-FOOD & COMMODITIES



# SOME REFERENCES



# BUREAU VERITAS: BENELUX ORGANIZATION

## MANAGEMENT & TEAMS



**Richard ZAPPEIJ**

Regional Chief Executive

Belgium and the Netherlands

- 13 locations – 6 in Belgium
- >1,100 full time staff – 350 in Belgium
- Active in Certification, Industrial Inspection, Risk Consultancy, Health & Safety, PED

## KEY CUSTOMERS



## OUR FOOTPRINT





**SUSTAINABILITY  
AS A SERVICE  
& CSR AS  
A COMMITMENT**

# Bureau Veritas

**WELL POSITIONED  
TO BENEFIT**

**from accelerating  
sustainability  
challenges**

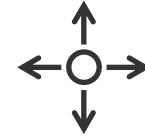
Reinforced stakeholders'  
expectations

Increasing regulations

Need for improving  
risk management

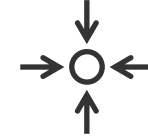
Optimizing business  
performance

Increased support from  
“Green” stimulus plans



**EXTERNAL  
POSITIONING**

Successful launch and strong  
traction from the **BV Green Line  
of Services & Solutions** supported  
by strong macro drivers



**INTERNAL STRATEGY  
& ACTION PLAN**

Ambition to become an **industry  
leader**, supported by our “**Shaping  
a Better World**” CSR plan through  
2025

# AT BV, WE SUPPORT OUR CLIENTS IN COMPLYING WITH REGULATIONS, MANAGING RISKS AND IMPROVING PERFORMANCE...

## RESOURCES & PRODUCTION

### RENEWABLES & ALTERNATIVE ENERGIES

#### ENERGY TRANSITION

Onshore and offshore Wind Farms, Solar Power Plants from Project to Asset Management, Biofuel and Hydrogen certifications

### SUSTAINABLE USE OF NATURAL RESOURCES

Agribusiness harvest monitoring and Precision Farming, Responsible Fishing, Forest Certification and Maritime Pollution Prevention

### INDUSTRY CARBON FOOTPRINT

Carbon footprint monitoring, energy saving verification, industrial environmental control and testing and emissions control

## CONSUMPTION & TRACEABILITY

### SUSTAINABLE SUPPLY CHAINS, FOOD CERTIFICATION

Product component testing, organic certification, supply chain resilience audit, circular economy verifications and ESG supply chain audits

## BUILDINGS & INFRASTRUCTURE

### CONSTRUCTION & REFURBISHMENT

Green building certification, project management for infrastructure improvement in developing countries and infrastructure life-cycle asset management in mature countries

## NEW MOBILITY

### E-MOBILITY, ALTERNATIVE PROPULSION

Batteries, charging station, connectivity testing, LNG ship inspection (new build, conversion)

## SOCIAL, ETHICS & GOVERNANCE

### SOCIAL PRACTICES

Social audits, health, safety, hygiene and inclusion protocols

### CSR STRATEGY

Policy monitoring, Management systems improvement, Reporting verification

### ETHICS & BUSINESS PRACTICES

Human rights assessment, supplier assessment, anti-bribery certification, Data Privacy and Cybersecurity certifications

... ALL ALONG A  
**GREEN LINE OF SERVICES & SOLUTIONS**



# OUR CSR RATINGS



Rated 84/100  
Listed in Europe and World indexes  
Gold medal in the sustainability yearbook



Rated "Robust"  
Ranked #9/102 of its market sector



Rated AA



Rated Low risk  
Ranked #2 in Research and Consulting category



Gold CSR rating for France



Rated 83/100, above sector (51)



Rated B, above sector average (B-)



Rated Prime



# HYDROGEN BV SOLUTIONS



# H2 ECOSYSTEM

## BV PARTICIPATION H2 PLATFORMS

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### BUREAU VERITAS IN H2 OFFSHORE

<https://north-sea-energy.eu/en/2021/04/22/bureau-veritas-new-partner-in-north-sea-energy-program/>

15



Hydrogen Council



# BUREAU VERITAS VALUE PROPOSITIONS

## ASSIST & SUPPORT ALL ACTORS IN THE HYDROGEN VALUE



**H2 quality**  
Certify quality of  
Hydrogen



**H2 Origin**  
Certify origin of Hydrogen  
from production source to  
end use



**Certification**  
Through a specific certification  
framework, ensure Hydrogen  
development projects comply with  
safety standards



**Carbon Intensity**  
Evaluate Carbon reduction  
impact by hydrogen  
production units

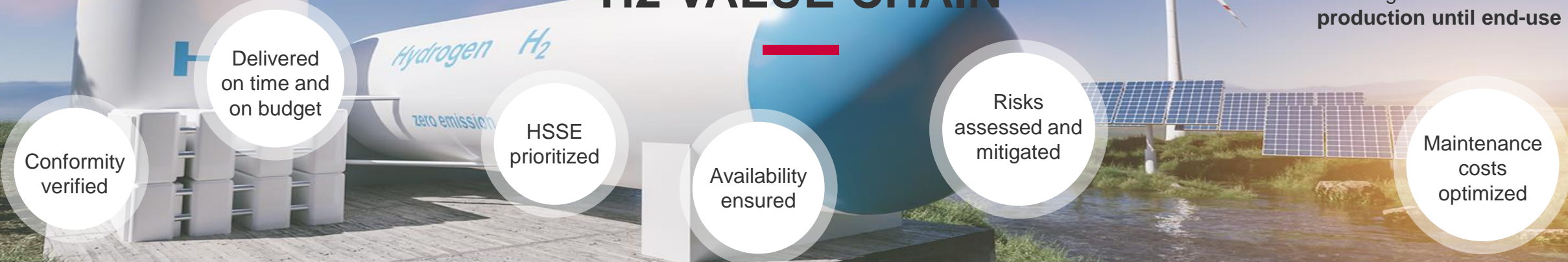


**Assistance**  
Accompany Hydrogen value  
chain actors in the field of  
risk assessment, regulatory  
framework, expertise



# DELIVERING INNOVATION H2 VALUE CHAIN

Dedicated sustainable energy services & solutions  
All along the value chain from production until end-use



## CERTIFICATION

**Demonstrate compliance & secure viability**

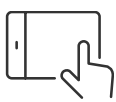
- Approvals in Principle
- Prototype certification
- Component certification
- Type certification
- Project certification



## DESIGN & PERMITTING

**Reduce development risk**

- Wind measurement & site assessment
- Marine Warranty Services
- Grid connection assessment
- Design review
- Environmental impact assessment
- Permitting support
- Risk assessment
- Due diligence
- Investor / lender services



## PROCUREMENT

**Access a global, reliable supply chain**

- Supply chain technical assessment
- Technical procurement support
- Shop inspections (QA/QC)
- Expediting
- Factory acceptance tests
- Transport, loading & unloading supervision



## CONSTRUCTION

**Run projects safely & to schedule**

- Project & construction management support
- On site QA/QC
- On site HSE
- Turbine foundation supervision
- Commissioning and test run supervision
- Take over and end-of-warranty inspections



## ASSET OPERATION

**Ensure availability & shorten outage time**

- Periodic inspections of blades & main components
- Non-destructive testing
- Load measurements
- Vibration monitoring
- Thermographic inspections
- Oil analysis
- Endoscopic inspections
- Rotor balance inspections
- Earth termination measurements
- Training
- Failure & damage analysis



## ASSET MANAGEMENT

**Extend operating life & increase performance**

- O&M management
- Maintenance strategies
- Condition monitoring & assessment
- Asset integrity management
- Reliability engineering
- Performance optimization
- Turbine digital twin
- Remaining life assessment & lifetime extension

# SOME REFERENCES





**BUREAU  
VERITAS**

**Shaping a World of Trust**

[WWW.BUREAUVERITAS.COM](http://WWW.BUREAUVERITAS.COM)



An aerial photograph of an industrial facility, likely a refinery or chemical plant, situated on a peninsula. The facility features numerous white storage tanks, complex piping, and several large buildings. A large ship is docked at a pier on the left side of the peninsula. The background is a dense forest of green trees, and a body of water is visible on the left and bottom edges of the frame.

# INEOS

A leading company in clean  
hydrogen development

Meeting with Waterstofnet  
02 June 2021

inovyn  
An INEOS company



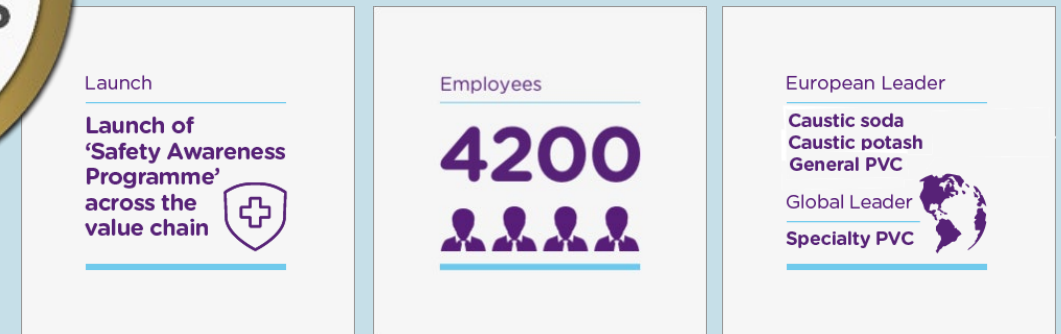
# INEOS

The world's 3<sup>rd</sup> largest chemical company

# inovyn

An INEOS company

A subsidiary of INEOS and leader in chlorvinyls

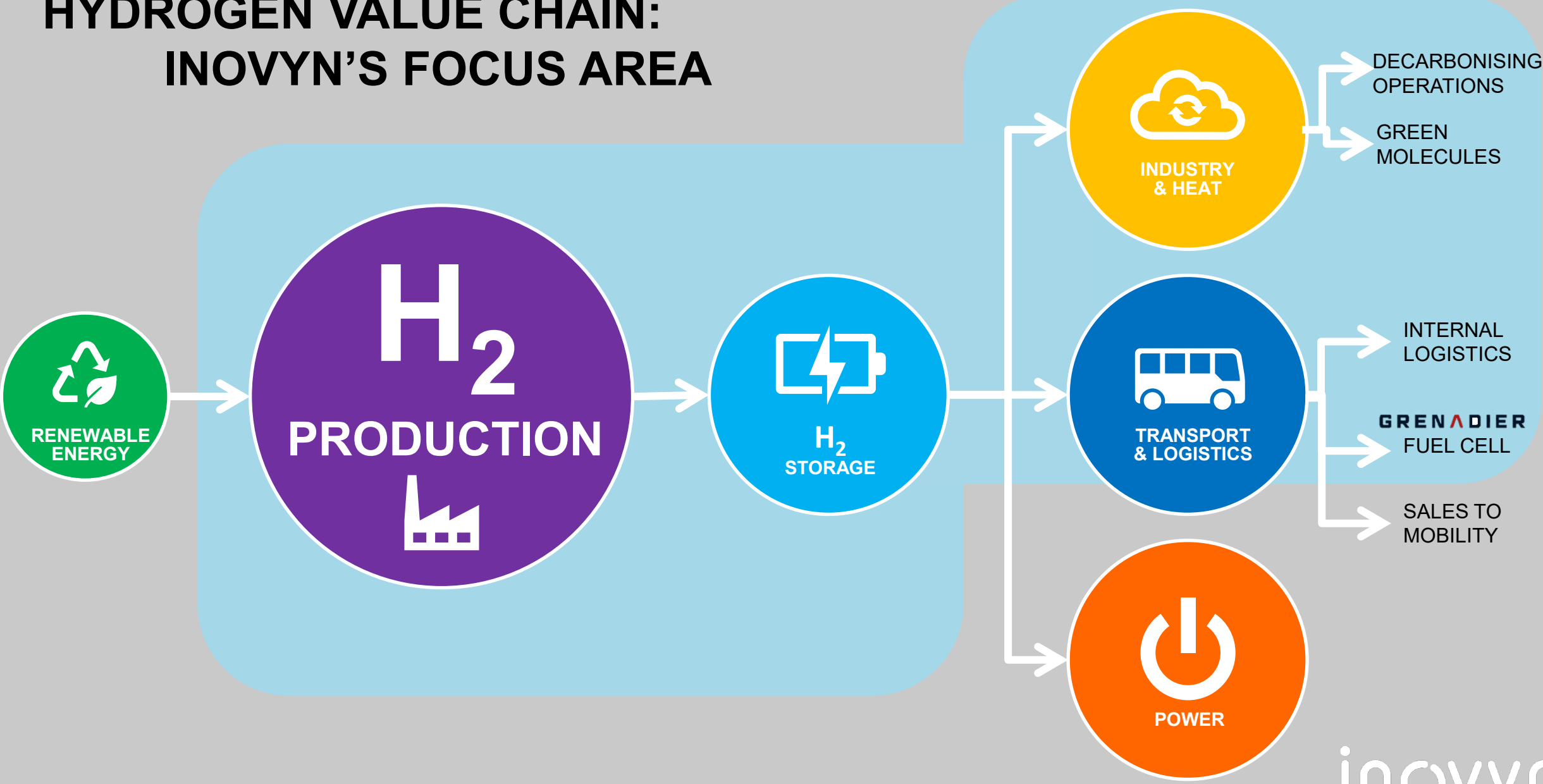


# INEOS credentials


- **INEOS launched a new clean hydrogen business in November 2020**
  - INEOS currently produce ~400,000t H<sub>2</sub> p/a as a co-product (of which ~60,000t H<sub>2</sub> p/a in INOVYN)
- **INOVYN is Europe's largest operator of electrolysis technology with the production of chlorine**
  - INOVYN develops and licenses electrolysis technology for a global market
  - Transferable knowledge of water electrolysis for H<sub>2</sub> production

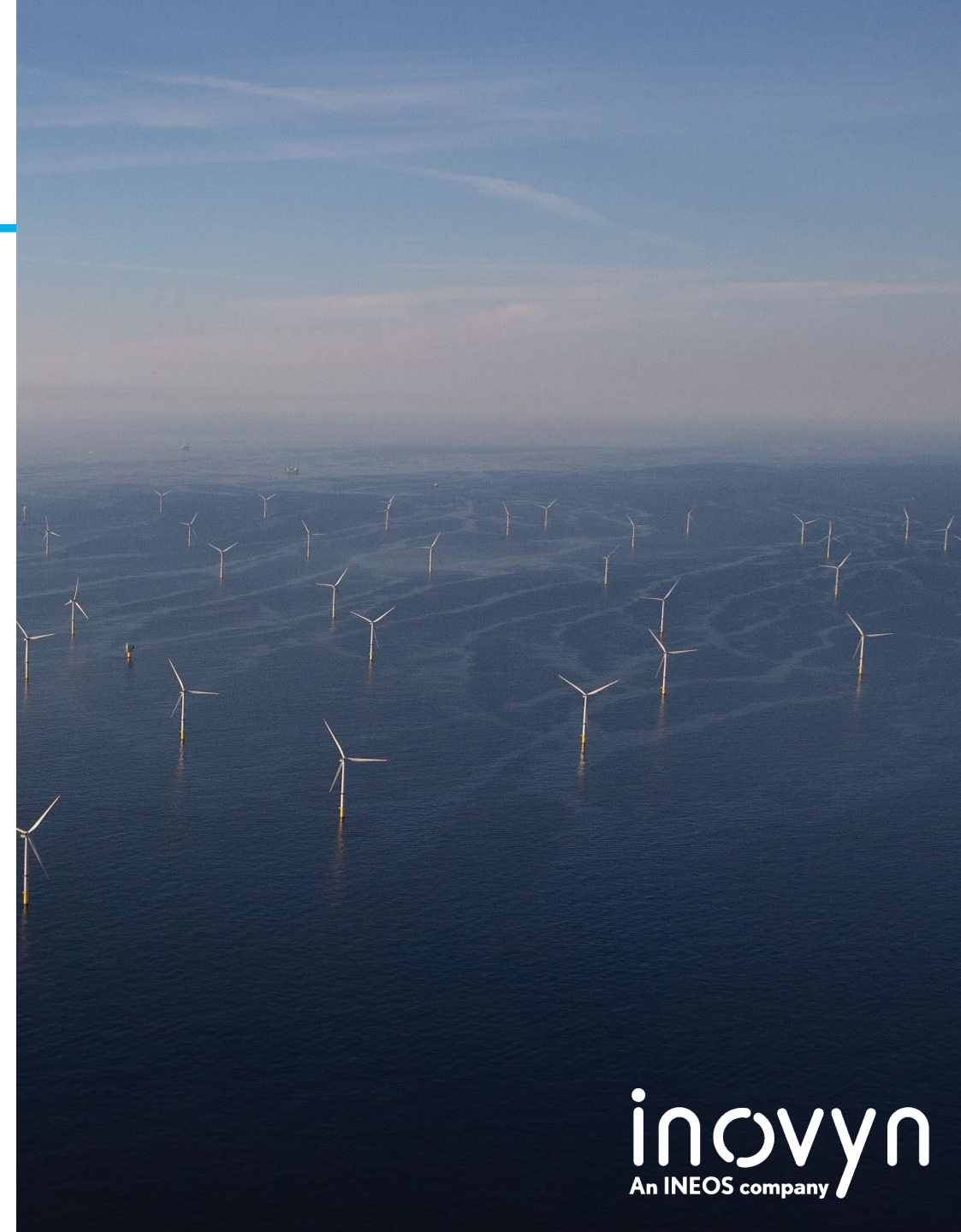


# HYDROGEN VALUE CHAIN: INOVYN'S FOCUS AREA



# INEOS roadmap

- **Use existing co-product hydrogen while working with partners to develop hydrogen applications:**
  - Chemical feedstock
  - Transport
  - Power/heat generation
- **Build first intent hydrogen production in our chemical clusters in 7 European countries:**  

- **Develop hydrogen storage projects**
- **Develop carbon capture and utilisation projects for the production of green molecules**





Accelerating the use  
of H<sub>2</sub> to support the  
drive to net-zero  
carbon emissions  
across Europe.

**20MW**  
electrolyser to reduce  
carbon emissions by  
**>22,000t**  
p/a

**First intent hydrogen production in Norway:  
INOVYN Rafnes builds a clean hydrogen supply hub**

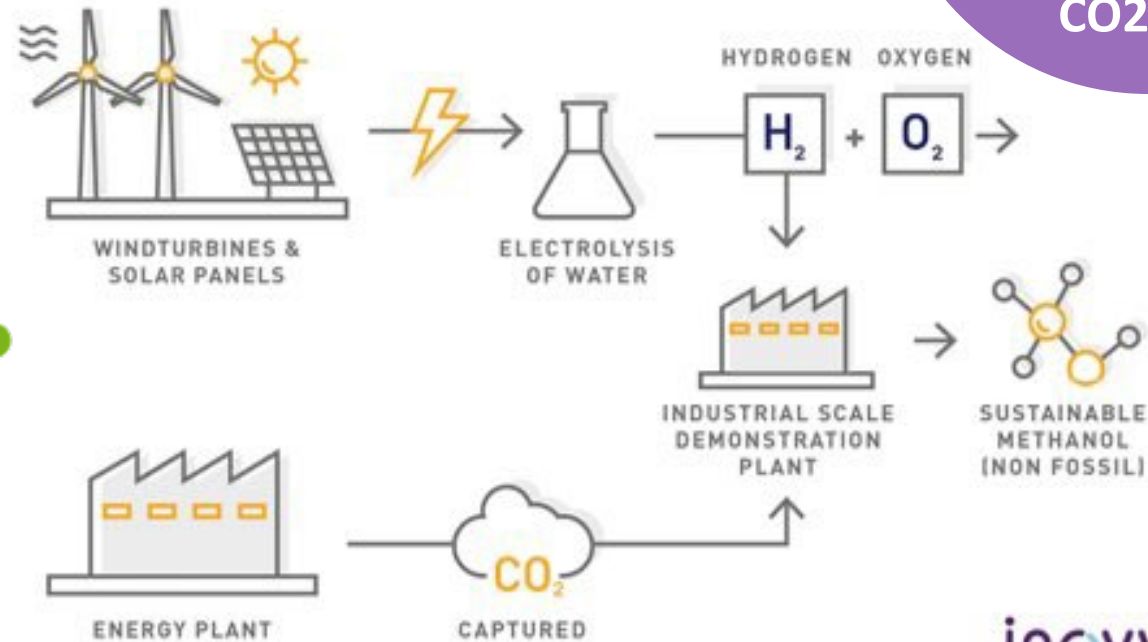
**inovyn**  
An INEOS company

# Power to Methanol Antwerp

## Advancing the energy transition and its presence in the Port of Antwerp

- A 7-strong consortium to produce methanol from captured CO<sub>2</sub> combined with H<sub>2</sub> generated from renewable electricity

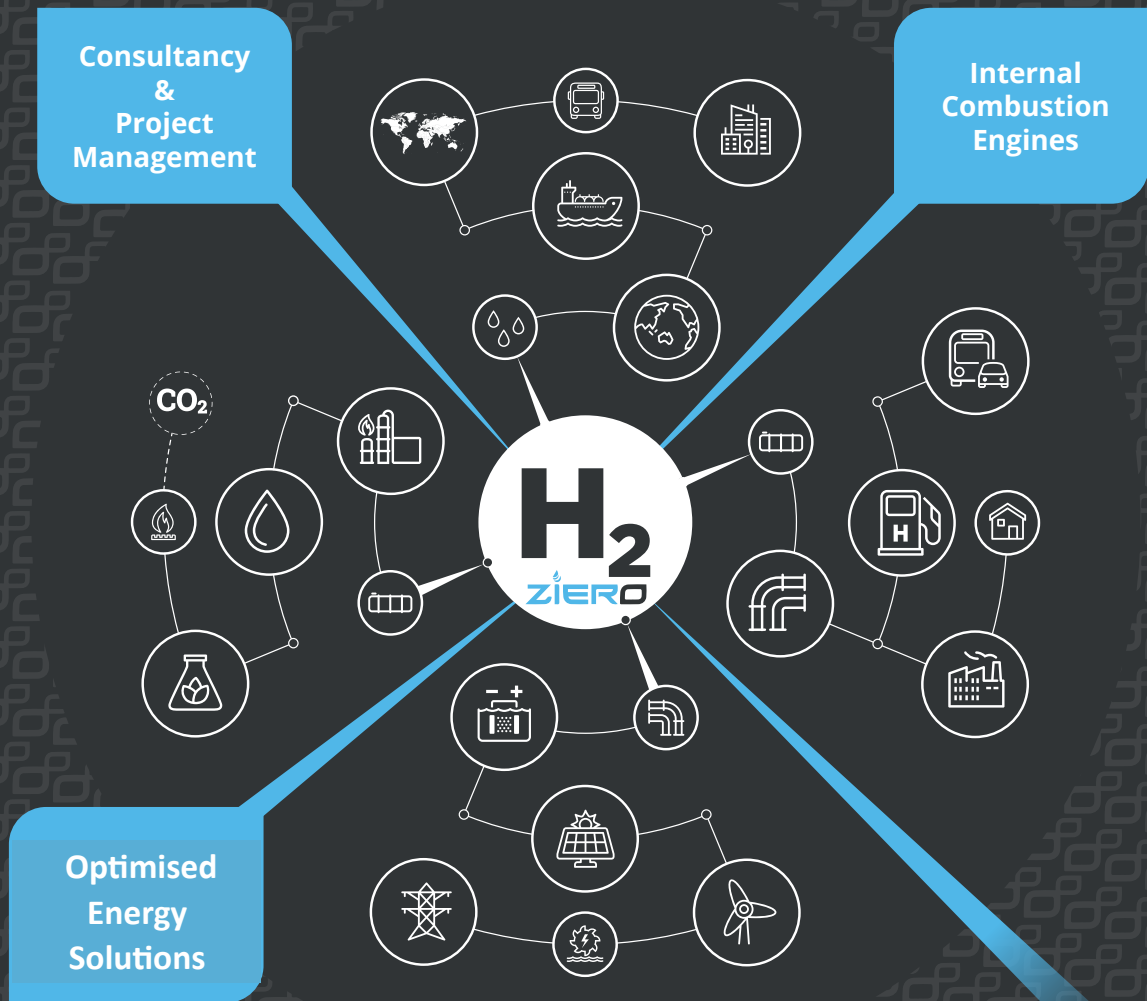
- INOVYN Lillo's industrial-scale demonstration unit will produce sustainable methanol



Sustainable methanol leading to a reduction of **>8,000t** CO<sub>2</sub> p/a



Offers Hydrogen Solutions



**WE  
BRING YOUR  
EMISSIONS  
TO ZIERO**

**TEAM COMPETENCES**

**A TEAM OF  
DEDICATED  
EXPERTS WITH  
YEARS OF  
EXPERIENCE IN  
HYDROGEN &  
ALTERNATIVE FUELS**

- Hydrogen & alternative fuels
- Internal combustion engines & drivetrains
- (Zero) Emissions
- Consultancy & project management
- Manufacturing engineering
- Regulations, CE-certification & safety support
- Product development
- Simulations, research & engineering
- Business & market development
- Connected with Thomas More & KU Leuven University Belgium

More Info: [www.ziero.eu](http://www.ziero.eu)



Offers Hydrogen Solutions

## SOME REFERENCE PROJECTS



- Bus running on a fuel mixture of hydrogen and CNG
- Opel Combo with internal combustion engine running on 100% hydrogen
- Volkswagen Caddy with internal combustion engine running on 100% hydrogen
- Test cell for ICE on hydrogen, complete certification and regulation of testcell and components
- Still Forklift with internal combustion engine running on 100% hydrogen, complete CE-certification and operational for more than 1000 hours in a warehouse
- Prototype "Hybrid Hydrogen Unit": a 2 cylinder powering a generator, running on 100% hydrogen, internal hydrogen storage and ultracap unit for peak power outputs
- 1-cylinder power generator running on 100% hydrogen
- Business exploration studies for Hydrogen in the Benelux



WE BRING YOUR EMISSIONS TO ZIERO

More Info: [www.ziero.eu](http://www.ziero.eu)





Offers Hydrogen Solutions

## HYDROGEN GENSET

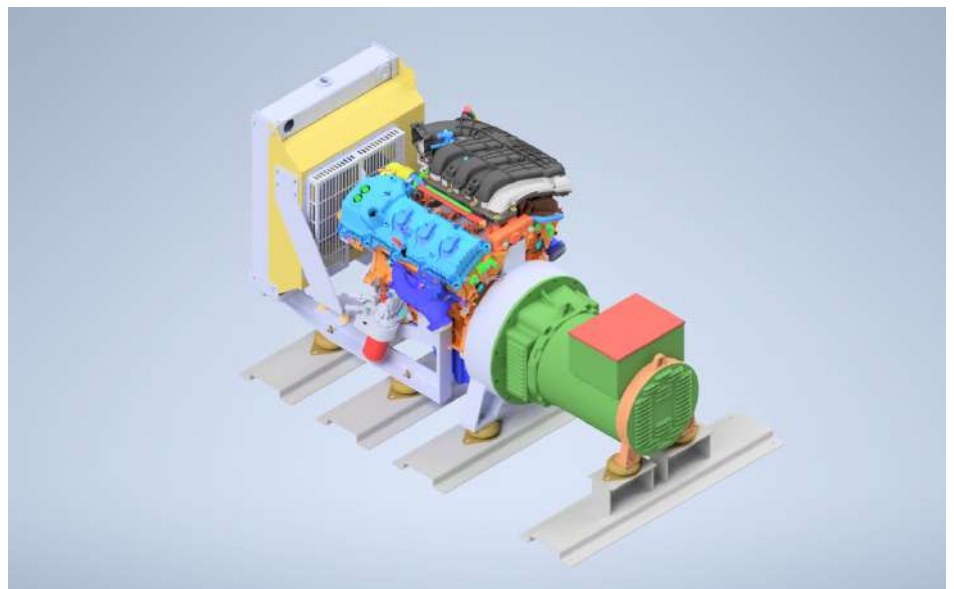
### RELIABLE TECHNOLOGY

The hydrogen generator, or H2 ICE genset, is the combination of a **hydrogen combustion engine** with an electric alternator to generate electrical energy. The setup is comparable with a diesel generator which runs on hydrogen instead of diesel fuel. The H2 genset will be **less complex and more reliable than Stage V diesel gensets** because it doesn't require complex and expensive after treatment systems.

### 100% HYDROGEN

The hydrogen engine of the H2 genset is designed and tuned to **run on 100% hydrogen** in order to avoid any toxic emissions. Therefore, there is no need for complex and expensive exhaust gas aftertreatment systems like catalysts, which require AdBlu-e, and particulate filters, as mandatory on conventional diesel gensets.

**The Hydrogen Genset is a product of Ziero and will be available starting form Q1 of 2021**

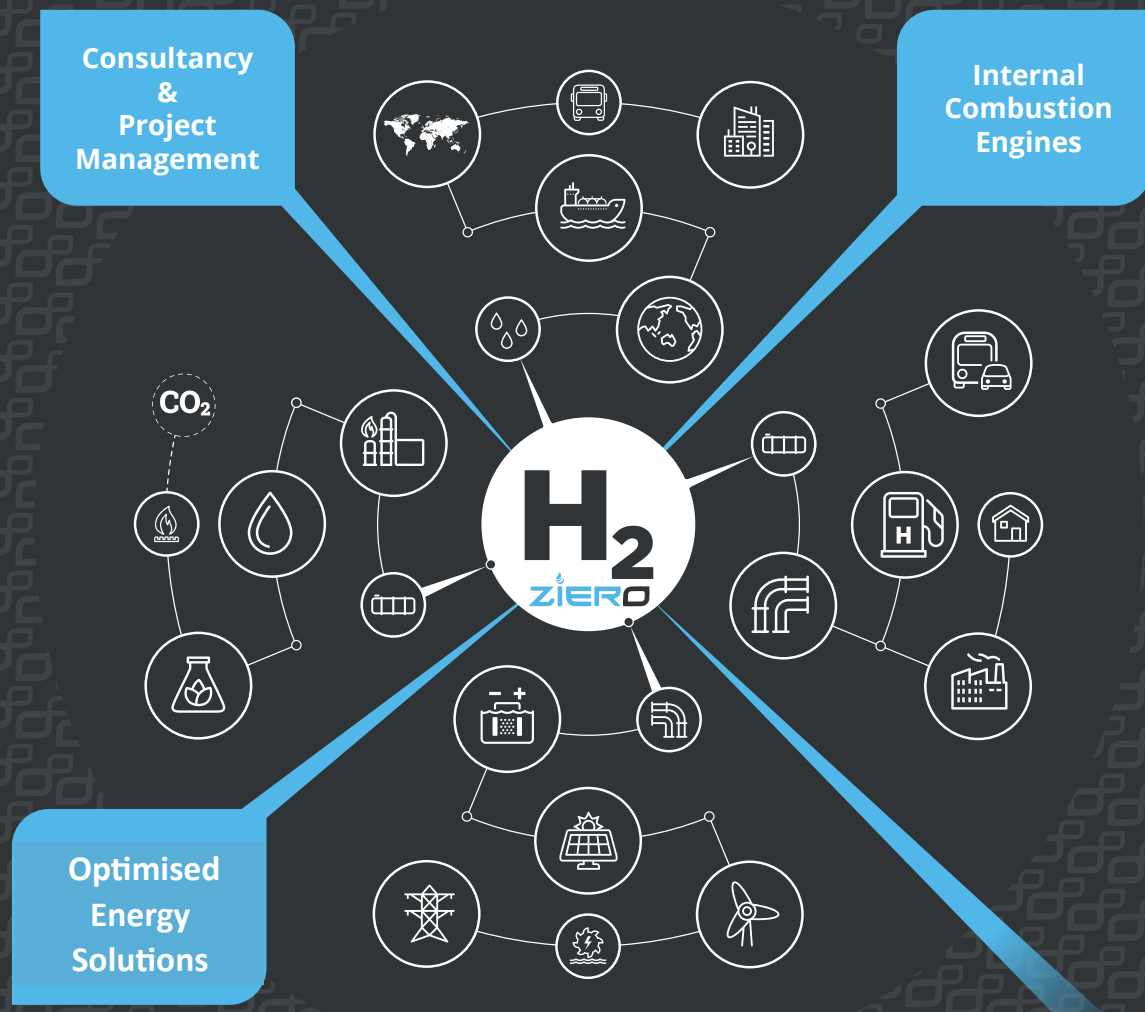


**WE BRING YOUR EMISSIONS TO ZIERO**

More Info: [www.ziero.eu](http://www.ziero.eu)



Offers Hydrogen Solutions



**WE  
BRING YOUR  
EMISSIONS  
TO ZIERO**

**Thank you for your attention!**  
**How can we help you?**

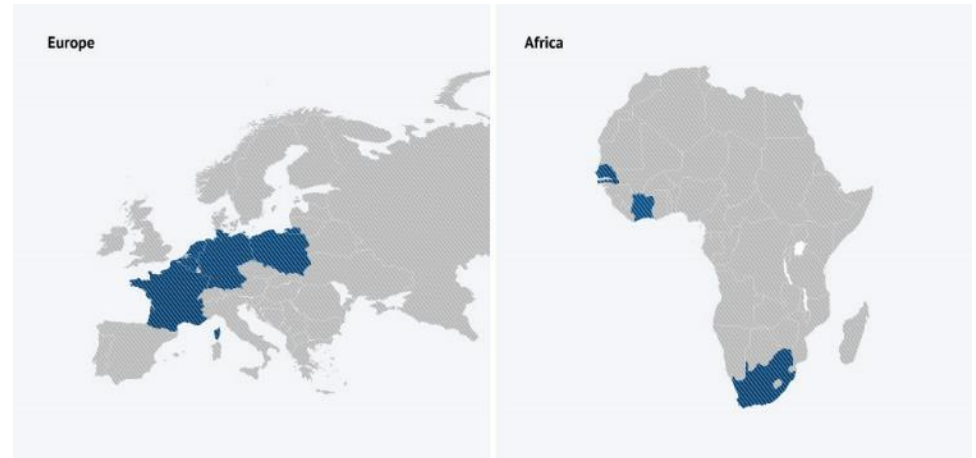
**Thomas Houben**  
**+32 473 83 13 36**  
**Thomas@ziero.eu**

More Info: [www.ziero.eu](http://www.ziero.eu)

# SEA-Invest

## A leading stevedoring company in Europe and Africa

- Active in 25 ports in 8 countries
- 4.500 employees
- Annual tonnage: > 100 million tons
- Long term vision
- Partnership thinking
- Agile

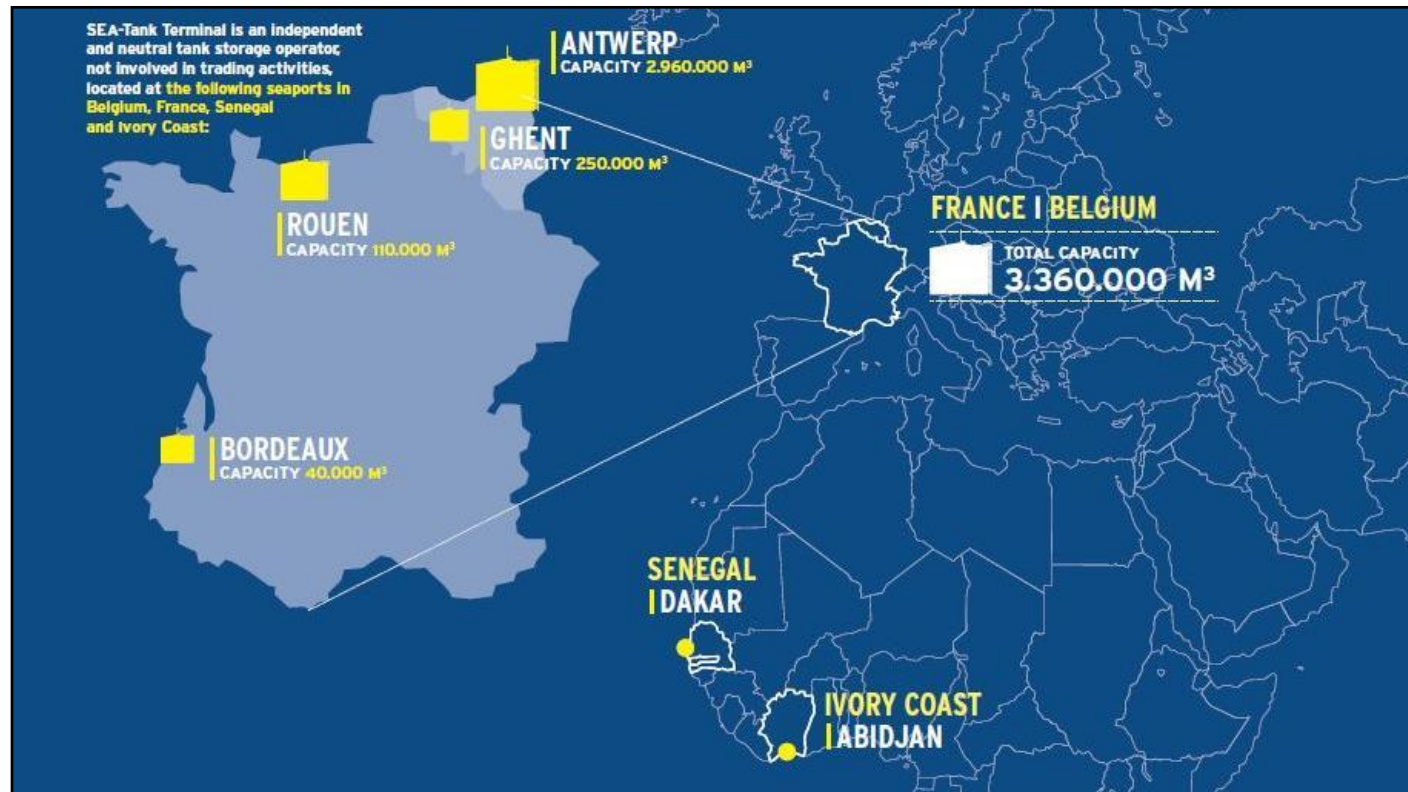


# SEA TANK TERMINAL

3,3 mio m3 storage in Europe and Africa



## SEA-Tank Terminal locations in Europe & Africa



- State-of-the-art storage and handling infrastructure for mineral and vegetable oil products, liquid fertilizers, molasses, fish oil, biofuels, base oils, light chemicals.
- Possibility for the customer to develop dedicated facilities or to adapt tankage in order to maximize the fulfilment of their needs.

## SEA-Tank Terminal – PRODUCT & SERVICES

### PRODUCTS:

- Petroleum products
- Base oils
- Biofuels
- Chemicals
- Oleo chemicals
- Sulphuric acid
- Liquid fertilizers
- Molasses
- Vegetable oils
- Animal fats / Fish oil



### TERMINAL SERVICES:

- Ship to ship transfers
- In-Tank & In-Line Blending
- Heating
- Nitrogen blanketing
- Circulating, Homogenizing and Transfers
- Truck & Rail loading facilities
- Customs and excise bonded storage

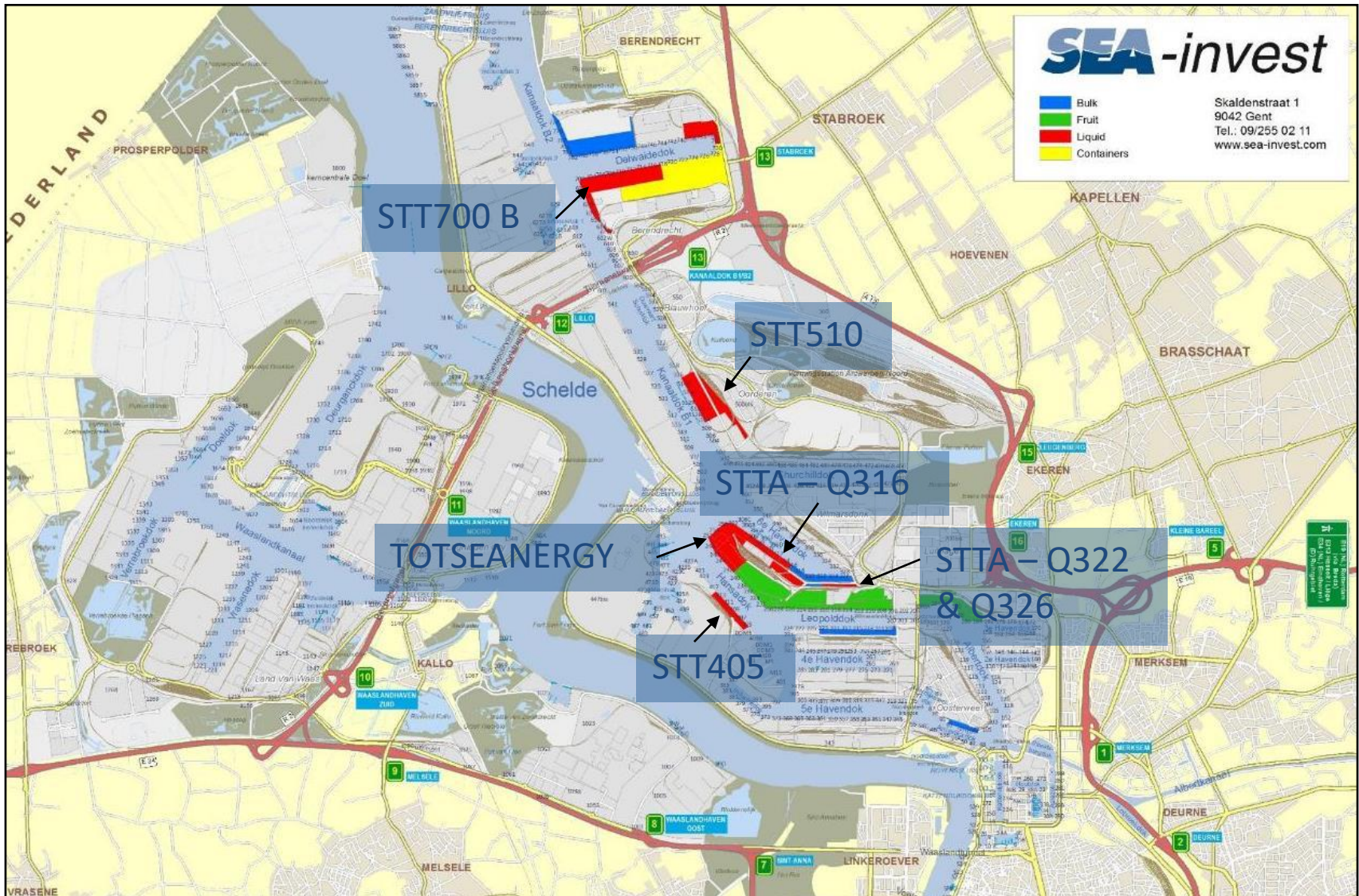


## SEA-Tank Terminal Gent

- Chemicals, oleochemicals, vegetable oils, fish oil, fats, liquid fertilizers, biofuels
- Tank capacity 280.000 m<sup>3</sup>



# Belgium – Sea-Tank Terminals in Antwerp





## Antwerp – Q300 & TOTSEANERGY



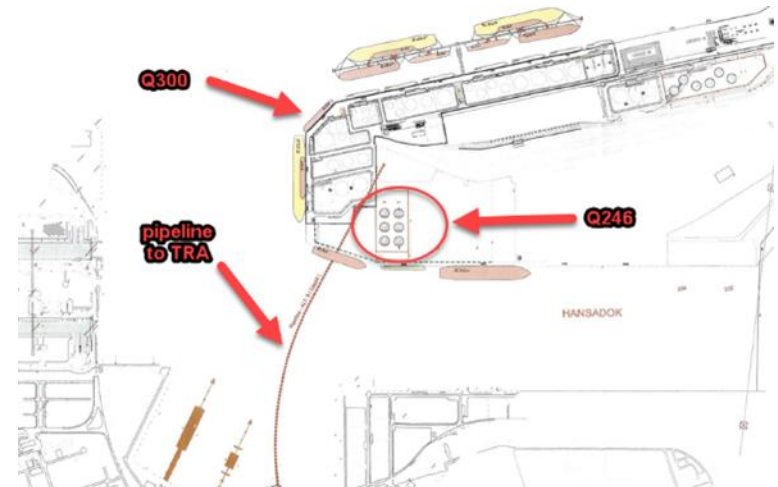
### SEA-Tank Terminal Antwerp – Quay 246 to 314

- Petroleum products
- Tank capacity 1.026.000 m<sup>3</sup>
- **Additional storage capacity for bio fuels**
- **Projects renewable energy under study**

### TOTSEANERGY (JV) – Quay 246 –

- Tank capacity 160.000 m<sup>3</sup>
- 8 tanks of each 20.000 m<sup>3</sup>

### Connecting storage tanks with the refinery



## Antwerp – SEA-Tank 510 - GLENCORE

### SEA-Tank 510 (JV) – Quay 510

- Petroleum products
- Tank capacity 920.000 m<sup>3</sup>



## Antwerp – SEA-Tank 700 B - LITASCO

### SEA-Tank 700 B – Quay 700

- Petroleum products
- Tank capacity 750.000 m<sup>3</sup>



## Antwerp – SEA-Tank Terminal Q316 - IMERYS

### Kaolin

- Tank capacity 16.500 m<sup>3</sup>
- 8 tanks ranging from 1.500 m<sup>3</sup> to 3.000 m<sup>3</sup>



## Antwerp – SEA-Tank Terminal Antwerp Q322

### Fatty acids

- Tank capacity 10.000 m<sup>3</sup>



## Antwerp – SEA-Tank Terminal Antwerp Q326

- Sulphuric acid
- Tank capacity 33.000 m<sup>3</sup>
- 3 tanks of each 11.000 m<sup>3</sup>



## Antwerp – SEA-Tank Terminal Antwerp Q405

- Petroleum products, biofuels, base oils, chemicals and oleochemicals
- Tank capacity 209.000 m<sup>3</sup>



# Innovation and sustainable products

## New technologies

- Best available technologies for terminals
- Zero emission (VOC) terminals



# Innovation and sustainable products

## Sustainable products

- Biofuels: FAME, ethanol,
- Feedstocks for HVO: greases, UCO's,...



# Allways looking for innovation and new products

## Investment opportunities

- Availability of concessions
- Looking for investment opportunities
- Involved in several potential H2 projects



## Contact information

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### SEA-Tank Terminal commercial team at your disposal

Georges Leysen

[georges.leysen@sea-tankterminal.com](mailto:georges.leysen@sea-tankterminal.com)

Leen Taeldeman

[leen.taeldeman@sea-tankterminal.com](mailto:leen.taeldeman@sea-tankterminal.com)

Luk Wuyts

[Luk.wuyts@sea-tankterminal.com](mailto:Luk.wuyts@sea-tankterminal.com)



Moving forward



# Air Products

An introduction to H<sub>2</sub> for Mobility

WIC  
02.06.2021



# Air Products Today

**\$8.9**  
billion in FY20 sales

**19,000+**  
employees

**50**  
countries

**~\$60B**  
market cap

**80**  
years in business

**170,000+**  
customers

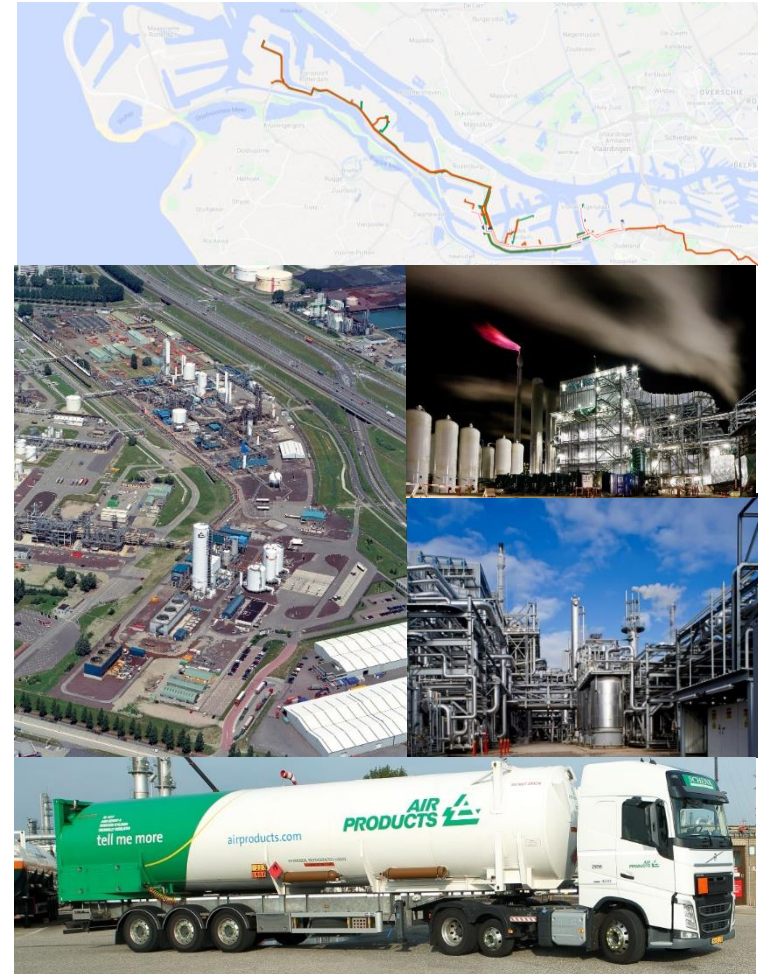
**1,800**  
miles of industrial  
gas pipeline

**750+**  
production  
facilities

**30+**  
industries  
served

# Air Products Benelux

- Rotterdam/Gent
  - Hydrogen production:  $\text{HyCO}_4$
  - Liquid hydrogen
  - $\text{O}_2$ ,  $\text{N}_2$ , Ar, liquid gases
  - Steam boilers (heat)
  - 200 km pipelines
- Haarlem/Vilvoorde/Keumiee/Zolder
  - Gas cylinders
  - Liquid gas sales
  - Spec gases



# Hydrogen for Mobility and Energy

**Decades of hydrogen production and distribution experience**

**Developing global infrastructure to support key trucking and bus transit applications**

**Providing safer, more reliable, and cost-effective solutions**



# Air Products H2 for Mobility

## *Hydrogen fueling solutions – Buses and Trucks*



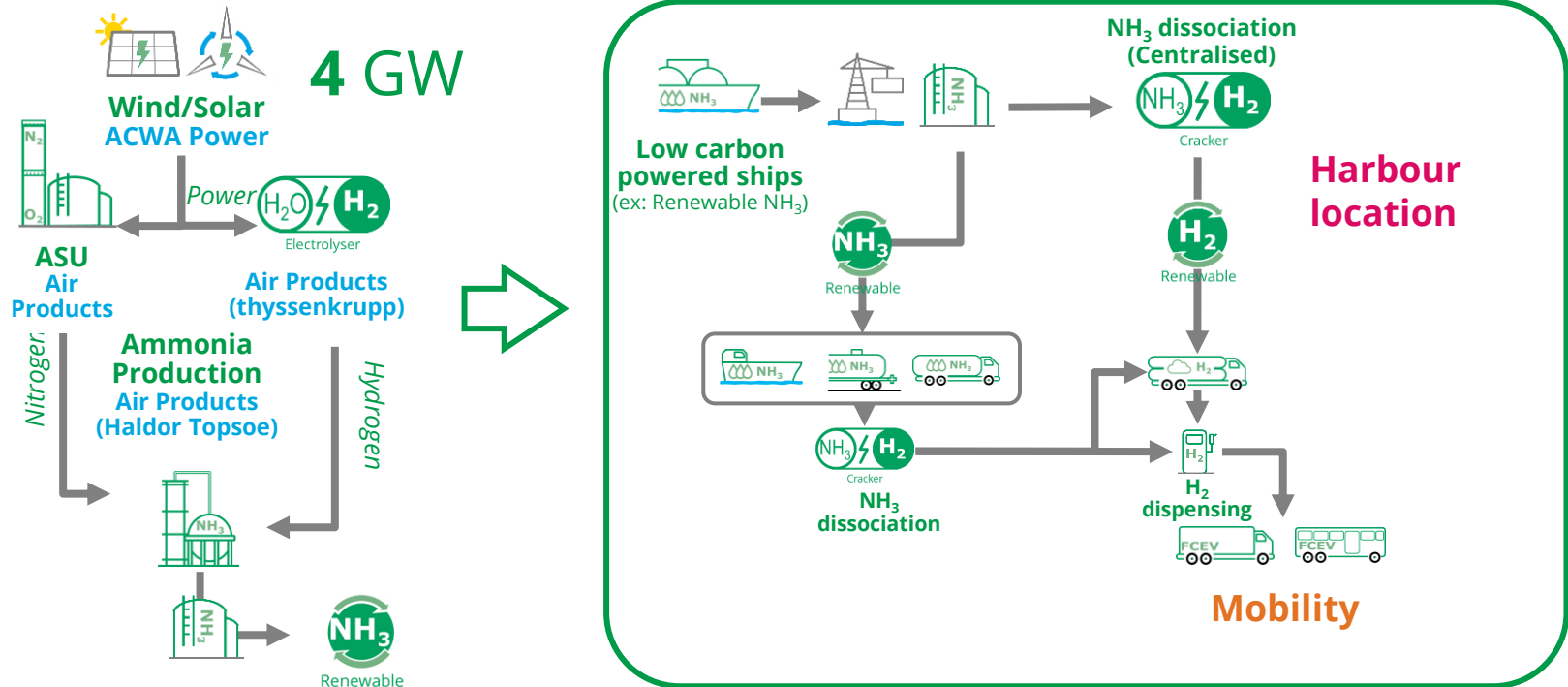
Air Products: London Heathrow HRS, July 2020



Air Products: London Heathrow HRS, October 2020

# NEOM green hydrogen project

## Supplying global Customers



Moving forward 

**Thank you**  
tell me more



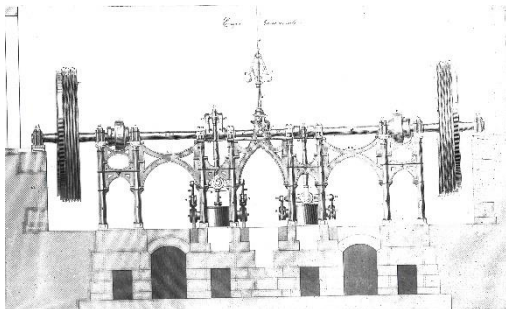
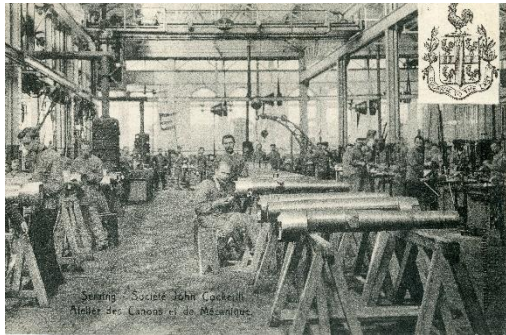
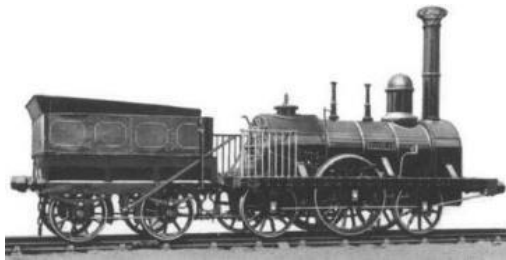
# John Cockerill's Hydrogen Solutions





# A strong history, a flourishing present, a promising future

Proud of its past, resolutely turned towards the future



200 YEARS OF FUTURE



# Leader in the Renewable Energy Sector



700 references in boilers for  
gas-steam power plants  
→ H2 potential



Solar thermal power plant  
24/7 thanks to molten salt



Miris: the largest industrial pilot plant in  
Europe



On-shore & off-shore wind  
turbine maintenance



A wide range of green  
Hydrogen solutions

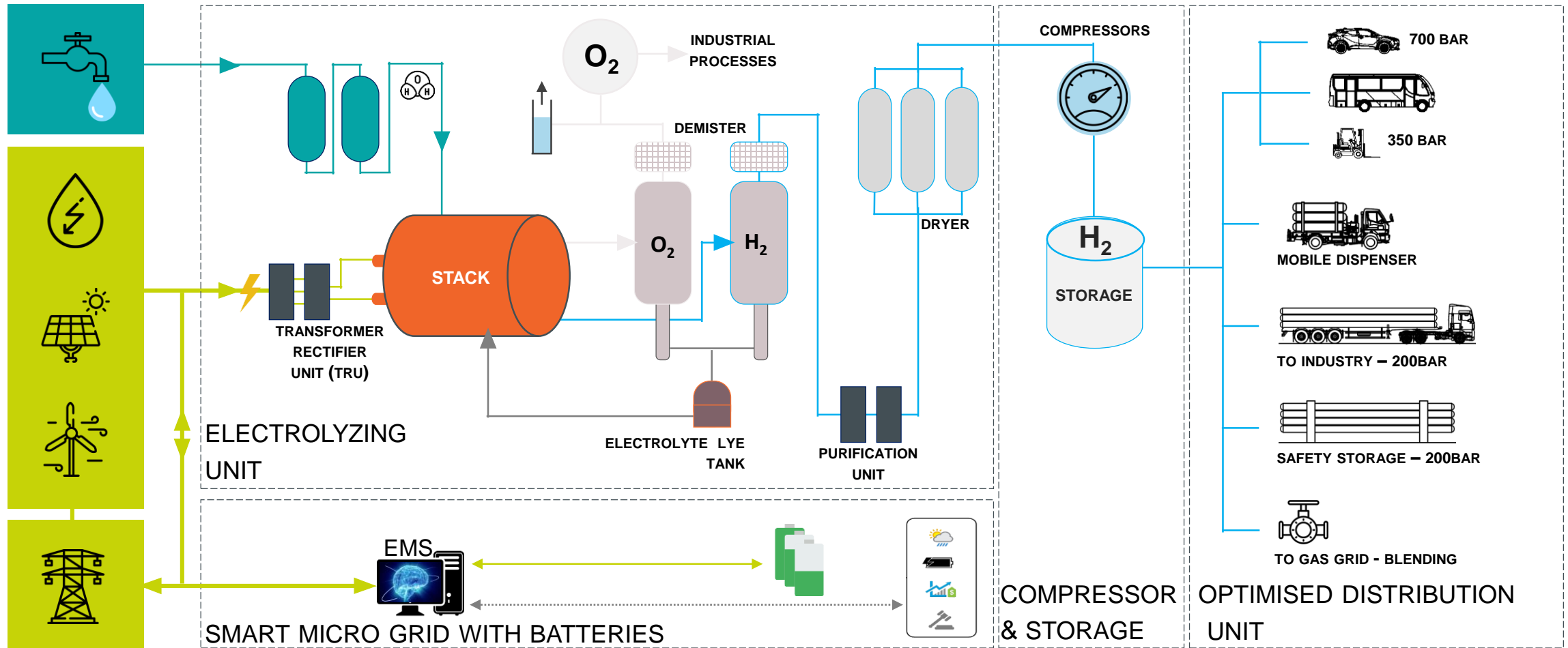


# # 1 in the World In Electrolyser manufacturing

- ▶ **Decades of experience in electrolysis and hydrogen**, as well as pressurized and gas treatment equipments
- ▶ More than **1000 references** in **+30** countries in many different industries (chemicals / glassmaking / steelmaking / power plants etc.)
- ▶ Largest electrolysers in the market : **5MW per unit** (already 12 references)
- ▶ Manufacturing plants at the heart of **China (350MW capacity)** and under construction in **Europe (1GW, phased scale up as from 2023)**
- ▶ Focus on **very large scale** production with solutions at **100MW and 1GW**
- ▶ Massive **€100M investment plan** in H2 developments and **R&D**
- ▶ **Mobility** and refueling stations equipments and projects



# John Cockerill in the H2 Value Chain



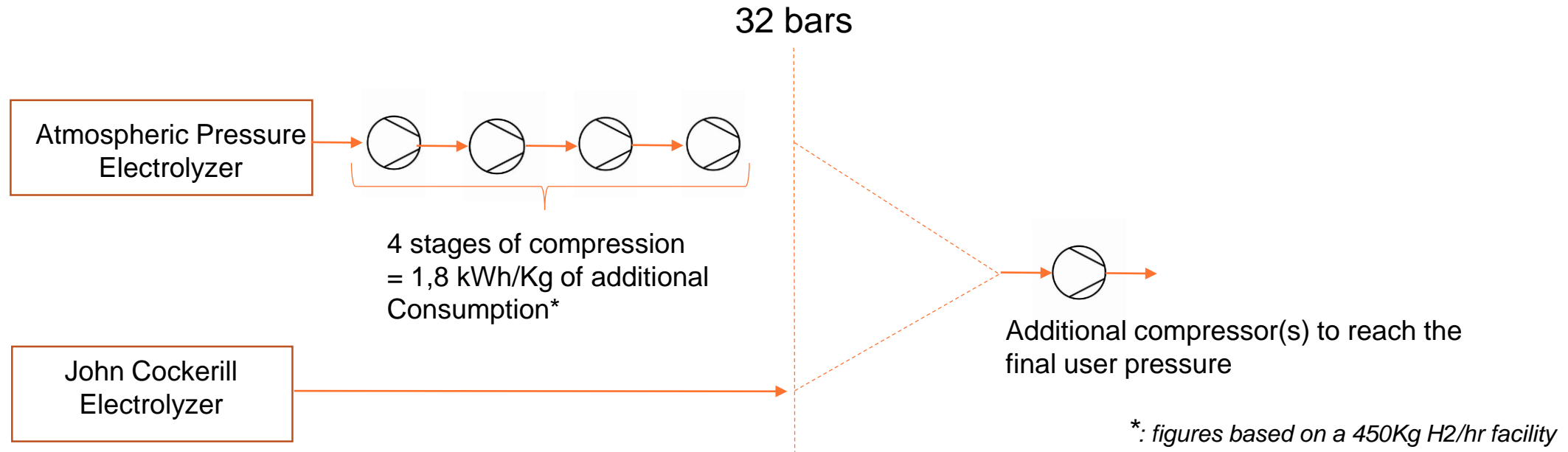
# Largest Single-Stack Electrolyzers

John Cockerill is the world leader in large scale electrolysis with already 26 x 5MW stacks references

1200m<sup>3</sup>/hr single stack electrolyzer to feed a HRS for the 2022 Winter Olympics



# Pressurized vs Atmospheric electrolyzers



## Key benefits of a pressurized electrolyzer:

- 3,5 % Electric Consumption gain (compared to stack only)
- Higher reactivity to capacity variation requests
- Decreased footprint
- Less maintenance
- Higher H2 plant availability



# Manufacturing capabilities



- Modern workshops in China dedicated to large capacity electrolyzer production (inaugurated in 2019) with 350MW annual capacity
- New manufacturing capacity under construction in France and Belgium with capacity starting at 200MW/year in 2023 and ramping up to 1GW



# Columbus: e-methane production

- Partnership with Engie and Carmeuse



- 75MW of electrolysis producing green H<sub>2</sub>
- Use of new lime kiln CO<sub>2</sub> in waste gases to produce e-methane
- 900,000 tons of CO<sub>2</sub> emissions prevented during the first 10 years





# HaYrport ®: a multi-modal refueling station



John  
Cockerill



# Thank you

## John Cockerill Hydrogen

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WaterstofNet

# Powering the Future

Prepared for : WaterstofNet

June 2021

Devon Hyver, Sales Director Europe

[dhyver@plugpower.com](mailto:dhyver@plugpower.com) +33.6.48.47.27.63

○ Plug Power 2024 Vision

**\$1.7B**

in Annual Sales

**\$200M**

Operating Income

**\$250M**

Adjusted EBITDA

**50% Green H2**  
**Cash flow \$5B**

**2024**

**+\$750M**

Annual Gross Billings

**+125,000**

GenDrive Cumulative Deployments

## The ABC's of Plug Power to achieve 50% Green H2 and \$1.7B revenue by 2024

## Recent Achievements

**A** 1997 : Strong R&D focus and technology leadership position for next decade in **PEM fuel cells**

**B** 2008 : integration of fuel cells for forklifts in the material handling and GSE industry.  
Strong early **successful deployments** of PEM fuel cell solutions in logistic ecosystem.

**C** 2014 : **Turnkey hydrogen** solutions that accelerated growth and repeat blue chip customers in Walmart (40), Amazon (50), IKEA, Carrefour, BMW, Fedex, DHL and many others

*Executed strategic acquisitions to accelerate **vertical integration***

*Established joint ventures and strategic partnerships, including expansion with **Renault (EU)**, **SK Group**, and **Acciona (EU)***

*Strengthened balance sheet with over **\$5B of capital** to accelerate growth*

## In numbers

50,000 FCs and over 25,000 electrolyzers      180 patents      125 sites

695millions hours of operation      450 dispensers      40 tons H2 daily

From <1kW to multi-MW PEM fuel cell and electrolyzer solutions



1. Based on Bloomberg New Energy Finance (March 30, 2020) estimates of over \$11Tn of hydrogen investment in production, storage and transport infrastructure in a "strong policy" scenario

# The Leader in Fuel Cell Technology

Plug Power has been innovating the design and manufacturing of **PEM Fuel Cells and stacks** for over 20 years.

In 2020 the company announced the construction of a new facility to accelerate the manufacturing of PEM fuel cells and stacks at

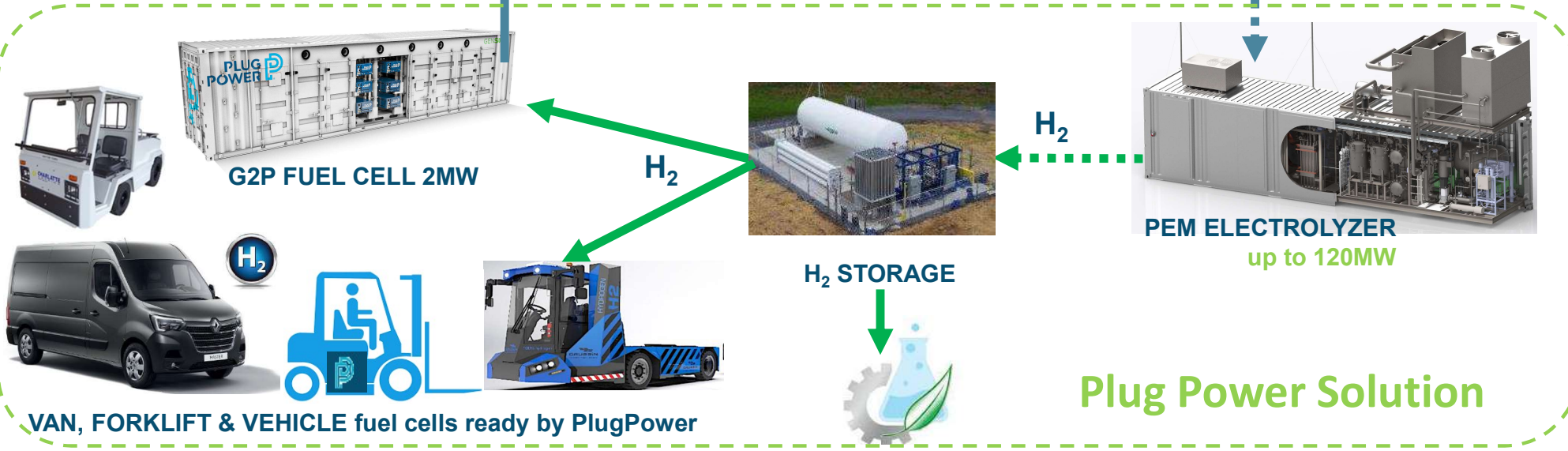
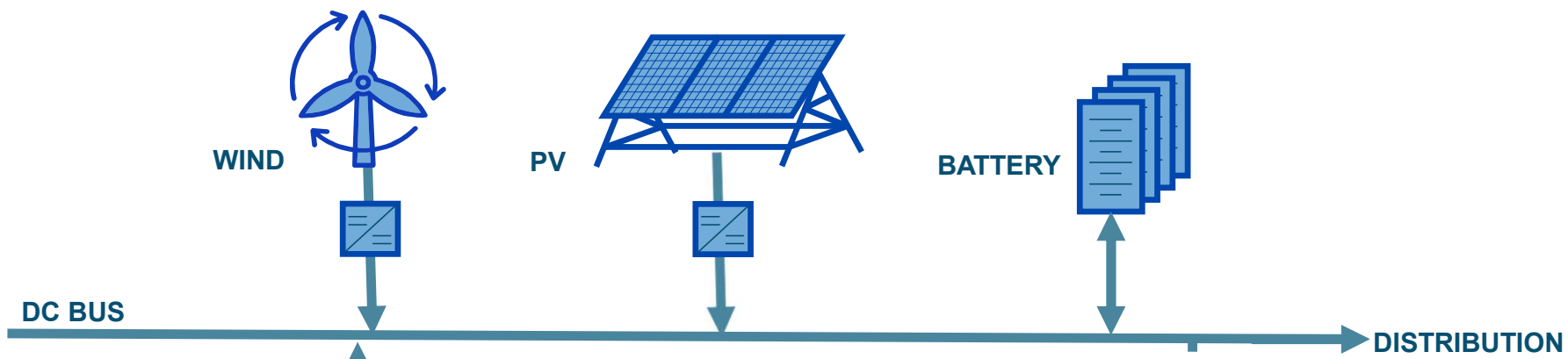
**1.5GW capacity**

**Plug Power's Gigafactory will be the largest fuel cell manufacturing facility in the world when it enters production in 2021**

From **1.33 Cells to 7.48 per 1cm**



# GenKey : Resilient Zero-emission complete Solution



**Plug Power Solution**

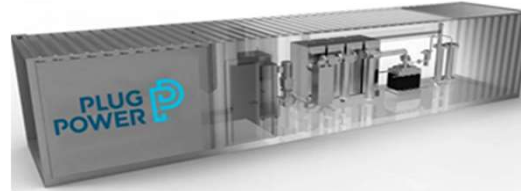
The Leader In

# Hydrogen Energy Solutions : GenKey

Plug Power is the world's most comprehensive hydrogen energy services provider.

Our 2020 acquisitions of **Giner ELX** and **United Hydrogen** expanded our product capabilities and positioned Plug to transition from low carbon to zero carbon hydrogen solutions.

Our **vertical integration strategy** positions the company as the global leader in generation, liquefaction, distribution and dispensing of hydrogen.



## Plug Electrolyzer up to 120MW

Generating **green hydrogen** through electrolysis for local, regional or **OffShore** applications



## Plug Hydrogen

National distribution of liquid hydrogen to end users to ensure constant supply



## GenFuel Supply 125 sites

Turn-key service that provides reliable hydrogen distribution and supply



## GenCare Services 24/7

Fully monitoring service network for real-time fault detection and ensured uptime



## PlugPower in Europe

# European sites

Strong local presence with our dedicated service technicians

European Service center in Belgium :

- 20 FTE in EU

Deploying 6 sites now in Europe

JV with RENAULT and ACCIONA



The Leader In  
**Your Fuel Cell**  
**for all Applications**

Plug Power provides the world's most extensive suite of fuel cell engines and application specific platforms in the world.

Our history of innovation spans applications in material handling, stationary backup, engines for transportation and even aerospace.

By enabling faster charging, consistent power during operation, longer ranges and higher cargo capacities our fuel cells replace batteries in most electric vehicle applications.



**GenDrive**

Fuel cells for material handling in warehousing, distribution and manufacturing



**GenSure**

Stationary backup power for datacenter, utility and other mission critical applications, GenSet



**ProGen Engines**

Fuel cell systems for a wide range of transportation and mobility applications



**ProGen Aerospace**

Fuel Cells extend runtime and range of UAVs, Drones and Passenger aircraft

○ Plug Power Fuel Cell Platforms

## GenSure HP : H2 Genset for Stationary Backup up to 2MW

Backup for mission critical applications

Eliminates diesel emissions

Reduced maintenance

Increases reliability



Plug Power Fuel Cell Platforms

## ProGen Engines for Mobility

Fuel cell engines for Electric Vehicles

Reduce charging / refueling time

Increase cargo capacity

Increase range



# PROGEN : The Leader In Fuel Cell Platforms



EPOD	< 5 kW		Drones UAVs
ProGen	15 - 30 kW		Robotics Airport Ground Support Equipment
ProGen	30 - 60 kW		Class 3-5 Trucks Buses & Class V Forklift Trucks
ProGen	85 - 500 kW		Class 4-8 Trucks Full-size Buses & Class V Forklifts
ProGen Systems	100 kW to multi-megawatt		Microgrid and Storage GenSet, Data Center Backup



# On-Road and European Expansion: Creation of a 50/50 JV with Groupe Renault (1)



Plug Power is a leading provider of clean hydrogen and fuel cell solutions



- ✓ Significant field experience with over 40,000 operating units <sup>(2)</sup> in the material handling market and over 100 refuelling stations <sup>(2)</sup>
- ✓ Technological leadership: best-in-class performance, durability and one of the smallest stacks in the market
- ✓ Large fuel cell manufacturing capabilities
- ✓ Dominion of the whole hydrogen value chain enabling to provide a one-stop-shop solution
- ✓ Blue chip customers in logistics such as Amazon and Walmart

Groupe Renault is a leader in electric vehicles across Europe



- ✓ OEM industrial manufacturing know-how and capabilities
- ✓ Vehicle design and certification expertise, large components supply base
- ✓ Pioneering experience in new energies and strong position in electric light commercial vehicles in Europe
- ✓ Iconic LCV models such as Renault Master and Renault Trafic with high market share across Europe
- ✓ Unparalleled European dealer's network
- ✓ Large European corporate client portfolio

50/  
50

Joint-venture based in France, expected by the end of the first half of 2021

2021

Expected beginning of commercialisation with pilot fleet deployments

30%

Targeting market share of fuel cell LCV market in Europe by 2030

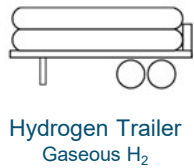
Notes:

1. Joint venture with Renault is subject to the entry of definitive agreements
2. Rounded figures, excludes stationary units

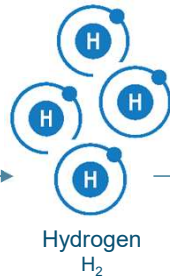
# Turnkey H<sub>2</sub> solution for distribution centers



Equipment Pad



Hydrogen Trailer  
Gaseous H<sub>2</sub>



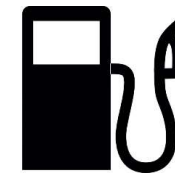
Hydrogen  
H<sub>2</sub>



Compression



Storage

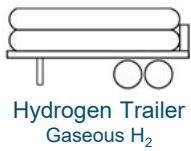


Dispenser  
+  
GenDrive ProGen  
GenSure HP 1.5MW



H<sub>2</sub> GREEN  
generation onsite

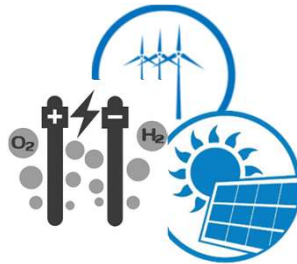
H<sub>2</sub> gas  
supplier



Hydrogen Trailer  
Gaseous H<sub>2</sub>

Tube Trailer

or



Water Electrolysis  
 $2\text{H}_2\text{O} \rightarrow 2\text{H}_2 + \text{O}_2$

# GENFUEL

Plug Power Fuel Cell Platforms

## GenDrive for Material Handling



Directly replace lift truck batteries

Eliminate battery removal and charging

Increase operator productivity

Eliminate battery room





# Material Handling

Operational Advantages

Operate lift trucks at full capacity, free up valuable floor space, and increase operator productivity

**90 seconds**

to refuel

**15 to 25%**

increased productivity



Higher Productivity

Higher Efficiency

Environmental Benefits

Plug Power

○ Thank you

Corporate HQ  
968 Albany Shaker Rd  
Latham, NY 12110

Devon Hyver, Sales Director Europe  
[dhyver@plugpower.com](mailto:dhyver@plugpower.com) +33.6.48.47.27.63



**TKI NIEUW GAS**  
Topsector Energie

# Hydrogen developments in the Netherlands

Jörg Gigler



June 2 2021

*Presentation for WIC WaterstofNet*



# Contents

1. National Hydrogen Programme (NWP)
2. National Growth Fund
3. National Project Overview



# 1. National Hydrogen Programme (NWP)

## **Background NWP**

Climate Agreement (2019) and Government Strategy on Hydrogen (2020):  
Need for a national programme

## **Cross-sectoral Working Group on Hydrogen (CSWW)**

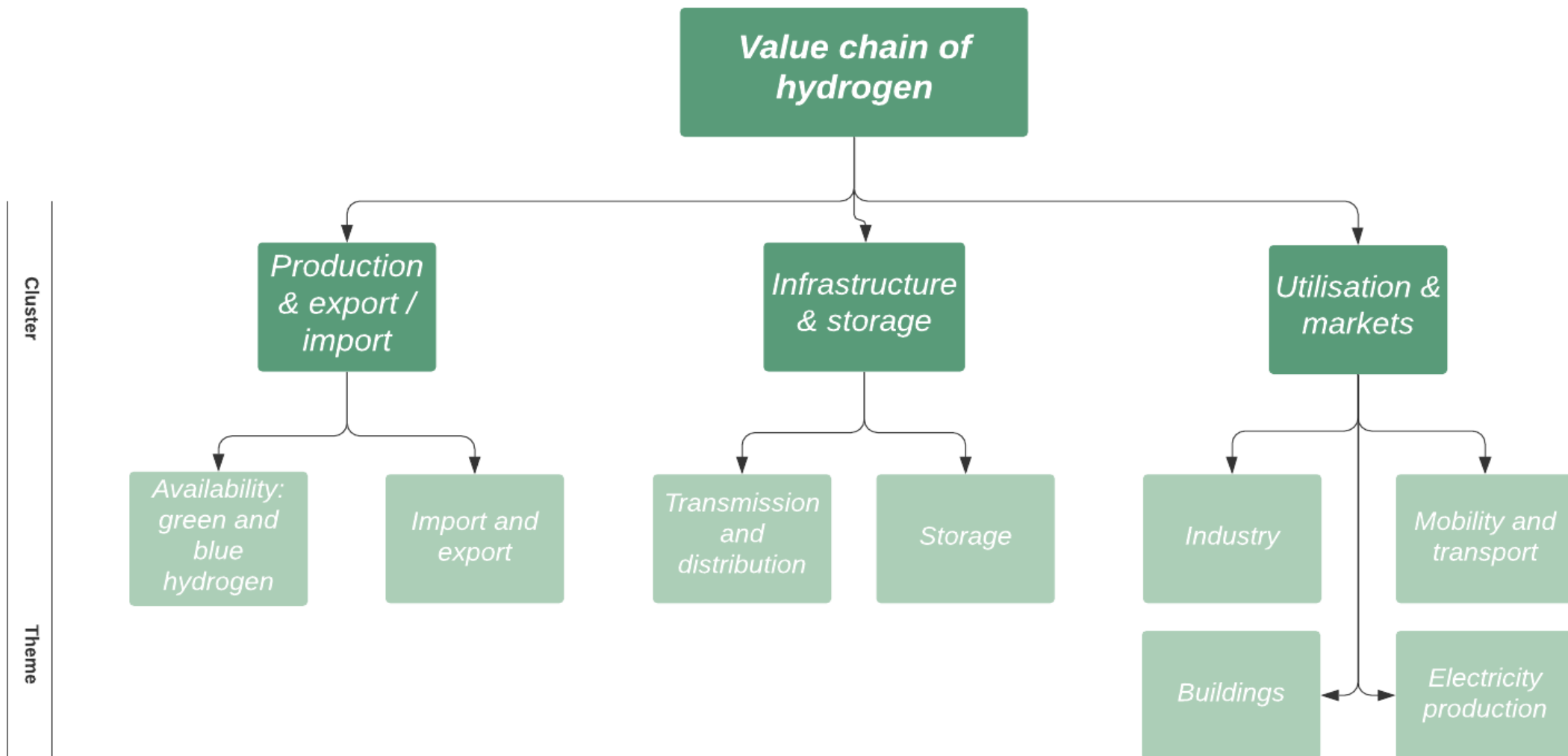
Consisting of and representing the Dutch stakeholder-community

## **Request to CSWW**

Construct a working plan for the NWP for the period 2022 – 2025, with a glimpse towards 2030. To be delivered July 2021

## **Main question**

How can hydrogen contribute to realising the energy transition in The Netherlands



Thema

Beschikbaarheid:  
groene en blauwe  
waterstofproductie

Import en export

Transmissie en  
distributie

Opslag

Industrie

Mobiliteit en  
transport

Gebouwde omgeving

Elektriciteitsproductie

Doorsnijdende aspecten

Investments

National and European regulation en certification

(Inter)national collaboration and coordination

Framework for efficient and effective use of hydrogen

Hydrogen market

Manufacturing industry (inc. supply chain)

Societal support and impact

Safety

Regional collaboration and coordination

Human Capital Agenda

Innovation

System integration

# Approach and process

## Themes round 1 (March - April)

- Production
- Import & export
- Infrastructure & storage
- Safety
- Manufacturing industry
- Use: industry
- Use: mobility
- Use: electricity production

## Questions

- *Describe IST and SOLL*
- *Activities*
- *Cohesion*
- *Organisations*
- *Deliverables*
- *Monitoring*

## Themes round 2 (April - June)

- Societal issues
- Regional collaboration & coordination
- Framework
- System integration
- Innovation
- Use: built environment

## Other themes

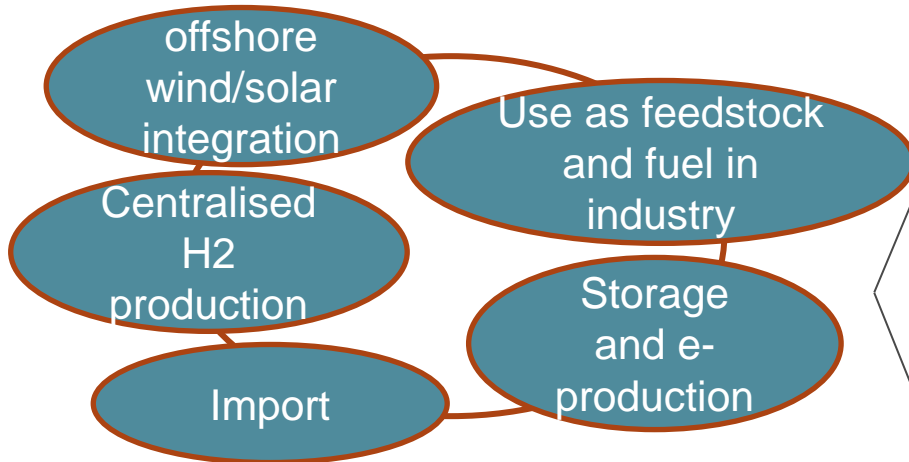
- Regulation & certification, instrumentation, market & trade, international collaboration, ...



# Preliminary results

**1a. Large scale development** of hydrogen chains in industry clusters (now) and (later) for electricity generation (back-up)

Objective: scale up of production and use



**1b. Built-up, demonstrate and facilitate roll-out in industry clusters and harbours**

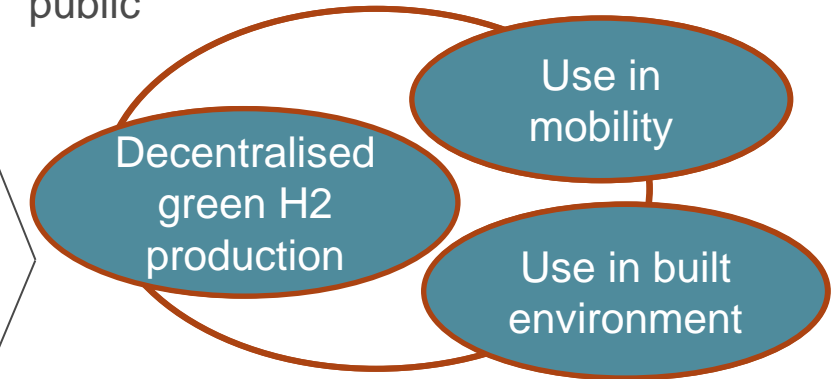
- Develop infra (backbone) and storage
- Develop international connections

**3. Create the right conditions**

- Develop policy instruments
- Develop markets
- Work on safety
- Set-up certification
- Start manufacturing industry
- Support system integration
- Investigate blending
- Support innovation
- Create framework
- Promote international collaboration
- Develop HCA

**2a. Decentralised development** of hydrogen chains for mobility, built environment and smaller scale industry

Objective: develop production and use of hydrogen, integrate this and involve the public



**2b. Demonstrate, integrate and facilitate roll out in regions**

- Develop local infra and storage
- Create public awareness and involvement

## 2. National Growth Fund



# Nationaal Groeifonds



## 2. National Growth Fund

“Groenvermogen van de Nederlandse economie”

- Applicants: Topsectors Energy, Chemistry and HTSM
- Volume: approx. 2 billion euro
- Requested subsidy: approx. 730 miljoen
- Received (conditional): 338 miljoen
- Topics: innovation, HCA, demo projects
- Start: Autumn 2021?



# 3. National Project Overview



# 3. National Project Overview: 130+ projects!

20 MW Electrolyser



H2 storage in caverns



Hydrogen valley



20 hydrogen buses



H2 in homes



Hydrogen trucks



# Summarising



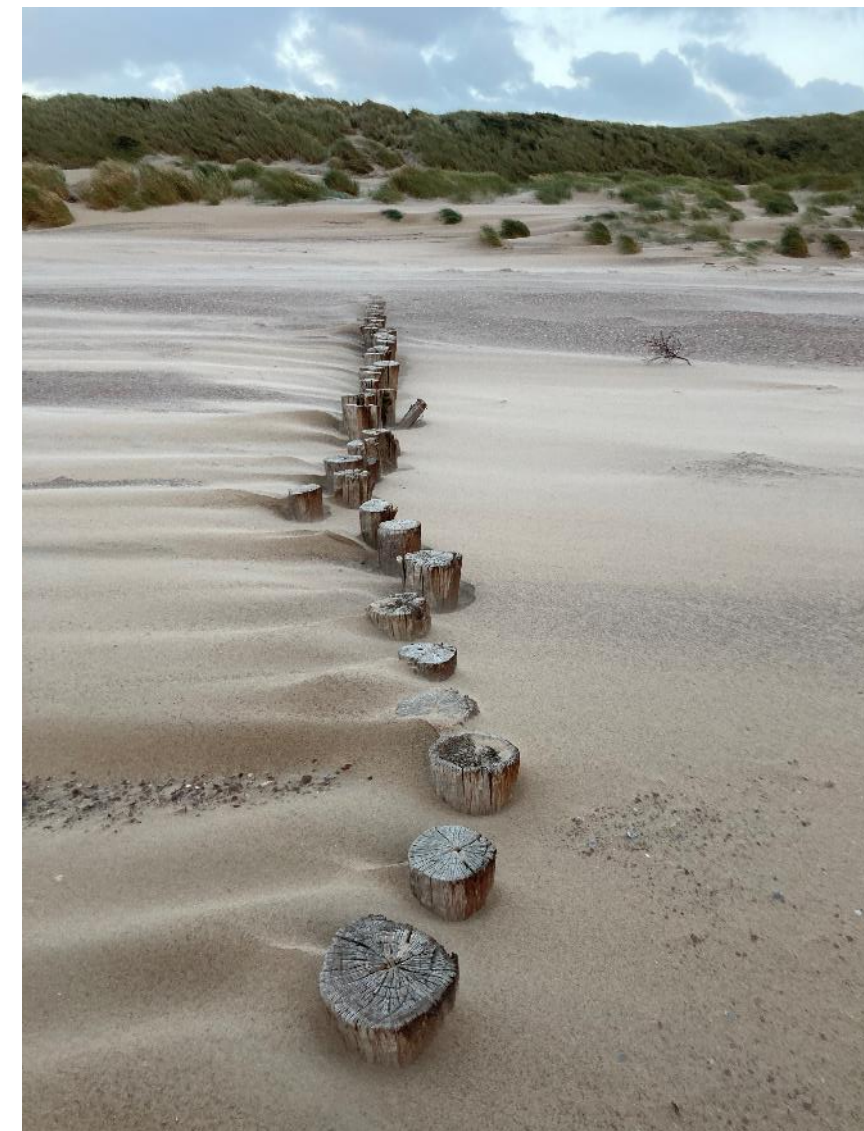
**TKI NIEUW GAS**  
Topsector Energie

- Great dynamics around hydrogen
- Everyone is searching for stepping stones towards implementation: many obstacles to overcome
- All efforts count but final words lie within new Dutch government coalition

Thank you for your attention

Jörg Gigler, TKI Nieuw Gas / CSWW

(jorg@gigler.nl - 06 4525 1571 - topsectorenergie.nl)



# Developments in the WIC

---

- (New )member info
- Status working groups
- Networking & meetings
- News from the governments FL-B-NL
- Feedback cabinet contacts Flanders
- Overview FL/BE/EU funding



# NEW MEMBERS SINCE PREVIOUS MEETING MARCH

**SEA-Tank Terminal**

**inovyn**  
An INEOS company

**AIR PRODUCTS**

**SGS**

**NV VERWATER**



**WDP**



**blue**



**pom**  
antwerpen



**CUYPERS VORKLIFTEN**



**IOK**  
afvalbeheer

Making our world  
more productive



**Linde**

# WIC STATUS: 90 MEMBERS!



# WIC STATUS: VALUE CHAIN



# STATUS WORKING GROUPS

---

## 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 & infrastructure  
(coll. With De Blauwe Cluster)

## H<sub>2</sub> for all



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

---




Evaluation & statements  
Related to EU or national legislation

- Recent activities: Cabinet visits Flanders
  - To do coming period:
    - Provide input for follow-up actions of the cabinet visits
    - Consultation REDII translation to Belgian Law → RE in transport obligations
-



## Development of H<sub>2</sub> pilots & infrastructure for shipping

- In collaboration with  BLAUWE CLUSTER
  - Recent activities:
    - Knowledge-exchange and matchmaking sessions
    - Questionnaire on desired follow-up
  - To do coming period:
    - ⇒ Identify project ideas
    - ⇒ Inventory of hydrogen sources for shipping initiatives
    - ⇒ Gather info on legislative framework
  - Next meeting June 10
-



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

- Recent activities:
    - Kick-off meeting with small group: defining the objectives
    - Second meeting with small group: choosing the means
      - Updated and more visually attractive information on the website
      - A podcast
  - To do coming period:
    - ⇒ Review existing information on website and elaborate
    - ⇒ Record first podcast episode
    - ⇒ Third meeting: feedback on the progress
-



Helping our WIC members to stay on top of the game

- Medium-short “explainer” articles on Brussels’ hot topics/concepts, such as:
    - Carbon Contracts for Difference
    - The different associations (the European Clean Hydrogen Alliance, Hydrogen Europe, Clean Hydrogen for Europe, etc.)
    - Additionality
    - Etc.
  - Aimed at giving a thorough yet concise explanation of the concept and its context in accessible language
  - The documents will be made available on the members’ portal and will be updated regularly
-



# WORKING GROUP MOBILITY



Monitoring and facilitating H2 refuelling stations in Benelux.  
Increase utilisation.

- Group of 18 companies
- Recent activities: kick-off meeting on 26/5
- Five goals/objectives:
  - ✓ Create a detailed roll-out plan a follow-up for Netherlands and Flanders
  - ✓ Monitoring, exchanging “data and experiences” of HRS and FCEV
  - ✓ Efficient, short, uniform and transparant approach of opening a HRS
  - ✓ Increase utilisation HRS
  - ✓ Communication to stakeholders
- To do coming period: develop goals into deliverables
- Follow up meeting: September 7



# FEEDBACK CABINET CONTACTS FLANDERS/BELGIUM

## Cabinet visits March-April 2021

VLAAMSE KABINETTEN			
	Topics	Status	Follow up actie
<b>Zuhair Demir</b> (Omgeving & Energie)	Studie VEKA import waterstofderivaten	Lopend	Navraag stand van zaken september 2021
	Update VEKP (met grotere rol H <sub>2</sub> )	On hold	Evaluatie in 2023. Navraag update begin 2022
	Uitrol hernieuwbare energie ook voor productie H <sub>2</sub>	Lopend	Moelijk hierop te wegen vanuit WIC
	GD's uitwisseling met Nederland	Lopend	Navraag stand van zaken september 2021
	Aanpassing VLAREM vergunning HRS	Lopend	Navraag stand van zaken mei 2021
<b>Hilde Crevits</b> (Economie & Innovatie)	<b>Topics</b>	<b>Status</b>	<b>Follow up actie</b>
	Vlaamse waterstofstrategie - bevoegdheidsverdeling VL - BE	Lopend	Navraag stand van zaken mei 2021
	Vlaamse waterstofstrategie - opstart gesprekken middenveld inc	Lopend	Navraag stand van zaken mei 2021
	Definiëring O&D noden waterstof	Lopend	Eigen actie WaterstofNet
	Uitbreiding Ecologiepremie+	Lopend	Navraag stand van zaken mei 2021
	OPEX-steun	Lopend	Ligt bij EU, begin 2022 polsen naar stand van zaken
IPCEI-traject	Lopend	Navraag naar plannen "tweede wave" begin 2022	
Vlaanderen cofinanciering ETS-IF	Lopend	Navraag stand van zaken mei 2021	
<b>Mathias Diependaele</b> (Verkeersfiscaliteit)	<b>Topics</b>	<b>Status</b>	<b>Follow up actie</b>
	Verlaging/vrijstelling van de kilometerheffing voor emissiearme/er	Lopend	Navraag stand van zaken mei 2021
	Fiscale korting kan gegeven worden op de CAPEX	Lopend	Navraag stand van zaken mei 2021
<b>Lydia Peeters</b> (Mobiliteit)	<b>Topics</b>	<b>Status</b>	<b>Follow up actie</b>
	Clean Power for Transport plan	Lopend	Navraag stand van zaken mei 2021
	Waterstofprojecten bij De Lijn	Niet gestart	Blijft moeilijke aangelegenheid
	Eurovignet richtlijn	Lopend	Navraag stand van zaken mei 2021
<b>Jan Jambon</b> (MP en Buitenlandse Zaken)	<b>Topics</b>	<b>Status</b>	<b>Follow up actie</b>
	H <sub>2</sub> samenwerking Noordrijn-Westfalen	Lopend	Navraag stand van zaken september 2021
	Samenwerking rond import via FIT/Belgische ambassades	Lopend	Navraag stand van zaken september 2021
BELGISCH FEDERALE KABINETTEN			
<b>Pierre-Yves Dermagne</b> (Economie & Werk)	<b>Topics</b>	<b>Status</b>	<b>Follow up actie</b>
	Technische uitwerking relanceplan	Lopend	Navraag stand van zaken mei 2021
	Call for projects reductie CO <sub>2</sub> gascentrales	Lopend	Navraag stand van zaken september 2021
<b>Thomas Dermine</b> (Relance)	Offshore energie eiland in de Noordzee	Lopend	Navraag stand van zaken september 2021
<b>Zakia Khattabi</b> (Klimaat en Green Deal)	<b>Topics</b>	<b>Status</b>	<b>Follow up actie</b>
	Update NEKP	On hold	Evaluatie in 2023. Navraag update begin 2022
	Koolstofaks	Lopend	Navraag stand van zaken begin 2022
<b>Tinne Van der Straeten</b> (Energie)	<b>Topics</b>	<b>Status</b>	<b>Follow up actie</b>
	Nationale waterstofstrategie	Lopend	Navraag stand van zaken mei 2021
	Vrijstelling grid fees elektrolyzers	Lopend	Navraag stand van zaken september 2021

- Digital meetings with all relevant Flemish and Belgian federal cabinets/administrations
- WaterstofNet + mixed teams from the policy group
- Open and fruitful discussions
- Short term follow up on topics: WaterstofNet
- Q1 2022: new cabinet visits FL

## Van der Straeten wil van België de waterstofhub van Europa maken



Minister van Energie Tinne Van der Straeten (Groen) Beeld Aurélie Geurts

Minister van Energie Tinne Van der Straeten (Groen) wil van België dé waterstofhub van Europa maken. **Nog voor de zomer** wil ze met een **strategie komen** die het **potentieel van ons land** daarvoor optimaal moet benutten. Dat heeft de groene minister verklaard naar aanleiding van een studie van Deloitte en de FOD Economie over de rol van gasvormige energiedragers in een klimaatneutraal België.

May 18:

Kick-off of study FOD economy and Deloitte “Towards a climate neutral Belgium: the role of clean gas”

=> Belgian H2 strategy to be expected before the summer

Total budget BE for H2: 330M€

FL: 125M€

WL: 110M€

BE: 95M€

- Development of 'Nationaal Waterstofprogramma' (presentation Jörg Gigler)
    - Visit the website at [Nationaal Waterstof Programma](#)
  - “Nationaal Groeifonds”: 338M€ for H2 and green chemistry
  - Demissionary cabinet having impact on earmarking of H2 budget
  - Dutch ministry of Infrastructure and Water Management aim for clean and quiet taxis by 2030.
  - Q3 2021: meetings of Waterstof Industry Cluster with Dutch government
-

# H2 NEWS FROM OUR GOVERNMENTS (FL/NL)

IPCEI-process : match-making phase

To be submitted by Germany in July



Project Title	Expected Plant Capacity		
	2020	2025	2030
Djewelt, Delfzijl	30 MW	100 MW	
HyNetherlands, Eemshaven	100 MW		1000 MW
PowertoMethanol, Antwerp	10 MW		100 MW
Hyoffwind, Zeebrugge	25 MW		
Zeeland Refinery/Yara, Vlissingen, Sluiskil	2*100 MW	600 MW	1000 MW
VolH2, Vlissingen	25 MW		100 MW
North-C Methanol, Rodenhulze	63 MW		600 MW
H2.50, Rotterdam		250 MW	
H2 Plant (Shell), Rotterdam		200 MW	
HyPort, Oostende	50 MW		300 MW
H-Vision, Rotterdam		750 MW	
North2, Groningen			5000 MW
H2ermes, Ijmuiden			100 MW
Green hydrogen production, Emsland	50 MW		500 MW
Coal to green hydrogen, Port of Hamburg		100 MW	
Westküste100, Hemmingstedt		30 MW	700 MW
Hybridge, Emsland	100 MW		
Element Eins, Lower Saxony			100 MW
HySynGas, Brunsbüttel		50 MW	
Power-to-Gas, BfW Bürgerwindpark Fehndorf / Lindloh GmbH & Co. KG	67,2 MW		
HydrDry Hub, Walsum		600 MW	
Energiepark, Mainz	6 MW (started in 2018)		
Energy Park, Bad Lauchstädt		30 MW	



Figure 4.1. Announced large-scale electrolyser plants in the region<sup>2</sup>

# OVERVIEW EU/NL/B/FL FUNDING

Funding programme	Region	Submission deadline	Funding amount	For who	Theme	Website
EIC Transition Challenges 2021 (HORIZON-EIC-2021-TRANSITION-CHALLENGES-01)	EU	19 May 2021 until 22 September 2021 17:00:00 Brussels time	40.5 M€	Check the website	The proposals are expected to develop energy storage technologies or combined energy harvesting/storage technologies ready for investment and business development, with the perspective to capture specific systems integration opportunities.	<a href="https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-eic-2021-transitionchallenges-01-02">https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-eic-2021-transitionchallenges-01-02</a>
LIFE	EU	Mid-june 2021	0.9 billion€ for sub-programaam "clean energy transition"	Project beneficiaries are <ul style="list-style-type: none"> <li>• 1/3 private enterprises</li> <li>• 1/3 NGOs and civil society organizations</li> <li>• 1/3 public authorities</li> </ul>	Financing climate, nature, and environmental projects. The subprogram "Clean energy transition" is relevant for us.	<a href="#">LIFE (europa.eu)</a>
Climate, energy and mobility cluster 5 - Horizon Europe	EU	Soon to be open	303.8 M€	Companies, research organizations	Areas of intervention: <ol style="list-style-type: none"> <li>1. climate science and solutions</li> <li>2. energy supply</li> <li>3. energy systems and grids</li> <li>3. buildings and industrial facilities in energy transition</li> <li>4. communities and cities</li> <li>5. industrial competitiveness in transport</li> <li>6. clean, safe and accessible transport and mobility</li> <li>7. smart mobility</li> <li>8. energy storage</li> </ol>	

Check the portal for regular updates [Downloads \(waterstofnet.eu\)](https://waterstofnet.eu) → Overview of the existing funding opportunities

# OVERVIEW EU/NL/B/FL FUNDING

Funding programme	Region	Submission deadline	Funding amount	For who	Theme	Website
DEI+	NL	January 18, 2021, 9:00 AM until January 7, 2022, 5:00 PM	76.6 M€ - an extra 9 M€ for natural gas-free built environment	entrepreneurs/organisations	Pilot and demonstration projects in: circular economy; CCUS; energy efficiency; renewable energy; local energy infrastructure; other CO2 reduction measures	<a href="https://www.rvo.nl/subsidie-en-financieringswijzer/demonstratie-energie-en-klimaatinnovatie-dei/themas-dei-2021">https://www.rvo.nl/subsidie-en-financieringswijzer/demonstratie-energie-en-klimaatinnovatie-dei/themas-dei-2021</a>
SDE++	NL	21/09/2021 till 15/10/2021	5 M€	entrepreneurs/organisations	The subsidy scheme SDE++ (Incentive Scheme sustainable energy transition) must make an important contribution to reducing CO2 emissions by 49% by 2030.	<a href="https://www.subsidiefocus.nl/subsidies/stimulering-duurzame-energietransitie?utm_source=bing&amp;utm_medium=cpc&amp;utm_campaign=Subsidiefocus%20-%20Energie%20%26%20Milieu%20(mbm)&amp;utm_term=%2B%20sde&amp;utm_content=SDE%2B%20(mbm)">https://www.subsidiefocus.nl/subsidies/stimulering-duurzame-energietransitie?utm_source=bing&amp;utm_medium=cpc&amp;utm_campaign=Subsidiefocus%20-%20Energie%20%26%20Milieu%20(mbm)&amp;utm_term=%2B%20sde&amp;utm_content=SDE%2B%20(mbm)</a>
TKI New Gas Hydrogen Technology	NL	June 8, 2021 - deadline for the submission of "Expression of Interest"; September 15, 2021 - deadline for the full proposal submission	3 M€	The consortium applying for a grant must consist of at least one company and one recognized research institution.	The themes are: 1. Measuring and analyzing hydrogen; 2. Decentralized hydrogen production via electrolysis; 3. Compression, cleaning, drying, cooling and odorization of hydrogen; 4. Storage of hydrogen; 5. Fuel cell technology; 6. Burner technology for hydrogen.	<a href="https://www.topsectorenergie.nl/nieuws/subsidieregeling-voor-waterstoftechnologie-geopend">https://www.topsectorenergie.nl/nieuws/subsidieregeling-voor-waterstoftechnologie-geopend</a>
TSE studies industry	NL	January 18, 2021 9:00 am until September 7, 2021 5:00 pm	8 M€	entrepreneurs in industry who investigate the feasibility of an innovative pilot or demonstration project that can cost-effectively reduce CO2 emissions by 2030	The 5 following themas: 1) innovation in industrial value chains; 2) a CO2-free industrial heating system; 3) maximizing electrification and extreme measures to change industrial processes; 4) CCUS; 5) other CO2-reductions measures in industries	<a href="https://www.rvo.nl/subsidie-en-financieringswijzer/topsector-energiestudies-industrie">https://www.rvo.nl/subsidie-en-financieringswijzer/topsector-energiestudies-industrie</a>

# OVERVIEW EU/NL/B/FL FUNDING

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Versnelde klimaatinvesteringen industrie	NL	September 1, 2020 9:00 AM until December 14, 2021, 5:00 PM	28 M€	entrepreneurs who want to take CO2-saving measures within their company, the effectiveness of which has been proven, but they are running into too high investment costs and the payback period is longer than 5 years.		<a href="#">Versnelde klimaatinvesteringen industrie aanvragen   RVO.nl   Rijksdienst</a>
Hernieuwbare Energietransitie (HER+)	NL	April 1, 2021, 9 AM until March 31, 2022, 5 PM	50 M€	entrepreneurs/organisations	HER+ follows the categories of the current scheme Stimulating sustainable energy production and climate transition (SDE ++).	<a href="https://www.rvo.nl/subsidie-en-financieringswijzer/hernieuwbare-energietransitie">https://www.rvo.nl/subsidie-en-financieringswijzer/hernieuwbare-energietransitie</a>
TSE industry	NL	6 July 2021, 09:00 till 14 September 2021, 17:00 uur	The budget for TSE Industry is 6.36 M€. The maximum subsidy per project is 500,000 €.	Check the website	Four themes: 1) Innovation industrial chains; 2) CO2-free industrial heating system; 3) Maximum electrification and radically renewed processes	<a href="https://www.rvo.nl/subsidie-en-financieringswijzer/tse-industrie">https://www.rvo.nl/subsidie-en-financieringswijzer/tse-industrie</a>
ConnectSME	NL/VL	Call open between 1/9/2020-31/12/2022	36 innovation projects SMEs receive "in-kind" vouchers of the value 10.000 € and in the second selection round 18 projects receive a second voucher for the value of 40.000 €		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.	<a href="#">Innovatieve kmo's en mkb'ers gezocht voor ConnectSME   CrossRoads2</a>



# AGENDA MEMBER INFO & NETWORKING

- Meet & Greet, July 1
- Cluster meetings, next on September 8
- WIC Webinar, next edition on September 30
- Working visit Groningen (TBC) October 6 – 7 – 8
- Conference in November (TBD)
- Online event “Emerging offshore technologies: [June 8-15-24](#)



Production of green electrons & molecules at sea” with

# HYVOLUTION 2021

- HyVolution 2021 @ Paris October 27 and 28
- Large scale hydrogen event for energy, industry and mobility with 120 exhibitors & brands and over 2000 visitors
- Participation with WaterstofNet/WIC still possible via a shared booth (4 sqm for 1.500€)
- Interested? Contact Yannick



Agfa launches its high performance ZIRFON UTP 220 membrane for the production of green hydrogen

Mortsel, Belgium | May 5, 2021 11:00 AM CET

# News from Cluster Members

Persbericht

Imec, VITO, Bekaert, Colruyt Group, DEME en John Cockerill bundelen krachten rond groene waterstof



## Colruyts en VoltH2 bouwen waterstoffabriek in Terneuzen



De haven van Gent, die samen met die van Terneuzen de North Sea Port vormt. ©BELGAONTHESPOT

**Questions & Comments?**

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**NEWS****ZIRFON**  
H<sub>2</sub> ADVANCED<sup>2</sup>

THE ADVANCED ALKALINE ELECTROLYSIS MEMBRANE

**AGFA** 

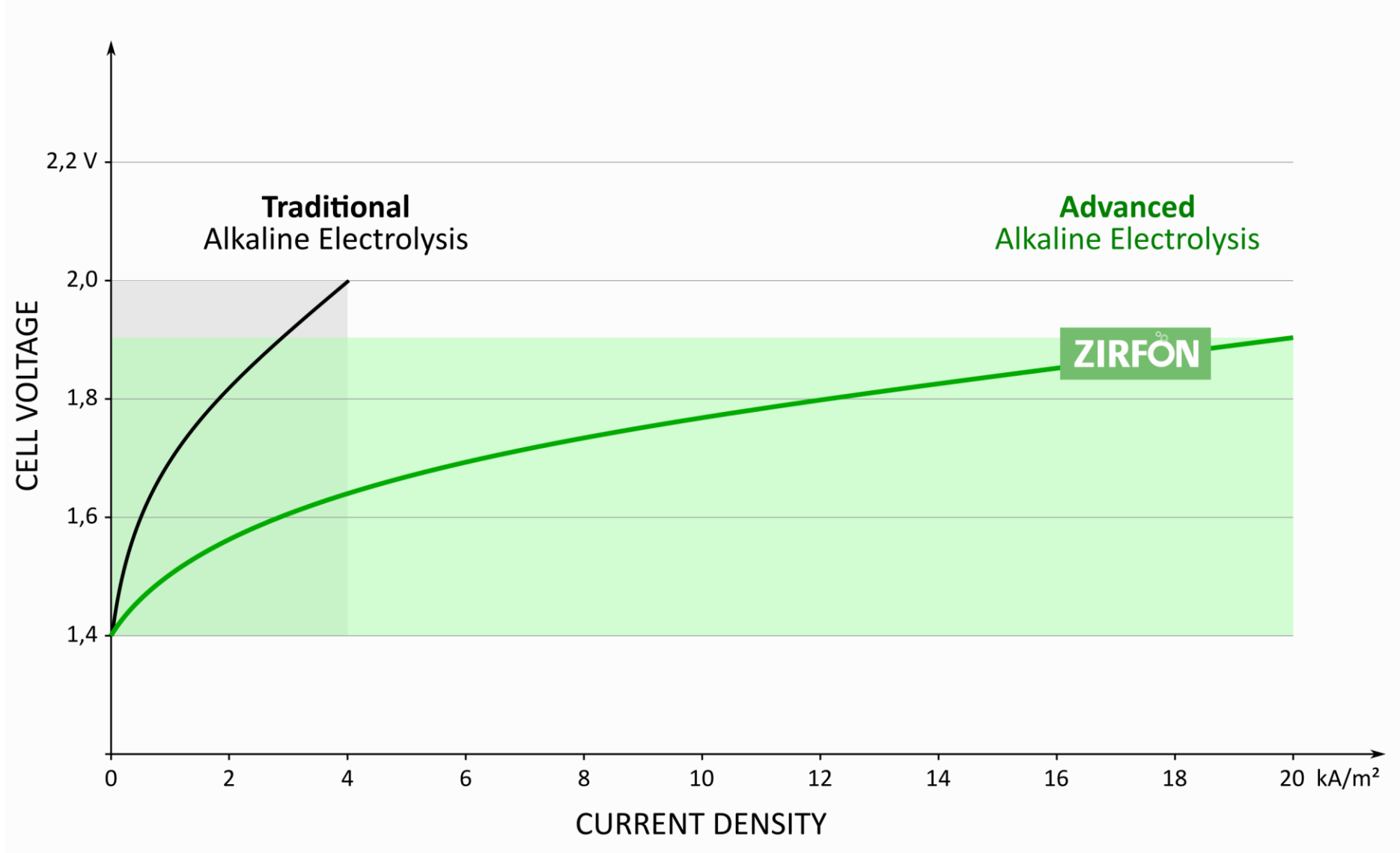
May 6, 2021

**Agfa has announced the launch of its high performance ZIRFON UTP 220 membrane for the production of green hydrogen and herewith contributes once more to lowering the cost of green hydrogen production.**

The new ZIRFON UTP 220 has excellent durability and its low resistivity allows for the highest yield of hydrogen production, setting yet another standard for advanced Alkaline ElectroLysis (AEL).

ZIRFON UTP 220 adds to the existing UTP 500+ and UTP 500 membranes in Agfa's portfolio. As recently revealed in a report by the Fraunhofer Institute, their use makes AEL the most efficient technology for the production of hydrogen.

# Alkaline Electrolysis (AEL) has improved performance **by 400%**



# Advanced AEL now equals performance of PEM **at lower cost**

