

# 1

## THE COMPETITION OBJECTIVE

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(P)olitical and public opinion in the US is more ready to accept competition as a good in itself than opinion in most European countries.

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### A. Introduction

The goal of promoting competition in European energy markets has always had to jostle for policy space alongside two other important concerns: on the one hand, the provision of energy security in a region characterized by a high and growing 1.01

<sup>1</sup> 'The Modernization of EC Antitrust Policy. Issues for Courts and Judges', paper presented at the Workshop on the Modernization of EC Antitrust Policy, European University Institute, Florence, 2000.

dependence on external sources for its primary energy consumption and, on the other, the achievement of environmental sustainability.<sup>2</sup> Their uneasy co-existence has been a much noted feature of European energy policy over the years, particularly since the competition goal acquired the status of *primus inter pares* with the internal market programme since the late 1980s. Very recently, the competition goal appears to have experienced a relative decline, even as the internal energy market programme has begun to make a real impact.

- 1.02 The manner in which competition is being introduced into EU energy markets is partly responsible for the emergence of doubts about the benefits. The first legal measures were finalized ten years ago after many years of controversy and set out a timetable for market opening or liberalization. This gradualist approach or ‘managed liberalization’ was designed to give energy companies time to adjust to a more competitive environment. Ultimately, energy consumers—that is, largely industrial consumers of energy—were expected to benefit from a greater choice of supplier and possibly from lower prices. By the end of the first decade of ‘managed liberalization’, consumer prices appeared to be volatile and lacking in transparency, markets for both electricity and gas remained segmented into national compartments, and there was a marked absence of new entrants. Even more challenging were a number of new problems that had appeared during the first decade: large investments were required in the ageing network infrastructures to modernize and expand them; dependence on non-EU imports of gas for power generation had grown continuously, and the introduction of a Europe-wide emissions trading scheme was beginning to impact upon electricity prices.
- 1.03 A consequence of these developments was to underline—if that were necessary—how sensitive and strategic the energy sector remains for the economy of the nation-state, and in this case the Member States of the EU. For a number of participants it appeared to confirm their perception of energy as, essentially, a service of general economic interest, which should not be entrusted to the care of the market, at least not entirely. The notion of energy as a *service public*, guaranteeing reliability and continuity of supply, preferably entrusted to the care of a privately or publicly owned national champion, has become again an influential idea in some parts of the EU, even if it lacks a coherent ideological framework. It is a challenge to the competition objective that has been the ultimate, if not the only, objective of the internal energy market programme over the past decade. All the more ironic then, that the key idea of *service public* has already been incorporated into the EU model for liberalized energy markets.

<sup>2</sup> The co-existence of these goals is vividly illustrated in the European Commission’s Green Paper, *A European Strategy for Sustainable, Competitive and Secure Energy*, COM (2006) 105 final, 8 March 2006, and in the Strategic European Energy Review document: *An Energy Policy for Europe*, COM (2007)1 final, 10 January 2007.

In this chapter a number of issues are addressed that are preparatory to the examination of EU energy and competition law that follows. First, the issue is examined of what competition means in the energy sector and why the goal of competition appears to have a particular sensitivity (section B). Next, the wider historical and intellectual changes that drove forward the idea of energy market reform are described by reference to the notion of a changing ‘energy paradigm’ (section C). Some of the specific reasons why electricity and gas present special challenges for the introduction of competition are then explained (section D). The ‘nodal points’ of liberalization, that is, the sensitive areas that must be operated on for a programme of market opening to succeed, whether in the EU or elsewhere, are also analyzed (section E). 1.04

## B. What is Competition?

There are many ways of answering the question of what ‘competition’ really means. From an essentially economic point of view, a leading competition lawyer, the late Daniel Goyder, offered a convenient definition: 1.05

Competition is basically the relationship between a number of undertakings which sell goods or services of the same kind at the same time to an identifiable group of customers. Each undertaking having made a commercial decision to place its goods and services on the market, utilizing its production and distribution facilities, will by that act necessarily bring itself into a relationship of potential contention and rivalry with the other undertakings in the same geographic market . . . <sup>3</sup>

The advantages often attributed to the operation of competition include:<sup>4</sup> 1.06

- *Allocative efficiency*: the part that competition plays in allocating resources in the direction preferred by consumers. This has the benefit of reducing the risk that goods or services produced will not be wanted, or not wanted at the price at which they are offered.
- *Innovation*: the constant process of dynamic adjustment to continual changes in consumer preferences is an incentive for producers to invest in research and development and to innovate, leading to the survival and growth of those companies which make the necessary changes in good time, whilst those that fail to do so inevitably fall behind.
- *Cost reduction*: the continual pressure on all producers and sellers in the market to keep down costs, and therefore prices, for fear of losing custom to other sellers who find ways to attract business either by general price cuts or by special discounts to favoured buyers.

<sup>3</sup> *EC Competition Law* (4th edn, 2003) 8.

<sup>4</sup> For a fuller discussion of this, see Prosser, T, *The Limits of Competition Law: Markets and Public Services* (2005) ch 2.

- *Progress*: the likelihood that a country whose economy is committed to the competitive process will enjoy greater advances in productive efficiency and in utilization of its resources of raw material and human capital.
- 1.07** All of these prospective benefits from competition could be said to lie behind the EU programme for energy market reform in recent years. The frequent linkage of energy market reform to the so-called Lisbon Agenda of growth and competitiveness testifies to the influence of the fourth item on the EU thinking about competition in this area.
- 1.08** If one seeks to rely upon a definition in the EC Treaty, there is a reference to 'competition' as a concept in both Articles 3(1)(g) and 81, but a proper definition is not offered. Article 81 has no application unless the agreement, decision or practice concerned has either the object or the effect of preventing, restricting or distorting competition, but the concept itself is not defined. At the same time, a perusal of the Treaty framework quickly reveals that competition is a *policy* with equivalent status to other *policies*, such as environmental or social policy. In the event of any actual or potential conflict there is a need to establish some balancing of the policies concerned.
- 1.09** This co-existence of competition policy with other policies in the framework of the EC Treaty is the key to how competition in the context of energy markets should be approached if not necessarily defined. The EC Treaty gives a particular importance to the notion of services of general economic interest (in which electricity and probably gas are included) and to notions of public service. By contrast, there is almost no mention of 'energy' in the EC Treaty at all. A balancing of the competition objective with the many possible interpretations of service public and all that it implies is rooted in the Treaty itself. It makes a social interpretation of 'competition' inescapable. Given the crucially important role that electricity and gas supply play in modern life in the EU as in most other parts of the world, this means that the scope for an unfettered form of competition is—at least within this legal framework—non-existent, and the way that competition in energy markets is introduced and promoted has to take fully into account the role of non-economic goals and values, not least those affecting the public service character of this sector.

### C. Energy Markets and Government Intervention: The Energy Paradigm

#### (1) Historical Characteristics of the Electricity and Gas Industries

- 1.10** In every industrialized country it has been normal practice for governments to involve themselves in the energy business, and especially in the activities of the

electricity and gas industries. This has been encouraged by at least five principal characteristics of these industries:

- (1) They necessarily involve activities that develop in successive phases (generation or production; followed by transmission, distribution and supply/retailing).<sup>5</sup> There are elements of *natural monopoly* in transmission and distribution activities which stimulate vertical integration of the above activities within a single company. Those integrated companies have traditionally been obliged by governments to provide and supply electricity and gas, and have in return been granted exclusive rights of supply over a specific area or territory (see below).
- (2) The services provided by these companies have traditionally been seen as *essential* for communities, and an obligation to supply has often been imposed by governments on the companies—electricity prices normally being controlled by government and based on costs.
- (3) The electricity and gas sectors are *strategic* for the overall economy and for the military capability of the nation-state.
- (4) They are capital-intensive industries with a high degree of technical complexity, which creates entry barriers and necessitates technical co-ordination in their operation. This has led to a structure of regulation that places strong emphasis on reliability of transmission and delivery. This has been particularly evident in the electricity sector, because electricity cannot be stored; rapid changes in demand can occur throughout any given day, and each request must be linked with supply.
- (5) There is a measure of *integration* between the various energy sub-sectors, so the regulatory status of one influences the other. Electricity is a secondary form of energy that derives from various primary natural sources such as gas, oil, coal, water or uranium. Gas is commonly found in conjunction with oil. But both electricity and gas can be substituted for each other and so compete for end-use in consumer markets.

#### (2) The Pre-Liberalization Paradigm

These characteristics contributed to a specific model or pattern of government—energy industry relations that, with some variations, was dominant in all the industrialized countries for several decades. Its wide acceptance over a long period of time and its impact on the policies of governments suggest that it may be described as the 'traditional paradigm' of energy network regulation. By this it is intended to refer not only to certain ways of organizing government relations with the

<sup>5</sup> Other phases can be distinguished, eg system operation and dispatch, 'spot' and contractual markets and, for gas, storage and possibly liquefaction and re-gasification. These, however, have different functional and cost characteristics and are less fundamental to the industries concerned.



electricity and gas industries, but also to a set of ideas about the scope of competition and the appropriate legal and institutional methods to achieve public policy aims. Such ideas have had both a prescriptive and a constraining effect on choices in policy. These ideas were dominant in the period before the current liberalization of electricity and gas markets began.

- 1.12 The concept of 'paradigm' has been defined in the context of the natural sciences as comprising 'universally recognised scientific achievements that for a time provide model problems and solutions to a community of practitioners'.<sup>6</sup> In the electricity and gas sectors the traditional paradigm comprised a wide variety of legal and institutional arrangements that were predicated on a *model of technical organization involving central control over a synchronized network*. It was assumed that these network-bound systems were strategic assets for a national economy and that the nature of their production made it economic to have a single entity construct the system facilities and operate the transmission grids. It emphasized stability, reliability of supply, and public service. This model of centrally-controlled and vertically-integrated monopoly is still to be found in various forms in some OECD countries, and in many developing countries as well as the emerging markets.
- 1.13 For many years most countries favoured a common technical model of an electricity system, based on central station synchronized 'AC' (alternating current). However, each system evolved its own structures for planning, decision-making, and other aspects of management. The technical feature was common, but the legal and institutional arrangements varied widely according to local history, politics, and culture.
- 1.14 The principal regulatory characteristics included:
- exclusive rights to build and operate networks, granted under concessions or licences;
  - closure to competition;
  - detailed regulation;
  - vertically-integrated operations;
  - remuneration on the basis of historical costs; and
  - a high degree of planning with tight, centralized control.
- 1.15 They had another common feature: they did not allow the ultimate beneficiary—the electricity consumer—to participate in decision-making. The electricity user had 'almost no role in this process except to switch things on and off'.<sup>7</sup> The legal and financial arrangements were set up and supervised by governments, generally

<sup>6</sup> Kuhn, T, *The Structure of Scientific Revolutions* (1970) viii. Although Kuhn's work is primarily concerned with the natural sciences, the paradigm concept that he used has gained a wide currency in law and the social sciences, even if not always acknowledged.

<sup>7</sup> Patterson, W, *Transforming Electricity* (1999) 5.

national governments. Technical arrangements were designed, manufactured, and installed by engineering companies. Electricity systems were operated by companies that had grown up with the systems—such as Électricité de France (EDF), Ontario Hydro, and Tokyo Electric Power.

The activities of all of these participants were guided by a single basic idea: large power stations generate electricity in large quantities and deliver it by wire to every user in the area, continuously adjusting the total amount being generated to match the total amount being used at any instant. A serious shortcoming of this approach was that those who planned, managed, and operated the system did not bear any of the risk, and did not suffer if it failed. The costs of incompetence or bad judgment were passed on to customers and sometimes to taxpayers. A similar approach was adopted in the transmission and supply activities of the natural gas industry. 1.16

### (3) Beyond the Pre-Liberalization Paradigm

The basic relationship between government and the electricity and gas industries has for some time been undergoing a radical, and seemingly irreversible, change. With respect to electricity markets, the current state of change has been characterized as one in which the 'comfortable old certainties have evaporated'. Indeed, the 'basic premises that everyone involved accepted without thought, which guided the evolution of electricity systems worldwide throughout the 20th Century, suddenly no longer apply'.<sup>8</sup> Throughout the 1990s, governments in countries around the world began to change the ground rules. This change may be characterized as a movement from 'traditional regulation' to 'regulation for competition'.<sup>9</sup> 1.17

The new idea behind this movement was that the institutional configuration of a system based on the technically-centralized model can be restructured, and monopoly rights withdrawn to permit different suppliers to compete for customers. The technical reasons for this have been discussed in the literature,<sup>10</sup> and include 1.18

<sup>8</sup> *ibid* 3.

<sup>9</sup> Ariño, GO, *Principios de Derecho Público Económico* (1999) 605–55, and see Newbery, DM, *Privatization, Restructuring, and Regulation of Network Utilities* (1999) ch 1. There is a considerable body of literature on economic regulation and on theories such as those of the public choice and public interest schools: see Newbery, *ibid* 133–69. An early overview of the arguments of the latter two schools is provided in Ogus, A, *Legal Form and Economic Theory* (1994) ch 4. An introduction to the various meanings of the concept of regulation is provided by Daintith, T, 'Regulation: Legal Form and Economic Theory' in *International Encyclopedia of Comparative Law*, vol XVII (State and Economy) ch 10. For an overview of UK experiences in energy and non-energy sectors of the economy, see Robinson, C, (ed), *Regulating Utilities and Promoting Competition* (2006) and for an earlier period, Prosser, T, *Law and the Regulators* (1997). For a contrasting but highly stimulating view of national energy policy changes during this period, see De Jong, J, Weeda, E, Westerwoudt, T and Correlje, A, *Dertig Jaar Nederlands Energiebeleid* (Clingendael International Energy Programme, 2005).

<sup>10</sup> *eg*, OECD/IEA study, *Electricity Market Reform* (1999) 23–4; this should also be read in the light of the more recent assessment in OECD/IEA, *Lessons from Liberalised Electricity Markets* (2005).



particularly the development of the combined cycle gas turbine. As a result, a new paradigm in government–energy industry relations has emerged, based on a greater reliance on markets. It has sought to introduce competition whenever possible, encouraging openness, decentralized production with network access, and remuneration on the basis of market prices, not costs. If an activity has the potential for competition, the kind of regulation implied by the new paradigm facilitates competition by (inter alia) encouraging and supporting new market entrants. If an activity is a natural monopoly, then regulation provides a substitute for the competitive market by introducing measures which act as a surrogate for competition (eg, publication of tariffs for transmission and distribution). Many diverse approaches result from this. Several basic characteristics of this new kind of regulation may be identified as follows:<sup>11</sup>

- separation of activities in order to facilitate the introduction of competition wherever possible;
- freedom of entry and freedom of investment in competitive activities, instead of a centrally-planned approach;
- freedom of contract and competitive formation of prices;
- access to networks and infrastructure;
- supervision of the model by an independent regulator; and
- adaptation to the use of information technology.

**1.19** For effective regulatory oversight it is necessary that the regulators understand how the energy businesses work and how the various elements in them combine. In systems organized according to the traditional paradigm, where public sector monopolies predominated in the energy sector of many economies, problems of co-ordination and cost allocation among the elements of an electricity or gas network were concealed. And in the reformed electricity markets in particular it has become of critical importance to understand how the different components work and *must work* together. New rules (including those on cost allocation) must be designed to promote the economic benefits that liberalization is supposed to bring. Some co-ordination by a regulator is necessary to support competition. However, the profile of other government bodies should decline through arrangements set up under the new paradigm, except in relation to social and environmental matters.

**1.20** The new energy paradigm has emerged in a context that displays some of the familiar characteristics of paradigm change noted by Thomas Kuhn.<sup>12</sup> A radical shift involves the successful challenge by a competitor theory of the practice carried out within the traditional paradigm, and leads to a redefinition of the problems suitable

<sup>11</sup> Ariño, GO, *Principios de Derecho Público Económico* (1999) 608–09.

<sup>12</sup> Kuhn, T, *The Structure of Scientific Revolutions* (1970).

for research and a change in world view. To promote this change, he notes, the proponents of a new paradigm will claim that they can solve the problems that have led the old one into its condition of crisis. In energy regulation, the advocates of the new market-oriented paradigm have successfully challenged the idea that network-bound energy industries defy the introduction of competition because of their natural monopoly characteristics. A new consensus emerged that was organized around a belief in markets. However, its supporters have not for the most part been proponents of some form of market fundamentalism in which all key issues are settled by way of reference to market principles. In challenging the traditional paradigm, it may well appear that this is being argued, but it is by no means inevitable and is expressly contradicted in some cases.<sup>13</sup> It is not necessarily being argued that energy should be treated as just another commodity.

On the contrary, in at least two ways the new paradigm's supporters acknowledge flexibility and open-endedness. First, the way in which governments introduce and promote competition has been and will remain highly diverse. Secondly, no one knows much at all as yet about the medium to long-term effects of liberalization (particularly on security and continuity of supply) because experience in most cases is still too recent. **1.21**

#### (4) A Three-Stage Evolution

The reasons for this paradigmatic shift are economic, ideological, and legal. They can perhaps best be understood in an historical context since much of the power of the new paradigm comes from its claim that the traditional paradigm in the electricity and gas industries had—because of technological advances and globalization of trade—outlived its usefulness. A number of recent studies of energy market reform have been at pains to explain the historical developments that have led to the present market-oriented reforms and to claim their superiority. For convenience, *three* broad stages in the evolution of government relations with the energy sector may be distinguished. **1.22**

The first began with the reconstruction and expansion after the Second World War. In Europe it saw the nationalization of energy companies (electricity, gas, town gas, coal, and, to a limited extent, oil companies) and the establishment of very close relationships between government and the state-owned (or controlled) energy companies. A characteristic of this stage was the consolidation of a highly fragmented electricity industry and, in Western Europe following the introduction of natural gas, the creation of state-owned monopoly suppliers. **1.23**

<sup>13</sup> OECD/IEA, *Electricity Market Reform* (1999); Hogan, WF, 'Making Markets in Power' (London, 2000) <<http://ksghome.harvard.edu/~whogan/index.htm>>; Helm, D, *Energy, the State, and the Market: British Energy Policy since 1979* (2nd edn, 2004).

- 1.24** A second stage can be seen as commencing with the energy crises in the 1970s and is characterized by first an intensification and then a critical reassessment of the government–energy relations that had been built up during the previous stage, particularly those that had been built up in relation to security of supply in the oil industry and the construction of nuclear power stations. The tentative beginnings of a new market-based approach to energy policy emerged during this stage, especially in the USA.
- 1.25** A third stage began from around 1985 onwards. Governments loosened the ties that bound them to their energy companies, whether through strategies of commercialization or privatization or both, and moved to set up independent regulators. Despite many national variations, a clear market orientation has now become evident in the energy affairs of most industrialized countries.
- 1.26** This three-stage scheme provides a useful framework for a brief review of the principal linkages between governments and the energy industry over these decades.
- (a) *Stage 1: Intervention*
- 1.27** The dominant view of governments in Western Europe in 1945 was that the control by the state of the commanding heights of the economy (which included the coal, electricity, and gas industries) was essential to the reconstruction of Western Europe and the creation of the new post-War society. Accordingly, those industries were nationalized and their assets vested in state agencies or state-owned companies which were responsible, subject to tight governmental control, for running them. In this way the high cost of investment incurred in production and infrastructure could be made to meet rising demand. Abuse of this concentrated power was to be avoided in most cases by public ownership or significant public control. Examples of this approach are to be found in France with the creation of EDF and GDF (*Gaz de France*) in 1946 and 1949, in Italy with the creation of ENEL in 1962, and in the UK with the establishment in the late 1940s of the Central Electricity Generating Board (CEGB), the Electricity Council and the regional Electricity Boards, and the establishment of the Gas Council and the area gas boards that were superseded by the state-owned British Gas Corporation in 1972.<sup>14</sup> So close was the relationship between government and industry in these cases that the term ‘regulation’ seems inappropriate to describe the kind of government supervision it entailed.<sup>15</sup>
- 1.28** Further consequences of this assumption were that the operations of the industries were usually exempted from the scope of national competition law, and entry of

<sup>14</sup> This even extended into the oil sector with the establishment of a state oil corporation which operated—successfully—for several years: see Cameron, P, *Property Rights and Sovereign Rights: the Case of North Sea Oil* (1983) 138–171.

<sup>15</sup> Well-illustrated by the use in the UK in the 1970s and 1980s of the term ‘lunch-time Directive’ to describe the means by which the minister responsible for a particular nationalized undertaking communicated his requirements to the Chairman of the undertaking.

new players into the market was excluded or strictly limited by statute. Public service obligations were imposed on the industry with respect to equality of treatment and continuity of service. In return, these industries obtained exclusive rights that amounted to, in practice, a monopoly, although the exact form differed from one country to another according to institutional structure, cultural background, political style, economic policy, and of course, the energy resource base.

In the USA, a different model was in operation: that of the private monopoly regulated by a publicly-appointed state or federal regulatory commission. There were a number of federal or municipally-owned power companies in business. The nearest counterpart to this in Europe was found in West Germany, where large, privately owned electricity and gas (and oil) companies constituted the dominant force in the energy sector. There too, many smaller energy distribution companies were in municipal or mixed ownership.

The highly interventionist role of the state during this time appeared to be vindicated by the rapid economic growth in which the energy industry played a major part by supplying increasing quantities of energy at affordable prices. It was also promoting the investment in networks that established the modern electricity and gas businesses.

This extensive and overt role of the state in national energy management had a considerable impact on the first efforts at European integration. The EC Treaty addressed issues of economic integration, but energy was not expressly mentioned. Although nuclear energy and coal were treated in some detail in the two other Treaties of the period (ECSC and Euratom), the network-related barriers to competition in the electricity and gas sectors were not addressed. In practice, even the antitrust provisions of the EC Treaty were not applied to these sectors, allowing various kinds of exclusive rights to be exercised by monopolies in most of the Member States. Indeed, it was not until the judgments of the ECJ in the *Genoa* and *Corbeau* cases (see paras 16.37–16.39 and 16.43–16.45) that it was established that holders of exclusive or special rights could be challenged under Article 86.

(b) *Stage 2: Uncertainty*

The energy crises of the 1970s led to the high watermark of government intervention in the energy sector in the industrialized economies. This was a period in which the goal of security of supply figured largely in public policy. For oil supply, this was a matter of particular concern due to the dependence of most of the industrialized countries on imports from the OPEC countries. The energy crises called into question the reliability of that oil supply—at that time the principal input fuel to electricity generation after coal.

There were many specific government interventions in energy markets. Some of these were concerned to avoid possible politically-inspired disruptions to supply,

but others were aimed at encouraging fuel diversification to reduce dependence on imported oil supplies and avoid a possible future scarcity of fossil fuels. Very expensive programmes were introduced to fund the construction of nuclear power plants and subsidies made available for alternative forms of energy generation. At intergovernmental level, the International Energy Agency was established to supervise an emergency allocation scheme and encourage fuel diversification. The European Community took related measures, including the adoption of a new Directive restricting the use of gas for electricity generation.<sup>16</sup> A proliferation of national energy policies and plans emerged, as well as energy departments and agencies to implement them.

- 1.34** The results of these market-distorting interventions were on the whole mixed. On the positive side, there was reduced dependency on imported fuels, greater efficiency in oil production, and use of alternative fuels, especially nuclear energy. Indeed, much of the French nuclear energy programme resulted from policy decisions taken as a result of these interventions. However, in the USA, federal capping of wellhead gas prices had adverse and unexpected results. Moreover, the government-inspired investment in new power plant capacity subsequently proved in a number of cases to have been very costly and unnecessary. Examples of this were particularly evident in the nuclear energy sector in several countries.
- 1.35** The negative effects of such attempts at government direction of the energy economy led to a severe questioning of the assumptions on which the interventions had been made. This climate of doubt about the role of government in the energy sector in the face of considerable evidence of malfunctioning did not by itself bring about a change in thinking about the adequacy of the prevailing paradigm for government–energy industry relations. That change required another very important development—a synergy between advocates of an alternative, pro-market approach and decision-makers who were able to put their ideas into practice. Such pioneers were beginning to emerge in the UK and the USA by the end of the 1970s.
- 1.36** Those pioneers were encouraged by several developments that occurred from the 1970s. Alternatives to vertically-integrated electricity systems appeared possible from the experience of independent generators operating on existing grids without seeing any decline in the quality of service provided through the system. Technical progress was also shifting the minimum efficient scale in power generation away from the large fossil fuel consuming units towards smaller ones, creating the possibility of easier entry for new players into energy markets. These developments were seized upon to challenge the traditional mode of thinking and replace

<sup>16</sup> Directive (EEC) 75/404 on the restriction of the use of natural gas in power stations [1975] OJ L178/24 (since repealed by Directive (EEC) 91/148 revoking Directive 75/404/EEC on the restriction of the use of natural gas in power stations [1991] OJ L75/52).

it with the idea that some competition in energy networks was both possible and desirable. It was argued that the activities of generation/exploration, end-use supply, marketing, and billing could be unbundled and opened to competition without significant adverse effects. This laid the basis for an alternative paradigm.

(c) *Stage 3: Globalization*

From the mid-1980s onwards, the traditional paradigm of government–energy industry relations was challenged again. There were two principal sources of this challenge. The first lies outside the energy sector—the complex of processes commonly referred to as ‘globalization’. The second came from within—specific initiatives taken by states to liberalize their energy markets.

‘Globalization’ refers to processes that promote economic interdependence and cut across the borders of nation-states, seeming to threaten the sovereignty of those states. These processes were greatly assisted by changes to the GATT agreed in the Uruguay Round (1994) bringing about both the creation of the WTO and increased opportunities for international trade. One of globalization’s most striking features has been the expanded role of world financial markets which increasingly operate on a real-time basis on a global scale. Another has been its relationship to the spread of information technology and transformation of everyday notions of time and space. Support for globalization has come from corporations, states, and many NGOs. Its effects have been most visible in the OECD countries.

Economic globalization triggered a debate on the future of the nation-state. With a few notable exceptions,<sup>17</sup> most writers have seemed to agree that there has been no decline in the nation-state but rather a transformation in its functions, some powers transferred away from nations and into a depoliticized global space or to supra-national entities.<sup>18</sup> At the same time, there has been a trend for some decision-making to move from the centre of nation-states to sub-national level. However, the scope of government, taken overall, has appeared to expand rather than diminish as globalization proceeds.<sup>19</sup> Nation-states remain the most important agents on the international scene.

Although the phenomenon of economic globalization is not entirely new, the current globalization processes have been occurring hand-in-hand with a widespread economic liberalization in which many functions associated with the state have been transferred to the private sector and made subject to different and often unfamiliar forms of regulation, either by the state or its agencies. There has also

<sup>17</sup> Stiglitz, J, *Globalization and its Discontents* (2002); Ohmae, K, *The End of the Nation State: The Rise of Regional Economies* (1996).

<sup>18</sup> Sassen, S, *Losing Control? Sovereignty in an Age of Globalization* (1996) xii–xiii.

<sup>19</sup> See, eg, Giddens, A, *The Third Way: the Renewal of Social Democracy* (1998) 32; *The Third Way and its Critics* (2000) 122; Stiglitz, J, *Making Globalization Work* (2006).



been a change in the role of supra-national institutions in promoting and facilitating these economic reforms. The nation-state has become more and more involved in the implementation of those laws necessary for economic liberalization and globalization, especially those concerning deregulation and the formation of legal regimes that favour the free circulation of capital, goods, information, and services.

- 1.41** The second and most significant challenge of all became from the actions taken by advocates of a new market-oriented approach to energy market organization. Their early experiments in liberalizing the electricity and gas markets first of the USA, the UK, and farther afield in Latin America showed that positive results could follow from the process, and went some way to confounding predictions of inefficiency and even system collapse. Amid much debate about the virtues and shortcomings of traditional regulation, a number of experiments were initiated in the liberalization of national energy markets. The significance of these early—and in retrospect rather primitive—experiments in market reform is that they had sufficient success to persuade others that there were hard-headed arguments in favour of this paradigm. As the arguments multiplied, with the growing number of experiments, the converts grew. There was a basis in the real world for faith in the new paradigm.
- 1.42** Other countries soon followed this route. In doing so they showed that there was no single model to be replicated but rather a set of ideas that could be adapted to permit a liberalization tailor-made to each specific setting. In the Nordic countries, for example, an electricity pooling system was established but without the privatization that had been chosen in the UK and in Chile. Australia and New Zealand also favoured approaches that suited their own special circumstances: The new paradigm became associated with 'progress', even if some stocktaking has taken place as a result of the concerns over various forms of energy security in recent years.
- 1.43** Differences between the two industries (electricity and gas) did present liberalizers with serious challenges. Take the USA for example. There the transition to greater reliance on competition to govern the performance of the natural gas market did not raise many important structural issues<sup>20</sup> (in contrast to the UK). Essentially, the network of gas pipelines had reached a mature stage, and when access provisions were introduced in the legal regime a very large geographic market was created. After the elimination of west-to-east constraints in transportation capacity, a continental market was created making it virtually impossible for a single seller or a combination of a few sellers to exercise market power. By contrast, the transition to competition in electricity markets has raised a host of structural questions. As one commentator observed, 'depending on the locations and effects

<sup>20</sup> Pierce Jr, RJ, 'The Antitrust Implications of Energy Restructuring' in *Natural Resources & Environment* (1998) 269.

of transmission capacity constraints, and depending on the way transmission is priced, the geographic market for electricity can be as large as a region of the country or as small as part of a single state'.<sup>21</sup> As a result, the idea took root in the USA that it is technically possible and economically desirable to develop a model of regulation based on market principles. There was a growing pressure for reduction in gas and electricity prices, particularly from major energy users. In addition, somewhat fortuitously, this pressure coincided with a period in which oil and gas were available at historically low prices. Moreover, as consumer benefits of competition in other sectors such as telecommunications became clear, similar benefits were sought in electricity and gas.

At a wider international level, there has been a growing acceptance of policies aimed at generating revenues for state finances from privatizations and of the benefits of international trade. An effect of globalization has been to encourage governments to accelerate experimentation in market reform at national level. The various experiences of governments committed to energy market reform showed too that the chaos predicted by some critics was avoidable. As a result of all this, the mindset of most governments to competition in network-bound energy markets changed fundamentally. **1.44**

#### (5) Crisis and the Shift Towards 'Energy Security'

Against the trend described in the preceding paragraphs it may be argued that the energy crisis in California in 2000 triggered concerns about the security risks of energy market liberalization. The California crisis comprised a lack of supply and artificially escalating prices resulting in the largest utility filing for bankruptcy. A combination of factors led to this situation including: **1.45**

- lack of new generation capacity due to an uncertain regulatory environment and unusually strict planning controls;
- rapidly increasing demand due to Silicon Valley (high-tech industry) consumption;
- existence of an obligatory pool leading to anti-competitive, oligopolistic pricing practices;
- the impossibility of off-setting risk through long-term supply agreements;
- locked retail prices and exposure to spot prices;
- impossibility of TSO launching tenders for the construction of new capacity combined with power purchase agreements;
- lack of interconnection capacity and supply arrangements with neighbouring states;
- external factors, eg drought; and
- lack of appropriate inter-state trading arrangements.

<sup>21</sup> *ibid.*

The result of this unusual combination of adverse conditions was a kind of 'perfect storm' that few, if any, systems could have survived intact, unless heavily protected by state subsidies and bail-outs funded by taxpayers. Nevertheless, the fact that interruptions to the power supply have occurred in many EU countries (and North America) from 2003 onwards has been sufficient to foster a sense of vulnerability about electricity supply in liberalizing markets that has required some adaptation of the market paradigm, if only in emphasis. Uncertainties in gas supply and external dependence have only served to underscore this factor. The legal measures taken are discussed in Chapter 18.

- 1.46** However, several of these factors could have been anticipated when designing the legal and technical structure of the liberalized regime. If new generation capacity is an objective, then incentives for new investment should be included and unduly restrictive planning or environmental laws should be either modified prior to implementation or taken into account in the regime's design. In the EU, the Commission has been keen to emphasize that the EU internal energy market regime allows Member States to take emergency action at an early stage if faced with an imbalance between demand and supply—notably by launching tenders for new capacity backed up by fixed price power purchase agreements.<sup>22</sup> In addition, most EU Member States have an excess of capacity that could, if necessary, provide a cushion to any disruptive effects of liberalization.

#### (6) Unfinished Business

- 1.47** In spite of the continued existence of systems organized according to the traditional paradigm, by the late 1990s the contest appeared to have been decisively won by the new market-oriented paradigm: 'regulation for competition' (see below) had become at least an organizing principle to which most governments aspired in those sectors of the economy characterized by networks.
- 1.48** However, a paradigm is more like an open-ended framework than a model, and the triumph of the market-oriented paradigm leaves a great many issues open for development by its supporters (and its converts). These may be divided into two categories.
- 1.49** First, there are problems that must be addressed that arise from the introduction of competition into network-bound energy sectors, such as the so-called 'stranded asset problem' (problems of *application*). They do not involve questioning the basic assumptions of the new paradigm but lead instead to the analysis and attempted solution of what might be called 'micro problems', using techniques compatible with the basic assumptions of the new paradigm.

<sup>22</sup> European Commission, 'Communication on Completing the Internal Energy Market' (2001) 46; Commission Press Release MEMO/01/174, 'The California Power Crisis', 11 May 2001.

Secondly, there are problems that are not directly connected with the new paradigm but which impact on it and present a possible threat to its implementation (problems of *compatibility*). They include the many environmental and public service issues that affect the energy sector and the issues concerned with the sustainable development debate. **1.50**

#### (a) Problems of Application

Problems of application are already apparent and are certain to increase. Three sets of problems may be noted. First, there are those concerning the transition to a liberalized market. As the IEA has noted, 'given that no competitive power market has operated for more than a few years, none has yet completed the stage of transition'.<sup>23</sup> Indeed, '[t]he impact of market liberalization on investments in long-term generating capacity and diversity of fuel inputs to power generators is not yet fully clear'.<sup>24</sup> The problem of stranded costs, or remuneration for sunk costs incurred in a regulated regime but not recoverable after the market has been opened to competition is only one example of such a problem of mopping-up after the basics of the new paradigm have been accepted. It has sparked off a very lively debate and interesting research into the possible solutions.<sup>25</sup> **1.51**

More fundamentally however, it appears that the transitional period may be a very lengthy one, involving periodic reviews by government and regulatory authorities and further legislation. In other words, the role of government may well have changed but the electricity and gas industries will probably remain subject to a high degree of government interference for the foreseeable future. **1.52**

Another set of problems concerns the application of competition law in the context of liberalized energy markets. Many established notions about energy markets became open to question because of the spread of liberalization. This is especially so when the actions of market incumbents are such as to anticipate and undermine the effects of liberalization while it is being introduced (through mergers and acquisitions, for example). **1.53**

Finally, outside the mature energy markets there are problems that affect those developing countries in seeking to liberalize their energy markets and at the same time increase investment in new networks and plant. In a number of such cases, this has led to a rejection of the energy market paradigm itself (in Russia, for example). **1.54**

<sup>23</sup> OECD/IEA, *Electricity Market Reform* (1999) 93.

<sup>24</sup> *ibid* 98.

<sup>25</sup> See, eg, Sidak, G and Spulber, D, *Deregulatory Takings and the Regulatory Contract: the Competitive Transformation of Network Industries in the US* (1998).

*(b) Problems of Compatibility*

- 1.55** Problems of compatibility primarily involve potentially market-distorting initiatives taken by governments. In particular they could involve measures to promote policies of sustainable development. It is early days for trying to discern how such problems will be addressed in ways that are compatible with the promotion of competitive markets. This is something of a 'black box'. The increasingly central position taken by environmental and social questions in energy law and policy is a powerful trend that is beginning to test the market orientation that developed in the 1990s. The new paradigm emerged during a period of abundant supply of electricity and gas but has increasingly had to concern itself with issues of security of supply.
- 1.56** The significance of these historically specific conditions for its long-term continuation is not yet clear: the complex relationships between markets, regulation, and investment behaviour (often cyclical in character when left to the market) are indeed 'not properly understood'.<sup>26</sup>
- 1.57** Paradigm changes also affect the method of inquiry in problem-solving. They will have a significant impact on the way in which a problem is defined and the way in which problems are prioritized.<sup>27</sup> A paradigm shift will ensure that some problems are not placed on the agenda for solution, as they would have been under the preceding paradigm.

*(7) A New Paradigm Emerging?*

- 1.58** In the pre-liberalization paradigm, a near absolute security of energy supply was provided but at unknown and inherently high cost. As liberalization has proceeded, the excess capacity built up during these early years has been reduced by companies that are unwilling to pay the high costs of such reserve capacity, with a corresponding reduction in security of supply. In the UK this has triggered a fairly new emphasis by policy-makers on the need for investment in additional capacity to combat what is known as 'asset-sweating'. In itself, this is not an argument against market reform since there are many ways of providing incentives to investors to make the large investments that may be required. As Chapters 5 and 6 show, this has been done within the framework of the pro-competition legal framework.
- 1.59** Other developments have been identified by observers as indicative of a new paradigm shift: the various changes taking place in international gas markets<sup>28</sup>

<sup>26</sup> Perceptive remarks by Robert Mabro underline this point: Oxford Institute for Energy Studies News, May 2001. For an assessment of the potential impact on energy of legal developments in combating climate change, see the contributions in Cameron, PD and Zillman, D, (eds), *Kyoto: From Principles to Practice* (2002), and Helm, D, (ed), *Climate Change Policy* (2005).

<sup>27</sup> Kuhn, T, *The Structure of Scientific Revolutions* (1970) 110.

<sup>28</sup> Clingendael Institute, 'The paradigm change in international natural gas markets and the impact on regulation', 2006.

and the advent of a low-carbon economy<sup>29</sup> are two examples. From a legal point of view, neither of these developments has yet generated the kind of sweeping changes that the market-driven paradigm initiated and effected over the past decade or more. The key to the success of this paradigm is the balance that it achieves with respect to three potentially divisive elements: market, security and sustainability. The weight given to each may change over time but they are always present. As we shall see, they have always been present in EU law, and have deep and surely long-lasting roots. What is very striking in the European context is the extent to which the new market-orientated approach has made extensive efforts to incorporate the other objectives in the formulation of specific legal measures. On the environmental side, it is perhaps equally striking that efforts have been made to achieve sustainability goals through the adoption of market mechanisms. This does not lead us to the conclusion that at this stage a further paradigm shift is taking place.

**D. Why is Energy Special?**

The dependence of electricity and gas supply on fixed networks to transport and deliver energy to users is a serious complication for any policy of market opening. In practice, the transmission system is almost always a national monopoly. By contrast, the supply of oil and coal are not affected by such transportation bottlenecks. The physical characteristics of coal and oil have led to international trade and free market practices, with a declining government role except in fiscal matters. Customers can readily negotiate with competing suppliers to obtain the best deal for oil or coal purchase. The price obtained by the customer may be influenced by product quality and by differing levels and structures of taxation or subsidies. However, transportation and distribution constraints in a network will not create problems of access for customers and producers in the way that they readily do in the gas and electricity sectors. **1.60**

A further characteristic of both sectors, linked to the above, is the high cost of infrastructure and the element of sunk costs. This has often been used to justify anti-competitive features. Exclusive rights over a determinate period have been sought by investors to permit financing of these projects, with long-term contractual obligations, such as those involving 'take-or-pay' obligations. The rights granted may include an exclusive right to own and operate a transmission system over a specified period and an exclusive right to import gas or electricity. **1.61**

<sup>29</sup> Helm, D, 'The Assessment: the New Energy Paradigm' (2005) 21 Oxford Rev of Economic Policy 1–18. The investment argument and the end of a long period of low energy prices are also used to suggest a paradigm shift.



**1.62** As the sections below illustrate, there are different obstacles to competition presented by the specific features of the gas and electricity sectors. For example, in the European context the production structures in each case are quite different and gas is obtained from a limited number of sources, many of which are located outside the EU. The markets are not however capable of being treated as *entirely* separate since a large part of the electricity generation market uses gas as a fuel: problems in the wholesale markets for gas can therefore impact upon electricity markets and upon the suppliers that make dual fuel offers.

(1) Electricity

**1.63** Electricity has a number of characteristics that are specific to it and impact on the design of any regulatory regime.

- (1) *Lack of storage potential* Electricity may not be stored in large amounts and at low cost, with the consequence that power at any point in time is not a good substitute for power at another point in time (except possibly in the case of small consumers of electricity). Power production and supply may therefore be seen as 'multiple time-differentiated products'.<sup>30</sup>
- (2) *High cost of outages* There is a high cost involved when load exceeds supply, or when there are so-called 'brownouts' or blackouts.
- (3) *Fluctuation* The above features, when taken together with a third feature, one which electricity shares with gas—that demand fluctuates throughout the day and also differs according to the season (with random variations superimposed, in large part due to the fact that much of it is used in weather-related uses such as heating and cooling)—create what is known as a 'peak-demand problem'. Essentially, if the entire load has to be supplied, capacity has to equal or exceed the load at all times. If not, there will be random supply interruptions in the form of brownouts or blackouts, leading to considerable economic damage. Demand for electricity can be subdivided into base-load power—electricity that is required seven days a week 24 hours a day—and flexible power—electricity required to absorb demand during peak hours.
- (4) *Transformation* Electricity demand requires transformation of electricity into some final form before it may be met. This form may be light, heat, and cooling- or motion-power. It means that some of the input energies to electricity such as natural gas are also its competitors in final energy markets. Moreover, demand is not very 'price-elastic' in the short term since a customer's transformation equipment is generally long-lasting. Electricity supply assets such as generating capacity have an even longer working life.

<sup>30</sup> IEA, *Electricity Market Reform: An IEA Handbook* (1999) 11.

- (5) *Technical specifications* Further, technical and financial specifications of power stations differ considerably due to the fact that electricity can be generated using different technologies and different raw materials (gas, coal, nuclear energy and hydro-power). The degree of flexibility of the generating units determines their ability to respond to changes in demand.

The impact of these characteristics is that the cost structures of power stations lead to the deployment of a 'merit order' or order of capacity based on the short-term marginal cost of a power station. Those power stations with relatively low marginal costs and/or which lack the capacity to generate electricity more or less quickly and on demand operate almost continuously and generate base load power. Those power stations that can increase or decrease production on demand and/or which have higher marginal costs operate mainly during peak hours. During the latter periods, when most facilities are fully utilized and cannot increase their generation further to meet peak demand, the number of effective competitors declines.<sup>31</sup>

Finally, there is another consequence that has relevance for competition policy. Some of the characteristics of electricity mean that abuse of market power is fairly easy and therefore likely. Due to the fact that short-run demand elasticities are very low, the supply cannot be stored and wholesale markets (even competitive ones) are highly volatile. Companies with small market shares 'have both the ability and incentive to raise prices when markets are tight and suppliers pivotal, rendering standard tests of market power (HHI or market shares) less effective'.<sup>32</sup> Among the consequences is a more complicated approach to the analysis of mergers. Moreover, where vertical mergers are planned between electricity and gas companies with market power in the gas market, this has the potential to increase the incentive to raise gas prices by the merged entity through ownership of power generation.

(a) *The Europe Factor*

In the European context two features of electricity supply organization may be noted.

- (1) *Lack of import dependence* Import dependence is practically zero. Self-sufficiency is very high as electricity companies have been able to locate generation close to where electricity is needed. Cross-border trade represents about six to eight per cent of total UCTE electricity consumption.<sup>33</sup> Electricity is generated to

<sup>31</sup> Netherlands Competition Authority, Consultation Document on Mergers on the Energy Markets in the Netherlands and a Possible North-East European Market, June 2006, paras 53–5.

<sup>32</sup> Gilbert, R and Newbery, R, *Electricity Merger Policy in the Shadow of Regulation* (2006) EPRG 06/27: <<http://www.electricitypolicy.org.uk/pubs/wp/eprg0628.pdf>>.

<sup>33</sup> European Commission, 'Communication on Completing the Internal Market in Energy', COM (2001) 125 final, 13 March 2001.

meet immediate demand and usually travels much shorter distances, requiring closer co-ordination between generation, transmission, and distribution elements of the industry, encouraging the creation of vertically-integrated monopolies. Where issues of cross-border trade have arisen, their focus has largely been on how to improve the efficiency, depth, and interconnected character of the existing transmission grids to promote exchanges between incumbent players. Consumer choice across borders has arguably been less important as a result. In this context, it is unsurprising that a major objective of the European Commission has been to identify and remove obstacles to cross-border trade in electricity (see Chapter 5).

- (2) *Interconnections are poor* A second notable feature of the European scene is that interconnections are poor. There are serious congestion problems, occurring when the state of the electricity networks and the transport capacities are such that the electricity that was planned to be transported from one point to another cannot be entirely physically transported. The levels of congestion can be serious: between Spain and Portugal they are almost permanent, and 'are not due to exceptional circumstances and are likely to keep occurring in the near future'.<sup>34</sup> These levels of congestion are much higher than those observed on the Nordic electricity pool, which are in the range of 0 per cent to 7 per cent of the time.<sup>35</sup> The limited interconnection capacity depends on the progressive implementation of a number of successive steps including not only technical measures on the electrical grids but also the elimination of regulatory and administrative barriers and the harmonization of the functioning and management methods of the systems' operators.<sup>36</sup>

## (2) Gas

1.67 Gas<sup>37</sup> has seven principal contrasting characteristics that impact significantly on the design and pricing of transmission services.

- (1) *Geopolitics* Gas supply has an international character with the bulk of supplies coming from non-EU countries on the basis of long-term contracts, but is

<sup>34</sup> *EDP/ENI/GDP* (Case COMP/M.3440) Commission Decision 2005/801/EC, [2005] OJ L302/69, para 83.

<sup>35</sup> In its decision *Sydskraft/Graninge* (Case COMP/M.3268) of 30 October 2003, the Commission found (p 26) that Sweden was isolated from all other areas in the Nordpool area only 5.5% (2000), 0.0% (2001), 0.1% (2002) and 0.0% (Jan–Sept 2003) of the time. Isolation percentages between individual neighbouring territories and Sweden were rather higher but also generally low (eg on average 7% between Sweden and Denmark East in the same period).

<sup>36</sup> *EnBW/EDP/Cajastur/Hidrocantabrico* (Case COMP/M.2684) Commission Decision of 19 March 2002, para 25.

<sup>37</sup> 'Gas' means here natural gas and not so-called 'town gas', which is manufactured from coal or oil at gasworks located very near consumption areas. It includes liquefied natural gas (LNG) but not liquefied petroleum gas (LPG).

much less exposed to competition in pricing than the oil sector. Its organization usually reflects this separation of the sources of production from the consumption markets. In Europe natural gas frequently travels very long distances and crosses many inter-state borders to reach its users. For many gas-consuming countries in Europe a dependence on external (non-EU) suppliers has been a fact of life for decades. More than 40 per cent of EU gas supply originated from non-EU sources such as Algeria, Norway, and Russia.<sup>38</sup> Even with respect to the EU's own gas production, the element of cross-border trade is considerable, one in every five cubic metres of gas produced in EU countries being exported. Just as non-EU gas from Norway is transported across the Netherlands to Belgium and France, gas produced from the Netherlands crosses Germany and Switzerland to reach Italy. About 50 per cent of all internationally-traded gas in the world is imported into the EU. This geopolitical element makes energy policy links with Russia, Algeria, and Norway of great importance. At the same time, such cross-border transactions normally take the form of transit and/or supply agreements between incumbent major gas wholesalers. There are few competition implications and it is misleading to describe it as 'trade' in the generally accepted sense of the term.

- (2) *The gas chain* Gas operations have a vertically integrated character from production to consumption (the so-called *gas chain*). This means that regulatory action in one segment of the chain can easily impact on other segments. When the internal energy market programme began in 1988, the gas sector came under scrutiny by the Commission mainly because of the exercise of monopoly power in the transmission and distribution segments of its operations. However, legislation designed to liberalize these segments has usually had significant implications for the 'upstream' activities of exploration and production as well.
- (3) *Storage and timing of actions* Gas can be stored in underground facilities, in transmission or distribution pipelines, in above-ground LNG facilities or by means of a technique known as 'line-pack'. The result is to provide gas system operators with a considerable degree of flexibility in balancing their systems over time. This contrasts quite starkly with the lot of electricity system operators who must manage the stability and reliability of the grid according to a time-frame of a few seconds. Pressure and flow management in gas pipelines may occur over much longer intervals, perhaps hours or days. This presents a rather different situation on harmonization requirements between the respective systems. In gas there is more flexibility, since the task is only to manage the balancing protocols between systems to ensure that there is adequate gas quality and timing consistency to permit each operator to maintain

<sup>38</sup> European Commission, *Next Steps Towards Completion of the Internal Market in Gas: draft strategy paper for discussion* (2000) 2.

its system flexibility.<sup>39</sup> Customers have in principle more discretion in exercising their rights to utilize various receipt and delivery points. To be active on the gas retail markets a gas supplier needs to have access to storage facilities. This allows it to manage the seasonal fluctuations in the demand of its customers. The supplier will have to manage daily, weekly and seasonal fluctuations according to the type and the number of its customers. Access to storage facilities is therefore 'an absolutely necessary condition' for any supplier. It may be noted that gas suppliers with a large and diversified customer base are subject to a lower overall variation in demand than suppliers with a limited number of customers and a fluctuating demand, limiting their storage requirements and giving them a competitive advantage over smaller competitors.<sup>40</sup>

- (4) *Technical ('loop-flows' and 'wheeling')* Electricity and gas share the characteristic, being network-bound energy sources. The network effects have different characteristics in each case however. The flow of electricity over wires follows different physical laws to that of gas, giving rise to 'loop-flows'. These are intrinsic to electricity transmission and affect the way that access to transmission capacity is made available to buyers and the way it is controlled by the system operator. So-called 'wheeling' transactions along one part of the path can have an effect on the availability of transmission capacity along an interconnected path. In the EU context, 'transit' has recently been defined as a physical flow of electricity hosted on the transmission system of a Member State, neither produced nor destined for consumption in this Member State, and including transit flows commonly denominated as loop-flows.<sup>41</sup> Although there are no 'loop-flows' in gas transmission, there are network effects nevertheless. The use by a consumer or third-party supplier of a receipt point into a gas network, or a delivery point out, will affect the ability of another shipper to utilize other receipt and delivery points on the network. As a result, the amount of transmission capacity that may be made available at any given time is a function of the planned utilization of the network. In electricity, however, the determination of available capacity is made considerably more difficult by the existence of loop-flows.
- (5) *Energy quality* Gas produced from different fields and wells can have a very different energy content and may contain variable contaminants and water in the gas stream. A number of issues of supply quality must therefore be addressed

<sup>39</sup> 'Methodologies for Establishing National and Cross-Border Systems of Pricing of Access to the Gas System in Europe', report for the European Commission prepared by the Brattle Group (February 2000) Appendix 2, 96.

<sup>40</sup> *E. On/MOL* (Case COMP/M.3696) Commission Decision 2006/622/EC, [2006] OJ L253/20, Recitals 477–8.

<sup>41</sup> European Commission, 'Proposal for a Regulation of the European Parliament and Council on Conditions for Access to the Network for Cross-Border Exchanges in Electricity in the Internal Electricity Market', 2001.

through physical specification standards or accounting treatment (calorific value). In electricity, by contrast, the supply is generated to meet very specific characteristics.

- (6) *Safety* If electricity is temporarily interrupted, it can be restored without risk to the consumer at a later date. This is not possible with the supply of gas. If non-interruptible gas consumers have their gas supplies unexpectedly terminated, supply cannot be resumed until safety checks have been carried out on every appliance to make sure they are switched off. This process may be costly and time-consuming, especially if it involves residential consumers. In terms of operational security of supply, it is not 'fail safe'.
- (7) *Size of provider* Historically, the players have been different between gas and electricity, with large international companies involved in gas and often also the oil business, directly or indirectly. They are often vertically integrated too. This situation arose from the fact that gas was usually found in association with oil or as an indirect result of exploration originally directed at finding oil. Conveniently, the price of gas is linked to oil in much of continental Europe, reflecting the high degree of substitutability between them. In recent years there has been a trend towards convergence of gas and electricity supply by companies that have become increasingly focused on the provision of several kinds of energy. In some cases, such companies have also been involved in the provision of water or telecommunications services as well, creating a so-called 'multi-utility'.

(a) *The Europe Factor*

At an early stage, analysis of the European gas market by the European Commission reached negative conclusions about the potential for competition: 'the structure of the European gas markets is currently not favourable to competition'.<sup>42</sup> Essentially, the gas markets are characterized by horizontal and vertical demarcation. This situation is brought about by the long-term supply contracts concluded by incumbents which are part of a well-established vertical supply chain, extending from gas producers to end-users.

'Vertical demarcation' means that each operator has its well-defined function and position in the supply chain and usually refrains from entering the markets of its customers and/or suppliers (eg, there will be no direct sales by producers to end-users). 'Horizontal demarcation' means that each importer or wholesaler and/or regional or local distributor has its traditional supply area and usually does not enter the neighbouring supply area.

<sup>42</sup> European Commission, *XXXth Report on Competition Policy 2000*, 35; Commission Press Release IP/99/708, 'Commission clears merger between Exxon and Mobil (both USA) subject to conditions', 29 September 1999.



Table 1.1 Gas Constraints on competition (a) Downstream market segment

| Product markets  | Corresponding geographic markets                               |
|--|--|
| Onshore transmission   | National markets and potentially markets smaller than national |
| Sales to regional wholesale and/or local distribution companies, power plants and other industrial users | National markets and potentially markets smaller than national |
| Sales to private users by local distribution companies   | Regional/local markets   |
| Storage  | National markets and potentially smaller than national ones    |

*Note:* The competition characteristics of these markets is as follows: network-bound industry; number of players limited; few new market entrants.

- 1.70** The Commission also found that the upstream markets were for the most part characterized by various forms of co-operation between competitors. This included the activities of exploration, production, and sales to wholesalers. Downstream markets, covering transportation, distribution, and storage, are at most only national in scope and are dominated by former monopolists. The latter are usually vertically-integrated and control the pipeline network. These pipeline networks are usually, and will probably remain, natural monopolies.

Table 1.2 Gas Constraints on competition (b) Upstream market segment

| Product markets                             | Corresponding geographic markets   |
|---|--|
| Exploration and development                 | Gas fields in EEA plus potentially Russian Federation and Algeria  |
| Offshore transmission processing            | Region in which the pipelines are located. Depends on geographic market defined for the offshore transmission. |
| Production and sales to wholesale companies | Gas fields in EEA plus potential RF and Algerian sources   |

*Source:* European Commission Competition Directorate.

- 1.71** A similar situation prevails today as can be seen from paras 11.48–11.64.
- (b) The Impact of LNG*
- 1.72** The prospect of increased supplies of gas becoming available from Liquefied Natural Gas (LNG) may seem to offer a way of limiting this external dependence and facilitating competition among suppliers to consumer benefit. However, there are competition issues here arising from the LNG business itself.
- 1.73** LNG terminals are very capital intensive. For this investment to be recouped, capacity is usually booked well in advance before the terminal is constructed.

If this capacity is already booked it will not be available for third parties under the TPA rules of the Gas Directive.<sup>43</sup> Even if there is capacity available for competitors, it is possible for the terminal owner to make access difficult for them. This can be explained as follows:<sup>44</sup> the regasification activity of an LNG terminal is composed of three main parts which are all inter-dependent and constitute as many bottlenecks:

- (1) LNG carrier ships have to be unloaded; time slots have to be booked; arbitrage between ships and priority rules are then crucial;
- (2) LNG can be stored in a storage facility; storage capacity may be limited, thereby preventing a competitor from unloading or forcing him to inject the gas in the network very rapidly; and
- (3) the LNG has to be regasified before being injected. There again, the regasification plant has limited capacity which has to be booked in advance.

Technical rules may also act as a restriction of the market. An LNG carrier may set technical constraints that can prevent certain LNG carriers unloading.

TPA rules are not sufficient to guarantee a satisfactory level of access to third parties. There are too many factors that can be manipulated to prevent effective use by third parties. Most of the LNG terminals are operated by their main user. Even when spare capacity is available, terms have to be negotiated, including pricing mechanisms, overall flexibility and allocation. Consequently, additional rules to TPA have been adopted by regulators on a case-by-case basis to help improve the way that competitors can use LNG terminals (such as paying for the booked capacity and/or use-it-or-lose-it rules). **1.74**

## E. The Requirements of Liberalization

There are a number of prerequisites for the introduction of competition into the gas and electricity markets. They include changes in the legal and institutional framework of regulation, particularly to ensure access by third parties, as well as liberalization, industry restructuring, and (possibly) ownership changes. Such changes are usually linked and are especially necessary where the industry has been vertically integrated or highly concentrated horizontally. Both of these characteristics were familiar in the pre-liberalization paradigm and have therefore had to be redesigned with the introduction of competition. Various national programmes of energy reform have yielded examples of the practical mechanisms required to support change, but diverse approaches to the introduction of competition have resulted. **1.75**

<sup>43</sup> Art 21: 'Natural gas undertakings may refuse undertakings access to the system on the basis of a lack of capacity'.

<sup>44</sup> *EDP/ENI/GDP* (Case COMP/M.3440) Commission Decision 2005/801/EC, [2005] OJ L302/69, paras 397–9; see para 14.93 below.

## (1) Regulation and Access

- 1.76 The idea of 'regulation for competition' may seem perverse. After all, the aim of liberalization and deregulation is to allow competition to do the work of regulating rather than to leave it to a regulator. However, as competition will not naturally occur in markets where natural monopolies of transportation exist, it is necessary for regulation to provide a surrogate for competition. Essentially, a dominant network owner will control access to consumers and network access will quickly become the principal but not the sole barrier to entry. The core aim of most market reform programmes is the creation of enforceable rights of access for third parties to the transmission and distribution networks. Experience shows that some form of regulation will be required to prevent the owner and operator of the networks from extracting monopoly rents at the expense of other parties in the supply chain. One of the tasks of a regulator will be to define and prioritize rights of access to the network. Another task will be to address the pricing of these rights.
- 1.77 The various regulatory tasks may be conveniently classified according to:
- structure (concerning unbundling and prevention of cross subsidies);
  - conduct (organization of regulation and the control of market behaviour through licensing, price-capping and non-discriminatory access); and
  - transitional problems (so-called 'stranded investments' and environmental matters).
- 1.78 Tasks affecting conduct, for example, would include the regulation of quality through safety standards and safety margins to ensure security of supply. Transitional issues have focused principally on 'stranded' investments. These can be unamortized costs of prior investments that would have been recovered through the continued charging of monopoly prices had liberalization of the market not taken place. They may include generation and transmission facilities, nuclear plant maintenance, and decommissioning costs as well as conservation measures. Other forms of stranded cost include contracts to purchase power from alternative energy sources and 'take-or-pay' obligations in long-term gas contracts. The latter impose an obligation on the buyer to pay for a percentage of the annual off-take volume even if he is unable to use or re-sell the gas.

*(a) An Independent Regulator*

- 1.79 Experience has shown that a prerequisite to a successful programme of liberalization in the network-bound sector of the energy market is the establishment of an independent regulator charged with taking actions to promote competition. Independence in this context means independence of the regulator from the companies being regulated and from day-to-day interference from the government authorities. This autonomy will provide assurance to market participants and especially to potential new market entrants that the rules of the game will be

applied in a non-discriminatory, stable, and transparent manner. This facilitates the creation of a 'level playing field'. The question of independence does however raise issues about accountability of the regulatory body. It has been addressed differently by various governments.

There has been much debate about the organization of regulation and especially about the horizontal and vertical allocation of authority.<sup>45</sup> Not surprisingly, such debates have been particularly intense in countries with federal systems of government. However, in the context of the EU, the interplay between the centre and Member State levels with respect to energy regulation is particularly complex, as will be seen in the following chapters. 1.80

In the network-bound energy sector, there is now a widespread acceptance that a single regulator to monitor the electricity and gas industries jointly is the most efficient solution, although more wide-ranging options are possible (eg Germany). There is a broad consensus too that a regulatory commission is preferable to regulation by an individual since it helps to avoid a personalization of the process. A separate issue concerns the relationship to be established between the regulatory body and the competition authority, where separate institutions are normally in operation. The important issue is which body is to be responsible in cases where both have jurisdiction. The regulation involved in each case is quite different—that of a competition authority typically being *post facto* in character. A sector-specific regulator will be charged with applying rules irrespective of actual conduct. Key differences will turn on the specificity of the rules, the burden of proof, and the penalties for violating the rules. 1.81

The procedures established for regulation are of great importance. Decision-making has to be transparent and the reasons should be published. The procedures should also be detailed and set out in advance. 1.82

## (2) Structure

It has been said that 'structure forms the context within which regulation takes place'.<sup>46</sup> If an industry is structured in such a way as to give market power to a single producer or consumer, choice for other producers and consumers must inevitably be limited and regulation has to be strongly interventionist. In recent years, an appreciation of the importance of industry structure for market reform has made restructuring central to most programmes of energy market reform and at the EU level has underlined the importance of 'ownership unbundling'. The aim has usually been to dismantle the monopoly positions that were common for many years 1.83

<sup>45</sup> Some examples are: McCahery, J, Bratton, WW, Picciotto, S and Scott, C, *International Regulatory Competition and Coordination: Perspectives on Economic Regulation in Europe and the US* (1996); the various contributions in (2000) 3 J International Economic L.

<sup>46</sup> Helm, D and Yarrow, G, 'Regulation and Utilities' (1988) 4 Oxford Rev of Economic Policy vii.

and to introduce competition. However, the natural monopoly elements in transmission and distribution networks present a challenge to such efforts.

(a) *Elements of Natural Monopoly in Supply Phases*

- 1.84** A network owner and operator is likely to have a conflict of interest if also involved in generation or supply phases. Both the latter stages in the supply chain are actually or potentially competitive, while the transmission and distribution phases are natural monopolies, allowing the owner and operator to extract monopoly rents. In the electricity chain this also applies to dispatch and real-time balancing. There is ample evidence that, if unchecked, the exercise of such monopoly rights will lead to abuses.<sup>47</sup> The customer could be charged anything the monopolist wishes for network access up to the cost of building an alternative system (or switching to another fuel). A policy objective is therefore to establish arm's length relationships between the owner and operator of the natural monopoly phases and the parties in the other phases of the supply chain.

(b) *Solutions: 'Unbundling'*

- 1.85** Various techniques have been developed to deal with this among countries engaged in market reform. The solutions have to take into account the continuing inter-relationship between the generation or production phases with the transmission network, and between the distribution network and sales within vertically-integrated energy companies. They will involve a form of vertical separation of activities by incumbent companies known as 'unbundling', aimed at eliminating incentives or abilities to discriminate against competitors by means of their control of assets up- or downstream from the transmission network. This may take one of three forms:

- (1) full structural separation by law;
- (2) functional separation; or
- (3) separation for accounting purposes.

- 1.86** **Full structural separation by law** A full legal separation of the various operations is one possibility. This can take the form of 'ownership' unbundling or a 'legal' separation as required in the EU (see paras 5.38–5.43 and 6.36–6.37). In the electricity sector, for example, a separation of supply or retailing from distribution is likely to encourage competition to develop in supply. Assets from the integrated company would be divided up among several newly-formed legal entities that have no common ownership, management, control, or operations. However, vertical separation may also be effected by means of a form of corporatization rather than formal legal separation. This has been the approach favoured in Norway, Sweden, and New Zealand.

<sup>47</sup> Kahn, AE, *The Economics of Regulation: Principles and Institutions* (1998) 118–20.

**Functional separation** Alternatively, there may be an unbundling according to functions. Functional unbundling allows for the same ownership of the elements that may be subject to competition and the monopoly infrastructure elements, but their operation is placed in the hands of separate management structures. The disaggregated entities will be managed independently but will not be legally separate companies. This kind of unbundling is designed to prevent discrimination against competitors who do not have a direct financial interest in the physical infrastructure.<sup>48</sup> In California an entity has been established in the electricity sector called an Independent System Operator. It has responsibility for short-term co-ordination, prices for use of the transmission grid, and administers a system of tradable congestion contracts.<sup>49</sup> **1.87**

**Separation for accounting purposes** Finally, there is the option of arranging unbundling by ring-fencing the accounts of the different types of businesses in the entity. The idea is that this promotes transparency and in so doing it will expose cross-subsidies and so prevent an entity from discriminating in favour of itself and against competitors. However, in practice it is hard to ensure that commercially sensitive information is not being transferred between the business units. This is probably the weakest form of unbundling and requires detailed regulation if it is to have any chance of being effective. **1.88**

So far, experience in market reform suggests that the unbundling of transportation networks from the activities that can be subjected to competition is a structural change of major importance. The means by which it is achieved and the extent to which it is adopted have, however, differed widely (see Chapters 5 and 6). **1.89**

(3) **Liberalization**

'Liberalization' refers to a process of market opening which at a minimum removes legal barriers to trade but in the EU context involves creation of an industrial structure in which competitive forces can work and a competitive ethos can be stimulated. Some of the general conditions for liberalization are obvious. If customers are to be able to choose suppliers, any statutory restrictions that limit their freedom to a particular supplier must be removed. Entry of new suppliers and producers should be possible, and the normal commercial consequences should apply to those companies which are unsuccessful in the market. In the EU entry barriers have often taken the form of exemptions from general competition law, frequently involving the grant of special or exclusive rights. However, competition is unlikely to develop if governments dismantle entry barriers and do little else. A level playing **1.90**

<sup>48</sup> In the USA a definition of functional unbundling is in FERC Order 888 (1996).

<sup>49</sup> IEA, *Electricity Market Reform: An IEA Handbook* (1999) 40–1. Australia and Canada have similar ISOs, while the USA has moved toward Regional Transmission Organizations.



field for information is also important to establish. All market participants should have simultaneous and equal access to information on the price of a commodity, whether it is gas or electricity, and for capacity.

- 1.91 Since transmission and distribution networks are likely to remain natural monopolies in most cases, the creation of non-discriminatory access rights to the networks is one of the most important conditions for liberalization. However, the tariffs and conditions of such access need to be transparent if competition is to develop in activities such as generation or production and supply. There are two regimes to facilitate the exercise of such rights: (i) regulated and (ii) negotiated access. In practice, the latter has proved less effective and usually involves an element of regulation too.
- 1.92 The methods of opening up gas and electricity markets have not been uniform but they opt for opening markets usually in a staggered manner, the large industrial customers being included in the first phase. Among the reasons for the popularity of this phased approach is that the liberalization process creates problems as it develops, and a staged approach allows adaptation to incorporate the lessons of previous stages. It also allows for the incorporation of lessons from the experiences of other countries with market reform (and also allows incumbents time to adjust). Some of the specific problems of transition that have arisen in the European setting are considered later in this book (see Chapters 5 and 6).

#### (4) Ownership

- 1.93 The importance of ownership for the introduction of competition is complex.<sup>50</sup> Early experience of privatization showed that the transfer of a publicly-owned monopoly into private ownership did not produce the expected benefits in competitiveness. Other structures are possible and perhaps inevitable when one considers the range of forms of public ownership: national, federal, provincial, cantonal, or municipal ownership. Nonetheless, substantial public ownership in energy companies is likely to impede the operation of competition by encouraging their protection from adverse market developments. They will not in all probability have the 'freedom to fail'. Changes in ownership have therefore been encouraged as part of an overall reform programme, involving an unbundling of industry elements. Usually, they involve a minimum of corporatization, where a government continues to hold a substantial shareholding but ceases to have any direct control of management. A financial separation will ensure that financial and asset transfers

<sup>50</sup> An IEA review has noted that ownership alone is not of overwhelming importance for power sector performance *in the short term*. Instead, key factors are subjecting potentially competitive parts to more competition and increasing the quality of regulation: *Electricity Market Reform: An IEA Handbook* (1999).

between government and the corporatized entity are at arm's length and transparent. This is intended to facilitate a degree of competition.

#### (a) Licensing and Concession Regimes

However, a key element in any regulatory system will be the establishment of a license or concession regime. This instrument will set down obligations with respect to the operation, maintenance, and development of transmission or distribution systems, as well as obligations to supply gas or electricity—the 'public service obligations'. With this instrument it is possible for the authorities to exercise a potentially large measure of control over the natural monopoly elements of an industry—irrespective of the form and pattern of ownership that is chosen.

## F. Conclusions

This chapter has attempted to sketch out the wider context in which a liberalization of EU energy markets was launched. It has emphasized the importance of the 'ideas' factor in energy market regulation by reference to a paradigmatic shift from a monopolist and state-interventionist approach to one in which market mechanisms are given a wide rein, checked mainly by independent regulation. The idea has taken firm root in public policy that the natural monopoly element in network industries is not a barrier to the creation of the internal market in electricity and gas as was asserted by the opponents of liberalization. It was accepted that the natural monopoly element could be dealt with by using regulation as a surrogate for competition and that the physical and technological problems of mass third-party access could be overcome.

Key features of the new context such as the emphasis on markets and their creation and the impacts of globalization are not absolutely new. However, the extent of their acceptance and their effects is unprecedented. In this sense it is justified to utilize the concept of a paradigm shift. The rejection of many of the features associated with the pre-liberalization paradigm is now widespread, most evidently in the developed countries but also in a growing number of developing countries and economies in transition.

Recent doubts about the priority given to the competition objective have been kindled by a variety of relatively new challenges faced by this paradigm, principally in the provision of energy security. This has required adaptation to promote new investment in infrastructure and to manage the growing import dependence. In addition, the development of a low-carbon economy is a challenge that will make significant impacts on the energy sector. The energy law framework that is the subject of this book is however based on a balancing of the competition goal with other aims, including those of security and sustainability.

1.98 Nevertheless, it is important to note how recent this consensus is and how open-ended the new paradigm is. Reformers face challenges in applying its framework character and in dealing with some issues that are potentially incompatible with it, such as those concerning environmental protection and sustainability. Many questions about energy market reform remain to be answered including questions that are being generated by the reform process itself. These include the new concerns about investment in additional capacity for security of supply purposes and the growing impact of climate change measures on energy markets. If one recalls the words of Thomas Kuhn about the victory of a new paradigm, he notes that its success depends 'less on past achievement than on future promise'. That promise is increasingly being questioned.

1.99 In practice, whoever embraces a new paradigm at an early stage must 'have faith that the new paradigm will succeed with the many large problems that confront it, knowing only that the older paradigm has failed with a few'.<sup>51</sup>

<sup>51</sup> Kuhn, T, *The Structure of Scientific Revolutions* (1970) 158.

## 2

### THE EU LEGAL ORDER AND ENERGY

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