## **Torben Brabo**

SVP, Energinet, Gas-Power TSO President, GIE Board, ENTSOG

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# Hydrogen & P2X

#### **Priorities unbalanced**

r power, industry,

Energy Taxation

Directive

Renewable

Energy Directive

FuelEU

Maritime

Initiative

Energy

Efficiency

Directive

maritime &

aviation

2030

CLIMATE

TARGETS

Alternative Fuels Infrastructure

Regulation

ReFuelEU Aviation Initiative

Fit for 55 - 2021

Land Use.

Land Use

Change, and Forestry

Regulation

Effort Sharing

Regulation

CO<sub>2</sub> emissions

standards

for cars and

vans

EU Forest

Strategy









# GIE contributes to the debate by providing perspectives from **TSO** and **SSO** and **LSO**!



#### **GIE members' work:**

- Enhancing the development of renewables and low-carbon technologies
- Decarbonising the hard-to-abate sectors (industry, transport, other energy-intensive applications) and heating
- Supporting the **regions phasing out coal**, particular in the CEE region
- Setting the EU on track for global decarbonization leadership
- Raising awareness on the technics to mitigate and monitor methane emissions
- Broad stakeholder involvement: industry, electricity, DSO, etc.
- Daily operation of gas infrastructure to most consumption types, aiming at EU policy target

Gas Infrastructure Europe



## Transition of all EU energy/feedstock





#### Gas Infrastructure Europe Hydrogen is still the main topic. GIE contributes to the debate by providing perspectives from TSO+SSO+LSO!



Hydrogen has the benefit that it can be developed along several pathways like clusters, dedicated backbones or blending, reflecting national starting points! As well as import!



- Start simple with experience from the gas/electricity Regulations
- Dynamic regulatory approach at European level as future is uncertain
- Use existing roles and competences harvest synergies
- Mutualisation of costs and benefits on new energy system
- Financial framework for infrastructure conversion + new H2-infrastructure!
- Joint Network Planning

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## Benefits of the gas infrastructure for integrating hydrogen

Transmission Pipelines

- Transport 22% of all EU primary energy
- Single hydrogen pipeline can transport 10-20 times more energy than an electricity cable<sup>1</sup>
- Repurposing pipelines at 10-35% of costs that would be required for newly built hydrogen pipeline<sup>2</sup>

#### **Storage Sites**

- GIE storages at 1150 TWh at 5 EUR/MWh
- Salt caverns, depleted fields and acquifers in the EU could already today have a theoretical potential of storing 60 TWh hydrogen<sup>3</sup>
- Gas storages are at least 100 times cheaper than electricity storage costs in batteries<sup>4</sup>

#### **Terminals**

- Current LNG import capacity at 200 TWh
- Retrofitting and repurposing LNG Terminals at lower costs (compared to investments into new terminals) or options for other hydrogen carriers or e-fuels



### European Hydrogen Storages



New map coming soon on PROD+CONS and TSO+SSO+LSO and DSO Projects and studies announced in the field of underground hydrogen storage



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GIE: first assessment of the value of UHS (Underground Hydrogen Storage)





Link: https://circabc.europa.eu/ui/group/8901eff0-0c6f-47c0-98a7-6f049061add3/library/d3e0054c-b9b2-41a7-8780-012b44f03c40/details

#### **Decarbonisation pathways using existing and upgraded LNG terminals**



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EXECUTIVE SUMMARY

## Five supply corridors are key to the EHB vision and can deliver access to abundant and low-cost hydrogen supply by 2030

To deliver the 2030 hydrogen demand targets set by the RePowerEU plan, five large-scale pipeline corridors are envisaged.

The corridors will **initially connect local supply and demand** in different parts of Europe, before expanding and **connecting Europe with neighboring regions** with export potential.

Certainty about the deployment of this infrastructure will **enable market actors to develop** supply and demand more rapidly

The five hydrogen supply corridors are:

- Corridor A: North Africa & Southern Europe
- Corridor B: Southwest Europe & North Africa
- Corridor C: North Sea
- Corridor D: Nordic and Baltic regions
- Corridor E: East and South-East Europe



These five corridors **span across both domestic and import supply markets**, consistent with the **three import corridors** identified by the RePowerEU plan, including a corridor via the **Mediterranean** (Corridors A and B), via the **North Sea** (Corridor C) and via **Ukraine** (Corridor E)



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#### My unsolved questions....

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•	Member States increases RENEWABLE production Business models for investments? Clarity reduces risk!	Energy Islands
•	Renewable electricity FIRST for electrification Are there enough potential? For whom? Where?	Heat / Industry
•	Hydrogen and e-fuels are GLOBAL Where are costs lowest? What is most secure?	Africa vs. NS
•	Storages increases VALUE of renewable electricity But how will the electricity flexibility market/tools develop?	GIE study
•	OFFSHORE wind expands Is hydrogen offshore grids cost optimal?	NSWPH
•	RAW MATERIALS and services under pressure Should this be our biggest concern?	Everyone

GIE looks forward to discussing with you the most appropriate scheme for regulating the hydrogen infrastructure!

# Thank you for your attention!



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