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MADRID FORUM – 29 APRIL 2021

THE ROLE OF HYDROGEN FOR THE FUTURE EUROPEAN GAS GRID

GREEN DEAL MISSION AND UPCOMING HYDROGEN LEGISLATION



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“Europe needs a new growth strategy that will transform the Union into a modern, resource-efficient and competitive economy, where there are no net emissions of greenhouse gases by 2050 economic growth is decoupled from resource use no person and no place is left behind.” (EC)

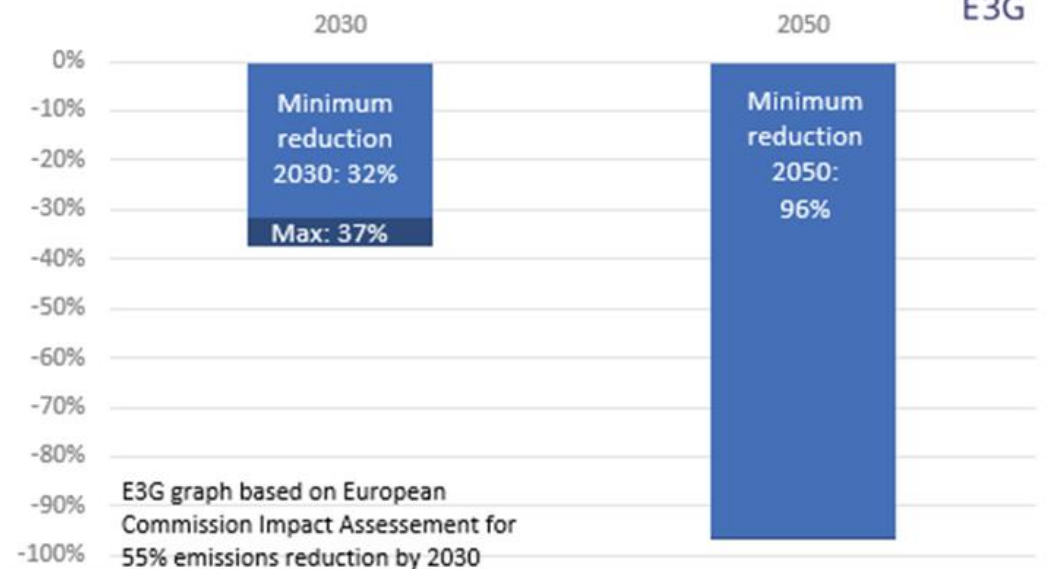
1. Upcoming gas and H2 legislation is a once-in-a-decade chance to ensure

- > the EU is ‘fit for 55’ by 2030 and in view of a further “ratcheting up” of climate targets under the Paris Agreement in 2025.
- > the needs of energy consumers are met then and in the years thereafter in light of the broader sectoral transitions.

2. Current gas market policy focuses on promoting gas-on-gas competition

- > This alone does not deliver against the Green Deal challenge as the use of fossil gas must start reducing rapidly
- > This means EU citizens need to change from using products and services that depend on fossil gas to ones produced by zero GHG emissions sources.

Change in natural gas final energy consumption compared to 2015



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WHAT IS HYDROGEN GOOD FOR ?



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Three things hydrogen can do well	Three things hydrogen can't do well:
Decarbonisation of specific industrial processes , e.g. some processes in the chemical and steel industries.	Supply large quantities and scale up fast. Supply of renewable hydrogen will be a constraint, and the scale up pace crucially depends on the build out of renewables and/or ability to deploy CCS at speed.
Decarbonisation of heavy-duty transport , such as shipping and potentially in aviation.	Transport across long distances – transport via ship is expensive and potentially needs a further conversion process to ammonia, transport via pipeline requires retrofitting of the full network.
As backup for electricity generation in prolonged periods without renewables generation, and for some combined heat and power.	Efficiency – ca. 1/3 energy losses in electrolysis of water & 1/4 in production from fossil fuels. For uses where electricity can be used directly, such as heating homes, this is thus a less desirable option.



Hydrogen should be used as a piece of the EU climate neutrality puzzle, focusing on end-use and where it is the most efficient to provide decarbonisation.





THE BLENDING ISSUE

> **Blending is insufficient to decarbonise efficiently**

- 5% blending by volume of H2 would only displace 1.6% of natural gas demand because H2 has a lower energy density than natural gas (Platts Analytics, 2020)
- Leakage is already a widespread issue (from natural gas extraction and transportation, between 0.5-4.1% depending on the country of origin)

> **Blending runs counter to an efficient allocation of scarce H2 resources**

- Blending H2 into the gas grid deviates from a strategic allocation of scarce resources to where there are no alternative decarbonisation options and through that drives up costs in high priority uses (e.g. industry)

> **Blending undermines gas quality standards**

> **Blending is a bad deal for consumers**

- As H2 will remain more expensive than natural gas and has a lower energy density, blending H2 will drive up consumer prices
- Issue with cost allocation: today's gas consumers, especially households, are unlikely to be tomorrow's H2 consumers

HOW TO STRUCTURE THE MARKET ?



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Scarce and inefficient resources such as hydrogen need to be allocated where they add most value → EU legislation needs to define the who and how

Markets should enable competition where other solutions exist (flexibility provision, heating) → Define markets around outcomes, not energy vectors

There is neither the time or money available to hold all options open → be clear on which options are no longer compliant with climate targets by when, or require local/national plans to do that.

Critical choices, such as the infrastructure and investment needs related to the future of gas, cannot be made through market processes. → Identify areas where anticipatory investment is needed to shift, using independent analysis

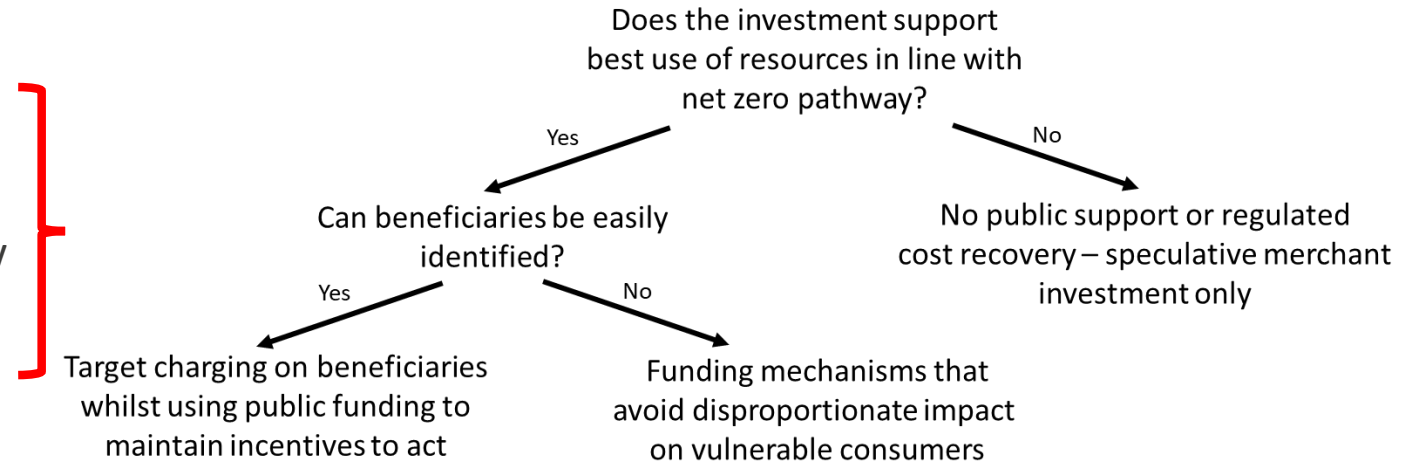
Technology proponents tend to display optimism bias and incumbent businesses are focused on protecting the value of their assets → ensure the right governance mechanisms so that risk of non-delivery of 100% renewable H2 not borne by consumer



SOLUTIONS: WHO PAYS?

How to ensure that today's gas consumers are not paying for tomorrow's hydrogen users?

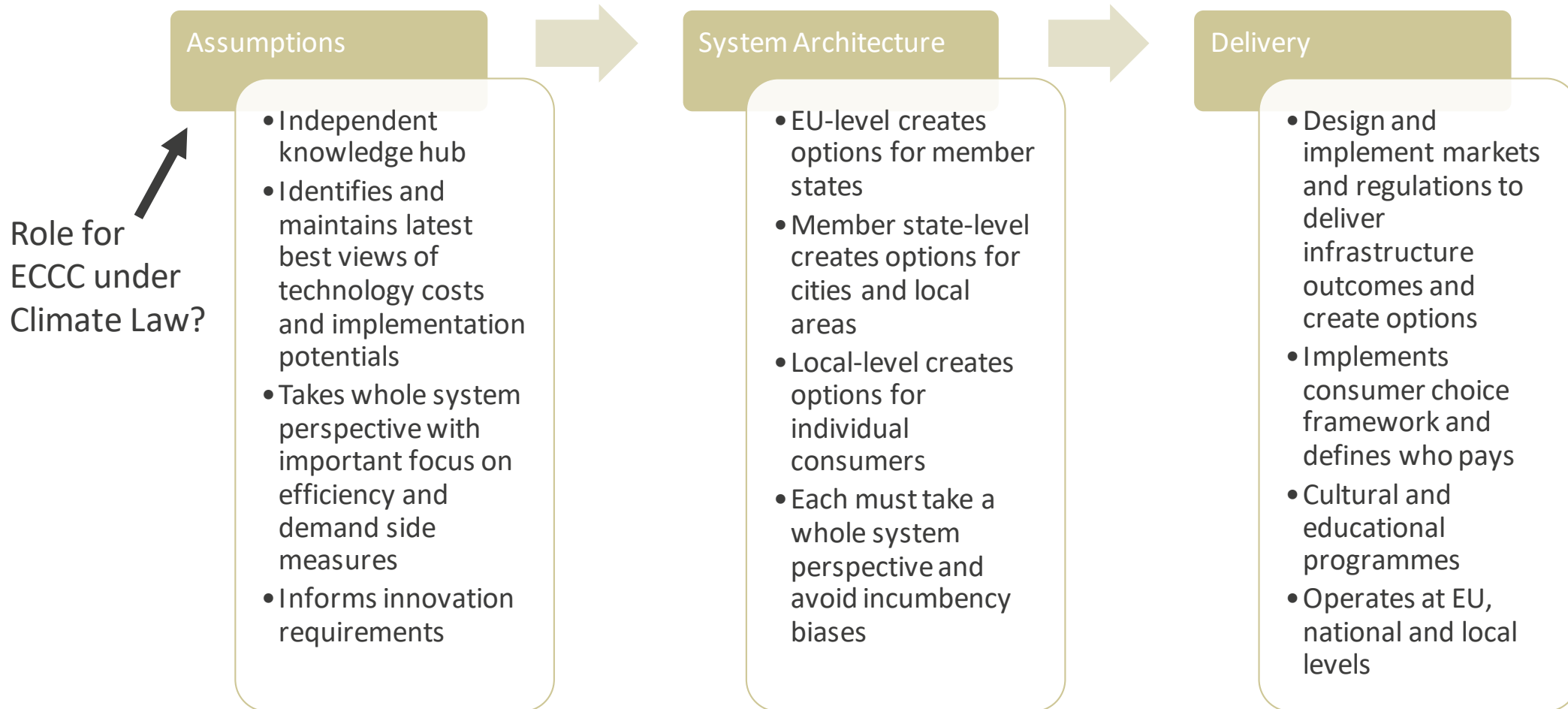
- Short term/maintenance ← Recovered from system users as per current approach
- Long term/upgrades
 - Interconnectors
 - Supply pipelines
 - **Hydrogen (or other zero emissions gas) production**
 - **Making existing networks hydrogen (or other zero carbon gas) ready**
 - **New dedicated networks**
 - Appliance upgrades for new gases
- Decommissioning
 - Including maintaining supply for residual consumers ← Gradually migrated from system users to Funding mechanisms that avoid disproportionate impact on vulnerable consumers



The imperative to leverage low cost private finance requires regulatory and fiscal approaches that de-risk investments underpinned by appropriate consumer protection.



SOLUTIONS: DELIVERY STRUCTURES (GOVERNANCE)



We need an integrated ‘whole system’ approach to deliver decarbonisation. This means coherence across sectors, along the value chain and between countries, with decisions based on independent, science-based analysis.



KEY MEASURES OF SUCCESS



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- > **Mitigate risk of “non-delivery”:** Do zero GHG emission products and services have access to the highest value markets such that scarce and high value resources are not constrained to low value markets where alternatives products and services exist?
- > **Improve Governance shortcomings:** Current Governance processes such as the role of ENTSOG in the planning of the hydrogen network could threaten a cost-efficient allocation of resources.
- > **Enhance competition and cost-effectiveness:** Is fair competition embedded in infrastructure planning processes to allow consumers access to the best value products? Are consumers bearing the risk of Green hydrogen not coming forward?
- > **Deliver a fair transition:** Has an appropriate balance been struck between maintaining incentives for consumers to move away from fossil gas usage whilst avoiding high penalties for those unable or unwilling to do so?
- > **Ensure climate value:** Do the measures lead to a measurable reduction in unabated fossil fuel consumption in line with climate targets and are conditions put in place to maximise the deployment of fully climate neutral solutions?



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ANNEX



RELEVANT RESOURCES



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❖ E3G Factsheets on Hydrogen

- Hydrogen supply
- Hydrogen blending
- Hydrogen for heating

❖ E3G's Commentary on the Gas package

❖ Harnessing Momentum - EU H2 strategy





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About E3G

E3G is an independent climate change think tank accelerating the transition to a climate safe world.

E3G builds cross-sectoral coalitions to achieve carefully defined outcomes, chosen for their capacity to leverage change. E3G works closely with like-minded partners in government, politics, business, civil society, science, the media, public interest foundations and elsewhere. In 2018, for the third year running, E3G was ranked the fifth most globally influential environmental think tank.

More information is available at www.e3g.org

