

# THE EUROPEAN UNION'S ENERGY SECURITY: THE CASE OF NATURAL GAS SUPPLY

Boyko Nitzov

Agency for the Cooperation of Energy Regulators  
+386 (0)8 2004 606, boyko.nitzov@acer.europa.eu

Damjan Zagožen

Agency for the Cooperation of Energy Regulators  
+386 (0)8 2053 418, damjan.zagozen@acer.europa.eu<sup>i</sup>

## Overview

The paper looks at various economic aspects of the security of natural gas supply in the European Union (EU) in the context of existing or perceived risks, and at the suggested policies and tools intended for the mitigation of these risks. The objective of the paper is to highlight the choices that policy makers and regulators may have to make at pan-EU, regional, and national (member state) level, along with the inherent cost-benefit tradeoff of these choices.

## Methods

The analytical framework is applied to the various security of gas supply risk mitigation instruments, such as, for example, the diversification of gas supply by pipeline and deliveries of liquefied natural gas, the enhanced use of underground gas storage (including via the establishment of strategic gas reserves), the improved "connectivity" of regional and national markets via the enhancement and better use of interconnections between the gas transmission systems, the development of the domestic gas resources, and other means. For each instrument, a cost-benefit assessment is proposed on a "risked" basis and the strengths and weaknesses are analyzed from the viewpoint of the instrument's ability to support the overall objective of improving the security of natural gas supply with the least amount of market distortions. The analysis is in the context of the essential features of the now debated Energy Union in the EU and the relationship of the EU with third countries. The analysis also uses comparisons to the instruments deployed by the member states of the International Energy Agency (OECD) for the enhancement of the security of oil supply.

## Results

A ranking is suggested of priorities in terms of adopting certain policies and the relevant instruments for the efficient mitigation of the prevalent risks and the achievement of an adequate level of security of gas supply on pan-European, regional, and national level, as applied to four randomly selected EU member states.

## Conclusions

Achieving security of gas supply is impossible without the existence and the proper functioning of an integrated natural gas market on the demand side. The least costly way of achieving security of gas supply is to have functioning free liquid and competitive markets on both the supply and demand side. Increased security of natural gas supply in the European Union is unattainable by policies and instruments that lead to isolationist, compartmentalized solutions.

Non-market approaches to the issue of securing natural gas supply lead to the need to invest in gas supply infrastructure beyond what is needed to meet the technical requirements for achieving acceptable levels of security of supply, and thus to the loss of welfare and competitiveness. Attention should be paid to the connectivity of the gas infrastructure system, i.e. whether it has the technical capacity and operates in the regulatory environment that does allow gas supply and gas stocks to be pooled over larger territory.

In cases where there is a market failure on the supply side, the magnitude of the gas supply risks to which the states and regions of the European Union are exposed varies hugely due to the various patterns of gas supply and

connectivity between the gas infrastructure of the member states and regions. A subset of priority projects for developing the gas infrastructure is therefore the one that connects the member states. Even though such projects do not necessarily provide supply from new sources to Europe, overall they make the already existing supply sources more accessible to more countries within Europe.

The efficient solutions for dealing with disruptions are not identical in the various countries and parts of Europe. In the current market environment and given the topology of the gas supply infrastructure, what may be a priority solution in Northwest Europe may not be so in Southeast Europe. To efficiently achieve the goal of integrating the internal gas market in the European Union, a discretionary application of the available tools for mitigation of potential gas supply disruptions will be required: the prioritization of the measures for improving the supply disruption resilience of the European Union's member states has to be aligned with the precise challenges, risks, and bottlenecks which the relevant country and location face.

Sensitivity analyses demonstrate that the outcome of a disruption of gas supply in terms of loss of income is primarily dependent on very few factors, namely, in this order: the resilience of the infrastructure in case of failure of the largest supply capacity (N-1 infrastructure standard), the degree to which the main supplier wishes to be cooperative (how likely is the cut-off of supplies, including under political stress), the dependence on imports of gas (the share of imports in gas consumption), and the diversification of gas sources and counterparties (the share of the major supplier in gas imports).

The establishment of a cooperative relationship with the major supplier may help eliminate the need to invest in infrastructure because of market-related concerns (including politically driven market interventions), thus reducing the cost of infrastructure development to the cost of technically needed projects, and in an ideal world would be the preferred solution. To achieve that, however, the constructive approach of the external suppliers is also needed; regretfully, at this time this may not always be the case. Whenever non-cooperative attitudes prevail with dominant suppliers, diversification of supply by counterparty, source, and route is a must - but only if the avoided cost of a supply disruption exceeds the cost of the required new infrastructure, i.e. in case the risked cost-benefit analysis demonstrates the appropriateness of the investment expenditure.

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<sup>1</sup> Boyko Nitzov and Damjan Zagožen are TSO Cooperation Officers at the European Union's Agency for the Cooperation of Energy Regulators (ACER). The views expressed in this paper are the views of the authors and do not necessarily reflect the official position of ACER or any of its Boards.