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First benchmarking report on the implementation of the internal electricity and gas market

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FIRST BENCHMARKING REPORT ON THE IMPLEMENTATION OF THE ELECTRICITY AND GAS DIRECTIVES

EXECUTIVE SUMMARY

Background

The European Council at Stockholm requested a detailed evaluation of the situation in the electricity and gas sectors relating to market opening. This has been carried out in the form of a benchmarking report considering in detail the regimes in place in different Member States for electricity and gas. The report has been compiled using information collected from market players and government agencies following a detailed survey. A number of individual studies have also been completed by DG Energy and Transport using both its own resources and external consultants.

Implementation of the Electricity Directive

Almost all Member States have passed appropriate legislation to transpose the Directive. In terms of market opening, a number of Member States have either already opened their markets more rapidly than the minimum requirements of the Directive or plan to do so. All Member States except France, Portugal and Greece envisage full market opening in a legal sense before 2008. However, in terms of detailed measures, a number of key barriers to competition have been identified in the report as follows:

- excessively high network tariffs, which form a barrier to competition by discouraging third party access, and may provide revenue for cross subsidy of affiliated businesses in the competitive market,

- a high level of market power of existing generation companies combined with a lack of liquidity in wholesale and balancing markets which is likely to expose new entrants to the risk of high imbalance charges,

- network tariff structures which are not published in advance or subject to ex-ante approval, this may lead to uncertainty and create costly and time consuming disputes unless combined with full ownership unbundling,

- insufficient unbundling, which may obscure discriminatory charging structures and lead to possible cross subsidy,

Table 1 below summarises the position in each Member State in relation to the obstacles identified above in columns 1-7. Where structures are in place which are likely to have negative consequences for the development of the internal market, these are shaded red. Green shading means more positive conditions exist. If no judgement can be made the boxes are left unshaded. The more boxes that are shaded red, the less likely that competition is to develop to its full potential. Column 8 summarises which of these issues form a barrier to competition in the opinion of respondents to the Commission's survey of market participants and regulatory agencies.

Table 1 Implementation of the Electricity Directive

	Declared market opening	Full opening date	Unbundling of TSO[1]	Regulator	Network tariffs 2001	Balancing market	Biggest three generator share (%)	Obstacles to competition responses mentioning:[2]
Austria	100%	2001	L	ex-ante	high	Y	68	X
Belgium	35%	2007	L	ex-ante	medium	N	97 (2)	D, B, R, X
Denmark	90%	2003	L	ex-post	low	Y	75 (2)	D, X
Finland	100%	1997	O	ex-post	low	Y	54	U (for DSOs)
France	30%	none	M[3]	ex-ante	medium	planned	98	D, B, U, X, R
Germany	100%	1998	M[4]	nTPA	high	planned[5]	63	U, R, X, T
Greece	30%	none	M	ex-ante	n.a.	N	100 (1)	no responses
Ireland	30%	2005	L	ex-ante	medium	N	97 (1)	D, B, U, X
Italy	45%	none	L	ex-ante	medium	planned	79 (2)	D, B, X
Neth	33%	2003	L	ex-ante	medium	Y	64	X, D
Portugal	30%	none	L	ex-ante	high	N	85	D, X
Spain	54%	2003	L[6]	ex-ante	high	Y	79	D, X, R
Sweden	100%	1998	O	ex-post	low	Y	77	D, B
UK	100%	1998	O	ex-ante	low	Y	44	D,U (Scot), X (NI)

Indicators of competitive activity

Shortcomings in the current arrangements appear to be having an effect on the level of customer choice and ultimately price levels as reported in Table 2.

Table 2 Competitive Activity and Prices

	Estimated customers switching supplier (% demand)		Average prices to final customers (€/MWh) July 2001	
	large users	other	large users[7]	households/ small commercial
Austria	5-10%		na	98
Belgium	5-10%		68	120
Denmark	n.a.		56	68
Finland	30%	10-20%	36	55
France	5-10%[8]		51	87
Germany	10-20%	<5%	61	122
Greece	nil		54	76
Ireland	30%		60	101
Italy	10-20%		77	110
Neth	10-20%		62	94
Portugal	<5%		59	106
Spain	<5%		52	88
Sweden	100%	10-20%	34	52
UK	80%	>30%	58	91

1 O – ownership, L – legal, M - management

2 R – insufficient regulator power/ delays, U – inadequate unbundling, T – high network tariffs, B–balancing regime, D – dominant incumbent, X – cross border issues. (in order of importance)

3 The TSO submits it's annual report to the Regulator rather than the EDF board

4 A number of network operators, including the two largest TSOs have unbundled on a voluntary basis

5 **Updated information 6/02/2002**

6 Partly ownership unbundled, other electricity companies cannot own more than 40% of TSO in total

7 "large users": Eurostat categories Ig and Ie. "households/small commercial", Eurostat categories Ib and Dd.

8 Not including balancing energy

The analysis above would appear to indicate that those Member States which have adopted policies along the lines of the Commission's proposals have experienced better performance of the electricity market in terms of customers exercising the right to choose. In addition for the Nordic countries, prices have reduced the most rapidly and are generally lower than average as a result.

Implementation of the Gas Directive

Almost all Member States have transposed the gas Directive although legal implementation has been delayed in France and is incomplete in Germany, and infringement procedures have been launched. Other than Finland, Portugal and Greece, which are emerging markets and have certain derogations in place, all Member States except France and Denmark are envisaging full market opening before 2008. However, as with electricity a number of obstacles to full competition have been identified in the Commission's Report as follows:

- network access tariffs based on distance and point to point capacity reservation which do not allow flexibility to third parties to change their gas sources or their customer base without incurring higher costs,

- high network tariffs, which will form a barrier to competition in themselves by discouraging third party access, and may provide revenue for cross subsidy of affiliated businesses in the competitive market,

- concentration of gas production and import with one or two companies, which tends to mean that new entrants find it very difficult to buy wholesale gas on reasonable terms,

- balancing regimes which are non-market based and which are unnecessarily stringent and not reflective of costs incurred,

- insufficient unbundling, which serves to obscure possible discriminatory charging structures and again lead to possible cross subsidy,

- network access tariffs and conditions that are not subject to ex-ante approval; this may lead to uncertainty and create costly and time consuming disputes unless combined with full ownership unbundling.

The Table below summarises the position in each Member State highlighting characteristics in the same way as the electricity section. Again, practices likely to impede competition are shaded red with positive conditions in green.

Table 3 Implementation of the Gas Directive

	Declared market opening 2000	Full opening date	Unbundling of TSO[9]	Regulator	Network tariffs: Transmission charges in force 2001 level[10]	point-point	Balancing regime -penal charges/ hourly balancing[11]	Obstacles to competition: responses mentioning:[12]
Austria	49%	2001	A	nTPA	medium	Y	N	T, X
Belgium	59%	2005	L	ex-ante	medium	Y	Y	B, X, T
Denmark	30%	none	L	ex-post	medium	N	Y	T, B
France	20%	none	A	ex-ante	medium	Y	N	T, R, B, D, X
Germany	100%	2000	A	nTPA	medium	Y	Y	R, T, B
Ireland	75%	2005	M	ex-ante	medium	N	N	R, T, B
Italy	96%	2003	L	ex-ante	high	N	N	X
Luxbg	51%	2007	A	ex-ante	medium	N	N	
Neth	45%	2004	A	hybrid	low	Y	Y	R
Spain	72%	2003	L	ex-ante	medium	N	n.a.	X, R
Sweden	47%	2006	A	ex-post	high	N	n.a.	R, U, D
UK	100%	1998	O	ex-ante	low	N	N	entry capacity

Indicators of competitive activity

As with electricity, these shortcomings in the current arrangements appear to be having an effect on the level of competitive activity and ultimately price levels as shown in Table 4 below.

Table 4 Competitive Activity and Prices

	Estimated customers switching supplier (% demand)	Average prices to final customers: July 2001 (€/MWh)	
	large users	large users[13]	hse-holds
Austria	<5%	22	n.a.
Belgium	<5%	21	39
Denmark	nil	19	40
France	10-20%	19	41
Germany	<5%	27	43
Ireland	20-30%	21	32
Italy	10-20%	25	46
Luxbg	nil	30	34
Neth	>30%	24	29
Spain	5-10%	20	48
Sweden	<5%	24	43
UK	90%	20	30

It is clear that the level of switching in the UK is much higher than any other country and prices tend to be lower. Progress is also being made in the Netherlands and Ireland in terms of

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9 O – ownership, L – legal, M – management, A - accounts

10 **updated 06/02/2002**

11 Red if multiple between sell and buy price more than 2 and hourly balancing.

12 R – insufficient regulator power/ delays, U – inadequate unbundling, T – tariff level/structure, B– balancing/storage regime, D – dominant incumbent, X – cross border issues. (in order of importance)

13 Eurostat categories I4-1 or I3-1.

increasing customer choice. Prices to large users show a degree of convergence although Germany and Luxembourg remain higher than the average. Full market opening in the UK appears to have encouraged lower prices for households.

Cross Border Transactions

In addition to the barriers to competition within Member States, there are also several constraints on cross border transactions. Firstly there is, at many points on the European network, insufficient capacity to accommodate all the potential trades. Secondly the methods used to charge for cross border transactions and to allocate capacity often discourage activity. The Report examines the rules in place at borders with the following conclusions:

- for electricity: there exists the beginnings of a coherent system for both cross border tariffs and capacity allocation. However more development is needed in terms of;
  - a more cost reflective tarification structure,
  - more frequent information provision,
  - greater integration of capacity allocation procedures between countries,
  - greater integration with power exchanges.

- for gas: very little progress has been made towards a transparent and cost reflective system for cross border transactions, in particular;
  - there is no simple harmonised tarification method for long distance cross border transportation,
  - there is no transparency concerning availability of capacity between countries,
  - there are no use-it-or-lose-it rules relating to long term capacity reservation.

A separate Communication is being published by the Commission on the subject of European Energy Infrastructure.

Public Service

In terms of the compatibility of market opening with public service the Report examines the methods used by governments and regulators to ensure that services are maintained, noting the following points.

Firstly, Member States are already adjusting the regulatory framework for ensuring security of supply to ensure compatibility with a market framework. In some cases this merely amounts to strengthening price signals coming out of developing wholesale markets. In other cases, particularly for gas, direct incentives or obligations are envisaged.

Secondly, it is clear that service standards can be maintained and indeed improved in a market framework. Incumbent companies are often the subject of target setting and performance monitoring already. This type of regulation can easily be extended to competitors.

Finally, both the Commission and Member States have important environmental objectives that must be developed within the new competitive framework. Legislators have been active in this area with some success in terms of additional renewable capacity and demand management.

Conclusions

There are considerable asymmetries in the implementation of the current Directives. These are leading to considerable distortions of the internal market in that some Member States' energy markets are more open to competitors and new entrants than others.

An uneven playing field is developing which affects both energy customers, for whom there are considerable variations in the level of customer choice and in prices, and energy companies, since the degree of threat from competitors varies considerably which may lead to unfair competition in the European market.

1. BACKGROUND TO THIS REPORT

The current electricity and gas Directives provide for partial opening of European Union energy markets, extending customer choice to larger energy users. However, the ultimate objective of Member States, voiced at the European Council at Lisbon, is the development of a single internal market for energy with full market opening. The support for this ultimate objective was re-iterated at the Stockholm summit with the request that the Commission should "evaluate the situation in these sectors…in order to enable further steps to be taken".[14] This Report fulfils that request by producing a comprehensive comparison, or benchmarking, of the regimes in place in different Member States for electricity and gas.

In accordance with the European Commission's White Paper on European Governance (COM(2001) 428 final), a wide consultation of all relevant interested parties has been undertaken as a basis for the preparation of this Report. Within the European Union, Member States, national regulatory authorities, network operators, gas and electricity industries, consumers, traders and other market participants have been consulted on the basis of a questionnaire. The Commission has received 70 specific responses to this survey which have been used extensively in the preparation of this Report. As well as these responses, a number of studies have been completed by DG Energy and Transport using both its own resources and external consultants. The Commission has also drawn on published research or data prepared by industry representatives.

2. EXISTING MARKET OPENING MEASURES

2.1 Legal Implementation of the Current Directives

The electricity Directive had to be implemented in national law by February 1999[15], and the gas Directive by August 2000. Not all Member States met these deadlines, despite the two year period granted in the Directive between adoption and implementation.

For electricity, delays were recorded for France, where the law implementing the Directive was passed in February 2000, one year behind the deadline, and for Belgium and Ireland where there have been delays in designating the transmission system operator (TSO). Regarding gas, Portugal and Luxembourg did not implement the Directive until early 2001 whereas the deadline was August 2000. The Commission is also conducting infringement procedures against France regarding non-implementation of the Directive and Germany for incomplete implementation.

Both the gas and electricity Directives give Member States considerable choice on the extent of market opening and the arrangement of competitive markets as reviewed in Table 1 below. This shows that many Member States have passed legislation which ostensibly opens their markets more rapidly than the minimum requirements of the Directive. Four Member States have already opened 100 % of their electricity markets and the average level of declared market opening is 69%. A further seven plan full opening by 2008. However there are still three Member States, France, Greece and Portugal with market opening no more than the minimum required and no plans to go further than the Directive. For gas, 79 % of demand is open to competition and two countries have fully opened their markets. However France and

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[14] Presidency Conclusions no. 100/1/01.

[15] Both Belgium and Ireland had a one year extension to their deadline for implementation of the Directive; Feb 2000 instead of Feb 1999.

Denmark have no plans to go any further than the minimum requirements. In addition Greece, Portugal and Finland are classed as emerging markets and derogations are in place.

Table 1 Measures Adopted By Member States in Implementing Directives[16]

Electricity						**Gas**				
	Market opening	eligibility threshold	100% in/by	Unbundling transmission	Network access	Market opening	eligibility threshold	100% in/by	Unbundling transmission	Network access
Austria	100%	-	2001	Legal	Reg.	49%	25mcm	2002	Accounts	Neg.
Belgium	35%	20GWh	2007	Legal	Reg.	59%	5mcm	2006	Accounts	Reg.
Denmark	90%	1 GWh	2003	Legal	Reg.	30%	35mcm	-	Legal	Reg.
Finland	100%	-	1997	Ownership	Reg.	Derogation[17]				
France	30%	c.16 GWh	-	Management	Reg.	20%[18]	25mcm	-	Accounts	Reg.
Germany	100%	-	1999	Management	Neg.	100%	-	2000	Accounts	Neg.
Greece	30%	100 GWh	-	Management	Reg.	Derogation				
Ireland	30%	4 GWh	2005	Legal	Reg.	75%	2 mcm	2005	Management	Reg.
Italy[19]	45%	20 GWh	-	Legal	Reg.	96%	0.2mcm	2003	Legal	Reg.
Lux	Derogation					51%	15mcm	2007	Accounts	Reg.
Neth	33%	20 GWh	2004	Legal	Reg.	45%	10mcm	2004	Accounts	Neg.[20]
Portugal	30%	9 GWh	-	Legal	Reg.	Derogation				
Spain	54%	1 GWh	2003	Legal	Reg.	72%	3mcm	2003	Legal	Reg.
Sweden	100%	-	1998	Ownership	Reg.	47%	25mcm	2006	Accounts	Reg.
UK	100%[21]	-	1998	Ownership	Reg.	100%	-	1998	Ownership	Reg.
source: DG Energy and Transport (shaded boxes indicate infringement procedures)										

Regarding structural measures, only one Member State has chosen a system of negotiated third party access for electricity and only three have done so for gas. Fourteen Member States now have a specific regulator with a duty to oversee the access regime. Many Member States have also gone further than the minimum level of unbundling of the TSO. One of the objectives of this report is to examine whether the differences in regulatory structure are restricting the level of "real" market opening such that the declared objectives of Member States are not being achieved.

2.2 Electricity: Access To Networks

Third party access to existing electricity and gas networks, on a non-discriminatory and cost reflective basis, is essential for the operation of a competitive market. In practice this means that network owners should be prevented from earning excessive profits from monopoly activities; and, where TSOs are part of a vertically integrated company, all network users, including those affiliated to the network operator, should be offered the same terms. These principles should apply both to transmission and distribution tariffs as well as other services, for example relating to balancing. The sections below review the current terms offered by network owners for access to their networks.

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16 Derogations: Luxembourg from Electricity Directive. Greece Finland, Portugal from the Gas Directive

17 Although there is a monopoly in Finland for the import of gas, there is a secondary market.

18 The market in France is open on a voluntary basis despite the absence of a legal framework.

19 In Italy smaller customers are able to group demand in order to pass the thresholds.

20 Regulated for distribution networks, regulator issues "guidelines" for negotiated access to transmission

21 In Northern Ireland the electricity market is only 35% open. Northern Ireland and Scotland have management unbundling only.

2.2.1 Transmission and Distribution Charges

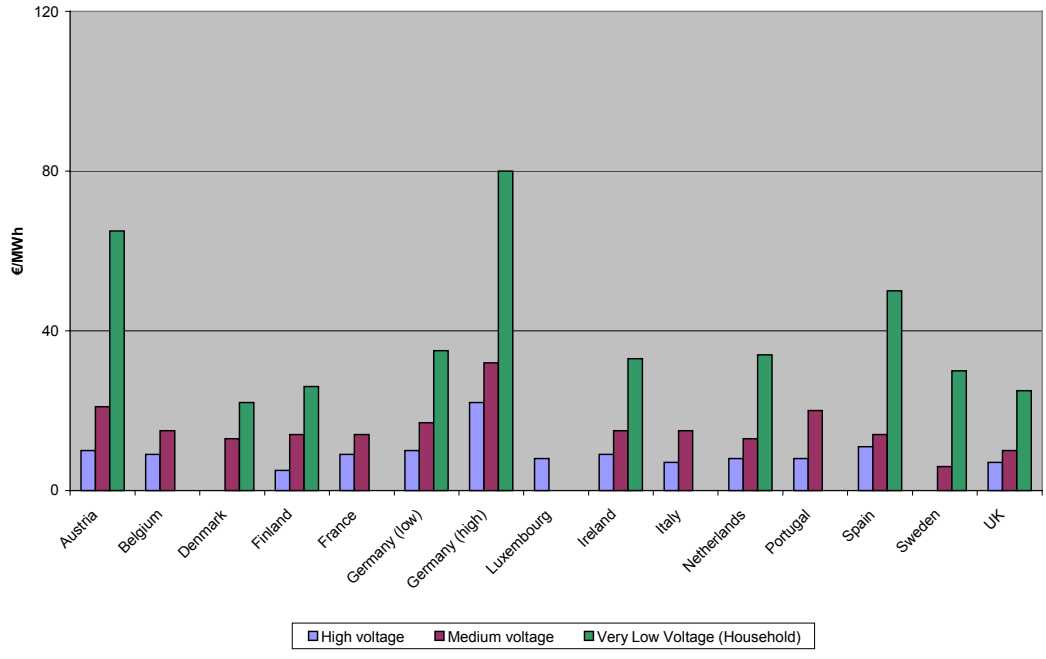
Analysis carried out for the Commission, summarised in Annex A, reveals a common design to the underlying structure of tariffs[22]. For transmission, in all cases, charges are made separately for entry (to generators "G charges") and for exit (to customers, "L charges"). Charges to G normally represent a much lower proportion of total overall tariffs and are zero in some Member States. Concerning locational signals, the following systems are in place;

- for most Member States charges are postalised, meaning that there is no variation in transmission tariff by location,
- for Greece, Ireland, Italy, Sweden and the UK charges vary by location, usually on a zonal basis, to provide incentives to generators.

For distribution, charges are generally postalised with no separation of G and L components or locational signals, although for Italy there is a distance related component. For both transmission and distribution, tariffs are usually based on a combination of capacity (€/KW/year) and flow (€/MWh) charges although there are variations in the balance between these parameters by Member State. Despite the variations, there do not appear to be any practices that are clearly discriminatory and none of the respondents to the survey highlighted tariff structure as a problem.

Transmission and distribution tariffs can be added together to produce a network charge for customers connected at different voltage levels. Estimates of the average level of network charges in each Member State are shown in Graph 1 below.

Graph 1 Estimated Level of Network Charges 2001: Electricity[23]



source: Comillas, Eurostat survey

[22] Report for DG Energy and Transport by Comillas (forthcoming)

[23] **Updated 06/02/2002**

These costs are a high proportion of final bills to customers. Although costs will never be identical, some of the differences observed appear difficult to justify and it would appear necessary for regulators to make certain that such charges are cost reflective. If network charges are too high there is a clear risk that monopoly profits will be earned and, in vertically integrated companies, allow the distortion of the competitive part of the market. A number of respondents to the Commission's survey suggested the level of distribution charges to be a particular problem.

2.2.2 Balancing

For electricity networks, the amount of energy delivered onto the system must constantly balance the amount being used. This requirement is usually met by the TSO providing an balancing service to network users. In doing this it will make charges for providing "top-up" energy to those market players with a shortfall, and pay a "spill" price if excess energy is input by any market actor. These charges are calculated for a certain balancing period which range from 15 minutes to 1 hour depending on the Member State.

These conditions are particularly important to new entrants since they are likely to have to make a commitment to purchasing generation or import capacity in advance of securing contracts with final customers, and they will not know in advance exactly the demand and load characteristics of the customers they will get. There may also be outages in new entrant's generation output during which time a back up supply of energy will be required, for example variations in the output of wind turbines. There are three main approaches available to TSOs for determining imbalance charges as follows:

- in most Member States, TSOs determine balancing prices by inviting bids from generators, and sometimes large consumers, to increase\decrease the availability of power;

- in Spain, a semi-mandatory market mechanism is used for most transactions on the wholesale market meaning that balancing is not such an issue, although it is possible to bypass this "Pool" with a bilateral contract and market mechanisms do exist for balancing,

- in Belgium, Germany (4 out of 6 operators), France (until 2002), Portugal and Ireland (for top-up), TSOs set charges at a pre-determined level, which may vary according to the time of day or the level of imbalance.

All of these models have potential drawbacks. For example, in many cases, the balancing "market" is dominated by one or two generation companies, often linked to the TSO itself. In this event prices for balancing energy may be asymmetric with very high top-up prices and low spill prices especially during individual balancing periods. In the UK, the introduction of the NETA balancing market initially saw a €110/MWh (£70) spread between average top-up and spill prices. This has, however, fallen to nearer €30/MWh (£20) in recent months.

If the TSO is left to determine imbalance prices without any oversight this could be criticised as being insufficiently cost-reflective. For example, the highest administered top-up price in France - in extreme circumstances - is around €150/MWh or roughly 7 times the wholesale price. Similarly, the Competition Authority in Germany is in the process of investigating the imbalance charges in place for the TSOs which do not operate a balancing market.

Where there is a risk of exposure to high imbalance charges, a key issue for new entrants is their ability to achieve a balanced position by making trades with other parties before "gate closure". One problem with this is the fact that the balancing period in Member States like Germany, the Netherlands and Belgium is 15 minutes, whereas power exchanges work on an

hourly basis. In such a situation new entrants are likely to have to negotiate bilaterally with the incumbent company and there are examples of dominant generators quoting very high prices to provide balancing or back-up supplies of power.

The underlying problem is the degree of concentration that exists in many Member States in the generation market. In this context, there is a trade-off between choosing a short balancing period which may seem cost reflective and the need to adopt market mechanisms which are conducive to competition. However those countries where the previous incumbents have a dominant position such as France, Ireland, Greece, Belgium and Portugal need particular attention and there may be a case for tighter regulation of the balancing market. However almost all other Member States have a significant degree of concentration.

2.3 Gas: Access To Networks

As for electricity, a fair access regime implies a cost reflective but simple tariff structure with non discriminatory access to balancing and storage services. A key issue for gas is the limited level of unbundling currently being implemented. At present it is very difficult to verify what, if any, charges are paid from the incumbent supply business to its affiliate, the network operator; and consequently whether tariffs offered to third parties are discriminatory or not. This situation is particularly unsatisfactory under a negotiated access regime.

2.3.1 Transmission and Distribution Charges

National network tariffs for gas are reviewed in Annex B in detail. It is clear from these that certain practices exist which appear unlikely to lead to effective competition and may in practice lead to discrimination and foreclosure of competition. One area of significant variation concerns the locational structure of tariffs as follows:

- in Luxembourg, Denmark, Sweden, and Ireland there is a standard postalised tariff across their whole territory; this is also true in Spain for the largest consumers,

- in the UK and Italy the transmission network operators have already, or intend to, adopt a tariff system based on variable charges for different entry and exit points, usually on a zonal basis,

- in Austria, Belgium, Germany, France and the Netherlands, transmission operators have tariff structures with significant distance related components.

Distance related tariffs are not likely to be cost reflective. There is usually no recognition that "backhaul" transactions, against the prevailing direction of flow, will lead to savings. They may also be discriminatory since often suppliers affiliated to the TSOs are unlikely to be paying charges on this basis.

In addition, in Germany and Austria there exists more than one network operator and some transactions require access to be negotiated with more than one company. Tariff structures used in each TSO may not be compatible and the aggregate charge that result may exaggerate the problems of distance related tariffs. A preferable system in these cases, as already used for electricity, is to have a nationally agreed cost reflective tariff structure and for the receipts to be fairly allocated to the different network owners.

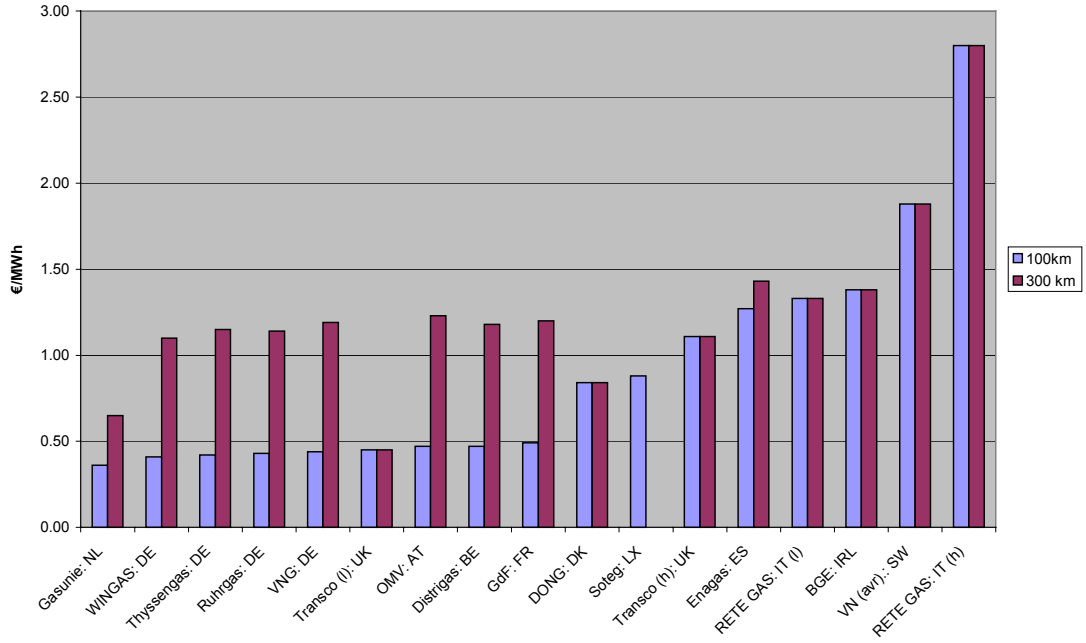
A final problem in those companies with distance related tariffs is that TSOs also oblige network users to purchase capacity between two fixed points for a minimum period of one year. This gives insufficient flexibility for suppliers that may have a varying portfolio of gas

and customers during the year or customers where demand varies significantly over time (the vast majority). For example a supplier injecting gas at a single point but which supplies two different customers, each during a six month period, will pay twice the normal transmission charge.

Survey respondents highlight the structure of transmission tariffs as a key barrier to competition. For example, tariff structures with distance related elements, combined with non-availability of capacity at certain entry points, tends to restrict competition to a small geographical area in the Member State concerned. The incumbent is then able to meet this limited challenge by negotiating prices lower for its large customers in that region.

Given these problems, it is somewhat misleading to conduct any benchmarking of the level of network tariffs as has been carried out for electricity. The first priority is to achieve greater harmonisation of tariff methodology along principles that would lead to effective competition. However some work has been undertaken by the Commission to examine the typical level of transmission charges ,which are included in the graph below.

Graph 2 Estimated Transmission Charges 2001: Gas[24]



source: DG Energy and Transport

Regarding medium pressure transportation and local distribution tariffs, limited information is available to date; particularly since many Member States have, so far, only opened markets to very large users. However given the major problems associated with transmission tariff structure it would appear that the prospects for domestic competition in some countries is already significantly reduced.

2.3.2 Balancing and Storage

Gas, unlike electricity, can be stored in underground facilities, or the transmission line itself through linepack. This makes the short term management of the network somewhat easier and

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[24] "Typical" eligible customer using 25 million m^3 per year with a load factor of 0.7 (i.e. peak daily offtake 97,847 m^3 and peak hourly offtake of 4,077 m^3). **Updated 06/02/2002.**

means that balancing periods can be longer than for electricity. The regime for balancing and storage constitutes a package which needs to operate in a fair way to ensure that conditions are non-discriminatory. For example requirements on third parties to balance over hourly periods, when combined with restricted access to flexibility and storage instruments is likely to form a barrier to new entrants. Practice here varies considerably, however the main distinction to be drawn is between;

- the UK where there is a balancing market similar to that in place for electricity,
- Member States where imbalance energy is charged at a multiple of the wholesale price, namely France, Denmark, Ireland, Luxembourg, Germany; these multiples range from 1.5 to 9.0 depending on the country and the circumstances and the degree of regulatory control also varies by Member State.
- other Member States, where network users are effectively obliged to purchase flexibility services relating to both capacity and flow in advance. In some cases any imbalance above a certain threshold is seen as a breach of contract.
- finally, a new on-line balancing regime was agreed as a result of the settlement of the Marathon-Thyssengas case which has the potential to avoid imbalances altogether.

The treatment of storage facilities also varies considerably;

- in Ireland, Sweden and Luxembourg, no storage facilities are available,
- in Austria, there is no formal third party access to storage,
- in France, the Netherlands, Belgium, storage is available in the form of standard flexibility service in association with a transportation contract but not on an independent basis,
- in Denmark, Germany[25], UK, Italy and Spain storage is available on the basis of auctions, or on a negotiated or regulated basis.

Given the general lack of liquid wholesale markets in continental Europe there are clearly risks for new entrants in being exposed to high imbalance charges, particularly for Member States with hourly balancing such as Belgium, Denmark, Germany and the Netherlands. This is seen as a significant problem by survey respondents. In regimes with hourly balancing the existence of liquid wholesale markets for gas as well as non-discriminatory access to storage and linepack are vital.

2.4 Regulation and Settlement of Disputes

In a market economy almost every sector is subject to a certain degree of regulation. However there is general agreement that electricity and gas markets require more intense regulation than most other industries in order to ensure proper functioning of competitive markets, to protect customers and deliver other policy objectives.

In most Member States, the legislation envisages regulated third party access with published tariffs. This allows the basic rules in the implementing legislation to be supplemented over

[25] **updated information 6/02/2002**

time by decisions taken by regulators on issues relating to network access tariffs and conditions. Even though most Member States use regulated TPA, there are significant variations in the powers and independence of regulators and their resources as discussed in Annex C and below in more detail. For example in Luxembourg, Ireland(gas), Spain, France[26] and Greece it is the relevant Ministry which has the final decision on tariffs and/or disputes in some cases. Such models may dilute the effectiveness of regulation, particularly where the Ministries concerned have a financial or other interests in existing electricity and gas suppliers.

In terms of procedure there are a number of models:

- For the majority of Member States the regulatory body tends to oversee the whole process of deciding tariffs and conditions for network access. This usually implies an overall **ex-ante** "open book" control on the turnover or profits of the transmission and distribution companies and the approval of a tarification methodology.

- The second approach is an **ex-post** system of regulation under which grid operators notify their tariffs to the regulator which then has the possibility to intervene or not. This is adopted in those Member States which have unbundled in ownership terms (i.e. where discrimination in favour of related suppliers is not an issue) such as Denmark, Finland and Sweden.

- A third approach used generally in Germany, and in Austria for gas, is based on negotiated access. This places more emphasis on the need for an authority to settle disputes and, implicitly, a procedure and methodology for handling these cases. However, where no regulator exists as in Germany, voluntary arbitration bodies exist but formal disputes have to be settled by recourse to general competition law.

- Finally a hybrid system exists in the Netherlands for gas. In principle this is based on negotiated third party access. However the Regulator issues guidelines on how charges should be set.

From the point of view of new market entrants it is important that there exists "effective regulation" whoever actually carries out the functions. The most important features of an effective regulatory framework are that disputes are handled quickly and without undue costs, for example legal costs. In this context it is apparent that a **fundamental difference exists in the extent of regulation required depending on whether ownership of networks is unbundled**. Without ownership unbundling, much more intense regulation appears to be favoured.

In Member States which apply ex-ante regulated third party access, disputes on the level of access tariffs and other conditions seem to be relatively rare because these are resolved through the setting or approval of tariffs by a regulatory body and, most importantly, the publication of fixed tariffs. Indeed most of the complaints dealt with concern connections, i.e. one-off events. Similarly there are fewer complaints where networks are fully independent in ownership terms. There is less issue with discrimination and the only problem is that of potentially excessive profit to the network's shareholders.

[26] The situation in France is that the Ministry decides on these on the basis of a proposal of the regulator. However the Ministry cannot modify the proposal, only reject it altogether

For Germany, which has neither ex-ante regulation or ownership unbundling a large number of complaints[27] have been received by the competition authorities on the level of network access tariffs, notably concerning the distribution system, and access conditions in general. Considering that Germany has over 900 distribution companies for electricity and 700 for gas, this level of disputes is not surprising in a negotiated framework where companies are trying to build up a national presence. Many responses to the survey also suggest that the burden of proof required under Competition Law to demonstrate a dominant position exists and that position has been abused for each individual case leads to a lengthy and costly procedure. For example the defendant has the possibility to appeal against decisions before civil courts and these leads to the suspension of the initial decision by the Competition Authority. The German government is considering amending this procedure.

Regarding the duration of dispute procedures, the information received does not allow a general conclusion since duration seems to vary considerably. However, two Member States have a legal provision on the maximum duration of dispute settlement (Spain: 2 months; France: between 3 and 6 months) and OFGEM (Great Britain) has set a target periods for dispute settlement on network access tariffs[28]. Under negotiated regimes some disputes can be settled quickly but others have taken over a year to resolve.

Finally it is noteworthy that the level of resources and staffing of regulators also varies considerably, although it is clear that some variation will be inevitable depending on the characteristics of the national market and the extent of the Regulator's responsibilities. A number of Regulator's offices have only recently been set up and not yet reached their planned staffing level.

2.5 Framework for Cross Border Transactions

In order to develop an effective internal market for energy it is crucial that the arrangements for cross border transactions are non-discriminatory and cost-reflective. Cross border issues arise in both electricity and gas, with the key issues relating to the interaction of different Member States' transmission tariff systems ("cross border tarification") and the allocation of capacity on interconnectors between Member States ("congestion management"). These issues, particularly the latter, are to be further examined in a forthcoming Commission Communication on European Energy Infrastructure.

2.5.1 Electricity

The development of interconnectors between the formerly isolated systems in Europe was firstly driven by power system security requirements. Subsequently interconnectors were developed to take advantage of complementary fuel mix, for example to make efficient use of hydropower. Finally some interconnectors were developed to allow long term baseload imports from countries with large nuclear production.

Currently there is little co-ordination between different TSOs or regulators to ensure that tariffs for cross border transactions are cost reflective. In most cases, cumulative transmission charges are still levied in each Member State along a notional contract path. This process, known as "pancaking" is not cost reflective; in that it does not reflect the actual physical flow of electricity, or recognise that some flows may actually alleviate congestion and reduce costs.

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[27] In Germany for example, around 150 complaints have been received by the Bundeskartellamt, to which those made to the Regional cartel authorities must be added.

[28] 28 days for transmission and 16 weeks for distribution complaints: Ofgem Corporate Plan.

Some Member States also impose specific import or export charges as set out in Annex D. It is possible that agreement on a temporary cross border tariff structure will be in place by January 2002 which will remove most of these charges. In the longer term a permanent framework to decide on these issues is proposed in the Commission's draft Regulation on cross border electricity exchanges.

As well as inconsistent cross border tariffs, each Member State uses a different approach to allocate interconnector capacity. Some of these, such as long term capacity reservations and "first-come, first-served" rules can clearly have discriminatory results and require careful control and, probably, revision. However, two market based models seem to be emerging. In the first (Nordpool), the market for capacity is directly linked to the spot market for electricity. The other market based approach is explicit auction. Again, in order to deliver a real single market for electricity, harmonisation of capacity allocation procedures is a necessary step.

2.5.2 Gas

For gas, the issue of cross border tariffs is sometimes easier to resolve since, over short distances, there is some correlation between the contract path and the actual flow of gas. However this is not true at a wider European level. For example, given the numerous entry points for gas that are used, there is little possibility that the actual gas will actually flow from, for example, Norway to Spain. To date there is no agreement between gas transmission operators to recognise this when tariffs are set for long distance transportation. The key question is whether capacity along the contracted path needs to be reserved for such transactions, or whether security can be delivered by other, less onerous, means such as the use of storage.

In addition, there are currently a number of other barriers, some of which are also described in Annex D. There relate generally to a lack of transparency concerning the availability of capacity, different balancing standards, and the potential for pancaking of charges, particularly where negotiations are required with several transmission and local distribution companies. It is often the case that part or all of the capacity of pipelines is contracted on a long term basis to incumbent companies whether or not the capacity is actually used and there is no agreement from most transmission system operators to providing information to the market on the amount of free capacity that is available. Use it or lose it provisions were agreed with Thyssengas as a result of the Marathon case.

The Association of Gas Transmission System Operators has not yet agreed to voluntarily publish detail information on available transmission capacity. However, it has published a "traffic light" system of indicative available capacities on the main European gas network. This information is, however, not real-time. Furthermore, contrary to the basic principle which has been agreed for electricity, contractually reserved, but unused, capacity is not considered to be available according to GTE's definitions. GTE's overview shows that out of 48 border crossing points, 45% are "red" indicating that there is little or no capacity available. 80% points are "red" or "yellow" and only 20% of these points have a "green light" indicating capacity available.

A final restriction on cross border trade results where gas import contracts have restrictive "destination clauses" which prohibit the re-sale of gas from the importing country to other Member States. Under the Vertical Restraints Regulation, such clauses are violations of European Competition Law and are unlikely to be exemptable.

2.6 Network Access Conclusions

Significant differences exist in the terms offered by TSOs and DSOs which appear difficult to justify, including tariffs levels and structures, and the provision of other services like balancing and storage. Of particular concern for electricity are charges for distribution tariffs and balancing arrangements. For gas there is a clear barrier arising from the use of inflexible distance related tariffs.

Where full ownership unbundling exists, regulation is usually relatively light-handed. Otherwise it would seem that a more pro-active approach based on fixed and published tariffs applicable to all users, approved directly or indirectly prior to its entry into force, is considered the best way of ensuring non-discrimination and avoiding an excessive amount of complaints. It would appear that the regulatory structure chosen affects Member States' ability to deal quickly and effectively with access complaints without excessive costs falling on complainants.

Finally, as already noted in the Commission's proposed Regulation[29], a common regime is required for dealing with transactions that cross the borders of one or more Member State. This would appear to require a degree of harmonisation of the approach to tariffs and capacity allocation.

[29] 2001/0078 (COD)

3. INDICATORS OF INTERNAL MARKET DEVELOPMENT

Generally, it is expected that market opening should, to some degree, lead to a dilution of market shares of incumbents and an increase in cross border trade as companies seek market share in new territory. There should also be a rise in the number of customers who switch between suppliers for some or all of their energy needs on a regular basis. The different choices made by Member States in terms of the level of legal market opening, and in terms of the arrangements for third party access, may well be reflected in terms of the level of competitive activity and in price developments.

3.1 Market Structure

3.1.1 Electricity

For the electricity market, the Commission has, through Eurostat[30], initiated a process to collect such information from Member States on an annual basis. It has also taken advice from external experts to improve the range of indicators available as the market develops[31]. The results of the various efforts to monitor the development of the market are summarised in the following two tables covering market structure and the level of customer switching activity.

Table 2 Market Development Indicators: Concentration and New Entry

	Biggest three generator share (%)	Biggest three retail supplier share	Main retail supplier entrant type
Austria	68	42	cross border sales, internal competition
Belgium	97 (2 companies)	100 (1)	cross border sales
Denmark	75 (2)	32	cross border sales, internal competition
Finland	54	na	cross border sales, internal competition
France	98	96	capacity auctions, cross border sales
Germany	63	62 (2)[32]	internal competition
Greece	100 (1)	100 (1)	na
Ireland	97 (1)	97 (1)	capacity auctions, cross border sales
Italy	79 (2)	93 (1)	cross border sales
Netherlands	64	80	cross border sales
Portugal	85	90 (1)	cross border sales
Spain	79	94	internal competition
Sweden	77	52	cross border sales, internal competition
UK	44	37	cross border sales, internal competition
source: Oxera, Eurostat, Information provided by survey			

The table above indicates a significant degree of concentration exists in generation in many Member States. As already noted the existence of generators with dominant market share is unlikely to be conducive to new entrants without tight control of wholesale and balancing markets. Thus, in order to deliver more effective competition many Member States have already carried out some release of generation capacity from the dominant suppliers; such as

[30] Eurostat Internal Document on Competition Indicators in the Electricity Market (May 2001)
[31] Report for DG Energy and Transport by Oxera et al (October 2001)
[32] Taking account of cross ownership.

the UK[33], and Italy where ENEL must sell capacity of 15,000MW before 2003. Other Member States such as France and Ireland have made capacity from the incumbent generator available to the wholesale market through an auction procedure. Without significant competition being generated internally, competition in the supply business has to come from cross border transactions but this may also be limited if arrangements for cross border transactions are discriminatory or congestion exists. Market share in supply therefore tends to reflect the generation market to an extent although the historical development of regional distribution\supply companies has some impact. Many Member States have seen considerable consolidation of the retail supply market.

Table 3 Market Development Indicators: Switching Estimates

	Declared market opening 2000	Large industrial users switch	renegotiate	Small commercial/ domestic switch	renegotiate
Austria	100%	5-10%	na		
Belgium	35%	5-10%	na		
Denmark	90%	na[34]	86%		
Finland	100%	30%	70%	10-20%	50%
France	30%	5-10%[35]	na		
Germany	100%	10-20%	50%	<5%	20%
Greece	30%	nil	nil		
Ireland	30%	30%[36]	35%		
Italy	45%	10-20%	na		
Netherlands	33%	10-20%	na		
Portugal	30%	<5%	na		
Spain	54%	<5%	50%[37]		
Sweden	100%	100%	na	15%	15%
UK	100%	80%	na	>30%	na
source: Oxera, Eurostat, Information provided by survey					

In Table 3, it is notable that the countries with the highest level of switching tend to be those where qualitative market opening measures have been the most conducive to competition such as Finland, Sweden and the UK. However some progress has also been made in most other Member States including Germany, Italy and the Netherlands. In some cases it would appear that switching is prevented by the incumbent company negotiating a new contract with their customer at a lower price. This may be a desirable outcome if the pressure of competition is driving better performance at the incumbent company. However, where a part of the market remains closed, either formally or through unfair network access conditions, such renegotiations may be the result of cross subsidy from the closed part of the market.

3.1.2 Gas

For gas, the new competitive arrangements have only been in force since August 2000. However it is already possible to measure the extent of competitive activity and the

[33] The Central Electricity Generating Board was split into 3 on privatisation .
[34] 86% of eligible customers have changed supplier, but many to a separate affiliate of the incumbent company.
[35] Not including TSO consumption of energy for losses, balancing
[36] The new supplier for some of these has since withdrawn from the Irish market.
[37] **Updated 06/02/2002**

Commission recently completed a initial report considering market indicators.[38] Table 4 examines the degree of competition by measuring the extent to which gas is being sold under third party access conditions and the amount of switching that has been reported.

Table 4 Market Development Indicators: Gas

	New supplier entrant type	Declared market opening 2000	Proportion of gas transported by TPA	Large industrial users/power generation		Small Commercial/ Domestic switching
				switch	renegotiate	
Austria	incumbent from another MS	49%	<5%	< 5%	na	
Belgium	incumbent from another MS	59%	<2%	< 5%	na	
Denmark	nil	30%	0%	nil	na	
France	incumbent from another MS, independent entry	20%	3%	10-20%	na	
Germany	competition between national incumbents incumbent from another MS, independent entry[39]	100%	2%	<5%	na	<1%
Ireland	incumbent from another MS, independent entry	75%	25%	20-30%	na	
Italy	independent entry	96%	16%	10-20%	na	
Luxembourg	nil	51%	0%	nil	na	
Netherlands	incumbent from another MS, independent entry	45%	17%	>30%	na	
Spain	incumbent from another MS, independent entry	72%	7%	5-10%	28%	
Sweden	nil	47%	0%	<5%	na	
UK	all types	100%	100%[40]	90%	na	45%
source: WEFA, information provided by survey respondents						

As with electricity a key problem is concentration in national markets for the production or import of gas. Member States have historically preferred to nominate a single company to exploit national resources or to negotiate with producer countries. Concentration also exists in the production of gas although the Commission has taken action where possible to prevent joint marketing agreements when sources of gas are developed. However in a competitive market structure this may impede successful entry if new entrants are prevented from obtaining gas on acceptable terms.

Some Member States have therefore introduced gas release programmes such as UK, Spain and Italy[41] whereby the main importer is obliged to sell on a certain proportion of imported gas. Other barriers to new entry arise from current problems with tarification and allocation of capacity for cross border exchanges of gas since these could potentially form a new source of competition within Member States.

Regarding the level of switching, the UK and Ireland appear to have the highest level of competitive activity. Other than these, the fastest evolving markets appear to be the Netherlands, Italy and Spain which have a high level of market opening and/or customer switching. Some progress has also been made in France, despite the lack of implementation of the Directive.

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38 Report for DG Energy and Transport by DRI-WEFA (July 2001).

39 **updated information 6/02/2002**

40 Only the UK has full ownership unbundling, hence all gas is transported by TPA

41 Italy: limit on dominant importer\producer to 75% by 2003, 61% by 2009.

3.2 Price Developments

Successful opening of energy markets might be expected to have two main effects on prices. Firstly, competition should drive companies to deliver price reductions in order to maintain market share. This is not to say that prices will always fall, since there may be other factors affecting the overall conditions in the market, particularly the price of other primary energy inputs such as oil. Secondly, the creation of a true internal market for electricity and gas would be expected to result in a degree of convergence between the prices in different Member States.

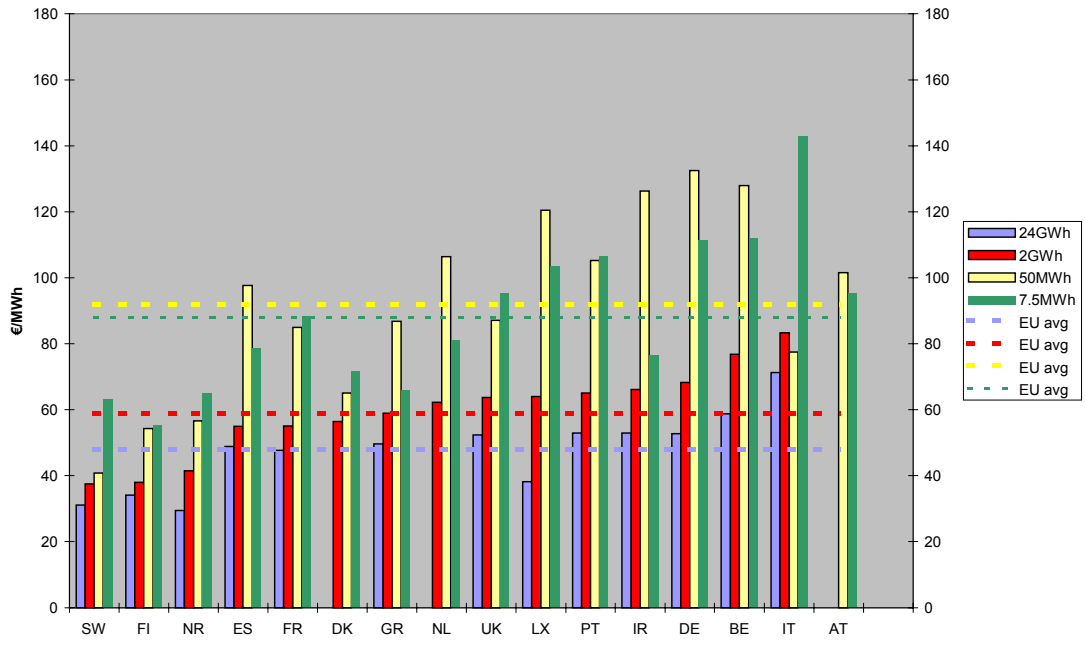
3.2.1 Electricity

For wholesale markets there is some evidence of convergence of prices between Member States, particularly for baseload, which has generally been around €20/MWh during 2001 in both power exchanges and bilateral contracts. Peakload prices show a greater variation and this may reflect the limited degree of interconnection and possibly market manipulation. Higher prices at peak periods have been experienced in Spain and the Netherlands, for example average monthly prices have often exceeded €35/MWh.

Generally, prices in Nordic markets have increased recently as a result of reductions in reserve capacity with very high prices experienced in February 2001. Opening of the German market has rapidly led to a reduction in wholesale price although volumes have been low to date. Wholesale prices appear to have fallen in the UK since the abolition of the Pool, although this may be a seasonal effect.

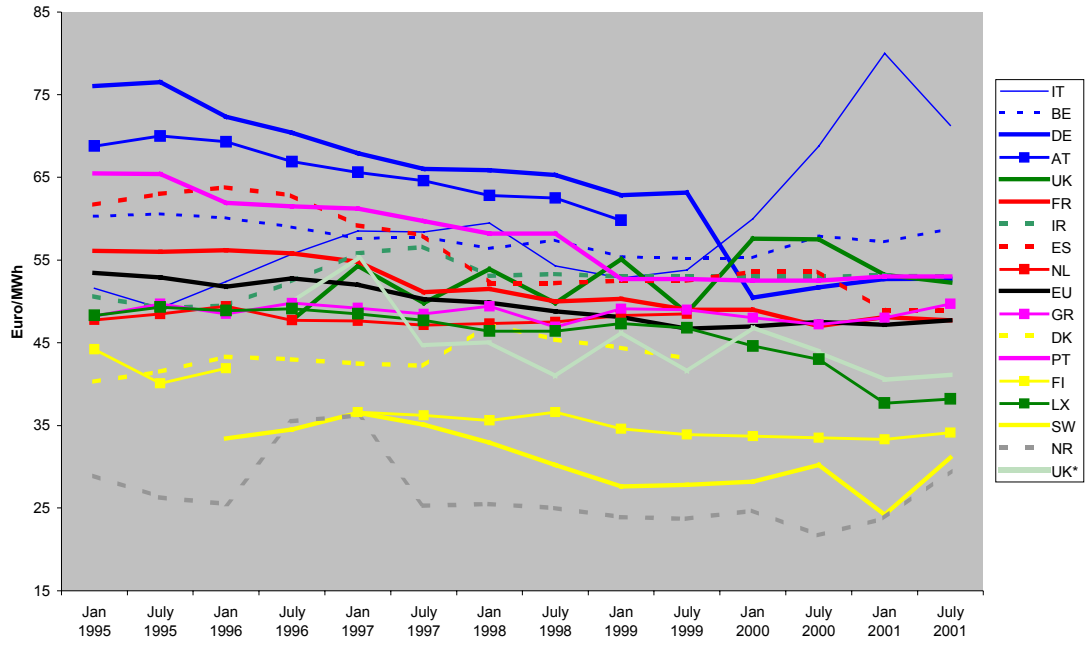
Despite some convergence in wholesale markets, prices to industry and households still show significant differences. The graphs below compare retail prices in Member States for 2001 and show the development of electricity prices since 1995. This information is collected on a twice yearly basis by Eurostat.

Graph 3 Electricity prices to different customer groups: July 2001



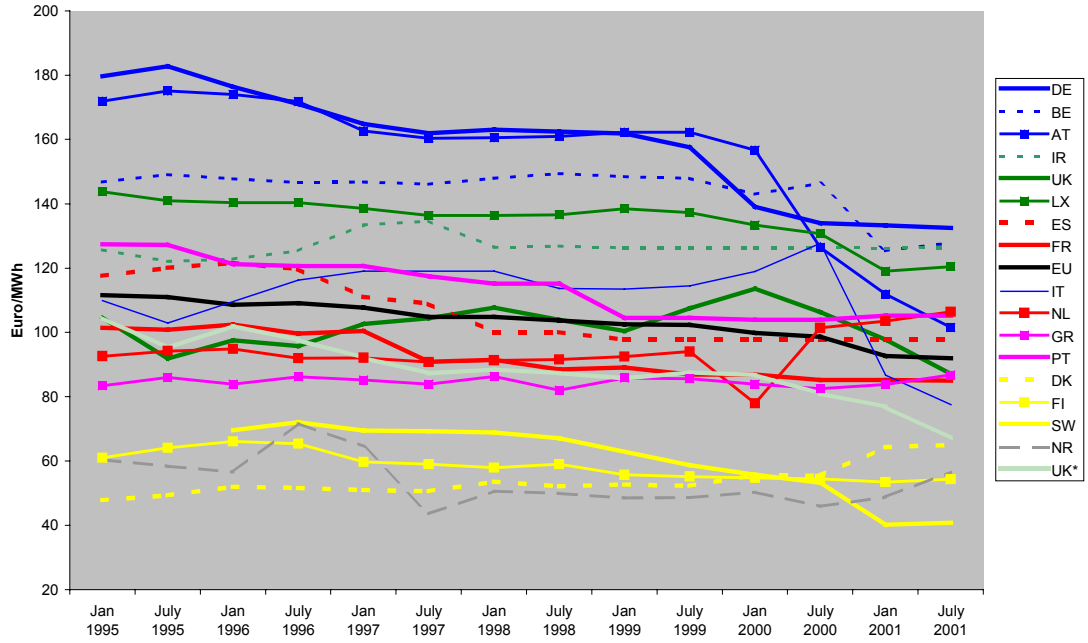
Source Eurostat: July 2001prices excluding VAT and other energy taxes.

Graph 4 Electricity Prices to very large consumers 1995-2001: 24GWh/year



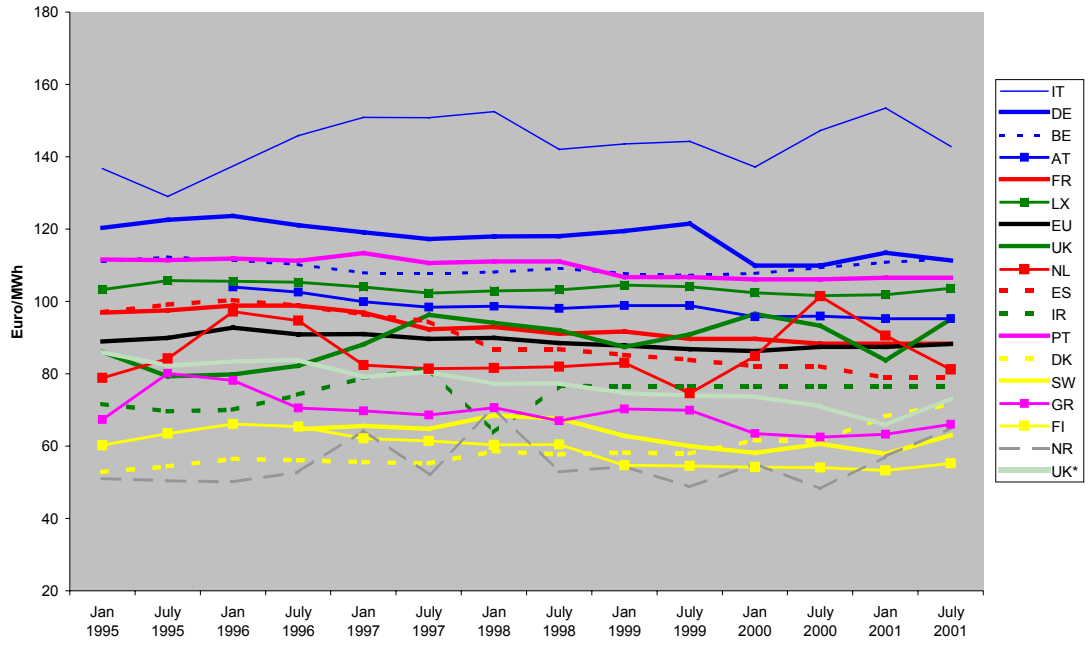
source: Eurostat: Prices are quoted in current prices excluding VAT and other energy taxes.
UK* at constant 1995 €/£ exchange rate

Graph 5: Electricity Price to small enterprises 1995-2001: consumption 50 MWh/year



source: Eurostat: Prices are quoted in current prices excluding VAT and other energy taxes.
UK* at constant 1995 €/£ exchange rate

Graph 6: Electricity Prices to Households 1995-2001: consumption 7.5 MWh/year



source: Eurostat: Prices are quoted in current prices excluding VAT and other energy taxes.
UK* at constant 1995 €/£ exchange rate

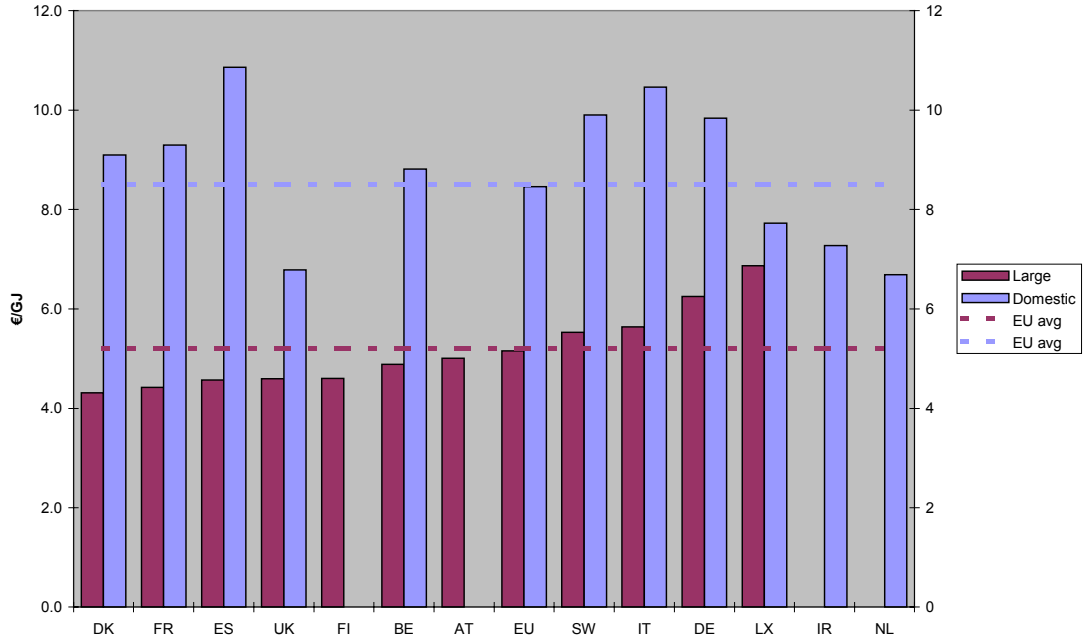
This series of graphs demonstrates the continued large divergence between high cost countries such as Italy and Belgium and the lower cost markets in the Nordic countries. Clearly price differences may be due to country specific factors such as the characteristics of the generation plant available and congestion on connections between Member States mean that such differences are likely to continue. However there is clear potential for some benefits to result from competition to the extent that current price differences can be further eroded as a result of improvements in the regulatory framework.

3.2.2 Gas

Wholesale prices are negotiated between importing companies and producers, usually over a long term period. The negotiated price is very often, but not always, entirely linked to the oil price. However, there are often opportunities in contracts to adjust the details of the oil/gas relationship. There is a general lack of information on wholesale prices paid for gas since transparent standardised markets only exist within the UK and, to a lesser extent, at the hub at Zeebrugge in Belgium. There is, however, anonymised reporting of bilateral contract prices by certain market monitoring companies. Border gas prices in continental Europe are generally linked to the oil price and high oil prices during 2000-01 meant the gas price was around €4-5/GJ. This increase also affected the UK which is now linked to the rest of Europe through the UK-Belgium interconnector and UK prices increased from €3/GJ to levels similar to those in other countries. However both oil and gas prices have fallen significantly in the second half of 2001 and prices at the UK national balancing point are now back below €3/GJ.

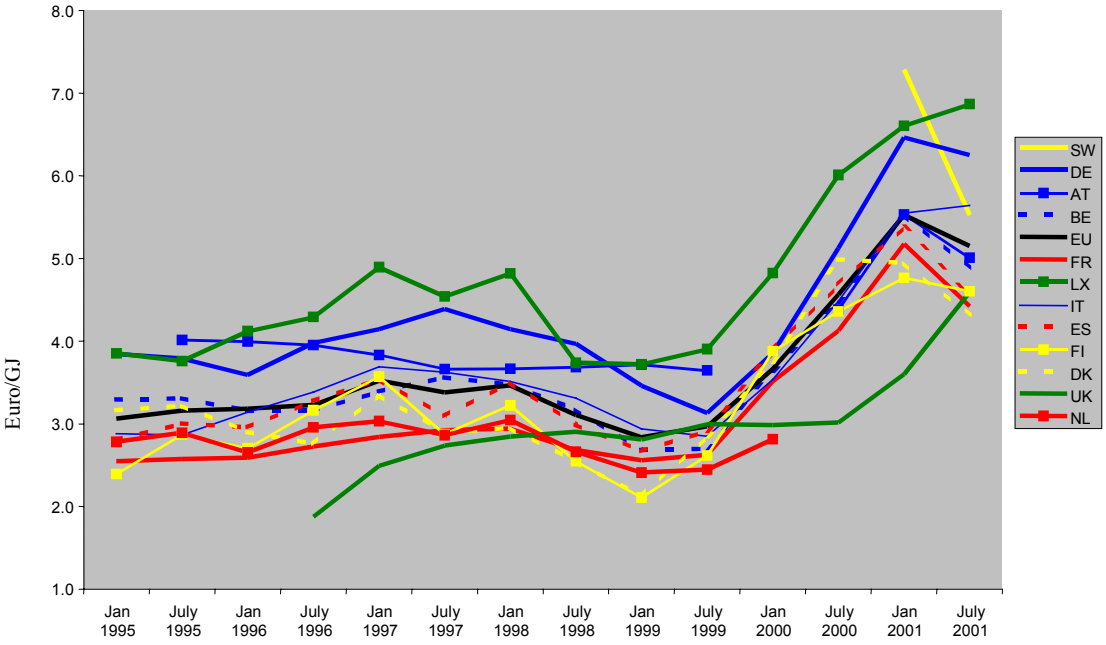
Retail gas prices are collected by Eurostat for gas customers on a twice-yearly basis. An analysis of the comparative level of prices and price developments since 1995 are set out in the graphs below.

Graph 7: Retail gas prices to different customer groups: July 2001



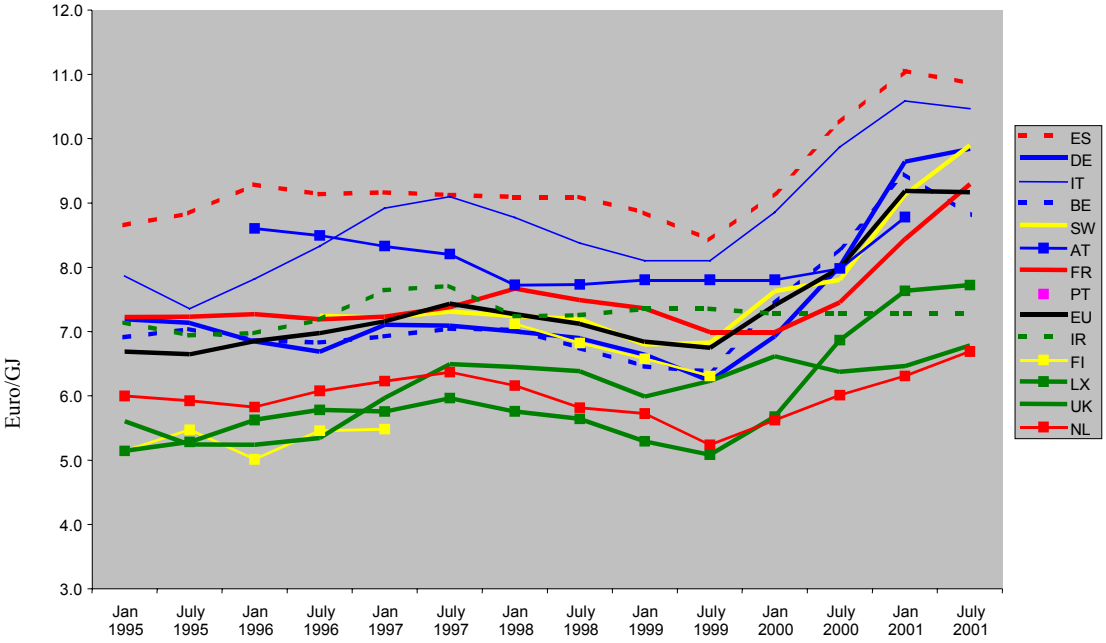
Source Eurostat: July 2001prices excluding VAT and other energy taxes.

Graph 8: Gas prices to large consumers 1995-2001: 420 000GJ/year (approx 10mcm)



source: Eurostat: Prices are quoted in current prices excluding VAT and other energy taxes.

Graph 9: Gas Prices to Household Customers 1995-2001: 84GJ/year(approx 0.002mcm



source: Eurostat: Prices are quoted in current prices excluding VAT and other energy taxes.

It is clear that the impact of increasing wholesale gas prices has differed by Member State. However most countries have registered very significant increases in final bills. However at household level it would appear that many countries particularly the Netherlands and the UK, have not passed on the effects as rapidly.

3.3 Trade between Member States

3.3.1 Current level of cross border exchange: electricity

The total of physical cross border flows amounts to around 7-8% of total electricity consumption within the Community. When this is compared against the total capacity available on interconnectors it would appear that most European interconnectors are either fully used or have a high utilisation ratio. This suggests that greater investment in interconnection capacity will be needed to make a significant difference in the level of integration of markets.

Despite this, even small interconnectors can serve to successfully integrate markets if used efficiently and where there is not a chronic price difference between the markets. In some cases set out in Annex D certain interconnectors do not appear to be used to their maximum potential or do not appear to be significantly reducing price divergences between Member States, for example in the Netherlands or Italy. This may be due to inadequate procedures to allocate capacity, for example lack of information or flexibility of auction design. The forthcoming Commission Communication on European Infrastructure will examine the regulatory framework for cross border capacity allocation and the regulatory framework for such investments in more detail. The Commission has also taken action to investigate long term capacity reservation on certain interconnectors.

3.3.2 Current level of cross border exchange: gas

For gas, cross border transactions are dominated by a few companies who have capacity reservations on the infrastructure being used. Although more than 60% of gas crosses at least one border before consumption, these flows mainly occur during the process of delivery from the ultimate producer to the importer in the Member State concerned. Indeed some gas import agreements have restrictive destination clauses that prevent further trade and which are likely to contravene EU competition rules. The consequence of this situation is that competition is only effective to the extent that new market entrants have gas available in the same locality as their potential customers. Thus, competition in regions of the EU nearest to the main sources of gas have generally been more vigorous since there may be a number of competing companies which have access to gas in this location.

3.4 Market Development Conclusions

The above section appears to confirm that measures chosen to implement the Directives, as well as the structure of the industry have affect the development of the market in different Member States. Concentration in generation and gas production/import also tends to impede competition and this has led some governments to tackle this through capacity release programmes or divestment. Regardless of the level of concentration, it would appear that the most effective competition in terms of both the level of entry, and activity in terms of changing supplier, has come in those Member States where network access conditions are generally conducive to new entry and in line with the Commission's proposals at Stockholm.

Table 5 Summary of energy price levels: July 2001

		Large Users		
		ELECTRICITY		
		Low	Med.	High
GAS	Low			
	Med.	FI	UK,NL,IR, AT FR,ES,DK	BE,IT
	High	SW	LX,PT,GR,DE	

Small Commercial/ Household		
ELECTRICITY		
Low	Med.	High
	NL, UK, IR	LX
SW, FI, DK	FR, AT	BE, DE , PT
	ES	IT

The tables above summarise price levels in different Member States for electricity and gas Although electricity prices have come down in most Member States, it is very clear that such reductions have been concentrated in the large user part of the market. Gas prices have remained the lowest where competition has been most effective and where indigenous gas is available. This suggests there are obstacles to cross border transactions in the gas market.

4. PUBLIC SERVICE

4.1 Ensuring Security Of Supply

The use of electricity and, to a lesser extent, gas is a necessary part of daily life. The failure to provide these services for anything more than a very short period would lead to a severe disruption of both businesses and households. Therefore, competitive markets must give the correct price signals to generators (for electricity) and producers/importers (for gas) to invest in additional capacity in time to prevent such events. Achieving a sensible balance of incentives in the competitive market is a major challenge for Member States.

4.1.1 Measures to ensure security of supply

The traditional approach to security of supply in most Member States is that incumbent supply companies would enter into long term agreements with energy producers, either within their own group or externally. They would then be given exclusive rights to sell the energy produced or imported over part or all of the country, thus removing the potential risks associated with long term investment. The opening of markets removes the possibility of such an approach although the current gas and electricity Directives both allow transitional arrangements in case if companies have already entered into long term contracts before their entry into force. The Commission recently agreed a methodology for dealing with any state aid aspects of such agreements and a number of decisions have been taken.

Ultimately it is expected that bilateral contracts between suppliers and generators/producers will continue. However, instead of market closure to reduce risk, it is expected that market mechanisms will emerge to enable companies to manage their risks more actively. Thus the contracts between generators\producers and energy suppliers become financial contracts which can be bought and sold in a secondary market. Standardised wholesale electricity markets have already developed in the Nordic market, the UK, Netherlands and Germany. An exchange is also planned in France later this year. In Spain a Pool-type mechanism is used and this is also envisaged in Italy[42].

However, there are some concerns that such markets may not provide sufficient signals to potential investors due to uncertainty, or perhaps where wholesale markets are lacking in liquidity and unduly dominated by a small number of companies. Even perfectly functioning markets may not secure capacity needed at the very highest peak period which only need to be run very rarely at unpredictable times. Governments may also wish to take further measures to safeguard security of supply and, as set out in Annex F, a number of alternatives exist within in the framework of the electricity and gas Directives and are already being used as follows:

- In Spain the calculation of the wholesale price includes a payment to generation capacity in the form of availability payments serving to intensify existing price signals. This approach is also being considered in Ireland whereas Italy is considering placing an obligation on consumers to purchase reserve capacity when their wholesale market is launched.

[42] In the Spanish and the proposed Italian model, the spot market is semi-mandatory and can only be by-passed though a bilateral contract between a generator and supplier if authorisation is given.

- In Nordic countries TSOs have already acquired a certain amount of peaking capacity that can only be used in extreme circumstances. This is also being discussed in the Netherlands.

For gas some Member States place general, non-specific obligation on all suppliers to ensure that they have enough electricity\gas available to fulfil their contracts. In addition, there currently two standardised trading hubs, in the UK and, to a lesser extent in Belgium. The emergence of active trading of wholesale gas to mirror the developments in electricity will become crucial in giving opportunities for producers and importers to trade gas in the wholesale market. In the meantime, other measures are being adopted.[43]

- For Belgium, Italy, France, Denmark and the UK there are obligations on the TSO to provide sufficient transportation capacity to meet certain extreme climatic events. TSOs also have to maintain a storage reserve in these countries, whereas in Germany these decisions are left to the individual companies owning and operating the network.

- In Spain, the government imposes specific requirements such as the need to maintain a minimum level of stored gas.

- In Ireland additional import capacity is financed through the price control of the transmission business, whereas in the UK incentives are to be placed on the TSO to make additional entry capacity available.

- Other possibilities arise from the greater proportion of demand covered by customers who may be content with interruptible contracts. Thus, if the gas price were to increase significantly due to a shortage of supply, some large users may be able to use other energy sources to meet their needs if sufficient compensation was available. Such measures are used in many countries including France and the UK.

Whatever mechanisms are used, all Member States have put measures in place to closely monitor the supply demand position and to make market players aware of any projected shortages. The proposed revision to the Directives expects Member States to play a key role in ensuring security of supply by designating a body to monitor security of supply issues and to submit an annual report to the Commission. Accordingly, a number of Member States such as France and Belgium already envisage the publication of an indicative plan for new electricity generation and, if insufficient investment arises, intend to invite tenders for new capacity.

4.1.2 Security of Supply Position

The current position of the EU in terms of the adequacy of capacity is generally favourable and for electricity there is a general state of overcapacity in the EU as a whole. A number of Member States, which are isolated from the main European transmission network will need new investment over the coming years including Ireland, Greece, Spain and Italy. However authorisation has already been provided for the development of significant new capacity within the new market framework including at least: 12,500MW in Italy, 8,000MW in Spain, 2,000MW in Greece, and 700MW in Ireland.

In some Member States which have already liberalised, reserve capacity appears to have been reduced as a result of falling average wholesale prices. This creates the risk that subsequent

[43] EU Benchmarking of Short and Long Term Security of Gas Supplies: CREG, Belgium.

demand increases may lead to the increased incidence of price spikes in wholesale markets; for example the Nordic market during February 2001. Similar spikes have been seen in the UK Pool and in the Amsterdam power exchange during certain periods. However, provided such events are not persistent, and generators respond to these price signals by investing in new capacity, they can be considered normal behaviour of the power market considering variable demand and weather conditions.

For gas, current estimates suggest that existing production and import contracts are sufficient to cover EU consumption until approximately 2010. Under current prices however it would appear that there are very significant economic possibilities to increase the level of imported gas into the European network even after taking into account the transportation costs.[44] Member States will need to monitor the construction of import capacity and the level of import agreements closely in the same way as for the electricity generation market.

4.2 Universal Service And Service Quality

The successful introduction of competition should also be characterised by the maintenance or indeed improvement of the level of service to customers in terms of security and reliability. Of particular importance is the need to maintain a universal supply so that all inhabitants have access to energy at reasonable prices regardless of their location[45]. In addition the interests of vulnerable groups such as the elderly and low income groups should be protected. All Member States have adopted measures, within the context of the electricity and gas Directives, to ensure these objectives are delivered. Indeed, the Commission Communication on Services of General Interest[46] detailed essential consumer rights in this area.

Universal Service

In all Member States licensed suppliers are obliged to offer electricity to anyone that requests it, regardless of their location or other characteristics. Some are prepared to rely on this to ensure universal supply, subject to the use of an emergency reserve from the TSO during a limited period, for example, in the event of bankruptcy of a supplier. However in most countries, additional safeguards are imposed such that a default supplier is always available. This is reviewed in more detail in Table 6 below.

In all Member States the final prices charged by default suppliers are regulated, even where markets are fully open to domestic customers.[47] Such an approach provides a ceiling on the price that any individual household or company will pay for electricity or gas.

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[44] Report for DG Energy and Transport by Observatoire Mediterraneen de l'Energie (OME), October 2001

[45] Obviously for gas, such a guarantee can only be given where the relevant transmission and distribution infrastructure is available.

[46] COM 2000/580

[47] UK will lift all supplier price controls from 2002.

Table 6 Maintaining Universal Service

	Supply guaranteed by:		Transmission charges vary by location	
	electricity	gas	electricity	gas
Austria	TSO reserve/ other suppliers	no information	no	yes
Belgium	DSO	no information	no	yes
Denmark	designated suppliers	designated suppliers	no	no
Finland	DSO	no information	no	
France	DSO	incumbent	no	yes
Germany	DSO	distributor	no	yes
Greece	incumbent (as DSO)	no information	no	
Ireland	incumbent (as DSO)	incumbent	yes	no
Italy	TSO	Ministry can act	yes	yes
Luxembourg	incumbent (as DSO)	incumbent	no	no
Netherlands	under discussion	designated suppliers	no	yes
Portugal	incumbent	na	no	
Spain	DSO	TSO	no	yes
Sweden	designated suppliers	na	yes	no
UK	TSO reserve/ other suppliers	TSO reserve/ other suppliers	yes	yes
Source: responses to Commission Survey				

Concerns regarding regional disparities in price levels have also been dealt with by most Member States. For most, transmission tariffs include a degree of postalisation whereby charges are uniform and do not include any locational element. This means that any additional cost of serving remote areas is spread across all users. Even where there are locational signal in transmission tariffs these have not yet led to an extreme effect on final customers' bills. The largest regional disparities tend to result where there are many different distribution companies, each with a different level of costs. A number of regulators and government agencies are currently examining whether such differences are justified, particularly Germany. By contrast in Italy, a compensation payment mechanism between distributors is in place to ensure equalisation of distribution tariffs.

Vulnerable Groups

When considering energy price for certain disadvantaged groups of customers, there appears to be two main approaches:

- In Austria, Germany, Netherlands, Luxembourg and the Nordic countries it is considered that the social security framework adequately takes into account energy prices so as to rule out the need for special measures relating to gas and electricity payments,

- In other countries obligations are placed on both gas and electricity supply companies to offer certain concessions to vulnerable groups. For example;

    - Belgium, France, Greece, Ireland, Italy, Portugal and Spain impose special tariffs for those on low incomes and low energy users such as the elderly,

    - Belgium, France and the UK put restrictions on companies disconnecting both electricity and gas customers which have not paid and requirements to offer phased repayments of arrears,

- Prepayment meters are used in the UK and Belgium which allow payment in advance for electricity and these assist budgeting for low income households and in parts of Belgium a small amount of electricity is delivered free to all households.

Quality of Service

Many Member States have, through their regulators, imposed minimum obligations on service standards and sanctions in the event of a failure to meet the required level. A recent survey by the CEER[48] on this subject for the electricity sector set out polices adopted in Member States and the resulting performance standards. These targets relate both to service continuity and voltage levels required of network operators, and to customer service standards which are imposed on suppliers. Thus, where markets are open to competition, the ability to meet given minimum standards is a precondition for operation in the market. Certain minimum customer service standards may, in fact promote competition since they provide customers with assurance that new entrants will meet the same standards as incumbents.

Generally speaking respondents to the Commission's survey considered that standards of service following liberalisation improve in some respects due to the pressures of competition. Service standards are one element for which companies can compete. Even in the non competitive part of the business, it would appear that the creation of a separate regulator can lead to more effective measurement of performance and enforcement of targets.

4.3 Environmental Objectives

Market opening must be compatible with the environmental objectives of the Community. In particular, the competitive framework should support the efforts of Member States to increase the share of renewable energy in line with the indicative targets in the Directive on the promotion of electricity from renewables and to manage demand for gas and electricity in order to meet the commitments made at Kyoto. Research being conducted by the Commission suggests that, there are two main impacts of market opening on emissions[49].

Firstly, competition will lead to the more rapid retirement of older and less environmentally sound plant. For example new combined gas turbine plant has a 60% efficiency factor compared to 45% for even the best coal fired plant. However, at the same time, lower prices for electricity and gas will lead to greater energy consumption. Thus if appropriate measures are taken to limit demand and to maintain incentives for energy efficiency so that reduced prices do not lead directly to increased consumption, and to increase the level of renewables in generation, the creation of an internal market could lead to significant opportunities in environmental terms.

There is considerable scope for Member States to take measures to encourage the use of renewables in competitive markets through, for example, the imposition of obligations on supply companies or consumers through "Green Certificates" to source a certain amount of electricity from renewable sources. There is also scope to use more conventional State Aids within the framework of the Community guidelines on State aid for environmental protection[50]. These measures must, however, be cost-effective and proportionate to the

[48] CEER report on Quality of Electricity Supply

[49] Report for DG ENV and DG Energy and Transport by Environmental Resource Management (forthcoming)

[50] 2001/C 37/03. Official Journal C 37, 03.02.2001, pages 3-15

objective. The most popular measures used in Member States are set out in Annex H. The effectiveness of such policies can be gauged by an examination of the fuel mix of net new capacity added during the years 1995-1999. Wind energy alone comprises almost 20% of all net new capacity being added in Europe with natural gas fired generation representing the major new source with more than 50%.[51]

Member States can also use taxation policy to support environmental policy objectives. In many countries there are specific taxes on the use of gas and electricity over and above normal value added tax. Annex H also sets out the main energy taxes in place in Member States. The use of taxation instruments, for example, to increase the cost of carbon to reflect the externalities associated with its use, may prove to be a key instrument in reducing the energy intensity of economic activity. Depending on their nature such taxes will serve to reverse the negative environmental effect of any price reductions that are likely to result from liberalisation; but there will be an indirect benefit in the form of tax reductions elsewhere in the economy that could support other objectives such as competitiveness.

Finally the Commission itself has taken a number of initiatives. The Renewables Directive which was adopted in 2001 provides indicative targets for each Member State for green electricity production. Further Directives are planned for 2002 on Demand Management, Energy Use in Buildings and Cogeneration.

Since liberalisation has only recently started in many Member States it is too early to draw definite conclusions on its environmental impact. Until now most developments have been positive in that there has not been significant demand growth, cleaner gas fired plant is replacing older coal and oil capacity and a major increase in renewable energy has been recorded. However, most of these developments have taken place prior to full liberalisation and they may be difficult to sustain in a fully liberalised energy market without further policy measures.

4.4 Monitoring The Effects On Employment

In order to deepen its understanding of the impact of market opening on the employment situation in the energy sector, both with regard to experience so far and possible future trends, the Commission launched a study, which was completed in 2000. The results of this study were described in detail and conclusions drawn in the Commission Communication "Completing the Internal Energy" Market. The most important points are restated below:

- The number of people employed in the electricity and gas sectors decreased between 1990 and 1998[52], but market opening is only one of the reasons which have caused this development.

- The reduction of the workforce was coupled with a change of the skill profile required by the industry and the emergence of new business activities, such as energy trading, has brought about new jobs.

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[51] Report for DG Energy and Transport by Oxera et al (October 2001)

[52] On the basis of the available European and national statistics, it has been estimated that more than 250 000 jobs could have been lost in the sector between 1990 and 1998. However, statistics often only show employment developments in utilities as a whole and do not – in case of multi-utilities – differentiate between the different services provided, e.g. gas, electricity and water supply.

- Staff reductions have been effected so far in a sociably consensual manner, for instance by applying voluntary early retirement schemes coupled with retraining.

The survey undertaken in preparation of this Report has confirmed this analysis. A number of companies reported the number of employees that have left the company since market opening and stated the circumstances of these reductions. By far the largest part have been early retirements and compulsory redundancies have been the exception corresponding to less than 2% of any staff reductions. The survey has also shown that companies have also recruited new staff in the same period, in some cases the number of new personnel exceeds the redundancies.

Therefore the conclusions drawn in the Commission's Communication "Completing the Internal Energy Market" remain valid.

4.5 Public Service Conclusions

Market opening is fully compatible with maintaining public serve standards to customers in all aspects of supply. A range of mechanisms to guarantee security of supply are available, many of which are already being used by Member States.

The guarantee of universal service is a key objective of the Commission and there is an obligation on Member States to ensure this in the proposed amendment to the electricity Directive. Such measures appear to be in place in most Member States, usually by nominating default suppliers. Service standards have also been protected through licence obligations on supply companies and network operators to meet certain targets.

Finally, there is considerable scope for Member States to take measures to deliver environmental protection. The effect of the Commission's proposals are likely to be positive in that competition will mean inefficient plant is closed more quickly. However it is also clear that appropriate measures to incentivise renewable generation and to control demand are also necessary complementary measures.

5. OVERALL CONCLUSIONS

5.1 Unequal implementation of the electricity and gas Directives

With a few exceptions the electricity and gas Directives have now largely been transposed into national legislation. The objective of these measures is that large users of electricity and gas should be able to choose their supplier and indirectly, the electricity generator or gas producer/importer, from the whole range of energy companies active in the European Union. The Community's ultimate goal, as stated by the European Council at Lisbon, is the full opening of these markets to competition.

In many respects, there has been more rapid advancement than expected against this objective. This is shown by the current plans of Member States to go further than the current minimum standards in the existing Directives. However, at the same time, a few Member States have limited market opening to the minimum legally possible. For the Gas Directive, France has not yet adopted any implementing legislation, and Germany has yet to ensure a full legal framework.

In addition to these obvious differences, this report also finds that the detailed regulatory framework varies significantly. In particular, in some Member States there are certain conditions relating to third party access that are not conducive to a competitive market, which cause particular problems where there is insufficient unbundling of network operators, in particular;

i. for Germany, Austria and Portugal in particular, and to a lesser extent Spain; electricity network tariffs appear relatively high at an aggregate level and require justification or modification,

ii. for Austria, Germany, France, the Netherlands and Belgium, gas transmission tariffs have a structure that is not cost reflective, for example, by being based on distance; in addition, gas transmission tariffs in Sweden and Italy[53], appear relatively high,

iii. for almost all Member States there is a degree to which a few existing electricity generators have a dominant position in wholesale markets; this may, for example, mean that imbalance charges are unnecessarily high; France, Belgium, Portugal, Ireland and Greece have a particularly powerful incumbent company without any plans for divestment; similar concerns are valid for gas production and import,

iv. there are generally restricted opportunities for cross border trade, for both electricity and gas, due to the lack of a cost reflective tarification system and a lack of co-ordination regarding capacity allocation without sufficient information being made available.

It is crucial that such practices can be examined and evaluated by the competent authorities in each Member State in an effective way without excessive delays or costs being incurred by third party users of networks. In some cases it would appear that the regulatory framework is failing to achieve Member States' desired objectives in terms of the real level of market

[53] **updated 06/02/2002**

opening "on the ground". In addition, the internal market remains, to a degree, segmented with restricted competition across internal borders.

5.2 Consequences for consumers from unequal market opening

Unequal market opening has affected consumer choice. One indicator of the varied effectiveness of market opening legislation is the very different levels of switching in Member States. Generally, competition is more vigorous in those Member States which have either strong regulatory procedures, full ownership unbundling or preferably both of these. Full market opening has failed to deliver the same level of competitive activity where vertical integration is strong, and regulation is not effective.

More effective competition feeds through to price levels. Higher prices are still to be found in those countries with minimal market opening or apparently ineffective regulation of third party access. In addition, many Member States have only achieved price reductions for large consumers, apparently at the expense of other users. By contrast, for those with effective market opening at all levels, price reductions have been significant to all groups. As stressed on a number of occasions by representatives of small and medium companies, the fact that they are free to purchase energy in some Member States, but not in others, results in considerable distortions of competition.

5.3 Consequences for energy companies from unequal market opening

Unequal market opening may also distort the competitive position of the energy companies themselves. This affects the motivation of Member States to exceed the minimum market opening requirement in the Directive since they see their national energy companies losing business to, or being vulnerable to takeover by, companies whose domestic markets are not fully opened.

This is particularly regrettable since major EU electricity and gas companies are endeavouring to transform themselves from national single product companies to pan-European, multi-product companies. The ability of an electricity company to develop a pan-European presence in the next few years, which can best be achieved through acquisition, will to a significant extent determine its commercial success in the internal market in years to come. A company operating in a jurisdiction that has limited market opening has a real and significant competitive advantage over its competitors in neighbouring countries where all customers are free to choose their supplier. A large captive customer base, whether legally protected or otherwise, provides a guaranteed market share and revenue, which provides financial stability and finance to acquire assets abroad.

This situation may be worsened due to different ownership structures. In some countries, almost all activities – generation, transmission and distribution – are in public hands and organised within a single company. This means that competitors cannot acquire generation capacity in that Member State. In addition, such a company may also be able to acquire advantageous financing rates, as they typically receive an AAA+ rating due to the fact of state ownership, and the implicit financial guarantee.

5.4 Effect of market opening on other energy policy objectives

Regarding other energy policy objectives such as security and quality of supply, promotion of renewables and demand management and protection of vulnerable customers, the information collected by the Commission clearly indicates that, where properly organised and regulated,

market opening does not lead to problems with security of supply or standards of service. Neither does it impede environmental policy or lead to unacceptable social consequences.

In particular, regarding security of supply, many Member States have a framework where a combination of liquid wholesale and bilateral markets together with the continued possibility of bilateral contracts - which were not permitted in California prior to the electricity supply crisis – will give sufficient incentives to make new capacity available. Other measures such as availability payments or compulsory reserve margins or gas storage can also be envisaged in order to guarantee supply at the very highest peaks or during adverse weather conditions. It is also worth recalling here that the Commission recently adopted a methodology for dealing with stranded costs arising from bilateral agreements made before the entry into force of the Directives. Safeguards therefore exist to prevent disruption of energy supplies.

Although electricity markets that have already liberalised have seen some movement towards lower reserve margins, this reduction in excess capacity should be seen as a rational response to the market arrangements rather than a supply problem. Furthermore, as re-inforced in the Commission's proposals, Member States and Regulators will play a vital role in providing a safety net to ensure adequate reserve margins by providing an annual report to the Commission on the supply-demand situation.

Market opening itself will have both positive and potential negative effects on environmental objectives. Nevertheless environmental targets can be, and are being, achieved through other supportive measures which are being pursued vigorously in all Member States with the support of the Commission which will mean that market opening will be accompanied by significant environmental benefits. Some 20% of newly commissioned generation capacity in 1999 was wind powered. Fiscal measures have also been very effective in controlling energy demand in some countries, for example in Denmark. Individual Member States' activities are backed up by a range of Commission initiatives in this area including the Renewables Directive and the proposed Directive on Energy Taxation[54]. Further legislation is planned for 2002.

Regarding public service, information provided to the Commission suggests that there should be no difficulty in maintaining public service standards and reasonable prices to all consumers. For example severe geographical price divergence within countries have been avoided through the imposition of certain tariff structures on network operators. In addition, regulators in many Member States have taken on the task of the protection of vulnerable groups and the safeguarding the standard of supply provided to customers; from both incumbent operators and new entrants. Finally the Commission is proposing comprehensive consumer rights in the Annex to the proposed Directive amendment.

5.5 The Commission's Proposals Restated

The results of this benchmarking exercise raise clear questions about whether partial market opening, and the limited structural reforms envisaged in the current Directives, are working satisfactorily towards a real competitive internal market; even for the large users of energy which are eligible to choose supplier.

The current position is not acceptable since it places some EU companies at a significant competitive advantage compared to others, due to the simple fact that some Member States have chosen to open their markets more quickly than others. It is precisely these reasons that

[54] COM (1997)30

led the Commission to propose the modification of the gas and electricity directives[55]. This modification proposes:

- Member States open all non-household electricity customers to competition by 1 January 2003, non-household gas customers by 1 January 2004, and all customers (including households) by 1 January 2005;

- Member States provide equivalent high minimum standards of qualitative market opening, in particular, regulated third partly access and unbundling;

- Member States will provide a universal service for electricity supply at a reasonable price and fulfil a minimum set of customer protection provisions. Member States will continue to be able to impose non-discriminatory requirements relating to security of supply and will be required to designate a body responsible for monitoring the supply-demand position;

- the proposed Regulation on Cross Border electricity transactions[56] will permit increased competition by removing barriers for the import and export of electricity.

At its meeting of 20 June 2001, the Commission reiterated the need for rapid adoption of this package in order to avoid distortions of competition.[57] Furthermore, and equally if not more important, it is necessary to ensure competitive energy prices, increasing competitiveness of Community industry and thus securing employment. It also stated that in the event of a lack of progress in implementing the proposed measures, the Commission may consider whether it should take action in its own right on the basis of Article 86 of the Treaty.

[55] 2001/0077 COD
[56] 2001/0078 COD
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ANNEX A ACCESS TO THE ELECTRICITY NETWORKS

Introduction

Third party access to both the transmission and distribution network is the key to effective competition. This is particularly important where network operators are vertically integrated with companies in the competitive parts of the market. There are two key criteria to determine whether there will be effective competition where vertical integration exists. Firstly charges must not be discriminatory. This means that tariffs and conditions offered to third parties should be consistent with those made to the network operators' affiliated companies. The second criterion is cost reflectiveness. If tariffs charged by network operators lead to excessive profits, there is a risk that this could be used to distort the competitive part of the market through cross subsidy.

Transmission Network

The transmission network is usually defined as cables which can carry electricity at voltage levels above 220kV. Indeed most of the transmission network is rated at 380kV or higher.

Tariff Structure

The Commission launched a study during 2001 to assess the transmission tariff structure and levels in place in each Member State for electricity.[1] The main results of this detailed review in terms of tariff structure are summarised in Table 1 below.

Table 1 Structure of Transmission Charges

% of total charges dependent on	Generation			Load				
	Fixed tariff (per connection)	Capacity (KW)	Flow (MWh)	Fixed tariff (per connection)	Capacity (KW)	Flow (MWh)	Charges vary by location?	Charges vary by time of day?
Austria	-	-	9	-	27	64	no	no
Belgium	no G charge				68	32	no	no
Denmark (E)	no G charge			-	-	100	no	yes
Denmark (W)	-	-	21	-	-	79	no	yes
Finland			7	-	-	94	no	yes
France	no G charge			-	54	46	no	yes
Germany	no G charge			-	81	19	no	no
Greece	30			70			no	no
Ireland	-	17	2	-	34	47	y: capacity charge	yes
Italy			13	1	25	61	y: loss charges	yes
Netherlands	2		21	2	31	44	no	(yes)
Portugal	no G charge			-	59	41	no	yes
Spain	no G charge			-	28	72	no	yes
Sweden	-	22	14	-	23	41	y: capacity and loss charge	yes
UK (E&W)	-	20	9	-	54	18	y: capacity and loss charge	yes
Norway	-	38	6	-	53	3	y: loss charges	yes
source: Comillas study for DG Energy and Transport								

A common feature of all transmission charges is that there are separate payments made for entry into the system for generators (the G charge), and exit from the system which is

[1] Report for DG Energy and Transport by Comillas (forthcoming)

allocated to consumers who extract electricity (the L charge). In all cases, apart from Norway the L charge contributes, on average, more than 70% of total income to the TSO. Some Member States have zero G charges such as BE, DK (East), FR, DE, PT and SP.

A number of different parameters may be taken into account. However the bulk of charges usually relate to the capacity of the connected facility or the total amount of electricity transported. These charges may be uniform ("postalised") or vary according to the input and offtake point of the electricity concerned, thus giving locational signals. There may also be differences depending on the time of day or year that a transportation is to be carried out.

Separation of entry and exit charges allows third parties the flexibility to changes their energy sources or change their customer base without the need to repeated negotiate new access terms. This is an important way of ensuring non-discriminatory access. It also increases the liquidity of wholesale markets as electricity can be traded on an "entry-paid" basis without any need for a different wholesale price for energy injected at each location.

Transmission Charge Levels

Using the information collected, estimates of transmission prices for certain standardised customers have been produced. These exclude charges relating to public service obligations or levies to finance sunk cost obligations.

Table 2 Transmission Tariff Levels

	"Baseload" transmission charge[2] €/MWh	"Factory" transmission charge [3] €/MWh
Austria	6.1	7.1
Belgium	5.7	8.8
Denmark (E)	4.4	6.5
Denmark (W)	8.6	5.2
Finland	3.0	3.7
France	5.9	8.3
Germany[4]	3.3	5.2
Greece	4.8	6.3
Ireland	5.2	6.6
Italy	5.6	7.8
Netherlands	3.6	4.2
Portugal	5.5	8.0
Spain[5]	7.3	10.4
Sweden	2.0	3.0
UK (E&W)	5.0	8.1
Norway	2.3	4.4

Table 2 shows some variation in tariff levels. These disparities need to be evaluated since although they may reflect real differences in the conditions in which TSOs operate, there is also the possibility that high transmission charges may not be cost reflective and lead to market distortions. Only a detailed examination of costs can reveal whether the average or typical charges of TSOs are cost reflective, or whether there are excessive profits.

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2 Flat consumption of 7MW for 8760 hours per year

3 Constant load of 15MW during 0800-2400. No load at weekends.

4 The different TSOs in Germany show a wide range, representative intermediate values have been used here

5 Data for Spain includes regulatory charges, for example recovery of generators' stranded costs

Distribution Network

Very few final customers are connected directly to the transmission network. Therefore, local distribution networks also need to provide non discriminatory access. Where market opening is limited, access may only be to the high (usually 50-110kV) or medium voltage (15-50kV) network. However with full market opening, all of the distribution network down to the lowest 0.4kV level may will be used by third parties and tariffs and conditions will need to be offered. Again both tariff structure and the level of tariffs are relevant and it is particularly important to avoid excessive tariffs and potential cross subsidies since this could affect the ability of entrants to compete.

A survey of distribution tariffs conducted by Eurostat, as well as information provided by the Comillas study for the Commission has been used to construct tables 3 and 4 for the relevant Member States. It is important to remember, however, that some Member States often have a large number of distribution companies and the terms offered may differ considerably within countries as a result. In some cases therefore, the tables report estimated tariff structures and levels in major European cities.

Table 3 Electricity Distribution Tariffs: Medium Voltage Network

	Number of distribution companies	Estimated average charge (€/MWh)[6]	Approx. range high-low (€/MWh)	Example DSO component for household in:	Fixed annual tariff (€/connection)	Capacity (€/KW)	Flow (€/MWh)	**Estimated charge (€/MWh)**
Austria	150+	22	18-33	Vienna	-	44	12	**21**
Belgium	50-70	15	n.a.	**National**	1000	60	3	**15**
Denmark	80	13	n.a.	Copenhagen	-	-	28	**28**
Finland	107	14	n.a.	Helsinki	2691	11	15	**17**
France	171	10	n.a.	**National**	808	26	4	**10**
Germany[7]	900+	n.a.	15-30	Munich	-	59	6	**18**
				Hamburg		49	8	**18**
				Berlin	-	67	9	**22**
Italy	171	15	n.a.	**National**	n.a	n.a	n.a.	**15**
Ireland	1	10	n.a.	**National**	2200	16	6	**10**
Netherlands	18	8	7-10	ENECO	2180	37	1	**9**
Portugal	1	19	n.a.	**National**	-	81	3	**19**
Spain[8]	c.400	16	n.a.	**National**	-	6	15	**16**
Sweden	204	9	8-11	Stockholm	1586	37	2	**9**
UK	15	10	8-13	London	790	21	3	**8**
				Glasgow	n.a.	n.a.	n.a.	**12**

Source: Eurostat Survey, Comillas Study, DG Energy and Transport

[6] For customer with constant load of 15MW during 0800-2400 (5840 hours). No load at weekends

[7] Not including KWK contribution. VDN estimates for a load of 5000 hours give a range €6-41/MWh

[8] Data for Spain includes regulatory charges, for example recovery of generators' stranded costs. Without these, the tariff is estimated to be < €10/MWh

Table 4 Electricity Distribution Tariffs: Low Voltage Network

	Number of distribution companies	Estimated average charge (€/MWh)[9]	Approx. range high-low (€/MWh)	Example DSO component for household in:	Fixed annual tariff (€/connection)	Capacity (€/KW)	Flow (€/MWh)	Estimated charge (€/MWh)
Austria	150+	66	43-83	Vienna	6	-	53	**54**
Denmark	80	20	n.a.	Copenhagen	-	-	52	**52**
Finland	107	26	n.a.	Helsinki	8	-	27	**28**
Germany	900+	65	35-80[10]	Munich	24	-	53	**58**
				Hamburg	-	12	44	**57**
				Berlin	-	-	55	**55**
Ireland[11]	1	33	n.a.	**National**	41	-	28	**33**
Netherlands[9]	18	35	26-49	ENECO	6	-	30	**31**
Spain[12]	c.400	49	n.a.	**National**	-	8	41	**49**
Sweden	208	30	25-40	Stockholm	159	-	15	**37**
UK	15	24	18-38	London	35	-	16	**21**
				Glasgow	19		31	**34**
Source: Eurostat Survey, Comillas Study, DG Energy and Transport								

For distribution, tariffs normally have a postalised structure and the charge made at any particular connection voltage includes any transport and distribution at higher voltages for the customer in question. There are some differences in the prevalence of capacity related or total flow related charges which are likely to reflect different local concerns.

The main differences are therefore the level of tariffs shown, which in absolute terms are much larger than for transmission and will, of course, have a much bigger impact on the prices offered to final customers. The tariff levels in certain countries look particularly high, for example Austria, Germany and Spain. A further point worth noting is that indicative tariffs quoted in regimes with negotiated third party access may not be adhered to by local distribution companies.

Balancing

Another important part of the access conditions are the arrangements in place for balancing input to and withdrawal from the network. If conditions for balancing are restrictive and do not provide adequate flexibility then this will constitute a barrier to those who wish to use the network. Furthermore, where balancing is provided by a vertically integrated company, it is important that charges are cost reflective and non-discriminatory in the same way as for transportation and distribution tariffs.

Electricity networks must balance at all times. However suppliers may not be able to guarantee that the electricity purchased by their clients will, at all times, match the amount of electricity they have contracted to buy from generators. Therefore, some mechanism is needed whereby balancing or "regulating" energy is provided if suppliers are short of energy and also for disposing of excess energy injected into the network by generators if customers take less than expected.

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[9] For typical customer: demand 7500KWh per year.

[10] VDN estimates for customers with demand 3500KWh/year.

[11] Market 100% open for customers purchasing renewable energy.

[12] Data for Spain includes regulatory charges, for example recovery of generators' stranded costs. Without these, the tariff is estimated to be < €30/MWh

Balancing mechanisms have a number of common features. Firstly, there is a settlement period over which imbalances are assessed, with any imbalance over a shorter duration than the settlement period absorbed by the TSO. Secondly, there may be opportunities for market participants to minimise their imbalances in the time before individual settlement periods by trading between themselves before "gate closure", the time at which point imbalances are measured.

Finally some mechanism is required for determining charges for those network users who are unable to remove all their imbalances. If suppliers use more energy than they have contracted for delivery to them in the period concerned, they will be liable to pay a "top-up" charge for the extra electricity needed. If, on the other hand, they deposit more electricity on to the network than their customers actually use, then they will receive a price for the excess electricity; a "spill" price. These prices may be determined by a market mechanism, or there may be an administered charge. In most cases the administered charge varies according to the degree of imbalance and the time of day or year.

Table 5 Electricity Balancing Arrangements

	Balancing period	Liquid wholesale market for balancing period	Method used to determine imbalance charges	Top-up energy sourced from	Load profiling
Austria	¼ hour	N	M	lowest bids	P
Belgium	¼ hour	N	T	tender process	Y
Denmark	1 hour	Y	M	lowest bids	P
Finland	1 hour	Y	M	lowest bids	Y
France	½ hour	N	R (M from 2002)	tender process	N
Germany[13]	¼ hour	N	M from 2002	lowest bids	Y
Greece	n.a.	N	no information available		N
Ireland	½ hour	N	M(spill)/R(top up)	lowest bids	P
Italy	n.a.	N	M from 2002	n.a.	N
Netherlands	¼ hour	N	M	lowest bids	P
Portugal	½ hour	N	R	n.a.	N
Spain	1 hour	unclear	M	intra-day markets	N
Sweden	1 hour	Y	M	lowest bids	Y
UK	½ hour	Y	M	lowest bids	Y
			Market : M TSO fixed price: T Regulated: R		P = planned
Source: Responses to Commission survey					

Table 5 above summarises the balancing regime in each Member State. A number of these arrangements have the potential to lead to significant costs for new entrants. For example, in many Member States there are insufficient arrangements to trade away imbalances, in particular where there are limited wholesale markets, or these markets operate with a different time basis than the settlement period for imbalances.

Even where adequate wholesale markets exist, serious problems may be caused if there are only one or two dominant generators. This means that any new entrants without their own

[13] RWE and EoN already have a market mechanism in place. HEW, EnBW, BEW and VEAG have a fixed price system but will move to a market mechanism in 2002.

local generating or import capacity will be obliged to negotiate with their own competitors if they wish to trade away their imbalances. Further, if imbalances cannot be minimised, they will be exposed to a balancing market where, in all likelihood, prices will be determined by bids from the same incumbent generators. Such markets therefore may need to be closely regulated.

Finally, where markets are fully open to competition smaller customers are included whose consumption is only measured on an annual basis and whose meters are only read rarely. This creates an issue regarding balancing since suppliers cannot measure exactly how much electricity they are delivering to their customers in each settlement period and it is not possible to tell whether they are in balance or not. The solution generally used is to make an assumption about the load profile of certain groups of customers and use this to assess the balance position of supply companies. Again, any costs resulting from inaccuracies in this approach are socialised. The existence of load profiling is a necessary condition for full market opening and the above table also sets out plans whether this is in place or not in each Member State.

Connection to the System

As well as annual charges, the method used to calculate the appropriate charge to connect users to the network also varies between Member States. The important consideration here is the extent to which newly connected facilities should expect to pay for any re-inforcement of the transmission network that may be required as a result of their being connected. A policy of shallow charges means only the direct connection costs are included with all users contributing to any reinforcements. A policy of deep charges means that all costs are included for an individual user. Of the Member States, most use shallow costs only as a basis for charges. The exceptions are Belgium, Germany and France which may allow deep costs to be recovered.

Where connection implies firm access it is often the case that new generation capacity may have to wait until any necessary re-inforcements have been completed as in the UK, Ireland, France and the Netherlands. Such a regime requires close regulatory scrutiny of the behaviour of the TSO or system owner, particularly for vertically integrated companies.

Conclusions

Some progress has been made in terms of creating a consistent set of network access conditions within Member States. Similar tariff structures have been chosen for transmission and distribution. The main obstacles for competition that remain appear to be the high level of distribution tariffs faced in some regions of Member States and asymmetric balancing regimes that often result from dominance of the market for generation. Continued effective regulatory oversight of this issue is therefore required.

ANNEX B ACCESS TO THE GAS NETWORK

Introduction

As with electricity, market entrants will only be able to compete in the gas market if they have fair access to networks. The same criteria of non-discrimination and cost reflectiveness apply. Non discrimination, i.e. that tariffs and conditions offered to third parties should be the same as those offered to the network operators' affiliated companies, is particularly difficult to verify for gas since the degree of unbundling is less than for electricity and potential cross subsidies are also more difficult to detect.

Transmission Network

The national or super-regional transmission network in any Member State is usually defined as those pipelines above a certain diameter (for example 900mm) or pressure level (e.g. 75 bar). However in some cases, pipelines with smaller specifications may also have the capability to transport gas across different regions without being considered as a national system. Most Member States have only one transmission network, although others such as Germany have several.

Tariff Structure

A number of investigations have been carried out by various market participants[1], as well as DG Energy and Transport, into the structure and level of transmission tariffs. A summary of the results from these are contained in the Tables 1 and 2 below

Table 1 Gas Transmission Tariff Structures

% charge dependent on	Fixed Charge	Capacity charge	Flow charge	Minimum Contract period	Locational signals
Austria	-	82	18	1 year, shorter contracts available at a premium	point-point/ distance
Belgium	6	88	6	1 year	point-point/ distance
Denmark	-	92	8	1 year	postalised
France	7	78	15	1 year	point-point/nodal
Germany	-	85	15	1 year, shorter contracts available at a premium	point-point/ distance
Ireland	-	88	12	not known	entry/exit
Italy	-	depends on entry/exit co-ordinates		not known	entry/exit
Luxembourg	-	98	2	1 year	postalised
Netherlands	-	87	13	1 year (1 month from 2002)	point-point/nodal from 2002
Spain (excludes regasification)	-	66	34	1 month	postalised / small DR component
Sweden	2	85	13 (peak flow)	1 year	postalised
UK	-	depends on auction results		1 day	entry – auctions exit zonal
source: DG Energy and Transport					

[1] For example the report by the Brattle Group for EFET

Generally the bulk of charges fall on capacity and this proportion exceeds 70% in most Member States. For many countries capacity charges are purely related to the distance along the point-to-point contracted path and there is no separation of entry and exit charges as for electricity. The exceptions to this are the UK, Italy and Ireland where entry-exit charges mainly apply and Luxembourg, Sweden and Denmark where charges are currently postalised.

It is becoming increasingly clear that a point to point charging structure can be a clear barrier to new entrants particularly if contracts for transmission capacity have to be agreed for a period of one year. This structure gives no opportunity for suppliers to change their portfolio of clients without negotiating a new transmission contract and increasing its overall transmission costs. Distance related tariffs are not necessarily cost reflective since most networks have several gas entry points and in such a case the physical path of gas transported does not always match the contracted path. They may therefore reduce competition to smaller geographical areas close to the sources of gas.

In addition, distance related tariffs tend to prevent the development of a liquid wholesale market since the price customers are willing to pay for gas will depend on their location and the injection point for which there may be a large amount of combinations. It is also worth noting that a system based on an entry-exit approach can implicitly, and often does, include a distance related element where this is cost reflective while at the same time reflecting the actual flows in the network.

Tariff Levels

Table 2 Estimated unit costs of transportation over 100, 200 and 300 km.

€/MWh	**100 km**	**200 km**	**300 km**
OMV (AT)	0,47	0,85	1,24
Distrigas (BE)	0,44	0,79	1,12
BEB (DE)	0,78	1,53	2,28
Ruhrgas (DE)	0,42	0,78	1,14
Thyssengas (DE)	0,42	0,79	1,15
VNG (DE)	0,44	0,83	1,19
WINGAS (DE)	0,41	0,75	1,10
DONG (DK)	0,84	0,84	0,84
Enagas (ES)	1,26	1,34	1,42
GdF (FR)	0,49	0,85	1,20
BGE (IR) (without I/C)	1,38	1,38	1,38
RETE GAS (IT) (low)	1,60	1,60	1,60
RETE GAS (IT) (high)	2,47	2,47	2,47
Soteg (LX)	0,88	0,88	0,88
Gasunie (NL)	0,36	0,65	0,65
VN (SV)	1,88	1,88	1,88
Transco (UK) national average	0,45-1,11		

Regarding the level of transmission tariffs, it is possible to estimate these for a "typical" transportation contract. Details of the assumptions behind this calculation are provided in the Appendix to this Annex and the results are set out in the Table 2 above.

Clearly Table 2 demonstrates that the results of any comparison of tariffs will vary according to the parameters chosen. However at a broad level it is possible to conclude that network access is relatively inexpensive in the Netherlands and UK network across all distances. Whereas costs tend to be higher on the Swedish and Italian networks.

Distribution Tariffs

Tariff Structure

As with electricity, most customers will be connected to the gas distribution networks rather than directly to the transmission grid. The distribution network is often divided into the regional transmission network and the local distribution network. The regional network is at medium pressure, with the local system usually including the network with a pressure below 6-7 bar.

These networks may be owned by the same company in each Member State, with a combined tarification structure. Alternatively, it may be that a separate contract is required with a different company at each network level. The main characteristics of distribution networks in selected Member States are reviewed in Table 3 below.

Table 3 Distribution Network Characteristics and Tariff Structures

	TSOs high pressure	Tariff structure	Regional network (medium pressure)	Tariff structure	Local networks (low pressure < 7 bar)	Tariff structure
Austria	1	distance related	9	distance related	25	postalised
Belgium	1	distance related	1	distance related	50-70	n.a.[2]
Denmark	1	postalised	1	postalised	no separate local networks	
France	3	distance related	3	distance related	mostly GDF/GSO/CFM	related to transmission tariff
Germany	5	distance related	not known	postalised and distance related	700+	postalised
Italy	1	entry-exit	2	postalised	c.800	postalised
Netherlands	1	distance related	1	postalised	10-20	n.a.[2]
Spain	1	mainly postalised	16	postalised	no separate local networks	
UK	1	entry-exit	1	postalised	no separate local networks	
source: DG Energy and Transport						

As shown in the table, the tariff structure for both regional and local networks varies by Member State and also between local distribution companies in the same Member State. Generally regional network tariffs have the same structure as national tariffs. So where national transmission is on a distance related basis, regional networks are also on this basis.

[2] very few eligible customers are connected to the low pressure network in NL and BE

Charges for the use of the local distribution network are postalised in all cases with no distance related components.

Tariff Levels

The overall charge to be paid by any particular customer will depend a great deal on the tariff structure and the system of ownership in place in each Member State. For those Member States with several network levels, each owned by different companies, the network tariff may vary considerable depending on the location and connection point of the customer, the contract path and, in some cases such as Germany, the diameter of the network along that path. In other Member States no distinction is drawn between customers which are connected a different pressure levels and network tariffs are determined according to consumption characteristics.

Table 4 Distribution Network: Preliminary Estimated Charges

Charge €/MWh	Large User 25mill. m3/year				Small Commercial 0.1mill m3/year	
	Regional network 50km	plus local network	Regional network 100km	plus local network	Regional network 50km plus local	Regional network 100km plus local
Austria[3]	case specific	+1.3	case specific	+1.3		
Belgium[4]	0.7	n.a.	1.4	n.a.		
Denmark	2.4		2.4			
France	1.3		n.a.			
Germany[5] (Hamburg)	0.8-2.6	2.1-3.9	1.6-5.1	2.9-6.4	8.8-12.5	10.4-17.7
Germany (Berlin)	0.9	2.4	0.9	2.4	10.6	10.6
Germany (Munich)	0.9-1.6	2.3-2.9	0.9-1.6	2.3-2.9	9.2-10.4	9.2-10.4
Italy	included in national	n.a.	included in national	n.a.		
Netherlands	0.3	n.a.	0.3	n.a.		
Spain	0.5	n.a.	0.5	n.a.		
UK	1.1		1.1		4.0	4.0
source: DG Energy and Transport						

Table 4 above contains preliminary estimates of the relevant distribution charges in different circumstances using examples from certain Member States such as Germany with a large number of network operators. The calculation of these estimates is set out in detail in Appendix 2. Clearly the Member States with the lowest regional distribution tariffs are the Netherlands, Italy and Spain and this may serve to offset higher transmission tariffs for the last two. Charges in other Member States are all markedly higher, particularly those in Denmark and, in some circumstances, Germany. For network access to smaller customers, the

[3] based on Steierische Ferngas and Ober-Osterreich Ferngas
[4] Based on pipe diameter of 350mm
[5] Range depends on diameter of pipeline on which regional transportation is carried out. Pipeline below 350mm diameter is the most expensive

examples used for Germany generate significantly higher charges than those for the UK, the only other Member State with 100% declared market opening.

Balancing

Balancing is also an important issue in the gas market in that charges may be made by TSOs where less (or more) gas is input by the supplier compared to the consumption of its customers. The TSO has either to make available additional gas, or dispose of the excess amount.

This type of balancing can be easier than for electricity since transmission companies do have the possibility of compressing the volume of gas in networks to deal with imbalances (known as line-pack). This means that balancing periods can be longer than for electricity and there can exist tolerance limits where no charges are made. In addition, gas, unlike electricity, can be stored.

The regime for balancing and storage are just as important for third party users of the network as tariffs themselves. These need to operate in fair way to ensure that conditions are non-discriminatory. These are reviewed in Tables 5 and 6 below.

Table 5 Gas Balancing Arrangements

	Balancing period	Liquid Wholesale market	Tolerances	Method used to determine imbalance charges	Average top-up price
Austria	Contract period		2%	Not applicable	
Belgium	Hourly	Y		Imbalances not permitted unless flexibility service is purchased: Volume: €3.2/m3 Capacity: €18.1(m3/h)	
Denmark	Hourly	N	20%	Standard tariffs	selling price: €50/MWh - €82 /kWh
France	Daily	N	20% up to 1000MWh/d 5 % beyond that level	**GDF:** Buy: 0.5 x daily reference price. Sale:1,5 x daily reference price Daily reference price taken from "Zeebrugge-Hub plus surcharge of 1,50/MWh.	Example: ZB price = €11/MWh buy at (11+1,50) *0.5 = €6,25/MWh sale at (11+1,50)*1.5 = €18.75/MWh
Germany	Instantaneous	N	15%	**Ruhrgas:** Minimum 100km transportation buy price: 0.5 x border gas price sell price: 1.7 x border gas price	
				Thyssengas: Minimum 100km transportation Buy: 0,25-0,5 x border gas price Sell: 3,0 –5,0 x border gas price	Example: border price = €11/MWh buy at 11 * 0.5 = €5,5/MWh sale at (11*3 = €33/MWh
				VNG: Buy: 0,2-0,4 x border gas price Sell: 2,6-5,2 x border gas price	Example: border price = €11/MWh buy at 11 * 0.4 = €4,4/MWh sale at (11*2.6 = €28,6/MWh
				WINGAS: WINGAS offers an extended balancing by increasing the hourly flexibility up to 50 % of the maximum hourly transportation capacity, if needed. This additional flexibility will be charged with a fee of €71,5/(m³/h). Otherwise imbalances are seen as breach of contract.	
				BEB: Minimum 100km transportation BEB is entitled to charge the transport customers payment for positive and negative deviation volumes at a price of TDPV and TDPE respectively. These prices are not published but are currently in the order of 1.5 and 0.5 respectively.	
Ireland	Daily	Y- via I/C	8% up to 1500 GWh 3% above that level	Buy = 0.5 x fixed balancing price Sell = 2.0 x fixed balancing price or use UK balancing prices if they are higher	The cost of the balancing is determined by the daily market of gas
Italy	Monthly but Enel on a daily basis		Maximum daily allowed off-take 1,3 x daily contract	Not applicable	Balancing costs included in total supply costs for final customers
Luxembourg	Daily		5 % during summer 3% during winter	€13/"unit" multiplied by up to 2,5% excess:1 –2 2,5%-5% excess : 2,5-4,5 >5% excess: 4,5-9,0	up to 9 x 13 = €117/MWh
Netherlands	Hourly (Daily from 2002)	N	2%	From 2002 Buy = 0.5 x fixed gas price Sell = 2 x fixed price	Example: border price = €11/MWh buy at 11 * 0.5 = €5,5/MWh sale at 11*2 = €22/MWh
Spain	Daily	N	Detailed balancing and operational rules are currently being developed. So far, access has not been prevented due to flexibility/balancing constraints. Balancing penalties have not yet been applied in practice.		
Sweden		N	Detailed balancing and operational rules are currently being developed		
UK	Daily	Y – NBP	zero	highest priced TSO trade sets the system buy price lowest priced TSO trade sets the system sell price. OR average price paid ± €0.5/MWh if higher.	

Table 6 Gas Storage Arrangements

	Storage volume bcm (% annual consumption)	Conditions for access to storage	Method for setting charges	Charge
Austria	2.6 (33%)	No access	n.a.	n.a.
Belgium	0.7 (5%)	Modulation service as part of transportation contract based on linepack	Charges set by TSO	Volume: €3.2/m3 Capacity: €18.1(m3/h)
Denmark	0.7 (17%)	Modulation service as part of transportation contract through a virtual balancing storage (the use of which does not require nomination).	Charges set by TSO	Tariff for balancing storage: 0.245 DKK/kWh/year. (€0.35/m3/year) Tariffs for access to seasonal storage are being developed.
France	10.4 (28%)	Modulation service as part of transportation contract	Charges set by TSO	Capacity Reservation: up to €10/MWh/year total storage required [€0.11/m3].
Germany	14.1 (17%)	**Ruhrgas:** storage available	Charges set by TSO	Storage fees 150€/(m3/h)/y for withdrawal capacity 40 €/y and contract for system charges
		Thyssengas	Charges set by TSO	Injection capacity €45/(m3(h)/y Withdrawal capacity €13/(m3(h)/y variable charge 9 cent/max m3 stored/y
		VNG	Charges set by TSO	n.a.
		WINGAS offers storage services	Charges set by TSO	Injection capacity €56/(m3(h)/y Withdrawal capacity €81.5/(m3(h)/y plus service component €2.30//(m3(h)/y variable charge 0.0562cent/max m3 stored/y
		BEB	Charges set by TSO	withdrawal capacity Poren Speicher €64/y/package (1000m3 volume, 0,47m3(h) exit capacity, 0,43m3(h) injection capacity Cavern speicher €180/y/package (100m3, 2,22m3(h), 0,67m3(h))
Ireland	No storage	n.a.	n.a.	n.a.
Italy	14.7 (26%)	Storage available	Charges set by TSO	capacity €0.564/GJ/year = €14/m3/year injection €0.2-0.6/(GJ/month)/d withdrawal €3.9-10.0/(GJ/month)/day
Luxembourg	No storage	n.a.	n.a.	n.a.
Netherlands	1.5 (4%)	Modulation service as part of transportation contract	Charges set by TSO	Capacity of hourly flexibility: 18,15 €/(m³/h)/y Volume of hourly capacity flexibility: 3,17 €/m³/h/y
Spain	1.1 (8%)	Standard transportation services include storage equivalent to 10 days of consumption.	Charges approved by Ministerial decree	Supplementary storage services are offered on the basis of a monthly payment of 0.753 ESP/m^3(N) multiplied by the monthly contracted storage capacity. €0.05/m3(N)/year
Sweden	No storage	n.a.	n.a.	n.a.
UK	3.5 (4%)	No conditions storage available to any potential user.	Auctions, with design subject to regulatory approval Bilateral deals for any unsold capacity	2000 Hornsea: 5.8p/(KWh/d) = €15/(m3/h)/y 1999 Rough: 10-11p/KWh/d = €28/(m3/h)/y

The least favourable conditions for market entrants are created where hourly balancing is required and where penalties for going out of balance are severe. Daily balancing is easier to achieve and the existence of high charges is less problematic. Hourly balancing applies in a number of Member States including, Belgium, Denmark, Germany and the Netherlands, although the Dutch TSO will move to daily balancing for 2002. In addition, some Member States such as Germany have high tolerance bands which may alleviate the difficulty of balancing to some extent. An alternative approach, as apparently used in Austria and Italy is too have longer periods for balancing such that TSOs carry out all balancing activities with the costs paid by the generality of customers.

Whatever period is used charges should ideally reflect the costs actually incurred by the TSO in offsetting the imbalances concerned. The existence of fairly arbitrary top-up and spill multiples is unlikely to be non-discriminatory.

Storage

Transmission system operators are required to make available access to storage to the extent that this is required for effective third party access. Clearly, this is more likely to be the case where the balancing requirements imposed on network users are strict and where high balancing charges apply.

Table 6 above sets out the main conditions and charges currently made for access to storage for the main TSOs in each Member State. It shows a range of different tarification mechanisms for providing storage and modulation services. Clearly access to storage is more important where balancing conditions are the most difficult to meet and where penalties are high. Therefore the limited amount of storage available in Belgium and Netherlands is likely to be problematic. Similarly where storage is not made available or is expensive, this is likely to restrict entry.

Ideally, limitations on access to storage should only be in place to the extent that the TSO requires storage for the management of the system, or to ensure security of supply. The availability of storage will create a more effective market for wholesale gas and increase flexibility available to market participants.

Conclusions

In contrast to the electricity market, progress has been slower in creating a set of coherent network access regimes. Differences in tariff structure between Member States are significant with many retaining systems with distance related elements. For transmission and distribution. The wide range of tariff levels is also an obstacle for new entrants. The regime for balancing and storage is also unsatisfactory in a number of Member States, particularly those with hourly balancing requirements and high charges for any deviations. Access to storage and other flexibility instruments is also highly variable. Only in a few cases are market based mechanisms or effective regulatory solutions in place to ensure cost-reflectiveness.

APPENDIX 1

CALCULATION OF ESTIMATED TARIFF LEVELS FOR GAS TRANSMISSION

General disclaimer.

Comparisons of access conditions are intrinsically difficult to make due to different circumstances prevailing and systems applied in different Member States. Due to different gas qualities, calorific values and many other different units applied, it would highly unlikely if the comparisons made below did not contain any errors. It may also be that some of the services compared contain different elements. Time has not allowed all assumptions, figures and calculations to be checked by gas companies. DG TREN intends to complete and correct the comparisons for any errors they may contain. DG TREN would therefore welcome any comments which readers may have on this document with a view to complete and improve it. The benchmarking made below merely compares published tariffs. It does not in any way attempt to answer the question whether tariffs are reasonable or to what extent they reflect actual costs.

Assumptions Used

A 100 km transportation through transmission network for an eligible customer using 25 million m^3 per year with a load factor of 0.7 (i.e. peak daily offtake 97,847 m^3 and peak hourly offtake of 4,077 m^3). Where transportation is explicitly diameter dependent (notably for some German gas companies), a 30" pipeline has been assumed. The same transportation service has been calculated for a distance of 200 km (and in the summary table results for 300 km have also been included).

It is assumed that 1 m^3 = 39 MJ (GCV) = 10.8 kWh. In cases where the calorific value of national gas qualities (such as in the case of Gasunie) have been published, these have been applied.
1 kWh = 3,600 kJ = 860 kcal.
Kilo = 10^3 Mega = 10^6 Giga = 10^9 Tera = 10^{12}
Annual offtake in Joules: 25 million m^3 = 25 million x 39 MJ = 975 million MJ = 975 TJ
Annual offtake in kilowatthour: 25 million m^3 = 25 million x 10.8 kWh= 270 million kWh = 270 GWh
Peak daily offtake in Joules: 97,847 m^3 = 3.816 TJ
Peak daily offtake in kilowatthour: 97,847 m^3 = 1.058 GWh
Peak hourly offtake in Joules: 4,077 m^3 = 159.0 GJ
Peak hourly offtake in kilowatthour: 4,077 m^3 = 44.03 MWh
A gas price of 22.5 pence/therm (Zeebrugge Hub price 20 October 2000) is applied for tariff elements relating to losses and fuel use.
22.5 pence/therm = 0.3808 €/therm (1 therm = 29.32 kWh) = 0.0130 €/kWh.

100 km transmission service.

Company	Total transport fee for the above service	Unit cost in €/MWh
OMV (A)	Distance capacity related element: 0,256 €/m3/h/km /y x 4.077m3/h x 100 km = 104.371 € System service element: 5,229 €/m3/y x 4.077 m3/y = 21.318 € TOTAL : 104.371€ + 21.318€ = **125.689€**	**0,47**
Distrigas (B)	Non-distance related element: 5,7 €/(m^3(n)/h)/year x 4.077 m^3/h = 23..239 € + Distance related element: 0,20€/(m^3(n)/h)/year x 4.077 m^3/h x 100 km = 81.540 € + Fixed element: = 7.190 € + Variable element: 0,2% of 270 GWh = 540.000 kWh x 0.0130 €/kWh = 7.020 € = TOTAL: 23.239 € + 81.540 € + 7.190 € = 111.969 € (for five year contract). For one year contract: 111.969 € x 1,08 (i.e. + 8%) = 120.926€ + 7.020 € (variable element) = **127.946 €**	**0,47**
BEB (D)	Distance/capacity/diameter related element: 54,80 €/(m^3N/h)/y x 4.077€/m^3/h x (100 km/110.2 km) = 202.740 € (this is based on pipeline section HT7-70 (Ellund-Quarnstedt) which according to European Gas Markets has a length of 110.2 km and which according to BEB has diameters of sections B and C of the Gas VV i.e. between 500-700 mm and between 700-1000 mm. 30" corresponds to 750 mm). + System service fee: 2,19€/m^3(n)/h)/year x 4,077 m^3/h = 8.929 € = TOTAL: 202.740 € + 8.929 € = **211.669€**	**0,78** **Note: This cost does not reflect transportation through a 30" pipeline and is therefore not comparable with other German gas transportation tariffs.**
Ruhrgas (D)	Distance/capacity/diameter related element: 0,237€//(m^3N/h)/km/a x 4.077 m^3/h x 100 km = 96.625€ + System service fee: 4,40€/m^3(n)/h)/year x 4.077 m^3/h = 17.939€ = TOTAL: 96.625€ + 17.939€ = **114.564€**	**0,43**
Thyssengas (D)	Distance/capacity/diameter related element: 0,24€/(m^3N/h)/km/a x 4.077 m^3/h x 100 km = 97.848€ DEM + System service fee: 4,35€ DEM/m^3(n)/h)/year x 4.077 m^3/h = 17.735€ = TOTAL: 97.848€ + 17.735€ = **115.583€**	**0,42**
VNG (D)	Distance/capacity/diameter related element: 0,25€/(m^3N/h)/km/a x 4.077 m^3/h x 100 km = 101.925€ + System service fee: 4€/m^3(n)/h)/year x 4.077 m^3/h = 16.308€ = TOTAL: 101.925€ + 16.3081€ = **118.233€**	**0,44**
WINGAS (D)	Distance/capacity/diameter related element: 0.23€//(m^3N/h)/km/a x 4.077 m^3/h x 100 km = 93.771€ DEM + System service fee: 4,3€/m^3(n)/h)/year x 4.077 m^3/h = 17.531€ = TOTAL: 93.771€ + 317.531€ = **111.302€**	**0,41**

DONG (DK)	Entry capacity charge: 1,19€/kWh/year x 44.030 kWh = 52.395 € + Exit capacity charge: 3,55€kWh/year x 44.030 kWh = 156.306 € + Volume quantity payment: 0.00007€kWh x 270 GWh = 18.900 € = TOTAL: 52.395€ +156.306€ +18.900 € = **227.601 €** **An additional fee is also payable to ensure connection in times of emergency fee. This fee is around €4/KWh(max hr)/year higher for customers with firm access.**	**0,84**
Enagas (E)	Fixed element: 0,19€/m^3(N)/day x 97.847 Nm3 x 12 (months) = 223.091€ + Variable element: 0.00009€/termie x 1 (100km) x 270 GWh/1.163 kWh = 22.325€ + Variable element: 0.1% of 270/(1-0.1%)GWh = 270.270 kWh x 0,0130 €/kWh = 3.514 € + Connection fee (for 12 months): 0,0004€/termie x 270 GWh/1.163 kWh = 93.485€ = TOTAL: 223.091€ + 22.325€ + 93.485€ = 338.901 € + 3.514 € (variable element) = **342.415 €** **including regasification** + Regasification charges: 0,18€/m^3(N)/d x 97,847m^3 x 12 = 211.350 € + Variable element: 0.0001€/termie x A GWh/1.163 kWh = 23.744 € + Share to cover losses and fuel consumption: 0.5% of A/(1-0.5%)GWh = 1,358,142 kWh x 0.0130 €/kWh = 17,656 € = **TOTAL including regasification**: 211.350€ + 23.744€ = 235.070 € = 235.094 € + 17,656 € (fuel/losses) + 342,415 € (transmission) = **595,165 €**	**1,27** **2,20** with regasification
Gaz de France (F)	Assume 100km corresponds to NTAD = 4. Off-take capacity charge (TCE): 18€/MWh/day/y x 1.058 MWh/day = 19.044 € + Transportation capacity (TCAP): 4 x 18€/MWh/day/y x 1.058 MWh/day = 76.176 € + Transported quantity (TQAP): = 4 x 0.018€/MWh x 270 GWh = 19.440 € + TFL (Delivery Fixed Term): 9.000 € per year = 9.000 € + TCL (Delivery Capacity Term): 9.00 €/MWh/day/year x 1,058 MWh/day = 9.522 € = TOTAL: 19.044 € + 76.176 € + 19.440 € + 9.000 € + 9.522 € = **133.578 €**	**0,49**

Bord Gais (IRL)	**Inch entry** Capacity charge: 310,943€ per peak day MWh x 1.058GWh = 328.978€ + Volume charge: €0.1607 per MWh transported x 270 GWh = 43.389 = TOTAL: 328.978€ + 43.389€ = **372.367€** **UK entry** Capacity charge: 580,910€ per peak day MWh x1.058GWh = 614.603€ + Volume charge: €0.3071 per MWh transported x 270 GWh = 82.917 = TOTAL: 614.603€ + 82.917€ = **697.520€**	**1,38 – 2,58**
RETE GAS (I)	Mazara del Vallo to zone Campania Entry charge €3,03/m3(d)/y Exit charge €0.52/m3(d)/y Capacity =(97.847kWh x 3,55€) = €347.357 Commodity charge €0,17/GJ = €0.64/Mwh Commodity = (0.64 * 270000) = €172.800 Fixed charge = €17.570 **Total = €537.727** Passo Gries to Emilia e Luguria Entry charge €0,34/m3(d)/y Exit charge €0.97/m3(d)/y Capacity =(97.847kWh x 1,31€) = €128.180 Commodity charge €0,17/GJ = €0.64/Mwh Commodity = (0.64 * 270000) = €172.800 Fixed charge = €17.570 **Total = €318.550** **Regional grid** Capacity charge = €1.312/m3(d)/y = 1.312 (1.801) * 97847 = **€128.375**	**1,18 - 1,99** excluding regional grid **1,60 - 2,47** including regional grid
SOTEG (LUX)	Capacity fee: €57 x 4.077m3/h = €238.389 Fixed annual charge = €6.000 TOTAL = **€238.389**	**0,88**
Gasunie (NL)	Entrance fee: 4,32€/m3/h/y x 4.077 x 1.108 (i.e. 39/35.17 MJ/m3) = 19.515€ + Distance related HTL transportation fee: 17,31€/m3/h/100km/y x 4.077 x 1,108 = 78.195€ = TOTAL: 19.515€ + 78.195€ = **97.710€**	**0,36**
Vattenfall Naturgas (S)	Administration fee: 2.532€ + Pressure reduction fee: = 7.595€ + Capacity charge: 109,36€/Nm^3/h x 4.077 m^3/h = 445.861€ + Peak load charge: 0,005 €/Nm3 transported November-March: 0.005 €/Nm3 x 150 days x 97.847 Nm3/day (assuming maximum daily off-take every winter day) = 73.385€ (or assuming average off-take every day in the year): 0,005 €/Nm3 x 150 days x 68.493 Nm3/day (average) = 51.370€ = TOTAL: 2.532€ + 445.861€ + 7.595€ + 73.385€ (max) or 51.370€ (min) = 5.015.859- 5.237;013 SEK = **507.385 – 529.373 €**	**1,88-1,96**

BG Transco (UK)	**Transmission charge based on overall weighted average entry capacity charge (derived by dividing the target revenue for entry auctions by forecast annual throughput) and Oct 2000 exit and capacity charges** Target entry charge = 0.012 p/kWh x 270 GWh = £32,400 Lowest exit charge (10/00): 0.0001 pence per peak day kWh per day (e.g. NE1) x 1.058 GWh x 365 days = £386 Highest exit charge (10/00): 0.0288 pence per peak day kWh per day (SW3)x 1.058 GWh x 365 days = £111,217) + Commodity charge (the assumed commodity charge in case the auctions had gone as expected): 0.160 p/kWh x 270 million kWh = £43,200 = TOTAL: 32,400 £ + 386 (or 111,217) £ +43,200 £ = 75,986-186,817 £ = **121,578€ - 298,907€** Entry auctions may generate a result different to the projected amounts. In this event, exit and commodity charges must be adjusted to ensure that TRANSCO does not collect too much/little revenue. This occurred during 2001 when auction prices were higher than expected. **Example transmission charges based on most recent entry auction results (for 10/2001-3/2002) combined with Oct 2000 exit and capacity charges** NTS Entry Charge at **Bacton** (average of highest 50% of bids for Oct 2001 – March 2002): 0.0013 p/kWh x 270 GWh = £3,510 + Exit charge at EA1 (approx **100km** from Bacton): 0.0039 pence per peak day kWh per day x 1.058 GWh x 365 days = £15,061 (or exit charge at EA4: 0.0096 pence per peak day kWh per day x 1.058 GWh x 365 days = 37,072 £) + Commodity charge: 0.0160 p/kWh x 270 million kWh = 43,200 £ = TOTAL: 3,510 £ + 15,061 (or 37,072) £ + 43,200 £ = 61,771-83,782£ **= €98,834-134,051** NTS Entry Charge at **St Fergus** (average of highest 50% of bids for Oct 2001 – March 2002)[6]: 0.0519 p/kWh x 270 GWh = 140,130 £ + Exit charge at SC1 (approx **200km** from St Fergus): 0.001 pence per peak day kWh per day x 1.058 GWh x 365 days = £386 + Commodity charge: 0.0160 p/kWh x 270 million kWh = 43,200 £ = TOTAL: 140130 £ + 386 £ +43,200 £ = 183,716£ = **293,946€**	**0,45-1,11** **0,37-0,50** **1,09**

[6] entry capacity prices at St Fergus were significantly higher than this during 2001

APPENDIX 2

CALCULATION OF ESTIMATED TARIFF LEVELS FOR GAS DISTRIBUTION

General disclaimer from Appendix 1 also applies.

Assumptions Used

Example 1: 50 km transportation through regional network plus local distribution for a customer using 25 mill. m^3 per year with a load factor of 0.7 (i.e. peak daily offtake 97,847 m^3 and peak hourly offtake of 4,077 m^3).

Where possible, calculations have been made both including and excluding the use of the low pressure local distribution network

Annual offtake in Joules: 25 mill m^3 = 25 mill. x 39 MJ = 975 mill. MJ = 975 TJ
Annual offtake in kilowatthour: 25 mill. m^3 = 25 mill. x 10.8 kWh= 270 mill. kWh = 270 GWh
Peak daily offtake in Joules: 97,847 m^3 = 3.816 TJ
Peak daily offtake in kilowatthour: 97,847 m^3 = 1.058 GWh
Peak hourly offtake in Joules: 4,077 m^3 = 159.0 GJ
Peak hourly offtake in kilowatthour: 4,077 m^3 = 44.03 MWh

Example 2: 50 km transportation through regional network plus local distribution for a customer using 1GWh (92,600m3) per year with a load factor of 0.3 (i.e. peak daily offtake 740m^3 and peak hourly offtake of 30.6m^3).

[Example 2 includes only those Member States with market opening to that level.]

Peak daily offtake in kilowatthour: 740m^3 = 8MWh
Peak hourly offtake in kilowatthour: 30.6m^3 = 330KWh
It is assumed that 1 m^3 = 39 MJ (GCV) = 10.8 kWh.

In cases where the calorific value of national gas qualities (such as in the case of Gasunie) have been published, these have been applied.

Example 1: 50 km distribution service plus (if required) local distribution.

Company	Total transport fee for the above service	Unit cost in €/MWh
Austria (Steierischen Ferngas)	Regional charges: not published/ negotiated Local distribution > 6 bar Capacity charge €57.38/m3(h)/y Commodity charge €0.00422/m3/y Fixed charge €150/month = 57.38*4077 + 0.00422*25000000 + 12*150 = 235.977+105.500+1.800= **€343.277**	**1.27** local distribution only no regional transmission
Austria Ober Osterreicher Ferngas	Regional charges: not published/ negotiated Local distribution > 6 bar Capacity charge €64.93/m3(h)/y Commodity charge €0.00365/m3/y Fixed charge €181/month = 64.93*4077 + 0.00365*25000000 + 12*181 = 264.720+91.250+2172= **€358.142**	**1.33** local distribution only no regional transmission
Distrigas (B)	Capacity charge: €0.2*(900/diameter)^1.5 /m3(h)/km/y plus €7.19 m3(h)/y for 350mm = 0.2*(2.57)^1.5*50*4077 = €167.972 + 7.19* 4077 = 29.314 **= €197.286**	**0.73** (excluding local distribution)
Example 1 (D)	**Hamburg Region using HEINGAS** Regional network capacity charge €1.05 - €3.4/ m3(h)/km/y (diameter dependent) Local distribution network estimated combined charge €1.3/MWh Fixed charge = €649/y Regional network charge = 1.05 (3.40) * 50km * 4077 = **€214.042-693.090** Local network charge = 1.3*270.000. = 351.000 + 649 = **€351.649**	**0.79-2.55** (excluding local distribution) **2.09-3.85** (including local distribution)

Example 2 (D)	**Berlin region using Gasag** Regional network capacity charge DM117/ m3(h)/y Local distribution network Capacity charge €58/m3(h)/y Commodity charge DMpf[15.834-0.853*ln(m3)]/m3 Fixed charge = €649/y Regional network charge = 117* 4077 /1.96 **= €243.372** Local network charge Capacity charge = 58 * 4077 = €236.466 Commodity charge = DMpf1.306 * 25.000.000 = DM326500 = €166.582 Fixed charge = €649/y Total= 236.466 + 166.582 + 649 = **€403.697**	**0.90** (excluding local distribution) **2.40** (including local distribution)
Example 3 (D)	**Munich Region Using Bayerngas S&W (N&O) regional network and Stadtwerke Munchen local network** Regional network capacity charge €102.2 (61.4) / m3(h)/y Local distribution network estimated combined charge €1.32/MWh Fixed charge = €649/y Regional network charge = 102.2 (61.4) * 4077 **= €250.328-416.669** Local network charge = 1.32*270.000. = 351.000 + 649 = **€357.049** **Total = €607.377-773.718**	**0.93-1.55** (excluding local distribution) **2.25-2.87** (including local distribution)
DONG (DK)	Regional and local distribution are not charged separately Capacity charge DKK 72455/MWh(h)/y Commodity charge DKK 4.545+1.8182 /MWh/y Fixed charge DKK300 Total (72455*44.083)+(6.363*270000) + 300 = DKK 3.194.034 + 1.718.010 + 300 = DKK 4.912.344 **= €659.375**	**2.44** (including local distribution)
Enagas (E)	Combined charge based on: monthly consumption 2Mm3, daily consumption 65,000m3 = 0.101PTS/thermie/month = 0.101/1.162*1000 = PTS86.9/MWh/y = €0.52/MWh	**0.52** (excluding local distribution)

Gaz de France (F)	**Regional network** Capacity charge = €27 x NTAR/ MWh/day Commodity charge = €0.09 x NTAR/ MWh/day For NTAR = 3 Capacity = (27 * 3 * 1058) = €85.698 Commodity = (0.09 * 3 * 270000) = €72.900 **Total = €158.598** **Local distribution** Capacity charge = €43.2 x NTAD/ MWh/day Commodity charge = €0.054 x NTAD/ MWh/day Fixed charge = €18000 For NTAD = 3 Capacity = (43.2 * 3 * 1058) = €137.117 Commodity = (0.054 * 3 * 270000) = €43.740 Fixed charge = 18.000 **Total = €198.857**	**1.32** (including local distribution)
Gasunie (NL)	Capacity charge €21.65/m3(h)/y *1.108 (39/35.17) * "Dr" Assuming Dr = 0.75 = 21.65*1.108*0.75*4077 = **€73.350**	**0.27** (excluding local distribution)
BG Transco (UK)	Capacity charge: GBP 0.2686-0.0146*ln(KWh(d)) + GBP0.87*(KWh(d))^-0.3 per KWh(d)/y = [0.2686-0.0146*ln(1.058.000) + 0.87*(1.058.000)^-0.3] * 1.058.000 = [0.0661 + 0.0136] *1.058.000 = £84.320 Commodity charge = GBP0.00199-0.0115*ln(peak daily consumption) per KWh/y =0.00199-[0.000115*ln(1.058.000)] * 270.000.000 = .000395 * 270.000.000 = £106.650 Total charge = £190.970 = **€305.553**	**1.13** (including local distribution)

Example 2: 50 km distribution service plus (if required) local distribution.

Company	Total transport fee for the above service	Unit cost in €/MWh
Example 1 (D)	**Hamburg Region using HEINGAS** Regional network capacity charge €1.05 - €3.4/ m3(h)/km/y (diameter dependent) Regional network charge = 1.05 (3.40) * 50km * 30.6 = **€1.607-5.202** Local distribution network estimated combined charge €7.29/MWh (using VV1 anlage) Local network charge = 7.29*1000 = = **€7.290** **Total = 8.897 – 12.492**	**8.8 – 12.5** (including local distribution)
Example 2 (D)	**Berlin region using Gasag** Regional network capacity charge €DM117/ m3(h)/y Regional network charge = 117* 30.6 /1.96 **= €1.826** Local distribution network Capacity charge DM[341-0.207*m3(h)]/m3(h)/y Commodity charge DMpf[15.834-0.853*ln(m3(h))]/m3 Fixed charge €649 Capacity charge = [334.7 * 30.6] = DM10242 = €5225 Commodity charge = DMpf6.08 * 92593 = DM5630 = €2.872 Total= 1826 + 5225 + 2872 + 649 = **€10572**	**10.6** (including local distribution)
Example 3 (D)	**Munich Region Using Bayerngas (N&O) S&W regional network and Stadtwerke Munchen local network** Regional network capacity charge € (61.4) 102.2/ m3(h)/y Local distribution network estimated combined charge €7.29/MWh (using VV1 anlage) Regional network charge = (61.4) 102.2* 30.6 **= €1879-3127** Local network charge = 7.29*1000. = **€7290** **Total = €9169-10417**	**9.2-10.4** (including local distribution)

BG Transco (UK)	Capacity charge: GBP 0.2686-0.0146*ln(KWh(d)) + GBP0.87*(KWh(d))^-0.3 per KWh(d)/y = [0.2686 – 0.0146*ln(8.000) + 0.87*(8.000)^-0.3] * 100.000 = [0.1375 + 0.0587] *8.000 = £1.570 Commodity charge = GBP0.00199-0.0115*ln(peak daily consumption) per KWh/y =0.00199-[0.000115*ln(8.000)] * 1.000.000 = £957 **Total charge = £2527 = €4.035**	**4.04** (including local distribution)

ANNEX C REGULATION OF THE MARKET

Introduction

In a market economy every sector is subject to a certain degree of regulation. However, there is general agreement that electricity and gas markets require more intense regulation than most other industry branches in order to ensure a proper functioning of the - newly created - open market and the respect of other policy goals.

The main reasons for this assessment are:

- Access to the *existing* electricity and gas networks is essential to operate in the market since duplication of the already existing networks, whilst in principle possible in legal terms, would be in nearly all cases uneconomical. These existing networks are in many cases owned and/or operated by the incumbent vertically integrated companies. They thus maintain a natural monopoly with regard to a essential facility for companies entering those markets, such as retail supply, in which monopoly rights have been abolished and competition introduced.

- Even after the abolition of the former monopoly rights of the incumbent energy companies, the latter are likely to maintain a dominant position in their national market for a certain period of time. A certain degree of regulatory oversight and control is thus necessary to ensure a level playing for new entrants.

- Electricity and gas industries deliver a product that is a necessity to daily modern life and which – at least in case of electricity – cannot be substituted.

- Finally, primary energy consumption has substantial environmental consequences in terms of emissions.

The basic elements of the national regulatory framework applicable to electricity and gas in Member States are contained in primary and secondary legislation, adopted by parliament and/or the government. These basic rules can then be supplemented over time by decisions taken by regulators, often taken on a case by case basis, on specific regulatory issues ("regulatory decisions").

All Member States except Germany have set up a sector specific regulatory authority with the responsibility to take regulatory decisions[1]. However, there is significant variation in the power of national regulatory authorities and in most Member States, including those having a sector specific regulator, the government, i.e. the competent ministry, remains responsible for certain regulatory issues, including network access conditions in some cases.

On the basis of written material publicly available and information directly received from the regulatory authorities of Member States, the Commission services have analysed in detail the responsibilities of regulatory bodies for electricity and gas in Member States. The results of this exercise have been summarised per Member State in the attached fact sheets. These sheets follow the same structure for each Member State and contain the basic information on key competencies of electricity and gas regulators.

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[1] The United Kingdom has two regulators, one for Great Britain (OFGEM) and one for Northern Ireland (OFREG), and Belgium has a federal regulator (C.R.E.G.) and three regional regulatory authorities

In the following a description of the situation in the Community as a whole is provided, based on the contents of the sheets on individual Member States:

Bodies with regulatory competencies

In all Member States except Germany a sector specific regulatory authority exists. These authorities are in most case independent public authorities. However, the Austrian regulatory authority has been set up under private law as a limited liability company, with the competent ministry being the sole shareholder. In the Netherlands the energy regulator forms part of the competition authority.

Only in two cases – Sweden and Northern Ireland - the sector specific regulator is responsible for all regulatory issues. In the remaining cases the government – the competent national and/or regional (Germany) ministry – has certain regulatory competencies. In Germany and with regard to gas in Ireland the competent ministry takes all regulatory decisions.

Responsibility for key regulatory decisions

Licenses

The main activities for which license requirements exist in Member States are: construction of electricity generating stations, generation of electricity, supply, network construction and operation.

Decisions related to licenses are in most Member States taken by the ministries. Only in the UK, Ireland and Finland is the final decision on licences taken by the regulator.

Network access

Decisions related to network access tariffs and other conditions are in most Member States taken by the energy regulator. In France, Luxembourg, Spain and Greece the ministry decides, on the basis of a proposal of the regulator. In France, however, the ministry cannot modify the regulator's proposal but only reject it altogether and ask for a new proposal.

As regards the timing of network access regulation, two approaches can be distinguished: one applied by a majority of Member States consists of "ex-ante" regulation, i.e. it provides for a requirement for operators to submit a schedule for network access tariffs to the regulator for approval prior to its application. The second approach is "ex-post" regulation, which is applied in Denmark, Sweden and Finland. Under this approach grid operators would, for instance, publish or notify network tariffs applied by them to the regulator, who then has the possibility to intervene or not.

Germany applies negotiated third party access and, as a consequence, access conditions are not regulated. The same applies to Austria and the Netherlands with regard to gas. In the Netherlands, however, the regulator issues binding guidelines to be respected when negotiating access. In Germany the industry has concluded agreements setting out principles and methodologies intended to facilitate the negotiations between network operators and users. These agreements are, however, not legally binding.

As part of the regulation of network access tariffs, regulatory authorities in some Member States impose a cap on total revenues of network operators and may also provide incentives and/or obligations to reduce costs over time.

Access to storage (gas)

In the Member States which have opened their market and dispose of storage facilities the UK (OFGEM), Belgium, Spain and Italy regulate access to storage in the same fashion as network access. In Denmark, Austria and the Netherlands, access is negotiated, in the Netherlands on the basis of binding guidelines issued by the regulator.

Dispute settlement – principles and duration of procedure

Dispute settlement is, in nearly all Member States, a responsibility of the regulator, carried out in many cases by a specific body within the regulatory authority. In some Member States (e.g. Spain and Belgium) dispute settlement tasks are split between the federal regulator and regional authorities, depending on the whether the transmission or distribution network is involved.

In Germany, the regional ministries can issue binding decisions in case of an unjustified refusal of network access or discriminatory application of conditions and tariffs.
Regarding the duration of dispute procedures, the information received is too vague to allow a general statement. Two Member States have a legal provision on the maximum duration of dispute settlement (Spain: 2 months; France: between 3 and 6 months) and OFGEM (Great Britain) has set a target period for dispute settlement on access tariffs (28 days for transmission and 16 weeks for distribution).

Current Status of the Sector Specific Regulator

Independence of the regulator: Appointment, accountability and independence from market operators and state ownership functions

In most Member States the Head of the regulatory authority – or the members of the board of the regulator – are appointed by the government, for a definite or indefinite (Finland) term. In France the right of appointment is shared between the government and the presidents of the national assembly, the senate and the economic and social committee. In Italy and in Luxembourg the Head of State makes the appointment.

Rules are in place in all Member States to ensure that the regulator has no direct or indirect interest in the energy industry. These rules are in many cases laid down specifically in the legislation on the regulatory authority, in other cases general rules applicable to all public administrations apply.

Regulatory authorities are not usually subject to instructions from the government on individual decisions, although this is possible in, for example, the Netherlands. In most cases governments determine their general policy objectives of regulators.

Other responsibilities (in addition to those mentioned under 2.)

Apart to the key regulatory competencies – licences, network access and dispute settlement – most regulators have other responsibilities, which include:

- Monitoring of the market, in particular compliance with the law (most regulators)
- Provision of advice to the government on electricity and gas issues (most regulators)
- Implementation of social and environmental policy (e.g. UK (OFGEM), Sweden)
- Implementation of public service obligations and/or quality standards (e.g. France, Italy, Ireland, UK)
- Establish long-term plans for supply (e.g. Belgium)
- Provide market information to customers (e.g. UK, Denmark)
- Regulatory oversight over the non-liberalised part of the market (e.g. Portugal, Italy, Ireland, Netherlands, Greece,)

Possibilities of appeal against decisions– suspending effect

In all Member States decisions of the regulator can be appealed, either to an administrative court, a civil court or an appeal body set up especially for this purpose. Generally, appeals have no suspending effect, but it can be established by the appeal jurisdiction.

Enforcement of decisions

In most Member States the regulator can impose sanctions (fines) in case of non-compliance with regulatory decisions

Staff numbers (2001)

A	B	DK	Fi	F	GR	IR	I	L	NL	P	Es	S	UK
43	**40**	**30**	**15**	**65**	**10**	**27**	**63**	**1**	**33**	**46**	**140**	**33**	**340**

Annual budget (2001) million Euro

A	B	DK	Fi	F	GR	IR	I	L	NL	P	Es	S	UK 1
7	**9,4**	**2,46**	**1,2**	**9,1**	**4,4**	**4,95**	**18**		**4**	**4,5**	**16,8**	**3,4**	**103**

In most Member States the budget of the regulatory authority is financed through a levy on energy consumption/production. In Finland and the Netherlands the finance is partly provided from the general budget and in part through a levy. Only in France is the regulator entirely financed from the general budget.

Conclusions

Although almost all Member States have an energy regulator, their responsibilities and degree of independence vary considerably by Member State. For example, in many Member States the regulator can be over-ruled by the competent Ministry on some decisions.

The level of staffing and budget also varies considerably between Member State. However it is important to remember their different duties in this respect and to recognise that a number of regulatory offices are relatively new organisations and have not yet reached the full complement of staff.

APPENDIX

SUMMARY: COMPETENCES AND RESOURCES OF REGULATORS

	ex-ante/ ex-post	Network access conditions		Dispute settlement		Licences issued by:	Annual Budget 2001 (€m)	Staff number
		gas	electricity	gas	electricity			
Austria	Ex-ante	N	R	M	R	Ministry	7.0	37
Belgium	Ex-ante	R	R	R	R	Ministry	9.4	40
Denmark	Ex-post	R	R	R	R	Ministry	2.5	30
Finland	Ex-post	R	R	R	R	Regulator	1.2	15
France	Ex-ante	n.a.	M	n.a.	Reg.	Ministry	9.1	65
Germany	n.a.	N	N	Competition Authority		Ministry	No regulator in place	
Greece	Ex-ante	n.a.	M	n.a.	R	Ministry	4.4	10
Ireland	Ex-ante	M	R	M	R	Ministry/ Regulator	5.0	27
Italy	Ex-ante	R	R	R	R	Ministry	18.0	63
Luxem	Ex-ante	M	M	M	M	Ministry	na	1
Neth	Ex-ante	N	R	R	R	Ministry	4.0	33
Portugal	Ex-ante	n.a.	R	n.a.	R	Ministry	4.5	46
Spain	Ex-ante	M	M	Regulator/Regional Govt		Ministry	16.8	140
Sweden	Ex-post	R	R	R	R	Regulator	3.4	33
UK	Ex-ante	R	R	R	R	Ministry/regulator	103.0	340
source: responses to Commission survey								

R – regulator responsible, M – ministry responsible, N – not regulated (e.g. nTPA)
n.a. - Directive not implemented in full

Austria

State of market liberalisation:

Electricity : 100%

Gas : 49%

1. Bodies with regulatory competencies:

- The government (Ministry of Economy and Labour)

- The Electricity-Control ltd. ("Elektrizitäts-Control GmbH" - ECGmbH) and the Electricity-Control Commission ("Elektrizitäts-Control Kommission"- ECC) – "The regulator"

2. Responsibility for key regulatory decisions

2.1 Licenses

Depending on the issue, licenses are granted by the Ministry, the competent regional authorities and the ECC

2.2 Network access

Electricity: Tariffs and contract conditions (technical and commercial) are determined ex-ante by the ECC, on the basis of a proposal by the network operators

Gas: negotiated third party access.

2.3 Access to storage (gas)

Negotiated third party access

2.4 Dispute settlement – principles and duration of procedure

Electricity: The ECC is dispute settlement authority

Gas: The ministry is dispute settlement authority regarding refusal of network access; for other network access issues, for instance the level of the tariffs, the civil courts are competent.

3. Details on the sector specific regulator

3.1. Independence of the regulator: Appointment, accountability and independence from market operators and state ownership functions

The chief executive of the Electricity-Control ltd. is appointed by the ministry, the three members of the Electricity-Control Commission are appointed by the government for a term of four years. Individuals which have an interest in the energy sector may not be nominated. Regulatory competencies are mainly with the ECC, but the ECGmbh has also some regulatory tasks. The ECC - a quasi-judicial body - has no staff on its own but can request assistance from the ECGmbh when preparing a decision. The ministry can give general instructions to the ECGmbH – which have to be made public - but not to the ECC, which acts in complete independence. The chief-executive of the ECGmbH acts as the speaker of the ECC.

3.2. Other responsibilities (in addition to those mentioned under 2.)

- Monitoring of compliance with the law, including the possibility to impose appropriate, binding measures where necessary;

- Watch-dog concerning abuse of market power

- Determination of compensation payments between the owners of interconnected networks

- Establishment of electricity market statistics

- Emergency measures in the event of crises

- Monitoring of targets for renewable electricity, administration of the green certificate market for small hydro

3.3. Enforcement of decisions

The ECGmbH has the possibility to impose sanction, including financial penalties

3.4 Staff numbers

2001: 43

3.5. Annual budget

2001: 7 Mill. €, financed through a levy on network users.

3.6 Possibilities of appeal against decisions– suspending effect

- Decisions of the ECGmbH: Appeal possible to the ECC

- Decisions of the ECC: Decisions, which relate to network access and decisions following an appeal against a decision of the ECGmbH can be appealed to the Administrative High Court, with no suspending effect unless established by the Court; as regards the remaining decisions, in particular on dispute settlement not involving network access, a complainant can request that the matter be referred to a Civil Court, in which case the decision of the ECC ceases to be in force.

4. Points of interest

- Regulator is only responsible for electricity

- The ECGmbH is – in legal terms – a company established under private law owned by the state, which provides flexibility with regard to the recruitment procedures and conditions ; recruitment process has been very quick since the creation of the regulator in march 2001

- Austria has a huge amount of individual electricity network operators (ca. 200), however, tariffs are not regulated for each individual operator but for 15 network-areas, under which all network operators are grouped. Access tariffs are identical of all networks within an area but individual operators can claim compensations from other operators of the area in case higher costs can be proven.

- Austria had to modify the former repartition of competencies between the national and regional level laid down in the Austrian constitution to enable regulation of the market through one regulator at the national level. Nevertheless essential parts of the Electricity Act concerning market rules are still decided by regional governments, leading to different legal provisions within Austria (cp. General terms of business, renewable energy,…).

Belgium

State of market liberalisation:

- Electricity: 35% (2003: 50%)

- Gas: 47%

1. Bodies with regulatory competencies:

- Minister of economic affairs
- The "Commission for electricity and gas regulation" (CREG) – the federal "regulator"
- Three regional regulatory authorities (for Flanders, Wallonia and Brussels)

2. Responsibility for key regulatory decisions

2.1 Licenses

The minister, on the basis of a proposal by the CREG, grants licences

2.2 Network access

Ex-ante approval by the CREG of network access tariffs following an annual notification by the TSO (GRT); calculation of the tariffs on the basis of orientations adopted by decree by the government, on proposal of the CREG; other conditions of access to the electricity transmission system are defined in the grid code published in the form of a Royal Decree. With regard to the gas transmission system , conditions will be published by a Royal Decree as a code of good conduct.

With regard to the distribution network, other conditions than tariffs are fixed by the regional regulatory authorities.

2.3 Access to storage (gas)

Access to storage and LNG will be part of the code of good conduct mentioned under 2.2.

2.4 Dispute settlement – principles and duration of procedure

- With regard to pre-contractual disputes regarding access to the transmission network a specific administrative jurisdiction for energy is responsible, the "chambre de disputes", to which the CREG provides secretarial assistance.
- With regard to contractual disputes regarding the transmission network, the CREG is responsible if the parties have agreed on arbitration; the network user can insist on the inclusion of an arbitration clause in the contract; otherwise, the civil Courts are responsible.
- With regard to disputes regarding the distribution network, the regional regulatory authorities or the civil courts are responsible, depending on whether these authorities have put in place an arbitration procedure

3. Details on the sector specific regulator

3.1. Independence of the regulator: Appointment, accountability and independence from market operators and state ownership functions

Member of the CREG are appointed by the government for 6 years; members may not have any direct or indirect (e.g. shares) interest in the electricity and gas industry; when making decision, the CREG is not subject to instructions from the ministry.

3.2. Other responsibilities (in addition to those mentioned under 2.)

- Give advice to public authorities on the organisation and operation of the market (the government has the obligation to consult with the CREG before adopting certain secondary legislation).

- Supervise the application of laws and regulations (e.g. on unbundling and public service obligations).

- Establish every three years indicative plans (10 years horizon) for gas supply and electricity generation

- Approve the statute and nominate the 6 independent board members of the TSO (6 out of the 12 members of the board have to be independent from the owner of the transmission system).

3.3. Enforcement of decisions

- CREG can impose sanctions (financial penalties) in case of non-compliance (Art. 31 E-Law)

3.4 Staff numbers

Around 40 posts (2001)

3.5. Annual budget

In 2001: 380 Mill. BEF (9,42 Mill. €) ; Budget needs approval of the ministry. For electricity, it is financed via a levy on network users, for gas by transport and supply licensees.

3.6 Possibilities of appeal against decisions– suspending effect

Decisions of the "chambre de disputes" (pre-contractual disputes) can be appealed to the Conseil d'Etat.

Decisions of the CREG made in the context of dispute settlement (arbitration) cannot in principle be appealed, unless otherwise specified in the arbitration agreement of the parties concerned.

Regulatory decisions of the CREG, for instance determination of network access tariffs can be appealed to the "Conseil d'Etat", with no suspending effect, unless established by the Court.

4. Points of interest

a) The TSO in the sense of Article 7 of the directive has not yet been nominated and as a consequence network access tariffs have not yet been approved by the CREG.

b) the secondary legislation necessary to operate the dispute settlement system in practice has not yet been adopted.

c) With regards to the gas market, the secondary legislation necessary to operate :

   – the natural gas supply and transport authorisation system;

   – the code of good conduct,

   has not yet been implemented.

Germany

State of market opening: *electricity and gas 100%*

1. Bodies with regulatory competencies:

The ministries competent for energy at the Federal State level (ministries of the "Länder")

2. Responsibility for key regulatory decisions

2.1 Licenses

Licences are granted by the ministries

2.2 Network access

No regulation of network access conditions and tariffs – negotiated third party access

2.3 Access to storage (gas)

No regulation of access conditions and tariffs – negotiated third party access

2.4 Dispute settlement – principles and duration of procedure

No specific dispute settlement authority exists. However, in case of an unjustified refusal of network access or discriminatory conditions and tariffs, the ministries can issue binding decisions.

3. Details on the sector specific regulator

not applicable

4. Points of interest

Germany is the only Member State not having set up a sector specific energy regulator

Denmark

State of market liberalisation:

electricity: 90% (2003: 100%)

gas: 30% (2003: 38%)

1. Bodies with regulatory competencies:

- The government (Ministry of the Environment and Energy)
- The Energy Supervisory Board (ESB) – "The regulator"

2. Responsibility for key regulatory decisions

2.1 Licenses

Licences are granted by the ministry without any involvement of ESB

2.2 Network access

- *Electricity*: Taking into account compulsory annual cost cuts with regard to their overall revenue, which is fixed by the ministry, the network operators calculate individual tariffs and notify them to ESB. ESB can require adjustments at any moment, where necessary
- *Gas*: same approach as in electricity

2.3 Access to storage (gas)

Negotiated access

2.4 Dispute settlement – principles and duration of procedure

ESB is dispute settlement authority

3. Details on the sector specific regulator

3.1. Independence of the regulator: Appointment, accountability and independence from market operators and state ownership functions

The chairman and the six members of the ESB are appointed by the Minister of Environment and Energy for four years; they must be independent of the parties in the energy sector; the ESB is not subject to instructions of the ministry; the Danish Energy Agency, which forms part of the ministry, and the competition authority provide secretarial assistance to the ESB; Annual account has to be submitted to the Minister

3.2. Other responsibilities (in addition to those mentioned under 2.)

- Supervising end-user prices and delivery conditions
- Providing market information to consumers

3.3. Enforcement of decisions

3.4 Staff numbers

2001: around 30

3.5. Annual budget

2001: 18,3 Mill. DKK (2,46 Mill. €) ,the budget is for a large part financed through various levies on:

- Electricity consumption (collected through the network operators)
- Electricity production, including CHP
- Transmission and Distribution of gas

3.6 Possibilities of appeal against decisions– suspending effect

Decisions of the ESG can be appealed in front of the "Energy Complaints Board", with suspending effect, except decisions regarding access to the network.

4. Points of interest

- Belongs to the group of three regulators applying ex-post regulation

Spain

State of market liberalisation:

Electricity: 54%. (2003: 100%)

Gas: 72%. (2003: 100%)

1. Bodies with regulatory competencies:

- The government (Ministry of Economy)

- The National Energy Commission ("Comision Nacional de Energia" - CNE) – "the Regulator", created in 1998 by the Hydrocarbons Act and set up in 1999

2. Responsibility for key regulatory decisions

2.1 Licenses

All licences are issued by the ministry

2.2 Network access

Tariffs and conditions are determined ex-ante by the ministry, on the basis of a proposal made by CNE

2.3 Access to storage (gas)

Tariffs and conditions are determined ex-ante by the ministry, on the basis of a proposal made by CNE

2.4 Dispute settlement – principles and duration of procedure

Complaints are handled and disputes settled by the CNE with regard to access to electricity and gas infrastructures and the economic and technical management of the electric and gas systems; disputes regarding connection to the network and the level of access tariffs are settled by the regional authorities

3. Details on the sector specific regulator

3.1. Independence of the regulator: Appointment, accountability and independence from market operators and state ownership functions

The president, the vice-president and the other six members of the Energy Commission are appointed for a six year term by the king, on the basis of a proposal by the Ministry of Economy and following consultation of Parliament. They are not allowed to have any professional activities or direct economic interests in the electricity and gas sector, during their term in office and the subsequent two years.

3.2. Other responsibilities (in addition to those mentioned under 2.)

- Provision of advice and proposals to the ministry on various matters

- Competencies regarding the non-liberalised part of the market.

3.3. Enforcement of decisions

The CNE cannot enforce its decisions by means of financial penalties

3.4 Staff numbers

2001: around 140

3.5. Annual budget

2001: 2808 Mill. Pesetas (16,8 Mill. Euros), financed through two levies, on wholesales of petroleum products, the other on gas and electricity supply

3.6 Possibilities of appeal against decisions– suspending effect

Decisions of the CNE can be appealed to the Administrative Court; appeal has no suspending effect but can be established by the Court

4. Points of interest

- The regulator belongs to the group of four regulators in the E.U (E, F, GR, LUX) which do not have the competence to decide on network access tariffs and conditions.

France

State of market liberalisation:

Electricity: 30%

Gas: directive not yet implemented

1. Bodies with regulatory competencies:

- The Ministry of Economy and Finance, State Secretary of Energy
- The "Commission for electricity regulation" (CRE) – "The regulator"

2. Responsibility for key regulatory decisions

2.1 Licenses

Licences for production and transmission of electricity are issued by the ministry

2.2 Network access

Terms, except the level of the tariffs, are determined "ex-ante" by the CRE through regulation; tariffs are approved "ex-ante" by the State Secretary of Energy, on the basis of a proposal by the CRE; State Secretary may not deviate from the proposal but has to ask for a revised proposal in case of disagreement

2.3 Access to storage (gas)

Gas directive not yet implemented in France

2.4 Dispute settlement – principles and duration of procedure

The CRE is dispute settlement authority. There is a legal obligation to settle disputes in a period of 3 to 6 months.

3. Details on the sector specific regulator

3.1. Independence of the regulator: Appointment, accountability and independence from market operators and state ownership functions

The 6 members of the CRE are appointed by the government (3 members), the president of the national assembly (one member), the president of the senate (one member) and the president of economic and social Council (one member); members may not have any interest in an energy company or an "eligible customer"; members can not be revoked during their term; staff of CRE has to respect rules of "déontologie" applicable to all French officials

3.2. Other responsibilities (in addition to those mentioned under 2.)

- Determination of rules on balancing;
- Evaluation of financial impact of PSO imposed on electricity companies in order to fix compensation;
- Determination of rules and approval of practice to ensure compliance with unbundling provisions
- Monitoring of compliance with rules,
- Advice to the government in a number of fields;

3.3. Enforcement of decisions

The CRE has the possibility to impose sanctions to enforce its decisions, including financial penalties.

3.4 Staff numbers

2001: 65

3.5. Annual budget

2001: 60 Mill. FF (9,15 Mill. €)

3.6 Possibilities of appeal against decisions– suspending effect

Decisions on dispute settlement of the CRE can be appealed to the "Cour d'appel " of Paris; appeal has no suspending effect but can be established by the Court

4. Points of interest

- The same body – Secretary of state of Energy - that is responsible for EDF within the government has key regulatory competencies, e.g. the approval of network access tariffs

- Practical operation of right of proposal of CRE on access tariffs in practice unclear: until 9/01 State Secretary had not reacted to proposal made by the CRE, in the meantime provisional tariffs set by the GRT are applied

Finland

State of market liberalisation:

Electricity: 100%

Gas: 90% (secondary market)

1. Bodies with regulatory competencies:

- The government (Ministry of Trade and Industry)
- The Energy Market Authority (EMA) – "The Regulator"

2. Responsibility for key regulatory decisions

2.1 Licenses

EMA grants licences with regard to network operation and construction, the latter except cross-border links, which is with the competence of the ministry

2.2 Network access

Tariffs and other conditions are set by the network operators (TSOs and DSOs) and have to be published. The EMA has the possibility to intervene – ex-officio or on request - and require adjustments to ensure compliance with the electricity and gas legislation (terms and prices must be equitable and non-discriminatory, prices must be reasonable)

2.3 Access to storage (gas)

There are no gas storage facilities in Finland

2.4 Dispute settlement – principles and duration of procedure

The EMA is dispute settlement authority

3. Details on the sector specific regulator

3.1. Independence of the regulator: Appointment, accountability and independence from market operators and state ownership functions

The Head of the EMA is appointed by the government, for an indefinite mandate; the ministry and EMA agree on a yearly basis on the objectives of EMA (agreement is published) ; ministry cannot interfere with individual decisions.

3.2. Other responsibilities (in addition to those mentioned under 2.)

Gas: Monitoring of wholesale, retail and end-consumers prices, with a right to intervene if prices are not reasonable, in order to protect non-eligible customers

Electricity: Monitoring of retail prices that are within the obligation to supply, with a right to intervene if prices are not reasonable.

EMA collects information on tariffs, separated accounts and technical as well as economic key figures. It also analyses and keeps the information publicly available to promote the transparency of the electricity and natural gas markets.

3.3. Enforcement of decisions

EMA can impose sanctions (conditional financial penalties) to a market operator in case of non-compliance with a decision of EMA. As an ultimate sanction, EMA can withdraw a network licence.

3.4 Staff numbers

2001: 15

3.5. Annual budget

2001: 7 million FIM (1,2 million euros). The financing is mainly organised through supervision and licence fees (approximately 85%) and the remaining part is from the state budget (15%).

3.6 Possibilities of appeal against decisions– suspending effect

Decisions of the EMA, including the imposition of sanctions, can be appealed to the Supreme Administrative Court of Justice

4. Points of interest/concern

- belongs to the four countries in the EC applying ex-post regulation

Greece

State of market liberalisation:

Electricity: 30%

Gas: no market opening until 2006

1. Bodies with regulatory competencies:

- The Ministry of Development
- The Regulatory Authority for Energy (RAE)

2. Responsibility for key regulatory decisions

2.1 Licenses

All licenses are granted by the ministry, on advice of RAE

2.2 Network access

The ministry approves ex-ante tariffs and other conditions, on advice of RAE

2.3 Access to storage (gas)

Not applicable

2.4 Dispute settlement – principles and duration of procedure

RAE is dispute settlement authority

3. Details on the sector specific regulator

3.1. Independence of the regulator: Appointment, accountability and independence from market operators and state ownership functions

The 5 members of the RAE are appointed by the minister for a term of 5 years ; RAE members are not allowed to have any direct or indirect interest in the energy industry ; RAE is not subject to any kind of instructions from the ministry

3.2. Other responsibilities (in addition to those mentioned under 2.)

- Monitor the electricity, gas and oil market
- Propose long-term energy planning and measures to improve competition
- Make proposals to the government for the adoption of new measures and regulation
- Advice the ministry on regulation of the non-liberalised part of the market

3.3. Enforcement of decisions

RAE can impose financial penalties in case of non-compliance with the law

3.4 Staff numbers

2001: 10 (ultimate objective : 70)

3.5. Annual budget

2001: 1500 Mill. GDR (4,48 Mill. €), financed through a levy on gas, electricity and oil supply

3.6 Possibilities of appeal against decisions– suspending effect

Decisions of the RAE can be appealed to ordinary courts

4. Points of interest

- current number of staff far lower than the ultimate objective

Italy

State of market liberalisation:

Electricity: 35% (2002: 40%)

Gas: 96% (2003: 100%)

1. Bodies with regulatory competencies:

- The government (Ministry of Industry)

- The independent regulatory agency for electricity and gas ("Autorità per l'energia elettrica e il gas – AEEG")

2. Responsibility for key regulatory decisions

2.1 Licenses

Licences are issued by the ministry. The AEEG makes observations and recommendations on licensing schemes, their renewal or any variations therein. If the ministry wishes to deviate from the proposal, the decision has to be taken by the Council of Ministers

2.2 Network access

Technical conditions and tariffs are determined "ex-ante" by the AEEG, the latter in a two step procedure: first the detailed methodology is determined, then the AEEG approves individual tariffs calculated by network operators on the basis of the methodology; rules on the allocation of interconnector capacities are determined by the AEEG

2.3 Access to storage (gas)

Access conditions and tariffs are approved "ex ante" by the AEEG

2.4 Dispute settlement – principles and duration of procedure

Complaints are handled and disputes settled by the AEEG

3. Details on the sector specific regulator

3.1. Independence of the regulator: Appointment, accountability and independence from market operators and state ownership functions

The President and the two Commissioners of the AEEG are appointed by the Italian President, following nomination by the government and approval by parliament. They are not allowed to have any professional activities or direct economic interests in the electricity and gas sector, during their term in office and the subsequent four years; whilst the government can define the general economic policy guidelines for the AEEG, it cannot give instruction with regard to individual decisions of the AEEG.

3.2. Other responsibilities (in addition to those mentioned under 2.)

- Setting maximum tariffs (maximum prices net of tax) and tariff adjustments according to a price-cap mechanism.

- Adopting rules on accounting methodologies and unbundling to be respected by electricity and gas companies;

- Establishing and enforcing quality standards for services (penalties in case of non-compliance)

- Providing advise and recommendations to the government and parliament relating to the market structure and the adoption and enforcement of European directives

- Authorising direct transactions between suppliers and customers of electricity (bilateral contract) who do not wish to trade via the pool

3.3. Enforcement of decisions

3.4 Staff numbers

2001: 63

3.5. Annual budget

2001: around 35 billion Lira (18 Mill.€)

3.6 Involvement in international matters

In legal terms, AEEG has no formal competence but the government consults it, where appropriate.

3.7 Possibilities of appeal against decisions– suspending effect

Decisions of the AEEG can be appealed to the Regional Administrative Court; appeal has no suspending effect, but can be established by the Court

4. Points of interest

- the foreseen total number of staff (120) has not yet been achieved;

Ireland

State of market liberalisation:

Electricity: 28% (2002: 40%)

Gas: 75%

1. Bodies with regulatory competencies:

- The government (Ministry of Public Enterprise)
- The Commission for electricity regulation (CER) – "The Regulator" for electricity

2. Responsibility for key regulatory decisions

2.1 Licenses

Electricity: Licences with regard to generation, supply, network operation and construction are granted by the CER

Gas: Licences are granted by the ministry

2.2 Network access

Electricity: network access tariffs and other conditions are approved ex-ante by the CER, taking into account annual caps on revenue of grid operators imposed by CER

Gas: network access conditions and tariffs are laid down in a ministerial decree

2.3 Access to storage (gas)

There are no gas storage facilities in Ireland

2.4 Dispute settlement – principles and duration of procedure

Electricity: The CER is dispute settlement authority

Gas: The Ministry is dispute settlement authority

3. Details on the sector specific regulator

3.1. Independence of the regulator: Appointment, accountability and independence from market operators and state ownership functions

Member of the CER are appointed by the Minister of Public Enterprise; the Commission reports to a joint committee of the Parliament and submits an annual report to the Minister for public enterprises; the Commission is not subject to instructions

3.2. Other responsibilities (in addition to those mentioned under 2.)

All responsibilities listed below relate to electricity only:

- Setting regulation on standard of performance
- Fixing the amounts recoverable by electricity companies for compliance with public service obligations
- Regulating prices of incumbent vertically integrated electricity company for franchise customers in order to ensure fair pricing practices (e.g. avoidance of cross-subsidisation). Franchise customers are all those who

remain with the Public Electricity Supply business of the incumbent and are not supplied by an alternative licensee.

- Encourage efficient use of electricity and the use of electricity produced from renewables

- Regulatory competencies regarding the non-liberalised part of the market

3.3. Enforcement of decisions

- CER can bring prosecutions with regard to offences committed under the Electricity Regulation Act, 1999.

3.4 Staff numbers

2001: 27

3.5. Annual budget

2001: 3,9 Mill Irish Pounds (€ 4, 95 Mill.), financed through a levy on electricity undertakings

3.6 Involvement in international matters

In legal terms, the regulator has no formal competence but the government consults it, where appropriate.

3.7 Possibilities of appeal against decisions– suspending effect

Decisions of the CER can be appealed to an appeals panel established by the Minister of Public Enterprise

4. Points of interest

- The ultimate objective is for CER to have full regulatory competencies for gas as well

Luxembourg

State of market liberalisation:

Electricity: 56% (2005:75%)

Gas: 51% (2003:74%)

1. Bodies with regulatory competencies:

- The government (Ministry of Energy)
- The Institute for Regulation (IR) – "The regulator"

2. Responsibility for key regulatory decisions

2.1 Licenses

Granted by the ministry, on the basis of advice given by the IR

2.2 Network access

The Ministry, on the basis of a proposal by the IR, approves ex-ante tariffs and conditions, notified by the network operators

2.3 Access to storage (gas)

There are no storage facilities in Luxembourg

2.4 Dispute settlement – principles and duration of procedure

The IR is dispute settlement authority

3. Details on the sector specific regulator

3.1. Independence of the regulator: Appointment, accountability and independence from market operators and state ownership functions

The Institute is in charge of telecommunication and energy markets; the board of directors, consisting of a director and two members, is appointed by the Grand-Duc for a period of 6 years;

3.2. Other responsibilities (in addition to those mentioned under 2.)

Electricity: Administration of compensation fund set up to compensate the industry for public service obligations; dispute settlement

3.3. Enforcement of decisions

3.4 Staff numbers

2001: 1 person dealing with energy issues

3.5. Annual budget

2001: ? , financed through a levy?

3.6 Involvement in international matters

In legal terms, the regulator has no formal competence but the government consults it, where appropriate.

3.7 Possibilities of appeal against decisions– suspending effect

Decisions of the IR can be appealed to the district court, no suspending effect

4. Points of interest

- one of the two TSOs in Luxembourg has not yet submitted its intended network access tariffs to the ministry for approval

Northern Ireland

State of market liberalisation:

Electricity: 35%

Gas: 90%

1. Bodies with regulatory competencies:

- The Office for the Regulation of Electricity and Gas (OFREG)

2. Responsibility for key regulatory decisions

2.1 Licenses

Granted by OFREG

2.2 Network access

OFREG approves ex-ante tariffs and conditions

2.3 Access to storage (gas)

There are no storage facilities in Northern Ireland

2.4 Dispute settlement – principles and duration of procedure

OFREG is dispute settlement authority

3. Details on the sector specific regulator

3.1. Independence of the regulator: Appointment, accountability and independence from market operators and state ownership functions

The Director General of Electricity Supply and Director General of Gas for Northern Ireland is heading OFREG

3.2. Other responsibilities (in addition to those mentioned under 2.)

- Approval of code of practice and minimum service standard to be respected by incumbent electricity company

- Regulatory oversight over the non-liberalised part of the market

3.3. Enforcement of decisions

3.4 Staff numbers

2001: na

3.5. Annual budget

2001: na

3.6 Involvement in international matters

In legal terms, the regulator has no formal competence but the government consults it, where appropriate.

3.7 Possibilities of appeal against decisions– suspending effect

Decisions of OFREG can be appealed to the UK Competition Commission, no suspending effect

4. Points of interest/concern

n.a.

Netherlands

State of market liberalisation:

- Electricity: 33% (2002: 66%)

- Gas: 45% (2004:100%)

1. Bodies with regulatory competencies:

- The minister of economic affairs
- The regulator: "Dienst Toezicht en Uitvoering Energie – DTE"

2. Responsibility for key regulatory decisions

2.1 Licenses

Licenses for network operators and suppliers to captive consumers are granted by the ministry, based on a detailed analysis and a recommendation by DTE; no specific energy licensing system for generators exists.

2.2 Network access

a) Electricity

Ex-ante approval by DTE of the structure of the tariff system ("Tariff Code") and – on an annual basis - individual tariffs, both on the basis of a proposal made by the grid operators; rules on allocation of interconnector capacities, balancing markets and the spot market (from 2002 onward) are contained in the Grid Code, adopted by DTE

b) Gas

DTE issues, after consultation of market parties and network operators, general and binding guidelines, on which basis actual tariffs are negotiated;

2.3 Access to storage (gas)

DTE issues, after consultation of market parties and network operators, general and binding guidelines, on which basis actual tariffs are negotiated

2.4 Dispute settlement – principles and duration of procedure

Dispute settlement authorities are the Competition authority and DTE, depending on the subject matter; furthermore, independent dispute settlement bodies exist ("Geschillen Commissie") to deal with certain consumer complaints

3. Details on the sector specific regulator

3.1. Independence of the regulator: Appointment, accountability and independence from market operators and state ownership functions

The minister appoints the director of the DTE and lays down general instructions in policy rules; the minister can give binding instructions on a case by case basis to the DTE; the DTE operates as a chamber of the Competition Authority (NMA); DTE reports annually to the ministry (findings and recommendations) who brings the report to the notice of parliament. (A draft law is being discussed in Parliament increasing the independence of NMA from the ministry and further integrating DTE in NMA so that all responsibilities with respect to the Gas and Electricity Act, formerly attributed to the director of DTE, would then be attributed to the director-general of the NMA)

3.2. Other responsibilities (in addition to those mentioned under 2.)

- Supervision of compliance with the law;

- Provision of information to customers in order to facilitate the free market (not yet clear what is the exact role of the regulator here);

- Market surveillance (for electricity, for gas not yet implemented)

- Regulation of the non-liberalised part of the market

3.3. Enforcement of decisions

DTE can enforce its decision, including through financial penalties

3.4 Staff numbers

2001: 33 (objective for 2002: 55)

3.5. Annual budget

2001: 4 Mio € (around 60% of the budget is financed by – compulsory - contributions of energy companies, the remaining part from the general state budget)

3.6 Involvement in international matters

In legal terms, DTE has no formal competencies. In practice, the ministry consults with DTE where appropriate.

3.7 Possibilities of appeal against decisions– suspending effect

Decisions of DTE can be appealed to the Trade and Industry Appeals Tribunal; an appeal has no automatic suspending effect although the Court can establish a suspending effect

4. Points of interest

- DTE not competent for off-shore gas activities (access to upstream pipelines)

Portugal

State of market liberalisation:

electricity: 25% (2003: 48%)

gas: no market opening until 2006

1. Bodies with regulatory competencies:

- The government (Director-General of Industry)
- The Regulator of the electricity market (ERSE) – "The regulator"

2. Responsibility for key regulatory decisions

2.1 Licenses

For supply, generation and transmission issued by the Directorate-General of Energy

2.2 Network access

Terms and tariffs are determined "ex-ante" by ERSE

2.4 Dispute settlement – principles and duration of procedure

3. Details on the sector specific regulator

3.1. Independence of the regulator: Appointment, accountability and independence from market operators and state ownership functions

The Board of directors of ERSE (chairman plus two directors) is appointed by the government for five years by the Council of ministers; they shall not have any economic interest in the industry;

3.2. Other responsibilities (in addition to those mentioned under 2.)

A number of regulatory competencies regarding the part of the market which is not open to competition, including the setting of electricity tariffs.

3.4 Staff numbers

2001: 46

3.5. Annual budget

2001: Pte 900 million (4,49 millions €). Financed by a levy on electricity supply

3.6 Involvement in international matters

The Regulator is responsible for defining terms and conditions for interconnector access.

3.7 Possibilities of appeal against decisions– suspending effect

Decisions can be appealed to the administrative courts, appeal has no suspending effect.

4. Points of interest

n.a.

Sweden

State of market liberalisation:

electricity 100%

gas 47%

1. Bodies with regulatory competencies:

- The National Energy Administration (NEA)

2. Responsibility for key regulatory decisions

2.1 Licenses

Electricity

According to the Swedish Electricity Act, it is not allowed to build or use any electricity grid (transmission, regional or local) without a permit, network concession. NEA grants the network concessions.

According to the Swedish legislation there are no requirements for a special license for supply of electricity. generators have to hold a licence from national or regional government

Natural gas

According to the Swedish Natural Gas Act, it is not allowed to build or use a natural gas pipeline without permit, concession, from the Government. An application for a concession shall be submitted to NEA. When NEA has processed the application it shall hand over the matter, together with its own statement, to the Government for consideration.

According to the Swedish legislation there are no requirements for a special license for supply of natural gas.

2.2 Network access

NEA supervises terms and conditions, including tariffs and technical access conditions. If NEA is not satisfied with the result found, it shall request the network operators to make necessary adjustments (ex-post regulation).

2.3 Access to storage (gas)

There are yet no gas storage facilities in Sweden. However, one is under construction at the moment.

2.4 Dispute settlement

NEA is dispute settlement authority for questions concerning network access issues as well other issues (Special remuneration to proprietors of power generation plants, Special terms and conditions for electrical generation plants with a capacity not exceeding 1 500 kW, Obligations for a network operator to provide information about network tariffs)

3. Details on the sector specific regulator

3.1. Independence of the regulator: Appointment, accountability and independence from market operators and state ownership functions

NEA is an independent authority accountable to the Ministry of Industry, Employment and Communications. The Government determines the overall goals, gives guidelines and allocates necessary resources for NEA's activities. The Government is however, according to the Swedish Constitution, not allowed to take any part in the activities of the Swedish authorities.

The Office of the Electricity and Gas Regulator (OEGR) is one of eleven departments within NEA. The Head of the Office (the Regulator) is fully independent from other parts of NEA regarding regulatory issues.

3.2. Other responsibilities (in addition to those mentioned under 2.)

NEA is Sweden's national authority for issues regarding the supply and use of energy. In 1997, the Swedish Parliament decided that NEA has the responsibility for implementing most of the Energy Policy Programme and also, co-ordinating the work of restructuring the energy system. In addition, NEA is also responsible for monitoring developments in the energy and environmental fields and for providing information on the current energy situation. This covers aspects, such as, changes in the structure and pattern of energy supply and use, energy prices and energy taxes.

NEA has authority tasks within the fields of supply and distribution, emergency response programmes and municipal energy planning, as well as tasks connected with the planning of natural resources. It is also responsible for state efforts aimed at promoting research and development in the field of energy.

3.3. Enforcement of decisions

3.4 Staff numbers

2001: NEA 162, of which 33 are allocated for the OEGR

3.5. Annual budget

2001: NEA 195 905 000 SEK (20 518 000 €), of which 32 823 000 SEK are allocated for the OEGR

3.6. Possibilities of appeal against decisions– suspending effect

Decisions by NEA, accept licensing, can be appealed in the public administrative court, with suspending effect until the administrative court has made its final decision.

Decisions by the NEA on licensing can be appealed to the Government, with suspending effect until the Government has made its final decision.

4. Points of interest/concern

- Sweden belongs to the group of four countries in the EC applying "ex-post" regulation

United Kingdom (excluding Northern Ireland)

State of market liberalisation:

Electricity and gas: 100%

1. Bodies with regulatory competencies:

- The government (The Department of Trade and Industry, DTI)
- The Office of Gas and Electricity Markets (OFGEM) – "The regulator"
- The Gas and Electricity Consumer Council ("energywatch")

2. Responsibility for key regulatory decisions

2.1 Licenses

Supply, generation, distribution and transmission licences are issued by OFGEM, after consultation with the DTI. For the construction of new electricity generation capacity DTI gives consent.

2.2 Network access

OFGEM approves the methodology to calculate tariffs as well as the other conditions ex-ante. On the basis of the methodology and taking into account annual revenue caps imposed by OFGEM, the network operators set tariffs.

2.3 Access to storage (gas)

LNG terms of access included within the grid code. Charges determined by annual auction. Other storage is not regulated as the market is considered to be competitive).

2.4 Dispute settlement – principles and duration of procedure

OFGEM deals with disputes relating to network access. Targets exist for the duration of such procedures.

Consumer complaints are handled by Energywatch. Energywatch are able to investigate concerns raised and resolve issues arising as a result of their investigations. Where Energywatch require technical advice, they may contact OFGEM for assistance. OFGEM has the responsibility for matters concerning enforcement and determination. Energywatch are able to refer matters to OFGEM should they believe there is a genuine breach of current legislation.

3. Details on the sector specific regulator

3.1. Independence of the regulator: Appointment, accountability and independence from market operators and state ownership functions

OFGEM is governed by the Gas and Electricity Markets Authority, which consist of a chairman, and – currently - 10 other members appointed by the Secretary of State (DTI) for a period of no longer than 5 years; OFGEM is not subject to instructions from DTI, but has to consult with it in some cases.

3.2. Other responsibilities (in addition to those mentioned under 2.):

OFGEM has five key policy areas these are:

- Social and environmental action.
- Regulation of monopoly businesses (networks)
- Efficient trading in the wholesale electricity and gas markets.

- Managing the move to competitive supply markets.

- Work on industrial structure and competitiveness.

3.3. Enforcement of decisions

OFGEM has a wide range of regulatory and legal tools available to it in order to ensure compliance with the statutory regime which range from the informal (assurances) to legal remedies. For example, it is possible for the Authority to revoke a licence in the circumstances set out in the licence. In addition, in the future, it will be possible for the Authority to impose financial penalties on licensees once those powers have been fully implemented under the Utilities Act 2000. Other remedies may be available to the Authority depending on the nature of the issue that arises.

3.4 Staff numbers

The number of full-time equivalent persons employed (including senior management) at the end of September 2001 was 306.

3.5. Annual budget

2001: £62,211,000 (103,858,000 €) ; OFGEM covers its costs by fees raised on the energy industry.

3.6 Possibilities of appeal against decisions– suspending effect

Decisions of OFGEM can be appealed to the Competition Commission, appeal has no suspending effect but can be established by the Commission.

4. Points of interest

- OFGEM is the largest regulatory authority in the Community, in terms of personnel and budget

- The work in respect of the social and environmental action plan is a significant new body of work arising out of the passing of the Utilities Act 2000.

- OFGEM has withdrawn from some aspects of regulation where competition is judged to be sufficient, for example, price controls for gas (the same is envisaged for electricity from April 2002).

ANNEX D FRAMEWORK AND DEVELOPMENT OF CROSS BORDER TRANSACTIONS

ELECTRICITY

Introduction

The development of interconnectors between the formerly isolated systems in the European countries was firstly driven by power system security requirements. Investments in reserve power could be considerably reduced when neighbouring systems were used for this purpose.

The second driver for the development of interconnectors was the desire to connect systems with a complementary fuel mix; especially the hydropower dominated alpine regions with the thermal power dominated regions. Examples of this kind of connections are those of Switzerland and Austria to their neighbours, and the connections from Norway and Sweden to Denmark and Germany.

A third driver in the development of interconnectors was the rapid investment in nuclear power after the oil crises in the 1970s. The Netherlands and Italy, having decided not to build nuclear capacity, relied partly on other countries for baseload capacity: France and Germany in the case of Netherlands and France and Switzerland in the case of Italy. Existing infrastructure and newly built lines were used to cope with these long-term commitments. Interconnectors from Russia to Finland and from France to the UK were also based on the philosophy of long term base energy imports.

Cross border flows of electricity

The net imports/exports share of total consumption in the UCTE area have increased steadily from 8,4% in 1995 to 9,5% in 2000. In Nordel the net imports/exports share has varied considerably depending on weather conditions, ranging from 2,3% (1999) to 7,4% (2000) in the period of 1995-2000. Since the synchronisation of CENTREL with UCTE, net imports/exports from that area have been from 0,7% (1995) to 1,2% on UCTE consumption. Exchange between UCTE and other areas (Nordel, UK and South-Eastern Europe) has been rather constant during the 1990s, at around 1,6% of UCTE consumption.

Overall, net imports/exports had a share of 7,4% of the total consumption in the area covered by EU15, Norway and Switzerland (EU15+2) in 2000.

Table 1 below sets out the total amount of physical cross border flows measured in the year 2000. These are the physical imports and exports aggregated separately at each border between two countries. The table shows the flows inside the area covered by the EU15+2 and the flows to and from countries outside this area.

Table 1 Cross border exchanges of electricity in 2000

	Physical import flows within EU15+2 TWh	Physical export flows within EU15+2 TWh	Physical imports into EU15+2 TWh	Physical exports from EU15+2 TWh	"Openness": imports/exports (whichever is higher) TWh	Consumption TWh	Openness/ consumption	Usage of interconnectors for imports/ exports[1]
AT	7,5	11,7	6,3	3,7	15	60	25%	84%
BE	11,5	7,3			12	88	14%	67%
DE	34,2	40,3	9,6	2,2	44	563	8%	111%
DK	8,4	7,8			8	36	22%	38%
ES	12,2	5,2	0,0	2,3	12	217	6%	125%
FI	8,3	1,0	4,5	0,0	13	82	16%	50%
FR	3,1	71,9			72	470	15%	80%
GR	0,0	0,0	1,7	1,5	2	53	3%	53%
IE	0,1	0,0			0	23	0%	13%
IT	40,4	0,4	4,5	0,1	45	320	14%	104%
LU	6,4	0,7			6	7	93%	
NL	22,9	4,0			23	108	21%	86%
PT	4,6	3,8			5	39	12%	159%
SE	18,2	13,2	0,1	0,4	18	150	12%	49%
UK	14,4	0,1			14	388	4%	81%
NO	1,2	20,5	0,2	0,0	21	124	17%	67%
CH	23,6	29,4			29	64	46%	82%

Source: UCTE, Nordel, Dti, Eurostat, ETSO

Table 1 shows that the existing interconnectors of the main net exporting country, France, are almost fully used. The other big exporter, Norway, has strong seasonal variation in exports depending on water resources, this results in a lower utilisation ratio. The main importing countries (Italy, Netherlands, UK, Finland and Spain) have also their interconnectors used to a high extent.

The level of saturation of the interconnectors in some transit countries (Germany, Austria, Switzerland) is also very high. Other transit countries (Sweden and Denmark) have more seasonal variation in the use of interconnectors. Belgium and Portugal are in a special position regarding network topography which explains a relatively low figure for Belgium and a very high figure for Portugal. In the case of Portugal the exchange of electricity between the North and the South of Spain strongly affects the flows in the Portuguese interconnectors.

There is limited room to increase the physical flows between the Member States with the existing infrastructure, but investments are needed to relieve the most severely congested interconnectors[2].

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[1] Compared to the theoretical maximum of sum of NTCs. This comparison is made by using 2000 cross border flows and ETSO summer 2001 Net Transfer Capacities (NTC). The real transfer capacities cannot in most cases be calculated by summing up the NTCs on different borders, but this still gives a good indication for assessing the usage rate. The usage rates above 100% are partly explained by higher NTCs in winter and the special situation on ES/PT border, which affect the figure for both countries.

[2] Consentec/IEAW study for DG Energy and Transport.

Congestion Management of electricity interconnectors

A closer look at certain critical interconnectors is given in the Table 2. This shows the extent to which congestion exists on a number of interconnectors and the processes used to allocate capacity.

Table 2 Congested Interconnectors

Border	Occurrence of congestion	Allocation method	Average price of capacity (€/MWh)	Utilisation ratio 2000[3]	Remarks
FR to ES	All year	First come-first served, priority to long term contracts		103%	
FR to BE	All year	Unclear		60%	
DE/BE to NL	All year day hours	Auction	10.75 from DE 3.01 from BE	91%	
DK to DE	All year	Auction	1.62 from DK	46%	Depends on wind generation
FR/CH/ AT to IT	All year	Several methods in use, priority to long term contracts		91%	
FR to UK	All year	Auction	5.75 from FR	82%	
NO to SE	All year	Market splitting		60%	Depends on water resources

Sources: Consentec/IEAW, OXERA, Eurostat survey

As shown in Table 2, a number of interconnectors do not yet have a satisfactory system of capacity allocation with a number tied up in long term contracts or with arbitrary ad-hoc mechanisms. However, two market based models seem to be emerging to deal with congestion, namely the "market splitting" method used in Nordpool and explicit auctions that are used elsewhere in the European network.

With market splitting, allocation is based on generators' bids into the electricity spot market. A price is then determined for each area on the assumption that no connection exists. The Nordpool system works on the basis of a single Scandinavian spot market with regional prices. Such a system could feasibly be replicated each side of a interconnector using power exchanges in their national markets.

Market splitting means that capacity is automatically allocated such that price differences between the two areas in question are minimised. The implicit price paid to the TSO for access amounts to the remaining differences between prices in the two markets since this will be the profit made by the TSO from its "brokering" activities. The procedure is carried out in real time for each settlement period. The advantage of this is that the TSO can ensure that all available capacity is used. The disadvantage is that the mechanism may it difficult for a supplier in one country to make a bilateral agreement with a generator in the other country since they can never be sure whether capacity will be available or not.
Under explicit auctions a separate transaction is necessary to secure capacity. This immediately creates an additional burden for cross border transactions although it does, at the

[3] Utilisation ratio calculated from UCTE 2000 flow data and ETSO Net Transfer Capacities (average of summer 2001 and winter 2000-2001).

same time, give the opportunity to secure capacity over a longer period. Explicit auction also allows generators to bid different prices in different spot markets. This may give them the opportunity to segment markets and preserve the price differences that would result in the absence of interconnection. For example if the price without interconnections is €40/MWh in one market and €50/MWh in the second market, successful bidders for interconnection capacity may have a large influence on the market price in the second market. They may then bid a higher price in the importing markets in order to maximise their return. Such a strategy is not possible in the market splitting approach since the generator may only provide one offer price that is valid both sides of the interconnector.

The opportunity to earn an increased return by segmenting markets will, however, feed back into the price that generators are prepared to pay for interconnection capacity itself. In this case, the ultimate beneficiary of market segmentation tends to be the TSOs which own the interconnector. Where those TSOs are part of vertically integrated businesses there may be an incentive for their affiliated generation companies to bid up the price of interconnection capacity. This is because capacity can be secured at a high price without such a damaging impact on the vertically integrated business, since the transmission part may be receiving at least part of the revenues collected. Such a possibility underlines the need for close regulation of capacity allocation procedures.

Tariff Mechanism for cross border exchanges of electricity

Transmission tariffs within individual Member States for electricity are not based directly on either distance or the contract path. Charges are either postalised, or an entry-exit system is used. Such a system can provide a basis for a general European system of charges on the basis that, for any cross border transaction an entry (G) charge would be paid to the TSO in the country of origin and an exit (L) charge would be paid to the TSO in the importing country. There remain two main questions, Firstly an appropriate mechanism is needed for compensating other countries affected by transit or loop flows. Secondly, there needs to be some harmonisation of G and L charges.

As demonstrated in Table 3, a number of Member States currently have export and import charges in place as well as specific transit charges along the contracted path of any cross border transaction.

Table 3 Cross Border Transactions: Example Transactions

Connection	export/import charges (€/MWh)	transit charges
within Nordpool	import and export SV (2.00)	
Nord-DE	import DE (0.64),export DK (0.65-1.34)	N (check)
Nord-DE-NL	export DK (0.65-1.34)	DE (1.20)
DE-BE-NL	export DE (0.64), export BE (1.00)	na
FR-NL	export FR (0.8-2.44), export BE (1.0)	BE(1.0-1.5)
BE – UK	export BE (1.0)	FR (0.8 – 2.44)
DE-SP	export DE (0.64)	FR (0.8 – 2.44)
FR-DE	export FR(0.8 – 2.44), import DE(0.64)	na
DE/AT-CH-IT	export DE (0.64), export AT(0.81)	transit CH(3.46-4.16)

Source: ETSO, Nordel

There is little co-ordination between different TSOs to ensure that the charges made for cross border transactions are cost reflective. Export/import charges and transit fees often imply that

cross border flows are required to contribute to fixed costs of all the TSO networks involved whereas domestic suppliers are only required to do this for the national network.

These cumulative charges, known as "pancaking" are not cost reflective since the physical flow implied by any transactions in fact bears little resemblance to the contracted path and the additional costs generated by any transaction are unlikely to be related to either the path or the distance. Cross border transactions are therefore put at a disadvantage in the current regime.

Temporary cross border tarification mechanism for electricity

In the framework of the Florence process ETSO has proposed a temporary mechanism to compensate the TSOs who host transit flows related to exports and imports between third countries. The compensation mechanism is based on a global amount of compensation of €200m in the UCTE area and would replace the specific charges in Table 3. Table 4 shows the main parameters of the proposed mechanism and the final result of compensation based on the 2000 electricity flows.

Table 4 ETSO proposal for transit flow compensation mechanism using 2000 data[4]

	Programmed exports TWh	Net imports TWh	Payment to the compensation fund (€ m)	Transit key %	Payment from the compensation fund (€m)	Net receipt (€/m)	Net effect €/MWh consumed
AT	2,6	-2,9	4,5	18,8	23,3	18,8	-0,31
BE	2,6	3,2	4,8	6,7	12,7	7,9	-0,09
DE	19,9	10,7	26,6	5,1	48,8	22,2	-0,04
ES	2,1	5,1	5,6	3,5	18,4	12,8	-0,06
FR	46,0	-45,4	76,2	1,1	5,8	-70,4	+0,15
IT	0,2	42,1	30,1	0,1	0,4	-29,7	+0,09
CH	30,0	-13,1	38,0	25,8	77,6	39,6	-0,62
NL	0,1	16,6	11,9	5,3	7,4	-4,5	+0,04
PT	1,1	1,7	2,3	9,1	5,5	3,2	-0,08

Source: ETSO

In the ETSO proposal, half of the compensation amount is collected proportionally based on programmed exports, the other half from net flows to or from the country. Compensation for hosting transits is based on share of transits on internal flows in a country (transit key) applied directly to total network cost claimed by each country.

Permanent cross border tarification mechanism for electricity

A permanent mechanism for the cross-border trade compensation has been discussed in the Florence forum. Both the National Regulators and ETSO have made proposals regarding the permanent mechanism. Even if an agreement on setting up a non-transaction based, cost reflective system exists, there are still several options regarding the content of the system. Further studies are required based on load flow modelling in order to reflect more accurately the real cost caused by transit flows.

[4] Nordel countries (DK, SE, FI and NO) and UK agree in principle to pay together the Programmed exports part of the contribution. Exports from Nordel to UCTE were approximately 7TWh in 2000, this would result in a compensation of 7M€ to the fund. Exports from UK in 2000 were minimal.

Conclusions: Electricity

Congestion is clearly an obstacle to the creation of an integrated EU electricity market. Most interconnectors are already used intensively without significantly affecting the spread of prices in the Community. However although progress has been made, there also remain regulatory obstacles to efficient cross border exchanges and a lack of co-ordination of capacity allocation and tarification mechanisms. This continues to be addressed in the context of the Florence Forum and, when appropriate, in the context of the Regulation proposed by the Commission.

GAS

Introduction

In contrast to electricity, where only 7 % of EU electricity consumption is based on cross-border trade in electricity, more than 60 % of current EU gas consumption crosses at least one border on its way to the final consumer. This cross-border "trade", however, does not reflect a real competitive internal market but rather the fact that gas is being imported by national gas companies from distant supply sources. About half of all Member States are 100 % import dependent. On average, the EU imports around 40% of its gas consumption, mainly from Russia, Algeria and Norway.

Cross Border Flows of Gas

Gas cross border transactions are dominated by a few companies who have capacity reservations on the infrastructure being used. Transit therefore mostly occurs at the point where the gas is delivered from the ultimate producer to the importer in the Member State concerned. Indeed many gas import agreements have restrictive destination clauses that prevent further exchanges.

The consequence of this situation is that competition only tends to be effective to the extent that new entrants have gas available in the same locality as their potential customers. Thus competition in regions of the EU nearest to the main sources of gas have generally been more vigorous since there may be a number of competing companies which have access to gas in such locations, particularly if governments have imposed gas release programmes on the incumbent gas importing companies.

Congestion on gas interconnectors

At this early stage it is difficult to see if there exists significant congestion different points on the European network. Limited problems have been reported to the Commission in the context of its survey regarding existing congestion. However it is possible at this stage to clearly indicate where such issues may be expected to arise in the near future.

The Association of gas Transmission System Operators has published a "traffic light" system of indicative available capacities on the main European gas network. This information is not available on a real-time basis and furthermore, contrary to the basic principle which has been agreed for electricity, contractually reserved, but unused, capacity is not considered to be available according to GTE's definitions. GTE's overview shows that out of 48 cross border nodal points, 45% are "red" indicating that there is little or no capacity available. 80% points are "red" or "yellow" and only 20% of the nodal points have a "green light" indicating capacity is freely available.

The "red spots" on the European gas transmission map include the following key gas supply routes and points:

UK-Ireland Interconnector
UK-Continent Interconnector (in both directions)
Zeepipe from Norway to Zeebrugge
Europipe II from Norway to Germany
Denmark-Germany (Deudan pipeline)
Austria-Italy (Trans-Austrian Gas pipeline - TAG)
France-Spain Interconnector
Maghreb-Europe pipeline from Algerian via Morocco to Spain and Portugal
Export pipelines from The Netherlands to Germany and Belgium

It is, however, thought that a number of these possible congestion points would be relieved if use-it-or lose it provisions were applied.

Cross Border Tariffs

Unlike electricity, transmission tariffs do not have a similar structure in each Member State. Although some tariffs are based on an entry-exit or postalised system, other countries have distance related charges based on a point to point calculation. As well as needing to book capacity, any cross border transaction is likely to be subject to a series of transmission tariffs in each country transited according to a different principle in each. The resulting aggregate transmission charge is likely to be somewhat arbitrary.

Furthermore, although there is likely to be some relationship between the contract path and the physical flow of gas, this is likely to become weak as greater distances are considered. Therefore it is likely that transactions involving one or more Member States with distance related tariffs are likely to result in inappropriately high transmission tariffs.

Table 5 Cross Border Issues: Gas

Example Connection	Compatible balancing arrangements	Transparency on available capacity	Allocation method	Quality conversion needed	Non cost-reflective charges
UK – BE – DE	UK – daily BE/DE – hourly	I/C, BE, DE all unclear	negotiation	Y – in DE	Y within DE - up to 3 sets of cumulative tariffs on different DE networks
DE – NL	Y – hourly throughout	publication of partial data	negotiation	Y - in NL	distance related tariffs in NL
BE – FR – SP	BE – hourly FR – daily with hourly limits SP – no formal regime	BE, FR, SP unclear	negotiation	N	Y - distance related tariffs in FR unlikely to reflect physical flows
AT – IT	Y	AT, IT unclear	"fully booked" no use-it-or lose-it	N	N
source: Brattle Group Report for EFET					

Finally there are possible difficulties relating to different technical standards in different Member States relating to the balancing arrangements and gas quality. All of these various issues are summarised briefly in Table 5 above.

Conclusions: Gas

To date there is very little transparency regarding the availability of capacity and no real co-ordination of tarification in order to facilitate cross border trade of gas. Currently much capacity is taken up by long term agreements with no mechanisms in place to release this un-used capacity. Different tariff structures in Member States and in particular the cumulative application of distance related tariffs mean that it is unlikely that cost reflective network access is available across borders.

ANNEX E MARKET SHARES, ENTRY AND CUSTOMER CHOICE

Introduction

The development of a competitive market can only take place in two parts of the supply chain, namely generation\production and supply. The transmission and distribution functions will generally remain as natural monopolies since competition through duplication of these networks is not usually considered to be a feasible way to enter energy markets.

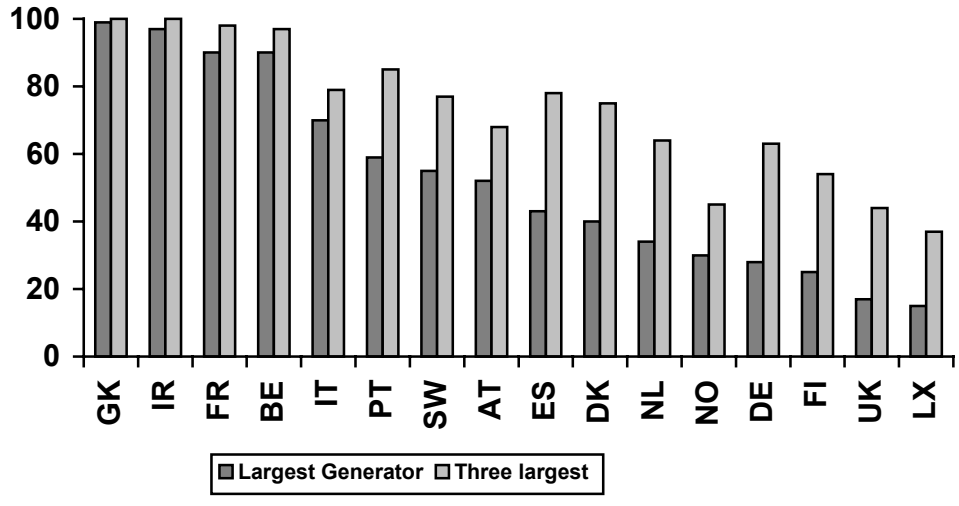
To be successful, market opening should, to some degree, be accompanied by a dilution of the market share of incumbent generators (electricity) and producers/buyers (gas). This is expected to occur as a result of new entrants in national markets, or following an increase in the amount of cross border trade. However there may also be opportunities in some countries for consolidation. In any case, incumbent suppliers of electricity and gas to final customers should experience the possibility of losing their share of the market.

The provision of a real choice to energy customers should also lead to a significant number of customers who switch between suppliers for some or all of their energy needs on a regular basis. The sections below review current developments in the structure of markets and consumer behaviour.

Electricity Generation Market

For generation of electricity the immediate effect of market opening may not be as pronounced in the short term in some countries since there is currently over-capacity in a number of Member States. This position is not conducive to new entrants since high concentration together with excess supply will mean that prices will tend to be below full cost recovery for a new entrant. In addition, the electricity Directive allows transitional regimes for the recovery of stranded costs associated with investments made at the time of a closed market which may now be uneconomic once the market is opened. Such a position will only reverse itself as older capacity is retired, capacity availability becomes tighter and wholesale prices increase. New entry may then take place, thus eroding the position of the dominant generators. The graph below sets out the market shares of the first three generation companies in each Member State.

Graph 1 Market Share in Generation Output



Clearly there is a significant degree of concentration for generation in many Member States. This has a number of consequences for the whole electricity market including the retail supply business. In particular, concentration may mean that there is a poorly functioning wholesale market and this may, for example, expose new entrants to the risk of high prices for balancing or back-up supplies of energy.

In some cases (FR, IRL) efforts have been made to address this issue by conducting auctions of blocks of generation from the existing generators to potential new entrants known as "virtual capacity auctions "[1]. These are a form of bilateral contract but the ability of the monopolist to negotiate is restricted. The capacity concerned has to be offered at a fixed price, usually at a reduction to the large user price. Suppliers then have to bid for the right to purchase the energy offered in the auction. The offer price, plus the successful bids is the amount received by the generator company. These mechanisms may be a useful way to introduce supply competition where there is significant dominance in the generation market. However they fall short of a policy of divestment which would establish fully independent competitors. Such a policy is in place in Italy whereby three to four tranches of ENEL generation capacity will be divested. Similar measures to introduce competition in the generation market were taken in the UK.

Electricity Wholesale Markets

Energy market reforms have, in many cases, led to the introduction of standardised commodity markets for electricity. These wholesale markets fulfil a number of useful functions which improve the prospects of market entry. The main advantage is that they produce a transparent price signal which is not available from individual bilateral transactions. The main types of wholesale markets are power exchanges and Pools.

- Power exchanges normally function on a day-ahead basis and electricity is bought and sold in hourly or half-hourly blocks. Usually both purchasers and vendors of electricity make bids and a price is determined that clears the market. Both private exchanges and publicly sponsored markets exist.

- Electricity Pools work in a similar way but often the administrator of the Pool is often responsible for estimating the level of demand in each settlement period. Pools tend to allow more exercise of market power since they bring together generators as a block. They are thought to generate higher prices than power exchanges, especially if participation is partly or wholly compulsory.

Standardised wholesale markets provide a transparent spot price that can be used as a reference for longer term bilateral contracts. They also allow producers/importers of electricity and potential suppliers greater flexibility since there is no need to exactly match the demand from customers to the generation capacity being purchased – any excess or shortfall can be corrected in the spot market. This is particularly useful for new entrants who may not know whether they will achieve enough market share to justify investment in generation capacity or concluding a long term contract. Standardised markets also allow a more flexible pricing strategy for certain types of electricity generation unit such as hydro-electricity or wind where production varies according to climatic conditions, or those where prices may vary according to the cost of oil or gas.

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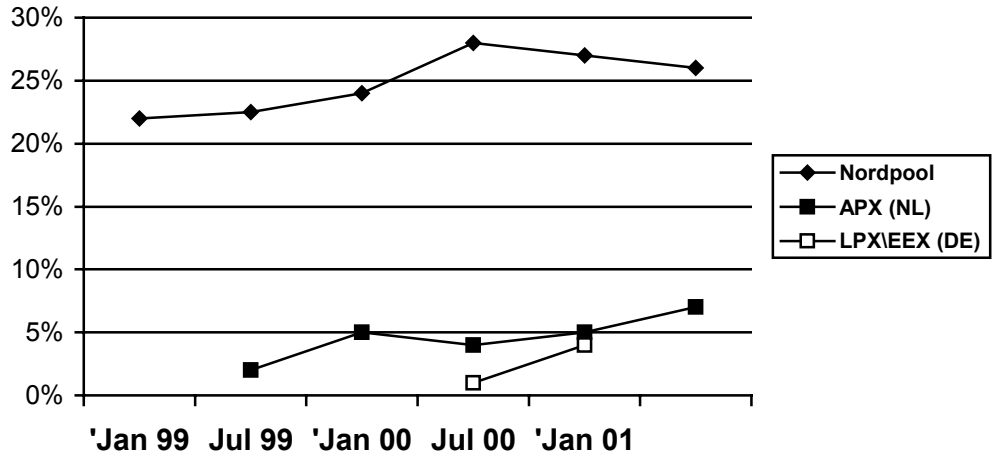
[1] In the case of France these auctions were imposed on EDF as a condition for approval of their purchase of EnBW.

The development of liquid and competitive wholesale markets is therefore an important indicator of the extent that favourable conditions for competition exist. Currently, the Nordic countries, UK, Netherlands and Germany have active power exchanges and the exchange in France was launched very recently. The graph below shows the proportion of electricity currently handled on power exchanges in selected countries.

Graph 2: Total market volume traded on power exchanges



Sources: APX, EEX, LPX, Nord Pool, UCTE

It is notable from this graph that even in Member States with mature power exchange such as the Nordic countries, we find only up to 25-30% is traded in the spot market with the rest in longer term non-standardised bilateral contracts. These arrangements often cover longer time periods of one month to several years and, of course, include any purchases made within vertically integrated companies from generation to the supply business. However the important issue is that both are available to give the best combination of security of supply i.e. bilateral contracts and flexibility and transparency through the spot market.

Meanwhile a Pool-type mechanism is in place in Spain and it is intended that this will lead to the creation of a common Iberian market including Portugal. A similar market structure is predicted for Italy. Some concerns have been raised that the Spanish market is overdependent on the Pool with around 95% of electricity traded in this manner. The market is also distorted somewhat by the effect of the compensation payments now offered to generators for stranded cost obligations. These may have the effect of imposing a price cap on the wholesale market since they are withdrawn if prices exceed a certain ceiling.

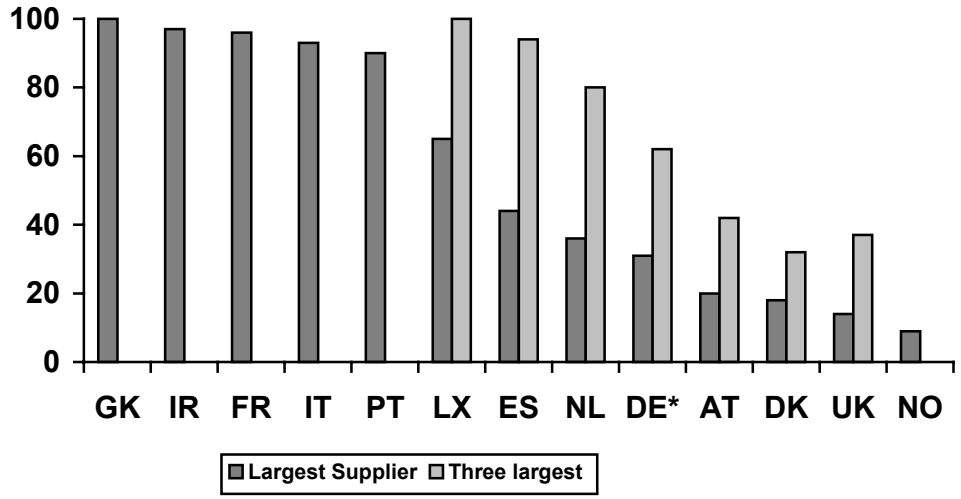
Electricity Supply Competition

Although the market for electricity generation remains concentrated, there remains some possibility of seeing an erosion of concentration in the market for electricity supply. This may occur provided that potential suppliers can freely purchase the required amounts from existing generators; either in wholesale markets, through virtual capacity auctions or from other Member States.

New entry may either come from totally new companies selling electricity to final customers. Or, more likely, where supply companies previous held a monopoly on a regional basis,

competition will lead to blurring of these boundaries as companies become more active in each other's regions and some attempt to build a national presence.

Graph 3 Market Share for Electricity Supply



* account taken of cross ownership source: OXERA, DG Energy and Transport survey

To date, however, the degree of concentration generally reflects that in the generation sector of the market as depicted in Graph 3 above. In particular, it would appear that suppliers are finding it difficult to penetrate markets which have a former monopoly player. It would also seem to indicate that competition from cross border trade is not developing particularly quickly. The exceptions to this are Denmark and Austria where there is much less concentration in the supply market than for generation. Both these countries have a considerable capacity for importing electricity. However the figure for Austria may be distorted to an extent, as there have been no adjustments for cross ownership effects which are significant. Furthermore, many countries, including Austria, have a large number of existing companies which previously had regional monopolies for both distribution and supply. In such circumstances there will inevitably be a low degree of concentration, but this may not be a very good indicator of the level of competition in the market.

Customer Switching: Electricity

An alternative way of assessing the level of competition is to estimate the extent to which customers have been exercising their new rights to choose supplier. A low level of switching may indicate that there exist barriers to competition in the market or alternatively that incumbents are resisting competition by cutting their own prices. Table 1 below reviews the level of switching activity for large users, which corresponds to the eligible market in most Member States at this stage.

Table 1 Estimated switching in large users market

	Customers with consumption above	Number of customers included	no. of customers switched or reneg.	% of market volume switched	% switched or renegotiated tariffs with incumbent	Market opening date for this group
Austria	20GWh	n.a.	n.a.	5-10%	n.a.	1999
Belgium	20GWh	n.a.	10	5-10%	n.a.	2000
Denmark	1GWh	2300	2000	86%[2]		2001
Finland	0.5MW[3]	n.a.	n.a.	30%	100%	1995
France	16 GWh	1350	82	5-10%[4]	n.a.	1999
Germany	9 GWh	n.a.	n.a.	10-20%	50%	1999
Greece	100 GWh	n.a.	nil	nil	n.a.	2001
Ireland	4 GWh	416	263	30%[5]	65%	2000
Italy	20 GWh	1069	800	10-20%	75%	1999
Netherlands	20 GWh	650	n.a.	10-20%	n.a.	1999
Portugal	9 GWh	214	37	<5%	n.a.	1999
Spain	1 GWh	n.a.	n.a.	<5%	50%	1999
Sweden	5GWh	n.a.	n.a.	100%		1996
Un. Kingdom	1MW	n.a.	n.a.	80%	100%	1990
source: responses to Commission survey						

A number of Member States have opened their markets to all consumers. It is therefore also worth considering the extent to which customers in those countries have sought a change in supplier, or have been able to negotiate different tariffs.

Table 2 Switching in commercial and domestic electricity market

% of consumption	Other commercial and households		Market opening date for this group
	switch	switch plus reneg.	
Austria	<5%	n.a.	2001
Finland	10-20%	50%	1999[6]
Germany	<5%	20%	1999
Sweden	10-20%	20-30%	1998
Un. Kingdom	>30%	n.a.	1998
source: responses to Commission survey			

This analysis seems to show that there are several discernible groups. In some Member States, both full market opening and significant switching has occurred. However in others, there exists a high declared level of market opening but a more limited amount of effective competition to date has been recorded in terms of customer switching.

For those Member States where market opening is at or close to the minimum required in the Directive there are some where a proportion of those customers have chosen to change

[2] 86% of eligible customers have changed supplier, but many to a separate affiliate of the incumbent company.
[3] 1MW corresponds to 5GWh if capacity is used for an average of 5000hours per year.
[4] Not including balancing energy
[5] The new supplier for most of these companies changing supplier has since withdrawn from the Irish market.
[6] Although all customers were eligible from 1997, load profiles were not introduced until Nov 1998

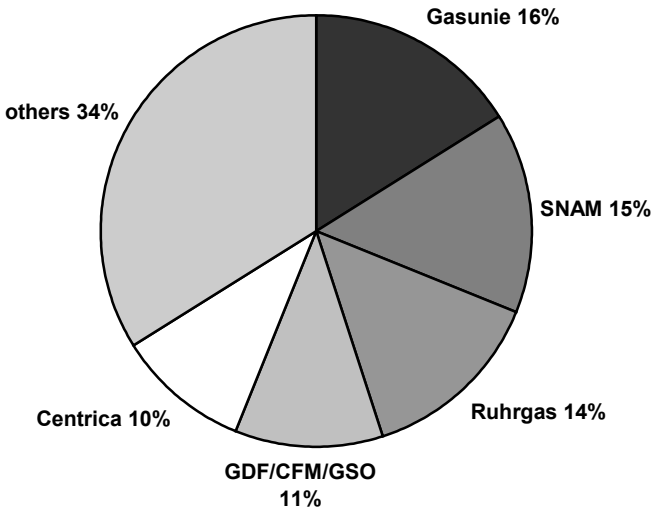
supplier, and others where both declared market opening and the actual level of competitive activity are low.

A number of incumbents have responded to competition by reducing their own prices and negotiating special prices with some customers. There are two interpretations of this. It could be argued that competition can have an impact without necessarily generating changes in supplier and indeed this is true if the threat of competition is real. On the other hand, where parts of the market are closed, either formally or through unfair network access conditions, such renegotiation may be the result of cross subsidy from the closed part of the market.

Gas Production and Import Competition

There is considerable concentration in most Member States in terms of the number of companies either producing gas, or importing it from overseas. In gas, this concentration tends also to restrict competition in the supply market since wholesale markets and bilateral sales are not common – apart from "sales" between the production\import and supply functions of vertically integrated businesses.

Graph 4 Concentration in Gas Productions and Import: Division of gas consumption by main buyers



NB. Some double counting is entailed since certain Gasunie volumes are also counted by their buyers
source: WEFA estimates

The chart above sets out the dominance of certain companies in the production and import of gas from either EU or internal sources. Such a degree of concentration acts against the development of major new entrants at this stage on the basis of national markets.

The development of wholesale markets for gas, with an adequate level of competition, is very important in terms of encouraging new entrants to participate in the market. If there is no way for entrants to access gas without entering into a long term contract with a producer, then the possibility for competition will be severely restricted. In particular, new suppliers will only be able to enter into such commitments once they are assured of a certain level of customer demand. However wholesale markets will not develop without measures to erode the dominant position of the major gas shippers either through cross border trade or from

dominant players selling off their capacity. In the UK the national regulators took the decision to reduce the market share of the incumbent. Italy has now placed limits on the market share of gas shippers and suppliers and Spain is also proposing a gas release programme.

Gas Wholesale Markets

Gas wholesale markets have only developed in two Member States to date. In the UK, a range of trading opportunities are available including bilateral trading, standardised gas exchanges such as those run by the International Petroleum Exchange (IPE) or by EnMO. The vast majority of UK gas trades are now concluded for delivery at the National Balancing Point. This point is a purely notional location-in short, it does not exist. But trading at the NBP allows traders to put gas into the system at any beach terminal and avoid binding a contract to any specific delivery point.

Zeebrugge is the largest continental gas trading hub. Its importance lies in its location. Zeebrugge has good access to French and German markets, and connections to Norwegian reserves through the Zeepipe. Zeebrugge also stands at one entrance to the UK-Belgium interconnector. Deals are concluded in pence/therm at one of two points, either at the interconnector Zeebrugge terminal or at the "hub". The hub is a gas facility that offers scheduling and trading facilities. It is operated by Huberator, which is a subsidiary of Distrigas. Most Zeebrugge trades are bilateral and there is no standardised exchange.

Very little gas is traded in spot markets elsewhere. Interest in new hubs is developing, for example at Bunde\Oude on the Dutch\German border and at Emden in Germany. Some bilateral exchanges are concluded at these points already.

Gas Supply Competition

Without efforts at national level to reduce concentration through gas release programmes and without an adequate wholesale market for gas, competition between suppliers is only likely to develop from cross border transactions. To the extent that this is possible, given current arrangements for allocation of capacity and tarification, there may be entry in supply markets despite concentration in the upstream market.

The Commission’s research in this area suggests that some 13 companies have begun to actively compete in more than one country. Most of these are major international companies with large gas portfolios or equity gas. Other smaller players are also starting to compete, but without substantial gas supplies. The table below reports on their progress in each Member State.

Table 3 Attempts at Market Entry by Member State

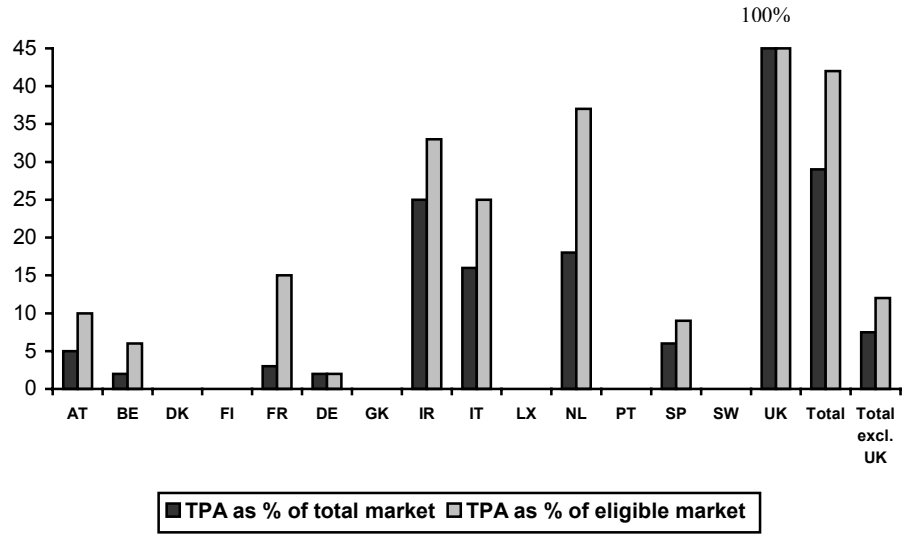
	AT	BE	DK	DE	ES	FR	FN	IR	IT	LX	NL	SV	UK
Major 1		**1**		**1**		**1**		**1**			**1**		
Major 2				**3**							**3**		
Major 3				**A**									
Major 4	**3**					**3**	**A**					**A**	
Producer 1		**3**		**3**	**3**	**3**					**3**		**3**
Producer 2	**1**			**1**									
Producer 3					**3**				**3**				**3**
Producer 4													**3**
Trader 1		**1**		**3**							**1**		**3**
Trader 2				**3**									
Trader 3	**1**	**2**		**3**	**1**	**3**					**3**		**3**
Trader 4				**3**									
Trader 5		**2**		**3**	**1**	**1**					**3**		**3**

source: WEFA report for the DG Energy and Transport

The number scale provides a visual indication of the success in entering the markets, with:
1. = tried but failed
2. = tried with partial success
3. = succeeded (even if only with small volumes and 1 or 2 clients.)
A. = sales through affiliate in which interest held

Clearly there is some activity occurring in terms of attempts to compete. This however, does not measure the overall level of success. One way of doing this is to assess the extent to which gas transportation companies are carrying the gas of third parties in their networks. In most cases this would indicate that the incumbent is losing market share.

Graph 5 Estimated market penetration through third party access



source: WEFA estimates, DG Energy and Transport information

This graph shows that, apart from the UK, competition is most vigorous in Ireland, the Netherlands and Italy. Entry in the other markets is restricted either because the market is not fully open or due to problems for entrants getting fair access to the network. This is thought to

be attributable to the lack of information on capacity availability, inflexible distance related tariff structures and the lack of a clear framework for cross border transactions. Although 50% of gas crosses national borders, this is predominantly part of the transaction bringing the gas from the producer country to the incumbent importer. It would appear that very little trade occurs after this point.

Gas Customer Switching

Another indicator, which should be related to the analysis above, is the extent to which customers have been able to switch supplier using provisions for third party access. This is set out in Tables 4 and 5 below.

Table 4 Switching in eligible or large users market

	Gas customers above	Number of customers in this group	no. of customers switched	% of volume switched	% switched including renegotiated tariffs with incumbent	this part of market open since
Austria	25mcm	n.a.	5-10	< 5%	n.a.	2000
Belgium	5 mcm	200	5-10	< 5%	n.a.	2000
Denmark	35 mcm	n.a.	nil	nil	n.a.	2000
France	25 mcm	100	8	10-20%	n.a.	2000
Germany	5mcm	n.a.	n.a.	<5%	n.a.	2000
Ireland	2 mcm	7	>2	30-35%	n.a.	1995
Italy	0.2mcm	n.a.	700-800	10-20%	n.a.	1991-2000
Luxembourg	15 mcm	n.a.	nil	nil	n.a.	2000
Netherlands	10 mcm	n.a.	125	>30%	n.a.	1996-2000
Spain	3 mcm	279	n.a.	5-10%	35%	2000
Sweden	25 mcm	n.a.	1	<5%	n.a.	2000
UK	0.1mcm	n.a.	n.a.	90%	n.a.	1992
source: WEFA, replies to Commission survey						

The level of reported switching tends to reflect the findings of the previous section which deal with third party access. Those markets which have been open to competition for the longest period appear to have had more activity. Progress in other Member States is, however, slow.

Table 5 Switching in other commercial and domestic market

	% customers switched	% switch plus renegotiated	market open since
Germany	<5%	n.a.	2000
UK	45%	n.a.	1998
source: WEFA, replies to Commission survey			

Conclusions

An examination of the emerging market structure in different Member States indicates the following trends. For the electricity market, there is significant progress in terms of building transparent wholesale markets for electricity on the basis of individual Member States. However the problems of market concentration are significant. Without significant increases in cross border capacity or an active divestment policy, the generation market in certain countries will continue to be dominated by the incumbent companies. Together with network access conditions, the existence of dominant player is likely to continue to provide an obstacle to new entrants and restrict the extent of consumer choice. The largest degree of switching has occurred in those Member States with the most favourable network access regime and the least amount of concentration. For gas, there has been little progress made in developing transparent wholesale markets across Europe, mainly due to the lack of coherence in the different systems for transportation charges. Wholesale markets in individual countries are generally dominated by the main producers and importers. Other than in the UK, Ireland Italy and the Netherlands, the development of customer choice has been relatively slow.

ANNEX F SECURITY OF SUPPLY

Introduction

In most Member States, security of supply has historically been assured by requiring a single company or organisation to plan the necessary amount of production and transmission capacity, and then provide that company with a closed market in return for taking on this obligation. Such a regime is not compatible with market opening and therefore new arrangements are required. Experience with reform of energy markets worldwide has shown that the design of the regulatory framework is crucial for maintaining the right incentives for the provision of an adequate amount of electricity and gas.

Characteristics of Energy Markets

Both electricity generation and the extraction and import of natural gas require long term investment. These investments also have relatively long lead times and may risk becoming "sunk costs" if expectations are not fulfilled. At the same time, demand for energy products is relatively price inelastic meaning that consumption does not respond strongly to movements in prices. In a competitive market, these factors lead to a risk of wholesale energy prices rising very quickly as the supply-demand position is eroded. This is demonstrated in more detail in the Appendix. This problem is exacerbated since many consumers are not metered on a half-hourly basis and there will be only a delayed response to price increases in terms of reduced consumption.

In such circumstances, it may not be in the interests of incumbent generators or gas shippers to make available additional capacity since they may benefit substantially from a period where supplies are tight. It is important, therefore, to design energy markets in such a way as to ensure that sufficient capacity will be made available and price volatility is minimised.

For electricity the main concern in most Member States relates to the availability of electricity generation capacity although in some Member States the capacity to import is also of concern. For gas, there is a distinction to be drawn between those Member States with indigenous resources and those without. For gas producing countries the level of extraction capacity is the appropriate area to consider as well as the capacity of the transmission network to handle this gas. For gas importers security of supply relates to the capacity to import and the volume and sources of contracted imports, as well as the internal capacity of the network.

Role of Wholesale Markets

At a general level, an important feature of both the electricity and gas Directives are the specific provisions which give the possibility for generators and suppliers to enter into bilateral long term purchasing agreements. Bilateral contracts are important since they spread some of the risks associated with entering into a long term investment by sharing these risks with suppliers and ultimately customers. This results in more gradual changes to electricity and gas prices to final customers. Bilateral contracts also help dilute problems associated with concentration since there is an opportunity for a price negotiation with a single energy producer. This contrasts with a wholesale market that relies totally on a Pool type mechanism which tends to encourage producers to collude. Therefore, even in long standing competitive models in the EU, such as Nordpool, it is normal for at least 70% of electricity to be traded on the basis of long term bilateral contracts. The gas market is also largely based on long term contracts.

The functioning of bilateral wholesale markets is enhanced, however, if there are also liquid standardised spot markets such as power exchanges or hubs. These serve to provide a transparent reference price to market participants which will be indicative of the supply and demand conditions in the market in question. If all energy is traded using bilateral contracts there is no transparency, either about the adequacy or availability of capacity or the market price. With a transparent market, rising spot prices will provide a signal to all market participants that new generation or new gas contracts will be viable and that any unused commitments may be sold on at a reasonable price without being exposed to imbalance penalties.

Such a framework relies on market signals to encourage the construction of new capacity and is dependent on liquid markets with a reasonable number of participants. An effort to reduce market power in generation and gas production/import is an important component of this strategy. This may, however be more difficult for gas due the external dimension increasingly involved in gas supplies.

Further Safeguards to Security of Supply: Electricity

There are a number of other possible measures that may also be adopted by Member States to support market mechanisms. The main models are as follows:

- financial incentives to new capacity (availability payments) or obligations to hold reserves,
- TSO responsibility for peak capacity at extreme times,
- direct price signals to customers (hourly metering),
- indicative planning and tenders.

These are set out in Table 1 below for electricity and these are discussed in more detail in the sections below. Note that these solutions are not necessarily mutually exclusive and a number may be used at the same time.

Table 1 Current and Planned Security of Supply Measures: Electricity

	liquid spot /forward market	incentive payments/ compulsory reserve	TSO controlled reserve	hourly metering	indicative planning
Austria	no information				
Belgium					x
Denmark	x				
Finland	x		x		
France	x				x
Germany	x	x			
Greece		x			
Ireland		(x)			
Italy	(x)	(x)			
Netherlands	x	x	(x)		
Portugal	no information				
Spain	x	x			
Sweden	x		x		
UK	x			(x)	
Source: responses to Commission survey. (x) indicates planned measures					

Incentive payments \ Compulsory Reserve

In this system, the transmission system operator is required to make a payment to all generators that nominate their facilities for dispatch, even if the particular generation plant is not fully used. These are known as availability payments and are financed from the general charges for use of the transmission network – that is by all customers. The payment represents an incentive to generators to maintain capacity (usually marginal existing capacity) whose operating costs are usually too high to allow them to bid successfully into the wholesale market. In such circumstances, the level of payment would need to be enough to allow such plants to cover fixed operating costs plus any remaining undepreciated capital value.

In this context, it is also worth noting that the Directives also allow recognition to be given to the existence of sunk costs embodied in existing generation capacity where these were constructed before the entry into force of the Directives. Accordingly, many Member States have designed temporary compensation mechanisms to prevent the incumbent supply companies losing out as a result of previous long term purchase agreements. These have been notified to the Commission and dealt with under the state aid procedure.

A different version of this mechanism is to require suppliers to have available a certain amount of reserve capacity compared to their level of demand. Such a requirement can be placed on all suppliers and penalties can be imposed on those who do not comply. This method achieves a similar effect to availability payments since it places a premium on the demand for generation capacity. Payments would, in effect, be made by suppliers rather than TSOs, with the same impact on final customers. This method is being discussed in Italy.

TSO Controlled Reserve

An alternative to the approaches above is for a general "emergency reserve supply" to be maintained and controlled by the TSO or some other independent agency. Such a mechanism is being considered in the Netherlands and in Sweden. Clear rules are required here to govern the circumstances under which the retained energy can be released into the market. If not, this reserve may damage the effect of price signals coming from the existing supply and demand position. Generators may not construct capacity independently if there is a risk that prices will be undermined by the use of the capacity reserve. The size of the reserve will then need to progressively increase and could eventually suffocate any market mechanisms.

Hourly Metering

Another strategy is to rely on the extension of hourly metering so that demand is more responsive to changes in wholesale electricity prices on this basis. The introduction of NETA in the UK is thought to have accelerated this process since it allows consumption to bid into the balancing market. This may encourage large companies to purchase retail electricity on a more flexible basis.

Long Term Planning/ Tendering

A final safeguard is the provision in the Directive that allows governments to take direct action if they can see an unacceptable supply-demand position emerging. The existing Directive already allows governments to adopt a general tendering procedure for the provision of new capacity. The proposed Directive revision, although it removes the use of tendering as a general rule, still would allow Member States to tender for additional capacity in order to avoid an unacceptable supply demand position. Such an approach is more likely to be suitable

in small, poorly connected areas where it is difficult to support enough independent generation for a liquid market to develop.

Current Security of Supply Position: Electricity

Table 2 above sets out recently collected information giving reserve capacity and as a % of peak demand in some Member States.[1] The size of import capacity as a % of installed capacity is also provided. Generally a margin of around 5% is thought to be sufficient for a secure supply although this may be lower in hydro-dominated areas.

By this criteria, some regions have particular security of supply issues particularly where there is a poor level of interconnection with other Member States, for example Greece and Ireland. In addition demand has been growing rapidly in Spain and Italy and the existing reserve capacity is likely to be quickly depleted. However significant expansions in generation are also expected in these regions.

Table 2 Security of Supply Position: January 2001

	Reserve capacity (% of peak demand)	**Import capacity (% of installed capacity)**	**Total**
"Core-UCTE" [2]	3.7	3.3	7.0
NORDEL	1.2	3.8	5.0
Greece + Yug. + FYROM	2.0	1.2	3.2
Ireland	zero	4.1	4.1
Italy	5.6	7.2	12.8
UK	5.9	2.7	8.8
Iberian Peninsula	4.1	1.9	6.0
source: UCTE			

Another way of measuring whether capacity problems exists is the existence of price spikes in spot markets. These spikes provide a clear signal that the supply-demand situation is deteriorating and hence provide a useful function. However their incidence should not become too frequent since this would eventually lead to a significant and abrupt impact on the bills of final customers and would indicate that potential generators are not responding in the way envisaged.

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1 "Reserve capacity" as defined by UCTE "Remaining Capacity at Peak Load" equal to "Guaranteed Capacity" minus "Reference Load" minus "Margin to Peak Load".

2 UCTE (Union for the Co-ordination of Transmission of Electricity) co-ordinates the interests of TSOs in 20 European countries (EU - except Scandinavia, UK and Ireland - CENTREL countries, the Balkans, and Switzerland). "Core-UCTE" refers to UCTE except Spain, Portugal, Greece, Yugoslavia, FYROM, Centrel, and Italy.

Table 3 The functioning of wholesale markets 2001

	Jan 2001					July 2001				
	Average price €/MWh			Maximum peak hours[3] average price €/MWh	Settlement periods with price > €80/MWh	Average price €/MWh			Maximum peak hours average price €/MWh	No of. hour periods with price > €80/MWh
Power exchanges	P	A	B			P	A	B		
Nordel[4]	21	20	16	56	4 from 840	21	20	18	25	0/744
UKPX						30	26	18	40	0/1488
Germany	27	25	23	38	0/744	25	23	19	42	1 /744
NL	41	33	17	99	31/744	67	50	16	377	64/744
Pools										
Spain OMEL	24	20	14	32	0/744	39	34	25	49	0/744
UK Pool	38	33	24	64	61/1488					
source: Power exchanges. P = peak, A=average, B = baseload										

The table above reviews the behaviour of spot markets for two months during 2001. This would appear to indicate that markets are functioning in a sensible way without excessive volatility. There were, however, some concerns about the behaviour of the Dutch market during July 2001.

Safeguards to Security of Supply: Gas

As with electricity, it is expected that there will be further development of spot markets so that correct price signals will be sent to market players to make new capacity available. Currently spot markets exist in the UK and Belgium, but these are used for reference purposes in other Member States such as IRL and FR.

Similar support mechanisms are also used by many Member States both to encourage the availability of adequate amounts of gas and relating to transmission capacity. These are reviewed in Table 4 below.

[3] 0700-2300
[4] includes 01/01 to 04/02

Table 4 Current and Planned Measures: Gas

	Gas availability					Network capacity	
	planning of import portfolio	liquid spot /forward market	incentives/ compulsory reserve requirement	TSO controlled reserve capacity	interruptible contracts	requirements to provide capacity for defined peak[5]	incentives/ payments to TSO in price control
Austria	no information						
Belgium	(x)	x		x	x	x	
Denmark				x	x	x	
France	x	(x)		x	x	x	
Germany					x		
Ireland							x
Italy			x	(x)	(x)	x	
Luxembourg	no information						
Netherlands	no information						
Spain			x				x
Sweden							
UK		x		x	x	x	x
Source: responses to Commission survey, CREG Belgium. (x) indicates planned or partial measures							

Incentive payments \ Compulsory Reserve

Incentive payments to gas producers and importers are not generally used regarding the availability of gas. It is more common for a requirement to be placed on suppliers to have available a certain amount of reserve volume compared to their level of demand. Such a requirement can be placed on all suppliers and penalties can be imposed on those which do not comply. This method has been used for gas in Spain, where all suppliers are obliged to keep a 35 day reserve in stored gas.

TSO Controlled Reserve

An alternative to the approaches above is for a general "emergency reserve supply" to be maintained and controlled by the TSO or some other independent agency. As for electricity clear rules are required here to govern the circumstances under which the stored energy can be released into the market.

Interruptible Contracts

Many gas customers have the possibility of using alternative sources of energy during limited periods. They therefore agree to be the first customers to be cut-off in the event of a shortage of gas and pay a lower amount as a result. This type of safety valve is used in a number of Member States to provide greater security of supply at a general level.

Long Term Planning

To date, some Member States have taken measures to plan for the diversification of import sources such as France and Belgium. Such measures might seem to imply a monopolistic structure under government control. However there is no reason why these cannot be adapted to a market framework in some non-discriminatory way.

[5] e.g. in the case of extreme weather conditions.

Measures to ensure adequate import and network capacity

Many Member States have policies in place to ensure that gas transmission networks are adequately designed to carry gas required at peak times. This is more usually in the form of an obligation placed on the TSO, However it may also possible to achieve this through incentives to increase capacity. This has been developed in the UK in relation to entry capacity from the North Sea. In addition, in Ireland, a second interconnector with the UK is likely to be funded largely by including appropriate costs in the TSOs price control.

Current Security of Supply Position: Gas

For gas the question of security of supply relates mainly to production capacity and to the amount of contracted imports – although other factors such as storage facilities, supply flexibility and the quantity of interruptible contracts are also relevant. Most gas consumed in the European Union comes from third countries, mainly Norway, Russia and Algeria. Information is available on the amount of production capacity plus imports and this can be compared against total forecast demand as in the Table below.

Table 5 Contracted gas and projected demand 2000-2010

MTOE (N.C.V.)	**1997**	**2005**	**2010**	**2020**
Total Demand	300	380	410	435
Indigenous Production	180	190	180	125
Net Contracted Imports	120	180	195	190
Additional Supplies to be Defined	-	10	35	120
Share of primary energy consumption	22%	25%	26%	27%
Source: Eurogas				

The following graph is taken from a recent Commission report[6] assessing the internal and external gas supply options, which tells a similar story.

However the same report estimated that, at current price levels (around $3/MBTU) there is clearly no shortage of gas available to the EU for import. Indeed the report estimates that by 2020, potential incremental external supply available for the EU15 is estimated at almost 300 bcm, to be compared with total import requirements of some 240 bcm representing a potential supply surplus of 24% over import requirements. These potential imports would be drawn from a variety of source countries including Algeria, Russia and former Soviet Republics and Iran. At prices above $3/MBTU imports of liquid natural gas also appear to be a feasible supply source.

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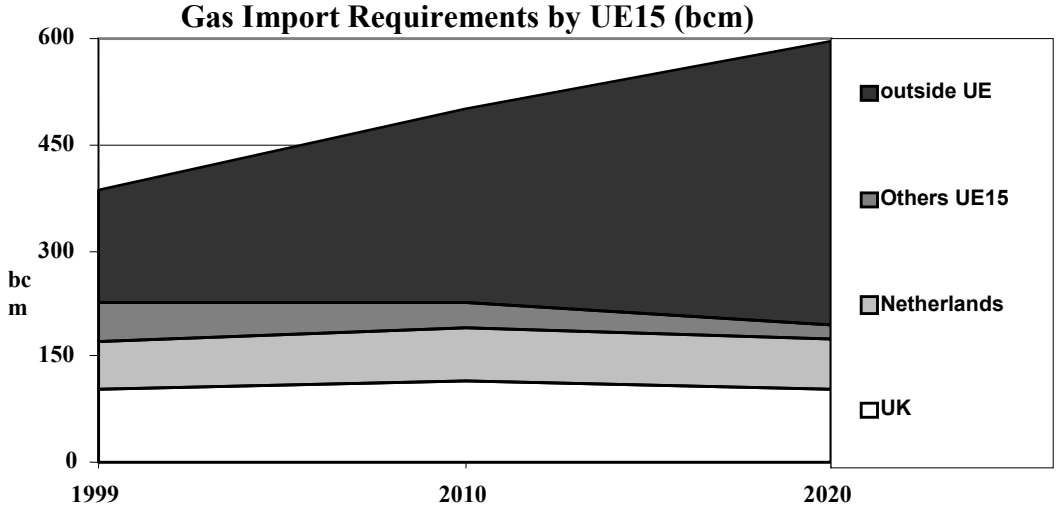
[6] Assessment of internal and external gas supply options for the EU" prepared for DG Energy and Transport by Observatoire Mediterraneen de l'Energie (OME), October 2001.



Conclusions

Most Member States have begun to introduce measures which will serve to maintain security of supply, particularly for electricity. Such measures are particularly important in smaller Member States and/or those which are poorly connected with the rest of the European network.

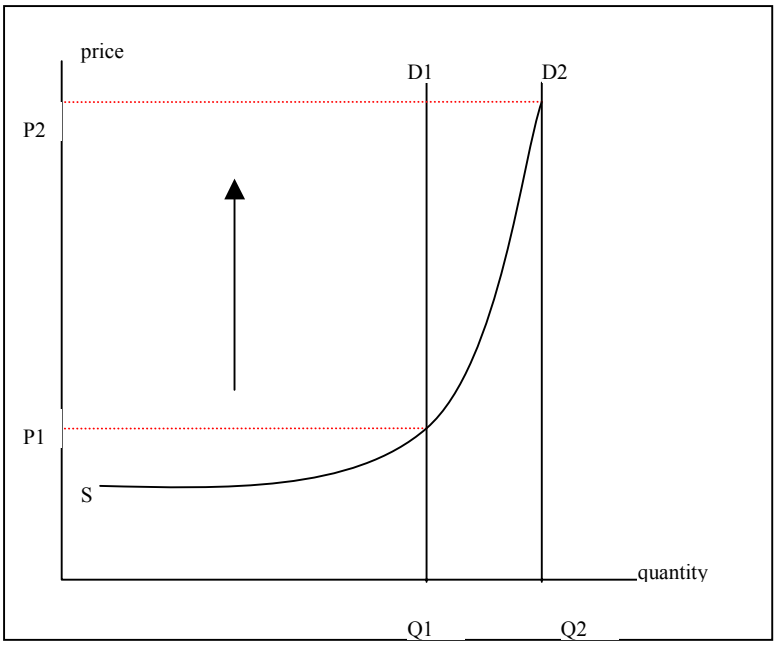
For gas there appears, to date, to be fewer explicit measures to support security of supply. However as competition increases and existing contracts require renewal it is necessary for Member States to give this subject further consideration. It is particularly important to ensure the development of a transparent and liquid spot markets to support the traditional long term contract structure in order that gas importers are able to offset volume risks by selling gas volume surplus in the spot market. This implies that the contract allows the re-sale of gas. This requires that spot markets develop and reach a threshold or critical mass beyond which fast, reliable operations become feasible.

On the other hand, Member States must not neglect the difference between gas and electricity in terms of security of supply. They accrue in particular from the fact that security of gas supplies will involve more and more an external dimension. Notwithstanding the policy measures designed to ensure security of gas supply from external suppliers, additional actions might be appropriate to counter rising risks from gas transported over large distances and coming from politically unstable regions.

APPENDIX

PRICE SPIKES IN ENERGY MARKETS

Figure 1 Characteristics of Energy Markets



In the graph above, the supply curve for energy (S) is elastic up to the point Q1; thereafter the unit cost per MWh increases rapidly. Demand is also inelastic and increases each year. The move in the demand from D1 to D2 represents this increase.

When demand is at point Q1, prices are low and this may not be sufficient to encourage new capacity to be built. As demand increases further towards Q2, the combination of inelastic demand and inelastic supply may bring about a rapid increase in prices.

Long term bilateral contracts between suppliers and generators give both incentives to hedge against such volatility by agreeing a forward looking price somewhere between P1 and P2. Such contracts reduce the incentive of generators to manipulate markets by giving a sustained "reward" to the generator for breaking any cartel arrangements (tactic or explicit). Such contracts may cover part or all of the supplier's requirements.

ANNEX G UNIVERSAL SERVICE AND SERVICE QUALITY

Introduction

Electricity and, to a lesser extent gas, are products on which households and businesses are dependent for a wide range of activities on a daily basis. There are few, if any, substitutes if these sources of energy are not available. It is important, therefore, that consumers can depend on a certain standard of public service provision and obligations are often put on some, or all, suppliers to ensure that the required service standards are met. There are a number of aspects to this, which are dealt with in the sections below.

Universal service

Customers need to be assured that at least one source of supply will be available at a reasonable charge. These objectives may require some regulatory intervention since certain groups of customers may be less attractive as clients; for example those in isolated locations, low users or those on low incomes. Therefore in the electricity and gas Directives, the possibility exists for Member States to place obligations on certain market participants to ensure that all customers are supplied with electricity and/or gas. Obviously, for gas, such obligations would only be effective in zones covered by the existing infrastructure.

These measures need not be contrary to the internal market legislation provided that there is no discrimination in the way such obligations are designed. For example they should not represent a disproportionate burden on certain companies or, if compensation is involved, this should not be excessive. Table 1 below sets out the measures that have been adopted in Members States to ensure universal service.

Table 1 Maintaining Universal Service

	Supply guaranteed by:		Transmission charges vary by location	
	electricity	gas	electricity	gas
Austria	TSO reserve/ other suppliers	no information	no	yes
Belgium	DSO	no information	no	yes
Denmark	designated suppliers	designated suppliers	no	no
Finland	DSO	no information	no	
France	DSO	incumbent	no	yes
Germany	DSO	distributor	no	yes
Greece	incumbent (as DSO)	no information	no	
Ireland	incumbent (as DSO)	incumbent	yes	no
Italy	TSO	Ministry can act	yes	yes
Luxembourg	incumbent (as DSO)	incumbent	no	no
Netherlands	under discussion	designated suppliers	no	yes
Portugal	incumbent	na	no	
Spain	DSO	TSO	no	yes
Sweden	designated suppliers	na	yes	no
UK	TSO reserve/ other suppliers	TSO reserve/ other suppliers	yes	yes
Source: responses to Commission Survey				

As shown in the table, a common approach to guarantee universal service, particularly for electricity, is to require certain companies to act as default supplier to those customers who have no alternative available. This obligation either applies to specially designated supply licence holders, or to the supply company affiliated to the distribution system operator in the

area concerned. Occasionally these obligations are left to the TSO as part of its duties to balance the network.

There is also a general recognition that household prices need to be regulated. Even in those markets with 100% liberalisation, the price charged by the default supplier to household customers in each area is almost always regulated[1]. There are also general provisions deriving from competition law in most countries to oblige suppliers not to discriminate between customers with similar characteristics, for example by attempting to secure customers with less likelihood of non-payment.

Regional differences in energy prices

Geographical deviation of price levels may occur if, for example, transmission tariffs include locational signals. However, in most cases for electricity there is some degree of postalisation of TSO and DSO charges. This means that where a TSO or DSO area contains both densely and sparsely populated areas, the cost of connecting sparsely populated areas is, to an extent, shared across all users. For gas however, distance related charges are commonplace and there is some evidence that these are leading to a variable impact on prices from market opening with prices falling fastest near to entry points for gas.

Another cause of geographical tariff differences appears to arise where networks tariff levels vary significantly by DSO area. This is, of course, a situation that predates market opening and more likely to affect those Member States with a multitude of distribution companies for example, Germany and Austria. Some network cost differences are likely to be justified. However, an important task of regulators and government authorities has been to verify why cost levels differ in this way.

In some Member States, for example Italy, schemes exist whereby justified cost differences can be offset by some form of compensation between distribution operators in order to produce standardised tariffs at a national level.

Protection of Vulnerable Groups

As well as universal service, the indispensable nature of electricity to modern life has encouraged governments to protect supply to, for example, those on low incomes and elderly customers. The concept of "fuel poverty" has emerged in some Member States which are reluctant to see individuals without energy services, even if they are having trouble paying their bills.

[1] Regulation of retail prices for households will be removed in the UK from 2002.

Table 2 Maintaining Universal Service: Electricity and Gas

	special tariffs	restrictions on disconnection	pre-payment meters	arrears payment schemes	social security
Austria				x	
Belgium	x	x	x	x	
Denmark					x
Finland		x –winter			x
France	x	x			
Germany					x
Greece	x				
Ireland		x		x	
Italy	x				
Luxembourg					x
Netherlands					x
Portugal	x				
Spain	x	x			
Sweden					x
UK		x	x	x	
source: responses to Commission survey					

Table 2 shows two main approaches to these concerns. A number of Member States consider that it is not the function of energy policy to protect vulnerable customers. They consider that the existing provisions in the overall social security regime are sufficient to allow households to meet their bills for electricity and gas.

In other Member States there are a range of options for protecting the interests of vulnerable customers. Most have certain restrictions on disconnection and schemes for phasing the payment of arrears. Pre-payment meters are also common which allow households to pay in advance for the energy they are using and consequently monitor more closely how much they are spending. Finally there are a number of special tariffs for lower users. In some Member States a small amount of electricity is provided free to each household.

Minimum Service Standards

At a general level, competition should encourage improvements in service since it is one method of attracting new customers. However Member States continue to regulate this aspect of the service. This is because, firstly, the network part of the industry will remain a monopoly even after market opening. Whatever system is used to regulate tariffs, some assessment of the performance of the network companies is also necessary to verify that standards are being maintained or improved according to the expectations of customers. Without such measures, network businesses may be tempted to cut corners in order to ease any financial pressures resulting from the regulatory regime in place.

Secondly, in the competitive parts of the business, customers need to be assured that new entrants will meet a minimum level of service otherwise they may be disinclined to consider switching from their existing supplier. In this sense, the establishment of minimum standards may improve the functioning of the market.

Obligations to achieve Minimum Service Standards

In order to achieve the desired standard of service, regulators and/or government usually set targets for either the maintenance or improvement for certain aspects of performance. These targets can be set either at an overall level; for example, that 80% of complaints are dealt with in a certain time. Alternatively it may be a requirement that all individual customers are guaranteed a certain minimum standards, for example that unplanned interruptions will be no longer than 4 hours. Occasionally there may be specific targets to improve the standard of service to the worst served customers.

The degree of enforcement can also vary. Some targets are only indicative and failure to meet these may only provoke a warning letter from the authorities. Where there are several service providers, the publication of comparative tables can be an effective non- –financial sanction since these often lead to bad publicity for poor performers. Of course, financial sanctions can also be used which may be either positive or negative depending on circumstances. These are most effective where the companies concerned are privatised. Ultimately the government or regulatory agency could withdraw the licence of the company concerned if service standards became totally unacceptable. The development of regulation of service standards is more developed for electricity and Tables 3 and 4 below set out the regime in place in selected Member States.

These include targets for TSOs and DSOs, which mainly centre on the continuity of service and on voltage as well as minimum standards for supply companies. Continuity is, of course, the most fundamental aspect of performance and failure of either transmission or distribution lines and the interruption of supply cannot be endured for more than a certain minimum period without generating severe inconvenience to businesses and households. Published standards with varying degrees of enforcement are used. Most of the Member States concerned are moving towards having financial incentives and/or penalties.

Table 3 Minimum Service Regime for TSOs/DSOs

	Overall average targets for perforce	Guaranteed individual standards	Worst served customer standards	Type of enforcement used	
				warning letters/ league tables	financial penalties/ incentives
Italy	continuity/voltage		continuity	x	x
Netherlands	continuity/ voltage			x	(x)
Portugal	continuity/ voltage	continuity		x	x
Spain	continuity/ voltage			x	(x)
UK	continuity/voltage	continuity	continuity	x	x
Norway	continuity			x	x
Source: CEER report, (x) indicates that financial penalties are being planned					

Table 4 Minimum Service Regime for suppliers

	Overall average targets for perforce	Guaranteed individual standards
Italy	handling complaints/letters	connection
Luxembourg		
Netherlands		fuse failure restore supply interruption notice handling complaints/letters
Portugal	restore supply connection handling letters	fuse failure handling complaints
Spain	interruption notice	connection handling complaints/letters
Sweden		
UK	restore supply connection handling letters	fuse failure restore supply connection interruption notice handling complaints
Source: CEER report		

Conclusions

It would appear from the analysis above that Member States are already making considerable progress in ensuring that the continuity and quality of services provided are maintained. Most have arrangements in place to provide a universal service for electricity and in all cases the default supply price is regulated. There are similar arrangements for gas in some countries.

Social issues are also important when energy supply is concerned. Many Member States have special arrangements for reducing bills to those on low incomes and preventing disconnection. However some countries consider that their general welfare arrangements are adequate without special measures in this regard.

Finally it is clear that service standards can be maintained under a liberalised market provided that adequate regulatory structures are in place. Indeed many Member States claim that market opening has led to a general improvement in service standards.

ANNEX H ENERGY LIBERALISATION AND THE ENVIRONMENT

Introduction

Market opening must be compatible with the efforts of the Member States to meet the environmental objectives including commitments made at Kyoto and air quality objectives. It is therefore necessary to manage demand for gas and electricity, to reduce emissions from power production and to increase the share of renewable energy used.

The reforms will affect these areas through very complicated mechanisms but in most cases the liberalisation agenda will not be the key driver behind the achievement of these objectives. For example, the greenhouse gas emission targets are fixed in the Kyoto agreement by Member States and the burden for power production might vary between member states. Similarly, the air quality targets result in emission limits defined as a combination of European and national legislation and environmental permits given by local authorities. A recent directive on Electricity from Renewable Energy Sources[1] gives a target for each Member State to promote renewable energy.

Effect of liberalisation on the electricity and gas demand and prices

Electricity prices have decreased in most Member States during the period 1995-2001 both for household customers and for industrial customers. It is, however, important to note that in many cases, prices with tax have decreased less than the prices without tax. During this period new taxes and levies have been introduced in order to raise money for financing of renewable energy support schemes, co-generation schemes or to increase tax income in general. Such taxes will serve to reverse the effect of any price reductions that are likely to result from liberalisation. However the benefits are preserved in the form of taxes reductions that will be possible elsewhere in the economy as a result.

Gas prices have, in any case, increased in the period of 1995-2001. The increase in the gas demand has been high mainly due to increased demand in power production. Gas has also replaced oil in the industry, tertiary sector and households.

An overview of electricity and gas demand and prices is given in Tables 1 and 2 below.

[1]Directive 2001/77/EC

Table 1 Development of electricity demand and prices

	Change in retail price 1995-2001 Industry		Change in retail price 1995-2001 Households		Final electricity consumption 1999	Change in consumption 1995-99
	without tax (%)	with tax (%)	without tax (%)	with tax (%)	TWh	% change
Austria[2]	-8	+7	-7	+2	50	+7
Belgium	-3	-3	-4	-3	75	+9
Denmark	+29	+31	+29	+40	32	+3
Finland	-17	-8	-9	+1	74	+14
France	-15	-17	-9	-11	375	+9
Germany	-29	-25	-5	+2	467	+3
Greece	0	-8	-13	-20	41	+20
Ireland	+5	+5	+8	+8	19	+27
Italy	+46	+28	+5	+3	261	+10
Luxembourg	-18	-12	+5	+10	6	+10
Netherlands[3]	+8	+37	+2	+18	95	+14
Portugal	-19	-19	-5	-5	36	+25
Spain	-25	-21	-19	-15	177	+26
Sweden[4]	-6	+6	-25	-24	125	+1
UK	+9	+9	-11	-13	320	+9
Norway	-2	0	+19	+29	108	+4
EU-15 + NO					**2261**	**+9**

Source: Eurostat, Households category Dc, Industry category Ie. (Increases shaded)

Table 2 Development of gas demand and price

	Price change 1995-2001 Industry		Price change 1995-2001 Households		Total consumption 1999	Change in consumption 1995-99
	without tax (%)	with tax (%)	without tax (%)	with tax (%)		% change
Austria[5]	+35	+13	+15	+2	179	+16
Belgium	+56	+55	n.a.	n.a.	413	+12
Denmark	+82	+66	+35	+37	80	+5
Finland[6]	+95	+96	+26	+23	68	+22
France	+74	+78	+18	+17	1410	+17
Germany	+63	+67	+39	+34	2465	+9
Ireland	+46	+46	+2	+2	48	+42
Italy	+96	+102	+37	+35	1752	+12
Luxembourg	+57	+57	+48	+48	28	+19
Netherlands	+69	+55	+43	+5	930	-9
Spain	+75	+75	+28	+28	453	+52
Sweden[7]	+122	+127	+31	+26	19	+24
UK	+21	+21	+12	+15	2383	+15
EU-15					**10261**	**+12**

Source: Eurostat, Households category Dc, Industry category

[2] Households 1996-2001, Industry 1995-1999
[3] 1995-2000
[4] 1996-2001
[5] Price data from 1996 instead of 19-95
[6] Prices 95-99
[7] Data from 1996 instead of 1995

An overview of current energy taxation policy is given in Table 3.

Table 3 Taxation of Gas and Electricity

	VAT rate (%)	Specific Energy Tax (€/MWh or % tax)			
	electricity and gas	Electricity		gas	
		household	commercial	household	commercial
Austria	20	€15	€15	€4	€4
Belgium	21	€1	-	€1	-
Denmark	25	€78-87	€2	€27	€2
Finland	22	€7	€4	€2	€2
France	19.6/5.5	3-11%	1-4%	-	€1
Germany	16	€15 + 8.6%	€3-15 + 8.6%	€3	€2
Greece	8	-	-		
Ireland	12.5	-	-	-	-
Italy	10/20	€23	€12	€2-15	€1-2
Luxembourg	6	€5	€2	-	-
Netherlands	19	€58	€6-19	€12	€2-12
Portugal	5	-	-	-	-
Spain	16	4.8%	4.8%	-	-
Sweden	25	€20	-	€14	€4
UK	5/17.5	-	€7	-	€2
source: Eurostat					

Note: these are derived from the standard rates in place in the Member States concerned. There may be exemptions for certain activities and regional variations not covered in the above table.

Effect of liberalisation on choice of fuel for electricity generation

In the EU-15 in the period of 1995-1999 78GW new electricity generation capacity came on line, more than 22GW was decommissioned in the same period. Given the growth in demand in this period, it can be concluded that during the period when the market players knew the market would open, overcapacity in installed power has decreased. The low level of investment is certainly a combination of several factors, among which the difficulties in investing in new nuclear plants and the anticipation of the implementation of the Kyoto commitments have been important ones. Technology development of combined cycle gas turbines has also been an important driving factor for new investments. The increased volatility of the electricity prices in the liberalised market might be expected to decrease interest to invest in capital intensive power generation (nuclear, large-scale hydro). Table 4 shows the fuel mix of changes in the stock of electricity generating assets over the period 1995-1999.

Table 4 Net investments (new minus decommissioning) in electricity production capacity 1995-99 by type of fuel (MW)

	coal and lignite	peat	oil	gas	nuclear	hydro	wind	refuse	total
Austria	0	0	0	502	0	1193	35	17	1747
Belgium	-1045	0	-1158	581	0	1	6	5	331
Denmark	-1121	0	-1710	870	0	1	1229	172	1113
Finland	784	30	566	1161	0	123	33	238	2100
France	250	0	533	856	3223	1	16	67	5039
Germany	323	0	4166	100	0	50	4101	624	8750
Greece	345	0	476	547	0	600	82	0	2050
Ireland	0	-110	-3	485	0	8	92	11	483
Italy	5093	0	8600	15047	0	529	207	138	16997
Luxembourg	0	0	0	9	0	0	18	0	9
Netherlands	-223	0	-3624	1006	0	0	252	326	1708
Portugal	295	0	208	961	0	269	49	49	1831
Spain	1105	0	752	1114	0	372	1520	319	4831
Sweden	0	0	-2740	55	0	-77	172	152	-3038
UK	-2317	0	164	12776	1220	32	204	201	12258
EU 15 (GW)	**+3.5**	**-**	**+6.2**	**+36.1**	**+4.4**	**+3.1**	**+8.0**	**+2.3**	**+56.2**

Source E.P.I.C. The information on the decommissioning dates is incomplete, for this reason the net investments are somewhat smaller than presented in this table. Multifuel capacity is counted for each fuel.

It is very early to look at the effects of liberalisation on new investments. Only in the UK and in Scandinavia could there already be major new plants where the investment decision was made when the market was already opened (exception: small units with short lead times like wind turbines).

Despite this, it is interesting to note that gas has by far the highest share in the new capacity with the largest share of this new gas fired capacity has been installed in UK and Italy. The availability of gas in the North Sea is of course the main reasons for this but recently decisions to build new gas based power plants have also been made especially in Spain.

However, the effects of Member States' measures to encourage the use of renewables in competitive markets are also clear, for example through the imposition of obligations on some or all supply companies to source a certain amount of electricity from renewable sources. There is also scope to use more conventional state aids within the framework of the Community guidelines on State Aid for Environmental Protection[8]. The measures currently used are reviewed in Table 5 below.

[8] 2001/C 37/03. Official Journal C 37, 03.02.2001, pages 3-15

Table 5 Promotion of Renewables

Investment subsidy	AT, FI*, FR*, DE*, GR*, IR*, NL*, SW*
Guaranteed Price	AT*, BE, DK, FR, DE*, GR*, IT, LX, PT, SP, SW
Obligation to supply specified amount of renewables\ Tender for Fixed Quantities	AT, FR, IR*, UK*
Green certificates market	BE*, DK*, NL*
Green labelling and promotion to consumers	FI*, DE, NL, SW, UK
Active taxation policy of non-renewables	BE, DK, FI, GK, IR, IT, NL, SP, UK
source: Notification to the Commission by Member States * indicates the most important policy in the Member State concerned	

Table 6 considers developments in the renewable sector more closely and demonstrates the considerable increase in wind power generation in the final columns. The countries with highest increase have strong support schemes for wind power.

Table 6 Share of Hydro, CHP and renewables in net electricity production

	Hydro share 1999	% change 1995-99	CHP share 1998	% change 1994-98	Renewables share (mainly wind) 1999	% change 1995-99
Austria	70%	+1.8	25%	+16	3%	+43
Belgium	2%	+5.9	4%	+21	1%	+24
Denmark	0%	-0.5	62%	+14	13%	+123
Finland	19%	-10.9	36%	+16	12%	+22
France	15%	-4.7	3%	+39	1%	+60
Germany	5%	+4.8	8%	-17	2%	+80
Greece	11%	+11.5	2%	+5	0%	+322
Ireland	5%	-9.2	2%	+27	2%	+1469
Italy	20%	+12.2	17%	+52	3%	+57
Luxembourg	75%	+9.9	23%	-	7%	+60
Netherlands	0%	-6.3	53%	+33	4%	+77
Portugal	18%	-31.2	8%	-15	3%	+7
Spain	13%	-17.2	11%	+111	2%	+154
Sweden	47%	+0.7	6%	-6	2%	+30
UK	2%	+17.3	5%	+44	1%	+166
EU – 15	**14%**	**-1.9**	**11%**	**+21**	**2%**	**+65**

Source: Eurostat

The development of hydropower is limited by the availability of suitable sites. The increase of combined heat and power has been rather slow in 1999 and 2000 with investments usually restricted to industrial CHP.

Emissions

CO2 emissions from the EU-15 Energy Industry reached a peak in 1991 and they have decreased slightly in the period of 1995-1999. At the same time, final electricity consumption increased 9,4% in the same period. The main reasons for this have been the switch to gas

(especially in the UK and Belgium) and the increase in the renewable electricity production (especially in Denmark and Germany).

Table 7 Development of emissions from Energy Industry[9]

	Energy Industry Total GHG Emissions (CO2, CH4, N2O) Mt 1999	Change 95-99	Energy Industry Total Acidifying Gas Emissions (SO2, NOx) [10] kt 1999	Change 95-99
Austria	11	+4%	0,3	-5%
Belgium	28	-8%	2,1	-45%
Denmark	29	-11%	2,4	-55%
Finland	22	-6%	1,6	-3%
France	62	+11%	11,9	-13%
Germany	334	-8%	20,2	-60%
Greece	52	+11%	13,6	-7%
Ireland	16	+19%	4,1	+7%
Italy	148	+4%	21,4	-36%
Luxembourg	-	-92%	-	-44%
Netherlands	57	-1%	2,4	-10%
Portugal	18	-8%	8,6	-2%
Spain	90	+6%	37,7	-9%
Sweden	12	-4%	0,7	+12%
United Kingdom	182	-9%	36,8	-45%
EU-15	**1062**	**-3%**	**164,0**	**-34%**

Source: European Environment Agency (EEA)

Regarding other pollutants there has been a strong downward trend in most member states. This is mainly due to the tightening of the emission limits of power plants and the switch to gas.

The air quality targets are set at the European level. The Large Combustion Plant (LCP) directive defines the emission limits for power plants. The national and local authorities have, however, a considerable role in defining the final emission limits through national legislation and permit procedures. Integrated Pollution Prevention and Control (IPPC) directive[11] imposes the use of Best Available Technologies for power production. Voluntary environmental policy measures of the owners of the power plants in form of voluntary agreements with government and other environmental actions have also had a significant role in the emission reductions.

Future developments

Research conducted by the Commission suggests that, all other things being equal, market opening is expected to have a neutral effect on overall emissions[12]. The two main offsetting effects are lower prices for electricity and gas leading to greater energy consumption, versus

[9] Energy Industry: Public electricity and heat production, refineries and manufacture of solid fuels
[10] S0x and N0x emissions presented here have been converted to potential acid equivalents using the following weighting factors: 1 g of SO2=0.0313 g eq, 1g of Nox=0.0217 g eq.
[11] Directive 96/61/EC
[12] Report by ERM Consulting (forthcoming) for DG Energy and Transport and DG Environment

the use of more fuel-efficient generation and the more rapid retirement of older and less environmentally sound plants.

Liberalisation is assumed to increase cross-border trade and physical flows resulting in a more optimal dispatching of generation with increased efficiency and lower emissions. These effects will more than offset any increase in losses due to transport of electricity in longer distances. In longer term, if appropriate locational signals are in place, the market may direct investments of generation closer to consumption, especially regarding new gas fired capacity. Emission trading is an initiative that also might become the most important driver for the environmental effects of power production.

Conclusions

Since liberalisation started in many Member States only recently, it is early days for conclusions on its possible impact on the environment. However until now, developments have been positive from an environmental point of view: no significant growth of demand, switch to gas of electricity production, major increase of renewable electricity generation, improvement of energy efficiency indicators, proliferation of "green electricity" offers by electricity suppliers, reduction of emissions.

Even if it is difficult to draw a causal link between liberalisation and the above improvements, it seems clear that many of them have been facilitated by the new competitive environment, for instance the switch to gas and green electricity schemes. But it is necessary to remain vigilant. Efforts must continue to promote cleaner energy production and use. It is important that the electricity and gas directives, in the current and the amended version as proposed by the Commission, as well as state aid rules allow necessary measures to be taken.