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## **GAS CORRIDORS CONNECTING EU WITH ITS NEIGHBOURING COUNTRIES IN NEXT DECADES - ANALYSIS OF REQUIRED INFRASTRUCTURE AND THE BARRIERS FOR IMPLEMENTATION**

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### **Overview**

The European Commission (EC) has acknowledged for several years now the importance of securing in the long run its increasing gas demand from supplies from a limited neighboring countries and regions for quite some time. For that purpose it issued for example a Green paper in 2000, Towards a European strategy for security of Energy supply and very recently in 2006 a Green Paper entitled "European Strategy for Sustainable. From these and other recently published Communications (see e.g. "Priority interconnection Plan" (end 2006) it becomes very clear that Supply security and for that to be realized the infrastructure of gas and electricity market in particularly the gas corridors with key suppliers play a key role and overriding prerequisite.

In the past the Commission identified a number of so-called priority gas infrastructure projects in the TEN-E programme.<sup>1</sup> But apart from the public goal of gas *availability*, the *affordability* of getting the resource at the end-consumer is a concern as well. This issue was also mentioned in the recent EU Green Paper (2006).

In the currently very recently finished, EU funded large research project Encouraged<sup>2</sup>, optimal energy (gas, electricity and for the very long term hydrogen) corridors were assessed. Given the limitations of this presentation we will focus herein on the in the assessment of the in the future required gas supply infrastructure for connecting the EU markets with its key gas suppliers in Russia, South East Europe, Middle East and North Africa as well as with other LNG sources in the future.

Although the optimality of these gas corridors on accounts of both availability and affordability of gas is well-founded, a important question is whether actors in the gas market will sufficiently and timely invest in these corridors.

In this paper we assess first the gas infrastructure up till 2030 and next potential economic and geopolitical barriers that might hamper the implementation of optimal gas corridors and finally we propose recommendations for EU policy and regulation. We find that both uncertainty regarding future policy and regulation applicable to the investment as well as co-ordination issues surrounding the investment negatively contribute to energy corridor investment issues. A larger role for EU coordination on development of a common gas infrastructure regulatory framework is suggested.

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<sup>1</sup> For more info on this program we refer to the DG-TREN website ([http://ec.europa.eu/ten/energy/documentation/index\\_en.htm](http://ec.europa.eu/ten/energy/documentation/index_en.htm)).

<sup>2</sup> Encouraged is an acronym for the two year RTD project recently finished and entitled 'Energy Corridor Optimization for the European Markets of Gas, Electricity and Hydrogen. For more info on this project we refer to website [www.encouraged.info](http://www.encouraged.info).

The presentation will present the key findings

### **Methods**

The ENCOURAGED project is launched for identifying and assessing the economically optimal energy corridors by building new and expanding existing one's, for electricity, natural gas and hydrogen supply between EU and neighbouring countries as well as identifying the barriers and benefits of connecting the different European energy systems. In the paper we present the findings of the project part on gas supply infrastructure, by adopting the following approach:

1. Assess the economic optimal gas corridors and related network infrastructure of connecting the EU with its neighbouring countries and regions.
2. Identify and evaluate the technical, economic and regulatory barriers and potential benefits of investing in these identified optimal energy corridors.
3. Analyse and assess the necessary policy and regulatory improvements to implement the necessary and recommended gas corridors with a focus on economic investment and international political framework in Europe.

We used the official EU energy scenarios published by DGTREN for projecting the gas demand and supply in the long term in Europe. On the geopolitical issues of the gas supply in the project the internal report drafted by G Luciani was valuable and used and particularly the work of OME Manfred Hafner regarding gas supply costs, production and options of routes provided a key contribution to this study part of ENCOURAGED project. See for different contributions also our website [www.encouraged.info](http://www.encouraged.info).

### **Results**

Main results are that pipelines are expected to remain the most dominant means of gas transport in Europe. According to the simulation, pipelines should represent 83% (low demand), 81% (high demand & BAU) or 77% (deferral) in 2030, the remaining shares being covered by LNG. LNG is expected to come from Qatar (33%), Nigeria (25%), Algeria (17%), Egypt (15%) and others (10%). LNG should supply the UK (28%), Spain (19%), Italy (18%), France (15%), Benelux (13%) and others (7%).

According to the different scenarios, investment needs from 2005 to 2030 are estimated between €90 billion (low demand) and €164 billion (high demand). In the business as usual case, the requirements are €126 billion. These figures include pipelines, storage facilities and liquefaction and gasification terminals. If one excludes the liquefaction plants, investment needs amount to €66 billion in the low demand scenario and €126 billion in the high demand scenario, compared to €94 billion in the reference case.

Several gas corridors are already in a stage of reinforcement or to planed to be developed. The traditional routes to Europe are all being strengthened. Six new pipeline corridors are also under development, from Norway to the UK (Langeled pipeline), from Russia to Germany across the Baltic (North European Gas Pipeline), from Algeria to Spain (Medgaz) and to Italy (Galsi). Another important route under development is the corridor from the Middle East and the Caspian across Turkey, further prolonged by pipelines across Greece (Turkey-Greece-Italy interconnection) or across the Eastern Balkan to Austria (Nabucco) which would allow Europe to diversify its supply sources. If all these projects are completed, the identified pipeline projects would represent an additional supply capacity to Europe of about 100 bcm by the beginning of the next decade.

The announced projects roughly correspond to the requirements identified in the business as usual scenario of the theoretical model analysis. It seems, however, that projects mainly focus on carrying more gas into the European market while fewer operators are keen on developing the needed interconnections inside Europe. While not being the scope of this

study, it might be useful to investigate the incentives for ‘de-bottlenecking’ the internal EU gas market.

Moreover, the number of projects proposed could support the idea that there is no problem of investment in international gas infrastructure to Europe. On the contrary our analysis evaluated a number of important economic, regulatory and political constraints such as uncertainty regarding future policy and regulation applicable to the investment as well as co-ordination issues surrounding the investment are negatively influencing the necessary gas corridor investments. A larger role for EU coordination on development of a common gas infrastructure regulatory framework is suggested.

The presentation will present all the key findings

### **Conclusions**

The results of the project provided useful insights in gas infrastructure requirements connecting the EU gas markets with our key suppliers and resulted in a EU report in support of the Commission.

### **References**

- EC (2006), Green Paper: A European Strategy for Sustainable, Competitive and Secure Energy, Brussels
- EC(2007), Summary of reports ENCOURAGED project, Brussels, Forthcoming in 2007

### **Key words**

Gas demand and supply, gas infrastructure and investments, gas market competition and regulation