

Decarbonisation can only be achieved in an affordable way by facilitating all lower carbon energy processes. This includes the use of significant quantities of renewable or decarbonised gases as fuel (methane and hydrogen).

GIE Vision 2050

GIE Members are committed to fulfil the European Union objectives under the UN Paris Agreement on Climate Change whilst guaranteeing the supply of affordable energy for all citizens.

GIE recognises the challenges in meeting these targets in light of increasing population and energy demand and the phase out of coal and in some countries nuclear energy.

To prevent the further rise of temperatures, implementation of long-term climate objectives are essential, including the development of gas and electricity systems that lower the carbon footprint or remove carbon.¹ GIE is aware that the EU is at a turning point where investment in the short-term is needed in how we produce and use energy (with other sectors) to establish the long-term changes that are needed.²

The success of a decarbonised energy system in Europe in 2050 is dependent on the establishment of a robust commercial, legal and regulatory framework that supports the changes needed, as well as a fair supporting financial framework based on a technology-neutral approach.

We believe that **decarbonisation can not be achieved without the use of gases**. Our vision is based on three pillars; *infrastructure, integration and innovation*.

Infrastructure



Gas infrastructure operators will continue to supply **reliable, clean, affordable energy** throughout the EU to 2050 and beyond.

The gas infrastructure of transmission pipelines, underground storage and LNG regasification facilities will transport and store renewable and decarbonised gases (carbon-neutral or carbon-negative) including hydrogen to meet demand from the power, industry, land and marine transportation and heating sectors.

Security of supply will be guaranteed through the inherent resilience and flexibility of the gas infrastructure and gases will continue to be the main provider of energy on days of normal demand as well as during periods of seasonal peaks when electricity supply cannot meet demand. Flexibility provided by the gas infrastructure to balance the variable renewable electricity supply will be valued as increasingly vital as power is increasingly generated from renewable energy sources.³

Using the existing gas infrastructure to deliver and store increased quantities of renewable and decarbonised energy, rather than build new electricity networks, will result in **significant cost savings**.⁴

¹ EU Member States share the same long-term climate goal despite individual countries being at different starting points, some with a large share of high-emission energy sources such as solid fuels and petroleum products. In some cases, these sources far exceed 50% of the mix. Similar conditions hold true for instance in the power generation and heating sectors. Implementation of climate goals can be led through the promotion of natural gas that contributes significantly towards substantial emission reductions.

² Short-term defined as 5-10 years, mid-term 2030-2050 and long-term 2050 and beyond.

³ Currently the capacity of the gas grids is tenfold that of electricity. HV electrical line energy loss can be in the order of 50 times more than that for gas.

⁴ Benefits also include least disruption to end-users of gas appliances and optimal utilisation of existing gas assets, workforce and supply chain.

Integration



The gas infrastructure facilitates a **fully developed EU energy market for all gases**, which will be achieved soon, reaching comparable levels of market integration, liquidity, diversification, competition and price convergence for the benefit of all EU consumers. Standards for gas quality and trading of all gases based on certificates will be harmonised EU-wide, both in terms of technology and regulation.

An **integrated system approach to the development of gas infrastructure and electricity networks** will optimise the delivery of energy to consumers and increase the storage of renewable energy, far exceeding battery capacity.⁵ This includes *sector coupling* - the use of electricity from wind and solar to produce renewable *green hydrogen* through the process of electrolysis (power-to-gas) - for use either directly as a gas fuel or for injection into the main gas grid to mix with methane.

The gas infrastructure enables increased **renewable energy storage** through sector integration – the conversion of biomass and biowaste to renewable *biomethane* - and offers a link between large quantities of renewable resources and consumers in Europe and neighbouring countries, contributing to the agricultural economy.

Upgrading biogas to biomethane and the methanisation of green hydrogen to *synthetic methane* are carbon neutral options to produce methane for direct use or injection into the gas grid.

GIE recognises that carbon capture and storage (CCS), carbon capture and utilisation (CCU) and other technologies enable the decarbonisation of natural gas used for processes in sectors without readily-available alternatives.⁶ Other technologies include the pyrolysis process, where hydrogen is produced from natural gas without emissions and the resulting solid carbon can be used in other industries.

Innovation



GIE Members embrace the opportunities that the energy transition offers and will **innovate the ways they operate and conduct business** to achieve decarbonisation, including integration with other sectors. Modernisation of the gas infrastructure, new technologies and a decarbonised energy sector will create new jobs and contribute to a thriving EU economy.

Gas technology will continually reduce emissions through **increased energy efficiency** in the key sectors of power, industry, heating and transportation.

In power, higher conversion rates with gas turbines and co-generation will improve efficiency. By 2050, renewable gases will fuel power and heating in buildings and contribute to the built environment being carbon neutral.⁷ Emissions as well as cost will be further reduced through the use of more efficient CHP units, hybrid heat pumps and bi-directional fuel cells. CNG, LNG, biofuels and hydrogen fuel cells for land and marine transportation will exceed emission targets and reduce air particulates and noise.

In accordance with the *Guiding Principles on Reducing Methane Emissions across the Natural Gas Value Chain*⁸, GIE Members will further reduce methane emissions from their operations, implement best available techniques to achieve this goal and demonstrate leadership in the energy industry.

⁵ Existing gas facilities in Europe can store approximately 1197 TWh of energy (1131 TWh in UGS and 66 TWh in LNG tanks, without considering the line pack potential), which is the equivalent of the capacity of more than 5 billion Tesla PowerPack battery units of 210 kWh. Source: GIE and Tesla websites.

⁶ Energy-intensive industrial processes currently comprise 25% of EU28 energy demand.

⁷ *Gasunie Survey 2050*; being conducted now with potential to be in 70% of buildings that will still be in use in 2050.

⁸ www.ccaoalition.org



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GIE Vision 2050

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