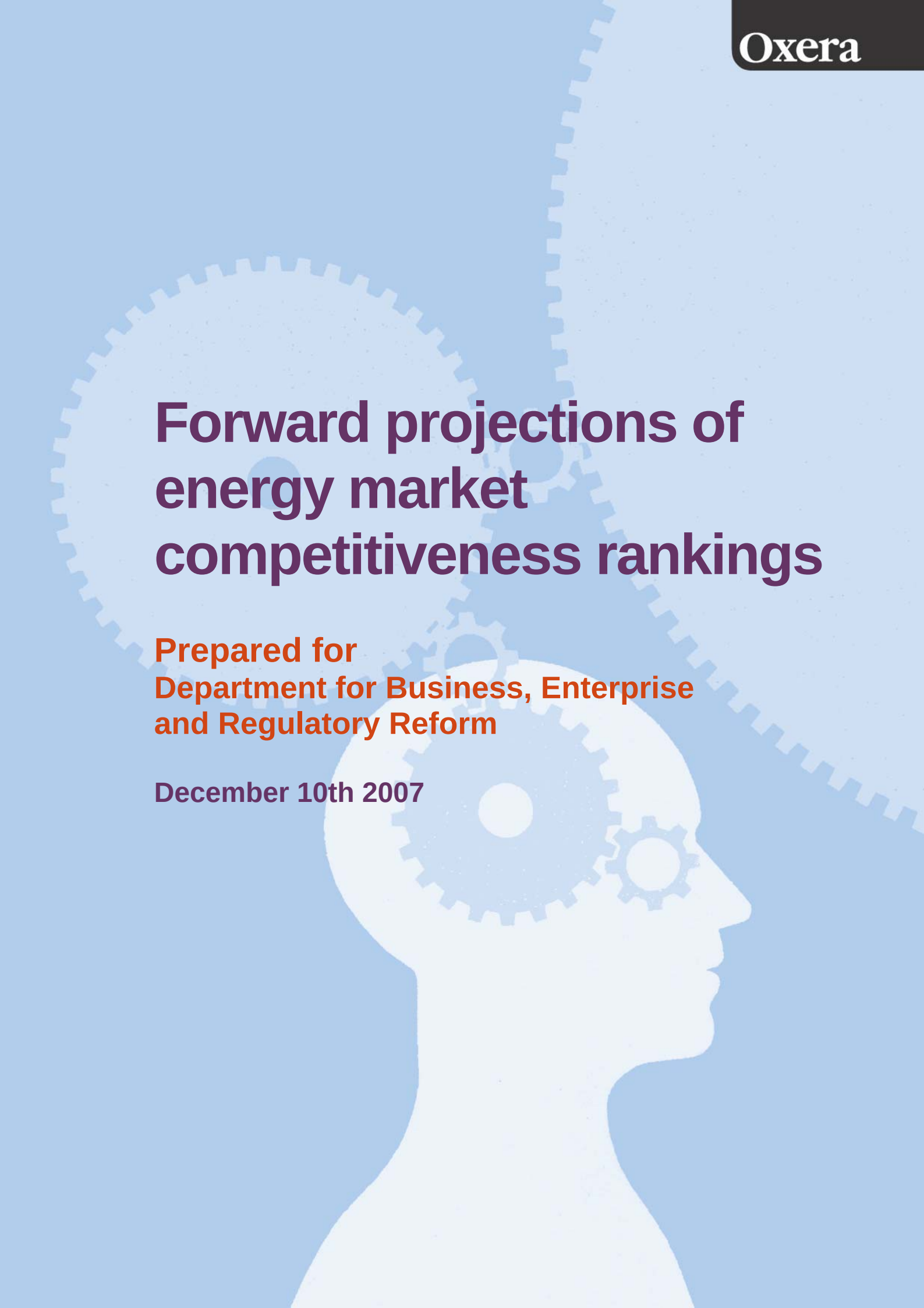
Oxera

Forward projections of energy market competitiveness rankings

Prepared for
Department for Business, Enterprise and Regulatory Reform

December 10th 2007



Contents

1 Forward projections of competitiveness rankings 1

2 Forward projections of UK scores and rankings 2

3 Comparison with 2006 comparator group 8

4 Conclusions 21

List of tables

Table 2.1 Preliminary 2006 disaggregated UK electricity market scores 2
Table 2.2 Upstream market with all planned capacity realised, MW 2
Table 2.3 Upstream market with planned capacity not realised 3
Table 2.4 Upstream electricity market scenarios (proportion of total market) 3
Table 2.5 Wholesale electricity market scenarios 4
Table 2.6 Downstream electricity market scenarios (proportion of total market) 4
Table 2.7 Overall electricity market scenarios 5
Table 2.8 Preliminary 2005 disaggregated UK gas market scores 5
Table 2.9 Upstream market scenarios (proportion of total market) 5
Table 2.10 Wholesale electricity market scenarios 6
Table 2.11 Downstream market scenarios (proportion of total market) 6
Table 2.12 Overall gas market scenarios 7
Table 2.13 Overall energy score scenarios 7
Table 3.1 Comparison of preliminary 2006 market structures (%) 8
Table 3.2 Gas market weightings of the 2006 comparator group 9
Table 3.3 Potential of comparator group to overtake the UK under the upside and downside scenarios for the UK 15
Table 3.4 Realisation of initial filter conditions 16
Table 3.5 Electricity market structure of potential new comparators (%) 17
Table 3.6 Gas market structure of potential new comparators (%) 18
Table 3.7 Gas market weightings of the future comparators 18
Table 3.8 Factors affecting future competitive scores 19

1 Forward projections of competitiveness rankings

By July 2007, the provisions of the second Internal Market Directives for Electricity and Gas had 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, consequently affecting the energy market competitiveness of alternative countries. Furthermore, with the implementation of the proposed third package of the European Commission's electricity and gas market directives, a higher degree of unbundling and a greater degree of competition may be expected across Member States.

While the UK was the most competitive of the EU and G7 energy markets in 2006, the dynamic effect of the liberalisation programme across Continental Europe may challenge that position in the future.

This report assesses how competitiveness rankings may evolve in the future, identifying changes that could take place in the UK and the rest of the EU from 2007 to 2011. It goes on to explore the potential risk that the competitiveness of the UK's energy markets will decline relative to those of other countries in the EU and G7, to the extent that the PSA target will not be met.

A detailed analysis of the potential changes in the UK markets is undertaken, including the development of upside and downside scenarios showing the positive and negative effects of changes in market structure and behaviour on the UK's competitiveness score. Changes in market structures required for energy markets in both the 2006 comparator group and the rest of the EU to become as competitive as the UK are then assessed, along with the plausibility of these changes given the current and future market, legislative and regulatory environments.

2 Forward projections of UK scores and rankings

2.1.1 UK electricity market

According to the methodologies used by Oxera, the UK has consistently had the most competitive electricity market from 2001 to 2006. Table 2.1 summarises the electricity market scores in the separate market segments.

Table 2.1 Preliminary 2006 disaggregated UK electricity market scores

Indicator	Preliminary 2006
Upstream market	8.3
Wholesale market	6.4
Downstream supply	9.1
Score—all market areas	**7.8**
Network-related activities	9.4
Score—network area	**9.4**
Overall electricity score	**8.3**

Source: Oxera calculations.

Upstream market

Market concentration is the primary determinant of upstream market competitiveness. In the competitiveness analysis, the measure of market concentration used is calculated from the market shares of the three largest generators (British Energy, RWE npower and E.ON UK at May 2005).[1] These market shares are affected by:

– introduction of new capacity;
– disconnection;
– decommissioning;
– introduction of new interconnection;
– mergers and acquisitions.

The National Grid Seven Year Statement 2007 ('SYS2007') figures for generation capacity show the planned expansion of major generators. The market shares of the largest three generators are summarised in Table 2.2, along with the potential changes in capacity and market concentration until 2011/12.

Table 2.2 Upstream market with all planned capacity realised, MW

Capacity in MW (% share in brackets)	2007/8	2011/12
British Energy	11,495 (15%)	11,495 (12%)
RWE	10,832 (14%)	12,882 (13%)
E.ON	9,593 (12%)	13,279 (14%)
UK total	78,428	97,748

Source: National Grid Seven Year Statement 2007.

[1] Department of Trade and Industry (2005), 'Digest of United Kingdom Energy Statistics', May, Table 5.11.

However, most of the projects that constitute the data in Table 2.2 have not received the necessary consents.[2] If these projects do not materialise, the major generators would experience little change in capacity, while the total capacity in the UK will increase by 4,409MW, leading to a minor reduction in their market shares of the largest three generators relative to current levels. Additional closures of the major generators' plants may be expected in 2015 as a result of the end of the period of the limited-life derogation from the Large Combustion Plants Directive and from 2013 onwards if plant viability is affected by the imposition of full auctioning of allowances under Phase III of the EU Emissions Trading Scheme. However, these factors will not affect the concentration in the UK generation market in the time period being analysed in this report.

Table 2.3 Upstream market with planned capacity not realised

Capacity in MW (% share in brackets)	2007/8	2011/12
British Energy	11,495 (15%)	11,495 (14%)
RWE	10,832 (14%)	10,944 (13%)
E.ON	9,593 (12%)	9,593 (12%)
UK total	76,285	82,847

Source: National Grid Seven Year Statement 2007.

As Tables 2.2 and 2.3 show, market shares in both cases are very similar, leading to a concentration measure of less than 30%. The downside scenario assumes a merger of the largest firms, which possibly increases market concentration up to 36%.

According to Oxera's methodology, the degree of technical openness, defined as the ratio of interconnection to installed capacity, also has a marginal impact on competitive score.

By 2010, the 1,000MW interconnector with the Netherlands should be complete, giving the UK a total interconnection capacity of 3,170MW, which is still less than 5% of total installed capacity.

The upside and downside scenarios for the upstream electricity market in the UK are summarised in Table 2.4.

Table 2.4 Upstream electricity market scenarios (proportion of total market)

Indicator	Preliminary 2006	Upside	Downside
Market share of largest generator	0.14	0.14	0.26
Market share of two largest generators	0.27	0.27	0.36
Market share of three largest generators	0.39	0.39	0.47
Market concentration	0.26	0.24	0.36
Degree of technical openness of the market	0.03	0.05	0.04
Openness of allocation mechanism to import capacity	Auction	Auction	Auction

Sources: Department of Trade and Industry (2006), 'Digest of United Kingdom Energy Statistics', May; National Grid Seven Year Statement 2007; and European Transmission System Operators (2006), 'Indicative Values for Net Transfer Capacities in Europe'.

Wholesale market

The electricity wholesale market in the UK is highly competitive relative to the comparator countries. It has a high degree of liquidity (although some other markets have higher liquidity)

[2] SYS2007, Table 3.2.

and price reporting, and a significant amount of trade takes place through standardised contracts. While these conditions are not expected to change in a manner unfavourable to wholesale market competitiveness, there is scope for further improvements in liquidity as the wholesale markets develop further. The upside scenario therefore assumes that liquidity increases from 173% to 300%, with the downside scenario remaining the same as present, as set out in Table 2.5.

Table 2.5 Wholesale electricity market scenarios

Indicator	Preliminary 2006	Upside	Downside
Existence of price reporting	Y	Y	Y
Liquidity	1.73	3.00	1.73
Existence of standardised contracts	Y	Y	Y

Sources: Ofgem's 2006 Submission to the European Commission (DGTREN) Report, p. 30

Downstream market

The I&C market concentration declined from 40% in 2003 to 34% in 2005. The upside scenario assumes that market concentration decreases further to 31% as smaller competitors gradually acquire market share. The downside scenario assumes a merger of the largest firms, resulting in an increased market concentration of 57% (See Table 2.6)

Switching rates in the I&C market are relatively high and have stabilised at 20%

Domestic market concentration has remained at 41% in the past four years, while the switching rate declined slightly from over 22% in 2003 to 19% in the most recent figures available. It is expected to decrease or stabilise as competition develops and the market matures. Similarly, the downside scenario for the domestic market assumes that a merger of the largest firms leads to an increase in concentration to a maximum of 58%.

Table 2.6 Downstream electricity market scenarios (proportion of total market)

Indicator	Preliminary 2006	Upside	Downside
I&C market			
Degree of supply market opening	100%	100%	100%
Market concentration	0.34	0.31	0.57
Annual gross switching	0.20	0.20	0.20
Domestic market			
Degree of supply market opening	100%	100%	100%
Market concentration	0.41	0.41	0.58
Annual gross switching	0.19	0.19	0.14

Sources: ERGEG, Ofgem, and Oxera calculations.

Potential changes in electricity market scores

In the upside scenario, the UK's overall score in the electricity market increases from 8.3 to 8.5. This is because the UK electricity market is fairly competitive according to the current methodology, and there is limited scope for further improvement. However, in the downside scenario, the score in the market areas falls to 6.6, leading to an overall decrease in electricity market score from 8.3 to 7.4. The results are presented in Table 2.6.

In the downside scenario, if competitive conditions in the comparator markets do not change, the UK would fall below Finland (8.0) and Denmark (7.7). However, the downside scenario, based on several hypothetical mergers, is unlikely to occur.

Table 2.7 Overall electricity market scenarios

Indicator	Preliminary 2006	Upside	Downside
Upstream market	8.3	8.5	7.7
Wholesale market	6.4	6.8	6.4
Downstream supply	9.1	9.3	5.8
Score—all market areas	**7.8**	**8.1**	**6.6**
Score—network area	**9.4**	**9.4**	**9.4**
Overall electricity score	**8.3**	**8.5**	**7.4**

Source: Oxera calculations.

2.1.2 UK gas market

Similarly to the electricity market, the UK gas market has been the most competitive from 2002 to 2006, as can be seen in Table 2.8.

Table 2.8 Preliminary 2005 disaggregated UK gas market scores

Indicator	Preliminary 2006
Upstream market	10.0
Wholesale market	6.6
Downstream supply	7.2
Score—all market areas	7.9
Score—network area	10.0
Overall gas score	**8.5**

Source: Oxera calculations.

Upstream market

Concentration in the upstream gas market declined from 43% in 2003 to 27% in 2006, and the upside scenario assumes a further reduction of concentration. However, as the UK gas sector becomes more dependent on imports, the incumbent shippers/suppliers may increase their portfolio positions to address the perceived rise in supply portfolio exposure. Correspondingly, an increase in market concentration of 10% is assumed in the downside case.

Table 2.9 Upstream market scenarios (proportion of total market)

Indicator	Preliminary 2006	Upside	Downside
Market share of largest shipper	0.20	0.19	0.24
Market share of two largest shippers	0.27	0.25	0.38
Market share of three largest shippers	0.33	0.30	0.48
Market concentration	0.27	0.25	0.37

Sources: EC2005; European Commission (2005), 'Energy Sector Inquiry', Draft Preliminary Report, p. 31, and Oxera calculations.

Wholesale market

As with the electricity market, using the PSA methodology, the gas wholesale market is highly liquid and transparent. With price reporting and standardised contracts covering most of the trade, these conditions are not likely to change for the worse in the near future. As the

UK already has the highest levels of liquidity amongst the gas markets analysed (240%), a small increase to 300% is assumed in the upside scenario.

Table 2.10 Wholesale electricity market scenarios

Indicator	Preliminary 2006	Upside	Downside
Existence of price reporting	Y	Y	Y
Liquidity	2.4	3.0	2.4
Existence of standardised contracts	Y	Y	Y

Sources: DUKES (2006) Table 4.1, and Ofgem's 2006 Submission to the European Commission (DGTREN) Report (2006), p. 68.

Downstream market

In the domestic market, the share supplied by BGT (owned by Centrica) has been falling by around 4% per year. The upside scenario assumes this trend continues and therefore that Centrica's market share averages at 39% in 2007–11. Assuming that Powergen and SSE do not capture Centrica's loss, and maintain their current market shares (13% each), this would give a market concentration of 52%. In the downside scenario, a merger of the large companies could increase the concentration to a maximum of 73%.

I&C market concentration is much lower than that of the domestic market, although it increased from 33% in 2002 to 38% in 2006. The downside scenario assumes that the trend continues into 2007–11, leading to a market concentration of 42%. In the upside scenario, concentration stabilises at 36%.

The switching rate has less of an impact on the competitiveness score than does market concentration. It is expected that switching rates will either stabilise or decline as competition develops. In the downside scenario, a 3% decrease is assumed for both I&C and domestic switching rates.

Table 2.11 Downstream market scenarios (proportion of total market)

Indicator	Preliminary 2006	Upside	Downside
I&C market			
Degree of supply market opening	1	1	1
Market concentration	0.38	0.36	0.44
Annual gross switching	0.15	0.15	0.12
Domestic market			
Degree of supply market opening	1	1	1
Market concentration	0.65	0.52	0.73
Annual gross switching	0.15	0.15	0.12

Source: Ofgem (2007), 'Domestic Competitive Market Review', June and Ofgem's 2006 submission to DG TREN (p. 45).

Potential changes in gas market scores

In the upside scenario, the market areas score improves from 7.9 to 8.2, leading to an improved gas market score of 8.7. In the downside scenario, the score of market areas declines to 6.9 from 7.9, largely due to rising market shares in both upstream and downstream markets, and the overall score declines to 7.9. The detailed results for gas market are shown in Table 2.10.

However, even the downside scenario would not affect UK's top ranking if conditions in comparator countries remain unchanged, since most comparator countries have gas markets

that appear significantly less competitive than that of the UK. At 6.5, Spain has the second highest score in the gas market.

Table 2.12 Overall gas market scenarios

Indicator	Preliminary 2005	Upside	Downside
Upstream market	10.0	10.0	8.8
Wholesale market	6.6	6.8	6.6
Downstream supply	7.2	8.1	5.6
Score—all market areas	7.9	8.2	6.9
Score—network area	10.0	10.0	10.0
Overall gas score	**8.5**	**8.7**	**7.9**

Source: Oxera calculations.

2.1.3 Overall energy market scores

While the current gas market weighting is 72%, the Department of Trade and Industry's projections estimate that this would equal 64% in 2010.[3] The overall energy score can be calculated by combining this weighting with the rebased forecast scores in the upside and downside scenarios. The results are presented in Table 2.13, showing that the UK retains the maximum possible score of 10.0 in the upside scenario, having the most competitive electricity and gas markets. In the downside scenario, despite falling behind Finland and Denmark in the electricity market, the UK retains the top position in the energy market in aggregate, with a score of 9.7, which is significantly higher than that of its nearest competitor Sweden, which has an energy market score of 8.4.

Note that the UK's energy market scores in the upside and downside scenarios are dependant on the scores of the remainder of the comparator group. The relativities between the UK's electricity and gas market scores and those of other countries will determine the outturn energy market score. Therefore, under the scenarios where other countries surpass the UK, the UK's energy market score in itself will change as the electricity and gas market scores are rebased relative to those of the country that has the highest possible score in the two markets.

Table 2.13 Overall energy score scenarios

Indicator	Preliminary 2006	Upside	Downside
Electricity market score	8.3	8.5	7.4
Gas market score	8.5	8.7	7.9
Electricity market score (rebased)	10.0	10.0	9.3
Gas market score (rebased)	10.0	10.0	10.0
Gas market weighting	0.72	0.64	0.64
Overall energy market score	10.0	10.0	9.7

Source: Oxera calculations.

[3] Department of Trade and Industry (2007), 'Updated Energy and Carbon Emissions Projections. The Energy White Paper', May, Tables 5.4 and 5.5 (See http://www.berr.gov.uk/files/file39580.pdf)

3 Comparison with 2006 comparator group

Having estimated the potential changes in the UK energy 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 2006. 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.

3.1.1 Comparison of market structures

As they pass the initial filter, all comparator countries have implemented either legal or ownership unbundling at transmission level in either the electricity or the gas market. Major differences across countries lie in their upstream, wholesale and downstream areas.

As unbundling of networks is implemented across Member States and wholesale market liquidity develops as markets mature, market structures at the upstream and downstream levels are expected to emerge as the foremost determinants of competitive rankings. Table 3.1 therefore compares the market structures of the comparator group. The UK has a significant advantage in upstream markets (for both electricity and gas) over the majority of the group.

Table 3.1 Comparison of preliminary 2006 market structures (%)

	UK	Comparator group range
Electricity		
Generator market concentration	26	46–82
I&C market concentration	35	24–86
Domestic market concentration	41	22–90
Gas		
Shipper market concentration	27	46–100 (46–91 if Finland and Portugal are excluded)
I&C market concentration	38	38–100 (38–84 if Portugal is excluded)
Domestic market concentration	60	20–100 (20–77 if Portugal is excluded)

Source: Oxera calculations.

Table 3.2 shows the gas market weightings of the comparator group. The gas markets are dominated by security of supply and import dependence issues and are in general less competitive than the electricity markets. Hence the overall energy score will tend to be lower for countries relying heavily on gas, such as the Netherlands and the UK, as long as the countries in question do not have the highest scores in both markets, in which case their energy score would remain unaffected by the gas market weighting. 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.

Table 3.2 Gas market weightings of the 2006 comparator group

Country	Gas market weighting
Netherlands	0.79
Italy	0.72
UK	0.72
Ireland	0.62
Germany	0.61
Austria	0.60
Spain	0.58
Denmark	0.57
Portugal	0.48
Finland	0.34
Sweden	0.07

Source: Eurogas (2006), 'Developments in European Natural Gas Consumption 2004–2005'; IEA Electricity Information 2005. Data is for 2004, which is the latest available, except for Estonia, Latvia, Luxembourg and Slovenia with 2003 data from Eurostat (supply, transformation and consumption of electricity).

3.1.2 Country-by-country analysis

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

Sweden

As shown in Table 3.2, Sweden has a very low gas market weighting, while its electricity market is relatively competitive. This leads to an overall score of 8.1 for Sweden, making it the second most competitive country in 2006.

Given the small size of the Swedish gas market, significant changes are required from the already competitive electricity market if Sweden is to equal the UK's current score, with even more extreme changes required for the UK to be overtaken. The wholesale market is fairly competitive, as the country is integrated to Nord Pool. High levels of concentration in generation appear to be the major shortcoming of the Swedish market. Vattenfall, Sydkraft and Fortum share around 85% of the generation capacity.

– For Sweden to surpass the UK's current score, its generation market concentration score would have to fall from the current 68% to 45%.

– Concentration levels in the downstream market would have to fall from current levels of 51% to 40%.

– Switching rates in the I&C market would have to increase from 3% to 10%.

The historical trend is that market shares of the largest companies have stabilised or increased in the past few years, making it unlikely that market concentration will fall, or that Sweden will be in a position to overtake the UK.

Finland

In 2006, Finland was the third most competitive country in the group, after the UK and Sweden. As with Sweden, it is helped by a highly competitive electricity market.

Integrated into the Nord Pool, the Finnish electricity market is the second most competitive in the comparator group. It has been characterised by low levels of concentration from 2002 to 2006. However, Finland's overall score is reduced by its uncompetitive gas market.

The Finnish gas market is isolated, with a pipeline connection only to Russia. Finland has therefore been exempted from the Second Gas Directive; the exemption is effective as long as Finland does not have a direct connection to the natural gas network of any other EU Member State. This derogation results in a low score for the gas market.

The gas market is the potential area for improvement. For Finland to overtake the UK's current score, the following changes would need to be made in the gas market:

– reduction of shipper market concentration from the existing 100% to below 55%;
– full opening of supply markets, for both I&C and domestic customers, with significant development of customer switching activity such that 5% of gas users switch suppliers annually; and
– ownership unbundling of TSOs.

In addition, ownership unbundling of the electricity TSO is also assumed to take place, which would further improve Finland's position in the electricity market.

While the required change in the electricity market may be considered feasible in light of the European Commission's third package of legislation, those in the gas market appear highly unlikely given the derogation from the EC's Second Gas Directive.

Spain

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

For Spain to surpass the UK's downside score, the following changes in market structures would be required:

– in the electricity market, market concentration for generators and suppliers would have to fall to 40% from the existing levels of over 60%;
– rates of switching electricity supplier would have to increase to 10% from the current levels of 7% and 1% in the I&C and domestic markets, respectively;
– gas shipping market concentration would have to decrease from 48% to 30%; and
– gas supply market concentration would have to decrease from the current 65% to 40%.

In 2006, the Spanish government introduced a series of reforms in the energy markets. These included the introduction of virtual capacity auctions, limits on marginal plant operations and a clampdown on vertically integrated firms selling to themselves, changes that are likely to improve wholesale market liquidity. This is likely to be further improved with the introduction of Mibel, the Iberian Electricity Market. Improved liquidity may be expected to have a small degree of positive impact on concentration at the upstream and downstream levels. The government also aimed to set up an independent company to promote customer switching.[4] In addition, the proposed sale of Endesa-owned generation plants to E.ON may improve the concentration level.

However, analysis of wholesale market liquidity and upstream/downstream concentration across a range of countries finds that there is not a direct correlation between these. Consequently, these steps taken by the Spanish government to improve wholesale market liquidity may not be expected to reduce market concentration to the extent required for Spain to overtake the UK's competitiveness in the 2007–11 period.

[4] *EU Energy,* **126**, February 10th 2006.

Germany

The gas market accounts for 61% of the total energy market. Therefore conditions in both the electricity and gas markets are important in determining the overall competitiveness of the energy market. For Germany to overtake the UK's downside score, the electricity market score would have to increase to the maximum of 10, with additional changes being required from the gas market:

– ownership unbundling at the transmission and distribution levels;
– shipper and supplier concentration would have to decrease substantially from around 70% to 50%.

Although Germany has been opposed to ownership unbundling of networks, the European Commission is moving towards the introduction of ownership unbundling as part of the third package of legislation, with the introduction of an Independent System Operator being an alternative option. It is, however, not clear at this stage, whether legislation to further the unbundling of transmission networks will be put in place.

However, a high degree of vertical and horizontal integration remains across the German energy markets. The gas market has a limited degree of liquidity in commodity as well as capacity terms, resulting from long-term supply contracts, contractual congestion in pipelines preventing new suppliers from obtaining capacity, and as well as limited sales by large gas producers to new market entrants.[5]

Regarding improvements in the electricity market, concentration in the generation market may be expected to decline with half of the planned generation capacity (18GW) to be installed by 2011 being built by companies other than the four incumbents.[6] However, long-term contracts have also been distorting competition in electricity markets, with the European Commission having expressed its concerns about the matter.[7]

In light of the current nature of both the electricity and gas markets, the significant changes required for Germany to overtake the UK appear unlikely.

Denmark

Denmark has a gas market weighting of 57%. Like Finland, its electricity market is also integrated into the Nord Pool, with its overall energy market score being reduced by its uncompetitive gas market.

As Denmark already has the highest electricity market score amongst the comparator group when considering the UK's downside scenario, changes in the gas market would be required for it to overtake the UK:

– shipper market concentration would have to decline to 40% from 91%;
– supply market concentration would have to decline to 40% from the current 71% in I&C and 79% in domestic markets;
– price reporting is needed to cover at least 60% of daily trading;
– rTPA to gas storage facilities is required.

The implementation of the Second Gas Directive in 2007 ensures rTPA to gas storage. However, the other conditions are unlikely to be met. For instance, Russia's Gazprom has signed a 20 year gas supply contract with Danish upstream player Dong starting 2011 to supply gas through the North European Gas Pipeline which is due to start delivering Russian gas to Europe from October 2010.[8] While the long-term nature of this contract may have

[5] European Commission (2007), 'Germany Internal Market Fact Sheet', January.
[6] *EU Energy,* **127**, February 24th 2006.
[7] *EU Energy,* **127**, February 24th 2006.
[8] *UK Gas Report,* **312**, June 6th 2006.

negative impacts on the upstream and wholesale markets, the introduction of greater volumes of gas into the market would tend to have an overall positive effect.

However, there are some positive factors at play. Dong agreed to release gas supplier HNG Midt-Nord Salg (which supplies gas to two-thirds of Danish gas consumers) from part of a long-term gas supply contract.[9] Whereas, Dong had been supplying Midt-Nord Salg with 100% of its gas supply needs, a new three year gas contract starting January 2007, involves Dong supplying only 60% of the company's gas requirements. This would consequently add to competition in the upstream market, potentially mitigating the impact of the forthcoming Dong-Gazprom long-term contract. Furthermore, as part of Dong's merger with electricity generators Elsam and Energi E2, Dong has been required to sell the larger of its two gas storage facilities and to release 400mcm of gas at the Danish transfer facility, the latter aiding in improving wholesale market liquidity.

In balance, the long-term outlook for the Danish energy markets is expected to remain neutral, with a low probability of an improvement in competitiveness such that Denmark overtakes the UK.

Austria

The Austrian energy market is characterised by high levels of concentration and low rates of switching. The domestic gas supply segment is probably the only exception; with a 60% weighting given to the gas market, both electricity and gas markets are important in determining the overall score for Austria.

In order for Austria to overtake the UK in the energy market rankings in the downside scenario, changes in the electricity network unbundling regime are required:

– Ownership unbundling at the transmission level;
– Legal unbundling at the distribution level.

In addition, changes in the Austrian gas market are also required:

– a significant reduction in shipper market concentration from 77% to 35%;
– price reporting covering at least 50% of daily trading;
– a reduction in I&C supply market concentration from 84% to 35%.

Indeed, there is some potential for Austria to improve its competitiveness position in the electricity market over the forthcoming years. In particular, the regulator e-control has called for the ownership unbundling of electricity networks from generation and supply activities.[10]

Improvements in the gas market, however, appear more challenging. Long-term gas contracts, in particular, have been found to be a barrier to new entry within the market. OMV's exclusive gas import rights, and Econgas' (50% owned by OMV) arrangements with three of the four largest regional distributors are particular obstacles.

The situation appears unlikely to improve, as OMV and Russia's Gazprom have agreed to extend all their gas supply contracts to 2027, even though they were set to expire in 2012.[11]

Netherlands

The Netherlands performs reasonably well in the electricity market but, like Germany, it faces the disadvantage of a large and low-scoring gas market. For the Netherlands to exceed the UK downside score, it will require significant changes in the gas market such as:

– a reduction in shipper market concentration from 72% to 30%;

[9] *EU Energy,* **136**, June 30th 2006.
[10] Power in Europe**, 483**, September 11th 2006**.**
[11] *International Gas Report,* **558**, October 6th 2006.

– a reduction in supply market concentration to from 58% to 30%;
– rTPA to transmission[12] and storage facilities.

In addition, downstream supply concentration in the electricity market would need to fall from 58% to 50% for the overall energy market competitiveness to surpass the UK's downside.

A study by DTe, the Dutch regulator, suggests that high concentration remains a point of concern. Trading at the Dutch Transfer Facility has not reduced the dominant position of Gasunie Trade & Supply.[13] Consequently, the probability of the large changes required in the gas market for the Netherlands to overtake the UK appears low.

Italy

The Italian gas market, which is lower-scoring than the electricity market, has a 72% weighting of the total energy sector. Developments in the gas market will therefore be the predominant driver of any changes to Italy's energy score.

The possible changes required in the gas market for Italy to surpass the UK's downside score would be as follows:

– a reduction in shipper market concentration from 76% to 40%;
– introduction of full price reporting with 50% coverage of volumes traded, along with the introduction of a standardised contract;
– a reduction in supply market concentration from 61% to 40%; and
– ownership unbundling of transmission networks, in addition to the existing legal unbundling.

In addition to gas market changes, the electricity generation market concentration would have to decline from 56% to 45%.

Ownership unbundling of the transmission networks may be expected with the introduction of the third package of legislation introduced by the European Commission. However, analysis of the supply market by the regulator AEEG found that suppliers' growth in the market was driven by M&A activity rather than by organic customer acquisition.[14] This arises due to the lack of transparency in suppliers' offerings, making it difficult for customers to switch supplier. In general, the required reduction in concentration across the supply chain is unlikely, given the high market share held by ENI.

Ireland

The Irish electricity market was opened to competition in 2005. It has the lowest scoring electricity market in the comparator group. The gas market is also low scoring compared to the UK. The 62% weighting in the gas market suggests that changes in both markets are important in determining the overall energy market score.

For Ireland to attain the UK's downside score, the following changes in the electricity market would be required:

– a reduction in generation market concentration from 82% to below 35%;
– a reduction in supply market concentration to 50% from 86% and 90% in the I&C and domestic markets respectively;
– ownership unbundling of transmission.

In addition, changes in the gas market will also have to take place:

– upstream market concentration would have to fall to 30% from the current 46%;

[12] Currently rTPA at regional level and nTPA at national level.
[13] *International Gas Report*, **520**, March 24th 2005.
[14] *EU Energy,* **146**, December 1st 2006.

– price reporting covering 50% of daily trade and standardised contracts are required in the wholesale market;
– I&C supply market share should fall from 60% to 35%, with domestic supply market concentration declining from 68% to 40%;
– ownership unbundling at transmission levels should be implemented;
– competitive access to gas storage is needed.

The introduction of the Single Electricity Market in November 2007, which combines the wholesale electricity market of the Republic of Ireland with that of Northern Ireland, is likely to improve the competitive position of the Irish electricity market. Northern Irish incumbent, Viridian, is planning to open a second power plant in the Republic of Ireland, which would reduce generation market concentration—as would other steps being taken towards increased competition, such as the planned disposal of 1,300MW of the electricity incumbent ESB's mid-merit plants by 2010.[15] However, given the dominant positions of incumbent electricity and gas companies, competition is unlikely to improve to the extent that Ireland surpasses the UK in 2007–11.

Portugal

Portugal is the lowest scoring country in the comparator group, due to a low score for its electricity market and derogation in its gas market. The gas market accounts for 48% of the energy market, which implies that the energy score remain well below the UK's even if the electricity market attains the highest score amongst the comparator group, as long as the derogation remains effective. Possible changes required in the gas market for Portugal to exceed the UK's downside score are as follows:

– rTPA at transmission, distribution and storage levels;
– development of wholesale market, standardised contracts and price reporting covering 100% of daily trading;
– 100% downstream market opening;
– a reduction of upstream and downstream market concentration to 45% from the current 100%; and
– downstream supplier switching rates equalling 5%.

The unbundling conditions will be met if the Gas Directive is transposed into national law. However, the monopoly position of Gas de Portugal is unlikely to change.

3.1.3 Summary

Drawing on the analysis in the above section, Table 3.3 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 are most likely to be threatened by Sweden. The extent of the changes required in the other countries is of sufficient magnitude that there is a low level of likelihood that they would achieve more competitive markets than the UK in the period 2007–11.

[15] *EU Energy,* **147–148**, December 15th 2006.

Table 3.3 Potential of comparator group to overtake the UK under the upside and downside scenarios for the UK

Country	Upside scenario	Downside scenario
Sweden	Low	High
Finland	Low	Low
Spain	Low	Low
Germany	Low	Low
Denmark	Low	Low
Austria	Low	Low
Netherlands	Low	Low
Italy	Low	Low
Ireland	Low	Low
Portugal	Low	Low

Source: Oxera calculations.

3.1.4 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.

– EU Member States have been required 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, and to 27 Member States in January 2007, most of the new Member States are also required to adopt the European Commission Directives by July 2007. The exceptions are Estonia where 100% electricity market opening has been planned for 2013, along with Greece and Latvia who have been granted derogations from the implementation of the second Gas Directive till 2009 and 2010, respectively.

Table 3.4 sets out the years in which countries are likely pass the initial filter. Passing of the initial filter in the electricity and/or gas market has been considered.[16] Passing the filter on the average market-opening basis has not been taken into account.

[16] 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 3.4 Realisation of initial filter conditions

Year	Country	Change taking place in given year
2006	Czech Republic	Full electricity market opening (Full gas market opening in 2007)
2007	Belgium	Full electricity and gas market opening
	Bulgaria	
	France	
	Hungary	
	Lithuania	
	Poland	
	Romania	
	Slovenia	
2007	Slovakia	Full electricity and gas market opening, conditional upon implementation of legal unbundling of gas TSO and rTPA to gas transmission.
2007	Greece	Full electricity market opening. (Derogation from Gas Directive until 2009)
2007	Latvia	Full electricity market opening. (Derogation from Second Gas Directive till 2010)
2007	Estonia	Full gas market opening. Electricity market to be fully opened in 2013.
2007	Czech Republic	Full gas market opening. In 2006, 74% of gas market open and 28%of electricity market open.
Depends on average degree of market opening	Luxembourg	Electricity market only opened for non-residential customers. Gas market 80% open. Faces a fine for non-compliance with Second Electricity and Gas Directive.
Information not found	Cyprus, Malta (Cyprus and Malta do not have gas markets)	

Sources: Electricity and gas regulators of the respective countries; Platts (2007), *EU Energy*, **167**, October 5th.

Tables 3.5 and 3.6 present data on the current electricity and market structures of EU Member States that have not yet passed the initial filter. In the electricity sector, most countries exhibit high levels of concentration in both generation and supply markets. Hungary, Poland and Romania appear to be the only exceptions.

Gas markets are generally less competitive than electricity markets in most Member States. Concentrations are extremely high (above 90%), and competition is not developed in some Member States, such as Greece and Slovakia. Even the potential comparators, Hungary and Poland, are adversely affected by uncompetitive gas markets. Countries with large gas sectors are likely to experience downward bias in the overall energy score. Table 3.7 summarises gas market weightings of the potential comparator countries. Cyprus and Malta are the only states without gas sectors. However, their electricity markets are highly uncompetitive. Without far-reaching changes in the electricity sector, they will not pose any realistic challenge to the UK's position in the period under consideration. Table 3.8 provides a summary of factors affecting competitiveness scores of the potential comparators.

Table 3.5 Electricity market structure of potential new comparators (%)

Country	Market share of largest generator	Aggregate market share of three largest generators	Aggregate market share of three largest downstream suppliers		
			Large industrial users	Small/medium businesses	Very small commercial/ household
Belgium	83	100	100/92	100/99	94/100
Bulgaria	–	–	–	–	–
Czech Republic	65	76	95	95	95
Cyprus	100	100	100	100	100
Estonia	90	100	95	95	95
France	87	97	91	97	96
Greece	–	97	97	97	100
Hungary	30	66	7	43	51
Latvia	-	95	99	99	99
Lithuania	50	92	100	100	100
Luxembourg	–	88	94	94	95
Malta	100	100	100	100	100
Poland	26	67	50	48	47
Romania	38	58	–	–	–
Slovakia	75	86	86	100	100
Slovenia	70	87	67	75	77

Note: Belgian data refers to the Flanders/Wallonia region. No data is available for the Brussels region.
Source: EC2004; European Commission (2005), 'Report on Progress in Creating the Internal Gas and Electricity Market', November (EC2005); European Commission (2005), 'Energy Sector Inquiry', Draft Preliminary Report; and European Commission (2007), 'Romania Internal Market Factsheet', January.

Table 3.6 Gas market structure of potential new comparators (%)

Country	Market share of largest shipper	Aggregate market share of three largest shippers	Aggregate market share of three largest downstream suppliers		
			Large industrial users	Small/medium businesses	Very small commercial/ household
Belgium	92	-	100/90	100/99	99/100
Czech Republic	99	100	54	51	57
Estonia	50	100	100	100	100
France	91	98	91	91	91
Greece	100	100	100	100	100
Hungary	100	100	77	76	79
Latvia	100	100	100	100	100
Lithuania	59	92	100	100	100
Luxembourg	–	–	95	93	93
Poland	98	100	65	65	65
Slovakia	100	100	100	100	100
Slovenia	100	100	86	86	86

Notes: Belgian data refers to the Flanders/Wallonia region. No data is available for the Brussels region. Cyprus and Malta have no gas market.
Source: EC2004; national reports to ERGEG; and EC2005.

Table 3.7 Gas market weightings of the future comparators

Country	Gas market weighting
Lithuania	0.82
Hungary	0.79
Latvia	0.78
Slovakia	0.71
Luxembourg	0.68
Belgium	0.67
Estonia	0.62
Czech Republic	0.59
France	0.51
Poland	0.51
Slovenia	0.49
Greece	0.33
Cyprus	0.00
Malta	0.00

Sources: Eurogas (2006), 'Developments in European Natural Gas Consumption 2004–2005'; IEA Electricity Information 2005. Data is for 2004, which is the latest available, except for Estonia, Latvia, Luxembourg and Slovenia with 2003 data from Eurostat (supply, transformation and consumption of electricity).

Table 3.8 Factors affecting future competitive scores

Country	Negative factors	Positive factors
Belgium	Presence of two types of gas quality—L-gas and H-gas High market shares of incumbents	The European Commission has concluded on its case on Distrigaz's long-term contracts. In commitments that will be made legally binding by the end of 2010, Distrigaz will be required to reduce the volumes of gas sold in Belgium that are tied up in long-term contracts. Nine new gas supply permits for the Flanders and Walloon areas have been issued by the regulator, who expects competition to develop in the future
Bulgaria	NEK, the former vertically integrated State-owned electricity monopoly continues to operate across the supply chain, engaging in generation (hydro only), export/import, trading and transmission Bulgargaz is dominant in the gas market engaging in public supply, transmission, storage and transit	86 regional gas distribution and supply licences will be issued through a tendering process
Cyprus	Vertically integrated EAC generates and supplies 100% of the electricity in Cyprus Legal and functional unbundling of electricity DSO not implemented, only accounts unbundling	Cyprus does not have a gas market
Czech Republic	High market shares of incumbents Single gas importer and wholesale supplier, that also controls six out of eight distribution and supply companies Limited customer switching, other than for large electricity consumers Access to gas storage is negotiated	Electricity TSO is unbundled in ownership
Estonia	10% of the Estonian electricity market is currently open. Market opening for large customers in 2009 and full electricity market opening in 2013 State-owned Eesti Energia, the dominant player in electricity State owned Eesti Gaas, the dominant entity in gas No independent suppliers	A 350MW electricity interconnection with Finland completed
France	High market shares of incumbents In the gas market, the French incumbents have long-term contracts with national production companies from producing countries	The presence of power exchange (but it covers a small part of traded volume) The share of non-incumbent gas companies in gas imports is rising
Greece	Vertically integrated State-owned gas company dominates the gas industry Regional gas monopolies have the right to supply 'small' customers within their concession areas for 30 years from the commencement of their licences in 2002	New interconnectors and an organised wholesale market have been planned
Hungary	Dominance of gas market by incumbent	Only account unbundling of DSOs

Country	Negative factors	Positive factors
Latvia	There is no electricity supply competition, due to the extremely low level of regulated tariffs State-owned Latvenergo produces 90% of power and is involved in import, transmission, distribution and supply No switching has occurred Russia is the sole source of gas, with no other sources likely to develop in the foreseeable future	
Lithuania	Gas supply chain remains vertically integrated Only account unbundling of networks	Lithuanian electricity market is well connected with Baltic states
Luxembourg	No effective electricity market exists. It relies on interconnection. Competition is mainly from neighbouring countries No wholesale market for gas, as all gas contracts concluded in foreign markets Limited switching, with the exception of large and very large industrial electricity consumers	Some competition developed in electricity wholesale market, with entry of traders engaging in import and export, though trades remain limited
Malta	No competition exists due to the small size of the market and the lack of interconnection with other markets The vertically integrated company Enemalta controls the entire supply Malta has been granted derogation from the implementation of the Electricity Directive	Malta does not have a gas market
Poland	Government is promoting consolidation of generation companies with distribution networks Low switching rates Limited liquidity of gas wholesale markets, with only 1.8% of electricity being purchased by entities other than the distribution companies	Generation segment is not concentrated with the largest two groups (BOT and PKE) controlling about 45% of capacity Although 35% of electricity is tied up in long-term contracts, these contracts are now being restructured
Romania	DSOs also undertake supply	TSO ownership unbundled Relatively unconcentrated electricity generation market
Slovakia	SE produced 84% of electricity, and SPP responsible for the supply of all gas in Slovakia on the basis of import contracts with Gazprom Low switching rates	TSO ownership unbundled
Slovenia	No entry of suppliers into the gas market Gas market is dominated by GEOPLIN which is responsible for shipping, transmitting and supplying either directly or through distribution companies the gas in Slovakia	Electricity TSO is ownership unbundled. Gas TSO is legally unbundled While all of Geoplin's sales are conducted on long-term contracts, these are set to expire in 2007

Source: Internal Market Fact Sheets for Member States published at http://ec.europa.eu/energy/energy_policy/facts_en.htm and European Commission (2007), 'Antitrust: Commission increases competition in the Belgian gas market – frequently asked questions', October 11th, press release available at http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/07/407&format=HTML&aged=0&language=EN&guiLanguage=en.

4 Conclusions

The UK currently has the most competitive energy market in the EU. This, however, implies that the UK also has limited scope for further improvements. Other countries are expected to close the gap as they gradually open up their markets and transpose existing and planned European Commission Gas and Electricity Directives into national law. The UK's major competitor is Sweden, which would overtake the UK in the downside scenario, and has a realistic chance of replacing the UK as the most competitive country. However, in most countries, the dominant positions of incumbent firms are unlikely to change despite the introduction of Gas and Electricity Directives. While several countries are expected to join the comparator group in 2007, without significant changes in market shares or regulatory regimes (for example, the lifting of derogations), none of them will be able to challenge the UK's top ranking in the period 2007–11.

While the UK's top ranking may be threatened by Sweden, achievement of the PSA target appears likely up until 2011.

www.oxera.com

Park Central
40/41 Park End Street
Oxford OX1 1JD
United Kingdom
Tel: +44 (0) 1865 253 000
Fax: +44 (0) 1865 251 172

Stephanie Square Centre
Avenue Louise 65, Box 11
1050 Brussels
Belgium
Tel: +32 (0) 2 535 7878
Fax: +32 (0) 2 535 7770