EU Energy Markets in Gas and Electricity - State of Play of Implementation and Transposition
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Abstract

It is the aim of the European Union to make natural gas and electricity market opening fully effective and to create a single EU market.

The present study assesses the opening and completion of the internal energy market through stocktaking of the current status and a critical assessment of the likely policy challenges ahead.

The study undertakes a sectoral review of implementation and transposition of the 2nd energy package and discusses the 3rd energy package. It gives an assessment of the road ahead and recommends needed policy steps.
This document was requested by the European Parliament's Committee on Industry, Research and Energy (ITRE).

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**LINGUISTIC VERSIONS**

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LIST OF ABBREVIATIONS

ACER  European Agency for the Cooperation of Energy Regulators
APX   Energy exchange operating in the Netherlands, UK and Belgium
Belpex Belgian Power Exchange
CEER  Council of European Energy Regulators
CCS   Carbon Capture and Storage
CEGH  Central-European Gas Hub
CNE   Comision Nacional de Energia
DSO   Distribution System Operator
EEX   European Energy Exchange
ERGEG European Regulators’ Group for Electricity and Gas
ERI   Electricity Regional Initiative
ENTSO-E European Network for Transmission System Operators for Electricity
ENTSOG European Network for Transmission System Operators for Gas
ETSO  Association of the European Transmission System Operators
EuroPEX Association of European Power Exchanges
EXAA  Energy Exchange Austria
GIE   Gas Infrastructure Europe
GRI   Gas Regional Initiative
HHI   Herfindahl-Hirschman Index
ICE   Intercontinental Exchange
IPA   Interconnection Point Agreement
IPEX  Italian Power Exchange
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>ISO</td>
<td>Independent System Operator</td>
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<tr>
<td>ITO</td>
<td>Independent Transmission Operator</td>
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<td>LNG</td>
<td>Liquefied Natural Gas</td>
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<td>LTC</td>
<td>Long Term Contract</td>
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<td>MAD</td>
<td>Market Abuse Directive</td>
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<td>MIBEL</td>
<td>Iberian electricity market</td>
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<td>MIBGAS</td>
<td>Mercado Ibérico del Gas (Iberian Gas Market)</td>
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<td>MiFID</td>
<td>Financial Instruments Directive</td>
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<td>MS</td>
<td>Member State</td>
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<td>NBP</td>
<td>National Balancing Point</td>
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<td>NP</td>
<td>Nord Pool</td>
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<td>NRA</td>
<td>National Regulatory Authority</td>
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<td>OBA</td>
<td>Operational Balancing Agreements</td>
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<td>OMEL</td>
<td>Spanish power exchange</td>
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<tr>
<td>OS</td>
<td>Open Session</td>
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<tr>
<td>OTC</td>
<td>Over-The-Counter</td>
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<td>PIP</td>
<td>Priority Interconnection Plan</td>
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<td>Polpx</td>
<td>Polish Power Exchange</td>
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<td>PSV</td>
<td>Punto di Scambio Virtuale</td>
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<td>PWXT</td>
<td>Powernext, French power exchange</td>
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<tr>
<td>RES</td>
<td>Renewable energy source</td>
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<tr>
<td>RI</td>
<td>Regional Initiatives</td>
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<tr>
<td>SSO</td>
<td>Storage System Operator</td>
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<tr>
<td>TEN-E</td>
<td>Trans-European Energy Networks</td>
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</table>
TPA  Third-Party Access

TSO  Transmission System Operator

TTF  Title Transfer Facility

UIOLI  Use It Or Lose It
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EXECUTIVE SUMMARY

Background

Against the background of increasing demand in the future, the dependency on external supply including the possibility of supply disruptions, as well as the risk of excessive price volatilities, the efficient functioning of energy markets in Europe is of paramount importance.

The aim of the community efforts in the field of energy markets is to complete the existing regulatory framework to make market opening fully effective and to create a single EU natural gas and electricity market with fair competition between companies, and lowest possible energy prices for citizens and industry.

Aim

The European Parliament Committee on Industry, Research and Energy (ITRE) has requested the present study on "EU Gas and Energy Markets – State of Play of Implementation and Transposition".

It is the aim of the study to assess the opening and completion of the internal energy market through stocktaking of the current status and a critical assessment of the likely policy challenges ahead. In addition, the study undertakes a sectoral review of the state of implementation and transposition of the 2nd package and discusses the 3rd package on the internal market for gas and electricity, presented in September 2007 in light of identified problem areas, with a view to giving an assessment of the road ahead and to recommend needed policy steps.

Though the implementation of the current 3rd package is yet to be completed (Member States must comply with legislation by 3 March 2011), the study discusses the evidence that led to the tabling of the 3rd package, as developed in the impact assessment accompanying it. Furthermore, the study addresses policy requirements going beyond the 3rd package.

The study is based on key documents of the European Commission as well as on independent sources. It thus reflects all main views in the area, and provides independent critical assessments.

Status of market liberalization and integration

The integration and liberalisation of EU markets in the field of gas and electricity is a challenging task, given the complexity of national structures, legislations, and international markets. While some progress has been made in the last years, there are still a number of areas and Member States where the existing legislation of the 2nd internal market package adopted in 2003 with implementation deadlines until 2004 and 2007 for distribution system operator (DSO) unbundling has not been properly implemented, or where the need for yet new legislation has become apparent. Therefore, the current challenge concerning electricity and gas markets is at least twofold: while following up on deficits of the implementation of the 2nd Electricity and Gas Directives, the 3rd energy package, adopted in July 2009 also needs to be implemented and followed up on – further shortcomings could reveal a need for additional measures at EU level for the completion of the internal market.

Electricity and natural gas markets have certain aspects in common, while for a number of factors a differentiated view is necessary.
Progress has been made in the competences allocated to the National Regulatory Authorities (NRA) and in their independence, in both electricity and natural gas. Nonetheless, regulators have not yet harmonized competences concerning capacity allocation and congestion management mechanisms.

Major problems are the lack of effective enforcement action by competent authorities and the absence of effective systems of penalties at national level. Also, there is a significant lack of autonomy on the part of ‘independent’ regulatory agencies.

The 2nd package places clear obligations with respect to consumer rights for transparent, simple, and inexpensive procedures for dealing with their complaints. This obligation has not yet been transposed in many Member States.

**Electricity market**

The level of liberalization of European electricity markets has increased during recent years. Nonetheless, liberalization is not as advanced as anticipated when the 2nd energy package was adopted, and the variance between Member States is still large. In comparison, the telecommunications market that is perceived to be the most liberalized of the utility sectors has only a slightly higher level of liberalization, but virtually no national variance.

The concentration in national electricity wholesale markets varies from moderate to high. While incumbents’ dominance on national markets is hard to decrease, market concentration can be lowered by enhancing market integration.

There are a number of power exchanges in Europe, and market designs differ. At least partial harmonization of market designs (for instance gate-closures) is required in order to achieve a single EU electricity market.

**Wholesale electricity prices in Europe are not uniform.** Correlations between regional electricity prices are increasing as more interconnectors between regional markets are built. The stage of physical market integration based on interconnection capacity and efficient trading regimes on interconnectors varies, but is generally well below the EU objective of 10% of national markets.

**Insufficient unbundling of network companies, notably DSOs,** remains a big obstacle to competition.

Paramount obstacles to network investments from the transmission system operator’s (TSO) point of view are the rigid authorization procedures in the Member States that can take up to eight years. In addition, the accommodation of renewable energies requires major investments, and the introduction of smart metering and smart grids, which have more effect on DSOs than on TSOs, will require time and significant resources. These requirements are not easy to combine with the NRAs’ pursuit of low and stable tariffs.

**Retail market integration is still in its infancy.** The most advanced Nordic regulators aim at launching a common Nordic retail market in 2015.

**Retail competition is still weak.** 57% of the households in EU-27 plus Norway still have regulated end-user prices, which is a major obstacle to competition. Also industrial customers enjoy regulated prices in at least France, Spain and Norway, which is an obstacle for wholesale market competition.

**Annual customer switching rates vary among Member States between zero and 20%** (by volume). Barriers to switching are the lack of available information and the lack of consumer interest.
National technical standards do not seem to constitute a great barrier to market integration anymore today.

**Natural gas market**

Natural gas imports are dominated by long term contracts (LTC), where in general the pricing is coupled to the price of oil. Trade within Europe is dominated by over-the-counter (OTC) deals on physical and virtual hubs. Exchange trade is still marginal and very illiquid, except for the mature UK market.

Considerable price differences exist between Member States, due to both differences in energy prices and taxes.

Physical and contractual congestion occurs both between countries and between different markets within countries. Congestion and, related to it, lack of market integration are the main barriers for new entrants. Third party access, mainly to import capacity, cross-border capacity and storage capacity is still restricted.

LNG provides flexible, but limited import capacity, with new capacities in planning. Third party access (TPA) is in most cases practically non-existent during the first decades of operation of import terminals as they are locked-in by the consortium building them. However, some countries require TPA for at least a minority of capacity.

Gas storage capacity is currently neither sufficient to guarantee security of supply nor to ensure competition through sufficient liquidity. Since 2007, significant capacity has been built and if all planned projects were to be finalized, a substantial increase in capacity would be achieved.

Legal/ functional TSO and DSO unbundling is implemented, except in those countries that received derogation. However, management independence remains a problem in DSOs.

Investments in natural gas infrastructure are a high risk venture with long-term perspectives and low rates of return. In Europe, the regulatory framework elements vary among Member States with regulators allowing more or less attractive returns on capital.

Retail markets are still very concentrated, only the Italian market is only moderately concentrated. Competition is very limited in retail markets. Switching rates are relatively low, especially for household consumers. Barriers to switching are the switching procedure, the information available, and consumer interest due to a lack of awareness of switching rights.

Technical standards remain slightly more of an obstacle in natural gas than in electricity for cross border trade, and in cases even for intra-Member State trade.

**Critical Analysis of the 2nd and 3rd packages**

Based on the experiences made with the implementation of the 2nd package, an equally slow and tedious implementation process of the 3rd package may be expected. It is recommended that the European Parliament closely monitors the implementation of the 3rd package and keeps pressure on the Commission (and regulators to the extent possible) to enforce the implementation.

Powers and tasks of NRAs vary a lot for the moment, but will be more harmonized after the 3rd package is transposed. Monitoring harmonized implementation will be important in this respect.
**Regulated prices** for both private households and industry, notably in electricity and including electricity-intensive industrial customers, are still abundant. They are a significant obstacle to efficient and fair competition and hinder market entry and infrastructure development. Tariff regulation should be eradicated with priority on industrial users by proper implementation of the 3rd package.

**Electricity market**

Access to networks and cross-border infrastructure is crucial for the integration of national markets, and for reducing barriers for new market entrants. Information provision by TSOs and capacity allocation systems on cross-border interconnections to optimize network use is lacking or insufficient. In general, coordination and cooperation across borders is inadequate. In these respects, the 2nd package is not properly implemented.

**Regional Initiatives (RI) have been established on a voluntary basis without connection to the 2nd package.** Allocation of costs from regionally important infrastructure investments has proven to be problematic. During the relatively short time in which the RIs have been operational, there has been real progress in transparency, capacity allocation, and congestion management. RIs offer a possibility to test practices and solutions before starting the implementation all over Europe. **The 3rd package will introduce obligations for regulators and TSOs to cooperate regionally.**

According to the new Electricity Directive the geographical area covered by each regional cooperation structure may be defined by the Commission. RIs should be defined on a case by case basis depending on the issue. They should be consistent with a coordinated European objective and harmonized wherever possible. RIs should improve the involvement of Member State governments.

**Natural gas market**

Natural gas RIs have quite different initial situations, approaches and foci than electricity RIs. In the 2nd package infrastructure planning was left to the RIs and to voluntary cooperation, which did not prove sufficient. In the 3rd package regulators and Member States are obliged to cooperate on a regional level, and regional network development plans will be drafted.

**Potential 4th package**

The 3rd package, if properly transposed and implemented together with independent ongoing activities, will considerably advance liberalization and market integration on a European level. At the present stage, it is too early to judge whether this will be sufficient or whether a 4th package will be necessary.

An issue that may develop in the future is the need for [additional competences for the European Agency for the Cooperation of Energy Regulators (ACER)](https://www.acer.europa.eu) to ensure that it will be able to play its role in creating a more integrated market. It is recommended that the European Parliament monitors and studies this closely.

A potential 4th package could also address the [guidelines and codes for market design](https://www.acer.europa.eu) should the work currently undertaken not deliver the desired results.

The 3rd package has not introduced ownership unbundling on a distribution level. The impact assessment accompanying the package, however, contains several arguments for a [further unbundling of DSOs](https://www.acer.europa.eu). If the producers of renewable energies continue to experience problems in grid connection in the future, a 4th package might have to address this issue.
The Financial Instruments Directive (MiFID) and the Market Abuse Directive (MAD) that currently regulate the markets do not contain specific transparency and integrity obligations applicable to traded energy markets. However, the NRAs must have access to data on transactions in the same way as the system users need the data on network use, generation, storage, and consumption. The Committee of European Securities Regulators (CESR) and the European Regulators’ Group for Electricity and Gas (ERGEG) have suggested that a framework carefully tailored to the needs of particular energy and energy derivatives markets should be designed.

The Lisbon treaty provides a possibility for enhanced cooperation of Member States in the field of energy as long as it does neither “undermine the internal market or economic, social, and territorial cohesion”, nor jeopardize trade relations nor distort competition between them. It remains to be seen whether a group of Member States would wish to proceed in this direction.

**Infrastructure investments**

It is an open question whether the currently developed Trans-European Energy Networks (TEN-E) guidelines will provide the required infrastructure incentives. This area should be closely studied after their finalization by the end of 2010.

The EU 20-20-20 target includes the reduction of primary energy consumption by 20% until 2020. An increase in natural gas consumption without violation of this target seems unlikely even if natural gas replaces coal in power generation. There have been indications that resource constraints in supplier countries may not allow to increase or even maintain current consumption levels in natural gas over the next decade. However, for the EU expected accumulated output losses will most likely reduce EU gross domestic product by 10% in 2020, compared to projections before the economic crisis. **While at the moment it is unclear what the projected gas demand will be in the next decade, required additional infrastructure investments for system or market integration may not be justified on a strictly market basis.** Infrastructure planning at EU level should analyse these constraints in more detail, and take them into account.

Similarly, increasing penetration levels of renewable energies will require additional investments in electricity and gas infrastructures from a reliability or security of supply perspective without necessarily increasing traded volumes. Justification of investments is difficult in view of possibly lacking return on investment. Additionally, **beneficiaries of these infrastructures may well spread over a large region.** **Mechanisms for cooperation should be developed and implemented to achieve their construction.**

Furthermore, **market integration has specific issues related to increasing renewable energy shares.** Currently, investments in renewable energy sources aim for maximum subsidies, which lead to a sub-optimal allocation of investments into regions with weaker renewable resources and thus higher generating costs. Hence, **harmonised support schemes would avoid distorted investment decisions and possibilities for gaming.** In addition, it is recommended to include incentives in the support schemes for renewables to react to system conditions and system requirements.

**In essence, infrastructure investments required for security of supply, increasing renewable energy shares and market integration may need additional incentives beyond market economics.**
1. Status Quo of European Energy Markets

This chapter describes electricity and gas market characteristics and the current implementation status. Electricity and gas markets are discussed separately, and are further subdivided into wholesale and retail markets. Finally, electricity and gas markets are briefly compared.

1.1. Electricity

1.1.1. Wholesale Markets

**Physical market integration**

An essential prerequisite for internal market is that national and regional markets are adequately connected, and that these interconnectors are efficiently used. National grids have often been developed by single state-owned companies for internal transmission needs. Since transmission infrastructure investments are large and life spans long, the altering of national transmission systems to a pan-European grid takes time.

In 2002 the EU agreed, that the minimum interconnector capacity between Member States should be at least 10% of the Member State’s installed generation capacity. However, a rigid threshold value for cross-border transmission capacity does not take into account different geographies and actual transmission needs, which are determined by price differences between regions. One way to measure the adequacy of transmission capacity is the magnitude of congestion rents. EC points out, that congestion rents on the electricity markets are still high [EC 2009a]. This suggests that investment in cross-border transmission capacity should be increased. Map 1 compares regional electricity consumption and cross-border transmission between regions. In 2006, Baltic countries were practically totally unconnected to the other European power system. Nowadays there is a power cable between Finland and Estonia, and there are plans for another cable between these two countries and a cable between Sweden and Lithuania or Latvia. Another example of insufficient interconnection capacity exists between France and the Iberian Peninsula, where crossing the Pyrenees faces technical and environmental challenges.

Main policies to increase cross-border capacity include the TEN-E (Trans-European Energy Networks) guidelines\(^1\) specifying which projects are eligible for EU funding under the TEN-E budget line, and a priority interconnection plan\(^2\) (PIP) which sets out five main priorities:

- identifying the most significant missing infrastructure up to 2013 and ensuring pan-European political support to fill the gaps
- appointing European coordinators to pursue the most important priority projects
- agreeing on a maximum of five years within which planning and approval procedures must be completed for projects that are defined as being of European interest under the TEN-E guidelines
- examining the need to increase funding for the trans-European energy networks, particularly in order to facilitate the integration of renewable electricity into the grid
- establishing a new mechanism and structure for transmission system operators, responsible for coordinated network planning.

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\(^1\) Decision No 1364/2006/EC

\(^2\) IP/A/ITRE/ST/2009-14

IP/A/ITRE/ST/2009-14

PE 433.459
Many of the electricity infrastructure projects of European interest have faced delays. Delays are most often caused by the complexity of planning and other authorisation procedures, but also local opposition and varying regulatory regimes on either side of the border. The lack of cooperation between transmission system operators also causes delays. PIP identified the following three transmission links as the most important infrastructure projects encountering significant difficulties:

- high voltage electricity connection between France and Spain
- Baltic and North Sea offshore wind connections
- The northern Europe power link (between Germany, Poland and Lithuania)

European coordinators were appointed for these projects in September 2007. The aim is to boost projects that have faced technical, political or financial difficulties [EC 2008]. Coordinators’ work is still ongoing, but some progress has been made. For instance for the northern Europe power link, the project development company LitPol Link has been established and an investment plan is under preparation.

In March 2009, the EU set aside €3.98 billion to assist European economic recovery. In December 2009, the Commission agreed to support Carbon Capture and Offshore Wind Projects with €1.5 billion. In March 2010, the Commission decided to grant €910 million for 12 electricity interconnection projects and €1,390 million for 31 gas pipeline projects3. The EU will co-finance parts of these projects with up to 50 %. The electricity and gas infrastructure projects selected reflect the energy priorities of the EU, and will help to better interconnect all EU Member States and to reduce the isolation of remoter parts.

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Policy Department A: Economic and Scientific Policy

Map 1: Electricity consumption and exchange in regions in Europe in 2006

Source: Reproduced from [EC 2008]

Note: (Excluding Malta, Cyprus and other insular territories). Countries belonging to several regions have been counted in the region to which they have the strongest physical connection. Switzerland has been included in the Central Western Europe region and Norway in the Northern Europe region.

In 2006, European Energy Regulators (ERGEG) launched the Regional Initiatives as a way to move from national markets to regional energy markets. The RIs has created 7 regional markets for electricity and 3 for gas. Regions for electricity are presented in Table 1; countries can participate in several regions. Through these regions, specific barriers to trade and competition are tackled by each country working with its neighbours. In addition to the coordination of regional development, the main objectives in the RIs are increasing market transparency and harmonising capacity calculation and market rules.
Table 1: Regions in the Electricity Regional Initiative.

<table>
<thead>
<tr>
<th>Regions</th>
<th>Countries</th>
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<tr>
<td>Central-West</td>
<td>Belgium, France, Germany, Luxemburg, the Netherlands</td>
</tr>
<tr>
<td>North</td>
<td>Denmark, Finland, Germany, Norway, Poland, Sweden</td>
</tr>
<tr>
<td>France, UK &amp; Ireland</td>
<td>France, the United Kingdom, Ireland</td>
</tr>
<tr>
<td>Central-South</td>
<td>Austria, France, Germany, Greece, Italy, Slovak Republic</td>
</tr>
<tr>
<td>South-West</td>
<td>Austria, Czech Republic, Germany, Hungary, Poland, Slovak Republic</td>
</tr>
<tr>
<td>Central-East</td>
<td>Austria, Czech Republic, Germany, Hungary, Poland, Slovak Republic, Slovenia</td>
</tr>
<tr>
<td>Baltic</td>
<td>Estonia, Latvia, Lithuania</td>
</tr>
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</table>

Trading regimes for interconnection capacity

ERGEG recognises that differences in trading regimes and in the calculation, allocation and the management of the available capacity are the primary obstacles to the efficient use of existing capacity. In fully integrated electricity markets harmonised rules for capacity allocation methods and other trading regimes are needed. The target model for day-ahead markets is market coupling/splitting. Several regions have already used these mechanisms effectively, but the state of market development varies. In the ERGEG Regional initiatives Progress Report from November 2009, it is concluded that coordinated capacity allocation and the management of congested interconnection capacity improved in all regions [ERGEG 2009a].

Market coupling/splitting is nowadays used in the Nordic countries, on the Iberian Peninsula, within the Trilateral Market Coupling Area (France, Belgium and the Netherlands), the Czech Republic and Slovak Republic. There are also two borders without congestion (Austria-Germany and Ireland-Northern Ireland) [ERGEG 2009c]. Belgium, France, Luxemburg, Germany and Netherlands (CWE region) are planning to implement a day-ahead flow-based market coupling mechanism. This requires also the harmonisation of gate-closures in respective exchanges.

In 2009, ETSO and EuroPEX published a report “Development and Implementation of a Coordinated model for Regional and Inter-Regional Congestion Management”. The main conclusions were as follows [ETSO 2009]:

- The electricity regional initiatives have made good progress to date, but the overlapping regional approach is now becoming a barrier to market coupling solutions.
- Few examples of market integration initiatives between regions exist and a more coordinated approach is needed if existing initiatives are to adequately align at the pan-European level.

---

4 Market splitting is a cross-border trading and congestion management method where the available transmission capacity on all interconnectors between bidding areas is utilised by an implicit auction. The mechanism ensures that the market balance between supply and demand per bidding area automatically is determined by the combination of bids and offers in all bidding areas, and that the available transmission capacity is utilised efficiently.

Market coupling is a mechanism, which uses implicit auctioning involving two or more power exchanges. The mechanism ensures that all the available trading capacity is utilised with power flowing towards the high price area.
• More “top down” direction is needed to foster further and more coordinated progress at the inter-regional and pan-European levels, but it is equally important to maintain the current progress of “bottom up” initiatives led by TSOs and power exchanges.

Prices and price convergence
Wholesale electricity prices in Europe are not uniform. While some of the most significant price drivers are the same for all European regional or national markets, local demand/supply conditions still make a major contribution to prices. Common price drivers for all exchanges are coal, gas and CO2 prices. In areas with large hydropower production capacity, the hydrological situation does have a large impact on prices. Each market area has its own composition of electricity generation plants, and these are utilised in merit order (in the order of variable costs: plants with the lowest variable costs are utilised first).

Figure 1 shows day-ahead spot price behaviour in major European power exchanges in the first quarter of 2009. Main reasons for the price divergence are dissimilar generation capacity and bottlenecks in transmission capacity between market areas. The Italian power prices are the most separated ones, and the high level of prices is mostly explained by insufficient generation and interconnection capacity, and the fact that Italy’s power generation capacity is mostly fossil-fuel based. There is a high correlation between German and French power prices, which indicates that these markets are reasonably well interconnected. In regions where hydropower production is large (Spain and Nordic countries) intra-week (and intra-day) variations are smaller. The low level of Nordic prices is explained by the large hydropower production, which is usually around half of the consumption.

Several recent research reports state that the correlation of European day-ahead power prices is increasing:

• In 2008, Ecorys published an analysis of the European wholesale energy markets [Ecorys 2008]. For exchanges over the period of 2002-2007, Ecorys found a clear increase in traded volumes, market participants and price correlations among various exchanges. Price correlation was 28% in 2002, and increased to 67% in 2007. It was also concluded, that an increase in physical connection capacities and market coupling initiatives had been increasing liquidity and price correlations in the European power market.

• In January 2010, ESMT Competition Analysis published a report about German electricity wholesale market integration and competition. German power prices from the years 2004, 2005, 2008 and 2009 were compared with its neighbouring countries’ power prices. The analysis showed that correlations increased or remained stable. The report was commissioned by RWE AG [ESMT CA 2010].
While spot power prices reflect the momentary supply/demand situation, forward power prices are influenced by forward fuel prices, cost of new generation capacity or capacity retirement, water reservoir levels, weather trends, interconnector capacities, CO₂ prices and economic growth [EC 2007a]. Asymmetries in forward prices reflect market participants’ expectations of differing spot prices (differences that cannot be equalised in cross-border trade).

The development of European power and commodity forward prices for the year 2011 is presented in Figure 2. German and French power prices are quite similar, while the Nordic price follows the same trend but the level is lower. Again, this can be explained by large hydropower production and restricted transmission capacity to continental Europe. Nordic prices follow coal prices closely, because coal usually is the marginal production technology in Nordic power exchange. In continental Europe, marginal technology is either gas or coal, and both these prices affect power prices. The price of emission allowance affects all power prices.
Policy Department A: Economic and Scientific Policy

**Figure 2: Development of electricity, coal, gas and emission allowance forward prices for 2011**

![Graph showing the development of electricity, coal, gas and emission allowance forward prices for 2011.](image)

**Source:** Respective exchanges; gas, coal and CO2 price from EEX

**Competition and market concentration**

While there are thousands of companies working in energy markets in Europe, a number of large international companies have emerged since electricity sector liberalisation. Considering EU-wide electricity generation, six power companies dominate the markets: French EdF, German E.ON, Italian Enel, Swedish Vattenfal, German RWE and French GdF Suez (Figure 3). These companies have generation assets in several European countries, and most of them have also some assets outside European borders.

**Figure 3: European and Russian power generators 2008, TWh/a (Fortum 2010).**
In 2005, the Commission launched a sector inquiry to identify the barriers preventing more competition on energy markets. Although significant progress had been made, markets remained mainly national and highly concentrated and there was relatively little cross-border trade. Gas and electricity prices had significantly increased, and there were persistent complaints about barriers to entry market and on limited consumer choice.

One of the key conclusions of the Sector Inquiry published in 2007 was that concentration in wholesale electricity markets was high in certain areas, especially on national markets [EC 2007a]. Generally, market concentration in national electricity markets still remains high. Map 2 shows Member States classified according to HHI-indices\(^5\). Only 8 out of 25 Member States have only moderately concentrated national markets, 12 countries have very highly and 5 highly concentrated markets. Historical power market development explains high concentration figures. Before the integration and liberalisation process, vertically integrated national or regional energy companies dominated the markets. Since liberalisation, these companies have emerged to be “national champions”, usually state-owned energy companies which own a major part of electricity generation and transmission infrastructure.

However, reported figures were calculated for capacity, since this information has been readily available in the NRAs’ databases. Capacity ownership does not always correspond to the actual situation in competition in price setting [VTT 2009]. Some market actors own and report capacity that is not used in normal market situations. Volume-based concentration figures are not easily achievable, since actors do not have to report produced volumes. Moreover, different types of capacity have different characteristics, and easily adjustable capacity-like hydropower opens up more possibilities for the owner to manipulate power prices than capacity-like nuclear power or wind power.

Market integration is seen as an essential means to reduce market concentration. For some regions, national concentration figures are insignificant, since power prices are settled in larger market areas. This is the case for most parts of the Nordic electricity market. However, integration does not always lead to lower concentration figures, since major energy companies have generation assets in several countries.

\(^5\) Herfindhal-Hirshman index (HHI) describes market concentration. It is the sum of squared market shares of individual companies. The HHI assumes values between zero and 10,000, with high values indicating high market concentration. An HHI of 10,000 is a monopoly, an HHI of 5,000 represents two market participants of 50% market share each, five equal market participants yield an HHI of 2,000.
The high degree of concentration on electricity markets has lead to vigilant merger controlling by the Commission. The Commission has prohibited the acquisition of GDP by EDP and ENI\(^6\), and it has imposed significant remedies on EdF/EnBW\(^7\) and on GDF/Suez\(^8\). In 2007, the Commission has also opened proceedings against EdF and Electrabel due to concerns that they could be foreclosing access to customers in France\(^9\) and Belgium\(^10\), through the use of long-term supply contracts. In 2008, the Commission received a proposal for commitments by E.ON\(^11\) to settle ongoing antitrust cases. E.ON proposed to sell its electricity transmission system network to an operator which would have no interest in electricity generation and/or supply businesses and to divest 4800 MW of generation capacity to competitors. In February 2010, the Commission approved the acquisition of E.ON’s TSO to TenneT (Netherlands’s TSO)\(^12\).

**Transmission System Operator unbundling**

The Impact Assessment accompanying the legislative package on the internal market for electricity and gas [EC 2007b] states that ownership unbundling is conducive to

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\(^{9}\) http://ec.europa.eu/commission/antitrust/cases/index/by_nr_78.html#i39_386.

\(^{10}\) http://ec.europa.eu/competition/antitrust/cases/index/by_nr_78.html#i39_387.


\(^{12}\) http://ec.europa.eu/competition/mergers/cases/index/m114.html#m_5707.
infrastructure investments, since vertically integrated companies have distorted investment incentives. These companies may not have incentives to develop the network in the overall interest of the market.

Country-specific characteristics make it difficult to compare investment levels across the EU. One can also compare investment levels over time in those Member States which have unbundled TSOs. Analysis shows that these TSOs have significantly increased the level of investments: three to four years after the implementation of ownership unbundling, investments were doubled [EC 2007b]. Unbundling also seems to have an effect on interconnector investments. However, these investments are only partly affected by transmission company ownership, and the results should be interpreted with caution. Investment barriers are further discussed in the report “Improving incentives for investment in electricity transmission infrastructure” [Frontier Economics 2008].

The Impact Assessment presents some evidence that unbundling has an effect on wholesale market concentration. For Spain, Italy and Portugal, the market shares of the largest generator dropped significantly (in all three countries more than six percentage points) following the implementation of ownership unbundling. However, the causality of the observed relationship between network unbundling and market concentration is questionable. For instance in Spain, transmission network unbundling happened much earlier than deregulation, and was followed some years afterwards by a mergers and acquisitions wave.

Electricity prices are affected by a number of factors other than unbundling (for instance fuel prices, CO₂ price, taxes and environmental fees), and the effect of unbundling is hard to separate from these other factors. However, unbundling weakens the market power of vertically integrated companies and thus potentially has a dampening effect on prices by encouraging efficiency and new entry. It should be seen as a way to achieve a price setting which reflects the real costs of efficient operation [EC 2007b].

In the last couple of years there have been no major changes in the obligations on the unbundling of electricity TSOs in Europe (all Member States have implemented legal and functional unbundling13). Map 3 shows the state of ownership unbundling14 in Europe.

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13 Legal and functional unbundling: Transmission must be independent in terms of organisation and decision making from other activities not related to the network. Transmission has to be done by a separate network company.

14 Ownership unbundling: Separate ownership of the TSO from other activities not related to transmission. Transmission is operated under different ownership than generation.
1.1.2. Retail Markets

In the second edition of the Consumer Markets Scoreboard [EC 2009c] energy markets were named as malfunctioning from the customer's point of view. Retail electricity market was set as the target sector for a follow up market analysis to assess consumer problems in more detail. ERGEG also stated in 2009, that “the national reports showed no major progress on most of the main deficiencies reported on in last year’s ERGEG status review; namely that competition in retail electricity and gas markets is almost non-existent and that insufficient unbundling of network companies remains a big obstacle to competition and security of supply” [ERGEG 2009c].

Electricity prices for customers

End-user prices can be divided into three components:

- In competitive markets, the price of the energy component is determined by wholesale electricity prices and retailer margins. This component varies according to the wholesale price. In 2008, the energy component varied between 3.1-12.4 c/kWh, average energy cost was 6.8 c/kWh. While a large part of the variation is explained with different wholesale prices, also retailer margins vary between Member States. Energy component can be affected by ensuring competitive price formation on wholesale markets and enhancing competition on retail markets.

- Network costs are more similar in different Member States, in 2008, these varied between 2.2-7.5 c/kWh. Average network cost was 4.8 c/kWh. As transmission and
distribution are monopoly businesses, end-user customer’s network costs can be affected by ensuring efficient regulation.

- **Taxes and other levies** vary largely between Member States. The countries with the largest energy prices for household consumers usually have also large PSO-fees (Public Service Obligation) including for instance green electricity feed-in tariff fees. Electricity-intensive industry is often exempted from these levies. This component has been quite stable in recent years, but increases in green electricity fees are expected.

Electricity prices for household consumers vary greatly among the Member States (Figure 4). Highest ranked Denmark, Germany and Italy have long remained high-price areas, whereas in the first half of 2009 household prices were lowest in Bulgaria, Lithuania and Estonia. In 2009, Danish power prices were more than threefold compared to Bulgarian prices. If purchase power parity is taken into account, prices are lowest in Finland, France and Greece and highest in Hungary, Germany and Malta.
For industrial consumers, prices are again highest in Denmark, followed by Slovakia and Italy. Sweden, Bulgaria and Estonia have lowest prices for industrial customers (Figure 5). It should be noted, that Eurostat only gathers and publishes information about industrial customers up to an annual consumption of 150,000 MWh. Largest energy-intensive industrial consumers have annual consumptions reaching several TWhs. These customers participate directly on the power market through exchanges or bilateral trades, and their power prices resemble the exchange price level.

Source: [Eurostat 2009]
The relationship between electricity retail and wholesale prices is affected by a number of factors. Only the energy component of the total retail price is determined by the wholesale price. Variations in network costs and taxes and other levies are usually smaller, but these should be removed when studying how changes in wholesale prices affect retail prices. The pass-through of wholesale price to retail price is different in different markets, and this makes the comparison between Member States complicated.

Even in the Nordic area, which is the single most integrated regional market, there are significant differences in retail price structures [Johnsen and Olsen 2008]:

- Norwegian retail prices closely follow wholesale prices with a low margin.
- Swedish retail prices react more slowly to wholesale price movements and exhibit a larger margin than in Norway.
• Finnish retail prices adjust even slower and for long time periods Finnish retail prices are below the wholesale price level.
• In Denmark, the default electricity supply price is regulated according to the three month forward electricity price.
• In all areas, passive customers (customers who do not change supplier) with a standard default contract face different prices.

In competitive markets, suppliers view the wholesale price as an opportunity cost of their sales to retail customers, and the energy component of the retail price closely follows the wholesale price [Johnsen, T. A. & Olsen, O. J. 2008].

Regulated end-user prices

In a position paper published in 2007 European Energy Regulators ERGEG state, that end-user price regulation in electricity (and gas) markets distorts the functioning of the market and jeopardises both the security of supply and the efforts to fight climate change. End-user price regulation should be abolished or brought in line with market conditions. ERGEG also says that “vulnerable customers” should still be protected, but this should not be confused with guaranteeing regulated tariffs to all customers [ERGEG 2007].

End-user price regulation distorts the market [ERGEG 2007]:

• If regulated end-user prices are not in line with wholesale market conditions (prices), suppliers without significant low cost generation capacities or equivalent LTC will not be able to make competitive offers which cover their supply costs. As there are a limited number of suppliers, there will be no development of wholesale markets. As a result, neither the wholesale nor retail markets will be competitive.
• Regulated prices limit the possibilities and incentives of customers to switch supplier and thereby limit competition in the market. If customers enjoy artificially low regulated prices there will be no incentive to switch supplier.
• The lack of competition on retail markets hampers the customers’ position. It is through exercising their right to choose that customers stimulate retail competition between suppliers. Competitive pricing on the retail side is an important driver for market integration.

Also, the EC Sector Inquiry highlights the concern with regulated tariffs, pointing out that if regulated tariffs are kept low, new entrants are excluded from the market and market players will not invest in new capacity, which is detrimental to the security of supply [EC 2007a].

In 2008, 17 countries had regulated end-user prices for households and 14 countries for other than household consumers. If regulated prices for households had existed, the share of households (by volume) supplied at regulated price would have been 90% in 2008 or above. The total share of households supplied at regulated price was around 57% [EU27 and Norway]. In 2008, the share of non-household customers (by volume) supplied at regulated prices varied widely, the share was between 3 and 100%. In some countries non-household end-user price regulation applies only in some customer categories. ERGEG’s “Status Review of End-User Price Regulation” of 2008 reveals that larger customers switched to free market retail prices more often [ERGEG 2008c, ERGEG 2009b].

Customer response - switching

National regulators report retail market supplier switching rates. However, only some of the countries have been able to provide the data.
Figure 6 illustrates 2007 and 2008 switching rates by volume for the entire electricity retail market. For the countries which have provided the data, usually only slight changes can be observed. Four countries (Cyprus, Estonia, Greece and Lithuania) had no switching at all. In Luxembourg, the switching rate reached 15% in 2007 and then decreased to 8% in 2008. In Austria the switching rate increased from 5.5% to 9.3%.

**Figure 6: Development of annual switching rates in the whole retail market (by volume)**

![Diagram showing switching rates by country for 2007 and 2008](chart)

**Source:** ERGEG 2009c

Large industrial customers are usually eager to change supplier, because larger financial benefits are available there. Therefore switching rates by volume are usually larger than switching rates by the number of customers. Figure 7 shows the development of switching rates for large industrial customers by volume. In many of the countries there was no switching at all for large industrial customers and eight countries showed switching rates between 8% and 19% in 2008. In 2008, the switching rate for Bulgaria was almost 50% due to market opening in the previous year.
Switching rates for households and small industrial consumers changed only slightly from 2007 to 2008 (Figure 8). Switching rates were largest in Great Britain. The Netherlands, Sweden and Norway had also rather high switching rates in both years.

**Figure 8: Development of annual switching rates for small industrial customers and households (by volume)**

Source: [EREGE 2009c]

**Retailer market shares**

National regulators annually report the market shares of the three largest suppliers. The figures differ widely among the countries. In 2009, seven countries reported that the three
largest suppliers had a market share of 100% or slightly below. In four countries this figure was below 50%. The remaining ten countries had shares between 58 and 97% for the three largest suppliers [ERGEG 2009c].

Countries also report the number of companies with at least 5% market share in the electricity retail market. In 2009, these remained almost unchanged [ERGEG 2009c].

In recent years, there have been only minor variations in the three largest suppliers’ market shares or in the companies with at least 5% market share.

Electricity retail markets are quite concentrated. Incumbents have been able to keep their market shares, and there is a lack of new entrants. Similarly to wholesale markets, retail market integration would lower concentration. This requires more uniform market designs.

**Distribution System Operators unbundling**

Most Member States implemented formal legal unbundling of DSOs by 1 July 2007, which was the official deadline. However, many distribution system operators do not yet have their own corporate culture. As ERGEG finds out, these companies use identical logos and they do not have websites of their own [ERGEG 2008d]. The status of DSO unbundling in 2008 is presented in Table 2. Many Member States apply the 100,000 customer exemption (if DSO serves less than 100,000 customers, legal and functional unbundling is not required). The objective of this threshold is to protect small companies with only a few employees, which could suffer from the loss of synergies [EC 2007b].

In principle, ownership unbundling (also for smaller DSOs) contributes to the creation of a level playing field in the retail electricity market. Unbundling eliminates the incumbents’ information advantages, prevents cross-subsidies and ensures fair network access and transparent customer switching process. However, benefits achieved by further DSO unbundling are restricted compared to TSO unbundling, and the Impact Assessment states that further DSO unbundling does not seem to bring sufficient added value at this stage [EC 2007b].

Effective DSO unbundling is a prerequisite for further retail market competition development. While the formal legal unbundling has already been done, in practise DSOs may still be linked with generation and supply businesses.
Table 2: Unbundling of DSOs in electricity

<table>
<thead>
<tr>
<th>Country</th>
<th>Total number of DSOs</th>
<th>Number of DSOs legally unbundled</th>
<th>Application of 100,000 customer exemption</th>
<th>Number of DSOs with less than 100,000 customers</th>
</tr>
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<td>150</td>
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</table>

Source: [ERGEG 2008d Status Review/National Regulators]

Retail market integration

In 2009, the cooperative organisation of Nordic energy regulators NordReg published a joint report about the creation and market design of an integrated Nordic retail electricity market [NordReg 2009]. Nordic regulators aim at launching the common Nordic retail market in 2015. In the common market, Nordic electricity consumers will enjoy free choice of supplier through the internal Nordic electricity market. NordReg states

“that a common Nordic retail market without any significant regulatory or technical obstacles for the suppliers to operate in various Nordic countries would lead to a larger electricity market being available to the suppliers and a potential reduction in their unit costs. The integrated Nordic market would also be more attractive for new entrants. Furthermore, this would increase competition in the retail market and, as the most important result the customers would gain more benefits.”

A prerequisite for integrated retail markets is the common market design of the participating countries. In Nordic markets, end-user market designs are already quite similar, but some incompatibilities still exist. One provision for a common end-user market is the harmonisation of balance settlement procedures. Others include for instance procedures for moving, supplier switching and meter reading.
Nordic markets are the most integrated regional electricity markets in Europe, and the four countries already have fairly similar market designs. Other regions are still trailing behind in integration development, and further integration is not expected in the near future.

1.2. Natural Gas

1.2.1. Wholesale Markets

Import of natural gas

The European wholesale market for natural gas is for the largest part being supplied by imports from a limited number of countries. This market is still dominated by long-term contracts (LTC) between the incumbent gas companies of the consuming states on the one hand and Gazprom (Russia), Sonatrach (Algeria) or Statoil (Norway) on the other hand. In a limited number of countries such as The Netherlands and the United Kingdom there is large but declining domestic gas production. Thus, unless gas demand for electricity generation is significantly supplanted by RES, Europe will become even more dependent on gas coming from outside her borders [Ecorys 2008].

The rationale behind LTCs is that it adds to the security of supply for the consuming countries. Countries remain hesitant to depend on short-term sourcing of a commodity that is of such importance to their economies. For the producing countries, LTCs are often necessary to justify the immense investments required for gas production and export.

Long-term contracts link gas prices to their main substitutes, mainly oil, but in some cases it can also be linked to coal or other energy commodities. In the Box below an example of such a linking formula is shown. This linkage caused a steep rise in gas prices at the end of 2008, following the rise in oil prices with a delay of three to six months. Because a global market for gas is only emerging from short-term LNG deliveries, independent gas pricing on exchanges still needs an increase in liquidity to allow for a dependable price setting free from manipulation. But, for the moment, a large price driver in the wholesale gas market remains the influence of substitute products included in the LTC [Ecorys 2008].
Example of a price formula in Long-term Contracts

\[ P_m = P_o + 0.60 \times 0.80 \times 0.0078 \times (LFO_m - LFO_o) + 0.40 \times 0.90 \times 0.0076 \times (HFO_m - HFO_o) \]

i. The gas price \( P_m \): applicable during the month \( m \) is a function of the starting gas price \( P_o \) and the price development of competing fuels compared to the reference month, in this example: Light Fuel Oil (LFO) and Heavy Fuel Oil (HFO)

ii. 0.60 and 0.40 are shares of gas market segments competing with respective fuels (no dimension):
   - Light fuel oil / Heavy Fuel Oil
   - These shares will be different from the shares of these fuels in total energy use; e.g., the share of heavy fuels used in most European markets is now rather small, however, it remains the best available alternative for most of the gas used for industrial purposes

iii. 0.80 and 0.90: Pass through factors (no dimension):
   - Sharing risk and reward of the price development between seller and buyer
   - Most of risk and reward for the seller (0.80/0.90)
   - May be different for different fuels

iv. 0.0078 and 0.0076: Technical equivalence factors to convert the units of prices for fuel into units of gas price
   - In this example:
     - Gas in kWh (GCV), Fuel oil in t,
     - Dimension: Euro cts / kWh / Euro / t

v. Competing Fuels
   - Quotations reflecting the market
   - With or without taxes on competing fuels
   - Time lag and Reference Period to be defined
   - LFO: Price of Light Fuel oil
   - \( LFO_o \): Price of Light Fuel Oil for starting month \( o \)
   - \( LFO_m \): Price of Light Fuel Oil resulting for month \( m \) (may refer to an average value of previous months depending on reference period and time lag agreed)
   - LFO is usually reflecting competition for medium and smaller customers whose alternative is using Light Fuel Oil (typically small industry, commercial, administration, households).
   - Serving those customers requires also investment into distribution (grid) to medium and small customers, and eventually more instruments to provide the flexibility needed. That would have to be taken into account in the determination of \( P_o \).
   - HFO: Price of Heavy fuel oil
   - \( HFO_o \): Price of Heavy Fuel Oil for starting month \( o \)
   - \( HFO_m \): Price of Heavy Fuel Oil for month \( m \)
   - Reflecting competition for larger customers whose alternative is using Heavy Fuel Oil (typically in boilers)

Source: Energy Charter Secretariat 2007

Natural gas hubs and exchanges

Once gas has entered the European markets, an increase in trading activity has been developing at gas hubs and on exchanges offering gas products. Most of this trade is still dominated by over-the-counter (OTC) activity at hubs. Two types of hubs have been developing, physical and virtual ones. Physical hubs are located on interchanges between two or more gas pipelines. Gas being traded on physical hubs has to pass that interchange,
which can give rise to considerable congestion problems. Examples of this kind of hubs are the Zeebrugge hub in Belgium and the Central-European Gas Hub (CEGH) at Baumgarten, Austria. Virtual hubs consist of large zones where gas input and output is being balanced. Trade is not limited to one particular point in the network, but can be entered and exited at any point in that zone. The best-known and oldest virtual hub is the National Balancing Point (NBP) in the UK, but others are PSV in Italy and TTF in The Netherlands [IEA 2008].

**Table 3: Natural gas hubs and exchanges**

<table>
<thead>
<tr>
<th></th>
<th>Hub</th>
<th>Exchange</th>
</tr>
</thead>
<tbody>
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<td>NBP</td>
<td>ICE, APX UK</td>
</tr>
<tr>
<td>The Netherlands</td>
<td>TTF</td>
<td>APX NL</td>
</tr>
<tr>
<td>Belgium</td>
<td>Zeebrugge</td>
<td>APX ZEE, Endex</td>
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<tr>
<td>Germany</td>
<td>EGT, BEB</td>
<td>EEX</td>
</tr>
<tr>
<td>France</td>
<td>PEG Nord/Sud</td>
<td>Powernext</td>
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<tr>
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</tr>
<tr>
<td>Austria</td>
<td>CEGH</td>
<td>Wiener Börse</td>
</tr>
</tbody>
</table>

Exchanges offer anonymous trading opportunities in standardised gas products and are linked to delivery at hubs. The NBP has gas products on the ICE and APX exchanges and the Zeebrugge hub and TTF also offer products on APX exchanges. Recently, the CEGH has also developed exchange products in cooperation with the Wiener Börse. Trading activity on the exchanges remains very illiquid, except for the ICE in the UK. Most of the trade is still confined to the OTC market [Ecorys 2008].

The increase of trading activity on the wholesale gas market is due to new participants entering the market, looking for gas to supply either themselves or their customers. Since third party access (TPA) to import capacity, either by pipeline or LNG, is still limited, most of the gas being offered comes from incumbent gas companies. They can offer it voluntarily to balance their own position, or be forced to offer certain amounts of gas on the wholesale market under gas release programs. Examples of countries that have implemented such programs are the Czech Republic, France, Italy and to some degrees Portugal [IEA 2008].

**Physical market integration**

In order to develop a functioning wholesale gas market there are prerequisites.

- First, a trading place is needed in the form of a hub, physical or virtual.
- Second, enough market participants are necessary to provide liquidity.
- Third, congestion-free transportation access to the hub has to be available, preferably importing gas from different sources and connections to different markets.

Several countries, mostly on the periphery, lack one or more of these prerequisites for the development of a well-functioning wholesale gas market. The best examples are the Baltic States and Finland where access to different markets is completely lacking. But also the PSV in Italy has problems with congestion-free access to other markets, resulting in limited activity on the hub. For the moment, the area Northern-France, Belgium, The Netherlands,
the UK and Germany has the best-developed transnational wholesale market in terms of liquidity and market participants [Ecorys 2008].

**Figure 9: Gas flows through pipelines (TWh) and priority interconnections**

The lack of market integration still forms a major barrier for further expansion of third party activity on the wholesale gas market. Alternative suppliers that have limited access to primary import capacity into the European market require access to other, diversified sources of gas, together with the guaranteed ability to transport it to their consumers. Additionally, access to storage to account for seasonality is also required. This allows market entrants to avoid buying gas at moments of peak demand.

However, congestion commonly occurs in regard to both the transport and storage capacity. This can be physical congestion, meaning too much gas wants to use the limited capacity. In order to solve this, several countries resorted to open seasons\(^{15}\) to gauge market interest in expansion of existing pipelines or storage, or the building of new pipelines and storage capacity. Examples of these are the interconnectors between France and Belgium, and France and Spain. Both open seasons indicated large interest in additional interconnector capacity, justifying the investment by the TSOs. To deal with existing congestion many countries allocate at least some of the capacity by auctions and pro-rata access, parallel to long-term capacity reservations. The same is being done for storage capacity. Unless impossible due to long-term contracts, part of the storage capacity is released for TPA using auctions or pro-rata.

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\(^{15}\) Open seasons are a two-step process allowing investors to consult the market regarding investment needs for planned infrastructure, and allocation of the resulting capacity on transparent and non-discriminatory terms.
Another occurrence is contractual congestion. This means that although the capacity is not fully utilised, alternative suppliers cannot get access because the capacity is locked-in by previous contracts. To solve this sort of congestion, no expansion of the current capacity is needed, but rather better management of the available capacity. Instruments being implemented here are use-it-or-lose-it (UIOLI) clauses, where TSOs reserve the right to re-allocate unused capacity. Another one is offering interruptible capacity after all firm capacity is allocated. Although this does not offer the same guarantees as firm capacity, at many interconnectors interruptible capacity proves as reliable as firm capacity. A third possibility is the creation of a secondary market in transmission capacity, where companies that have spare capacity can offer it to other market participants [EC 2007a].

**Gas Regional Initiatives**

To overcome the difficulties in creating a single European energy market, the European Regulators Group for Electricity and Gas (ERGEG) created the Regional Initiatives in 2006 to improve market integration. For gas, three regional initiatives were launched, the North-West (NW) region, the South region and the South South-East (SSE) region. The goal is to use this regional cooperation as a first step towards a single European gas market. The Gas Regional Initiatives (GRI) focus on five key issues: investment, capacity allocation and congestion management, transparency, interoperability and security of supply.

**Map 4: Gas Regional Initiatives**

![Map of Gas Regional Initiatives](image)

**Source:** [ERGEG 2009a]

The NW region is the heart of the European gas market and is the most advanced in terms of market integration and hub development. Gas systems are well interconnected although they do suffer from congestion. The focus has therefore been on transparency, interconnection management and increasing border capacity. The most important investment project is an open season between France and Belgium, launched by GRTgaz and Fluxys in April 2007. The Transmission Transparency Project, also launched in 2007, was successfully implemented in 133 interconnection points and helps to estimate capacity availability. It is an agreement between the TSOs to publish daily data on transmission
capacity and gas flows. With regards to interconnection management, Germany, the Netherlands and Denmark launched a secondary capacity platform, so market participants can sell and buy firm capacity\(^{16}\) more easily.

The South region’s main focus for the moment is on two open seasons to increase capacity between Spain and France, and the development of the Iberian gas market (MIBGAS). As the current interconnection between France and Spain suffers from severe congestion, two projects are being developed to increase capacity. The first is to upgrade the existing interconnections at Larrau and Biriatou, and the second is a new pipeline through the eastern Pyrenees. Both open seasons are considered a success by identifying clear market interest in the investment projects.

The development of MIBGAS requires regulatory changes and harmonization of units and nomination. In order to achieve the necessary adjustments, the NRAs of Spain and Portugal are working together to meet the MIBGAS timetable. They have also developed a study on the implementation of a common trading licensing process.

In the South-south-east (SSE) region, both the NRAs and the TSOs are working on closer cooperation. They are examining how transmission capacity can be used more effectively and trying to identify potential harmonisation of contractual, legal and regulatory arrangements. In this way, the NRAs should be able to better apply congestion management at interconnection points.

Additionally, a clear lack of liquidity at these interconnection points was identified as both a barrier to new entrants and a danger to security of supply since it reduces flexibility. To address this issue, several efforts have been made to increase liquidity. One was the Interconnection Point Agreement for the Baumgarten hub. By standardising technical details, the IPA facilitates cooperation between TSOs and trade between shippers [ERGEG 2009a].

**The role of LNG**

The objective of the wholesale market in gas in its current form is the optimal allocation of the existing gas supply. Unlike the electricity market, market participants cannot easily offer additional supplies by simply turning on a generator. Until additional import capacity will have been created, this will remain its most basic limitation.

\(^{16}\) Firm capacity means that the shipper has a right to compensation if his capacity is curtailed. Interruptible capacity on the other hand does not offer such compensation and as such has not the same degree of assurances for a shipper.
In order to overcome this limitation, increasing interest is being given to LNG. While most LNG is being contracted under LTCs, a spot market is developing. This offers the prospect of increasing import capacity in times of large demand by routing LNG-tankers to Europe instead of North-America or Asia. Spain has been at the forefront of this development, sourcing more than 70% of its gas demand by LNG.

Throughout Europe, new LNG installations are being built and planned. The Map 5 above shows the LNG terminals that already exist or were under construction in 2006. More terminals have been planned since 2006: According to Gas Infrastructure Europe (GIE), the association representing gas transmission companies, storage system operators and LNG terminal operators in Europe, there were in October 2009, 11 terminals under construction and/or included under administrative planning and 35 terminals under study or proposed. These data are indicative and it is unclear how concrete and how advanced these plannings are.

While many of these plants will be locked-in by the consortium, building them for some decades, some countries require release of TPA for them for at least a minority of capacity. In Spain, regasification facilities are subject to regulated TPA. Requests are dealt with on a "first come first served" basis, and 25% of the total capacity is allocated to contracts lasting less than two years. LNG terminals in other Member States have applied for exemptions from regulated TPA, either in order to apply negotiated TPA or "own-use" models, allegedly to promote investment.

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17 Gas Infrastructure Europe (GIE) GLE LNG Map dataset; version of October 2009 available here: http://www.gie.eu.com/maps_data/lng.html. It covers all European countries, not EU Members States only.

18 Disclaimer: The data published in the GLE LNG Map are based on publicly available information: Some of the data have been provided by GLE member companies, others come from public source. The data reflect the most probable expectation at the moment. However, under no circumstances shall the data published be understood as any company’s ultimate commitment to execute the project. This is of particular relevance for projects marked as “planned”. Equally, for the projects marked as “under construction”, the expected capacity expansions are indicative and shall not be understood as any company’s commitment.
Currently, LNG represents about 15% of European gas imports and is confined to a limited number of countries. As such, on the short to medium term, it will mainly play the role of limiting the upward movement of gas prices and transferring market power away from incumbents toward new market entrants in countries where it can easily be transported to. Land-locked and peripheral countries will first have to dramatically improve market integration to use LNG as a way of opening up their wholesale gas markets [IFRI 2008].

**TSO Unbundling**

In the wholesale gas market, the current European directive requires the transmission system operator (TSO) to be legally and functionally unbundled from sales activities. While the incumbent gas company can still be the owner of the TSO, this should in no way lead to preferential treatment of the incumbent gas company with regard to operation of the transmission network. In this way, new entrants on the gas market should have non-discriminatory access to gas transmission capacity to order source gas for their own use or their customers. It is therefore important that apart from being legally independent, the TSO should also be functional independent.

Legal unbundling is now implemented in all countries except those that received derogation, such as Latvia, Estonia, Finland, Luxembourg, Cyprus and Malta. There is also a group of countries that went beyond legal unbundling towards ownership unbundling. Hungary, Poland, Portugal, Romania, The Netherlands and the UK have complete ownership unbundling of their TSO. Germany, Italy, Spain and Sweden have several TSOs of which one or more have undergone ownership unbundling [Gomez-Acebo&Pombo Abogados 2005, Annual Reports of the National Regulatory Authorities of the EU27 countries 2009].

**Competition and market concentration**

However, despite the implementation of unbundling in most of the European wholesale gas markets, market concentration is still very high in many of them. The three largest wholesalers still represent more than 90% of the market in 12 countries. Keeping in mind that most of the gas imported is being done by the incumbents under LTCs, this concentration can be expected [EC 2009a].

Moreover, considering that countries such as France and Germany actually consist of two or more markets, market concentration in these sub-markets can be even higher. On the other hand, the region being formed by Northern-France, Belgium, The Netherlands, the UK and parts of Germany can be considered as a nascent integrated wholesale gas market, where actual concentration is lower than the HHI of the individual countries would suggest. Market integration is thus an important factor when considering the exact concentration of different markets [EC 2009b].

**1.2.2. Retail Markets**

**DSO Unbundling**

The European retail gas market has officially been liberalized since July 1st 2007 when all distribution system operators (DSOs) had to be legally unbundled from retail activities. However, countries could choose to exempt DSOs with less than 100 000 customers. France, Germany, Hungary, Poland, Slovakia and Slovenia implemented this exemption. Austria exempted all DSOs with less than 50 000 customers and the Czech Republic chose to exempt DSOs with less than 90 000 customers. Finland, Estonia, Latvia, Luxembourg, Cyprus and Malta also received derogations. Some markets, such as Greece, did implement legal unbundling but still have local, monopolistic concessions in use [Gomez-Acebo&Pombo
Retail market concentration

Despite legal unbundling on DSO level being implemented in most European countries, almost all of them are still highly to very highly concentrated, according to the HHI. Only one country, Italy, has a moderately concentrated retail market with the three largest suppliers having a combined market share of just over 50%. In 14 Member States the three largest suppliers capture over 80% of the retail market, while the other Member States still remain above 60% [EC 2009a].

Figure 10: Concentration on the retail gas market (Source: Capgemini, 2008)

Customer response: switching

In most liberalized markets, the switching rate remains relatively low. In countries such as the Czech Republic, Denmark, Slovakia and Sweden less than 1% of household customers switched in 2008 despite a remarkable hike in gas prices. On the other side of the spectrum, the UK had a switching rate of 19%, the Netherlands 9.1% and Spain 6.1%.
One also has to be careful when looking at switching rates as to whether they count customers or volumes. A recurring trend in all liberalized markets is that large-offtake customers are the first to take advantage of switching to a cheaper supplier. Examples are Italy, where 1.2% of customers changed suppliers but represented 34.9% of consumed volume; and Denmark where 0.6% of customers switched while representing 17% of the consumed volume. The same trend can be seen when comparing households with industrial consumers. As mentioned earlier, 0% of households switched supplier in the Czech Republic but 6.7% of industrial customers did. However, scarce and incompatible data on consumer switching as published by the NRAs prevents a clear comparison between the Member States [Annual Reports of the National Regulator Authorities of the EU27 countries 2009].

Several thresholds for household consumers who would like to switch supplier could be perceived:

- In the first place, consumers are put off by the administrative burden. Many Member States have remedied this by implementing a standardized switching procedure that minimizes consumer input. Consumers only have to contract a new supplier, who in turn will contact the DSO and the previous supplier about the supplier switch.

- Another threshold is the lack of information the customer has about switching possibilities. One reason is the new relationship between the incumbent supplier and the DSO. Customers still fear problems when switching to an alternative supplier that doesn't have ties to the DSO. In several countries the national regulatory authorities (NRA) opened procedures against incumbent gas suppliers that did not differentiate themselves enough from the DSO or encouraged the existing fear of customers.

- The third threshold is the lack of interest, small consumers have in the potential savings coming from supplier switching. However, given a large enough price incentive, a number of consumers will actively start looking for potential savings. A good indication of this was the 2008 gas price hike. In several countries the NRAs found an increase in interest from small consumers for the potential savings of a switch to an alternative supplier, although this did not necessarily translate into an increase in switching, possibly due to the other barriers mentioned above [Annual Reports of the National Regulator Authorities of the EU27 countries 2009].
Retail natural gas prices

In terms of prices, the most remarkable evolution in the retail gas market was the large price hike at the end of 2008, with its sudden decline at the beginning of 2009. This rapid rise in price had a large correlation with the steep rise in oil prices from 2007 to 2008. As mentioned before, the price of gas in the LTC with the producing countries is coupled to the international price of oil, which can be tracked with a delay of three to six months. This sudden increase in the gas price had no justification of its own, since the gas market shared none of the elements that fuelled the sudden rise in oil prices. Moreover, since there is a delay of some months, the peak of the gas price occurred when the economic downturn that collapsed the oil prices was already underway. Partly as a result of that, gas consumption declined in many European markets in 2008 [Ecorys 2008].

Figure 12: Evolution of gas prices (EU27, €/Gigajoules)

Source: Eurostat Energy Database nrg_price, Bands D1 and I3, all taxes included

In most European countries, gas prices consist of three major components.

First, the energy or supply price itself. It was the rise of this component that led to the sudden increase in 2008. This component varies from 30% to 50% for domestic users and 70% to 85% for large, industrial consumers. Unlike the second component, the energy price is unregulated in the liberalized market. However, countries can still choose to implement regulated prices for consumers that remain with the incumbent supplier or the supplier with the largest market share. In markets that are not yet fully liberalized, such as Latvia, Estonia and Greece, regulators opt for regulated prices to counter the lack of competition [Annual Reports of the National Regulator Authorities of the EU27 countries 2008].

The second component is network charges. They include distribution costs, transmission costs and possibly regulation costs. These costs are regulated in all Member States but the implementation of regulation varies. Most of them are a variation on the cost-plus, guaranteed revenue or allowed profit. Often they are combined with an incentive scheme to encourage investment in the network and attain cost reductions.

For an example of how network charges are distributed to final customers, the Spanish system will be described. Every year, the Spanish regulator Comision Nacional de Energia
(CNE) makes a projection of the total revenues of the gas system based on data from the network operators and individualised data from the largest consumers. This data is then broken down by tariff groups to attribute to every group its respective portion of gas consumption. Using pre-defined formulas and using the gas consumption data for every tariff group, each group is allotted a part of the network charges. These network charges are calculated at standard levels and indexed using the Consumer Price Index and Producer Price Index, taking into account investment and operating costs. These charges include the functioning of the TSOs, storage operators and regassification plants. The DSO is remunerated using a revenue cap formula. All these charges, together with other regulated costs such as the CNE levy and the system operator fee, form the network charges to be paid by the final consumers. Using the tariff group data described above, a network charge is set for each group in the form of a fixed charge per kWh or MWh. In this way, each tariff group as a whole pays its part of network costs and each individual consumer pays in relation to its consumption. The prices shown below are the network charges for Spanish consumers as applied to each group for 2008 and include levies for receiving and unloading LNG carriers, regassification, transport and distribution, underground storage, the CNE levy, the System Operator fee and the fee for provisional re-routing. [CNE, 2008].

Figure 13: Network charges by type of consumer

<table>
<thead>
<tr>
<th>Type Consumers (1)</th>
<th>Annual Consumption (kWh)</th>
<th>Access Toll (cent/kWh) (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>D2</td>
<td>23 260</td>
<td>2.44</td>
</tr>
<tr>
<td>H1</td>
<td>116 300</td>
<td>1.23</td>
</tr>
<tr>
<td>I4</td>
<td>116 300 000</td>
<td>0.26</td>
</tr>
</tbody>
</table>

(1) Consumer types according to the new methodology implemented by Eurostat from January, 1st 2008 onwards. Consumer D2: 5 560 kWh < Consumption < 55 600 kWh, H1: Consumption < 278 000 kWh and I4: 27 800 000 kWh < Consumption < 278 000 000 kWh.
(2) Not including taxes.

Source: [CNE 2008]

Network charges vary from 20% to over 50% for domestic users and from 7% to 14% for large, industrial consumers. Since they are regulated, they normally do not fuel price fluctuations in the retail gas price. However, regulators are being confronted with a demand for increasing network charges because of unbundling without clear information on the optimal height of guaranteed revenues or allowed return on investment [Kema 2009, EC 2009a].

The last major component of gas prices is taxes. They consist mainly of VAT taxes, sometimes combined with energy and environment taxes. Because they are more or less stable, taxes are also not a major driver of gas prices.

When comparing retail gas prices for domestic and industrial consumers across Member States, large variations can be observed. Eastern European countries such as Bulgaria, Estonia, Latvia, Lithuania, Hungary and Romania all had low prices prior to 2008. However, Latvia and Lithuania experienced large increases due to the 2008 price hike, while Bulgaria, Estonia and Romania had relatively stable gas prices.
Countries with higher-than-average gas prices were Belgium, Denmark, Germany, France, The Netherlands, Slovakia and Sweden. Countries with remarkable lower than average gas prices were Bulgaria, Estonia, Hungary, Romania and the United Kingdom [Eurostat 2009].
1.3. Differences between Gas and Electricity Markets

Gas and electricity are commodities with differing physical characteristics. These physical attributes are the bottom-line reason for differences in market design and price mechanism. The main differences are:

- Storability. While gas can be stored and used later, the amounts of electricity generated and consumed must be in momentary balance all the time.
- Sourcing. Gas has to be sourced either from a couple of countries within or from outside the EU. Electricity can be generated by a number of different techniques and fuels situated in different locations.

These differences are reflected in the market set-up and the role of the exchanges. In the gas market, hubs and exchanges are mainly focussed on the allocation of the available gas. This means that only the shortfall and excess gas are traded there. For electricity on the other hand, a liquid exchange determines the merit order, replacing former central planning. Many utilities even sell all the generated electricity to the exchange and also buy all further supplied electricity from the exchange. This procedure enhances efficiency in both generation and supply and adds liquidity. In merit ordering, the available power generation plants are ranked in the order of variable costs, and the last plant needed to satisfy the demand determines the price of electricity. In continental Europe, this last plant is usually gas fuelled. This makes a well-functioning gas market also important for the electricity market.
2. Transposition and Implementation

This chapter is divided into three parts. Chapter 2.1. deals with central changes from the 2nd to the 3rd legislative package on the internal electricity and gas markets. The main barriers for implementing the 2nd package common to both electricity and gas sectors are assessed in Chapter 2.2., while separate issues related to electricity and gas are dealt with in Chapters 2.3. and 2.4., respectively. Finally, chapter 2.5. deals with the the fast movers and laggards among Member States in both markets. The conclusions and progress towards complying with the 3rd package are dealt with in the third chapter on forward looking policies.

2.1. Main changes from the 2nd to the 3rd package

This chapter first describes the principal changes relevant both for electricity and gas markets before concluding with more specific changes in the gas sector.

2.1.1. TSO Unbundling

The first Electricity Directive adopted in 1996 called for accounting and management unbundling. The belief at the time was that by separating the accounts and by introducing different separate management structures, the cross-subsidisation of activities could be avoided and more transparency guaranteed. The 2nd energy package called for legal unbundling and for the management staff of the TSOs not to take decisions in other parts of the vertically integrated company. Furthermore, all commercial and operational decisions were to be made within the TSO in order to exclude discriminatory behavior, and a compliance program was to be established.

In the 3rd package the controversial proposal of ownership unbundling was complemented with the ISO and ITO models. In practice, ownership unbundling means that the vertically integrated companies are obliged to sell parts of their assets. However, a legal person can hold shares in both a network operator and a supply undertaking as long as these shares represent a non-controlling minority interest. Independent System Operator (ISO) was referred to by the Commission in the initial proposal as the second best alternative. In the ISO model the companies involved in both production and supply can still hold ownership of the assets, but cannot control the technical and commercial operation. This is left to an independent company (i.e., the ISO). In other words the ISO is fully responsible for operating, maintaining and developing the transmission system and has responsibility for investment planning [EC 2010a].

The independent transmission operator (ITO) model also allows for the integrated companies to maintain ownership of network assets. Separation of the network assets is ensured through a number of conditions that the ITO performing the TSO duties needs to comply with. The ITO must be able to raise finance from the capital market in order to finance its investments. All financial relations and agreements can be controlled by the NRA and certain types of them must be submitted for approval beforehand. An ITO compliance programme to be approved by the NRA is meant to ensure that discriminatory conduct is excluded. A special compliance officer is appointed by the Supervisory Body, subject to approval by the NRA. The Supervisory Body of the ITO is in charge of taking all decisions regarding the management of the ITO and again all decisions must be notified to the NRA. Furthermore, the management of the ITO cannot have held or hold positions in the vertically integrated company for a certain period of time before and after their appointment, or have any other financial relations to the undertaking [EC 2010a]. The two models in addition to ownership unbundling are a result of a difficult compromise. Especially
the ITO-model requires a complex administrative structure and heavy supervision by the NRA.

2.1.2. Distribution Networks

In the 2nd package, DSOs were subject to legal unbundling effective from 1 July 2007. Undertakings serving less than 100,000 clients or operating in isolated systems could be exempted from these provisions by Member States. The 3rd package did not make any significant changes to these rules; however, it abolished charges for switching provider and introduced additional requirements regarding information for consumers. The 3rd package launched the introduction of smart electricity metering and smart grids to make billing more accurate, facilitate small-scale generation, but also as a means to reduce GHG emissions. Subject to an economic assessment,19 up to 80% of consumers should be equipped with such intelligent meters by 2020.

2.1.3. Third party access to network and transparency

The 2nd Directive required a regulated system of third party access that was to be based on published tariffs. This TPA regime was not significantly changed in the 3rd package, except for new requirements on data transparency for gas storage. Market participants are now forced to keep records of their daily operations while existing transparency requirements were extended to cover gas stocks, forecasts of demand and supply, costs of balancing the network and trading.

2.1.4. Third country clause

The 3rd package requires Member States or national regulators to refrain from certifying a TSO from a non-EU country if it could "put at risk the security of supply of the Member State and the Community", thereby leaving a good degree of discretion to Member States. NRAs are required to refuse certification if the acquiring company does not comply with this clause or the unbundling provisions and to notify the European Commission [see also Smith 2009]. Note that the third country clause is to be transposed two years later (i.e., in 2013) than the rest of the provisions.

2.1.5. Powers to national regulators and ACER

The 2nd package required Member States to appoint one or more competent bodies as a regulatory authority, totally independent from industry, but not necessarily separated from government structures. However, the ministry in charge was allowed to review certain of the decisions, e.g., on tariffs. Certain decisions, e.g., exemptions from TPA for interconnectors were subject to approval by the European Commission. There was no obligation for NRAs to cooperate.

With the 3rd package, a single regulatory authority at national level, legally and functionally separated from the government, with own and sufficient budgetary resources must be entrusted with all regulatory duties. This means that a ministry or some other government agency can no longer be in charge of regulatory duties entrusted to the regulator. NRAs have the mandate to investigate, issue binding decisions and to impose penalties on companies.20 They will fix or approve transmission tariffs, terms for network access, balancing services and terms and conditions for access to cross-border infrastructure. Furthermore, the NRA has far reaching monitoring duties in controlling the proper

19 Subject to an economic assessment that must be completed by 3 September 2012.
20 The provisions allow for "effective", "proportionate" and "dissuasive" fines of up to 10% of annual turnover.
management of the ITO/ISOs. NRAs are also required to work closely with other national organisations responsible for the protection of consumers, such as consumer bodies and competition authorities to ensure adequate consumer protection. The new more uniform powers of the NRAs are an important part of the 3rd package.

Another innovation is the Agency for the Cooperation of Energy Regulators (ACER) which will be headquartered in Ljubljana. It will provide a framework for cooperation of NRAs, mainly by requiring them to cooperate on cross-border issues. Each NRA has a representation in the agency’s Board of Regulators. In addition, ACER will issue opinions to the European network of transmission system operators for electricity (ENTSO-E) and to the European network of transmission system operators for gas (ENTSOG) on their work programmes. To ensure consistency of the cross-border networks, it will give opinions and will monitor the implementation of the non-binding 10-year network development plan on the EU-level and the binding national plans. ACER will also monitor the implementation of the Network codes and the regional cooperation of TSOs. The process of preparing the Framework guidelines and Network codes for the gas sector is explained in Figure 16. The same four steps apply to the development of Network codes in the electricity sector except for the fact that they will be developed by ENTSO-E in that case.

**Figure 16: Development of Network codes in the gas sector**

In addition, ACER provides opinions to the Commission and the NRAs and adopts individual decisions on technical issues when this is foreseen in the Directives and Regulations. It can also give binding individual decisions on terms and conditions for access and operational security for cross border infrastructure and grant exemptions from third party access for new major electricity interconnectors or gas infrastructures if they are located in the area of several Member States. Nevertheless, ACER’s decision making power is one of last resort, i.e., it makes a binding decision only in case NRAs were not able to reach a solution in six months or ask for it. During the negotiations of the 3rd package the proposed powers of ACER were not seen as sufficient by the Regulators and the European Parliament. Consequently, the issue of ACER competence and power will remain open to debate in the future.
2.1.6. Co-operation between transmission system operators (TSOs)
The 2\textsuperscript{nd} package did not foresee provisions on the cooperation between national TSOs except for voluntary schemes under the Regional Initiatives (see chapter 2.2.2.). The 3\textsuperscript{rd} package goes further by establishing two new bodies in the form of the European Network of Transmission System Operators for Electricity (ENTSO-E) and for Gas (ENTSOG). Furthermore, the 3\textsuperscript{rd} package requires TSOs to make forecasts and a ten year network development plan for the region, taking into account regional security of supply considerations in addition to developing grid codes through harmonised standards for access and common procedures for booking and allocating network capacity.

2.1.7. Consumer protection
The 2\textsuperscript{nd} package was required from Member States to ensure a high level of consumer protection, transparency of contracts, general provision information and a dispute settlement mechanism. The 3\textsuperscript{rd} package requires consumers to have access to data concerning energy consumption and the composition of the energy mix. Customers also have the right to switch suppliers with three weeks notice and to receive a final account closure at the latest six weeks after the change of supplier. Furthermore, they are entitled to compensation if service quality levels are not met [EC 2010b]. Member States are obliged to create an independent mechanism, i.e., an energy ombudsman or consumer body that will deal with complaints and will facilitate out-of-court dispute settlements.

Member States are obliged to guarantee universal service to all household customers and small enterprises.\textsuperscript{21} The customers will have the right to be supplied with electricity of a specified quality at reasonable, easily and clearly comparable, transparent and non-discriminatory prices. Member States should design National Energy Action Plans or benefits in social security systems to guarantee a necessary level of energy supply to vulnerable customers [EP 2009].

2.1.8. Gas specific (long-term contracts and third-party access to storage)
In the 2\textsuperscript{nd} package, Member States were obliged to designate a system operator for transmission, storage and LNG facilities, which acts in a transparent and non-discriminatory way. DSOs of less than 100,000 connected customers were allowed to be exempted from legal unbundling. This exemption is retained in the 3\textsuperscript{rd} package.

The 2\textsuperscript{nd} directive did not prohibit long-term contracts as long as they comply with the general competition rules. This has been changed in the 3\textsuperscript{rd} package. Although long-term contracts remain important for gas supply, they must be in line with the directive’s overall objectives now. Notably, exemption under Article 22 (Art. 36 in 2009/73/EC) of the 2\textsuperscript{nd} package for major gas infrastructure allowed for the regulator to decide about exemptions from regulated third party access on a case-by-case basis. This has been retained in the 3\textsuperscript{rd} package. Now applicants will have to demonstrate the existence of an open season procedure (see Annex 4) and the exemptions will expire after a five year period.

Significant amendments have been made in regards to third-party access to storage. To date, the gas directive required Member States to define and publish criteria which govern (non-discriminatory) access. The 3\textsuperscript{rd} package requires storage system operators (SSOs) as part of supply undertakings to be legally and operationally unbundled. The Regulation sets legally binding standards for storage facilities, third party access services, capacity allocation, congestion management and transparency. For example, information on gas stocks will be published on a daily basis. The package also defines TPA services, capacity allocation and congestion management.

\textsuperscript{21} With fewer than 50 employees and an annual turnover or balance sheet of less than €10 million.
allocation and congestion management for LNG terminal operators. As a result, the influence of NRAs is likely to grow. Finally, the package promotes access for biogas and biomass.

2.2. Status of implementation of the 2nd package in aspects common for electricity and gas

Since the adoption of the 2nd package on the Internal Energy Market in the year 2003, ERGEG has provided annual status reviews on its implementation. The latest of these reviews was published in 2009 and reports on the year 2008. With 2008 being the first year for transposition of all provisions of the 2nd package, ERGEG gives a gloomy picture of the status quo on retail markets:

“Generally, the national reports relating to 2008 showed no major progress on most of the main deficiencies reported on in last year’s ERGEG status review; namely that competition in retail electricity and gas markets is almost non-existent and that insufficient unbundling of network companies remains a big obstacle to competition and security of supply.” [ERGEG 2009c]

2.2.1. Infringement procedures

Simultaneously with the adoption of the 3rd package in June 2009, the European Commission initiated an infringement procedure against 25 Member States that had not transposed the 2nd package properly. Table 4 shows the infringements per Member State, some of which are further discussed in Chapter 2.5. The Commission identified three major areas where the transposition was seriously lacking behind:

1. The infringements against most of the Member States concern the lack of transparent access to cross-border network infrastructure and the lack of information provided by TSOs and capacity allocation systems to optimise network use. In the electricity sector, the Commission criticised a lack of coordination and cooperation across borders. In the gas sector, inadequate efforts by gas TSOs to make available maximum capacity were pointed out by the Commission [EC 2009a].

2. The existing directives place clear obligations on consumer protection and on consumer complaints. Customers have a right to transparent, simple and inexpensive procedures for dealing with their complaints. The European Commission’s analysis of Member States’ practices showed that in Belgium, the Czech Republic, Germany, Poland, Romania and Slovenia there was no adequate system in place to allow for consumers to settle their disputes according to the requirements.

3. The existing electricity and gas directives do not forbid regulated end-user prices, but Member States must comply with restrictions: The regulated prices should be clearly defined, transparent, non-discriminatory and verifiable. They should not impede EU energy companies’ equal access to national consumers and the opening of the market [EC 2009a]. According to the European Commission, the price regimes of Greece, Poland, Portugal, Romania and Lithuania did not fulfill these criteria.

---

22 The household markets were required to open to full competition by July 2007, i.e., three years later than the industrial markets.

23 Cyprus and Malta do not use gas have no interconnections with other MS and the Baltic states and Finland enjoy derogations concerning gas.
Other infringement cases on regulated prices are pending for Estonia, Ireland, Italy and France [see DG TREN 2009 and 2010].

Furthermore, the European Commission identified a lack of effective enforcement action against the violations of EU regulations by the competent authorities (NRAs). This concerns especially the absence of effective systems of penalties at national level [EC 2009a].

In October 2009 the Commission launched infringement proceedings on gas transit against Belgium and on gas storage against another member state. Also, the Commission's infringement actions have resulted in the European Court of Justice censuring Sweden and Belgium for not correctly implementing the provisions concerning the competences of the NRAs with regard to network tariffs. Moreover, in Case C-475/08 Belgium was condemned for having failed to designate a gas TSO [DG TREN 2010].

---

24 COM(2010)84.
25 Case C-274/08 (Sweden) and case C-474/08 (Belgium).
### Table 4: Infringement procedure 2009/Member State

<table>
<thead>
<tr>
<th>Country</th>
<th>Insufficient information on capacity</th>
<th>Congestion management to be improved</th>
<th>Maximum capacity not made available</th>
<th>Other</th>
<th>Lack of effective penalties</th>
<th>Lack of dispute settlement mechanism</th>
<th>Regulated prices incompatible with EU law</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>E+G</td>
<td>E</td>
<td>G</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Belgium</td>
<td>E+G</td>
<td>E</td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bulgaria</td>
<td>E+G</td>
<td>E</td>
<td>G</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Czech Republic</td>
<td>E+G</td>
<td>E: Intra-day</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Denmark</td>
<td>E+G: transmission</td>
<td></td>
<td>G: forecasts and utilization rates</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estonia</td>
<td>E</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finland</td>
<td>E</td>
<td>E: Nordics, DE, PL</td>
<td>E: forecasts and NRA approval</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>France</td>
<td>E</td>
<td>E: Benelux, DE, IT, AT, SP, UK</td>
<td>G: reverse flow</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td>E+G</td>
<td>E</td>
<td>G</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greece</td>
<td>E+G</td>
<td>E</td>
<td></td>
<td></td>
<td>Unbundling of DSO</td>
<td></td>
<td>E</td>
</tr>
<tr>
<td>Hungary</td>
<td>E</td>
<td>E: Calculation and allocation methods</td>
<td>G</td>
<td></td>
<td>G: Long-term forecasts and utilization rates NRA activity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ireland</td>
<td>E</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Italy</td>
<td>E+G</td>
<td>E</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Latvia</td>
<td>E</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lithuania</td>
<td>E</td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Luxembourg</td>
<td>E+G</td>
<td>E+Data</td>
<td>G: data on entry points</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Netherlands</td>
<td>E</td>
<td>Cross-boarder</td>
<td>G: points for info published G: networks pending ECJ</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poland</td>
<td>E+G</td>
<td>E</td>
<td>G</td>
<td>x</td>
<td></td>
<td>G</td>
<td></td>
</tr>
<tr>
<td>Portugal</td>
<td>E+G</td>
<td>E</td>
<td></td>
<td>x</td>
<td></td>
<td>G</td>
<td></td>
</tr>
<tr>
<td>Romania</td>
<td>E+G</td>
<td>E</td>
<td>G</td>
<td>x</td>
<td></td>
<td></td>
<td>E+G</td>
</tr>
<tr>
<td>Slovakia</td>
<td>E+G</td>
<td>E</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>NRA activity</td>
</tr>
<tr>
<td>Slovenia</td>
<td>E</td>
<td>E</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spain</td>
<td>E</td>
<td>E: PT and FR</td>
<td>E</td>
<td></td>
<td>G: reverse flow</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sweden</td>
<td>E+G</td>
<td>E: Nordic, DE and PL</td>
<td>G products TPA to Baltic cable + SwePol</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UK</td>
<td>E</td>
<td>E: FR and IRL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: [EC 2009a]

**Note:** E stands for electricity and G for gas. X indicates the lack of effective penalties and a lack of a dispute settlement mechanism

### 2.2.2. Powers of NRAs and effectiveness of regulation

The 1st energy package left significant ambiguity as to the different tasks of regulators. The 2nd package introduced more specific provisions, including that there should be one or more authorities, independent from the industry. Regulators’ key tasks were to (i) ensure non-discrimination; (ii) approve methodologies and tariffs that determine the access to transmission and distribution; (iii) monitor transparency and compliance of the TSOs and
DSOs with the Directives (see, e.g., Roggenkamp et al. 2007). ERGEG and CEER have been useful in the coordination of the NRAs’ work on the European level, but have only had a consultative role in preparing legislation.

The most common tasks of regulators include competition, market transparency and consumer protection, but there are quite significant differences between Member States (see Table 5). Competition is usually a shared task with the competition authorities. The NRAs deal with the retail markets, whereas the competition authority focuses on wholesale markets and mergers.

### Table 5: Powers of NRAs in the EU15

<table>
<thead>
<tr>
<th>Country</th>
<th>Competition</th>
<th>Market transparency</th>
<th>Consumer protection</th>
<th>Economic efficiency in the supply industry</th>
<th>Environmentally friendly electricity supply</th>
<th>Security of supply</th>
<th>Socially responsible price policies</th>
<th>Number of objectives (n=7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>5</td>
</tr>
<tr>
<td>Denmark</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>5</td>
</tr>
<tr>
<td>Finland</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>2</td>
</tr>
<tr>
<td>France</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td>5</td>
</tr>
<tr>
<td>Greece</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>7</td>
</tr>
<tr>
<td>Ireland</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>7</td>
</tr>
<tr>
<td>Italy</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td>6</td>
</tr>
<tr>
<td>Luxemburg</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>3</td>
</tr>
<tr>
<td>Netherlands</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>5</td>
</tr>
<tr>
<td>Northern Ireland</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>5</td>
</tr>
<tr>
<td>Norway</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>6</td>
</tr>
<tr>
<td>Portugal</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>6</td>
</tr>
<tr>
<td>Spain</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
<td>5</td>
</tr>
<tr>
<td>Sweden</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>1</td>
</tr>
<tr>
<td>GB</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>4</td>
</tr>
</tbody>
</table>

| No. of countries with the objective (n=15) | 14 | 13 | 13 | 11 | 8 | 7 | 6 |

**Source:** [Hope and Singh 2009]

**Note:** Compiled information on the powers of NRAs for EU 27 is currently not available.

Several ERGEG national reports show an increase in competencies allocated to the NRAs and their independence. However, according to the latest ERGEG status report, regulators are generally not able to ensure effective competition. Regulators lack comparable competencies concerning capacity allocation and congestion management mechanisms, despite the fact that some regulators saw their powers extended, like the Spanish NRA and the Belgian Federal authority. [ERGEG 2009c] concludes that harmonisation of NRA powers would improve the prospect for more competition in the sector.
ERGEG also noted that enforcement of regulatory decisions is one of the biggest problems. According to [ERGEG 2009c] and the European Commission [EC 2009a] infringement procedures launched by the European Commission in mid-2009 for lack of transposition of the 2nd energy package showed this lack of effective enforcement by the competent authorities and the absence of effective systems of penalties at national level. Regulators have stressed that their core duties related to tariff setting, balancing etc. should not be subject to review by the national ministries. ERGEG concludes that “despite new competences, political interference in decisions of energy regulators still remains a concern but is less present than in 2007” [ERGEG 2009c]. Furthermore, it is clear that the imbalance of powers between NRAs leads to insufficient regional and EU level cooperation. This has now been addressed by the 3rd package.

### Table 6: Index of NRA independence

<table>
<thead>
<tr>
<th>Country</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>3</td>
</tr>
<tr>
<td>Luxemburg</td>
<td>3,5</td>
</tr>
<tr>
<td>Italy</td>
<td>4,5</td>
</tr>
<tr>
<td>Denmark</td>
<td>3</td>
</tr>
<tr>
<td>Finland</td>
<td>4</td>
</tr>
<tr>
<td>Belgium</td>
<td>5</td>
</tr>
<tr>
<td>Greece</td>
<td>3</td>
</tr>
<tr>
<td>Sweden</td>
<td>4</td>
</tr>
<tr>
<td>Ireland</td>
<td>5</td>
</tr>
<tr>
<td>Netherlands</td>
<td>3</td>
</tr>
<tr>
<td>France</td>
<td>4</td>
</tr>
<tr>
<td>Portugal</td>
<td>5</td>
</tr>
<tr>
<td>Spain</td>
<td>3</td>
</tr>
<tr>
<td>Austria</td>
<td>4,5</td>
</tr>
<tr>
<td>UK</td>
<td>5</td>
</tr>
</tbody>
</table>

**Source:** [Pollitt 2009]

**Note:** Scores range from 0-5, with 5 representing the highest level of independence

The Authorities’ competences differ from country to country and it is unclear who is actually in a position to evaluate the autonomy of an NRA from a willingness, authority and data point of view. ERGEG is reluctant to make such evaluations and the European Commission benchmarking reports do not deal with the issue either. [Pollitt 2009] has illustrated the progress in introducing an independent national electricity regulator by allocating to the regulatory agency a score from 0 to 5 (with 5 representing the highest level of independence) according to five characteristics 26 which are indicative of its independence from central government. The results of this study are shown in Table 6. According to the study, only Germany has shown significant improvement since 2005, with its score rising from 0 to 3. Furthermore, only 4 countries have a top score, indicating a significant lack of autonomy on the part of ‘independent’ regulatory agencies [Pollitt 2009].

---

26 Scoring: Type of regulation, Ex Ante=1 point, Ex Post=0 points; Network Access conditions set by regulator=1, Other=0; Dispute Settlement by regulator=1, Other=0; Ministry involvement, No=1, General only=0.5, Yes=0; Information powers, strong =1, Other=0. Source: Derived from EC 3rd Benchmarking Report (2004), updated.
2.2.3. Structure of Distribution System Operators (DSOs) ownership

In most Member States the legally unbundled DSOs have more than 100,000 customers. To date around 80% of all consumers are served by DSOs falling under legally unbundled DSOs. However, the exemption from legal unbundling DSOs serving less than 100,000 customers appears to be frequently used by Member States. This is despite the 2008 ERGEG Guidelines of Good Practice on Functional and Informational Unbundling for DSOs, which call for DSOs granting non-discriminatory access to networks and act in full independence of any commercial interests, i.e. this would constitute in fact a step beyond the provisions in the 2nd package.

The 2009 Status Report for 22 European countries came to following conclusions: Consumers are not aware of the requirement of DSO unbundling and expect the companies to be integrated. Network users and competitors to the vertically integrated businesses do not trust the neutrality of integrated DSOs. Especially, the provision of information (time, quality) is a major problem, with only nine out of 21 regulators being satisfied with the handling of commercially sensitive information. Due to the fact that distribution and supply businesses often share employees, informational unbundling seems difficult to guarantee [ERGEG 2009b]. In the electricity sector, the NRAs are willing to provide finance to DSOs for communication campaigns to provide customers with information of the separation between the network and the supply [Eurelectric 2010]. This might be also suitable for the gas sector.

The picture is roughly the same for gas. Many of the consumers are not familiar with the separation requirements and make no distinction between the supplier and the distribution companies. The fact that the different divisions of the integrated companies operate under the same logo, name and website reinforces this. Competitors of the vertically integrated firms do seem to lack trust in the neutrality of incumbents. And the majority of NRAs have expressed their worries concerning vertically integrated undertakings possibility to access commercially sensitive information through the DSO.

The partially good news is that by and large the gas sector is not lagging behind the electricity sector in most countries. While management independence remains a problem in gas, communication is more advanced than in the electricity sector [ERGEG 2009b].

2.2.4. Elements influencing investments and infrastructure planning in gas

Possible obstacles to transmission network investment

The paramount obstacle from the TSO’s point of view is the rigid authorization procedure, which includes an assessment of the environmental impacts of the new lines. In electricity, these procedures can take up to eight years and according to ERGEG case studies, cross-border lines can be at best built within 5-6 years [ERGEG 2008d].

A second impediment is the level of tariffs. Some TSOs claim that the NRA’s pursuit of low and stable tariffs might be in conflict with infrastructure investments, especially when one takes into account the investments needed for ensuring access of renewable energy sources under the 2020 targets [Hellner 2010]. It also appears that even TSOs are affected negatively by the current problems of access to credit, despite their stable source of revenue.

There has been criticism that the European Commissions’ policy of breaking up vertically integrated companies and attack long-term contracts (in order to allow for new entrants to enter the market) has created legal uncertainty with negative effects on investments. Mainly due to the ongoing modernisation of EC competition law and the parallel limited
number of precedents, some market participants claim that they are not able to predict what will be the policy approach of European Commission in individual cases. In electricity, this usually refers to relevant provisions in contract clauses such as duration, exclusive dealings, i.e. restricting the choice of supplier and use restrictions. In gas, the controversy is about destination clauses and exclusive distribution. Recent cases and the methodology applied by the Commission as in the case against Distrigaz\(^{27}\) provide insights into the European Commission’s approach and seem to indicate that the antitrust enforcement in the field of energy is converging with other sectors [see also Hauteclocque 2009].

The problems influencing and hindering investments are in many ways the same in gas as in electricity. The gas industry tends to criticise strict national regulation for permitting low rates of return (especially the absence of early-return on investment), and a lack of certainty and predictability and transparency (see Chapter 3.3.4. for more discussion). The increasing share of renewable energy sources in the EU’s energy mix requires and will require the construction of new electricity infrastructure. However, much of that infrastructure will be required by the system not on a strictly market basis, but out of reliability or security of supply considerations. Given that beneficiaries may well be spread over larger regions, infrastructure construction by a single country or pair of countries is especially challenging. Furthermore, new capacity and cross-border interconnections are expensive investments and the economic rationale on the regional level suggests that they should be built where they are most cost effective. However, the users that benefit most from these investments can be in the area of another TSO and thus perceived as free-riders from the investing TSO’s point of view [Hellner 2010].

**Possible obstacles to distribution investment**

On the DSO level in electricity, the integration of local generation and small scale RES requires the modernisation of networks, including the introduction of smart grids with smart metering systems. This will require incentives for DSOs to build the necessary infrastructure allowing for an increasing penetration of renewables. Eurelectric has developed some Key Performance Indicators that could help the regulators to assess the performance of the DSOs to identify gaps. The ideas include efficiency of the switching process, the level of automated operation within the DSO, projects in R&D on smart grids and flexibility to customers for consumption and generation [Eurelectric 2010a].

**Challenges and solutions for infrastructure planning**

The 2\(^{nd}\) package does not foresee common regional infrastructure planning. As noted earlier, the allocation of costs for regionally important infrastructure investments has proven to be problematic because of the lack of models and the lack of a common understanding concerning the division of costs. The ERIs have made progress on a case by case basis.

One example for a successful regional infrastructure planning initiative has been the launch of the North Sea grid to link wind farms on the German and British coast with Belgian and Danish tidal power stations and Norwegian hydroelectric plants. The nine countries involved signed the North Seas’ offshore initiative in December 2009 and there should be a binding agreement before the end of 2010. The project will cost up to €30 billion and a major part of the finance is expected to come from private energy companies. The 2009 gas crisis revealed the shortcomings in the current security of supply standards and emergency planning. As a result, the latest ERGEG Country Reports describe several interconnection projects between Member States. As an example, the New Europe Transmission System

(NETS) was initiated by the Hungarian MOL group in 2008. The NETS aims to create a unified infrastructure platform and to facilitate the development of a competitive regional gas market with secondary trading between the TSOs in Hungary, Romania, Croatia and Bosnia. The feasibility studies are ongoing and implementation is foreseen in the beginning of 2012 [NETS 2009].

2.3. Implementation of the 2nd package provisions in the electricity sector

When progress in the liberalization of the electricity internal market is put in the general context of utility sector reforms across the EU (including electricity, gas, rail and telecoms), it shows that liberalization in the electricity sector is rather advanced, albeit with large variance between the Member States.28 The telecom sector, in comparison, is often perceived to be the most liberalized of the utility sectors, but had a only slightly lower (more liberalized) average score with virtually no national variance [Wölfli et al. in Pollitt 2009].

As presented in the first chapter, national wholesale electricity markets remain highly concentrated (see Map 2 for concentration on the Member State level). On wholesale markets, integration is seen as an essential means to lower concentration. For instance in Nordic countries, which are reasonably integrated, national concentration figures for wholesale trading are insignificant because the price of electricity is determined in common exchange.

In retail markets, there is a high level of concentration. According to [Pollitt 2009] some 40% of EU electricity customers are served by only four companies.29 10 out of 24 Member States reported an increase in market concentration from 2007 to 2008 [ERGEG 2009c].

2.3.1. Structure of transmission network ownership and system operation

Network ownership varies from one Member State to another but in general public ownership of network companies remains strong. Public ownership was less than 51% in only eight out of 26 Member States, which means that governments control most network companies in the EU. In most of the Member States the TSO(s) are almost or entirely owned by governments [DG TREN 2009 and 2010]. None of the Member States were infringed regarding the lack of legal unbundling of TSOs. As a matter of fact, 15 Member States have already gone further than what was required by the 2nd package. They have already implemented ownership unbundling - several Member States even on DSO level.

However, the real issue is efficiency and investment. In the course of the Sector Inquiry and the antitrust investigations, the European Commission provided proof that the legal unbundling required by the 2nd package had not sufficiently targeted the vertical foreclosure. The Commission’s Impact Assessment for the 3rd package provides a table of investments in different TSOs [DG Comp 2007]. The results imply that ownership unbundled TSOs score better in investments, but at the same time it remains open whether the choice of material studied in the Commission’s documents is completely unbiased. The evidence has been contested by, for example, Grassani 2007 and Boscheck 2009. The critics argue that ownership unbundling has occurred simultaneously with other reforms,

28 On a score from 0 (most liberalised) to 6 (most restrictive), electricity had a reasonably low average score (1.9), but the highest variance (+/- 0.8) where as for telecoms the numbers were (1.3) and (+/-0.2).
29 EdF, ENEL, E.ON and RWE report 38m, 32m, 22m and 14m electricity customers in their latest annual reports. If the total number of EU electricity customers is around 250m (a rough estimate), this results in a market share of 40%.
30 The ownership structure for Malta does not appear in the EC data.
making it difficult to draw meaningful conclusions. Assessing the quality of the investments, transparency and non-discriminatory behavior remains a complex task and difficult to base it on purely quantitative terms.

There is research about methodologies for assessing efficiency, but actual benchmarking reports that would provide information on the country or TSO-level are not available. Cross-border comparisons are not easy to make as long as elementary data remains confidential. Furthermore, there does not seem to be an automatic correlation between efficiency and ownership unbundling when taking the Finnish case into consideration. The majority of the Finnish TSO is owned by the generation industry and the incumbent, what means it does not seem to fulfill the criteria for ownership unbundling. Yet the Finnish TSO appears to be among the most efficient TSOs in Europe.

The latest study [Agrell and Bogetoft 2009] commissioned by CEER examined 22 electricity TSOs in 19 countries and came to the conclusion that the companies could enhance their efficiency by 13%, i.e the TSOs should be able cut costs and transmission network tariffs while keeping the level of services/investments/other activities unchanged. In total, the study identified 12 companies as efficient in 2009 while leaving another three out of the assessment as they were considered as outliers, i.e. too efficient in comparison to the rest.31 However, detailed results for individual TSOs were not published.

2.3.2. Regional initiatives and cooperation

The Regional Initiatives (RIs) were launched in 2006 in order enhance cooperation between all stakeholders and especially between the TSOs and the National Regulatory Agencies (NRAs). In general, both electricity and gas RIs have made good progress in many fields, but one of the problems is the lack of a clear role for national governments and governance, as the regional initiatives combine several Member States’ jurisdictions. The NRAs’ varying powers restrict their ability to support the processes at national level in some cases. This can lead to a situation where the progress of an RI mirrors the regulatory powers of NRAs in the least competitive Member State. Finally, the geographically defined structure can be too rigid to tackle simultaneous developments on several fronts [Everis and Mercados 2009; Europex 2010].

In terms of the seven Electricity Regional Initiatives (ERIs), they are seen to be more advanced in their work than the Gas RIs.

Progress in the ERIs can be grouped under the following main headings: congestion management, balancing, transparency and region specific issues. In addition, planning and investment issues have also been mentioned but did not seem to have the highest priority in any of the regions [Everis and Mercados 2009 and ERGEG 2009a].

Congestion management and balancing

The ERIs have tackled several aspects of congestion management including capacity calculation, long-term, day-ahead and intra-day capacity allocation. Advances in capacity calculation depend on the extent to which the networks are meshed32 or subject to problems due to loop flows. More emphasis has been given to the calculation processes in Central West, Central East and Central South Regions. In order to allocate long-term capacity, several regions plan to create Regional Auction Offices, but real progress has been made in the Central West and Central East Regions. For day-ahead capacity

32 A technical term describing the grid structure, i.e. the network is looped contrary to a radial structure.
allocation, the Nordpool and the TLC\textsuperscript{33} have market coupling/splitting in place and the rest of the Central West Region should join the market coupling in mid-2010. Other ERIs only show limited progress to date. The intra-day capacity allocation has been raised as a key issue in all regions but progress is generally slow [Everis and Mercados 2009]. Differences in balancing markets make it hard to move to or even to suggest a single cross-border balancing model.

**Transparency**

Five ERIs have produced Transparency Reports, and although not binding, they form a basis for the harmonization of transparency rules [Everis and Mercados and ERGEG 2009a]. This model could possibly be applied to the EU as a whole.

In five of the regions the stakeholders have been able to develop regional Transparency Reports, two regions have managed to establish a Regional Auction Office. There are ongoing new market coupling projects between Norway and the Netherlands, and between Germany and Denmark. There is also an ongoing new balancing mechanism project in the France-UK-Ireland region. The approach in the regions has been quite different and depends on the tradition of cooperation in the area. All in all, it is fair to say that ERIs have brought added-value to the provisions of the 2\textsuperscript{nd} package, but the devil is in the detail. For details on the progress in the seven electricity regional initiatives, please see Annex 1.

2.3.3. Disparities between national technical standards and harmonization of network codes

The 2\textsuperscript{nd} package requires Member States to provide minimum technical designs and operational requirements connecting generating installations, distributions networks and directly connected consumers to the system on a non-discriminatory basis and ensuring interoperability [Roggenkamp et al. 2007].

National technical standards do not seem to constitute a great barrier to market integration anymore with one possible exception. The wind energy industry argues that it faces a range of differing grid code requirements and the requirements are often unclear, lack technical justification and economic rationale [EWEA 2009].

The UCTE\textsuperscript{34} operation handbook\textsuperscript{35} has set technical and organizational standards as a common reference for all continental TSOs since 2002 [UCTE 2008] - despite the fact that grid codes and technical guidelines on grid connection differ from country to country. The grid codes govern TSOs operation and planning market actors’ access to the grid. The codes include the essential requirements and procedures needed for the operation and development of the network.

The harmonisation process aims to achieve coherent and coordinated operation and planning between the companies responsible for operating the transmission systems.\textsuperscript{36} The

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\textsuperscript{33} Trilateral Market Coupling to allocate daily capacities on the France-Belgium and Belgium-Netherlands interconnections.

\textsuperscript{34} Union for the Co-ordination of Transmission of Electricity” (UCTE) before ENTSO-E the association took care of the cooperation of the TSOs in continental Europe.


\textsuperscript{36} In the past grid connection and access have not been critical issues for the vertically integrated companies. This has changed and grid connection has become more important for the unbundled grid operators and market operation in general. As mentioned above, common rules for operational security have existed for decades in the European synchronous areas (such as UCTE and Nordel), but grid connection and access have not yet been jointly addressed. Different frequency and voltage requirements within national grid connection
harmonisation of network access conditions in practice means that the neighbouring countries start to use similar grid or network codes. The Nordic countries have harmonized the codes and the latest 190-page long code is from 2007.

2.4. Implementation of the 2nd package provisions in natural gas

2.4.1. Structure of transmission network ownership and system operation

Legal and organizational unbundling is still not a reality in all the networks and often the incumbent supplier - unlike other system users - has access to confidential information because of the vertically integrated structure. The long-term contracts between incumbent TSOs and the supply affiliates make it hard for new entrants to secure transit capacity, and even in the case of new capacity being made available, this usually ends up with companies that already hold the primary capacity [DG Comp 2007].

The European Commission’s and other reports do not provide for a detailed picture of the ownership structure of gas TSOs, but the number of ownership unbundled companies seems to be lower than in the electricity sector. Public ownership is less common in gas than in electricity. European Commission data shows that out of 24 Member States, 37 nine have TSOs with a majority of public ownership and in 15 the majority is in private ownership. However, it is not entirely clear where to place gas TSOs that are a part of the incumbent owned by the state. The state as an owner is not necessarily neutral and can potentially pursue its own interests just like private asset holders.

Several countries have proceeded further in unbundling than required by the 2nd Directive. Denmark, the UK, the Netherlands, Poland, Portugal, Romania and Hungary have implemented ownership unbundling and in the case of Sweden, two out of three TSOs have undergone complete ownership separation [DG TREN 2009 and 2010]. Again, the ownership structure does not necessarily affect the functioning of the TSO, and TSOs should be assessed with respect to their performance in non-discriminatory access, efficiency and investments. The investments in infrastructure in some ownership unbundled TSOs are higher than in TSOs that have not undergone separation of ownership. However, there is a lack of data on the interplay between ownership, investment and performance. It is thus not absolutely clear whether investment levels will radically change in an effectively unbundled TSO.

Like for electricity, ERGEG had a study made in 2006 for comparing the different methods of measuring efficiency in European gas TSOs. The study used data from four anonymous European TSOs. However, as in electricity, no data with actual names of the TSOs has been published.38

2.4.2. The role of regional initiatives and cooperations

The Gas and Electricity Regional Initiatives GRIs that were launched by ERGEG in 2006 can be seen as a move towards full market opening. The aim is to ensure the coherence and

and access rules increase the probability of severe disturbances when national power systems become more interlinked through market integration. The problems can be even bigger in a more mature electricity market that incorporates demand response, smart grids and the massive deployment of existing and new distributed and intermittent generation [ERGEG 2009e].

37 No data on Cyprus, Malta and the UK.
38 In 2006, a research project on whether European or US gas transmission companies were more efficient, concluded that “the mix of a long history of regulation and recent moves towards competition not only in a particular network but also pipe-to-pipe” make the American counterparts more efficient [Jamasb, Newbury, Pollitt and Trieb 2006]. For example, the variety of supply sources in the US market enables pipe-to-pipe competition and therefore eventually more investment and efficiency.
convergence of these regions towards the ultimate goal, a single EU energy market. GRIs differ from ERIs in some fundamental ways. In gas there are only three regions and the flows between the regions are less significant than in electricity. For example, the Iberian market is the smallest and supplied to large extent by LNG terminals in Spain. There are fewer regional gas exchanges than in electricity and the national balancing markets are not connected with each other [De Jong 2008].

The main issues addressed in the GRIs are interconnection and capacity, interoperability, transparency, hubs, security of supply and other region specific issues. The ERGEG report describes that there has been progress on all fronts, whereas the Everis and Mercados study (2009) points to a more diverse picture. All the regions have prioritized efficient use of existing pipelines and the development of new capacity. There has also been a focus on standardising operational procedures and technical rules, which has created a more uniform business practice. The regions have advanced by concluding IPAs/OBAs for several points [Everis and Mercados 2009 and ERGEG 2009a].

All regions concentrated on transparency, but ERGEG studies on the compliance of transparency requirements introduced in the 2nd package showed a large variance in implementation.

The creation of hubs and sufficient liquidity in trading has been another priority for all regions. For example, in the South-South East (SSE) region both the PSV40 hub in Italy and the CEGH41 in Austria have made concrete progress. The supply disruptions in 2008 and 2009 have given additional impetus to security of supply. The impossibilities for reverse flow from East to West as well as the scarcity of peak storage capacity have been identified as shortcomings. As a result several infrastructure projects have been identified to improve security of supply, see Chapter 3.3.3. for information on the EEPR infrastructure investments.

In general, the GRIs offer an effective platform to improve interconnection capacity. This could be done in steps: The first step is to increase transparency regarding the use of transmission capacity and gas flows. To date, detailed transparency guidelines are annexed to the guidelines in the Regulation 1775/2005. In the Commission’s proposal – that was launched in autumn 2009 and is currently in the Comitology procedure - the enhanced transparency requirements include forecasts and more detailed information both on capacities, gas flows, gas quality parameters and conversion capacities, including provisions on historical data, information onlinepack and imbalance charges. This is complemented by transparency requirements for secondary trading, crucial for congestion management [DG TREN 2009a].

To conclude, cooperation between NRAs has generally been enhanced in all the regions. For details on GRIs see Annex 2 [Everis and Mercados 2009 and ERGEG 2009a].

### 2.4.3. Disparities between national technical standards

Technical standards remain more of an obstacle in gas than in electricity. The European Association for the Streamlining of Energy Exchange (EASEE-gas) modelled on the Gas Industry Standards Board in the United States worked on simplification and streamlining of both the physical transfer and the trading of gas across Europe has since 2002. In addition, the GTE website42 provides an interactive map of the different rules applied in the gas interconnection points including quality, nomination processes, codification and units used.

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39 IPA: Interconnection Point Agreement; OBA:Operational Balancing Agreements.
40 Punto di Scambio Virtuale.
41 Central European Gas Hub.
Although technical standards differ, transparent information is available. The European Commission initiated a project to harmonise the gas quality in the EU to facilitate cross-border flows and trade and contracted consulting companies to make a cost-benefit analysis of the harmonization\textsuperscript{43}. The European Committee for Standardization (CEN) studies how to achieve common gas quality parameters in the EU.

2.4.4. Harmonization of network access conditions

In 2006 ERGEG published Guidelines of Good Practice for Gas Balancing. This report shows that there are significant differences in the balancing regimes which can act as barriers for market entry to new entrants. Reduction of balancing zones and the creation of larger balancing areas would improve the situation. To date, users do not seem to receive the relevant information in a timely manner and therefore cannot balance their position and make optimal use of the network. Market-based mechanisms for balancing are not yet in place in several regions \cite{ERGEG 2008b}.

2.5. From laggards to fast movers

This section will give an indication of which member states have been most successful in implementing the 2\textsuperscript{nd} package and creating functioning gas and electricity markets. The aim is not to rank the member states\textsuperscript{44} but rather to provide a general overview of the sector. Some basic indicators such as regulated prices, infringements, level of unbundling and market liquidity serve as a good benchmark to assess which member states are lagging behind, whereas a description of the Nordic market provides an example of where the other regional markets could aim at.

2.5.1. Laggards

Price regulation can serve as a very simple indicator of progress. On the basis of regulated prices, Greece, Poland, Portugal, Romania and Lithuania are still laggards because they rely on regulated energy prices in non-compliance with the provisions of the 2\textsuperscript{nd} package. The overall situation in member states is discussed below.

Greece has not fulfilled the requirements of electricity distribution unbundling and the consumers are therefore left without the possibility to freely choose their supplier. The DSO is an organisational unit integrated within the incumbent, PPC S.A., and not separated from other parts of the integrated company. In the retail market, the low and medium voltage tariffs remain regulated, but the ERGEG country report informs that improvements are made in opening the retail sector.

Portugal was infringed due to regulated prices in the gas sector. The regulated prices are available for all customers and there is no link between the regulated price and the market price. In regard to gas, it was only 2009 when the start of the implementation of market mechanisms started. The Iberian Natural Gas Market (MIBGAS) is yet to be set up, but the natural gas markets are dominated by long-term supply contracts of the “take-or-pay” type. This will hinder or even impede the establishment of an Iberian-wide natural gas wholesale market. In general, electricity retail market concentration is found to have increased in 2008, but at the same time this was the first year of Portuguese agents’ participation in the spot market of the Iberian Electricity Market (MIBEL). The Portuguese TSOs and DSOs are appropriately unbundled \cite{ERGEG country file 2009}.

\textsuperscript{43} More on gas quality harmonization: \url{http://ec.europa.eu/energy/gas_electricity/gas_quality_harmonisation_en.htm}.

\textsuperscript{44} Such a ranking would require a sophisticated energy market index.
Lithuania was the only one of the three Baltic States receiving an infringement letter on regulated prices in electricity for non-household customers. However, all of the Baltic states have market regulations in place that deter the formation of a uniform price, although there is no congestion at the borders. The Baltic countries have announced that they aspire to integrate with the Nordic electricity exchange Nord Pool. Like in Romania, Bulgaria and Greece, the Lithuanian TSO levies an extra payment on systems users that export electricity and in general the market rules are from a time before EU membership. In order to join the Nordic market, these practices will need to be adjusted [ERGEG 2009c and Eurelectric 2010]. In the natural gas markets, all gas is bought from Russia and there are only three companies selling gas to customers. The wholesale market does not exist in practice as in 2008 the trade in natural gas among gas companies amounted to 0.3% of the total imported volume only. Lithuanian customers are supplied with gas by two major suppliers, and like the wholesale, the retail market is dominated by these two undertakings.

2.5.2. Main markets

Due to their volume and central geographical location, the main markets are crucial in the creation of a truly internal market in energy. In the main markets chosen here, including France, Germany and the UK, the “liquidity” of the electricity exchanges remains highly limited. This means that in those countries only a small part of the total electricity produced is being traded on the exchanges. Most of it is bought and sold bilaterally in the so-called over-the-counter (OTC) market.

In Germany, the infringements concern the “usual” information on available capacities, congestion management for electricity, and relevant points for information on gas. In addition, the lack of effective penalties and dispute settlement mechanisms are raised by the European Commission. Around half of all German household customers are still supplied by universal supply, which tends to be the most expensive supply. In addition, universal suppliers are regionally very highly concentrated with little competition in this segment. [ERGEG 2009 country file] argue that for this reason, the price increase for household customers in the last three years at 23% has been much greater than that for industrial and commercial customers.

In Germany, the unbundling provisions of the 3rd package started restructuring of the transmission networks already before the package had been approved. At the end of 2008 E.ON, which holds a considerable market share in Germany, announced that it would sell part of its power generation capacity and the extra-high voltage distribution network. At the time it was perceived that this was either an attempt to avoid further antitrust investigations or just to avoid the necessary investments required in the future. Vattenfall Europe which owns and operates Vattenfall’s German transmission grid has reached a similar deal with the Belgian TSO Elia and the Australian Industry Funds Management (IFM). Moreover, RWE has made a commitment to sell its natural gas transmission lines in the first half of 2010 [EC 2009b and 2010b]. Whether these major changes in German transmission grids will lead to significantly increasing investments remains to be seen.

The French market is characterized by a high degree of concentration and with the incumbents exerting significant market power. Recently, the discussion has been active

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45 Universal service: “the right to be supplied with electricity of a specified quality within their territory at reasonable, easily and clearly comparable, transparent and non-discriminatory prices. To ensure the provision of universal service, Member States may appoint a supplier of last resort.” 2009/72/EC.

46 In the meantime the sale of the high-voltage network to TenneT has been approved by the European Commission [EC 2010].
concerning the TaRTAM. A law from 2008 allows for household customers who have chosen a market price in electricity to return to regulated retail tariffs until 30 June 2010. The system allowed companies to switch back to the regulated tariff for a period of two years if they had made use of the market based prices and experienced a drastic price rise. The Champsaur committee, created by the French government in October 2008 to concentrate its future action on the organization of the electricity market, proposed in its report that the tariff system for small household consumers should be kept in its current form, but the retail administrated tariff for business should be withdrawn. In exchange and in order to stimulate competition, all suppliers in the market should be given access at a regulated price to the low-cost electricity generated EDF's fleet of nuclear reactors. The Champsaur report and the French electricity market arrangements in general have faced a criticism for several reasons: The low and flat tariffs for households will not help the deployment of smart metering devices and technologies. Furthermore, they disincentive savings and by reducing competition between suppliers the tariffs also discourage investments in new generation capacity.

As to natural gas, the market share of new suppliers has increased. In 2008 news rules for allocating capacity at French borders were introduced with an automatic resale mechanism of long-term capacity for the day-ahead market, which will be extended to all French interconnections [ERGEG 2009 country file].

The UK experienced gas supply problems during the winter 2009/2010 and the National Grid announced several gas balancing alerts and asked the big industrial consumers to cut their consumption. This has lead to a debate whether the UK gas storage capacity would be sufficient and whether the security of supply could be guaranteed by the existing interconnections. An Ofgem report states that the current market system is not guaranteeing the needed investments to reduce greenhouse gas emissions and dependency on gas imports and that more regulation would be needed. The Ofgem reform ideas include placing more stringent legal obligations on suppliers, a centralized renewable market, or a central buyer of energy for all the UK. The UK energy companies have been divided on the proposals and the consultation will continue before the final report is published.

2.5.3. Fast Movers

The Nordic countries have effectively transposed the 2nd package and act as a positive example for the integration of regional markets. The cooperation between the Nordic countries has long historical roots and the market integration has been beneficial to all participants.

There have been significant benefits for all Nordic countries from the electricity market cooperation due to differing generation profiles. Almost 100% of Norwegian electricity production capacity is hydropower, while Sweden and Finland have a combination of nuclear, hydro and thermal power. About 80% of electricity generated in Denmark is either condensing power or CHP, and 20% is wind power. Hydropower production has large yearly variations. In years with low precipitation more electricity has been produced with thermal power, and in years with large precipitation thermal power production has been low. Nordic cross-border electricity trade dates back to the 1910s, when the first interconnection between Denmark and Sweden was built. The first multi-national power exchange (Nord Pool) was established in 1996, when Sweden joined the Norwegian power market. Although trading in Nord Pool is voluntary, the volumes traded have increased steadily and in 2009

47 Tarif Réglementé Transitoire d’Ajustement du Marché.
about 70% of electricity generation in Nordic countries was traded via the Nord Pool day-ahead market. Nord Pool also offers a liquid power derivatives market and an intra-day power market.

All interconnectors between the Nordic countries are owned and operated by TSOs. Cross-border capacity between Nordic countries is allocated by day-ahead implicit auctions. Possible congestions occurring between pre-determined bidding areas are handled by market splitting (the bidding areas include Finland and Sweden, Eastern and Western Denmark, Norway is divided into 3-4 bidding areas depending on the hydrological situation). Internal congestions inside bidding areas are mainly handled through counter trade.

In recent years, there have been failures on major power lines which have led to restrictions on available cross-border transmission capacities. In 2008, prices were the same for all Nordic regions only 7% of the time. However, figures for linked markets within the Nordic market are significantly higher (e.g. in 2008, Finland was in a common price area with Sweden about 97% of the time).

The Nordic market is already well integrated to continental European power markets through a number of power lines. The co-operation organisation of Nordic TSOs Nordel (now part of ENTSO-E) has set promoting market integration with neighbouring countries as its strategic target. Market coupling between EEX and Nord Pool Spot was launched in 2008, when Germany and Denmark were coupled through the EMCC solution (European Market Coupling Company). In the same year, implicit auctioning had to be closed due to problems in calculating the capacity (calculation lead to price differences between Germany and Denmark which do not correspond to the direction of flows), but auctioning was relaunched in 2009. Market coupling is also planned or in process to be implemented by means of the links NorNed (between Norway and the Netherlands) and Estlink (between Finland and Estonia).

There are several plans to build new transmission lines between the Nordic and continental power markets. Because of a large hydropower production, the power price in the Nordic area is still at a lower level compared to continental power prices. In the future, Nordic countries will be exporting electricity to continental Europe: significant capacity increases are expected mainly in nuclear and wind power. However, there is some opposition against transmission link projects, because new interconnectors to continental Europe would raise the power price in Nordic countries.

Nordic regulators aim to launch a common Nordic retail power market in 2015. In the common retail market, Nordic suppliers should be able to offer electricity to customers in any Nordic country.

2.5.4. Conclusion: Considerable variation between the Member States

Table 7 presents the Member States’ progress in three central aspects of the electricity and gas markets: price regulation, concentration and unbundling. Price controls show the extent to which Member States apply regulated prices in both sectors for household and non-household consumers. The concentration figures illustrate the degree of concentration in gas wholesale and retail and electricity wholesale markets (see Map 2). Electricity retail markets are not included as the HHI-figures were not available and in general, data is often

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48 Norway was the first Nordic country to launch the liberalisation of electricity markets with the approval of the Electricity Market Act in 1990. Norway was followed by Sweden and Finland in the mid-1990s, and Denmark started electricity market liberalisation in 1998.
limited. The table also shows to what extent Member States have already implemented ownership unbundling for transmission and legal unbundling for distribution.
Table 7: Assessment of Member State status concerning regulated prices, market concentration and unbundling

<table>
<thead>
<tr>
<th>Regulated Prices</th>
<th>Concentration</th>
<th>Unbundling</th>
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<tbody>
<tr>
<td></td>
<td>Households</td>
<td>Non-Households</td>
</tr>
<tr>
<td></td>
<td>retail</td>
<td>wholesale</td>
</tr>
<tr>
<td>Austria</td>
<td>High</td>
<td>Moderate</td>
</tr>
<tr>
<td>Belgium</td>
<td>Very high</td>
<td>Very high</td>
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<tr>
<td>Bulgaria</td>
<td>G+E</td>
<td>G+E</td>
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<tr>
<td>Cyprus</td>
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<tr>
<td>Czech Republic</td>
<td>G+E</td>
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<td>Denmark</td>
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<td>Finland</td>
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<tr>
<td>France</td>
<td>High</td>
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<td>Germany</td>
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<td>Great Britain</td>
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<td>Italy</td>
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<td>Latvia</td>
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<tr>
<td>Lithuania</td>
<td>G+E</td>
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<td>Poland</td>
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<td>Portugal</td>
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<td>Romania</td>
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<td>Slovak Republic</td>
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<td>Slovenia</td>
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<tr>
<td>Spain</td>
<td>E</td>
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<tr>
<td>Sweden</td>
<td>G+E</td>
<td>G+E</td>
</tr>
<tr>
<td>The Netherlands</td>
<td>High</td>
<td>Very high</td>
</tr>
</tbody>
</table>


Note:
- Price regulation: G stands for gas and E for electricity, red indicating regulated prices for both gas and electricity, yellow indicating regulated prices for either gas or electricity.
- Market concentration: HHI 750-1800 moderately (green); 1800 - 5000 highly (yellow) and 5000 and over (red) very highly concentrated markets. Electricity retail markets are not included as the HHI-figures were not available.
- Ownership unbundling of TSOs shows the number of ownership unbundled TSOs out of total TSOs and legal unbundling of DSOs indicates the percentage of legally unbundled DSOs out of all DSOs. Green indicates that all TSOs/DSOs in a Member State are ownership/legally unbundled.
- The colours do not give an indication of whether the policies are in accordance with the current legislation. For example, DSOs with less than 100,000 customers can be exempted from legal unbundling and therefore there is no formal requirement that 100% of all DSOs should be legally unbundled.
According to the latest Commission data used for this table, Spain does not have price regulation; however, this is contested in the interviews conducted for this study.

Despite the possible minor inaccuracies, the chosen data with the simplified colour indicators should provide a broad overview and direction of which Member States are more advanced than others.
3. Forward Looking Policies

3.1. Policy changes required to complete the implementation of the 2nd package

From the first to the 2nd package there has been a gradual broadening of the scope of regulation and deepening simultaneously, i.e. provisions have become more stringent. Requirements for TPA have helped market opening and the creation of NRAs has been a necessary prerequisite for the functioning of markets, both at Member State and EU level. However, regional and EU-level infrastructure planning was not addressed in the 2nd package. Decisions on interconnections are typically made within the borders of a single Member State and do not take the welfare gains in the area of another TSO into account.49 Legal unbundling was unable to ensure non-discriminatory access to networks for all electricity producers/users. After the requirement for unbundling of accounts in the first package, the 2nd package did not directly impose ownership unbundling and had to limit itself to a more incremental approach, i.e. legal unbundling.

Transposition of several provisions like legal unbundling and the abolishment of regulated prices in the retail segment have not yet been completed. This limits the degree of effective competition and keeps the customer switching rates low. However, jumping to quick conclusions based on the switching rates as indicators for competition should be avoided. In the Nordic market, which has competitive prices in general, the switching rates from country to country still vary considerably.

Requirements for non-discriminatory third party network access have not been fully implemented. This is documented inter alia by the infringement procedures. Additional requirements on transparency and access to gas storage have been introduced in the 3rd package to address the shortcomings of the 2nd package concerning TPA. The introduction of national regulators was a considerable change in many Member States but NRA’s independence and autonomy is still not always ensured. Consumer protection provisions are fairly well transposed, but the possibilities for allowing regulated prices for large groups defined as vulnerable consumers are hindering market development.

Increased transparency allows for differentiating between physical and contractual congestion. Contractual congestion can be remedied by better capacity management which will be dealt with in the context of the new framework guidelines and codes. Physical congestion can be remedied by open seasons, where the GRIs can play a role together with the TSOs involved. RIs could also become active in creating a bundled capacity instrument, allowing shippers to transport gas across the networks of several TSOs. This can be initiated on the RI level, although the goal should be to eventually go to bundled capacity instruments for the European market.

Harmonisation and standardisation of transmission access and tariffs, IPAs and OBAs may benefit from a European approach instead of a RI approach. This would avoid a split of the European gas market into three regional markets using different rules and instruments. Adapting two or all three of these markets again once the three regions are integrated into one European gas market would create costs that can be avoided by tackling these issues on a cross-regional basis.

49 However, not without exemption the Nordic countries have long had common grid planning and common grid plan between Nordics, Baltic countries and Poland with socioeconomic analysis exists: http://www.fingrid.fi/attachments/fi/sahkomarkkinat/selvitykset/multiregional_planning_project_market_base d_analysis_final_v2.pdf.
ENTSO-E points out in its response to the ERGEG consultations that the RIs should be defined on a case-by-case basis, depending on the presence of regionally relevant issues. Currently within the ENTSO-E structure, the regional groups vary depending on the area of coordination: The system developments committee is in charge of pan-European level network development and has six different regional groups, system operations in charge of technical and operational standards has five regional groups, and the markets committee in charge of market integration measures, such as congestion management, integration of balancing markets etc. has only three groups [ENTSO-E 2010 and Hellner 2010]. A similar division might correspond more accurately to the challenges in the different sectors than the current framework of overlapping area.

The bottom-up approach of regional initiatives works in many cases but could be greatly helped by guidelines and/or reference model to become “consistent with a coordinated European objective and harmonized wherever possible” [ENTSO-E 2010]. Within the RIs a regional governmental committee could offer a forum for higher-level policy discussions. [Everis and Mercados 2009] argue that such a regional governmental committee should be coordinated by the European Commission to include a “broader policy dimension of Government decision” and simultaneously follow-up the progress in the area. Furthermore, the RIs should receive more policy guidance in issues like congestion management, transparency and balancing, possibly by the European Commission and/or ERGEG. It has also been suggested to group regions according to the level of progress on key issues and to a lesser extent on a geographical basis. In order to avoid overlapping areas one solution would be to merge regions as they advance in market coupling [Everis and Mercados 2009]. In electricity congestion management methods have experienced a change towards market-based allocation. On most borders, explicit auctions are used for long-term allocation of capacity. Implicit auctions are already, or will soon be, used for short-term allocations at the interconnections in the Nordic market and at the links between the Nordic market to certain continental markets where the same methods are in use (at least between France, Belgium and the Netherlands).

Despite this progress, the 2nd package did neither provide guidelines on how the market design should look like nor did it provide a market model that might be used by regional initiatives as a role-model. In 2008, ERGEG launched the work on the Target Model, which is a practical model to harmonize interregional and EU-wide coordinated congestion management. The model covers forward, day-ahead, intraday and balancing markets as well as capacity calculation and governance issues. A Project Coordination Group including experts from the EC, regulators, Member States and other stakeholders worked on the issues and presented the final proposals at the Florence Electricity Forum in December 2009. The work achieved common understanding in capacity allocation and congestion management. ERGEG will include the work done in the draft framework guideline on capacity allocation and congestion management.

Lack of efficient DSO unbundling and the problems with grid connection for many of the renewable energy producers have been pointed out as central problems for renewable energy at the moment. Though wind energy is increasingly connected to transmission lines, most of the other RES are still on distribution grid level. The only legitimate reasons not to allow connection for new producers are technical constraints. However, RES generators claim experiencing competitive distortions from the vertically integrated companies when seeking for possibilities to get their production connected. This would imply that a further enforcement of the current unbundling rules is needed and that ownership unbundling on the DSO level should be considered as an option in the future [EWEA 2010].

As described in the first part, regulated prices are still common in many countries. The Member States that have regulated prices include both old and new members: Bulgaria,
Denmark, Estonia, France, Greece, Hungary, Ireland, Italy, Lithuania, Poland, Portugal and Romania have regulated prices for both electricity and gas and Latvia and Cyprus only for electricity. The number of households under regulated prices is considerable, but the regulation is not limited to households as industry also enjoys regulated tariffs in several Member States.

Regulated prices are usually justified by the fact that the liberalization process has not been completed and there has not been any competition in the market yet. The regulated price protects customers from fluctuating energy prices and acts as a complement to industrial and social policies. As might be the case for some Member States, the electricity and gas prices do not reflect full costs, and this will lead to under-investment in new supply capacity and distort the competitive position of industry - domestically between different industries and internationally within the industry branch. In addition low (regulated) tariffs make the emergence of real competition impossible as the new suppliers cannot enter the market.

3.2. Appropriateness of policies in the 3rd package

The 3rd package tackles many of the biggest obstacles to the creation of a functioning market. The effective unbundling through ownership unbundling, the ISO or the ITO models gained a lot of attention in the 3rd package. However, there seems to be a deep difference of opinion between the stakeholders and scholars as to the extent of ownership, whether full unbundling in general will positively affect grid investments and what other policies are needed on top [see Pollitt 2007 and Boscheck 2009]. The effect of the new unbundling legislation on investments is currently difficult to assess. It is likely that the independent TSOs will invest more in maintaining the grid and even in interconnections, but at the same time TSOs need to be able to cover the costs.

In the future the question of ownership structure will become far less relevant once the provisions are transposed into Member States’ legislation. For electricity, the TSO restructuring has already started but there is a real danger that some of the TSOs will try to nominate parts of their system as DSOs in order to avoid the unbundling rules. Regarding gas, there are TSOs that are owned by one legal entity like the state (e.g. in the Netherlands), which will cause some difficult discussions with respect to the unbundling rules. Other reasons for sale of networks are possible. Recent news reveal that the Italian gas incumbent ENI that holds a majority of the gas transport unit Snam is considering selling its share. The sale of Eni’ share to Snam would help both, to reduce Eni’s leverage and avoid restructuring Snam into an ISO/ITO. Similar news can be expected from other vertically integrated companies and there is a good chance that some consolidation at TSO-level will take place. Consolidation can lead to companies with a stronger financial basis that are better placed to do the necessary investments. It can also make negotiations for harmonisation of network access and tariffs easier. A regulator with powers on the European instead of at NRA level may be required to regulate these consolidated companies which might own assets in more than one Member State. This would require a reassessment of ACERs duties and powers.

Both for electricity and gas the 3rd package retains legal unbundling for DSOs. The Commission did not think ownership unbundling necessary on the distribution level as the grids do neither contribute to cross-border flows nor are they involved in balancing rules that makes discrimination impossible. The downside could be that for electricity the vertically integrated DSOs might have less interest in introducing smart metering systems that enhance retail market transparency. The views remain split on whether the arguments

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50 Bulgaria, Denmark, France, Greece, Hungary, Italy, Poland, Portugal, Romania. See Table 7 for further reference.
against introducing ownership, unbundling on the DSO level outweighs the benefits. To answer this question, it would be helpful if key information on efficiency and investments of the regulated businesses were to be made publicly available.

The 3rd package requires regulators and Member States to cooperate on the regional level and calls for the development of regional network development plans. If the Framework guidelines and Network codes are adopted through comitology, they will form a new kind of binding cross-border regulatory setting. However, with ACER becoming operational in 2011, a complete set of network codes might only be ready some three years later. An ad hoc advisory group (AHAG) of stakeholders will contribute to the work on this first Framework guideline that acts as a pilot for the guidelines that will follow once ACER is operational. The guidelines will be turned into Network codes in cooperation between ENTSO-E/ENTSOG, ACER and the European Commission and will eventually become binding through comitology procedure. This might require an interim arrangement between NRAs.

In electricity the regulators are currently working on a pilot project for framework guidelines on grid connection and in gas on capacity allocation. Simultaneously regulators have provided input to Framework guidelines, to congestion management, operational security and transparency in electricity and balancing rules and harmonised transmission tariff structures in gas. Future progress will depend on how the guidelines will be translated into network codes, at what level of specificity and to which extent they can and will be made binding. Political pressure by the European Parliament could help speeding up this process.

The powers and the tasks of NRAs, which still vary considerably across Member States will become more harmonised with the transposition of the 3rd package. Similarly, the new independence from other government bodies will help the cooperation in cross-border issues although falling short of full powers on cross-border issues and the ability to impose binding guidelines.

ACER will act as as the new framework for NRA cooperation and exchange of information and monitoring responsibilities should not cause any friction between the agency and the regulators as this has already been practice within the current framework.

ACER is not as strong as the American regulator, the Federal Energy Regulatory Commission (FERC), which has played a major role in the liberalization of the American electricity markets and created a counterweight for the individual states regulatory actions that could have hindered further integration. FERC enjoys powers in transmission access and pricing, wholesale market power issues, market power mitigation and mergers [Joskow in Glachant and Leveque 2009] whilst the Commission has in general restricted possibilities in regulating wholesale markets and relies on antitrust enforcement. ACER instead focuses on exchange of information and monitoring. If ACER could influence e.g. cost reallocation between TSOs concerning the investments identified in the ten year network development plans, this could facilitate the creation of new infrastructure that nobody is willing to pay for. However the agency ‘advises and oversees the ten year plan and monitors its completion’ and whether this means that it has any enforcement powers in this case is unclear [EUI 2010]. Still, clashes between ACER and the NRAs can be anticipated where the regulators cannot agree on cross-borderer issues. Despite the legal and political restrictions and all in all, by creating ACER the EU demonstrates that the regulatory framework has changed.
3.2.1. Implementing the 3\textsuperscript{rd} package

The Commission’s interpretative notes of January 2010, dealing with unbundling, independence and powers of regulators, gas storage and retail issues provide some clarity on the implementation procedure.

A year before the actual implementation date, as yet no compiled information is available on the progress made in all the Member States. The effective unbundling provisions in combination with the European Commission’s anti-trust enforcement measures have initiated changes in the ownership of TSOs in many markets. Several countries have started the roll-out of smart metering, but as the economic assessment concerning smart metering has to be conducted only by the second half of 2012, it is much too early to draw far reaching conclusions on the eventual laggards.

If the time required for the transposition of the 2\textsuperscript{nd} package acts as a precedent to the implementation of the 3\textsuperscript{rd} package, several of the Member States will not be able to transpose within the expected timetable.

3.3. Policy challenges ahead

3.3.1. Harmonisation or coordination of renewables support

While gaining significant experience in the EU with renewable support schemes, competing national schemes were healthy at least during a transition period. Competition among schemes has given the EU a greater variety of solutions from which to choose. As long as volumes remained relatively low, cross-border externalities remained limited. However, such competition finds its constraints where national schemes erect barriers to trade or distort competition. Nevertheless, the cross-border effects of large quantities of wind-based electricity generation suggest that the cross-border consequences of national renewables policies have to be properly taken into account.

Policy coordination (i.e., setting a common framework) or even total harmonisation would be beneficial for reasons of productivity, cost effectiveness, cross-border externalities (e.g. impact on the grid and the security of supply for neighbouring countries and more generally, potential effects on the functioning of the internal energy market) or economies of scale, should a tradable certificate scheme be chosen (i.e. leading to larger, more liquid and efficient markets). However, this might undermine Member States support as they would no longer control where investment flows.

In the short-term, it can therefore be argued that the potential cross-border effects need to be balanced with the reality that support schemes are emerging through a bottom-up approach, i.e. Member States are experimenting with how to make such schemes best fit into national circumstances. There is, however, a medium- and long-term need for coordination and possibly harmonisation of the entire sphere of electricity from renewable energy sources. To differentiate this sphere, national support-scheme frameworks can be separated into three distinct parts:

1. level of support,
2. support-scheme models and
3. the legal framework including regulatory issues.

The level of support has a direct impact on decisions related to project development by providing locational signals. With sufficient interconnections and infrastructure in place, it will be time for EU Member States to reconsider their national approach to renewables support schemes. In a well-functioning internal European electricity market, support
schemes should incentive investments in the most cost effective locations (e.g. Mediterranean for solar power and coastal northern Europe for wind power). Currently, however, investments in renewable energy sources aim for maximum subsidies, which lead to a sub-optimal allocation of investments into less productive and more costly regions. Hence, different levels of support schemes may distort investment decisions and provide incentives for gaming. Gaming generally undermines the efficiency of markets and risks creating development imbalances across borders. It may lead to inefficient investment decisions, whereby a location is chosen on the merit of the support scheme rather than its resource endowment. The level of support would also include benefits that accrue from the fact that renewables will not have to pay full costs in all cases. Harmonisation of the level of support would reduce incentives for gaming. Some sort of levelling out support in border regions would reduce the incentive for shopping around borders for the best subsidy, yet still ensure that Member States have a high level of discretion over the subsidies they want to spend.

Another area is the coordination or harmonisation of the different models of support schemes. In order to avoid a negative impact on the internal energy market or the internal market as such, at some stage there will be a need to agree on a common support scheme at least for the same technologies. There may be no need to have a uniform system across the EU for all technologies. But the same technologies should fall under a support mechanism to be agreed upon by all Member States.

The third level of harmonisation of support schemes is the creation of an EU-wide regulatory framework for support. While many aspects will remain the responsibility of the Member States, such as permitting and more generally the administration, the implementation of renewables support policy would need to be undertaken within a common EU framework. Different elements of this framework can be developed within different timeframes.

Progress towards an increasing coordination of support schemes has been made with the inclusion of the possibility to create joint support schemes as one of the four flexible mechanisms defined in the Renewables Directive. [Jansen et al. 2010], for example, argue that if well designed, such joint support schemes may well prove to be the most cost-effective of the flexible mechanisms. They also show that entry of the Netherlands to the joint support scheme by Sweden and Norway (which is currently being designed and planned to be operational by early 2012) could result in welfare benefits for all participating countries “amounting to several hundreds of millions of Euros per year”. This gives an indication of the potential benefits of EU-wide harmonisation of the currently fragmented national support schemes.

### 3.3.2. Transparency in financial products

In parallel to attempts to create a pan-European electricity market, financial markets have developed new products. As presented in the first chapter, a growing number of trading platforms has emerged (see Figure 18) across the EU. The power exchanges (PXs) provide a large variety of complex products that are either trade of physical electricity flows or financial products, i.e. derivatives like forwards and futures. The exchanges differ from each other concerning the products available and the market design, i.e. opening hours etc. Different regulatory regimes can apply for the exchange-based physical and financial transactions and OTC-trades.

In the past, energy prices were set by supply and demand and affected by physical facts like weather conditions. In the era of power exchanges the electricity forward prices closely follow fuel prices and fuel prices in turn are affected by macroeconomic factors like interest
rates. The market participants, from utilities to hedge funds, engage in either hedging to mitigate their risks or arbitrage and proprietary trading to make profits by increasing their risks. The presence of purely financial market participants is twofold: while they may speculate prices, they also increase liquidity.

The lack of the regulatory oversight of electricity wholesale markets was noticed by the Commission during the preparations of the 3rd package. The Committee of European Securities Regulators (CESR) and ERGEG were asked to provide the Commission with input concerning transparency of transactions in electricity and gas supply contracts and derivatives. According to the results the information on the market depends to high extent on regulatory rules that the respective trading venue falls under. The on-exchange trades in physical and financial markets are supervised by securities and energy regulators, competition authorities but the direct bilateral trade is generally not subject to any supervision.

The Financial Instruments Directive (MiFID) and the Market Abuse Directive (MAD) that currently regulate the markets do not contain specific transparency and integrity obligations applicable to traded energy markets: MiFID provides with rules for fair and orderly trading but the spot markets fall out of its scope. The MAD does not apply to physical market products and though it contains provisions against market manipulation it is ill applied to traded energy markets. In order to prevent market manipulation, the NRAs must have access to data on transactions. CESR/ERGEG advice that a framework carefully tailored for the needs of particular energy and energy derivatives markets should be designed [DG TREN 2009]. According to ERGEG, the increased transparency and effective supervision recommended by the regulators would in the best case be taken care of by “one single Supervisory Authority for Energy and Emissions trading at national level, cooperating closely and on the basis of the same standards with other authorities of the relevant Member States.”. Furthermore the energy regulators argue that because of their expertise they should assume a prominent role in the context [Kindler 2009]. The work is currently under progress and some of the stakeholders fear that because of the financial crisis, there might be danger of over-regulation.

3.3.3. EU policies to promote energy infrastructure projects

Article 176 of the Lisbon Treaty defines that the union policy shall aim, in a spirit of solidarity between the member states, to promote the interconnection of energy networks. The central policy instruments for Energy Infrastructures development are the TEN – E, the Second Strategic Energy Review, the European Energy Programme for Recovery (EEPR) and the Infrastructure - Green Paper from 2008.

The European Energy Networks (TEN-E) list the projects that are eligible for Community assistance and define projects that are of ‘European interest’. The most important projects have been appointed European coordinators that will monitor and facilitate the implementation. Although the TEN-E policy has been ongoing for about 15 years, only 10% of the gas interconnections between Member States have been finalized [EC 2008]. It should be noted that the total TEN-E budget for the period 2007-13 amounts to €155 million, i.e. €20-25 million annually, including electricity projects and gas-importing pipelines. The TEN-E budget may be used to finance feasibility studies but with its current budget the TEN-E will not be able to provide centrally planned and financed infrastructure [EC 2008b]. This would require new financial means that correspond with the current levels of funds allocated by the EEPR.

A significant investment boost in interconnectors was provided by EU funds from the European Energy Programme for Recovery (EEPR) where gas and electricity infrastructure
projects\textsuperscript{51} received roughly €2.4 billion, i.e. 60% of the total budget. The amount of financing is intended to cover up to 50% of total costs, and therefore is much more substantial than the previously allocated TEN-E funds that only covered mainly feasibility studies. These funds are to be added to the previously allocated TEN-E €1.5 billion for Carbon Capture and Storage (CCS) and offshore wind. As these measures are intended to provide an economic stimulus to the economy, it is not clear how financing is to be continued (or not) and regulated in the longer term [EC 2010].

The TEN-E Implementation Report 2007-2009 lists some of the strengths and shortcomings of the policy. TEN-E has been successful in its original task to bring together the fragmented energy market. The intervention of European Coordinators has also facilitated the simplification of authorisation procedures for major energy infrastructure projects. However, it had much less impact in dealing with diversification of supply sources, security of supply and climate change. Moreover, the TEN-E in its current form has too little resources to make a contribution to the strategic energy and climate objectives.

The European Commission has identified the following future needs: i) greater alignment between TEN-E and the strategic priorities including more focus on a limited number of projects that represent ‘real’ European priorities and ii) better integration of low carbon technologies. In addition, the European Commission would like to see member states better working together to speed up planning and reduce authorisation delays. Infrastructure projects that co-financed by the EU should be guaranteed the same legal status in the member states as the projects of national interest [DG ENER 2010].

The TEN-E guidelines are under revision by the Commission and are expected to be finalised by spring 2011. The 2010 European Commission Work Programme however foresees an Energy Infrastructure Package. This package will include a Communication on energy infrastructure development for the 2020/2030 horizon and a Staff working paper on progress of the six priority infrastructure actions proposed under the Second Strategic Energy Review\textsuperscript{52}. Furthermore the package will include a Communication on the preparation of a blue print for offshore grids in the Northern Seas of Europe and Report on the state of play of smart grids to map the current developments and key regulatory issues [EC 2010c].

The revision of TEN-E guidelines is expected to be combined with a proposal for a new EU Energy Security and Infrastructure Instrument in spring 2011. The financial part will also include a revision of the energy finance envelope of TEN Financial Regulation [DG ENER 2010].

\subsection*{3.3.4. Investments in gas and electricity infrastructure}

Flexible gas power plants are generally considered to help balancing the intermittency of renewable energy sources and thus to facilitate their deployment [PBL 2009]. For this reason there might be a need of further investments in the gas networks. At the same time the economic downturn has affected the demand for gas and the gas prices. For Europe to return to its old consumption levels may take some 5-7 years [Booz\&Company 2010]. However, returning to the old consumption levels is not in accordance with the 20-20-20 targets and therefore it is unclear how much additional investments in infrastructure would be needed.

\textsuperscript{51} Eligible projects include: Baltic interconnection Estlink-2 Between Finland and Estonia; Interconnection Sweden- Baltic States and strengthening of the grid in Baltic States; Halle/Saale – Schweinfurt in Germany; Wien-Györ in Austria; Portugal-Spain interconnection reinforcement; Interconnection France-Spain ; New 380 kV AC submarine cable between Sicily- Continental Italy; 500 MW Ireland/Wales interconnector and interconnection Malta-Italy.

\textsuperscript{52} Baltic Interconnection Plan, Southern Corridor, Mediterranean Ring, North-South gas and electricity interconnections within Central and South-East Europe, North Sea offshore grid, LNG
Even in a scenario where gas becomes less important in the future or pipeline gas would be
replaced by LNG or European unconventional gas, the security of supply aspects probably
require the possibility for additional infrastructure, better utilization rates, reverse flows
and more storage capacity [De Jong, Glachant, Hafner, Grant (ed.) 2010]. The current
market conditions might not be appropriate to make the required investments possible.
Comparing the weighted average cost of capital (WACC) in the US (9-16%) and in
Northwest Europe (average 6.3%) and including the level of risk involved in these
investments this might not be adequate. The US natural gas market in its current form is
open and competitive and the infrastructure investments significantly override the
European levels [Mckinsey 2010]. The Rate of Return (ROR) regulation that the US
regulator FERC applies has met critique due to claimed overinvestment and an inefficient
use of capital and labor, but simultaneously it has secured long-term investment. Between
1996 and 2003, the WACC for interstate pipeline projects in the US was 11.6%
[Hirschhausen 2007]. The regulatory framework elements in Europe vary from one Member
State to another and some regulators allow more attractive returns that cover the real cost
of capital. A report by McKinsey argues that the allowed return on new gas transmission
investment in Germany is value destroying [McKinsey 2010].

In March 2010, ENTSO-E started a consultation of the ten year network development plan.
The plan contains over 500 investment projects in 34 European countries, worth €23-28
billion over the first five years. In order to ensure the introduction of renewable energy
sources the Member States are required to produce National Renewable Energy Action
Plans (NREAPs) by the end of June 2010 [ENTSO-E 2010]. The transformation of the
DSOs into smart grids and installing smart metering systems will play a major
role in the future. Some of the members states, France, UK, The Netherlands, Italy and
Sweden have already deployed the meters and the European Commission has created a
task force for smart grids in Europe. On top of the existing needs, constructing the smart
grids carrying digital information and enabling automated fault repair requires investments
will be worth several billions. As the network owners are the ones to initiate the
investments, the NRAs have responsibility to incentive the DSOs appropriately. In order
for the EU achieve the 20-20-20 goals, the smart grids need an effective
regulatory framework, appropriate financial incentives and public support and
acceptance.

In a functioning market, the investments should be made where they are most cost
efficient. However, the investments for improving the security of supply are not in the
interests of the market participants and the TSO making the investment does not
necessarily need to be the one who will benefit from the investments. In 2007 Eurelectric
proposed the creation of Regional Independent Operators (RIOs). The idea for the RIO was
to gradually take over all transmission network-related tasks from the TSOs in a defined
region. The TSOs could be either ownership unbundled or vertically integrated. Moreover
the grid planning and investments would be done within the RIO and this would lead to
optimisation of the regional grid. It remains to be seen whether some regions adopt the
RIO model and how much consolidation will happen in the TSO sector due to the new
unbundling requirements introduced in the 3rd package. However, turning the mind set into
more regional thinking, combined with the new planning requirements could help to
balance the division of investments regionally.

Investment may not happen for other reasons than for a too low rate of return. Should the
EU step in in these cases? Apart from the Energy Program for Recovery (EEPR), which
granted almost €2.4 billion for gas and electricity infrastructure projects, the EU does not
have the financial means to participate in large scale infrastructure investments under the
current budget. It is a fundamental question whether the EU should try to contribute
financially to infrastructure projects or stick to what is in its powers already for the moment, i.e. creating a stable and predictable regulatory framework and identifying common priority cross-border projects. Eurogas argues that the TEN-E projects should only be additional as the market will provide with the adequate investments. The EU’s role could be the one of a facilitator who brings together parties that have not yet found common ground. Cecchi argues that the access prices to gas interconnections could be increased by a risk premium [Cecchi 2009]. In principle, the Member States that are preoccupied by security of supply considerations could also book the necessary capacity in the OS procedures.

3.3.5. Electricity exchanges and market integration

Clear advances have been made with the Mibel connecting the Iberian regional market and the Pentalateral Energy Forum,53 which represents a temporary, intergovernmental initiative between the Benelux countries, France and Germany. The latter is a good step forward in order to create a regional Northwest-European electricity market. The Scottish markets are merged with the English and Welsh market under the BETTA54 project. The Irish and Northern Irish Single Electricity Market unites the 1.8 million consumers in the Republic of Ireland and 0.7 million in Northern Ireland. This physical market launched in 2005 operates in two currencies [De Jong 2008]. In short, there are advances in price coupling and building spot markets in many regions, but while these developments take place, a clear vision of how the regional markets should be built is not yet in place.

In the liberalized market, power exchanges play a crucial role in facilitating the trading of electricity and building a pan-European market. The PXs are the product of the liberalization process and have become driving forces behind it. Most of the current power exchanges are designed separately from each other and the design has been made for a national context. It should be noted that the regulatory status of the PXs depends on where they are situated. A recent trend is the consolidation of the PXs that in the longer run could solve some of the problems that the different designs constitute. The European Energy Exchange EEX and Powernext have cooperated in launching a spot exchange active in France, Germany and Switzerland EPEX (European Power Exchange). In addition there is a project of pan-European price coupling by Nord Pool Spot, EPEX Spot and the Spanish OMEL. Furthermore, gas exchanges have been set up in Austria and Denmark [EC 2010c].

The Everis and Mercados report on the RIs proposes the creation of a Common Allocation Office (CAO) that would run the explicit auctions between the regional markets. This has been opposed by the EUROPEX as an unstable governance system [Everis and Mercados 2009, EUROPEX 2010]. The 3rd package does not define the future role of the PXs or cooperation among them. Whether the existing PXs consolidate into regional or EU level operators and/or a reference model for further integration emerges through this development is unclear.

3.3.6. Gas market development and security of supply

As already mentioned, before the 3rd package was adopted, there were ideas of granting ACER with powers to issue binding guidelines and approve the ten year investment plans. In addition, in order to make an ex-ante evaluation of efficiencies and potential foreclosure effects stemming long-term contracts, ACER would have been granted powers to assess the LTCs either on a case-by-case basis or within the consultation process for the Community-

54 British Electricity and Transmission Trading Arrangements (BETTA).
wide 10-year network investment plan. ACER did not gain these powers, but will there be any change in the logic of LTCs despite the limited regulatory means?

**The future of the LTCs in European gas markets is more unsecure now** that the economic downturn has lead to oversupply. At the moment LNG is available from the US and the spot prices are even 30% lower than the price in many of the LTCs. E.ON Ruhrgas and the Italian Eni have recently started to renegotiate their contracts with Gazprom. As the new contracts will not be only tied to oil prices but partially to the gas spot price, this can mean a major shift for the gas markets. Moreover as regulators push for competition, more contracts are indexed to electricity or spot gas and more storage capacity will be made available. Thus there is a **real chance that the gas market could be changing towards a more liquid form.** The US experienced demand destruction in the 1970s similar to the current European, and in the American market this lead to a changed price setting mechanism and liquid spot markets [Booz & Company 2010].

Gas storage is important for the gas market from both the competition and security of supply point of view. Liquid markets depend on sufficient volumes of gas available. Short-term availability of gas enables trading and the most easily accessible sources for such short-term volumes are LNG imports, storage or domestic production. The fact, that only few Member States have LNG terminals and domestic gas resources, indicates, that a certain level of gas storage capacity is an essential prerequisite for markets to work.

Since 2007 significant capacity has been built in Austria and Hungary and additional capacity is under construction in Germany, Italy and France (see table on gas storage in Annex 4). Other large projects have been initiated in the Netherlands and in Romania, but since construction has not yet started, it is impossible at this stage to give an exact figure of the new capacity. It is assumed, however, that if all planned projects were to be finalized, the capacity in the North region could increase by 50% and in the South East region by even more.

An important challenge for the security of gas supply is to meet the demand not only under regular circumstances, but also when a supply disruption occurs. The market, however, has very little or no demand for investments in additional storage and reverse flows to serve security of supply where it is most needed. There appears to be a need for more EU involvement here but this will require some sort of agreement on allocating costs according to the expected benefits, even across borders [Kindler 2010].

To improve supply reliability to customers during interruptions, the European Commission in July 2009 tabled a proposal for a Regulation “concerning measures to safeguard security of gas supply and repealing Directive 2004/67/EC” [COM 2009/363]. This draft measure calls for better preparedness of Member States for supply disruptions and introduces important novelties for the gas sector like the N-1 rule 55 and the possibility to reverse flows on interconnectors. The proposal includes biennial risk assessments, preventive action plans, emergency plans and the monitoring of the security of gas supply by a competent authority. In addition, the Commission proposes the introduction of three crisis levels (early warning, alert and emergency) and calls for the competent authority to develop emergency plans containing a strong element of cooperation between Member States. Another innovation set by the Regulation is the definition of a ‘Community emergency’, which may be declared by the Commission when the EU loses more than 10% of its daily gas imports. In this case, the Commission would coordinate actions of competent authorities and may go as far as intervening in actions of such authorities if it considers these actions as

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55 The N-1 means that the the gas transmission system can lose its biggest source, e.g. pipeline, storage etc. without risking the security of supply.
inappropriate or dangerous for other Member States. Strengthening the Gas Coordination Group and facilitating shared access to reliable supply information and data are other core elements of the proposal.

The Commission proposal has raised criticism mainly due to the dual approach it takes on introducing both a binding set of supply standards that the Member States should comply with and mandatory national security assessments. The first question focuses on whether similar standards can be made binding for all the countries or whether the required level of insurance might need to be country specific. Second, the benefits of security assessments for Member States are unclear, given that a certain level of security would be arbitrarily set from outside by the Regulation. The danger is, that Member States which are above the proposed standards take an indifferent attitude towards the whole proposal while the ones lagging behind oppose it and try water down the standards to the extent possible. [Noel 2010] proposes an alternative strategy where the Commission should opt for making the gas security assessment reports as in-depth as possible and carried out in a context of a regional security group assisted by the Commission and high-level independent experts. Noel argues that the high level scientific reviewers and the public availability of all documents would act as efficiently as the binding standards to guarantee that the Member State is taking the required actions, but at the same time also offer the flexibility needed.

The negotiations are ongoing, the European Parliament is in its 1st reading and the amended draft regulation has been unanimously approved in the ITRE committee. The plenary vote will take place at a later stage depending on the outcome of the negotiations.
4. Conclusions and Recommendations

This chapter summarizes the main points found in chapters 1 through 3, including lessons to be learnt from difficulties of implementation for the future.

Based on these conclusions, recommendations, and suggestions to overcome difficulties of implementation and of adopting a unified/harmonized approach are developed. The recommendations give due regard to the institutional and legislative context. Recommendations with respect to a potential 4th package are considered.

4.1. Status of liberalization

The level of liberalization of European electricity and natural gas markets has increased during recent years. Nonetheless, liberalization is not as advanced as anticipated when the 2nd energy package was adopted and the variance between Member States is still large. In comparison, the telecommunications market that is perceived to be the most liberalized of the utility sectors has only a slightly higher level of liberalization, but virtually no national variance.

4.2. Critical Analysis of the 2nd and 3rd packages

Access to networks and cross-border infrastructure is crucial for integration of national markets and for reducing barriers for new market entrants. Information provision by TSOs and capacity allocation systems on cross-border interconnections to optimize network use are lacking or insufficient. In general, the coordination and cooperation across borders is inadequate. In these respects, the 2nd package is not properly implemented.

Regional Initiatives (RI) have been established on a voluntary basis without connection to the 2nd package, which does not foresee common regional infrastructure planning. However, during the relatively short time that the RIs have been operational, there has been real progress in transparency, capacity allocation, and congestion management. In general, the electricity RIs are more advanced than the natural gas RIs.

The 3rd package will introduce obligations for the regulators and TSOs to cooperate regionally. According to the new Electricity Directive the geographical area covered by each regional cooperation structure may be defined by the Commission. RIs should be defined on a case by case basis depending on the issue. They should be consistent with a coordinated European objective and harmonized wherever possible. RIs should involve Member State governments better.

Progress has been made in the competences allocated to the NRAs and their independence. Nonetheless, powers and tasks of NRAs vary a lot for the moment, but will be more harmonized after the 3rd package has been transposed. Monitoring harmonized implementation will be important in this respect. The major problems are the lack of effective enforcement action by the competent authorities and the absence of effective systems of penalties at national level. Also, there is a significant lack of autonomy on the part of ‘independent’ regulatory agencies.

Regulated prices for both private households and industry, notably in electricity and including electricity-intensive industrial customers, are still abundant. They are a significant obstacle to efficient and fair competition. Regulated tariffs distort competition and hinder market entry and infrastructure development. They should be eradicated with priority on industrial users.
With respect to the protection of vulnerable customers, the Electricity Directive of the 3rd package specifies: “Member States should take the necessary measures to protect vulnerable customers in the context of the internal market in electricity. Such measures may differ according to the particular circumstances in the Member States in question and may include specific measures relating to the payment of electricity bills, or more general measures taken in the social security system.”

Implementation monitoring by the European Commission should ensure that the definition of vulnerable customers is restrictive and does not provide for possibilities to private customers or industry as such. Alternative protection measures for vulnerable customers include social benefits, specific tax policies or direct subsidies. Here, compatibility with EU state aid rules must be ensured.

4.2.1. Assessment of 3rd package implementation timeline
Based on the experiences made with the implementation of the 2nd package, an equally slow and tedious implementation process of the 3rd package may be expected. It is recommended that the European Parliament monitors the implementation of the 3rd package closely and keeps pressure on the Commission (and regulators to the extent possible) to enforce proper implementation.

4.3. Potential 4th package
The 3rd package, if transposed and implemented properly, together with independent ongoing activities will advance the liberalization and market integration on European level considerably. At the present stage, it is too early to judge whether this will be sufficient or whether a 4th package will be necessary. Thus, details of a possibly required 4th package cannot be described at the present stage.

An issue that may develop in the future is the need for additional competencies for the European Agency for the Cooperation of Energy Regulators (ACER) in order for it to be able to play its role in creating a more integrated market. It is recommended that the European Parliament monitors and studies this closely.

A potential 4th package could also address the guidelines and codes for market design should the currently undertaken work not deliver the desired results.

The 3rd package has not introduced ownership unbundling on the distribution level. The impact assessment accompanying the package contains, however, several arguments for further unbundling of DSOs. If the producers of renewable energies continue to experience problems in grid connection in the future, a 4th package might have to address this issue.

The Financial Instruments Directive (MiFID) and the Market Abuse Directive (MAD) that currently regulate the markets do not contain specific transparency and integrity obligations applicable to traded energy markets. However, the NRAs must have access to data on transactions in the same way as the system users need the data on network use, generation, storage, and consumption. The Committee of European Securities Regulators (CESR) and the European Regulators’ Group for Electricity and Gas [EREGE] have suggested that a framework carefully tailored to the needs of particular energy and energy derivatives markets should be designed.

4.3.1. Lisbon treaty
An aspect worth mentioning in the context of future legal developments is that the Lisbon treaty provides a possibility for the Member States for enhanced cooperation also in the field of energy. Article 329 TFEU allows for enhanced cooperation in “one of the areas
covered by the Treaties” other than areas with exclusive competence, and energy falls under this category. A minimum of nine participating states can initiate enhanced cooperation as long as it does not “undermine the internal market or economic, social, and territorial cohesion”, nor jeopardize trade relations nor distort competition between them. However, the decisions taken within the enhanced cooperation are not part of the acquis and do not bind Member States not participating. It remains to be seen whether a group of Member States would wish to proceed in this direction.

4.3.2. Infrastructure investments

It is an open question whether the currently developed new Infrastructure Package and the forthcoming Infrastructure Instrument (see Chapter 3.3.3 for details) will provide the required infrastructure incentives.

The current stimulus package providing financing for gas and electricity infrastructure projects that are of ‘European interest’ are much more substantial than the previously allocated TEN-E funds. These measures are intended to provide a one-time economic stimulus to the economy. The majority of the market participants argue that in order to avoid competition distortion, eligible projects should be able to raise their financing from the markets according to market principles also in the future. It is recommended to analyse the Commission’s revision of the TEN-E guidelines once available for the development of further conclusions and recommendations.

The EU 20-20-20 target includes the reduction of primary energy consumption by 20% until 2020. An increase in natural gas consumption without violation of this target seems unlikely even if natural gas replaces coal in power generation. There have been indications that resource constraints in supplier countries may not allow to increase or even maintain current consumption levels in natural gas over the next decade. However, for the EU, expected accumulated output losses will most likely reduce EU gross domestic product by 10% in 2020, compared to projections before the economic crisis. While it is unclear at the moment what the projected gas demand would be in the next decade, required additional infrastructure investments for system or market integration may not be justified on a strictly market basis. Infrastructure planning at EU level should analyse these constraints in more detail, and take them into account.

Similarly, increasing penetration levels of renewable energies will require additional investments in electricity and gas infrastructures from a reliability or security of supply perspective without necessarily increasing traded volumes. Justification of investments is difficult in view of possibly lacking return on investment.

Additionally, beneficiaries of these infrastructures may spread over a large region. Therefore, their construction by a single country or pair of countries may be particularly challenging. Mechanisms for cooperation should be developed and implemented to achieve their construction.

Furthermore, market integration has specific issues related to increasing renewable energy shares. Currently, investments in renewable energy sources aim for maximum subsidy which leads to a sub-optimal allocation of investments into regions with weaker renewable resources and thus higher generating costs. Hence, harmonised support schemes would avoid distorted investment decisions and possibilities for gaming. There may be no need to have a uniform system across the EU for all technologies. But the same technologies should fall under a support mechanism to be agreed upon by all Member States. Furthermore, it is recommended to include incentives in the support schemes for renewables to react to system conditions and system requirements.
In essence, infrastructure investments required for security of supply, increasing renewable energy shares and market integration may need additional incentives beyond market economics.
REFERENCES


- Annual Reports of the National Regulator Authorities of the EU27 countries 2009, available: http://www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_PUBLICATIONS/NATIONAL_REPORTS/National%20Reporting%2009


• ERGEG 2006: Compatibility of National Legal Conditions Concerning Regulatory CompetencesRef: E06-REM-08-03 6 December 2006


• ERGEG 2009a: Safeguarding the move to a single EU energy market, ERGEG Regional Initiatives Progress Report - November 2009: http://www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_INITIATIVES/Progress_Reports/2009


• ERGEG 2009d: European Regulators’ Experience with Article 22 exemptions of Directive 2003/55/EC 2008 Update of ERGEG’s internal survey Ref: E08-GIF-02-03, 10 March 2009

• ERGEG 2009e: Final Guidelines of Good Practice on Electricity Grid Connection and Access, Ref: E09-ENM-16-04, ERGEG, 10 December 2009


• Eurelectric 2010: Interview with Mr. Pierre Schlosser, Gunnar Lorenz and Marco Foresti, 26.2.2010


• Eurogas 2009: Eurogas on the Communication "TOWARDS SECURE, SUSTAINABLE AND COMPETITIVE EUROPEAN ENERGY NETWORKS", 27.3.2009: www.eurogas.org/publications_positionPapers.aspx -


• EWEA 2010: Interview with Paul Wilczek, Regulatory Affairs Advisor in EWEA - European Wind Energy Association asbl, 18.3.2010


• Hellner 2010: Interview with Cecilia Hellner ENTSO-E 18.2.2010


• Kindler 2009: Presentation by Vice-President of ERGEG Johannes Kindler “Sector specific regulation for energy trading” in the Florence Forum December 2009: ec.europa.eu/energy/.../meeting_17_5_ergeg_market_transparency.pdf

• Kindler 2010: Presentation by chairman of the German regulator BNetzA Johannes Kindler in Security of gas supply conference organized by the EPP group in the European Parliament, 3.2.2010


• Marco Foresti, 26.2.2010


• NETS 2009: NETS progress report, downloadable from: www.energy-community.org/pls/portal/docs/406207.PDF


ANNEX 1: PROGRESS OF ELECTRICITY REGIONAL INITIATIVES

The Baltic Region has adopted common balancing rules and is about to finalize a common set of transparency data for the region. Estlink 1 is in operation between Finland and Estonia and Estlink 2 is planned. The provision for Estlink 2 is that Baltic countries liberalize their electricity markets and start trading in Nord Pool. The implementation of the Baltic Energy Market Interconnection Plan BEMIP\(^{56}\) would integrate the Baltic States into the EU market.

The Central East European Region (CEE)\(^{57}\) has issued a regional transparency report and created a region-wide Common Allocation Office (CAO) in order to allow for a regional flow based congestion management in the future (possibly starting 2010). Progress in removing market entry barriers, balancing and market design is, however, limited.

The Central-South Region (CS)\(^{58}\) published a transparency report in 2009 and from 2010 onwards all relevant information will be published on the TSOs or the ETSO Vista-site.\(^{59}\) A single auction office for coordinated allocation procedures has been set up but because of opposition from some TSOs no auctions have taken place yet. As to other priority areas, there is little progress regarding the compatibility of balancing markets and national legal frameworks and interconnections [Everis and Mercados 2009 and ERGEG 2009a].

In the Central-West Region (CW)\(^{60}\) the trilateral market coupling of the Belgian, French and Dutch spot markets has been in place since 2006 and the linking with Germany and Luxembourg is awaited in mid-2010. The CW region has also adopted a transparency report, a single auction platform (CASC-CWE)\(^{61}\) and a set of rules for cross-border exchanges. The regional investment plan has been passed on to the intergovernmental Pentalateral Forum due to NRA’s lack of competence.

The France-UK-Ireland Region (FUI) has made progress on border balancing on the French-English Interconnector and for the two TSOs to access the cross-border balancing services in the UK and France. Furthermore the FR-UK interconnector offers a one-stop-shop for all capacity management aspects now [Everis and Mercados 2009 and ERGEG 2009a].

In the South-West Region (SW)\(^{62}\) the MIBEL\(^{63}\) has integrated the Spanish and Portuguese markets since 2007. On top of the interconnection capacity between the two countries, the governments of France and Spain signed an agreement to build a power new power line through the Eastern Pyrenees that could almost double the commercial capacity by 2014. There is also a proposal for a balancing model presented by the TSOs.

The North Region (N)\(^{64}\) incorporates countries that belong to Nord Pool and which are highly integrated. The N region has published a transparency report and although the balancing market is advanced, the coupling of the Danish and the German TSOs has been slower than anticipated. Financing new interconnectors and cooperation on integrating wind energy show limited progress [Everis and Mercados 2009 and ERGEG 2009a].

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\(^{56}\) For more see chapter 2.5.2.

\(^{57}\) Austria, Czech Republic, Germany, Hungary, Poland, Slovakia and Slovenia.

\(^{58}\) Austria, France, Germany, Greece, Italy, Slovenia.

\(^{59}\) www.etsovista.org offers the central market information services free of charge to all interested parties.

\(^{60}\) Belgium, France, Germany, Luxembourg, Netherlands.

\(^{61}\) Capacity Allocating Service Company for Central West Europe.

\(^{62}\) France, Portugal and Spain.

\(^{63}\) Mercado Ibérico de Electricidade.

\(^{64}\) Denmark, Finland, Germany, Norway, Poland, Sweden.
ANNEX 2: PROGRESS OF GAS REGIONAL INITIATIVES

The North West (NW) region is the largest of the GRIs by geographical scope and volume. The fact that the region is more interconnected than the other regions, together with a larger number of gas hubs, increases the liquidity in the area. The NW region has advanced on many topics. Concerning the region's priorities, a transmission transparency project has been implemented at the majority of interconnection points and there are improvements in storage transparency. The primary and secondary capacity markets are strengthened and new capacity products are available. The region produced an action plan to overcome barriers in trade for the Danish GTF hub and after successful implementation stakeholders in other hubs have been interested to follow. Regarding investments, the open season at the Belgian-French border increased understanding of the procedure and a project plan to facilitate investments is on its way. Already earlier the NRAs had committed to a consistent regulatory framework [Everis and Mercados 2009 and ERGEG 2009a].

The South region (S) is the smallest of the GRIs but strategically important due the several LNG terminals in the area. In Spain and Portugal the demand for gas is still increasing whereas France is a more mature market. The region has launched an open season procedure for the interconnection capacity between France and Spain. The subscriptions override the available capacity offered and indicated that there was a need for more capacity. Furthermore, the South region has improved data publication and interoperability. The General principles and Organization model of the Iberian Gas Market (MIBGAS) were published in 2008.

The South-South East (SSE) region has heterogeneous national gas markets ranging form Greece, where gas was introduced only ten years ago, to the more mature markets like Austria. The region is important for the security of EU energy supplies and several countries are dependant to a large extent on Russian gas. The local incumbents control the market in each country and have limited interest in making the markets more liquid. The SSE has been able to create a Standard Bulletin Board for Capacity Trading. Similarly, a one-stop-shop has been proposed and studied. This would allow shippers who want to transport gas through several countries in the region to use only a single booking. Regarding interoperability, IPAs and OBAs on several interconnection points have been reached [Everis and Mercados 2009].
Trading in the European power markets has been increasing in recent years. From 2007 to 2008, volume of electricity traded at power exchange spot markets (day-ahead) rose by 93TWh or 9.6% [ERGEG 2009b]. The development of traded volumes is illustrated in Figure 17. Figure 18 shows the percentage of consumption traded in power exchange for each country.

- Nord Pool (NP) is the largest power exchange in Europe, both in terms of physical and financial trade volumes. Nord Pool operates in Denmark, Finland, Norway and Sweden, and the market is coupled with German power market.
- European Electricity Exchange (EEX) is based in Germany, and EEX cooperates with the French Powernext (PWXT). EEX holds 50% of the joint venture EPEX Spot based in Paris, which operates spot trading for Germany, France, Austria and Switzerland.
- The volume of Italian power exchange (IPEX) is large both in absolute terms and compared to consumption. The exchange is organised on the basis of the pool system. The exchange is managed by a market operator (Gestore Mercato, GME), who collects all the bids and determines the merit order. Demand bidding started in 2005.
- Iberian power exchange (MIBEL) operates both Spanish and Portuguese spot trading. Trading is voluntary but encouraged with capacity payments.
- Anglo-Dutch APX group operates markets for electricity and gas in the Netherlands, the United Kingdom and Belgium.
- Belgian power exchange (Belpex) operates only physical short-term power market.
- Energy Exchange Austria (EXAA) was launched in March 2002. Austrian power market is strongly interconnected to Germany.
- Polish Power Exchange (Polpx) was established in 1999 and trading was launched in 2000.

Besides other reasons (mainly maturity of the exchange), differences in traded volumes can be explained with differing market designs. In some Member States (for instance Italy and Spain), power exchange trading is or has been in practice mandatory or trading is encouraged with financial benefits.
Figure 17: Electricity volumes (spot market) traded at European power exchanges 2006-2008.

Figure 18: Volume of electricity traded in power exchange versus consumption in 2007

Source: EC 2009b
## ANNEX 4: GAS STORAGE LEVELS 2008

<table>
<thead>
<tr>
<th>Region</th>
<th>Total 2008</th>
<th>New since 2007</th>
<th>Under construction</th>
<th>Planned</th>
<th>Max withdrawal rate mcm/day 2008</th>
<th>Max injection rate mcm/day 2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>North</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UK</td>
<td>3.863</td>
<td></td>
<td></td>
<td></td>
<td>76</td>
<td>30</td>
</tr>
<tr>
<td>DK</td>
<td>1.001</td>
<td>90</td>
<td>30</td>
<td></td>
<td>16</td>
<td>7</td>
</tr>
<tr>
<td>NL</td>
<td>5.078</td>
<td>180</td>
<td></td>
<td></td>
<td>4280</td>
<td>177</td>
</tr>
<tr>
<td>BE</td>
<td>635</td>
<td></td>
<td></td>
<td></td>
<td>23</td>
<td>6</td>
</tr>
<tr>
<td>DE</td>
<td>18.388</td>
<td>120</td>
<td>1501</td>
<td></td>
<td>7225</td>
<td>19816</td>
</tr>
<tr>
<td>PL</td>
<td>1.575</td>
<td></td>
<td></td>
<td></td>
<td>34</td>
<td>19</td>
</tr>
<tr>
<td>LV</td>
<td>2.300</td>
<td></td>
<td>1000</td>
<td></td>
<td>24</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>32.840</td>
<td>390</td>
<td>1501</td>
<td></td>
<td>12535</td>
<td>770</td>
</tr>
</tbody>
</table>

| South-West |            |                |                   |         |                                 |                               |
| PT         | 150        |                |                   |         | 7                               | 3                             |
| FR         | 12.730     | 180            | 540               |         | 1250                            | 213                           |
| ES         | 3.829      |                |                   |         | 153                            | 10                            |
| Total      | 16.709     | 180            | 540               |         | 1250                            | 373                           |

| South-East |            |                |                   |         |                                 |                               |
| CZ         | 2.250      |                |                   |         | 795                            | 36                            |
| SK         | 2.600      |                |                   |         | 34                             | 29                            |
| IT         | 13.014     | 330            | 4152              |         | 6525                           | 254                           |
| BG         | 350        |                | 450               |         | 3                              | 3                             |
| RO         | 2.694      |                | 2150              |         | 22                             | 3                             |
| GR         | 0          |                |                   |         | 0                              | 0                             |
| AT         | 4.120      | 1200           | 1200              |         | 2000                           | 44                            |
| HU         | 3.720      | 2300           |                   |         | 51                             | 26                            |
| Total      | 28.748     | 3830           | 5352              |         | 11920                          | 445                           |
| EU Total   | 78.297     | 4400           | 7393              |         | 25705                          | 1.588                         |

### Sources:
- Study on natural gas storage in the EU, DG TREN 2008
ANNEX 5  PROCEEDURES TO FACILITATE INFRASTRUCTURE INVESTMENTS IN GAS

Transmission network infrastructure can either be provided on a regulated basis by TSOs or through private investments by means of ‘merchant’ models. In the merchant model, the owner receives revenues from access fees. These tariffs are usually unregulated. While in electricity, privately funded interconnections usually connect two areas that have sufficient price differences in order for the investment to pay off, merchant pipelines in gas concern big import pipelines. To date two major procedures are used to facilitate infrastructure investment in gas. They are described below.

- The open seasons (OS) procedure is a pro-competitive process, allowing interested third parties to gain access to new capacity (shipping, LNG or storage capacity) on a non-discriminatory and transparent basis. They can be initiated by one or more TSOs, depending on where the new capacity is located, or by the NRA if it deems action to be necessary but not taken by the TSO. In case two or more TSOs are involved (i.e., a so-called integrated OS) the goal is to synchronize capacity expansion across the two networks. Before an OS is initiated, it has to be determined whether there is contractual or physical congestion, and in case of physical congestions, whether it is sufficient to warrant new capacity investment. Consultation with system users should clarify this. The investor then has to notify the NRA of its intention, together with the procedures of the OS, in order for the NRA to evaluate the non-discriminatory and transparency aspects. Then, the OS itself can be initiated by publicizing its intention.

- This first phase is non-binding and allows interested parties to indicate what capacity at what terms they would be interested in. This allows the investor to evaluate whether the planned investment has to be expanded or decreased. After the first phase and the evaluation, the investor sends out proposals to the parties that expressed interest, who can agree by signing a binding agreement. The open season thus allows all parties to participate in new capacity, and by signing long-term agreements (often ten years or more) also allows the investor to finance the project. However, it does result in a conflict, since in order to finance the project, long-term agreements are necessary, but this can discriminate against new entrants, since they have less certainty about their position in five, ten or more years. This is why ERGEG insists to consider short-term allocation. The OS procedure allows the NRA to evaluate both short and long-term implications. The OS is also considered (as a temporary solution) because the lack of liberalization does not provide the necessary price-indications for infrastructure investment. Once a fully functioning energy market emerges, investment decisions would then be based on these price-indications instead of the OS.

- The gas release programmes have the same origin. The supply-lines providing gas to Europe are limited and mostly blocked by LTC of incumbents. In order to guarantee new entrants to the market, some NRA/governments have obliged the incumbent to force-sell some of its gas to the market. This is done under close supervision, scrutinizing the price and prohibiting sales to affiliated companies. The sale can be undertaken under a number of procedures: auction, first-come-first-served, using an exchange to boost its liquidity. Additionally, using an exchange can aid in establishing a more market-based gas-price. The procedure can also be extended to existing storage or shipping capacity, obliging the incumbent to force-sell some of its long-term rights to it. The gas releases are considered a temporary measure until the market matures.
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