

# **The European Natural Gas Sector until 2025**

## **– Which Role for Russia and LNG? An Application of the GASMODO Model**

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### Kurzfassung:

Natural gas supply to Europe is of utmost importance both for the European countries, and for current suppliers in the increasingly globalized markets. This paper proposes an application of the GASMODO model. GASMODO is a numerical simulation model of the European natural gas sector, where imports to Europe and wholesale trade within Europe are represented as a two-stage game. The market situation can be modeled as perfect competition, Cournot competition or cartel on either of the two stages which enables us to simulate different market situations such as a successive oligopoly, a liberalized European market, an export cartel, etc. The model includes 17 importing regions and 13 exporters where we distinguish pipeline and LNG (Liquefied Natural Gas) supplies. We take into account infrastructure capacities since these can be an important limitation to natural gas trade.

In this paper we use the GASMODO model to investigate the role of Russia and the role of LNG for the European market until 2025. Russia is considered as an important supplier to Europe, and current projects like the North European Pipeline through the Baltic Sea and the development of a field in the Barents Sea (Shtokman) support this idea. However, natural gas production in Russia is relatively cost-intensive (mainly because of unfavorable climate conditions), and the currently exploited fields are reaching depletion within the next years, forcing to bring on stream new fields with even higher costs of production. In addition, producers in Russia are faced with a domestic market where the regulated price still is lower than the (long-run) marginal costs of production, which reduced the attractiveness of the Russian natural gas sectors for investors in the production and transport infrastructure.

In contrast, the LNG business is experiencing an increasing interest of investors in capacities at all stages of the value-added chain (liquefaction, shipping, regasification). Moreover, LNG

costs have declined substantially in the last years and some further cost reductions can still be expected (e.g. economies of scale in liquefaction). This has led to a shift in the structure of relative costs in the natural gas sector. LNG trade has also led to a globalization of natural gas markets, which in turn favors the development of competition.

We propose to study the outcome of these changes on the European natural gas trade. Our results show that market forces lead to a diversification of European natural gas supplies. They confirm the deterioration of the Russian position on the European market, accompanied by increasing imports from LNG exporters (from North Africa, the Middle East, West Africa, and the Caribbean). LNG import (regasification) capacities could become a bottleneck in Europe, whereas export capacities (LNG and pipeline) are largely sufficient to meet the rising demand for natural gas in Europe.

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