

Energy storage: Gas solves a major barrier to the energy transition

Becoming carbon neutral requires a massive increase in renewable energy. Much of this will come from a shift of conventional power generation and increasing shares of variable renewable electricity, which is hard to store. This isn't an issue if supply instantaneously matches demand. But wind and solar are highly variable and not always aligned with variable demand. Gas – natural, renewable and decarbonised – will have to be part of the solution to address this obstacle to the energy transition.

Eurogas urges Members of European Parliament to

- ✓ Underline that the energy storage challenge for the electricity sector cannot be solved by electricity solutions alone
- ✓ Recognise that gas – natural, renewable and decarbonised – will play an important role in a carbon neutral economy
- ✓ Recall that the three pillars of the Energy Union – security, affordability, sustainability – are equally important for the success of the energy transition
- ✓ Call on the Commission to set a binding EU-level target for renewable and decarbonised gas
- ✓ Call on the Commission and Member States to ensure adequate market rules to facilitate the deployment of renewable and decarbonised gas

Integrating and storing variable renewable electricity is challenging: a combination of solutions is needed

These solutions need to make use of excess electricity when production exceeds demand and ensure adequate backup when demand cannot meet variable renewable electricity production.

Energy storage: Mitigates both excess and deficit production. Different forms of storage exist such as batteries for short-term hourly storage or Power-to-Gas in combination with the existing gas grids and gas storage for long-term seasonal storage. Renewable and decarbonised gas can already be used to reduce the carbon intensity of existing storage facilities.

Dispatchable generation: Dispatchable capacity is necessary to quickly increase electricity generation to match demand. Gas-to-Power provides this service through so-called Combined Cycle Gas Turbines (CCGTs) which also provide heat for industrial processes, district heating and other uses. CCGTs can operate at increasingly high rates of renewable and decarbonised gas.

Expanding electricity grids: Mitigates both excess and deficit production. It facilitates electricity transport between areas of high production and low demand and *vice versa*. Barriers remain to electricity grid expansion, including high costs: electricity cables contain many elements including copper that make them much more expensive than the gas grid; and social opposition, as many citizens oppose high voltage frequency (HVF) lines close to their homes.

Demand-side response: When we produce too little renewable energy, we can also restrict demand or encourage shifting the demand to a later time. Consumer needs and behaviour are the key limiting factors to be considered here. Deployment of hybrid heating solutions would increase the demand side response potential along with increased digitalisation.

Solving the energy storage challenge: not feasible without gas

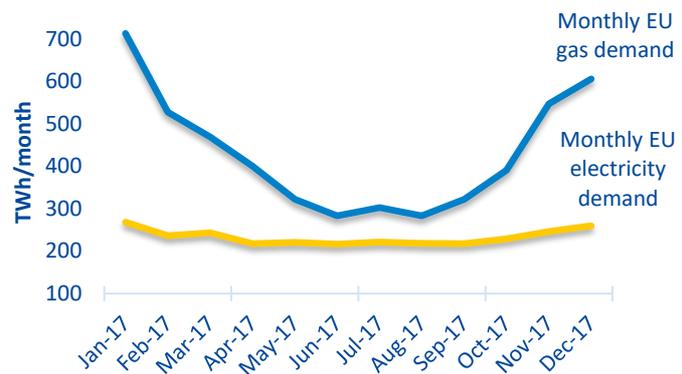
Different storage options serve different parts of the energy system. A combination of all storage options is needed to tackle the challenge. Only gaseous solutions can realistically provide the needed volume of energy at scale and at the right moment.

Batteries have a very fast response time, but a relatively low energy density and high self-discharge rate compared to hydrogen and methane. This makes batteries suitable for short-term storage and balancing but cannot provide Europe with the necessary volume of seasonal storage for cold winters.

“Gas plays a crucial seasonal balancing role that is difficult to replicate using electricity” IEA, 2019

Gas infrastructure provides Europe with 1.500 TWh of competitive and cross-seasonal flexibility. Underground storage provides 1.200 TWh. The distribution grid and LNG terminals provide 300 TWh of additional flexibility.

In contrast, electricity storage today reaches just 30 TWh. The majority of this is pumped hydro storage, whose potential is mostly exploited and is geography sensitive.



The existing gas storage capacity ensures that Europe’s heating needs can be affordably met, and that power can be competitively generated at any time.

What Europe needs to unleash the potential of gas storage.

A binding EU-level target for renewable and decarbonised gas to enable the scaling up of necessary carbon neutral gases.

Adequate market rules to facilitate the deployment of renewable and decarbonised gases and to enable a business case. Current market rules can constrain product offering and impose barriers to innovative solutions.

- ✓ **Develop a harmonised framework for Guarantees of Origin** that covers renewable and decarbonised gas in all Member States. Remove the optionality under RED II, Art. 19.
- ✓ **Create a level-playing field between flexibility services.** Disproportionate consumption-based fees, taxes and levies related to energy conversion and storage should be waived.
- ✓ **Flexibility services must be adequately rewarded.** This includes short-term, decentralised flexibility services, such as the use of linepack.

Support the innovation potential of the gas sector through a sustainable finance framework. Renewable gas technologies, such as anaerobic digestion/pyrogasification or Power-to-Gas, and gas decarbonisation technologies such as Steam Methane Reforming, Autothermal Reforming and pyrolysis in combination in carbon capture, need to be further exploited.