

An isometric illustration of a hydrogen valley ecosystem. It features a network of blue pipes representing hydrogen distribution. Various elements include wind turbines, solar panels, industrial buildings with smokestacks, residential houses, a train, cars, trucks, and a ship. Several buildings and pipes are labeled with 'H2'. A sign in the bottom right corner displays the website 'www.h2v.eu'.

# Mission Innovation Hydrogen Valley Platform

Virtual Relaunch Event: [www.h2v.eu](http://www.h2v.eu)



Brussels, 8 May 2023



An isometric illustration of a clean hydrogen ecosystem. It features a network of blue and white pipes connecting various elements: wind turbines on a grassy hill, solar panels, industrial buildings with smokestacks, residential houses, a train, cars, and trucks. Several buildings and pipes are labeled with 'H2'. A large blue circle in the center contains the name 'Mirela Atanasiu'. The background is a mix of green, blue, and yellow, representing land, water, and infrastructure.

# Welcome

**Mirela  
Atanasiu**

Head of Unit Operations and Communications,  
Clean Hydrogen Partnership

# H2.0 Valley Platform Relaunch Event

## 1 Welcome and introduction

10:00 – 10:05: Mirela Atanasiu, Head of Unit Operations and Communications, Clean Hydrogen Partnership

## 2 Opening remarks

10:05 – 10:15: Rosalinde van der Vlies, Vice-Chair of the Mission Innovation Steering Committee

10:15 – 10:25: Kurt-Christoph von Knobelsdorff, CEO of NOW GmbH, German Sen. Rep. for the Clean Hydrogen Mission

## 3 Key highlights of global Hydrogen Valley developments and new features of the Hydrogen Valley Platform 2.0 (incl. Q&A)

10:25 – 10:50: Uwe Weichenhain (Senior Partner) and Markus Kaufmann (Principal), Roland Berger  
Laura Marquez, EU Research and Innovation Consultant, Inycom

## 4 Project snapshots and panel discussions: Best practices of Hydrogen Valleys

Moderators: Uwe Weichenhain and Markus Kaufmann, Roland Berger

10:50 – 11:15: Session 1 - Building and managing Hydrogen Valleys

11:15 – 11:40: Session 2 - Project development and funding of Hydrogen Valleys

11:40 – 11:50: Q&A

## 5 Closing remarks

11:50 – 12:00: Matthijs Soede, Director, Mission Innovation Clean Hydrogen Mission



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# Opening remarks

**Rosalinde  
van der Vlies**

Vice-Chair of the Mission Innovation  
Steering Committee



# Opening remarks

**Kurt-Christoph  
von Knobelsdorff**

CEO, NOW GmbH and  
German Senior Representative for the  
MI Clean Hydrogen Mission



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#H2ValleyPlatform



www.h2v.eu



An isometric illustration of a hydrogen valley ecosystem. It features a mix of green spaces, industrial buildings, residential houses, and infrastructure. Key elements include wind turbines on a hill, solar panels, a hydrogen production plant with a large storage tank, a hydrogen distribution network with pipes and trucks, a hydrogen refueling station, a hydrogen-powered train, and a hydrogen-powered car. The background is a light blue sky with a few clouds. The overall theme is sustainable energy and infrastructure.

# Key highlights of the global Hydrogen Valleys development and new features of the Hydrogen Valley Platform 2.0 (incl. Q&A)

**Uwe  
Weichenhain**

Senior Partner,  
Roland Berger  
Global Hydrogen Lead

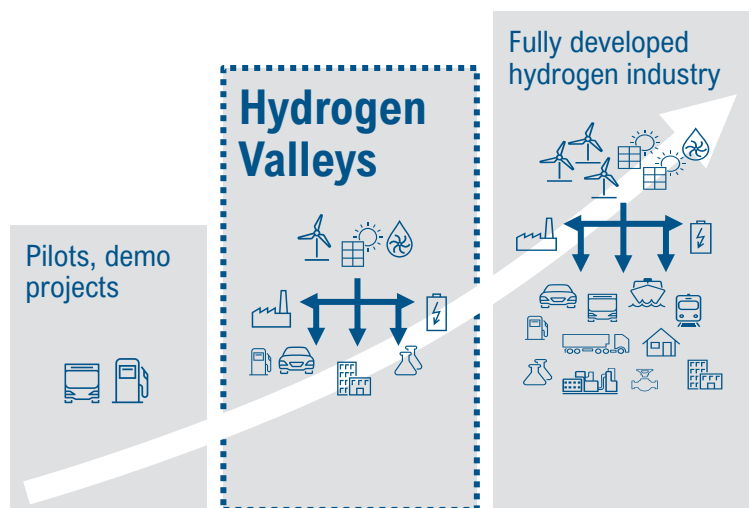
**Markus  
Kaufmann**

Principal,  
Roland Berger  
Global Hydrogen Team

# "Hydrogen Valleys" are local market makers for clean hydrogen – Integrated infrastructure projects along the full value chain

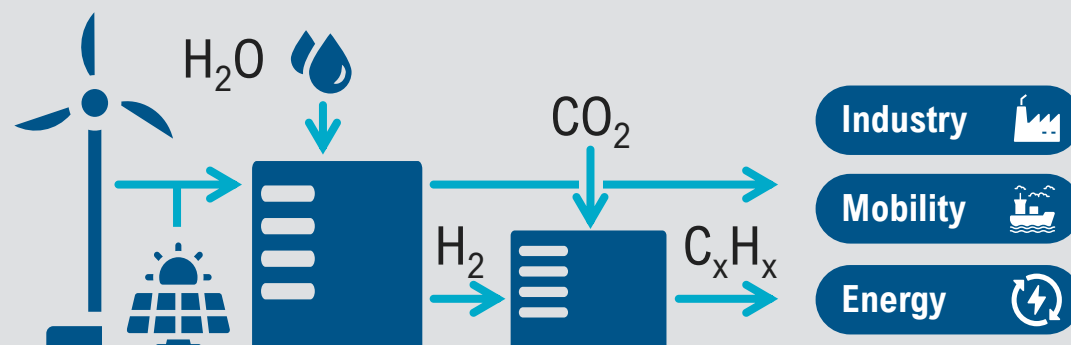
## Hydrogen Valleys ...

- Next-generation H<sub>2</sub> market development
- Integrated (and larger-scale) projects covering more and more of the value chain – "mini hydrogen economies"



## ... and what they're made of

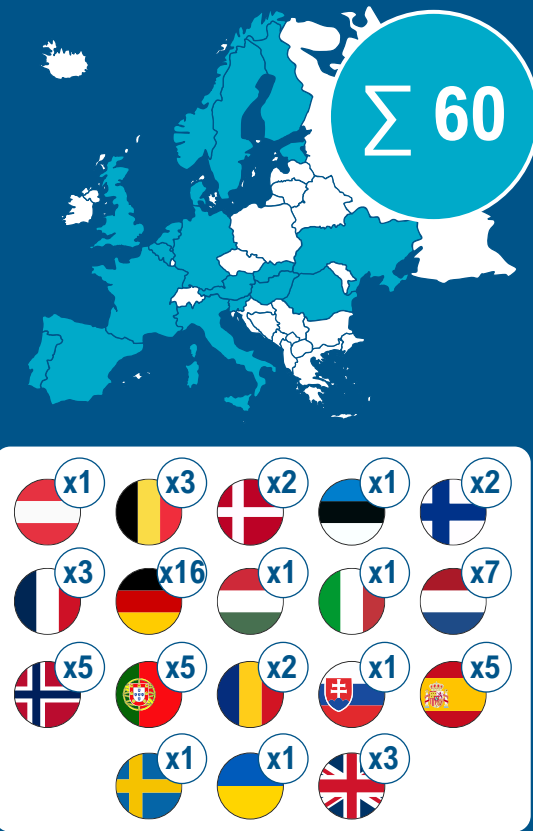
- **Large-scale joint investment** (> EUR 10 m and up to multi-bn EUR)
- **Full hydrogen value chain coverage**
  - Centralized clean hydrogen production (*de facto* mostly green H<sub>2</sub>)
  - Shared infrastructure (e.g., pipelines, refueling stations)
  - Multiple end-uses (e.g., steel industry, fuel cell trucks)
- **Clear regional scope** (e.g., around a major port)





# Hydrogen Valleys are truly going global – As of today, we have identified **more than 80 Hydrogen Valleys** under development around the world

Europe



Asia-Pacific



Americas



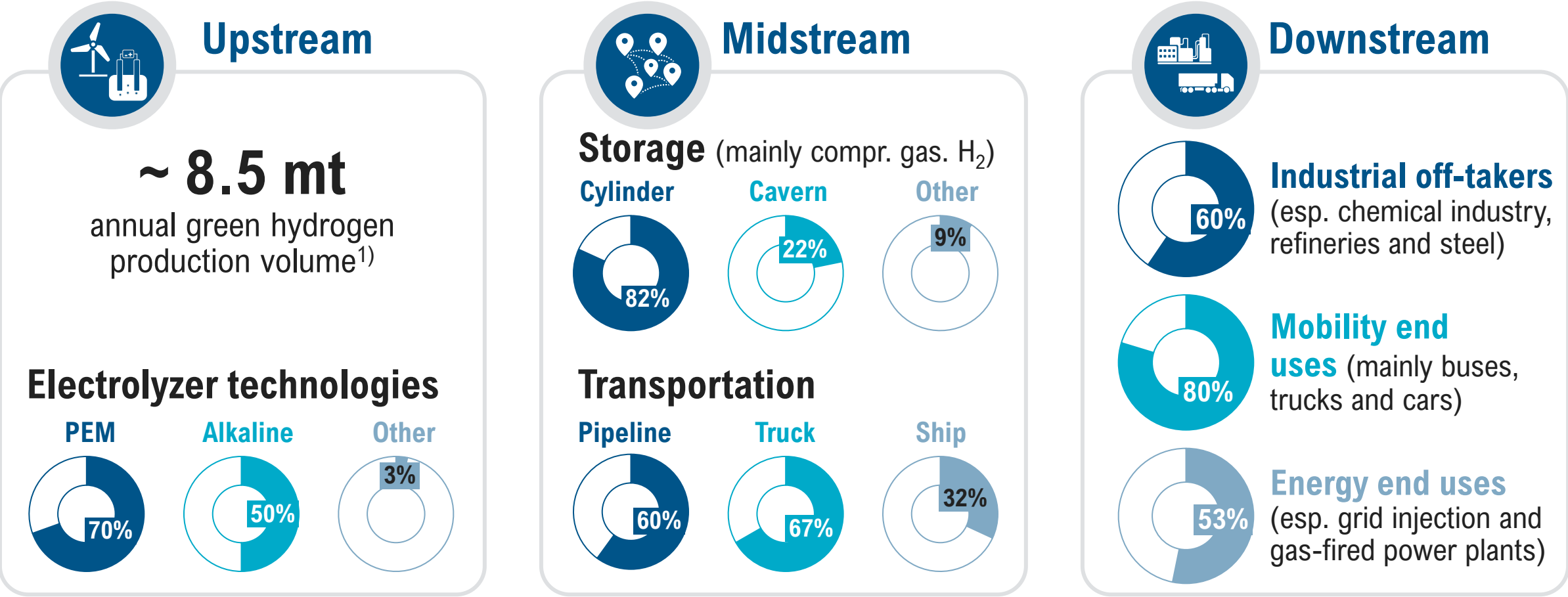
Middle East & Africa



Note: Only considering Hydrogen Valleys participating in the Mission Innovation Hydrogen Valley Platform



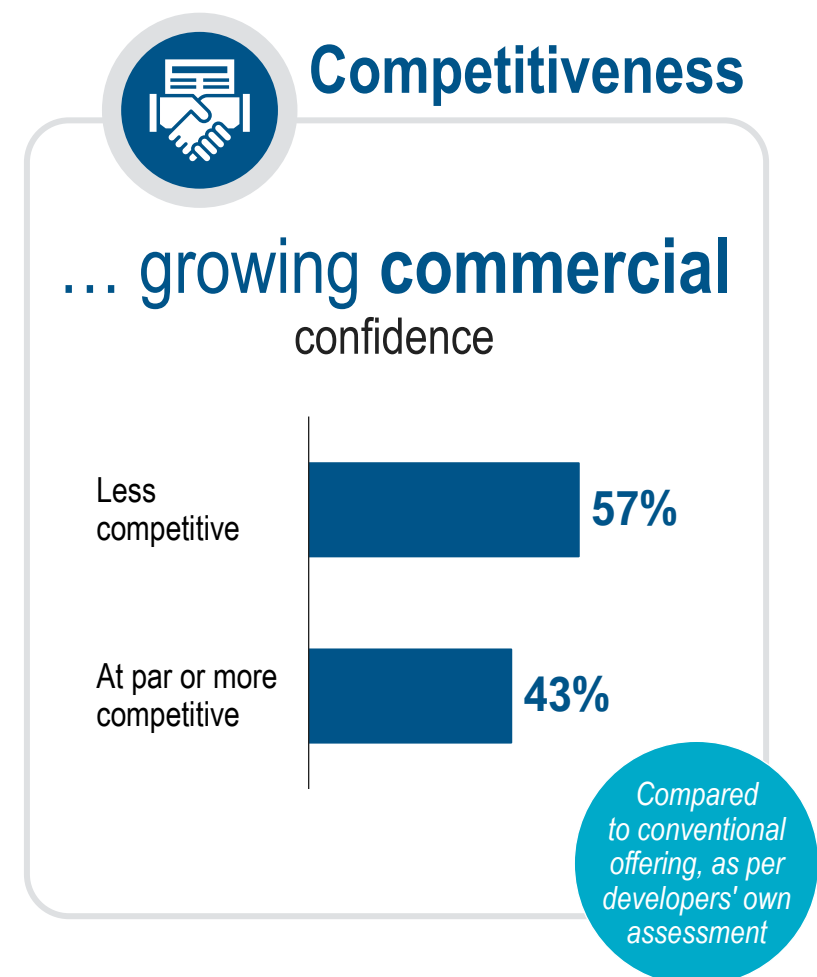
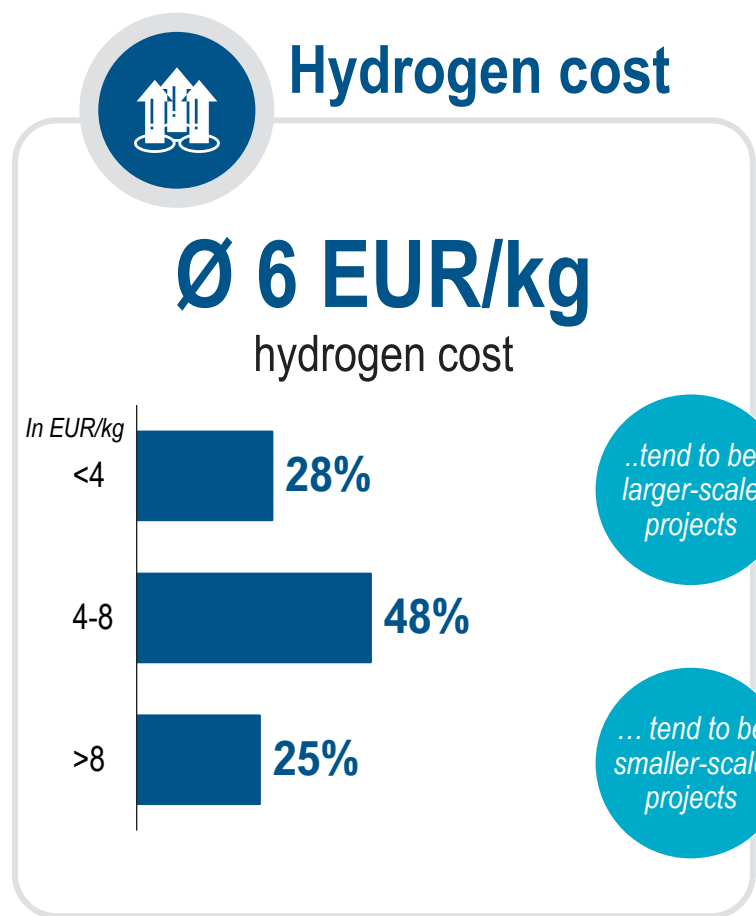
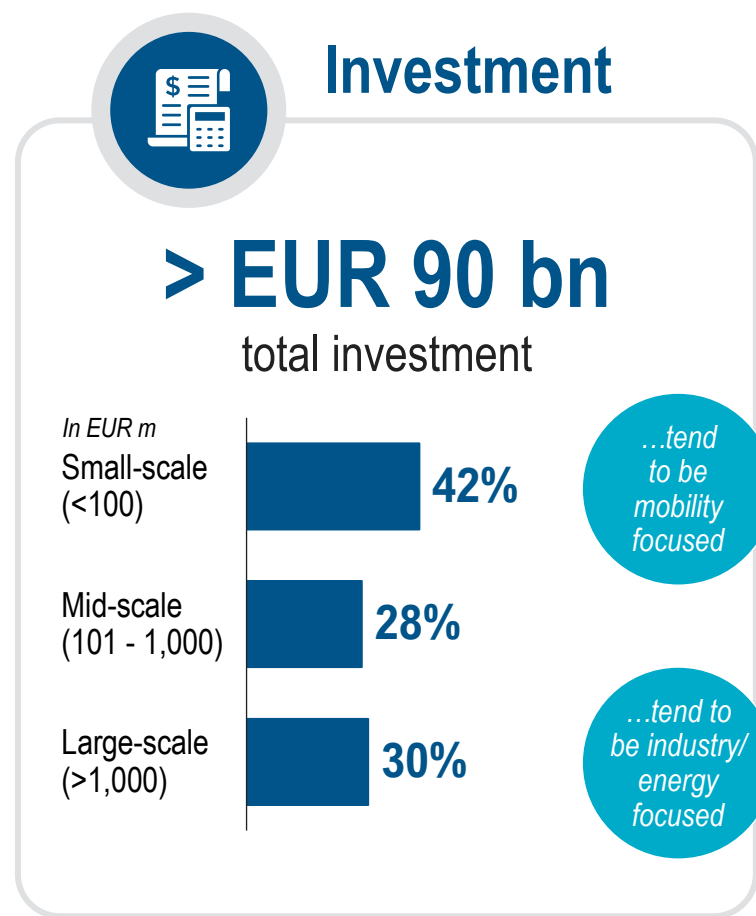
# Hydrogen Valleys focus on green H<sub>2</sub> for various end-uses in mobility, industry, and energy sectors



1) After reaching maximum build-out stage

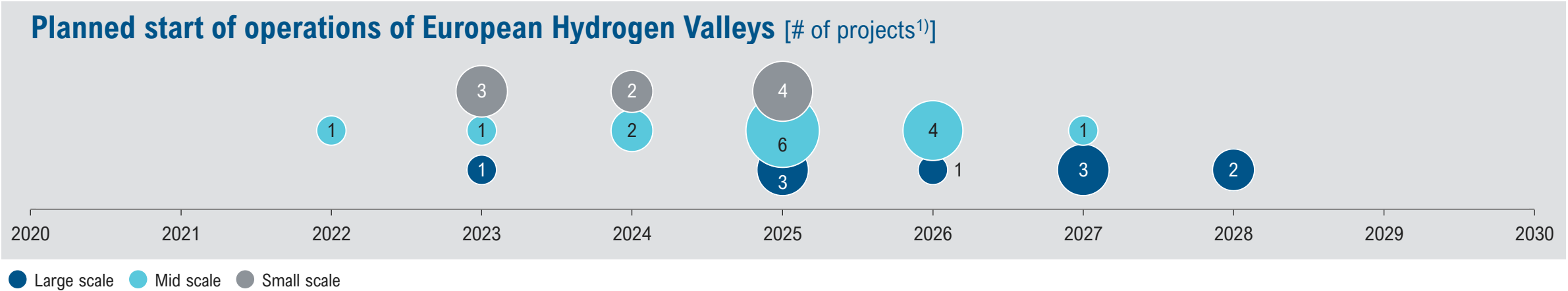
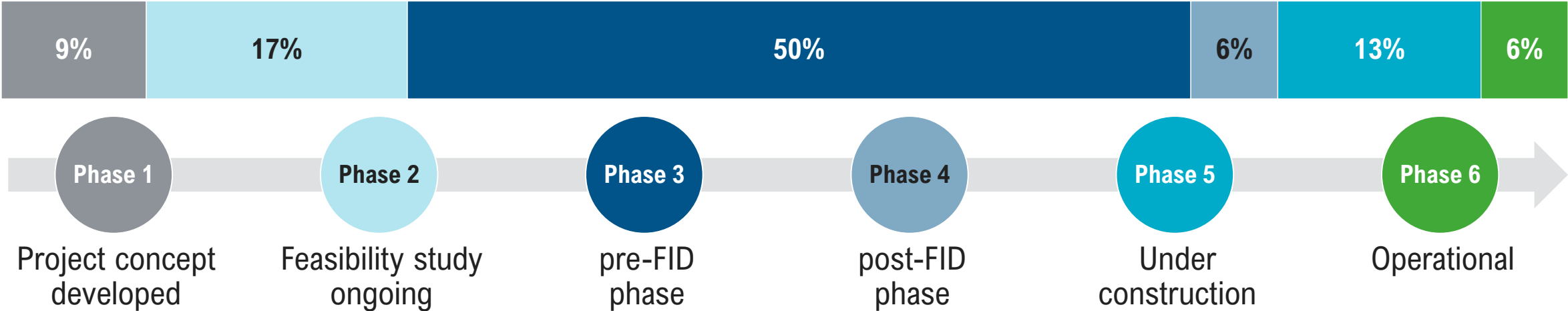


# With **EUR 90+ bn planned investment**, Hydrogen Valleys are on a **path to competitiveness** with fossil H<sub>2</sub>





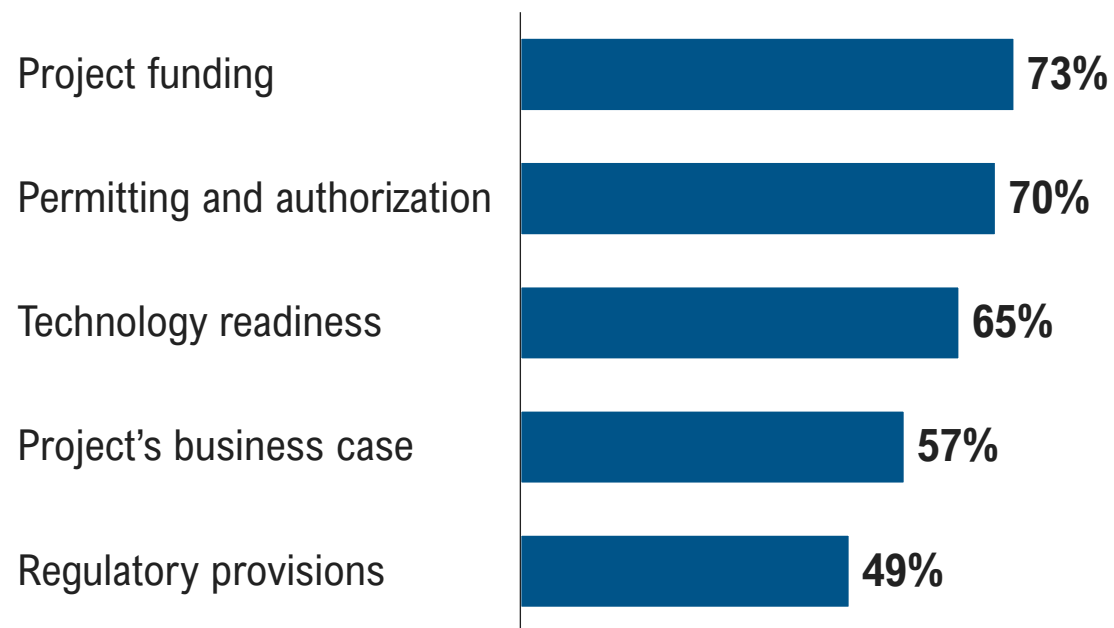
Hydrogen Valleys are still "early stage" – About **3/4 of projects** under development are **yet to reach a final investment decision**



Note: Small scale: Investment < EUR 50 m; Mid scale: Investment EUR 50 – 500 m; Large scale: Investment > EUR 500 m; 1) n = 34

# Hydrogen Valley developers face common challenges, especially concerning funding and regulation

## Top overall challenges when developing Hydrogen Valleys<sup>1</sup>



## Top overall success factors when developing Hydrogen Valleys<sup>1</sup>



1) Top 5 answers from survey; multiple answers possible



Time for your **questions, comments and feedback**



Join at [Slido.com](https://www.slido.com)

**#H2ValleyPlatform**



And now, let's take a look ...

# Mission Innovation Hydrogen Valley Platform

Showcasing hydrogen flagship projects around the world: A platform for project developers

LEARN MORE

Platform Relaunch May 8th - Register Here

Join The Hydrogen Valleys Community

81 Hydrogen  
Valleys

31 Countries

89,611 Total investment  
(M€)





# HEAVENN

HEAVENN is a large-scale demo project addressing the requirements of the call, by bringing together core elements: production, distribution, storage and local end-use of hydrogen into a fully-integrated and functioning Hydrogen Valley.

### LEAD DEVELOPER

New Energy Coalition

### PROJECT PARTNERS

Gasunie, Nobian, Engie, Getec, Groningen Seaports, Nederlandse Aardolie Maatschappij, Qbuzz, TotalEnergies, Energie Beheer Nederland, Lenten Scheepvaart BV, Green Planet, Municipalities of Groningen, Hoozeveen and Emmen, HyEnergy TransStore, Shell, H2Tec,

### MAIN POLITICAL SPONSORS

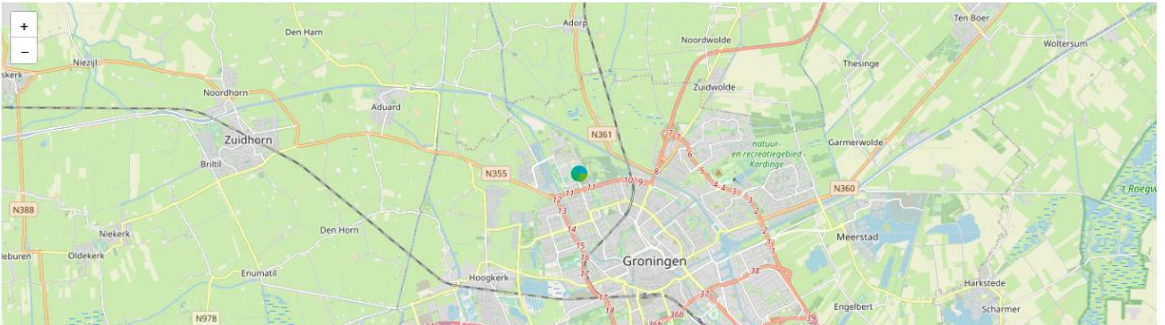
Province of Groningen, Province of Drenthe, The Netherlands Ministry of Economic Affairs and Climate, The Netherlands Ministry of Infrastructure and Water Management

### MAIN LOCATION

Netherlands

### OTHER LOCATIONS

Yes



## Project details

- ▶ H2 PRODUCTION VOLUME

[T/year]: 36500
- ▶ INVESTMENT VOLUME

[M€]: 2,800.00
- ▶ FUNDING

Public: EU funding

Public: National funding

Public: Regional funding

Public: Local funding

Private funding
- ▶ VALUE CHAIN COVERAGE

⚠️ PRIMARY ENERGY SOURCING

⚡ H2 PRODUCTION

Water electrolysis with PEM electrolyser

Water electrolysis with ALK electrolyser

Byproduct

🏠 H2 STORAGE

Cavern - Compressed H2

✈️ H2 TRANSPORT

Pipeline - Compressed H2

Trucking - Compressed H2

Ship - Compressed H2

📦 H2 DISTRIBUTION FOR MOBILITY

HRS 700 bar

HRS 350 bar
- ▶ END USES

🚗 MOBILITY

Cars

Buses

Trucks

Ships

Other

🏠 ENERGY

Stationary fuel cells for distributed generations - Back-up or off-grid applications

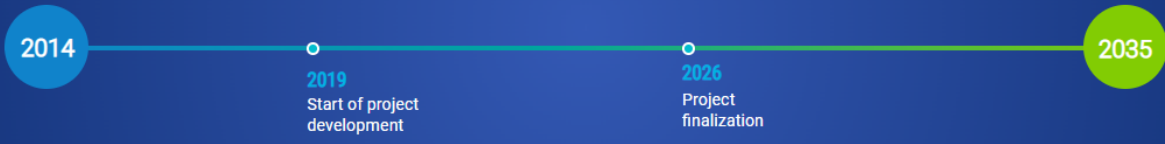
Hydrogen supply to gas-fired power plants

🏭 INDUSTRIAL FEEDSTOCK

Supply to other industries

## Project timeline

✓ CURRENT STATUS: post-FID (financing, tendering, etc.)



Clean Hydrogen Partnership

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HYDROGEN VALLEYS

ANALYSIS

TOOLBOX

MATCHMAKING

JOIN

ABOUT US

Statistics

Fundamentals

Value Chain

Preparation


Financing

Impacts

Barriers

Best Practices

Reports





### Statistics

This section is based on the most comprehensive survey that has ever been conducted on Hydrogen Valleys globally. More than 2,500 data points collected from more than 30 Hydrogen Valleys offer an exclusive look inside the projects and provide you with details on the Valleys' fundamentals, technologies deployed, project development, financing aspects as well as overarching project goals and benefits.

### Barriers

Also based on the Hydrogen Valley Survey, this section explores the barriers that the Hydrogen Valleys indicated. Both during the preparation and the financing phase, the projects provide an exclusive look into their specific challenges and hurdles they faced or are facing to this day. On top of that, have a look at the most important regulations for successful projects according to the Hydrogen Valleys.






### Best Practices

The Best Practice section offers insights into various topics commonly identified as main hurdles and barriers for Hydrogen Valleys, ranging from how to successfully obtain both private and public funding, how to secure off-take commitments, manage technological risk, cooperate with project stakeholders and much more. The Best practices are based on comprehensive interviews with outstanding Hydrogen Valleys that have been managing selected challenges particularly well.

### Reports

The final report regarding the Hydrogen Valley Platform can be found here.



Co-funded by the European union

This platform has been prepared for the Clean Hydrogen Partnership by Roland Berger and INYCOM as a result of a public procurement contract.

[Data Protection](#) [Legal Notice](#)

Clean Hydrogen Partnership

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Analysis > Statistics > Value chain > Overview

Statistics

Fundamentals

Value Chain

Overview

Primary energy sources

Hydrogen production

Hydrogen storage/conversion

Hydrogen transport

Hydrogen distribution for mobility

End use applications

Preparation

Financing

Impacts

Barriers

Best Practices

Reports

## Overview

This section provides an overview on the many different parts of the hydrogen value chain covered by Hydrogen Valleys. If you want to find out more about the value chain coverage of specific Hydrogen Valleys, go to our Hydrogen Valleys section where project-specific overviews provide additional insights.

### Value chain coverage (number (share) of Valleys)

This question provides insights into the value chain coverage of Hydrogen Valleys displaying both the number of Valleys as well as the share of Valleys. Please note that the Hydrogen Valleys were able to choose multiple answers. Use the filter options to find out information on Hydrogen Valleys based on more specific characteristics.

Filter

None > No filter applied

Primary energy sourcing	42	53.16%
H2 production	76	96.2%
H2 storage/conversion	61	77.22%
H2 transport/distribution	64	81.01%
H2 distribution for mobility applications	44	55.7%

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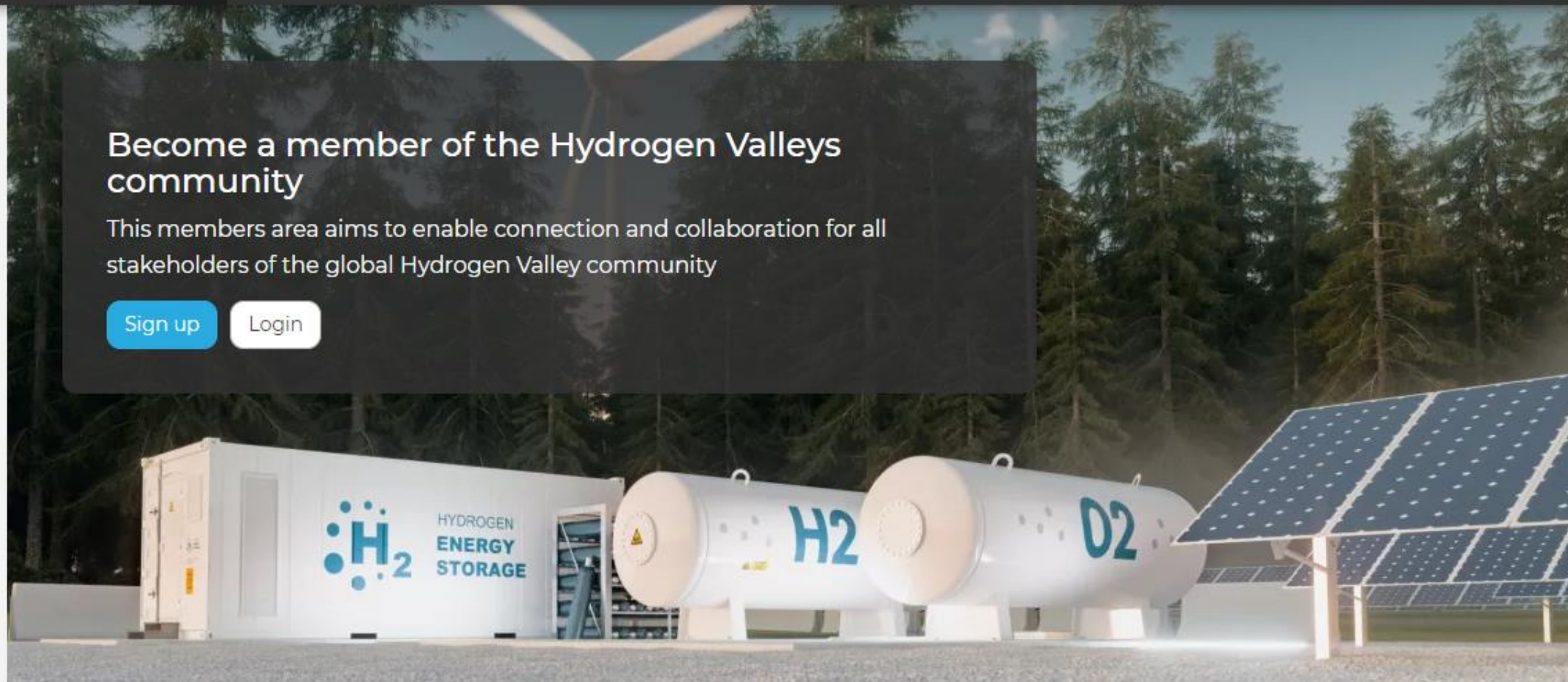
Roland Berger | 20





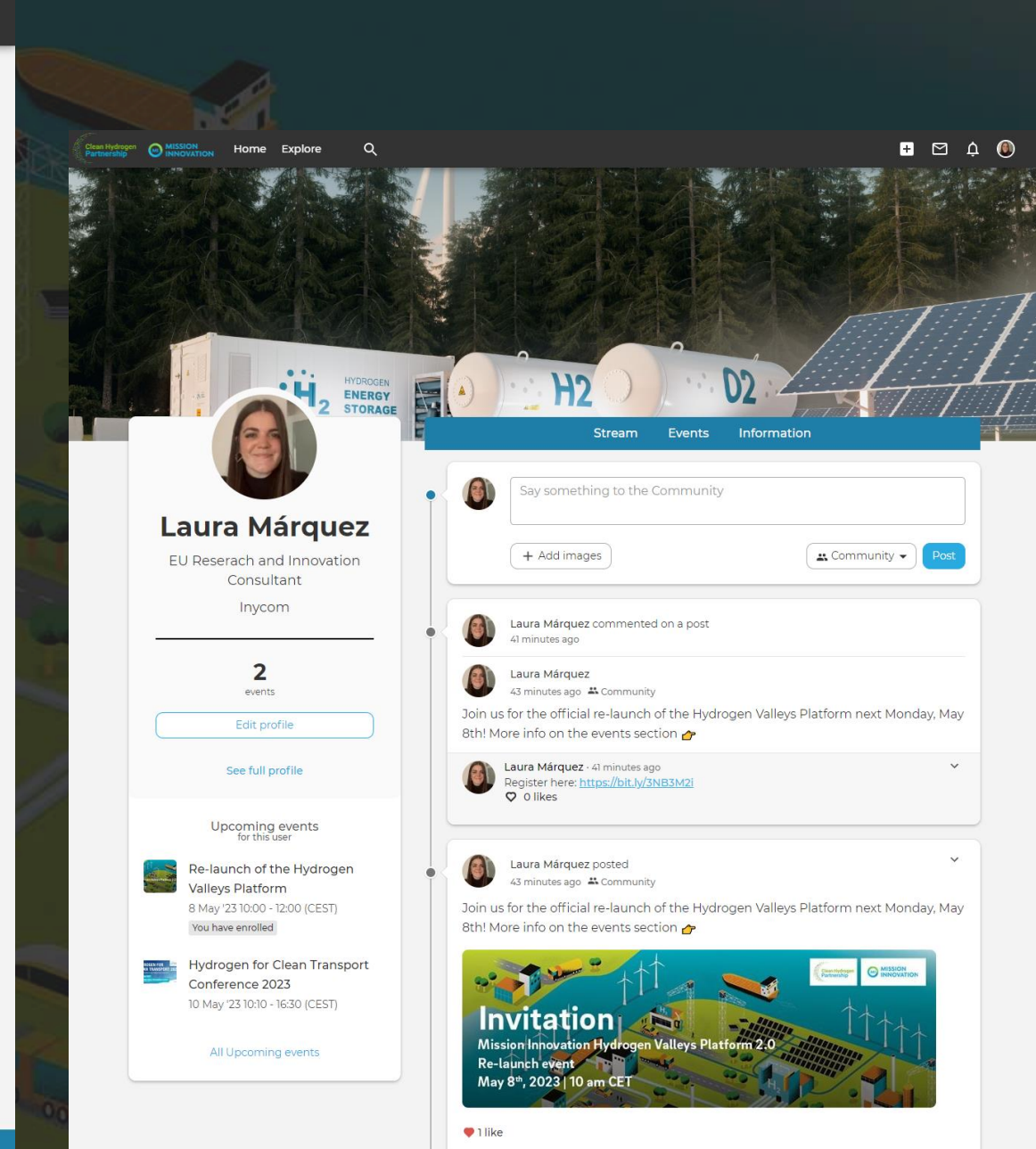
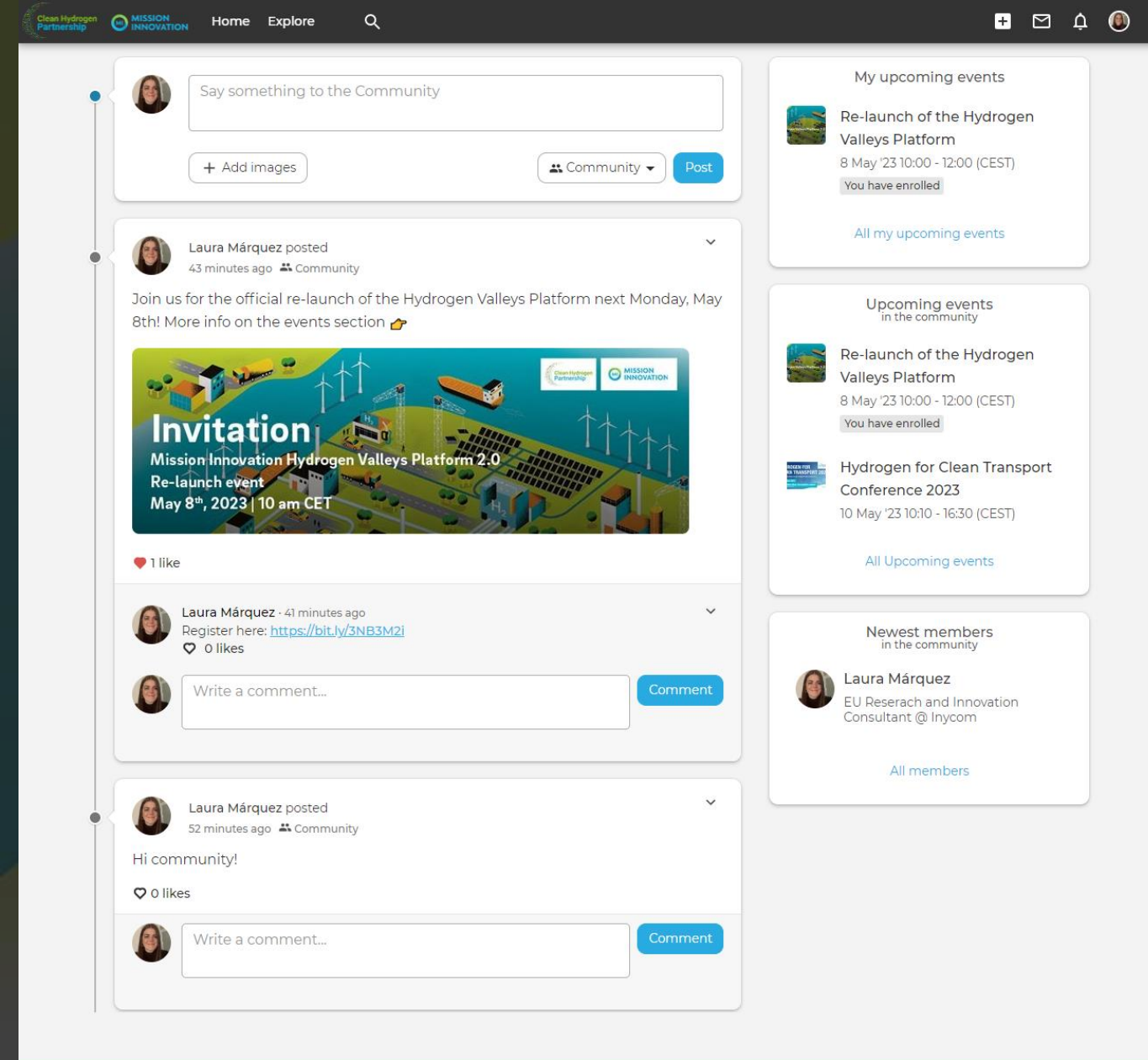
## Become a member of the Hydrogen Valleys community

This members area aims to enable connection and collaboration for all stakeholders of the global Hydrogen Valley community

[Sign up](#)[Login](#)

All Hydrogen Valley platform members can now sign-up for the members area here: <https://membersarea.h2v.eu/>





# Do you represent a Hydrogen Valley? **Join us now!**

## What defines a Hydrogen Valley?

- ✓ Clean hydrogen production
- ✓ Larger in scale (double-digit EUR m investment)
- ✓ Supply of more than one end use
- ✓ Broad value chain coverage
- ✓ Geographically defined scope
- ✓ Project feasibility

## How to join the platform

- 1 Reach out to [H2V@clean-hydrogen.europa.eu](mailto:H2V@clean-hydrogen.europa.eu) with a **first introduction** of your Hydrogen Valley
- 2 After initial screening, you are invited to an **online survey** on your project fundamentals – **All information is treated confidential!**
- 3 After submission, your **Hydrogen Valley profile** is published on the platform – Welcome to the community!
- 4 You continue to have full control – **You can adapt or update your project information** at all times

**All projects displayed on the platform are welcome to use the MI Hydrogen Valley certificate**





# What's next for the Hydrogen Valleys platform? Our way forward



## Reports and analytics

- **Update reports** on the state-of-play of the Hydrogen Valleys
- Continuous **updates of the data analysis section**



## Hydrogen Valleys white paper(s)

- **Information dossiers** on key insights for successful project development
- Directed at **different target audiences**, e.g., existing Valleys, aspiring new Valleys, policy-makers, etc.)



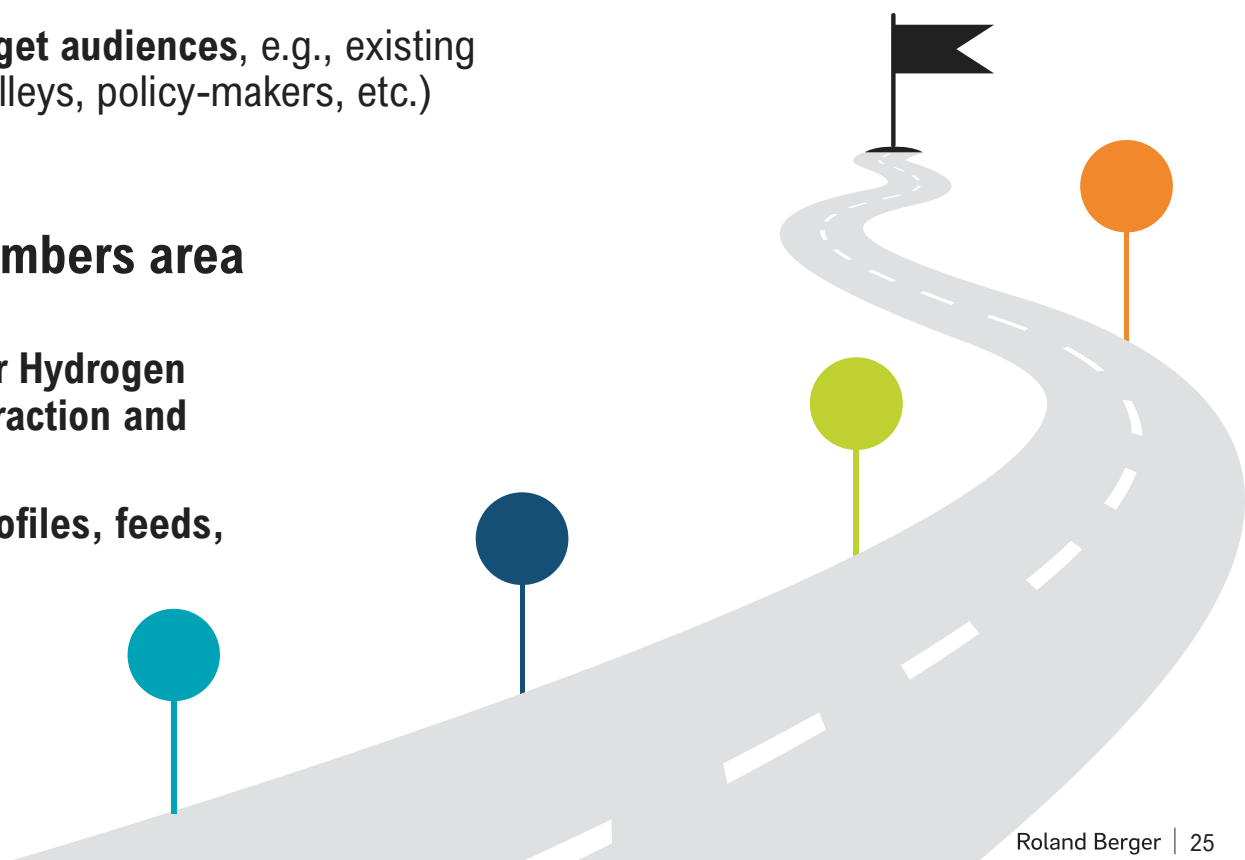
## Topical & regional workshops

- **Workshops** on key **hurdles and success factors** of Hydrogen Valley project development
- Different target **audiences and geographies**



## H2 Valleys members area

- A **network dedicated for Hydrogen Valleys** to enhance **interaction and collaboration**
- Creation of individual **profiles, feeds, and events**



# Have a look at [www.h2v.eu](http://www.h2v.eu) and don't hesitate to reach out

## Your contacts at the Clean Hydrogen Partnership



**Mirela  
Atanasiu**

**Head of Unit of Operations  
and Communications**

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@clean-hydrogen.europa.eu



**Antonio  
Aguilo Rullan**

**Project Adviser Operations  
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**Kostis  
Sakellaris**

**Knowledge Management  
Officer**

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**Uwe  
Weichenhain**

**Senior Partner**

uwe.weichenhain@rolandberger.com  
hydrogenvalleys@rolandberger.com



**Markus  
Kaufmann**

**Principal**

markus.kaufmann@rolandberger.com  
hydrogenvalleys@rolandberger.com

## Your contacts at Roland Berger



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# Moderated panel session 1: Building and managing Hydrogen Valleys

**Uwe  
Weichenhain**

## Moderation

Senior Partner, Roland Berger  
Global Hydrogen Lead

**Grande Region  
Hydrogen,  
GER, FRA, LUX**

**Anamaria  
Zianveni**

Project Manager,  
Encevo

**Clean Hydrogen  
Coastline,  
GER**

**Geert  
Tjarks**

Head of Business  
Development, EWE

**H2 Valley  
Mid-Norway  
NOR**

**Nils  
Rokke**

Executive Vice President  
Sustainability, Sintef

**North Adriatic  
Hydrogen Valley,  
SLO/CRO/ITA**

**Stephen  
Taylor**

Director / Technical Advisor,  
Area Science Park



# Grande Region Hydrogen Germany/France/Luxembourg

Anamaria  
Zianveni

Project Manager,  
Encevo



# Grande Region Hydrogen: a crossborder H2 ecosystem

Objective: to promote a hydrogen economy along the entire value chain



**11 Members**  
along the value chain

A crossborder H2 **pipeline** grid enabling investments in H2 **production via electrolysis, industrial consumption** (e.g. DRI for steel production), **mobility** services

2027-2030, ramp up to **450 MWe of production capacity**

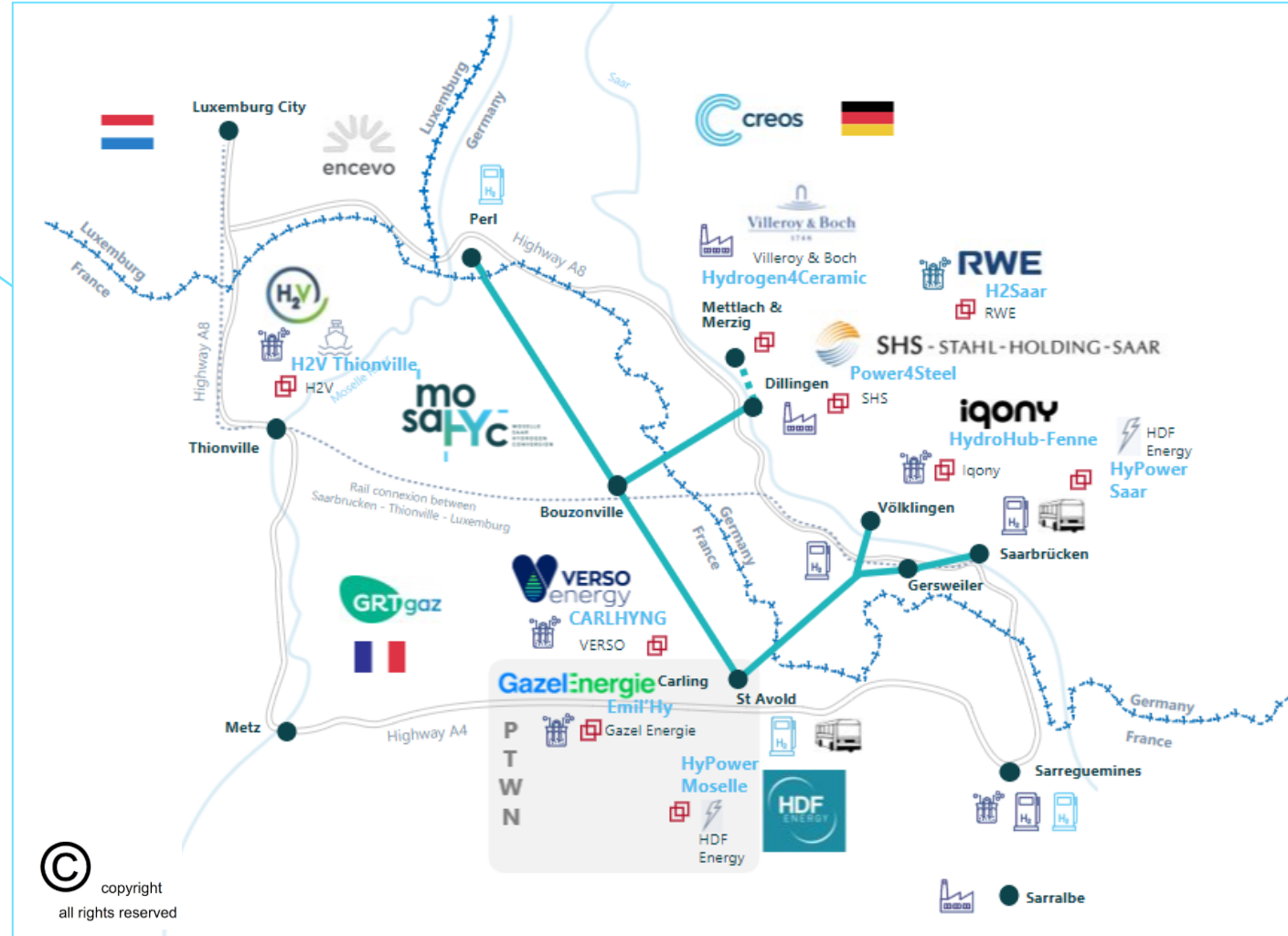
**Repurposed & new pipeline:**  
**55 000t** of transported H2/y

Integrated into **hydrogen european development plan**

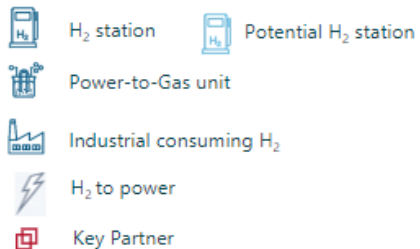
**3 200 000 t/y**  
of CO2 avoided by 2030



**Common objective for projects commissioning in 2027**



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Grande Region  
**Hydrogen**

Unsere Energie.  
Notre futur.

# Clean Hydrogen Coastline Germany

Geert  
Tjarks

Head of Business Development,  
EWE



# Project Clean Hydrogen Coastline

Integrated approach for a European hydrogen economy



Image: EWE AG

- Create a hub, that will secure **hydrogen production capacities** for an Intra-European energy market with an electrolyser capacity of up to 400 MW by 2026
- Development of a **trans-european hydrogen infrastructure** for transport via pipelines and storage in salt caverns
- Enable **first markets for green hydrogen** in industry and in the transport sector
- Total investment in the technology of around **700 Million €** by the end of 2026
- Suitable **funding scheme and regulatory framework** is required (IPCEI status applied)







# H2 Valley Mid-Norway Norway

**Nils  
Rokke**

Executive Vice President Sustainability,  
Sintef





 1 express boat operative from 2028	 1 service vessel operative from 2023
 2 container ships under planning	 8 service vessels under planning

RØRVIK



### H2 PRODUCTION | H2 STORAGE | H2 DISTRIBUTION

One service vessel and H2 infrastructure for bunkering under construction. Operative from 2023

Investment: €6 million | **Production: 0,5 T/day**



### H2 PRODUCTION | H2 STORAGE | H2 DISTRIBUTION

Funding approved. Full-scale production, storage and distribution for mobility. Operative from 2025

Investment: €30+ million | **Production: 8 T/day**



### H2 PRODUCTION | H2 DISTRIBUTION

Four heavy-duty trucks, warehouse forklifts and fuel station. Operative from 2020

Investment: €9 million | **Production: 0,3 T/day**



### H2 R&D FME HYDROGENi and LAB FACILITY (SINTEF & NTNU)

Research and development

Norwegian Fuel Cell and Hydrogen Centre

HITRA

 3 bulk carriers under planning	 4 service vessels under planning
 1 express boat operative from 2026	

TRONDHEIM

 1 express boat operative from 2026	 4 trucks operative from 2020
---	-------------------------------------

MERÅKER



### H2 PRODUCTION

Joint initiative  
Ambitions for operation from 2028

Investment: N/A | **Production: N/A**



### H2 PRODUCTION | H2 STORAGE | H2 DISTRIBUTION

Funding approved. Full-scale production, storage and distribution for mobility. Operative from 2025

Investment: €30+ million | **Production: 6 T/day**

### H2 PRODUCTION | INDUSTRIAL

Methanol production. H2 use in methanol process 15-30 t/day. Working on a development plan which might facilitate for large export of blue and/or green H2 or H2 derivatives.

Investment: €x million | **Production: 15-30 T/day ++**





# North Adriatic Hydrogen Valley Slovenia/Croatia/Italy

Stephen  
Taylor

Director / Technical Advisor,  
Area Science Park





# North Adriatic Hydrogen Valley (NAHV) the first transnational Hydrogen Valley



- In the beginning there was a bottom-up process led by a visionary industrialist, Aleksander Gerbec
- Letter of Intent – first political declaration of the will to form the first transnational Hydrogen Valley
  - Republic of Croatia/Republic of Slovenia/ Region of Friuli Venezia Giulia, Italy
- Joint Working Group – initial organizational structure defined
  - Institutional partners + representatives of industry and research communities from each of the three territories
- Horizon Europe Call – first funding opportunity identified
  - Large Scale Hydrogen Valley – up to € 25M
- Open calls for manifestations of interest in three territories
  - Over a hundred companies manifested interest
- Rapid but rigorous selection process
  - Assessment of each pilot project proposal for feasibility, readiness and fit
- Construction of partnership and presentation of first project led by Slovenian energy company HSE
  - Consortium constructed to include adequate production/storage/distribution and end use in power, transport and hard to abate sectors
- Ongoing further development of the North Adriatic Hydrogen Valley initiative
  - Extension of activities in the three territories and networking with other hydrogen valleys
- AISBL chosen as future governance model to guarantee success of the transnational model

# Moderated panel session 2: Project development and funding of Hydrogen Valleys

**Markus  
Kaufmann**

## Moderation

Principal, Roland Berger  
Global Hydrogen Team

**Green  
Hysland,  
ESP**

**Carlos  
Navas**

Head of Strategy and  
Regulatory Affairs,  
Enagas

**H2U Hydrogen  
Valley,  
UKR**

**Iaroslav  
Kryl**

CEO,  
Hydrogen Ukraine

**SoHyCal,  
USA**

**Pedro  
Pajares  
de Tena**

CEO,  
H2B2

**Ceará – Green  
Hydrogen House,  
BRA**

**Corne  
Hulst**

COO, Pecem Industrial &  
Port Complex

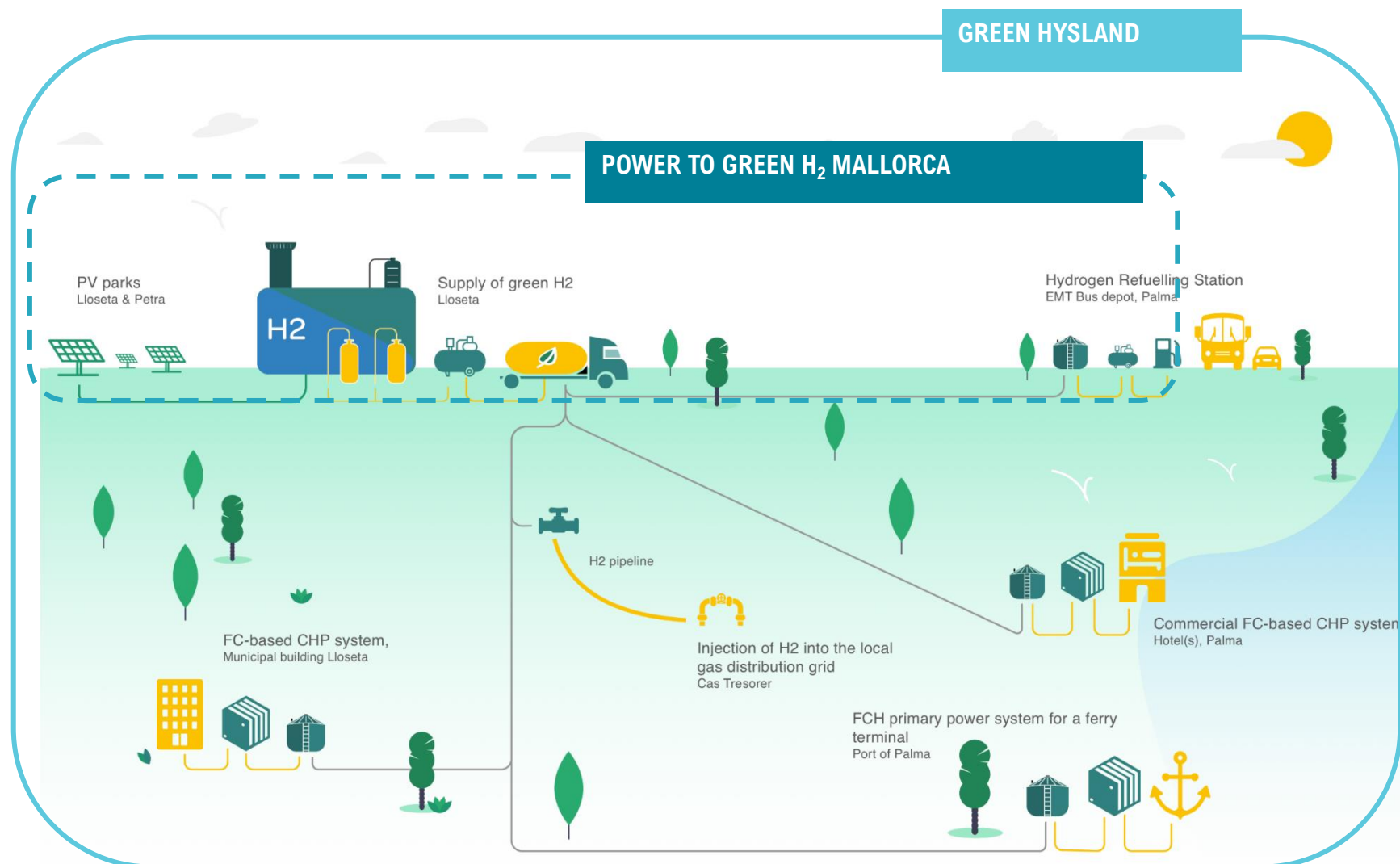


# Green Hysland Spain

Carlos  
Navas

Head of Strategy and Regulatory Affairs,  
Enagas

# GREEN HYSLAND: Deployment of a Hydrogen Ecosystem in the island of Mallorca





# H2U Hydrogen Valley Ukraine

Iaroslav  
Kryl

CEO,  
Hydrogen Ukraine



# H2U Hydrogen Valley in Odesa Region, Ukraine

Electrolyser capacity: 100MW

Solar: 120MW

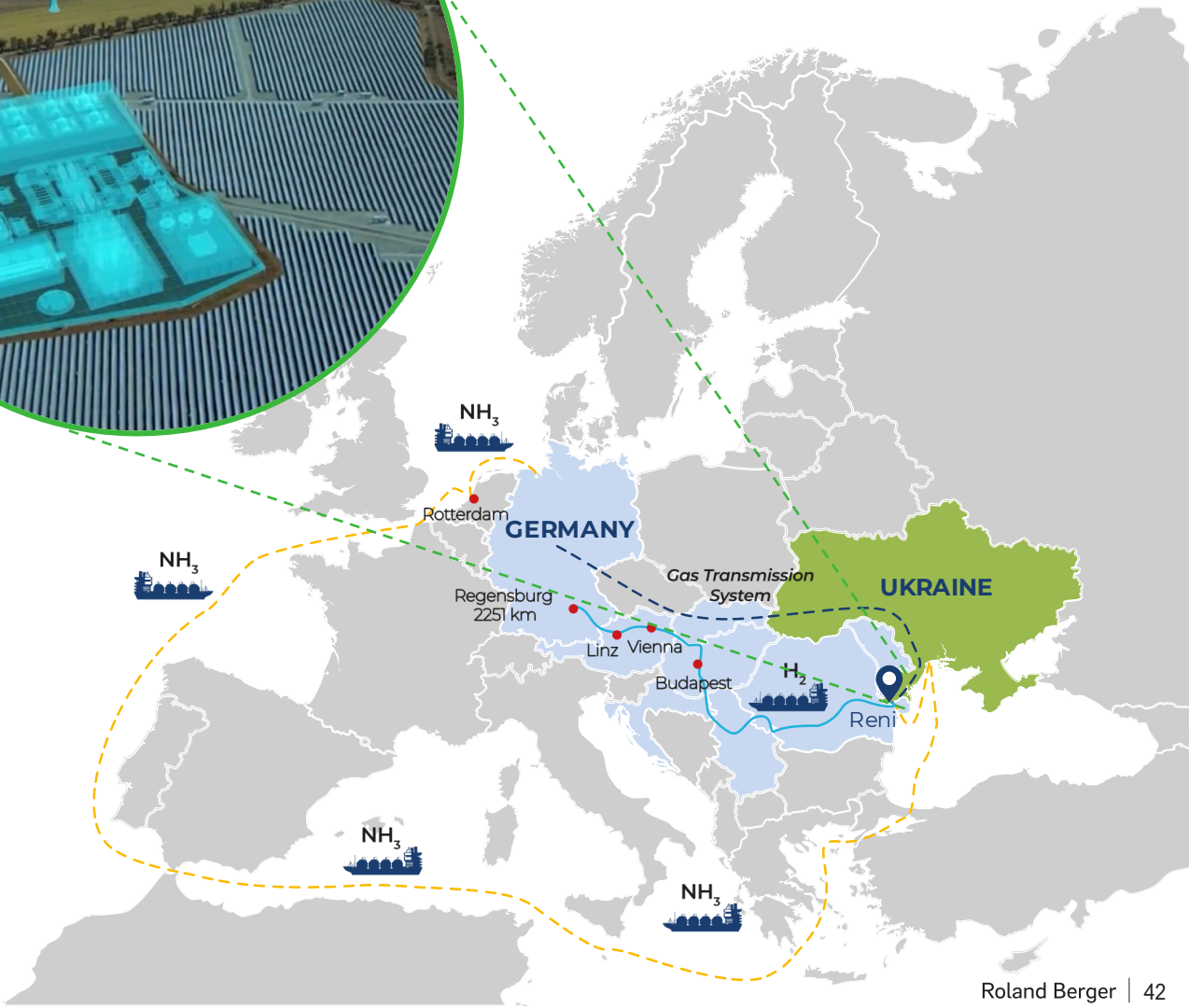
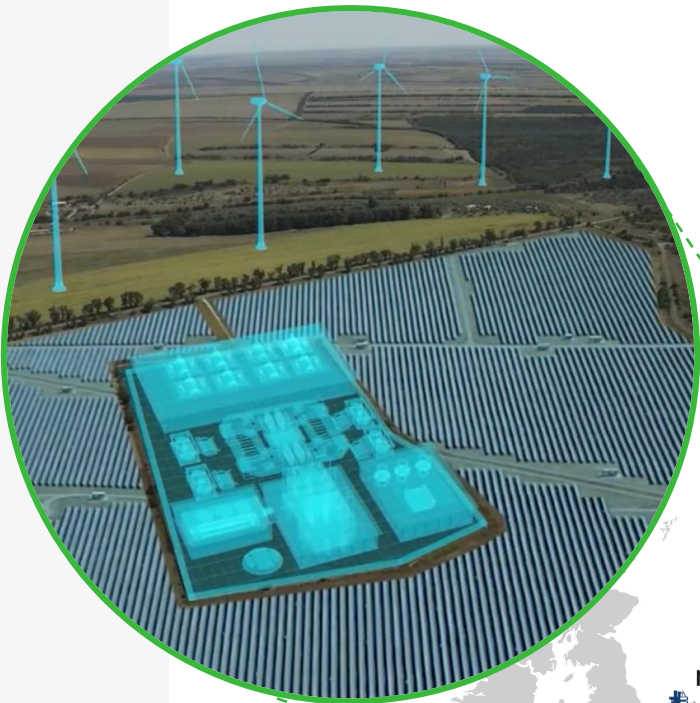
Wind: 80MW

Period of construction: 24 months



**HYDROGEN UKRAINE, LLC**  
20, Lavrska Street,  
Kyiv, 1015, Ukraine

<b>Project name</b>	H2U Hydrogen Valley
<b>Lead developer</b>	Hydrogen Ukraine LLC
<b>Location</b>	Reni, Odesa region, Ukraine
<b>Description</b>	Constructing a renewable hydrogen plant aiming for an initial electrolysis capacity of 100 MW, dedicated to producing renewable electricity and green hydrogen for export to EU countries.
<b>Advantages</b>	Abundant water resources, optimal PV and wind power configuration H2 production is strategically located near the EU border
<b>Challenges</b>	Despite challenges due to the Russian invasion, H2U continues to advance the project and contribute to Ukraine's hydrogen energy strategy





An isometric illustration of a hydrogen infrastructure network. It shows a coastal area with wind turbines, solar panels, and a ship. A network of pipes and trucks distributes hydrogen (H2) to various locations, including industrial facilities, residential houses, and a train. A large orange circle in the center contains the name 'Pedro Pajares de Tena'.

**SoHyCal  
USA**

**Pedro  
Pajares  
de Tena**

CEO,  
H2B2



**SoHyCal Project**

Providing the market global solutions



- H2B2 will start producing green hydrogen for mobility in our facility SoHyCal, located in CA Central Valley. Production will ramp up from 1.2 Tons per day by end of 2023 to 3.8 Tons per day by end of S1 2024.
- SoHyCal will start operations by June 2023 with a limited capacity of 300 kg/day.
- SoHyCal is a pioneering project, being the first of its kind to be powered behind the meter, 100% renewable energy powered facility by means of biogas and solar energy.
- Hydrogen will be generated and injected into tube trailers for storage and transportation in gas state at up to 520 bars.





# Ceará – Green Hydrogen House Brazil

Corne  
Hulst

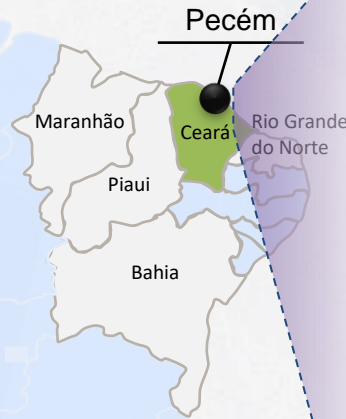
COO,  
Pecem Industrial & Port Complex



## Unique Gh2 potential

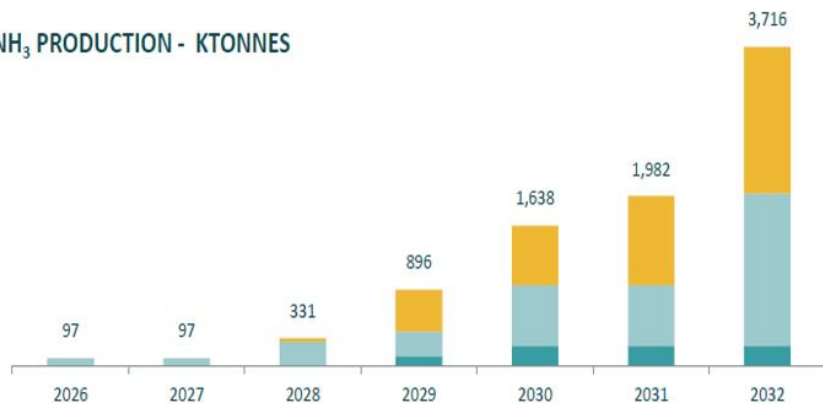
- **Abundant potential of low cost Renewable Energy;** High full load hrs.
  - Solar; 28,500 GWp
  - Onshore Wind; 880 GW
  - Offshore Wind; 1,335 GW
- **Production water;** Abundant effluent water vs. desalination
- **High demand;** Export to EU & Local GH2 hub
  - Rotterdam 4 Mil. Ton – 2030 / 20 Mil. Ton 2050
    - *Distance to EU & Low transport cost vs. total cost*
  - Pecém Industry; Steel, Power Plants, Cement, Fertiliser
- **Stable investment climate;** Government, Education, Labour market, PoR
- **Commercial;** 20+ MOU's & 3 FEED studies – FID end 2023/begin 2024

Brasil

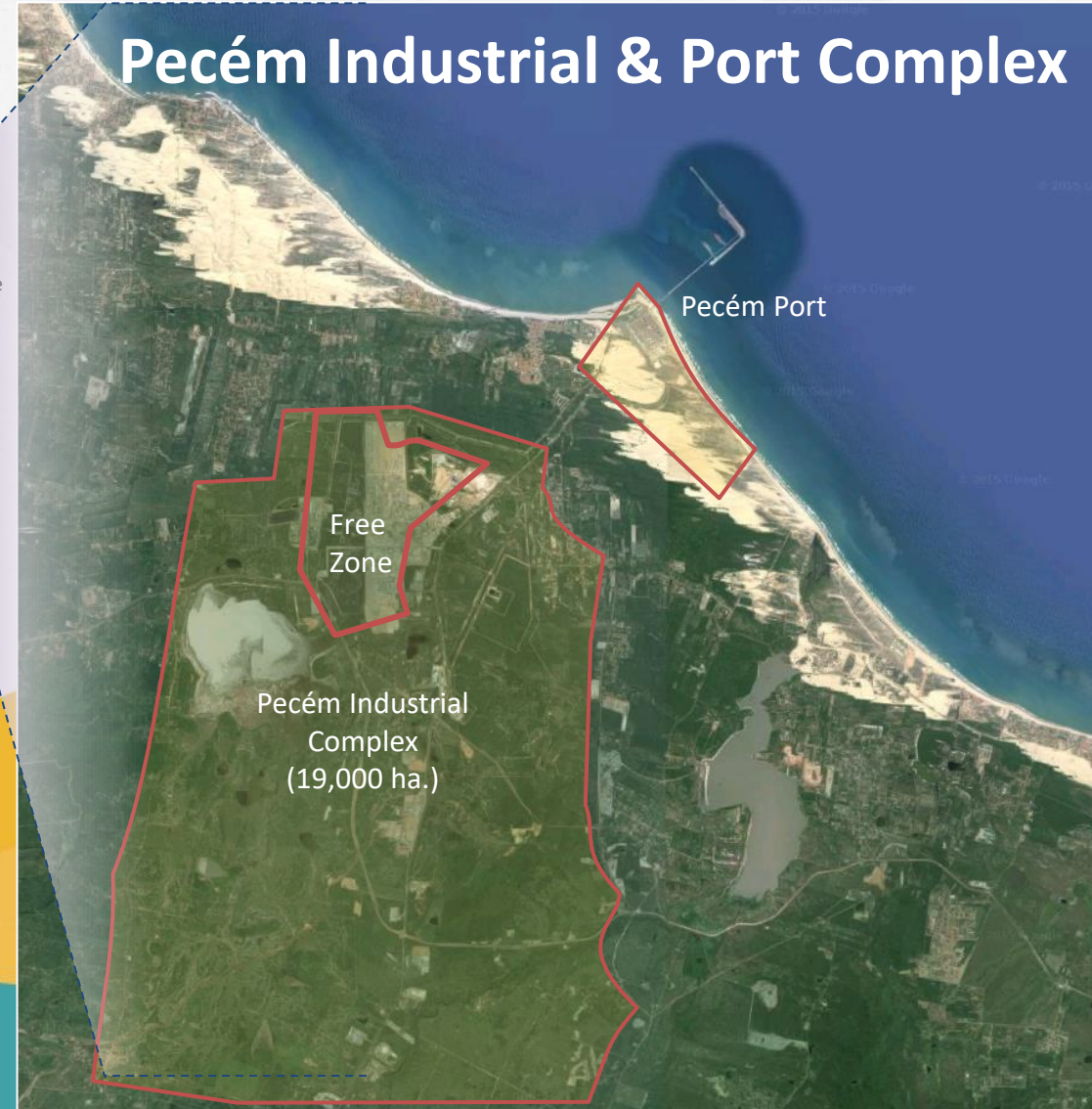


State of Ceará  
Pecém hinterland

NH<sub>3</sub> PRODUCTION - KTONNES



## Pecém Industrial & Port Complex





# H2.0 Valley Platform Relaunch Event

## 1 Welcome and introduction

10:00 – 10:05: Mirela Atanasiu, Head of Unit Operations and Communications, Clean Hydrogen Partnership

## 2 Opening remarks

10:05 – 10:15: Rosalinde van der Vlies, Vice-Chair of the Mission Innovation Steering Committee

10:15 – 10:25: Kurt-Christoph von Knobelsdorff, CEO of NOW GmbH, German Sen. Rep. for the Clean Hydrogen Mission

## 3 Key highlights of global Hydrogen Valley developments and new features of the Hydrogen Valley Platform 2.0 (incl. Q&A)

10:25 – 10:50: Uwe Weichenhain (Senior Partner) and Markus Kaufmann (Principal), Roland Berger  
Laura Marquez, EU Research and Innovation Consultant, Inycom

## 4 Project snapshots and panel discussions: Best practices of Hydrogen Valleys

Moderators: Uwe Weichenhain and Markus Kaufmann, Roland Berger

10:50 – 11:15: Session 1 - Building and managing Hydrogen Valleys

11:15 – 11:40: Session 2 - Project development and funding of Hydrogen Valleys

11:40 – 11:50: Q&A

## 5 Closing remarks

11:50 – 12:00: Matthijs Soede, Director, Mission Innovation Clean Hydrogen Mission

# Closing remarks

**Matthijs  
Soede**

Director,  
Mission Innovation  
Clean Hydrogen Mission





