23 June 2022

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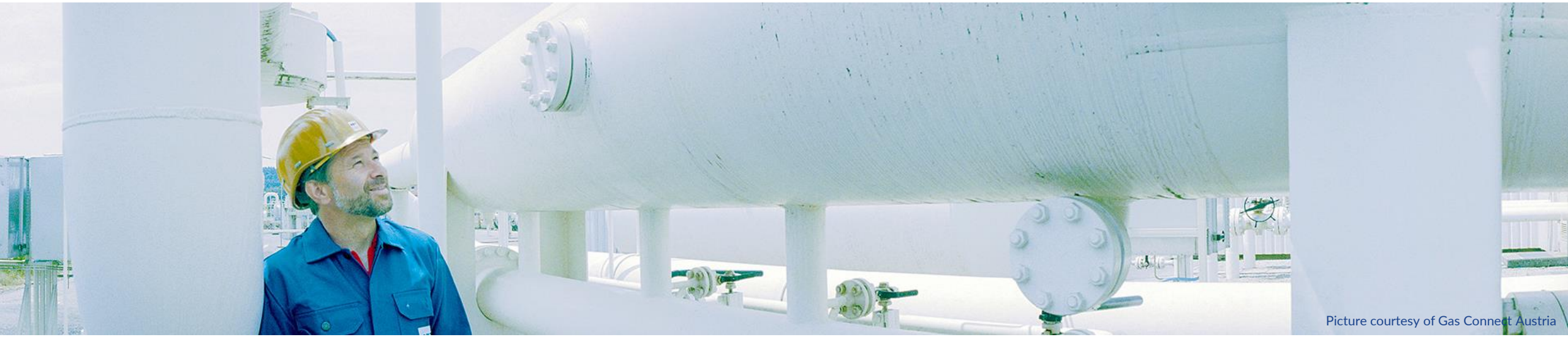


Picture courtesy of Gas Connect Austria

7th meeting of Advisory Panel for Future Gas Grids

Meeting on 23 June 2022

ENTSOG

Introduction

Welcome

Copenhagen School of Energy Infrastructure (CSEI)

Agenda

	Description	Time
1.	**Introduction and welcome by Piotr Kuś**	14:00-14:05
2.	**Session on REPowerEU: Infrastructure perspective** • Introduction by Piotr Kuś (ENTSOG) • Panel: J. Chatzimarkakis (Hydrogen Europe), D. Muthmann (EHB), R. Bahke (GIE) • Discussion	14:05-15:05
3.	**Session on REPowerEU: biomethane perspective** • Introduction by James Watson (Eurogas) • Panel: H. Dekker (EBA), P. Kristensen (GEODE/EVIDA), B. Brendstrup (Energinet) • Discussion	15:05-16:05
3.	**Session on REPowerEU: legislator's perspective from infra** • Introduction by Piotr Kuś (ENTSOG) • Panel: J. Balke (EC) and P. Binhack (CZ presidency) • Discussion	16:05 – 16:50
4.	**Summary and next steps**	16:50 - 17:00

Summary key take aways from last meeting on 30 March

- **Session on Security of Supply and RePower EU with Stefano Grassi**
  - **EFET:** coordinated action important, **wholesale price signals remain the best means to attract new supplies**, reservations on joint purchasing arrangements as difficult to agree and may inhibit commercial innovation, storage policies should work with the market to ensure they can be delivered at least cost
  - **Equinor:** agree with EFET to focus working on markets, **as investors need market and price signals**, EC right to minimize high electricty prices through **retail level measures** than wholesale measures, need to use flexibility of state aid rules, on gas storage regulation there is risk for overall gas demand increase and MS competition rather than cooperation
  - **Eurogas:** welcomed higher targets for res gases, but question where to include in legislation remains open (REDIII?), diversification is needed, we still see the role for natural gas for future, **need for long-term contracts,** need to make sure the storage is grounded in market function and coordination is needed
  - **GIE/GSE:** support market-based approach with necessary regulatory incentives for storage bookings, difficult to define one size fits all as filling target to provide for SOS, filling targets and pathways are reasonable in times of crises but need to take into account different conditions in MS, flexibility needed
  - **GIE/GLE:** storage capacity obligation with SOS reg there should be bigger role for LNG terminals, have storage capacities not used for operation purposes and can contribute to SOS, **need fast-track approval procedures for planned LNG terminals, LNG terminals can be used for decarbonisation**
- **Session on Hydrogen and Decarbonised Gas Market Package**
  - **Gassco:** NO intends to continue as trustworthy supplier to EU, blue H2 and ammonia can be produced and transported, **need security of demand downstream in EU**
  - **CEFIC:** **GQ needs to be maintained**, H2 purity levels to be ensured, definition of low-carbon H2 should be predictable, no fundamental issue against blending but need to address cascading elements
  - **Hydrogen Europe:** **in order to replace 50bcm of gas per year need 300-400GW electrolysers capacity by 2030, need feasible rules in DA on RFNBOs, no need to overregulate the nascent H2 sector, grid development – need to include the H2 stakeholder in planning, 5% blending cap at IPs acceptable,** need definition of low-carbon gases by end of the year, tariff discount – prioritization for renewable gases should be considered

1. Session on REPowerEU – Infrastructure perspective

1. Session on REPowerEU – Infrastructure perspective

Chair: Piotr Kus, ENTSOG General Director

Jorgo Chatzimarkakis
Hydrogen Europe

Daniel Munthmann,
European Hydrogen Backbone

Ralph Bahke,
Gas Infrastructure Europe

7th Advisory Panel Meeting

Future Gas grids

Daniel Muthmann, Chairman

June 2022

Thesis

- Decarbonize by 2050 and keep industrial value creation in Europe: need a significant renewable power and hydrogen availability
- Sufficient hydrogen from renewables available in and around Europe (even beyond what is needed for power) accessible by gas infrastructure existing today
- Reaching competitiveness requires mass scale developments, which depend on (a) (security of demand), (security of) supply (!!!) and open access infrastructure (pipes and storages) which is the best basis to create a market
- Anchor projects in Europe pave the way for further H2 deployment.
- Hydrogen is not a market yet – in order to develop it, the right stimulus is necessary (otherwise „everybody is waiting for everybody“)

➢ **The war in Ukraine did not change that, but it pushes us! TIMING!!! And emphasized the importance of interconnectivity**

Must leave theory behind, no more pilot projects, REPowerEU claims 2030 targets → **need to start with re-purposing first infrastructures now!**

Who we are

What we do

31 Gas Infrastructure Companies (TSO-Level)

➢ Committed to enable hydrogen scale-up and market development in Europe

➢ Well connected practicing cross border cooperation along value chain in spirit of European cooperation

➢ Existing permitted and re-purpose-ready gas infrastructure key success factor

EHB Updated infrastructure maps

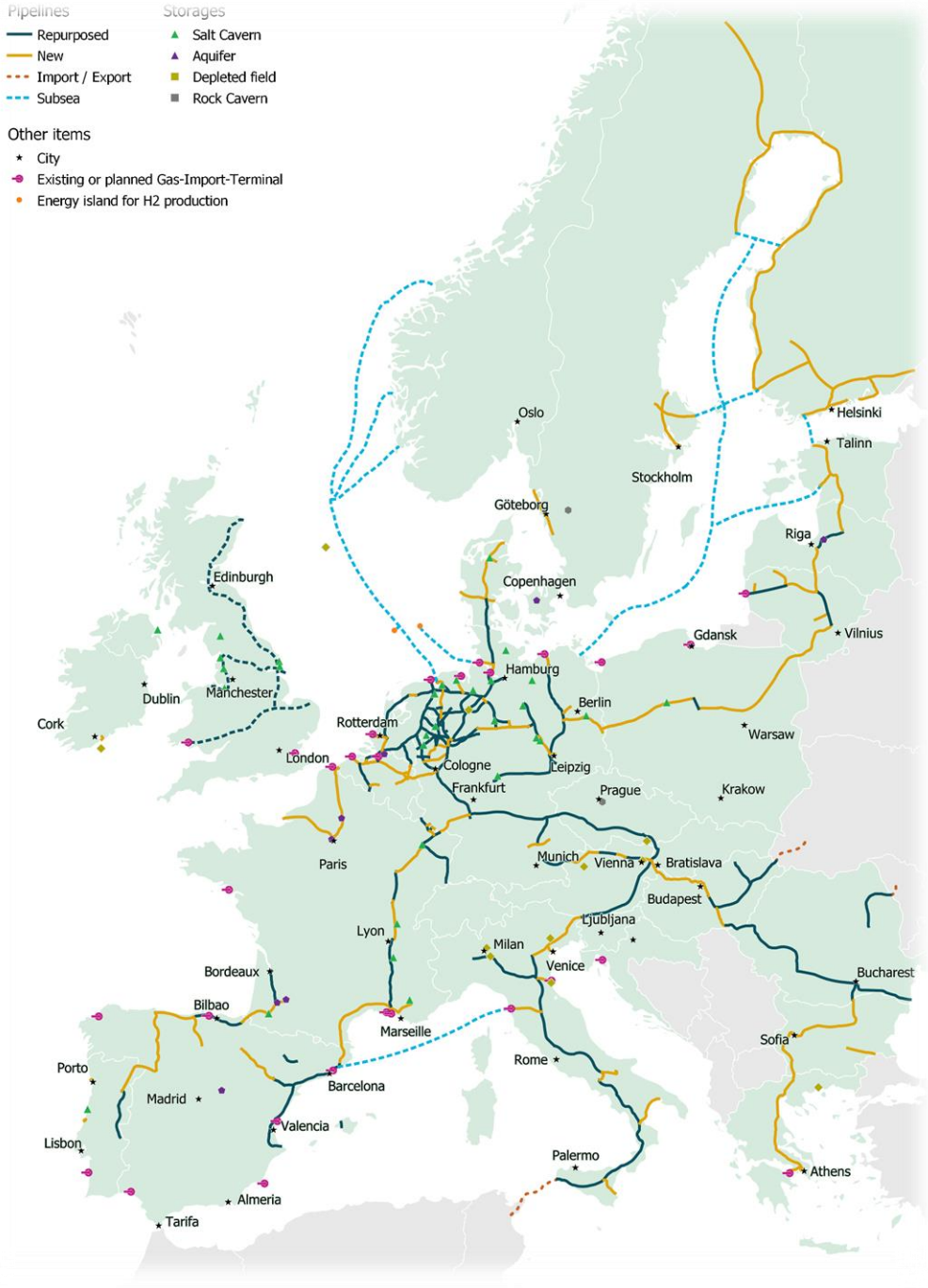
Acceleration of hydrogen infrastructure by 2030

The 2030 vision shows an **Acceleration** of hydrogen infrastructure to enable the emergence of **pan-European supply and import corridors** by 2030. Resulting in a total length of

~28,000 km

The emergence of **5** corridors enable hydrogen imports from **5** distinct export regions

To support the **EC's ambition** to promote the development of **20 Mt** (~665 TWh) renewable and low carbon hydrogen market in Europe



EHB Updated infrastructure maps

Five hydrogen supply & import corridors identified

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.

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 SouthEast Europe

These five corridors span across both domestic and import supply markets, **consistent with the three import corridors identified by the REPowerEU** plan

Required actions

To ensure the development of each corridor by 2030, there is a need for clear and concrete actions now

- **Fostering H2 infrastructure development** inter alia by unbundling rules facilitating efficient use of expertise and services from TSOs and by allowing different vertical unbundling models across EU in analogy to natural gas
- **Unlock financing to fast-track hydrogen infrastructure deployment** by leveraging regional regulatory flexibility and other pragmatic financing solutions (including incentivizing use of hydrogen on demand side)
- **Simplify and shorten planning and permitting procedures** for renewable energy and hydrogen infrastructure projects.
- **Intensify energy partnerships with exporting, non-EHB countries** (e.g., with Morocco, Algeria, Tunisia, Ukraine) providing financing support to lower cost of capital in export countries
- **Establish integrated energy system planning of hydrogen, natural gas, and electricity infrastructure**

“Volume target + Infrastructure target + Mandate”

Our recommendation: Establish hydrogen supply corridors as target for 2030 as enabler for hydrogen market creation

Answering to REPowerEU

The reports shows how
all 31 members are able to
accelerate the hydrogen infrastructure development
to enable the 20 Mt of renewable hydrogen by 2030

EHB recommends:

- REPowerEU targets to include supply corridors to be operational by 2030 (“front running”)
- Mandate to combine top-down EHB perspective with ENTSOG bottom-up planning
- Develop supply corridor planning by end 2022
- Engaging implementing with TSOs on how to manage initial risks

Gas Infrastructure Europe

Session 1 on REPowerEU – Infrastructure Perspective

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Ralph Bahke, GIE

7th Meeting of Advisory Panel for Future Gas Grids, 23 June, Brussels

REPowerEU targets – how gas infrastructure can contribute

Why do we need gas infrastructure capacities?

- → …because recent months have shown the need for gas infrastructure both in the short- and in the long-term
- → …because they contribute to diversification of supply and establish new import routes
- → …because they enable cost- and time savings when being repurposed
- → …because renewable and low-carbon gases need to be transported, stored and imported

*"To facilitate the import of up to 10 million tonnes of renewable hydrogen, the Commission will **support the development** of three major **hydrogen import corridors** […]"*

*"To help achieve these targets, the Commission will **map preliminary hydrogen infrastructure needs by March 2023**, based on the TEN-E Regulation, in a **process** involving Member States, national regulatory authorities, ACER, ENTSOG, project promoters and other stakeholder"*

How can we move forward together?

Reality Check: Hydrogen

Regulatory tools to facilitate achievement of REPowerEU targets

1. Unbundling of hydrogen network operators

- All existing proven unbundling models (OU, ISO, ITO) should be extended to the hydrogen market
- Horizontal unbundling provision on the legal form preventing gas TSOs to become HNOs within one company should be removed. The unbundling of accounts ensures sufficient transparency between the regulatory asset base for natural gas and hydrogen.

2. Financing cross-border hydrogen infrastructure

- Abolishment of tariffs at the interconnection points within the hydrogen network (i.e. introduction of cross-border inter-HNO compensation mechanisms) might seriously deter investors from taking interest in investments into cross-border hydrogen infrastructure and thus hinder the swift development of hydrogen networks in the EU.

3. Network Planning

- No creation of third hydrogen pillar (i.e. European Network of Network Operators for Hydrogen) besides ENTSOG and ENTSO-E to exploit synergies under the same umbrella.

4. Regulated Third Party Access (rTPA) for hydrogen storages as essential facilities

- Some deviations from rTPA to be allowed for geographical confined market areas, cross-border projects or regulatory sandboxes for innovative projects.

5. Choice between regulated Third Party Access (rTPA) and negotiated Third Party Access (nTPA) for hydrogen terminals

- It is recommendable to allow flexibility for the Member States to decide on the best third-party access regime which can fit their respective markets and ensure a swift deployment of the Renewable and/or Low-Carbon market

2. Session on REPowerEU – biomethane perspective

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Chair: James Watson, Eurogas

Harmen Dekker,
European Biogas Association

Peter Kristensen,
GEODE/EVIDA

Bjarne Brendstrup
Energinet

EBA
European Biogas Association

Adapting gas grids to decentralised biomethane production

Advisory Panel for Future Gas Grids

Harmen Dekker – CEO – European Biogas Association

23/06/2022 - Brussels

What do the biomethane producers need to scale-up quickly injection into existing gas grids?

European Biogas Association

Needs of the sector	Items of the Biomethane Action Plan	What should come next
Political Prioritisation Predictability and stability of policies in each Member State	An EU political target of 35 bcm National Biomethane Strategies	35 bcm target in the RED III Swift drafting of the National Strategies with targets/milestones
Regulatory framework Legal certainty and clarity Swift & affordable grid connections	Support to cost-sharing for grid connection Faster permitting procedures for grid connection	Harmonized enabling framework for grid connection and grid reinforcement (Gas Package) Quick reform of permitting procedures
Cooperation for network reinforcements Clear bottom-up process adapted to decentralised biomethane production	Assessment of production potential Regional assessment of grid development needs (DSO in coordination with TSOs and NRAs)	Potential assessment to be done at regional level Need for a clear process leading to the right grid reinforcements
Coordination on gas quality Preventing technical barriers to cross-border flow while protecting sensitive users	Issue of fragmented gas quality standards for biomethane identified but no strong wording	1) Gas quality coordination for biomethane in the Gas Package 2) Reassessing and updating gas quality standard

A bottom-up approach to gas infrastructure planning adapted to decentralised biomethane production

European Biogas Association

	2023 - 2025	2024 - 2026	From 2024
	1 Assessment of long-term biomethane potential at regional level	**2 Grid reinforcement plans at local level**	**3 Investment proposals and implementation**
Who	• *Member States (responsible for)* • *Grid operators* • *Regional authorities* • *Other relevant public parties*	• *Grid operators (responsible for)* • *National regulator (validator)* • *Local authorities as consulted parties*	• *Grid operators (responsible for)* • *National Regulator (validator)* • *Third-parties (possible investors)*

Benefits of the approach

- **The assessment as a sound basis to design regional / local supportive policies**
- **Continuous injection ensured to biomethane producers**
- **Visibility of grid reinforcement plans in existing planning (National Development Plans, TYNDP)**
- **Cost-efficiency ensured by the Regulator**

The Network for Networks

REPowerEU – Biomethane perspective

Peter Kristensen, Chief Strategy Officer, Evida
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Gas DSOs can REPower the EU?

REPowerEU = **affordability** + **security of supply** + **sustainability**

Gas DSOs play a **key role** in achieving these 3 objectives because:

- they enable a rapidly available decarbonisation solution

- at minimal costs for consumers and society

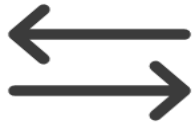
- directly improving security of supply

- and enabling diversification from Russian natural gas

Source: Gas for climate action plan for implementing REPowerEU, March 2022

How to reach 35 bcm biomethane by 2030?

Available and reliable connection: 5,000 biomethane plants units must be built by 2030 (EBA forecasts)... and **connected!**



Safe injection points: based on national gas quality standards and grid digitalization solutions enabling a smooth management of different gas blends

Joint network planning: in cooperation with TSOs, joint network planning and management of reverse flows

Some points for reflection

- Infrastructure planning / grid reinforcements (bottom-up)
  - Distribution systems (network meshing and reverse flow units)
  - From the distribution system to the transmission system (reverse flow units)
  - Distribution and transmissions systems (digitalization – more complex systems)
- Capacity planning and security of supply
  - Matching demand and supply – is paramount to an efficient network
  - A question about having the biomethane in the right place at the right point in time
  - Is firm capacity possible?
- Long term planning and stable support schemes
  - National targets
- Cross border / cross energy sources
  - Close coordination with electrification and hydrogen roll-out
  - Biomethane will move from being local gas til being EU grid gas
  - Ensure coherent quality standards between countries as biomethane will travel across countries
- Investment
  - Invest in the future before it arrives
  - Investment goes hand in hand with development of plants

ADVISORY PANEL FOR FUTURE GAS GRIDS

23rd of june 2022

Bjarne Brendstrup, Ph.d., Senior Director - Energinet

MAIN POINTS

- The 35 bcm European production target, is a game changer.
  - From a situation where biomethane has been produced in small scales and consumed locally => to a situation where integration of biomethane becomes national, regional, and European issue.
    - Markets – utilize the pan-European wholesale market
    - Infrastructure
- In Denmark, this is not the future, we are already there. (30% biomethane in 2022)
  - Supply exceeds demand of gas in distribution network areas
  - Need to use the transmission system
- One of the major barriers for further integration of biomethane is oxygen
  - Need to find the optimal acceptance limit – in order to obtain an efficient integration.

3. Session on REPowerEU – legislator's perspective

3. Session on REPowerEU – legislator's perspective

Chair: Piotr Kus, ENTSOG General Director

Joachim Balke,

DG ENER, European Commission

Petr Binhack,

Czech Presidency of the Council

Summary and next steps

Next steps


Early October
8th Meeting of Advisory Panel
Madrid Forum
Nov/Dec
Start preparing Recommendation Report
December – January
Finalise Recommendation Report
1. Align on messages before Madrid Forum
2. Streamline efforts on the Gas/H2 package
3. Discuss scope of the Recommendation Report

Thank you for your attention

ENTSOG

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