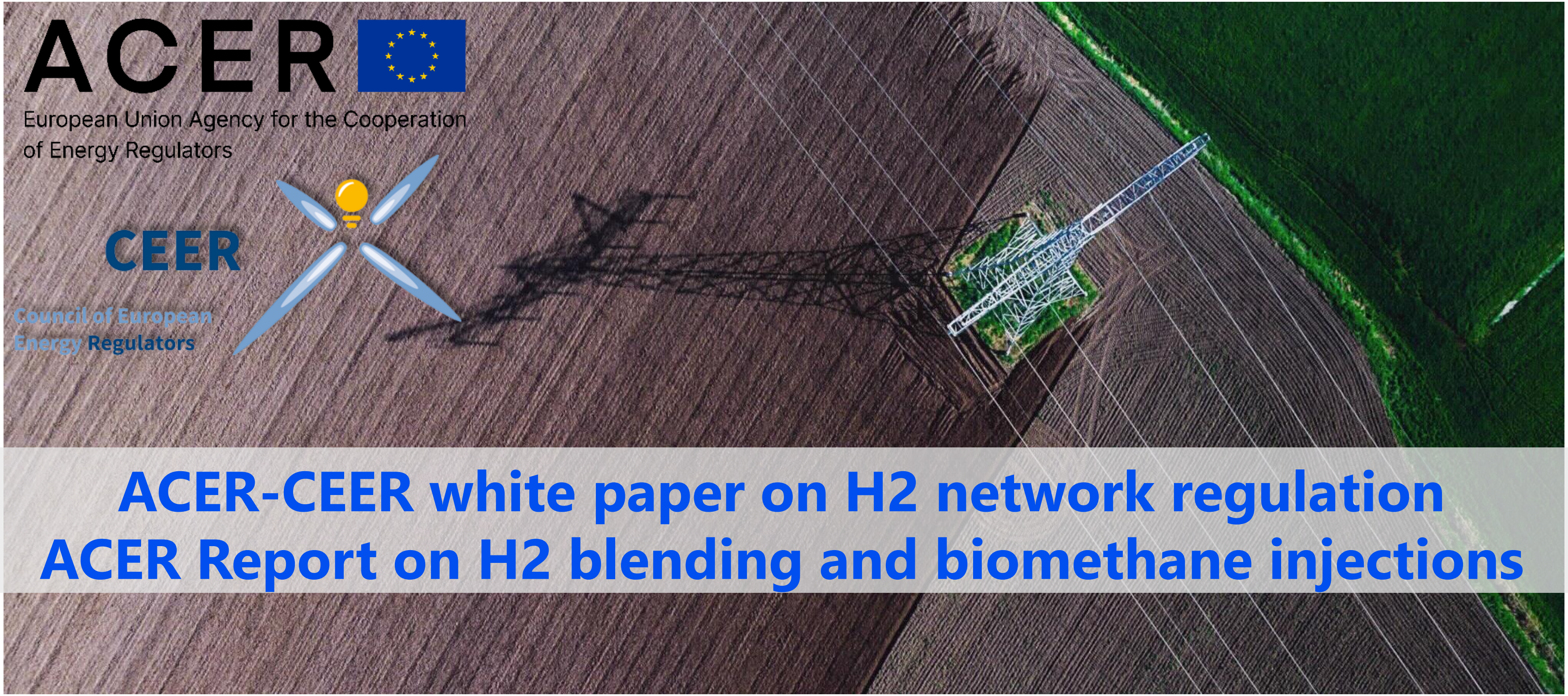


ACER-CEER white paper on H2 network regulation
ACER Report on H2 blending and biomethane injections

H2Future Green Hydrogen for Industry - Regulatory Workshop, 11/02/2021

Gas Department – ACER
Riccardo Galletta and Juan Lopez

Outline

ACER-CEER white paper on H2 network regulation

Report on H2 blending & BioCH4 injections

Main takeaways

ACER-CEER white paper H2 network regulation

Why this white paper?

- EU hydrogen strategy
  - **key role for pure hydrogen** in achieving the green transition
  - the hydrogen sector will be **integrated EU-wide**

- **EU Hydrogen regulation** and **markets** shall pave the way for effective transition

- But current EU gas rules do not cover **transport of pure hydrogen**

- This white paper presents **six main recommendations on hydrogen network regulation** that regulators have agreed upon

1. Regulate gradually

- Economic principles calling for regulation of network (NW) industries:
  - **Natural monopoly**
  - **Risk of abuse of dominant position**

- Regulation should address the actual risk of **market foreclosure**

- Risks depend on how **demand and supply develops** (number of players, volumes, routes, …) and how **NWs can accommodate** them

- Member States will face different H2 development paces → hence the importance to allow a **flexible and gradual** regulatory regime EU-wide

2. Monitor periodically

- NRAs to monitor the **evolution of H2 sector** nationally
  - Market structure and statistics (volume, prices, etc.)
- National monitoring based on **indicators developed at EU level**
  - Involve the industry
  - Consistency checks on monitoring results at EU level
- Get inspired by existing flexible models
  - E.g. telecoms: adapting regulatory measures (from a set of tools) according to the market situation (informed by monitoring)

3. Clarity on key regulatory principles

- Stable environment for investments through:
  - NRA monitoring and oversight
  - Third party access (TPA)
  - Transparency
  - Non-discrimination
  - Unbundling
  - Consumers protections

- Base future detailed **H2 rules on CH4** ones to *the extent that* H2 sector develops similarities with CH4 one

- *Energy System Integration* → new principles?

4. Exemptions for business-to-business networks

- Business-to-business NWs can be **exempted** from regulation
- **Temporary exemptions → monitor**: if market conditions change and a NW becomes an essential facility, exemptions should be revoked
- How to find the **right balance** between **flexibility** to foster H2 sector development, while at the same **avoiding foreclosure** (e.g.: by giving too many exemptions)?

5. Assess repurposing of gas pipelines

- EC H2 strategy
  - Rely on **repurposing** CH4 pipelines
  - Limited new H2 infrastructure

- **Identify** pipes sections to repurpose
  - E.g.: unused CH4 pipes, crucial “H2-backbone” pipes
  - Including them in national development plans
  - And in EU Ten-Year Network Development Plan

- Use *improved* **Cost Benefit Analysis** (CBAs)
  - Consider decommissioning costs, Security of Supply, societal aspects, etc.

6. Keep the principle of cost-reflectivity

- H2 users pay for H2 NWs, CH4 users for CH4 NWs
- **Separate Regulated Asset Bases (RABs**)
- Use other instruments to subsidise H2 (not NW tariffs)
- Regulated assets transfer should be value, as a reference, **based on their RAB** value at time of transfer

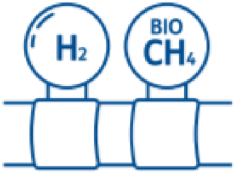
European Union Agency for the Cooperation of Energy Regulators

Report on H2, BioCH4, and Related Network Adaptations

ACER
European Union Agency for the Cooperation of Energy Regulators

Why this ACER Report?

Investigate gas network adaptations for ET: *Is gas* ***transmission*** *infrastructure in the EU ready to allow ren. & low-c gases (H2 and biomethane)?*

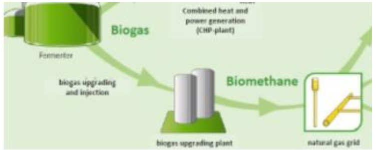


By 2050 "green gases" (H2 and bioCH4) ~ 30% to 70% of total gas use (*)

H2 TSO acceptance, blending limits/ targets, EU vs. national approach, type of injection, connection points, treatment in network plans

100%

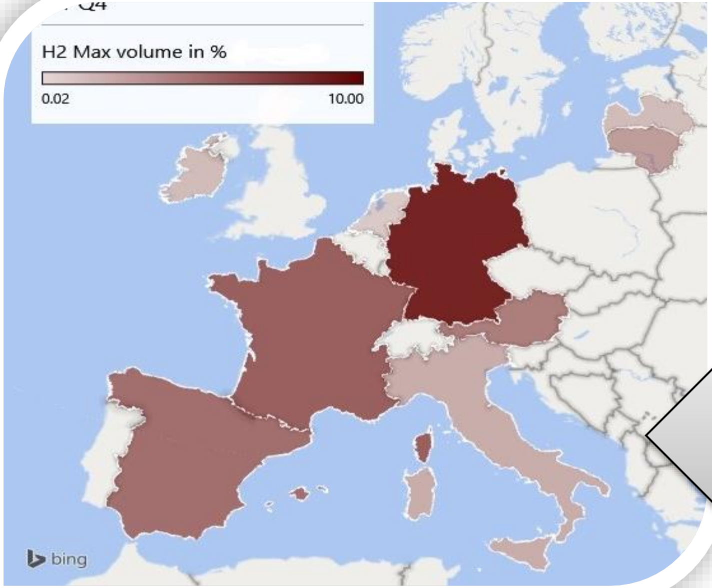
Networks regulation, national H2 strategies, operators, electrolysers ownership



BioCH4 injections, capacities, connection points, roles of producers/DSO/TSO

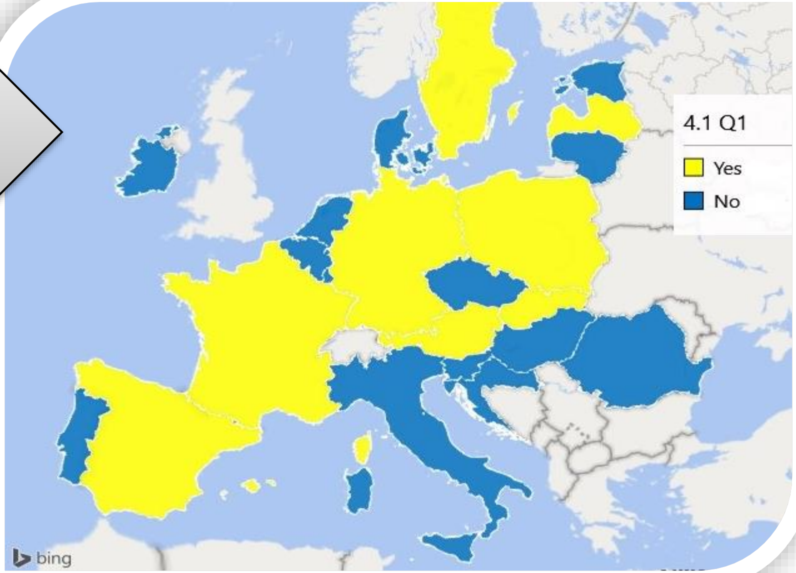
Available at: link – The Report is based on info provided by energy regulators (NRAs)
Published on 10 July 2020, info collected as of 20 May 2020. (*) EUCO Conclusions, 19.12.2019

H2 blending [1/2]



TSO H2 acceptance

Max. H2 limits **(*)**



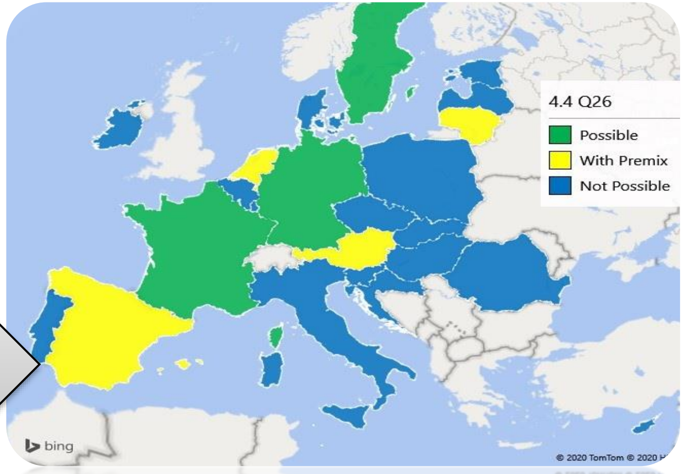
- **Safety** and **tolerances of network and end-use equipment** main reasons for setting H2 limits
- **Most MSs do not offer specific incentives** for TSOs **for H2 projects**, but in some MSs consultations are ongoing

(*)H2% limits are <u>max. level for some sections</u>. E.g. in DE , 10% is only allowed if no "sensitive" customer is connected (NG filling station); in IT, the H2 % is in biomethane injections; in ES, 5% is allowed for “non-conventional” gases. See report for details.

H2 blending [2/2]

- **No MS blending targets on %H2 limits**, but ongoing discussions
- **%H2 limits not** yet **part of interconnection agreements**
- **90% of NRAs mostly agree** that H2 blending limits be decided at **EU level** if different H2 blending limits at transmission level would be a barrier for trading
- H2 blending temporary / transitional
- Pure **(100%) H2 networks** is the way to **optimise the economic value of H2**
- **H2 blending and pure H2 networks not mutually exclusive** (parallel development possible)
- Most H2 blending projects are "pilots"
- H2 injection: "direct" or in "premix" of gas

Type of H2 injection



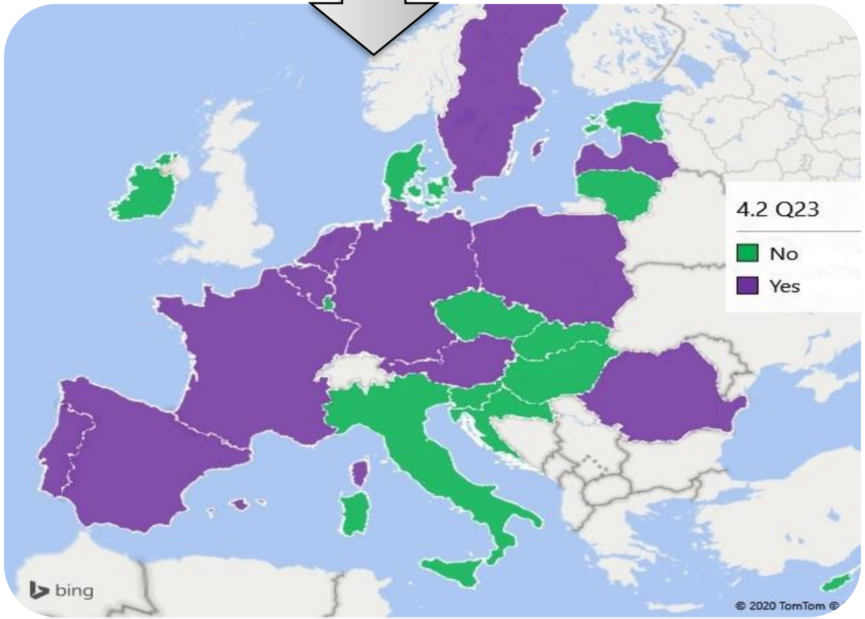
100% (pure) H2 networks

Pure H2 networks & regulation

- BE, FR, DE, NL have **100% H2 non-regulated networks for industrial purposes** (e.g. supply to refineries), operated by private entities (e.g. Linde, Air Liquide).
- Only few NRAs report plans to develop 100% H2 pipelines/networks
- **Regulatory framework for pure H2** generally **not (yet) available**, to be steered by clear policy vision on H2
- **Unbundling issues** intervene in the role of TSOs regarding H2

H2 strategies

- H2 strategies (published, or under development), including as part of NECPs /Covid-19 recovery plans



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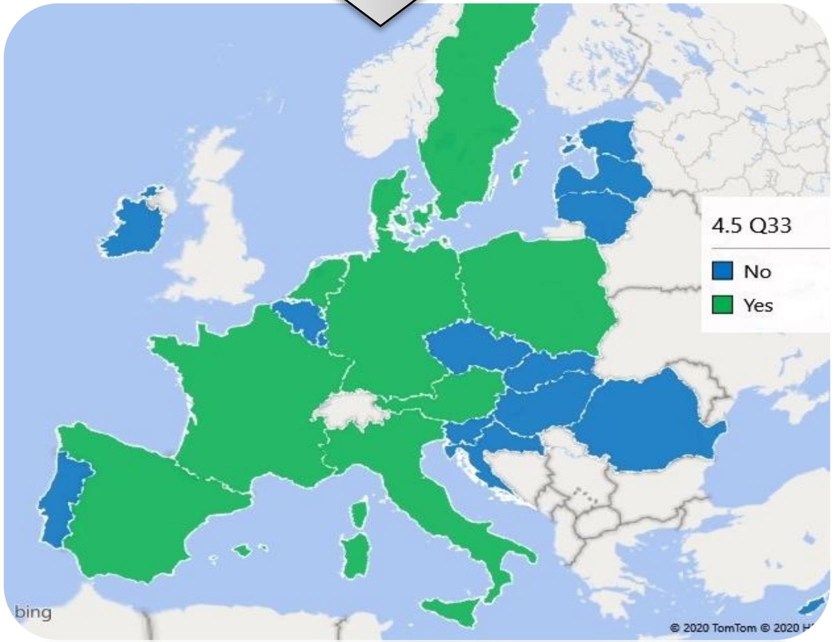
Biomethane injection

Biomethane acceptance

- **Injection of biomethane (~= NG)** appears **not** to be very **problematic**
- 7 NRAs report investments in NDPs(*) to allow/increase biomethane injections
- 15 NRAs report **network operators obligations to provide a connection point for biomethane** injection
- **Biogas producers generally responsible for gas quality** upgrading

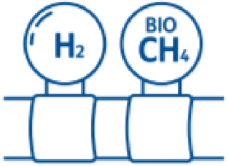
(*) NDP: Network Development Plan

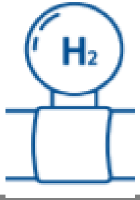
Is there **reverse flow** (from distribution to transmission grid) **and/or direct injection to transmission** from biogas /biomethane plant?



Main takeaways

Findings on blending and recommendations on pure H2





Blending of H2 and biogas injection

1. Blending readiness differs across EU
2. Pilot projects drive developments
3. NRAs support EU-wide approach to H2 limits
4. Pure H2 and blending could co-exist
5. Gas quality standards need revision to ensure interoperabity
6. NW plans to focus on repurposing
7. Limited regulatory change needed (under gas legislation)

Regulation of pure H2 network

1. Regulate gradually
2. Monitor H2 sectoral development
3. Clarity on key regulatory principles
4. Allow temporary exemptions
5. Assess NW repurposing
6. Keep cost-reflectivity

ACER European Union Agency for the Cooperation of Energy Regulators

CEER Council of European Energy Regulators

Thank you for your attention!

https://www.acer.europa.eu/en/Gas/Pages/Low-carbon-gasses.aspx

ACER European Union Agency for the Cooperation of Energy Regulators

CEER Council of European Energy Regulators

When and How to Regulate Hydrogen Networks?

"European Green Deal" Regulatory White Paper series (paper #1)

relevant to the European Commission's Hydrogen and Energy System Integration Strategies

9 February 2021

Introduction

This European Green Deal Regulatory White Paper provides the views of Europe's energy regulators, represented by ACER and CEER[1] on when and how to regulate the hydrogen networks in the future.

On 8 July 2020, the European Commission published its EU Hydrogen Strategy[2], explaining why hydrogen is a key priority to achieve the European Green Deal and Europe's clean energy transition. The EU Hydrogen Strategy includes a roadmap for building a hydrogen economy in Europe over the next decades up to 2050. The roadmap foresees a gradual transition with a phased approach for scaling up production[3] of, and demand[4] for, hydrogen. It is expected that the EU Hydrogen Strategy will stimulate an EU-wide development of the hydrogen sector. In its Strategy, the European Commission states that a condition for the widespread use of hydrogen as an energy carrier in the EU is the availability of energy infrastructure for connecting supply and demand[5]. The actual infrastructure needs for hydrogen will ultimately depend on the pattern of hydrogen production and demand and on the transport costs.

The future development of infrastructure for the transport of hydrogen raises questions about the possible need to regulate this infrastructure. It should be noted that the current situation for discussing possible regulation for the transport of hydrogen is very different from the situation when regulation for gas and electricity networks was introduced. In the latter cases, when regulation was introduced, gas and electricity networks were already in place in most Member States, while

[1] ACER is the European Union Agency for the Cooperation of Energy Regulators. See www.acer.europa.eu. CEER is the Council of European Energy Regulators which is the European association of energy national regulatory authorities, see www.ceer.eu.

[2] European Commission Communication on a Hydrogen Strategy for a Climate-Neutral Europe, COM/2020/301 final. Hereafter: EU Hydrogen Strategy.

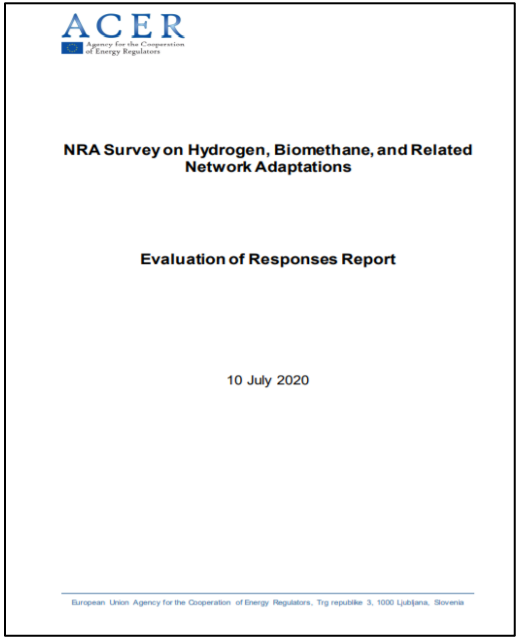
[3] The EU Hydrogen Strategy focuses on the development of renewable hydrogen production and outlines three phases:

- From 2020 to 2024, at least 6 GW of renewable hydrogen electrolysers shall be installed with a production of up to one million tonnes of renewable hydrogen per year;
- From 2025 to 2030, at least 40 GW of renewable hydrogen electrolysers shall be installed with a production of up to ten million tonnes of renewable hydrogen per year;
- From 2030 to 2050, renewable hydrogen technologies should reach maturity and be deployed at large scale across all hard-to-decarbonise sectors.

[4] The EU Hydrogen Strategy focuses on the development of demand in industrial applications and mobility. In the first phase, the current use of carbon-intensive hydrogen in the petrochemical industry shall be replaced by renewable and low-carbon hydrogen. In the second phase, hydrogen would support zero-carbon industrial processes in the sectors that are hard to decarbonise, such as steel, cement, etc. In transport, hydrogen is considered as a promising option where electrification is more difficult.

[5] Hydrogen can be transported via pipelines as well as via non-network-based transport options, e.g. trucks or ships docking at adapted LNG terminals.

1



ACER Agency for the Cooperation of Energy Regulators

NRA Survey on Hydrogen, Biomethane, and Related Network Adaptations

Evaluation of Responses Report

10 July 2020

European Union Agency for the Cooperation of Energy Regulators, Trg republike 3, 1000 Ljubljana, Slovenia

Annex- ACER activities on decarbonising the gas sector

ACER contribution to the H2 regulation workstream

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EC H2 and ESI strategies (8 July 2020)

ACER Report on blending of H2 and bioCH4 (10 July 2020)

Madrid Forum discussion (Oct-2020)

Feedback to and input on the EC studies and regulatory discussion on decarbonisation (Q3 2020 - ongoing)

ACER-CEER white paper on pure H2 NW regulation (Feb-2021)

ACER-CEER white paper on P2G regulation (Feb-2021)

Background paper on H2 NW regulation – contracted by ACER to a consultant (Feb-2021)

ACER participation in the Prime Movers group on gas quality (Q3 2020 - Q4 2021)

ACER dissemination activity: events, workshops, articles, etc. (Q1 2020 - Q4 2021)

…

EC legislative proposal on decarbonised gases (Q4 2021)