ClientEarth

Hydrogen and gas market decarbonisation package

Response from ClientEarth

Content

Open Public Consultation on the Hydrogen and Gas Market Decarbonisation Package

I. General questions on the review and possible revision of the Gas Directive and Gas Regulation

Costs for renewable energies have decreased significantly in the last ten years. In the relevant scenarios used by the Climate Target Plan Impact Assessment, biogas, renewable and low-carbon hydrogen and synthetic fuels would represent two-thirds of the gaseous fuels in the 2050 energy mix, with fossil gas used in combination with CCU/S representing the remainder. The areas where renewable and low-carbon gaseous fuels are expected to come into play include today's industrial sectors (e.g. refineries, fertilisers, steel making, glass, ceramics) and certain heavy duty transport sectors (ships, aviation, long distance heavy vehicles). They are also expected to continue serving the needs of the electricity system as flexible power production. The role of gas in heating depends on the competition with other technologies, including heat pumps. The process to decarbonise the gas supply and to shift demand for gases to most needed uses must start already now. Achieving the 2030 renewable, energy efficiency and greenhouse-gas reduction targets in time is an important step in this process.

1. What is your view on the role of gaseous fuels in 2030, in particular as regards hydrogen, biogas and biomethane? *500 character(s) maximum*

Gaseous fuels will be used to serve the limited and specific applications for which efficiency, smart/flexible innovations, and electrification are not sufficient. There will be a limited role for green hydrogen, targeting very high heat applications. Biogas from waste and residues, and biomethane will be used for industrial heat applications.

2. Do you see a need to revise the Gas Directive and Gas Regulation to help to achieve decarbonisation objectives?

- **Yes**
- No

3. If, yes what should the main elements of the reform be? Which benefits do you expect? *500 character limit*

This legislative revision is a once-in-decade opportunity to establish a coherent legal framework for gas regulation to align with climate targets. Reforms must incentivise markets for renewable gases, but also disincentivise fossil-based fuels, eg by defining governance structures that ensure transparent system planning free from conflicts-of-interest; integrating gas with markets for power, flexibility and efficiency solutions; addressing emissions (incl. methane) that are unaccounted for; and allocating gas to the highest priority applications.

4. How could the revised legislation support the aims of the Energy Efficiency Directive (2018/2002) and the Renewables Energy Directive (2018/2001/EU)?

500 character(s) maximum

The aim of the Renewable Energy Directive (REDII) is to promote energy from renewable sources and ultimately reduce greenhouse gas emissions (Art. 1 & Recital (2), REDII). The reform of the Gas Directive and the Gas Regulation can support this aim by contributing to the swift decarbonisation of the energy system. To that end, a clear fossil gas phase-out date of 2035 should be fixed, and the future role of renewable gases should be designed based on realistic estimations of their future availability and whole-of-life-costs. In terms of EED, see our separate response.

5. Should the revised legislation, in addition to the instruments under the Fit for 55 package, in particular the Renewables Energy Directive and the Energy Efficiency Directive, include also measures that dis-incentivise the use of unabated fossil gases?

- **Yes**
- No

6. Should the revised legislation, in addition to the instruments under the Fit for 55 package, in particular the Renewables Energy Directive and the Energy Efficiency Directive, include also measures that incentivise the use of renewable and low carbon gases, for example via specific targets?

- Yes
- **No**

7. Do you expect that the technological and regulatory changes necessary to decarbonise the gas market have a potential to create new jobs by 2030?

- Yes
- On balance neutral
- No

8. What type of jobs will be created? What are the characteristics of jobs that are at risk of being discontinued? If applicable please identify the potential changes in the skills requirements, job quality and occupational safety of the gas market jobs.

500 character(s) maximum

Decarbonising the gas market involves scaling down and phasing out gas in favour of clean alternatives. A climate-compatible gas market will therefore likely see fewer jobs overall in gas-related industries, while more jobs will be created in renewable energy, electrification, flexibility and efficiency. Fossil fuels, including gas, generally employ far fewer people RES and efficiency, so forward-planning should not rely on gas as a major employer for the EU (Beyond Zero Emissions, “The Million Jobs Plan” (2020).

9. Do you consider that investments in installations and infrastructure operating on fossil methane gas subject to the risk of stranded assets. If so can the revised legislation address this issue, and how? *500 character(s) maximum*

There is already significant market distortion in favour of gas installations and infrastructure, resulting in overinvestment (Global Energy Monitor 2021). Under current regulatory approaches the risk of stranded and economically burdensome gas and hydrogen assets will only increase. In our Roadmap response, we outlined measures to ensure system planning, market access and public finance for gas are regulated to avoid stranded assets and overshooting of climate targets.

II. Consumer's choice and renewable and low-carbon gases

Recognising that citizens must be at the core of the Energy Union and the European Green Deal, clear and easily accessible information is essential to enable citizens to change energy consumption patterns, switch to solutions offered by an integrated energy system, and whenever applicable, switch supplier. Today's consumers are not always made aware of the origin of gases they consume and their climate impacts. To that effect, the certification of renewable and low-carbon gases is envisaged in the context of the upcoming revision of the Renewable Energy Directive (EU) 2018/2001. Recent changes to market rules for electricity have established a comprehensive framework for consumer protection and empowerment (see articles 4, 5, 9-19, 22-29, and Annexes I and II of recast Electricity Directive (EU) 2019/944) in the sector.

While technical and economic conditions in gas markets may differ from electricity markets, updating the legislative framework for gases could ensure an equal level of protection and empowerment for electricity and consumers of gaseous fuels, and increase certainty for market actors. This revision could establish the tools to empower consumers to actively take part in the energy transition while enjoying high level of consumer protection , and ensure that they fully benefit from their contributions to the decarbonisation process. This gives also an opportunity to complement existing legislation addressing the challenges related to vulnerable households and energy poverty.

Consumers should become well-informed and empowered as buyers. This could be achieved through clearer billing and advertising rules, trustworthy price comparison tools, the possibility to conclude contracts to buy specifically renewable or low carbon gas and by leveraging their significant bargaining power through collective schemes (such as collective switching and energy communities). Finally, consumers need to be free to generate and consume their own energy under fair and transparent conditions in order to save money, help the environment, and ensure security of supply.

10. Do you consider that the Gas Directive needs to be modified to ensure consumer protection and empowerment? *(multiple answers possible)*

- **Yes, it needs to be more ambitious to reflect the citizen/consumer focus of the Clean Energy Package for all Europeans and the Green Deal.**
- **Yes, and mirroring consumer protection and empowerment rights of electricity consumers conferred by the recast Electricity Directive and by 2018 Energy Efficiency Directive would be the most straightforward**

approach to do so.

- No, it strikes the right balance as it is.

11. If you answered 'yes' to the previous question, which provisions pertaining to consumer protection and empowerment should be prioritised in the revised Gas Directive?

(multiple answers possible)

- Provisions on protection of energy poor and vulnerable customers.
- Provisions on single points of contact for consumers for information on rights, gas consumption and costs, legislation and dispute settlement.
- Provisions on protection mechanisms to ensure efficient treatment of complaints through transparent, simple and inexpensive procedures and out- of-court dispute settlements.
- Provisions on supply contract information and modification.
- Provisions on accessibility to transparent information on share of renewable gas consumed, gas quality, applicable prices and tariffs and on standard terms and conditions.
- Provisions on frequency of billing and available payment methods. Provisions on cost of access to metering and billing information.
- Provisions related to switching suppliers (switching related fees, final closure account).
- Provisions on accessibility of consumption data.
- Provisions on smart installation of individual meters in multi-apartment or multi-purpose buildings.
- Provisions on intelligent and remotely metering systems and their costs.
- Provisions on protection against disconnection during winter.
- Other

12 Which of the following do you think would be appropriate in strengthening the rights and information of consumers in the gas market? (multiple answers possible)

- Consumer participation in demand response through aggregation contracts to sell or buy gases.
- Enabling the participation/the establishment of energy communities.
- Access to reliable online price comparison tools for improved switching rates.

- Introduction/deployment of smart metering systems for gases.
- Obligations to provide pro-active consumer information on switching possibilities, consumer rights etc.
- More consumption and billing information.
- Additional requirements (please explain further in next question).
- Enabling self-consumption for large customers using gas absorption heat pumps.
- Setting minimum requirements for billing information.
- Providing further billing information on breakdown of gas supply prices.
- Providing further information about historical consumption and energy sources.
- **Providing information on the nature of gas supply i.e. fossil, renewable, low carbon.**
- Other

13. Please specify and/or explain your choice for the three previous questions.

500 character(s) maximum

Consumers should be offered proper incentives to transition to clean alternatives to gas. This will help avoid energy poverty and unaffordable tariffs being imposed on consumers who are least able to invest in clean alternatives. Reforms should align with Directive 2005/29/EC (esp. Art.5, 6 & 7) which prohibits misleading commercial practices, including false claims about the environmental benefits of fossil fuels. EMD provisions that allow consumers to take an active part in the energy transition should be transposed into gas legislation. We do not support energy communities based on fossil gas projects (except biogas).

14. Whether for residential or commercial purposes, consumers may bundle their utilities with a single energy provider. The idea of bundling is based on combining several services in one package. As regards households, some utility companies can provide electricity, gases and heating offers in a single deal. How do you think transparency and the flexibility of such bundled electricity, gases and heating offers could be further improved to benefit consumers? *500 character(s) maximum*

Suppliers should indicate prices for each item (gas, electricity, heating) to allow comparisons between (a) individual and bundled offers; and (b) suppliers. Suppliers should be prohibited from charging fees for unbundling during the contract period. Regulatory authorities should monitor bundled products and assess the benefits for consumers

15. To what extent has current EU legal framework on gas been effective:

for vulnerable consumers in:

	Highly effective	Effective	Moderately effective	Somewhat ineffective	Not effective	No opinion
ensuring a fair protection against disconnections?						X

for customer empowerment in:

	Highly effective	Effective	Moderately effective	Somewhat ineffective	Not effective	No opinion
contributing to decarbonisation i.e. choose the most affordable sustainable energy source?					X	
contributing to the achievement of the EU internal energy market (i.e. choose the preferred supplier irrespective of their place of residence)?						X
stimulating the availability of comparison tools?					X	

protecting consumers from aggressive marketing practice?					X	
stimulating *green offers?*					X	
stimulating diversity in the choice of payment methods?						X
setting clear deadlines for dealing with requests to switch supplier?						X
establishing unique contact points for consumers?						X

for information about dispute settlement mechanisms in:

	Highly effective	**Effective**	**Moderately effective**	**Somewhat ineffective**	**Not effective**	**No opinion**
establishing conditions to exercise the right of withdrawal?						X

accessing to speedy and effective complaint handling procedures?						X
providing available out-of-court procedures?						X

for right to information in:

	Highly effective	Effective	Moderately effective	Somewhat ineffective	Not effective	No opinion
spreading the practice of clear description of the service/product?						X
spreading the practice of offers presented in a clear, consistent and simple manner?						X
spreading the practice of clearly presenting key information about prices, discounts, termination fees?						X

for access to consumption data in:

	Highly effective	Effective	Moderately effective	Somewhat ineffective	Not effective	No opinion
ensuring access to consumption data shortly after consumption?						X
boosting consumer confidence in the market?						X
ensuring transparency and fairness of contractual conditions?						X
preventing unilateral change of contractual conditions by the supplier?						X

for right to accurate information on billing and switching in:

	Highly effective	Effective	Moderately effective	Somewhat ineffective	Not effective	No opinion
providing price increase notifications?						X
stimulating transparent bundled offers to consumers?					X	
discouraging surcharges in the payment methods?						X
ensuring a smooth and fast switching process?						X
preventing termination fee or penalty for switching?						X

16. Do you see the price of residential gaseous fuel products as an important element in affordability? Do you see an energy poverty challenge in households' access to gaseous fuel products in the future? *500 character(s) maximum*

Households must be supported to switch from gas products to alternatives that ensure the EU can meet climate targets. There are risks of energy poverty if consumers are not supported to electrify household heat and applications. The polluter pays principle should be applied to support customer switching (BEUC, 'How to make the home heating and cooling revolution consumer-friendly' (2021)) Forecasts indicate that renewable hydrogen will not be available at sufficient scale to ensure affordable prices for household use.

17. In your view, how important are price signals to consumers in the gas market?

	Very important	Important	Neutral	Not very important	Not important	No opinion
Would consumers benefit from price signals?	X					
Would price signals drive system integration and energy efficiency and decarbonisation?	X					

18. The recast Electricity Directive clarifies the scope of Public Service Obligations which concern notably the price setting for the supply of electricity (see Art. 5) in the electricity market. In your view, should such provisions be introduced in the field of gas?

- Yes
- **No**

III. Integrated infrastructure planning

Coordinated infrastructure planning across multiple energy carriers, types of infrastructure, and consumption sectors – is the cornerstone of an integrated energy system. In this spirit, the TEN-E Regulation requires that projects of common interest are to be included in national network development plans with highest priority. The Commission proposal https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12382-Revision-of-the-guidelines-for-trans-European-Energy-infrastructure envisages provisions for cross-sectoral infrastructure planning. Hydrogen infrastructure is included as a new infrastructure category and used for the network development plan on European level. The requirements for national development plans of the Gas Directive and Gas Regulation are focused on preventing underinvestment that could result in less competition. These requirements correspond neither to the decarbonisation objectives nor to the planning requirements on European level. They also lack consistency between gases and electricity sectors.

19. How to ensure non-biased scenario building and planning?

500 character(s) maximum

1. Decisions must be based on objective facts and latest science, considering all alternatives (incl. those that do not increase the asset base of TSOs like operational measures or energy efficiency). 2.Comprehensive assessment of the relative lifecycle costs and decarbonisation potential of different forms of energy. 3. Transparency must be ensured throughout. 4.A wide variety of stakeholders should be involved. In this respect, the recently created European Scientific Board on Climate Change should set high-level assumptions, such as the storylines of the TYNDP.

20. Do you support an alignment of the national network planning with the European Network Development, for instance regarding frequency of the plans (i.e. timing of submission), time-frames and scenarios to consider?

- **Yes**
- No

21. Should the national network development plan be based on a joint scenario used for gases and electricity planning?

- **Yes**
- No

22. What actions are needed to ensure that national network development plans properly take into account the Energy Efficiency First Principle, meaning that energy efficiency alternative solutions must be first considered when national network development decision are made? *500 character(s) maximum*

1. Require that non-infrastructure-based solutions be prioritised when assessing infrastructure gaps and selecting infrastructure projects. 2. Losses (incl. conversion losses) must be estimated based on best available data and considered in planning. 3. Develop mechanisms to gather data, monitor and enforce application of the principle at national and EU level. 4. Explicitly require the "energy efficiency first" principle to be applied to all relevant EU and national energy policies related to energy infrastructure.

23. What is your position on establishing a single national network development plan for all energy carriers?

Statement	Completely agree	Agree	Neutral	Disagree	Dompletely disagree	No opinion
A single national network development plan can optimise infrastructure needs.		X				
All regulated infrastructure should be part of a single national network development plan.		X				
Should the single national network development plan be binding?				X		
There is no objective model to optimise network planning across different energy carriers.					X	
It is better to keep separate network plans for each sector, but based on a joint scenario.					X	

24. Do you support requiring the setting up of national network development plans by all electricity and gas transmission system operators, irrespective of the unbundling model (i.e. also including ownership unbundled transmission system operators)?

- **Yes**

- No

25. What role should distribution system operators have in relation to network planning*? (multiple answers possible)*

- **Provide information on expected supply and demand for the creation of a joint scenario for the national plan.**
- Prepare their own distribution system network plan.
- **Share information with transmission system operators for network planning purposes.**
- Be allowed to conduct their own cross-sectoral optimisation.
- None of the above.

26. Should hydrogen transmission/distribution infrastructure be included in national network development plans?

- **Yes**
- No

27. What should the network development plan be used for?
(multiple answers possible)

- **Provide transparency.**
- **Ensure a robust network to match supply and demand for different scenarios.**
- **Enable execution of investments.**
- Regulatory prerequisite for cost acceptance in regulated network tariffs.
- Guarantee that infrastructure contained in the plan is built (binding plan).

28. Should the national network development plans provide information where new electricity production, consumers, storages or electrolysers reduce additional investment needs into the network?
(multiple answers possible)

- No, the selection of production, consumption and storage sites is not an activity system operators should be involved in.
- Yes, but only as information, without legal consequence.
- **Yes, for hydrogen production.**
- **Yes, for electricity production (renewable and/or conventional).**
- **Yes, for electricity and/or hydrogen storage.**
- **Yes, for major consumption sites.**
- Yes, to take into account externalities not necessarily perceived by market

participants.

29. [question available only if “yes” to one of the bullets under 30]: If you answered yes, how should this be achieved?

- **By selecting indicative areas which are particularly suitable from an energy network perspective for the given type of production/storage/major consumption site, as an information only.**
- **By defining areas where sufficient connection capacity to the energy networks for such sites can be guaranteed.**
- By establishing that this type of site may only be connected in the indicated areas.
- **By establishing areas in which lower network tariffs for the use of the respective sites, and/or connection charges can be expected, based on the tariffs approved/decided by the national regulatory authority.**
- **By indicating in which areas system operators expect to make offers for the purchase of system services which could typically be provided by the given type of site.**
- **By using connection in designated areas as a prerequisite for eligibility in support schemes.**
- Other

30. If you consider that, in question 29, other approaches are required, please explain what approach is needed and why? *500 character(s) maximum*

NNDPs should not be simply developed and approved by TSOs. NNDP development should involve a wide range of stakeholders, and approval should be through NRAs or other public authorities. The Union should encourage Member States to involve in the NNDP process the national climate advisory bodies they may establish following the invitation in the European Climate Law. National climate advisory bodies should at least be involved in the setting of qualitative scenarios and assumptions.

IV. Hydrogen infrastructure and a hydrogen market

Pure hydrogen, used today mainly as a feedstock, can be expected to be used as a fuel or as an energy carrier. Pure hydrogen may be transported via a network of dedicated pipelines that could consist of repurposed methane gas pipelines and/or newly built pipelines. Currently, infrastructure for the transport of pure hydrogen is not covered by the Gas Directive, as the gas system currently does not include network infrastructure dedicated to the transport of pure hydrogen.
The Commission's vision as set out in the EU's hydrogen strategy[1] is that (low carbon and, preferably renewable) hydrogen will be used first in certain industrial applications (like refineries, steel production, fertiliser production, chemical complexes) and certain transportation modes (heavy duty road transportation, maritime) and that, progressively, an integrated market will emerge from initially disconnected hydrogen valleys. The hydrogen landscape is expected to evolve rapidly in the coming years, but its development is likely to differ in speed and scope per Member State. The present consultation seeks to collect views on regulatory measures that may be required to accompany the emergence of an EU hydrogen market over the next 10-15 years.

[1] https://ec.europa.eu/energy/sites/ener/files/hydrogen_strategy.pdf

31. Which are in your view the main regulatory barriers to the development of a well-functioning cross-border hydrogen market and a cross-border hydrogen infrastructure within the EU? *500 character(s) maximum*

Deploying fossil-based hydrogen across the EU will be incompatible with climate targets, and green hydrogen is likely to be limited in supply. A comprehensive assessment of the deployment priorities is required. Given hydrogen is expensive and hard to transport, hydrogen clusters close to industrial users should be prioritised. It is unclear whether or when hydrogen demand will justify the development of an EU-wide market. The competition and State aid rules are a cornerstone of a well-functioning internal market and not a regulatory barrier to development of a hydrogen market.

32. Which are in your view the main regulatory barriers to the development of a cross-border hydrogen market and a cross-border hydrogen infrastructure with third countries? *500 character(s) maximum*

A hydrogen backbone has been heavily pushed by the gas industry, but lacks support from independent energy experts (IDDRI, What role in the transition for a Trans-European hydrogen network? (May, 2021)). Before addressing regulatory barriers to establish cross-border trade, the Commission should procure a comprehensive study into hydrogen demand and supply, and strategies to ensure climate-compatibility. This would include assessing opportunities for renewable energy production in third countries, and interconnections, to meet green hydrogen production needs in the EU.

Section IV.1. Regulatory framework for pure hydrogen markets and pure hydrogen infrastructure

33. What regulatory model at EU level do you consider suitable to foster the emergence of a well-functioning and competitive hydrogen market and hydrogen infrastructure?

- No regulatory intervention is needed. Progress so far has been made without rules at EU level and competitive markets outcomes are likely to emerge without intervention.
- The creation of 'competition for the market' by tendering concessions at national level to own and operate hydrogen networks is a market model that can work for hydrogen. It will foster infrastructure development. Rules on the operation of the network are not needed.
- We need regulation to ensure "competition in the market". A common approach is needed in which an EU legislative framework outlining key regulatory principles (such as neutrality of network operation, third party access, cost reflective and market compatible network tariffs, treatment of private networks) are set as networks can represent natural monopolies. The rules could be developed stepwise, e.g. the creation of more detailed EU- wide technical rules could be left to later, or Member States could be allowed to develop such rules earlier where needed.

- We need regulation to ensure "competition in the market", already with a greater level of detail at EU level. The final market organisation should be specified now to prevent regulatory divergence between Member States and create investment certainty. Detailed rules (with implementing regulatory principles and technical rules) are needed at EU level from the start.
- **Other approaches are needed/required to regulate the hydrogen network as the regulatory approach currently used in gas and electricity offers little guidance.**

34. If you consider that other approaches are needed/required, please explain what approach is needed and why. *500 character(s) maximum*

Future hydrogen demand and availability is still too uncertain to justify the deployment of hydrogen cross-border transport infrastructure or the development of a comprehensive regulatory model for it. The regulation of hydrogen should be limited and focused on ensuring safety and that hydrogen is used in hard to electrify end-use applications where efficiency or electrification are not feasible or efficient, as noted by the Commission in its Strategy for Energy System Integration.

35. Although further development of hydrogen markets along the value chain seems highly likely, significant uncertainties remain. How should this uncertainty be taken account of in designing a 'fit for purpose' regulatory framework?

- Setting clear key regulatory principles for infrastructures will remove important uncertainties, while flexible rules do not. Precise rules are thus

better than flexible ones.

- Setting main regulatory principles leaves enough flexibility for details to be set later or at Member State level. No specific provisions are required to allow for flexible application of main regulatory principles.
- Main regulatory principles are needed. However, flexibility needs to be built in, e.g. by allowing temporary exemptions/derogations from main regulatory principles.
- A dynamic regulatory approach should apply. Based on a periodic assessment of the market's maturity, it will be decided if regulatory intervention along pre-defined principles is needed. The benefits of such a flexible approach outweigh the costs of interventions with retroactive effect and regulatory uncertainty.

36. If you consider allowing temporary exemptions/derogations from main regulatory principles an important element, please explain which principles exemptions/derogation are useful and why.

500 character(s) maximum

37. How important would you consider to define the following regulatory roles and principles early in order to facilitate the development of a dedicated hydrogen network and market framework towards 2030?

Role/regulatory principle	No opinion	Very important	Important	Neutral	Not very important	Not important
Role of existing network operators (TSOs/DSOs) in developing hydrogen infrastructure						X
Role of private parties (non-TSO/DSO operators) in developing hydrogen infrastructure			X			
Rules to ensure the neutrality of hydrogen network operations (i. e. unbundling)				X		
Third Party Access to hydrogen infrastructure				X		
Cost-reflective, non-discriminatory network tariffs for hydrogen networks that are market compatible.			X			

Market rules on capacity allocation and congestion						X

management at cross-border interconnection points in hydrogen networks						
Market rules on balancing the injection of hydrogen in a network with the volumes taken off the network by a given network user				X		
Rules on cross-border operability of hydrogen networks.				X		
Rules on tariff setting for hydrogen networks				X		
Rules on the valuation of assets when they are repurposed and taken out of the regulated asset base of a gas-TSO			X			

Section IV.2. Regulated versus non-regulated hydrogen networks

38. With the imminent phase out of low-calorific methane gas (L-gas) and the demand for methane gas expected to decline after 2030, parts of the existing pan-European gas infrastructure could be repurposed to provide for the necessary infrastructure for large-scale cross-border transport of hydrogen. Should existing methane gas network operators be allowed to own, operate and invest in hydrogen networks?
    - Yes, the current gas network operators (TSOs/DSOs) should have a prominent role. The current gas market model could serve as a model for future hydrogen markets.
    - Yes, but a parallel pathway for non-regulated infrastructure investments by private parties should exist.
    - **No, a hydrogen network will need to be regulated, but the current gas network operators (TSOs/DSOs) should not have a prominent role.**
    - No, hydrogen networks should be left unregulated. “Competition for the market” can work.

39. How should **existing private** hydrogen pipelines (pipelines directly connecting hydrogen supply and demand whilst not being part of a meshed, interconnected network) be regulated?
    - Existing private networks should be left unregulated. This is a pathway for infrastructure development in parallel to a regulated system.
    - Existing private network operators should be left unregulated but able to unilaterally choose to ‘opt-in’ into an existing regulated system.
    - Existing private networks can be exempted (under NRA supervision) from regulatory requirements (such as unbundling and third party access) but a sunset date needs to be set (e.g. once supply contracts expire, once it is integrated in a other, already regulated hydrogen network or by conducting regular market tests to verify market interest in accessing the pipeline).
    - No special treatment for existing private infrastructure. Main regulatory principles should apply to all networks as of the moment of their introduction.

40. Should **future private** investments in hydrogen pipelines be regulated?
    Future private networks should be left unregulated. This is a pathway for infrastructure development in parallel to a regulated system.

- The default rule for future networks should be that they are regulated. Exemptions for private investment from certain provisions (e.g. unbundling, third party access, tariff regulation) can be considered provided conditions are met (akin to Article 36 of the current Gas Directive).
- Private investments should be allowed and exemptions for private investors to stimulate them should be considered. However, day-to-day operations of private networks could be left to other bodies, e.g. an Independent System Operator (ISO).
- No special treatment for future private infrastructure. Main regulatory principles should apply to all networks.

Section IV.3. Main principles for regulated hydrogen networks

41. Vertical unbundling[2] should prevent that hydrogen network operators (i) discriminate against third parties with regard to the connection or access to the network in favour of affiliated production and supply activities, and/or (ii) that hydrogen network operators over- or under-invest in their energy network which could increase energy system costs or purposely limit capacity to hinder competitor's access. Please indicate the extent to which the vertical unbundling principle should apply to hydrogen networks:

[1] For the purpose of this questionnaire and to reflect the specific situation of interrelation between hydrogen and methane gas networks, the Commission will refer to "vertical unbundling" when describing the separation of hydrogen production, trade and supply activities from hydrogen network-related activities and to horizontal unbundling, when describing the separation between ownership of hydrogen and methane gas networks.

- Accounts unbundling should be applied: the use of separate accounts for the regulated hydrogen network activities and hydrogen production and supply activities.
- Functional unbundling should be applied: the effective separation of the decision making rights between the network and production/supply activities, as well as the separation of the human, technical, physical and financial resources.
- Legal unbundling should be applied: the separation of network operation activities in a distinct legal entity.
- Based on the experience in gas and electricity markets, ownership unbundling should be applied from the start: the same company is not allowed to control both the hydrogen network and hydrogen production or

supply interests, although e.g. the ownership of minority shares without rights to vote or appoint board members may be allowed.

42. Should (regulated) network operators (e.g. gas, electricity or hydrogen TSOs /DSOs) have a role in Power-to-gas installations (i.e. electrolysers)?

- Network operators should never own or operate Power-to-gas installations. To avoid conflicts of interest and network foreclosure, system operators should be precluded from investing in and running power-to-gas installations (as is currently the case). Investment and management of power-to-gas installations should be market-based and open to competition among market players. Investment by regulated entities will discourage investments by market participants and create competition distortions.
- **Network operators should never own or operate Power-to-gas installations. However, network operators should be encouraged to be involved in R&D and development projects that are related to energy grid operations (e.g. grid connection and grid services, like balancing provision). Network operators are well placed to assist in such projects and encouraging their active involvement will facilitate the integration of Power-to-gas installations where no rules exist and speed-up rule setting.**
- Vertical unbundling remains the default option. Exemptions for network operators to own or operate Power-to-gas installations should only be allowed in clearly defined circumstances. For example, only if this is necessary to guarantee network operations and if no other market party is willing to carry out the investment. Clear and limited conditions should be defined (e.g. limitations in scope, scale and time), after it has been proven that the market is not willing to invest in such installations and foreseeing a procedure to transfer such installations back to a market-based regime once the derogation expires.
- There are no reasons to impose restrictions on network operators to operate or invest in power to gas installations or such choices can be left to Member States or National Regulatory Authorities.

43. How should non-discriminatory access to future regulated hydrogen networks be ensured?

- The principle of *negotiated* third party access should apply. It will be left to the hydrogen network operator and the network users to negotiate the terms of access to the network, such as tariffs. National regulators play a role at distance only.
- The principle of *regulated* third party access should apply. Infrastructure operators should be obliged in EU legislation to provide non-discriminatory access to network users on the basis of published terms and conditions, including tariffs that are set or approved by the national regulator.
- Third party access does not have to be ensured.

44. Today's rules for gas network tariffs (see Art. 13 of the Gas Directive) seek to avoid cross-subsidies between network users but also to provide incentives for investments. In an emerging hydrogen market, the transported hydrogen volumes as well as the customer base might be low initially. This could lead in certain cases to high initial hydrogen network tariffs for early users of a hydrogen network. Please indicate the appropriateness of the statements below in case incumbent methane gas network operators should be allowed to retrofit their assets for hydrogen transport:

Statement	No opinion	Completely agree	Agree	Neutral	Disagree	Completely disagree
Horizontal unbundling rules should ensure that hydrogen pipelines are being financed by hydrogen network users only and not by methane gas network users. Methane gas network users should not carry the costs and risks for a hydrogen network and non-TSO hydrogen operators should not suffer a competitive disadvantage.		X X				

Cross-subsidisation between users of the						X

methane gas infrastructure and the hydrogen infrastructure should be allowed. This could lower the initial tariffs for the use of hydrogen networks and could facilitate the conversion of parts of the methane gas infrastructure into hydrogen infrastructure.						
Cross-subsidies between methane and hydrogen network users should not be allowed. Other measures should be made available to lower initial hydrogen network tariffs (such as public grants or subsidies to network users or network operators).			x			

45. Do you think the current structure of cross-border gas transmission tariff system is suitable for the development of the hydrogen market (or other renewable and low carbon gases) in the EU?

Yes

No, other ideas should be developed, for instance to avoid tariffs on cross-border points between EU Member States.

Please explain why *500 character(s) maximum*

There is a high degree of uncertainty about the future of hydrogen demand and availability. Hydrogen networks will develop in smaller areas or clusters. While some clusters may be cross-border, many will not, and therefore the development of a cross-border hydrogen tariff system is not necessary.

46. The creation of hydrogen networks, specifically by repurposing, may give rise to coordination problems when operated by separate and fragmented system operators. This may hamper the development of a well-functioning cross-border hydrogen market. The creation of hydrogen markets opens up a possibility to manage and operate the hydrogen pipelines by a European Independent System Operator (ISO). Do you support to introduce an EU ISO model for hydrogen?

Yes

No

Please explain your answer *500 character(s) maximum*

At this stage, with the high degree of uncertainty about the future of hydrogen demand and availability, we do not consider that the creation of an EU ISO is necessary. Hydrogen networks in the foreseeable future will only develop in reduced, separate clusters, a layout that does not call for the intervention of a single EU ISO.

47. The configuration of many energy networks and the rules that apply to them set out a clear distinction between a transmission and distribution level. Is this distinction relevant for a hydrogen regulatory framework before 2030? Do you expect the development of a “transmission” and a “distribution” level for hydrogen?

- No: hydrogen networks may have different features than methane networks (e.g. high/low pressure distinction less relevant in hydrogen network). At this stage, main regulatory principles should apply at any point in a hydrogen network.
- Yes: Many potential customers are connected to distribution grids; it should already be anticipated now that different rules should apply for the distribution and transmission level.

- Yes: At this stage, rules should be set for the transmission level only. EU rules for the distribution level can wait until later or be defined at Member State level.
- **Yes: At this stage, rules should be set for the distribution level. EU rules for the transmission level can wait until later or be defined at Member State level.**

Please explain your answer

500 character(s) maximum

Section IV.4. Inventory of national rules on the construction of methane and hydrogen pipelines

48. In order to repurpose the existing methane gas infrastructure for hydrogen transport, it is necessary to clarify whether rights of land use, private easements as well as (other) public permits that have been granted for the construction and operation of methane gas pipelines will remain valid once the transported gaseous energy carrier changes from methane gas to hydrogen. In addition, a legal framework covering these aspects might also be required for the construction and operation of new hydrogen pipelines. Will the construction of dedicated hydrogen pipelines (either repurposed or new built pipelines) be considered a public interest in your Member State?

- Yes
- No
- Do not know

49. Will rights and permits in your Member State initially obtained for the construction and operation of methane gas pipelines remain valid in case the development and (re-) use of these pipelines for hydrogen transport is foreseen?

- Yes
- No
- Do not know

50. Is a (new) legal framework covering public permits and rights of land use required in your Member State for the construction and operation of new hydrogen pipelines?

- Yes

- No
- Do not know

51. Should rights and permitting requirements for hydrogen infrastructure be similar to that of those that are applicable today to methane gas pipelines in your Member State?

- Yes
- No
- Do not know

52. If you replied ‘no’, please explain

500 character(s) maximum

Section IV.5. Consumer rights for users of pure hydrogen

53. The Commission expects as set out in the EU hydrogen strategy[1] that renewable and low carbon hydrogen will be used first in certain industrial applications (like refineries, steel production, fertiliser productions, chemical complexes) and certain transportation modes (heavy duty road transportation, maritime). In view of these typical end-users that may adopt hydrogen by 2030, what rights and protection rules for users connected to a pure hydrogen network may be needed?

[2] https://ec.europa.eu/energy/sites/ener/files/hydrogen_strategy.pdf

- Other than network access rights, little needs to be done in terms of customers rights. These typical end-users do not need specific consumer rights and protection.
- It is important that these typical users of a hydrogen network have the same rights as if they would be connected to the methane gas grid. Having the same consumer rights and protection ensures a level playing field between energy carriers.
- It is important that consumer rights and protection rules for all consumers connected to a hydrogen grid are fully aligned with those for consumers of connected to the methane grid, regardless as to whether they are likely to use hydrogen or not or their size (i.e. households).

54. What consumers rights and protection rules will need to be clarified already now for users receiving pure hydrogen from dedicated hydrogen networks?

Consumers rights and protection rules	No opinion	Very important	Important	Neutral	Not important	Very important
Access to consumption data	X					
Information on billing	X					
Information on quality of H2 supplied		X				
Information on CO^2 content of hydrogen along its life-cycle[4] [Including emissions determined from hydrogen transport, distribution, liquefaction and storage].		X				
Information on rights to switch supplier	X					
Information about dispute settlement mechanisms			X			

Section IV.6. Quality standards for pure hydrogen and its governance

55. Different hydrogen production methods produce hydrogen of different purity and different end-uses require specific purity levels[4]. To ensure the cross-border flow of pure hydrogen from production to consumption centres and to ensure the interoperability of the connected, neighbouring markets, common quality standards or cross-border operational rules may be necessary. In your view, at what level should such binding hydrogen quality (purity) standard be established?

[3] In a simplified way, we can distinguish between industrial grade purity for the hydrogen used e.g. in refineries, for ammonia and steel production and fuel cell grade purity for use in low temperature fuel cells, e.g. current road and rail transport applications.

- At Member State level (i.e. maintaining potential differences between Member States).
- **At Member State level with EU-level cross-border coordination rules (i.e. allowing for coordination between Member States).**
- At EU-level, setting common standards for hydrogen quality across the EU. No common rules on hydrogen quality standard are necessary before 2030.

56. In a cross-border dedicated hydrogen network, adapting the quality of hydrogen for specific end uses (purification) might become an important task (including the measurement and monitoring of hydrogen quality). In your view, what would be the most efficient and appropriate way to establish the necessary rules on roles, responsibilities and cost-allocation for the management of hydrogen quality?

- Member State level regulatory framework (i.e. with potentially very different regimes per Member State).
- EU-level principles providing for a common overall approach in the Member States.
- EU-level principles providing for a common approach combined with regional implementation.
- EU-level rules ensuring a harmonised approach across the EU. No common rules are necessary before 2030.

Section IV.7. Hydrogen storage and hydrogen import from outside the European Union

57. Do you see the need to develop larger-scale, dedicated hydrogen storage facilities in the EU in light of the increased use of hydrogen in the EU?

- Yes
- No

58. Do you think that regulation of hydrogen storage would be necessary?

- Yes, to the same degree as for methane storage (leaving Member States the choice of negotiated or regulated third party access).
- Yes, but it should not be directly available to the market itself and should only be used by the operators for network operation purposes.
- No, hydrogen storage facilities can be left unregulated.

59. Hydrogen is likely to be produced inside the EU at the same time imports from outside the EU may be possible and competitive for the supply of hydrogen.

- **I disagree, imports will not take place before 2030 and therefore there is no need to look into relevant infrastructure.**
- Whilst imports may still be modest by 2030, they will require the necessary infrastructure and reflection on appropriate measures should start now.
- It is important that import infrastructure is in place by 2030.

60. Hydrogen may be transported via pipelines into the EU, but also via non-network based transport options. In case you expect non-network based imports from outside the EU, in which way do you expect hydrogen to be carried into the EU?

- Shipped into the EU as liquefied hydrogen.
  Shipped into the EU as ammonia.
- Shipped into the EU on the basis of Liquid Organic Hydrogen Carriers ('LOHCs').
- Transported into the EU via trucks.

61. Do you see a need to prepare EU LNG terminals to receive liquefied hydrogen?
Yes, todays import terminals can play an important role in supplying the EU.
No, imports will become important but large-scale LNG terminals will not be relevant.

62. In case hydrogen is carried into the EU as liquefied hydrogen, ammonia or LOHC, would you expect subsequent injection into pipelines?

	No	Yes
If imported as liquefied hydrogen		
If imported as ammonia		
If imported as LOHC		

63. How important would you consider to define the following regulatory principles early in order to facilitate the development of a dedicated hydrogen infrastructure and market framework towards 2030?

Regulatory principle	No opinion	Very important	Important	Neutral	Not very important	Not important
Market rules for access to storage for (pure) hydrogen						
Market rules for access to import terminals for pure hydrogen						

V. Access of renewable and low carbon gases to the existing methane gas networks and markets, including LNG terminals and gas storages

Today, biogas[5] and biomethane provide the most significant sources of renewable and low carbon gases in the EU with some 18 bcm annually (5% of total gas demand). Whereas biogas is used off the grid (for power production or by the industry to reduce process related CO2 emissions), biomethane can be injected into the existing methane network. However, the deployment of biomethane is currently below its potential. There are about 725 biomethane plants connected to the gas grid, the majority at the distribution grid level. Synthetic methane has the potential to support the decarbonisation of gas as well. It is produced by adding CO2 captured during the upgrading of biogas to biomethane, from industrial processes, or eventually directly from the air to renewable or low carbon hydrogen.
Biomethane and synthetic methane injected at distribution level may face barriers preventing it from being traded on the EU's wholesale markets to the same degree as methane gas. Similar difficulties may be encountered by hydrogen when blended into the existing gas grid.

[4] Biogas is about 60% methane, 40% CO2 + some impurities. Upgrading biogas to biomethane level requires removal of CO2 and impurities. If used and, more importantly, stored the CO2 obtained in production of biomethane from biogas is sometimes argued to create 'negative' emissions

64. Which are in your view the main regulatory barriers to the deployment of biomethane and synthetic methane?

500 character(s) maximum

65. Do you consider it important to adapt the Gas Directive and Gas Regulation to facilitate injection biomethane and synthetic methane into the existing methane gas grid?

- Yes
- No

66. Do you consider it important to adapt the Gas Directive and Gas Regulation to the needs of hydrogen to be injected into the existing gas grid?

- Yes
- **No**

67. How do you rate the measures below? (one answer per question)

Measure	No opinion	Very important	Important	Neutral	Not very important	Not important
Adapt tasks and responsibilities of national regulatory authorities to oblige them to facilitate the process of decarbonisation of gas when taking decisions (e.g. as regards development of infrastructure).		X				
Improve the coordination between transmission and distribution system operators to facilitate the process of decarbonisation of gas.	X					
Ensure access to the transmission level and to the EU's wholesale market of renewable and low-carbon gases produced at distribution level.						X

Integrate the distribution system operator level into the	X					

entry-exit system with the same balancing regime that is applicable to the transmission system operator.						
Extending the model of energy communities of the Electricity Directive to the gas market to consume volumes of biogas, biomethane or hydrogen not injected to the interconnected grid.						X (not relevant)
Obliging operators to ensure connection for new renewable gases facilities i.e. priority connection and dispatch.		X				
Reducing network tariffs for injection of renewable gases to the grid.		X				
Limit tariffs to efficient network operations, not supporting other policy objectives.						

Make the short term capacity products for methane pipeline and						

storage infrastructure more attractive to better reflect the interdependency with electricity and compatibility with the support schemes for renewable and low-carbon gases.	X					
		X				
System operators should be obliged to explore the opportunities for improving the energy efficiency of the system (i.e. eliminate leaks, recovering energy from pressure drops between high, medium and low pressure grids, optimise heat management including cold recovery from pressure decrease).		X				

68. The current gas market model implies diverging access tariffs at the borders of Member States. As pointed out by ACER *"Cross-border tariffs tend to have a referential role over hub price spreads, although the role may vary per case. In hub pairs, mainly in the Nord-West Europe area, day-ahead price spreads are regularly below daily transportation tariffs and frequently also below yearly transportation tariffs (the latter being usually more economic)[6]".* For the sake of an enhanced efficiency of gas markets into an integrated EU-wide internal market so as to facilitate the uptake of renewable and low-carbon gases within the market, a re-design of the access tariff to be more compatible with market dynamics could be introduced. This would lead to a full integration of gas markets and avoid price spreads across EU. It would however bear the risk of redistribution of transportation tariff between Member States in accordance with inter-TSO agreements and changes to end-user tariffs. Moreover, the re-designing of the short-term capacity products may avoid capacity foreclosure/lock-in in favour of long-term (natural) gas trade to the detriment to the renewable and low carbon gases. This may also help in aligning the capacity products of the future methane-based system with the electricity market operating on the basis of short-term trading. This could be done even in absence of EU-wide common rules on e.g. the overall rate of return, depreciation times or asset value for the gas grids, as these are set out at national level.

How do you rate the measures below to reach this enhanced level of design?

[5] see ACER's Market Monitoring Report 2019, p.58)

Measure	No opinion	Very important	Important	Neutral	Not very important	Not important

Abolishing grid charges on intra-EU cross-border points, payable price for capacity booking determined by auctions only (minimum price fixed at variable costs only). Charging the entry points from non-EU countries based on capacity weighted distance to a virtual point in the middle of EU's grid in addition to some fees set according to market and security of supply criteria Collecting the remuneration of the EU's						

network operators from capacity auction revenues at extra-EU entry points, intra-EU entry points for gas' production and from exit points Introducing an inter-TSO compensation mechanism to reconcile revenues by keeping TSOs revenues neutral with the current circumstances. Setting up short-term capacity products						
Harmonising allowed revenues parameters for TSOs (e.g. WACC, depreciation time, valuation of assets)						

EU level guidance for the regional integration						

of the gas market, including gas market mergers						

69. The measures under question 67 and 68 could be combined. How do you see such a possibility?

500 character(s) maximum

70. The LNG market in Europe has significantly changed since the adoption of the Third Energy Package setting the rules applicable to LNG terminals in the EU. Additional LNG volumes imported to the EU, more short-term trade and an increased number of LNG terminals in the EU change the way the terminals operate. Market participants are calling for more transparency, flexibility of products and access rules[7]. Provided that adaptations are made and that sustainable renewable gases can be verified in third countries, LNG terminals can play a role in importing renewable and low-carbon gases (i.e. liquid hydrogen, biomethane, ammonia, synthetic-fuels). Gas storage facilities may also play an important role for renewable and low-carbon gases either directly or after adaptations. Do you think the existing regulatory framework for LNG needs to be modified? (multiple answers possible)

[6] https://op.europa.eu/en/publication-detail/-/publication/efa4d335-a155-11ea-9d2d-01aa75ed71a1/language-en.

- Yes, it needs to incentivise and promote the access of renewable and low-carbon gases into the LNG terminals (i.e. synthetic methane, bioLNG, etc.) Yes, it needs to be more harmonised in terms of transparency and access to available capacities to improve the functioning of LNG market in the
- Yes, it needs to be less prescriptive compared to the current framework, allowing for negotiated access rules to LNG terminals
- No, it strikes the right balance as it is
- Other (pls allow for comments)

71. Do you think that LNG terminals will play an important role in the decarbonisation of the gas sector?

- Yes, the import of renewable and low-carbon gases via LNG terminals into the EU will play an important role
- No, LNG terminals cannot be used to import renewable and low-carbon gases

72. Which renewable and low-carbon gases, in your view, can be imported via LNG terminals?

100 character(s) maximum

73. How important do you consider the following measures to be to improve the current regulatory framework for LNG terminals?

	No opinion	Very important	Important	Neutral	Not very imortant
Require LNG terminals and other gas depressurising sites to provide waste heat/cold to nearby heat/cold consumers			X		
Introduction of measures coordinating the adaptation of LNG terminals to renewable and low-carbon gases e.g. coordination of development plans, market tests etc.			X		
Removing of the tariff discount for gaseous fuels entering the TSO grid from LNG terminals, regardless of the type of gas.	X				
Introduction of stronger enforcement rules preventing cross-subsidisation of LNG terminals.		X			
Introduction of an EU-wide information platform that ensures transparency on and comparability between terminal service offerings, tariff levels, and available capacities.	X				
Facilitate more transparency in the secondary trading of capacity.	X				
Harmonise the congestion management rules to improve terminals' usage.				X	
Provide an option for Member States to opt for "negotiated" access similar to storage facilities.	X				

74. Do you have any other view or ideas related to improve current regulatory framework for LNG? Please specify.

500 character(s) maximum

There is a risk that LNG facilities will continue to receive State aid on the premise that they will be able to process clean fuels, despite a lack of independent analysis and binding conditions regarding the viability, cost and timing of such conversions. LNG facilities should not receive public funding for new facilities or upgrades unless for the purpose of importing green hydrogen or green ammonia subject to strict conditions. Any public funding must be contingent on legally-binding requirements for independent assessment of the viability of conversion (that considers the risk of insufficient supply of the relevant gas in the future), and the associated costs and public finding needs.

75. Do you think the Gas Directive and Gas Regulation should be revised to encourage and promote the role of storage for use of renewable and low-carbon gases by introducing transparency measures such as coordination of development plans, market tests?

Yes

No

76. The blending of hydrogen and other renewable or low carbon gases into the existing methane gas grid requires a consideration of its contribution to the decarbonisation of the energy system as well as its economic and technical implications (see specific questions on technical implications in section on gas quality). Please indicate the appropriateness of the statements below with regard to blending

Statement	Completely disagree	Completely agree	Agree	Neutral	Disagree
Blending provides a cost efficient and fast first step to energy system decarbonisation. It will facilitate the offtake of hydrogen and other renewable and low carbon gases by using existing methane gas infrastructure	X				
Blending prevents the direct use of pure hydrogen in applications where its value in terms of GHG-emission reductions is higher, such as industry and transport.		X			
Blending creates technical constraints and additional costs at injection and end-use appliances which makes it a less cost-efficient option for decarbonisation.		X			

VI. Gas Quality

The variety of sources of gases transported through the EU's methane gas networks[8] leads to a corresponding variety of gas quality with different physical and chemical characteristics. These gas quality characteristics are an essential consideration for the design of gas infrastructure and end-use appliances, as well as for industrial processes using gas as feedstock, in order to ensure the safety and efficiency of operation. To this end, gas quality standards have been developed. Member States have established their own practices to control gas qualities at national level, adapted to their national context (e.g. quality of gases historically consumed and appliances in use). In addition, the CEN standard on H-gas quality[9] is currently the fundamental standard for the EU gas sector used in EU Member States. However, the CEN standard is not applied in a coordinated[10] or binding manner and therefore, is not sufficient on its own to provide for a harmonisation of gas quality standards across EU Member States. Differences in gas quality can lead to problems for end users and have negative effects on cross-border trade.

The issue of gas quality is becoming more pressing with the effort to decarbonise the EU's energy sector, as this will require the injection of growing volumes of renewable and low-carbon gases into the existing gas transmission and distribution networks. The quality parameters of gas consumed and transported in Europe will change, leading to more frequent quality fluctuations to a much larger extent than is the case today. This will affect the design of methane gas infrastructure and end-user applications, as well as industrial processes using gases as feedstock. However, the existing regulatory framework was not designed to cater for such developments[11].

[7] Currently mainly natural gas from different sources in and outside of the EU combined with a growing volume of renewable and low- carbon gases produced in the EU.

[8] European Committee for Standardisation, EN 16726 "Gas infrastructure – quality of gas – group H", OJEU, December 2015.

[9] Study: Potentials of sector coupling for decarbonisation: Assessing regulatory barriers in linking the gas and electricity sectors in the EU, December 2019, https://ec.europa.eu/energy/studies/potentials-sector-coupling-decarbonisation-assessing-regulatory-barriers_en; 6th CEER benchmarking report on the quality of electricity and gas supply, 2016.

[10] The Interoperability and Data Exchange Network Code is establishing a dispute resolution process in case of cross-border trade restrictions due to gas quality differences; Commission Regulation (EU) 2015/703 of 30 April 2015 establishing a network code on interoperability and data exchange rules, Article 15.

78. In your view, what is necessary to ensure efficient coordination on gas quality between Member States?

- ○ The current cross-border coordination framework, is sufficient to deal with problems due to gas quality differences in the energy transition.
- ○ Reinforced cross-border coordination tools (e.g. streamlined procedure, involving all impacted market. participants, increased transparency).
- ○ Harmonised application of gas quality standards across the EU.

79. In your view, the harmonised application of the CEN standard across EU Member States would be best achieved by:

	Completely disagree	Completely agree	Agree	Neutral	Disagree

Increased transparency on the application of the current standards (e.g. on measured parameters, on frequency of measurement, on rules of information provision).					

EU-wide harmonised rules on information provision and publication of CEN quality parameters.					
Harmonising the gas quality standard across the EU based on the CEN H-gas standard.					
Harmonising the gas quality standard across the EU based on a standard taking fully into account renewable and low-carbon gases, developed by an independent technical expert group.					

80. The injection of hydrogen into the existing methane gas network (blending) is currently explicitly accepted only in a few Member States and only possible at very low concentration levels. Similarly, hydrogen blending limits at cross-border interconnection points are applied only in a few Member States. In your view, what would be necessary to avoid or limit potential negative effects of hydrogen blending into the existing methane gas network from the perspective of end-users and infrastructure operators (e.g. for safety, production efficiency, product quality, emissions, etc.)?

- **Not to blend hydrogen into the current methane gas network.**
- Develop robust gas quality standards (e.g. CEN, national) allowing for the injection of renewable and low-carbon gases (including hydrogen) into the existing methane gas network.
- Establish EU wide harmonised quality specification at the transmission level, including at cross-border interconnection points, allowing for the injection of renewable and low-carbon gases (including hydrogen) into the existing methane gas network.

81. Clearly defined allowed blending levels at the EU or national level (e.g. minimum and/or maximum level of hydrogen in % by volume to be accepted in the network) could provide certainty for producers, infrastructure and appliance manufacturers and end-users. Applied at cross-border interconnection points, such blending levels would enable the unhindered flow of blended gases across Member States. In your view, should allowed hydrogen blending levels be introduced, and if yes in what form?

- **Not at all.**
- National hydrogen blending levels set by Member States.

- National hydrogen blending levels set by Member States in a standardised and transparent way, based on EU rules.
- Harmonised EU-wide hydrogen acceptance level for hydrogen blends, which TSOs have to accept at cross-border interconnection points (minimum and
- /or maximum level of hydrogen in % by volume).

82. Do you consider that rules on roles and responsibilities on gas quality management, including e.g. on cost allocation, dispute resolution and regulatory oversight, should be defined, and if yes in what form?

- Not necessary to define such rules.
- At Member State level (i.e. maintaining potential differences of the regulatory framework across Member States).
- By establishing EU-level principles providing for a common approach in the Member States.
- By setting EU-level rules ensuring a harmonised regulatory framework across the EU.

83. Do you see changes to the roles, tasks and liabilities of market participants with regard to gas quality monitoring, measurement and management?

Type of market participant	No	Yes
Gas producers, including producers of renewable and low-carbon gases		
Transmission System Operators		
Distribution System Operators		
Consumers		
Gas appliance manufacturers		
Service providers		
Others (please specify)		

Please specify what these changes would entail *(gas producers)*

100 character(s) maximum

Please specify what these changes would entail *(TSOs)*

100 character(s) maximum

Please specify what these changes would entail *(DSOs)*

100 character(s) maximum

Please specify what these changes would entail *(consumers)*

100 character(s) maximum

Please specify what these changes would entail *(gas appliance manufacturers)*

100 character(s) maximum

Please specify what these changes would entail *(service providers)*

100 character(s) maximum

Please specify what these changes would entail *(others)*

100 character(s) maximum

84. In your view, at what point in the gas value chain should the quality of gases be adapted to the standard specifications, considering also technical feasibility and cost-effectivity?

- At gas production/injection points by the producer (i.e. before injection into the gas system, e.g. with adequate quality contracts).
- In the transmission and/or distribution system by the system operator. At the exit point by end-users.
- At the exit point to end-users by a third party service provider.

85. While handling varying qualities and more frequent quality fluctuations of the different renewable and low-carbon gases, gas quality management should remain cost-effective in the coming years and decades. Cost effective quality management requires sufficient transparency and information sharing. Do you consider that providing improved visibility on gas quality and transparency on the cost of gas quality measurement, monitoring and handling is needed?

- Yes

- No

86. The current regulatory framework[12] includes some requirements on TSOs to share information on gas quality. In order to enable market participants to deal with different gas qualities and potentially with quality fluctuations, it might be however necessary to further develop the visibility on gas quality for market participants. Please indicate the importance of the measures below.

[11] Commission Regulation (EU) 2015/703 of 30 April 2015 establishing a network code on interoperability and data exchange rules (Articles 7, 16, 17 and 18).

Measure	Not important	Very important	Important	Neutral	Not very important
The current regulatory framework is sufficient to ensure adequate transparency on gas quality (Interoperability and Data Exchange Network Code).					
Provide improved visibility on gas quality (actual and forecast) to market participants.					
Extend the group of market participants receiving gas quality information (e.g. to include producers, all end-users, appliance manufacturers).					
Ensure transparency on the roles, responsibilities and liabilities for gas quality management.					
Provide for transparency on the costs of gas quality management (incl. measurement, monitoring and handling).					
Include gas quality aspects into the coordinated network planning (national and EU-wide).					

87. The potential changes to the regulatory framework and the changing role of market participants in gas quality management requires revisiting the question of proper regulatory oversight. However, harmonised rules on the role of National Regulatory Authorities (NRAs) for gas quality issues is currently missing. While NRAs have a role in dispute resolution in case of cross-border trade restrictions due to gas quality differences[13], most of them are not involved in setting gas

quality standards or in monitoring gas quality parameters. Do you consider it necessary to reinforce the roles and responsibilities of NRAs in a harmonised way to ensure proper regulatory oversight of the revised gas quality regulatory framework?

[12] Commission Regulation (EU) 2015/703 of 30 April 2015 establishing a network code on interoperability and data exchange rules, Article 15.

Yes

No

88. Do you see any other issues related to improving the regulatory framework on gas quality management you would like to raise? Please explain.

500 character(s) maximum

VII. Alignment of institutional rules for gaseous fuels to the Clean Energy Package

EU electricity and gas market rules have been developed in parallel over the last 20 years and no distinction was made so far as concerns regulatory oversight over gas and electricity markets. Sector integration, i.e. more integrated EU electricity and gas markets may even require more aligned rules.

The revision of the Electricity Directive and Electricity Regulation adopted in 2019 (Directive (EU) 2019/944 on common rules for the internal market for electricity and Regulation (EU) 2019/943 on the internal market for electricity) reinforced the institutional framework to make it fit-for-purpose for the changes in the electricity sector (integration of renewables, decentralised electricity production, regionalisation, etc.). However, this creates differences in the institutional set-up between the electricity and gas sectors, which might lead to detrimental regulatory divergence and unnecessary complexity that could affect consumers, industry and regulators alike.

The revision of the gas legislation would envisage to align the provisions on the institutional framework for the gas sector to those already adopted for electricity, as this would also help implementing the sector integration principle. Updating the institutional framework for gas appears also necessary to make the EU gas sector fit for decarbonisation.

89. In your view, to ensure the consistency of the regulatory framework, in which areas is it important to align the institutional provisions of the electricity and gas sectors?

Area of alignment to the electricity institutional framework	Gas market specificities require a	Align gas legislation to the rules in the

	different set of rules for gas	Clean Energy Package (electricity legislation)
Adapting ENTSOG's mission, tasks and the rules governing its transparency and oversight by the Agency for the Cooperation for Energy Regulators (Electricity Regulation, Articles 28-31).		X
Adapt the role of ACER to oversee the effective functioning of the integrated markets and cross-border infrastructure (ACER Regulation, Article 4).		X
Aligning the process for developing detailed regulatory rules on the operation of the market and networks (i.e. network codes and guidelines, Electricity Regulation, Articles 58-60 and ACER Regulation, Article 5).		X
Aligning the provisions reflecting the increasing link between the distribution and transmission network levels in the regulatory framework (e.g. requirements for cooperation on network planning; Electricity Regulation, Article 57).		X

90. The revision of the Electricity Market Design formalised the role of Distribution System Operators (DSOs) at European level by creating a single European DSO entity, rendering their participation effective and independent (Electricity Regulation, Articles 52-55). The aim was to facilitate distributed resources to participate in the market by – among others – enabling DSOs to become more active at European level and have increased responsibilities and tasks (similar to those of the TSOs). In your view, what would be required to ensure the EU-level representation of gas DSOs?

- There is no need to establish a DSO entity for gases.
- It is necessary to establish a separate DSO entity for gases.
- **It is necessary to establish a "department" for gases under the existing electricity DSO entity with all rules from electricity applying.**
- It is necessary to establish a "department" for gases under the existing electricity DSO entity with some specific rules applicable to gas DSOs.

91. Do you see any other issues related to the alignment of the gas institutional provisions to the Clean Energy Package provisions? Please explain.

300 character(s) maximum

The Commission should consider the need of separate ENTSOs for electricity and gas. This includes considerations of whether a single, new ENTSO-E (with the second E standing for Energy) would be capable of carrying out all the functions currently split between ENTSOG and ENTSO-E.

VIII. Security of supply dimensions

With the adoption of the Security of Gas Supply Regulation[14], the framework for the security of gas supply in the EU has developed significantly over the past years. Other EU initiatives such as the protection of critical energy infrastructure and cybersecurity were added to the energy security and safety framework. The revision of the Gas Directive and the Gas Regulation needs to take into account this evolution. At the same time, the upcoming revision and the clean energy transition might imply amendments to these other pieces of EU acquis applicable in the sector of gases.

[13] Regulation (EU) 2017/1938 of the European Parliament and of the Council of 25 October 2017 concerning measures to safeguard the security of gas supply and repealing Regulation (EU) No 994/2010, OJ L 280, 28.10.2017.

92. How do you see the security of supply challenge in the context of the decarbonisation of the supply of gases in the EU in line with the climate-neutrality objectives?

- Security of supply will not be an issue when renewable and low-carbon gases will be used in the EU.
- Security of gas supply will still be an important challenge that needs to be taken into account in the context of increased use of renewable and low-carbon gases in the EU.
- **New security issues should be taken into account.**

93. In case you consider that new security issues should be taken into account please explain which *500 character(s) maximum*

The very concept of security of supply will need to be redefined to accommodate energy system decarbonisation. “Security of gas supply” is a concept only created by secondary legislation; the Treaty on the Functioning of the European Union (Art. 194(1)(b)) provides that Union energy policy shall aim to ensure security of energy supply, not security of supply of a particular carrier. The existing framework will have to be rethought to ensure that different carriers can contribute to energy security of supply in the most efficient manner while meeting the Union’s climate targets.

94. Do you think that changes are needed to guarantee consistency between the

Gas Directive and the Security of Gas Supply Regulation:

Area of alignment	Not important	Very important	Important	Neutral	Not very important
Definitions, in general			X		
Definition of “protected customers”, in particular			X		
Clarify the conditions under which PSOs on security of gas supply grounds may be justified				X	
Solidarity mechanism					
Safeguard measures					

95. Do you see room for harmonising other elements, in addition to those listed under 94?

Yes

No

* Please specify what these changes would entail

500 character(s) maximum

96. The scope of the Security of Gas Supply Regulation is currently limited to guaranteeing the provision of “methane gas”. Do you think that the rules on security of gas supply need to be amended ?

- **Yes, the SoS Regulation should be amended as soon as possible.**
- Yes, the SoS Regulation should be amended, based on the experience of the application of the new gas market rules.
- No, the SoS Regulation is fit for purpose (guaranteeing the methane gas supply, based on existing gas corridors).
- No, the provisions of the SoS Regulation are flexible enough and already allow to take into consideration the expected adaptation of the market to the needs of renewable and low carbon gases.

* Please explain *(mandatory field)* *500 character(s) maximum*

The Security of Gas Supply Regulation should be amended to incorporate a concept of security of supply aligned with the Energy Integration Strategy that considers and makes use of the contributions of all energy carriers and solutions to safeguard security of energy supply.

97. The increasing digitalisation of energy technologies and networks makes the energy system smarter and enables consumers to benefit from innovative energy services. At the same time, digitalisation creates significant risks as an increased exposure to cyberattacks and cybersecurity incidents potentially jeopardise the security of energy supply and the privacy of consumer data. Cybersecurity and challenges related to it are evolving at a rapid pace, which is why the European Commission has taken a series of measures to tackle it[15]. Taking into account the specific challenges in the energy sector[16], the Commission adopted a dedicated recommendation on cybersecurity in the energy sector in April 2019. Further, the recent Clean Energy for all Europeans Package[17] introduced the possibility to develop cybersecurity rules for electricity.

Do you consider that developments in the gas sector also require establishing cybersecurity rules for gas? *(only one answer possible)*

[14] At horizontal cross-sectoral level, the Commission adopted a package on cybersecurity and critical infrastructure on December 2020, including a revised NIS Directive (Cybersecurity, COM(2020) 823 final), a revised Cybersecurity Strategy (JOIN(2020) 18 final) as well as a new proposal for a Directive on the resilience of Critical Entities (COM(2020) 829 final).

[15] E.g. real-time requirements, cascading effects and the mix of legacy technologies with smart/state of the art technology.

[16] Further information on cybersecurity measures: https://ec.europa.eu/energy/topics/energy-security/critical-infrastructure-and-cybersecurity_en?redir=1

- ○ There is no need to develop cybersecurity measures for the gas sector.
- ○ It is necessary to establish EU-level legislation for cybersecurity specifically for the gas sector.
- ○ **It is necessary to establish a comprehensive EU-level legislative framework for cybersecurity for the energy sector (covering the electricity, gas, hydrogen and heating sectors).**

98. Do you think that energy-specific measures should be introduced to improve the resilience of critical gas infrastructure, including renewable and low-carbon gases?

Yes

No

* Please explain *(mandatory field)*

500 character(s) maximum

ClientEarth

June 2021

Hydrogen and gas market decarbonisation package

Additional responses from ClientEarth

Introduction

The reforms to the Gas Directive and Gas Regulation represent a once-in-a-decade opportunity to update EU gas market legislation to align it with fundamental changes in the EU's energy markets. ClientEarth is concerned that some key questions in the consultation questionnaire do not invite sufficient detail on how reforms can deliver decarbonisation of gas, and what this means in terms of the phasing out of fossil fuel-based gases. We therefore outline below key issues for the Commission's considerations which, due to the nature of the questions or the space provided, we were not able to address in the questionnaire.

There needs to be a mandate for, and target to achieve, emissions reductions across the gas system in legislation (regardless of where that legislation sits). Within that target, there can be flexibility in paths for achieving it, but all decisions (planning, approvals, public funding, network codes and guidelines) should align with it. A clear decarbonisation mandate in the gas system would mitigate the risk that commitments of emissions neutrality from the gas industry will provide reassurance to decision-makers, but without legal effect. Such commitments could easily amount to greenwashing, and should not be relied on as they mislead the public and decision-makers.

I. Gas reforms in the context of the EU Green Deal

Role of the gas package reforms in achieving decarbonisation (Questions 2 and 3)

In order to achieve decarbonisation objectives, parameters must be defined in legislation for:

(a) The cost-efficient and equitable phase-out of gas; and

(b) How markets for clean gas, or lower-emissions gas, can develop,

each in line with climate targets.

While the questionnaire focuses on establishing markets for clean and low-emissions gas, it is vital that commensurate consideration be given to how to phase-out fossil-gas. This includes considering the role of regulatory incentives, market access and system planning, which ClientEarth covered in its Roadmap response.

Risk of overinvestment (Question 9)

The current regulatory environment for gas fails to address the economic risks of gas overinvestment, and the climate impacts of gas. In order to correct this, reforms to the Gas Directive and Gas Regulation should include:

1. Governance structures for transparent, climate-aligned system planning free from conflicts-of-interest (see further next section);
1. Establishing, through a science-based approach, the priority sectors for the limited gas consumption that will be possible under the EU's climate scenarios and renewable gas supply forecasts, and regulating markets based on those constraints. See, for example, Agora Energiewende's No Regret Hydrogen analysis;
2. Integrating gas and hydrogen with markets for efficiency, flexibility and power solutions;
3. Accounting for the total climate impacts of gas (including the methane emissions which are vastly underreported and unregulated in current regulation).

Improving governance to ensure Paris-alignment of energy infrastructure planning (Questions 2 and 3)

Decarbonising our energy system requires rethinking the way the Union's energy infrastructure is planned and developed. In particular, governance provisions under the Gas Directive and Gas Regulation should be reformed if these two pieces of legislation are to contribute to the achievement of the decarbonisation objectives.

Energy infrastructure planning is a good example of an area where governance is key. Both the Gas Directive and the Gas Regulation regulate certain aspects of network development, by establishing conditions and obligations for the development of national network development plans and Union-wide network development plans (Union-wide TYNDPs). The execution of Union-wide TYNDs, which are prepared by the ENTSOs and to a large extent influenced by TSOs, have led to a situation of clear overcapacity in the EU gas system that leads to higher system costs, borne by consumers and taxpayers.

Energy infrastructure planning, including the development of TYNDPs, should evolve to become an integrated process that considers different carriers, the energy efficiency first principle, and also non-infrastructure-based solutions, while ensuring delivery of climate targets. This would be in line with the Commission's Energy System Integration Strategy, which calls for a new, holistic approach for both large-scale and local infrastructure planning. While the ENTSOs possess valuable, relevant expertise that must continue to be relied on in the development of energy infrastructure, the decision-making around TYNDPs would greatly benefit from the addition of objective, multi-disciplinary guidance and input from an independent technical scientific body.

The European Climate Law has recently created the European Scientific Advisory Board on Climate Change (**ESABCC**), an entity tasked with providing scientific advice on existing and proposed Union

measures and their coherence with the objectives of the TEN-E Regulation and the Union's international commitments under the Paris Agreement. This advisory board should be involved in the decision-making, so that it can provide technical input on how to undertake more integrated energy infrastructure planning. The intervention of the ESABCC would also help mitigate the bias towards intense infrastructure development of the ENTSOs.

ClientEarth recently published a report on options to improve decision-making in the TEN-E Regulation, which, given the close relationship with gas market regulation, is also relevant in the context of the hydrogen and gas decarbonisation package. The briefing touches on the significance of involving the ESABCC in Union-wide TYNDP decisions currently regulated in the TEN-E Regulation.

Exporting these governance improvements to the process for preparing national network development plans should also be considered, especially since the European Climate Law invites Member States to establish entities similar to the ESABCC at national level.

Supporting the aims of the Energy Efficiency Directive (EED) (Question 4)

The energy efficiency first principle must be applied to the Gas Directive and Regulation, in particular at the planning stage. In addition to the items listed in our questionnaire submission at Question 22, this requires:

- Reduce wasted energy: incentives should be put in place that ensure buildings are insulated and (retro-)fitted with energy savings solutions as a priority to avoid wasted heat; energy from industry and data centres should be captured; bio-waste should be used for heat generation.
- Demand-side solutions such as smart charging should be prioritised before pursuing expensive infrastructure upgrades (see, for example, the Regulatory Assistance Project's Start with Smart report).
- This will help reduce carbon and methane emissions linked to the gas production. Reducing fossil fuel demand together with increasing flexibility will allow a better penetration of renewable energy into the market (which creates an indirect synergy with the RED).

II. Consumers

Protection of energy poor and vulnerable customers (Question 11):

Due to indications of limited supplies, it is important not to assume that green gases will be available at sufficient scale to serve household uses – and regulation should not be developed based on such an assumption.

Green gas in homes should not be pursued because, as noted by BEUC, "the production of renewable hydrogen and renewable gases is connected to significant uncertainties regarding future availability and prices." Rather, BEUC notes that "more proven and easily-scalable solutions, such as electrification, should be prioritised to decarbonise residential heating".

However, electrification will likely lead to a rise in the price of energy for the final consumer. Adequate measures should be taken to avoid placing all the burden of the energy transition on the final consumer, e.g. applying the polluter pay principle and adjusting taxes to adequately reflect the environmental cost of energy.

Considering the climate and health impact of gas, it is crucial that its use is disincentivised compared to clean alternatives. Inadequate "green" heating grants are locking in fossil fuel use. A swathe of subsidy

schemes to increase the energy efficiency of home heating are promoting the use of gas boilers rather than a move away from fossil fuels, particularly in less wealthy EU countries. The Commission is not strongly disincentivising these subsidies in its draft CEEAG (which it should).[1]

The Regulatory Assistance Project further points out that uptake of lower-emitting electrified alternatives to gas will over time lead to less households being connected to the gas grid, and therefore contributing the infrastructure costs, capturing those who cannot afford a change of their home appliances to pay higher prices for gas. Clear (price) incentives and information need to be given as soon as possible to help consumers make to make the right decision about their heating appliances.

The legislative reforms should also include provisions for access to transparent information on the share of renewable gas consumed, associated emissions, gas quality, applicable prices and tariffs and on standard terms and conditions (similar to Annex I, paragraph 5 of the Electricity Directive). In the same spirit, Paragraph 28 of the preamble to the Renewable Energy Directive states that "Consumers should be provided with comprehensive information, including information on the energy performance of heating and cooling systems… to allow them to make individual consumer choices with regard to renewable energy and avoid technology lock-in".

The reforms should also address the problem of greenwashing and the likely future increase in greenwashing claims about hydrogen- or green fuel-readiness. Under Articles 5, 6 and 7 of the Unfair Commercial Practices Directive, misleading claims are prohibited, but it is crucial that this prohibition clearly apply to claims regarding the environmental qualities of gas future supplies. Such claims should only be allowed if the product promoter clearly show at the same time how such compatibility can be achieved and at what cost to the consumer (including in terms of tariffs).

The importance of price signals to consumers in the gas market (Question 17)

Price signals are an important incentive and means of rewarding consumers for green choices. At EU level, electricity is subject to a carbon price, as its production falls under the Emissions Trading System, while fossil fuels are not. As a result of this imbalance, the real cost of energy, which also includes the impact of energy choices on the environment, is not properly reflected in energy prices. The EU should address this imbalance and ensure that consumers receive the right price signals (see further BEUC, How to make the home heating and cooling revolution consumer-friendly (2021).

Public Service Obligations for gas should not be introduced (Question 18)

The introduction of a provision on price setting in the framework of a Public Service Obligation could lead to the further gas lock-in and stranded assets. Energy poor or vulnerable household customers should as a matter of priority be directed and supported by other climate-friendly energy solutions. A Public Service Obligation for the supply of gas with set prices would direct energy poor or vulnerable household customers towards gas instead of climate-friendly energy solutions. Price setting for the supply of gas to

[1] §135 Measures that incentivise new investments in natural gas-fired equipment aimed at improving the energy efficiency of buildings may lead to a reduction in energy demand in the short run but aggravate negative environmental externalities in the longer run, compared to alternative investments. Moreover, aid for the installation of natural gas-fired equipment may unduly distort competition where it displaces investments into cleaner alternatives that are already available on the market, or where it locks in certain technologies, hampering the wider development of a market for and the use of cleaner technologies. The Commission considers that the positive effects of measures that create such a lock-in effect are unlikely to outweigh their negative effects. As part of its assessment, the Commission will consider whether the natural gas-fired equipment replaces energy equipment using the most polluting fossil fuels, such as oil and coal.

these customers should therefore be exceptional and by all means avoid the deployment of additional gas infrastructure.

III. Network planning

Whether the national network development plan should be based on a joint scenario used for gases and electricity planning (Question 21)

A joint scenario should be used, but infrastructure planning should take into account all energy solutions, prioritising efficiency and flexibility – not just electricity and gas.

Whether a single national network development plan for all energy carriers should be binding (Question 23)

We support making the specific needs in a national network development plan binding, but not the plan itself. See Megan's email and document.

IV. Hydrogen

Cross-subsidisation between methane and hydrogen (Question 44)

There are important reasons for not supporting cross-subsidisation:

1. Cross-subsidisation for energy infrastructure is in principle to be excluded due to the distortive effect on competition (See Notice on the notion of State aid, §211-212 and the Infrastructure analytical grid for energy infrastructure).
2. Hydrogen infrastructure investments should follow a no-regret approach, prioritising applications for which viable alternatives are not yet available.
3. Hydrogen clusters may be necessary (dedicated infrastructure) but at this point the regulatory and economic case for developing a hydrogen backbone comparable to the methane gas network has not been proven;
4. It is inequitable for methane gas users to share the clearly-apparent risk of over-development of hydrogen infrastructure, such as for heating. Hydrogen should be limited to hard-to-abate sectors only, and those sectors should be incentivised to minimise the use and associated costs of hydrogen production;
5. If hydrogen does receive public funds, for transparency and fairness the State aid rules should apply, subject to Commission control, and not through cross-subsidisation.

Question 44 also poses the question of whether other measures should be made available to lower hydrogen tariffs such as public grants to network users or network operators, instead of cross-subsidies. Such measures should be considered only if a 'no regret' approach has been taken to hydrogen development, for renewable hydrogen, and for hard-to-abate sectors, subject to the conditions set out in the State aid rules.

Blending of hydrogen into existing methane gas network (Questions 80 and 81)

Blending hydrogen into the methane network has little support outside of the gas industry, and lacks any compelling rationale. The Commission should not establish a regulatory framework to support blending.

1. Blending is not cost-effective and is highly energy inefficient. One of the main applications for hydrogen blended into the gas network would be for heating. Hydrogen for heating has an energy

efficiency of 46%-58%, whereas heat pumps have energy efficiency of 270% (see London Energy Transformation Initiative's Hydrogen: a decarbonisation route for heat in buildings? report (2021)). Potsdam Institute researchers have pointed out that producing and burning hydrogen-based fuels in home gas boilers required six to 14 times more electricity than heat pumps providing the same warmth. University College London's research shows that hydrogen dominated pathways to decarbonise heating cost consumers 73% more than heat pumps and district heating pathways .Hydrogen for heating would also likely increase heating costs for those who are not readily able to electrify without support schemes, as it would require:

(a) the conversion of largely concealed pipework in millions of homes and buildings,;
(b) increased use of networks to deliver the same amount of energy, due to low efficiency of blended hydrogen. This would result in fewer and poorer (non-electrified) households carrying a greater burden of network costs;
(c) upgrading of domestic appliances to be able to process hydrogen.

2. Even blending with green hydrogen would impede emissions mitigation. Using green hydrogen to heat buildings via boilers would be almost six times less energy efficient than heat pumps powered by renewable energy, and would require a 150% increase in primary energy generation (LETI report, page 2). In light of the EU's limited access to renewable energy, and consequent additionality constraints, there would be very limited emissions benefits from switching from methane gas heating to green hydrogen heating, compared with electrification.

3. Fossil-based hydrogen development is not compatible with climate targets. At present, the vast majority of hydrogen produced is from fossil fuels, and given the demands for rapid electricity decarbonisation, the availability of additional renewable resources from which to produce mass-scale hydrogen will be limited. Hydrogen produced from fossil gas is highly greenhouse polluting both in terms of supply chain methane and combustion of carbon dioxide, and there are no clear regulatory restrictions to curb those emissions. Professor Robert Howarth of Cornell University has noted that overall, emissions of both carbon dioxide and unburned methane are 50 percent greater for gas-based hydrogen than simply burning methane gas for the same quantity of energy. He points out that the GHG footprint of fossil fuel-produced hydrogen is substantially larger than even that of coal.

   Even if the EU addresses the problem of unregulated methane emissions, there will be increasing costs associated with emissions abatement for gas-based hydrogen, and potentially methane pricing. Along with the uncertain but likely very high costs of CCS to abate carbon dioxide emissions, this would likely make gas-based hydrogen uneconomic.

4. In addition to household inefficiencies, blending is a sub-optimal solution for industry. At present, some industrial users need separate methane and hydrogen, and blending would create complications with respect to end-use adaptability. Blending would require conversions depending on different blending amounts and would create an administrative burden around monitoring of gas quality. In addition, the future indirect costs relating to the whole-of-life impacts of hydrogen use (including potentially the requirement for storage of captured carbon from fossil-based hydrogen for an infinite period). These costs have not been properly disclosed to industry, and carry considerable commercial risk.

The EU should therefore not promote blending hydrogen in the gas supply. This would lead to speculative, publicly-funded investments in an unproven technology, and risk locking-in fossil fuels.

Instead, the EU should support rapid deployment of the electrified alternatives to gas-based heating which have already been proven at scale for their cost-effectiveness and efficiency, such as heat pumps.

V. Governance

Updating the exemption system

The questionnaire only mentions exemptions with regard to a hypothetical regulatory framework for pure hydrogen markets, and does not allow for a general comments about them.

We recommend that the Commission reconsider the conditions under which exemptions from market rules are granted, the obligations that can be exempted, and whether there is any reasonable justification for exemptions to be made available to methane gas or other non-renewable gases, in light of the need to swiftly decarbonise the energy system and avoid fossil gas infrastructure lock-in.

Transparency and openness around the procedure for granting exemptions should be improved. Currently there are no public consultation requirements relating to the review undertaken by the Commission of the exemption decisions received from national regulatory authorities, despite the significant impact such exemptions can have on competition and cost-effectiveness. Furthermore, exemption decisions are reviewed based on Guidelines that were approved when the Second Gas Directive was still in force, where the provision regulating exemptions used slightly different language, and prior to the judgment in the OPAL case which demonstrated the legal effect of the energy solidarity principle in relation to exemptions. Lastly, the Guidelines currently in use do not set out the procedure to be followed for the application of paragraphs 3, 6, 8 and 9 of Article 36 as laid down in Article 36(10) of the Gas Directive.

VI. Security of supply

Transcending the concept of security of gas supply (Questions 89 to 98)

When addressing the issue of security of supply, the questionnaire focuses on existing sectoral legislation dealing with security of gas supply and technical safety, and fails to address the need to reconceptualise this based on modern forms of system integration and competition between energy solutions.

The Gas Directive relies on a concept of energy security that is exclusive for gas (‘security of supply of natural gas’), which disregards the contribution that electricity and other carriers can make to energy security. This concept is not founded in the Treaties: Article 194 of TFEU refers to ‘security of energy supply’ as one of the aims of the energy union, without providing for a specific concept of gas security of supply. The recently approved Energy System Integration Strategy calls for further integration of the energy system, defined as ‘the coordinated planning and operation of the energy system “as a whole”, across multiple energy carriers, infrastructures, and consumption sectors’. The new framework should work towards a new concept of security of energy supply, not limited to gas, which takes into account the contribution that all carriers can make to keep the lights on.