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Challenges for European natural gas supply security regulation

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This article evaluates the imposition of EU-wide security of supply standards as foreseen in the proposed regulation on security of natural gas supply from both an economic and legal perspective.

Energy security is a heavily discussed issue and has become one of the key drivers of European energy policy. The reasons for unsettling concern are varied and well-known: the increased reliance on imports from third countries due to rapidly rising natural gas consumption accompanied by a decline in domestic production; the occurrence of regional supply disruptions due to conflicts between Russia and transit countries that revealed shortcomings of both the existing regulatory framework and the European gas network as well as ongoing discussions of major suppliers to cooperate within a 'Gas-OPEC' in the globalizing natural gas market.

This article addresses present challenges for natural gas security regulation in the EU. Obviously, no country wants to depend on 'insecure' foreign supplies of an important economic input such as natural gas. However, security of supply has a price. After outlining those factors that are relevant for determining the optimal level of security, we examine one of the building blocks of the recent Commission's proposal for a new regulation concerning measures to safeguard security of gas supply, that is, unique Union-wide standards of minimum security. We argue that from an economic perspective, the optimal level of security should be evaluated at a national or regional scale. The subsequent legal issues will put into question the capability of the Union to define these standards with regard to the exclusive right of the Member States to determine their national energy mix.

Optimal level of supply security

Security of supply has mainly to do with concerns about '… supply disruptions arising from risks associated with sources of gas supplies, the transit and the facilities through which gas is delivered' (Stern, 2002) as well as about 'affordable prices' (see for example, OECD, 2007) since short-term price elasticities in the energy sector typically are very low for the majority of customers. Short-term reliability (operational security) has to be distinguished from long-term adequacy of supply and infrastructure (strategic security). However, supply security is first and foremost a short-term phenomenon, with the long-term effects being much less dramatic (see for example Huppmann et al., 2009).

The establishment of a functioning, well interconnected and competitive internal market is one major precondition for guaranteeing a high level of supply security and providing efficient incentives to invest in natural gas infrastructure. In order to be prepared for potential future supply disruptions, European policy makers support a range of additional measures aimed at reducing the risk of gas shortages. These include the diversification of supply sources and routes, a better use of existing infrastructures (for example, reverse flows), the elimination of (cross-border) bottlenecks, enhanced internal coordination between Member States or external cooperation with supplying countries. Several funding sources supporting infrastructure investments are made available. For instance, €1.39 billion have recently been awarded to 31 natural gas infrastructure projects (of which 14 include reverse flow projects and two LNG import terminals) within the framework of the European Energy Programme for Recovery.

From an engineer's point of view, the optimal level of supply security might probably be such 'that never constrains operation'. This line of reasoning neglects the fact that supply security, beside its benefits, also has a cost. From an economic (that is, social welfare) perspective, the optimal level of security equates marginal social benefits and marginal social cost. Where the security level is relatively low, the cost of providing more security may be quite low but rises steeply when remaining risks are expensive to deal with. Consumers, on the other hand, are willing to pay a large amount to eliminate major risks but much less for eliminating further risks.

If there were a perfectly competitive market (that is, every stakeholder has complete information about potential risks and the respective costs of reducing them, consumers are able to express their willingness to pay for extra security, and absence of any market failures), market mechanisms would call for this optimal level of security. However, supply security has some characteristics of a public good,

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the willingness to pay differs by consumer, and there are information asymmetries about risks and the costs of reducing them. Therefore, it is not feasible to estimate cost or benefit curves correctly. However, the welfare losses of over- or underestimation remain acceptable within the so-called 'zone of adequacy'.

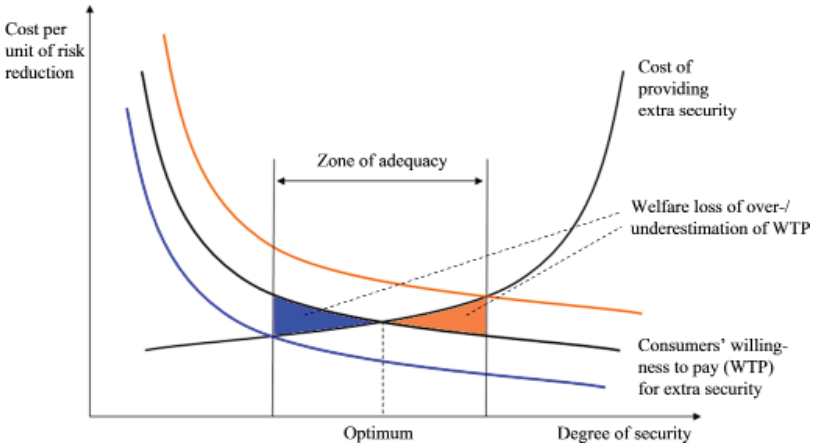

Figure 1 | Optimal level of security

Both consumers' willingness to pay curves and the cost of providing extra security differ by region. Natural gas represents varying shares in the primary energy mix of Member States (for example, 2 percent in Sweden but 37 percent in the Netherlands); it is employed in different shares in residential, industrial, and power sectors; and there are differences in the availability of potential substitutes and the actual level of supply security. Moreover, different instruments are available that can absorb supply disruption. These might include strategic storage, an increase in domestic production, the delivery of additional volumes under existing long-term supply agreements via alternative routes, access to flexible short-term volumes (pipeline and/or LNG), or demand response measures. Therefore, the optimal level of supply security should be evaluated on a disaggregated (that is, Member State, or where appropriate regional) level.

Recommendations for European regulation

Following its 2009 Assessment Report of Directive 2004/67/EC on security of gas supply stating an 'ineffective work' of the regulation in place to date, the EC proposed a new Regulation concerning measures to safeguard security of gas supply. The proposal builds on two main pillars: a top-down approach defining minimum supply security standards at EU level as well as a bottom-up approach based on a local and/or regional risk assessment (see also Noël, 2010).

The major component for infrastructure standards is the so called (N-1) rule that describes the ability of the network to deliver the necessary volume of gas during a period of 60 days of exceptionally high gas demand in case of disruption of the largest infrastructure. Further supply standards request Member States to ensure gas supply to 'protected customers' under different circumstances. The regular risk assessment in contrast shall provide the basis for a determination of individual, region-specific, preventive measures addressing the respective risks identified.

From an economic perspective, EU-wide, unitary standards for supply security bear the hazard of providing a level of security which might be too high, that is, too expensive, with the cost of providing it exceeding the consumers' willingness to pay. Especially the proposed (N 1) rule is a very strong measure and it is highly disputed as to whether it reflects the true risk situation of every Member State. It is not always the largest infrastructure, which is subject to the risk of serious supply disruptions but alternative scenarios; for example, a total disruption of deliveries of Russian gas via Belarus and/or Ukraine, might be much more relevant.

A detailed risk assessment in turn can provide an overall picture of the supply security situation of a Member State or region including the actual level of security, potential risks, a probability distribution of potential events of supply disruptions, as well as the resulting economic damage. Such an analysis should form a reasonable basis on which to evaluate the costs and benefits of providing extra security and makes EU-wide standards needless (see also Noël, 2010).

Therefore, we recommend that the future European regulation of security of gas supply should focus on a bottom-up approach, that is, a local and/or regional risk assessment should form the base for an evaluation of: first, the risks with respect to short and mid-term security of supply; second, the necessity to enhance the security level based on the consideration of social benefits, and third, the costs of potential measures providing extra security.

Measures at the national level should — in line with EC(2009a) — include the establishment of a preventive action plan containing the measures identified to mitigate risks, the continuous monitoring of supply security as well as emergency plans specifying actions and stakeholders' responsibilities in the case of supply disruptions. On a regional level, the consistency of preventive action and emergency plans has to be ensured. Joint plans shall be formulated if this is necessary and economically reasonable. Finally, at EU level, the scope of relevant regions shall

be decided and the necessity of joint preventive action and emergency plans. In the case of EU-relevant emergencies, Member State actions should be coordinated.

Legal perspective

Being the prerogative of the Member States, to date gas security of supply regulation occurs mainly at national level. Based on national sovereignty and the strict limitation of powers of the EU, it is up to the Member States to decide on for example, their fuel mix, energy saving measures, alternate energy sources, or security of supply enhancing tools. Until today, at EU level the issue of gas security of supply has been addressed only on the basis of a deficient competence basis obstructing common legislative processes. Per definitionem, non-energy provisions, such as an approximation of laws (ex-Article 95 EC), a competence to align the laws at national level that have an immediate effect on the creation or functioning of the internal market had to be used. In fact, this general provision also formed the legal basis for the proposal at hand (see EC, 2009a).

An additional reason for the lack of a coherent European gas security of supply policy is the nature of the regulatory framework currently in place. The legal instrument chosen, that is, the 'Directive', was not directly applicable at national level but required transposition into national law and thus opened the door for discretion; the Directive led to heterogeneous ways to ensure levels of security of supply across the 27 Member States (for example, various definitions of a gas supply crisis or the choice of measures provided for in the 2004 Directive).

On account of its rapid entry into force and uniform application due to its direct applicability to the competent authorities in the Member States, natural gas undertakings and customers, its replacement by a stronger regulatory tool, that is, a 'Regulation', seems to be the adequate choice. The envisaged future security of gas supply regime's focus (as incorporated in the proposed Regulation on EU-infrastructure and supply standards as well as a broadened review regime at EU level) implies a preference of the EC for an enhanced 'European' regulatory approach combined with a strengthened role of EU institutions.

The 2004 Directive already obliged Member States to specify adequate minimum security of supply standards to be complied with by selecting from a non-exhaustive list of instruments. The proposed Regulation goes beyond the Directive by redefining the standards of emergency and specifying mitigation instruments with an emphasis on regulation, and by doing that, goes beyond the competence of the Union: the definition of a crisis in view of the role of natural gas is under the exclusive competence of the Member States.

The imposition of a standard such as the (N-1) rule violates the right of the Member State to determine the significance of gas in the national energy mix. Thus, also from a legal point of view, the imposition of Union-wide standards is not the preferable tool for European supply security regulation. Instead, national security assessments would allow for a tailor-made minimum level of supply security determined by the Member States and individual measures on how to achieve it, and, by the same token, would not risk a collision with exclusive Member States competences.

Conclusions

Whether any given level of security is optimal or even adequate is difficult to assess; benefits from extra security have to be traded-off against the cost of providing it. European regulation of security of gas supply should not emphasize top-down measures but should rather build on a bottom-up approach in the form of decentralized security assessments at a national (or regional) level. Member States deciding on their adequate level of security of supply are the preferable tool from both an economic and legal perspective. The coordination of security of supply policies nevertheless is of central importance; possible means include regional cooperation, strengthened monitoring and coordinating rights at a EU level. ★

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