



# **ERGEG's Assessment of the development of the European Energy Market 2006**

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## Table of contents

<b>1</b>	<b>Introduction .....</b>	<b>3</b>
<b>2</b>	<b>General Assessment.....</b>	<b>4</b>
2.1	The need for enhanced market integration .....	4
2.2	Insufficient Unbundling is the most persistent impediment to competition .....	6
2.3	Independence and Competences of Regulators needs to be improved .....	7
2.4	Market Opening in 2007 – current status? .....	8
<b>3</b>	<b>Electricity .....</b>	<b>10</b>
3.1	Developments .....	10
3.2	Market Design Issues and Market Structure .....	11
3.3	Investment.....	13
<b>4</b>	<b>Gas .....</b>	<b>15</b>
4.1	Developments .....	15
4.2	Market Design Issues and Market Structure .....	15
4.3	Investment.....	17
<b>5</b>	<b>Conclusions.....</b>	<b>18</b>
<b>6</b>	<b>Annex .....</b>	<b>19</b>

## 1 Introduction

Under the Electricity Directive 2003/54/EC (Article 23) and the Gas Directive 2003/55/EC (Article 25), national energy regulatory authorities are required to publish an annual report on the outcome of their monitoring activities related to the functioning of the electricity and gas markets. The 2006 National Reports by national regulatory authorities are mainly an update of the 2005 reports. This ERGEG assessment draws some conclusions from the reports of the national energy regulators and from several additional sources. It also concentrates on changes in relation to ERGEG's preliminary assessment report of last year<sup>1</sup>.

The paper focuses on unbundling, competences of regulators, regional integration and security of supply. It should be emphasized that this is the first report covering a period when legal implementation of the EU-directives should already have been transposed into national law. The report tries to identify general tendencies, without prejudice to possible exceptions in individual cases.

In order to ensure appropriate coherence and consistency among the national reports, and to provide an input to the Commission's own assessment, the European Commission invited the European Regulators to:

- a) ask its members to follow a common structure for their national reports;
- b) coordinate the preparation of the national reports and to ensure consistency of data;
- c) cooperate in the analysis of the individual reports in order to enable an overall assessment of the functioning of the internal energy market
- d) report mainly on changes since last years reports;
- e) focus in particular on **unbundling**.

In preparing their national reports, energy regulatory authorities have received the support of several national institutions.

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<sup>1</sup> A Preliminary Assessment of the European Energy Market by ERGEG (E05-REP-03-04).  
See: [http://www.erggeg.org/portal/page/portal/ERGEG\\_HOME/ERGEG\\_DOCS/NATIONAL\\_REPORTS/2005](http://www.erggeg.org/portal/page/portal/ERGEG_HOME/ERGEG_DOCS/NATIONAL_REPORTS/2005)

## 2 General Assessment

### 2.1 The need for enhanced market integration

The 2006 reports reflect developments in 2005. Most *legal* developments towards full market opening were already visible in those countries which decided to open retail markets in 2007, although the concrete implementation of some procedures, such as customer switching processes or data handling, is still open. The national reports indicate that most concerns raised last year are still relevant, even if some first positive signs of regional integration in many markets can be seen.

Encouraging steps of cross border cooperation are being taken<sup>2</sup> although development is often slow and faces major barriers. In February and April of 2006 ERGEG launched the Electricity and Gas Regional Initiatives respectively. Their intention is to establish functioning and effective regional energy markets as a step which converges towards a competitive single European market. Regional Energy Markets are now established, and the majority are making progress in terms of tackling the key cross border barriers in their regions. Nevertheless it is quite clear that significant differences in progress exist between them. Real implementation of the Regional Initiatives also very often faces challenges because of changing national circumstances, new governments, and national public discussions. The tendency to put regulators under more political control is at present a development that acts against regional integration, where harmonized approaches to cross-border regulation is at the heart of future developments. **There is sometimes a real danger that public declarations of support for regional integration are not followed through with the necessary action.**

ERGEG welcomes any development of enhanced market integration, an issue which was identified in DG Competition's sectoral inquiry as a key barrier to competition. However, ERGEG is concerned that two phenomena may work against further integration. The first is that the current discussion of security of supply in Europe might have a negative effect on the development of open gas and electricity markets. Political support for liberalisation seems to be counterbalanced by perceived risks of being held responsible for potential underinvestment or high prices. Because of the perceived risks relating to security of supply, investment is a major concern to politicians and regulators. This is at a time when the influence of incumbents on

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<sup>2</sup> such as the "Trilateral Market Coupling" project which links three power exchanges (APX, Belpex and Powernext) in the Netherlands/Belgium/France, the Irish market integration project and the Iberian market integration project.

political and regulatory decisions has increased. For instance in order to preserve security of supply, a rate of return higher than is normal incentive might be guaranteed for new investment, or new gas pipelines might seek and probably be granted exemptions from Third Party Access (TPA). It remains to be seen whether the forthcoming investment cycle and potentially increasing security margins in electricity will change the picture again

**More and more the cornerstones of the liberalized markets (access to essential infrastructure, independence of regulators and market based pricing, effective unbundling) are being reconsidered.** Despite high energy prices, rising profits of energy companies and increases discontent of customers, there are many signs of a stronger hold of politics on the technical details and underlying principles of liberalisation, which potentially compromises efficiency by reducing competition. Perceived risks relating to issues of security of supply can politicize energy into a security issue. The result can be the pursuit of national protectionist objectives which undermine the liberalisation process and the single European energy market objective. ERGEG underlines that stronger political commitment is necessary to deliver the next steps of market integration. **The ERGEG Regional Initiatives offer a “springboard” from which the move from the current national markets to regional energy markets and ultimately a Single European energy market can be made, but it depends crucially on the political support of the EU institutions and market actors working alongside regulators.**

Secondly, there was a wave of proposed major cross border mergers. The search for “European champions” might well lead to future market dominance by these new conglomerates despite or perhaps helped by the recently initiated developments towards market integration. The European Commission must be vigilant in applying competition rules so as to ensure that any industry consolidation will bring benefits to European consumers. At the same time, there is a regulatory gap which must be filled in that **regulators are unable to effectively monitor cross border** related unbundling where a single company (which also carries out the TSO function) operating in one company may own subsidiaries in another country, and operate its network in a way to benefit the affiliate in the neighbouring country. Regulators call for new legislation to put in place effective unbundling, including monitoring cross border unbundling.

## 2.2 Insufficient Unbundling is the most persistent impediment to competition

The 2006 national reports clearly show that despite some progress – mainly at TSO level – the status of unbundling of vertically integrated electricity and gas companies is generally still insufficient in relation to the requirements of the directives. **National transposition did not bring about network companies acting independently and with their own identity.**

In April 2006 the EU Commission opened infringement procedures against seventeen countries of which fourteen have not fulfilled their unbundling obligations<sup>3</sup>. The 2005 reports described a situation where unbundling rules in many countries had only been vaguely discussed but by no means implemented into national law or regulations. Some regulators (Germany, Netherlands, etc.) have drawn up guidelines on unbundling in order to improve the existing legal framework. These were welcomed by the market players and used as an orientation guide. The transposition into national law was due in mid 2004, so in most countries at least this process should be finalized.

For the most part the national reports do not point to any major progress since 2004. Many of them show the need for clear legal provisions on management and information unbundling is still unsatisfactory. Vague implementation occurs because legal transposition of the relevant articles of the EU Directives very often allows a lot of discretion on behalf of the integrated companies. Moreover, even if precise rules exist, companies often act without fear of enforcement because of a lack of adequate powers of regulators. **Insufficient unbundling still seems to be the most persistent impediment to competition in electricity and gas.**

Soft factors of unbundling (branding, location, etc) as reported last year are also still not always satisfactory. In Great Britain for instance, the regulator reports energy groups owning both distribution and supply businesses moving towards common branding strategies. Some regulators, however, report significant progress due to new national unbundling laws. Tight legal rules on management and informational unbundling as well as plans to fully unbundled ownership of the network companies and the competitive business(es) are important.

In principle, **EREGEG considers ownership unbundling to be the preferred approach.** However, since not all network companies have the same potential to act in a discriminatory way,

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<sup>3</sup> [http://ec.europa.eu/commission\\_barroso/piebalgs/media\\_en.htm](http://ec.europa.eu/commission_barroso/piebalgs/media_en.htm), press memo 06/152 and IP/06/430 of the 4th April 2006.

the approach adopted in relation to unbundling should be proportionate to the risk of discrimination.

**ERGEG recommends that a European regulation** could be envisaged in order to define in more detail minimum criteria for information and management unbundling as well as monitoring and enforcement of unbundling, including competencies for monitoring cross border ownership links.

### **2.3 Independence and Competences of Regulators needs to be improved**

Independent regulators have to be placed in all Member States so as to guarantee decision making which is independent from industry as well as from political interest. This is necessary as the over-arching aim of regulators should be to protect the interests of consumers<sup>4</sup>.

**The national reports contain some alarming cases where regulators have increasingly had to coordinate decisions with “political” decision-makers; or where politics has had a greater ability to wield influence by other means** e.g. the possibility of the government overruling decisions taken by the regulators, setting returns on capital or giving direct instructions to the board of directors of the regulator<sup>5</sup>. ERGEG had already drawn attention to these problems in the 2005 assessment report, however the situation has, in several cases, developed towards even more political interference. The main reason for this is that in many countries rising prices and tighter capacities have been used to justify an interventionist approach, as the market is perceived not to deliver secure supply at low prices.

**On a national basis, regulators still face problems in fulfilling their tasks of monitoring and data collection.** Enforcement powers in these areas in particular are in most cases inadequate. The potential consequences of non-compliance are often not proportional to the potential gains when companies do not provide the data. They are either too small (small fines) or too drastic to justify (withdrawal of a licence). The consequence is that whilst regulators can by and large fulfil

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<sup>4</sup> This aim of protecting the interests of consumers is discharged by a combination of regulating network monopolies, driving forward the introduction of competition and monitoring its progress, and exercising oversight of the proper separation between networks and competitive parts of the industry. In the context of a competitive European energy market, these aims take on a European context. This means that national regulators' competencies must be compatible and complementary to develop the EU energy market.

<sup>5</sup> The ERGEG report on “Compatibility of National Legal Conditions Concerning Regulatory Competencies (see footnote 5 below) identifies the EU countries where the relevant Ministry retains some powers to approve, reject or amend regulatory decisions, and where the relevant Ministry is in charge of making the final decision on network tariffs.

the task of tariff setting, they are not able to cover the whole range of ex ante regulation and ex post monitoring foreseen by the Directives. In some countries, however<sup>6</sup>, the possibility exists to issue turnover related fines.

ERGEG concludes that the Directives are not sufficiently explicit in these areas, such that **national discretion in implementation leads to an unsatisfactory situation as regards the adequate enforcement of regulatory decisions. In general, powers given to regulators need more harmonization.**

This is also necessary to facilitate cross border co-operation, which should be a core defined duty of regulators. As highlighted by CEER in its Response to the Energy Green Paper, a “regulatory gap<sup>7</sup>” on cross-border issues exists in Europe – regulatory powers and collaboration across-borders needs to be extended in order to ensure the necessary co-ordination for the development of an Internal Energy Market in Europe. Building on this, the ERGEG report on “Compatibility of National Legal Conditions Concerning Regulatory Competences” reviews the powers of electricity regulators at both the national and cross border/EU level<sup>8</sup>. It outlines the “in principle” set of powers and competences that national regulators should have, identifies the gaps between the reality and the desired set of competencies, and makes recommendations on how to close these gaps. The recommendations include levelling up a minimum set of competencies and powers for each national regulator on independence, enforcement and sanctions; regulation of monopoly activities; unbundling; and oversight of market rules and efficient market functioning.

## 2.4 Market Opening in 2007 – current status?

The national reports paint a mixed picture vis-à-vis the readiness for full market opening in July 2007. Regulators report that about one third of the Member States have already fully liberalized gas markets whereas about half have done so for electricity. In general, most regulators – taking into account the necessary uncertainty – believe or at least hope that liberalization should be effective by the 1 July 2007 deadline. However, technical details are still unresolved in some cases, such that households’ ability to freely choose their supplier in July 2007 cannot be

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<sup>6</sup> such as Great Britain or Hungary.

<sup>7</sup> The “regulatory gap” not only refers to the powers of regulators. New legislation and regulatory measures are also needed to facilitate the development and operation of an integrated EU grid and to deliver effective unbundling of network companies.

<sup>8</sup> “Compatibility of National Legal Conditions Concerning Regulatory Competences” (E06-REM-08-03), Dec. 2006. [http://www.ergereg.org/portal/page/portal/ERGEG\\_HOME/ERGEG\\_DOCS/NATIONAL\\_REPORTS](http://www.ergereg.org/portal/page/portal/ERGEG_HOME/ERGEG_DOCS/NATIONAL_REPORTS)

guaranteed. **Furthermore, price regulation for household prices still impedes the development of a competitive market<sup>9</sup>.** The provisions on public service obligations contained in the Directives (art.3) have only been partially implemented in most Member States.

Legal market opening (in 2007) will only be the first step towards working competition in retail markets as in reality markets need time to develop in addition to technical rules being put in place.

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<sup>9</sup> End-user price regulation which keeps customer prices artificially low can lead to customers staying with their incumbent supplier on regulated tariffs rather than switching supplier.

### 3 Electricity

#### 3.1 Developments

The national reports contain for the first time information on regional integration. It is clear that after such a short time horizon any conclusion can only be preliminary. However, since the launch of the ERGEG Electricity Regional Initiative (February 2006), there are encouraging signs of market integration in some regions.

A comparison of the correlation between power exchanges over recent years shows that prices on the continental plate are reacting much better to cross border “shocks” than before – i.e. the correlation of prices has increased (figure 1)<sup>10</sup>. Even prices in regions such as the Iberian Peninsula seem to be more in line with the continental prices than only one year ago. There may be diverse reasons for increased correlations such as better allocation of scarce capacity, the CO<sub>2</sub> trading system constituting a common cost factor, more homogeneous production structures on the margin, etc. On the other hand, even in the rather well integrated Nordic market prices still differ (figure 2). During 2005 the Nordic countries formed a common price area for almost 32% of the time. This example shows that price differences may persist even in rather well integrated markets.<sup>11</sup> Persistent price differences are signals for new investment in interconnection capacity.

Better integration is mainly due to **more efficient market based allocation** of cross border capacities as well as to **more liquidity on transparent wholesale markets**. Physical and purely financial traders play an important role in this integration process. The decision of the European Court of Justice<sup>12</sup> found that priority treatment of old long term contracts is in conflict with the Internal Energy Market Directive. The subsequent implementation of this decision by regulators has already led to visible improvement of capacity allocation.

Transparency is key to more efficient trading. ERGEG has proposed “Guidelines on Information Management and Transparency” in electricity (wholesale) markets. **There is a need for European standards (mandatory Guidelines or a regulation) on minimum transparency requirements**, as progress by voluntary agreement of the industry will (almost necessarily)

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<sup>10</sup> See Figures in Annex A.

<sup>11</sup> Market splitting was used to optimize dispatching in the region under these circumstances.

<sup>12</sup> ECJ 07.06.2005, C 17/03, Vereniging voor Energie, Milieu en Water (VEMW).

proceed very slowly and will not cover all necessary information. The recent improvement of information provision at the German power exchange is an important first step towards more transparency. In a broader context information management in network companies as well as important market players has to be improved so as to guarantee a level playing field for all competitors.

In some cases, power exchanges have a role to play in disclosing price sensitive data to the market. Several regulators (in co-operation with competition authorities) use reference price models as an indicator as to whether an investigation into bidding behaviour is warranted. Transparency is also therefore crucial for monitoring and analyzing the market. Free access to detailed information will also enable third parties such as researchers deepen their understanding of market behaviour.

In most of the countries household energy prices (total prices excluding network tariffs as well as all levies and taxies) are higher than industrial prices (figure 6). However, in some cases industry prices are higher than households. Where there are only small price differences, this can possibly be attributed to fiercer competition for small customers than for large customers. Higher price differences, on the other hand, could indicate non market based pricing for either the industry or households. The fact that electricity household prices exhibit the highest differences in Europe also indicates that these prices do not always reflect market conditions. **This empirically supports the ERGEG view that regulated consumer prices often distort competition and should therefore be abolished or, where appropriate, brought into line with market conditions.**

### 3.2 Market Design Issues and Market Structure

Concentration has not visibly decreased since the 2005 National Reports (figures 3 and 4). If retail markets are taken to be national, the corresponding figures exhibit quite low concentration measures in some countries. However, retail markets (for small customers) are very often geographically restricted to the network area of the incumbent<sup>13</sup>.

In order to reduce the market power of nationally dominant producers virtual power production (VPP) has been introduced in many countries as a remedy to the negative effects of proposed

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<sup>13</sup> In these cases national concentration ratios are not meaningful.

mergers. Although useful, VPPs and other measures have proven to be insufficient in producing a competitive environment and should therefore be increased. Congestion and tight supply can even reinforce the market power of major companies, since typically only they have the means to alleviate grid problems or to provide balancing energy.

Alternatively, successful market integration can reduce market shares in relevant markets. As national measures to restructure the industry in order to increase competition are quite rare, enlarging and integrating markets seems more promising – although several measures to better integrate markets had no or insignificant impact on the size of the relevant market.

A wave of major cross border mergers in 2006 dominated public discussions. Such mergers can result in a situation where even market integration will not fundamentally change the competitive pressure on companies because they already hold major market shares across the border. Integration might, as a consequence, not affect concentration. ERGEG is concerned about the fact that mergers develop much faster than market integration, such that any merger assessment warrants a very carefully balanced judgement of the advantages for integration and disadvantages for competition in future integrated markets. Any new legislative framework must also keep pace such that cross border unbundling issues can be properly monitored.

**The aim of ERGEG's Electricity Regional Initiative<sup>14</sup> is to facilitate market integration.** ERGEG proposed seven (electricity) regions in Europe where major bottlenecks in the transmission system have to be overcome, and where integration has to be based on formal cooperation between the relevant players. The basic problem of insufficient transmission capacities between markets is still unresolved, leading to major inefficiencies in power production in Europe as well as to higher than necessary power prices for European customers. This is the reason why many of the regions are primarily concentrating on interconnection in the first phase. **Political commitment to the ERGEG Regional Initiative is necessary.**

The examples of the Nordic market as well as the newly established “Pentalateral Forum” in the North Western Region demonstrate the advantage of political support and coordination of regional initiatives. Unfortunately, it seems that as long as the gas and electricity sectors are seen to be strategic, despite the existing directives, **Members States generally still tend to**

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<sup>14</sup> [http://www.ergereg.org/portal/page/portal/ERGEG\\_HOME/ERGEG\\_RI](http://www.ergereg.org/portal/page/portal/ERGEG_HOME/ERGEG_RI)

**protect national champions.** Entering foreign markets therefore becomes a political question, which can easily be seen in most cross border merger cases.

ERGEG, as well as the European Commission, has to play an important role in overseeing a unified and harmonized approach to market integration. That said, some differences will always exist which will allow some form of competition between systems, and adjacent countries could in principle eventually join “successful” regions and leave less efficient settings. It was explicitly highlighted by ERGEG that existing initiatives (such as the all-island project between Northern Ireland and the Republic of Ireland, the Nordic market or the Trilateral Market coupling project) should not be slowed down by the ERGEG initiatives. It will also be a challenge for lead countries in the regions to integrate the new Member States in ongoing projects.

### 3.3 Investment

The issue of security of supply is at the forefront of public interest. The European electricity industry is facing a new investment cycle. Although there are major differences between the number of announced projects and the amount of actual new power plants on line, UCTE figures point to an increase in reliability margins in Europe. This is also supported by the last UCTE adequacy report, where a possible mismatch between reference margin and remaining capacity has been postponed by three years to 2013/2014<sup>15</sup>. Many capacity additions which were “doubtful” last year are now assessed to be “confirmed”.

**Investment projects still face major administrative burdens which make them lengthy and add significant project risks.** There is an open question as to whether “green field” projects will also come on line as planned in contrast to past “brown field” investment. Until now many capacity additions have been due to refurbishment of existing power plants. A quite unforeseen trend is the re-use of oil and power stations which had been mothballed in the past. In the UCTE the total increase in installed capacity is forecast at between 50 and about 100 GW by 2015 depending on the status of the projects. The latter amount of investment would be necessary to provide the same level of system adequacy as today. Major investment is, for instance, undertaken in Italy (some 15 GW until 2009) possibly reducing import flows and resulting in a reduction of electricity flows from northern to southern Europe. In 2005 Italy already showed a slight surplus in peak power availability.

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<sup>15</sup> ETSO however draws a slightly less comforting picture for the European market including UCTE, GB, Ireland, Nordel and the Baltic countries.

Despite encouraging investments in Europe, local or regional situations are in some cases less than satisfactory. In this respect, ERGEG also supports new interconnection between the regions. It seems, however, that investment in interconnection is lagging behind the level required.

The national reports show a variety of different means to foster investment in generation capacity. Some countries use capacity payments of different kinds. However, there is neither a common view on the necessity nor on the best way to facilitate and increase investment. National measures that constitute state aid can easily distort competition and should therefore preferably be put under the scrutiny of European competition authorities.

## 4 Gas

### 4.1 Developments

One of the major barriers to entry into the gas market is the limited supply of natural gas. There is some evidence that liquidity at some gas hubs is increasing and new hubs are established as trading points (e.g. VTP in Italy), however the fact that there are physically only three major exporting countries/regions to the EU market (Russia, Norway and Algeria) limits potential competition. Trade is still mainly done via the old beaten tracks. As regards the size of exporters, big importers clearly enjoy considerable advantages. A new organization of import for smaller supply companies has not been found yet. But even if competitive supply can be organized, the **lack of transparency and efficient use of capacity separates markets even further.**

The increase of LNG was mentioned in the 2005 reports as one of the most promising developments regarding access to gas. However, market segmentation makes competition in small countries very unlikely. Even in bigger countries like Germany and France, competition on a national scale is developing very slowly. **The market share of incumbents is still very high as they also control critical infrastructure (pipelines, LNG terminals etc). Gas release programmes have helped slightly to enable new suppliers (mainly foreign incumbents) to enter the retail market on a limited regional basis and should therefore be reinforced.** The usefulness of these release programmes also depends on the adequate availability of transportation capacity to suppliers.

**Again, in the gas market in some countries industrial prices are higher than household prices indicating the distorting effects of regulated prices** (figure 5).

### 4.2 Market Design Issues and Market Structure

**The gas markets are even more concentrated than electricity markets** (figures 3 and 4). As indicated above, there are some economies of scale when negotiating with big exporting countries. ERGEG and CEER support the idea of extending the principles of liberalization by building a common regulatory space around Europe. However, many producer countries will still be outside this area. Ensuring a level playing field in terms of access to markets and infrastructure based on the principle of reciprocity would be to the benefit of all trading partners.

Furthermore, due account should be taken of the risk of abuse of market position resulting from dependency on a single supplier.

Within the EU traditional channels of bilateral contracts, as already stated in ERGEG's assessment of 2004, still dominate the market. Mergers are internalizing contractual arrangements of risk allocation into newly established conglomerates. This bears the risk that even after limiting the extent of long term contracts the degree of competition will not change. Independent activities of market players within countries are still quite rare or even negligible. **The gas industry is still a “closed shop” of former incumbents.**

One of the major questions which has to be answered urgently in this scenario is how the European Union can guarantee non discriminatory access to gas in a secondary market after the gas has been imported or produced? **Integration and the development of regional hubs is a source of re-trading and thus access to gas within the borders of the EU.** However, the question of how to achieve enough liquidity at these trading hubs has to be addressed.

Access to transport infrastructure is slowly improving. Access to storage infrastructure, which is necessary to procure the necessary flexibility in supply, is not generally competitive, such that increased efforts have to be undertaken to improve the market design in that respect. If real competition cannot be created, “storage” might have to be re-evaluated and non-discrimination and transparency more strictly enforced in the future.

**Market integration across borders is the objective of the ERGEG Gas Regional Initiative** (launched in April 2006). However the integration process is still at the very beginning. High levels of concentration prove to be even more restrictive in tight supply conditions. ERGEG therefore underlines that **even very tight regulatory regimes will not lead to functioning competition if concentration remains at present levels.**

Gas prices are currently still mainly pegged to oil prices in various forms. Oil price changes therefore trigger rather uniform changes in gas prices in Europe. Only those countries where LNG or indigenous production plays a major role have the possibility to show gas market driven price developments. The experience in Great Britain, however, shows that market integration with the continent, necessitated by reduced indigenous production, has the capability to “import” a closer relationship with oil prices.

### 4.3 Investment

**Huge gas demand increase is forecast for the coming years and investment in gas infrastructure is lagging behind.** Indigenous production is projected to decline (for resource reasons but also because of lengthy bureaucratic procedures for new explorations such as in Italy). Many regulators report difficulties in keeping up with investment needs. Some regulators have therefore (for a limited period of time) introduced a higher return on investment for new pipeline, interconnection and storage projects in order to foster additions to capacity. The alternative approach is contracts-based mainly resting on long term contracts and exemptions from Third Party Access (TPA). **The method for consistently and reliably handling investment needs in natural gas seems to be one of the key decisions which will influence the functioning of the European gas market in the future.** ERGEG will therefore develop guidelines for the regulatory treatment of Article 22 exemptions.

## 5 Conclusions

This report, ERGEG's Assessment of the development of the European Energy Market 2006, clearly indicates that further development towards integrated and competitive electricity and gas markets is confronted with several challenges. Four major issues have been identified. ERGEG will in its work programme next year<sup>16</sup> focus, *inter alia*, on the main issues raised in this report:

- Unbundling,
- Market design issues concerning market integration,
- Independence and enforcement powers of regulators as well as the treatment of regulatory gap issues,
- A coordinated approach towards necessary investment.

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<sup>16</sup> [http://www.ergreg.org/portal/page/portal/EREGEG\\_HOME/EREGEG\\_DOCS/EREGEG\\_WORK\\_PROGRAMME](http://www.ergreg.org/portal/page/portal/EREGEG_HOME/EREGEG_DOCS/EREGEG_WORK_PROGRAMME)

## 6 Annex<sup>17</sup>

Figure1: Correlation of base load day-ahead prices

<b>2002</b>	<b>APX</b>	<b>EEX</b>	<b>NORDPOOL</b>	<b>OMEL</b>	<b>POWERNEXT</b>
APX	1				
EEX	0.67	1			
NORDPOOL	0.23	0.04	1		
OMEL	0.26	0.52	-0.50	1	
POWERNEXT	0.65	0.83	0.08	0.55	1
<b>2003</b>	<b>APX</b>	<b>EEX</b>	<b>NORDPOOL</b>	<b>OMEL</b>	<b>POWERNEXT</b>
APX	1				
EEX	0.68	1			
NORDPOOL	0.24	0.20	1		
OMEL	0.37	0.48	-0.33	1	
POWERNEXT	0.69	0.88	0.15	0.52	1
<b>2004</b>	<b>APX</b>	<b>EEX</b>	<b>NORDPOOL</b>	<b>OMEL</b>	<b>POWERNEXT</b>
APX	1				
EEX	0.71	1			
NORDPOOL	0.12	0.35	1		
OMEL	0.41	0.47	-0.03	1	
POWERNEXT	0.72	0.91	0.29	0.50	1
<b>2005</b>	<b>APX</b>	<b>EEX</b>	<b>NORDPOOL</b>	<b>OMEL</b>	<b>POWERNEXT</b>
APX	1				
EEX	0.83	1			
NORDPOOL	0.50	0.53	1		
OMEL	0.50	0.56	0.30	1	

<sup>17</sup> Whenever countries are not mentioned in the graphs 3 to 6 either data was not available (i.e. the regulator has no information on these categories) or not applicable (for instance Cyprus has no gas industry, so gas categories are not applicable). Data refers to 2005.

Figure 2: Percentage of time with different whole sale electricity prices in the Nordic Market

2005		NO1	NO2	SE	FIN	DK1	DK2
		Lower spot price than:					
NO1	Higher spot price than:		17	3	4	4	2
NO2		17		2	3	8	3
SE		18	17		1	6	0
FIN		24	23	8		9	7
DK1		51	53	47	47		42
DK2		28	29	17	17	15	

Source: NVE

NO1: South Norway, NO2: North Norway, SE: Sweden, DK1: Denmark (Jutland), DK2: Denmark (Zealand), FIN: Finland.

Figure 3: Market share of 3 biggest companies in wholesale markets (electricity: by capacity; gas: by traded volumes)

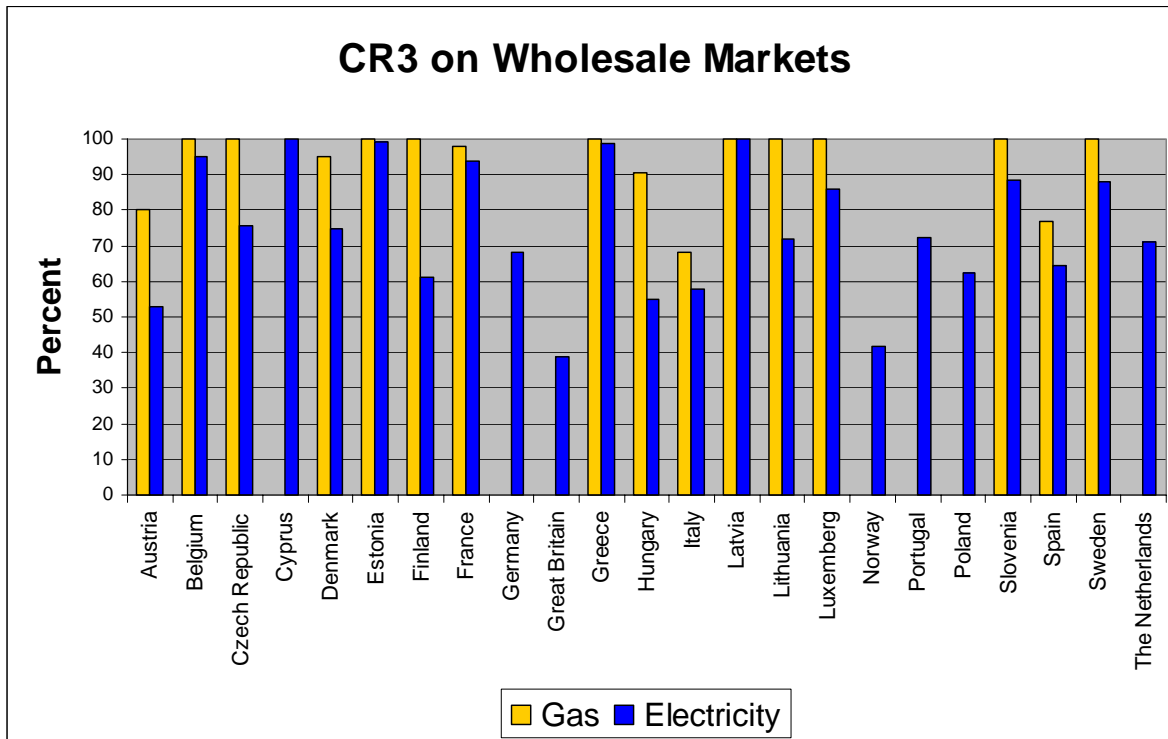
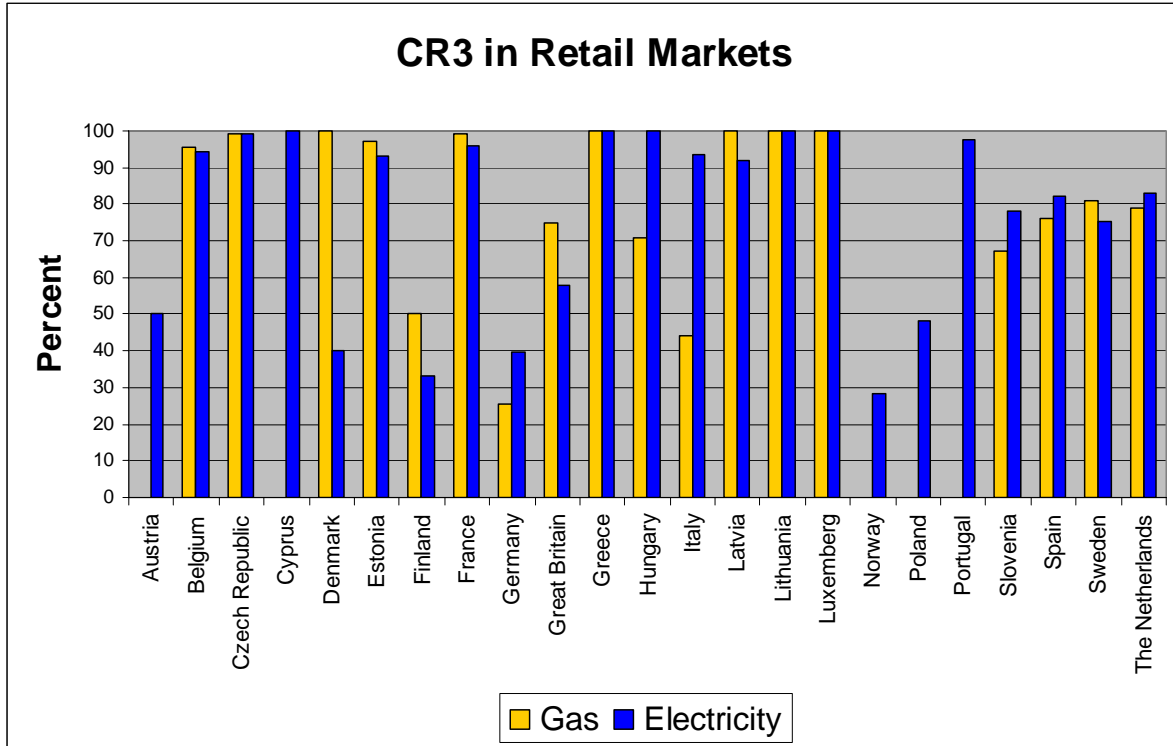


Figure 4: Market share of 3 biggest companies in retail market (households & small commercial customers)<sup>18</sup>



<sup>18</sup> CR3: Concentration Ratio of the 3 biggest companies.

Figure 5: Pure Gas Prices in the EU (without taxes, levies and grid charges)

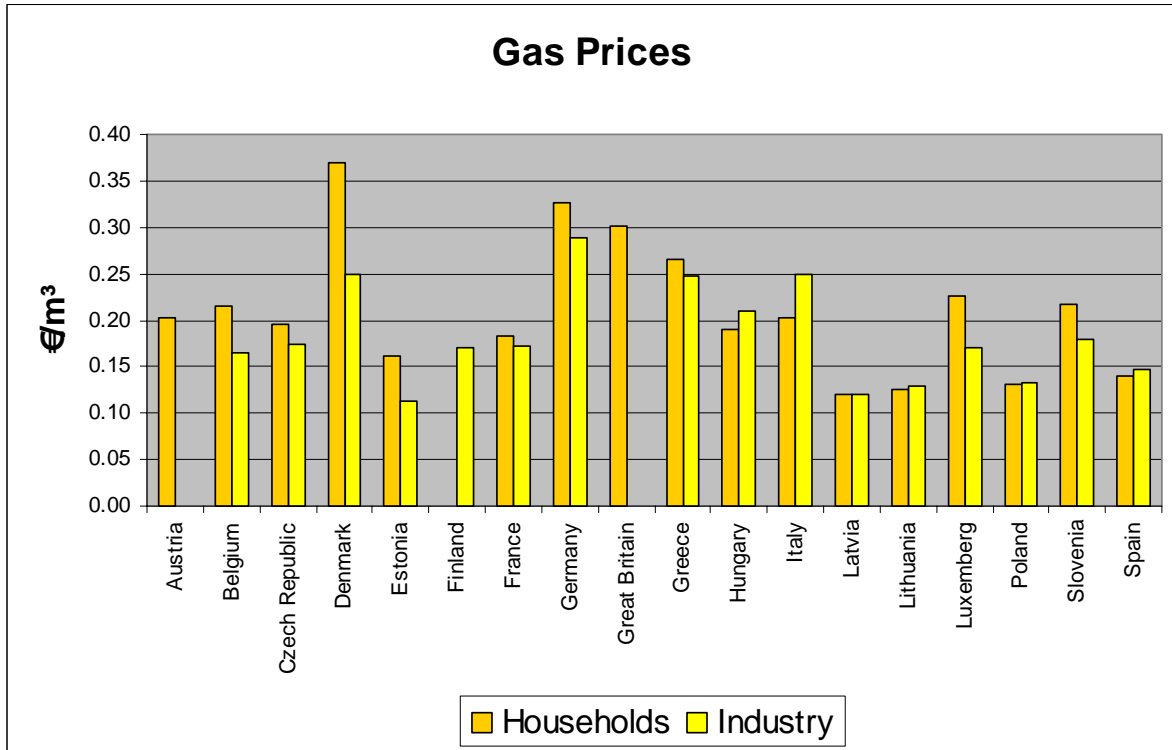


Figure 6: Electricity Prices in the EU (without taxes, levies and grid charges)

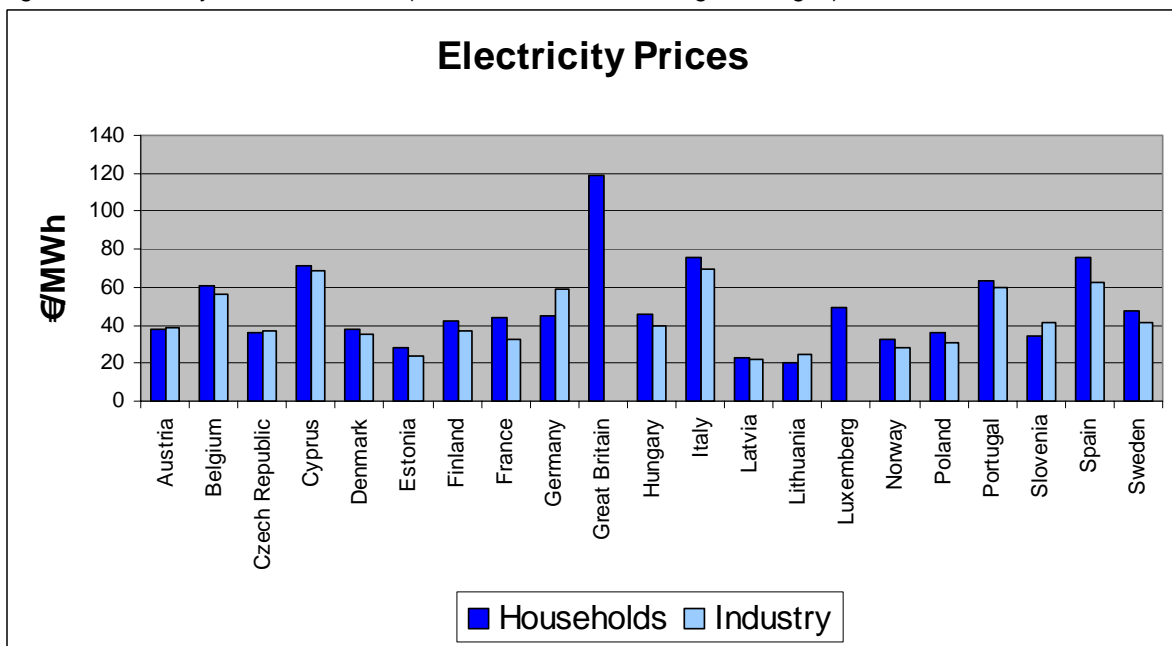


Figure 7: System Adequacy Forecast 2006-2015 (UCTE): Comparison to the Report 2005-2015

