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NATURAL GAS SYSTEM
TRANSITION AND COMPETITIVITY

EXECUTIVE SUMMARY

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Position Paper

NATURAL GAS SYSTEM: TRANSITION AND COMPETITIVITY

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Executive Summary

Creating a European Energy Union implies the integration of different energy sources, both fossils and renewables, balancing internal demand and import dependency issues. Europe imports more than half of all the energy it consumes and the current geopolitical context compels us to do our best in order to conjugate foreign policy choices with security of supply in the energy sector. This study analyzes the role of Natural Gas in the future energy framework, in order to underline its importance in Italian, European and global sustainability policies.

A structural analysis of the global and European energy context leads to highlight national opportunities and risks, considering three main drivers: energy demand forecasts, according to climate change policies, gas supply dynamics, according to infrastructure developments, and gas market competitiveness, according to the full exploitation of Italian strategic geographical position in the Mediterranean sea.

Dealing with our future challenges, from energy security to CO_2 reduction, means to coordinate multiple actions through a new strategic vision on infrastructures. Thanks to its flexibility, reliability and energy density, Natural Gas is considered the best traditional energy source for the transition to a low carbon economy and the best ally of renewable energy. It is contributing to the reduction of both GHG and polluting emissions - supporting renewable electricity and enabling green gas development (e.g. power to gas, biomethane, etc.) - enhancing air quality. Italy leads this transition, with more than 17% of its final energy consumption obtained from renewable sources and 38% of electricity generated by efficient gas power plants. In the next few years the fuel switch, from coal to gas, is going to be on the table of all European countries, as gas turbines are the best option to balance the increasing renewable intermittent capacity (primarily wind and photovoltaic), needed to reach the 2030 ambitious target (+32% of final energy consumption from renewable sources).

Although many countries in Europe have made efforts to decouple energy use from economic growth, energy consumption is still related to gross domestic product. This paper considers a scenario of stable economic growth for Europe and for Italy[1], driven by manufacturing. According to those projections, we estimate a light increase of European energy demand, particularly related to Natural Gas due to climate change policies pushing the coal-to-gas fuel switch. The significant improvement in efficiency envisaged in the Clean Energy Package, however difficult to achieve, will not prevent a modest increase in gas consumption, which could become much more sustained if the Commission's forecasts are not met.

[1] Around 1,2% average per year between 2010 and 2040.

In the first place, a whole and comprehensive integration of the European energy systems is going to be necessary, coupling gas and power sectors, in order to enable a greater electrification of final end uses and an increasing renewable power generation, without jeopardizing network stability and business competitiveness, pursuing cost-efficient options among production, storage, transport, distribution and consumption in order to avoid stranded assets. Due to its energy density compared to electricity transmission, gas pipelines constitute the most cost-effective way of transporting energy both within and across EU Member States. At the same time, the electrification of final energy uses is not always possible or, at least, economically sustainable, without a disruptive technological leap which for the moment is not foreseeable : this is the case of the industrial sector. Natural Gas demand from the industrial sector cannot be reduced in the short and medium term, because of the proper nature of technical processes and the chemical composition of final products. The use of Natural Gas in Italian manufacturing clusters is also an example of industrial commitment on environmental protection, through high efficient cogeneration systems. Cogenerating heat and power within industrial plants produces 30% less CO_2 emissions compared to traditional technologies. Besides, it produces remarkable benefits on energy efficiency, lowering energy and carbon intensity, and circular economy, involving green gasses in the process, such as the biomethane or synthetic gas. Furthermore, investments' allocative efficiency and households availability of expenditure should not be underestimated. Replacing gas with electricity in home heating, for example, requires investments that families, in most cases, cannot afford. For this reason, we consider as stable Natural Gas households consumption in the next decade, while transport sector will experience a radical change, with the deployment of alternative fuels including gas.

Having established the role of gas in the future of energy mix, it is necessary to adopt an holistic approach to make the commodity more secure (in terms of supply), competitive (in terms of price) and environmentally compatible (in terms of GHG emissions).

Security of supply and market competition are strictly related to the availability of inland reserves and the differentiation of supply infrastructure: the availability of reserves is in fact correlated with market power, while the purchase price is correlated to the willingness to pay for the commodity. European gas reserves are declining, domestic gas production is forecasted to decrease 30% by 2030, therefore we have to develop a competitive internal gas market without counting on a truly competitive domestic upstream sector. In 2016 77% of gas imports to the EU were controlled by three major government-owned companies, which supplied the EU predominantly through their pipeline systems, while LNG providers played the role of a competitive edge. Russian Gazprom, in particular, counted for more than 40% of those extra-EU imports, around 31% of the European gas consumption. This market concentration is reflected on wholesale gas prices. Liquid hubs, such as TTF (Title Transfer Facility) and NBP (National Balancing Point) which have access to LNG and Northern Sea reserves, show the cheapest

quotations in Europe. Highest prices can instead be found in countries that have no direct access to the North-Western region. The spread between the cheapest and the most expensive country narrowed from 46% to 49% and the average price gaps suggest that the European gas market is not yet a fully integrated single one.

Diversifying supply routes by developing a comprehensive LNG strategy and a Mediterranean & Southern Gas Corridor is considered by the European Commission a milestone in order to achieve "*Energy Security, Solidarity and Trust".* Germany is now completing the Nord Stream II, doubling its import capacity from 55 to 110 billion cubic meters a year, a pipeline which is going to strengthen European dependence on Russian gas imports. It is necessary to develop new competitive supply routes to Europe, such as the Southern Corridor from Caspian and Middle Eastern regions - TAP project (Trans Adriatic Pipeline) had the green light from the Italian Government at the end of 2018 – and other Projects of Common Interest (PCI) in gas infrastructure. In particular, East Med and Poseidon will contribute to diversify supplies and to exploit the enormous potential of the Eastern Mediterranean reserves discoveries. Italy, thanks to its strategic position, should become an interconnection hub between production areas and consumer markets in Europe. Adequate decisions in order to stimulate infrastructure investments and cooperation measures among Member States have to be taken in the next few years: short-term hub-indexed contracts, instead of long-term Take or Pay oil-indexed ones, have to be considered in future European statements and Final Investment Decision (FID) for Projects of Common Interest.

Import diversification can have a significant effect on security of supply and wholesale prices, but the creation of a fully integrated single market is vital to establish a common level playing field across Europe: a competitive European gas market comprising entry-exit zones with liquid virtual trading points, where market integration is served by appropriate levels of infrastructure, which is utilized efficiently and enables gas to move freely between market areas to the locations where it is most highly evaluated by gas market participants. The wholesale gas markets of the five cheapest countries (Denmark, Belgium, the United Kingdom, the Netherlands, Germany) are fully integrated, and can be considered together as a single market. Although Italy presents the greatest number of supply sources in Europe, in terms of the geographical origin of the gas, its PSV (*Punto di Scambio Virtuale – Virtual Exchange Point*) spot price is structurally around 2 €/MWh higher than TTF, due to lack of integration. This differential across European countries determines a loss of competitiveness for industrial companies and must be tackled through infrastructural interventions and regulatory measures aimed at improving market liquidity and eliminating tariff barriers, such as pancaking. Promoting the shift from national markets to a single energy market is a key point of all European orientations, from the Third Energy Package to the Energy Union. The convergence of national rules needs to go on with the common development of both network codes and physical infrastructures, and, in this regard, finance will

be pivotal. Given the magnitude of the challenges we are about to face, more and more cooperation will be needed among Member States, especially if we want to achieve an Energy Union able to grant security, efficiency, solidarity and competiveness.

Italy has one of the most reliable gas networks in the world, thanks to investments and improvements made over 70 years. The whole Europe already benefits from a well-interconnected gas network, an heritage which has to be enhanced in order to reach the decarbonization targets.

The following five strategic lines aim to promote the efficiency of the European gas system and develop a safe, competitive and integrated European gas market:

1. Strengthen sector coupling, integrating power and gas systems, in order to balance energy networks, storage renewable sources, and deploy electricity and heat cogeneration;
2. Attend the transport gas consumption increase, both compressed (CNG) and liquid (LNG), freeing up the potential of biomethane, through the construction of the related infrastructure;
3. Efficiently exploit the existing infrastructures potential and consider their strengthening, diversifying sources and supply routes, in particular those of the Southern Corridor;
4. Favor a full exploitation of the internal gas production;
5. Improve gas transit regulation within Europe, in order to increase the efficient use of existing capacity and to develop a competitive and integrated market across Europe.