

A regulatory framework for the electricity and gas industry

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Abstract

The recent sector inquiries have revealed major structural deficiencies on the electricity and gas markets. Market integration may reduce concentration on relevant markets. The major prerequisite for market integration is the avoidance of potential discrimination. Today, two main alternatives to that end are discussed: ownership unbundling and the national ISO.

This paper proposes a regional ISO as a third alternative, not only to reduce discrimination but also to optimise the usage of existing infrastructure and to facilitate market integration.

The regional approach necessitates adequate regulatory oversight not only to approve standards but also to regulate the regional ISOs, to impose decisions on them and to allow for appeal procedures.

1. Introduction

Around the turn of this century, electricity and gas market reforms opened up closed markets to competition within the EU. These changes brought about the opportunity for customers to shop around for the best deal and for suppliers to source electricity at the lowest possible cost. At the same time, generators got the chance to sell their product to those who would pay the most for it. As a result, a number of wholesale marketplaces emerged throughout Europe during the last couple of years.

On 10 January 2007, the EU Commission published the “EU Strategic Energy Review”, which was announced in its Green Paper “A European Strategy for Sustainable, Competitive and Secure Energy”.

Drawing conclusions from the various immediate comments by Member States, the hot potatoes of the whole package are not, as might have been assumed, the various ambitious binding targets proposed for the reduction of CO₂ emissions or the share of renewable energy. Much more controversy has arisen on the questions of whom national electricity and gas grids belong to and whether there will be delegation of powers to the European level. The measures proposed are mainly based on findings of the European sector inquiry of DG COMP. The present paper discusses the main organisational questions raised in the strategic review and puts forward solutions to those questions on the basis of an analysis of the existing flaws in market design. The core of the text consists of chapters 4 to 6, which sketch an ISO model. The paper refers to electricity, although the main conclusions on incentives, structures and institutions also hold for gas.

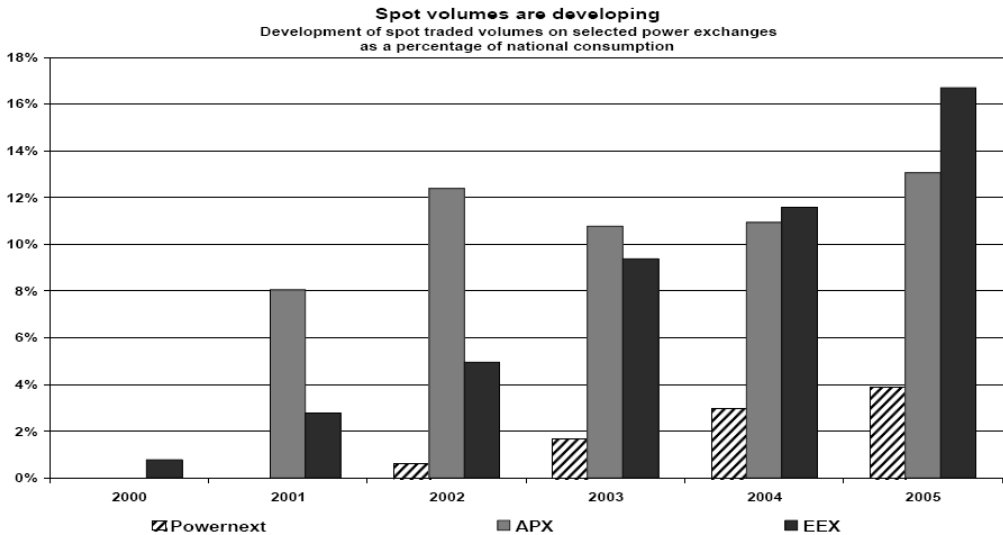
2. Setting the Scene

From the beginning, the main challenge has been to give an answer to the following question: “How do we transform a monopolistic market into a competitive market?” The traditional procedure has been to limit the potential influence of the natural monopoly and separate the monopoly (the grid) as clearly as possible from competitive parts of the value chain. The implicit assumption has been that the competitive markets would evolve “naturally”; markets would integrate because of commercial pressure from traders, producers, storage providers and consumers.

The first two liberalisation packages for the electricity and gas markets followed the same philosophy, deliberately neglecting cross-border issues. Only the subsequent regulations on cross-border exchanges (EC 2003 and 2005) have tried to improve the situation. However, their main aim is to avoid discrimination and not to improve the integration of markets.

Experience shows (almost) no evidence for natural market integration. Potential losses at national level are in many cases higher than potential gains from competition and only in those very rare cases where major parts of the generation capacity of a country have very low OPEX and are thereby located in early positions on the merit order curve have positive economic forces been able to prevail. A “splendid” isolation of national markets is the most probable market outcome under these circumstances.

Nevertheless, some continental wholesale markets made fairly good progress in the last couple of years, notably in electricity. Especially on the Dutch and German markets traded volumes are fairly high on both spot and forward markets and activity has been increasing on exchanges and OTC markets alike. The market coupling between Fr-Be-NL shows a price correlation between 2 or 3 markets 98% of the time (mainly to the advantage of Be and NL consumers during peak hours and to the Be-Fr consumers during off-peak hours).



Source: EU Commission, Energy Sector Inquiry

However, these developments are positive exceptions to the general picture in Europe. Many markets still suffer from regulated or long-term bound supply and demand, from pricing schemes under public influence (whether regulated or controlled) and from other deficiencies. Market-based price formation is still the exception rather than the rule in Europe.

On a national level, competitive forces are often not able to effectively restrict the market power of incumbents. The insufficient size of these markets for workable competition is a characteristic element in many countries. A lack of political will to improve market structure is relevant for publicly owned companies and to a lower extent also for private companies (e.g. Germany, Belgium). Only in those rare cases where companies have been sold to foreign investors a braver approach and a more competition-oriented policy emerges.

For most markets therefore, only integration across borders with other markets has the capability to fundamentally restrict the market power of incumbents.

The level of development of wholesale markets differs greatly between European countries, to a large extent reflecting the historical structure of the industry and the regulatory framework they work in. There is a long list of indicators against which we can measure the functioning of wholesale markets. In general they should offer a large number of short and long-term products with an appropriate market depth with high traded volumes, which would enable market participants to trade efficiently at the lowest possible costs. In order for this to happen there should be a large amount of equally sized and well-informed market participants with inherently different trading interests, such as generators, pure traders and suppliers.

Looking around in Europe, we find that these criteria only partly apply to the majority of the markets. Some are large enough but dominated by a single player (France) or a small number of large players (Germany), others have the potential to evolve but are plagued by omnipresent long-term contracts (Hungary) and a few are lucky and compensate with good connections to larger neighbours for small size and strong concentration (Austria, Belgium).

In general, markets have a fairly good track record in regions where traded commodity markets have a long history and market reforms also included structural measures (UK) or where countries have long ago learned to think

in regional instead of national terms (Nordic region).

Today discussion focuses on wholesale markets. The main reason for this is the existence of major price differences between markets, indicating potential efficiency gains from competition.

Interestingly, retail markets are rarely mentioned. However, in a market framework where the short side of the market, i.e. the retailers, is not subject to working competition it seems unlikely that their buying behaviour will be very price sensitive. In addition, low price elasticity on the demand side contributes to an economic behaviour which concentrates on security of supply and almost neglects associated cost. In this respect the Strategic Review retains the same focus as previous documents. An Energy Consumers' Charter is envisaged for the mass market; it shall relate to consumer protection and improvement of the switching process, but does not address the fundamental question of retail market integration - the one aspect an average consumer would actually notice.

3. The “Official” Analysis

As long as markets offered acceptable prices, imperfections did not seem to bother market participants and politicians. With strongly increasing prices since the middle of 2003, industrial customers have started questioning mechanisms and the prevailing market framework. They have also alleged large generators of market wrongdoings and claimed that dominant players pushed up prices deliberately to cash in on customers. These allegations mobilised decision makers and kicked off a debate on a number of issues.

The following paragraphs try to capture the picture the European Sector Inquiry as well as a National Sector Inquiry have drawn recently.

The European Commission's DG Competition identified serious market shortcomings in its Energy Sector Inquiry.

Many of the problems highlighted concern the functioning of wholesale markets, such as:

- high market concentration
- vertical foreclosure

- insufficient market integration
- lack of transparency

At a closer look, two categories of problems can be distinguished: structural and market-design-related shortcomings.

Most markets show high concentration, e.g. 87% of installed capacity in France or 46% of production in Spain. Major parts of production are balanced by internal demand, so that relevant net positions only exist in Germany, Great Britain and Poland. This is a result of traditional supply companies producing electricity for their own supply needs. Market concentration is supported by vertical integration as market entry and market integration depend on the non-discriminatory behaviour of network operators. Insufficient unbundling is therefore the main cause of the structural deficiency of European wholesale markets.

Taking into account that public and political support for the liberalisation process depends on success at the mass-market level, concentration on wholesale markets seems inadequate. A recent sector inquiry into the Austrian gas and electricity markets (BWB 2006a and 2006b) which concentrated on retail found that mass markets for consumers of up to about 1-5 GWh annual consumption of gas or electricity are still local, so that almost all incumbent suppliers enjoy a dominant market position. The main reason found was insufficient unbundling at the DSO level resulting in “psychological” preferences for local suppliers in relation to security of supply. DSO unbundling and specifically soft factors such as branding or communication policy in general therefore seem to be a key to more dynamic retail mass markets. Today most Member States as well as the EU Directive foresee only insufficient rules on these soft factors and in many cases also on more technical aspects such as informational and functional unbundling. A strict, detailed and legally binding EU regulation on DSO unbundling is therefore complementary and essential to successful market opening. The straightforward option of full ownership unbundling for all DSOs seems difficult to attain in the current political environment with a large share of public ownership at the DSO level.

4. Major Cross Border Market Deficiencies

Glachant et al. (2006) present a very lucid exposition of deficiencies and possible remedies for the electricity wholesale market. The remedies relate to the following topics:

- National Market Design
- European Market Design
- Industry Structure
- TSOs' Governance
- Regulators' Governance

However, the remedies presented are restricted to mid-term measures under the (explicit) assumption that no 3rd European legal package will be implemented. As a consequence, cooperation and harmonisation on a regional level pushed from the bottom are key drivers of the ideas put forward by the authors.

In a recent Communication from the EU Commission (EU-C 2007b), the approach proposed is very similar. Cooperation of TSOs in their respective Organisations (ETSO+/GTE+) and cooperation of regulators in ERGEG+ are based on the basic assumption that ownership unbundling of TSOs will hopefully assure the good will of the vast majority of TSOs to develop the European market irrespective of national political sensitivities.

Only once, a potential alternative road is alluded to; the Commission states that “[e]fforts should also be made to have a gradual evolution towards regional system operators: Cross border system operators would be set up. These would be independently owned and would require additional unbundling...” (EU-C 2007b, p17).

This paper argues that cooperative solutions in themselves will not work properly. The main deficiency of any cooperative solution is a lack of liability, enforcement and legal certainty.

The following chapters develop a “regional ISO Model” along the three dimensions discrimination, optimisation and regulation.

5. Discrimination

Avoiding discrimination is one of the key requirements for working competition in gas and electricity. Discrimination by the natural monopoly (transportation, distribution and partly storage as well as LNG terminals) reveals itself mainly in two manners: pricing and physical access to the essential facility. The directives set out structural and behavioural measures to restrict discretion as well as to improve economic incentives. This model is known as the “separation model”. However, its success is questionable. The directives grant wide latitude to Member States in transposing the unbundling provisions into national law (principle of subsidiarity). In many cases this has led to a situation where the new structural entity, the network operator, manages only the grid, whereas assets and staff are still managed by the affiliated mother company. Concerning TSOs this might even be of minor consequence for the functioning of the market; the main challenge is to separate information flows, as information constitutes important economic value on wholesale markets. At the same time, information is the dimension where behavioural provisions are least efficient.

At first sight, TSOs in countries with major generation capacity in low positions on the merit order curve seem to be more “inclined” to improve interconnection than those in countries with marginal capacities. However, all wrongdoings are hard to prove, as investment projects always face resistance, either on a local level by the affected population or on a national level by stakeholder groups such as environmentalists. So, very often it will depend on the incentive of the TSO whether it is willing to undergo all the burdensome procedures necessary to overcome resistance. In general it is therefore easy to blame red tape and long permission procedures for insufficient investment. This clearly supports what Glachant et al. call the “structural and behavioural obstacle” to the construction of a competitive energy market.

The primary solution put forward by the EU Commission as well as by the European Energy Regulators Group (EREG) is *ownership unbundling*. Formally, ownership unbundling prohibits companies to be active as a network operator as well as in the competitive electricity business (producer, trader or supplier). But it is not only about ownership, it is about control or undue influence of the competitive business on the essential facility. This is certainly a much wider scope and might raise questions of public ownership, private shareholding, long-term contracts or financial relations which allow such influence.

In addition the Commission presented an alternative, the ISO Model, where an *Independent System Operator* would be assigned all operational tasks of the TSO, which in turn would only keep ownership of the assets. In this extreme format, the transmission owner (TO) almost becomes a bank. The immediate question arises on how such an entity, the TO, can be obliged to provide money for necessary investment. All existing examples show the difficulties that arise in setting up the contractual arrangements necessary to allocate risks and financial return between ISO and TO.

Because of these difficulties, models are implemented where only those activities of TSOs which involve a very high degree of discretion and potential for discrimination (shallow ISO Models) are transferred to the ISO. In these cases, maintenance and investment are still with the TO, enabling sound asset management. The main tasks transferred to the ISO are real-time operation, calculation and allocation of capacity, the former involving least discretion. This shows that such a shallow model will not resolve most of the problems.

The general idea put forward by the Commission is a replacement of every TSO by a new ISO, thereby adding a new layer to the system of transmission (transport).

The obvious advantage is that mother companies in vertically integrated incumbents are less likely to influence decisions of ISOs than of their direct daughter TSOs. Still, in principle this idea of an ISO only means duplicating the existing separation model, where mother companies are supposed to become mere financial investors. Here TSOs become financial investors, their mother companies are investors in investment companies.

Until now only structural discrimination has been discussed. But will a national ISO have any other incentives concerning national discrimination? The answer to this question is that this will depend on the ownership of the ISO. Most Member States propagating such a model intend to set up a “National ISO”, i.e. an ISO which is publicly owned. If at the same time major production capacities are also public, an incentive to discriminate will remain. But the national view can also be promoted by various other means such as licensing etc. It is hard to see how a national ISO could be set up as an entity independent from national interests and even harder how such an entity could be defined in European law. The only means to overcome, at least partially, such a national discrimination is to establish cross-border structures (regional ISOs) large enough to avoid that the members of the

region have homogenous interests. This paper therefore argues that there is a fundamental difference between national and regional ISOs. National ISOs will presumably still respect national priorities, and might, although being independent from specific competitive interests, favour national generators or suppliers.

6. Optimisation

Most interconnector capacities are scarce. In most cases they have to be allocated competitively according to the willingness to pay for their use. Scarce capacities lead to sustained price differences on wholesale markets and to inefficiencies in the whole system. The previous chapter makes reference to insufficient investment because of distorted incentives of transmission system operators.

However, there is another factor that further limits the availability of transfer capacities. The electricity system today is a decentralised system where capacities are calculated so as to adhere to common security principles in all individual subsystems. A centralised calculation of capacities would free up considerable transfer capacities as security margins could be lower in such an integrated calculation.¹

In principle the calculation of capacities can be coordinated between independent transmission operators, which would have to provide the necessary data on network properties as well as demand and supply forecasts. But such a setting would have to include some sort of shared responsibility and liability. At a closer look this seems very difficult to implement, as in case of system failure any proof of wrongdoing will be virtually impossible to achieve. Individual ISOs might even argue that they were overruled in internal votes and are therefore not liable for any damage incurred.

The experience of the widespread system failure in 2006 showed that the cooperative coordination of the European electricity system did not deliver. The cooperative coordination even failed between two TSOs in the same country. Therefore, the institutional setup for coordination tasks must be

¹ In the gas sector Austria implemented a Grid manager that is able to calculate capacities for the whole system. The Grid Manager has been able to raise available capacity to shippers by about 10% by optimizing the use of the grid.

adapted. Cross-border issues need an entity which has the possibility to control all discretionary decisions relevant for the functioning of the European market. The main argument concerning optimisation is therefore in favour of a cross-border entity carrying out or controlling all activities according to approved standards, with full responsibility and liability for the outcome of the process.

7. Regulation

Clear and transparent market structures with supportive incentives lend themselves to light-handed regulation. On the other hand, the obvious danger of abusive behaviour in heavily concentrated markets and distorted incentives in integrated companies make tighter regulatory control necessary. The discussion of the first two dimensions demonstrated the advantages of ownership unbundling combined with a cross-border unit which can optimise the use of the existing grid and even further avoid potential national discrimination.

In a model with ownership unbundling, regulation can count on typical economic goals, such as profit maximisation, which are not distorted by the interest of the affiliated companies. However, regulation has to take care of the interfaces between the TO, the regional ISO and, potentially, the European level, where harmonisation procedures must exist (typically discussed under the title of a European grid).

7.1. European Level

In order to finally facilitate a common marketplace, unified standards and rules have to be approved on a European level. These standards cover the grid code, market standards such as balancing markets and security standards such as the ones covered in the operational handbook of UCTE.

7.2. Regional Level

Activities such as investment planning, capacity calculation and capacity allocation should be allocated to the regional level. A regional ISO would be responsible for these tasks. These are the most important activities for the functioning of regional markets. Further activities such as schedule

management or procurement of balancing energy are second-stage activities which are to be regionally centralised if further integration is sought. The regional ISO will have to be under regulatory oversight from the European level.

7.3. National Level

On the national level with ownership-unbundled TSOs, real-time operation as well as asset management (investment and maintenance) can be left with the TSOs. The national TSOs will be regulated by national regulators.

In order to consistently cover all levels of necessary regulation, also some kind of coordination of regulation has to be established. The requirement such a regulatory system has to fulfil is that decisions on all levels must be challengeable by the regulated companies, i.e. there must be an appeal procedure in place. This only seems possible where European regulation is done by a European agency, a European institution, with independent decision-making procedures. Decisions by this entity will be binding on the national level, where they have to be imposed on national TSOs.

8. Conclusions

Today the public discussion focuses on structural measures and a change of the regulatory regime, thereby concentrating on only one dimension of the problem, namely potential discrimination by TSOs. Two alternatives have been put forward. This paper argues that ownership unbundling and ISO are no alternatives if further dimensions such as optimisation, market integration and regulation are taken into account. Ownership unbundling **and** a regional ISO are complementary. Furthermore, such a model requires two levels of regulatory oversight, a European level with adequate decision-making powers and appeal procedures and the national level.

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