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ISSUES ABOUT THE GAS REGULATORY FRAMEWORK AND POSSIBLE SOLUTIONS

A vision paper

Introduction

In this Discussion Paper, we set out:

- Our view on the **challenges for the gas market in a decarbonising environment**;
- Candidate **areas for reform** to address these challenges; and
- Our **vision for the European gas market**.

Challenges for the gas market in a decarbonising environment

EU energy policy has three objectives: competitiveness/affordability, security of supply and environmental sustainability. Consistent with this, the internal gas market aims at providing a competitive and secure gas market, while also supporting environmental policy objectives.

Our analysis of the current status of the European gas market, based on previous project experience, indicates that within the framework of these objectives, there are a number of important challenges or deficiencies. While these are not intended to represent an exhaustive list, they provide a sound starting point for analysis of possible reform options.

Competitiveness

In relation to competitiveness, some existing deficiencies in the market include:

- Upstream and wholesale markets are still highly concentrated in parts of Europe, especially in CEE – The EU relies on imports for two thirds of its natural gas supply and this reliance is likely to increase in future as domestic supplies decline (although new domestic production of synthetic gas from renewable power sources could oppose this trend). In turn, between them Russia and Norway make up about two thirds of gas imports to the EU and the CEE region is particularly dependant on imports from Russia. Market design has an important role to play (in combination with creating the required physical infrastructure) in ensuring the maximum degree of competitiveness of markets, including those more remote and predominantly supplied from one or few upstream sources.
- Trading markets are illiquid in the largest part of Europe and particularly in forward trading – Institutions such as ACER, CEER and ICIS Heren consider only the UK and (parts of) North-West Europe as offering acceptable levels of market liquidity over the full relevant term structure (e.g. intra-day/day-ahead

to multiple years forward). Some neighbouring countries (e.g. Austria) exhibit emerging liquidity in short-term trading, but not in forward trading. This impedes competition, security of supply and affordability.

- Obstacles remain in the primary and secondary trading of transport capacity – The result is that secondary markets for transmission capacity are illiquid in large parts of Europe. This could lead to suboptimal use of infrastructure. Some infrastructure may be "overused", because the owners of capacity rights regard their cost as sunk. Some of the issues result from the (national) rules according to which transport capacity can be assigned or sold on.

Sustainability

Decarbonising society will imply that the use of (fossil) natural gas as a fuel is likely to decline in the long run. At the same time transport routes will alter due to changing production locations. This may – without further policy guidance - lead to unused gas infrastructure. More specifically there is likely to be excess capacity at interconnection points (IPs) between some EU member states, and at some entry points to the European gas network, i.e. LNG import terminals and pipeline entry points from non-EU member states.

Issues may arise if demand for gas and gas infrastructure falls and attempts are made to recover historic cost over a falling consumption base thereby increasing average tariffs. This may lead to suboptimal use of the gas system in the short run and to gas users prematurely abandoning gas applications (e.g. in heating, power generation etc.). These concerns are complicated by the interest of pipeline operators to recover the full cost of their investments and operations

In contrast, the use of synthetic substitutes to natural gas may rise. This prompts the question whether existing gas infrastructure can be used to meet energy transport needs that would otherwise be fulfilled by new – and in many cases expensive – electricity infrastructure.

Security of supply

Security of supply may be seen as less of an issue in a world of a long-term trend of falling gas demand: with existing network capacity still available and demand falling we would – at first glance – expect less of a reliability issue.

However, if existing infrastructure is not sufficiently remunerated, pipelines may not be sufficiently maintained and some gas storages closed in the short-term. This debate reminds one of a parallel debate in the electricity sector, where the EC through its market design initiative and the capacity market sector enquiry has just explored the need for policy intervention and mandated capacity mechanisms to ensure (generation) adequacy.

Different member states apply different mechanisms to incentivise market players to take care of supply security. As traded markets are intended to integrate (through the strict implementation of existing market design rules and further reform of market design, where needed) this can increase distortions to investment and divestment and gas flows.

Candidate areas for reform

Regulatory interventions to date

The regulatory framework developed under the Third Energy Package and the Energy Infrastructure Package is intended to improve the functioning of the internal market:

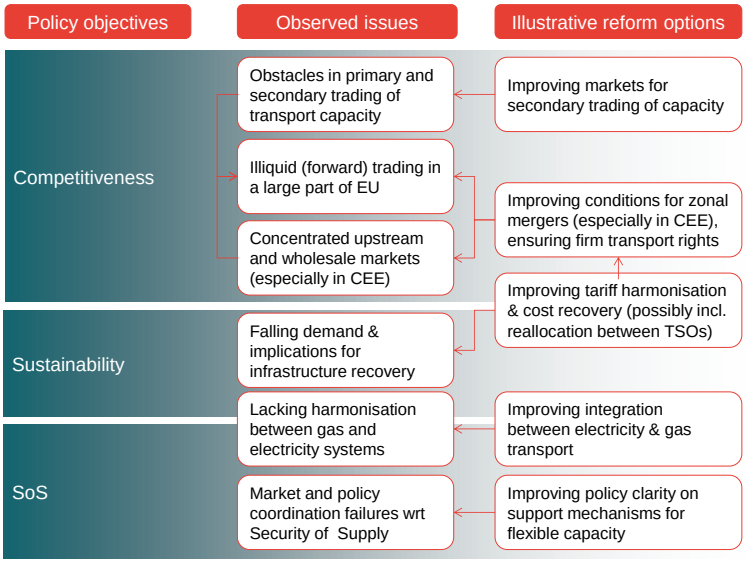
- Transport capacity allocation – the relevant network code (NC CAM) requires capacity auctions to be harmonised;
- Congestion management – the relevant procedures (CMP) require use it or lose it (UIOLI) procedures to be applied to unused transport capacity held by parties, with the capacity being returned to the market; and
- Tariff design – the recently adopted network code on rules regarding harmonised transmission tariff structures for gas (NC TAR) requires common parameters for setting transmission tariffs.

While some elements (such as NC TAR) are still in the process of implementation, and their full effects cannot yet be observed, we believe it is possible to identify gaps in the rules that will hamper the achievement of the EC's policy objectives for the gas sector, and especially so in light of the new challenges outlined above. Our own analysis suggests that simply implementing rigorously the existing regulatory framework will not allow the EU to reach otherwise attainable objectives. Instead, we expect that the challenges outlined above will principally remain even with full and strict implementation of existing rules.

In this context the EC is seeking analysis as to whether the current regulatory framework is the most effective in enhancing social welfare or whether changes are needed and, if they are needed, what the changes should be.

Areas for future regulatory intervention

Figure 1. Analysis of issues and reform options



Source: Frontier Economics

The figure above sets out some of the areas where we believe it would be reasonable for the EC to consider reform to the Gas Target Model, in order to address the challenges highlighted above.

We consider these candidate areas for reform and how they relate to existing rules and regulations in turn.

Improving markets for secondary trading of transport capacity

Access to transport capacity has long been recognised as critical to delivering an efficient gas market. As well as primary sales of capacity, secondary trading of gas transport capacity plays an important role in the fabric of gas market design and can serve multiple purposes:

- It helps the recycling of capacity that may otherwise go unutilised – It is important to note here that UIOLI will never be a perfect substitute for secondary capacity trading. UIOLI recycles capacity, but provides little certainty to potential users of its availability (particularly for short term UIOLI). Secondary trading allows for the reallocation of capacity with more certainty, for longer periods and potentially periods more aligned to the term structure of sales and trading contracts (e.g. months, quarters, years etc.); and
- It helps the holders of primary transmission rights to efficiently decide on the use of capacity – If there is another market participant who can make better use of capacity, then ideally the capacity can be reallocated through the market. Such an incentive only arises for the primary capacity holder if there is a *liquid* secondary market that allows them to extract an alternative value (compared to using the capacity themselves).

In the EU, we have created the logistical infrastructure to facilitate the secondary trading of transport capacity. Nonetheless, this has not been sufficient in many EU countries to also create liquid secondary trading in capacity.

The development of such secondary markets is sometimes derailed by special national rules and regulations regarding the assignment and trading of capacity. This could, for example, arise, where the transport capacity buyer needs to nominate use through the seller of secondary capacity so that the buyer needs to disclose confidential commercial information to the seller (who is also a competing shipper) or where only the full primary transport contract can be assigned rather than a part of it (e.g. only part of the capacity or only a certain sub-period).

The effect is that some holders of primary capacity rights may be commercially incentivised to hold on to capacity. This can lead to distortions as it can create very different trading patterns from those that would arise in the absence of multi-year transport contracts or in case of liquid secondary trading.

Improving conditions for zonal mergers

The relatively high concentration of upstream gas supply to Europe means that any additional barriers to competition may have a disproportionately large effect

on market outcomes.[1] Obstacles to trade caused by boundaries between different balancing zones could be one such additional barrier to effective competition between supply sources.

Zonal mergers could in some cases improve the functioning of the market by reducing these barriers so as to improve the contestability for upstream supply while bringing the added benefits of improving liquidity in traded markets and therefore improving price signals.

Conversely, some zonal mergers would not have a material impact on competition and could be detrimental in other ways. For example, as a result of congestion within the merged zone they may result in the use of a disproportionate share of interruptible transport contracts or inefficient investment decisions (e.g. investments aimed at reducing physical congestion within the merged zone or investments between the merged zone and its neighbours induced as a result of market price spreads that were not cost reflective).

Zonal mergers would therefore need to be carefully considered and only those beneficial zonal mergers should proceed. However, even zonal mergers which have a positive societal cost-benefit-analysis (CBA) can be impeded by national considerations. Since they involve tariff and wholesale price harmonisation, zonal mergers tend to involve winners and losers among customer and producer groups, which can result in political barriers. Therefore, even certain beneficial zonal mergers are not taking place in practice.

Options including re-examination of the governance of decisions around zonal mergers, and potentially the use of common funding arrangements to address wealth transfers resulting from zonal mergers may need to be considered.

Improving tariff harmonisation and cost recovery

In case of declining demand and excess transportation capacity, a conflict arises between wider welfare interests of infrastructure owners or operators. Textbook economics suggests that where capacity is systematically and structurally underutilised, it should not be charged at the level of average historic cost or replacement cost (including capital cost) but rather at short run marginal cost. On its own, this approach would threaten cost recovery on the part of the infrastructure owner or operator. To resolve this dilemma, textbook economics further suggests Ramsey pricing – charging the remaining costs on those users who are less price sensitive (so that cost recovery results in least change to behaviour). This can be applied at a national level (i.e. among groups of users) or at an EU-wide level (i.e. among gas flows). At an EU-wide level, it would imply that users who have less ability to change transport routes or switch supply sources would have to pay more for gas transportation.

The consequences of Ramsey pricing need careful thought. For example:

- If such principles were applied at the EU level, those participants who are already adversely affected by high concentration and a lack of switching

[1] The Herfindahl–Hirschman Index (HHI), which measures market concentration, provides an example of this type of effect. The HHI is non-linear – a market with eight equal sized firms would have an HHI of 1,250, a market with 4 equal sized firms would have an HHI of 2,500 and a market with 2 equal sized firms would have an HHI of 5,000.

options in their respective upstream supply market could be further disadvantaged with higher transport tariffs;

- If such principles were applied within a country, this would imply placing a higher mark-up for cost recovery on within-country domestic entry points than on entry points into the EU system or exit points to neighbouring systems (in case those could be supplied by alternative routes). In order for gas trades to avoid distortion of gas trades, the same principles should be applied within wider regions in Europe or even throughout Europe.

Where transport capacity is tight and congested, auctions have been and continue to be an efficient means of allocating that capacity. With falling gas demand in some regions or on some routes the prices in auctions may fall and auctions may even be "undersubscribed". Auctions would then still serve to allocate uncongested capacity, but auction revenues may not be sufficient to fund the full cost of the infrastructure. In line with the NC TAR, the auction design resorts to "reserve prices" (effectively price floors below which capacity would not be allocated). The use of such price floors may raise several issues:

- Where reserve prices become the effective determinant of transportation prices, then cost recovery is by definition focused on transfers between countries, which may be price sensitive and create distortions in flows around the continent; and
- Such reserve prices would ideally be harmonised within wider regions in Europe as otherwise differences might add further to distortions. NC TAR goes some way towards harmonising the level of reserve prices but these may still vary from country to country.

In essence therefore, even if auctions are used, a good design and harmonisation of reserve price arrangements is important for the effective and efficient functioning of the internal market.

There have also been discussions in various member states, whether – when applying the logic outlined above – different tariffs could be applied for different transport uses such as those by (to remain concise we confine ourselves to selected considerations in the debate):

- Gas imports (at entry points into the national system) – in addition to the above considerations it is worth noting that not all gas import routes and corridors constitute a natural monopoly – some routes may compete against each other. The tariff structure may determine the preferred routing which may affect the usage of the transport system in multiple countries. A lack of close harmonisation of tariff structures in different systems can have significant effects on the routing of imports and the efficient use of infrastructure.
- Power stations – the tariff design for gas fired-power stations has become more complex recently. With annual utilisation falling below a thousand hours (rather than 5000 or more hours per year for which some plants may have been conceived), transport tariffs may become a significant part of the cost of operating a plant. The gas transport tariff may swing the balance between continued operation, mothballing or even closure of a station. Tariff design must ensure that plants do not close prematurely as a result of inefficient

charges, when they could still provide a valuable contribution to the system, which burdens other market participants with the revenues lost from power stations.

- Gas storage – gas storage is important as it is an important element of supply security. Therefore, the tariff design must contribute to the efficient use of storage and it must not unduly burden storage such that storage facilities close pre-maturely. Where storage facilities pose a cost burden on the network infrastructure, this could be driven by the entry into the storage or the exit from storage as a matter of local network and market topology. Other storage sites may not be a burden to the network infrastructure at all and could even reduce network costs, as the absence of that site, e.g. serving local peak demand, would require even more costly network expansion. Therefore, there can be no simple rule. However, tariff design must ensure that storage facilities are not, without clear justification, charged twice, once for entry then again for exit.

While some of these considerations are reflected in the way member states have implemented NC TAR, many regulators appear narrowly focused on not discriminating between users and network points (i.e. uniform entry and exit tariffs throughout a balancing zone). While this is understandable from a political point of view, it does not provide efficient incentives to network users with respect to the use of infrastructure, and therefore might induce inefficient gas flows.

Improving integration between electricity and gas transportation

Reinforcement of the electricity transmission grid is required to deliver growing volumes of intermittent renewable generation to the consumer. For example, grid reinforcement within Germany is needed to allow the transfer of wind generation from Northern Germany to Central and Southern Germany. However, it is extremely difficult to reinforce the electricity transmission grid due to opposition from local communities and the cost of electricity transmission rises as local opposition requires the undergrounding of lines.

In contrast, there may be spare capacity on the gas transmission network and, if reinforcement were required, there would be relatively little opposition to doing so. This may make energy transportation by means of gas infrastructure viable in comparison to electricity transmission in lines yet to be built, even after considering some conversion losses e.g. of converting renewably produced electricity into synthetically produced gas. The result may be the transportation of renewable energy by a combination of gas and electrical infrastructure.

The issue is how to capture these synergies between the gas and power networks to deliver electricity from renewable sources to the customer. To achieve this in an unbiased way, it will be important to ensure that transport regimes, including the tariff design and congestion management are consistent across the European electricity and gas systems, so that neither infrastructure is unduly favoured over the other.

Improving policy clarity on support mechanisms for flexible capacity

Gas storages have an important role to play in providing flexibility to the market and for keeping gas in store for periods of shortage, e.g. in cases of political stand-off with a major supplier to Europe.

There has been a discussion in Europe, whether storages require some wider financial support (including possibly through mechanisms that would constitute State Aid). The European discussion appears undecided, with some countries implementing explicit mechanisms to support the use of storages (e.g. storage obligations on retail suppliers) or the recovery of some of the cost of storages through transportation tariffs, while other countries rely on market forces. In many countries, storage competes with other sources of flexibility (production swing, import flexibility, demand side response) to provide security of supply.

Somewhat surprisingly little reference has been made in this debate to an analogous debate in the electricity sector. There have been extensive discussions about the electricity sector in many countries over whether existing "energy only markets" are sustainable or whether additional capacity remunerations mechanisms (CRMs) are required. The EC has even initiated two inquiries into the matter:

- The so called Market Design Initiative, run by DG Ener; and
- The sector inquiry into CRMs, run by DG Comp.

There are several simple lessons that can be drawn from the electricity debate:

- **The market benefits from greater clarity over the future market design** - Unless a proper political discourse is run, significant uncertainty will remain for investors (e.g. whether their own investment may later be outpaced by investment at a later time that may be explicitly promoted; or conversely, it is the option value of a possible capacity mechanism in the future that may keep certain storage facilities in operation that would otherwise close to allow the market to consolidate).
- **Certain no-regret measures help security of supply even before explicit capacity mechanisms are devised** – Clarifications and reforms regarding national balancing arrangements and short-term markets and their better harmonisation and integration across borders can help create a level playing field for sources of flexibility and supply security. This may require tightening balancing arrangements. A further important measure is the mobilisation of demand to offer flexibility to the market, by accepting supply reductions (e.g. by customers who can dual fuel) in situations of shortage.
- **Support mechanisms only when a market failure can be proven** – Any support mechanism runs the risk of distorting the Internal Energy Market. Therefore, mechanisms should only be deployed if there is a proven market failure. Whether there is will depend on local market conditions. Market failures are less likely in markets that already exhibit low levels of concentration and high liquidity in short and long-term gas trading. Any assessment should consider the advances in terms of reducing market concentration and enhancing market liquidity by other measures as discussed in this note.

- **Procedures for crisis events need to be well co-ordinated ex-ante** – Whether the measures discussed above actually entice flexible capacity also depends on whether the commercial opportunities still prevail during crisis situations. This requires clear policy commitments within each country and also clear rules on how Member States and neighbouring pipeline and network operators will interact during crises.

Vision for the gas target model

The vision for the new regulatory framework for the gas market should balance the objective of solving the above potential issues with being something that EU member states would accept. To summarise, our vision for the gas target model entails:

- **Market rules that facilitate competitive pressures in gas upstream and wholesale markets** that are more remote from existing liquid markets (in the UK and the Netherlands). Capacity allocation and market zone design will play an important part in this. In particular, it will be important to consider the competition enhancing effect of wider bidding zones, even when the broader zone creates the potential for more physical congestion within the zone than in today's world. The key challenge will be to consider governance arrangements around zonal mergers, methods to mitigate wealth transfers, and to define rules that provide an appropriate balance of firm and interruptible transmission rights at entry and exit points to the wider zone to give the TSO the tools needed to manage congestion.
- **Market rules that facilitate liquid forward and short-term trading of gas in Europe** – Enhancing competitive pressures in upstream markets (including partly through regulatory design) is going to significantly facilitate forward liquidity in gas trading. It will be important to also employ other regulatory means, such as improvements in secondary trading of capacity (see below).
- **Further improved markets for secondary trading of transport capacity** – A key inefficiency in many countries today is a split transportation market. On the one hand existing (longer-term) transportation contracts can set very different usage incentives to capacity allocation that is available on a shorter term basis (e.g. within year). In many countries, the missing link between the two transport market segments is an effective secondary market for transport capacity. From our experience, the development of such secondary markets can be hampered by specific national rules and regulations regarding the assignment and trading of capacity.
- **Further regional harmonisation of gas network tariffs especially regarding the increasingly important question of the approach to recovering fixed costs** in underutilised gas systems – While NC TAR provides guidelines for tariff harmonisation, it still leaves room for significant variations in tariffs structures and the level of reserve prices. The effective variations may increase with the threat of reduced utilisation of existing assets and different member states potentially adopting different tariff structures to recover fixed costs. This can lead to distortions in the sourcing of gas and gas flexibility, gas flows and trading patterns. We consider it important to develop a vision of the end point of tariff harmonisation.

- **Clarity on the use of "capacity mechanisms" and a level playing field for flexible capacity** – The EU's position on whether and under what circumstances mechanisms should be used to incentivise flexible capacity should be clarified.
- **Improved interaction between electricity and gas as (competing) mediums for the transport of energy (especially renewable energies)** – As regards regulatory and market design this requires consistency in the tariff and capacity allocation regimes (but also wider harmonisation outside the sphere of regulatory design, e.g. also in taxation).
- **Mechanisms to re-allocate costs and revenues among gas pipeline operators or Member States** may also be required to accompany a more integrated approach to setting transmission tariffs and balancing zones. One could use a central body to collect and distribute revenues, potentially having its income topped up by the Connecting Europe Facility (CEF). The aim would be avoid any country being made worse off as a result of the reforms to market design so as to reduce opposition to change that enhances efficiency of the gas market.