Oxera

Energy market competition in the EU and G7:
preliminary 2004 rankings

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1 Introduction

The Department of Trade and Industry (DTI) has a Public Service Agreement (PSA) to ensure that the UK ranks among the three most competitive energy markets in the EU and G7. Following enlargement of the EU in May 2004, the comparator set of countries now totals 28: 25 EU countries (including the UK) and the three G7 countries outside the EU, the USA, Canada and Japan. Over the last two years, analysis undertaken by Oxera for the DTI has reviewed the achievement of this target in 2002 and 2003, finding that the UK has met its target and has the most competitive electricity and gas markets among its comparator group, using a consistent benchmarking methodology.

This report presents the results of the analysis for assessing compliance with the 2004 PSA target using a new 2004 dataset, and finds that the UK continues to retain its position as having the most competitive gas and electricity markets.

2 Preliminary 2004 rankings

The 2004 PSA target analysis follows the methodology set out in Oxera's September 2003 report, determining the appropriate set of comparator countries, and ranking these using a 2004 database.[1] The results obtained are necessarily preliminary as some data elements are not yet available for 2004. However, using this dataset, the UK meets the PSA target and continues to exhibit the most competitive electricity and gas markets within the EU and the G7.

2.1 Application of the initial filter

An initial filter is applied to the electricity and gas markets in the EU countries, to determine whether the prerequisites for introducing competition into each country's energy markets are present. A country passes the filter in either the gas or the electricity markets if the following conditions are met:

– full supply market opening;
– unbundling of transmission;
– regulated third-party access (rTPA) in transmission.

Tables 2.1 and 2.2 below list countries that meet the above conditions for electricity and gas respectively.

As the energy markets in the USA and Canadian states differ greatly from state to state, composite indicators have been constructed for both countries using the methodology described in Oxera's September 2003 report. The calculations of these indicators are detailed in Appendices 2 and 3. The composite indicators are then compared against the three requirements for passing the initial filter, as was done for the rest of the EU and G7 countries.

Countries that pass the filter in either the electricity or the gas market pass the initial filter for the energy market as a whole. These countries are selected as relevant comparators to the UK in determining whether it meets the required PSA target. As a result of changes implemented in the energy markets of the EU and G7 countries between 2003 and 2004, the Netherlands and Portugal have been added to the list of seven comparators previously used in the 2003 analysis.

As a result of the definition of the initial filter, some countries such as Italy pass it with full market opening in one market and not in the other. Other countries, however, may not have full market opening in either the electricity or the gas market. In addition, some countries such as Portugal and Finland have been granted derogations from the application of the EU Directive in the gas market while they pass the initial filter in the electricity market and consequently in the energy market as a whole.

Those countries with an average degree of market opening that is greater than that of the lowest of the initial filter group (excluding the countries that have been granted a derogation

[1] The detailed methodology used to calculate competitiveness scores for the energy markets is set out in Oxera's September 2003 paper for the DTI, 'Energy Market Competition in the EU and G7: the Relative Extent of Energy Market Competition in the EU and G7', pp. 20–33, available at www.oxera.com.

from the transposition of the EU Directive in either the electricity or gas market) are also deemed to pass the filter, provided the other two conditions are satisfied.

Example

Assume country X has unbundling and rTPA in transmission with 80% market opening in the electricity sector and 90% market opening in the gas sector, with the weights of the electricity and gas market in terms of relative consumption being 60% and 40%, respectively.

Thus, the weighted average degree of market opening in the energy market of country X is:

(0.80 x 0.60) + (0.90 x 0.40) = 0.84 or 84%.

Assume that country Y passes the initial filter with 100% market opening in the electricity sector and 50% opening in the gas sector, with relative weights of the two sectors being 30% and 70% respectively. The average degree of market opening in the sector is therefore:

(1 x 0.30) + (0.50 x 0.70) = 0.65 or 65%.

Also assume that country Y has the lowest average degree of market opening among the countries that pass the initial filter for the energy market as a whole without having been granted a derogation from the transposition of the EU Directive on gas or electricity. Country X would therefore also pass the initial filter as it has a higher average degree of market opening in the energy market than country Y, in addition to satisfying the conditions of rTPA and unbundling at the transmission level.

Table 2.1 Ranking of PSA countries—electricity

Electricity market	Degree of market opening (%)	Transmission unbundling	rTPA in transmission	Selected as relevant comparator for electricity
Countries passing the network-related filters with 100% market opening				
Austria	100	✓	✓	✓
Denmark	100	✓	✓	✓
Finland	100	✓	✓	✓
Netherlands	100	✓	✓	✓
Portugal	100	✓	✓	✓
Spain	100	✓	✓	✓
Sweden	100	✓	✓	✓
UK	100	✓	✓	✓
Countries passing the network-related filters with less than 100% market opening (ranked according to degree of market opening)				
Belgium	90	✓	✓	×
Italy	79	✓	✓	×
Slovenia	75	✓	✓	×
France	70	✓	✓	×
Hungary	67	✓	✓	×
Slovakia	66	✓	✓	×
Greece	62	✓	✓	×
Luxembourg	57	✓	✓	×
Ireland	56	✓	✓	×
Poland	52	✓	✓	×
Czech Republic	47	✓	✓	×
Canada composite	41	✓	✓	×
US composite	39	✓	✓	×
Estonia	10	✓	✓	×
Lithuania	Not known	✓	✓	×
Countries not passing the network-related filters				
Germany	100	✓	×	×
Latvia	76	×	✓	×
Japan[1]	40	×	✓	×
Cyprus	35	×	Not known	×
Countries with incomplete information				
Malta	0	Not known	Not known	

Note: [1] As of 2004, the Japanese electricity market is only partially liberalised. In April 2004 the eligibility threshold was lowered to include medium-voltage customers with a contract demand of 500kW or more and there are plans for further expansion of the liberalised market in April 2005. Source: International Energy Agency (IEA), Tokyo Electric Power Company.
Sources: European Commission (2005), 'Annual Report on the Implementation of the Gas and Electricity Internal Market—Fourth Benchmarking Report', January; and Eurostat data table: 'Supply, Transformation, Consumption—Electricity—Annual Data' (latest data available is for 2003).

Table 2.2 Ranking of PSA countries—gas

Gas market	Degree of market opening (%)	Transmission unbundling	rTPA	Selected as relevant comparator for gas
Countries passing the network-related filters with 100% market opening				
Austria	100	✓	✓	✓
Denmark	100	✓	✓	✓
Italy	100	✓	✓	✓
Netherlands	100	✓	Hybrid (rTPA at the regional level and negotiated TPA at the national level)	✓
Spain	100	✓	✓	✓
UK	100	✓	✓	✓
Countries passing the network-related filters with less than 100% market opening (ranked according to degree of market opening)				
Canada composite	94.3	✓	✓	×
Slovenia	91	✓	✓	×
Belgium	90	✓	✓	×
Ireland	86	✓	✓	×
US composite	75	✓	✓	×
Luxembourg	72	✓	✓	×
France	70	✓	✓	×
Hungary	69	✓	✓	×
Sweden	50	✓	✓	×
Poland	34	✓	✓	×
Countries not passing the network-related filters				
Germany	100	✓	×	×
Estonia	95	×	✓	×
Lithuania	70	×	✓	×
Japan[1]	44	×	✓	×
Slovakia	34	×	×	×
Czech Republic	0	×	Hybrid: negotiated TPA transportation, rTPA distribution	×
Latvia	0	×	×	×
Derogations				
Finland	–	–	–	–
Greece	–	–	–	–
Portugal	–	–	–	–
Northern Ireland	–	–	–	–
Information not available				
Cyprus	–	–	–	–
Malta	–	–	–	–

Note: [1] The Gas Utility Industry Law came into effect in April 2004, instating third-party access and expanding the large-volume gas market to 0.5 million cubic metres or more. Sources: IEA, Japan Gas Association.
Sources: European Commission (2005), 'Annual Report on the Implementation of the Gas and Electricity Internal Market—Fourth Benchmarking Report', January; and Eurogas (2004), 'Eurogas Consumption 2003', press release, February.

Table 2.3 shows the average degree of market opening in the EU, weighted with the relative amount of gas and electricity consumption in each country.

With an average degree of market opening of 94%, Italy has the lowest level of average market opening among the countries that pass the filter in either of the markets, without having been granted a derogation from the implementation of the European Commission's Electricity or Gas Directives in the other market. 94% is thus the threshold for selection of comparators on an average market opening basis. Countries with an average degree of market opening greater than the 94% benchmark and with transmission unbundling and rTPA in transmission also pass the initial filter; however, this is not the case for any of the countries listed in Table 2.3.

Table 2.3 Average degree of energy market opening

Country	Degree of market opening (%)		Gas consumption (TWh)	Electricity consumption (TWh)	Relative weight of gas market	Average degree of market opening	Passes filter for the energy market
	Electricity	Gas					
Austria	100	100	97.8	60.7	0.62	100	✓
Belgium	90	90	187.3	79.7	0.70	90	×
Cyprus	35	Derogation	–	3.6	0	35	×
Czech Republic	47	0	102.7	52.4	0.66	16	×
Denmark	100	100	52.7	32.4	0.62	100	✓
Estonia	10	95	8.3	5.6	0.60	61	×
Finland	100	Derogation	52.8	80.8	0.40	60	✓
France	70	70	505.0	408.4	0.55	70	×
Germany	100	100	969.4	509.3	0.66	100	×
Greece	62	Derogation	25.8	48.6	0.35	40	×
Hungary	67	69	152.4	31.4	0.83	69	×
Ireland	56	86	47.5	23.0	0.67	76	×
Italy	79	100	815.0	291.0	0.74	94	✓
Latvia	76	0	17.8	5.2	0.77	17	×
Lithuania	Not known	70	30.4	7.1	0.81	Not known	×
Luxembourg	57	72	16.6	6.0	0.73	68	×
Malta	0	Derogation	–	1.8	0	0	×
Netherlands	100	100	464.0	100.4	0.82	100	✓
Poland	52	34	148.3	98.3	0.60	41	×
Portugal	100	Derogation	33.9	43.2	0.44	56	✓
Slovakia	66	34	71.4	23.0	0.76	42	×
Slovenia	75	91	11.5	12.5	0.48	83	×
Spain	100	100	275.4	220.0	0.56	100	✓
Sweden	100	50	11.1	129.8	0.08	96	✓
UK	100	100	1,014.7	337.4	0.75	100	✓

Sources: European Commission (2005), 'Annual Report on the Implementation of the Gas and Electricity Internal Market—Fourth Benchmarking Report', January; Eurogas (2004), 'Eurogas Consumption 2003', press release, February; and Eurostat data table: 'Supply, Transformation, Consumption—Electricity—Annual Data' (latest data available is for 2003).

A dataset is therefore required for the detailed indicators for the countries that pass the filter:

– Austria;

– Denmark;
– Finland;
– Italy;
– Netherlands;
– Portugal.
– Spain;
– Sweden;
– UK.

2.2 Creation of the 2004 dataset

In creating the dataset of competitiveness indicators for the PSA comparators, several sources were considered, including:

– the European Commission's benchmarking reports on the electricity and gas markets;
– national regulators' reports and websites;
– Eurostat sources;
– individual companies' reports.

The sources provide data collected at different points of time, with the European Commission's fourth benchmarking report covering the period from July 2003 to June 2004.[2] While previous Oxera studies selected the benchmarking reports as the primary source of information to ensure consistency in the data used, this report sees an increasing trend towards using data from national regulators due to the reasons set out below.

Despite the extensive number of sources referred to, some data is still missing, particularly as the European Commission has changed the level of detail of data it provides in its benchmarking reports.

– Data on the aggregate market shares of the top three suppliers to industrial and commercial (I&C) and domestic consumers alone is now provided, instead of market shares of the largest as well as aggregate shares of the three largest suppliers, as was provided in the third benchmarking report.[3]

– No differentiation has been made between I&C and domestic consumers from the third benchmarking report onwards.

– The benchmarking report provides data on the market shares of the largest and aggregate market share of the three largest generators of electricity, but not the aggregate market share of the two largest generators of electricity.

Consequently, it was necessary to make assumptions based on available information. These have been detailed in the appendices.

Another issue that has arisen with the data is that there are some discrepancies between the data obtained from the European Commission benchmarking reports and that obtained from individual regulators. In such cases, data from national regulators has been used. For example, the Danish Competition Authority was contacted to obtain detailed information that has been used instead of the data provided in the benchmarking report.

[2] European Commission (2005), 'Annual Report on the Implementation of the Gas and Electricity Internal Market', January (hereafter referred to as the fourth benchmarking report).
[3] European Commission (2004), 'Third Benchmarking Report on the Implementation of the Internal Electricity and Gas Market', March.

Tables 2.4 and 2.5 present the most recent year for which data was available in the electricity and gas markets respectively. Complete data is available on network-related activities, and there are few gaps in the wholesale market data. However, assumptions have had to be made for market shares of companies in the upstream and downstream markets, with the gaps being most severe for the second and third largest shippers in the gas market. Nevertheless, given the high market share of the largest shippers, this lack of information does not greatly affect the calculation of the competitiveness rankings.

Table 2.4 Availability of electricity market data

Key

2004 data | 2003 data | 2002 data | 2001 data | Assumption

Indicator	Austria	Denmark	Finland	Italy	Spain	Sweden	UK	Netherlands	Portugal
Upstream market									
Market share of the largest generator	2004	2004	2004	2004	2004	2003	2004	2004	2004
Market share of the two largest generators		2004	2004			2003	2004		
Market share of the three largest generators	2004			2004	2004	2003	2004	2004	2004
Degree of technical openness of market	2004	2004	2004	2004	2004	2004	2004	2004	2004
Openness of allocation mechanism to import capacity	2004	2004	2004	2004	2004	2004	2004	2004	2001
Wholesale market									
Existence of price reporting	2004	2004	2004	2004	2004	2004	2004	2004	
Share of total (daily) volume traded covered by price reporting	2003	2004	2004	2004	2004	2004	2004	2004	
Existence of standardised contracts	2004	2004	2004	2004	2004	2004	2004	2004	
Downstream supply									
I&C									
Degree of supply market opening	2004	2004	2004	2004	2004	2004	2004	2004	2004
Market share of largest supplier	2003	2004	Assumption	Assumption	2004		2004		
Market share of two largest suppliers	2003	2004	Assumption	Assumption	2003		2004		
Market share of three largest suppliers	2003	2004	2004	2004	2003	2004	2004	2004	2004
Annual gross switching	2003	2004	2003	2003	2003	2003	2001	2004	2003

Indicator	Austria	Denmark	Finland	Italy	Spain	Sweden	UK	Netherlands	Portugal
Domestic									
Degree of supply market opening									
Market share of largest supplier									
Market share of two largest suppliers									
Market share of three largest suppliers									
Annual gross switching									
Network-related activities									
Unbundling at transmission level									
rTPA at transmission level									
Unbundling on distribution network level									
rTPA at distribution level									

Source: Oxera.

Table 2.5 Availability of gas market data

Key

2004 data | 2003 data | 2002 data | 2001 data | Assumption

Indicator	Austria	Denmark	Finland	Italy	Spain	Sweden	UK	Netherlands	Portugal
Upstream market									
Market share of the largest shipper	2004	2004	2004	2004	2004	2004	2004	2004	2004
Market share of the two largest shippers			2004						2004
Market share of the three largest shippers			2004						2004
Wholesale market									
Existence of price reporting	2004	2004	2004	2004	2004	2004	2004	2004	2004
Share of total (daily) volume traded covered by price reporting	2002	2004	2002	2004	2002	2004	2002	2004	2004
Existence of standardised contracts	2004	2004	2004	2004	2004	2004	2004	2004	2004
Downstream supply									
I&C									
Degree of supply market opening	2004	2004	2004	2004	2004	2004	2004	2004	2004
Market share of largest supplier	2002	2004	2004	2004	2001	2002	2004		2004
Market share of two largest suppliers	2002	2004	2004		2001		2004		2004
Market share of three largest suppliers	2002	2004	2004	2004	2004	2004	2004	2002	2004
Annual gross switching	2002	2004	2004	2001	2002	2001	2002	2004	2004

Indicator	Austria	Denmark	Finland	Italy	Spain	Sweden	UK	Netherlands	Portugal
Domestic									
Degree of supply market opening									
Market share of largest supplier									
Market share of two largest suppliers									
Market share of three largest suppliers									
Annual gross switching									
Network-related activities									
Unbundling at transmission level									
rTPA at transmission level									
Unbundling on distribution level									
rTPA at distribution level									
Competitive access to gas storage									

Source: Oxera.

The data collected has been analysed and the results are presented in sections 2.3 and 2.4.

2.3 Preliminary 2004 PSA target results

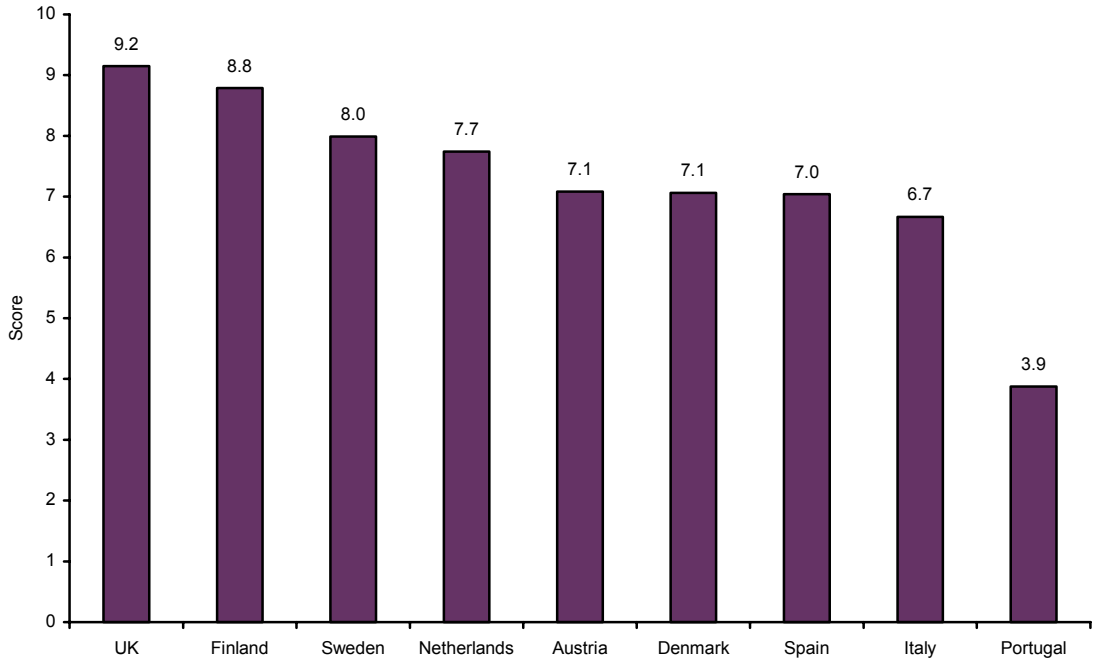
The following sections look at the PSA comparators' scores in the electricity and gas markets respectively. A weighted average of these scores is subsequently taken to determine the overall energy market scores.

2.3.1 Electricity market indicators

The UK's electricity market score remains at 9.2, and as such it retains the highest ranking in the market. Finland is a close second with a highly competitive electricity market, although it has a lower degree of concentration in the downstream supply segment of the market than the UK. The UK, however, has a lower degree of market concentration in the generation segment.

Figure 2.1 and Table 2.6 detail the electricity market scores of the comparator group. All the countries in the comparator group are seen to have highly competitive electricity markets.

Figure 2.1 Overall competitiveness scores for electricity markets (preliminary 2004)



Source (for this and subsequent charts and tables in sections 2 and 3): Oxera calculations.

Table 2.6 Disaggregated scores for selected EU electricity markets (preliminary 2004)

	Austria	Denmark	Finland	Italy	Spain	Sweden	UK	Netherlands	Portugal
Upstream market	5.8	4.4	5.4	3.5	4.6	4.4	8.7	7.0	0.6
Wholesale market	8.7	10.0	10.0	5.7	10.0	10.0	10.0	7.8	0.0
Downstream supply	3.2	3.2	10.0	6.7	2.9	7.2	7.9	5.8	3.2
Score—all market areas	**5.8**	**5.8**	**8.4**	**5.2**	**5.8**	**7.1**	**8.8**	**6.8**	**1.3**
Network-related activities	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Score—network area	**10.0**	**10.0**	**10.0**	**10.0**	**10.0**	**10.0**	**10.0**	**10.0**	**10.0**
Overall electricity score	**7.1**	**7.1**	**8.9**	**6.7**	**7.0**	**8.0**	**9.2**	**7.7**	**3.9**

2.3.2 Gas market indicators

As in 2003, the UK continues to have the most competitive gas market in Europe in 2004, as is illustrated in Figure 2.2 and Table 2.7. However, the UK's lead over Spain has decreased substantially. While the UK's competitiveness score has remained at 2003 levels, that of Spain has increased from 4.9 to 6.0 due to a more competitive upstream market than in 2003.

Figure 2.2 Overall competitiveness scores for gas markets (preliminary 2004)

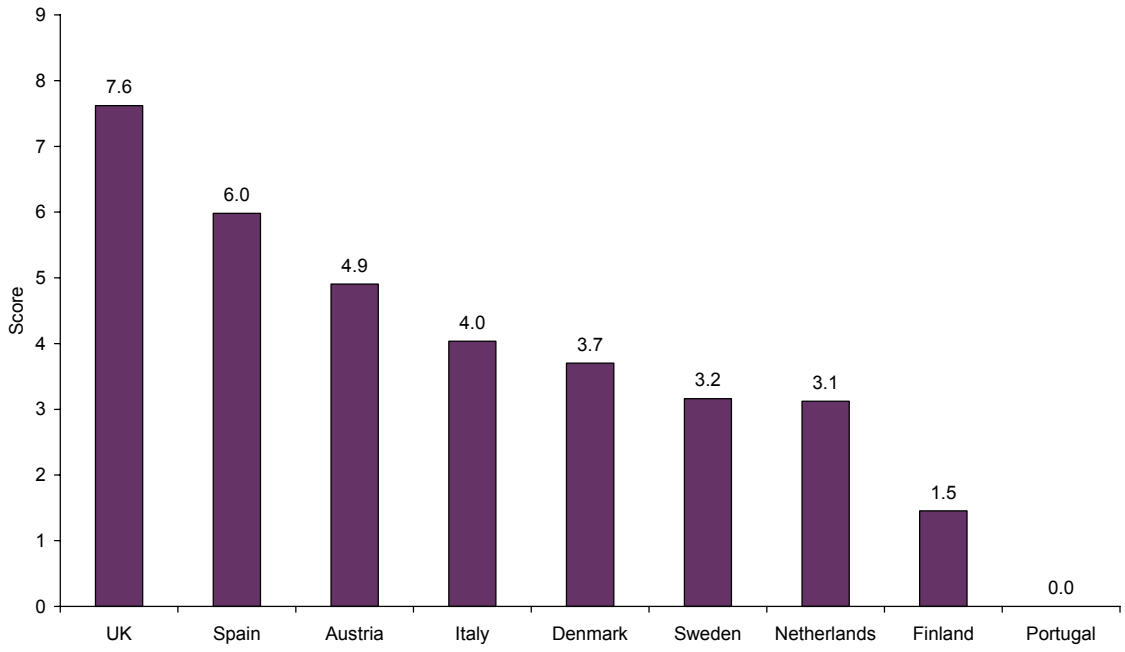


Table 2.7 Disaggregated scores for selected EU gas markets (preliminary 2004)

	Austria	Denmark	Finland	Italy	Spain	Sweden	UK	Netherlands	Portugal
Upstream market	0.0	0.0	0.0	0.0	4.0	0.0	6.0	2.0	0.0
Wholesale market	7.9	2.5	5.0	0.0	7.9	0.0	10.0	0.0	0.0
Downstream supply	0.4	1.8	0.0	4.5	1.0	0.7	4.0	3.7	0.0
Score—all market areas	**2.7**	**1.4**	**1.7**	**1.5**	**4.3**	**0.2**	**6.6**	**1.9**	**0.0**
Network-related activities	10.0	9.0	1.0	10.0	10.0	10.0	10.0	6.0	0.0
Score—network area	**10.0**	**9.0**	**1.0**	**10.0**	**10.0**	**10.0**	**10.0**	**6.0**	**0.0**
Overall gas score	**4.9**	**3.7**	**1.5**	**4.0**	**6.0**	**3.2**	**7.6**	**3.1**	**0.0**

Table 2.8 presents the overall energy market scores as an average of the electricity and gas market scores weighted by the relative sizes of the markets. As shown, the analysis of the data collected using the methodology applied to calculate rankings determines that the UK has the most competitive energy market within the PSA comparator group.

Table 2.8 Preliminary 2004 results

	Austria	Denmark	Finland	Italy	Spain	Sweden	UK	Netherlands	Portugal
Electricity market score	7.1	7.1	8.8	6.7	7.0	8.0	9.2	7.7	3.9
Relative electricity market size	0.38	0.38	0.6	0.26	0.44	0.92	0.25	0.18	0.56
Gas market score	4.9	3.7	1.5	4.0	6.0	3.2	7.6	3.1	0.0
Relative gas market size	0.62	0.62	0.4	0.74	0.56	0.08	0.75	0.82	0.44
Weighted energy market score	5.7	5.0	5.9	4.7	6.4	7.6	8.0	4.0	2.2

A comparison of the final 2003 and preliminary 2004 scores and rankings is provided in Table 2.9. Sweden, Finland and Denmark's scores have decreased, whereas those of Spain, Austria and Italy have increased. The rankings have remaining largely the same, except that Finland and Spain have switched positions.

Table 2.9 Comparison of final 2003 and preliminary 2004 PSA target calculations

	Final 2003 score	Final 2003 rank	Preliminary 2004 score	Preliminary 2004 rank	Change in rank
UK	8.0	1	8.0	1	0
Sweden	7.9	2	7.6	2	0
Finland	6.1	3	5.9	4	–1
Spain	5.7	4	6.4	3	+1
Austria	5.6	5	5.7	5	0
Denmark	5.1	6	5.0	6	0
Italy	3.8	7	4.7	7	0
Netherlands	n/a	n/a	4.0	8	n/a
Portugal	n/a	n/a	2.2	9	n/a

3 Country-by-country preliminary 2004 PSA target results

Sections 3.1 to 3.9 below compare the final 2003 and preliminary 2004 scores in the electricity and gas markets on a country-by-country basis, highlighting the factors that have driven the changes in the scores observed.

3.1 Austria

3.1.1 Austrian electricity market

The Austrian electricity market is still fragmented with over 130 utilities, but dominated by just a few. Electricity generator, Verbund, and nine provincial electricity companies are the major market players, with a total market share of over 90%. Verbund is the most significant, controlling half of the country's generation capacity, roughly 85% of which is based on hydropower, as well as operating the national transmission grid. The nine provincial electricity companies also produce some generation capacity, though they remain primarily distributors supplying end-consumers.

European electricity market liberalisation triggered a concentration process in the Austrian electricity sector. First came the establishment of a strategic alliance of the provincial and municipal utilities in the eastern region of Austria in 2000. Backed by the cooperation EnergieAllianz (an alliance between EVN, BEWAG, WienStrom and Energie AG), a closed market emerged with 4m end-users (70% of the total electricity consumption and 80% of the total gas consumption in Austria). This was followed in 2003 with the first vertical merger in Austria between Verbund and EnergieAllianz to form a strategic partnership, the 'Austrian Electricity Solution'.[4] The business profiles of the partners are complementary: EnergieAllianz is strong on the retail side, while Verbund enjoys a strong position in electricity production and wholesale. For this purpose the groups established two joint venture companies, one that carries out the trading business and coordinates the electricity sources of all partners, and one that is responsible for key account clients.

Between 2003 and 2004, Austria's overall electricity market score increased from 6.8 to 7.1 due to a fall in the market concentration of generators from 61.4% to 60%.[5] This slight increase in Austria's score is largely a data issue. The final 2003 report used projections from HHIs[6] obtained from the 2003 E-control annual report to determine market shares of generators. As no further information or detailed breakdown of firms' market shares have become available from E-control, this report uses data obtained from the European Commission's fourth benchmarking report.

[4] The Verbund/Energie Allianz deal was approved by the European Commission, subject to conditions. COMP/M.2947—Verbund/EnergieAllianz, Commission Decision of June 11th 2003.

[5] According to the methodology used to calculate electricity market scores, the generation market concentrations are divided into bands, with higher market concentration bands being given lower standardised scores. The fall in generation market concentration implies that Austria moves from the market concentration band of 60–70% in 2003 to that of 50–60% in 2004. Thus, the decrease in market concentration from 61.4% to 60% has led to a large increase in Austria's upstream market score.

[6] Herfindahl–Hirschmann Indices are calculated by summing the squares of the market shares of all the firms in the market.

Table 3.1a Austrian electricity—final 2003 versus preliminary 2004

	Final 2003	Preliminary 2004
Upstream market	4.4	5.8
Wholesale market	8.7	8.7
Downstream supply	3.2	3.2
Score—all market areas	**5.4**	**5.8**
Network-related activities	10.0	10.0
Score—network area	**10.0**	**10.0**
Overall electricity score	**6.8**	**7.1**

3.1.2 Austrian gas market

Austria's gas market has remained highly concentrated with no change in its overall gas market score compared with the 2003 calculation. However, the unavailability of more recent data has meant that the data used for the downstream supply market concentration is from 2003.

Changes were seen in the market, such as the joint venture between Salzburg AG and Terragas GmbH, thought to be a countervailing force against the Econgas merger which took place in 2003. In addition, Steirische Gas Wärme took an 80% holding in Gas Alive GmbH, a service company aimed at small business and industrial consumers.

Table 3.1b Austrian gas—final 2003 versus preliminary 2004

	Final 2003	Preliminary 2004
Upstream market	0.0	0.0
Wholesale market	7.9	7.9
Downstream supply	0.4	0.4
Score—all market areas	**2.7**	**2.7**
Network-related activities	10.0	10.0
Score—network area	**10.0**	**10.0**
Overall gas score	**4.9**	**4.9**

3.2 Denmark

3.2.1 Danish electricity market

The final 2003 report used 2002 data obtained from the Danish Energy Regulatory Authority for market shares of downstream suppliers. In this report, the data has been updated to 2004 based on information from the Danish Competition Authority. The new data reflects the substantial consolidation in the market between 2002 and 2004, with an increase in downstream market concentration from 29% to 64%.

This increase in concentration was driven by Elsam's acquisition of the Danish electricity distributor and supplier, Nesa. Elsam has significant activities in electricity generation, particularly in Jutland and Funen (western Denmark), while Nesa owns the power distribution grid in the Gentoffe district and sells power to customers predominantly in the Greater Copenhagen region. The Danish Competition Authority approved this purchase in March 2004, subject to commitments from Elsam, which included the sale of Elsam's and Nesa's

gas-fired local combined heat and power stations, as well as offering some generation capacity for sale as virtual power.[7]

Table 3.2a Danish electricity—final 2003 versus preliminary 2004

	Final 2003	Preliminary 2004
Upstream market	4.4	4.4
Wholesale market	10.0	10.0
Downstream supply	10.0	3.2
Score—all market areas	**8.1**	**5.8**
Network-related activities	10.0	10.0
Score—network area	**10.0**	**10.0**
Overall electricity score	**8.6**	**7.1**

3.2.2 Danish gas market

Significant changes in the Danish gas market in 2004 were the introduction of standardised contracts in the wholesale market. In addition, the Danish gas market opened fully on January 1st 2004—a large jump from the 35% market opening in 2003.

To make the 2003 calculation, combined data on market shares in I&C and domestic markets from the European Commission's third benchmarking report was used. In this report, separate data for I&C and domestic consumers has been obtained from the Danish Competition Authority, which states that there was little change in market shares from 2003 to 2004. However, a large fall in the aggregate market share of the largest three suppliers was noted between the European Commission's third and fourth benchmarking reports. Danish Competition Authority data was thus selected over European Commission data.

[7] Elsam (2004), 'Annual Report', p. 8. http://elsam2004.webannualreport.com/log/multimedia/Elsam_2004_UK.pdf.

Table 3.2b Danish gas—final 2003 versus preliminary 2004

	Final 2003	Preliminary 2004
Upstream market	0.0	0.0
Wholesale market	0.0	2.5
Downstream supply	0.5	1.8
Score—all market areas	**0.2**	1.4
Network-related activities	9.0	9.0
Score—network area	**9.0**	9.0
Overall gas score	**2.8**	**3.7**

3.3 Finland

3.3.1 Finnish electricity market

The degree of technical openness of the market, as reported in the European Commission's benchmarking reports, fell from 25% in 2003 to 14% in 2004, resulting in a slight decline in Finland's overall electricity score from 8.9 to 8.8. This minimal impact on Finland's electricity market score has been due to the low weighting given to the degree of technical openness of the market in calculating the score.

While the third benchmarking report included interconnection capacity from Russia in calculating the value for interconnection capacity as a percentage of total installed capacity in Finland, the fourth benchmarking report excludes Russia. As Finland receives a significant proportion of its gas from Russia, this exclusion has led to the substantial fall in the calculated value of the degree of technical openness of the market.

Table 3.3a Finnish electricity—final 2003 versus preliminary 2004

	Final 2003	Preliminary 2004
Upstream market	5.8	5.4
Wholesale market	10.0	10.0
Downstream supply	9.7	9.7
Score—all market areas	**8.4**	**8.3**
Network-related activities	10.0	10.0
Score—network area	**10.0**	**10.0**
Overall electricity score	**8.9**	**8.8**

3.3.2 Finnish gas market

As a result of the derogation granted from the transposition of the European Commission's Second Gas Directive, Finland has not seen changes in its gas market since 2003.

Table 3.3b Finnish gas—final 2003 versus preliminary 2004

	Final 2003	Preliminary 2004
Upstream market	0.0	0.0
Wholesale market	5.0	5.0
Downstream supply	0.0	0.0
Score—all market areas	**1.7**	**1.7**
Network-related activities	0.0	1.0
Score—network area	**1.0**	**1.0**
Overall gas score	**1.5**	**1.5**

3.4 Italy

3.4.1 Italian electricity market

The most notable development in the Italian electricity market was the creation in March 2004 of the first wholesale market (Gestore del Mercato Elettrico). The degree of market opening in the downstream supply market increased from 66% to 79%. Gas incumbent, Eni, has expanded into the electricity sales market, and plans to increase its electricity generation to 6GW in 2007.[8] Enel, the largest generator in Italy, transferred ownership of its local power distribution network to the northern province of Trento, and brought back on stream one of its previously closed generating plants, bringing more capacity into the market.

These changes have had the following effects:

– a large increase in the wholesale market competitiveness score from 0.0 to 5.7;
– a lower level of market concentration in the downstream supply market than in 2003 (35% in 2004 compared with 67% in 2003);
– a lower upstream market score due to a higher degree of market concentration (59% in 2003 as against 65% in 2004[9]);
– a lower degree of technical openness to import capacity (12% in 2004 to 8% in 2004).

As a result, Italy's overall electricity score has increased from 4.6 to 6.7. Further changes are anticipated in 2005 following the recommendations resulting from the investigation into competition in the sector by the regulator, l'Autorità per l'energia elettrica e il gas. These included recommendations that Enel be forced either to give or lease a number of its power generation facilities to new entrants in order to boost competition.[10]

[8] *EU Energy*, Issue 78, March 12th 2004.

[9] The market concentration moves from the 50–60% band to the 60–70% band that has a lower standardised score, leading to a lower upstream market score.

[10] Datamonitor.

Table 3.4a Italian electricity—final 2003 versus preliminary 2004

	Final 2003	Preliminary 2004
Upstream market	5.2	3.5
Wholesale market	0.0	5.7
Downstream supply	1.9	6.7
Score—all market areas	**2.3**	**5.2**
Network-related activities	10.0	10.0
Score—network area	**10.0**	**10.0**
Overall electricity score	**4.6**	**6.7**

3.4.2 Italian gas market

The Italian–Austrian company, Energia, has increased its share of sales in the gas market. Just as Eni has expanded into the electricity market, electricity incumbent, Enel, has expanded into the gas market—for example, through its acquisition of the Sicilian gas distributor, Sicimetano.[11] While Eni has the largest market share, Enel Gas now has the second largest. Therefore, a large decrease in concentration is seen in the market shares of downstream suppliers, leading to a rise in Italy's overall gas market score from 3.4 to 4.0. However, the upstream market remains highly concentrated, with Eni controlling 90% of production and large parts of the distribution and import chain.

Table 3.4b Italian gas—final 2003 versus preliminary 2004

	Final 2003	Preliminary 2004
Upstream market	0.0	0.0
Wholesale market	0.0	0.0
Downstream supply	1.7	4.5
Score—all market areas	**0.6**	**1.5**
Network-related activities	10.0	10.0
Score—network area	**10.0**	**10.0**
Overall gas score	**3.4**	**4.0**

3.5 Spain

3.5.1 Spanish electricity market

The Spanish electricity market has seen a number of changes. In the upstream market, a lower market concentration of generators (61.1% in 2003 compared with 60% in 2004[12]) has tended to increase the overall score, whereas a lower level of technical openness of market has put downward pressure on the overall score. With regard to the downstream market, there is now a lower degree of supplier market concentration (70.6% in 2003 against 70% in

[11] *International Gas Report*, Issue 491, January 16th 2004.

[12] The market concentration moves from the 60–70% band to the 50–60% band that has a higher standardised score, leading to a higher upstream market score.

2004[13]). The net effect of these changes has been an increase in the overall electricity market score from 6.4 in 2003 to 7.0 in the preliminary 2004 calculation.

A report by Spanish regulator, CNE, in June 2004 highlighted the regulator's concerns that vertical integration of distribution and trading activities in the Spanish market represented a significant obstruction to the development of competition. In particular, the regulator expressed concern that Endesa and Iberdola between them controlled a significant share of the liberalised market segment, while 82% of electricity customers have remained with their incumbent supplier.[14]

Table 3.5a Spanish electricity—final 2003 versus preliminary 2004

	Final 2003	Preliminary 2004
Upstream market	3.3	4.6
Wholesale market	10.0	10.0
Downstream supply	1.5	2.9
Score—all market areas	**4.9**	**5.8**
Network-related activities	10.0	10.0
Score—network area	**10.0**	**10.0**
Overall electricity score	**6.4**	**7.0**

3.5.2 Spanish gas market

Lower market concentration in the shipper market (90% in 2003 compared with 55% in 2004) has led to an increase in Spain's overall gas score from 4.9 to 6.0.

Table 3.5b Spanish gas—final 2003 versus preliminary 2004

	Final 2003	Preliminary 2004
Upstream market	0.0	4.0
Wholesale market	7.9	7.9
Downstream supply	0.5	1.0
Score—all market areas	**2.8**	**4.3**
Network-related activities	10.0	10.0
Score—network area	**10.0**	**10.0**
Overall gas score	**4.9**	**6.0**

3.6 Sweden

3.6.1 Swedish electricity market

The downstream supply segment of the Swedish electricity market became more concentrated with the acquisition of Graninge by Sydkraft AB. In addition, the number of local

[13] The market concentration moves from the 70–100% band to the 50–70% that has a higher standardised score, leading to a higher downstream supply market score.
[14] *Power in Europe*, Issue 429, July 5th 2004.

distribution companies in Sweden has decreased due to mergers and acquisitions, leaving 177 companies in the market.

In the final 2003 calculation, the degree of market concentration in the Swedish downstream electricity supply sector was found to be 34% using the 2002 data obtained from the Graninge Energy Company investor report. The preliminary 2004 report that makes use of the European Commission's fourth benchmarking report reflects the mergers, with an increase in the market concentration to 47%. This has meant that Sweden's overall electricity market score fell from 8.3 in 2003 to 8.0 in 2004.

Table 3.6a Swedish electricity—final 2003 versus preliminary 2004

	Final 2003	Preliminary 2004
Upstream market	4.4	4.4
Wholesale market	10.0	10.0
Downstream supply	8.6	7.2
Score—all market areas	**7.6**	**7.1**
Network-related activities	10.0	10.0
Score—network area	**10.0**	**10.0**
Overall electricity score	**8.3**	**8.0**

3.6.2 Swedish gas market

While the 2003 calculation made use of data from the third benchmarking report, the decrease in data reported by the European Commission has meant that this report has made use of the third and fourth benchmarking reports. As a result of a slight decrease in concentration in its downstream supply market from 70% in 2003 to 67% in 2004, Sweden has seen a small increase in its gas market score from 3.0 in the final 2003 analysis to 3.2 in the preliminary calculations for 2004. Nevertheless, its score remains low in the competitive areas.

Table 3.6b Swedish gas—final 2003 versus preliminary 2004

	Final 2003	Preliminary 2004
Upstream market	0.0	0.0
Wholesale market	0.0	0.0
Downstream supply	0.0	0.7
Score—all market areas	**0.0**	**0.2**
Network-related activities	10.0	10.0
Score—network area	**10.0**	**10.0**
Overall gas score	**3.0**	**3.2**

3.7 UK

3.7.1 UK electricity market

Even though the UK's data has been updated to 2004 figures, its electricity market competitiveness has remained the same as that in 2003.

Table 3.7a UK electricity—final 2003 versus preliminary 2004

	Final 2003	Preliminary 2004
Upstream market	8.7	8.7
Wholesale market	10.0	10.0
Downstream supply	7.9	7.9
Score—all market areas	**8.8**	**8.8**
Network-related activities	10.0	10.0
Score—network area	**10.0**	**10.0**
Overall electricity score	**9.2**	**9.2**

3.7.2 UK gas market

The UK gas market score has not changed from 2003 to 2004, even though the data has been updated to 2004 figures.

Table 3.7b UK gas—final 2003 versus preliminary 2004

	Final 2003	Preliminary 2004
Upstream market	6.0	6.0
Wholesale market	10.0	10.0
Downstream supply	4.0	4.0
Score—all market areas	**6.6**	6.6
Network-related activities	10.0	10.0
Score—network area	**10.0**	10.0
Overall gas score	**7.6**	**7.6**

3.8 The Netherlands

3.8.1 Dutch electricity market

The Netherlands was not chosen as a comparator in 2003 as it did not pass the initial filter. However, 2004 data shows that it has a relatively high degree of competitiveness in all segments of the electricity market.

Table 3.8a Dutch electricity—preliminary 2004

	Preliminary 2004
Upstream market	7.0
Wholesale market	7.8
Downstream supply	5.8
Score—all market areas	**6.8**
Network-related activities	10.0
Score—network area	**10.0**
Overall electricity score	**7.7**

3.8.2 Dutch gas market

The Dutch gas market has a relatively low degree of competitiveness, with Finland and Portugal being the only countries with lower scores—both Finland and Portugal have received derogations from the implementation of the European Commission's Second Gas Directive. The Netherlands' low gas market score of 3.1 is the result of a number of factors: the largest gas shipper, Gasunie, has a market share of 60%; a non-competitive wholesale market exists; and there is high concentration with low switching rates in the downstream supply market. Gasunie, has reported that its sales of gas (by volume) fell 3% in 2003, a fall which it attributed to liberalisation of the energy market.[15]

Table 3.8b Dutch gas—preliminary 2004

	Preliminary 2004
Upstream market	2.0
Wholesale market	0.0
Downstream supply	3.7
Score—all market areas	**1.9**
Network-related activities	6.0
Score—network area	**6.0**
Overall gas score	**3.1**

3.9 Portugal

The main event of 2004 in the Portuguese energy markets was the prevention of a potentially significant change to their structure. There was a proposed acquisition of joint control over Gás de Portugal (GDP), the incumbent gas company in Portugal, by Energias de Portugal (EDP), the incumbent electricity company in Portugal, and ENI, an Italian energy company. This proposed acquisition was blocked by the European Commission in December 2004 on the grounds that it would have significantly impeded competition and greatly reduced or pre-empted the effects of liberalisation of the electricity and gas markets.[16]

3.9.1 Portuguese electricity market

Like the Netherlands, Portugal was not chosen as a comparator in 2003. In the preliminary 2004 data, it is seen to have a high degree of concentration in the upstream and downstream markets. Due to non-availability of information on its wholesale market, its overall score varies within the range of 3.9–6.2 according to the assumptions made.

[15] *International Gas Report*, Issue 497, April 8th 2004.

[16] COMP/M.3440—ENI/EDP/GPD, December 9th 2004.

Table 3.9a Portuguese electricity—preliminary 2004

	Preliminary 2004
Upstream market	0.6
Wholesale market	0.0
Downstream supply	3.2
Score—all market areas	**1.3**
Network-related activities	10.0
Score—network area	**10.0**
Overall electricity score	**3.9**

3.9.2 Portuguese gas market

Limited information on the Portuguese gas market is available due to the derogation it has been granted against the transposition of the European Commission's Second Gas Directive.

Table 3.9b Portuguese gas—preliminary 2004

	Preliminary 2004
Upstream market	0.0
Wholesale market	0.0
Downstream supply	0.0
Score—all market areas	**0.0**
Network-related activities	0.0
Score—network area	**0.0**
Overall gas score	**0.0**

4 Conclusions on preliminary 2004 rankings

The application of the initial filter, followed by the detailed analysis of the nine EU countries that pass it, results in the provisional conclusion that the UK meets the PSA target that requires it to be among the three most competitive electricity and gas markets in the EU and G7—indeed, it is found to be the most competitive in both markets.

The current state of competition in the electricity markets, which began to liberalise before gas, is higher than that in the gas markets as a whole. The network-related segments of the market have high scores in both the electricity and the gas markets. Developments in the wholesale market, particularly in the gas market, will be relevant for future analysis of competitiveness.

5 Forward projections of competitiveness rankings

By July 2007, the provisions of the second Internal Market Directives for Electricity and Gas are due to have been implemented in the majority of EU Member States. These fundamental changes in market opening, ownership structures and network access conditions, together with the increasing maturity of liberalised trading and retail markets, can be expected to affect the behaviour of existing and potential market participants. As such, the relative competitiveness of national energy markets is likely to vary across time.

While the UK emerged as the most competitive of the EU and G7 energy markets between 2002 and 2004, using the benchmarking methodology established in the 2003 Oxera report, the dynamic effect of the liberalisation programme across Continental Europe may challenge that position in the future.[17]

This section of the report assesses how forward competitiveness rankings may evolve, identifying the changes that could take place in the UK and the rest of the EU from 2005 to 2009, to identify the potential risk that the competitiveness of the UK's energy markets will decline relative to those of other countries in the EU or G7.

Changes in market structures required for the energy markets in both the 2004 comparator group and the rest of the EU to become as competitive as the UK are assessed, along with the plausibility of these changes given the current and future market, legislative and regulatory environments.

5.1 Forward projections of UK scores and rankings

This section looks at the potential changes that could take place in the UK electricity and gas markets in the period 2005–09.

The regulation of the network areas of the UK energy markets has been identified herein as being appropriate to facilitate competition by the granting of non-discriminatory access to customers. Ownership unbundling of gas transmission, gas distribution and electricity transmission and legal unbundling of electricity distribution have taken place, as has the introduction of rTPA to electricity and gas networks and competitive access to gas storage. This regulation follows the European Commission's Electricity and Gas Directives and is not likely to alter. Therefore, changes in the competitiveness of the UK energy markets are focused on the upstream, wholesale and downstream retail market areas.

On the basis of the methodology developed by Oxera for assessing the relative degree of competition in the energy markets in different countries, these markets in the UK can currently be considered highly competitive. Structural changes to the market resulting from consolidation of major players active in those markets would be the main potential driver of future changes. This section analyses news and information on market structures to develop upside and downside scenarios on how the electricity and gas markets will evolve over the period under consideration. Scenarios for the energy markets as a whole are then derived using the projections for the electricity and gas market weightings.

[17] Oxera (2003), 'Energy Market Competition in the EU and G7: The Relative Extent of Energy Market Competition in the EU and G7', September.

5.1.1 UK electricity market

On the basis of the PSA competitiveness rankings methodology, the UK has consistently had the most competitive electricity markets in 2002, 2003 and 2004. Table 5.1 below quantifies the electricity market competitiveness in the separate segments of the market.

In December 2004, there were six generators with a market share greater than 5%, while the market share of the largest generator (British Energy) was slightly less than 16%, implying that the upstream market is relatively unconcentrated and considered highly competitive. The wholesale market is well established, and although there has been consolidation among electricity suppliers, regulatory reviews of the development of competition have consistently illustrated the active nature of competition between the main competitors.

Table 5.1 Preliminary 2004 disaggregated UK electricity market scores

	Preliminary 2004 electricity scores
Upstream market	8.7
Wholesale market	10.0
Downstream supply	7.9
Score—all market areas	**8.8**
Network-related activities	10.0
Score—network area	**10.0**
Overall electricity score	**9.2**

Source: Oxera calculations.

The most significant single element in the downside scenario for the UK is the potential sale of Scottish Power to one of the other operators currently active in the energy sector. There is considerable speculation relating to the potential buyer. Given the similarities in market share across the upstream and downstream markets of the potential acquirers,[18] the downside scenario is non-specific and has been constructed to represent the average impact of changes on the basis of available information.

Upstream market

The primary determinant of upstream market competitiveness is market concentration. The methodology used to calculate market concentration focuses on the market shares of the three largest generators.[19] These market shares could change due to the introduction of new capacity into the market either by existing or new companies, disconnection or decommissioning of plant and changes of ownership of plant. The effects of these actions on market concentration are likely to be mostly minimal. However, a significant change in market concentration would take place if one of the three largest companies merges with another generator. Figures from the National Grid's 'Seven Year Statement' on current installed capacity and planned future changes in capacity are used to develop the upside and downside scenarios on market concentration.

[18] Neither Centrica nor British Energy have been considered as a potential acquirer of Scottish Power.

[19] Oxera (2003), 'Energy Market Competition in the EU and G7: The Relative Extent of Energy Market Competition in the EU and G7', September.

The most recent National Grid figures indicate a slightly lower concentration in May 2005 than in the preliminary 2004 analysis, reflecting some changes in ownership around the margin, such as E.ON's acquisition of the 392MW Enfield gas-fired station in June 2005.

The known disconnections in 2005–09—the disconnections of BNFL British Nuclear Group's Nuclear Magnox plant—involve 1.52GW[20] out of a total current installed capacity in May 2005 of 76.97GW.[21] The increase in capacity in the same period according to NGC's 'Seven Year Statement' is of the magnitude of 11.6GW.[22] Of this, 3.1GW belongs to RWE npower and 0.8GW to E.ON through its London Array offshore wind farm.[23] However, in addition to already existing plant that are increasing capacity, these values include plant that have currently either not received consents for construction or are currently not under construction. Only considering plant that have received consents and are already under construction reduces the increase in overall capacity to 2.8GW. Also, the increase in RWE npower's capacity is expected to be 1.1GW, while E.ON does not have any planned capacity increase in the period under consideration.

The upside scenario assumes that all the planned increases in capacity (including plant that have not received the required consents) and disconnections will take place. As a result, the 2009 generator market concentration is calculated to be lower than the May 2005 figures.

The downside scenario has been developed assuming that the increase in capacity from 2005 to 2009 is only due to increases in capacity of plant that either already exist or are currently under construction. Planned plant that have not yet received consent are not included.

Another factor that would affect the UK's upstream competitiveness is the degree of technical openness of its electricity market. This will increase with the planned interconnector with the Netherlands, which will have a capacity of 0.6GW in 2007/08 and in 2008/09.[24] The upstream scenario assumes that this increase takes place. However, as the completion of the interconnector within the planned time frame may not be achieved, the downstream scenario assumes that its construction does not take place.

Table 5.2 Upstream market scenarios

Indicator	Preliminary 2004	Upside	Downside
Market share of largest generator	0.16	0.14	0.19
Market share of two largest generators	0.28	0.28	0.34
Market share of three largest generators	0.39	0.39	0.47
Market concentration	0.28	0.27	0.33
Degree of technical openness of the market	0.03	0.04	0.03
Openness of allocation mechanism to import capacity	Auction	Auction	Auction

Sources: DTI (2005), 'Digest of UK Energy Statistics', July; European Commission (2005), 'Fourth Benchmarking Report on the Implementation of the Internal Energy and Gas Market', January; and Oxera calculations.

[20] National Grid (2005), 'GB Seven Year Statement', Table 3.10, May.

[21] DTI (2005), 'Digest of UK Energy Statistics'.

[22] National Grid (2005), 'GB Seven Year Statement', Table 3.7, May.

[23] DTI (2005), 'Secretary of State's First Report to Parliament on Security of Gas and Electricity Supply in Great Britain', p.27 and p.29, July.

[24] National Grid (2005), 'GB Seven Year Statement', Table 3.7, May.

Wholesale market

The UK's wholesale market for electricity has developed a high degree of liquidity. Price reporting and standardised contracts are at significantly high levels. A reversal of these conditions is not expected to occur to such an extent that would be detrimental to the UK's wholesale market score.

Downstream market

Developments in the downstream market over the last few years have involved the take-over of small companies by the larger ones. The only major change has been the take-over of TXU Energi's retail business by Powergen in October 2002.

As in the upstream market, the major driver of the downstream market competitiveness is the degree of downstream market concentration, calculated separately for the I&C and domestic segments of the market.

As competition develops and markets mature, customer switching between suppliers may stabilise at a lower level than that at present. Thus, organic changes in market shares through switching of suppliers are expected to be small, relative to the changes that would occur as a result of merger activity. It should also be emphasised that, while the importance of switching rates is expected to decline over time, the current methodology gives a relatively small weight to switching rates as an indicator of competition in the market.

Domestic market concentration has remained stable with values of 38% in 2002, 42% in 2003 and 41% in 2004. With switching rates potentially declining slightly over time, domestic market concentration is considered to be stabilising at 40% in the upside scenario.

The downside scenario for the domestic market assumes that Scottish Power is sold to one of its current competitors, increasing concentration from 41% in 2004 to a maximum of 56%.[25]

The concentration measure in the I&C market has declined from 40% in 2003 to 32% in 2004. In the upside scenario, a small further reduction in market concentration, to 29%, is assumed over the period 2005–09.[26] Mergers and acquisitions are likely to be the major driver of a detrimental change in market concentration. This is assumed in the downside scenario, which would lead to an increase in market concentration.

The switching rates in the domestic market increased from 2002 to 2003. The upside scenario assumes a further increase, whereas the downside scenario assumes a decrease in switching rates. As the I&C market has stable switching rates, both scenarios assume that they do not change further.

[25] Calculations of concentration based on data obtained from Ofgem (2004), 'Domestic Competitive Market Review', p.153.

[26] On November 11th 2005, Ofgem published a consultation about whether there are sufficient grounds to undertake a market review of the non-domestic energy supply markets. (Ofgem (2005), 'Non-domestic Supply Market Review: Consultation', November 11th.)

Table 5.3 Downstream market scenarios

Indicator	Preliminary 2004	Upside	Downside
I&C market			
Degree of supply market opening	1	1	1
Market concentration	0.32	0.29	0.34
Annual gross switching	0.15	0.15	0.15
Domestic market			
Degree of supply market opening	1	1	1
Market concentration	0.41	0.40	0.53
Annual gross switching	0.22	0.26	0.18

Sources: DTI; European Commission (2005), 'Fourth Benchmarking Report on the Implementation of the Internal Energy and Gas Market', January; and Oxera calculations.

Potential changes in electricity market scores

In the upside scenario, the UK's score in the competitive areas increases from 8.8 to 9.3, leading to an overall rise in electricity market score from 9.2 to 9.5. Under the downside scenario, the UK's score in the market areas declines from 8.8 to 8.1, decreasing the electricity market score from 9.2 to 8.7.

If competitive conditions in the comparator markets remain at the levels reported in Oxera's preliminary 2004 analysis, the downside scenario would see the UK falling below Finland, which had a score of 8.9 in the assessment. The next closest comparator was Sweden, with a score of 8.0.

5.1.2 UK gas market

Like the electricity market, the UK gas market has been found to be the most competitive in the EU and G7 in 2002, 2003 and in the preliminary 2004 calculations. Table 5.4 presents the competitiveness scores of the market and network areas of the gas sector. As is the case across the markets studied, the upstream and downstream markets exhibit a higher degree of concentration (ie, lower competitiveness score) than the comparable markets in electricity.

Table 5.4 Preliminary 2004 disaggregated UK gas market scores

	Preliminary 2004 gas scores
Upstream market	6.0
Wholesale market	10.0
Downstream supply	4.0
Score—all market areas	**6.6**
Network-related activities	10.0
Score—network area	**10.0**
Overall gas score	**7.6**

Source: Oxera calculations.

Upstream market

The emerging import dependence of the UK gas sector is likely to be a key factor in the future upstream market performance with new producers emerging as economic sources of gas. This may result in the current larger shippers/suppliers increasing their portfolio positions to address the perceived rise in supply portfolio exposure. As in last year's

analysis, therefore, no real upside is anticipated, but the downside scenario assumes that the largest shipper/supplier increases its market share by 10%.

Table 5.5 Upstream market scenarios

Indicator	Preliminary 2004	Upside	Downside
Market share of largest shipper	0.25	0.25	0.35
Market share of two largest shippers	0.45	0.45	0.55
Market share of three largest shippers	0.60	0.60	0.70
Market concentration	0.43	0.43	0.53

Sources: European Commission (2005), 'Fourth Benchmarking Report on the Implementation of the Internal Energy and Gas Market', January; and Oxera calculations.

Wholesale market

As with the electricity market, using the PSA methodology, the gas wholesale market in the UK is highly competitive relative to the comparator countries. It has a high degree of liquidity and price reporting, and a significant amount of trade takes place through standardised contracts. These conditions are not expected to change in a manner unfavourable to wholesale market competitiveness.

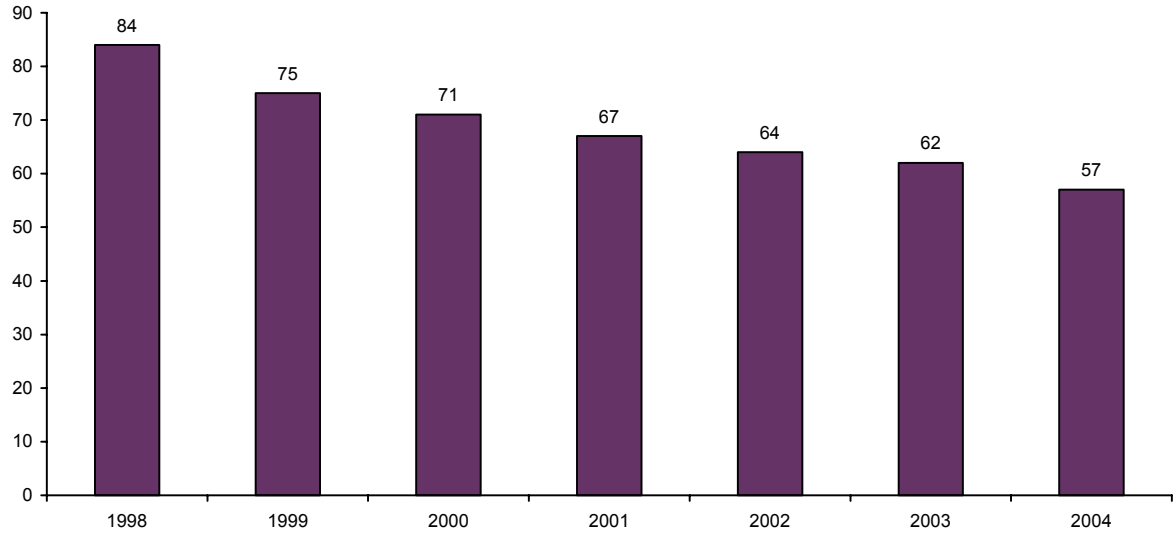
Downstream market

Market concentration of the largest suppliers is the primary determinant of the downstream market score. Switching rates receive a relatively small weight in the methodology used, other than through their impact on the concentration of the largest players. Furthermore, as noted above, as competition develops and markets mature, switching rates may stabilise below their current levels.

Switching rates in the domestic market fell from 19% in 2002 to 13% in 2003. The upside scenario assumes they do not change further, whereas the downside scenario assumes there is a further fall in the rates. Switching rates in the I&C market are quite stable, with a small rise of 3 percentage points from 2002 to 2003. The upside scenario assumes a further rise. The downside scenario assumes that the switching rates remain stable at 2003 levels.

The largest player in the UK gas supply markets is Centrica, the former incumbent. While it continues to hold a highly significant share of supply, as shown in Figure 5.1, Centrica's share in the domestic market has declined year on year since 1998, and in 2004 had fallen to 57%. The upside scenario assumes this declines further.

Figure 5.1 Changes in Centrica's market share (%)



Source: Ofgem (2004), 'Domestic Competitive Market Review' and Centrica Annual Report 2004'.

The second and third largest operators in the domestic gas supply markets (ie, those with market shares that are currently relevant to the PSA methodology) are E.ON and RWE npower, with market shares of 13% and 10% respectively.[27] This gives a concentration ratio for the three largest players of 0.69. If Scottish Power is acquired by one of the operators already active in the market, domestic market concentration will increase to a maximum of 0.73.[28]

In contrast, in the market for supply to I&C consumers, concentration levels are considerably lower than in the domestic markets, but have been increasing. The downside scenario assumes that this increase continues. The upside scenario, however, assumes that there are no further changes in I&C market concentration.

Table 5.6 I&C supplier market concentration—gas

	Concentration (%)
2002	33
2003	39
2004	48

Source: 2004 figures obtained from the DTI; 2003 figures calculated using data obtained from Ofgem's review of non-domestic gas and electricity markets and 2002 figures obtained from European Commission (2002) 'Second Benchmarking Report on the Implementation of the Internal Electricity and Gas Market', October.

[27] Due to confidentiality of market share data, market concentration figures for the downstream markets were directly obtained from the DTI. As Centrica's market share has declined from the 2003 figure in Ofgem (2004), 'Domestic Competitive Market Review', E.ON and RWE npower's market shares have been assumed to be 1 percentage point higher in 2004 than the 2003 figures in the Ofgem report.

[28] Data obtained from Ofgem (2004), 'Domestic Competitive Market Review'.

Table 5.7 Downstream market scenarios

Indicator	Preliminary 2004	Upside	Downside
I&C market			
Degree of supply market opening	1	1	1
Market concentration	0.48	0.48	0.52
Annual gross switching	0.19	0.20	0.19
Domestic market			
Degree of supply market opening	1	1	1
Market concentration	0.69	0.66	0.73
Annual gross switching	0.13	0.13	0.10

Sources: European Commission (2005), 'Fourth Benchmarking Report on the Implementation of the Internal Energy and Gas Market', January; DTI; and Oxera calculations.

Potential changes in gas market scores

In the upside scenario, the score of the market areas does not change; hence, the gas market score remains at the preliminary 2004 levels of 7.6.

In the downside scenario, the score in the market areas declines from 6.6 to 5.4, largely driven by rising market concentration in the upstream and downstream areas leading to a decline in the gas market score from 7.6 to 6.8.

With reference to the comparator countries included in the preliminary 2004 assessment, the changes in the UK's gas market scores does not affect its top ranking position in the assessment (again assuming that the competitive conditions in the comparator countries do not change). After the UK, the next highest-ranking country is Spain with a score of 5.4.

5.1.3 Overall energy market scores

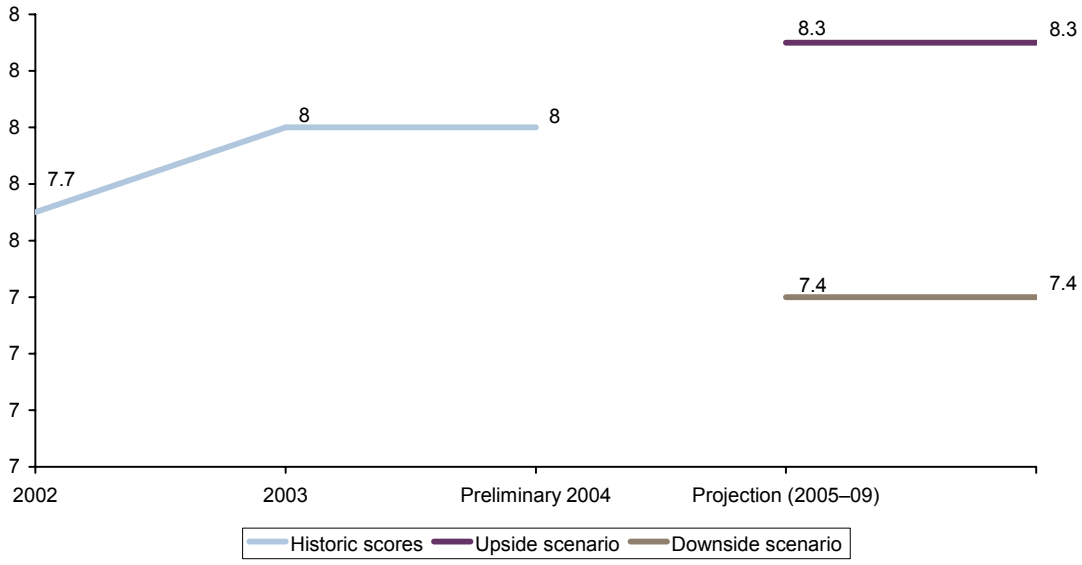
Using the DTI's energy projections on total final demand for 2005 and 2010, the gas market weighting is 66% or 67%. Combining this weighting with the anticipated changes in the upside and downside scenarios enables the separate gas and electricity scores to be combined into an overall score for energy markets as a whole. Table 5.8 and Figure 5.2 below present the results of this analysis. As illustrated, the downside scenario gives an overall energy market score of 7.4—below Sweden's current score, but above the preliminary 2004 ranking for the other countries included in the analysis.

Table 5.8 Overall energy score scenarios

Indicator	Preliminary 2004	Upside	Downside
Electricity market score	9.2	9.5	8.7
Gas market score	7.6	7.6	6.8
Gas market weighting	0.75	0.67	0.67
Overall energy market score	8.0	8.3	7.4

Source: Oxera calculations.

Figure 5.2 Historic scores and future scenarios



Source: Oxera calculations.

5.2 Comparison with 2004 comparator group

Having estimated the potential changes in the UK market over the forthcoming five-year period, this section brings out the major differences between the UK's electricity and gas markets and those of the rest of the comparator group in 2004. Changes required in the latter to enable them to become as competitive as the UK are then identified, with discussion of the likelihood of such changes.

5.2.1 Comparison of market structures

There are no major differences in the network areas of the comparator group of countries. The countries that have not yet introduced rTPA or unbundling are required to do so by July 2007—the time frame for the implementation of the European Commission's Electricity and Gas Market Directives. For example, ownership unbundling of Dutch gas and power networks of 100kV and above has been mandated by the Dutch Parliament. Supply and network activities will now be owned by separate businesses.[29]

As market structures are the primary determinants of the relative competitiveness of the electricity and gas sectors, Table 5.9 compares the market structures of the comparator group of countries with that of the UK, highlighting the major differences. Significant differences lie in the generator market concentration and gas shipper market concentration, although in general, the UK is found to have a more competitive structure than the rest of the group.

In the I&C and domestic electricity supply markets, only Finland and Italy have lower concentration than the UK, with the others having a concentration level of at least 47%. In markets such as Italy and Austria, the relatively low retail market concentration levels are driven by the involvement of a number of municipalities in the supply markets. However, there is evidence that consolidation is taking place, adversely affecting the levels of concentration in those markets.

[29] *EU Energy* (2005), Issue 116, September 23rd, p.14.

While wholesale markets for electricity have developed across the comparator group, the same has not occurred in the gas markets to the extent in the UK market. None of the non-EU G7 countries are expected to implement the changes necessary for them to pass the filters for them to enter the comparator group in the next five years.

Table 5.9 Comparison of preliminary 2004 market structures

	UK	Comparator group range
Electricity		
Generator market concentration	28	45–72
I&C market concentration	32	22–70
Domestic market concentration	41	22–70
Gas		
Shipper market concentration	43	64–100 (64–98 if Finland and Portugal are excluded)
I&C market concentration	48	50–100 (50–77 if Finland and Portugal are excluded)
Domestic market concentration	69	58–100 (58–79 if Finland and Portugal are excluded)

Source: Oxera calculations.

Table 5.10 shows the gas market weightings of the comparator group in 2004. Unlike the electricity markets, the gas markets are dominated by security of supply issues and import dependence. As the latter are less competitive overall than the electricity markets, for countries where gas supply comprises a larger proportion of energy supply, the overall scores will face a downward bias. A large increase in the gas market competitiveness of a country with a relatively small gas market weighting will not significantly influence its overall energy market competitiveness. Electricity market scores will therefore be more relevant in determining the overall energy market scores for countries that have a low gas market weighting and vice-versa. Thus, in case of the UK, the Netherlands and Italy, changes in gas markets will be more relevant to the analysis, while the electricity market will be the dominant force in Sweden. In the rest of the comparator group, both electricity and gas markets will be important in determining energy market competitiveness.

Table 5.10 Gas market weightings of the 2004 comparator group

Country	Gas market weighting (2004)
Netherlands	0.82
UK	0.75
Italy	0.74
Austria	0.62
Denmark	0.62
Spain	0.56
Portugal	0.44
Finland	0.40
Sweden	0.08

Source: Eurogas (2004), 'Eurogas Consumption 2003', press release, February; and Eurostat data table, 'Supply, Transformation, Consumption—Electricity—Annual Data'.

5.2.2 Country-by-country analysis

This section considers the sector or sectors of greatest importance in determining overall energy market competitiveness for each country included in the comparator group. It identifies the changes required in each country for it to be as or more competitive with respect to the UK. Recent experiences indicating the likelihood of such changes are then discussed.

Sweden

Despite its low gas competitiveness, Sweden had the second most competitive energy market after the UK in 2002, 2003 and 2004, due to its very low degree of dependence on gas.

As noted above, its current score (7.6) is higher than the UK's downside score. For Sweden to overtake the UK's current score, the market share of the largest generator would have to decrease from 47% in 2003 to 29%, which is substantially lower than that of the comparator group of countries other than the UK, and would require a reversal of recent developments in the market. There are 30 power-generating companies in Sweden, but the largest five controlled 88% of generation in 2004.[30] The trend over the last few years has been towards an increased share of the largest firms.

Spain

Since there is almost an equal weighting given to the electricity and gas markets in Spain, changes in both would have implications for Spain's overall energy market competitiveness score.

For Spain to equal the UK's downside score, the following changes in the electricity market would be required.

– Market share of the largest generator would have to decrease from 40% to 30%. Currently, three firms represent 80% of generation output, while recent developments have not led to any significant changes in this level. The probability of a fall in market shares will be higher when the Iberian market starts functioning.

– Market share of the largest and second largest suppliers would have to decrease from 42% to 32% and from 37% to 27% respectively.

In addition to changes in the electricity market, changes in the gas market will have to take place.

– Gas shipper market concentration for the three largest shippers would have to decrease from 55% to 40%, well below the rest of the comparator group. A large decline in the concentration of the largest shipper from 90% to 40% has already taken place between 2003 and 2004.

– Market concentration of the domestic gas market suppliers would have to decrease from 74% to 64% and that of I&C suppliers from 73% to 63%.

In terms of current developments, Spanish antitrust authorities are currently considering Gas Natural's take-over of Endesa.

Finland

Finland had the second most competitive electricity market after the UK in 2002, 2003 and 2004. However, it has a very low gas market score, having no natural gas reserves and

[30] http://www.svenskenergi.se/engelsk_sida.htm

importing all its gas from Russia. It has been granted a derogation of the obligation to open its natural gas networks under the European Commission's Second Gas Directive until its network is directly connected to another EU country, or when gas can be purchased from at least two external suppliers. This derogation results in the low score. Given its gas market weighting of 40%, this pulls down its energy market competitiveness.

Even if Finland's electricity market score improved to the maximum value of 10, if there were no changes in the gas market, Finland's overall energy market score would increase only to 6.5—still below the UK's downside score of 7.4. Changes required in the gas market so that the overall energy market score slightly exceeds the UK score would be as follows:

– shipper concentration would have to reduce from 100% to 60%;
– I&C and domestic supplier concentration would have to decrease from 100% to 60%;
– development of a wholesale market with reporting of prices for 20% of the volume traded;
– unbundling at the transmission and distribution levels, which will take place when the Gas Directive is implemented.

The shipper and supplier concentration ratios are below those currently observed in Austria, Denmark, Italy and Spain, which between them have implemented gas release schemes and imposed target market shares on incumbent suppliers. Therefore, it is unlikely that Finland would be able to surpass the UK's score within the time frame under consideration.

In September 2005, Gazprom signed an agreement with BASF AG and E.ON AG for the construction of the Northern European Gas Pipeline connecting Russia and Germany through the Baltic Sea. This pipeline, also expected to connect Finland to the European gas network, will be commissioned only in 2010. This is a step towards Finland meeting the conditions that would remove the derogation, therefore obliging Finland to implement the Gas Directive.[31]

Austria

Austria has lower electricity and gas market scores than the UK in the upstream, wholesale, as well as the downstream segments of the market.

With a 62% weight given to the gas market, both electricity and gas markets are quite important in determining Austria's overall score.

Probable changes required in the electricity market for Austria to equal the UK's downside scenario would be:

– reduction in the market share of the largest generator from 45% to 25%, which is lower than that of the comparator group except the UK and Netherlands;
– reduction in the market share of the largest supplier in the domestic and I&C markets from 59% to 39%.

The above changes are unlikely, as the Austrian electricity market has seen consolidation since liberalisation. While it remains fragmented with over 130 utilities, Verbund and nine provincial electricity distribution companies are dominant. Provincial and municipal utilities in eastern Austria formed an alliance in 2000. In addition, 2003 saw a vertical merger between Verbund (a strong player in the generation and wholesale markets) and EnergieAllianz (a strong player in the retail business). There is potential for international players to enter the

[31] http://www.maakaasu.fi/11_in_english/11.3_actual.html
http://www.gazprom.ru/eng/news/2005/09/17871.shtml

market (both through new entry and through acquisition). To date, none has entered other than through acquisition.

Austria has particularly low switching rates in the domestic market, which is currently unlikely to improve because of low price differences between suppliers.[32]

In addition to the changes in the electricity market, the following possible changes would be required in the gas market for Austria to overtake the UK's downside score:

– reduction in shipper market concentration from 94% to 60%. (Currently OMV has a 91% share). The UK is the only country to have a lower concentration, and the Netherlands is quite close;
– reduction in market share of largest domestic and I&C suppliers to 38%.

Denmark

Like Austria, Denmark has a 62% weighting given to its gas market. Therefore, both electricity and gas markets are likely to be important in determining Denmark's overall competitiveness.

The possible changes required in the electricity market for Denmark to equal the UK's downside energy market score would be as follows.

– Reduction in the market concentration of generators from 62% to 50%—the most recent major market development has been the purchase of a majority stake in Nesa by Elsam, west Denmark's leading generator in October 2003. As a part of this deal, it also received Nesa's 36% stake in Energi E2, the largest generator in east Denmark, thereby increasing concentration.

– Reduction in the market shares of the largest domestic and I&C suppliers from 47% to 37%—again, recent evidence indicates that concentration in the market has been rising as a result of mergers or alliances that the operators have entered into.

In addition to electricity market changes, the following possible changes would be required in the gas market for Denmark to equal the UK's downside energy market score:

– with DONG currently the dominant shipper, reduction in shipper market concentration from 87% to 50% is therefore required (within the comparator group, only the UK has a lower concentration);

– reduction in market share of largest supplier in I&C market from 45% to 35% and in the domestic market from 55% to 35%;

– development of a wholesale market with 40% price reporting of the gas traded;

– introduction of rTPA to gas storage (which will take place due to the transposition of the European Commission's Second Gas Directive).

Italy

Italy is a major electricity importer while the gas market in Italy has a weight of 74% of the total energy market. Therefore, developments in the gas market will be the predominant driver of any changes to its energy market score.

[32] http://www.e-control.at/pls/econtrol/docs/FOLDER/INTERN/ADMINISTRATION/DATEIEN/WORKINGPAPERS/WP+10+-+ELECTRICITY+MARKET+LIBERALISATION+IN+AUSTRIA.PDF - pg 2

Electricity market changes required so that Italy's overall energy score equals the UK's downside score are outlined below.

– Reduction in generator market concentration would be needed from 65% to 45% (within the comparator group, only the UK and the Netherlands have market concentrations equal to or lower than 45%). Recent market developments include Edison's (the sole contender to Enel, the electricity incumbent) 10GW plant currently under construction and combined-cycle plant being built by small municipal utilities. Endesa also plans to increase its market share from 7% to 10% by 2007 through capacity additions. In May 2005, AEEG recommended that Enel be forced to give or lease a number of its power generation facilities to new entrants to boost competition.[33]

– 100% price reporting of traded volume would also be required.

Recent investigations into competition in the sector may act as a driver towards some of these changes. In particular, in February 2005, the Italian regulator—AEEG—completed an in-depth study in conjunction with the Antitrust Authority into competition within the Italian power market. In April 2005, the AEEG had ordered GRTN (the transmission system operator) and GME (the power market operator) to improve wholesale market transparency (and competition) by publishing a series of indices.

In addition to electricity market changes, the following gas market changes would be required so that Italy's overall energy score equals the UK's downside score.

– A reduction in shipper market concentration from 73% to 50% would be needed. (Within the comparator group, only the UK has a lower market concentration.) The production, procurement, storage, transmission, distribution and sales of gas are currently concentrated within ENI, which exceeded the 61% ceiling on gas imports placed on it by the AEEG. Furthermore, this ceiling will be lifted in 2010.[34] Only a limited amount of new entrants have entered through the gas release programme, and appear to have found it difficult to arrange gas imports, in part due to ENI's control over transport rights for access infrastructure. Partial releases of gas are decided by ENI itself. AEEG has therefore recommended the divestment by ENI of a part of its national production and long-term import contracts. The reformulation of the ceiling on imports that is due to expire in 2010 has also been recommended.[35]

  Limited capacity of import and storage infrastructures and congestion on import pipelines currently prevent any excess supply and greater competition.[36] However, Italy plans on increasing its gas storage capacity by 20% by 2008. This additional capacity is to be operated by third parties.[37]

– A wholesale market would need to develop with 10% of share of total daily volume traded covered by price reporting. There has been no discussion by the regulator of establishing such a scheme.

[33] Source: Datamonitor.

[34] AEEG (2005), 'Observations of the Authority for Electricity and Gas, Submitted to the Italian Parliament and Cabinet, regarding the Independence of the National Pipeline Network and Storage System and the Development of Competition in the Natural Gas Market, January 27th, available at http://www.autorita.energia.it/inglese/press/segnalazione_050127.htm; and AEEG (2005), 'Observations submitted to the Parliament and the Cabinet—Recommendations for Fostering Competition in the Gas Market', press release, available at http://www.autorita.energia.it/inglese/press/press_release_050128.htm .

[35] AEEG (2005), 'Annual Report on the State of Services and the Activity Carried Out', June 23rd, p. 7, available at http://www.autorita.energia.it/inglese/annual_report/eng_pres_2005.pdf.

[36] AEEG (2005), 'Observations submitted to the Parliament and the Cabinet—Recommendations for Fostering Competition in the Gas Market', press release, available at http://www.autorita.energia.it/inglese/press/press_release_050128.htm .

[37] *EU Energy* (2005), Issue 116, September 23rd.

– There would need to be standardised contracts for trade.

The Netherlands

Even though the Netherlands has a high score in the electricity market, the 82% weight given to its gas market means that it is in only eighth position in the overall energy market scores.

The changes required in the Dutch electricity market for it to exceed the UK's downside energy market score would be:

– reduction in generator market concentration from 45% to 25%, much lower than figures in the rest of the comparator group—the Dutch generation market has seen increased consolidation through mergers and take-overs, the most recent being the Nuon/Reliant merger, with Reliant's main business being that of generation and Nuon's distribution, with some stake in generation as well.

Additional changes required in the Dutch gas market for it to surpass the UK's downside energy market score are as follows:

– reduction in shipper market concentration from 64% to 50%;
– development of the gas wholesale market with 50% of the total daily volume traded covered by price reporting;
– rTPA to transmission and gas storage (this will develop due to the implementation of the European Commission's Second Gas Directive).

The effects of increased competition in the gas market have been observed with the 3% fall in Gasunie's (supply and transport company) sales in 2003.[38] However, the three largest electricity and gas suppliers have more than 80% of the supply market share, even though there are about 20 other suppliers.

Portugal

Portugal's gas market has a 44% weight in its energy market. It has low electricity market competitiveness and its derogation from the transposition of the European Commission's Gas Directive until 2007 implies that it has very low gas market competitiveness, which further pulls down its overall score.

Even with a full score in the electricity market, Portugal would have an overall energy market score of 5.6. The following changes would therefore be required in the gas market for Portugal to equal the UK's score:

– reduction in shipper concentration from 100% to 50%;
– development of the wholesale market, with 50% of total daily volume traded covered by price reporting;
– existence of standardised contracts;
– reduction in I&C and domestic supplier concentration from 100% to 50% and 60% respectively;
– 100% supply market opening;
– unbundling of transmission and distribution;
– rTPA to storage.

While the last three conditions will come into force with the implementation of the Gas Directive, the current monopoly position of Gas de Portugal on virtually all the gas markets is

[38] Platts (2004), International Gas Report—Issue 491, January 16th.

unlikely to change to the extent that would bring about the required changes in the market areas.

5.2.3 Summary

Drawing on the analysis in the above section, Table 5.11 below lists the countries on the basis of their probabilities of overtaking the UK's energy market score. The probabilities are defined as follows:

– 'high' if there is a high probability of the event, with minimal change in the market structures or legislative regime required;

– 'medium' if substantive adjustment to market and legislative structures could deliver comparability with the UK;

– 'low' if there is very little probability that the necessary changes would be achievable in the time frame under consideration.

On the basis of this analysis, the UK's top position in the energy market competitiveness rankings would most likely be threatened by Sweden. The extent of the changes required in the other countries are of sufficient magnitude that there is a low level of likelihood that they would achieve more competitive markets than the UK in the period 2005–09.

Table 5.11 Potential of comparator group to overtake the UK under the upside and downside scenarios for the UK

	Upside scenario	Downside scenario
Sweden	Medium	High
Finland	Low	Low
Spain	Low	Low
Austria	Low	Low
Denmark	Low	Low
Italy	Low	Low
Netherlands	Low	Low
Portugal	Low	Low

5.2.4 Future comparators

In addition to those countries currently included in the comparator group, there is the potential for other countries to meet the conditions necessary to be included in the analysis. Indeed, the number of countries forming the comparator group is expected to increase in future as a result of the following factors.

– The EU Member States will have to comply with the European Commission's Electricity and Gas Directives by July 2007, unless they have been awarded derogations from the transposition of these Directives.

– Following the EU's expansion from the original 15 Member States to 25 Member States in May 2004, most of the new Member States are also required to adopt the European Commission Directives by July 2007. The exception is Estonia where 100% electricity market opening has been planned for 2016.

Table 5.12 sets out the years in which countries are likely pass the initial filter. Passing of the initial filter in either the electricity and/or gas market has been considered.[39] Passing it on the average market-opening basis has not been taken into account.

Table 5.12 Realisation of initial filter conditions

Year	Country	Change taking place in given year
2005	Ireland	Full electricity market opening
	Poland	Full gas market opening. (Full electricity market opening will take place in 2007)
2006	Czech Republic	Full electricity market opening. (Full gas market opening in 2007)
2007	Hungary, Lithuania	Full electricity opening
	Belgium, France, Slovenia	Full electricity and gas market opening
	Greece	Full electricity market opening. (Derogation from Gas Directive until August 2006)
	Germany	rTPA to transmission
	Luxembourg	
	Slovakia	Laws coming into force in 2005 leading to compliance with EU legislation
2016	Estonia	Full electricity market opening in 2016. (Gas market is already 95% open, therefore, Estonia may pass the filter on an average market opening before 2016)
Information not found	Latvia (currently highly uncompetitive), Cyprus, Malta (Cyprus and Malta do not have gas markets)	

Sources: Electricity and gas regulators of the respective countries.

Tables 4.2 and 4.3 below present data on the current electricity and gas market structures of EU Member States that have not yet passed the initial filter. Among the new EU Member States, the current market structures of energy markets in Poland and Hungary are comparable with that of the UK. Looking at current market structures alone, it appears that they could potentially overtake the UK once they have full market opening and become part of the comparator group. For Poland, this will occur in 2005 and for Hungary in 2007. In addition, Germany has competitive electricity and gas market structures and is due to pass the initial filter in 2007 with the introduction of rTPA to transmission.

[39] Countries pass the initial filter for competitiveness in either the electricity or the gas markets if transmission has been unbundled, and there is rTPA to transmission and 100% supply market opening. A country passing the initial filter in either the electricity or gas markets passes it in the energy market as a whole.

Table 5.13 Electricity market structure of potential new comparators (%)

	Market share of largest generator	Aggregate market share of three largest generators	Aggregate market share of three largest downstream suppliers
Belgium	85	95	90
Czech Republic	65	75	46
Cyprus	100	100	100
Estonia	90	100	Not known
France	85	95	88
Germany	30	70	50
Greece	100	100	100
Hungary	30	65	56
Ireland	85	90	88
Latvia	95	100	99
Lithuania	50	80	100
Luxembourg	Not known	Not known	100
Malta	100	100	100
Poland	15	35	32
Slovakia	75	85	84
Slovenia	70	95	71

Source: European Commission (2005), 'Annual Report on the Implementation of the Gas and Electricity Internal Market—Fourth Benchmarking Report', January.

Table 5.14 Gas market structure of new Member States (%)

	Market share of largest shipper	Aggregate market share of three largest downstream suppliers
Belgium	92	95
Czech Republic	99	59
Estonia	50	100
France	91	91
Germany	50	10
Hungary	100	62
Ireland	40	88
Latvia	100	100
Lithuania	59	99
Luxembourg	Not meaningful	Not known
Poland	98	65
Slovakia	100	100
Slovenia	100	86

Source: European Commission (2005), 'Annual Report on the Implementation of the Gas and Electricity Internal Market—Fourth Benchmarking Report', January

In general, market concentration in gas markets is higher than that in electricity markets. Countries with high gas market weightings as listed in Table 5.15 will find a downward bias

on their energy market competitiveness due to the inherently less competitive characteristics of the gas supply chain. This is the case for Poland, but Germany is an exception to the general trend of gas market concentration being higher than that of electricity markets. Due to the high competitiveness of its gas supply market in particular, the high gas market weighting will provide an upward bias to its energy market competitiveness.

Table 5.15 Gas market weightings of the future comparators

Country	Gas market weighting (2004)
Hungary	0.83
Lithuania	0.81
Latvia	0.77
Slovakia	0.76
Luxembourg	0.73
Belgium	0.70
Ireland	0.67
Czech Republic	0.66
Germany	0.66
Estonia	0.60
Poland	0.60
France	0.55
Slovenia	0.48
Greece	0.35
Cyprus	0.00
Malta	0.00

Sources: Eurogas (2004), 'Eurogas Consumption 2003', press release, February; Eurogas (2005), 'Eurogas Consumption 2004', press release, February; and Eurostat data table, 'Supply, Transformation, Consumption—Electricity—Annual Data'.

Currently, the market structures of Poland, Hungary and Germany are potentially comparable with that of the UK. Table 5.16 lists the negative and positive aspects of the energy markets of these and the rest of the countries expected to pass the initial filter in the future. Despite their currently favourable market structures, Poland and Hungary's competitiveness is seen to be unlikely to improve. Germany, however, might prove to be a threat to the UK's position.

Table 5.16 Factors affecting future competitive scores

Country	Negative factors	Positive factors
Belgium	High market shares of incumbents.	
Estonia	Full electricity market opening in 2016. State-owned Esti Energia, the dominant player in electricity. Gas transmission unbundling by account. No transmission unbundling.	
France	High market shares of incumbents. Negotiated TPA for gas storage (rTPA will be introduced with the implementation of the Gas Directive in 2007)	
Germany		Low concentration in downstream market
Greece	Competition not yet developed in electricity or gas. Gas derogation until August 2006.	
Hungary	Small size of electricity and gas markets. 17 independent electricity generator licensees exist, but a significant portion of the power plant capacity is held by MVM, the public utility wholesaler. Highest gas market weighting among the EU 25 of 83%. A single party holds domestic gas production and important sources of import. The obligations to release free capacity 'do not work'[1] due to statutory priority of public utilities. No power exchange exists.	Rate of growth of Hungarian gas market is falling, which could have positive as well as negative impacts.
Ireland	Small size of electricity and gas markets.	
Latvia	State-owned Latvenergo produces 90% of power and is involved in import, transmission, distribution and supply.	
Luxembourg	No effective electricity market exists. It relies on interconnection.	
Poland	Long-term power purchase agreements tie up 50% of power generation. Only 1% of electricity is traded on the exchange that has existed for three years. Government is promoting consolidation of generation companies with distribution networks.	

Note: [1] Hungarian Energy Office (2004), 'Experiences of Opening the Markets so Far, Expected Vision of the Network Energy Systems', September.

5.3 Conclusions

While the UK currently has the most competitive energy market within the EU and G7, analysis of recent news and announcements leads to the conclusion that there is likely to be limited scope for further improvements. Merger activity may substantially increase levels of concentration, and hence reduce its competitiveness scores. Studying the 2004 comparator group, Sweden has already overtaken the UK in the worst-case scenario.

Since the European Commission's Second Gas and Electricity Directives will be implemented in most of the EU by July 2007, this section compared the existing market structures of the UK with that of the countries expected to join the comparator group by 2007. Among these, Poland, Hungary and Germany were the only countries found to be possible competitors to the UK. However, taking forthcoming market and regulatory developments into account, Poland and Hungary are ruled out from overtaking the UK in the 2005–09 period. Germany, however, with its low market concentration may challenge the UK's competitiveness.

Appendix 1 Data used for indicator evaluation—preliminary 2004 dataset

A1.1 Data availability—preliminary 2004 dataset

Tables A1.1 and A1.2 set out whether data is available for the different segments of the electricity and gas markets in the nine comparator countries, providing details where data is missing.

Electricity

Indicator	Austria	Denmark	Finland	Italy	Spain	Sweden	UK	Netherlands	Portugal
Upstream market									
Market share of generators	Info n/a for second largest generator	Info n/a for third largest generator	Info n/a for third largest generator	Info n/a for second largest generator	Info n/a for second largest generator	Yes	Yes	Info n/a for second largest generator	Info n/a for second largest generator
Degree of technical openness of market	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Openness of allocation mechanism to import capacity	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wholesale market									
Price reporting	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Share of total (daily) volume traded covered by price reporting	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Standardised contracts in wholesale markets	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No

Indicator	Austria	Denmark	Finland	Italy	Spain	Sweden	UK	Netherlands	Portugal
Downstream market									
Degree of supply market opening	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Market share of largest suppliers	Info n/a for market shares of largest and two largest suppliers	Yes	Yes	Yes	Yes	Info n/a for market shares of largest and two largest suppliers	Info n/a for market shares of largest and two largest suppliers to the domestic market	Info n/a for domestic market, and for market shares of largest and two largest suppliers in the domestic market	Info n/a for market shares of largest and two largest suppliers
Switching rates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Network-related activities									
Unbundling at transmission level	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
rTPA at transmission level	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Unbundling at distribution level	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
rTPA at distribution level	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Gas

Indicator	Austria	Denmark	Finland	Italy	Spain	Sweden	UK	Netherlands	Portugal
Upstream market									
Market share of shippers	Info n/a for second and third largest shippers	Info n/a for second and third largest shippers	Yes	Info n/a for second and third largest shippers	Info n/a for second and third largest shippers	Info n/a for second and third largest shippers	Info n/a for second and third largest shippers	Info n/a for second and third largest shippers	Yes
Wholesale market									
Price reporting	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Share of total (daily) volume traded covered by price reporting	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Standardised contracts in wholesale markets	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Downstream market									
Degree of supply market opening	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Market share of largest suppliers	Info n/a for the second largest supplier	Yes	Yes	Info n/a for the second largest supplier	Info n/a for the first and second largest suppliers	Info n/a for the second largest supplier to the I&C market	Info n/a for the first and second largest suppliers	Info n/a for the first and second largest suppliers	Yes
Switching rates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Network-related activities									
Unbundling at transmission level	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
rTPA at transmission level	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Unbundling at distribution level	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
rTPA at distribution level	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Competitive access to gas storage	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

A1.2 Detailed data—preliminary 2004 dataset

Austrian electricity market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest generator	Proportion of total available capacity	0.45	EC2004, Table 3.3, p.20	
two largest generators	As above	0.60	Assumed	Assumed an equal market share for the second and third largest generators
three largest generators	As above	0.75	EC2004, Table 3.3, p.20	
Degree of technical openness of market	Total interconnector capacity as proportion of peak demand	0.240	EC2004, Table 3.2, p.19	
Openness of allocation mechanism to import capacity	rTPA, auction mechanism, long-term contracts	rTPA		
Wholesale market				
Price reporting	Price information publicly available	Y	Energy Exchange Austria	
Share of total (daily) volume traded covered by price reporting		0.500	As above	
Standardised contracts		Y	As above	
Downstream market				
I&C				
Degree of supply market opening	Proportion of total customer base in volume terms	1	EC2004, Annex 1, p.2	
Market share of				
largest supplier	Proportion of total supply/consumption	0.590	E-control Market Report 2004, p. 63	2003 data on total sales to final customers is the latest data available from E-control
two largest suppliers	As above	0.690	As above	As above

Indicator	Definition	Assessment	Source	Comments
three largest suppliers	As above	0.750	As above	As above
Switching	Proportion of eligible customers' gross switching per annum	0.07	EC2004, Annex 1, p.5	2003 data
Domestic				
Degree of supply market opening	Proportion of total customer base in volume terms	1	EC2004, Annex 1, p.2	
Market share of				
largest supplier	Proportion of total supply/consumption	0.590	E-control Market Report 2004, p. 63	2003 data on total sales to final customers is the latest data available from E-control
two largest suppliers	As above	0.690	As above	As above
three largest suppliers	As above	0.750	As above	As above
Switching	Proportion of eligible customers' gross switching per annum	0.01	EC2004, Annex 1, p.5	2003 data
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	Y	EC2004, Annex , p.2.	Legal
rTPA at transmission level	Tariffs imposed or approved by independent regulator	Y	EC2003, p.13, Table 1	
Unbundling at distribution level	Legal or ownership separation	Y	EC2003, p.4, Table 1	Legal
rTPA at distribution level		Y	EC2003, p.13, Table 1	

Sources (for this and subsequent tables): EC2003 = European Commission (2004), 'Third Benchmarking Report on the Implementation of the Internal Electricity and Gas market', March; and EC2004 = European Commission (2005), 'Fourth Benchmarking Report on the Implementation of the Internal Energy and Gas Market', January.

Austrian gas market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest shipper	Proportion of total gas sources by shipper	0.91	EC2004, Annex 5, p.33, Table 5.1	
two largest shippers	As above	0.94	Assumed	One firm with market share > 5%
three largest shippers	As above	0.97	As above	As above
Wholesale market				
Price reporting	Price information publicly available	Y		
Share of total (daily) volume traded covered by price reporting		0.20		
Standardised contracts		Y		
Downstream market				
I&C				
Degree of supply market opening	Proportion of total customer base in volume terms	1	EC2004, Annex 1, p.2.	
Market share of				
largest supplier	Proportion of total supply/consumption	0.68	E-control market report 2004, p. 65	2003 data on total sales to final customers is latest data available from E-control
two largest suppliers	As above	0.79	As above	As above
three largest suppliers	As above	0.84	As above	As above
Switching	Proportion of eligible customers' gross switching	0.09	EC2004, Annex 1, p. 6	2003 data

Indicator	Definition	Assessment	Source	Comments
Domestic				
Degree of supply market opening	Proportion of total customer base in volume terms	1	EC2004, Annex 1, p. 2	
Market share of				
largest supplier	Proportion of total supply/consumption	0.68	E-control market report 2004, p. 65	2003 data on total sales to final customers is latest data available from E-control
two largest suppliers	As above	0.79	As above	As above
three largest suppliers	As above	0.84	As above	As above
Switching	Proportion of eligible customers' gross switching	0.005	EC2004, Annex 1, p.6	2003 data
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	Y	EC2004, Annex 1, p.2	Legal
rTPA at transmission level	Tariffs imposed or approved by independent regulator	Y	EC2003, Table 1, p.13	
Unbundling at distribution level	Legal or ownership separation	Y	EC2004, Annex 1, p.2	Legal
rTPA at distribution level		Y	EC2003, Table 1, p.13	
Competitive access to gas storage	Competitive auctions; rTPA	Y	EU Energy, Issue 97–98, December 17th 2004, p.26	

Danish electricity market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest generator	Proportion of total available capacity	0.39	Danish Competition Authority	Calculations based on the following: Elsam has an installed available capacity of 3.645MW, corresponding to 72% of the total installed available capacity in West Denmark (5.091MW) Energi E2 has an installed available capacity of 3.970MW, corresponding to 76% of the total installed available capacity in East Denmark (5.206MW)
two largest generators	As above	0.74	Danish Competition Authority	As above
three largest generators	As above	0.75	Assumed	
Degree of technical openness of market	Total interconnector capacity as proportion of peak demand	0.5	EC2004, Table 3.2, p.19	
Openness of allocation mechanism to import capacity	rTPA, auction mechanism, long-term contracts	rTPA		
Wholesale market				
Price reporting	Price information publicly available	Y		
Share of total (daily) volume traded covered by price reporting		1		
Standardised contracts		Y		
Downstream market				
I&C				
Degree of supply market opening	Proportion of total customer base in volume terms	1	EC2004, Annex 1, p. 2	

Indicator	Definition	Assessment	Source	Comments
Market share of				
largest supplier	Proportion of total supply/consumption	0.47	Danish Competition Authority	The Danish Competition Authority gave combined values for industrial, commercial and domestic customers
two largest suppliers	As above	0.67	Danish Competition Authority	As above
three largest suppliers	As above	0.77	Danish Competition Authority	As above
Switching	Proportion of eligible customers' gross switching per annum	0.21	Danish Competition Authority	2004 data from the Danish Competition Authority refers to users with annual consumption of more than 100MW; whereas, EC2004 in general refers to users with consumption above 1GW
Domestic				
Degree of supply market opening	Proportion of total customer base in volume terms	1	EC2004, Annex 1, p. 2	
Market share of				
largest supplier	Proportion of total supply/consumption	0.47	Danish Competition Authority	The Danish Competition Authority gave combined values for I&C and domestic customers
two largest suppliers	As above	0.67	Danish Competition Authority	As above
three largest suppliers	As above	0.77	Danish Competition Authority	As above
Switching	Proportion of eligible customers' gross switching per annum	0.01	Danish Competition Authority	2004 data from the Danish Competition Authority refers to users with annual consumption of less than 100MW; whereas, EC2004 in general refers to users with consumption under 1GW
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	Y	EC2004, Annex, p. 2	Legal
rTPA at transmission level	Tariffs imposed or approved by independent regulator	Y	EC2003, Table 1, p. 13	
Unbundling at distribution level	Legal or ownership separation	Y	EC2003, Table 1, p. 4	Legal
rTPA at distribution level		Y	EC2003, Table 1, p. 13	

Danish gas market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest shipper	Proportion of total gas sources by shipper	0.83	Danish Competition Authority	DONG is the largest shipper
two largest shippers	As above	0.87	Assumed	Statoil, Shell, Sydkraft, BEB and E.ON deliver the remaining consumption. The Danish Competition Authority does not have data on their market shares EC2004 states that one firm had market share > 5% in 2001
three largest shippers	As above	0.91	As above	As above
Wholesale market				
Price reporting	Price information publicly available	N	Gastra	
Share of total (daily) volume traded covered by price reporting		0		
Standardised contracts		Y	Gastra	
Downstream market				
I&C				
Degree of supply market opening	Proportion of total customer base in volume terms	1	EC2004, Annex 1, p. 2	
Market share of				
largest supplier	Proportion of total supply/consumption	0.45	Danish Competition Authority	Data refers to medium-sized and large industrial customers
two largest suppliers	As above	0.72	Danish Competition Authority	As above
three largest suppliers	As above	0.9	Danish Competition Authority	As above
Switching	Proportion of eligible customers' gross switching	0.3	Danish Competition Authority	2004 data refers to consumers who consume more than 300,000 cubic metres

Indicator	Definition	Assessment	Source	Comments
Domestic				
Degree of supply market opening	Proportion of total customer base in volume terms	1	EC2004, Annex 1, p. 2	
Market share of				
largest supplier	Proportion of total supply/ consumption	0.55	Danish Competition Authority	Data refers to households
two largest suppliers	As above	0.82	Danish Competition Authority	As above
three largest suppliers	As above	1	Danish Competition Authority	As above
Switching	Proportion of eligible customers' gross switching	0.0024	Danish Competition Authority	2004 data refers to consumers who consume less than 300,000 cubic metres
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	Y	EC2004, Annex 1, p. 2	Ownership
rTPA at transmission level	Tariffs imposed or approved by independent regulator	Y	EC2003, Table 1, p. 13	
Unbundling at distribution level	Legal or ownership separation	Y	EC2004, Annex 1, p. 2	Legal
rTPA at distribution level		Y	EC2003, Table 1 p. 13	
Competitive access to gas storage	Competitive auctions; rTPA	N	EU Energy, Issue 97–98, December 17th 2004, p. 26	Negotiated TPA

Finnish electricity market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest generator	Proportion of total available capacity	0.40	EMV	
two largest generators	As above	0.63	EMV	
three largest generators	As above	0.68	Assumed	
Degree of technical openness of market	Total interconnector capacity as proportion of peak demand	0.14	EC2004, Table 3.2, p. 19	
Openness of allocation mechanism to import capacity	rTPA, auction mechanism, long-term contracts	rTPA		
Wholesale market				
Price reporting	Price information publicly available	Y	Nord Pool	
Share of total (daily) volume traded covered by price reporting		1	As above	
Standardised contracts		Y	As above	
Downstream market				
I&C				
Degree of supply market opening	Proportion of total customer base in volume terms	1	EC2004, Annex 1, p. 2	
Market share of				
largest supplier	Proportion of total supply/consumption	0.12	ES2003, Table 3.2, p. 69	
two largest suppliers	As above	0.23	ES2003 Table 3.2, p. 69	
three largest suppliers	As above	0.30	EC2004, Annex 3, Table 3.5, p. 23	
Switching	Proportion of eligible customers' gross switching per annum	0.16	EC2004, Annex 1, p. 5	2003 data
Domestic				
Degree of supply market opening	Proportion of total customer base in volume terms	1	EC2004, Annex 1, p. 2	

Indicator	Definition	Assessment	Source	Comments
Market share of				
largest supplier	Proportion of total supply/consumption	0.12	ES2003, Table 3.2, p. 69	
two largest suppliers	As above	0.23	ES2003, Table 3.2, p. 69	
three largest suppliers	As above	0.30	EC2004, Annex 3, Table 3.5, p. 23.	
Switching	Proportion of eligible customers' gross switching per annum	0.04	EC2004, Annex 1, p. 5	2003 data
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	Y	EC2004, Annex, p. 2.	Ownership
rTPA at transmission level	Tariffs imposed or approved by independent regulator	Y	EC2003, Table 1, p. 13	
Unbundling at distribution level	Legal or ownership separation	Y	EC2003, Table 1, p. 4	Accounting
rTPA at distribution level		Y	EC2003, Table 1, p. 13	

Finnish gas market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest shipper	Proportion of total gas sources by shipper	1		Result of derogation
two largest shippers	As above	1		As above
three largest shippers	As above	1		As above
Wholesale market				
Price reporting	Price information publicly available	Y		
Share of total (daily) volume traded covered by price reporting		0		
Standardised contracts		N		
Downstream market				
I&C				
Degree of supply market opening	Proportion of total customer base in volume terms	0		Because of the derogation and 0% market opening, the competitiveness indicators of market opening and customer switching = 0
Market share of				
largest supplier	Proportion of total supply/consumption	1		Because of the derogation and 0% market opening, share of supplier/s = 100%
two largest suppliers	As above	1		
three largest suppliers	As above	1		
Switching	Proportion of eligible customers' gross switching	0		
Domestic				
Degree of supply market opening	Proportion of total customer base in volume terms	0		

Indicator	Definition	Assessment	Source	Comments
Market share of				
largest supplier	Proportion of total supply/consumption	1		
two largest suppliers	As above	1		
three largest suppliers	As above	1		
Switching	Proportion of eligible customers' gross switching	0		
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	N		
rTPA at transmission level	Tariffs imposed or approved by independent regulator	N		
Unbundling at distribution level	Legal or ownership separation	N		
rTPA at distribution level		N		
Competitive access to gas storage	Competitive auctions; rTPA	Y	EU Energy, December 19th 2003	

Italian electricity market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest generator	Proportion of total available capacity	0.55	EC2004, Table 3.3, p. 20	
two largest generators	As above	0.65	Assumed	Assumed equal market shares for second and third largest generators
three largest generators	As above	0.75	EC2004, Table 3.3, p. 20	
Degree of technical openness of market	Total interconnector capacity as proportion of peak demand	0.14	EC2004, Table 3.2, p. 19	
Openness of allocation mechanism to import capacity	rTPA, auction mechanism, long-term contracts	Auction		
Wholesale market				
Price reporting	Price information publicly available	Y	GME	
Share of total (daily) volume traded covered by price reporting		0.30	GME	
Standardised contracts		N	GME	
Downstream market				
I&C				
Degree of supply market opening	Proportion of total customer base in volume terms	1	EC2004, Annex 1, p. 2	
Market share of				
largest supplier	Proportion of total supply/consumption	0.12	Assumed	Six firms with market share > 5%
two largest suppliers	As above	0.23	As above	As above
three largest suppliers	As above	0.35	EC2004, Annex 3, Table 3.5, p. 23	

Indicator	Definition	Assessment	Source	Comments
Switching	Proportion of eligible customers' gross switching per annum	0.15	EC2004, Annex 1, p. 5	0.15 is the value of switching since liberalisation, given in EC2004. As no values have been given in previous benchmarking reports, 0.15 is taken as the relevant switching rate
Domestic				
Degree of supply market opening	Proportion of total customer base in volume terms	1	EC2004, Annex 1, p. 2	
Market share of				
largest supplier	Proportion of total supply/consumption	0.12	Assumed	Six firms with market share > 5%
two largest suppliers	As above	0.23	As above	As above
three largest suppliers	As above	0.35	EC2004, Annex 3, Table 3.5, p. 23	
Switching	Proportion of eligible customers' gross switching per annum	0	EC2004, Annex 1, p. 5	
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	Y	EC2004, Annex, p. 2	Ownership
rTPA at transmission level	Tariffs imposed or approved by independent regulator	Y	EC2003, Table 1, p. 13	
Unbundling at distribution level	Legal or ownership separation	Y	EC2003, Table 1, p. 4	Legal
rTPA at distribution level		Y	EC2003, Table 1, p. 13	

Italian gas market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest shipper	Proportion of total gas sources by shipper	0.68	EC2004, Annex 5, Table 5.1, p. 33	
two largest shippers	As above	0.73	Assumed	Three firms with market share > 5%
three largest shippers	As above	0.78	As above	As above
Wholesale market				
Price reporting	Price information publicly available	N		
Share of total (daily) volume traded covered by price reporting		0		
Standardised contracts		N		
Downstream market				
I&C				
Degree of supply market opening	Proportion of total customer base in volume terms	1	EC2004, Annex 1, p. 2	
Market share of				
largest supplier	Proportion of total supply/consumption	0.3913	ENI Factbook 2004, p. 49	
two largest suppliers	As above	0.5107	Assumed	
three largest suppliers	As above	0.63	EC2004, Annex 5, Table 5.2, p. 35	
Switching	Proportion of eligible customers' gross switching	0.10	EC2003, Table 4, p. 9	The data refers to switching in 2002. EC2004 did not contain switching data for 2003 or 2004
Domestic				
Degree of supply market opening	Proportion of total customer base in volume terms	1	EC2004, Annex 1, p. 2	

Indicator	Definition	Assessment	Source	Comments
Market share of				
largest supplier	Proportion of total supply/consumption	0.3913	ENI Factbook 2004, p. 49	
two largest suppliers	As above	0.5107	Assumed	As above
three largest suppliers	As above	0.63	EC2004, Annex 5, Table 5.2, p. 35	
Switching	Proportion of eligible customers' gross switching	0.35	EC2004, Annex 1, p. 6	2003 data
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	Y	EC2004, Annex 1, p. 2	Legal
rTPA at transmission level	Tariffs imposed or approved by independent regulator	Y	EC2003, Table 1, p. 13	
Unbundling at distribution level	Legal or ownership separation	Y	EC2004, Annex 1, p. 2	Legal
rTPA at distribution level		Y	EC2003, Table 1	
Competitive access to gas storage	Competitive auctions; rTPA	Y	EU Energy, Issue 97–98, December 17th 2004, p. 26	

Spanish electricity market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest generator	Proportion of total available capacity	0.40	EC2004, Table 3.3, p. 20	
two largest generators	As above	0.60	Assumed	
three largest generators	As above	0.80	EC2004, Table 3.3, p. 20	
Degree of technical openness of market	Total interconnector capacity as proportion of peak demand	0.04	EC2004, Table 3.2, p. 19	
Openness of allocation mechanism to import capacity	rTPA, auction mechanism, long-term contracts	Auction		
Wholesale market				
Price reporting	Price information publicly available	Y		
Share of total (daily) volume traded covered by price reporting		1		
Standardised contracts		Y		
Downstream market				
I&C				
Degree of supply market opening	Proportion of total customer base in volume terms	1	EC2004, Annex 1, p. 2	
Market share of				
largest supplier	Proportion of total supply/consumption	0.42	Endesa annual report 2004, p. 96	2004 data for sales to all consumers
two largest suppliers	As above	0.791	CNE (2004), 'Electricity Consumption in the Spanish Mainland Market in 2003', p. 40	2003 data on sales to all consumers is the latest data available from the regulator
three largest suppliers	As above	0.880	CNE (2004), 'Electricity Consumption in the Spanish Mainland Market in 2003', p. 40	As above
Switching	Proportion of eligible customers' gross switching per annum	0.05	EC2004, Annex 1, p. 5	2003 data

Indicator	Definition	Assessment	Source	Comments
Domestic				
Degree of supply market opening	Proportion of total customer base in volume terms	1	EC2004, Annex 1, p. 2	
Market share of				
largest supplier	Proportion of total supply/consumption	0.42	Endesa annual report 2004, p. 96.	2004 data for sales to all consumers
two largest suppliers	As above	0.791	CNE (2004), 'Electricity Consumption in the Spanish Mainland Market in 2003', p. 40	2003 data on sales to all consumers is the latest data available from the regulator
three largest suppliers	As above	0.880	CNE (2004), 'Electricity Consumption in the Spanish Mainland Market in 2003', p. 40	As above
Switching	Proportion of eligible customers' gross switching per annum	0	EC2004, Annex 1, p. 5	
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	Y	EC2004, Annex , p. 2	Ownership
rTPA at transmission level	Tariffs imposed or approved by independent regulator	Y	EC2003, Table 1, p. 13	
Unbundling at distribution level	Legal or ownership separation	Y	EC2003, Table 1, p. 4	Legal
rTPA at distribution level		Y	EC2003, Table 1, p. 13	

Spanish gas market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest shipper	Proportion of total gas sources by shipper	0.40	EC2004, Annex 5, Table 5.1, p. 33	
two largest shippers	As above	0.55	Assumed	Four companies with market share > 5%
three largest shippers	As above	0.70	Assumed	As above
Wholesale market				
Price reporting	Price information publicly available	Y	Gas release programme	
Share of total (daily) volume traded covered by price reporting		0.20		
Standardised contracts		Y		
Downstream market				
I&C				
Degree of supply market opening	Proportion of total customer base in volume terms	1	EC2004, Annex 1, p. 2.	
Market share of				
largest supplier	Proportion of total supply/consumption	0.64	2004 regulatory report	2002 data
two largest suppliers	As above	0.76	2004 regulatory report	2002 data
three largest suppliers	As above	0.8	EC2004, Annex 5, Table 5.2, p. 35	
Switching	Proportion of eligible customers' gross switching	0.22	EC2004, Annex 1, p. 6	2003 data
Domestic				
Degree of supply market opening	Proportion of total customer base in volume terms	1	EC2004, Annex 1, p. 2	

Indicator	Definition	Assessment	Source	Comments
Market share of				
largest supplier	Proportion of total supply/consumption	0.65	Assumed.	Assumed proportions of market shares of three largest companies remain the same as in 2003
two largest suppliers	As above	0.78	As above	As above
three largest suppliers	As above	0.8	EC2004, Annex 5, Table 5.2, p. 35	
Switching	Proportion of eligible customers' gross switching	0.05	EC2004, Annex 1, p. 6	2003 data
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	Y	EC2004, Annex 1, p. 2	Legal
rTPA at transmission level	Tariffs imposed or approved by independent regulator	Y	EC2003, Table 1, p. 13	
Unbundling at distribution level	Legal or ownership separation	Y	EC2004, Annex 1, p. 2	Legal
rTPA at distribution level		Y	EC2003, Table 1, p. 13	
Competitive access to gas storage	Competitive auctions; rTPA	Y	EU Energy, Issue 97–98, December 17th 2004, p. 26	

Swedish electricity market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest generator	Proportion of total available capacity	0.47	STEM (2004), 'Energy Market 2004', p. 19	
two largest generators	As above	0.69	As above	
three largest generators	As above	0.875	As above	
Degree of technical openness of market	Total interconnector capacity as proportion of peak demand	0.29	EC2004, Table 3.2, p. 19	
Openness of allocation mechanism to import capacity	rTPA, auction mechanism, long-term contracts	rTPA		
Wholesale market				
Price reporting	Price information publicly available	Y	Nord Pool	
Share of total (daily) volume traded covered by price reporting		1	As above	
Standardised contracts		Y	As above	
Downstream market				
I&C				
Degree of supply market opening	Proportion of total customer base in volume terms	1	EC2004, Annex 1, p. 2	
Market share of				
largest supplier	Proportion of total supply/consumption	0.23	Assumed	Four firms with market share > 5%
two largest suppliers	As above	0.47	Assumed	As above
three largest suppliers	As above	0.70	EC2004, Annex 3, Table 3.5, p. 23	
Switching	Proportion of eligible customers' gross switching per annum	0.05	EC2004, Annex 1, p. 5	2003 data

Indicator	Definition	Assessment	Source	Comments
Domestic				
Degree of supply market opening	Proportion of total customer base in volume terms	1	EC2004, Annex 1, p. 2	
Market share of				
largest supplier	Proportion of total supply/consumption	0.23	Assumed.	Four firms with market share > 5%
two largest suppliers	As above	0.47	Assumed.	As above
three largest suppliers	As above	0.70	EC2004, Annex 3, Table 3.5, p. 23	
Switching	Proportion of eligible customers' gross switching per annum	0.10	EC2004, Annex 1, p. 6	2003 data
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	Y	EC2004, Annex , p. 2	Ownership
rTPA at transmission level	Tariffs imposed or approved by independent regulator	Y	EC2003, Table 1, p. 13	
Unbundling at distribution level	Legal or ownership separation	Y	EC2003, Table 1, p. 4	Legal
rTPA at distribution level		Y	EC2003, Table 1, p. 13	

Swedish gas market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest shipper	Proportion of total gas sources by shipper	0.97	EC2004, Annex 5, Table 5.1, p. 33	
two largest shippers	As above	0.98	Assumed	
three largest shippers	As above	0.99	Assumed	
Wholesale market				
Price reporting	Price information publicly available	N		
Share of total (daily) volume traded covered by price reporting		0		
Standardised contracts		N		
Downstream market				
I&C				
Degree of supply market opening	Proportion of total customer base in volume terms	0.5	EC2004, Annex 1, p. 2	
Market share of				
largest supplier	Proportion of total supply/consumption	0.55	EC2003, Table 14, p. 33	
two largest suppliers	As above	0.67	Assumed	Five firms with market share > 5%
three largest suppliers	As above	0.79	EC2004, Annex 5, Table 5.2, p. 35	
Switching	Proportion of eligible customers' gross switching	0	EC2003, Table 4, p. 9	EC2004 states switching value as not known
Domestic				
Degree of supply market opening	Proportion of total customer base in volume terms	0.5	EC2004, Annex 1, p. 2	

Indicator	Definition	Assessment	Source	Comments
Market share of				
largest supplier	Proportion of total supply/consumption	0.55	EC2003, Table 14, p. 33	
two largest suppliers	As above	0.67	Assumed	Five firms with market share > 5%
three largest suppliers	As above	0.79	EC2004, Annex 5, Table 5.2, p. 35	
Switching	Proportion of eligible customers' gross switching	0	EC2004, Annex 1, p. 6	
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	Y	EC2004, Annex 1, p. 2	Accounting
rTPA at transmission level	Tariffs imposed or approved by independent regulator	Y	EC2003, Table 1, p. 13	
Unbundling at distribution level	Legal or ownership separation	Y	EC2004, Annex 1, p. 2	Accounting
rTPA at distribution level		Y	EC2003, Table 1, p. 13	
Competitive access to gas storage	Competitive auctions; rTPA	Y	EU Energy, Issue 97–98, December 17th 2004, p. 26	

UK electricity market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest generator	Proportion of total available capacity	0.16	Digest of UK Energy Statistics 2004, Table 5.11	
two largest generators	As above	0.28	As above	
three largest generators	As above	0.39	As above	
Degree of technical openness of market	Total interconnector capacity as proportion of peak demand	0.03	EC2004, Table 3.2, p. 19	
Openness of allocation mechanism to import capacity	rTPA, auction mechanism, long-term contracts	Auction		
Wholesale market				
Price reporting	Price information publicly available	Y		
Share of total (daily) volume traded covered by price reporting		1		
Standardised contracts		Y		
Downstream market				
I&C				
Degree of supply market opening	Proportion of total customer base in volume terms	1	EC2004, Annex 1, p. 2	
Market share of				
largest supplier	Proportion of total supply/consumption	Market concentration = 0.32	DTI	Market share not available due to confidentiality
two largest suppliers	As above	As above	DTI	As above
three largest suppliers	As above	As above	DTI	As above
Switching	Proportion of eligible customers' gross switching per annum	0.15	EC2003, Table 4, p. 9	As EC2004 states not known, 2002 data from EC2003 is used
Domestic				

Indicator	Definition	Assessment	Source	Comments
Degree of supply market opening	Proportion of total customer base in volume terms	1	EC2004, Annex 1, p. 2	
Market share of				
largest supplier	Proportion of total supply/consumption	Market concentration = 0.41	DTI	Market share not available due to confidentiality
two largest suppliers	As above	As above	DTI	As above
three largest suppliers	As above	As above	DTI	As above
Switching	Proportion of eligible customers' gross switching per annum	0.22	EC2004, Annex 1, p. 5	2003 data
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	Y	EC2004, Annex , p. 2	Ownership
rTPA at transmission level	Tariffs imposed or approved by independent regulator	Y	EC2003, Table 1, p. 13	
Unbundling at distribution level	Legal or ownership separation	Y	EC2003, Table 1, p. 4	Legal
rTPA at distribution level		Y	EC2003, Table 1, p. 13	

UK gas market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest shipper	Proportion of total gas sources by shipper	0.25	EC2004, Annex 5, Table 5.1, p. 33	
two largest shippers	As above	0.45	Assumed	Five companies with > 5% market share
three largest shippers	As above	0.60	Assumed	
Wholesale market				
Price reporting	Price information publicly available	Y		
Share of total (daily) volume traded covered by price reporting		1		
Standardised contracts		Y		
Downstream market				
I&C				
Degree of supply market opening	Proportion of total customer base in volume terms	1	EC2004, Annex 1, p. 2.	
Market share of				
largest supplier	Proportion of total supply/consumption	Market concentration = 0.48	DTI	Market share not available due to confidentiality
two largest suppliers	As above	As above	DTI	As above
three largest suppliers	As above	As above	DTI	As above
Switching	Proportion of eligible customers' gross switching	0.19	EC2004, Annex 1, p. 6	2003 data
Domestic				
Degree of supply market opening	Proportion of total customer base in volume terms	1	EC2004, Annex 1, p. 2	

Indicator	Definition	Assessment	Source	Comments
Market share of				
largest supplier	Proportion of total supply/consumption	Market concentration = 0.69	DTI	Market share not available due to confidentiality
two largest suppliers	As above	As above	DTI	As above
three largest suppliers	As above	As above	DTI	As above
Switching	Proportion of eligible customers' gross switching	0.13	EC2004, Annex 1, p. 6	2003 data
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	Y	EC2004, Annex 1, p. 2	Ownership
rTPA at transmission level	Tariffs imposed or approved by independent regulator	Y	EC2003, Table 1, p. 13	
Unbundling at distribution level	Legal or ownership separation	Y	EC2004, Annex 1, p. 2	Ownership
rTPA at distribution level		Y	EC2003, Table 1, p. 13	
Competitive access to gas storage	Competitive auctions; rTPA	Y	*EU Energy*, Issue 97–98, December 17th 2004, p. 26	

Dutch electricity market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest generator	Proportion of total available capacity	0.25	EC2004, Table 3.3, p. 20	
two largest generators	As above	0.45	Assumed	
three largest generators	As above	0.65	EC2004, Table 3.3, p. 20	
Degree of technical openness of market	Total interconnector capacity as proportion of peak demand	0.03	EC2004, Table 3.2, p. 19	
Openness of allocation mechanism to import capacity	rTPA, auction mechanism, long-term contracts	Auction	EC2002, Appendix 5, p. 34	
Wholesale market				
Price reporting	Price information publicly available	Y	APX	
Share of total (daily) volume traded covered by price reporting		0.15	As above	
Standardised contracts		Y	As above	
Downstream market				
I&C				
Degree of supply market opening	Proportion of total customer base in volume terms	1	EC2004, Annex 1, p. 2	
Market share of				
largest supplier	Proportion of total supply/consumption	0.293	Assumed	
two largest suppliers	As above	0.586	As above	
three largest suppliers	As above	0.88	EC2004, Annex 3, Table 3.5, p. 23	
Switching	Proportion of eligible customers' gross switching per annum	0.05	NMa and DTe annual report 2004, p. 104	
Domestic				
Degree of supply market opening	Proportion of total customer base in volume terms	1	EC2004, Annex 1, p. 2	

Indicator	Definition	Assessment	Source	Comments
Market share of				
largest supplier	Proportion of total supply/consumption	0.293	Assumed	Three companies with market share > 5%
two largest suppliers	As above	0.586	As above	As above
three largest suppliers	As above	0.88	EC2004, Annex 3, Table 3.5, p. 23	
Switching	Proportion of eligible customers' gross switching per annum	0.05	NMa and DTe annual report 2004, p. 104	
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	Y	EC2004, Annex, p. 2	Ownership
rTPA at transmission level	Tariffs imposed or approved by independent regulator	Y	EC2003, Table 1, p. 13	
Unbundling at distribution level	Legal or ownership separation	Y	EC2003, Table 1, p. 4	Legal
rTPA at distribution level		Y	EC2003, Table 1, p. 13	

Dutch gas market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest shipper	Proportion of total gas sources by shipper	0.60	EC2004, Annex 5, Table 5.1, p. 33	
two largest shippers	As above	0.64	Assumed	One firm with market share > 5%
three largest shippers	As above	0.68	Assumed	
Wholesale market				
Price reporting	Price information publicly available	N	No gas exchange existed in 2004	
Share of total (daily) volume traded covered by price reporting		0	As above	
Standardised contracts		N		
Downstream market				
I&C				
Degree of supply market opening	Proportion of total customer base in volume terms	1	EC2004, Annex 1, p. 2	
Market share of				
largest supplier	Proportion of total supply/consumption	0.25	Assumed	Six firms with market share > 5%
two largest suppliers	As above	0.50	As above	As above
three largest suppliers	As above	0.75	EC2003, Table 14, p. 33	
Switching	Proportion of eligible customers' gross switching	0.03	NMa and DTe, Annual Report 2004, p. 104	
Domestic				
Degree of supply market opening	Proportion of total customer base in volume terms	1	EC2004, Annex 1, p. 2	

Indicator	Definition	Assessment	Source	Comments
Market share of				
largest supplier	Proportion of total supply/consumption	0.29	Assumed	Three firms with market share > 5%
two largest suppliers	As above	0.58	As above	
three largest suppliers	As above	0.87	EC2004, Annex 5, Table 5.2, p. 35	
Switching	Proportion of eligible customers' gross switching	0.03	NMa and DTe, annual report 2004, p. 104	
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	Y	EC2004, Annex 1, p. 2	Legal
rTPA at transmission level	Tariffs imposed or approved by independent regulator	N	IEA, 'Energy Policies of the Netherlands'	rTPA at regional level and nTPA at national level
Unbundling at distribution level	Legal or ownership separation	Y	EC2004, Annex 1, p. 2	Legal
rTPA at distribution level		Y	IEA (2004), 'Energy Policies of the Netherlands'	
Competitive access to gas storage	Competitive auctions; rTPA	N	*EU Energy*, Issue 97–98, December 17th 2004, p. 26	

Portuguese electricity market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				
Market share of				
largest generator	Proportion of total available capacity	0.65	EC2004, Table 3.3, p. 20	
two largest generators	As above	0.725	Assumed	
three largest generators	As above	0.8	EC2004, Table 3.3, p. 20	
Degree of technical openness of market	Total interconnector capacity as proportion of peak demand	0.08	EC2004, Table 3.2, p. 19	
Openness of allocation mechanism to import capacity	rTPA, auction mechanism, long-term contracts	pro rata	EC2002, Appendix 5, p. 34	
Wholesale market				
Price reporting	Price information publicly available	N		Full implementation of the Single Iberian Electricity Market would change the wholesale market indicators
Share of total (daily) volume traded covered by price reporting		0		
Standardised contracts		N		
Downstream market				
I&C				
Degree of supply market opening	Proportion of total customer base in volume terms	1	EC2004, Annex 1, p. 2	
Market share of				
largest supplier	Proportion of total supply/consumption	0.33	Assumed	Three firms with market share > 5%
two largest suppliers	As above	0.33	As above	As above
three largest suppliers	As above	0.99	EC2004, Annex 3, Table 3.5, p. 23	
Switching	Proportion of eligible customers' gross switching per annum	0.07	EC2004, Annex 1, p. 5	2003 data

Indicator	Definition	Assessment	Source	Comments
Domestic				
Degree of supply market opening	Proportion of total customer base in volume terms	1	EC2004, Annex 1, p. 2	
Market share of				
largest supplier	Proportion of total supply/consumption	0.33	Assumed	Three firms with market share > 5%
two largest suppliers	As above	0.33	As above	As above
three largest suppliers	As above	0.99	EC2004, Annex 3, Table 3.5, p. 23	
Switching	Proportion of eligible customers' gross switching per annum	0.01	EC2004, Annex 1, p. 5	2003 data
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	Y	EC2004, Annex , p. 2	Ownership
rTPA at transmission level	Tariffs imposed or approved by independent regulator	Y	EC2003, Table 1, p. 13	
Unbundling at distribution level	Legal or ownership separation	Y	EC2003, Table 1, p. 4	Accounting
rTPA at distribution level		Y	EC2003, Table 1, p. 13	

Portuguese gas market data

Indicator	Definition	Assessment	Source	Comments
Upstream market				Information not available due to derogation from the European Commission's Second Gas Directive
Market share of				
largest shipper	Proportion of total gas sources by shipper	1		
two largest shippers	As above	1		
three largest shippers	As above	1		
Wholesale market				
Price reporting	Price information publicly available	N		
Share of total (daily) volume traded covered by price reporting		0		
Standardised contracts		N		
Downstream market				
I&C				
Degree of supply market opening	Proportion of total customer base in volume terms	0		
Market share of				
largest supplier	Proportion of total supply/consumption	1		
two largest suppliers	As above	1		
three largest suppliers	As above	1		
Switching	Proportion of eligible customers' gross switching	0		
Domestic				
Degree of supply market opening	Proportion of total customer base in volume terms	0		

Indicator	Definition	Assessment	Source	Comments
Market share of				
largest supplier	Proportion of total supply/consumption	1		
two largest suppliers	As above	1		
three largest suppliers	As above	1		
Switching	Proportion of eligible customers' gross switching	0		
Network-related activities				
Unbundling at transmission level	Legal or ownership separation	N		
rTPA at transmission level	Tariffs imposed or approved by independent regulator	N		
Unbundling at distribution level	Legal or ownership separation	N		
rTPA at distribution level		N		
Competitive access to gas storage	Competitive auctions; rTPA	N	*EU Energy*, Issue 97–98, December 17th 2004, p. 27	

Appendix 2 Detailed calculation of the US comparator

A2.1 Construction of a single US electricity composite

A2.1.1 Methodology

Tables A2.1 and A2.2 list the US states separated into two groups: those that pass the filters and those that do not, with the states sorted according to market size defined in terms of electricity retail sales. The market size data used has been determined by data availability and consistency between the 28 countries included in the PSA target—market size data for the USA, Canada and the EU Member States is needed for the creation of the composites. For reasons of concise presentation, only the ten largest states that do not pass the filters are presented in Table A2.2.

Tables A2.1 and A2.2 show that the states that pass the filters together account for 31.9% of the total US electricity market.

California does not appear in the list of states considered among the most competitive electricity markets because of the measures imposed following the crisis in 2001, which led to the suspension of full retail market opening in September 2001.

Table A2.1 US states passing the filters for electricity markets, ranked by size

US state	100% open	Separation at transmission level[1]	rTPA[2]	Market size (2004) Total retail sales (GWh)
Ohio	Y	Y	Y	154,525
New York	Y	Y	Y	144,543
Pennsylvania	Y	Y	Y	143,165
Illinois	Y	Y	Y	128,787
Michigan	Y	Y	Y	106,115
Virginia	Y	Y	Y	105,021
New Jersey	Y	Y	Y	77,292
Maryland	Y	Y	Y	66,556
Arizona	Y	Y	Y	65,569
Massachusetts	Y	Y	Y	55,341
Connecticut	Y	Y	Y	31,865
Maine	Y	Y	Y	11,949
Delaware	Y	Y	Y	11,598
District Of Columbia	Y	Y	Y	11,415
New Hampshire	Y	Y	Y	10,949
Rhode Island	Y	Y	Y	7,884
Total (competitive states)				**1,132,572**
Total US electricity market				**3,550,512**
% of competitive US electricity market				**31.9**

Notes: [1] FERC Order 888 (1996) requires all public utilities that own, control, or operate facilities used for transmitting electricity in interstate commerce to separate transmission from generation and marketing functions and communications. [2] FERC regulates wholesale electricity rates and services for wholesale transactions. According to Energy Information Administration calculations in 2000, FERC had, at that time, jurisdiction over around 73% of the electricity transmission system in the USA. The remainder was federally owned, municipally owned or owned by cooperative utilities outside of FERC's jurisdiction. Distribution rates are set by the state public utility commissions. In December 1999 FERC issued Order 2000 calling for the creation of regional transmission organizations (RTOs), independent entities that would control and operate the transmission grid, free of any discriminatory practices.
Sources: US Department of Energy: Energy Information Administration, and Federal Energy Management Program.

Table A2.2 US states not passing the filters for electricity, ranked by size (10 largest states only)

US state	Market size (2004) Total retail sales (GWh)
Texas[1]	331,871
California[2]	254,169
Florida	219,289
Georgia	129,201
North Carolina	126,178
Indiana	102,549
Tennessee	100,051
Alabama	86,837
Kentucky	86,533
Washington	82,558
Total (non-competitive states)	**2,417,940**
Total US electricity market	**3,550,512**
% of non-competitive US electricity market	**68.1**

Note: [1] On January 1st 2004 competitive metering was launched for industrial and non-residential commercial customers with a peak demand greater than 200 KW. However, Southeast Texas has been unable to deregulate its electricity markets because its major provider, Entergy, serves a utility grid in the southern states. As of December 2004, no solution had been found. [2] The Californian electricity market had full retail access from March 31st 1998 until its suspension in September 2001.
Source: Market size data compiled from the state profiles on the Energy Information Administration website.

If the critical mass for the single US composite in electricity is defined as similar to the largest EU market then it is the German market which provides the indication for the size of the US composite: the total size of the German electricity market is 557.9TWh (electricity supplied in 2004).[40]

Given this indication of the critical size for the US composite, states must have an aggregate market size of at least 177.4TWh (557.9 × 0.318) to pass the filters. Taking the largest state from Table A2.1 first, Ohio, gives a market size of 154.5TWh. Thus, the comparator needs to be scaled up to maintain the ratio 32:68 between competitive and non-competitive states.

After proportional adjustment, the threshold for the uncompetitive states becomes 328.31TWh (ie, 154.5 × (0.68/0.32)). Adding California and Missouri (combined total of 329.46TWh) gives a total market indicator with 154.5TWh competitive and 329.46TWh non-competitive market volumes—ie, a broad ratio of 32:68.

In summary, the composite indicator for the US electricity market would take into account the markets of Ohio, California and Missouri.

A2.1.2 Aggregation of sub-markets

In view of the initial analysis above, the representative US electricity market composite is constructed on the basis of a proportional mix of liberalised and non-liberalised US states, and takes into account the markets of Ohio, Missouri and California. The filter information on

[40] Eurostat (2005), 'Electricity Statistics', 5/2005.

these three states is summarised in Table A2.3, together with market size information used as weights for the aggregation of the composite.

Table A2.3 Construction of US electricity market comparator

US electricity market	Degree of market opening (%)	Market size (2004) Total retail sales (GWh)	Relative market size in composite (%)
Ohio	100.0	154,525	31.9
Missouri	0.0	75,297	15.6
California	None (suspended)	254,169	52.5
Total market size of composite	**–**	**483,991**	**100.0**
Composite US electricity market comparator	**31.9**		**–**

Source: Energy Information Administration and Oxera calculations.

Using market size as weights, it is possible to construct a theoretical US electricity market comparator with a 31.9% degree of market opening and passing the filters of transmission unbundling and rTPA.

A2.2 Construction of a single US gas composite

5.3.1

A2.2.1 Methodology

Tables A2.4 and A2.5 separate the US gas markets into those that pass the filters and those that do not. As for the electricity markets, the states in both groups are sorted according to market size (defined in terms of gas consumption). Again, only the largest states that do not pass the filters are presented in Table A2.4. Tables A2.4 and A2.5 show that the group of states that pass the filters account for 19.9% of the total US gas market, leading to a ratio of 20:80 of competitive versus non-competitive market parts for US gas.

Table A2.4 US states passing the filters for gas market, ranked by size

US state	100% open	Separation at transmission level	rTPA	Market size (2004) Delivered to residential and commercial customers (BCF)
New York	Y	Y	Y	639
New Jersey	Y	Y	Y	397
Pennsylvania	Y	Y	Y	389
New Mexico	Y	Y	Y	60
West Virginia	Y	Y	Y	56*
District of Columbia	Y	Y	Y	32
Total (competitive states)				**1,573**
Total US gas market				**7,867**
% of competitive US gas market				**19.9**

Note: * = 2003 figure. BCF, billion cubic feet.
Source: Energy Information Administration.

Table A2.5 US states not passing the filters, ranked by size (10 largest states only)

US state	Market size (2004) Delivered to residential and commercial customers (BCF)
California	739
Illinois	650
Michigan	535
Ohio	491
Texas	425*
Indiana	234
Minnesota	229
Wisconsin	217
Massachusetts	186*
Georgia	182
Total (non-competitive states)	**6,358**
Total US gas market	**7,867**
% of non-competitive US gas market	**80.81**

Note: * = 2003 figure
Source: Energy Information Administration.

If the critical mass for the US composite in gas is defined as equal to the largest EU gas market, the UK provides the indication for the size of the composite. The size of the UK gas market is 3,640BCF (gas consumption in 2004).[41]

Therefore, the composite indicator requires states with an aggregate market size of 724BCF (3,640 × 0.199) to have passed the filters. Taking three of the states from Table A2.4, New York, New Mexico and District of Columbia gives a combined volume of 731BCF, which is within the 5% buffer zone defined in the methodology. The comparator size needs to scaled down only slightly to maintain the ratio 20:80 between competitive and non-competitive states.

After proportional adjustment, the threshold for the non-competitive states becomes 2,924BCF (ie, 731 × (0.8/0.2)). Adding California, Illinois, Michigan, Ohio, Texas and Utah (2,932BCF) gives a total market indicator, with 724BCF competitive and 2,932BCF non-competitive market volumes (ie, a ratio of 20:80).

Thus, the composite indicator for the US gas market will take into account the markets of New York, New Mexico, District of Columbia, California, Illinois, Michigan, Ohio, Texas and Utah.

5.3.2 A2.2.2 Aggregation of sub-markets

The composite US gas market comparator is constructed on the basis of the pertinent states. The filter information on these nine states is summarised in Table A2.6 below, together with the market size information used to create the weighted composite.

[41] Eurogas (2005), 'Natural Gas Consumption Increased Further In 2004', press release, February 18th. Conversion from petajoule into BCF undertaken with a conversion factor of 1 Petajoule = 0.95BCF.

Table A2.6 Construction of US gas market comparator

US gas market	Degree of market opening (%)	Market size (2004) Consumption (BCF)	Relative market size in composite (%)
New York	100	639	17
New Mexico	100	60	2
District of Columbia	100	32	1
California	100[1]	739	20
Illinois	56.3	650	18
Michigan	91.9	535	15
Ohio	91.1	491	13
Texas	None	425	12
Utah	None	92	3
Total market size of composite	**–**	**3,663**	**100**
Composite US gas market comparator	**75**	**–**	**–**

Note: [1] implementation phase.
Source: Energy Information Administration and Oxera calculations.

Using market size as weights, the resulting theoretical US gas market comparator displays 75% degree of market opening and passes the filters of transmission unbundling and rTPA.

Appendix 3 Detailed calculation of the Canada comparator

A3.1 Construction of a single Canadian electricity composite

5.3.3 **A3.1.1 Methodology**

As at 2004, only Alberta and Ontario had deregulated their electricity markets (in January 2001 for Alberta and May 2002 for Ontario). None of the other Canadian provinces has taken any definitive steps toward deregulating their electricity markets and instead are approaching deregulation from a 'wait-and-see' perspective.

Tables A3.1 and A3.2 list the Canadian provinces separated into two groups: those that pass the filters for electricity and those that do not, sorted according to market size defined in terms of electricity retail sales. The tables show that the ratio between competitive and non-competitive provinces is 37:63.

Table A3.1 Canadian provinces passing the filters for electricity markets, ranked by size

Canadian province	100% open	Separation at transmission level	RTPA	Market size (2004) Electricity generation (GWh)
Ontario	Y	Y	Y	154,860
Alberta	Y	Y	Y	55,669
Total (competitive provinces)	–	–	–	210,529
Total Canadian electricity market	**–**	**–**	**–**	**567,687**
% of competitive Canadian electricity market	**–**	**–**	**–**	**37.167**

Source: Energy Statistics Handbook, Statistics Canada.

Table A3.2 Canadian provinces not passing the filters for electricity, ranked by size

Canadian province	Market size (2004) Electricity generation (GWh)
Quebec	174,572.0
British Columbia	60,596.0
Newfoundland and Labrador	41,531.0
Manitoba	27,703.0
New Brunswick	20,798.0
Saskatchewan	18,206.0
Nova Scotia	12,564.0
Northwestern Territories	677.0
Yukon	329.0
Nunavut	139.0
Prince Edward Island	43.0
Total (non-competitive provinces)	**357,158.0**
Total Canadian electricity market	**567,687.0**
% of non-competitive Canadian electricity market	**62.9**

Source: Statistics Canada.

To define the critical mass, C, for the Canadian market, a market size is chosen reflecting the relative proportions of the US and Canadian markets. The reason for not adopting a market size based on an EU market—as was done for the US case described above—is that the Canadian market is relatively small, and a large EU market would represent a large proportion, if not all, of the Canadian energy market.

The total size of the Canadian electricity market of around 567TWh represents 15.9% of the total US electricity market size of 3,550TWh. Considering that the US electricity composite had a size of 1,132TWh, the Canadian electricity composite should be scaled at 180TWh (1,132 × 0.159).

Given this indication of the critical size for the Canadian composite, the latter requires provinces with an aggregate market size of 66.6TWh (180 × 0.37) to have passed the filters. Taking the largest state from Table A3.1first, Ontario, gives a volume of approximately 154.8TWh, and thus the comparator needs to be scaled up significantly to maintain the ratio of 37:63 between competitive and non-competitive Canadian provinces.

After proportional adjustment, the threshold for the non-competitive provinces becomes 263.5TWh (ie, 154.8 × (0.63/0.37)). Adding Quebec, British Columbia and Manitoba (total: 262.8TWh) gives a total market indicator, with 154.8TWh competitive and 262.8TWh non-competitive market volumes—ie, a ratio of 37:63.

The composite indicator for the Canadian electricity market should therefore take into account the four markets of Ontario, Quebec, Manitoba and British Columbia.

5.3.4 A3.1.2 Aggregation of sub-markets

The composite Canadian electricity market comparator is constructed on the basis of the provincial markets of Ontario, Quebec, British Columbia and Manitoba. The filter information on these four states is summarised in Table A3.3

Table A3.3 Construction of Canadian electricity market comparator

Canadian electricity market	Degree of market opening (%)	Market size (2004) Electricity generated (GWh)	Relative market size in composite (%)
Ontario	100	154,860	37.1
Quebec	None (wholesale access only)	174,572	41.8
British Columbia	Approx. 101	60,596	14.5
Manitoba	Wholesale open access only	27,703	6.6
Total market size of composite	**–**	**417,731**	**–**
Composite Canadian electricity market comparator	**41.25**	**–**	**–**

Notes: [1] Retail access is currently available only to the large industrial customers of Aquila Networks.
Source: Statistics Canada and Oxera calculations.

The theoretical Canadian electricity market composite has a calculated degree of market opening of 41.25%.

A3.2 Construction of a single Canadian gas composite

A3.2.1 Methodology

Third-party access is allowed to the distribution grids and some large industrial customers and power generators can buy gas directly from producers. Some smaller customers in the residential and commercial sectors can also buy gas directly from producers through aggregators and brokers. There are about 4.8m customers (4.2m residential customers, 0.47m commercial customers and 18,000 industrial customers).

Tables A3.4 and A3.5 separate the provincial Canadian gas markets into those that pass the filters and those that do not. As for the electricity markets, the states in both groups are being sorted according to market size (defined in terms of natural gas sales). The tables show that the ratio of competitive to non-competitive Canadian gas markets is 54:46.

Table A3.4 Canadian provinces passing the filters for gas market, ranked by size

Canadian province	100% open	Separation at transmission level	rTPA	Market size (2004) Natural gas sales (BCF)
Ontario	Y	Y	Y	938
Quebec	Y	Y	Y	203
Saskatchewan	Y	Y	Y	199
New Brunswick	Y	Y	Y	22
Total (competitive provinces)	**–**	**–**	**–**	**1,362**
Total Canadian gas market	**–**	**–**	**–**	**2,542**
% of competitive Canadian gas market	**–**	**–**	**–**	**54**

Source: Canadian Gas Association, National Energy Board, Statistics Canada.

Table A3.5 Canadian provinces not passing the filters, ranked by size

Canadian province	Market size (2004) Natural gas sales (BCF)
Alberta	857
British Columbia and territories	244
Manitoba	77
Nova Scotia	2
Total (non-competitive provinces)	**1180**
Total Canadian gas market	**2,542**
% of non-competitive Canadian gas market	**46**

Source: Canadian Gas Association, National Energy Board, Statistics Canada.

To define the critical mass, C, for the Canadian gas market, the size of the Canadian gas market relative to the US gas market needs to be determined. The total size of the Canadian gas market is 2,542BCF, representing 32% of the total US gas market, the size of which is 7,867BCF. Considering that the US gas composite had a size of 1,573BCF, the Canadian gas composite should be scaled at 503BCF (1,573 × 0.32).

Given this critical size for the Canadian composite, the latter requires provinces with an aggregate market size of 272BCF (503 × 0.54) to have passed the filters. Taking the largest province from Table 3.4 first, Ontario, gives a volume of 938BCF, and thus the comparator needs to be scaled up significantly to maintain the ratio 54:46 between competitive and non-competitive Canadian provinces.

After proportional adjustment, the threshold for the non-competitive states becomes 799BCF (ie, 938 × (0.46/0.54)). Adding Alberta (ie, 857BCF) will lead to a total market indicator with 938BCF competitive and 857BCF non-competitive market volumes—ie, a ratio of 52:48, which lies inside the 5% buffer.

Thus, the composite indicator for the Canadian gas market would take into account the two markets: Ontario and Alberta.

5.3.5 A3.2.2 Aggregation of sub-markets

The composite Canadian gas market comparator is constructed on the basis of the markets of Ontario and Alberta. Table A3.6 summarises the filter information.

Table A3.6 Construction of Canadian gas market comparator

Canadian gas market	Degree of market opening (%)	Market size (2004) Natural gas sales (BCF)	Relative market size in composite (%)
Ontario	100.0	938.0	52.0
Alberta	881.0	857.0	48.0
Total market size of composite	**–**	**1,795.0**	**100.0**
Composite Canadian gas market comparator	**94.3**	**–**	**–**

Notes: In the Alberta gas market, small industrial customers have been able to choose their supplier since 1988. Retail supply has been fully open in some areas since 1996, although competitive offerings are not available to all domestic customers, as only the two investor-owned utilities (ATCO Gas and AltaGas Utilities) are required to provide consumers with the option of buying from a marketer. Customers of rural gas cooperatives do not have the option to buy from a competitor unless they are a non-agricultural customer using more than 10,000 GJ per annum. Although municipally owned utilities may allow their customers to buy from a marketer, they are not required to do so.
Source: Statistics Canada and Oxera calculations.

Using market size as weights, the resulting theoretical Canadian gas market comparator displays a 94.3% degree of market opening.

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