CORINTH PIPEWORKS
Member of CENERGY HOLDINGS

85η Διεθνής Έκθεση Θεσσαλονίκης
11-19.9.2021
ΕΛΛΑΔΑ: Παρελθόν · Παρόν · Μέλλον

Hydrogen era :

The transition to a low carbon economy

85th Thessaloniki International Fair (TIF) - 14th of September 2021

Bekiros Ilias, CEO

Our company

At a glance

Steel pipe segment of Cenergy Holdings

Leaders in the energy sector for more than 50 years

Our strategic priorities are:

- Make a positive contribution to energy transition
- Develop innovative products
- Reduction of the carbon footprint of our production activities & supply chain

More than
50
Years of experience

Sales in
45
countries
Leader in energy

Tier 1
supplier

> 22,000 km pipelines
> 3,000 km offshore pipelines
> 1,000 km CO_2 pipelines

Investments
350
Million €

* 2002-2020

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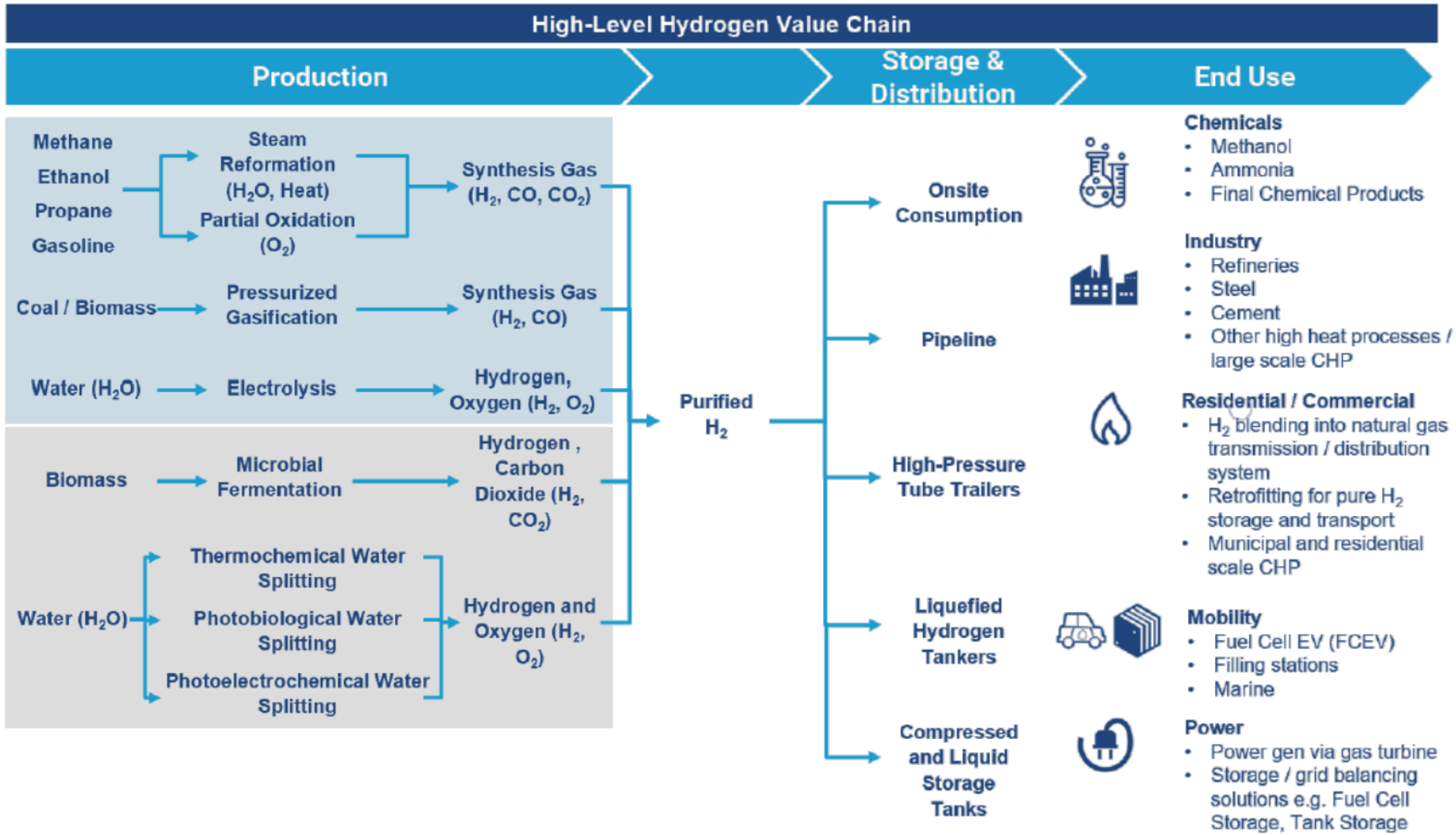
Hydrogen
Value Chain



Source: Wood Mackenzie

Hydrogen pipelines

- Can effectively transport renewable hydrogen across long distances (up to 5,000Km)
- Can transport 10 times the energy at one-eighth the cost associated with electricity transmission lines and with longer lifespan
- Can serve as both a transmission and storage medium
- Can also work with mixture of gaseous fuels

NH_3: Ammonia
LOH : Liquid hydrogen
LOHC: Liquid organic hydrogen carriers)

Exhibit 12: Overview of distribution options

		Costs				
		Distribution		Transmission		
		0–50 km	51–100 km	101–500 km	>1,000 km	>5,000 km
Pipelines[1]	Retrofitted	City grid	Regional distribution pipelines	Onshore transmission pipelines	Onshore/Subsea transmission pipelines	N/A
	New	City grid	Regional distribution pipelines	Onshore transmission pipelines	Onshore/Subsea transmission pipelines	N/A
Shipping	LH_2	N/A	N/A	N/A	LH_2 ship	LH_2 ship
	NH_3[2]	N/A	N/A	N/A	NH_3 ship	NH_3 ship
Trucking	LOHC[2]	N/A	N/A	N/A	LOHC ship	LOHC ship
	LH_2 trucking	Distribution truck LH_2	Distribution truck LH_2	Distribution truck LH_2	N/A	N/A
	Gaseous trucking	Distribution truck CH_2[3]	Distribution truck CH_2[3]	Distribution truck CH_2[3]	N/A	N/A

1. Assuming high utilization
2. Including reconversion to H_2; LOHC cost dependent on benefits for last mile distribution and storage
3. Compressed gaseous hydrogen

Hydrogen Insights Report 2021 – Hydrogen Council, Febr 2021 KcKinsey & Company

Hydrogen

Current situation

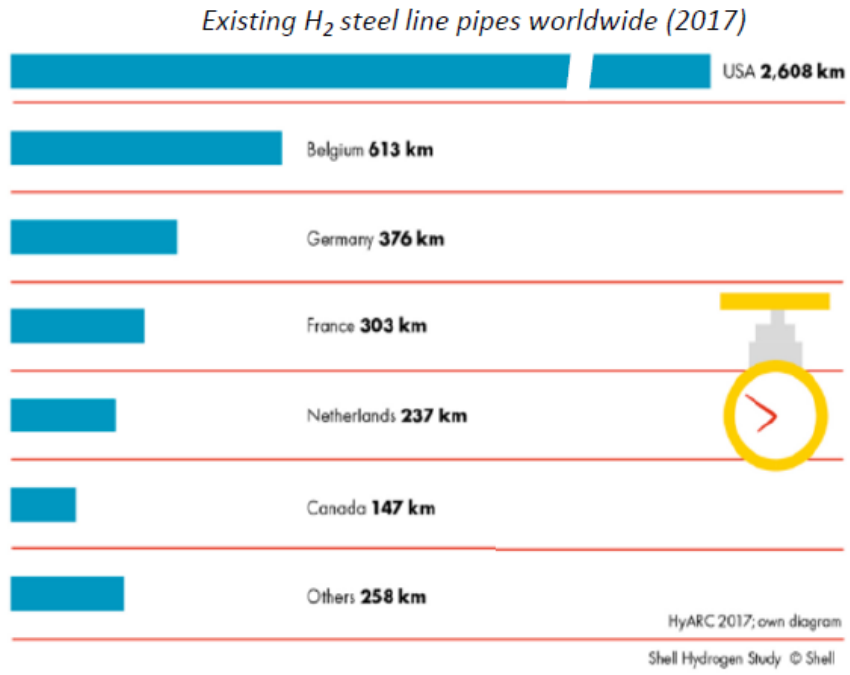
Hydrogen injected into pipelines is not a new concept

4,500km hydrogen linepipes are under operation in US and Europe, having:

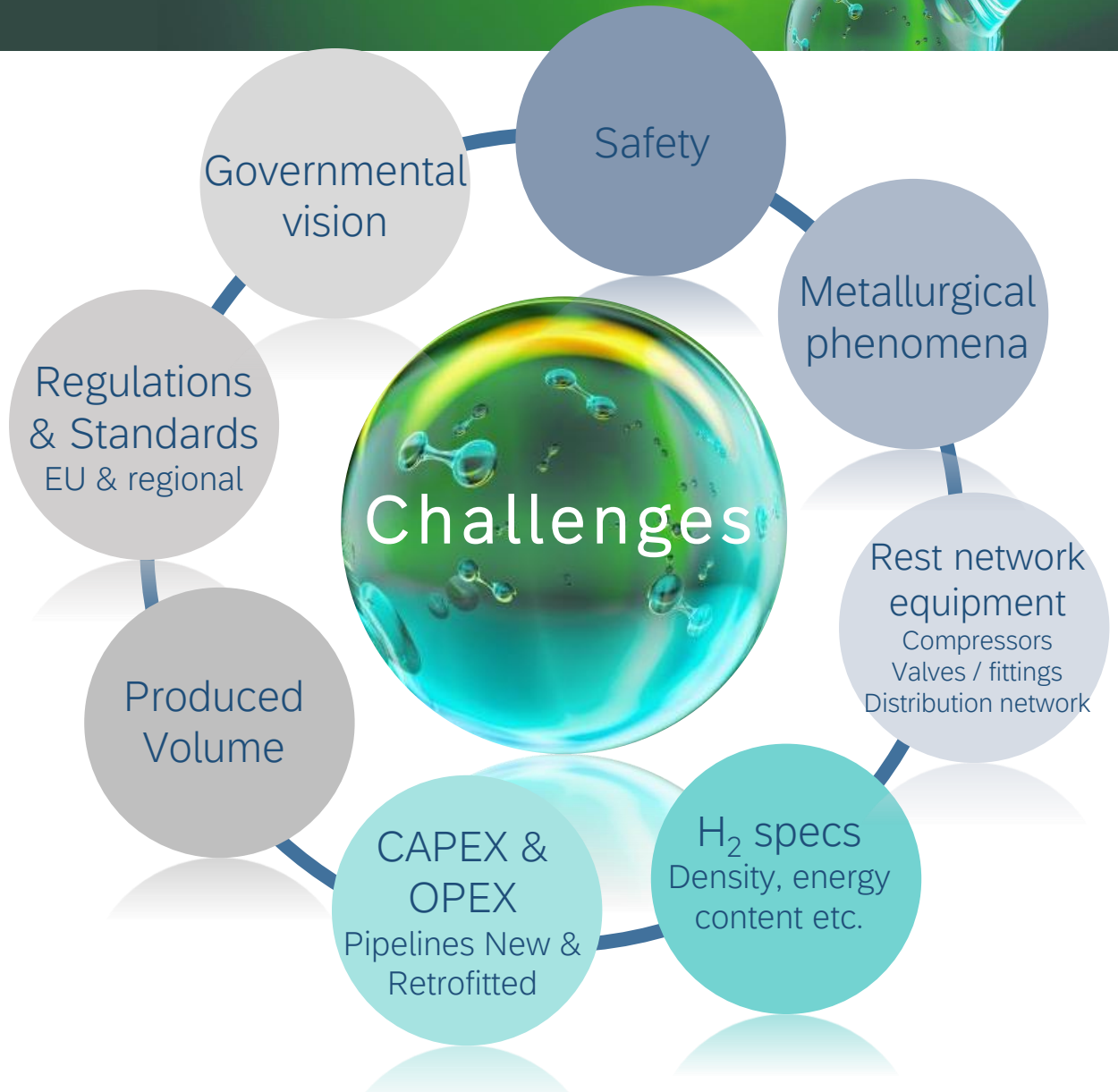
- Small diameter 4”-12”
- Low strength materials up to X52
- Low operating pressures
- Low capacity

Is it enough? NO

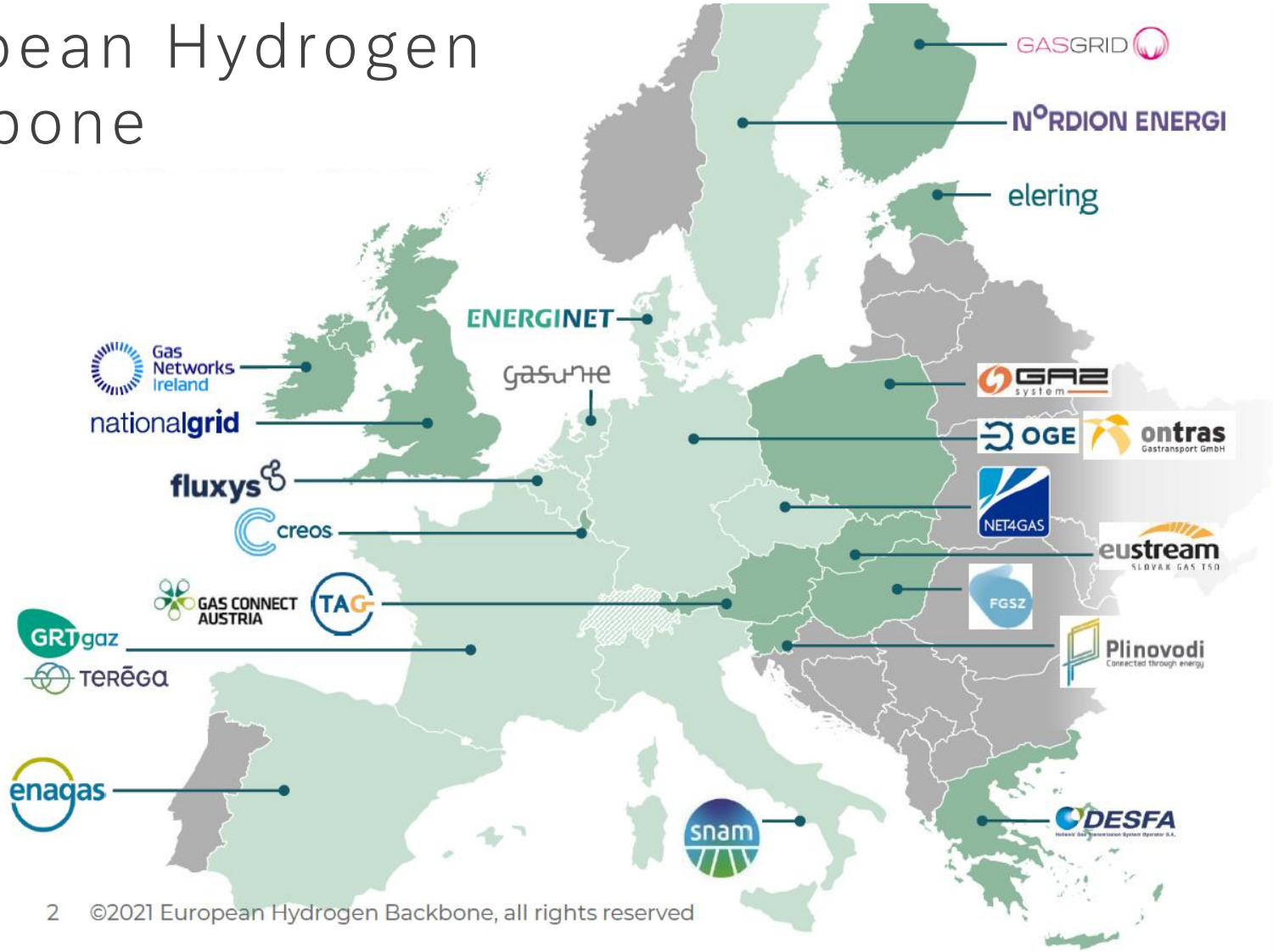
- EU28 transmission pipelines are ~ 235,000km (high pressure network)
- Existing and new EU gas infrastructure is ideal to meet the future needs for hydrogen economy



Meeting the Challenges



European Hydrogen Backbone



2020

- 11 European gas TSOs
- Covering nine EU Member States plus Switzerland

2021

- 23 European gas TSOs
- Covering 19 EU Member States plus the United Kingdom and Switzerland

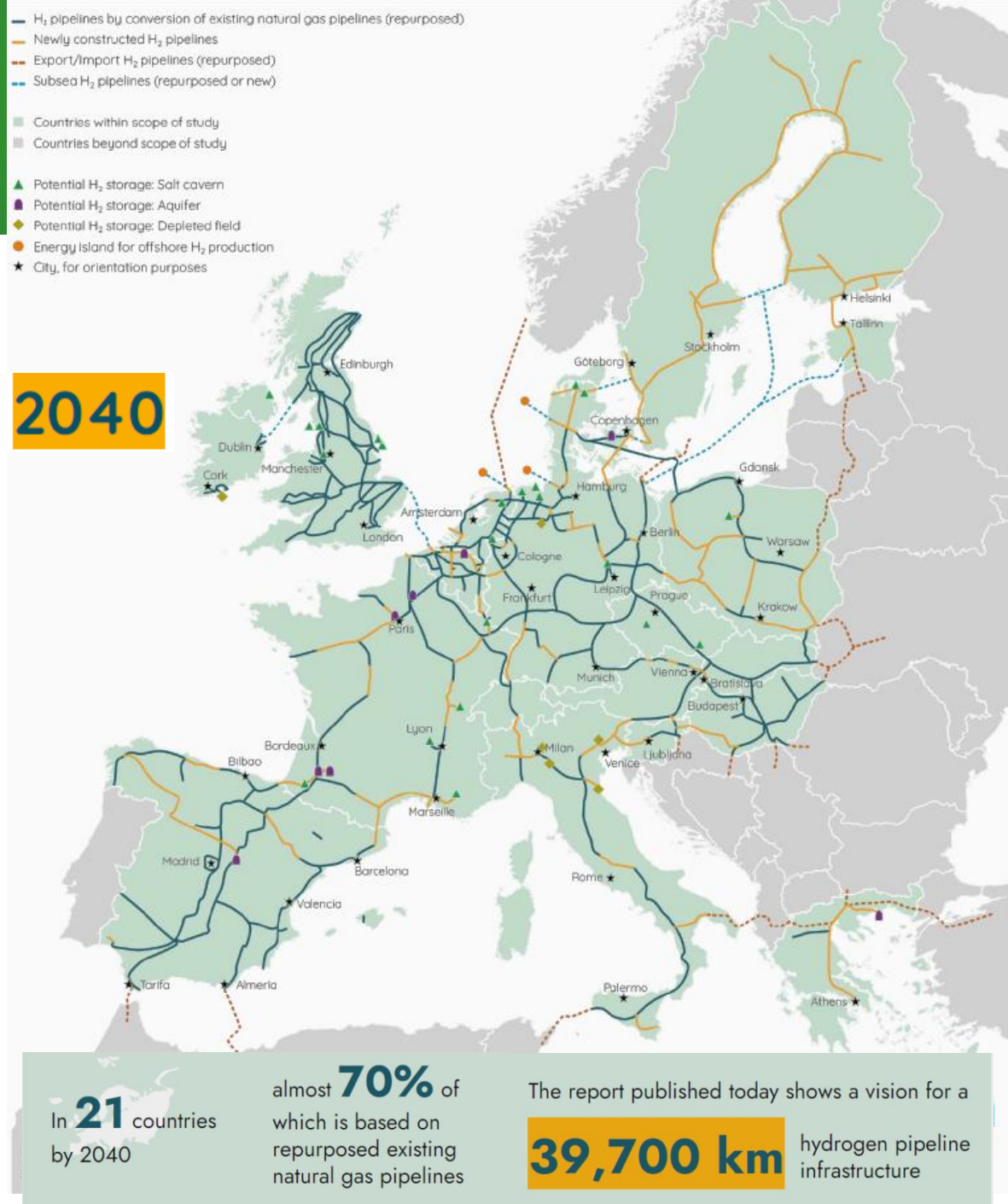
European Hydrogen Backbone

Dedicated hydrogen pipeline infrastructure is needed to help **integrate large amounts of renewable energy** and to create a **liquid, cross-border market for renewable and low-carbon hydrogen**

European Hydrogen Backbone demonstrates a **technically and economically plausible vision** for such a dedicated hydrogen infrastructure

Twelve European gas TSOs from eleven European countries have joined the European Hydrogen Backbone initiative and the **2040 backbone has almost doubled in length** compared to last year's report

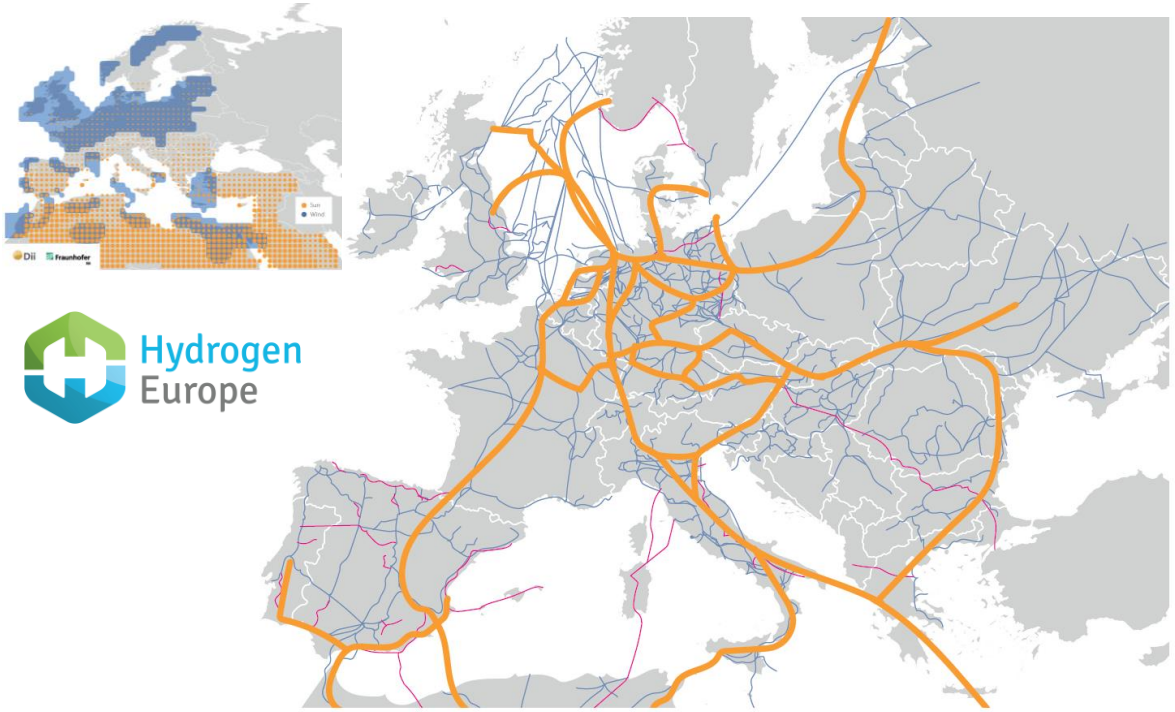
The European Hydrogen Backbone can be created at an **affordable cost**



Source : Extending the European Hydrogen Backbone – Guidehouse 2021

Connecting Europe

2X40 GW Green hydrogen initiative



European Transnational Hydrogen Backbone - The natural gas infrastructure in Europe (blue and red lines) and an outline for a hydrogen backbone infrastructure (orange lines).

Source : Green Hydrogen for a European Green Deal - A 2x40 GW Initiative – Hydrogen Europe

IGI Poseidon

Our contribution

Bring hydrogen era closer

CENERGY HOLDINGS

CORINTH PIPEWORKS
Delivering energy to the world

R&D

Certified steel pipes to **safely transport** gas/hydrogen mixture and pure hydrogen in the future

First in EU pipe manufacturer with in house Hydrogen lab

Participate

Participate in European organizations (Hydrogen Europe, Hydrogen Alliance) and **contribute to the regulatory framework**

European Clean Hydrogen Alliance

Hydrogen Europe

Execute

Execute with SNAM, 440km of pipes certified to transport up to 100% hydrogen, among the first high-pressure transmission gas pipeline in Europe.

snam

Cooperate

Cooperate with authorities, suppliers and operators (RAE, DEPA, DESFA, SNAM etc.) to **create a hydrogen certified network and participate in future IPCEI projects** (White Dragon)

Develop

Solutions for offshore pipelines are in progress, focusing on projects such as **Eastmed and Poseidon** with significant geopolitical interest