05.10.18

Eurogas preliminary position paper on the EU long-term strategy

October 2018

Commitment to EU objectives under the UN Paris Agreement on Climate Change

Eurogas is the business sector association representing natural, renewable and decarbonised gas in Europe on behalf of 44 companies and associations from 22 countries.

Eurogas members are fully committed to helping the European Union fulfil its objectives under the UN Paris Agreement on Climate Change. Limiting global temperature increase to well below 2°C above pre-industrial levels is the minimum aim: Eurogas also supports the Paris commitment to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels.

The gas sector recognises that the Paris Agreement has transformed the energy landscape for good and welcomes the EU discussion on a forward-looking strategy to implement the Agreement as a positive opportunity: A lot has to be done to make this framework operational and to make swift progress. Meeting deep decarbonisation climate targets requires a rethink of how we all use and consume energy. It needs solutions for all parts of the economy and needs to take into consideration the specificities and energy density needs of different sectors.

The combined potentials of natural, renewable and decarbonised gas will help to achieve climate ambitions on time, and bring other quality of life and environmental benefits, while maintaining energy system efficiency and resilience. Gas – in all its forms: natural, renewable and decarbonised – will also help to keep the energy transition cost low, making it socially acceptable for European citizens, and at the same time modernising the economy and strengthening the competitiveness of European industry.

CO_2-neutral gas fuels in the long-term low-carbon economy

Gas fuels are necessary in all European economy-wide pathways to the mid-century. CO_2-neutral renewable and decarbonised gases,[1] as well as carbon negative gas-based solutions, will therefore play a crucial role in achieving EU long-term climate objectives to 2050 and beyond.

These include:

- CO_2-free Green Hydrogen from Power-to-Gas (P2G) processes using renewable electricity;
- CO_2-neutral Blue Hydrogen produced from natural gas in combination with carbon capture and storage/use;

[1] Renewable gas is the category name for CO2-neutral gases, including green hydrogen and synthetic methane from power-to-gas, biogas and biomethane. Renewable gas can be produced from various feedstocks: electricity from renewable sources; municipal waste; agricultural residues; sewage. Decarbonised gas is the category name for CO2-neutral gas produced from natural gas with CCS/U.

- CO_2-neutral Biogas and Biomethane produced from municipal waste, agricultural residues and sewage.
- CO_2-neutral Synthetic Methane produced from biogas or P2G in combination with post combustion CCS

In line with this, innovative technologies that produce renewable and decarbonised gas and that inject it into the grid are already being developed throughout Europe. Among the advantages that these gases bring to the energy system are ease of storage, including for seasonal use, and flexibility – gas grids are naturally capable of managing high energy demand fluctuation, while biogas and P2G offer a renewable resource that is not intermittent.

Modelling by Eurogas using PRIMES (The sustainable credentials of gas – a study of scenarios to 2050 by using PRIMES) has shown that these climate-safe gas resources and technologies could enable much overall higher shares of renewable energy to 2050. Other major studies by DENA, ADEME, Ecofys and Poyry confirm this direction of change.

In order to ensure that CO_2-neutral gas fuels will develop at the scale required by the EU long-term pathways, Eurogas is calling for:

- A binding target at EU level for renewable and decarbonised gases.[2]
- Guarantees of Origin (GOs) for renewable and decarbonised gases under the revised Renewable Energy Directive (RED II).[3]
- A harmonised European framework for renewable and decarbonised gas support schemes, allowing technology specific subsidies until maturity is reached.
- Full life-cycle emissions analysis, creating greater transparency for policy-makers and consumers on the sources of emissions[4], including the mobility sector.

[2] The target should be time-limited with the objective of enabling renewable and decarbonised gas to reach technology maturity and scale. It should encompass both renewable and decarbonised gas on a technology-neutral basis. Delivery of the target should be based on market measures such as tendering. To facilitate this, the Commission could establish a "best practice" dialogue at EU-level to learn from existing schemes in Member States both in order to spur the development of renewable and decarbonised gas projects and to help create a level-playing field between countries.

[3] Guarantees of Origin make the source of the specific renewable and decarbonised energy transparent to the customer and can prove that the new renewable and decarbonised gas target is being delivered. Under RED II, GOs will become mandatory for renewable electricity and gas in all Member States. The various national standards for GOs should be harmonised over time according to a European blueprint, which should be developed in cooperation with the gas industry. Eurogas would also like to discuss a timeline for European harmonisation to enable the cross-border transferability and tradability of GOs in order to increase competition and transparency and to lower the prices of renewable and decarbonised gas. It will also be important to encourage small projects, not to stifle them with administrative and financial burdens.

[4] This assessment could calculate and publish data on CO2 and other GHG avoidance and abatement costs, for example, based on life-cycle emissions calculations for well-to-wheel emissions in different mobility technologies; for biogas/biomethane in terms of reducing agricultural methane emissions; and for different energy storage technologies, including power-to-gas and batteries. The results of the assessment and the publication could be for use by policy-makers and could be established by the EC under the European Environment Agency and JRC. The gas sector has a good starting point for this sort of

- A technology-neutral approach to carbon abatement options for vehicles and heating.
- Financial support at EU level and in Member States for RD&D to accelerate, mature and deploy new technologies for the production of renewable and decarbonised gas, and for the optimisation and future-proofing of existing infrastructures.

Together with renewable gas, Eurogas sees Carbon Capture and Storage as a key enabling technology to achieve a low-carbon economy.[5] The gas industry would like to work with the EU institutions to develop a step-by-step decarbonisation pathway so that CCS value chain investments can be spread over time at the pace that different Member States can afford.

To tackle agricultural and waste site methane emissions, Eurogas supports using gasification and digestion as a source for biogas. A large share of EU waste is currently incinerated, and urgent consideration should be given by the EU to quantifying the advantages of biogas/biomethane, and to the removal of barriers preventing optimal use of gasification in waste management. This can also offer opportunities to develop the circular economy and local economies.

At a later stage, Guarantees of Origin can also be an opportunity for the EU to reintroduce the use of European and even international credits for GHG reductions achieved outside Europe. Based on strong monitoring, reporting and verification, non-EU GOs offset carbon offset projects could help non-EU countries to efficiently achieve their commitments under the Paris Agreement.

Quick wins are still possible

As recognised by the Commission, higher ambition toward 2050 also increases the importance of opportunities for early cuts in emissions. Natural gas has been a key factor in reducing EU emissions from energy use since 1990. Further quick wins are readily available:

- Switching today from coal-fired power plants to gas-fired installations, preferably via further strengthening the EU ETS, to enable the EU to more easily reach or exceed its 2030 greenhouse gas emissions reduction target. (The contribution of fuel switching is also an important result of Eurogas study on the sustainable credentials of gas using PRIMES).
- Accelerating the further deployment of condensing gas heating boilers throughout the major European gas heating markets to achieve the same efficiency savings that this technology has delivered in the Netherlands and the UK.
- Gas CHP (micro, mini or large) to lower residual electricity demand.
- Wider deployment of CNG, LNG and hydrogen fuelled vehicles.

These quick wins would also provide time to roll out new options toward 2050.

transparency in its existing work on methane leakage which has already reduced fugitive methane emissions from natural gas activities by 46% between 1990 and 2015 (based on EEA data).

[5] When CCS technologies are combined with the use of biomethane, this achieves negative emissions which will be instrumental for net zero.

Sector integration, costs

Using the virtues of all clean energy sources and energy carriers is the best and fastest way to establish a sustainable low-carbon economy. The smart combination of the electricity, gas and heat systems can deliver early achievements, enable more renewables, deliver overall system efficiencies, lower costs and increase system resilience.

Natural gas has long been the reliable backbone of the European energy system, efficiently providing bulk resource, flexibility, and resilience. Integration of the gas and electricity systems allows the flexibility and storage potential of gas infrastructure to deliver benefits to the electricity system. CO_2-neutral gases can continue to play this role as well as be a stand-alone source of energy through the low-carbon transition.

- Gas is easily stored, providing seasonal resources to meet peak heating demand, an issue that cannot be tackled by the electricity sector on its own and that may become an increasing challenge due to climate change impacts on temperature extremes, rainfall and weather patterns including wind.
- Gas grids are capable of managing high energy demand fluctuation, making gas inherently flexible and demand responsive.
- Gas enhances customer choice and energy system resilience, whereas having strong electrification as the basis of the future energy system would mean dependence on one infrastructure.
- Gas power plants offer dispatchable capacity capable to cover production gaps from variable renewables.

Deep decarbonisation requires more renewable electricity production, with an increasing need for storage, and new solutions for (long-distance) energy transport from centralized renewable electricity supply sources such as offshore wind to end-users. Power-to-Gas is a means to integrate both energy systems. Flexing the gas infrastructure from end to end will allow large amounts of energy from intermittent renewables to be stored in gaseous form in a cost-effective manner, enhancing security of supply and the sustainability of the energy system.

Sector integration (which includes the coupling of the electricity and gas sectors as well as the use of each energy source where it serves best) therefore needs to be at the centre of the future energy system. This means ensuring the holistic view and connection of the different sectors of the energy system: electricity, heat and transport, with the corresponding infrastructure in power, gas, district heating and smart energy digital information and control systems.

Eurogas recommends:

- A focus on developing and scaling both renewable and decarbonised gas resources.
- A focus on technologies that interface between electricity and gas, including Power-to-Gas and fuel cells.

- A sector integrated approach infrastructure planning based on a new requirement for joint infrastructure planning in Ten Year Network Development Plans, with cost-benefit analysis, at both European and national levels.[6]

This updated approach to infrastructure planning will also help to manage the cost of the transition by maximising the opportunity for capitalising on and converting existing, largely depreciated assets for the transportation of renewable gas, hydrogen and CO2, resulting in less need for new investment, fewer issues with the public acceptance of new infrastructure, and avoiding of stranded assets, both centralized and distributed.

Technology assumptions, modelling, key questions to address in further studies

More clarity in Commission analyses on sector integration and the market potential for CO_2-neutral gas fuels is also essential in order for renewable and decarbonised gas to develop at the necessary pace and scale to deliver emissions outcomes in line with EU commitments.

Eurogas strongly recommends to the Commission that a central next step in the work on the long-term strategy is the development of a detailed vision (Communication and implementation roadmap) on sector integration.[7] The vision should:

- Address how to value the resilience of the gas system in supporting the resilience of the energy, industrial and mobility system as a whole.
- Draw up pathways for the scaling up of low-carbon and CO_2-neutral/negative, gas technologies making available dedicated resources where these are necessary to support innovation and immature technologies.
- Consider the potential to optimise heat sources in buildings, for example hybrid systems of gas (natural, decarbonised or renewable) and other renewable and electric technologies. In this context, an enabling plan for smart gas solutions should also ensure that these can benefit from innovation funding.
- Consider the potential for sector coupling and for gas in transport (g-mobility), particularly in shipping and heavy-duty vehicles.
- Assess the potential new role of grid operators in the development of necessary flexibility, such as storage for the electricity grid and Power-to-Gas services, for a limited period of time—if other parties, following an open and transparent tendering procedure, have not expressed an interest to carry out those activities.[8]

[6] For example, this would mean that before investing in new electricity transmission for debottlenecking, it will first be checked if existing gas pipeline assets and power-to-gas plants could solve the issue at lower cost, in particular taking account of the marginal avoided cost of electricity capex.
[7] The vision and related proposals should make use of the full analytic toolkit that informs EU policy: quantitative and qualitative assessment, reference scenarios and narratives, and a full system cost approach.
[8] This potential role should be subject to appropriate regulatory oversight, with clear principles/criteria to determine the degree of contestability in an agreed set of activities. A regular market test should monitor whether the market situation is evolving and establish exit conditions.

- Be based on real historic temperature data not on standardised temperature years, in order to describe the reality of the power system costs and backup capacity that will be needed in case of increased electrification of transport and heating, and also the impact of cold weather on the efficiency of heat pumps at times of high heating demand.[9]

Without this basis, Europe risks to miss out on cost-efficiencies and also on opportunities for technology leadership in low-carbon innovation. At the same time, the need for electricity grid and backup generation capacity risks to be significantly underestimated. Eurogas members stand ready to input to this crucial exercise.

In parallel, the Commission should carry out a study on the market potential for renewable and decarbonised gas, to consider and compare different scenarios of cost development, prices and usage of the different forms of gas, including hydrogen from natural and renewable sources (both for dedicated supply and injection into the gas network), together with the associated costs for upgrading existing gas infrastructure for the injection of hydrogen. The study should consider what interim funding may be necessary to make the development of scalable renewable and decarbonised gas competitive.

The Commission should also work with the gas sector to support key pilot projects to inform these analytic steps.

The Commission should ensure the alignment of other EU policies with climate objectives and the long-term strategy, e.g. updating the Energy Tax Directive and examining how tax frameworks are applied to Power-to-Gas.

[9] Regarding gas for power generation backup: The more electricity that is used in transport and heating, the more backup capacity can be required. This depends highly on the temperature data that are used. For Germany, analysis with the Enervis model showed the following: Results from a standard temperature year do not describe the reality of the backup capacity that is needed. The difference is very significant: In order to cover the actual historic temperature situations of the last 25 years up to 20 GW of additional capacity in Germany alone is required, compared with the standard year modelling.
Regarding heat pumps: As the efficiency of heat pumps depends on the outside temperature, the colder the winter, the lower the efficiency – which can go down by 100%. This becomes a key element for projections about how to run hybrid gas and heat pump heating systems. See Fraunhofer ISE, ENERGIESYSTEM DEUTSCHLAND 2050, Figure 8 on page 19.