

# Challenges and policy implications of gas reform in Italy and Ukraine: Evidence from a benchmarking analysis

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## ABSTRACT

This paper presents a cross-country benchmarking study of natural gas distribution to final consumers and compares two samples of companies in Italy and Ukraine. A 2-stage DEA procedure calculating efficiency of gas providers and identifying critical context factors and policy issues that affect it is implemented. Both countries are low performing in terms of operators' technical and scale efficiency and there is room to design more efficient market configurations.

Some issues need attention to develop an effective gas market policy: a) search for efficiency requires accurate investigation of its main drivers that depend on context factors; b) while greater efficiency is necessary to reduce cost and increase service quality, at different stages of progress of the reform process other goals may be more important; c) gas industry reform process should be planned adopting a systemic perspective as its development does not remain confined to the sector, but implies changes in the whole country economy, particularly when the gas market is of primary relevance to the economy; d) a more comprehensive package of reforms may be necessary to make gas market reform successful; e) even though the gas market reform is an economic process, it has unavoidably social and political implications.

## 1. Introduction

Natural gas plays a vital role in the economy of Europe, which together with North America, is a major consumer of this commodity. Natural gas has several applications, and is commercially utilized across many sectors. In the residential sector it is used to operate boilers, furnaces, and water heaters for commercial buildings and houses heating, cooking, sanitary water heating, while in the industrial sector it is used mainly in electric power generation alone or in combination with other energy sources, and in several manufacturing processes as a heat source in the production of a large number of commodities. It is also used in transportation as fuel for vehicles both private and public.

Natural gas has significant advantages over coal, gasoline and diesel fuels. Indeed, it is one of the cleanest non-renewable energy sources, emitting about 30% less CO<sub>2</sub> than oil and 50% less than coal per unit of energy produced because of its higher hydrogen to carbon ratio. When used as a fuel in transportation, gas operated vehicles produce a lower amount of smog pollutants and greenhouse gas emissions. In addition, the low price of natural gas in comparison to other fossil fuels has made it a very attractive source of energy.

During the last decade, the worldwide consumption of natural gas has been considerably growing and an increasing number of countries are importing large amounts of gas from the international market being unable to meet demand through domestic supply. In the European Union (EU)'s 28 Member States, as well as in Switzerland and Turkey, the consumption of natural gas in 2013 decreased by 1.5% compared with 2012, consistently with the reduction of the primary energy consumption. Two major factors contributed to such a decrease, i.e. the reduction in electricity demand determined by the slow economic growth in Europe and an increased utilization of renewable and coal in power generation. However, according to statistics provided by Eurogas (2014), natural gas remains the second largest source of primary energy consumption among the EU's 28 Member States, Switzerland and Turkey, with a consumption share of 23.1% in 2013. As a consequence of the commitment towards greenhouse gas emissions and its high efficiency and green properties, natural gas consumption in Europe is expected to grow from 490 billion m<sup>3</sup> in 2012 to 550 billion m<sup>3</sup> in 2020 (Fig. 1).

Since the end of 1980s the structure of the industry and the value chain that delivers the natural gas to the final customers has dramatically changed, becoming more complex but more open to market

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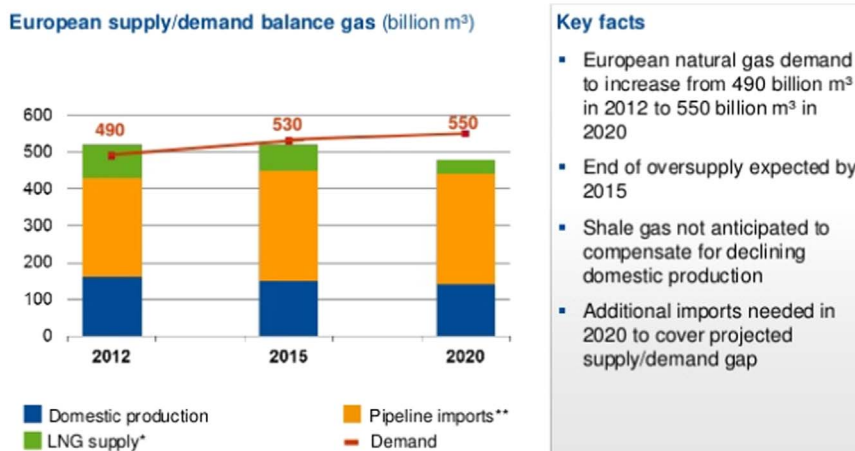


Fig. 1. EU supply/demand gas balance Source: Seele (2013).

competition and choice opportunities for customers. Distribution, the final stage of the natural gas value chain, is a critical one. Most of the final customers receive gas from local utilities that generally deliver gas to the consumers within a very circumscribed geographical area having been awarded a concession for supplying gas and performing services like billing, safety inspection, gas hookups for new customers in a regulated market. Natural gas is distributed by the local utility from a city gate to the final users' meters through a widespread network of small pipes. Because the local utility must transfer small volumes of gas to a large number users – households and businesses – which may have very different locations within the concession area, transmission cost can become relatively high, reaching about a half of the total cost paid by the consumer. Thus, it is very important to measure to what extent local utilities operate efficiently in order to avoid any unjustified high price for gas delivering that the customers have to borne because of a low performing delivery system.

Italy and Ukraine are two countries where the natural gas industry has a critical importance to the national economy. They are large consumers, but, at the same time net importers of natural gas, much of which comes from Russia. In both countries the natural gas market has undergone an in depth restructuring process to meet market challenges, EU directives and pressure of international bodies.

### 1.1. The natural gas distribution market in Italy and Ukraine

The Italian natural gas market is regarded as one of the most vital and interesting in Europe. Only about 18% of the national gas market needs are satisfied by domestic production, while a large amount of gas supplies come from abroad, mainly from Algeria and Russia, but also from the Netherlands, Nigeria and Norway. Throughout the whole 2013, the decrease in the consumption and industrial production induced by the downturn of the economy caused difficulties to all energy sectors, including the gas market. Data provided by the Ministry of Economic Development indicate that gross domestic consumption was 70.1 Gm<sup>3</sup>, while domestic production stopped at 7.7 Gm<sup>3</sup> and net imports amounted to 61.7 Gm<sup>3</sup>, decreasing the country level of dependence on foreign supplies to 88.4%. The Eni, Edison and Enel industrial groups account for 82.5% of all the gas supplied. Total demand of the gas industry in 2013 including total gas volume sold on the wholesale market (including reselling), retail, and self-consumption was 180.6 Gm<sup>3</sup>. According to recent estimates, the natural gas retail market consists of about 21 million customers, including domestic customers, central heating providers, manufacturing and power generators. The restructuring process of the gas industry began in 2000 when the Legislative Decree no. 164 (the "Letta" Decree) was issued by the Italian Parliament to adopt the EU Directive no. 30/98, the first one that has established the fundamental architecture of the industry

necessary to promote competitiveness among firms and start the liberalization process in the market. This decree has opened the Italian market to competition and has qualified the local distribution of gas – a monopolistic market by nature – as the only public service activity of the whole natural gas value chain. Since the Letta Decree several legislative and regulatory acts have been issued by the Parliament and the AEEG (the national Energy, Electricity and Gas Regulatory Authority) to support an in depth reform of the industry. The recent legislative decrees issued since November 2011 by the Ministry of Economic Development have reorganized the regulatory framework and the whole natural gas distribution industry to meet the indications of the EU Third Energy Package by adopting the ATEM (the Minimum Territorial Area where the utility operator should provide service) as the geographical and administrative reference unit, rather than the individual municipality. Critical issues of the decrees are the selection of the concessionary company by public tender that should provide service to market introducing in downstream distribution of natural gas market a higher degree of competition, and the minimum level of service quality guaranteed to consumers. However, till the end of 2015 gas distribution was still provided on a municipality base, and existing concessions for gas delivery have been awarded by individual municipalities to the gas supplying companies. Gas distribution is very concentrated as there are a small number of companies that supply gas to a large amount of municipalities. In general, smaller companies concentrate their operations on a limited geographical area.

Ukraine annually consumes 40–50 Gm<sup>3</sup> of natural gas. Of these, more than 20 Gm<sup>3</sup> are extracted domestically, and the rest is imported from the CEE countries (Slovakia, Hungary and Poland) and Russia. About half of the total gas consumption in Ukraine falls on industry, mainly metallurgy and chemical industry. The rest is consumed by heating plants and households. Ukrainian gas distribution system is one of the largest systems in the world. It has two main functions, i.e. to provide natural gas to domestic consumers (till 50 Gm<sup>3</sup>) (downstream distribution), as well as transit natural gas from Russia and Central Asia through Ukraine to Western and Central Europe (over 60 Gm<sup>3</sup> per year) (upstream distribution). In the gas balance of the EU, gas supplied through Ukraine is more than a quarter of all gas demand. On October 1st, 2015 a new law on the natural gas market entered into force, as one of the obligations of the Ukrainian Government to harmonize the national legislation with the Third Energy Package issued by the European Union addressing the implementation of the European Parliament Directive 2009/73/EU and the European Council Regulation 715/2009 respectively concerning common rules for the domestic natural gas market and conditions for the access to natural gas transmission networks. This reform is aimed at promoting a more competitive and efficient natural gas market in Ukraine and, in terms of distribution, every consumer will be allowed to choose the gas supplier

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