

**WIC MEETING FEBRUARY 3, 2022**

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**Welcome to the WIC meeting!**



# AGENDA

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## New members presentation

10.00 -10.30 Uniper, FPIM, KdG Expert, BASF and Kelvion

## Guest speakers

10.30-10.45 Anne Melchers (Min. EZK, NL): Dutch National Hydrogen Program

10.45-11.00 Bart Biebuyck (CHP): Hydrogen valleys & the Clean H2 Partnership

11.00-11.15 Jorre Van Damme & Sandra Vandewiele (VLAIO): Interreg program

11.15-11.30 Ben van der Erve (Netherlands Enterprise Agency RVO): CEF programs

## News from cluster members

11.30 - 11.45 Toyota, Fluxys, Hitachi Energy, Vives, VKI

## WIC info

11.45 - 12.00

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# NEW MEMBERS WIC SINCE DEC WIC MEETING



# NEW MEMBERS PRESENTATION TODAY

uni  
per

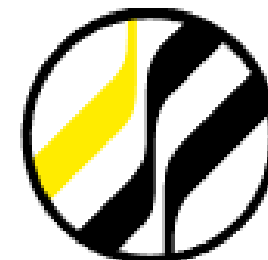
S F P I M

FROM HERE. FOR ALL OF US. ABOUT TOMORROW

 **BASF**  
We create chemistry

KdG Expert  
Karel de Grote Hogeschool

Kelvion







**uni  
per**

**Empower Energy Evolution – with Hydrogen**

Uniper Hydrogen Corporate Presentation, December 2021





Uniper actively  
driving the  
**hydrogen**  
future since  
2013





# Uniper at a glance

## Our operations

- Power Generation
- Commodity Trading
- Energy Sales
- Energy Services
- Growth areas: Hydrogen, Renewables



## Financial Year 2020

€ 1.657 bn EBITDA

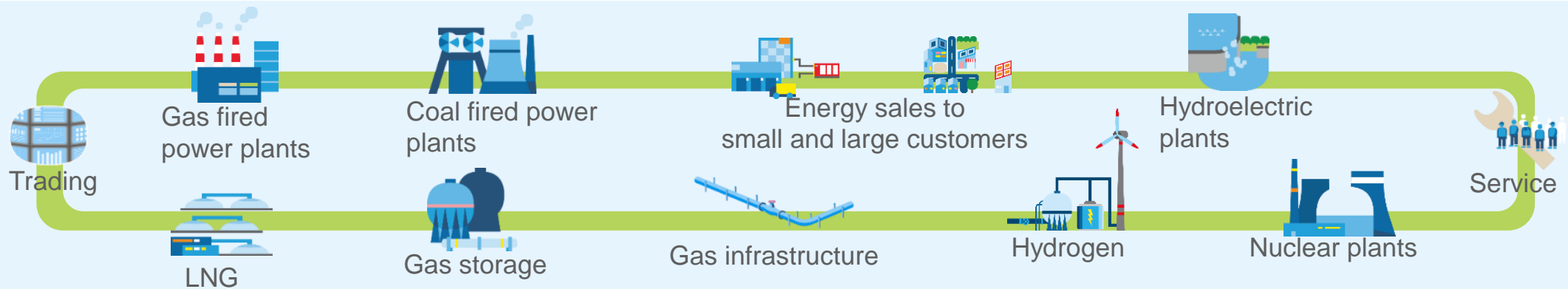
3.7 GW of hydro electric power

4.2 MW of electrolysis in operations

33.5 GW generation capacity

368 TWh LTC gas portfolio

BBB S&P rating



# Uniper's hydrogen strategy is well defined and customer centric to develop large scale projects

**A** >1GW installed by 2030

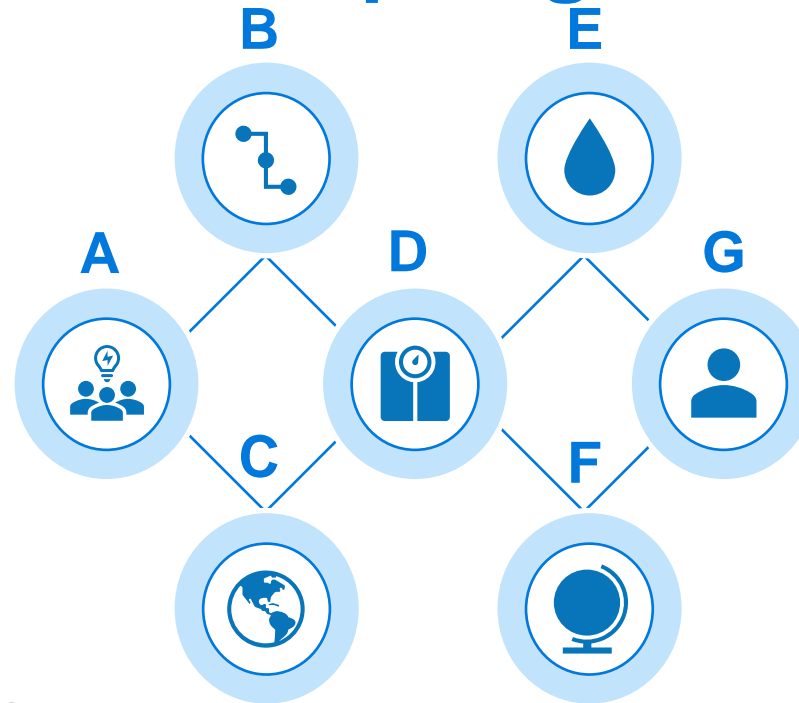
- Semi-commercial (now – 2025)  
Grow from 10 to 100 MW installations
- Industrial scale (2025 – 2030)  
Grow to GW scale  
emerging sales business & small spot market  
stabilise regulation

**B** Embark on all elements of the hydrogen supply chain

- Blue/Green Hydrogen
- Electrolysis, Gas splitting, Reforming & Carbon Capture
- Conversion
- Midstream

**C** Developing large scale H<sub>2</sub> projects w/ focus in our core markets

- The Netherlands
- Nordics
- Germany
- UK



**G** Defined target customers

- Industry
- Transport/mobility

**D** Large scale H<sub>2</sub> projects, from pilot plants to market maturity

- Project Air  
Green H<sub>2</sub> for chemical  
>25MW
- HumberH2ub**  
Green + blue H<sub>2</sub> for industry  
>200MW
- Hydrogen to Maasvlakte**  
Green H<sub>2</sub> for industry  
>100MW, etc.

**E** Developing hydrogen and its derivatives as a key enabler

- Increasing share of hydrogen for industrial use
- Supply and trading of hydrogen products
- Partnerships with OEMs

**F** Uniper's trading capabilities and experience

- Strong link to natural gas business
- Global sourcing utilising our expertise

# Uniper's existing hydrogen plants

## Power-to-Gas Hamburg



- Power: **1.5 MW<sub>el</sub>**
- Hydrogen production: **290 Nm<sup>3</sup>/h**
- Technology: **PEM Electrolysis**
- Feed into the local distribution gas grid
- Commissioning year: **2015**

### Goals:

- Utilisation of highly efficient "Proton Exchange Membrane" electrolysis (PEM)
- Business development

## Power-to-Gas Falkenhagen



- Power: **2 MW<sub>el</sub>**
- Hydrogen production: **360 Nm<sup>3</sup>/h**
- Technology: **Alkaline Electrolysis**
- Feed into the gas grid of ONTRAS Gastransport
- Commissioning year: **2013**

### Goals:

- Demonstration of the process chain
- Optimisation of operational concepts

## Store&go – Methanation



- Input: Renewable H<sub>2</sub>: **210 Nm<sup>3</sup>/h**  
Biogenic CO<sub>2</sub>: **52,5 m<sup>3</sup>/h**
- SNG production: **57 m<sup>3</sup>/h**
- Feed into the gas grid of ONTRAS Gastransport
- Commissioning year: **2018**

### Goals:

- Testing new methanation technologies
- Gain experience in technology, operation and permitting

## OKG Hydrogen plant



- Power: **0.7 MW<sub>el</sub>**
- Hydrogen production: **143 Nm<sup>3</sup>/h**
- Technology: **Alkaline Electrolysis**
- Commissioning year: **1992**

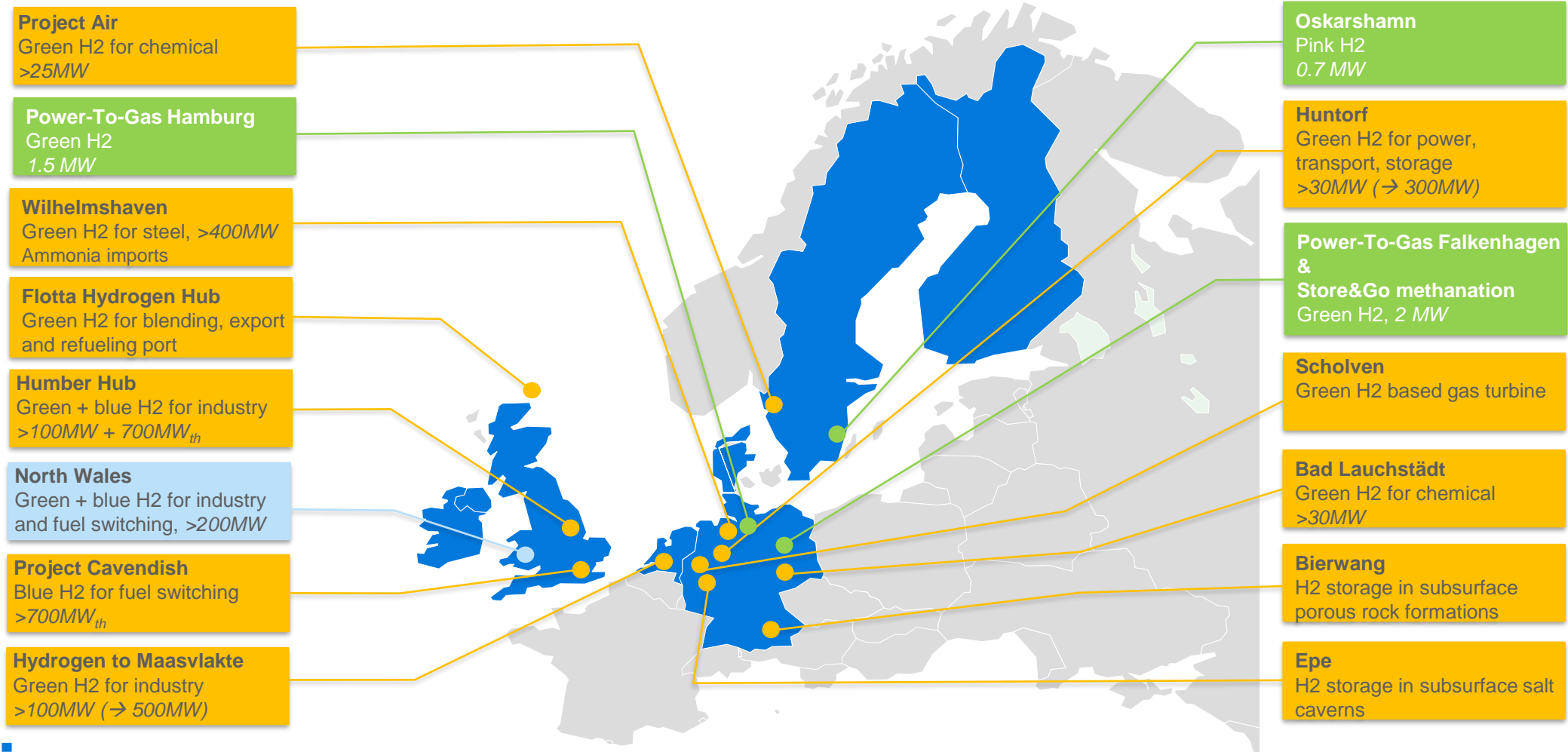
### Goals:

- Cooling nuclear generator
- Reducing the amount of oxygen in the water at O2

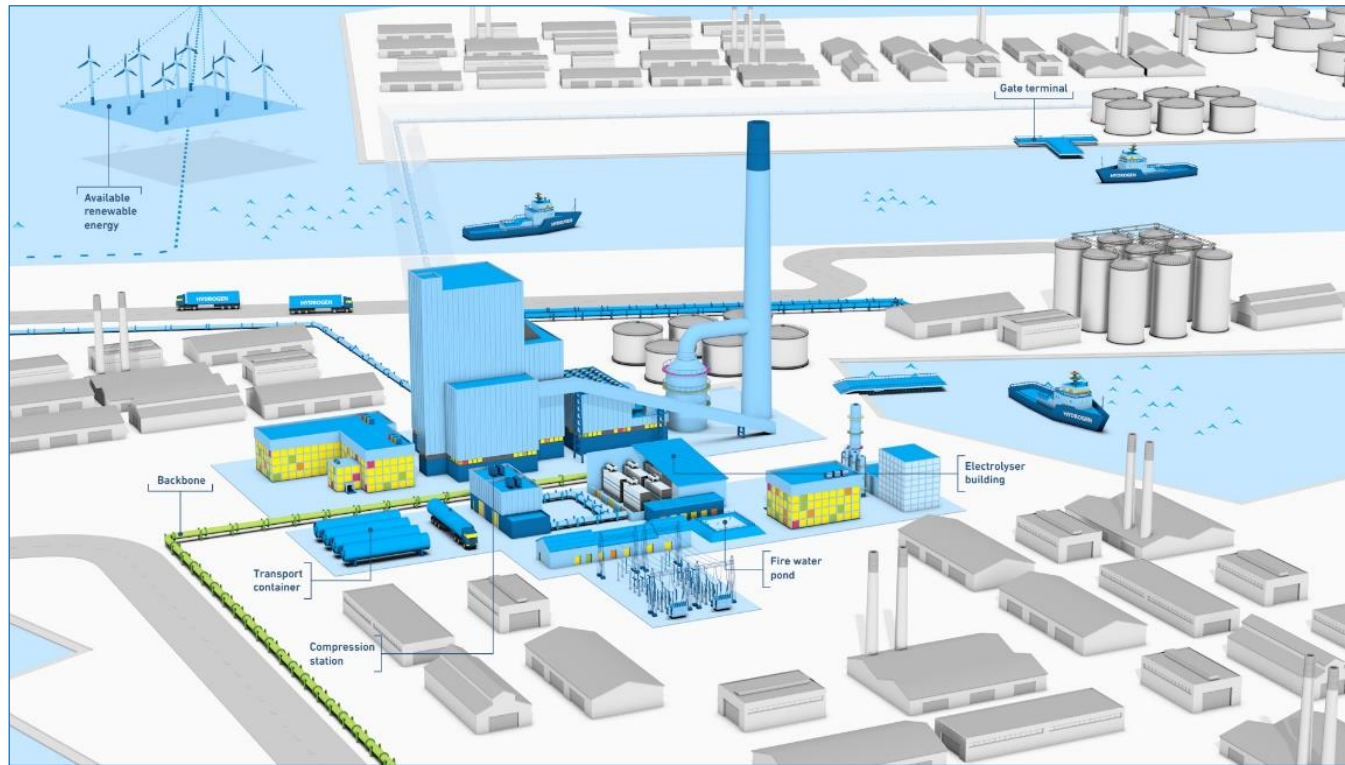
# Uniper focussing on developing large scale H<sub>2</sub> projects

From pilot plants to market maturity

● Project idea ● Project in design ● Project completed



# Feasibility study with the Port of Rotterdam for Green hydrogen production at the Maasvlakte



**Key Location:** Uniper's Maasvlakte site is a key location to enable the delivery of Hydrogen at scale in line with the vision of the Port of Rotterdam Authority and its's hydrogen backbone

**Cost effective:** Synergies available at this location can make hydrogen production cost effective (Demi water, cooling water, power, gas infrastructure etc., already available)

**Green Hydrogen:** Future offshore wind lands at the Maasvlakte enabling the role out of green hydrogen

**Scalable:** The port of Rotterdam has well connected hydrogen infrastructure to key hydrogen markets such as Germany and France, which facilitate hydrogen transportation, storage and utilization

Creation of the **Hydrogen economy** enabling the energy transition across **PoR**





**Our Purpose**

**Empower  
Energy  
Evolution**

**uni  
per**





# ***Company presentation***

***03.02.2022***

**From here.  
For all of us.  
About tomorrow.**

**S F P I M**

## 2. **S<sub>FPI</sub>M** in figures – Where we are

Striking a **balance** between an acceptable **financial return** on the one hand and **societal impact** on the other

**2,5** billion €

assets on balance - YE 2020  
(+ 180% in 10 years time)

**1** million €

Net result - YE 2020

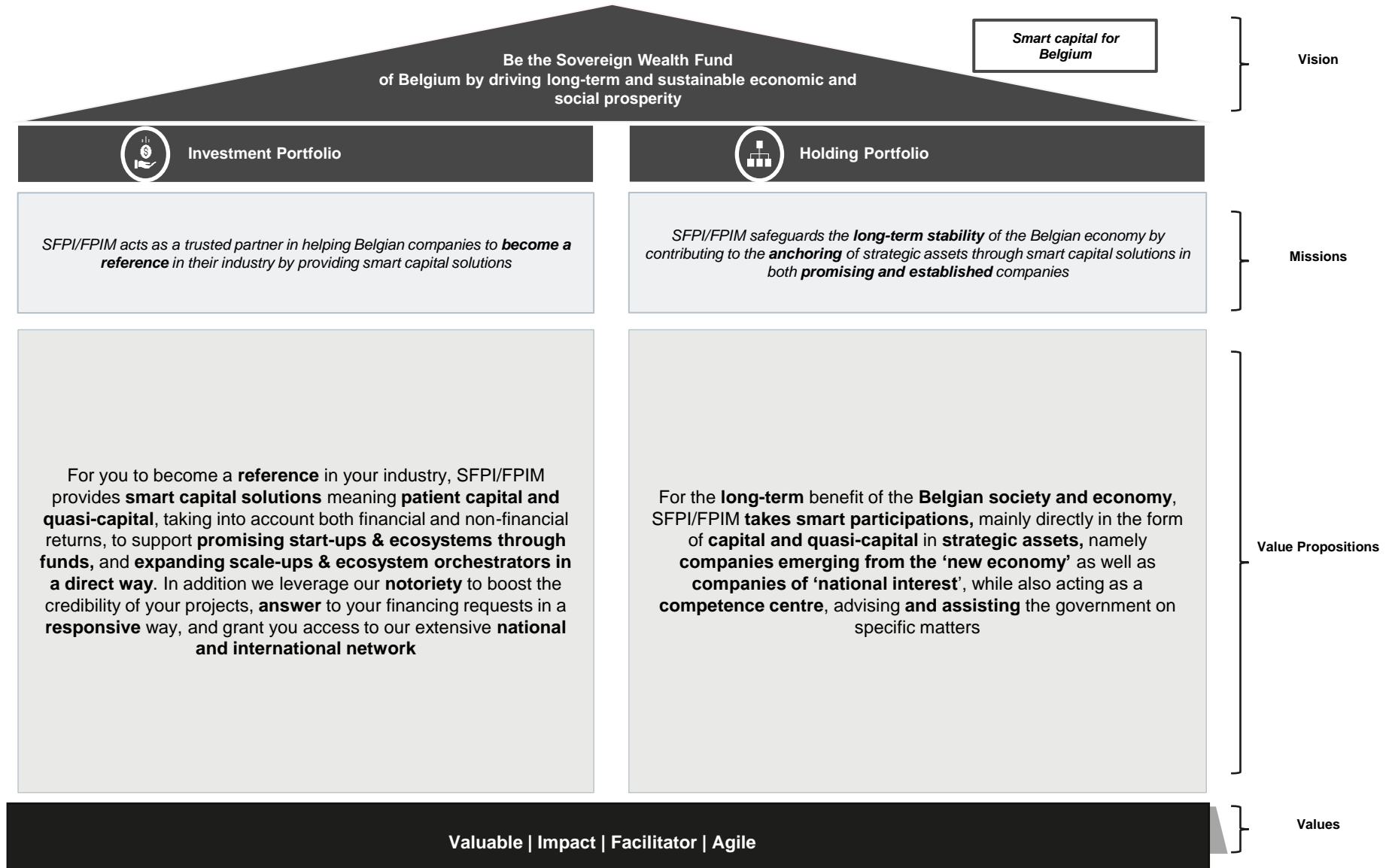
**14** billion €

AuM for the Federal State  
YE 2020

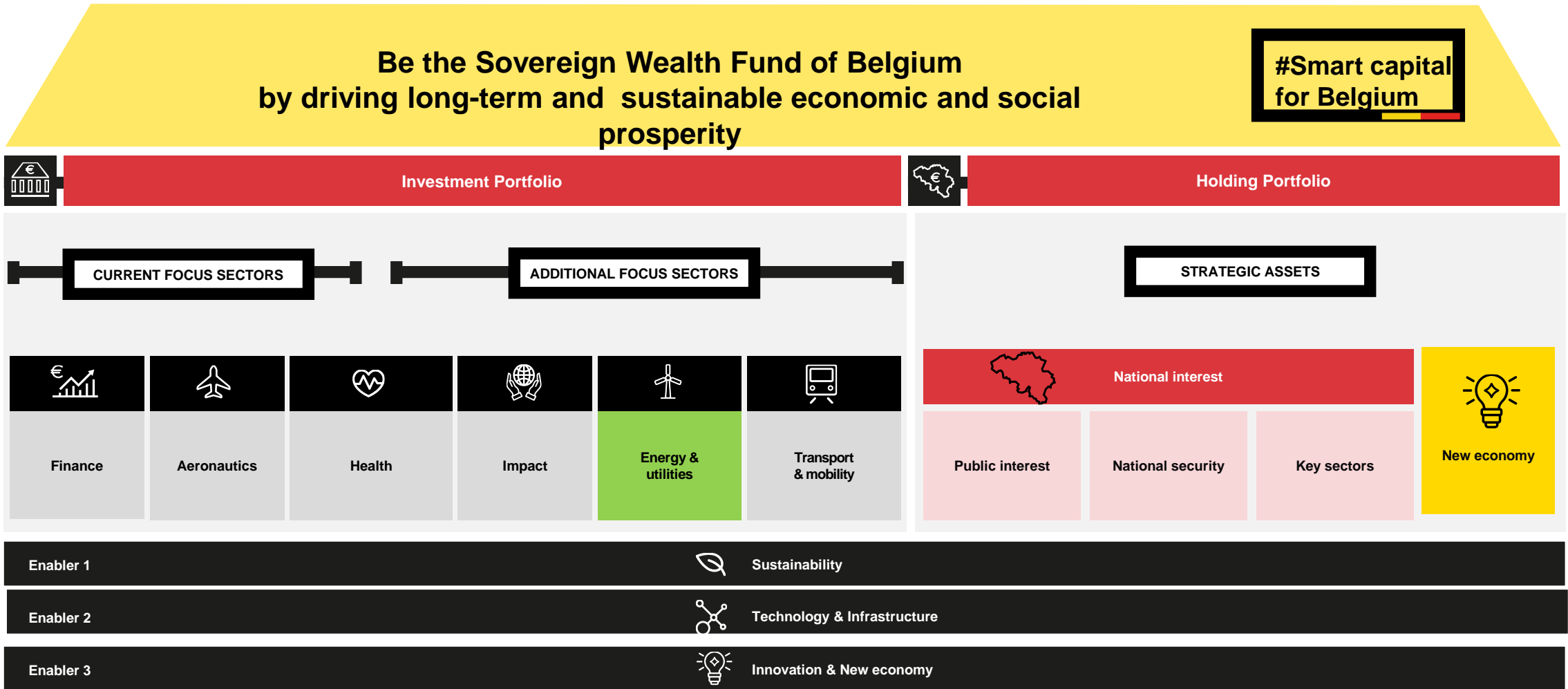
**>140**

participations, both direct in the equity of companies and indirect via VC & private equity funds

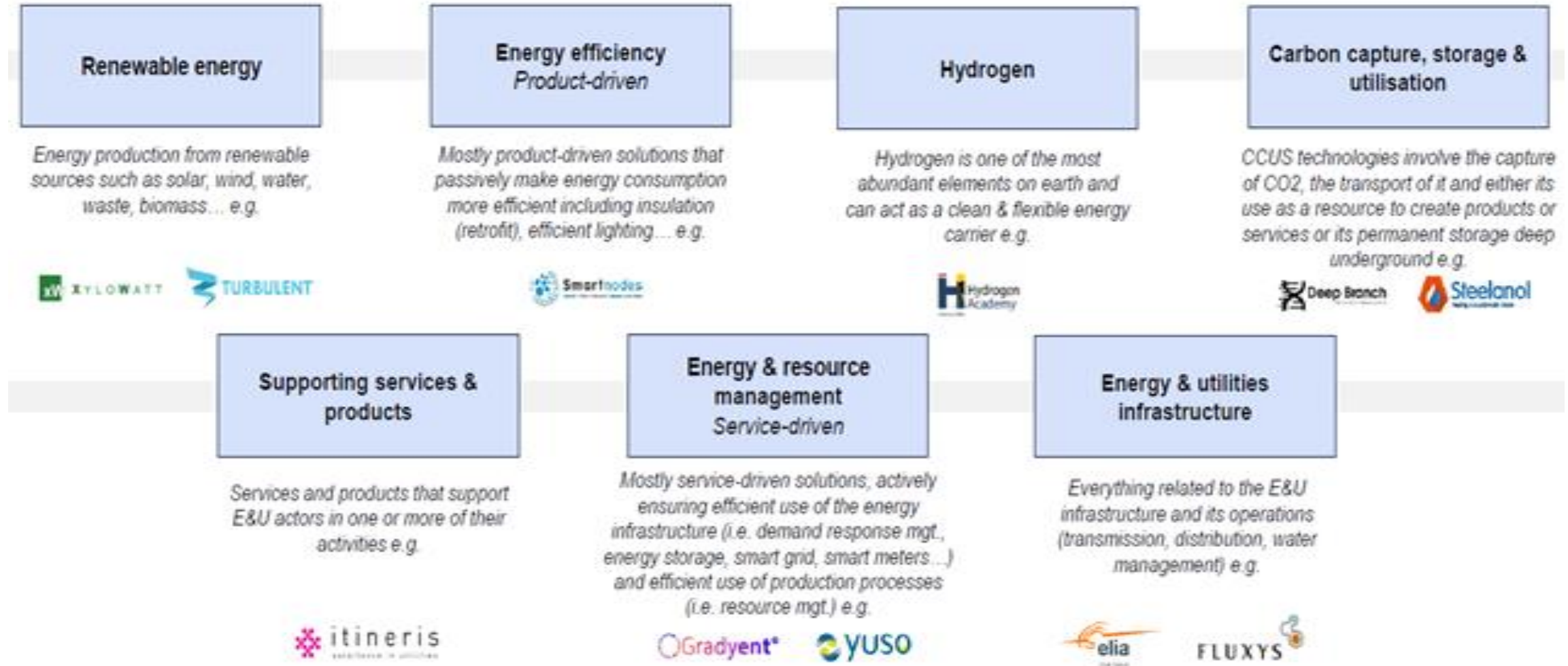
# 3. STRATEGY 2025: VISION, MISSION, VALUE PROPOSITION



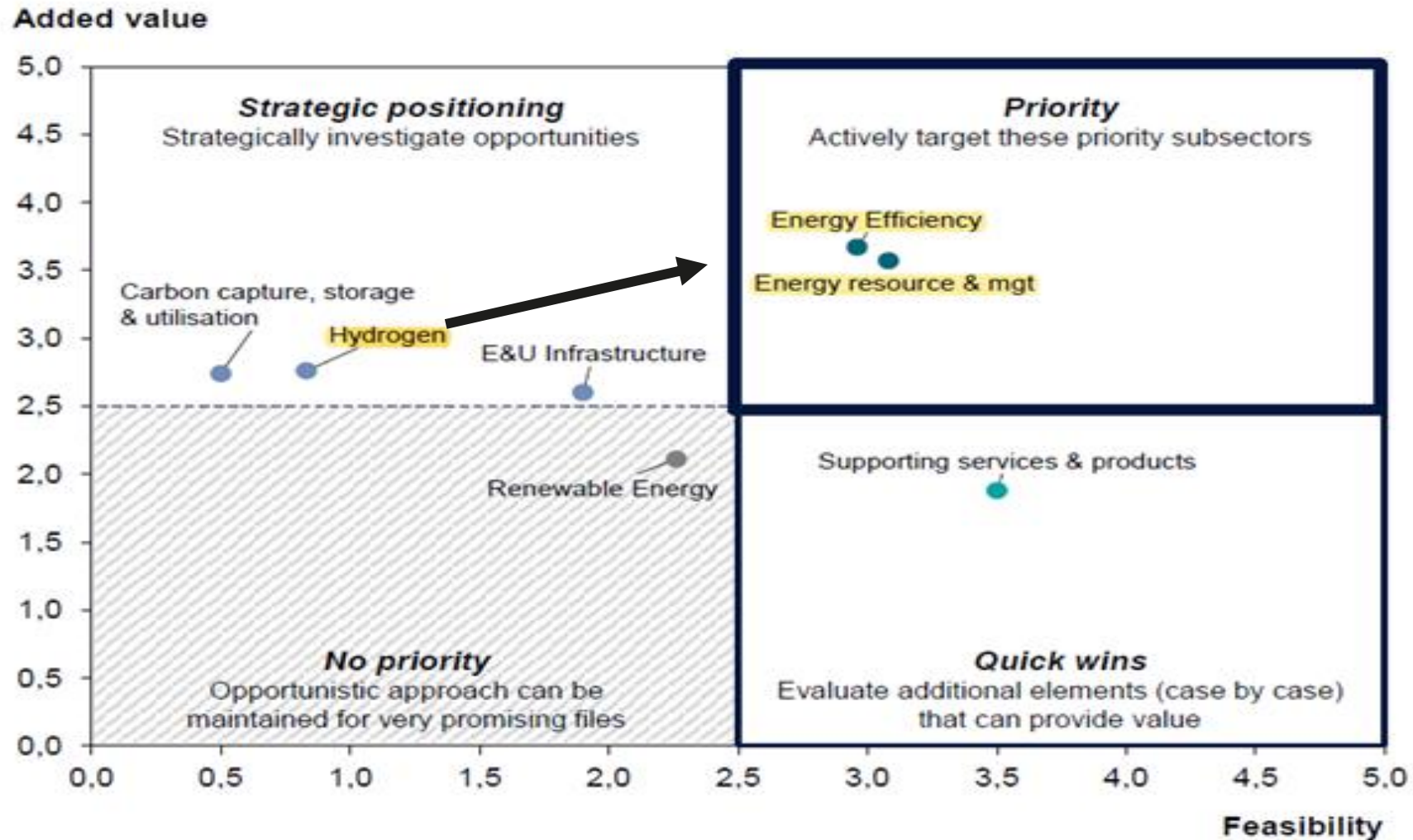
# 3. STRATEGY 2025 : INVESTMENT PILLARS



# Energy & utilities : 7 subsectors



# Hydrogen : one of the priority sectors for FPIM



## 4. INVESTMENT GUIDELINES

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- ▶ Ticket size for new investment starting at 5M€, or above
- ▶ Type of instruments: equity or convertibles
- ▶ No role of lead investor, minority equity positions, necessity to have private investors on board ( max 50% of the round)
- ▶ Board seat to monitor the investment on an ongoing basis
- ▶ Strong collaboration with regional investment companies (PMV, SRIW, Finance.Brussels ...)
- ▶ Patient capital: no short-term horizon
- ▶ Strategic vision

# FPIM as a LT financial partner

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- Interested ?
  
- Leon Cappaert
- [l.cappaert@sfpi-fpim.be](mailto:l.cappaert@sfpi-fpim.be)
- Tel : 02 548 52 29





# Thank you

From here.  
For all of us.  
About tomorrow.

[WWW.SFPI-FPIM.BE](http://WWW.SFPI-FPIM.BE)





We create chemistry

# Introduction BASF Antwerpen

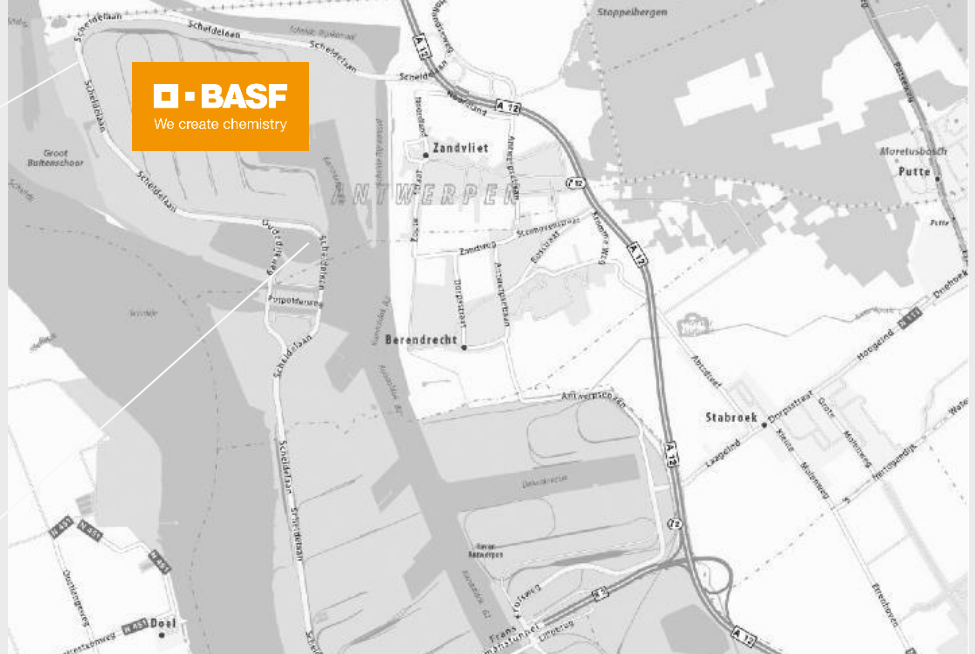
Sandra Wauters

Waterstof Industrie Cluster meeting

03.02.2022



# BASF IN THE PORT OF ANTWERP



**6**  
km<sup>2</sup>



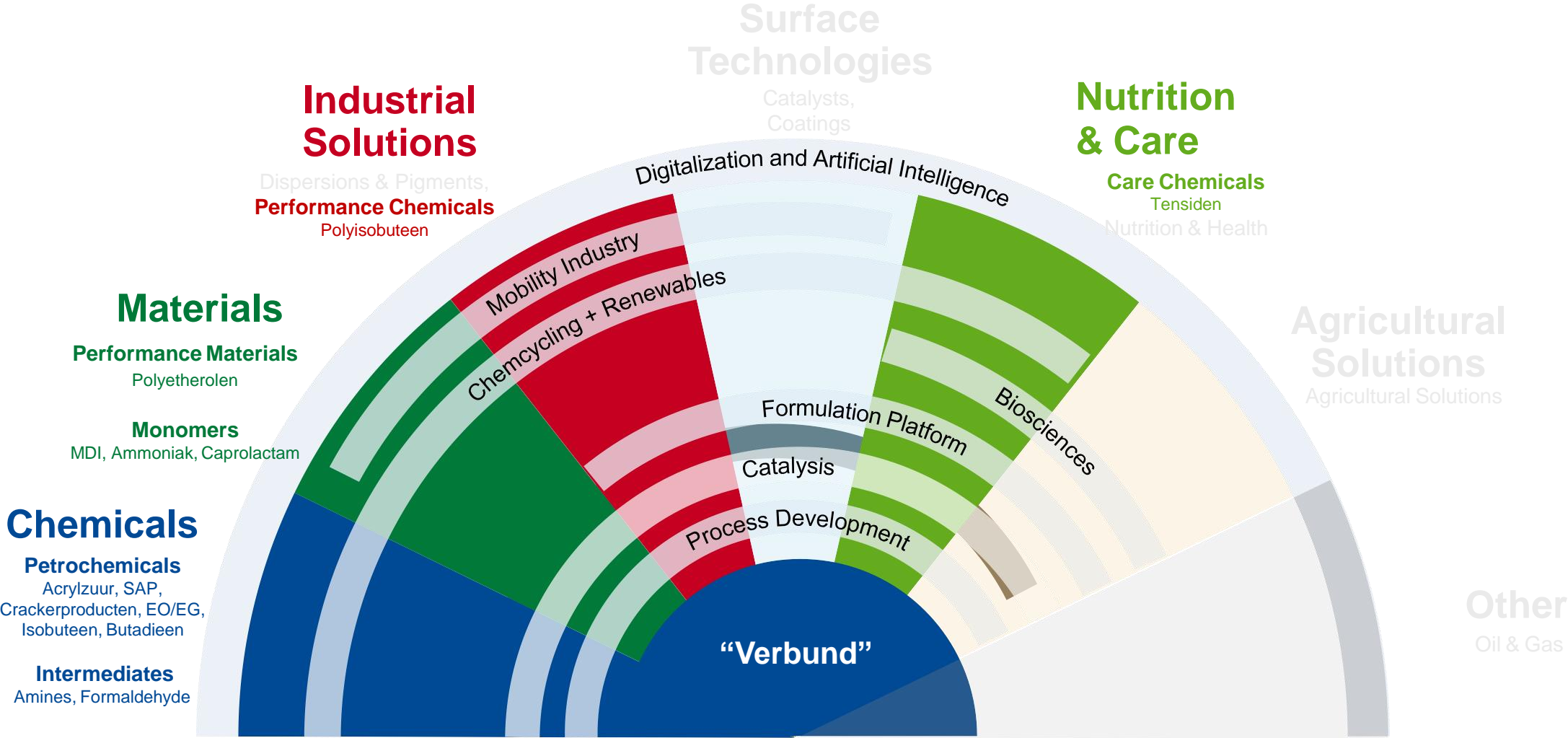
**3,529**  
employees



**approx. 4.3**  
billion euro



# BASF PORTFOLIO



# Our commitments to reaching the Paris Climate Agreement

**2030**

**25%**  
CO<sub>2</sub> emissions reduction  
(compared with 2018)<sup>1</sup>

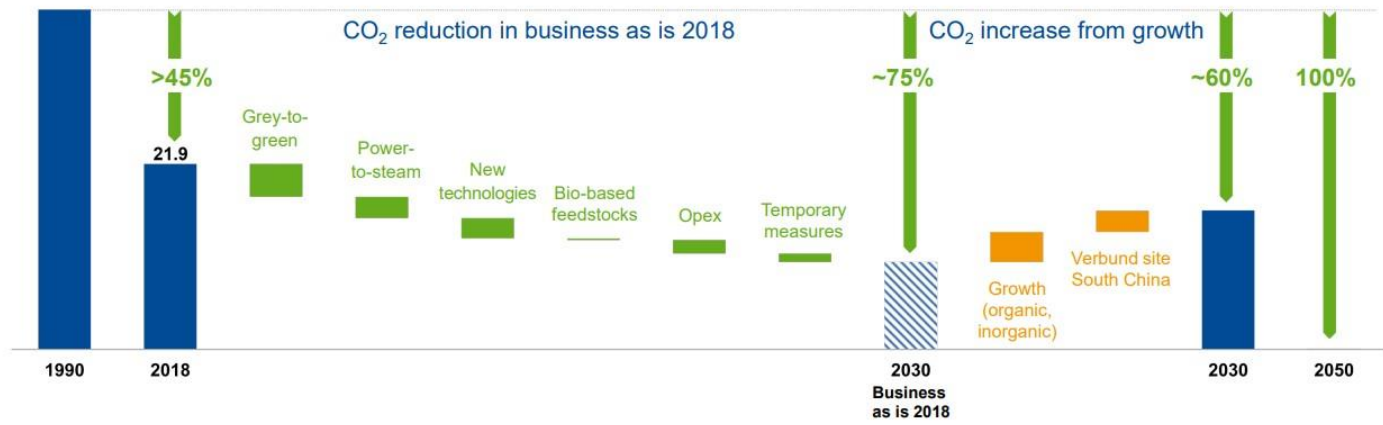
**2050**

**net zero**  
CO<sub>2</sub> emissions<sup>1</sup>

<sup>2</sup> BASF Capital Markets Day, March 26, 2021 | Keynote    <sup>1</sup> Scope 1 and Scope 2; 2030 target compared with 1990; 60% CO<sub>2</sub> reduction

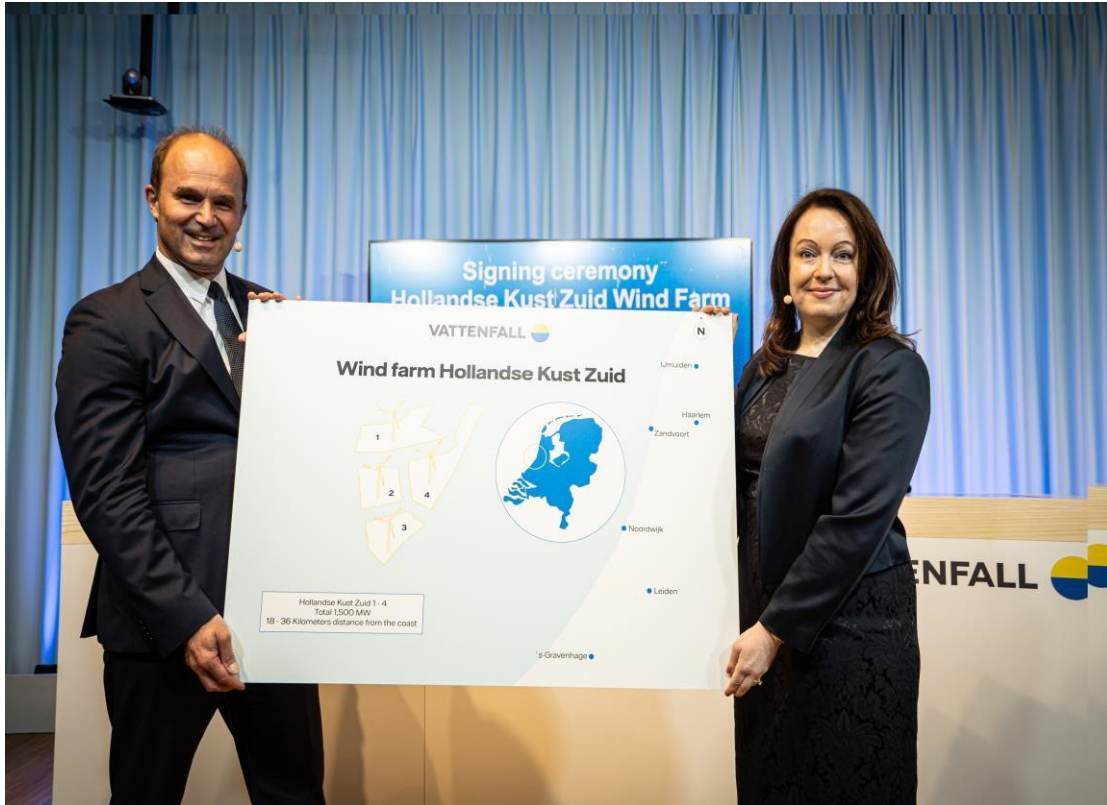
## Our path to reduce BASF emissions from 1990 to 2050

BASF greenhouse gas emissions (Scope 1 and Scope 2) 1990–2050





# Renewable energy



## Joint News Release

June 24, 2021

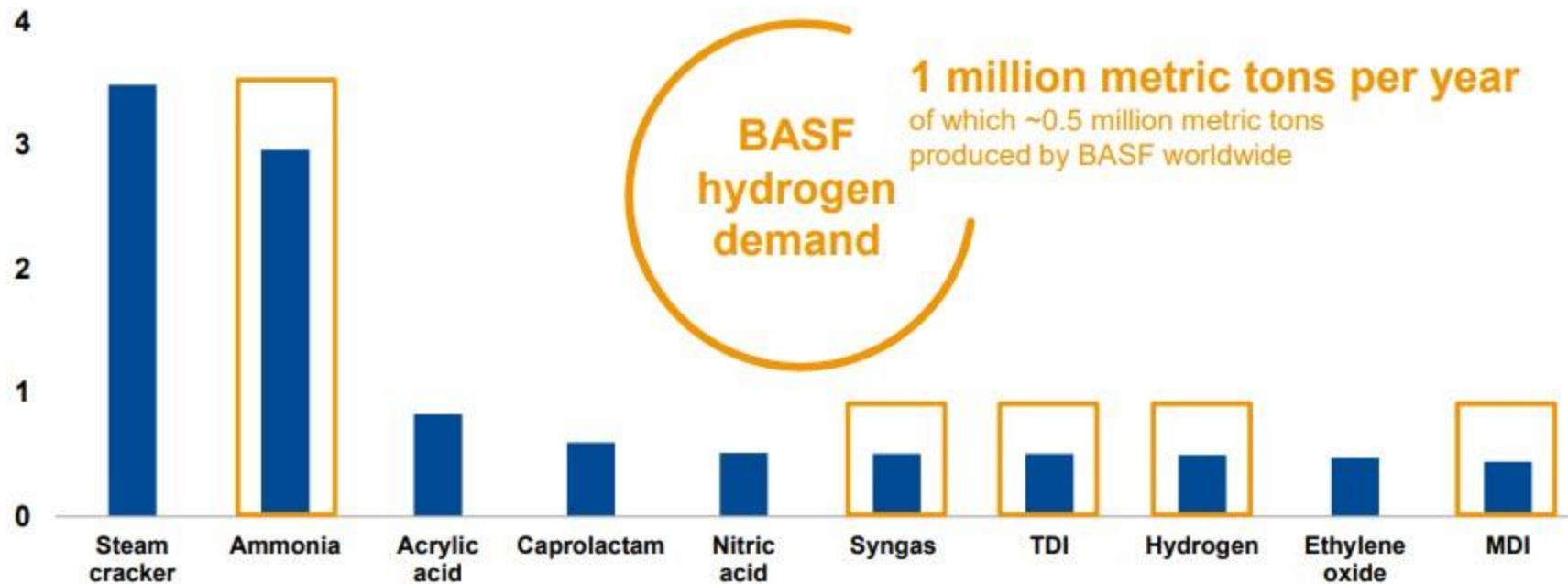
### Vattenfall to sell 49.5% of the offshore wind farm Hollandse Kust Zuid to BASF

- Once fully commissioned it will be the largest offshore wind farm in the world
- First offshore wind farm ever to be built without subsidies for the power produced
- Vattenfall will use Hollandse Kust Zuid to supply fossil-free electricity to its customers in the Netherlands, BASF to support chemical production in sites across Europe

# The use of hydrogen as a raw material is a key lever for CO<sub>2</sub> emissions reduction across several technologies



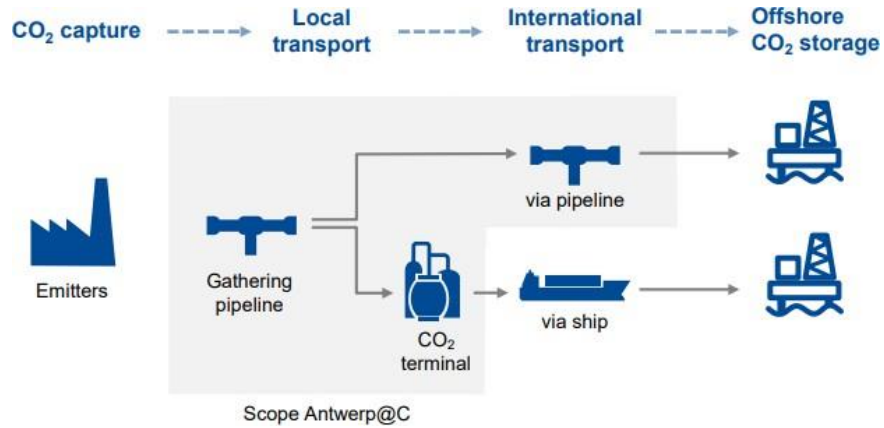
**Greenhouse gas emission profile of BASF technologies**  
Energy and chemistry emissions, million metric tons per year<sup>1</sup>



Achieving CO<sub>2</sub>-free hydrogen production will tackle 2 to 3 million metric tons of our CO<sub>2</sub> emissions across several technologies

# BASF is investigating different potential technology options for carbon abatement

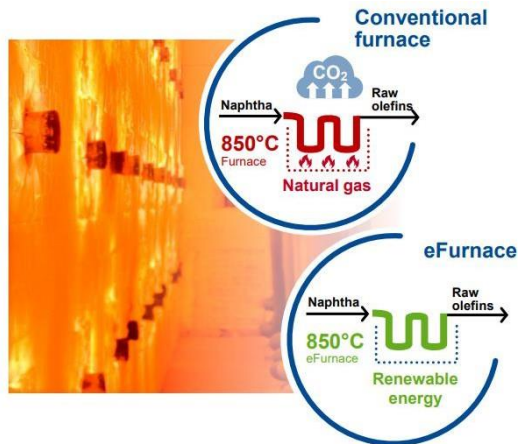
## CCS



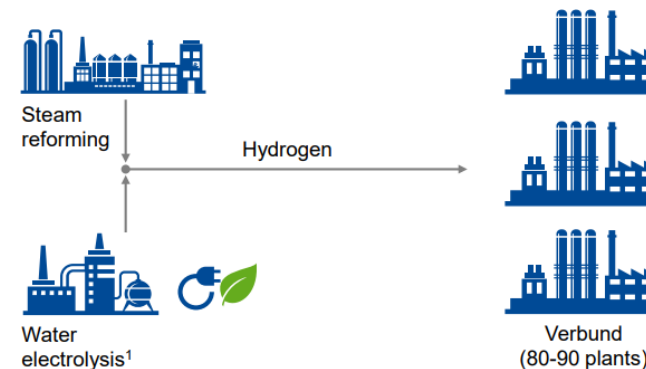
## Methane pyrolysis



## E-Furnace



## Electrolysis







We create chemistry



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[@basf\\_antwerpen](https://www.instagram.com/basf_antwerpen)



[basf antwerpen](https://www.linkedin.com/company/basf-antwerpen)



[basf antwerpen](https://www.youtube.com/basf-antwerpen)



[basf.be/antwerpen](https://basf.be/antwerpen)  
[werkenbijbasf.be](https://werkenbijbasf.be)

# **Centre of Expertise Sustainable Mobility**

**New WIC members presentation  
3 February 2022**

**KdG Expert**  
Karel de Grote Hogeschool

03/02/2022

# Research domains

03/02/2022



Vehicle data



Sustainable Fuels for combustion engines



Sustainable drive systems

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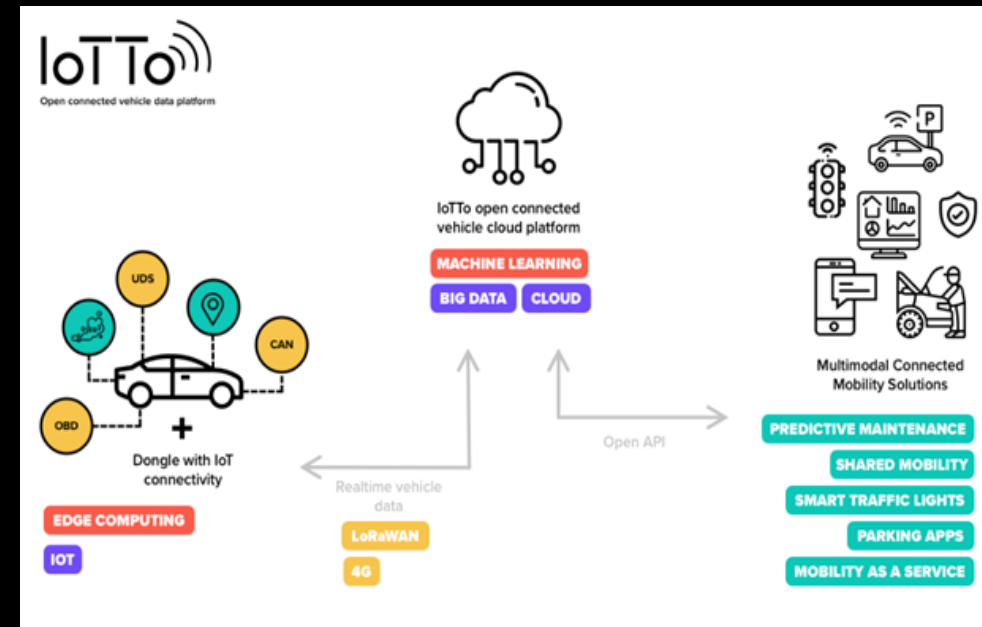
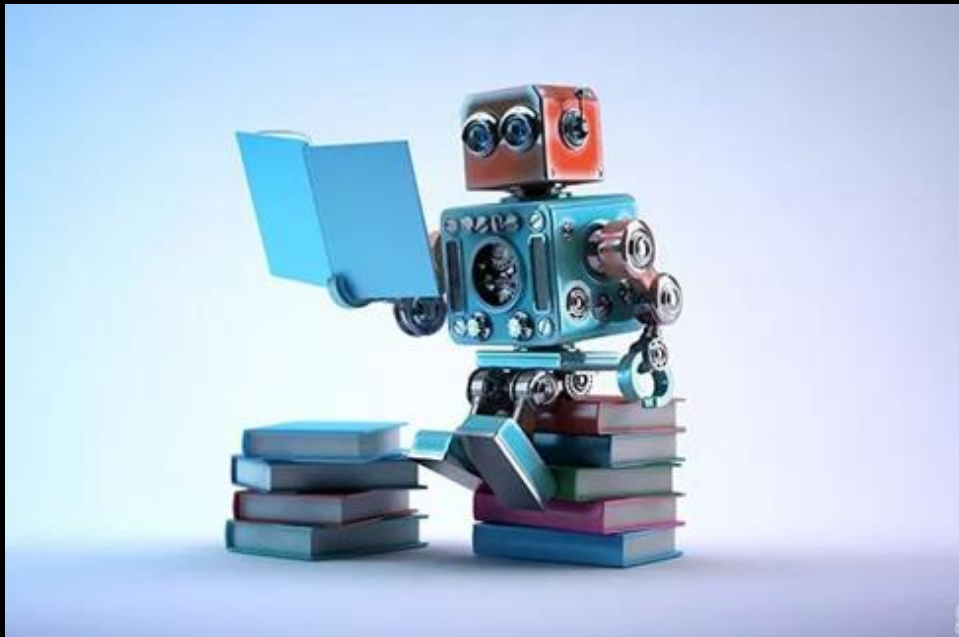
# Vehicle data

03/02/2022

- Retrieval of useful signal values from in-vehicle communication
  - The need of dbc files for translating the in-vehicle communication into usable sensor data
  - No provider of dbc files of vehicles available
  - Solution = manually reverse engineering every vehicle
    - = Time consuming!!!
    - = expensive
  - Development of automatic reverse engineering algorithm
    - LinkedCar= First Spin-off of Kdg

**RevCAN:** Automating the reverse engineering process of CAN communication with standard algorithms and machine learning techniques

**IoTTo:** Open connected vehicle data platform



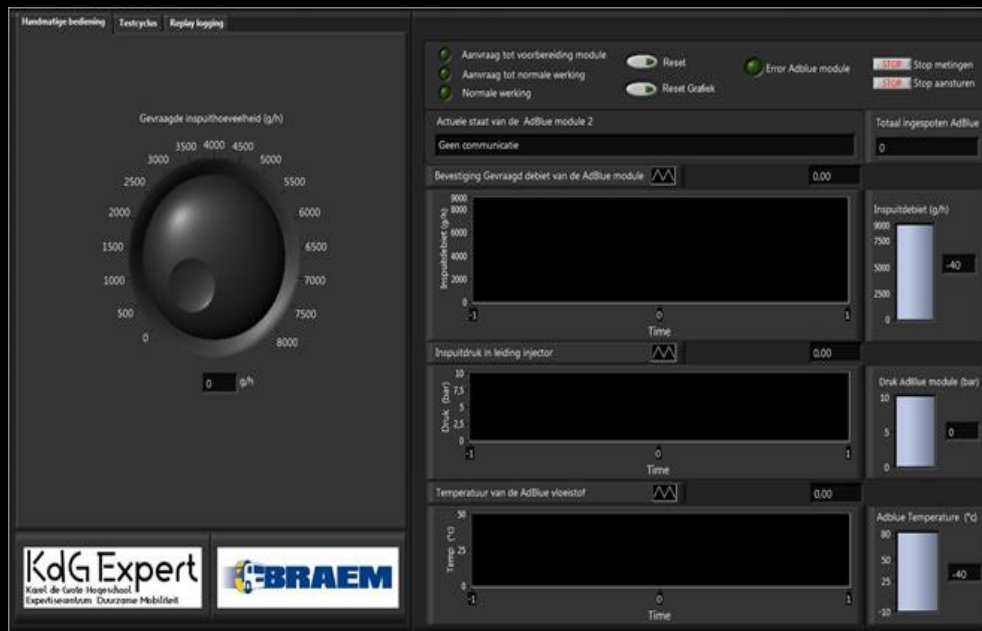
## CANSIM:

Method for determining the network communication necessary for testing combustion engines on an engine testbench

03/02/2022

## U-CANsim:

Universal method and hardware setup to support the testing of mechatronic subsystems





# Sustainable drive systems

03/02/2022

- Official technical partner ERA Championship
- Drivetrain development and optimisation
- Telemetry for vehicle data
- E-racing charging infrastructure

ERA EUROPE 2022

TEST	BELGIUM CIRCUIT ZOLDER	MAY TBC
MEDIA STREET	FRANCE PAU GRAND-PRIX	MAY 08-09
R1 STREET	TURKEY ISTANBUL	MAY 21-22
R2	HUNGARY HUNGARORING	JUN 11-12
R3	SPAIN JARAMA	JUN 18-19
R4	BELGIUM CIRCUIT ZOLDER	JUL 09-10
R5	ITALY VALLELUNGA	JUL 23-24

ETCR  
FIA  
AT RACING CAR  
WORLD CUP

FREE TO VIEW LIVE STREAM OF EVERY RACE  
+ RACE HIGHLIGHTS ON EUROSPORT



## Elektrische racewagen van KdG verbreekt record op Circuit Zolder



De elektrische racewagen verpulverde het vorige record.

### ANTWERPEN

De elektrische racewagen van de Karel de Grote Hogeschool (KdG) en Electric Racing Academy (ERA) verbrak deze week het elektrisch ronderecord op het circuit van Zolder. Met een tijd van 1.38.81 werd het huidige record met meer dan 3,5 seconden aan flarden gereden.

ERA en onderzoekers van KdG werken aan een duurzamere toekomst voor de autosport en, een belangrijke stap, ook

voor de algemene mobiliteit. "Het is fantastisch om te zien dat we de resultaten van ons praktijkgericht wetenschappelijk onderzoek kunnen toepassen in zoiets concreets als een duurzame racewagen en bij uitbreiding elektrisch rijden in het algemeen", zegt Kris Martens, hoofd van het expertisecentrum Duurzame Mobiliteit van KdG.

Als 'Official Technical Partner' van het ERA Championship werkt het expertisecentrum Duurzame Mobiliteit van KdG structureel samen aan de ver-

dere ontwikkeling van de elektrische wagen en de telecommunicatie en informatica voor de ERA-racevoertuigen. De nieuwe kennis die ze opdoen, zetten ze rechtstreeks in bij de professionele bacheloropleiding Autotechnologie van KdG. »We zijn ontzettend trots«, aldus Veerle Hendrickx, algemeen directeur van KdG. »Met ons praktijkgericht wetenschappelijk onderzoek willen we de motor zijn van een groene welvaart door verantwoorde consumptie en productie. Deze racewageh is daar een prachtig voorbeeld van.»

# Sustainable Fuels

03/02/2022

## Hydrogen

- Opel Combo,  
dual fuel gasoline - H<sup>2</sup> conversion
- VW Caddy  
dual fuel gasoline - H<sub>2</sub> conversion
- Still fork lift  
H<sub>2</sub> conversion

## Methanol

- VW 1,9 TDI  
Conversion to 100% methanol





# BioOpt: Biodiesel optimization for use in inland vessels

03/02/2022

- Minimizing exhaust emissions existing engines
  - Fatty acids manipulation
- 8 different fatty acids compositions
- 3 injection timing variations
- 3 injection pressure variations
  - (Inhouse developed tool )



# MethOpt: Methanol dual fuel injection for inland vessels

03/02/2022

- Minimising exhaust emissions of existing inland vessels
  - Retrofit methanol injection
  - Retrofit aftertreatment system
  - Focus on minimizing the economic impact



# Engine test cell (Overhaul 2021)

03/02/2022

## New datalogging system

- AVL Combustion analyser
- AVL Smokemeter
- AVL Particle Counter xApp 10™
- Kelma Emission measurement
- Bronkhorst Fuel and intake air measurement system



# Maha 4-wheel rolling road testbench

03/02/2022

Fully equipped

- OBD Module
- Pressure/Temperature Module
- Analog Input Module
- Load simulation
- Driving Cycle simulation & assistance
- Combi exhaust gas analyzer

MAHA, type MET 6.3

- Radial cooling fan AIR 5



# Thank You

If we knew what it was we were doing, it would not be called research, would it?

Albert Einstein



Kelvion



YEARS OF  
EXPERTISE **100**<sup>+</sup>

We are Kelvion

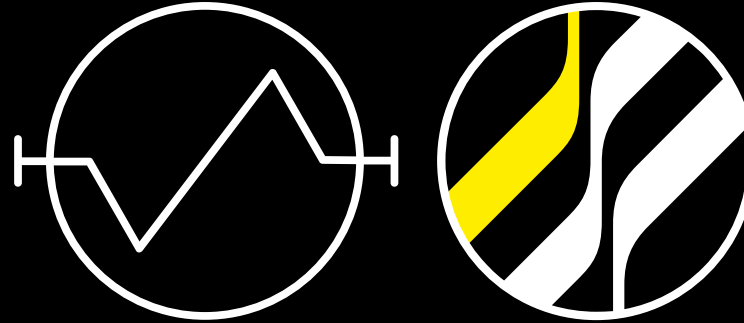
# EXPERTS IN HEAT EXCHANGE SINCE 1920

## KELVION – A TRIBUTE TO LORD KELVIN (1824 - 1907)

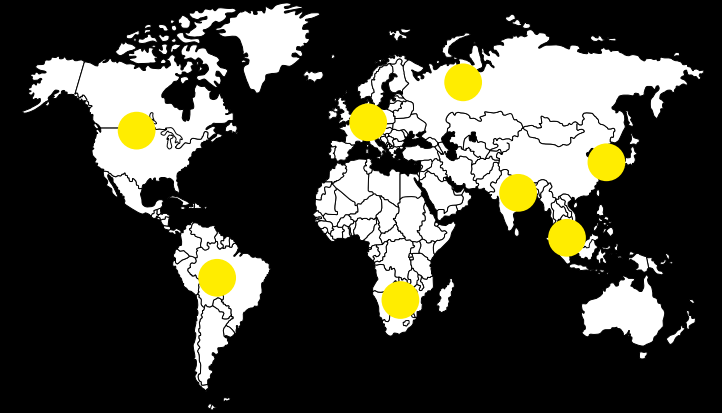


Lord Kelvin formulated the laws of thermodynamics and absolute units of temperature are stated in kelvin, in his honor.

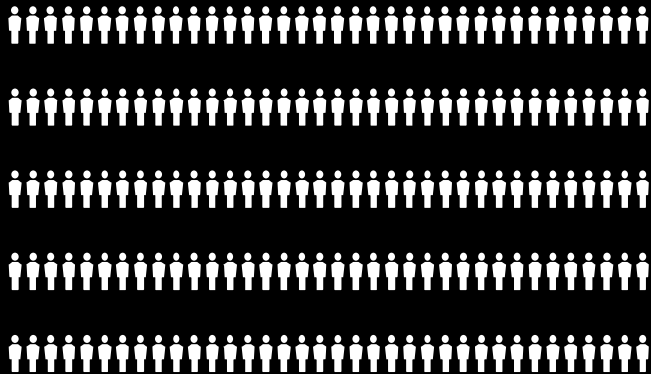
## OUR LOGO – INSPIRED FROM THE SCHEMATIC FOR HEAT EXCHANGER



## 67 BRANCHES AND SALES PARTNERS WORLDWIDE



## 5,000 EMPLOYEES – WORLDWIDE



## YOUR MARKETS ARE OUR MARKETS

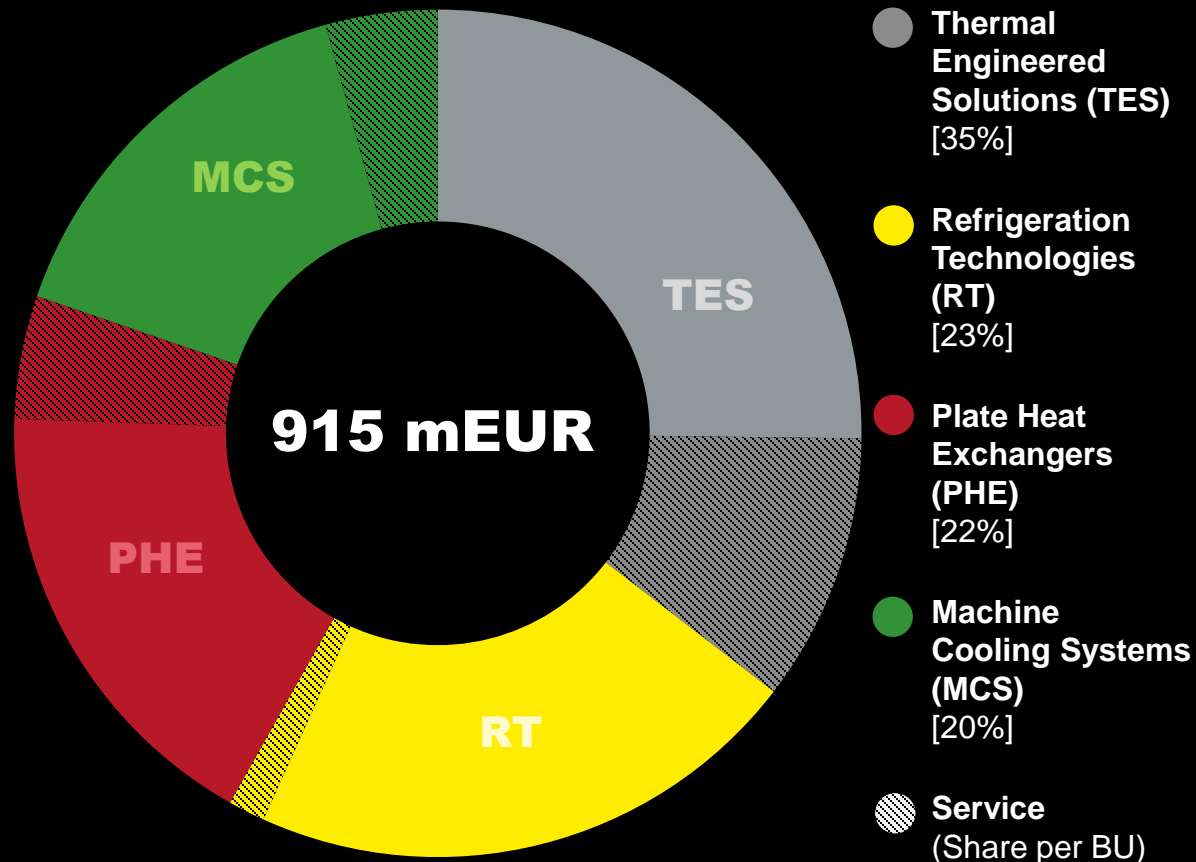


## KELVION HAS A LONG HISTORY

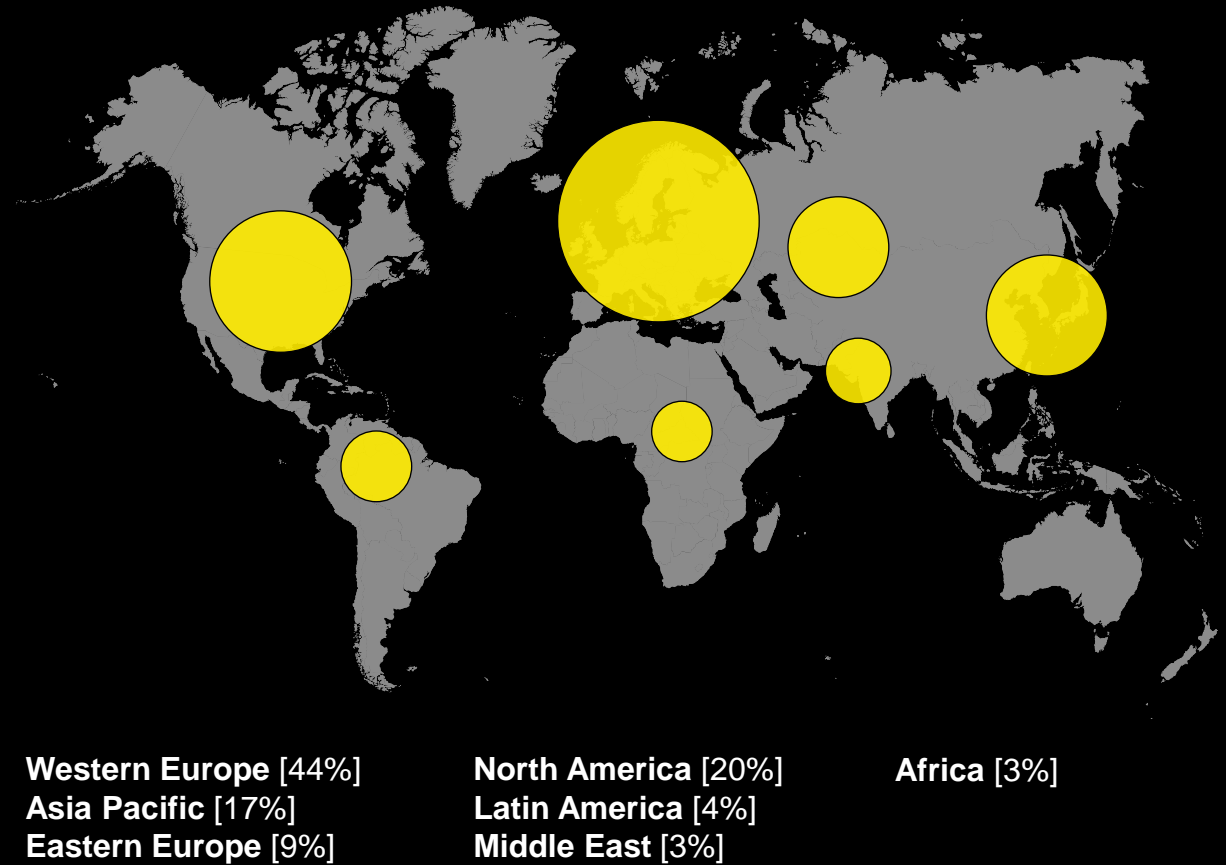


# REVENUE STATISTICS

## REVENUE BY BUSINESS UNIT FY19 [%]



## REVENUE BY REGION FY19 [%]





# KELVION HEAT EXCHANGER PORTFOLIO



Plate Heat Exchanger Gasketed



Plate Heat Exchanger Brazed

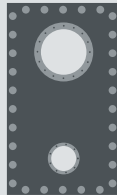
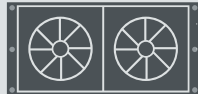
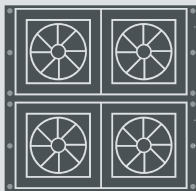


Plate Heat Exchanger Fully-Welded



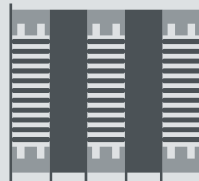
Commercial Aircooler



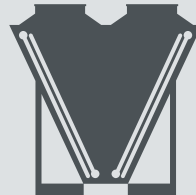
Customized Aircooler



Condenser



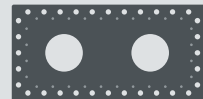
Aluminium Bloc



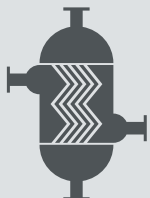
Radiators & Dry Coolers



Coils



Closed Circuit Cooler



Printed Circuit Heat Exchanger



Recirculation Cooler



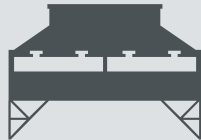
Exhaust Gas Heat Exchanger



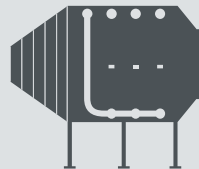
Charge Air Cooler



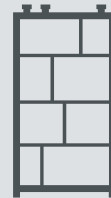
Air Cooled Condenser



Air Fin Cooler



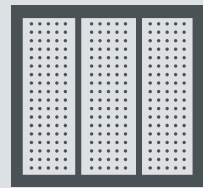
Air Dryer



Air Preheater



Economizer



AirToAir



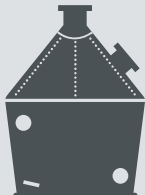
Box Cooler



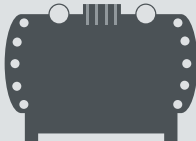
Shell & Tube Double Safety



Shell & Tube Single



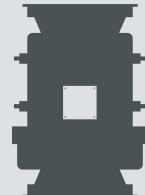
Shell & Tube Process



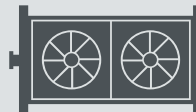
Shell & Tube Steam



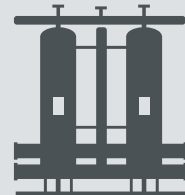
Desublimators



Transformer Oil Pumps



Transformer Oil Air Coolers



Transformer Oil Water Coolers

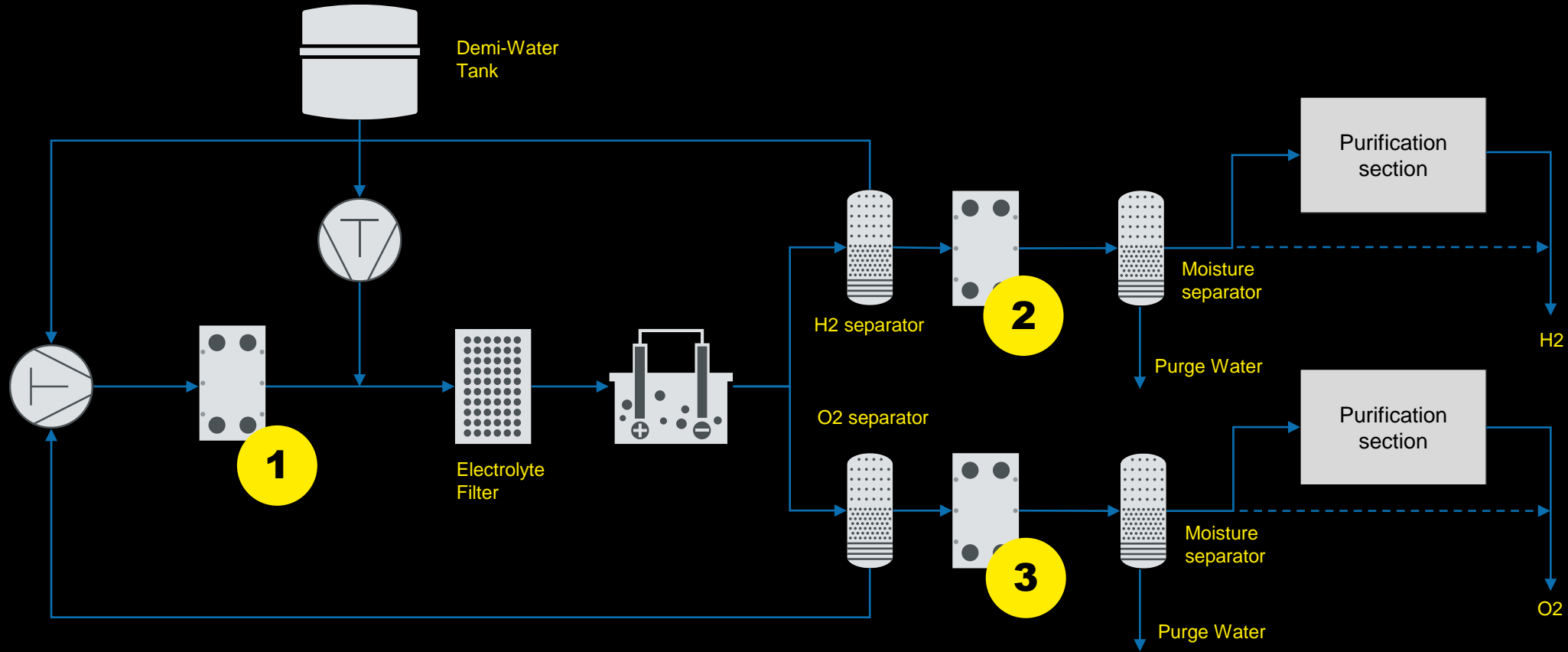


Cooling Tower



# **KELVION IN HYDROGEN**

# ALKALINE ELECTROLYSIS CELL (AEC)

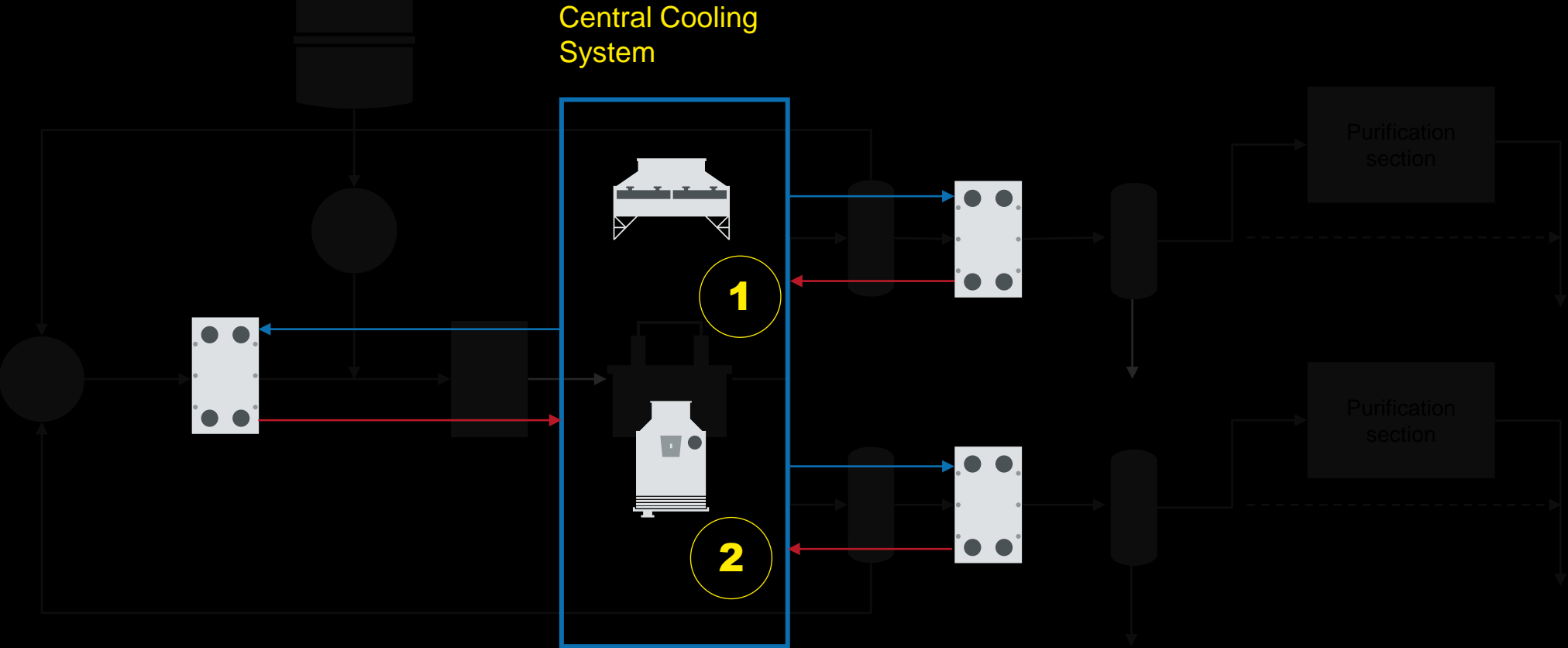


**1** Gasketed Plate Heat Exchanger

**2** Gasketed Plate Heat Exchanger

**3** Gasketed Plate Heat Exchanger

# CENTRAL COOLING FOR H2 PRODUCTION



**1** Air Fin Cooler

**2** Cooling Tower

# K°BOND FOR HRS



## Heat exchange coefficient

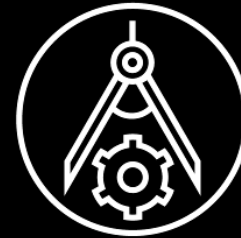
Gas / Liquid : up to 4,000 W/m<sup>2</sup>K

Liquid / Liquid : up to 10,000 W/m<sup>2</sup>K

## Heat exchange area

Approx. 700 to 1,400 m<sup>2</sup>/m<sup>3</sup>

(depending on the design pressure)



**Standardized  
Design**



**Suitable for “T40 Cooling”  
according to SAE J2601**



**Increasing reference list,  
also, in Truck Filling**

# ALREADY DELIVERED TO OUR CLIENTS



**Kelvion**

# **CONTACT**



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**roy.niekerk@kelvion.com**



**www.kelvion.com**



# [www.kelvion.com](http://www.kelvion.com)



# AGENDA

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## New members presentation

10.00 -10.30      Uniper, FPIM, KdG Expert, BASF en Altea

## Guest speakers

10.30-10.45      Anne Melchers (Min. EZK, NL): Dutch National Hydrogen Program  
10.45-11.00      Bart Biebuyck (CHP): Hydrogen valleys & the Clean H2 Partnership  
11.00-11.15      Jorre Van Damme & Sandra Vandewiele (VLAIO): Interreg program  
11.15-11.30      Ben van der Erve (Netherlands Enterprise Agency RVO): CEF programs

## News from cluster members

11.30 - 11.45      Toyota, Fluxys, Hitachi Energy, Vives, VKI

## WIC info

11.40 - 12.00

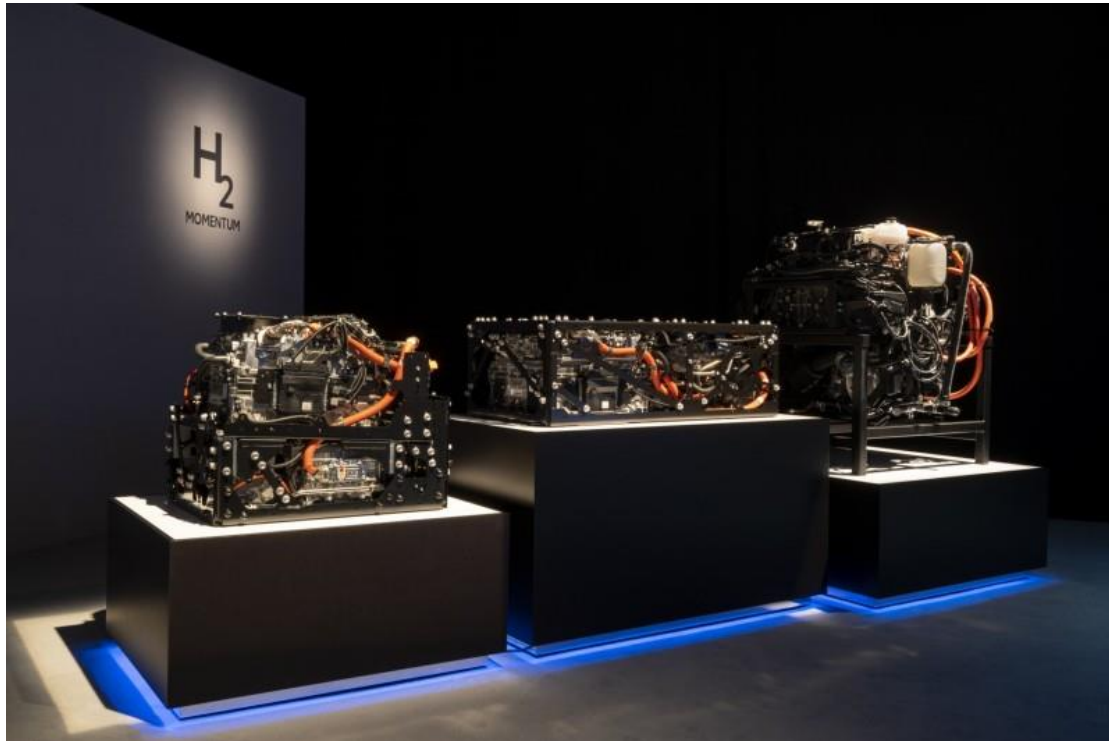
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# NEWS FROM CLUSTER MEMBERS

- Toyota: Vincent Mattelaer
- Fluxys: Steven Van Caekenberghe
- Hitachi Energy: Alireza Khakpour
- VIVES: Sam Schotte
- VKI: Peter Simkens



## 2/12: Toyota starts European production of 2nd generation fuel cell modules in Zaventem!



Standardised boxes being defined in STasHH project



# H2 & CO2 infrastructure



Information Memoranda



shaping together  
a bright energy  
future

# Fluxys Commercial Process H2/CO2 Infrastructure





# Publication of Specific Infrastructure Proposals for H<sub>2</sub> and CO<sub>2</sub>

[https://www.fluxys.com/en/energy-transition/hydrogen-carbon-infrastructure/carbon\\_preparing-to-build-the-network](https://www.fluxys.com/en/energy-transition/hydrogen-carbon-infrastructure/carbon_preparing-to-build-the-network)

**Information Memorandum for H<sub>2</sub> infrastructure**  
Fluxys Belgium  
December 2021

**Information Memorandum for CO<sub>2</sub> infrastructure**  
Fluxys Belgium  
December 2021

18/01/22

18/01/22

18/01/22

# Antwerp Cluster

H<sub>2</sub>



CO<sub>2</sub>



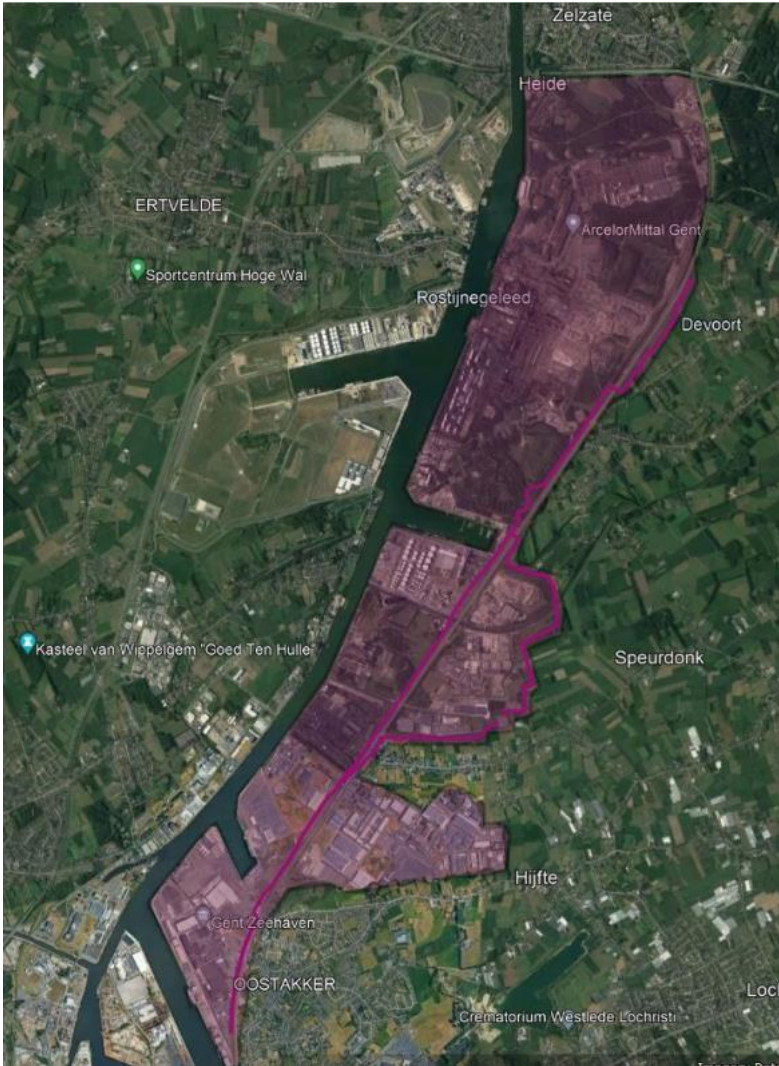


# Ghent Cluster

H<sub>2</sub>



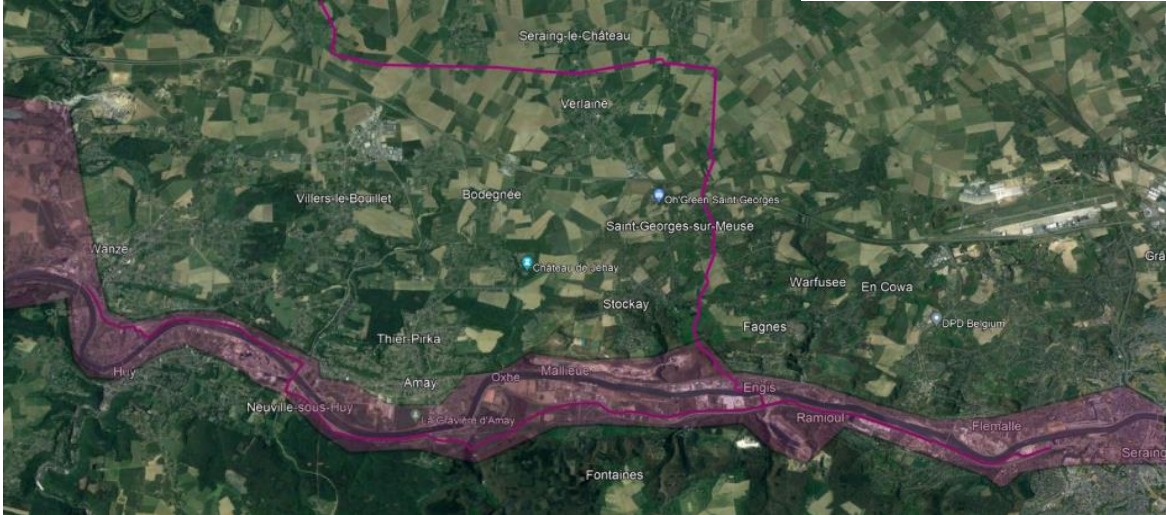
CO<sub>2</sub>





# Liège Cluster

H<sub>2</sub>



CO<sub>2</sub>





# Mons Cluster

H<sub>2</sub>



CO<sub>2</sub>



# Coming soon

- Cluster Charleroi
- Cluster Zeebrugge







## Waterstofnet presentation

Alireza Khakpour

–

[Alireza.Khakpour@hitachienergy.com](mailto:Alireza.Khakpour@hitachienergy.com)

Wessel Hofs

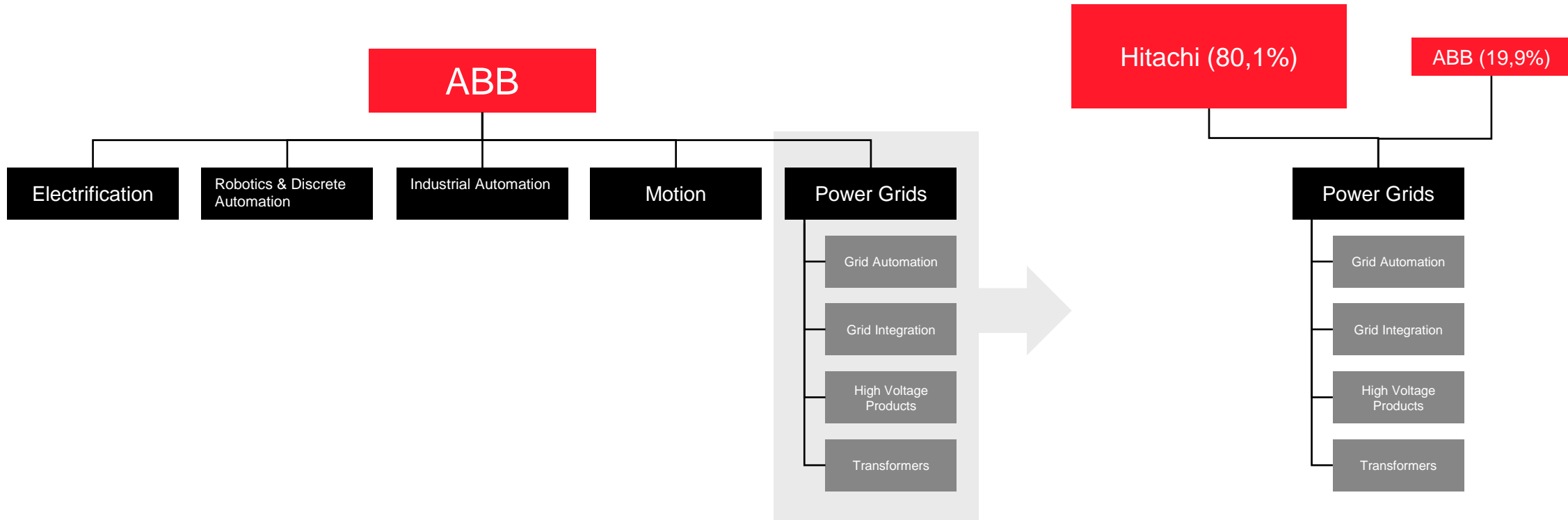
–

[Wessel.Hofs@hitachienergy.com](mailto:Wessel.Hofs@hitachienergy.com)

- Introduction Hitachi Energy
- Power Consulting
- A reference project

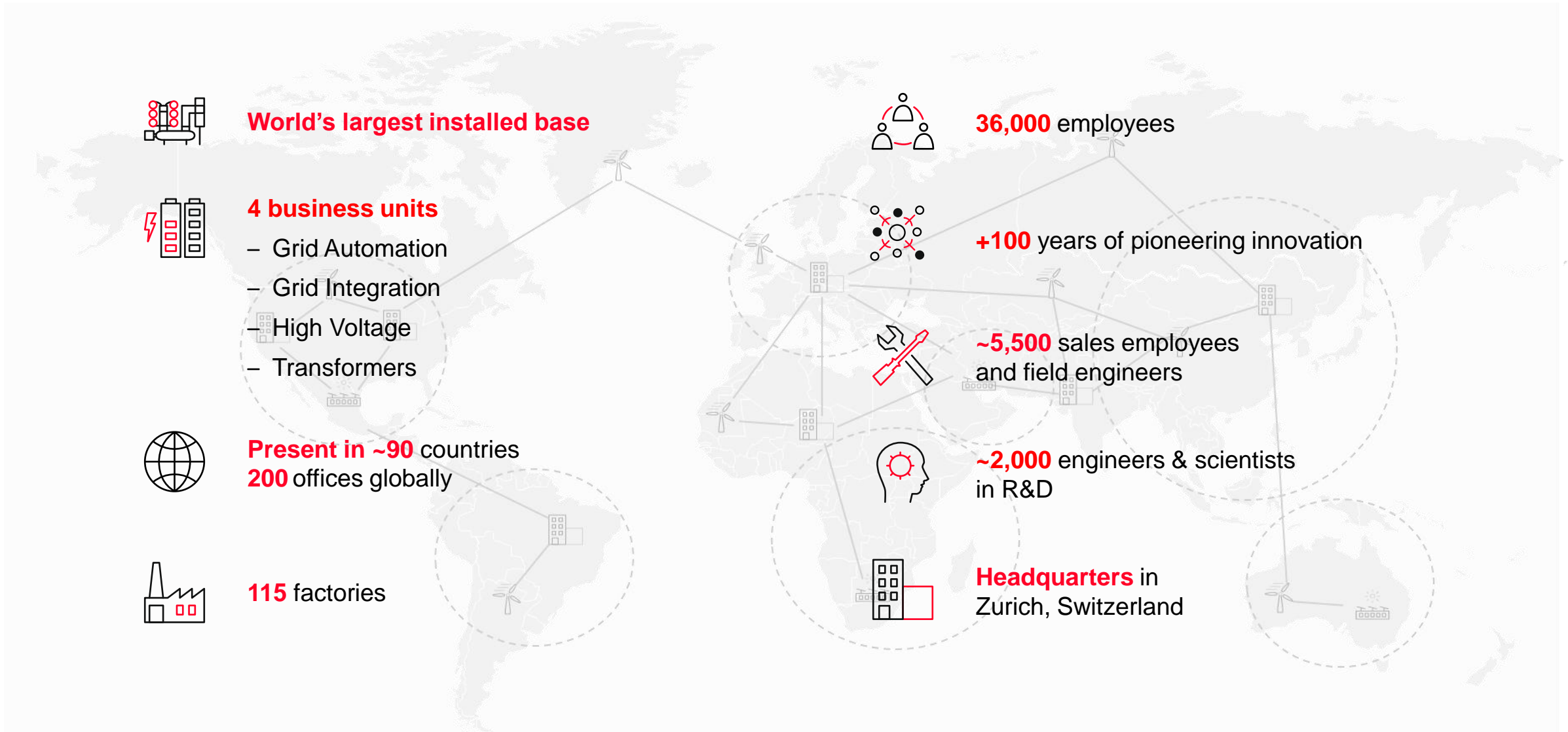
Announcement -December 17, 2018

July 1 2020 - Day 1



Power Grids Business valued \$ 11 billion US





Hitachi Energy offers consulting services covering all stages from investment/feasibility to operation

## Economic & Regulatory

- Technology developments, political & socio-economic factors
- Market policy & regulatory measures
- OPEX/CAPEX quantification
- Long term price and cost projections
- Strategic planning

## Grid Code & Interconnection

- T&D Analysis (planning and operation)
- Master plan definition
- E-mobility/DER/BESS/MG/RES impact
- Transmission type (AC/DC)
- Alignment with TSO/DSO expansion plans
- Grid code requirements risks at the specific countries of investment
- Grid impact from large intermittent energy sources
- Power Quality
- FEED

## Conceptual Design

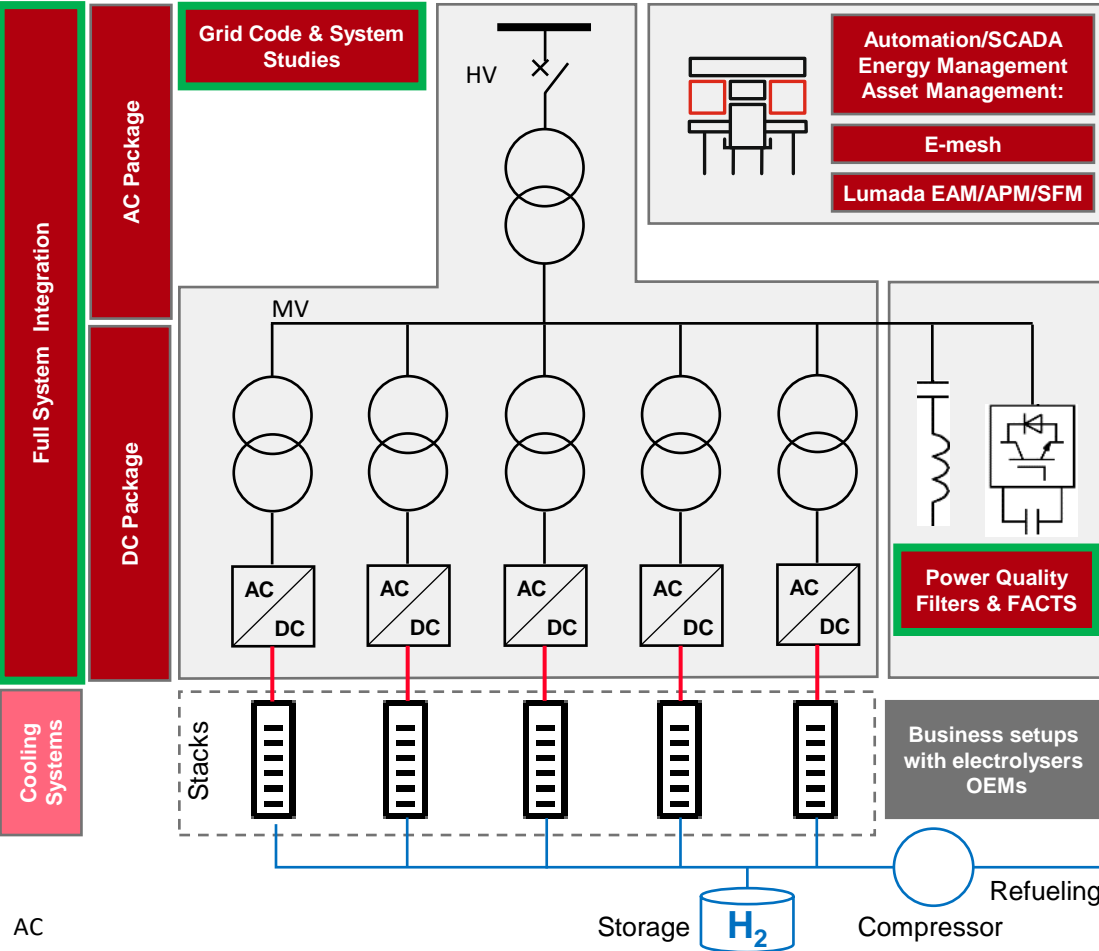
- C&P Design & Evaluation
- Power Quality Assessment
- System design
- Plant sizing & connection point
- HV and collecting system design and optimization

## Operational

- LCA management
- Reliability and availability: FMEA and RCM
- Operational excellence – human resources - training
- Equipment performance & System Data Analysis
- AI Creation – algorithms
- Maintenance & Operations Improvement

## Mitigation of risks and challenges

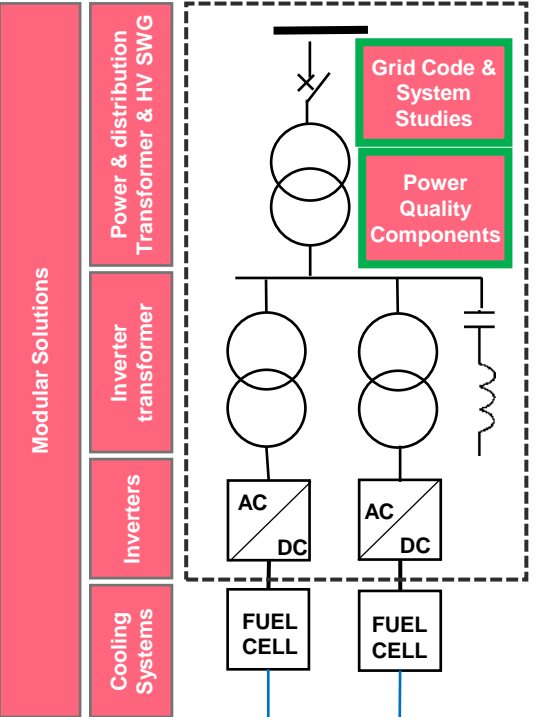
## Power to Green Hydrogen



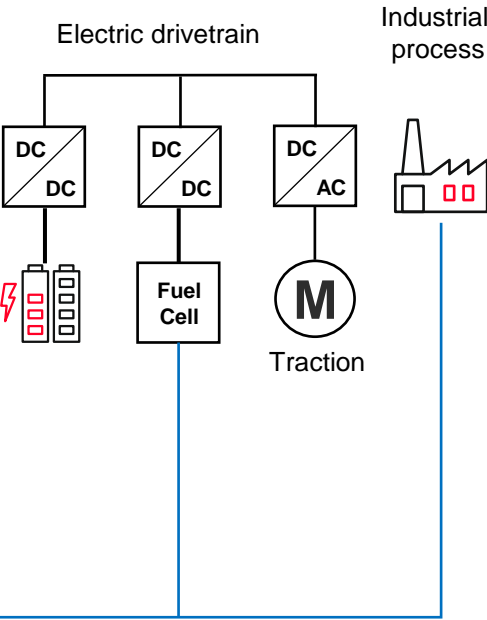
## Hydrogen to Power



### Stationary applications (Data centers, back-up generation)



### Mobility applications (marine, rail, road, off-road)



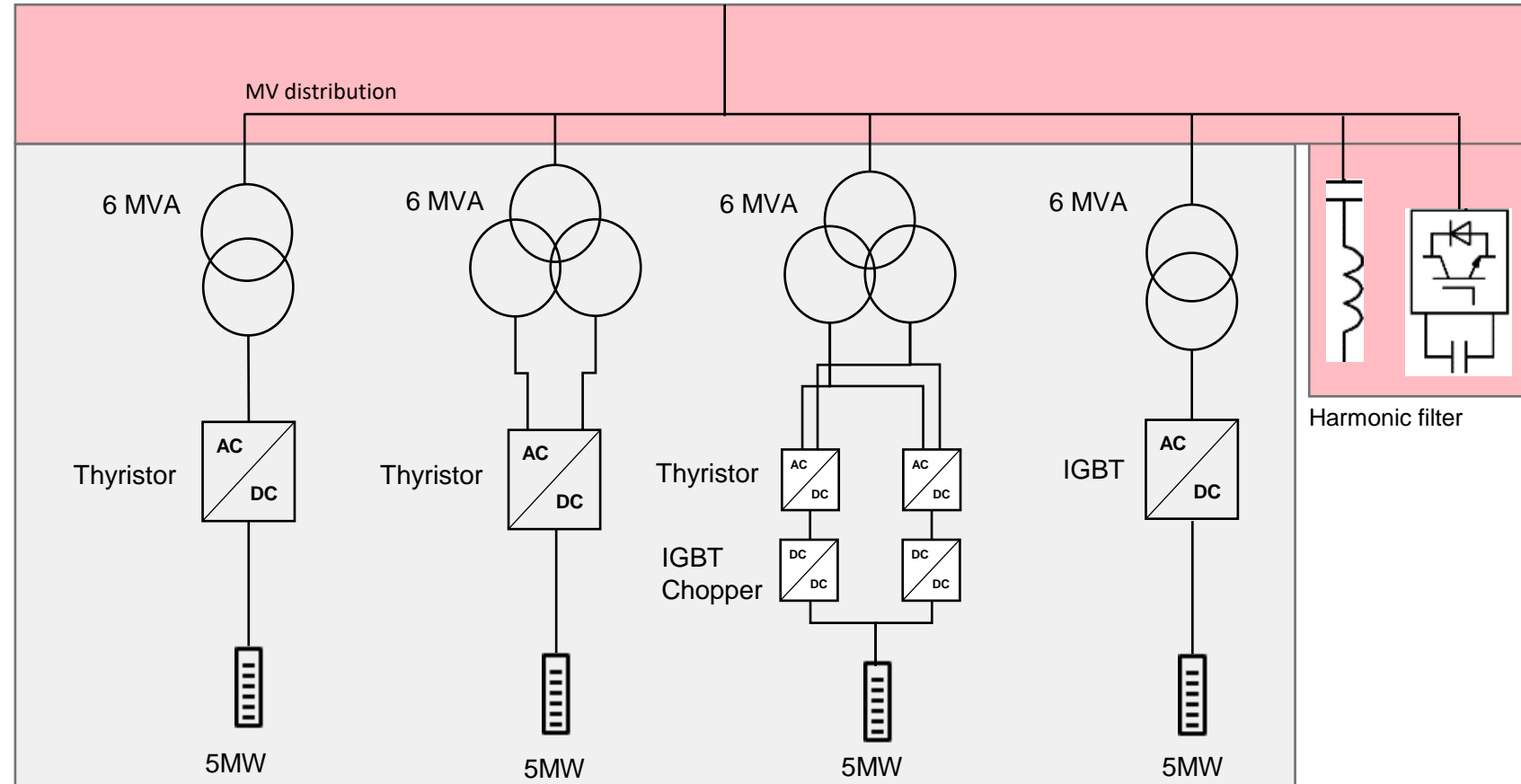
— AC  
— DC  
— H<sub>2</sub>

## Performances

- THDi 30-40% --- 7/-10% --- < 3%
- PF 0.7-0.93 --- 1
- DC Voltage range 0-100% --- 70-100%
- DC Current range 0-100%

## Advantages / Disadvantages

- Grid Code Compliance requirement
- Redundancy/Reliability
- Harmonic and necessity of filter
- Footprint
- Flexibility to operate
- Price



## Project

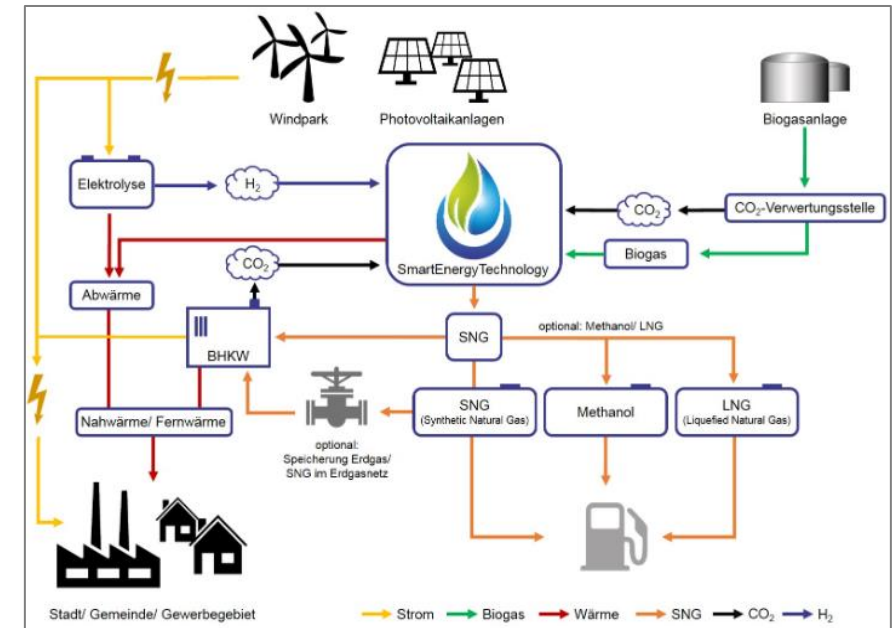
- Customer: Exytron
- Country: Germany
- Application: Hydrogen electrolysis, Methanization, Microgrid

## Application

- Scope supplied: Consulting study – load flow, short circuit, protection  
Possible extension to: Power Quality & Dynamic studies
- Voltage level: 20/30 kV
- System: Microgrid consisting of electrolyzers, BESS, CHP plant, renewable generation and customer load

## Customer Benefits

- Lighthouse project for customer P2X technology
- Electrical grid connection planning and engineering knowledge from a reliable partner
- Continuity potential for further cooperation on project execution
- ONE single microgrid partner (grid connection, BESS & system integration)





## Project

- Customer Air Liquide
- Country Egypt
- Application Hydrogen electrolysis

## Application

- Scope supplied Deployment of detuned capacitor banks to provide reactive power safely
- Voltage level 11 kV

## Customer Benefits

- Correct sizing based on measure/analyze solution
- Reactive power requirements solved, considering also the harmonic pollution in the grid





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Front-end Sales Manager

The Netherlands

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E-mail: [Wessel.Hofs@hitachienergy.com](mailto:Wessel.Hofs@hitachienergy.com)



**Alireza Khakpour**

Principal Technical Power Consultant

Germany

Mobile: +49 176 32926898

E-mail: [Alireza.Khakpour@hitachienergy.com](mailto:Alireza.Khakpour@hitachienergy.com)



**HITACHI**  
Inspire the Next 

# Call for Industrial Advisory Board Members

- Goal of the project:

- Develop a proof-of-concept for an ultrasound driven reactor to produce green hydrogen based on the sonolysis of water, generating cavitation bubbles in a new advanced reaction medium, in which H<sub>2</sub> is generated.

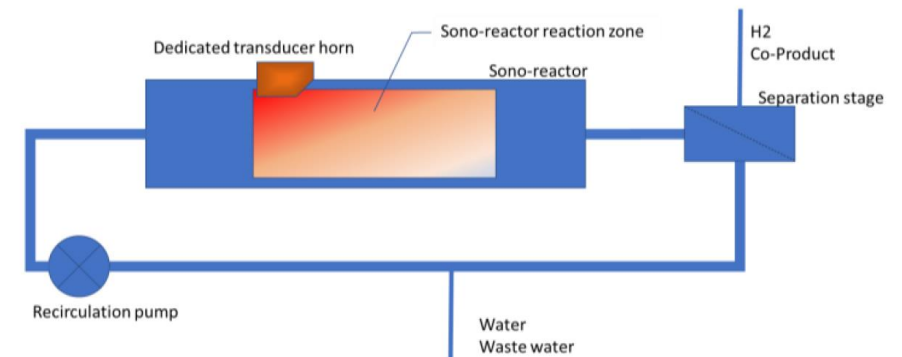
- Looking for Industrial Advisory Board members

- Profile

- Companies using green hydrogen in their production process
- Companies developing hydrogen production equipment and chemical reactors
- Companies developing special reaction mediums or metal-oxide nanoparticles
- Companies specialized in Ultrasound technologies
- ...

- Interested?

- Contact Peter Simkens ([peter.simkens@vki.ac.be](mailto:peter.simkens@vki.ac.be))



**von KARMAN INSTITUTE  
FOR FLUID DYNAMICS**



**WN/WIC News**

# Minister Crevits promotes WIC in collaboration with Tasmania/New South Wales

- 2/2/2022: Memorandum of Understanding on hydrogen Flanders/Tasmania
- Topics
  - Research and innovation
  - Marine, shipping and offshore applications
  - Heavy duty mobility
  - Hydrogen industry and business development
  - Hydrogen import/export opportunities



## Memorandum of understanding (Collaboration in relation to Hydrogen)

The Crown in Right of Tasmania  
(State)

and

The Government of Flanders  
(Flanders)

### Vlaanderen sluit deal om waterstof te halen uit Tasmanië



Vlaams minister van Economie Hilde Crevits (CD&V) heeft donderdag ook met haar collega van New South Wales een onderhoud over gezamenlijke waterstofplannen. ©Photo News

# WIC FOCUS POINTS FOR 2022

- Growing network → keep track of members' activities
  - ✓ Who does what? on the WIC member portal
  - ✓ **More user-friendly member database under development**
- Clustermeetings @ WIC member's premises
- Impact on national H2 programs Benelux
  - ✓ Regular & structural contacts with policy makers
  - ✓ Active role in implementation of EU policy in our region
- Link with Germany
  - ✓ Visit to NRW in Sept/Oct 2022
  - ✓ ....

## Member Portal

Welcome to the member portal of the 'Waterstof Industrie Cluster'!

Here you can consult all kinds of documents, such as reports and presentations of cluster meetings, general documents (e.g. info over the activities and expertise of other members) and the newsletters.

You can manage your account via the 'manage account' button.

To the portal

Manage account

[Who does what?](#)

[Activities and expertise WIC members \(28 KB\)](#)

# NEW WATERSTOFNET COLLEAGUE : TOM VERLINDEN

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Graduated as master of engineering (KU Leuven)

Atlas Copco : 12 years in operational functions

BASF Antwerp : 10 years in project functions

Port of Antwerp : 4 years as mobility manager

Since 01/01/22 : project manager WaterstofNet

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

Two main results:



- Short **animated video** on what hydrogen is, now online
  - Made in collaboration with the Waterstofregio project, to be promoted soon
- A series of **podcasts** on different aspects of the hydrogen economy: "Waterstof: het hele verhaal"



- First four episodes available on Spotify, *desirable other platforms?*
  - Aflevering 1: Een toekomst met waterstof?
  - Aflevering 2: Waarom zou je waterstof maken van elektriciteit?
  - Aflevering 3: Rijden op waterstof
  - Aflevering 4: Waterstof transport door pijpleidingen – deel 1: Een Europese "backbone"
- New episode every month

- **WG is open to new members!**





## Knowledge exchange H<sub>2</sub> combustion

- Started on request of a number of WIC partners active in H<sub>2</sub> combustion
- Next meeting March/April
- Aim
  - Exchange info, experiences and issues on
    - ✓ Legislation, permitting, CE approval ...
    - ✓ Technical aspects (e.g. component lifetime behaviour)
  - One voice towards policy makers
  - Promotion/clarification of H<sub>2</sub> combustion technology towards the larger public
- Working on a podcast episode with H<sub>2</sub>ForAll

# WORKING GROUP MOBILITY

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

- Group of 27 companies
  - Next meeting on 16th of March
  - Five main goals/objectives:
    - Development of H<sub>2</sub> Roadmap for BeNeLux → Targets set by WIC on Cars, HD and purpose fleets (taxi)
    - Monitoring, exchanging “data and experiences ” of HRS and FCEV → quarterly updates
    - Short, uniform and transparent approach of opening an HRS → First discussions and knowledge sharing with stakeholders + further development of the blackbox.
    - Increase utilisation HRS → involvement WIC partners and vehicles (lease proposal)
    - Communication and lobby to the government
-



Development of H<sub>2</sub> pilots & infrastructure for shipping;  
(in collaboration with De Blauwe Cluster)

- Knowledge exchange, monitoring technology and initiatives of WG members
  - Project development
    - ✓ Matchmaking partners
    - ✓ Connection with RH2INE initiative South-Holland/Germany
  - Next meeting planned Feb 21, 13.30-15.00
  - Contact person: Tom
-



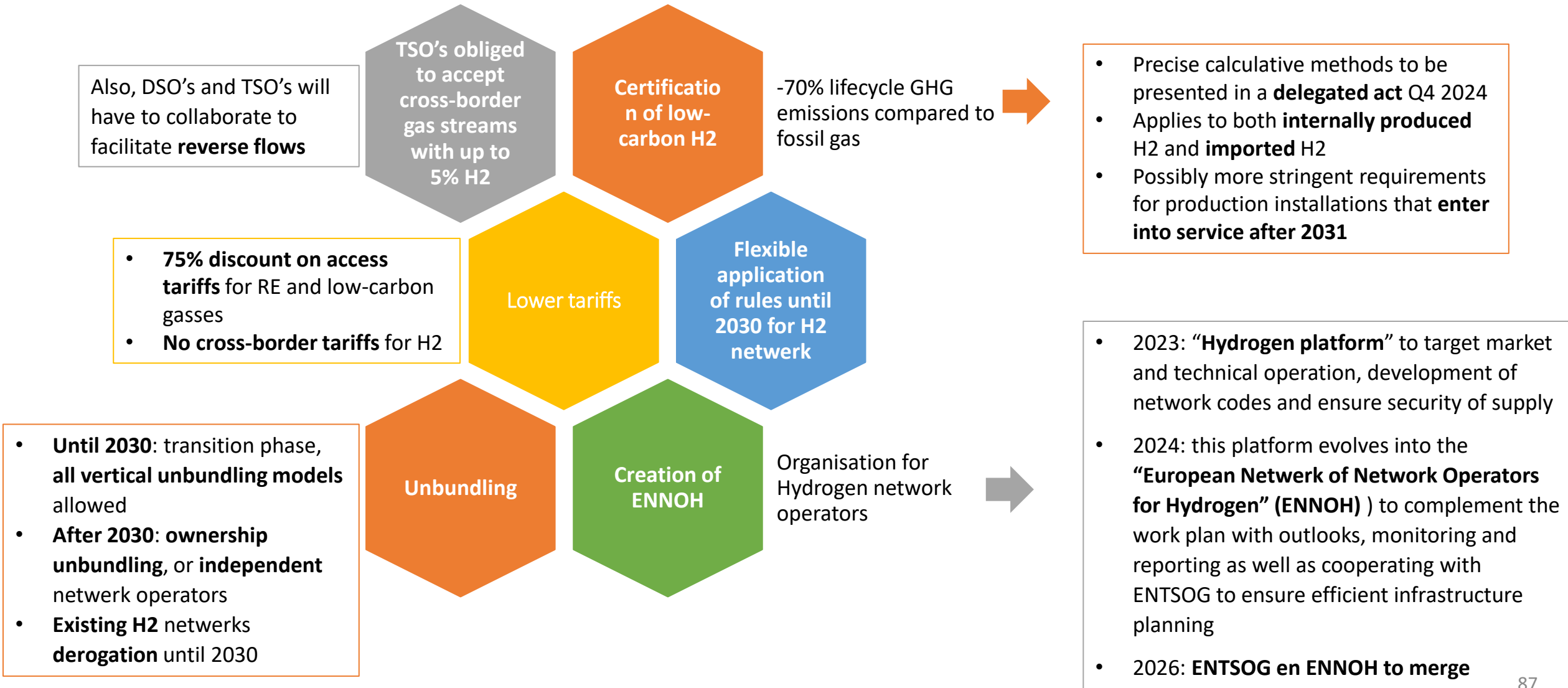
## Evaluation & statements Related to EU or national legislation

- Policy recommendations
  - ✓ Additionality paper ready => distributed to different BE representatives
- Analysis of CCfD-type of support mechanisms
  - ✓ With H2-import coalition => discussion with FL/Fed cabinets
- Hydrogen and decarbonised gas package
  - + Belgian federal consultation round on proposal for H2 transport regulatory framework
  - ✓ Reaction on public consultation
- Other topics for action always welcome!



- 2022 Will be the Year of Negotiation
  - ✓ Delegated act on article 27.3 of RED II with regards to the use of renewable electricity for the production of hydrogen
  - ✓ Fit for 55 summer package (14/07/2021)
  - ✓ Fit for 55 winter package, including the **hydrogen and decarbonised gas package** (15/12/2021)
- Belgian public consultation on regulation of hydrogen transport via pipelines
  - ✓ **Timing consultation : starts on January 25, 2022 and ends on February 22 , 2022.**
  - ✓ <https://economie.fgov.be/nl/themas/energie/energietransitie/waterstofstrategie/publieke-raadpleging-over-de>
- Fuel cell and hydrogen observatory  
website: <https://www.fchobservatory.eu/observatory/technology-and-market/hydrogen-supply-capacity>
  - ✓ Recent update; overview H2 market

# NEWS FROM EU: H2 & DECARBONISED GAS PACKAGE



# NEW CALLS FOR FUNDING

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## EU

- Innovation Fund second large-scale call for projects → deadline 03 March 2022 ([More info](#))
- Breakthrough Energy's Catalyst program → Deadline 13 May 2022 ([More info](#))

## NL

- Renewable Energy Transition (HER+) → deadline 31 March 2022 ([More info](#))
- Systeem integratie (Smart Multi Commodity Energy Systems) → deadline from 1 February 2022, 09:00 until 29 March 2022, 17:00 ([More info](#))
- MOOI-regeling 2022 Zon op gebouw en zon op infra → info day 8 February 2022 between 15:00 - 16:30 ([More info](#))
- Missiegedreven Onderzoek, Ontwikkeling en Innovatie (MOOI) → deadline from 1 April 2022 09:00 till 19 April 2022 17:00 ([More info](#))
- Upscaling Hydrogen Production (infrastructuur & marktordening en certificering) → info day on 15 February between 10:00 and 12:00

# UPCOMING EVENTS

- The WIC meetings in 2022
  - June 9 (i.s.o. May 12 as announced); @ Engie-Laborelec (tbc)
  - Sept 8
  - Dec 1
- Webinars
  - Next: March 3 → suggestions for the topics are welcome
- Meet & Greet
  - Next March 31 → participation is mandatory once you're registered 😊
- WIC conference (postponed from 22/11)
  - May 18  > 5 years, >>100 members