

## EXECUTIVE SUMMARY

**Decarbonisation in Central-Eastern and South-Eastern Europe:  
How gas infrastructure can contribute to meet EU's long-term  
decarbonisation objectives**





Photo : Inčukalns underground gas storage, Conexus Baltic Grid, Latvia

## Executive summary

Achieving carbon neutrality by 2050 requires significant efforts and the commitment of all Member States and sectors. To allow an efficient and fair energy transition, it will be crucial to take into consideration the specificities in terms of resources and potential of the different regions within the European Union (EU). This report focuses on Central-Eastern and South-Eastern Europe. Gas Infrastructure Europe (GIE) produced it to identify and highlight the opportunities brought by the gas infrastructure and gas in all its forms – natural gas, low-carbon and renewable gases – for a number of Central-Eastern and South-Eastern European countries in the context of their energy transition, against the background of the EU's climate goals to achieve CO<sub>2</sub>-neutrality by 2050.

This report covers a selected group of countries which expressed an interest in this exercise, namely: Austria, the Czech Republic, Germany, Greece, Hungary, Latvia, Poland, Romania, Slovakia and Slovenia. It was drafted in cooperation with GIE member operators and other stakeholders from Central-Eastern and South-Eastern Europe: GIE established a dedicated working group on 'Central-Eastern and South-Eastern Europe decarbonisation' where member companies discussed the optimal energy transition pathways for the regions. In 2020, the working group drafted a questionnaire based on the Integrated National Energy and Climate Plans (NECPs) and distributed it among the companies. In July 2020, GIE organised a dedicated virtual workshop on 'Decarbonising the Gas Infrastructure in Central-Eastern and South-Eastern Europe with a Sustainable Recovery'. Policy-makers – the European Commission, the European Parliament, and the Polish Permanent Representation –, academics and research partners, together with the gas industry, exchanged their views on the topic.

This report outlines the benefits of the gas infrastructure for contributing to the EU climate

goals in the short-term, as well as in the mid- and long-term, in Central-Eastern and South-Eastern Europe. By 2030, a significant reduction in CO<sub>2</sub>-emissions can be achieved by the switch from coal-to-gas and the uptake of low-carbon gases into the existing gas infrastructure. By 2050, the gas infrastructure serves as a valuable asset for the achievement of the EU climate goals, since it is able to integrate renewable gases like green hydrogen and biomethane and thereby, guarantees the transport and storage of these gases.

### 1. Vision 2030: The untapped potential of natural gas - Immediate CO<sub>2</sub>-reductions by switching from coal to gas

Natural gas has an untapped potential to achieve fast and significant greenhouse gas emission reductions for the Central-Eastern and South-Eastern European regions. Coal-based total CO<sub>2</sub> production in the ten selected countries equalled 645,9 Mt CO<sub>2</sub> in 2018, which is equivalent to the overall emissions generated in France and Spain (656 Mt CO<sub>2</sub>). In the same vein, in 2019, the gross inland energy consumption in the ten selected countries equalled 601,31 Mtoe with 130,39 Mtoe accounting for solid fossil fuels. We can therefore observe that coal and lignite still represent more than 20% of the energy consumption of these regions (Eurostat, 2020).

Transitioning to natural gas is the only immediate and sustainable way to reduce emissions in regions that are still heavily dependent on carbon-intensive fuels, such as coal, lignite and heavy fuel oil in the power generation, heating and industrial sectors, as represented by Figure 1 below. For example, in Warsaw, the replacement

of an ageing coal-fired combined heat and power plant with a new gas unit and a 10 km connecting pipeline to the transmission system allowed a reduction of particulate emissions by up to 60% and avoided the supply of coal provided by 17,000 railway wagons per day. Natural gas, in its liquid form, can also be a flexible alternative to other fuels that cannot be distributed due to the lack of supporting infrastructures.

Growing importance of intermittent renewable energy sources such as wind and solar challenges the electricity systems with regard to its balancing, secure operation and integration of these sources. Modern, flexible and low-emission gas power plants can be the answer and solution to this challenge especially in times of growing renewable energy sources potential. The role of gases in its various forms will further increase during a transitional period, as some countries like Germany are phasing out nuclear power.

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## 2 Vision 2050: From fuel substitution to complementarity to renewables - The future of renewable and low-carbon gases

The switch from coal to gas, while being a key pathway for decarbonising the power generation in a cost-effective manner in Central-Eastern and South-Eastern Europe, will also be crucial to prepare the energy system of the ten selected countries for the transition to renewable and low-carbon gases in the mid- and long-term perspectives. These gases will play a major role

in the future energy system as they will secure a base load energy supply in these regions. This base load supply is especially crucial in those periods of the year when the supply of electricity from intermittent sources is not available. The EU Hydrogen strategy and the EU Energy System Integration Strategy, both published in July 2020, acknowledge the need of renewable and low-carbon gases as an indispensable solution to achieve CO<sub>2</sub>-neutrality. Renewable gases like green hydrogen will gradually adopt the role of integrating the electricity and gas sectors, providing more flexibility within the entire energy system.

## 3 Future-proof gas infrastructure

With its flexibility and storage capacities, the existing gas infrastructure supports the integration of renewable electricity in Europe and reduces the need for large investments into electricity grids – on both transmission and distribution levels. A better integration and sector coupling between gas and electricity grids can also reduce price volatility and overall end-user energy prices, thereby alleviating energy poverty. Moreover, the gas infrastructure will be ready for the uptake of renewable and low-carbon gases, such as biomethane, hydrogen and synthetic methane, and future decarbonization technologies such as Power-to-Gas or carbon capture, storage and utilisation (CCS/CCU). The NECPs of the ten selected countries attribute very important role to gases in their forecasts. In the short- and mid-term, natural gas and the existing gas infrastructure are to play a significant role in their decarbonisation plans. In the mid- and long-term perspective, renewable and low-carbon gases and technologies enabling climate neutrality combined with an upgrade of the gas infrastructure shall take over this role.

## 4 The social benefits of the switch from coal to gas

The switch from coal to gas would decrease emissions without a significant cost increase, thus leading to a greater acceptance by end-users and civil society. In the short-term, natural gas can also have an immediate and tangible positive effect on the life of EU citizens: air pollution resulting from burning high-emission fuels (including NO<sub>x</sub>, SO<sub>x</sub> and fine particles) constitutes a serious health problem in many communities. Some countries of the analysed regions perceive gas as a quick win solution to this problem. A shift from waste burning, coal, lignite and oil to natural gas in the heating and electricity sector, and from diesel and petrol to liquefied natural gas (LNG) and compressed natural gas (CNG) in the transport sector, will significantly reduce the level of air pollution in a timely and cost-efficient manner. This could also result in tens of thousands of lives being saved annually.

Moreover, the uptake of natural gas in the short-term and renewable gases in the mid- and long-term will boost economic growth and help the regions meeting the EU climate targets. Monthly day ahead electricity prices for 2021-2022 show that the German electricity price will be about 46.7 EUR/MWh and the Polish electricity price will be around 59.6 EUR/MWh (Energy Live, 2021). Taking into account that the average net salary in Germany is about 1600 EUR, compared to 600 EUR in Poland, energy poverty could be the main challenge ahead.

Figure 1 - Gross electricity generation in the selected Central-Eastern and South-Eastern European countries by fuel in TWh

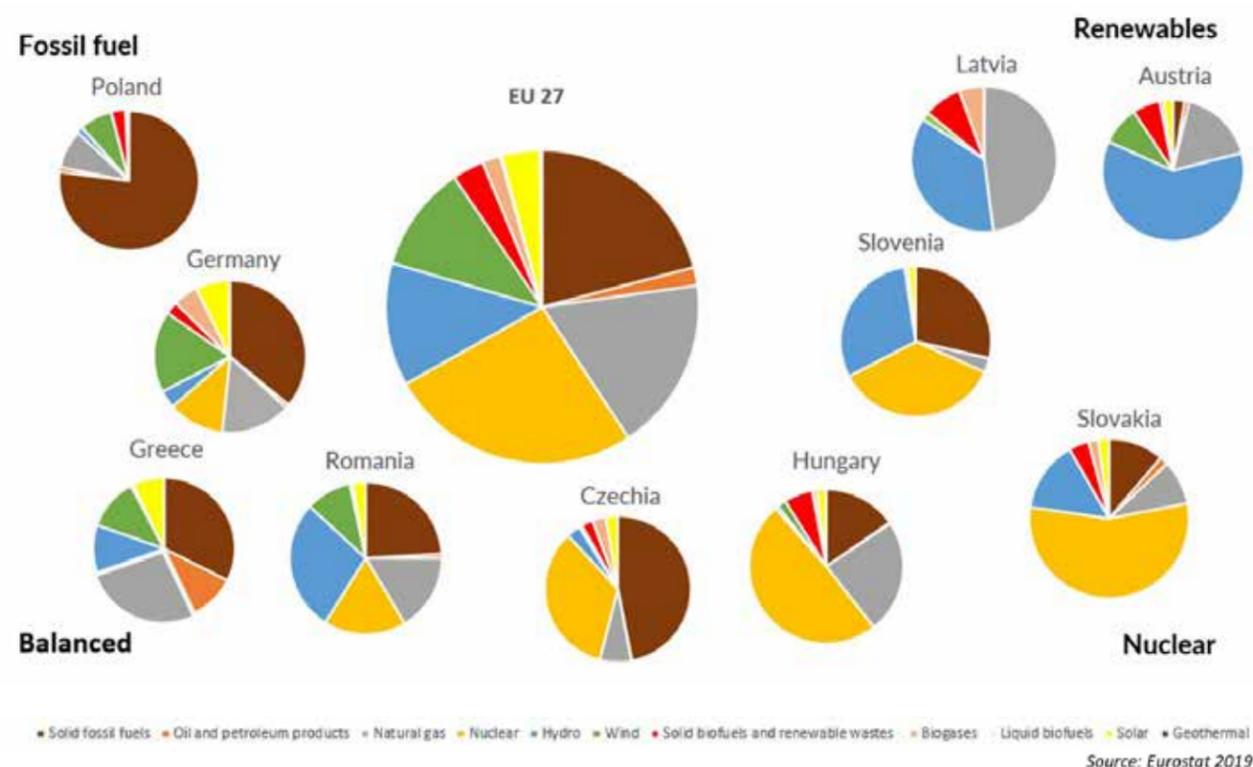
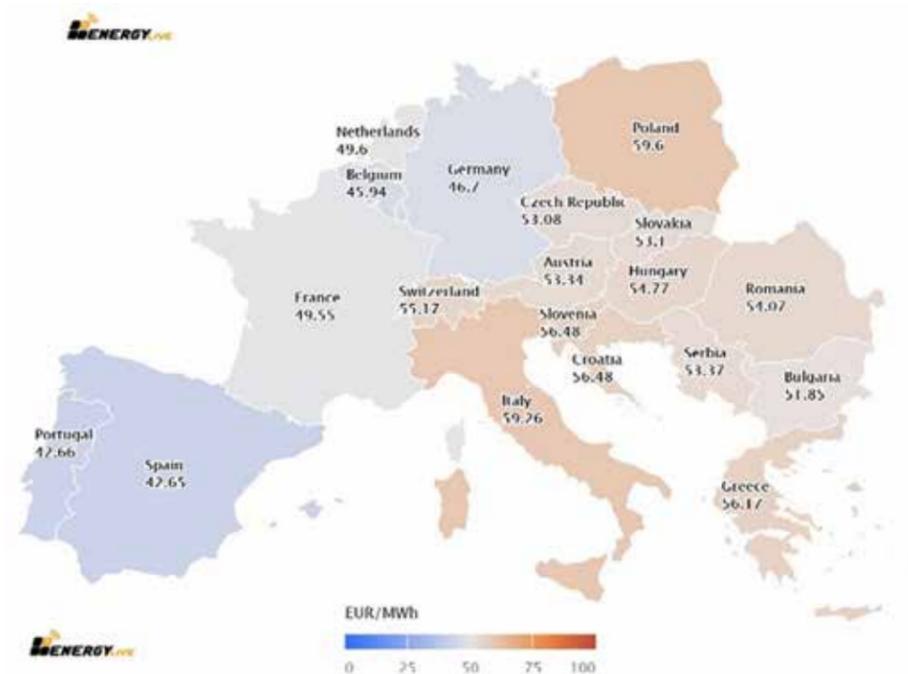


Figure 2 - Monthly day ahead electricity prices in EUR/MWh as of 18th March 2021 (EnergyLive, 2021)



5 What emerged from the debate is that there is no 'one-size-fits-all' solution to achieve the ultimate objective of carbon neutrality

This report has prompted a focus on several key benefits brought by gas and the gas infrastructure: these include the untapped potential of natural gas, the future of renewable and low-carbon gases, a future-proof gas infrastructure and the social benefits of the switch to gas.

Each country is moving towards decarbonisation in a different way. The common denominator is the shared awareness of the issues at stake, their urgency as well as a strong push for efficiency.

### Looking ahead

Gas infrastructure can play a crucial role in tackling decarbonisation and addressing economic sustainability. However, this will depend on the policies adopted by Central-Eastern and South-Eastern European governments and the way in which energy markets will develop in the regions. In such context, knowledge-sharing and multi-stakeholder engagement must underpin the energy transition.

As a next step, the GIE dedicated working group will continue in 2021 to identify immediate measures and initiatives that can be taken to transform the report's recommendations into implementable actions. The upcoming revision of the gas part of the Third Energy Package offers a window of opportunity to endorse these reforms and lay the foundations for a sustainable and cost-efficient energy transition in Central-Eastern and South-Eastern Europe.



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Gas Infrastructure Europe (GIE) is an association representing the infrastructure industry in the gas business, including Transmission System Operators, Storage System Operators and LNG Terminal Operators.

With 69 companies coming from 27 European countries, GIE voices the views of its members vis-à-vis the European institutions, regulators and other key stakeholders. Its mission is to actively contribute to the construction of a single, sustainable and competitive gas market in Europe, underpinned by a stable and predictable regulatory framework as well as by a sound investment climate.

The opinions expressed in this document are the responsibility of the GIE alone.

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