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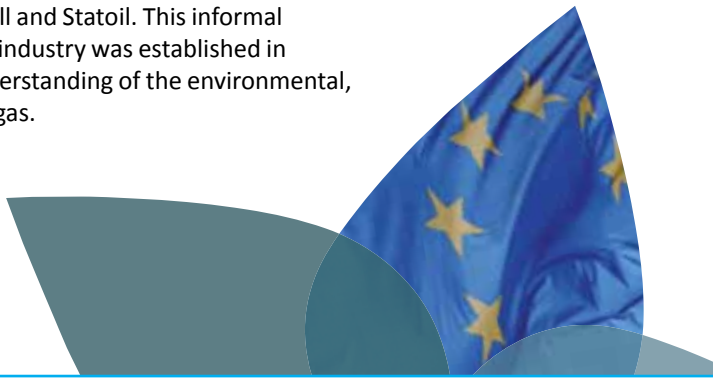
The Future Role of Natural Gas

Overview

Europe's ability to meet the climate challenge while remaining economically competitive depends on a deeper understanding of the energy supply options available. The aim of this joint position paper is to highlight that the outlook for natural gas is characterised by abundance, affordability and environmental attractiveness.

About the Forum

The European Gas Advocacy Forum is composed of: Centrica, Eni, E.ON Ruhrgas, Gazprom Export, GDF SUEZ, Qatar Petroleum, Shell and Statoil. This informal group of experienced players in the European gas industry was established in 2010 to increase – at all levels of society – the understanding of the environmental, economic and energy security benefits of natural gas.



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NATURAL GAS IS ABUNDANT

Globally, estimates point to more than 250 years of recoverable natural gas resources at current consumption levels. New pipelines, new inter-connections and expanding LNG infrastructure, along with a revolution in the exploitation of unconventional resources, have transformed supply realities. For Europe – situated within a 5,000-kilometre radius of 80% of proven worldwide gas reserves – the outcome has been a surge in natural gas supplies and a diversification of natural gas suppliers. Europe nevertheless needs to foster an environment that stimulates the longer-term availability of global gas resources.

NATURAL GAS POWER PLANTS ARE A COST-COMPETITIVE ALTERNATIVE

Combined-cycle natural gas power plants have lower full costs than the other generation alternatives for mid-merit and peak operations. Depending on assumptions for future fuel and carbon prices, natural gas powered plants could also have lower full costs than coal for base-load generation. In addition, combined-cycle natural gas power plants are also much less capital investment intensive. Coal plants and nuclear plants require, respectively, two-to-three and four-to-five times as much capital per megawatt as natural gas plants. Natural gas plants are also typically faster to build, with a shorter, more straightforward permitting process.

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NATURAL GAS IN POWER GENERATION OFFERS SIGNIFICANT EMISSIONS REDUCTIONS

Replacing old coal plants with new natural gas-fired plants could lower emissions of carbon dioxide by 60-70% per kilowatt-hour generated – taking into account the entire life cycle, from exploration and extraction right through to decommissioning and disposal. Even the most modern coal plants can emit twice the amount of CO_2-equivalents per kilowatt-hour as natural gas combined-cycle power plants. Furthermore, the US National Research Council estimates that the cost of environmental damages unrelated to climate change from natural gas power plants is 95% lower per kilowatt-hour than the cost of those caused by coal plants.

NATURAL GAS HAS AN IMPORTANT ROLE TO PLAY IN DECARBONISING THE ENERGY MIX

– In the short term, fuel switching from other fossil fuels to natural gas can deliver a substantial decrease in CO_2 emissions in both power generation and other sectors.
– In the medium term, combining investments in natural gas plants with investments in renewable energy could ensure a secure supply of energy with reduced CO_2 emissions – even when the wind is not blowing or the sun is not shining. Because natural gas powered plants can start up or shut down within minutes, they can serve as a flexible complement to intermittent renewable energy sources. Up to 2030 Europe's required CO_2 mitigation can be reached with existing technologies. We therefore have until then to demonstrate the social acceptability and maturity of carbon capture and storage (CCS) technology.
– In the long term, CCS could enable natural gas to play an important part in the energy mix in a decarbonised 2050. After 2030, CCS could be retrofitted to natural gas power plants to achieve near-zero emissions.

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NATURAL GAS HAS ADVANTAGES BEYOND POWER GENERATION

In heating, industry and city transport, natural gas is an environmentally sound alternative to other fossil fuels. Fuel substitution and replacing old appliances with gas-based heating technologies are fast and cost-effective ways of reducing both CO_2 and other emissions; these same technologies are a good match for integrating renewable energies (like solar heating or biogas) over time. More and more cities around the world are taking advantage of natural gas's twin benefits in public transportation: dramatically improved air quality and a smaller urban carbon footprint.

GDF SUEZ / HAUTEMANIERE NOEL

NATURAL GAS SUPPORTS EUROPEAN ECONOMIC DEVELOPMENT AND COMPETITIVENESS

Compared to the European Climate Foundation's pathway to a 2050 European energy mix featuring 60% renewables ("Roadmap 2050: A practical guide to a prosperous, low-carbon Europe"), an "optimised" pathway could secure, in total power cost savings, an estimated €500 billion up to 2030. While it might be possible to avoid €300-400 billion in capital expenditure between 2030 and 2050, the total power system cost over this same period could be roughly equal or slightly better relative to the ECF pathway referred to above.

For Europe, natural gas is thus not only an abundantly available energy source, but one that used in combination with a growing and innovative renewable industry meets agreed reduction ambitions in an economically superior manner.

Mandating the exact technologies and energy sources to be used to decarbonise the European economy, rather than setting clear end-goals and levelling the playing field, risks hamstringing innovation. And innovation, along with a flexible and robust energy system, is a prerequisite of Europe's future competitiveness.

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Xyntéo, an advisory firm which specialises in low-carbon growth, has served as an independent, third-party advisor and facilitator in the process. www.xynteo.com