

OPENING EUROPEAN ELECTRICITY AND GAS MARKETS

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1. INTRODUCTION

In this paper, I take a look at market opening in European electricity and gas markets from an economic point of view, which means from three separate angles.

1. First, I consider whether the move towards competition is being driven simply by the economics of the sector, without the need for specific interventions by governments and regulators.
2. Second, since I will answer this first question in the negative, I will look the measures that governments and regulators need to introduce, if they are serious about introducing competition.
3. Third, I will list some outstanding issues, ie problems that legal and regulatory institutions in European markets have yet to deal with, but which are crucial to achieving the benefits of efficient competition.

Note that the last point refers to “institutions”, rather than just to governments and regulators. There is only so much that one can expect of the government agencies responsible for energy sector regulation. As we shall see, some of the outstanding problems may not be solved without the attention of legislatures and/or the judiciary.

1.1. Promoting Competition, Not Competitors

Before embarking on a discussion of competition, I need to stress is that the promotion of competition should be synonymous with promoting efficiency and not (for example) with promoting the existence of (potentially inefficient) competitors. In fact, I would go further. *Unless a reform creates an environment that promotes more efficient choices, it cannot be said to promote competition.*

Competition is only beneficial if it improves economic efficiency, which means that a competitive environment should allow the producer with the lowest incremental costs to capture the customer. A producer with sunk costs may start with an advantage over new entrants, if as a result that producer has lower incremental costs– but this advantage should be exploited, not handicapped. This view contradicts a number of oft-stated, but impractical views of competition:

- That more competitors in the market means more competition;
- That all new entry is beneficial; and
- That incumbents must be obliged to sell their produce as if they were a “standalone business”, incurring the full costs of a new entrant.

In the UK, discussion of competition has moved beyond the mere counting of competitors. However, in the UK, and in Europe generally, there is still a need to distinguish between reforms that promote efficient competition and reforms that “merely” promote competitors or lower prices. Neither is good for the economy as a whole.

Many appraisals of “competition” focus primarily on whether or not prices fall. However, it would be only right and proper to ask whether the price cuts reflect real falls in costs, or whether they reflect transfers to customers from the owners of production facilities. Transfers of wealth come from eliminating monopoly profits, or from denying the recovery of costs (usually sunk costs). Neither will provide a compelling case for retail competition in countries where prices are determined by regulation. On the one hand, if there are monopoly profits, the regulator should eliminate them anyway. On the other hand, if it is beneficial to consumers to deny recovery of sunk costs, the regulatory regime should disallow them anyway.

The real rationale for introducing competition, where previously there was regulation, is therefore not to eliminate monopoly profits, or to prevent recovery of certain costs. The purpose of introducing competition is to achieve the real reductions in cost (or improvements in service quality) that count as improvements in economic efficiency. Anything that diminishes efficiency is not promoting competition, but something else. Accept no substitutes!

1.2. A Basic History Lesson for Novices

The electricity and gas sectors have had a history of development based on integrated monopolies. Monopolies have been more strongly entrenched in the electricity sector than in the gas sector (which competes with oil and electricity for some customers). Trade between consenting monopolies has been possible for many years. However, both sectors now have to deal with demands for access by “third parties”, ie they must allow independent generators and traders access to the network, so that they can serve the monopolies’ existing customers. These demands create interesting conflicts and challenges.

Individual member states have taken their own initiatives to promote competition, with the UK being a leader within the European Union (and Norway being a leader just outside it). However, the major impetus now comes from European institutions. Following adoption of the Single European Market principle in 1985, the European Commission began to consider the possibility of creating a single internal market for energy. In 1990, a European directive required Member States to facilitate the “transit” of power, ie the transmission of power

from one Member State to another, over the network of a third.¹ Then, in 1992, the Commission forwarded proposals to the Council of Ministers advocating common rules for electricity and natural gas markets across Member States. After much discussion of different proposals (to which NERA made a small, but timely contribution²), the European commission issued directives for the creation of internal markets in electricity and gas.

The European electricity directive (96/92/EC) entered into force on 19 February 1997 and was to be implemented by most Member States within two years. (Belgium and Ireland received an additional year for implementation, and Greece two years.) The directive required Member States (MSs) to allow third party access (TPA) to national transmission and distribution networks or to set up arrangements for a “single buyer” that would have the same effect as TPA. (MSs immediately abandoned attempts to define such a single buyer.)

The European gas directive (98/30/EC), requiring TPA on gas pipeline networks, entered into force on 10 August 1998 and was to be implemented by 10 August 2000. The majority of Member States have implemented the requirements of the directive, but Portugal and Greece were granted some derogations as “emerging markets”.

Details of the electricity and gas directives are set out in sections 2 and 3.

1.3. A Brief Progress Report

The benefits identified by the Commission in creating liberal energy markets had already been recognised by several Member States. The UK, Spain, Sweden, Finland and (outside the EU) Norway all liberalised earlier. The reforms undertaken in these countries were often more extensive than those proposed by the Commission and in these states the subsequent directives had little impact.

The directives prompted a new round of liberalisation measures and several more states have gone further than the directive requires. The German electricity sector, in particular, moved overnight from a system of protected monopolies and cartels to full retail competition, in which all customers are (in law at least) eligible to choose their supplier. However, liberalisation has not been without its problems:

- *Liberalisation is still delayed in some Member States.* For example, the Commission has sent formal notices to Germany, France, Portugal and Luxembourg over their failure to implement the gas directive. The Commission also started legal proceedings against France for its failure to properly implement the electricity directive.

¹ Council Directive 90/547/EEC of 29 October 1990 on the transit of electricity through transmission grids.

² John Rhys, Graham Shuttleworth, Leigh Hancher (1995), *Evaluation of the French Proposal for a Single Buyer Model*, NERA, London.

- *Liberalisation has not produced noticeable benefits in all countries.* Some classes of industrial consumers in the Netherlands, Greece and Spain have experienced increases in electricity prices over the last two years, as have some domestic consumers in the Netherlands, Ireland and Denmark.³ Moreover, small traders often voice a belief that the provisions of the directives are inadequate to secure competition.⁴

The state of competition in gas and electricity markets contrasts sharply with the situation in telecoms. Consumers readily switch between telecoms suppliers and there is competition developing between competing networks (i.e. copper and cable, fixed and mobile). Developments in technology and economic pressures are driving telecoms markets away from natural monopoly and into the competitive arena.

These developments give rise to two questions that this paper addresses:

1. Will similar economic pressures produce competition in electricity and gas? (Section 4)

And (since the answer to this question is, “No”):

2. What challenges will European regulators face if they try to enhance competitive pressure?

The answer to this second question comes in two parts. First, the economics of energy networks mean that European regulators will have take some deliberate measures to promote competition in energy markets, specifically various forms of unbundling (section 5), real-time balancing markets (section 6) and the treatment of cross-border trade (section 7). In addition, however, European regulatory regimes will have to rediscover some principles of economic regulation that have lain dormant for many years, to avoid descending into “regulatory opportunism” (sections 8 and 9). General lessons are summarised in section 10.

To begin at the beginning, however, I describe the two key directives for electricity and gas in sections 2 and 3, respectively.

³ “Electricity prices for EU industry on 1 January 2000: downward trend” and “Electricity prices for EU households on 1 January 2000: downward trend”, Eurostat, Statistics in Focus, Environment and Energy.

⁴ For example, see “Florence Forum: The threat of new regulation”, EU Energy Policy, 31/10/00.

2. FEATURES OF THE EUROPEAN ELECTRICITY DIRECTIVE

The objective of the European electricity directive is to establish a set of common rules for the generation, transmission and distribution of electricity that leads to a single, common market for the commodity. The following section presents a selection of key elements in the directive.

2.1. Conditions of Network Access

The conditions of access to transmission and distribution networks are vital in ensuring that the benefits of liberalisation are realised. Articles 17 and 18 of the electricity directive offer Member States three alternative approaches to providing access: Single Buyer procedure; regulated Third Party Access (rTPA); or negotiated Third Party Access (nTPA).

The Single Buyer procedure requires the Single Buyer to purchase electricity contracted by eligible customers at a price equivalent to its published retail tariff (for the customer concerned) *minus* the tariff for use of the network. This condition effectively renders the Single Buyer Model equivalent to rTPA, since the Single Buyer retains only the published tariff for use of the network. *No Member State has chosen to implement the directive using the Single Buyer model.*

Several Member States announced their intention to adopt nTPA. However, Germany is the only country that actually adopted nTPA rather than rTPA. Germany's choice reflects a tradition of letting industry and its customers develop sector-specific rules within a pro-competitive framework rather than establishing sector-specific regulators.⁵ Every other MS has opted for a regime of regulated access that would be broadly familiar to a UK audience.

2.2. Eligible Consumers

The potential for competition depends on which eligible customers are free to choose between different suppliers. Article 19 of the directive establishes a timetable for the minimum requirements for market opening defined by annual consumption levels, as shown in Table 2.1.

The requirements for extending the number of eligible customers are minimum requirements only. Member States are required to open up 33% of their national markets to competition from 2003, but may go further. The majority of Member States have pursued quicker and more extensive liberalisation timetables than established in the directive.⁶ As

⁵ Negotiations over network access are effectively regulated by the adoption of common agreements between "associations" of the industry and its customers ("Verbändevereinbarungen"), with arbitration over details by the Federal Cartel Office.

⁶ From 19/2/99 almost two thirds of electricity consumers in Europe were, in principal, free to choose their supplier.

already noted in the introduction, the extent to which this has succeeded in promoting effective competition remains open to question in some Member States.

Table 2.1
Electricity Directive's Timetable for Liberalisation

	Market opened to consumers with annual electricity consumption over:	Market share open to competition
Stage 1: 19/2/99	40 GWh	26.5%
Stage 2: 19/2/00	20 GWh	28%
Stage 3: 19/2/03	9 GWh	33%

2.3. Unbundling of Accounts

The directive does not require the structural unbundling of generation, transmission and distribution. Vertically integrated electricity operations can be designated by Member States as the Transmission System Operator (TSO) and Distribution System Operator (DSO), with no need for independence. The only prescription on unbundling requires the production of separate accounts for generation, transmission, distribution and any other non-electricity activities.

2.4. Tendering and Authorisation of Power Stations

The directive envisages that new power stations will be constructed either by holding competitive tenders, or by setting up a non-discriminatory system of “authorisations” (equivalent to the UK system of licences and consents). The idea of competitive tenders makes most sense when there is a single buyer, whilst authorisations would most likely be needed under TPA. However, the directive did not explicitly link the form of network access to the method of introducing new power stations.

2.5. Reciprocity

The directive envisages a form of mutual reinforcement of liberalisation by Member States. If Member State A fails to declare a type of customer as “eligible”, other Member States may block sales to their own customers of the same type by traders from Member State A. This provision is intended to encourage “reciprocity”, ie parallel market opening. In practice, the existence of wholesale markets provides an outlet for traders to which access cannot be restricted, which renders the reciprocity sanctions ineffective. The degree and form of liberalisation is, subject to the minimal requirements of the directive, whatever each Member State chooses it to be.

3. FEATURES OF THE EUROPEAN GAS DIRECTIVE

As part of the framework for a single energy market, the European gas directive was intended to establish, through a set of common rules, the internal market in natural gas.

The gas directive provides Member States with two systems for access to gas pipeline networks: nTPA and rTPA. Only Austria, Germany, Denmark and Belgium have chosen nTPA as the basis for access to gas pipeline networks, whilst the Netherlands has a hybrid system.⁷ Under nTPA, incumbent gas suppliers are required to publish the main commercial conditions for access but are not required to provide full explanations of tariff structures (although in Belgium, indicative tariffs are subject to the approval of the regulator). This has led to the accusation that nTPA suffers from a lack of transparency that could hide discrimination against new entrants.⁸

As with the electricity directive, the gas directive sets a timetable for the minimum level of market opening. The criteria for eligible customers are based on the annual consumption level of final consumers but, in addition, Member States have to ensure that specified shares of the market are open to competition, see Table 3.1.

Table 3.1
Gas Directive's Timetable for Liberalisation

	Market opened to consumers with annual gas consumption over:	Minimum market share to be open to competition
Stage 1	25 million m ³	20%
Stage 2: 2003	15 million m ³	28%
Stage 3: 2008	5 million m ³	33%

The potential for competition is limited by the number of customers declared eligible. France is adopting the directive's minimum requirement. Greece and Portugal, both eligible for derogation under their classification as emerging markets, have yet to decide on the extent of their liberalisation. However, the majority of countries have provided for quicker and more extensive liberalisation than required by the directive. The Commission expected 78% of total EU gas demand to be eligible by August 2000 and 90% by 2008.

Again, mirroring the electricity directive, there is no requirement for gas undertakings to establish the independence of transmission, distribution or storage activities, although accounting separation is required. Consumer organisations and independent market players have expressed concern that effective competition requires a clearer separation of transmission system operations from integrated undertakings, most recently at the Madrid Gas Regulatory Forum, 26-27 October 2000.

⁷ See *TPA conditions of major European gas transmission operators*, draft discussion document prepared by the EC, 09/11/00, www.europa.eu.int/comm/dgs/energy_transport/index_en.html.

⁸ For example, see "EC set to introduce unbundling decree", *Gas Daily Europe*, 09/11/00.

4. ECONOMIC PRESSURES FOR REFORM

Some sectors, most notably telecoms, are seeing established companies come under pressure from new entrants, even in the areas of network construction and operation that were previously thought to be natural monopolies. These pressures are leading to a reassessment of the role of regulation. However, the economic conditions of the telecoms sector are different from those in the electricity and gas sectors. Experience in telecoms is not therefore directly transferable to the energy sectors.

4.1. Competition in Telecoms

Telecom networks used to be regarded as natural monopolies. The only way to promote competition was to provide third party access to the network. However, in recent years, this has started to change:

- *Competition between networks is developing.* For example, in the UK, around 50% of households now have a choice over the provider of fixed line services to their house, i.e. copper or cable. Moreover, the 25 million mobile phone subscribers have a choice between four competing networks.
- *Broadcasting, IT and telecom technologies are converging.* As convergence occurs, the boundaries between these markets become blurred and the scope for competition is further expanded.

As the existence of monopoly elements diminishes and competition increases, the role of regulation and the requirement for a sector-specific regulator is brought into question. Many commentators regard regulation of telecoms as a *transitional* measure, before it emerges into the full glare of competition and becomes subject to little more than general competition policy. Price caps in regulation tend to be viewed as a remedy for market power that may become unnecessary in the future. The situation in electricity and gas is (so far) quite different.

4.2. Natural Monopolies in Electricity and Gas

Could natural monopoly elements in electricity and gas industries erode to the extent that sector specific regulation becomes unnecessary? As I explain below, the answer to this question is, “No”, at least on current evidence. Regulation of electricity and gas networks (at least) must be regarded as *permanent*, not transitional. This has important implications for the form of regulatory institutions.

In economic terms, an industry is referred to as a natural monopoly when a given set of outputs can be produced more cheaply by one firm, than if the outputs are divided among several firms. To meet this condition, the industry must exhibit “economies of scale or scope” or, more formally, when the industry cost function is “sub-additive”.

By common agreement, natural monopolies exhibit other characteristics as well, as David Newbery notes in his recent lectures on the economics of regulation.⁹ In particular:

- Network investments are durable (so rents persist);
- Capital investment in the network is large and irreversible (or “asset-specific”, to use the correct economic jargon); and
- Networks are connected directly to large numbers of consumers (which increases transactions costs).

Natural monopoly in electricity and gas networks implies that some sector-specific regulation will continue to be necessary *for the foreseeable future*. This means that the economics of competitive markets is not relevant to all of these markets and that regulation must abide by the economics of natural monopoly. This distinction affects the choices of regulatory methods.

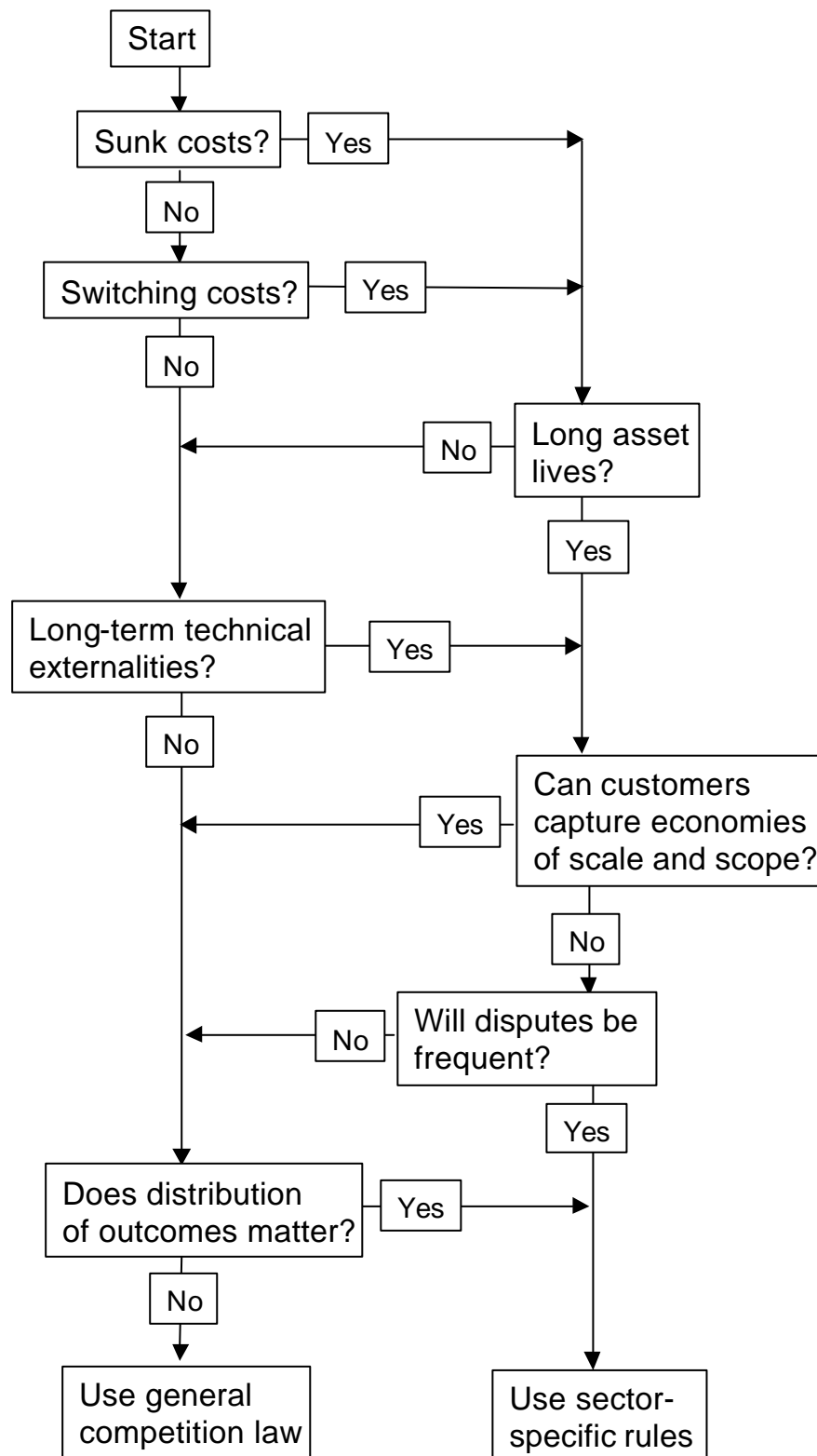
4.3. Economic Conditions in the Energy Sector

Most industries are subject to general competition law, not sector-specific regulation of their prices and terms of sale. Economic pressures in telecoms may be pushing the sector into the competitive arena. This suggests that governments need to take stock of sectoral conditions, to see whether sector-specific regulation is still required. Figure 4.1 shows a decision tree that NERA once developed for a European government client, setting out how to choose between sector-specific regulation and general competition law. Figure 4.1 might be too mechanistic for real policy decisions (the client certainly thought so), but it usefully describes the economic factors that suggest where energy sector regulation is headed.

Consider production (electricity generators and gas wells). Although characterised by sunk costs and long-lives, the current state of technology allows customers to capture the implicit economies of scale, through wholesale trade. The elimination of major economies of scale, with the introduction of smaller gas-fired power stations, was one of the reasons for introducing competition in production in the first place. (If economies of scale re-emerge, legislatures may have to rethink their position.) Hence, production should end up being governed by general competition law. However, not every government of every Member State is prepared to abandon concerns about income distribution, such as protection of domestic coal miners, so residual controls persist.

⁹ Newbery, D.M. (2000), *Privatization, restructuring, and regulation of network utilities; Walras-Pareto Lectures at the École des Hautes Études Commerciales - Université de Lausanne*, MIT Press, Cambridge, Massachusetts.

Figure 4.1
Decision Tree for Choosing Between
General Competition Law and Sector-Specific Regulation



The situation in low-voltage (electricity) or low-pressure (gas) distribution networks is also relatively straightforward. They suffer from sunk costs, long asset lives and large economies of scale *relative to the size of a typical customer*. Disputes will be frequent, because long asset lives will confront short-term contracts and tariffs (which require frequent revision or renegotiation) and the most efficient way to deal with such disputes is to lay down sector-specific regulations, rather than to approach each dispute as an individual case. Hence, even if protection of specific population groups like the poor and the elderly were not an objective of regulation, distribution networks would fall under sector-specific regulation.

High-voltage and high-pressure transmission networks present a more complex picture. In the gas sector, there is a long-standing tradition of production and distribution companies coming together to arrange the construction of new pipelines and to share the associated costs and benefits. This suggests that the customers (ie the companies concerned) are able to capture the economies of scale. For this reason, some regulatory systems treat large pipelines as a matter to be governed by long-term contracts under a regulatory scheme that is akin to (if not always identical to) *general competition law*. For example, in the US, long-distance gas pipelines are subject to the jurisdiction of the Federal Energy Regulatory Commission, but some contracts reduce the role of regulation to arbitration over particular contract terms. Offshore gas pipelines in the UK sector of the North Sea are handled by similar means.

However, in some cases, there is no separation between high- and low-pressure pipelines (as with Lattice in Britain). In such conditions, there are no distribution companies to take on contracts for high-pressure pipelines; instead, Lattice serves a myriad of final consumers. Furthermore, where existing high-pressure systems are not covered by long-term contracts, the owners may be able to exploit their economies of scale to earn an additional profit. In systems where anyone can build a pipeline, it would be unfair to characterise such profits as due to a *monopoly*; nevertheless, regulators may feel that it is in consumer's best interests to reduce profits by capping prices, essentially for distributional reasons. In both cases, high-pressure gas pipelines will end up under *sector-specific regulation*.

Hopes for a decentralised, contractual approach to electricity transmission have so far proved to be illusory. The main problem is the existence of technical externalities, such that one person's transmission line affects the capacity of other connected lines. In addition, the system operator possesses a real-time informational advantage over other users. These factors reinforce the economies of scope and natural monopoly characteristics of network *operation*. However, given a process for coordinating the design and specification of transmission projects, construction can be decentralised by any number of competitive methods, as evidenced by the number of "national" grids in Europe that incorporate assets built and owned by different companies.¹⁰

¹⁰ The "national" grid company leases assets from others in the Netherlands, Norway, Spain and Sweden.

4.4. Implications for Regulation and Competition

From the above, some segments of the energy sector will remain subject to sector-specific rules for the foreseeable future. The economics of competitive markets will be irrelevant to the choice of regulatory method in these segments and affect the design of regulatory institutions, as discussed in sections 8 and 9.

In contrast (and *pace* the telecoms profession, which may have a different perspective), the shorter lives of investment in telecoms networks (say, 10 years rather than 40 years) mean that the scope to exploit any natural monopoly is only temporary, as evidenced by the recent quickening of competition. The telecoms sector may therefore soon proceed down the left-hand side towards regulation as a competitive sector - once when distributional concerns about basic telephone service for the poor, the elderly or remote areas are made redundant by the sheer cheapness of the service.

So, if energy networks will continue to be subject to natural monopoly regulation, regulators face several challenges if they want to introduce competition in the supply of electricity and gas as a commodity. The key challenges that I will discuss are:

- unbundling;
- real-time balancing; and
- cross-border trade.

Later, I will discuss the challenges presented by the recognition that natural monopoly regulation is permanent.

5. UNBUNDLING

5.1. Unbundling Services to Create Competition

Many European utility companies are vertically and horizontally integrated. The natural monopoly they possess in distribution networks may also give them equivalent power in markets for related services. For example, the advantage of possessing a network may extend into energy markets, new connections, system support services (ancillary services) and metering. Hence, natural monopoly in networks may act as a barrier to efficient competition in other services. This raises the question - should these other services be unbundled, and opened to competition? The solution to this problem is not straightforward.

In the UK, there has been a tendency – and indeed it has been a legal duty of regulators¹¹ - to promote competition in these related areas. To fulfil this requirement, UK regulators have often demanded extensive unbundling of management and ownership. They have occasionally reallocated costs from networks to competitive businesses, in order to create “a level playing field”. However, not all demands for unbundling are efficient or (therefore) pro-competitive.

To being with, I wish to discuss two different aspects of competitive unbundling:

- Outsourcing by competitive tender; and
- Allowing customers to choose their supplier of peripheral services.

5.2. Single Buyers – About to Rise from the Dead?

The Single Buyer Model (SBM) described in the European electricity directive seems to be a dead duck, since it is equivalent to TPA. As a consequence, the SBM for wholesale electricity offers none of the advantages of monopoly that made it attractive to some Member States. However, the rationale for such models persists in other parts of the energy sector.

- **Competitive Tendering for Power Stations**

¹¹ The Electricity Act says the DGES must “promote competition in generation and supply” (energy retailing); further unbundling has been imposed to facilitate the latter. The Gas Act 1986 contained a secondary duty to “enable persons to compete effectively in the supply of gas through pipes at rates which, in relation to any premises, exceed 25,000 therms a year”. The Competition and Service (Utilities) Act 1992 required effective competition “between persons whose business consists ... of the supply of gas” without the restriction to the market for more than 25,000 therms a year. The Utilities Act 2000 adds a general duty to protect consumers’ interests, bearing in mind the scope for competition.

The purpose of the Single Buyer Model was to ensure that new power stations were procured efficiently, even if the incumbent sold the output to consumers. Regulation would be required, to ensure that the monopoly could not set prices higher than necessary. However, investment in generation did not need to be carried out by a monopoly. The directive would have allowed Member States to adopt competitive tendering as a means to identify the most efficient producer.

Experience of this approach has not been conspicuously successful. The design and volume of power station construction is a big determinant of future efficiency, and would not be subject to the same competition pressures, since the single buyer specifies the terms of the tender. The Public Utilities Regulatory Policy Act (1978) set up a similar system for the US, but did not work well in some states, because utilities, regulators and other interests conspired to favour inefficient forms of production. In some states, this meant favouring local sources of coal (a story that is familiar to Europeans). On the West Coast, high cost “renewable” energy sources were also an important feature of energy procurement.

- **Competitive Tendering for Standard Projects**

In some cases, the variation in service volume and specification is a relatively minor determinant of overall efficiency, especially where the services involved are subject to common standards. The construction of new connections for electricity consumers is a case in point. Here, the major efficiency gains can be captured by competitive tendering for construction of the facilities, even if operation (and even ownership) reverts to the monopoly network at the end of the project. The same is true of many projects to build electricity lines and gas pipelines according to a defined specification.

Regulators may demand (and indeed have demanded) further unbundling, by letting consumers choose who operates and maintains such facilities. However, the additional gains to be achieved (compared with normal incentive regulation) tend to be small. In the case of connections, each new connection immediately creates a small, localised natural monopoly that demands to be regulated; if each is run by a separate company, the task of regulating them will quickly spiral out of control. The loss of economies of scope in operations and regulation translate into inconvenience and transactions costs for the consumers concerned. In Railtrack’s case, it seems that outsourcing maintenance may have created severe problems for scrutiny of contractors’ performance – something known to economists as the “principal-agent” problem.

Hence, in some instances, the gains from unbundling are limited, and the disadvantages are significant, in which case one should expect to see demands for reintegration. The combination of (1) political concern over safety and (2) economic factors probably explains the undiminished clamour at the time of writing for Railtrack to take a more active role in maintaining its own track.

In electricity and gas sectors, the proper scope for unbundling may be confined to competitive tendering of construction projects, where gold-plating and over-building are not major sources of inefficiency. Incidentally, if changes in technology ever place power generation into this category, we should expect a resurgence of the Single Buyer Model.

5.3. Unbundling to Remove Discrimination in Wholesale Energy Trade

The largest potential benefits arise out of competition in wholesale energy markets, because independent investors in power stations and gas wells can achieve big efficiency gains over monopolies, when they are driven by competition pressure. However, in many European Member States, independent investors still have to deal with network companies integrated with wholesale trading activities. Unregulated integration of trading and network activities tends to conflict with efficient competition, since the incumbents can discriminate against efficient new entrants in (1) network access and (2) services ancillary to trading, including balancing. The UK and some other MSs have already separated out their national grids, to remove conflicts of interest between integrated and independent traders. However, several European regulators (still) face the challenge of deciding whether integrated utilities should be required to separate out their networks and, if so, how to do so efficiently. Others have essentially given up the task of motivating a privately owned transmission company to behave in a non-discriminatory manner, and have opted for public ownership. Table 5.1 summarises the current situation (or likely changes in the near future).

Table 5.1
Ownership and Status of EU Energy Transmission Businesses

Country	Public ownership?		Legal Separation?	
	Electricity	Gas	Electricity	Gas
Austria	Yes	Yes	Some	No
Belgium	No	Yes	No	No
Denmark	Yes	Yes	West: Yes East: No	No
Finland	Yes (12%)	Yes (24%)	Yes	No
France	Yes	Yes	No	No
Germany	No	No	No	No
Greece	Yes	Yes	Within holding	
Ireland	Yes	Yes	Yes	No
Italy	Yes	Yes	Yes(?)	From 2002
Luxembourg	Yes	Yes	No ¹²	No
Portugal	Yes (50%)	Yes	Yes, within EDP	
Spain	Yes	Yes	Yes	Yes
Sweden	Yes	Yes	Yes	No
The Netherlands	Partial(2000)/full(2001?)	Yes (50%)	Yes	No
UK	No	No	Yes	Yes

Source: Various

¹² In practice, the Luxembourg grid relies on imports, and is therefore not integrated with production to any great degree. However, the network companies still handle the bulk of wholesale trade.

Completing a table like this is difficult, because there are so many different degrees of unbundling – and because the situation keeps changing. The UK, Finland, Sweden and Norway have separate grid companies owned independently of producer interests (ie owned by the state in all but the UK). In Spain and the Netherlands, the grid is effectively an independent company, but ownership rests in whole or in part in the producing companies. In Portugal and (soon) in Greece, the grid company is a separate business or subsidiary under one holding company. Looking at this variety of experience, what can one recommend?

It seems likely that efficient competition will not happen if particular producers retain a significant and influential influence over the transmission company. On the other hand, the solution of nationalisation (as favoured in Scandinavia and as about to be adopted by the Netherlands) runs counter to the belief that privatisation best serves consumers' interests, because the profit motive is an essential component of all incentive regulation. In the Netherlands, the government has recently determined that electricity companies must separate their networks into businesses that are independent of shareholder influence. The Dutch proposals do not provide scope for shareholders to encourage efficient management (and proved unsatisfactory in the UK, when applied to REC ownership of NGC from 1990 to 1995). Opinions on nationalisation may depend on ideology, but it is hard to think of good economic reasons for the negation of shareholder control.

Europe might learn from recent developments in the US, where the Federal Energy Regulatory Commission (FERC) has to face similar questions. Given a disaggregated industry with many grid companies, limited powers to enforce restructuring, and a long-standing commitment to "interstate commerce", FERC has been looking for ways (1) to facilitate access over multiple networks and (2) to enhance the efficiency of operations. FERC's Order 2000 (22 December 1999) sets out a framework of "regional transmission organizations" (RTOs), which combine the grid companies of several states to provide integrated operations and tariffs over a wide area.¹³ Companies had to file proposals by mid-October 2000. The overwhelming majority have chosen to create profit-driven "transcos", ie self-managing grid companies in the image of NGC and Lattice, rather than "independent system operators" (ISOs) driven by stakeholder committees in the Californian model. These proposals offer independence from any *particular* producer interest, combined with a profit-oriented incentive to be efficient. Experience with RTOs is limited, but offers a possible solution where European utilities are unwilling to sell off their networks.

To summarise, it seems likely that accounting separation is insufficient and that further unbundling of key networks will be desirable for promotion of competition. Such unbundling represents an infringement of the property rights of the original investors over their networks, which they intended to use themselves. Several EU Member States regard such infringements of property rights as undesirable, or even unconstitutional. However,

¹³ See Gene Meehan and Walter Surrat (January 2000), *Order 2000: FERC's Final Rule on RTOs?*, Energy Regulation Brief No. 4, NERA.

the long-term advantages of allowing more efficient competition in production may outweigh the disadvantage of undermining property rights – as with any “essential facility”. The remaining challenge is to unbundled networks without eliminating the profit incentive that encourages efficiency; a multi-utility – or even multi-state - RTO model may provide a means of diluting *individual* influence whilst preserving the benefits of shareholder power *in general*.

5.4. Unbundling to Promote Retail Competition

Several Member States have already opened up retail trade to competition and are facing (or have already faced) questions as to the proper degree of unbundling between retail supply and distribution networks.

In the UK, such unbundling is taken for granted, since the creation of the necessary institutions to facilitate retail choice in gas and electricity took place back in 1998-99 (although it was known as the “1998 process”). UK observers might expect other MSs to follow down the same path, but there is good reason to think that they might not, for economic reasons as well as political ones.

Memories being short,¹⁴ most industry personnel will already have forgotten that the whole “1998 process” was estimated to cost around £1 billion for new software systems, with running costs of £100 million per year. This estimate omits several costs incurred by independent traders. It also omits the transactions costs of consumers. If every one of 25 million consumers spends one hour per year deciding which supplier to adopt, and if we price that time at the minimum wage (say £4 per hour), consumers’ own transactions costs amount to *another* £100 million per year.¹⁵

The regulator’s papers occasionally argue simply that such costs of “1998” were small compared with the size of the industry, but this is not valid without some consideration of the cost-benefit ratio. When challenged by the National Audit Office to produce a cost-benefit analysis, OFGEM was unable to produce a convincing one.¹⁶ Some of the benefits were in fact transfers (which economists exclude from cost-benefit analysis) and some might have been achieved anyway by regulation. In any case, the electricity sector may be big, but a billion here, a billion there – pretty soon that adds up to serious money.

Other MSs will be less willing to spend a comparable amount on retail competition. Retail supply was liberalised fully in Norway from 1991, but the Norwegian regulator (NVE) adopted a piecemeal approach, solving problems as they arose. So far, NVE has abolished

¹⁴ The costs of “1998” may have been forgotten, because another £1 billion is being spent on the New Electricity Trading Arrangements.

¹⁵ If consumers decide not to incur these costs, by never switching supplier, the costs will translate into a price advantage for their current supplier, so they bear the costs anyway.

¹⁶ See FT Energy Economist, 20 February 1998, *An Unanswered Question*.

administrative charges for switching supplier and has introduced a single load profile for all unmetered demands within each distribution network (as an alternative to fitting hourly meters). The amount of customer switching in Norway has been less than in the UK, but Norway – a country of only 4 million people – has avoided major expense on information systems without retail competition falling into disrepute.

5.5. Conclusion

Unbundling is essential to avoid conflicts of interest, where the conflict reduces efficiency overall. Efficiency gains from competition are real – but need to be compared against the loss of economies of scope due to unbundling and any increase in transactions costs. UK regulators have a legal obligation to promote competition, which they interpreted as justification for major expense on systems designed to facilitate customer switching. Other Member States are unlikely to reach precisely the same conclusions. Hence, there is no reason to expect unbundling to proceed to quite the same extent as seen in the UK. A tentative recommendation, combining experience from various sources, would be:

- Encourage network companies to form profit-driven multi-utility gridcos (“transcos”), subject to limited (or no) influence from individual producer interests;
- Require network companies to offer standard projects for competitive tender, where principal-agent problems are minor;
- Adapt retail supply conditions stepwise to meet specific problems where benefits exceed costs.

In addition, any consideration of competition and conflicts must consider the need for independent operation of the real-time balancing system, to which I turn next.

6. REAL-TIME BALANCING

Electricity and gas trading is never exact. Flows always differ from the sales that traders make in their contracts. There is always a need for two monopoly functions:

1. organising real-time balancing – adjusting energy production or consumption to make up inadvertent shortfalls or to absorb inadvertent surpluses; and
2. charging for imbalances (making sure no-one without a contract can take free energy merely by flicking a switch).

The European directives are silent on this aspect of liberalised markets, but it is already proving to be a major focus of interest, especially in countries that have not unbundled grid operations from wholesale trading.

6.1. European Situation

In the gas sector, balancing tends to be managed by contractual penalties for departing from pre-specified flows. Such penalties work well enough at the wholesale level, because wholesale gas traders are normally able to keep gas flows within acceptable bounds. However, electricity is not so amenable to decentralised control, and nor is retail trade in gas. In the electricity sector, and in fully liberalised gas sectors, the price for inadvertent flows (“imbalances”) is therefore a subject of much debate.

In the electricity sector, one can observe two different approaches in Europe:

1. The incumbent utility sells or absorbs imbalances at a tariff rate, as seen for example in the Netherlands (at least until 2001), Portugal (where the “integrated system” performs balancing for the “independent system”), and Germany (under the latest “Verbandvereinbarung”); or
2. An independent market operator (often the same as the independent system operator) who provides a competitive market for real-time balancing (or “regulation power”) and who puts a price on imbalances (Britain, Scandinavia, Finland, Spain and the Netherlands from 2001).

National regulators will only accept tariff schemes on the understanding that the tariff is monopolistic, must be cost reflective, and will be subject to regulation. However, as our recent (German language) report on the German system¹⁷ shows, such schemes use a monopoly to favour incumbents without good reason. The German system currently limits the provision of regulation power to incumbents, and settles imbalances at (asymmetric and

¹⁷ Graham Shuttleworth, Enese Lieb-Doczy (August 2000), *Wirtschaftliche Effizienz und Wettbewerbliche Aspekte der Bereitstellung von Regelernergie in Deutschland (Economic Efficiency and Competitive Aspects of the Provision of Regulation Power in Germany)*, NERA.

fixed) tariff rates. The possibility of incurring a large capacity charge (per kW) for deficits causes independent traders to run a permanent surplus, which incumbents absorb at a very low tariff (per kWh) for “spill”. This system creates costs and risks for traders that only incumbents or large companies can manage. Such tariffs *unnecessarily* put small new entrants at a competitive disadvantage to incumbents and other large companies.

6.2. Future Developments

The prospect for tariff-based systems is not good. The Netherlands is switching to a regulation power market from 1 January 2001, with the market being operated by the independent grid company, TenneT. As a condition of their proposed mergers, RWE/VEW and E.On, the two biggest German utilities, must comply with a demand from the Federal Cartel Office to develop similar regulation power markets over the next 2 years. They must open up the supply of regulation power to all capable producers and traders, and they must move to a system of kWh prices based on market rates. (They have begun by conducting competitive tenders for 6-month contracts, and will gradually switch over to a daily process.) Other German companies are expected to follow the example of their bigger brothers and the rest of Europe will come behind.

6.3. Conclusion

Electricity traders know that the terms for real-time balancing and the charges for imbalances effectively determine the value of electricity as a commodity, and the ability of traders to compete. Systems that bias competition in favour of some suppliers (particularly incumbents) can expect to face an onslaught of complaints. Even the German system, which nominally addresses complaints via general competition policy, has used the recent mergers to impose sector-specific rules for the procurement and pricing of power in real-time. Other regulatory regimes, more open to sustained pressure and better able to impose common solutions, are unlikely to resist similar pressures for long.

7. CROSS BORDER TRADE

The stated intention behind the EU directives was to liberalise national markets and create a single market for energy. However, they say little or nothing about cross-border trade or the need to promote efficient inter-country choices. Several problems have emerged as a result, and the Council of European Electricity Regulators (CEER) and a Gas Regulatory Forum were established, taking place every six months in Florence and Madrid respectively, in order to develop a common position on these issues. Detailed below are some of the problems addressed by the Florence Forum.

7.1. “Pancaking”

The original concern raised by the European Commission was the accumulation of transmission charges from several grids on long-distance trade, in a manner unrelated to the marginal costs of any energy flow. This phenomenon is known in the US as “pancaking”, ie piling up charges. It represents the initial rationale for forming RTOs that cover a wider area.

The CEER regards pancaking as a “barrier to trade”. (Economists might say that the addition of multiple charges based on sunk costs is simply inefficient.) The CEER has therefore been trying to find ways to remove such impediments. In practice, the CEER, and the European association of TSOs (ETSO) is finding it hard to design an efficient system, and is solving problems step by step.

7.2. Transmission Charges Paid by Generators

The proportion of transmission charges levied directly on generators (as opposed to consumers and other traders) varies significantly across Europe, from 0 in Spain and France to 30% in the UK and, under recent proposals, to 50% in Greece. The CEER noted early on that differences between these percentages could distort competition between generators located in different countries. In particular, they could damage the efficiency of plant location (kW charges) and despatch (kWh charges), and might act as a barrier to (efficient) trade.

Early discussions in the CEER established that transmission charges were largely a matter of recovering sunk costs, and should therefore be charged to the most inelastic demands – meaning consumers rather than generators. However, some systems (including the UK) use generator charges as a means to encourage efficient location of generation plant. The latest

proposals from the CEER suggest that generators would pay up to 25% of total transmission charges, as a means of providing incentives for efficient location.¹⁸

Signals to encourage efficient location of generation can derive from sources other than transmission charges (strictly defined). Many electricity markets set different prices for different locations - either different areas of the grid ("zones") or different points on the grid ("nodes"). Gas networks in the US offer short-term and long-term signals about the value of transmission capacity (and hence of gas in different places) by creating tradeable rights to use defined routes.

If European electricity markets were to introduce such schemes, it would no longer be necessary or efficient to allocate a share of network charges to generators. However, European institutions seem unable to achieve a consensus on the treatment of constraints within European networks.

7.3. Allocation of Congestion Costs

Within the Interconnected European electricity system, some grid companies experience high levels of congestion due to transit flows (ie flows between two other states that cross their network). These grid companies have complained about the costs of reinforcing their grids for transit, which must currently be borne by their own customers. The European association of TSOs (ETSO) has developed a short-term proposal for compensation payments between grids within the integrated UCTE (continental European) system:

- TSOs must contribute Euro 2 per MWh for all exports to other UCTE Member States;
- TSOs receive a share of the revenue proportional to the role of transit in their domestic power flows (ie maximum of exports or imports, relative to domestic consumption).

At the Florence meeting of 9-10 November 2000, the scheme received broad approval for one year, allowing for total compensation payments of around Euro 200 million. However, France, Belgium and Germany wished to levy the charge of Euro 2 on actual exports, whereas the other states involved (Portugal, Spain, Italy, Netherlands, Luxembourg, Austria and Denmark¹⁹) preferred to recover it from all users. The European Commission indicated that adoption of differing systems would be unacceptable, and offered to speak to the French, Belgians and Germans. The resulting scheme therefore has yet to be decided. In any case, it is not intended to operate for longer than one year, after which some alternative is

¹⁸ Unlike earlier drafts, recent documents from the CEER do not link the imposition of generator charges to the need to provide locational signals. The absence of such a link may have been imposed by the Dutch regulator, who recently assigned 25% of transmission charges to generators, without offering any locational signals.

¹⁹ Ireland, Finland, Greece, Sweden and the UK fall outside the interconnected UCTE system.

needed. Ultimately, it may prove most efficient to internalise these costs of congestion by forming proper RTOs spanning several states, in the US model.

7.4. Access to International Interconnectors.

Questions have arisen over access to international interconnectors. Some parties treat them as the property right of incumbents. Others regard them as part of a network that, under the directive, is subject to TPA.

Recent developments regarding the Skagerrak, the sub-sea interconnector between Norway and Denmark, provide a potentially useful way forward. Capacity to the link had been tied up in long-term contracts with 20 years to run. However, in June 2000 the holders of these contracts (Elsam, Statkraft and PreussenElektra) agreed to convert these physical contracts into *financial* contracts. Instead of benefiting from the link by moving power from low price markets to high price markets, these companies will now receive a rental fee, equal to the difference between Norwegian and Danish spot market prices. Any trader prepared to pay the difference will be able to trade between the two markets, as currently happens within Nord Pool. This approach both opens up competitive access, and allows the current contract holders to earn a reasonable return on their investment.

At the European level, the CEER is discussing the possibility of auctioning congested capacity. However, such schemes must be reconciled with the contractual rights of existing users, to avoid accusations of expropriation. European regulators will not benefit consumers by expropriating investors' rights and the Skagerrak solution provides a useful and efficient alternative. It becomes feasible, once real-time spot markets operate efficiently at either end of the connector.

7.5. Conclusion

European discussions face the same problems about transmission pricing and access as national markets, but with more discussion of congestion and the associated variation in electricity prices. These problems have been studied at length for the US and, recently, in the UK, in the context of NETA. Any permanent solution will have to have the following characteristics:

1. Real competition means facing up to physical realities, including real transmission constraints and the associated differences in price between different locations. Attempts to create a single European market without recognising such factors are doomed to failure. In the US, FERC is pushing, if anything, for more segmentation of electricity markets.
2. Congested capacity can be rationed by price (long- or short-term auctions) or by quantity (awarding contractual rights to use a certain amount of capacity). There are no efficient alternatives.

3. Reallocating rights leads to windfall gains and losses for investors in long-lived irreversible investments – including generators and factories, as well as the interconnectors themselves. European economies will not prosper if regulation routinely undermines property rights in such a fashion. Any scheme must therefore give due consideration to the existing rights of incumbents. Failure to respect property rights will *not* promote efficiency or consumers' interests.

This last point begins to bring in some of the *economic* constraints on regulators' freedom of action and it is to these constraints that I now turn. However European regulators choose to unbundled their energy sectors, to set up real-time balancing markets or to solve problems of congestion, they will face a number of economic constraints. Existing regulatory institutions in Europe may or may not incorporate these economic constraints; the sooner they do, the better for consumers and for European economies at large.

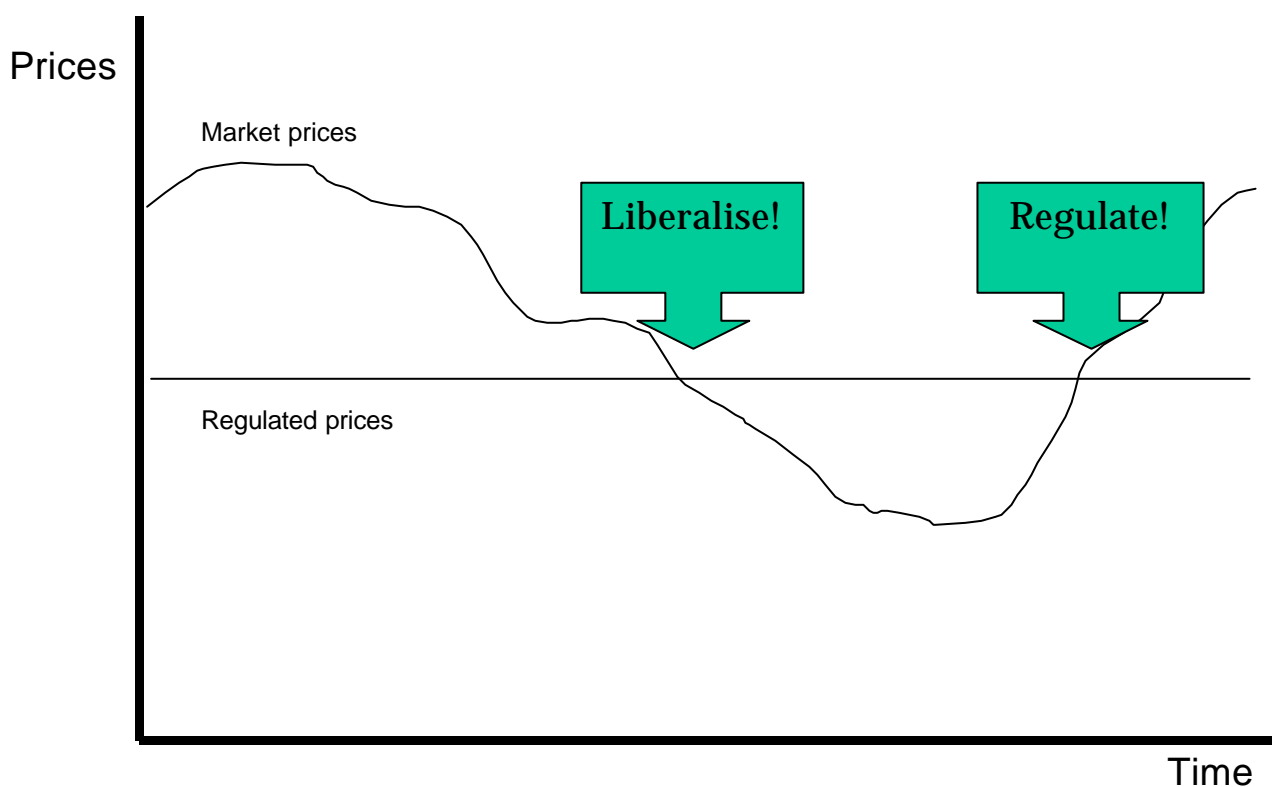
8. COST RECOVERY (1): STRANDED COSTS

As the previous section indicates, a major concern of investors is (and of reformers should be) the treatment of sunk costs of past investments. When it proves impossible to recover these costs in a liberalised market, they are termed “stranded costs”, but the same principles apply both to liberalisation of markets and to regulation of the remaining monopolies. In the following sections, I examine both the temptations facing governments and the economic factors that should constrain their actions. It remains to be seen whether regulatory institutions in Europe offer the procedural constraints needed to ensure that decisions are driven by a concern for efficiency (not transfers), and that true competition results.

8.1. Regulatory Policy as a Game

Introducing competition can be merely an opportunistic tool to deny cost recovery by incumbents, if market prices are lower than regulated prices. As with any opportunistic tool, using liberalisation to cut prices immediately appeals to governments and regulators who have only a narrow section of the public interest at heart (eg consumers’ *short-term* interests). However, such choices open up the possibility of an inefficient regulatory “game”, as show in the following figure.

Figure 8.1
Schematic of an Opportunistic Regulatory Cycle



Assume that regulated prices reflect average costs. In this example, the government follows a simple “myopic” policy:

- If market prices are lower than average costs, liberalise;
- If market prices are high than average costs, regulate.

The result of such behaviour is to create a regime over the long run in which it is practically impossible for an investor to recover total costs. If they anticipate such a regime, investors may keep existing facilities in operation until they breakdown. However, they would be wise not to engage in new investment within the regulated sector. The result would be a gradual (or catastrophic) decline in service quality that could only be offset by offering very high regulated prices (ie accelerated cost recovery) to cover the increase in the required rate of return.

8.2. Pressures for and Safeguards Against Opportunism in Europe

Is such a development likely in Europe? Certainly, European institutions will favour liberalisation were it reduces prices, and not otherwise. They may also follow the example of California, and attempt to reimpose controls the minute that market prices rise above certain levels. In California, the consensus seems to be moving (in November 2000) away from demands for re-regulation and in favour of reforms to the market rules (in particular, a move towards nodal spot pricing and more transparent treatment of congestion). European regulators might adopt the same attitude - but investors have been warned!

The main safeguard against the opportunism described in Figure 8.1 is a legal prohibition on legislation or regulatory decisions that prevent long-term cost recovery without good reason. (Observing that market prices this year would be lower than regulated prices would not count as a good reason.) This provision would give investors some protection against the expropriation of their investments through the creation of stranded costs. The European Commission (in the person of Sr. Mario Monti) is currently considering the Spanish system of “compensation for the transition to competition” (CTC) and his decision may set the standard. However, European investors will also look to the European Convention on Human Rights for higher level protection, if individual decisions threaten their viability and hence their ability to raise capital for investment in the sector.

9. COST RECOVERY (2): REGULATORY INSTITUTIONS

9.1. Economic Principles of Regulation

The issue of stranded costs is only one of many where regulators have the ability (if not always the power) to prevent recovery of certain costs. In many cases, regulators prevent recovery of costs that were incurred unnecessarily or imprudently, in order to provide an incentive for efficient decisions by the regulated company in the future. However, all regulatory regimes contain scope for opportunistic decisions to deny cost recovery in ways that act against consumers' long-term interests, but which serve the interests of a narrow section of the population.

Recall the fundamental characteristics of natural monopoly – that they consist of long-lived, irreversible investments. In the absence of legal or procedural constraints, it is easy²⁰ for any single regulator (whether an individual or body) to cut prices now, by denying recovery of *sunk* costs. The regulator will receive praise for the immediate benefit to consumers, and the company will continue to operate its existing facilities as long as prices exceed operating expenses. By the time the quality of service starts to decline, because the company is no longer willing to commit funds to new irreversible investments, the offending regulator is long gone.²¹

Such regulatory opportunism is bad for consumers, damaging to efficiency and hence – according to section 1 - inconsistent with the promotion of competition.²² The only safeguard is a set of regulatory institutions (law, procedures, and bodies) that protect investors against opportunism over the long-run. These institutions do not need to guarantee cost recovery (which would be inconsistent with incentives for efficiency). However, they should not deny the possibility of cost recovery. To summarise the combination of these two principles, one might say that regulatory institutions must offer investors a “reasonable prospect of cost recovery”.

9.2. Regulatory Institutions in Europe

Europe is unfamiliar with the need for institutions to constrain opportunism and to protect investors in the energy sector, for several perfectly understandable reasons.

²⁰ Cutting prices is sometimes called “tough regulation” - it isn't. Cutting prices is the easiest thing for a regulator to do, given the likely degree of public support. “Tough” regulation is ordering a price increase when costs go up!

²¹ Part II of the Utilities Act 2000 obliges gas and electricity regulators to “protect consumers' interests” and explicitly defines consumers to mean “existing and future consumers”. Hence, actions that put the interests of future consumers in jeopardy, in return for temporary, opportunistic gains, may already be illegal under UK law.

²² This idea can be found in numerous academic texts. A recent contribution is found in Newbery (2000), op. cit.

There is a history of public ownership where government supervision acts in place of shareholders and the profit incentive. The government can afford to act opportunistically with companies that it owns, since such behaviour will not damage the (already weak) incentives for efficiency. Under private ownership, the effect of economic regulation is quite different. Regulators are no substitute for shareholder control of management. All they can do is to adjust the company's incentives, so that shareholders earn more profit when management improves the company's efficiency.

Misunderstandings about this role abound, eg where regulators imply that cutting revenues will *in itself* make companies more efficient. Regulatory institutions with a history of public ownership tend to underestimate the role and need for profits in encouraging efficient operations and investment. Public agencies might conceivably become more efficient if their budgets are cut, if they have incentives to *spend*. Private companies have an incentive to *maximise profits* and will cut costs and become more efficient whenever they can make more profit by doing so. Simply cutting revenues does not enhance incentives to be efficient. It might place the company under a cash constraint, but the resulting cost cutting is unlikely to be efficient.

The basis for incentive regulation is unfamiliar. Many European systems operate with a variant of cost pass-through (or do not relate prices to costs because the sector is publicly owned). As part of a major restructuring, regulators will often pick up the world-wide trend towards use of price caps, but may not recognise that effective incentive regulation is still cost-based. Again, misunderstandings abound, eg, for example where regulators insist that competitive markets provide some guide to pricing for natural monopolies.²³ I have recently encountered statements that competitive markets set prices equal to efficient costs, and therefore so should regulators. Both halves of the statement are incorrect: efficient companies earn super-normal profits precisely because prices are set by *averagely* efficient companies; offering a reasonable prospect of cost recovery means assuming average efficiency, not exceptional efficiency.

There is no explicit constitutional protection of investments. Western economies are founded on the premise that property rights (and competitive markets) work better in most conditions than government ownership (and control). This was the rationale for privatisation. Otherwise, there is no reason why the utility sector could not have continued to receive the necessary capital from Government borrowing. Normally, European governments are careful not to trample on property rights without good reason. Regulation by government can undermine property rights. There is no good reason to allow opportunistic decisions that undermine the property rights of investors in utilities. However, the impact of regulatory decisions on property rights is not immediately apparent, and will only emerge from protracted discussions.

²³ Such statements can be found in documents recently issued by the Dutch energy regulator, DTe, along with other statements that incorrectly describe how prices are set in competitive markets. DTe's attempt to apply these (incorrect) principles has provoked a number of disputes that may result in court proceedings.

9.3. US Precedents

Much is made of the “constitutional protection of property” in US regulation. However, anyone perusing the 200-year old US Constitution will be hard put to find an explicit safeguard against opportunism in the regulation of electricity, gas and telecoms sectors. In fact, the protection offered to investors is not explicit and has three components:

1. The 5th Amendment of the Bill of Rights prohibits government from “taking without due process” (ie, from depriving citizens of their life, liberty and property without following due process of the law);
2. Supreme Court Decision on *Bluefield Water* (1923):²⁴ Regulators must allow investors to earn a rate of return comparable with that earned by investors in other sectors, or else the decision constitutes a “regulatory taking” (expropriation of investors’ property);
3. Supreme Court Decision on *Hope Gas* (1944):²⁵ Regulators must allow investors the opportunity to earn the comparable rate of return *after* recovery of operating costs and depreciation (return of capital).

Application of these principles applies to the rate of return earned on past investments (ie recovery of sunk costs) as well as to the rate of return promised for future investments (ie recovery of avoidable costs).

I should point out that these principles allow for a wide range of regulatory methods. These legal constraints do not “guarantee” any particular rate of return. Regulators can design incentive schemes in which the rate of return rises or falls in line with the efficiency of the regulated business, so long as the general level of return on offer is comparable with that in other sectors. The US Constitution does not require pass through of all costs. US regulators frequently impose the kind of price caps and other forms of incentive regulation found in the UK.

What is more, these principles do *not* rule out disallowance of investment costs – provided that *due process* shows such disallowances to be beneficial to consumers (and not just a regulatory taking). To meet this requirement, regulators have to show, broadly speaking, that the expenditure was inefficient, imprudent or unnecessary, in the light of information available at the time of the decision to incur the cost. Such disallowances encourage efficiency in the future; other disallowances would not.

As this last point illustrates, the ultimate safeguard against opportunism is the requirement for due process – regulators who want to infringe investors property rights must show that

²⁴ *Bluefield Water Works & Improvement Co. v. Public Service Commission of West Virginia* (262 U.S. 679, 1923)

²⁵ *Federal Power Commission v. Hope Natural Gas Company* (320 U.S. 391, 1944)

they have a good reason for doing so. The most obvious reason for disallowing costs (that it results in lower prices in the immediate future) is not good enough.

9.4. Implications for the Promotion of Energy Competition in Europe

European observers should note immediately that the “constitutional protection” of US investors does not rest in any explicit constitutional or legal treatment of utilities that is specific to the US. Points 1 to 3 are general lessons derived from economic experience within the framework of a particular legal system.²⁶ Economic principles (unlike laws) know no boundaries; they merely await discovery by different means in different legal systems. The US took roughly 50 years to establish these principles; European consumers will be better off if their institutions discover and adopt the same principles more quickly.

Some Member States already have public procedures that allow all arguments to be subject to detailed scrutiny and regulators in these states are already constrained by due process. (I am working with a procedure of this type in the Netherlands.) However, some MSs are more used to political negotiations with utilities and would find it more difficult to adapt to open procedures. Moreover, due process alone may not immediately result in the adoption of the three economic principles set out above, or of any similar variant. Where they are not already entrenched in the law, they will need to be rediscovered through a process of discussion and dispute. Whilst this process continues, investors will be unsure of their rights, investment will be discouraged, and the full benefits of efficient competition will not be achieved.

Within the UK, it will be interesting to see what difference the repatriation of the European Convention on Human Rights will make to British government procedures. The EHCR may impose new procedural requirements, including a requirement for substantive appeals in “criminal” cases (eg where OFGEM penalises companies for breach of a licence). Only time will tell how this affects our regulatory institutions.

²⁶ Canada has adopted the same principles of regulation, without being subject to the US Constitution, on the basis of British-style common law.

10. CHALLENGES FOR EUROPEAN REGULATORS

This brief survey of European energy markets draws on my experience (and I make no apology for focusing on the electricity sector, with which I am more familiar). However, my findings depend on analysis of general economic factors and their effect on the development of competition.

It seems to me that the telecoms sector does not provide a useful indicator of the way ahead for energy sector regulation, because it is significantly less prone to natural monopoly conditions. In telecoms, regulation might just be viewed as a measure to mitigate market power until competition reduces the dominance of certain players. Competitive markets may even provide a paradigm for the design of such measures. In electricity and gas, however, natural monopoly is so widely prevalent that (a) regulatory interventions will be required to promote competition and (b) regulation of the natural monopolies must be regarded as permanent.

The measures required to promote competition should follow the principles of the “essential facility doctrine”. Networks are the property of investors who intended to use them. Regulators may require such networks to be made available to others, when the efficiency gains coming from competition among network users more than offset any loss of efficiency due to loss of economies of scale and scope, or any disincentive to invest in networks. To avoid creating such disincentives, European regulation may need to give more detailed consideration to (and may require more institutional safeguards of) the need to offer a reasonable prospect of cost recovery.

In the mean time, European electricity and gas markets will require regulatory measures that are by now familiar to a UK audience:

- Unbundling of transmission networks, preferably as profit-driven independent “transcos” in the style of NGC and Lattice; and
- Unbundling of an open and competitive market for real-time balancing (“regulation power”).

For good economic reasons, European regulators probably should (and will) be a little more selective than in the UK when adopting measures to promote competition in other parts of the system, including:

- Measures to facilitate retail competition; and
- Unbundling or outsourcing of peripheral services.

Within any energy liberalisation process, the biggest economic problem facing European regulators, utilities and traders alike in the immediate future will be the design of efficient

transmission pricing. Sustainable solutions should take the following economic principles into account:

- Ignoring physical realities does not promote efficient competition;
- The physical reality of any transmission system (gas or electric) includes real congestion over capacity that must be rationed by price or quantity;
- Segmenting markets will lead to changes in prices and windfall gains and losses in the value of long-lived investments in production and consumption;
- Efficient investment in networks will only be forthcoming if regulated revenues offer a reasonable prospect of cost recovery, and so regulation should offer reasonable protection against (or compensation for) investors' windfall gains and losses.

Where private investment is important, regulators need to be sensitive to the need to attract capital for continuing investment. Regulatory institutions will therefore need to restrain the tendency or temptation to indulge in opportunism – both when deregulating markets and when regulating the remaining monopolies. Given the importance of future investment for competition, efficiency and consumers, the need to develop such institutions may overtake transmission pricing as a higher priority for Europe in coming years.

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