12/04/2021

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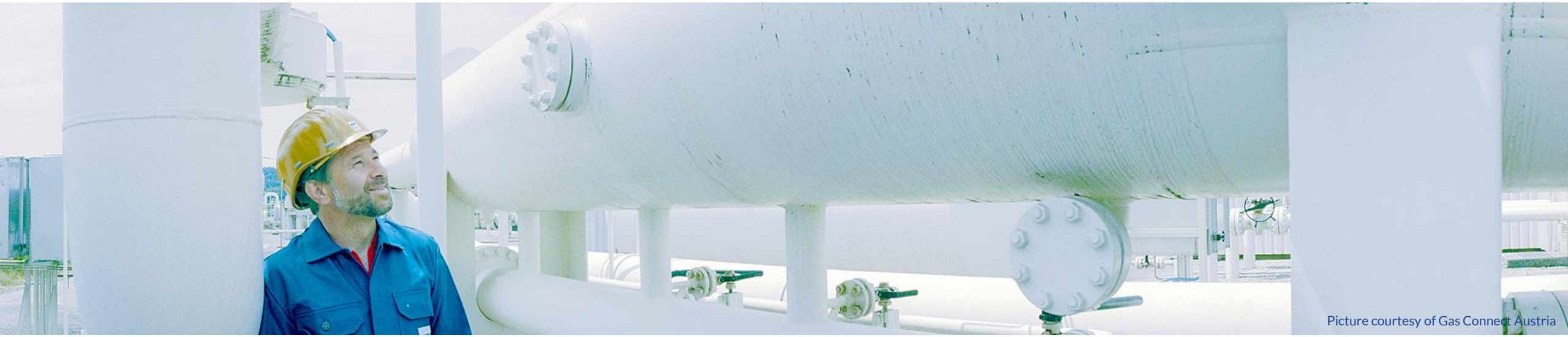


Picture courtesy of Gas Connect Austria

Advisory Panel for Future Gas Grids

2nd meeting on 14 April 2021

Jan Ingwersen, ENTSOG General Director

Online

Introduction by Jan Ingwersen

Aim of the Advisory Panel

Connecting the dots between:

- market players and stakeholders,
- Initiatives and activities,
- work streams (technical, markets, infrastructure, regulation).

Focusing on HOW to transition gas grids.

Panel vis-à-vis other initiatives

- Focus on projects & barriers

European Clean Hydrogen Alliance

European Net-zero Alliance

- Focus on electricity, H2, biogas, heating, transport, etc

Advisory Panel for Future Gas Grids

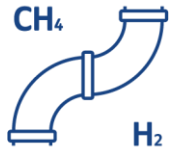
- Focus on coordination & transparency along H2/gas value chain on how to transition gas grids
- Focus on regulatory, market & technical topics
- Framework umbrella for Prime Movers

- Focus on development & transferability of GOs under existing & future legal framework

Prime Mover Group on GOs & Certificates

External contributions from GfC/EHB, H2GAR, civil society, etc

Prime Mover Group on Gas Quality & H2 Handling



Focus on delivering concrete principles on gas quality management

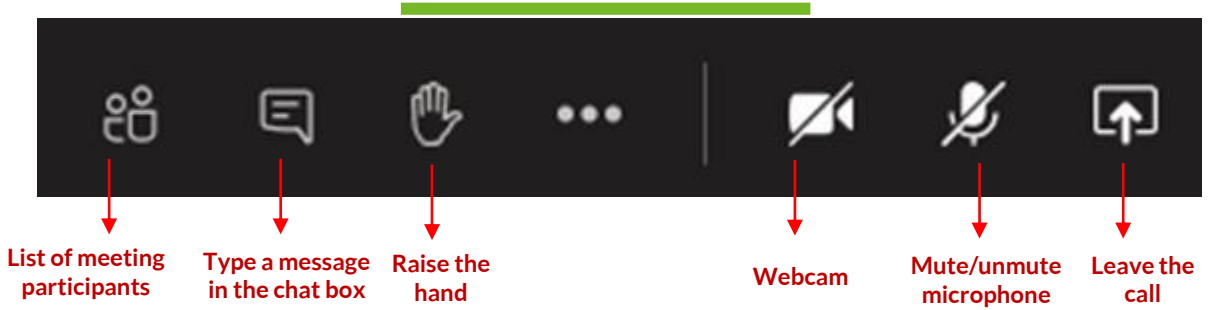
Broad Stakeholder Representation

Copenhagen School of Energy Infrastructure (CSEI)

Agenda

Description	Time
1. Introduction and welcome by Jan Ingwersen	13:00 – 13:10
2. TEN-E revision 2.1. Intervention by Mr. Joachim Balke (DG ENER) 2.2. Panel: ENTSO-E, Hydrogen Europe, Gas for Climate, ENTSOG 2.3. Discussion with all Members (40 min)	13:10 – 14:20
3. Gas legislation revision including H2 regulation 3.1. EC Intervention by Mr. Bartlomiej Gurba (DG ENER) 3.2. Panel: Eurogas, ACER, GD4S, CEFIC, ENTSOG 3.3. Discussion with all Members (40 min)	14:20 – 15:30
4. RED III 4.1. EC intervention by Ruud Kempener (DG ENER) 4.2. Panel: ENTSOG, Fertilisers Europe, Hydrogen Europe 4.3. Discussion with all Members (40 min)	15:30 – 16:40
5. Summary and next steps	16:40 – 17:00
6. Closure of the meeting	17:00

Housekeeping



General:

- Please **mute your microphone** when not speaking
- Please **use the webcam** function only when you present
- Do **not connect via multiple devices**
- If you dialled in via phone, please **press *6 to mute/unmute**

Posing questions/interventions:

- Use **chat box** for **questions**
- '**Raise the hand**' if you want to intervene

2. TEN-E revision

Intervention by Mr. Joachim Balke (DG ENER)

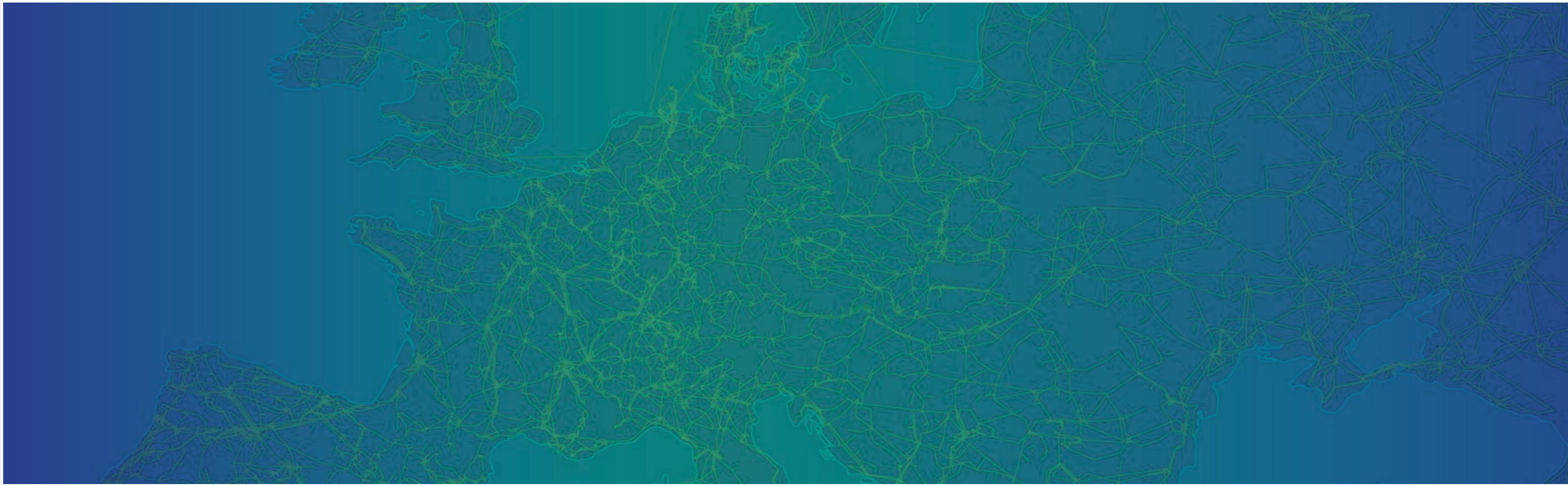
Mr Joachim Balke

Infrastructure and Regional Cooperation (ENER.C.4)

DG ENERGY

TEN-E revision: ENTSO-E's views

Sonya Twohig, Secretary-General, ENTSO-E



2nd meeting of ENTSOG Advisory Panel for Future Gas Grids
14 April 2021

entsoe
Reliable Sustainable Connected

ENTSO-E welcomes the new TEN-E proposal as a key instrument to deliver the Green Deal objectives

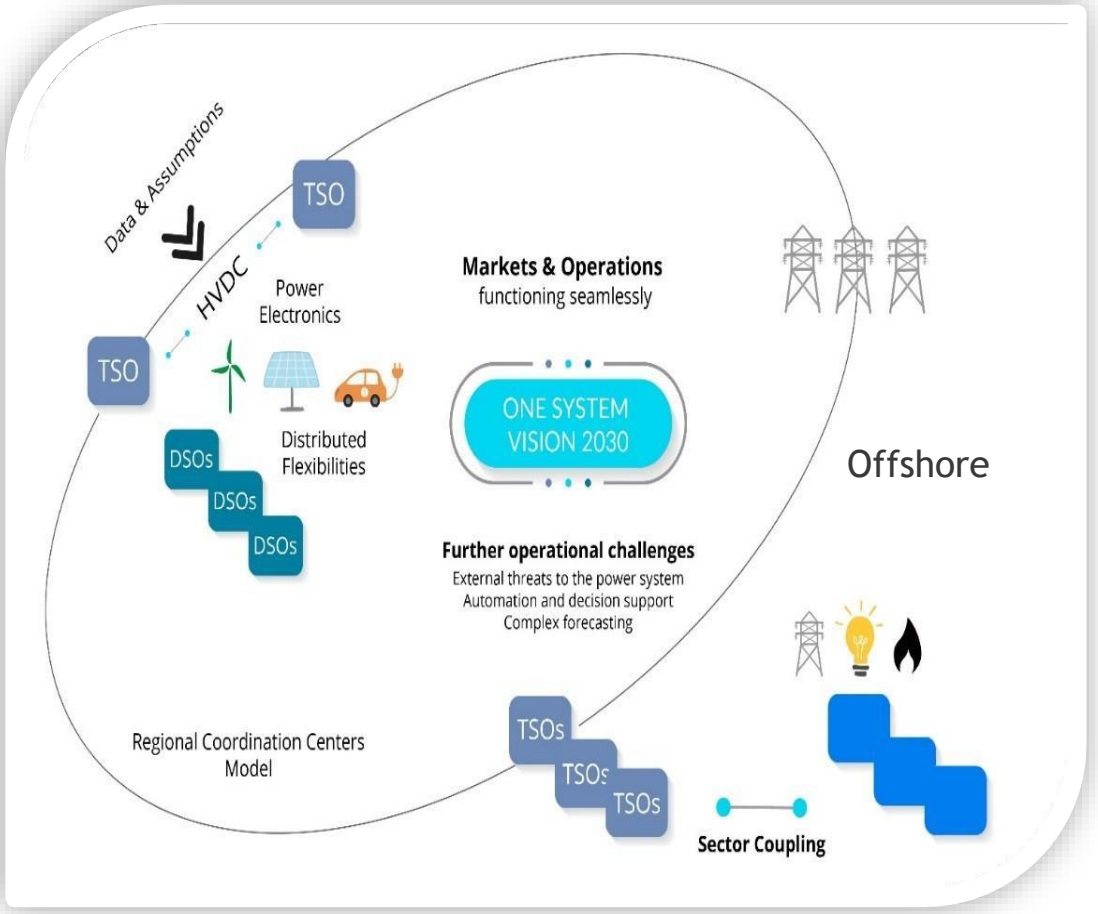
Inclusion of offshore hybrid projects & new task for ENTSO-E to elaborate offshore development plans

Enhanced provisions regarding energy system integration, including provisions for energy system-wide cost-benefit analysis

Support for innovation technologies and smart solutions

Recognition of the importance of interconnections with 3rd countries

Need for a framework for a long-term holistic "one energy system vision"



Some improvements still needed

Governance of TYNDP: clarification of roles & responsibilities of EU bodies

Offshore and onshore grid planning processes and timelines' alignment

Full energy system view – a multisectorial approach beyond gas and electricity

CBCA and financial support: need for fair and simple financing mechanisms

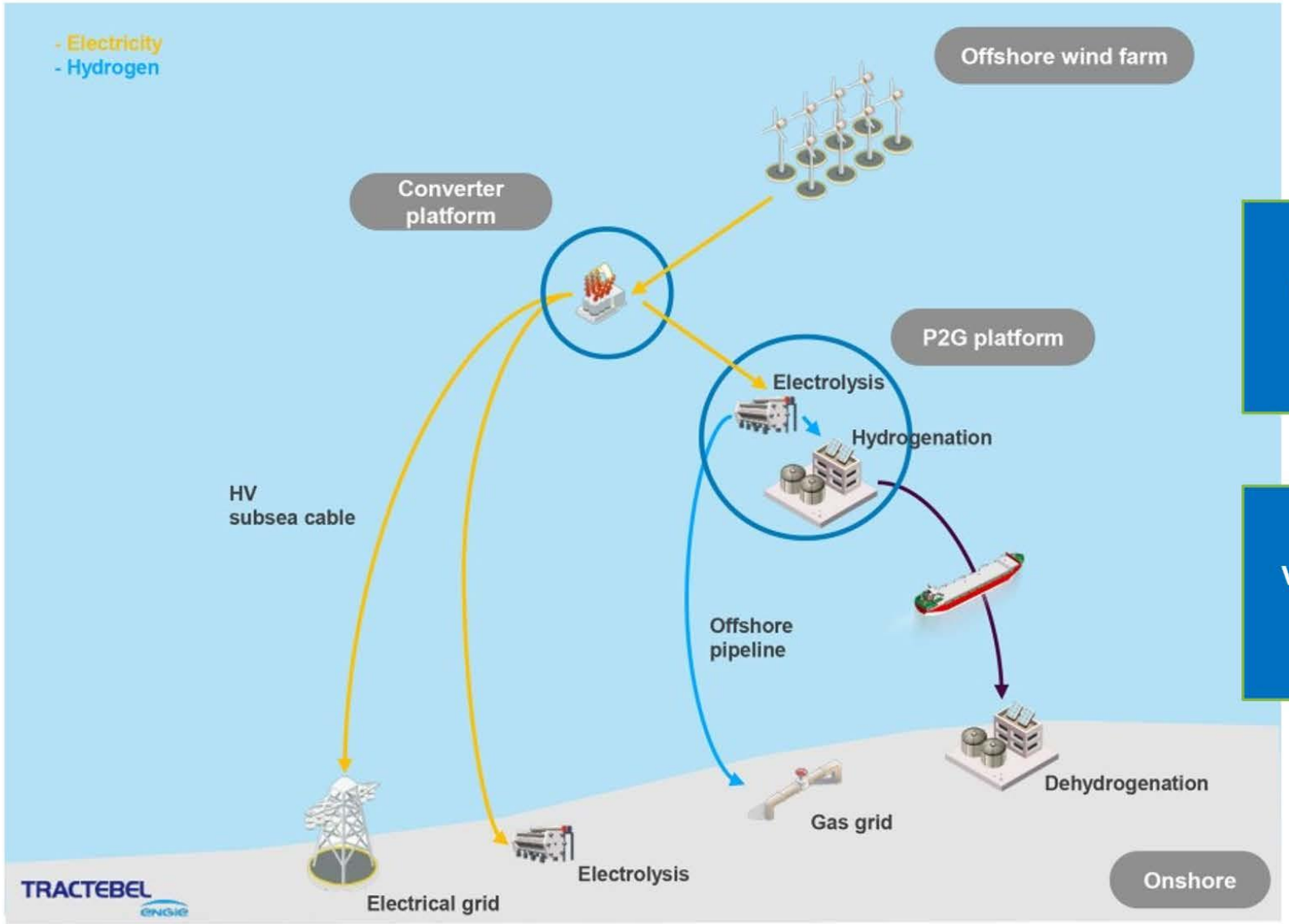
Cost sharing for offshore: a fit-for-purpose framework to support the 2050 policy objectives

Projects of Mutual Interest (PMIs) criteria to allow the necessary interconnection with neighbors

Other elements: simplification of processes and PCI stability, fair identification of infrastructure gaps, CBA, 500 MW criteria, 15% interconnection criteria

Thank you for your attention!

“HydroGenouvelables” 2050



Bringing together the energy and maritime sectors.

Vision of a fully fledged “HydroGenewables” based ecosystem by 2050.

Hydrogen Europe

Gas for Climate

A Gas for Climate response to the proposed TEN-E revision

Marie-Claire Aoun. Chair GfC

ENTSOG Advisory Panel for Future Gas Grids, 14th of April 2021

Gas for Climate view: build on renewable and low carbon gases to support the full decarbonisation of the EU energy system at the lowest societal costs

→ Increased injection of **biomethane.**
→ Existing **H2 networks and new CO2 pipelines** will supply regional customers with renewable H2.

→ **National H2 infrastructures** are expected to emerge gradually creating the **EU Hydrogen backbone**
→ **Biomethane** will be mostly transported and distributed through **existing gas infrastructure**

GAS FOR CLIMATE
A path to 2050

Gas for Climate view to TEN-E revision

1. **Ensure PCI eligibility of H2 and smart gas grids in the 6th Union list and timely access to funding**
   - Need to clarify how projects under the **'hydrogen'** and **'smart gas grids'** categories will be evaluated for their inclusion in the 6th Union list (access to fast permitting procedures and timely access to CEF funding).
2. **Speeding up repurposing of gas pipelines to transport 100% hydrogen**
   - Including the investments directly linked to the repurposing of existing gas pipelines to be **'hydrogen-ready'**, i.e. the capability to operate with 100% hydrogen, in the **'hydrogen'** category even if the infrastructure will only transport pure hydrogen at a later moment in time (well before 2050).
   - H2 transport infrastructure has the potential to play an important role in the development of offshore grids ⇒ **jointly organise an integrated offshore electricity and hydrogen network** and investment plans.

GAS FOR CLIMATE
A path to 2050

Gas for Climate view to TEN-E revision

3. Clarifying and broadening the 'smart gas grids' category

- Need to include **technological upgrades of existing capacity required to blend higher shares of renewable and low-carbon gases**, if regionally relevant and during a transitory phase ⇒ support the emerging renewable and low-carbon gas market up to the early 2030s.
- Include all required investments in **grid assets and equipments** that contribute <u>both</u> to the decarbonisation and the smartening of the gas sector.
- Define transparent and quantifiable indicators to measure the projects' **cross-border impact** ⇒ reflect a **net positive contribution of the project to the pan-European energy system** ⇒ based on ENTSOG's CBA guideline for project assessments.

  - Reduction of gas supply costs
  - Convergence of gas prices between EU market areas
  - Reduction of EU import needs
  - Reduction of CO_2 emissions
  - Contribution to switching fuels from fossil energy sources to renewable and low-carbon gas

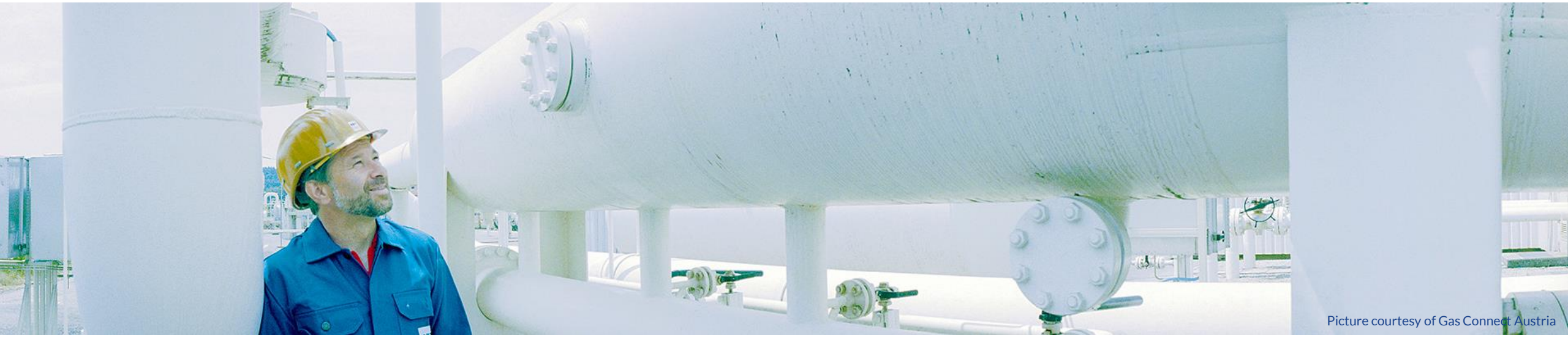
- Establish an **additional performance indicator for the 'smart gas grids'** category, i.e. a minimum number of PCIs to be implemented by 2026, to monitor the progress specific to the deployment of smart gas grid projects.

GAS FOR CLIMATE
A path to 2050

Gas for Climate view to TEN-E revision

4. **Inclusion of CO_2 storage facilities and transport infrastructure for CCU under the CO_2 infrastructure category**
   - Welcome the (continued) support to the development of CO_2 infrastructure as a key enabler of low-carbon hydrogen, of negative emissions and of process emissions reductions.
   - **Need for policy support for the development of CO_2 infrastructure (transport and storage)**: National policy instruments such as Carbon Contracts for Difference could be implemented to bridge the financial gap and help de-risk these technologies, especially in the early deployment stages.
   - Need to consider including in the scope of TEN-E **CO_2 storage and transport infrastructure for CCU**, i.e. the transport infrastructure enabling the direct connection between a CO_2 transport backbone and an industrial facility.

GAS FOR CLIMATE
A path to 2050



ENTSOG position on TEN-E revision

Future of Gas Grids panel

Louis Watine – Director, System Development

14 April 2021, online

Sustainability

Inclusion of hydrogen is welcome

- First hydrogen projects were included in ENTSOG TYNDP 2020 on a voluntary basis
- TYNDP 2022 will go further and deliver hydrogen infrastructure assessment
- Hydrogen projects should be eligible starting with the 6th PCI list
- Repurposing and retrofitting of pipelines need a clear framework

Coal/oil to gas switch is key to achieve Net-Zero

- Technology neutrality is necessary to support all renewable and decarbonised energies
- Traditional infrastructure meeting the sustainability requirements should be eligible,
- Especially when they carry renewable gas (biomethane) and can be hydrogen ready

System Integration and Transparency

System integration is key for offshore planning

- Power-to-gas and offshore infrastructure interlinkage should be considered to allow for a comprehensive and comparable assessment of all solutions

Transparency and scrutiny

- EC approval of scenarios is welcome
- ENTSOG panels and joint stakeholder engagement will support transparency
- Scenario Framework Guidelines can reinforce the neutrality of the ENTSOs and would benefit from further definition in the regulation
- Role of ACER to ensure the scrutiny and regulatory compliance of TYNDP can be clarified

TYNDP process can be more efficient to make it more relevant

- A simpler process can deliver a more up-to-date assessment

Thank you for your attention

Louis Watine
Director, System Development

ENTSOG - European Network of Transmission System Operators for Gas
Avenue de Cortenbergh 100, 1000 Bruxelles

www.entsog.eu | info@entsog.eu

Discussion with all Members

3. Gas legislation revision including H2 regulation

Intervention by Mr. Bartlomiej Gurba (DG ENER)

Mr Bartomiej Gurba

Internal Energy Market (ENER.C.3)

DG ENERGY

Gas legislation revision including H2 regulation

14 April 2020

Dr James Watson
Secretary General

Wishlist for the ‘Gas Decarbonisation Package’

Alignment of the Gas and Electricity Market Design

Ensure consistency and coherence between gas and electricity

- Stricter requirements for gas price regulation and phase out regulated prices ASAP
- Align consumer protection rules for gas and electricity incl. bundled products, changes in contractual conditions, prepayment systems, and info. on alternatives to disconnection
- Strengthened role of DSOs in national network development planning that are part of the TYNDP
- SOs can own/operate storage/P2G facilities, limited in time, if market does not deliver; facilities to operate under TPA, network owners do not own electrons/molecules

Towards a regulatory framework that covers hydrogen

Provide investors certainty and an efficient market

- Priority ensure to investors certainty, avoid market fragmentation and ensure its liquidity and competitiveness
- A single legislative framework covering all gases by bringing hydrogen within the scope of the GMD
- Based on core principles: unbundling, TPA, transparency, non-discriminatory tariffs and potential temporary exemptions
- Additional regulatory actions could be undertaken ‘dynamically’ in line with market monitoring
- Temporary exemptions, to be approved by NRAs/ACER according to pre-determined and EU-harmonised set of criteria

Coherence with other ‘Fit for 55’ legislative initiatives

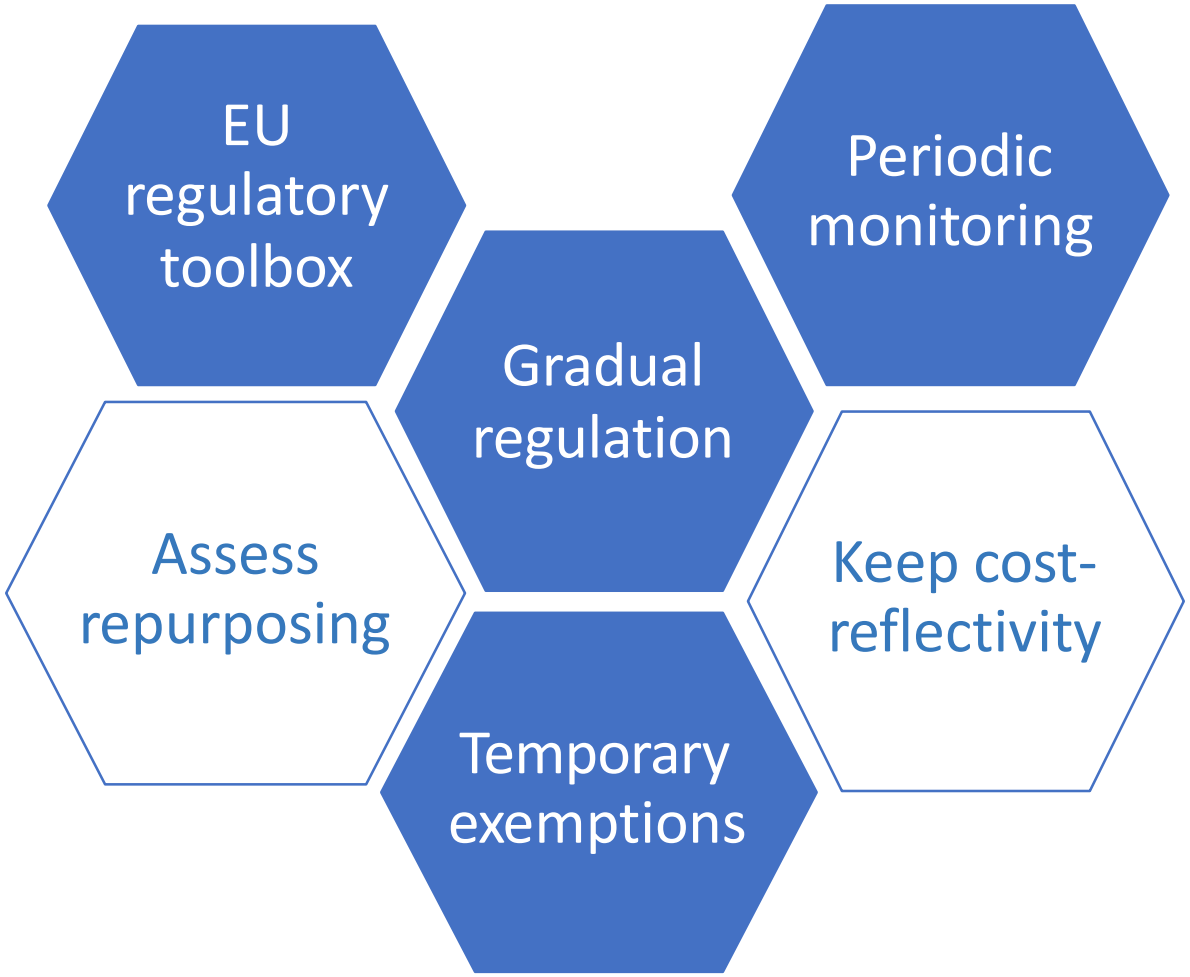
Address market barriers to role out renewable and low-carbon gas

- EU level gas decarbonisation target: -20% GHG by 2030 vs. 2018
- EU level renewable gas target: 11% by 2030
- Clear terminology based on LCA
- Single GO for all gases, incl. low-carbon, with carbon footprint information
- GO to be used to offset ETS obligations
- Carbon pricing: ETS long term, ETD short term

eurogas 30 years

ACER
European Union Agency for the Cooperation of Energy Regulators

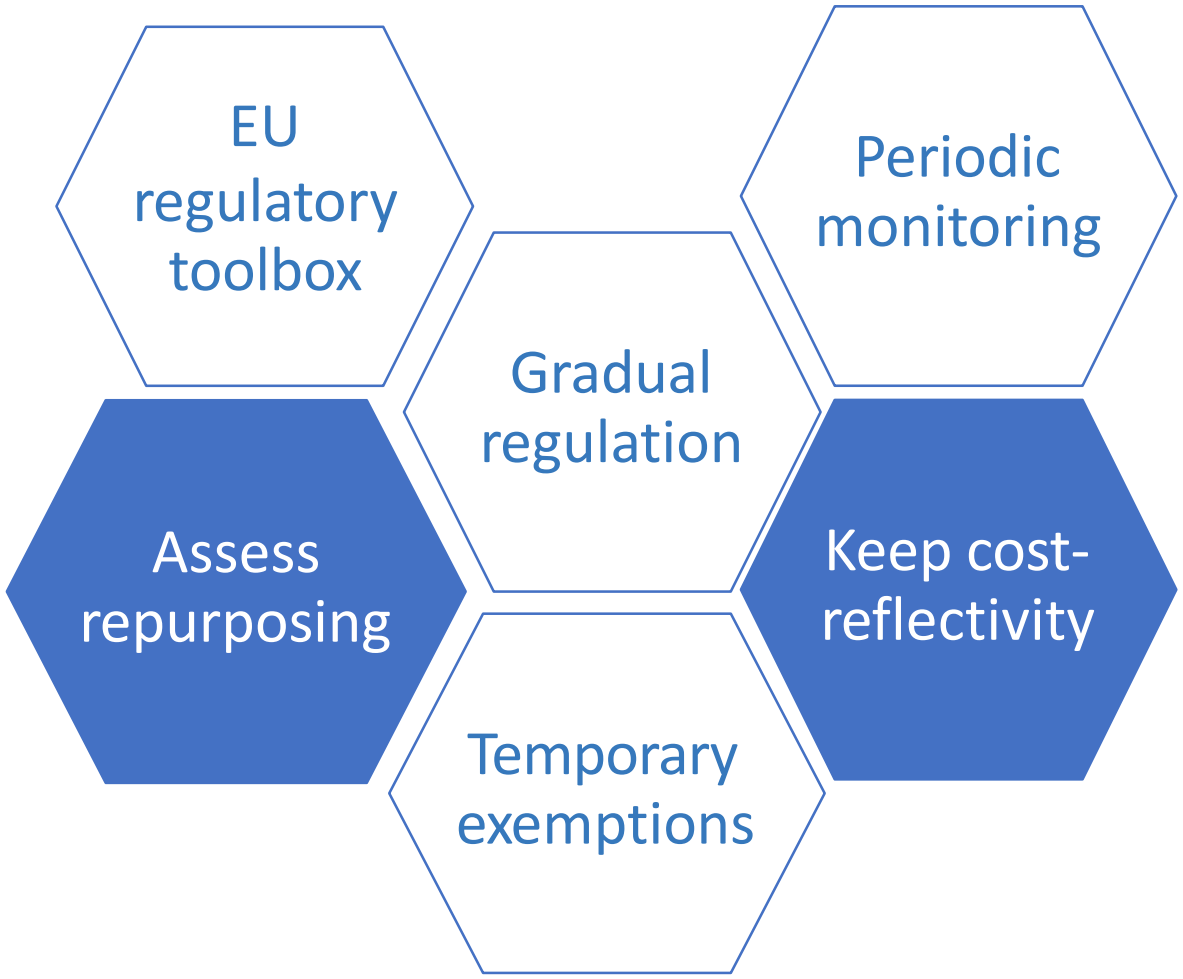
H2 regulation: relying on an EU-wide approach (1)



- **Gradual regulation** → offering sufficient certainty to investors, but flexibility for different stage of developments
- **Periodic monitoring** → with a focus on competition and key EU metrics
- **EU regulatory toolbox** → retain key basic principles:
  - NRAs supervision
  - Third-party access
  - Non-discrimination
  - Transparency
  - Customer protection
  - Unbundling
- **Temporary exemptions** → for business-to-business networks

ACER
European Union Agency for the Cooperation of Energy Regulators

H2 regulation: relying on an EU-wide approach (2)



- **Assess repurposing** → To optimise investments
  - Repurposing can give value to potentially underutilised gas pipelines
  - Develop advanced cost-benefit analyses (CBAs) to incorporate societal values and avoided cost (e.g. for addressing electricity network congestion)

- **Keep cost-reflectivity** → avoiding cross-subsidisation
  - The gas/hydrogen network costs should be paid by their respective users
  - Sound practical rule: Don't make users 'pay twice' for the same pipe (once for gas, then again for hydrogen)

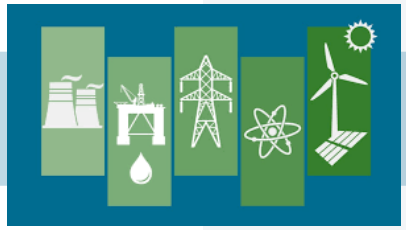
ENTSOG Advisory Panel for Future Gas Grids

2° meeting

Virtual
14.04.2021

The gas model of the future

Energy transition



Views	***Implications***
Gas expected to be around 20% of total European energy consumption in 2050	***Renewable gas production must grow considerably already in the next few years to reach decarbonization targets***
Approx. 1/3 will be green H2; the remaining 2/3 will be biomethane or decarbonized H2 and e-fuels	***Gas infrastructures must be able to manage variable flows of different gases over time***
Role of gas infrastructures is essential for energy storage, transport and distribution and for empowering energy savings	***Gas infrastructures must develop in a coordinated manner along the entire gas value chain***
Investments are needed for achieving flexible grids and enabling interaction with the electricity system	***Gas and electric infrastructures must be able to dialogue in order to maximize efficiency and cost effectiveness***

European Commission

Priority to address

Gas DSOs perspective

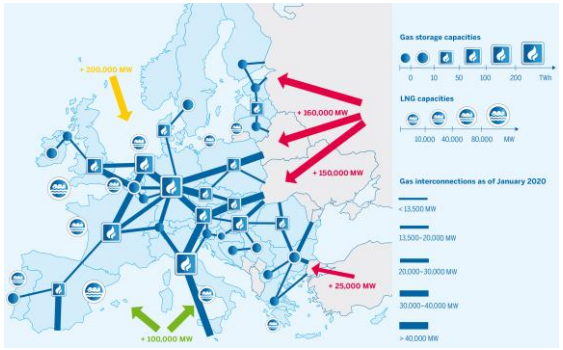
- *Renewable gas production increasingly decentralized and injected in the gas DSOs grids*
- *Blends the most common content in gas DSOs grids*
- *Production costs to decrease rapidly if green H2 has to reach expected targets*

Answer

Answer

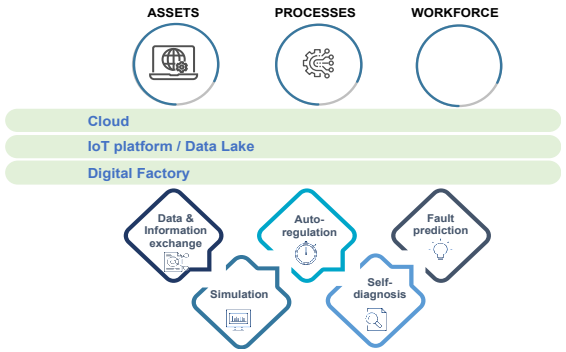
Answer

Joint infrastructure planning

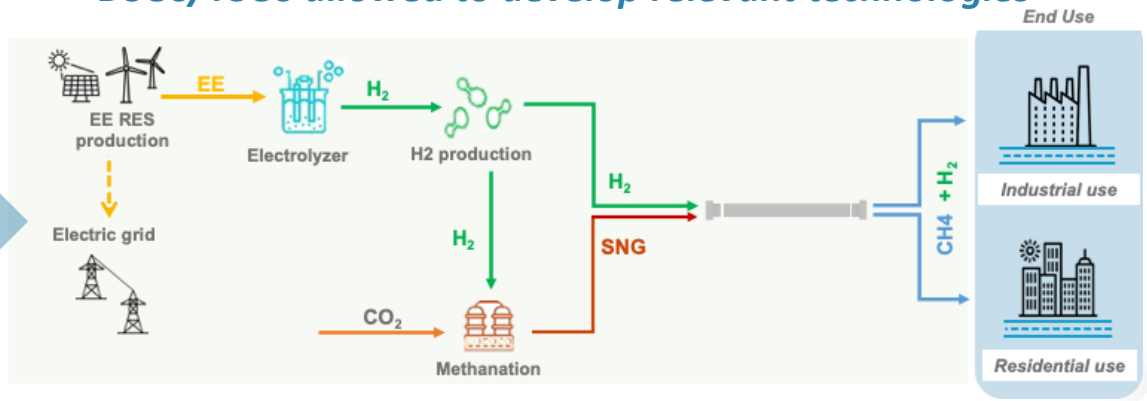


DSOs/TSOs Reverse flows

Grid digitization



DSOs/TSOs allowed to develop relevant technologies



Gas legislation revision: perspectives from the chemical industry

Nicola Rega
Energy Director

14 April 2021
ENTSOG - 2nd meeting of Advisory Panel for Future Gas Grids

Key priorities in the gas legislation revision

- Ensuring the proper functioning of energy markets
- Creating lead markets
  - The competitiveness of renewable and low carbon gases needs to rapidly improve
  - To minimise societal costs, it is essential that renewable and low carbon gases are accommodated in a technology neutral manner.
  - Support measures would be needed in parallel on both production and demand side
- Ensuring gas quality (focus in next slide)
- Safeguarding industrial competitiveness
- Promoting an “energy system approach”

Note: For more detailed info please see “Cefic response to the Inception Impact Assessment on the Hydrogen and Gas markets Decarbonisation Package”, available at: https://cefic.org/app/uploads/2021/04/Gas-packaged-Cefic-response-to-Roadmap-FINAL.pdf

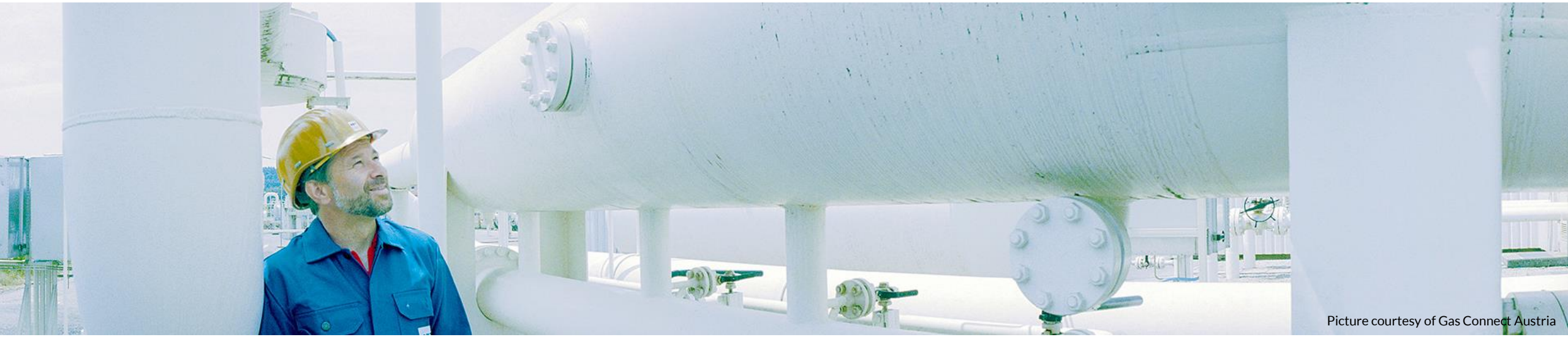
Focus on ensuring gas quality

- The chemical industry can use hydrogen and renewable and low carbon gases both as feedstock and as energy carriers.
- Hydrogen, on the one hand, and renewable and low carbon gases, on the other hand, should be delivered in dedicated pipelines.
- The transmission system operator (TSO) needs to be ultimately responsible to deliver these gases in a stable and predictable quality to the chemical industry.
- Just blending hydrogen in the natural gas grid can have negative impacts which are three-fold:

  1. It will lower and widen the Wobbe band, which affects the stability of equipment.
  2. It may render natural gas unusable as a feedstock due to downstream processes not being able to process the hydrogen (or causing upsets).
  3. It may affect cross-border trade of hydrogen and natural gas.

- A preferred general way forward would be the establishment of parallel methane and hydrogen pipelines at the TSO level.

14 April 2021



Picture courtesy of Gas Connect Austria

Gas legislation revision including Hydrogen regulation

Future of Gas Grids Panel – 14th April 2021

Matt Golding, Director Market

Gas legislation revision (1)

1. Application of Regulatory Principles to the future Hydrogen market

- Consistent application of regulatory principles to all network providers from the outset (unbundling, non-discriminatory TPA and transparency)
- Exemptions should be considered for existing 'private' hydrogen pipeline – but sunset clause is required
- Incorporating the rules for hydrogen in gas legislation would be the most efficient way of ensuring regulatory alignment between these two closely related energy vectors.

2. Role of gas TSOs

- Revised gas legislation should recognise that gas TSOs can be certified as owners/operators of H_2 networks, covering repurposed, retrofitted and new-build networks
- Gas TSOs should be able to own/operate P2G facilities under certain circumstances: where no market provision or risk of dominant position; consistent with regulatory requirements; no commodity interest i.e. 'Tolling' arrangement.

3. Financing the development of the hydrogen networks

- Revised gas legislation should provide a clear regulatory framework that enables practical and reasonable solutions
- One solution could be to mutualise the H_2 network costs with the gas network costs

Gas legislation revision (2)

4. **Recognition of cost for repurposing gas pipelines**
   - Repurposing and retrofitting costs should be recognised by the NRAs
   - The planning of H_2 infrastructure to be further integrated into the ENTSOG TYNDP for gas (from the TEN-E revision)
   - National processes should likewise be adapted to integrate gas and hydrogen infrastructure planning.
     - The European gas regulation should include guidelines/principles in this regard.
5. **Treatment of hydrogen injected into the gas network (blending)**
   - When blending H_2 in the gas network, specific issues may arise which would need dedicated provisions
6. **Sandbox**
   - Member States should introduce and apply regulatory sandboxes in a harmonized way
   - The revised gas legislation should allow for the implementation of such arrangements

Discussion with all Members

4. RED III

Intervention by Mr. Ruud Kempener (DG ENER)

Mr Ruud Kempener

Renewables and Energy System Integration Policy (ENER.C.1)

DG ENER

Future gas grid

Jacob Hansen, Director General, Fertilizers Europe

14 April 2021

Green Deal and renewables

- Today the fertilizer industry with natural gas as raw material produces 50 % of all hydrogen – and uses it to produce ammonia.
- Fertilizer industry supports increased supplies – especially local and EU supplies – of green energy and feedstock supplies, especially green hydrogen; it recognizes the RED III is a key driver for the further promotion of these sources;
- Natural gas has highly valuable role as transition energy source - blue sources must also be promoted – so the industry supports technology neutral approaches;
- The quality of the gases (the molecules) into (fertilizer) plants must have predictable quality

Green ammonia

- Green ammonia produced with green hydrogen has huge potential
- carbon free or green fertilizers
- carbon free shipping fuel
- carbon free energy carrier

- The development programme for hydrogen is likely to be: electrolysers at industrial sites, then hydrogen pipes for industrial clusters/“valleys” and then EU regional grids.

- Today Fertilizers Europe see a dedicated hydrogen supply grid as best option to supply industry. Blending hydrogen in natural gas less useful.

GOs: an essential tool to market clean hydrogen

Hydrogen as a distinct energy carrier, separate from electricity and gas.

GO must include (1) the primary energy sources and (2) the GHG footprint.

5 Ts – GOs must be **T**rackable, **T**raceable, **T**radeable, **T**ransparent and ultimately, **T**rustworthy.

GOs need to capture the attributes resulting from different production pathways.

An international GO system is required for import and export of hydrogen.

Hydrogen Europe

2021 PORTUGAL.EU

ENTSOG proposals for RED II revision

Low-carbon gases in RED III

Supporting policy framework for low-carbon gases with low carbon footprint

Terminology

Clear terminology for low-carbon gases based on LCA

Market signals for RES energy

Relief from administrative burdens (additionality, geographical and temporal correlation in transport for RES H_2)

EU 'single currency' for the climate value

EU – wide certification system based on GOs for RES and low-carbon energy

Interaction with EU ETS

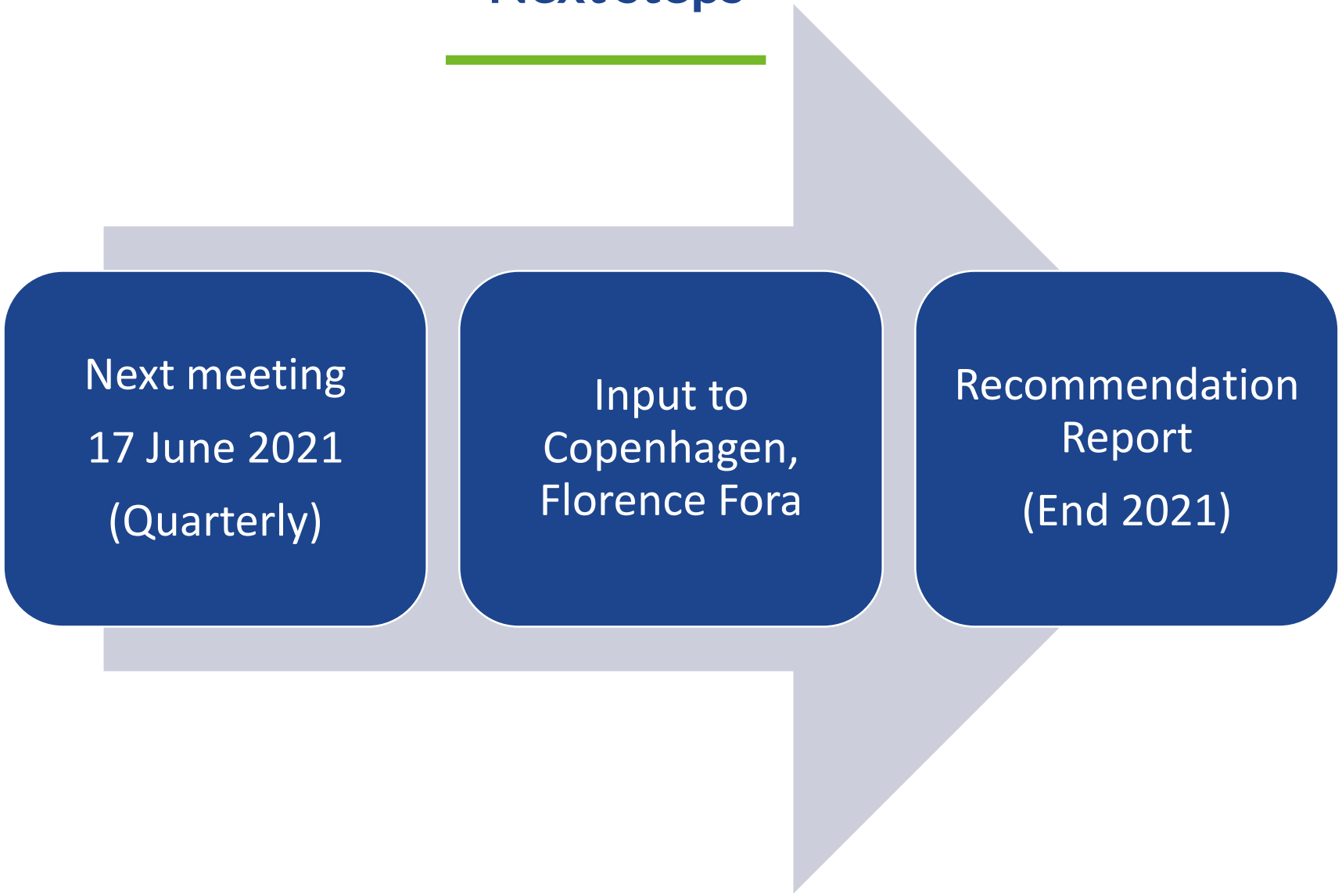
Using GO as a purchase record of renewable and low-carbon gas – for the workable implementation of the revised MRR

We stand ready to discuss these points with you.

Discussion with all Members

5. Summary and next steps

Next steps


Next meeting
17 June 2021
(Quarterly)
Input to Copenhagen, Florence Fora
Recommendation Report
(End 2021)

Thank you for your attention

Contacts: Sara Piskor & Patricia Orglerova

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