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## Hydrogen and Gas Markets Decarbonisation Package Gas Market Reform

*EUTurbines and EUGINE, the gas power plants technology providers, welcome and support the European Commission's initiative to prepare gas markets for the increased EU's climate ambition. A consistent EU-wide legal framework will be essential to drive the decarbonisation of European gas markets, namely by facilitating the emergence of a market for competitive renewable and low-carbon gases.*

### The role of gas in integrated energy systems

The transition towards a decarbonised energy system is not to be misunderstood with the development of an electricity-only system. Only by utilising all energy carriers and benefitting from the interactions of the electricity, gas and heat networks, sufficient climate-neutral energy will be made available to end-users in the most cost-effective way. A **co-ordinated and joint planning of the energy grid infrastructure for electricity and gas** is needed, aiming at the most cost-efficient decarbonisation.

The gas infrastructure – including gas storage facilities – provides the **most suitable and cost-efficient seasonal storage**, which other storage solutions are not able to adequately provide. Combined with gas power generation and cogeneration, it offers an ideal complement to variable generation technologies, enabling the provision of flexible, reliable and cost-effective electricity and heat.

In connection with the growing seasonal electricity demand for the provision of heat and cold in buildings, the importance of gas storage combined with power/cogeneration will grow further. While it is now widely recognised that excess energy from variable renewables should be stored as hydrogen for seasonal demand, the **conversion of the stored hydrogen with gas power plants to cover demand peaks** will also be needed. A secure and reliable energy system will need flexibility solutions to complement each other, and the conversion of hydrogen with gas power plants should not be disregarded.

A gas market reform leading to the transformation of Europe's energy system requires:

- An integrated approach reflecting the interdependence of energy vectors and promoting the interactions of the electricity, gas and heat networks to ensure a cost-efficient and reliable energy supply
- The recognition of gas storage as the most suitable and cost-efficient long-term energy storage solution, which helps meet peak electricity and heat demand with flexible gas power generation – using renewable and low-carbon gases

## Creating renewable and low-carbon gas markets

Today's main challenge is the lack of renewable and low-carbon gases. While some contributing factors might also be addressed under other legislation, the **supply of renewable and low-carbon gases should be incentivised** through global targets (for example as share of total gas supply – primary energy) but also through financial support to make those gases competitive. Only like this, the provision of sufficiently large amounts of renewable and low-carbon gases to end-users such as power only and cogeneration plants will be ensured.

The definition of targets for specific customer segments would not be appropriate, as it would interfere with a market-based approach and lead to inefficiencies. In the same way, to consistently promote the emergence of a hydrogen economy, EU-wide rules should promote the **access and use of hydrogen across all customer groups**, and not limit the development of clean hydrogen markets to some specific sectors only.

Natural gas will be replaced by renewable and low-carbon hydrogen, but also by biomethane and locally used biogas. The EU should, therefore, support the scaling-up of biomethane and biogas production from waste, which are usable in gas power plants without any limitations. A dedicated sub-target for biomethane and biogas could help incentivise the market uptake.

The decarbonisation of gas will require a transitional phase, ending in the full decarbonisation of the gas supply by 2050. Therefore, while clean hydrogen from renewable electricity should be the target, **low-carbon hydrogen** with the support of CCU/S for ramping up production and demand should not be excluded from the onset.

The system of certification and guarantees of origin must be modified to ensure that electricity and heat generated from gas power plants using renewable or low-carbon gas including hydrogen to be recognised as decarbonised energy. Achieving this requires a **classification of renewable and decarbonised gases**. A **functioning EU-wide certification system that works for all energy carriers** would put renewable or low-carbon gas including hydrogen on an equal footing with renewable electricity and ensure tradability between countries.

A gas market reform leading to the transformation of Europe's energy system requires:

- A long-term perspective and market design incentivising the supply and use of renewable and low-carbon gas in Europe
- The recognition that the decarbonisation of gas will undergo a transitional phase before supplying fully renewable gas to end-users by 2050, during which CCU/S will be used to provide low-carbon hydrogen
- EU-wide rules that promote the access and use of hydrogen across all end-users, including centralised and decentralised power generation
- EU-wide rules that ensure the development of an effective cross-border trade of renewable and low-carbon gases, including a standardised classification scheme for renewable and low-carbon gases
- A system of certification and guarantees of origin that allows electricity and heat generated from gas power plants using renewable or low-carbon gas to be recognised as decarbonised energy

## Getting the future gas infrastructure right

The adaptation of the gas infrastructure to hydrogen should cover the entire chain, including end-users such as gas power plants. Given the importance of flexible gas power generation in the future energy system, these should **continue to be connected to the gas network**, also when it becomes decarbonised.

The development of a cost-effective hydrogen infrastructure will only happen with the support of **EU-wide rules**, which should provide the general framework, ensure consistency, and provide predictability on the transformation of the gas network. Still, differences in EU regions or networks – especially at the distribution level – should also be allowed.

The development of hydrogen valleys should be supported and allow certain regions to develop a hydrogen infrastructure, including related end-users. Such areas could be used as role models and share their experience with the rest of the EU. Essential learnings could be used to ramp up the rest of the EU in a fast, cost effective and secure way.

Until larger amounts of hydrogen become available, the initial **blending of hydrogen** into the natural gas network should be allowed. Here as well, predictability on progress and blending levels is needed for end-users to be prepared for any changes. From the gas turbines and engines manufacturers' point of view, up to 20% hydrogen in the natural gas pipeline could be considered; above this value, the repurposing of the pipeline into a dedicated hydrogen pipeline should be examined.

When considering the blending of different gases into the gas network, it is important to ensure a **certain stability of the gas quality delivered to end-users** (i.e. at exit point). Short-term variations at the connection point to the power plant must be kept within a reasonable range and the speed of the variation (rate of change) needs to be controlled. For this reason, information on expected gas quality changes needs to be communicated by grid operators in a structured way and well ahead.

The use of the existing gas infrastructure to transport renewable and low-carbon hydrogen, where possible, offers a cost-effective solution to transform the gas sector. Similarly, **retrofit options** to adapt gas power plant technologies to hydrogen are increasingly available – and should be considered when shaping the future gas infrastructure. It is, therefore, of utmost importance that the **manufacturers of end-user technologies are involved in the discussions leading to the transformation of the gas network**. This ensures that the technology is ready for changes in the quality of gas and can continue to provide essential services to the energy system also in 2050.

Existing gas power plants have been built based on the specifications agreed between operator and technology provider and potential adaptations to the use of hydrogen should be assessed individually. The use of hydrogen-derived synthetic methane or biomethane typically does not require modifications. The technical capability of a plant to handle hydrogen may be higher than the contractually agreed capability – but needs careful assessment. In this sense, the gas turbine and engine manufacturers are working on a checklist to assess the level of modifications potentially needed to adapt an installation to the use of a blend (up to 20%) or 100% hydrogen. The work should be finalised soon.

In addition, new **H2-ready** equipment will ensure that investments in gas power generation do not lead to a lock-in demand for natural gas. H2-ready installations will initially start using natural gas but will be able to adapt as hydrogen becomes available – be it as a blend or pure hydrogen. The gas turbine and engine manufacturers are developing a H2-ready concept defining different levels of H2-readiness for their equipment. The work should also be finalised soon.

A gas market reform leading to the transformation of Europe's energy system requires:

- EU-wide rules that provide the general framework, ensure consistency and give predictability on the transformation of the gas network – including on blending
- The support to a controlled blending of hydrogen into the natural gas network in the beginning, until larger amounts of hydrogen are available
- Flexible gas power generation to continue to be connected to the gas network and receive renewable and low-carbon gases
- The integration of all gas customer segments in the infrastructure planning and decision process to ensure that end-users are also prepared for the transition
- Information on expected gas quality changes to be communicated by the grid operators in a structured way and well ahead – while ensuring a certain stability of the gas quality delivered to the customer
- Support to the upgrading of not only the gas networks but also of end-users such as gas power plants, for which retrofit solutions are already available
- The recognition that investments in new H2-ready infrastructure and equipment do not lead to a lock-in demand for natural gas

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*About EUGINE and EUTurbines:*

**EUGINE** is the voice of the European engine power plants industry, representing the leading European manufacturers of this flexible, efficient, reliable and environmentally sound technology. Engine power plants are an optimal solution for both backing-up and generating renewable energy (e.g. with biogas). Cogeneration, the combined generation of power and heat/cold, is a typical engine power plant application providing highest efficiency. For more information please see [www.eugine.eu](http://www.eugine.eu)

**EUTurbines** is the only association of European gas and steam turbine manufacturers. Its members are Ansaldo Energia, Baker Hughes, Doosan Skoda Power, GE Power, MAN Energy Solutions, Mitsubishi Power Europe, Siemens Energy and Solar Turbines. EUTurbines advocates an economic and legislative environment for European turbine manufacturers to develop and grow R&I and manufacturing in Europe and promotes the role of turbine-based power generation in a sustainable, decarbonised European and global energy mix. For more information please see [www.euturbines.eu](http://www.euturbines.eu)